Godden Mackay Logan
Heritage Consultants

Sydney Opera House: Vehicle and Pedestrian Safety Project (VAPS)

Archaeological Management Plan and Archaeological Impact Assessment

Report prepared for the Sydney Opera House Trust

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Report Register

The following report register documents the development and issue of the report entitled Sydney Opera House: Vehicle and Pedestrian Safety Project (VAPS)—Archaeological Management Plan and Archaeological Impact Assessment, undertaken by Godden Mackay Logan Pty Ltd in accordance with its quality management system. Godden Mackay Logan operates under a quality management system which has been certified as complying with the Australian/New Zealand Standard for quality management systems AS/NZS ISO 9001:2000.

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1.0 Introduction

1.1 Project Background

Godden Mackay Logan has been engaged by the Sydney Opera House Trust to prepare an Archaeological Management Plan and Archaeological Impact Assessment for the proposed construction of a new basement level beneath the Sydney Opera House. This project is known as the Vehicle and Pedestrian Safety (VAPS) project. This new basement level would incorporate a loading dock, security amenities and storage facilities, and would be accessed via a vehicular tunnel that would run from the existing surface access road to the south of Sydney Opera House to the proposed new basement level.

The provision of a new loading dock below Sydney Opera House and the associated access ramp would separate heavy vehicle deliveries from busy pedestrian areas and would increase public safety. It would also avoid the need for heavy vehicles to use the western and northern boardwalks.

1.2 Purpose of this Report

This report assesses the archaeological impacts of the proposed works and identifies management strategies to mitigate any identified adverse impacts.

This report has been prepared as part of the Environmental Assessment (EA) for the proposed works, to accompany an application to the Department of Planning for approval under Part 3A of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act).

This report has also been prepared to accompany an application to the Heritage Council of New South Wales under Section 60 of the *Heritage Act 1977* (NSW).

This report assesses the archaeological impacts of the proposed works only and does not assess any other heritage impacts that may be associated with the proposed works.

1.3 The Site

The Sydney Opera House site is located at 2 Circular Quay and Macquarie Street, Bennelong Point, Sydney, and occupies part of Lot 5 Deposited Plan 775888 at Bennelong Point, Parish of St James, County of Cumberland, City of Sydney; and part of Lot 4 in Deposited Plan 787933 at Circular Quay East, Parish of St James, County of Cumberland, City of Sydney (see Figure 1.1).

The study area of this report is the area beneath the podium of Sydney Opera House as well as the forecourt area of Sydney Opera House. The forecourt is defined as the area bounded by the base of the Sydney Opera House steps, the western side of the access road between the end of Macquarie Street and Sydney Opera House, the base of the wall of the Tarpeian Precinct of the Royal Botanic Gardens, and the eastern seawall of Bennelong Point (see Figure 1.1).

The study area for the Vehicle Access and Pedestrian Safety project is wholly contained on land that is in the care, control and management of the Sydney Opera House Trust.

1.4 Site History

Bennelong Point's history has been the subject of numerous reports and publications. This report relies largely on the historical research contained in the endorsed *Sydney Opera House—A Revised Plan for the Conservation of the Sydney Opera House and its Site* (3rd Edition) by James

Semple Kerr (see Appendix A), as well as detailed analysis of historical plans of the area. A summary of the historical development of the site, with particular focus on the physical development of the forecourt area, is included in Section 2.0 of this report.

1.5 Heritage Listings

Sydney Opera House is listed on the World Heritage List (see Appendix B).

Sydney Opera House is listed on the National Heritage List (see Appendix C).

Sydney Opera House and surrounds are listed on the Register of the National Estate (see Appendix D).

Sydney Opera House is listed on the New South Wales State Heritage Register (SHR) (see Appendix E).

Sydney Opera House is a heritage item in the *Sydney Local Environmental Plan 2005*.

The Bennelong stormwater channel (Bennelong SWC No. 29) is located within the study area and is listed on the Sydney Water Section 170 Heritage and Conservation Register as an item of Local significance (see Appendix F).

1.6 Statutory Context

1.6.1 UNESCO World Heritage List

Sydney Opera House was inscribed on the UNESCO World Heritage List on 28 June 2007 for its Outstanding Universal Value and as a Masterpiece of Human Creative Genius under criterion (i) of the Operational Guidelines for the Implementation of the World Heritage Convention.

1.6.2 National Heritage List

Sydney Opera House was included in the National Heritage List on 12 July 2005 under a range of criteria, including its significance as a masterpiece of modern architectural design, engineering and construction technology in Australia and as a national icon that has become an internationally recognised symbol of modern Australia.

The National Heritage List is compiled and maintained by the Commonwealth Department of the Environment, Water, Heritage and the Arts.

1.6.3 Environment Protection and Biodiversity Conservation Act 1999

The Sydney Opera House site is subject to the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act), owing to the World Heritage and National Heritage listings of the site. Part 3, Division 1 of the EPBC Act identifies requirements relating to matters of national environmental significance (Subdivision A—World Heritage and Subdivision AA—National Heritage).

Under Section 137 of the EPBC Act, approval of activities related to a World Heritage property must be consistent with:

(a). Australia's obligations under the World Heritage Convention; or

(b). the Australian World Heritage Principles; or

(c). a plan that has been prepared for the management of a declared World Heritage property.

Under Section 137A of the EPBC Act, approval of activities related to a National Heritage place must be consistent with:

(a). the National Heritage management principles; or

(b). an agreement to which the Commonwealth is party in relation to a National Heritage place; or

(c). a plan that has been prepared for the management of a National Heritage place.

The Sydney Opera House site is subject to a bilateral agreement between the Australian Government and the State of New South Wales made in 2005 pursuant to Section 45 of the EPBC Act. Under the terms of the agreement (Clause 8.1), an action taken at the Sydney Opera House site does not require the approval of the Commonwealth Minister for the Environment, Heritage and the Arts where:

> *the taking of the action has been approved by the State of New South Wales or an agency of New South Wales in accordance with the Management Plan for the Sydney Opera House …*

As the Sydney Opera House site is listed as a State Significant Site under Schedule 3 of the State Environmental Planning Policy (State Significant Development) 2005, any proposed development on the Sydney Opera House site would require the approval of the Minister for Planning. Such proposals would be subject to the assessment and approval processes outlined in Part 3A of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act) and the Sydney Opera House Management Plan under Section 46 of the EPBC Act submitted in August 2005.

The Management Plan referred to in the bilateral agreement provides a framework for protection of the National and World Heritage values of the Sydney Opera House site and has been endorsed by the Heritage Branch, Department of Planning (formerly the NSW Heritage Office). The Management Plan states that approval of actions in relation to the Sydney Opera House site may only be made in accordance with the Management Plan.

The Management Plan identifies that any proposed development on the Sydney Opera House site would require two statutory approvals one pursuant to the EP&A Act and one pursuant to the *Heritage Act 1977* (NSW) before works could commence.

1.6.4 Environmental Planning and Assessment Act 1979

The Sydney Opera House site has been declared a State Significant Site under Schedule 3 of the State Environmental Planning Policy (Major Development) 2005.

All development on the land covered by this State Environmental Planning Policy is therefore considered as State Significant Development. Part 3A of the EP&A Act applies to State Significant Development and the Minister for Planning is the consent authority where that development requires development consent.

Director General's Requirements

The Director General's Requirements (DGRs) for this project were issued by the Department of Planning on 17 December 2010. Section 2 covers Heritage and Archaeology:

2. Heritage and Archaeology

This EA must include a detailed Heritage Impact Statement prepared by a suitably qualified person which addresses the Conservation Management Plan prepared by J. S. Kerr as well as other matters including, but not limited to:

a) Details of the underground loading dock, vehicle access tunnel and associated works and assessment of the physical impact of the proposal works on the heritage significance of the Sydney Opera House;

b) The measures undertaken to minimise and mitigate potential heritage impacts;

c) Alternate designs and solutions that involve lesser intrusion into the forecourt, which may utilise other public and private lands;

d) An assessment of the likely impacts of the proposal on Aboriginal cultural heritage values and the protection measures to be adopted during the works;

e) An assessment of how much of the existing Sydney Opera House building fabric is to be demolished or removed, level of significance and physical condition;

f) Justification for the removal of any intrusive fabric and consideration for reuse. If historic fabric is to be demolished or removed a storage disposal strategy is required outlining preferred options and possible alternatives for the use of historic fabric;

g) Consideration of measures to conserve and protect the ovoid Bennelong Stormwater outfall;

h) Demonstration (if applicable) to adherence to the principles, processes and practices of the Burra Charter (Australia ICOMOS)

i) Demonstration (if applicable) of consideration of advice contained in Statements of Heritage Impact published by the Heritage Office; and

j) Demonstration of compliance with Sydney Opera House Conservation Plan dated 23 June 2003.

The EA must also include an Archaeological Assessment prepared by a suitably qualified person in accordance with Heritage Council Guidelines and should make references to any previous archaeological studies.[1]

It is our understanding that a standard Heritage Impact Assessment of the above ground impacts [(DGR issues 2 a), b), c), e), f), h), i) and j)] would be undertaken by another consulting firm.

The current report responds to DGR's 2.a), b), d), g), h), i) and j) where they relate to historical and Aboriginal archaeology only.

An assessment of the likely impact of the proposal on Aboriginal cultural heritage values and the protection measures to be adopted during the works DGR 2.d) are addressed in separate report that is currently being prepared titled 'Sydney Opera House: Vehicle and Pedestrian Safety Project–Aboriginal Cultural Heritage Values'.

Consideration of measures to conserve and protect the ovoid Bennelong Stormwater outfall DGR 2.g) are addressed in Section 4.3.2 of this report.

The current report adheres to the Burra Charter (Australia ICOMOS) principals and the *Statements of Heritage Impact* published by the Heritage Branch referring to DGR's 2.h) and i) respectively.

The current report adheres to the Sydney Opera House Conservation Plan, covering DGR 2.j) where they relate to archaeology. This is detailed in Section 4.4 of this report. It is our understanding that other policies from the Conservation Plan apply to the proposed development on above ground impacts and these are being addressed by another consulting firm.

The current report is an "Archaeological Assessment prepared by a suitably qualified person in accordance with Heritage Council Guidelines" and makes reference to previous archaeological studies (See Section 5.3).

1.6.5 Heritage Act 1977

The *Heritage Act 1977* (NSW) would usually only apply to the proposed development of a State significant site if the Minister were to determine that the proposed works were subject to the provisions of Part 4 of the EP&A Act. However, the Sydney Opera House Management Plan under the EPBC Act requires that the Heritage Act still apply to this site. The relevant provisions of the Heritage Act include:

State Heritage Register

Sydney Opera House is listed on the NSW SHR.

The SHR, established under the Heritage Act, is a list of identified heritage items of particular importance to the people of New South Wales. It includes items and places determined to be of State heritage significance. The Heritage Act governs the development of sites registered on the SHR, specifying compliance with a variety of requirements prior to development under Sections 56–65A of the Act.

Section 57 of the Heritage Act states:

> *When an Interim Heritage Order or listing on the State Heritage Register applies to a place, building, work, relic, moveable object, precinct, or land, a person must not do any of the following things except in pursuance of an approval …*
>
> *(c) move, damage or destroy the relic or moveable object,*
>
> *(d) excavate any land for the purpose of exposing or removing the relic,*
>
> *(e) carry out any development in relation to the land on which the building, work or relic is situated …*

The relics provisions of the Heritage Act (Sections 138–146) do not specifically apply to sites that are listed on the SHR, although the site may contain 'relics' as defined by the Heritage Act.

Section 170 Heritage and Conservation Register

The historic subterranean stormwater channel (Bennelong SWC No. 29) that crosses the site is in the ownership of Sydney Water and is listed on its Section 170 Heritage and Conservation Register as an item of High historical and technical significance. Sections of the original (decommissioned) drain would be removed as part of the proposed works.

Section 170 of the Heritage Act requires government instrumentalities to maintain a heritage and conservation register of heritage items in their ownership or control and requires minimum

standards of maintenance and repair to all items listed on this register. Notice must be given to the Heritage Council of New South Wales prior to removal of any item from the agency's Section 170 Register, transferral of ownership of any listed items or demolition of any items.

1.7.6 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NSW) (NPW Act) would only apply to the proposed project if the Minister were to determine that the proposed works were subject to the provisions of Part 4 of the EP&A Act. Relevant provisions of the NPW Act, if they were to apply, are discussed below.

The NPW Act provides statutory protection for all Aboriginal objects (consisting of any material evidence of the Aboriginal occupation of New South Wales) under Section 90 and for 'Aboriginal places' (areas of cultural significance to the Aboriginal community) under Section 84. Aboriginal objects and places in New South Wales are afforded automatic statutory protection through the NPW Act, whereby it is an offence (without the Minister's consent) to:

> *Damage, deface or destroy Aboriginal sites without the prior consent of the Director-General of the National Parks and Wildlife Service…*

The NPW Act defines an 'Aboriginal object' as:

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

There is one registered Aboriginal site within the study area (Site No. 45-6-1615 in the Aboriginal Heritage Information Management System (AHIMS) database, recorded as a 'midden'), but the condition of this site is recorded as 'destroyed' (this site was destroyed before it was recorded in 1983).

The proposed works would not affect any known Aboriginal sites and would be unlikely to disturb any Aboriginal objects.

1.7 Methodology

This report has been prepared following a thorough conservation planning process and considers the potential Aboriginal and historical archaeological resource. The methodology used is based on the guidelines contained in the *NSW Heritage Manual* (Department of Urban Affairs and Planning and the Heritage Council of NSW, 1996), including 'Archaeological Assessments' and 'Statements of Heritage Impact', and applies the principles contained in *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance 1999*.

1.8 Limitations and Exclusions

This assessment is based on review and analysis of available historical information, including the 2003 Conservation Plan and copies of historical plans of the site provided by Design 5 Architects.

The description of the proposed works and assessment of potential heritage impacts are based on information provided by the proponent.

This report does not consider any geotechnical information about the site.

Consideration of the potential Aboriginal archaeological resource associated with the site comprised a check of the AHIMS database (which is maintained by the Department of Environment, Climate Change and Water (DECCW)) and consultation with Allen Madden of the Metropolitan Local Aboriginal Land Council in relation to the proposed works.

An assessment of the likely impact of the proposal on Aboriginal cultural heritage values and the protection measures to be adopted during the works are addressed in separate report that is currently being prepared titled 'Sydney Opera House: Vehicle and Pedestrian Safety Project– Aboriginal Cultural Heritage Values'.

1.9 Author Identification

This report has been prepared by Godden Mackay Logan staff including Anne Mackay, Senior Associate, and Lyndon Patterson, Consultant. Consultation was undertaken with the Metropolitan Local Aboriginal Land Council by Laura Farquharson, Consultant. The report has been reviewed by Professor Richard Mackay, AM, Partner of Godden Mackay Logan.

Figure 1.1 Site location plan, with the study area of this report outlined. (Baseplan source: Google Earth)

1.10 Endnotes

[1] NSW Department of Planning, 2009, Director General's Environmental Assessment Requirements, Sydney.

2.0 Assessment of Archaeological Potential

2.1 Historical Summary

2.1.1 Bennelong Point

Bennelong Point's history has been the subject of numerous reports and publications. This report relies largely on the historical research contained in the endorsed *Sydney Opera House—A Revised Plan for the Conservation of the Sydney Opera House and its Site* (3rd Edition) by James Semple Kerr (see Appendix B), as well as detailed analysis of historical plans of the area. The site's layered history is discussed in the Conservation Plan according to the following periods of land use:

- Phase 1: 1788–1795—The earliest period of European settlement in Sydney Cove when Bennelong Point was the location of Bennelong's brick hut and, a short while later, a saltworks and windmill.
- Phase 2: 1788–1802—A period of anxiety for the early settlers when the defensive value of Bennelong Point was realised through the construction of a redoubt (1789), later falling out of use, to be replaced with a 'half moon' battery (1798).
- Phase 3: 1810–1843—Work commenced on the construction of a fort at the northern tip of the peninsula (Fort Macquarie) in 1817, while large parts of the rest of Bennelong Point and the surrounding area were reserved for parks and public space.
- Phase 4: 1817–1901—A period in which Fort Macquarie's gothic towers dominated the area, notwithstanding its flaws as a defensive facility. The fort was augmented with new gun batteries in the 1860s and at this time an esplanade was built around the fort by creating an encircling seawall and steam ferries began operating from points along the shore. In the late nineteenth century, the eastern side of Sydney Cove (the western shore of Bennelong Point) was converted to use by trading companies for major longshore wool, mail and passenger wharves. In the 1890s the western rampart of the fort was demolished to make way for facilities associated with the P&O operation that dominated the western shore.
- Phase 5: 1901–1958—The early twentieth century saw Bennelong Point accommodate a number of jetties for use by the public, serviced by a tramline to a new 'tram-car house' which came to be known as 'the shed' in spite of its Neo-Gothic design. The shed was built on the site of Fort Macquarie and was large enough to house 72 trams on 12 parallel tracks. The shed became redundant in the 1950s.
- Phase 6: 1955–present—This period saw the conception of Sydney Opera House, which was completed over the next two decades amid ongoing controversy and opened in 1973.

2.2 Site Formation and Disturbance

The potential for relics to survive at the site depends on the nature of activities undertaken there over the years (the phases of development). Some activities have the potential to disturb or destroy relics, while others (such as introducing or removing fill deposits) can enhance or reduce the chances of archaeological relics surviving.

On the basis of the many activities that have taken place on the site in the twentieth century, the New South Wales State Heritage Register citation notes that 'it is unlikely that much archaeological potential is retained in relation to its historical associations …'. However, excavations beneath Sydney Opera House in the early 1990s and minor excavations for a lift well in 2004 exposed wall footings of a previous structure(s) at a relatively shallow depth, suggesting that levels of disturbance in parts of the site might be lower than expected.

Major episodes (or areas) of modification or potential disturbance are discussed below.

2.2.1 Bennelong Point

Land Reclamation

Bennelong Point was used throughout the nineteenth and twentieth centuries for a variety of purposes, including reclamation of the shorelines and modification of the landform that changed the shape and character of the area throughout its history.

By 1829, parts of the shoreline of Bennelong Point had been modified and reclaimed. This process continued over the next century, with various phases of seawall and wharf construction.

The shoreline along the southeastern section of the peninsula was the first section to be reclaimed (by 1829) and a boat slip had been created in this area by 1845.

In 1861, an esplanade was created around Fort Macquarie by erecting an encircling seawall and filling the area formerly covered by high tides.

The western shore was used from the 1860s (but mainly from the 1880s) for wharves, jetties and wharf buildings. In the late nineteenth century, earlier wharf buildings were demolished and then replaced with larger wharf facilities by P&O. The expanded P&O facilities were demolished as part of the Sydney Opera House development.

The present shorelines of Bennelong Point, which are contained by seawalls, represent entirely reclaimed land.

Episodes of reclamation of the shorelines of Bennelong Point throughout the nineteenth and twentieth centuries would have been unlikely to have caused any major disturbance to archaeologically sensitive deposits and in some cases may have sealed historical ground levels, original shorelines and remains of other features beneath introduced fill deposits, thereby providing some protection for the survival of such remains.

Modification to Ground Levels

The physical development of Bennelong Point over the nineteenth and twentieth centuries has also affected the ground levels of the peninsula.

A photograph taken in the late 1850s shows the top of the Bennelong stormwater channel exposed along the western side of Fort Macquarie (see Figure 2.13). The top of the channel protrudes just above the surrounding ground surface in this image, which gives an indication of the mid nineteenth-century ground levels in relation to the channel. It is understood that this section of the channel was decommissioned as part of the Sydney Opera House construction. The extent of impact of the construction of the 1901 tram-car house on the original channel is unknown. On the basis of this 1850s photograph, it is understood that this section of channel is located approximately

two metres below the current ground (forecourt) surface, which suggests that this area may have been built up by approximately two metres since this time.

The most significant modification to ground levels across Bennelong Point were most likely in association with construction of the tram house and associated track infrastructure in the early twentieth century, as well as the construction of Sydney Opera House in the 1960s–1970s.

Modifications to ground levels throughout the history of Bennelong Point have largely involved the introduction of fill deposits and reclamation of shorelines. On this basis, these episodes of modification would have been unlikely to have caused any major disturbance to archaeologically sensitive deposits and in some cases may have sealed historical ground levels and remains of other features beneath introduced fill deposits, thereby providing some protection for the survival of such remains.

Sydney Opera House Construction

Construction of Sydney Opera House in the 1960s–1970s had a dramatic impact on the physical form of Bennelong Point, including:

- modification of the shape of Bennelong Point with the construction (and some replacement) of seawalls around the entire shoreline;
- regularisation of ground levels through the introduction of fill deposits to create a level forecourt and broadwalk platforms;
- excavation for the construction of basement levels and other structural elements of Sydney Opera House itself; and
- construction of other infrastructure associated with Sydney Opera House and its operation.

The construction of Sydney Opera House would therefore have resulted in major impacts on archaeologically sensitive deposits beneath the footprint of Sydney Opera House, particularly in the basement and sub-basement areas. However, excavation for a lift shaft in 2004 revealed the presence of some substantial sandstone structural remains beneath the building, most likely associated with Fort Macquarie. Information recorded during the 2004 works indicates that the structural remains were located within the existing basement level of Sydney Opera House (that is, between levels RL+3.658 (AHD) and RL-0.305 (AHD) [+12' and -1']) (see Figures 2.14 and 2.15). This evidence indicates that while major disturbance is likely to have occurred across much of the site, there are areas beneath Sydney Opera House that still retain archaeological potential.

The construction of Sydney Opera House is likely to have had a relatively minor impact on any archaeologically sensitive deposits within the forecourt area. Photographs taken in the 1960s–1970s, which show the construction of Sydney Opera House in progress, do not indicate any specific episodes or areas of major disturbance or excavation within the forecourt area (see Figures 2.16–2.18).

Evidence of the tram tracks has been exposed at relatively shallow levels on Bennelong Point, indicating that excavation work associated with the construction of Sydney Opera House had only a limited impact on these relics in at least some places.

Underground Services

The forecourt area contains a number of underground services including conduits, access pits and other infrastructure associated with electricity, water, telecommunications and sewerage. An indicative service layout is shown in Figure 4.2. Many of these services would be located within introduced fill deposits, though some elements are likely to have extended below historical ground levels. However, the impact of these services on archaeologically sensitive deposits is likely to be relatively minor and localised.

Bennelong Stormwater Channel

The Bennelong Stormwater Channel was one of five combined sewers built in Sydney c1857 in order to dispose of the city's stormwater and sewage into Sydney Harbour. The portion of the channel that extended along Bennelong Point serviced the CBD area and was of brick oviform construction. The channel originally discharged adjacent to Fort Macquarie and was diverted beneath Sydney Opera House. Some original fabric would have been removed at this time, though it is likely that some sections of the decommissioned oviform channel remain in place. Part of the channel was also relocated in the 1980s in association with the construction of the Bennelong Point Parking Station.

It is understood that a section of the original brick oviform channel extends immediately north of the Tarpeian Way cliff face for approximately 20 metres. The original channel was diverted at this point in the 1960s–1970s as part of the Sydney Opera House construction works and was curved further to the east. It is understood that the 1960s–1970s diversion was constructed as a concrete box culvert.

The diversion of the channel in the 1960s–1970s and 1980s would have also resulted in localised disturbance along the diversion route, which would have removed or disturbed any deposits or features that were present along this alignment.

Other Areas of Disturbance

Ventilation shafts and tunnels associated with the Bennelong Point Parking Station also extend within the forecourt area. A pedestrian tunnel also provides a direct link between the lower forecourt and the parking station. The construction of this infrastructure in the 1980s would have resulted in localised but major disturbance of any archaeological remains within these areas.

2.3 Archaeological Potential

2.3.1 Aboriginal Archaeological Potential

A search of the Aboriginal Heritage Information Management System (AHIMS), the database of recorded Aboriginal sites maintained by the Department of the Environment, Climate Change and Water (DECCW), identified one registered site within the study area (Site No. 45-6-1615). This site is described in the NPWS site card as a 'midden' from which 'shells … were used by the early settlers in lime-burning, to provide building mortar'. The registered co-ordinates for the site indicate that it was located near the base of the Tarpeian Way cliff face, though the actual location of the site is uncertain. However, the site card records the site's condition as 'destroyed' and it is clear that it had been destroyed some time before its inclusion in the database in 1983.

There is some potential for parts of the study area to contain relatively intact natural soil deposits that may contain evidence of Aboriginal use or occupation of Bennelong Point, either prior to the

arrival of Europeans in 1788 or during the early years of the colony. Much of the study area appears not to have been subject to major disturbance that would have definitely removed any potential deposits associated with this phase of the site's history. However, while this area has remained largely undeveloped throughout its history relative to the rest of Bennelong Point, it has been subject to land modification and extensive use for pedestrian and vehicle traffic, including trams, which would have had some impact on the survival of any evidence of Aboriginal use or occupation of the area. On that basis, the study area is considered to have low potential to contain any Aboriginal archaeological evidence.

The study area also includes some areas of reclaimed land. These areas would have no potential to contain in-situ Aboriginal archaeological objects. There is some potential for introduced fill deposits across the site to contain isolated and unstratified objects, but the likelihood of such evidence is impossible to determine.

During the course of this study, consultation was undertaken with Allen Madden of the Metropolitan Local Aboriginal Land Council (MLALC), in order to inform MLALC of the proposed works to the site and to invite comment. This consultation was undertaken on Wednesday 15 April 2009 with Laura Farquharson, Consultant from Godden Mackay Logan. There were no issues raised by MLALC about the proposed works during this meeting. There was also no suggestion made that the study area has any special associations with MLALC. A separate report is being prepared to address DGR 2.d) – the likely impacts of the proposal on Aboriginal cultural heritage values.

2.3.2 Historical Archaeological Potential

A number of historical plans that document the physical development of Bennelong Point throughout the nineteenth and twentieth centuries have been analysed in detail to determine how the study area was used during this time in order to assess the nature and extent of physical evidence of these uses that may have survived at the site. A selection of these plans is included as Figures 2.1 to 2.11, with the study area boundary indicated on each plan. These plans have all been overlaid with modern plans so as to determine which areas and historical features were located within the study area and therefore would be relevant to this assessment.

On the basis of the documented historical development of Bennelong Point and episodes of modification and disturbance that have occurred throughout its history, the historical archaeological potential of the study area is outlined in the table below.

The table has been structured as follows: 'Phase' denotes the phase of historical development as identified by JS Kerr in the Conservation Plan; 'Site Features' indicates features (or activities) shown on historical plans or that may be present as a result of usual site formation processes (eg accumulation of deposits); 'Date' indicates either the date range of the historical phase that the features or activities are related to, or a particular period of time when that feature or activity was known to be present or occur; 'Potential Remains' describes the types of evidence associated with the feature or activity that may survive at the site; and 'Likelihood of Survival' indicates the likelihood that the potential remains would survive intact and/or in situ.

Phase	Site Features	Date	Potential Remains	Likelihood of Survival
—	Aboriginal evidence. (The only recorded site in this area was 'destroyed' prior to 1983.)	Pre 1788–1802	Deposits and features associated with Aboriginal occupation or activities in this area (eg middens, artefact scatters, isolated artefacts).	Very low
1–2	There is no specific development or land use activity recorded within the study area during this period.	1788–1802	Deposits associated with the original shorelines (eastern and western sides of Bennelong Point) and original landform. Evidence associated with incidental activities in this area, such as artefact scatters/rubbish dumps.	Low–moderate
1–5	Rubbish dumps into water—later reclaimed land.	1788–1960s	Concentrations of artefacts within areas of reclaimed land beneath introduced fill deposits.	Moderate
3	Rectangular structure shown on plan adjacent to eastern shoreline (form/function unknown).	By 1829	Structural remains (probably timber).	Low
3–4	Fort Macquarie.	1817–1901	Structural remains (stone, brick). (Remains of eastern wall discovered in 2004.)	High
3–4	Fort Macquarie.	1817–1901	Structural remains (stone, brick, timber) associated with internal and/or external features of or additions to Fort Macquarie.	Low–moderate
3–4	Fort Macquarie.	1817–1901	Deposits associated with occupation/use of Fort Macquarie (internal and external).	Low
3–4	Fort Macquarie.	1817–1901	Roadways or pathways around Fort Macquarie.	Low
3–5	Former seawalls.	1810–1960s	Former seawalls (stone) behind outer face of existing seawalls.	Moderate–high
4	Drill hall.	1890s–1901	Structural remains (stone, brick, timber) and associated deposits and features.	Low–moderate
4	Small rectangular structures to west of Fort Macquarie (shown on 1845 plan and 1850s photograph—see Figure 2.13).	c1845–1860ss	Structural remains (timber, brick) and associated deposits and features.	Low
4–5	Boat harbour/slip in southeastern section of Bennelong Point.	By 1845 to 1960s	Remains of stone seawalls defining boat harbour; stone steps on external face of seawall.	Moderate–high
4–5	Wharf infrastructure—western shoreline.	By 1860s to 1960s (rebuilt/ upgraded 1889)	Stone seawall, piers, structural remains and remains of other wharf infrastructure (Messagenes Maritimes Co).	Low–moderate
4–6	Bennelong stormwater channel.	c1857 1960s	Brick oviform channel. Concrete diversions.	High (known feature in parts of site)

Phase	Site Features	Date	Potential Remains	Likelihood of Survival
5	Infrastructure associated with boat harbour/slip.	1901–1960s	Structural remains (stone, brick or timber) associated with sheds/offices adjacent to boat harbour/slip.	Low–moderate
5	Tram-car house and associated infrastructure.	1901–1950s	Structural remains of tram-car house (stone, brick), tram tracks, roads, footpaths extending from and adjacent to the tram-car house.	Moderate–high
6	Evidence associated with the construction of Sydney Opera House.	post-1963	Any such evidence would generally not be considered as 'relics' under the Heritage Act.	N/A

2.4 Summary of Archaeological Potential

The study area has some potential to contain intact archaeological remains associated with various phases of the site's history. Parts of the study area have been subject to major disturbance while other areas have remained relatively undisturbed, despite extensive modification of the area and intensive phases of development and use.

Much of the area beneath Sydney Opera House itself has been subject to major disturbance, particularly associated with the construction of the basement and sub-basement levels of the building. However, evidence discovered during excavation works in 2004 revealed that the remaining areas beneath the building do still have archaeological potential. Potential remains beneath Sydney Opera House include structural and other remains associated with Fort Macquarie, various wharf facilities, the early twentieth-century tram-car house and associated infrastructure, sections of Bennelong stormwater channel (original and later diversion), as well as remains associated with other, less well-documented or incidental uses of the area.

Analysis of historical information and other evidence related to the development and modification of Bennelong Point throughout its history indicates that the forecourt area of Sydney Opera House has remained relatively undisturbed. However, this area has also remained largely undeveloped relative to other parts of Bennelong Point. As a result, the forecourt area is unlikely to contain substantial structural remains associated with the major phases of redevelopment (Fort Macquarie and the tram-car house) other than part of the southeastern section of Fort Macquarie. However, owing to the relatively limited amount of disturbance to the area throughout its history, it is likely that some minor infrastructure associated with these historical phases may survive intact (eg pathways, roadways, tram tracks).

The extent of physical modification of Bennelong Point through various phases of land reclamation may also have enabled evidence associated with the earliest phases of the site's history to survive beneath introduced fill deposits. In most cases, this evidence would not be directly associated with known features or activities at the site, but instead would be related to incidental site use.

Former seawall alignments around the peninsula (including the former boat slip on the eastern side of Bennelong Point) are unlikely to have been removed in association with the construction of Sydney Opera House; instead they are likely to have been covered by introduced fill deposits when this area was reclaimed. The solid and utilitarian construction of these features would most likely have determined their at least partial survival behind the current alignment of the seawall. The

survival of remains of associated infrastructure, such as former buildings around the boat harbour, is less likely.

Importantly, analysis of the available evidence indicates that the majority of the archaeological evidence that may survive at the site is likely to be located at depths equivalent to the current basement level of Sydney Opera House (that is, between levels +3.66m and -0.30m [+12' and -1']). Evidence associated with natural ground levels and former shorelines may survive at deeper levels, especially around the margins of the study area. Archaeological remains of any deeper subsurface features, such as wells or privies (if present) may also survive at deeper levels across the site, but the presence or specific location of any such features has not been determined as part of this study. This aspect of the site's archaeological potential is particularly relevant in relation to the proposed works at the site, which are discussed in detail in Section 4.0 of this report.

The likelihood of survival of these remains (ie their archaeological potential) is distinct from their heritage significance or value. Their significance is assessed in Section 3.0.

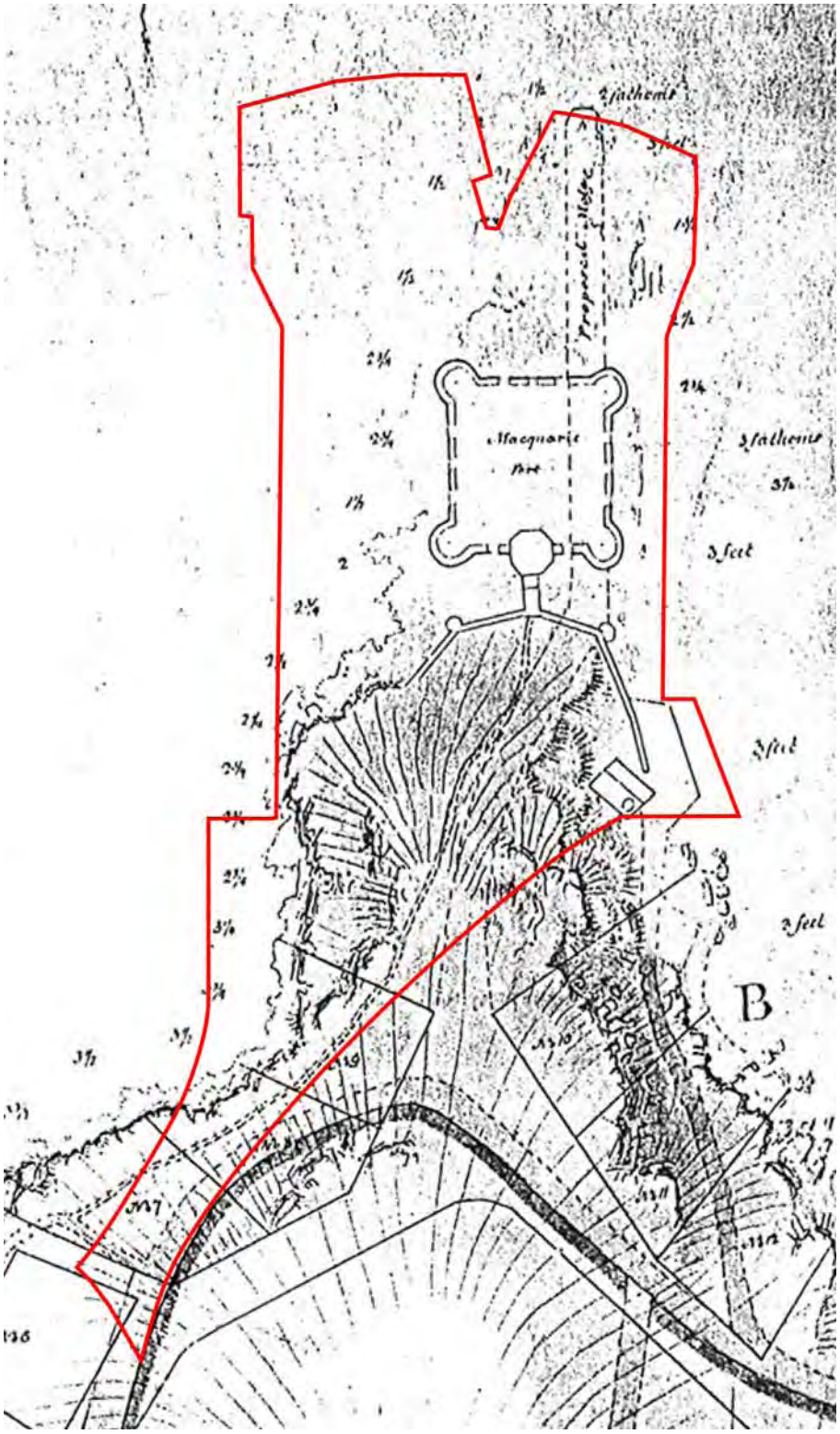


Figure 2.1 Extract of 1829 plan showing the Sydney Domain between Sydney Cove and Farm Cove. Note the southeastern extension of Fort Macquarie, as well as a rectangular structure near the eastern shoreline. The study area is outlined. (Source: SRNSW, AO Map SZ454 [SG Map S.627], Surveyor: White and Larmer)

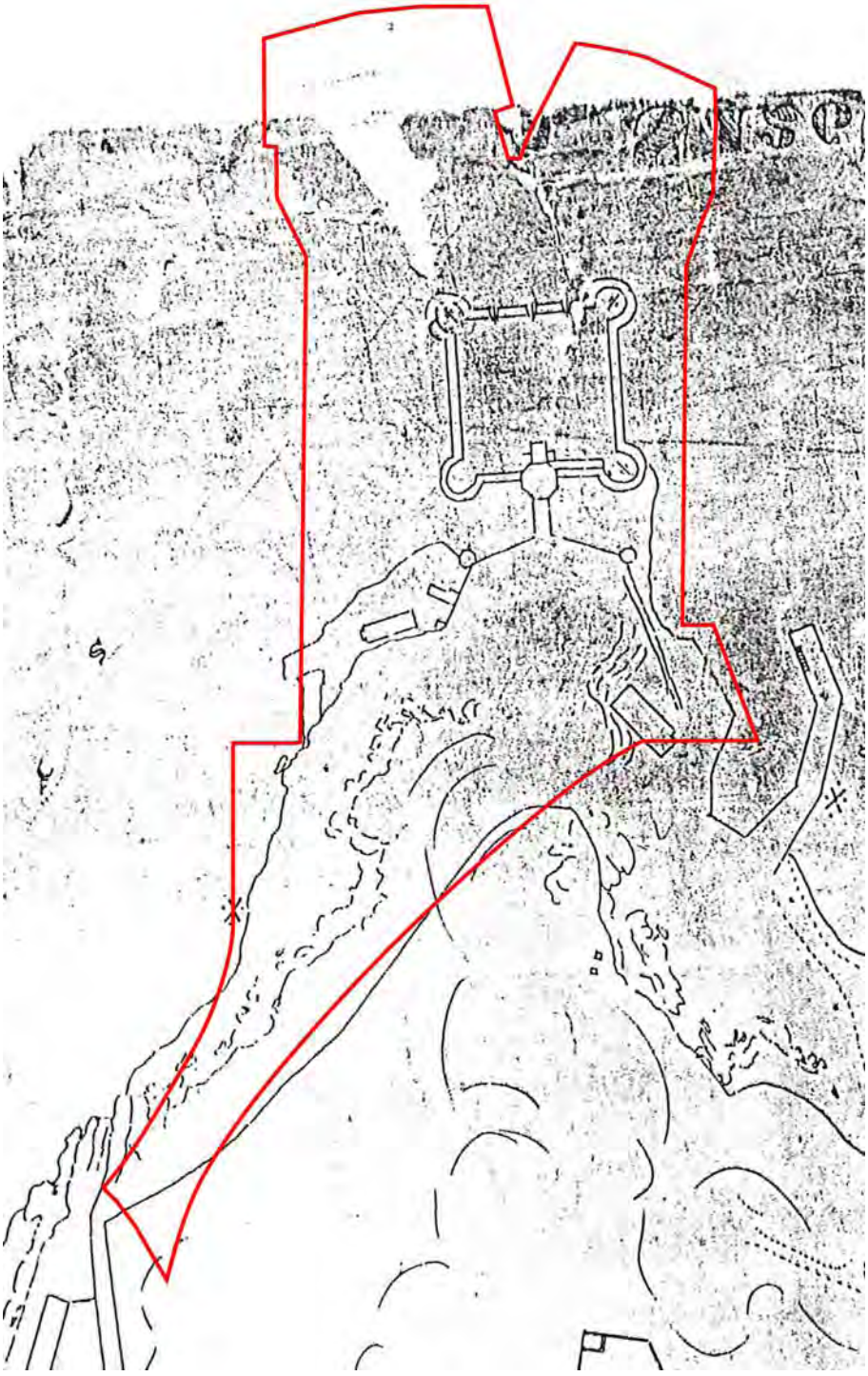


Figure 2.2 Extract of 1845 plan of Bennelong Point. Note the southeastern extension of Fort Macquarie, as well as a rectangular structure near the eastern shoreline. The boat harbour/slip on the eastern shore had been constructed by this time. The study area is outlined. (Source: SR Item Map No. 5628)

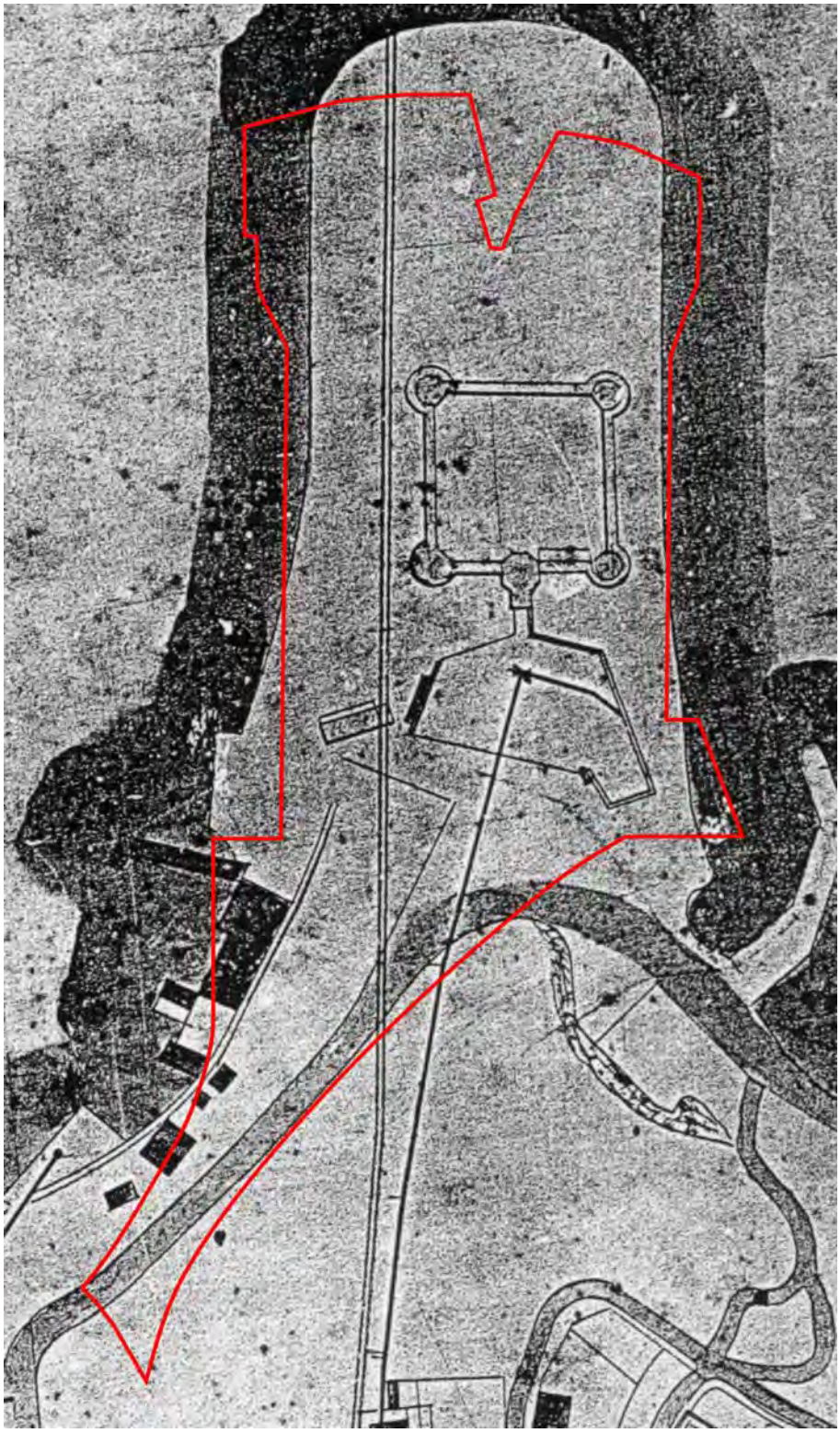


Figure 2.3 Extract of the 1865 Trigonometrical Survey of Sydney showing Bennelong Point. Note the southeastern extension of Fort Macquarie, the boat harbour/slip on the eastern shore and wharf facilities along the western shore. The rectangular structure near the eastern shoreline shown on earlier plans had been demolished by this time. The study area is outlined. (Source: SRNSW, NRS 9929)

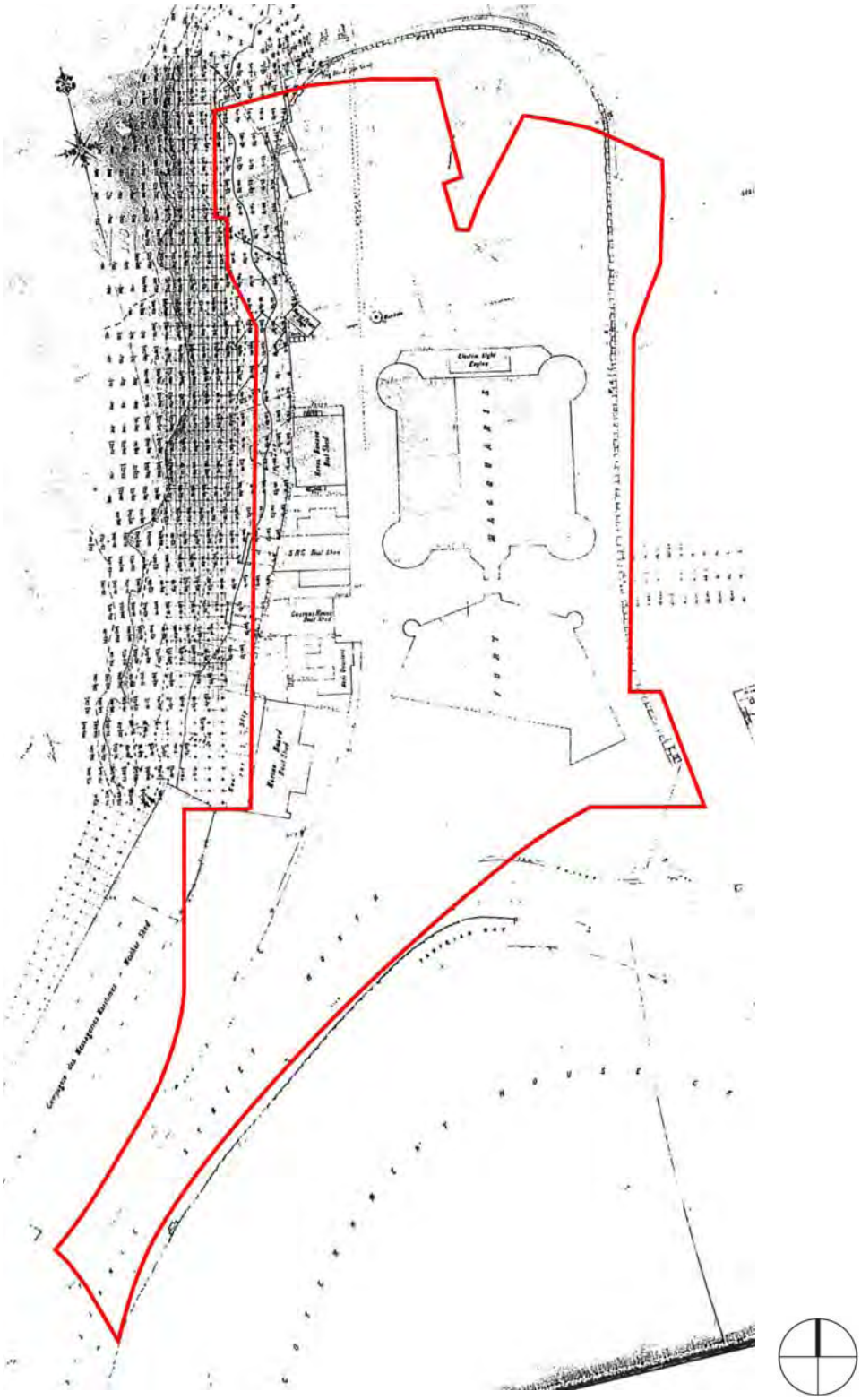


Figure 2.4 Extract of c1887 plan of Bennelong Point showing the southeastern extension of Fort Macquarie, the boat harbour and wharf facilities along the western shore. The study area is outlined. (Source: SRNSW, AO Map No. 608)

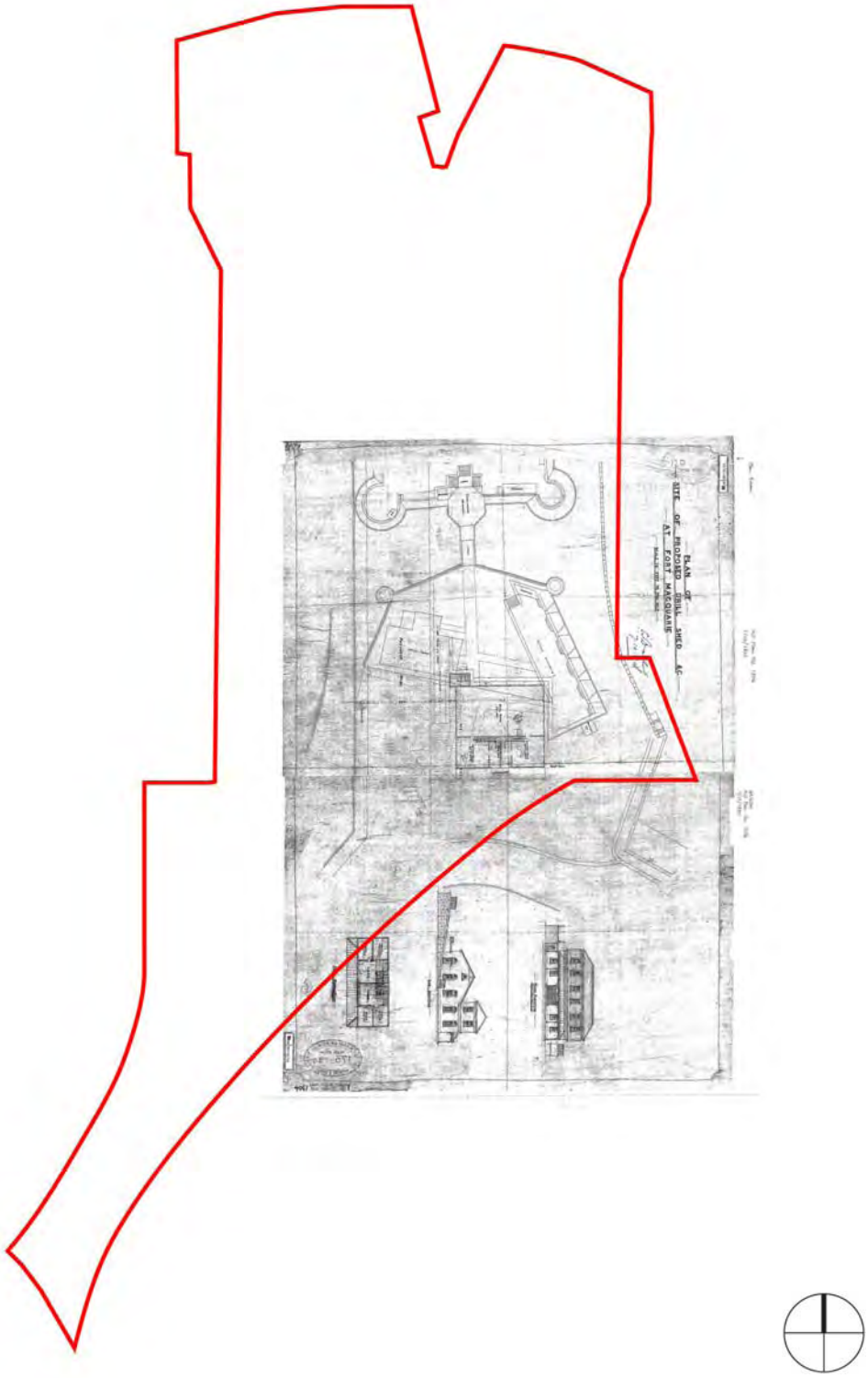


Figure 2.5 1890 'Plan of the Site of Proposed Drill Shed &c at Fort Macquarie', showing detail of the southern extension of Fort Macquarie. The study area is outlined. (Source: SRNSW, AO Plan No. 1306)

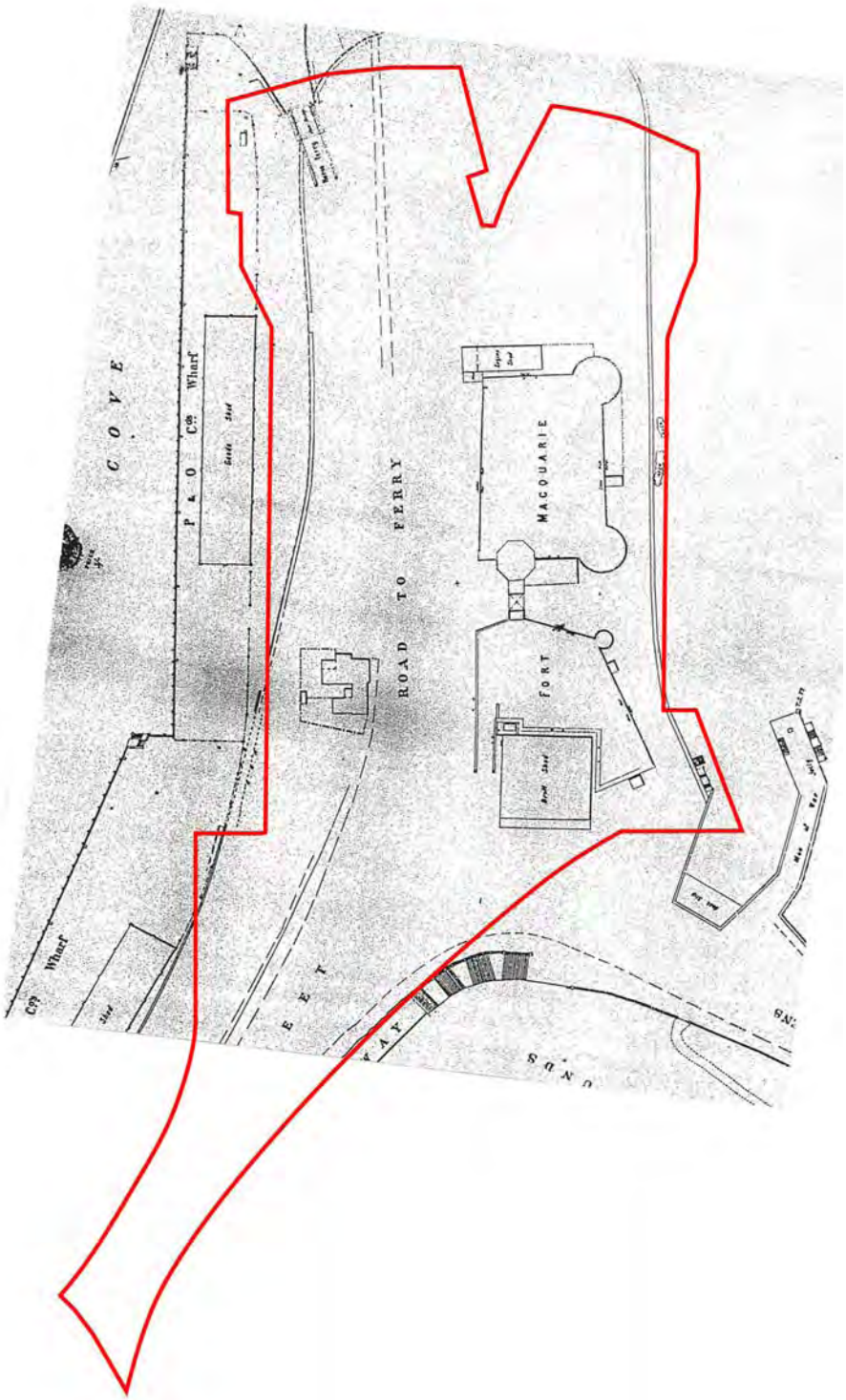


Figure 2.6 1894 plan of Fort Macquarie and Bennelong Point showing the southeastern extension of Fort Macquarie, the boat harbour and wharf facilities along the western shore. The study area is outlined. (Source: Metropolitan Detail Survey M Ser 4 811.17/1 Sydney Sheet P4; Australian Archives (NSW) B1905/10192)

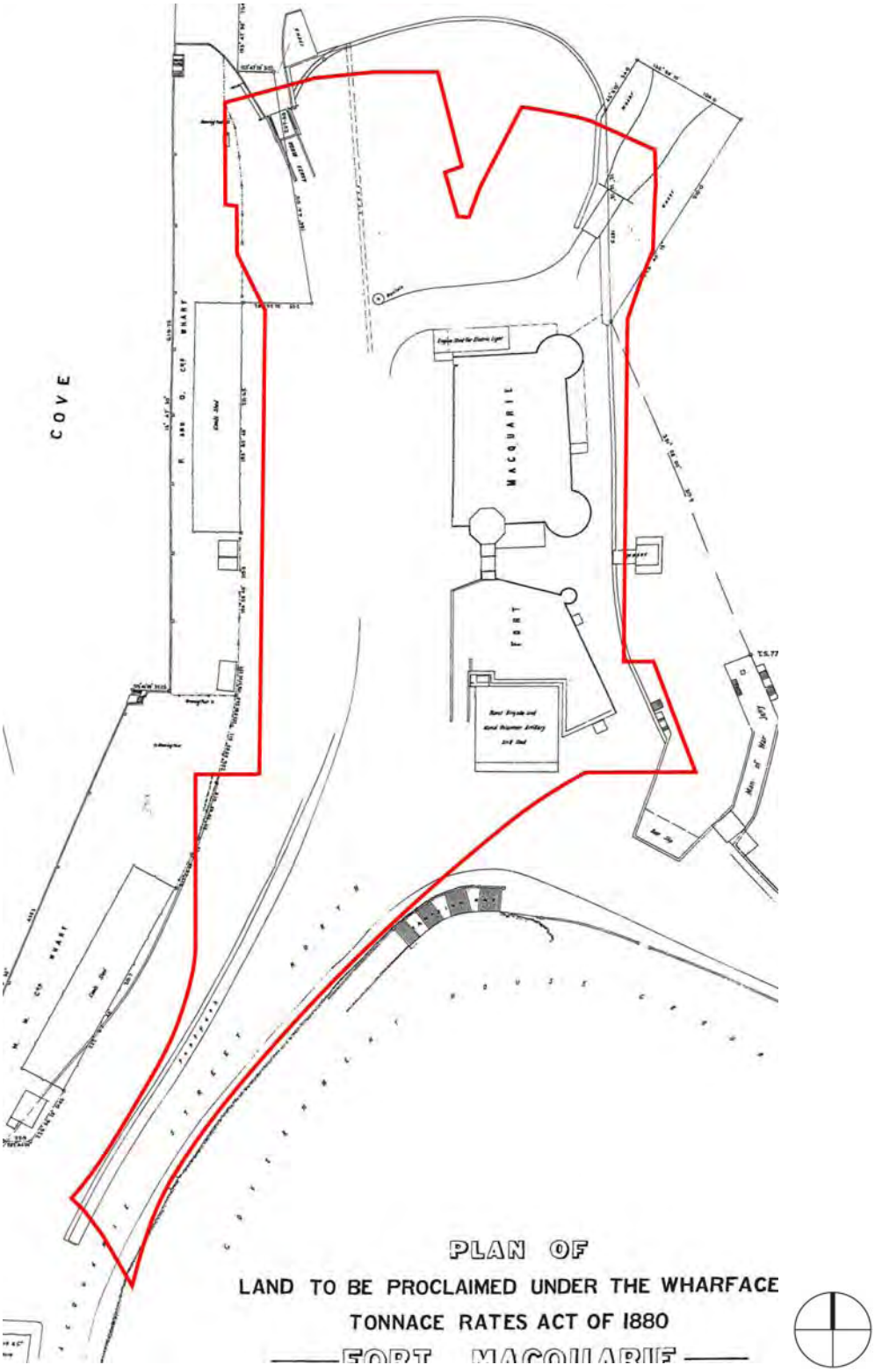


Figure 2.7 Extract of 1899 plan of Bennelong Point showing the southeastern extension of Fort Macquarie, the boat harbour and wharf facilities along the western shore. The study area is outlined. (Source: SRNSW, AO Map No. 521)

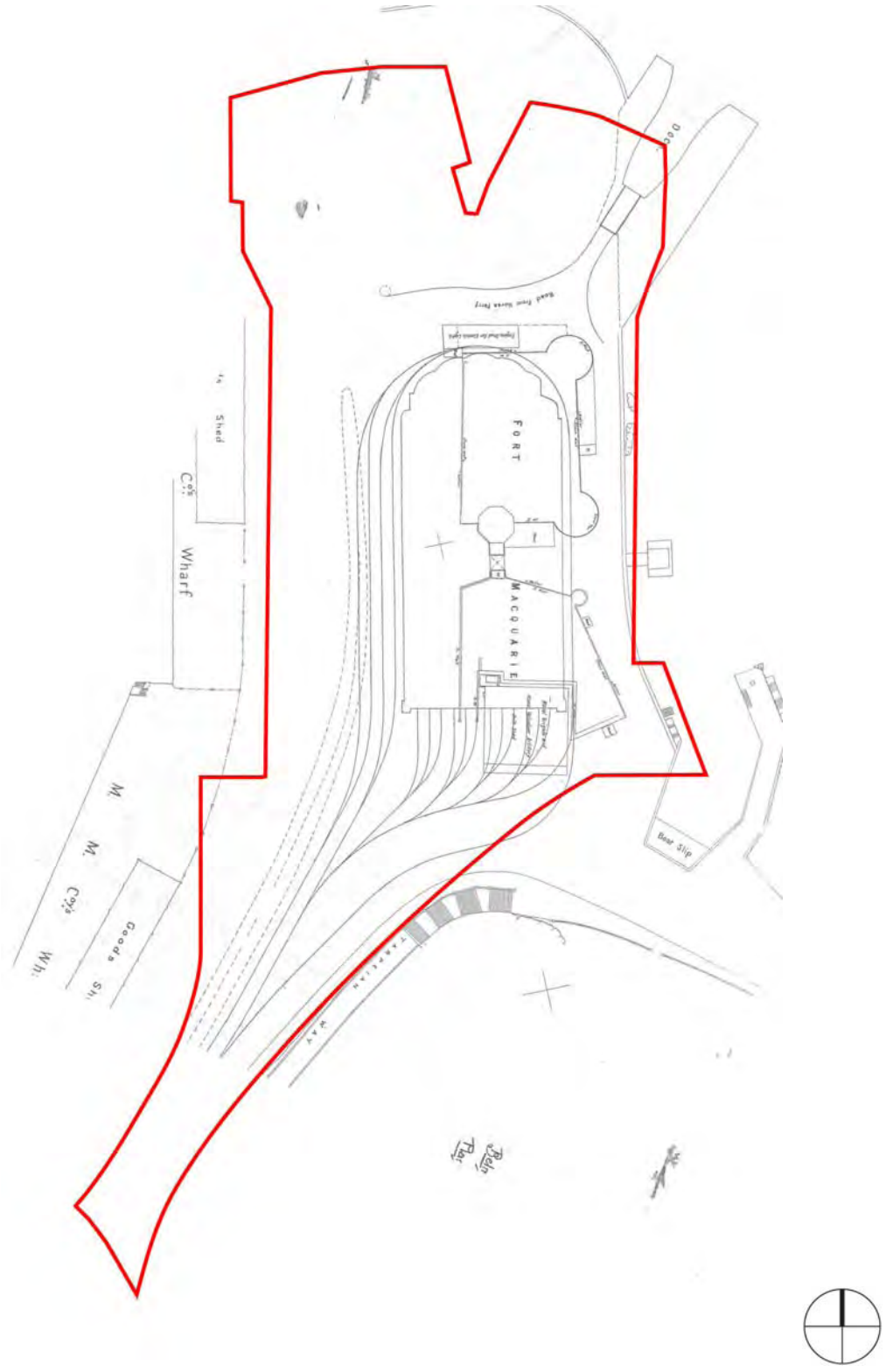


Figure 2.8 Extract of 1901 NSW Government Transport Plan—'Belmore Park to Fort Macquarie Electric Tramway Plan Showing Position of Car House…'. This plan shows the location of Fort Macquarie in relation to the tram-car house. The study area is outlined. (Source: SRNSW, CGS 12909, SR Plan No. 61078)

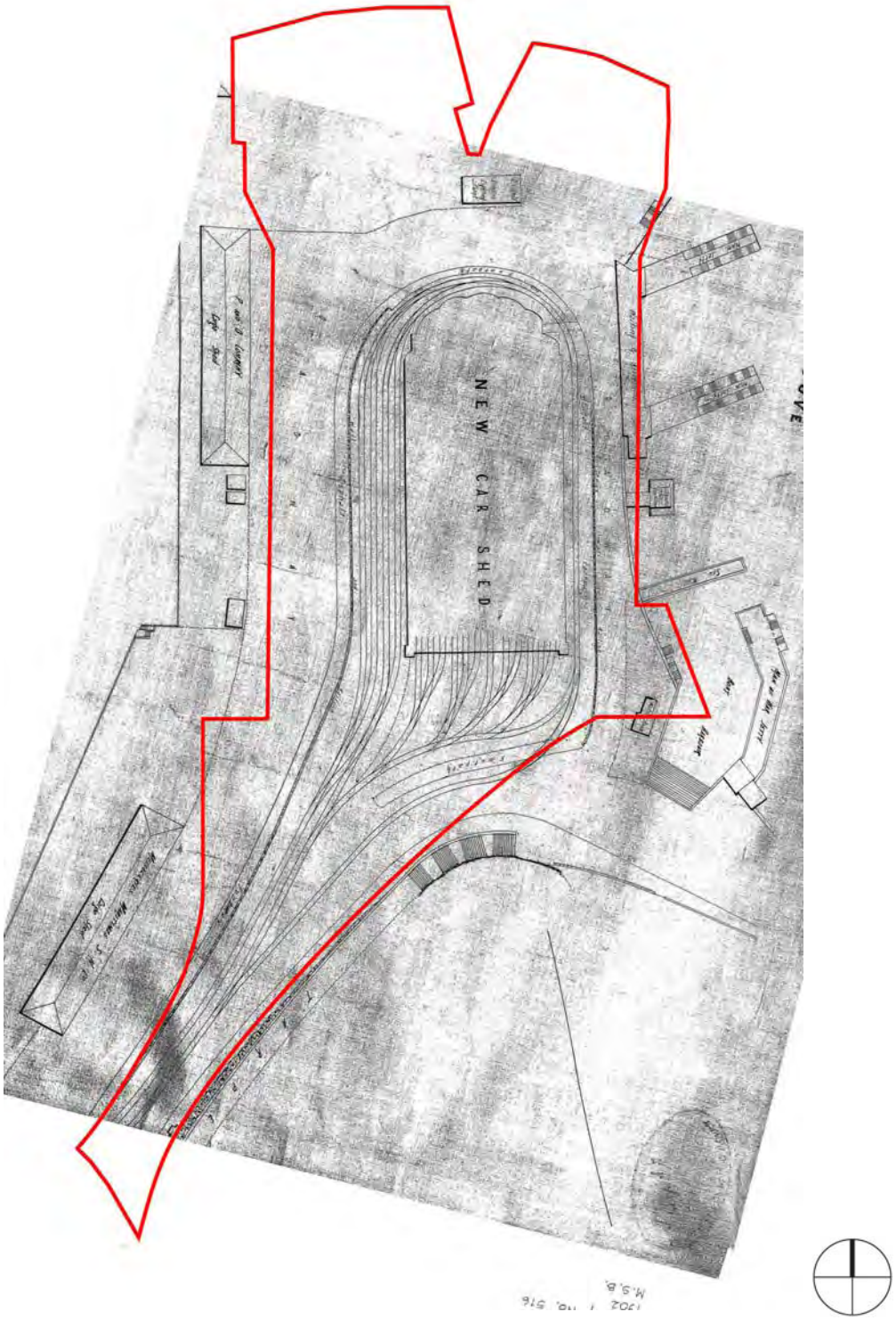


Figure 2.9 Extract of 1902 plan of 'Part of Circular Quay and Fort Macquarie', showing the tramlines and pathways to the south of the tram-car house, as well as a 'waiting room' structure adjacent to the boat harbour/slip. The study area is outlined. (Source: SRNSW, AO Map No. 516)

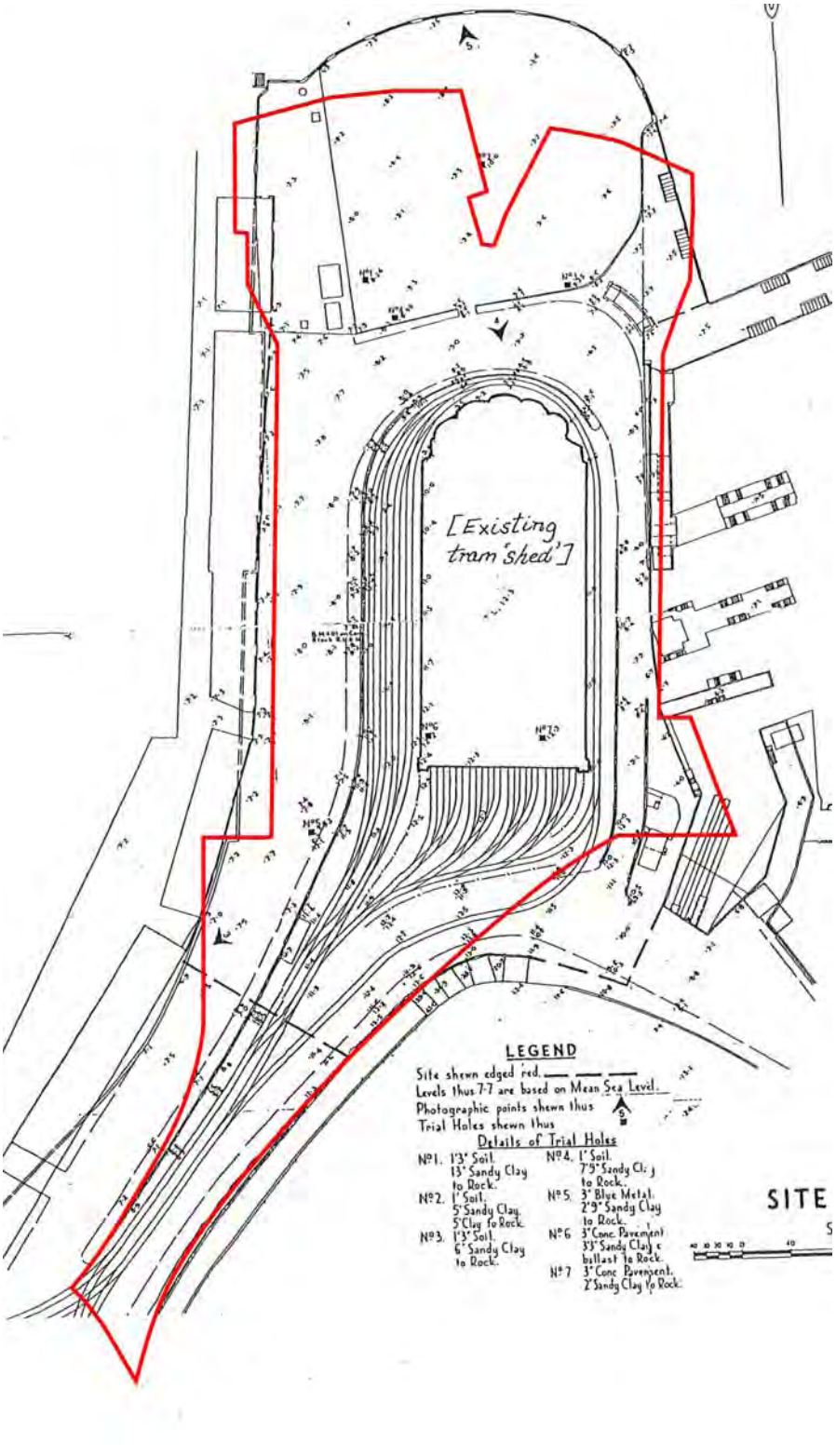


Figure 2.10 1955 plan of Bennelong Point, showing the tramlines and pathways to the south of the tram-car house as well as various structures adjacent to the boat harbour/slip. The study area is outlined. (Source: Reproduced from 2003 Conservation Plan, Figure 12)

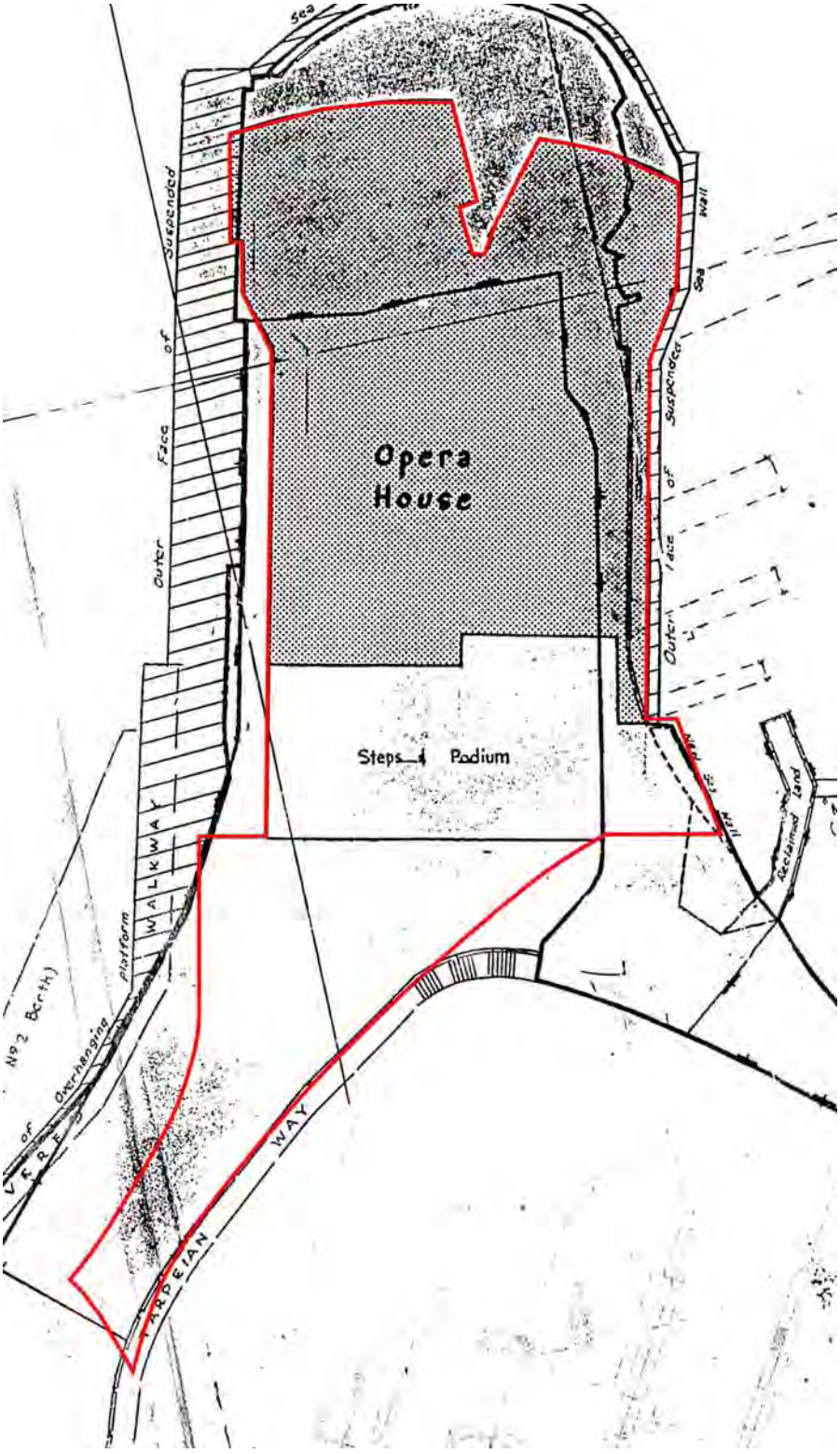


Figure 2.11 c1973 plan of the Sydney Opera House site, indicating the new section of seawall constructed along the eastern shoreline. The study area is outlined. (Source: Sydney Opera House Trust)

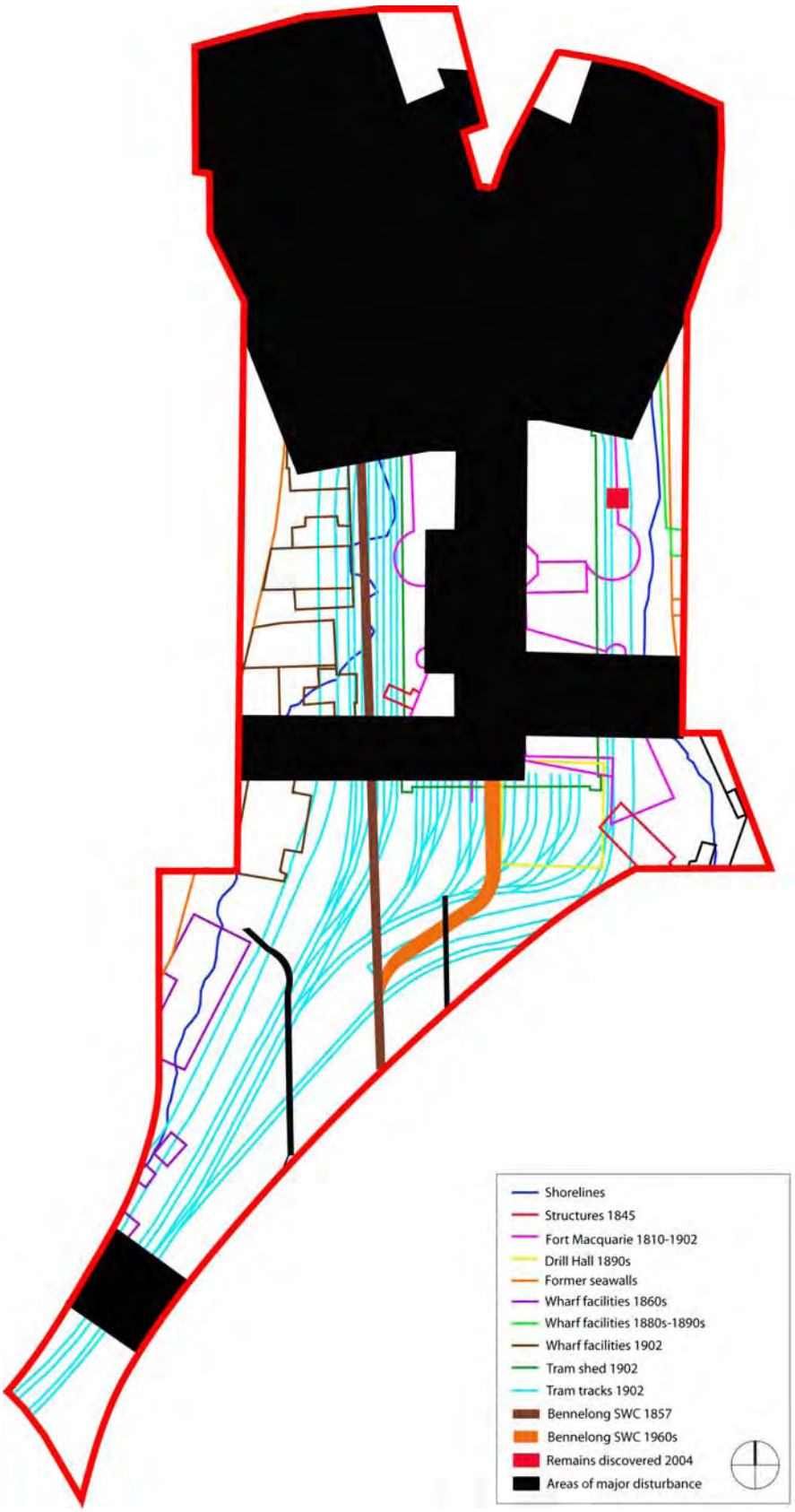


Figure 2.12 Plan summarising the historical archaeological potential of the study area, showing the location of potential archaeological remains based on site analysis and overlay of historical plans. (Source: GML)

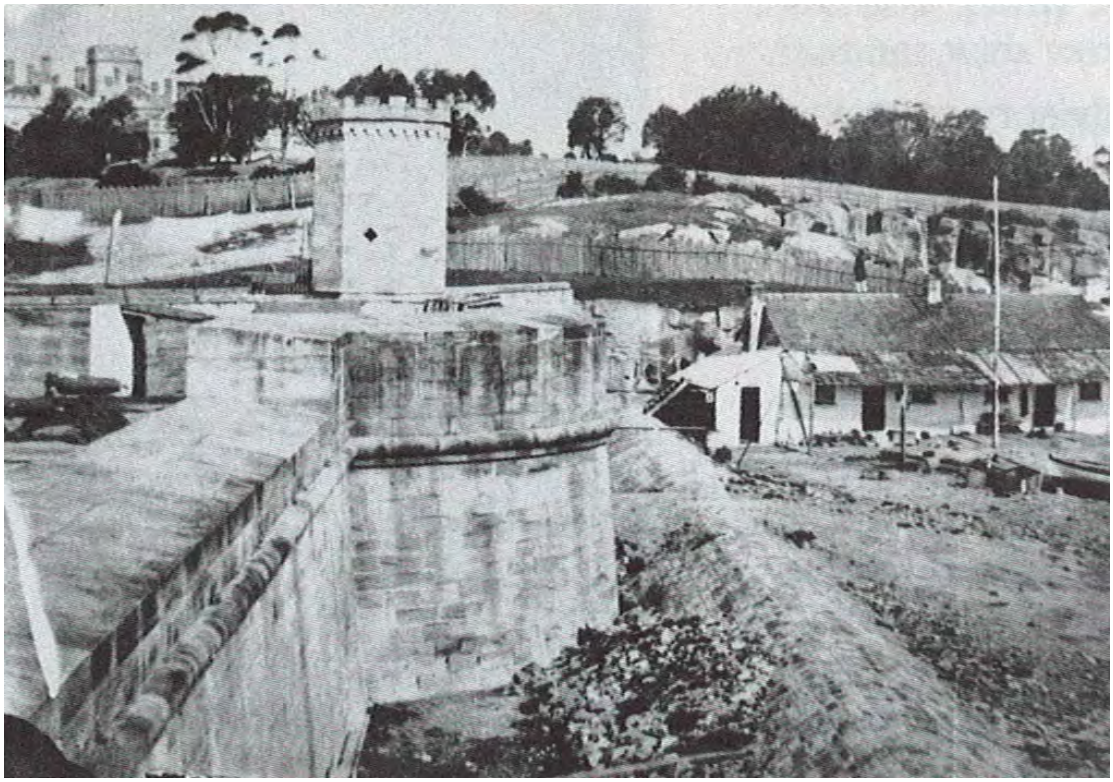


Figure 2.13 Photograph taken in the 1850s showing the top of the original Bennelong stormwater channel (brick oviform drain) running along Bennelong Point adjacent to Fort Macquarie. (Source: Reproduced from the 2003 Conservation Plan, Figure 70, p 94)

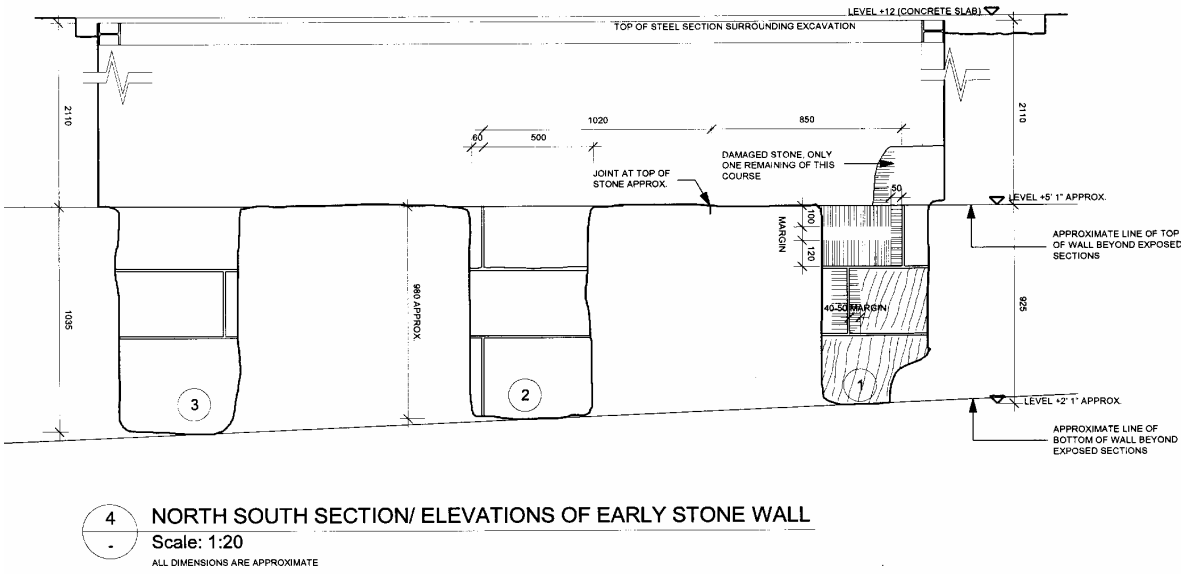


Figure 2.14 Section drawing showing structural remains of Fort Macquarie discovered beneath Sydney Opera House during 2004 excavation works. Note the recorded levels of these remains (between approximately +6'and +2'). (Source: Design 5 Architects)

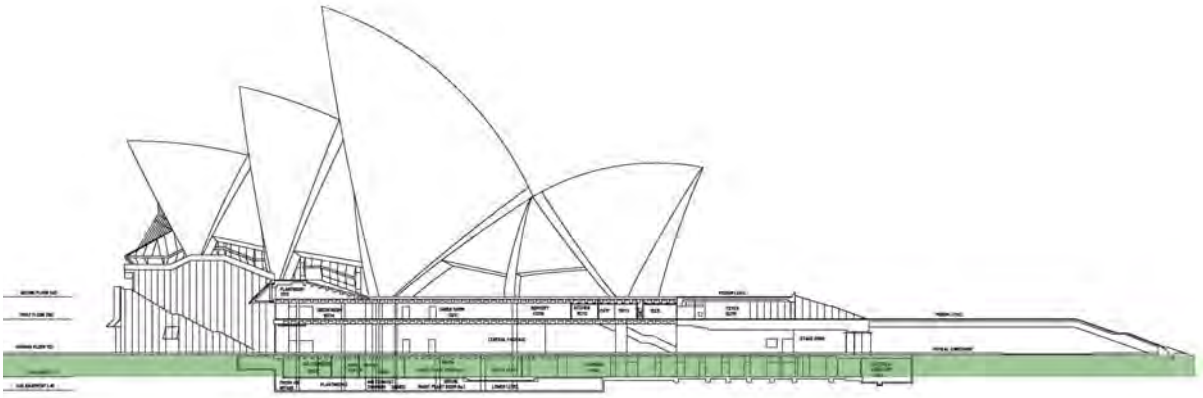


Figure 2.15 Section drawing of Sydney Opera House showing the levels of existing building elements. The majority of the site's potential archaeological remains would be located at depths equivalent to the existing basement level (between +12' and -1'), which is shown here shaded green. (Source: Sydney Opera House Trust)

Figure 2.16 Photograph taken in the 1960s showing the construction of Sydney Opera House in progress. (Source: SLNSW)

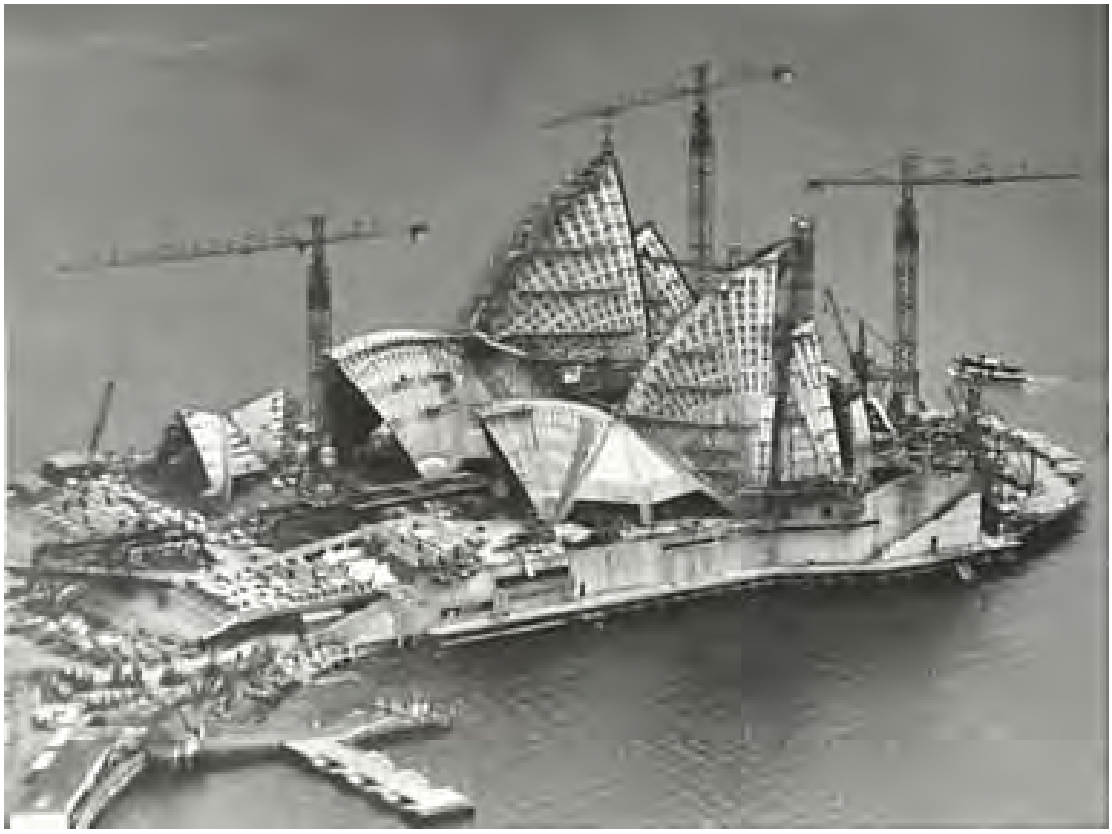


Figure 2.17 Photograph taken in 1966 showing the construction of Sydney Opera House in progress. (Source: SLNSW, Frame No. Australian Photographic Agency–22157)

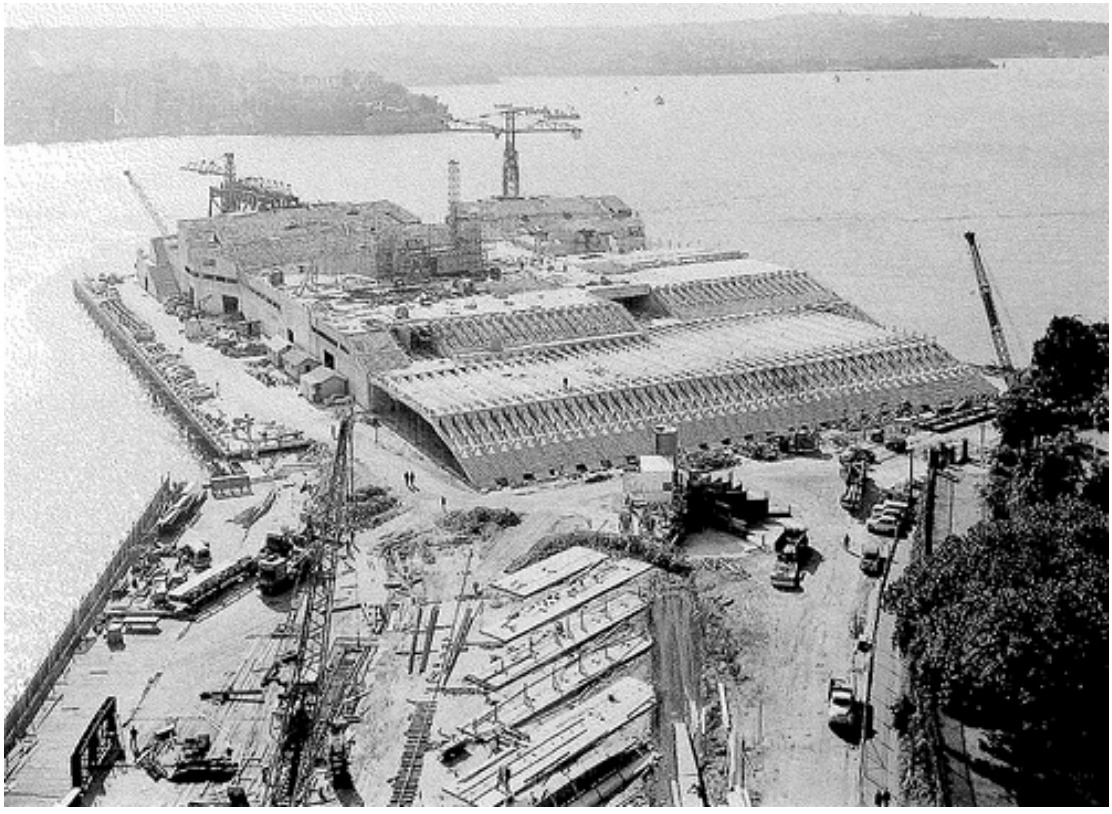


Figure 2.18 Photograph taken in 1963 showing the construction of Sydney Opera House in progress. (Source: SLNSW, Frame No. GPO 2–23027)

3.0 Assessment of Significance

3.1 Principles

The concept of 'cultural significance' or 'heritage value' embraces the value of a place or item which cannot be expressed solely in financial terms. Assessment of cultural significance endeavours to establish why a place or item is considered important and is valued by the community. Cultural significance is embodied in the fabric of the place (including its setting and relationship to other items), the records associated with the place, and the response that the place evokes in the community.

The assessment of cultural significance with respect to archaeological sites is more difficult in that the extent and nature of the features is sometimes unknown, therefore it becomes necessary for value judgements to be formulated on the basis of expected or potential attributes. The element of judgement can be enhanced by historical or other research, as has been carried out in the case of the current study.

Archaeological deposits and features provide important evidence of the history and settlement of New South Wales. Archaeological sites may include stratified deposits of material culture which can be analysed to yield information about the history of the place—within a local or broader context—which is unavailable from documentary sources alone. Archaeological investigations can reveal information about technologies, economic and social conditions, taste and style. The features and artefacts extracted and recorded can provide primary evidence about the way of life of previous generations through examination of structural features, artefacts and deposits. Archaeological sites that contain these elements, therefore, have scientific value. This value can be further enhanced where there is a substantial body of supporting documentary evidence that enables further inference to be drawn from the archaeological records. It is through this potential for revealing information that the heritage significance of archaeological sites occurs.

The study area of this report has some potential to contain intact subsurface archaeological features and deposits. These site elements are analysed here primarily in terms of their archaeological significance—that is, their ability to contribute to archaeological research. This assessment partly draws on the significance assessment for the site contained in the 2003 Conservation Plan.[1]

3.2 Basis of Assessment

The *NSW Heritage Manual*, published by the NSW Heritage Office and Department of Urban Affairs and Planning, sets out a detailed process for conducting assessments of heritage significance.[2] The manual provides a set of specific criteria for assessing the significance of an item, including guidelines for inclusion and exclusion. The following assessment has been prepared in accordance with these guidelines.

The Heritage Council of NSW has adapted specific criteria for heritage assessment which have been gazetted pertinent to the *Heritage Act 1977* (NSW). The seven criteria upon which the following significance assessment is based are outlined below:

Criterion (a) an item is important in the course, or pattern, of NSW's cultural or natural history;

Criterion (b) an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history;

Criterion (c) an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

Criterion (d) an item has strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons;

Criterion (e) an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history;

Criterion (f) an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history; and

Criterion (g) an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or cultural or natural environments.

The criteria should also be applied in relation to the local area (Sydney) to determine whether the archaeological resources are of Local significance.

While these criteria provide an overall framework for significance assessment, they are not specific with regard to archaeological sites and historical archaeological sites in particular. This is a matter that has been considered in an influential paper by Bickford and Sullivan, published in 1984.[3] Bickford and Sullivan draw attention to the dilemma faced by archaeologists and developers in connection with sites that are to be destroyed as a result of development and discuss effective means of assessing their heritage value. Archaeological significance has long been accepted in the United States as linked directly to scientific research value:

> *A site or resource is said to be scientifically significant when its further study may be expected to help answer questions. That is scientific significance is defined as research potential.*[4]

This is a concept that has been extended to the Australian situation by Bickford and Sullivan and redefined as the following three questions which can be used as a guide for assessing the significance of an archaeological site within a relative framework:

1. Can the site contribute knowledge that no other resource can?
2. Can the site contribute knowledge that no other site can?
3. 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 evaluation of cultural significance below is based on the criteria of the Burra Charter, the Heritage Manual and Bickford and Sullivan's approach. Each criterion of the Heritage Manual is considered in turn in Sections 3.3.1 to 3.3.7. The exact definitions of the criteria are also included. As the criteria of the Burra Charter are very similar to those of the Heritage Manual, they are not considered separately. Each Bickford and Sullivan question is addressed in turn in Sections 3.3.8 to 3.3.10.

The National Heritage List and World Heritage List citations for Sydney Opera House do *not* include the site's archaeological potential. The site is not listed for values associated with criterion (c) of the National Heritage criteria (potential to yield information that will contribute to an understanding of

Australia's natural or cultural history). The site is also not listed for values associated with the World Heritage criteria. The New South Wales State Heritage Register citation concludes that the contribution of the site's potential relics to the site's overall significance is likely to be low. (This report is consistent with these assessments.)

3.3 Significance Assessment

3.3.1 Criterion A

An item is important in the course, or pattern, of NSW's cultural or natural history.

The primary significance of the site is related to Sydney Opera House, an item of Exceptional significance and a masterpiece of twentieth-century architecture. The potential archaeological remains within the study area have no direct association with this significant phase of the site's history. However, the site's potential archaeological resource is associated with various significant phases in its historical development that have influenced its current form. In particular, the study area has potential to contain archaeological evidence associated with the modification of the shoreline of Bennelong Point, Fort Macquarie, nineteenth- and twentieth-century wharf facilities, the Bennelong stormwater channel and the twentieth-century tram operations. Kerr notes that the significance of the Sydney Opera House site 'is intensified by the extensive associations of the site and its structures'.[5]

The Bennelong stormwater channel is itself an item of historical significance as the main sewer of the first five original combined sewers built in Sydney around 1857.[6]

3.3.2 Criterion B

An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history.

While Sydney Opera House, Fort Macquarie and Bennelong Point are significant for their close associations with prominent individuals who have contributed to the social, cultural and economic life of Sydney and New South Wales, the potential archaeological resources within the study area are unlikely to contribute to this significance. The study area is unlikely to contain substantial archaeological evidence that could be identified as being associated with significant individuals or groups.

3.3.3 Criterion C

An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW.

The potential archaeological resources within the study area are generally unlikely to contribute to the aesthetic significance of the site and are unlikely to meet this criterion.

The seawalls surrounding Bennelong Point contribute to the visual coherence of the Sydney Opera House site. Kerr identifies the seawalls as contributing to the aesthetic character of the site.[7]

The Bennelong stormwater channel has a relationship with cultural and historical structures. The sewer originally discharged adjacent to Fort Macquarie, one of the earlier forts built in Australia. The stormwater channel now discharges adjacent to Sydney Opera House, one of Australia's most famous landmarks and significant heritage items.[8]

3.3.4 Criterion D

An item has strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons.

The potential historical archaeological resources within the study area are unlikely to contribute to the social significance of the site and are unlikely to meet this criterion.

The study area is not known to have any special association with local Aboriginal groups.

In the event that any archaeological evidence of Aboriginal use or occupation of the site were to be discovered, including isolated objects in disturbed contexts, this material may have an evocative quality that evidences potential associative values of the place.

3.3.5 Criterion E

An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history.

The research potential of the site's potential archaeological resource is discussed below according to various categories of potential evidence associated with the site's historical phasing.

Aboriginal Evidence

Parts of the study area may have some potential, albeit very low, to contain archaeological evidence associated with Aboriginal use and activity in this area prior to and in the early years of European presence. This evidence, if present, may be located beneath introduced fill deposits in areas that have not been subject to major disturbance. Such evidence has potential to contribute to our understanding of Aboriginal use of this area. Isolated artefacts may also be located in introduced fill deposits, but such evidence would have limited research value.

Development of the Shoreline

The changing configuration of the land that is most closely associated with the first settlement of Australia by the First Fleet in 1788 is a matter of historical interest. Archaeological evidence of the changing shoreline therefore has the potential to contribute to our understanding of the landforms that existed around Sydney Cove prior to non-Aboriginal settlement and after land reclamation works in the nineteenth century.

Incidental Remains Associated with Early Use and Development of Bennelong Point

There is some potential for incidental remains associated with unrecorded development or activities on Bennelong Point to survive within the study area. These remains may include artefact scatters, rubbish dumps (on land or in areas of reclaimed land that were previously under water) or remains associated with undocumented structures or other site features. The research potential of such remains is difficult to ascertain at this stage and would be dependent to some degree on the extent to which these remains could be linked to particular phases of the site's history, development or use. However, the research potential of such remains is enhanced as the information that they may provide could generally not be obtained from any other source.

Early Structures

There were a few small structures located across Bennelong Point throughout its history. These are generally poorly documented, in terms of their form, function and occupation. Any

archaeological evidence of these former structures may provide a better understanding of them and what they were used for (eg dwellings, wharf facilities, military facilities etc).

Fort Macquarie

Fort Macquarie represents a significant phase in Australia's defensive history, despite the fort's limited defensive capacity. The Gothic-style fort was a prominent landmark for its picturesque qualities. There is potential for structural remains of the fort and associated deposits and features to be present within the study area (structural remains were discovered during the 2004 excavation works beneath Sydney Opera House). The research potential of these remains may include information about the construction and development of the fort as well as insight into the operation and occupation of the fort throughout its history.

Boat Harbour

Remains of the boat harbour/slip established on the southeastern section of Bennelong Point by 1845 are likely to survive relatively intact beneath introduced fill deposits. There is also some potential for remains of other infrastructure associated with the boat harbour/slip such as wharf structures, buildings and steps to survive in adjacent areas. The research potential of these remains is likely to be limited to information about the construction and location of former seawalls, buildings and other infrastructure. There is only limited potential for any occupation deposits or other features that would provide further information associated with the operation and use of these facilities.

Nineteenth and Twentieth Century Wharf Facilities

The development of the eastern side of Sydney Cove along the western shore of Bennelong Point for wharves, ferries and other facilities related to seaborne trade is a matter of considerable historical interest, having a bearing on our understanding of the local area's development and the growth of Australian trade and industry during the nineteenth century. Relics relating to the nineteenth-century wharf facilities have potential to shed light on early and changing attitudes to the visual qualities of the harbour's built environment (from the picturesque to the utilitarian) and the changing functions of Bennelong Point (from defensive position to transport hub). Their research potential in this regard is likely to be limited by a degree of disturbance caused by subsequent activities on the site, as well as the limited extent to which the study area may include such remains.

Twentieth Century Tram Operations

The site has potential to contain structural and other remains associated with the former tram house and associated infrastructure. Archaeological remains associated with the operation of the trams on Bennelong Point would have limited potential to yield information relating to the development of Sydney's public transport system that could not be provided by other sources.

Bennelong Stormwater Channel

The Bennelong stormwater channel is an excellent example of the engineering construction techniques of the mid and late 1800s and of the city's early infrastructure. The numerous extensions and modifications made throughout the years provide a good example of the advancement of drainage construction techniques.[9] The later modifications and diversions of the channel, such as the 1960s–1970s diversion associated with the development of Sydney Opera House, would make less of a contribution to the significance of this item than would sections of original oviform or tunnel construction.

Investigation of the study area could provide information about or confirm the form and location of the original oviform channel and later diversions, but this information could also be obtained from other sources.

3.3.6 Criterion F

An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history.

Archaeological sites in the Sydney Central Business District dating to the nineteenth century are increasingly rare (as part of an ever-diminishing resource). The potential archaeological resources at this site could therefore be considered as a rare surviving element of Sydney's history. In particular, archaeological remains associated with modification of the shoreline, early wharf and harbour facilities and early defensive sites would be relatively rare. The Bennelong stormwater channel was the original oviform sewer of the five harbour sewerage systems constructed in Sydney around 1857, and one of a number of oviform sewers that were built.

On the basis of this assessment, parts of the site provide a unique opportunity to gain information about various aspects of early development on Sydney Harbour.

3.3.7 Criterion G

An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or cultural or natural environments.

Information relating to land reclamation is likely to be representative of this activity, which dramatically changed the shape of Sydney throughout the nineteenth and early twentieth centuries. Information relating to the wharf facilities and tram operations is also likely to be representative of these aspects of Sydney's transport system.

3.3.8 Can the site contribute knowledge that no other resource can?

The shoreline of Bennelong Point is recorded in a number of historical plans dating to the nineteenth century, although they vary in detail and accuracy. Historical photographs and illustrations also record the changing shoreline throughout the nineteenth century. Archaeological evidence may serve to confirm or correct these plans and other images and may provide additional knowledge only partially accessible from other sources.

The research potential of incidental remains associated with the early use and development of Bennelong Point is difficult to ascertain at this stage and would be dependent to some degree on the extent to which these remains could be linked to particular phases of the site's history, development or use. However, the research potential of such remains is enhanced as the information that they may provide could generally not be obtained from any other source.

Information about the form and construction of Fort Macquarie and wharf facilities is generally available from historical documentation (plans, illustrations, photographs and historical texts). This documentation provides extensive evidence related to the date, siting, form, function and occupants of these sites. Structural remains of these features may complement or confirm this information which is available from other sources. Therefore, archaeological investigation would be likely to principally confirm these other sources rather than provide additional knowledge not accessible from other sources. Deposits or artefacts associated with these features, if present, may provide information about the occupation and use of the site that may not be available from any other source.

The development of the tram system in Sydney, and on Bennelong Point in particular, is well documented in other sources (written, drawn and photographic). The technologies employed are also well documented and understood. Archaeological relics at Bennelong Point relating to this phase of use are unlikely to yield additional information not obtainable from the existing alternative sources.

The Bennelong stormwater channel has been well documented, including various phases of modification and diversion. Investigation of the channel may complement or confirm this information which is available from other sources.

3.3.9 Can the site contribute knowledge which no other site can?

The archaeological remains of the original and developing shoreline would be peculiar to Bennelong Point. No archaeological remains from another site could contribute the same knowledge about the development of the area that the remains at Bennelong Point could.

Evidence associated with incidental or unrecorded activities throughout the history of the site would be particular to the occupation and development of Bennelong Point and would provide specific information about how this site was used.

Archaeological remains associated with Fort Macquarie, various wharf facilities and early structures across Bennelong Point may provide information that is particular to the form and function of these sites. However, similar sites around Sydney Harbour or elsewhere may provide comparable information about these types of sites. For example, sites of other defensive locations around Sydney Harbour such as the Dawes Point battery or Fort Denison may provide similar information about this type of site. Similarly, the wider area of Sydney Cove was characterised by wharves and associated facilities in the nineteenth century that were similar to those at Bennelong Point. Wider research questions that may be asked of such sites may be able to be addressed by reference to other sites in Sydney Harbour and elsewhere.

Although the Bennelong Point tram-car house was particular to the site, and to that degree could yield information specific to that site, it is unlikely to yield substantive information that could not be obtained from tram depots and related facilities elsewhere in Sydney and Australia.

Investigation of the Bennelong stormwater channel may provide particular information about the form and function of this particular site feature. As one of five combined sewers built in Sydney in the mid nineteenth century, the other channels may be able to provide comparable information about the form and function of this type of item. Other sections of the Bennelong stormwater channel may also be able to provide comparable information.

3.3.10 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?

Information regarding the development of Sydney Harbour's shoreline, on the location of the first non-Aboriginal settlement of the country, would contribute to questions relating to Australia's history including the early settlers' responses to the pre-existing natural environment, the development of the harbour and the defensive uses to which the area was put. Archaeological remains could also be used to test the veracity of early surveys and illustrations of the city.

The potential archaeological relics in the area of the proposed works might contribute to research questions relating to the study of early and changing attitudes to the aesthetics of the harbour (from

the picturesque to the utilitarian) and the changing functions of Bennelong Point (from defensive position to transport hub). Relics could also be used to test the veracity of early surveys, written reports and illustrations of the city. Their principal value would lie in the contribution that they may make to our knowledge of the nature of development of the site itself (Bennelong Point) and the surrounding area.

3.4 Summary of Significance of Site Features

The following table summarises the significance of the site's features including potential archaeological resources, the Bennelong stormwater channel and the eastern seawall.

Phase	Site Features	Date	Potential Remains	Significance
—	Aboriginal evidence.	Pre-1788–1802	Deposits and features associated with Aboriginal occupation or activities in this area (eg middens, artefact scatters, isolated artefacts).	High
1–2	There is no specific development or land use activity recorded within the study area during this period.	1788–1802	Deposits associated with the original shorelines (eastern and western sides of Bennelong Point) and original land form. Evidence associated with incidental activities in this area, such as artefact scatters/rubbish dumps.	High
1–5	Rubbish dumps into water—later reclaimed land.	1788–1960s	Concentrations of artefacts within areas of reclaimed land, beneath introduced fill deposits.	Moderate
3	Rectangular structure shown on plan adjacent to eastern shoreline (form/function unknown).	By 1829	Structural remains.	High
3–4	Fort Macquarie.	1817–1901	Structural remains (stone, brick). (Remains of eastern wall discovered in 2004.)	High
3–4	Fort Macquarie.	1817–1901	Structural remains associated with internal and/or external features of or additions to Fort Macquarie.	High
3–4	Fort Macquarie.	1817–1901	Deposits associated with occupation/use of Fort Macquarie (internal and external).	High
3–4	Fort Macquarie.	1817–1901	Roadways or pathways around Fort Macquarie.	Moderate
3–5	Former seawalls.	1810–1960s	Former seawalls (stone) behind outer face of existing seawalls.	Moderate
4	Drill hall.	1890s–1901	Structural remains (stone, timber, brick) and associated deposits and features.	Moderate
4	Small rectangular structures to west of Fort Macquarie.	c1845–1860s	Structural remains (timber, brick) and associated deposits and features.	Moderate–High
4–5	Boat harbour/slip in southeastern section of Bennelong Point.	By 1845 to 1960s	Remains of stone seawalls defining boat harbour; stone steps on external face of seawall.	Moderate

Phase	Site Features	Date	Potential Remains	Significance
4–5	Wharf infrastructure—western shoreline.	By 1860s to 1960s (rebuilt/ upgraded 1889)	Stone seawall, piers, structural remains and remains of other wharf infrastructure (Messagenes Maritimes Co).	Moderate
4–6	Bennelong stormwater channel.	c1857 1960	Brick oviform drain. Concrete diversions.	High Low–Moderate
5	Tram-car house—associated infrastructure.	1901–1950s	Tram tracks, roads, footpaths extending from and adjacent to the tram-car house. (The tram-car house itself was located wholly outside the study area.)	Moderate

3.5 Summary Statement of Significance

Sydney Opera House is an item of Outstanding Universal Value. However, the site's potential archaeological remains have no direct association with Sydney Opera House itself or this significant phase of the site's history. The site's potential archaeological resource is associated with various significant phases in the site's historical development that have influenced its current form. In particular, the study area has potential to contain archaeological evidence associated with the modification of Bennelong Point's shoreline, Fort Macquarie, nineteenth- and twentieth-century wharf and harbour facilities and the twentieth-century tram operations.

The changing configuration of the land that is most closely associated with the first settlement of Australia by the First Fleet in 1788 is a matter of historical interest. Archaeological evidence of the changing shoreline therefore has the potential to contribute to our understanding of the landforms that existed around Sydney Cove prior to non-Aboriginal settlement and after land reclamation works in the nineteenth century. Such evidence would have High archaeological significance. Any evidence associated with Aboriginal occupation or use of the site, including isolated objects in disturbed contexts, would have High archaeological significance.

Archaeological remains associated with small structures that were located across Bennelong Point during the early-to-mid nineteenth century would have Moderate–High archaeological significance for their potential to contribute information about these poorly documented site uses.

Archaeological remains associated with Fort Macquarie, including structural remains or associated deposits or features, would have High archaeological significance and research potential for their ability to contribute to our understanding of this major period in the historical development of Bennelong Point.

The development of the eastern side of Sydney Cove along the western shore of Bennelong Point for wharves, ferries and other facilities related to seaborne trade is a matter of considerable historical interest, having a bearing on our understanding of the local area's development and the growth of Australian trade and industry during the nineteenth century. Relics relating to the nineteenth-century wharf facilities have potential to shed light on early and changing attitudes to the visual qualities of the harbour's built environment (from the picturesque to the utilitarian) and the changing functions of Bennelong Point (from defensive position to transport hub). Their potential in

this regard is likely to be limited by a degree of disturbance caused by subsequent activities on the site. Such evidence would have Moderate archaeological significance.

Archaeological investigation of relics associated with the operation of the trams on Bennelong Point would have limited potential to yield information relating to the development of Sydney's public transport system. Such evidence would have Low archaeological significance.

3.6 Endnotes

1 James Semple Kerr 2003 (third edition), Sydney Opera House—A Plan for the Conservation of the Sydney Opera House and its Site. Sydney Opera House Trust.

2 *NSW Heritage Manual*, 1996, NSW Heritage Office and NSW Department of Urban Affairs and Planning, Sydney; and *Assessing Heritage Significance* (a *NSW Heritage Manual* update), 2001, NSW Heritage Office.

3 Bickford, A and S Sullivan 1984, 'Assessing the Research Significance of Historic Sites', in Sullivan S and S Bowdler (eds), *Site Surveys and Significance Assessment in Australian Archaeology* (proceedings of the 1981 Springwood Conference on Australian Prehistory), Department of Prehistory, Research School of Pacific Studies, the Australian National University, Canberra.

4 Bickford and Sullivan, op cit, pp 23–24.

5 Kerr, p 32.

6 Sydney Water S170 Heritage Register Item Report—Bennelong SWC No. 29.

7 op cit, Kerr 2003, pp 34–35.

8 op cit, Sydney Water S170 Register.

9 op cit, Sydney Water S170 Register.

4.0 Assessment of Archaeological Impacts

4.1 Proposed Works

The proposed works include:

- construction of a new basement level below Sydney Opera House that incorporates a loading dock; and
- construction of a vehicular tunnel to the new basement level of Sydney Opera House;.

4.1.1 Construction of New Basement Level

It is proposed to construct a new basement level beneath Sydney Opera House that incorporates a loading dock, security amenities and storage areas (see Figures 4.1 and 4.2). The new basement level would be located beneath the existing sub-basement level, with the finished floor level of the new basement at RL-10.942 (AHD) [-35' 1"] and the finished upper level at RL-4.442 (AHD) [-14' 7"]). The new basement level would be connected to the existing levels of Sydney Opera House via three lifts. These lifts would be the only points of intersection with the Sydney Opera House structure.

The new basement level would be constructed using a horizontal drilling technique. Part of the loading dock turning zone (which extends to the south of Sydney Opera House) may need to be constructed using a cut-and-cover technique to allow access to barges in Farm Cove during construction (to minimise truck movements in the forecourt area and Macquarie Street during the construction program).

4.1.2 Construction of Vehicular Tunnel

It is proposed to construct a vehicular tunnel that runs from the existing surface access road to the south of Sydney Opera House to the proposed new basement level. This tunnel would provide direct access for vehicles from the Macquarie Street roundabout to the new loading dock beneath the building (see Figures 4.1 and 4.3).

The tunnel structure would be 9900mm wide and 7100mm high, and would include a 6500mm wide roadway as well as a services zone and pedestrian footpaths. A truck-turning/parking area would be constructed at the northeastern end of the tunnel.

The tunnel would be constructed using a cut-and-cover technique, requiring bulk excavation along the proposed route of the tunnel to varying depths along its gradient to the base of the Sydney Opera House steps. The maximum depth at the northeastern end of the tunnel would be approximately 7600mm. The finished level of tunnel road surface would be RL-10.942 (AHD) [-35' 1"].

An existing air vent for the Bennelong Point Parking Station located adjacent to the Tarpeian Way cliff face would be enlarged to provide ventilation to the proposed vehicular tunnel.

4.2 Evaluation of Impacts

4.2.1 Construction of New Basement Level

The proposed construction of the new basement level would be unlikely to result in any major archaeological impacts, given that the depth of proposed excavation would be well below the majority of surviving archaeological remains and the proposed method of excavation (horizontal drilling techniques) would avoid or minimise any disturbance of these remains. Archaeological impacts associated with this component of the works would be limited to the location of the three lifts that would connect the new basement level to existing levels of Sydney Opera House, as well as some deeper subsurface elements that may be present across the site (eg natural ground levels and former shorelines around the periphery of Bennelong Point, as well as deeper built elements such as wells or privies).

In the event that cut-and cover bulk excavation were to be required in the loading dock turning zone, this may result in major archaeological impacts in this area. Potential archaeological remains in this area may include structural and other remains associated with Fort Macquarie, the former tram shed, or other earlier structures, as well as deposits and other features associated with the shoreline and former seawalls.

4.2.2 Construction of Vehicular Tunnel

The proposed works would require bulk excavation along the proposed route of the vehicular tunnel. The area of excavation is expected to be at least 10m wide to a maximum depth of up to 8m below the current forecourt surface.

The area of proposed bulk excavation for the tunnel would have only minor archaeological impacts, as it avoids most of the areas identified in this report as having archaeological potential.

4.2.3 Summary of Potential Archaeological Impacts

The areas of proposed excavation are shown in Figure 4.4 in relation to potential archaeological remains that may be located in these areas. Potential archaeological remains that may be affected by the proposed excavation works include:

Phase	Potential Archaeological Remains	Date	Significance	Potential Impacts
—	Aboriginal evidence.	Pre-1788–1802	High	Potential partial disturbance through cut-and cover excavation (tunnel and loading dock).
1–2	Deposits associated with the original shorelines (eastern and western sides of Bennelong Point) and original land form.	1788–1802	High	Potential partial disturbance through cut-and cover excavation (tunnel and loading dock).
1–2	Evidence associated with incidental activities in this area, such as artefact scatters/rubbish dumps.	1788–1802	High	Potential partial disturbance through cut-and cover excavation (tunnel and loading dock).
1–5	Rubbish dumps into water—Concentrations of artefacts within areas of reclaimed land, beneath introduced fill deposits.	1788–1960s	Moderate	Potential partial disturbance through cut-and cover excavation (loading dock).

Phase	Potential Archaeological Remains	Date	Significance	Potential Impacts
3	Structural remains and deposits associated with unknown rectangular feature shown on plan adjacent to eastern shoreline.	By 1829	High	Removal disturbance through cut-and-cover excavation (loading dock).
3–4	Structural remains, deposits and other features associated with Fort Macquarie.	1817–1901	High	Potential partial disturbance through cut-and-cover excavation (loading dock).
3–5	Former seawalls.	1810–1960s	Moderate	Potential partial disturbance through cut-and-cover excavation (loading dock).
4	Drill hall.	1890s–1901	Moderate	No proposed disturbance.
4	Structural remains, deposits and features associated with small rectangular structures.	c1845–1860s	Moderate–High	No proposed disturbance.
4–5	Structural remains, deposits and other infrastructure associated with boat harbour/slip in southeastern section of Bennelong Point.	By 1845 to 1960s	Moderate	Potential partial disturbance through cut-and-cover excavation (loading dock).
4–5	Structural remains and other infrastructure associated with wharves along western shoreline.	By 1860s to 1960s (rebuilt/ upgraded 1889)	Moderate	No proposed disturbance.
4–6	Bennelong stormwater channel.	c1857 1960s	High Low	Potential partial disturbance through cut-and-cover excavation (tunnel).
5	Tram house, tram tracks, deposits and associated infrastructure.	1901–1950s	Low–Moderate	Potential partial disturbance through cut-and-cover excavation (tunnel).

The proposed construction of the new basement level would be unlikely to have any major archaeological impacts, given the proposed depth of the new basement level (below the majority of the site's potential archaeological remains) and the proposed method of construction (horizontal drilling rather than excavation).

Two of the proposed lifts that would connect the new basement level to existing levels of Sydney Opera House would be unlikely to have any archaeological impacts, they would be located within the footprint of the existing basement level. The proposed temporary scenery lift may have some archaeological impacts, as it would extend through a part of the site that may not have been previously disturbed. However, the proposed location of this lift does not intersect with any known major potential remains. It would be located within the former footprint of Fort Macquarie and the later tram-car house and may therefore disturb archaeological deposits or features associated with these periods of the site's history. The nature and extent of any surviving remains in this specific area is unknown, but any remains associated with these periods of the site's development may have Moderate–High significance and research potential.

The proposed cut-and-cover construction of the vehicular tunnel would have a relatively minor archaeological impact. The proposed area of excavation intersects with areas of the site identified as having limited archaeological potential or significance. The majority of the potential remains in

this area, if they survive, would be tram tracks and other infrastructure associated with the early-to-mid twentieth-century tram operations at the site. Disturbance or removal of such remains would be minor archaeological impacts only, given the limited significance and research potential of these remains.

Excavation for the proposed tunnel would also require removal of sections of the Bennelong stormwater channel (sections of the original brick oviform drain as well as later concrete diversions). The stormwater channel would have been diverted prior to the commencement of the proposed works (as part of a previous development proposal for the site, in preparation for the current scope of proposed works). Removal of sections of the drain for construction of the tunnel would represent only a minor incremental impact to this heritage item when considered in conjunction with the previous works.

The component of the proposed works that would have the greatest archaeological impact would be the potential cut-and-cover excavation for construction of the easternmost section of the loading dock turning circle. Excavation of this area (that is, disturbance of levels above the proposed loading dock level) would potentially disturb structural and other remains associated with the southeastern extension of the Fort Macquarie battery, structural and other remains of an early nineteenth-century building in this area, and potential remains associated with the original shoreline and former seawalls. Excavation of this area would therefore be considered to have a major archaeological impact.

4.3 Recommended Mitigative Strategy

4.3.1 Potential Archaeological Impacts

The significance of the site's potential archaeological resources is primarily derived from their research potential. Therefore, the adverse impacts associated with the proposed works could be mitigated by appropriate archaeological investigation and recording in association with the proposed site works to ensure that the research potential of the site is fully realised.

In the event that cut-and-cover excavation were to be required in the eastern part of the study area for construction of the proposed loading dock turning area, the potential archaeological impacts of this component of the project could be mitigated through archaeological investigation of this area in conjunction with the proposed works prior to the removal of remains. Archaeological investigation of this area would provide an opportunity to investigate key phases of the site's development, including elements of the natural landform, early use of the site and major periods of development and occupation. Investigation of this area could provide insight into the site's history and development and a better understanding of the impact of land modification and subsequent phases of development on earlier remains. The proposed investigation methodology and research framework is discussed in more detail in Section 5.0.

Archaeological investigation in conjunction with the proposed construction of the temporary scenery lift would not be feasible, because of the constraints of the construction of this element of the project (excavation of a confined area within an existing building). Given the limited archaeological potential of this area, archaeological investigation in conjunction with the proposed works would not be warranted.

In view of the limited archaeological potential of the area of the proposed vehicular tunnel (tram tracks and associated infrastructure), detailed archaeological investigation in conjunction with this element of the proposed works would not be warranted, as investigation of this area would be

unlikely to contribute substantial or significant information about this part of the site that could not be obtained from other sources. However, it would be worthwhile to monitor excavation in this area and to make a photographic record of any features uncovered and removed.

4.3.2 Bennelong Stormwater Channel

The Bennelong stormwater channel is to be investigated and recorded as part of a related drain diversion project. For consistency, similar mitigative measures recommended for that project would be appropriate here for the current scope of proposed works, as follows:

- The removal or disturbance of any sections of the original oviform channel (currently functioning or previously decommissioned) should be minimised wherever possible.
- Any sections of the channel that are to be removed should be photographed in situ prior to removal (including sections of the original oviform drain and later diversions).
- Any exposed sections of the original oviform channel that would not be removed should be protected during excavation works, as well as in association with construction of the new diversion junction.
- Removal of any sections of the original oviform channel would be undertaken in consultation with Sydney Water.
- Sydney Water would be consulted in relation to any preservation requirements, including the retention and storage of any fabric or artefacts recovered from the Sydney Water asset.

4.3.3 Temporary Visual Impacts

Management of the construction site should be such that temporary visual impacts for the duration of the proposed works are minimised, including appropriate hoardings that contain all aspects of the proposed excavation and construction. Hoardings should be solid, clean, and well constructed. Movement of vehicles, equipment and construction personnel across the forecourt area should also be controlled to minimise physical and visual disruption to open public areas.

4.3.4 Interpretation

Interpretation of any exposed archaeological features and the contribution of this evidence to archaeological research may also mitigate any adverse archaeological impacts. Any such interpretation should be part of a holistic approach to the interpretation of the site and consistent with requirements and restrictions identified in the Sydney Opera House Management Plan and Signage Manual.

4.4 Compliance with 2003 Conservation Plan

The 2003 Conservation Plan includes policies that guide the protection of the design principles and heritage significance of the Sydney Opera House site. The following policies are relevant to the current proposal:

The Forecourt and Lower Forecourt

Policy 15.3 Any scheme for providing facilities under the Forecourt should:

-Retain the existing level of the Forecourt;

-Co-ordinate and minimise above ground intrusions;

-Record the surviving nineteenth century fabric of the storm water drain before diversion;

-Provide for paving designed to be consistent with the character of adjacent Podium and Broadwalk paving as well as accommodating changed structural requirements.[1]

This report addresses the archaeology or below ground impacts only. Section 4.3.2 above details the appropriate method to record the fabric of the storm water drain and as such this report is consistent with the requirements of Policy 15.3 of the Conservation Plan.

Excavation

Policy 53.1 Work involving excavation or investigation of sub surface objects, should be planned and executed in accordance with the requirements of the Heritage Act 1977 and advice of the NSW Heritage Office.[2]

This report has been prepared as supporting documentation for an application to the Heritage Branch, Department of Planning (formerly the NSW Heritage Office) to ensure that the potential archaeological impacts of the proposed works are appropriately managed. This process of assessment and approval is consistent with the requirements of Policy 53.1 of the Conservation Plan.

4.5 Compliance with 2005 Management Plan

This report has been prepared to address the heritage impacts of the proposed works in relation to the requirements of the Sydney Opera House Management Plan and to provide supporting documentation for the required statutory approvals. This report is consistent with the objectives of the Management Plan.

This report concludes that the proposed works do not include any activities that would have a significant adverse impact on the National and World Heritage values of Sydney Opera House.

This report also recommends that any approval for the proposed works be conditioned so as to protect the National and World Heritage values of Sydney Opera House. These conditions should be appropriately monitored and enforced.

The conclusions and recommendations of this report are consistent with the objectives of the 2005 Management Plan.

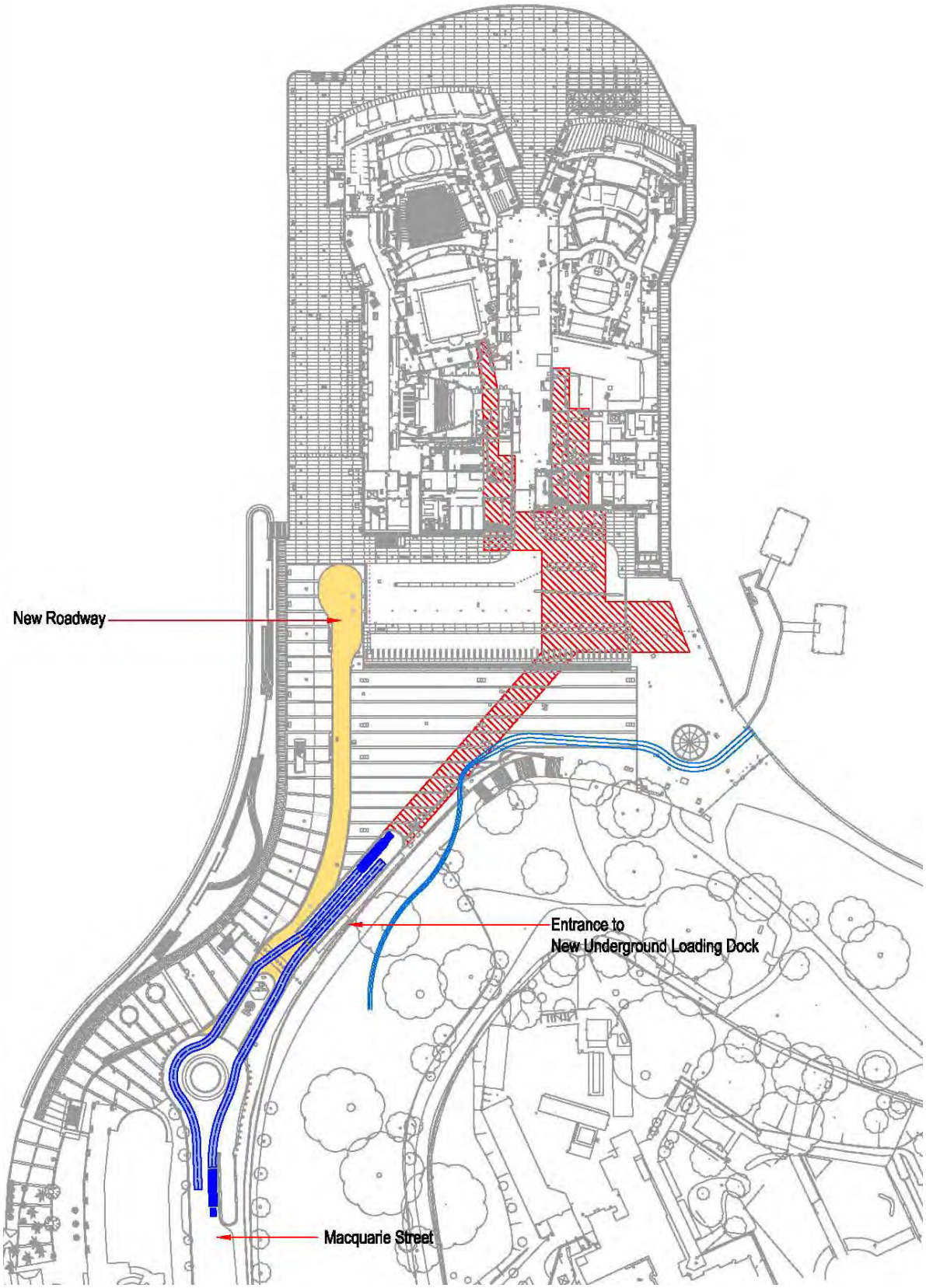


Figure 4.1 Plan of the Sydney Opera House site showing elements of the proposed works. The red hatching indicates the area of the proposed works addressed in this report. (Source: Sydney Opera House Trust)

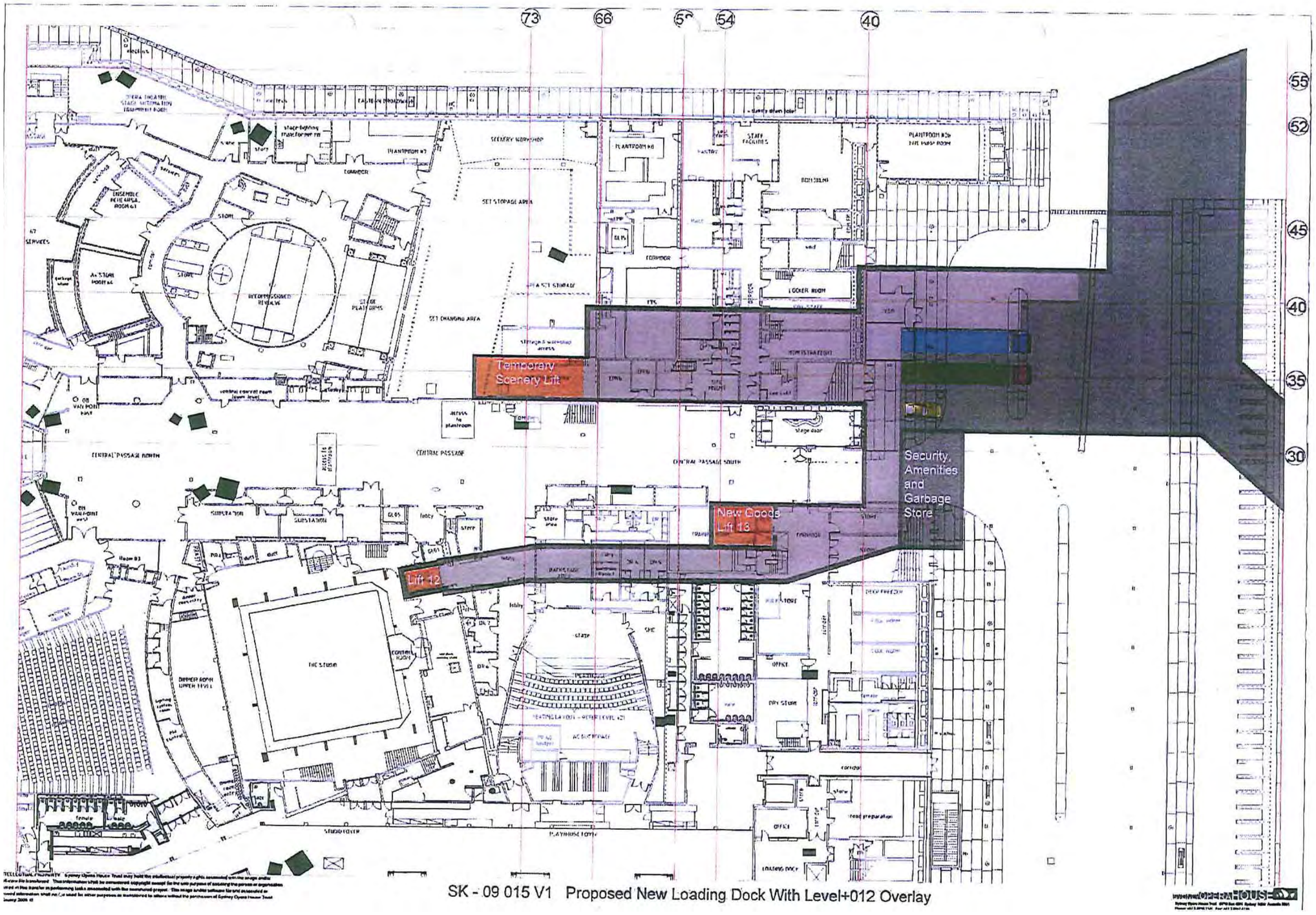


Figure 4.2 Plan of Sydney Opera House showing details of the proposed new basement level in relation to the existing ground floor layout. (Source: Sydney Opera House Trust)

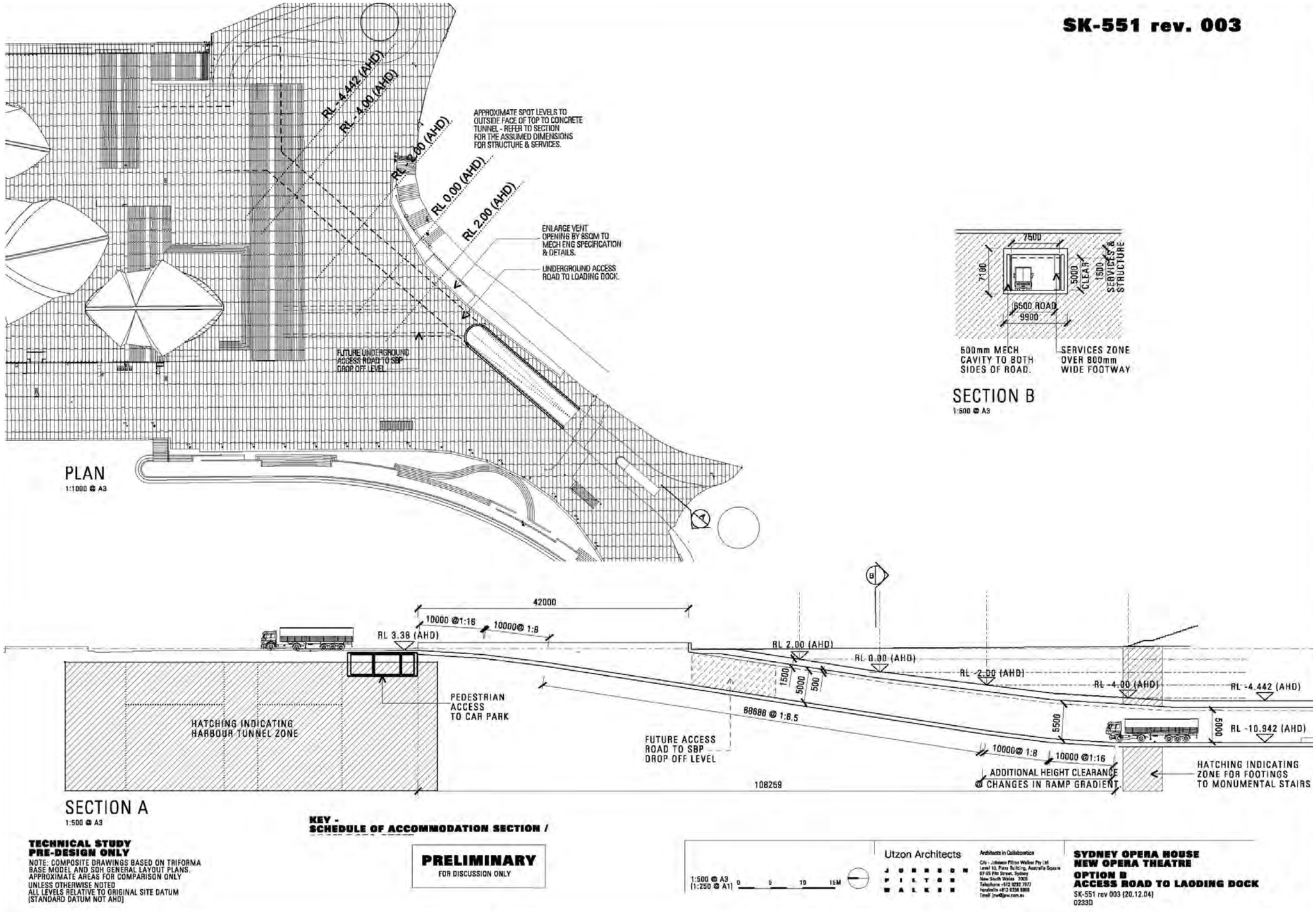


Figure 4.3 Plan and section drawings showing details of the proposed vehicular tunnel. (Source: Sydney Opera House Trust)

Figure 4.4 Plan summarising potential archaeological impacts of the proposed works, showing areas of archaeological potential in relation to areas of proposed excavation. (Source: GML)

Figure 4.5 Photomontage looking south from Man O'War jetty towards the proposed drain outlet in the seawall, at low tide. (Source: Sydney Opera House Trust)

Figure 4.6 Photomontage looking west from the Farm Cove seawall towards the proposed drain outlet, at low tide. Given the curve of the seawall, the proposed drain outlet would be hardly visible from this location. (Source: Sydney Opera House Trust)

Figure 4.7 Photomontage looking west from the Farm Cove seawall (further east than Figure 4.6) towards the proposed drain outlet. Given the curve of the seawall and the distance of this viewpoint, the proposed drain outlet would be hardly visible from this location. (Source: Sydney Opera House Trust)

Figure 4.8 Photomontage looking west from the eastern side of Farm Cove towards the proposed drain outlet, which would be hardly visible from this distant location. (Source: Sydney Opera House Trust)

4.6 Endnotes

[1] Kerr, J. S. 2003, Sydney Opera House: A Plan for the Conservation of the Sydney Opera House and Its Site, Sydney, p 59.

[2] Ibid, p 94.

5.0 Archaeological Management Plan

5.1 Preamble

This section of the report provides an Archaeological Research Design and a proposed investigation and recording strategy to mitigate the impact of the proposed works on the site's potential archaeological resources. This investigation would be undertaken in accordance with a research framework that would guide the information to be recovered from the site during the proposed investigation. This Archaeological Research Design recommends a program of archaeological testing and monitoring in conjunction with proposed excavation works to ensure that any significant archaeological remains that are exposed are investigated and recorded prior to their removal. The proposed program of archaeological investigation relates primarily to the option of cut-and-cover excavation for the construction of the loading dock. Given the relatively limited archaeological potential and significance of other areas of proposed impact, detailed archaeological investigation in conjunction with other components of the proposed works would not be warranted. However, the remains of the Bennelong stormwater channel, where exposed would be recorded, prior to their removal, and the excavation of the area affected by the proposed vehicular tunnel would be monitored so that any features uncovered could be recorded.

Elements of the proposed works would require the disturbance of archaeological relics that are protected under the *Heritage Act 1977* (NSW). This Archaeological Research Design has been prepared as accompanying documentation for an application to the Heritage Council of NSW for approval to disturb or remove these remains in association with the proposed site works. This section includes a research framework and excavation methodology to guide the proposed investigation of the site to ensure that its archaeological remains are appropriately managed throughout the investigation.

5.2 Research Framework

5.2.1 Thematic Research Framework

The proposed archaeological investigation of the site should consider physical evidence associated with the historical development and occupation of Bennelong Point and its surrounds within a broad thematic context. New South Wales Historical Themes have been compiled by the Heritage Council of NSW to assist heritage practitioners (among others) to understand heritage places within a broader research framework, beyond the site itself.

The NSW Historical Themes that are potentially relevant to the study area include:

- Environment—cultural landscape—Activities associated with the interactions between humans, human societies and the shaping of their physical surroundings.
- Defence—Activities associated with defending places from hostile takeover and occupation.
- Industry—Activities associated with the manufacture, production and distribution of goods.
- Transport—Activities associated with the moving of people and goods from one place to another, and systems for the provision of such movements.

5.2.2 Broad Research Framework

One of the main objectives of any archaeological investigation is to recover information from the site that is not available through any other sources. The types of questions that might be asked of the site include:

- What physical evidence of former activities survives on the site?
- What is the extent of the surviving archaeological evidence?
- What is the nature of extant archaeological features?
- What is the date of the identified elements?
- What can the material culture contribute to our knowledge about this site or other sites?

Any site investigation should be designed to answer these basic questions about the nature and extent of the surviving archaeological resource. While these questions provide a basic archaeological context for the site investigation, more specific questions must be asked to address the research potential of the study area.

5.2.3 Site-specific Research Framework

Investigation of the site may allow a number of specific questions to be addressed. These questions arise from considering the available historical documentation of the site's development and occupation, observing its physical condition and assessing the specific nature and extent of the archaeological remains that may survive there.

Site-specific research questions that may be addressed through physical investigation of the archaeological resource include:

- What can the fill deposits relating to land reclamation activities tell us about the original and early configurations of the western shore of Bennelong Point? How was the natural landform modified to accommodate development?
- Does the site contain any intact natural or topsoil deposits that may contain evidence of Aboriginal occupation of the area, either prior to the arrival of Europeans in 1788 or during the early colonial period?
- How does the archaeological evidence of the shoreline relate to historical plans and images of it? Does it shed light on the veracity of well-known historical plans and illustrations?
- Do any remains of former seawalls survive at the site? How does this evidence relate to the documentary record? How have subsequent phases of development affected these remains?
- Does the site contain any evidence of minor structures recorded in this area in the early-to-mid nineteenth century? What does this evidence tell us about the nature and form of these structures or their inhabitants?
- Does the site contain any evidence of unrecorded buildings or other site features?
- Do any subsurface remains of Fort Macquarie survive within the study area? Does this evidence provide any new information about the design, operation or occupants of the fort?

- Can the subsurface remains be associated with any other recorded structures on Bennelong Point? Can specific operations be identified?
- Do any other deposits or artefacts associated with the use and occupation of Bennelong Point survive? If so, what do they reveal about the site's use and history?
- To what extent did periods of redevelopment and modification of Bennelong Point throughout its history disturb or protect the site's archaeological resources?
- What impact did the construction of Sydney Opera House have on the archaeological potential of the study area?

5.2.4 Other

As with all archaeological investigations, this project provides an opportunity to gather information about site formation and disturbance processes. It is expected that analysis of the taphonomy (site formation processes) and stratigraphic analysis will present some challenges. The report on this aspect of the project may be a useful reference document for those undertaking subsequent excavations at this site or similar sites.

5.3 Previous Archaeological Works at Sydney Opera House Site

5.3.1 2004 Works

In February 2004, excavation was undertaken on the eastern side of the Sydney Opera House site for a new lift shaft. The excavation works exposed part of a sandstone wall probably relating to Fort Macquarie and isolated artefacts dating broadly to the second half of the nineteenth century. These relics were managed as part of an Exemption issued by the (then) NSW Heritage Office.

The exposed relics were recorded by an archaeologist from Godden Mackay Logan. They demonstrate the potential for archaeological relics to survive at the site at relatively shallow levels and in areas previously assumed to have been subject to major disturbance.

5.3.2 2007 Works

In 2007, excavation was undertaken in association with the construction of a new lift and pedestrian access corridor as part of the Sydney Opera House Western Foyer Upgrade project. These works involved mechanical excavation from the surface into deposits underlying the western boardwalk and were undertaken in accordance with an Exemption issued by the NSW Heritage Council pursuant to Section 57(2) of the *Heritage Act 1977* (NSW).

As part of the 2007 works, it was believed that it would be necessary to construct a 'coffer dam' that would disturb or destroy an approximately 10.5m stretch of seawall dating to c1894, running approximately north–south along the eastern side of Circular Quay (to the west of Sydney Opera House). It was proposed to undertake appropriate archaeological excavation and documentation of the wall prior to any disturbance, and to reconstruct the wall in its original position on completion of the works. However, during the course of the works, it was possible to introduce sheet piling along the inside (eastern) face of the wall instead of the anticipated coffer without causing damage or disturbance to the seawall itself.

5.4 Proposed Archaeological Investigation Methodology

5.4.1 General Approach

Archaeological investigation would only need to occur in response to or in conjunction with excavation associated with the proposed project works in areas of archaeological sensitivity. The areas where archaeological monitoring would be required in conjunction with proposed excavation works are shown in Figure 5.1. Any areas of archaeological potential that would remain undisturbed as part of the proposed program of works would not require archaeological investigation.

5.4.2 Cut-and-Cover Excavation for Loading Dock

In the event that cut-and-cover excavation were to be adopted for construction of the easternmost section of the proposed loading dock, a program of archaeological testing, monitoring and recording in conjunction with the proposed excavation works is recommended in order to mitigate the proposed impacts to the site's potential archaeological resources and to adequately realise the site's archaeological research potential.

Archaeological testing refers to focused excavation of targeted areas within the impact zone prior to bulk excavation of the site. The objective of archaeological testing is to determine the nature and extent of any archaeological remains present within the area to inform ongoing works at the site. Archaeological testing allows for adequate investigation and recording of exposed features and deposits outside of the critical path of the on-site construction program. Potential outcomes of archaeological testing may include:

- no further archaeological works (if testing reveals that the site is more disturbed than previously identified, or if the archaeological potential or significance of the remains is limited or nil); or
- open-area excavation (if testing reveals that the site contains substantial and/or significant remains that would warrant detailed investigation and recording); and/or
- archaeological monitoring in conjunction with excavation works to allow for further investigation or recording of any exposed remains, as required (if testing reveals that the site has some potential to contain archaeological remains that would warrant further investigation and recording).

Open-area excavation refers to a controlled program of archaeological investigation across a broader area to investigate the extent of site features and relationships between them. It generally extends the area of investigation from the area/s initially excavated as part of the testing program.

Archaeological monitoring refers to the observance by an archaeologist of excavation works undertaken by mechanical excavator within areas assessed as having archaeological potential. The objective of archaeological monitoring is to determine the nature and extent of surviving features and/or deposits, to identify and record these features and/or deposits and/or to determine whether further investigation, if any, may be warranted.

An Excavation Director would be appointed as the primary archaeologist who would direct the nature and extent of specific investigation and recording on site in response to site conditions. The Excavation Director would also be the key contact for the client and/or project manager of the proposed site works. They would be assisted by other archaeologists on site, as required by the

needs of the project. It may also be appropriate for a representative of the Metropolitan Local Aboriginal Land Council (MLALC) to participate in the archaeological monitoring program. (An invitation to participate should be made once the proposed works are approved and the timeframe is known.)

Archaeological Testing

A small team of archaeologists, under the direction of the Excavation Director, would excavate a number of small trenches across the site to target specific locations of potential remains. The test trenches would be excavated using a combination of mechanical and manual excavation, as appropriate.

Open-area Excavation

If open-area excavation was warranted, a larger team of archaeologists, under the direction of the Excavation Director, would extend the archaeological excavation of the site based on the findings of the testing program. The depth and extent of excavation required would be dependent on the findings of the investigation and site conditions.

Archaeological Monitoring

During archaeological monitoring, the archaeologist(s) on site would require authority to halt site works, as required, to undertake investigation or recording of any archaeological remains exposed during the monitoring process. Work should not recommence in these areas until directed by the archaeologist(s) on site.

Archaeological monitoring should continue at the site until:

- the archaeologist(s) on site is satisfied that the research potential of the subsurface deposits has been realised;
- culturally sterile deposits have been encountered across the site; or
- the maximum depth of excavation required for the proposed works has been reached.

5.4.3 Cut-and-Cover Excavation for Vehicular Tunnel

Detailed archaeological investigation along the majority of the proposed tunnel route would not be warranted. However, this excavation is expected to expose and remove sections of the Bennelong stormwater channel. In-situ recording of elements of this heritage item prior to its removal would be appropriate.

Initial excavation along the proposed tunnel route should be undertaken using a methodology that would allow for the exposure and recording of the drain before its removal. Any sections of the channel (original oviform drain and later diversions) that are exposed during site works should be photographed by the archaeologist(s) on site prior to the removal of any sections of the channel. This photographic recording should include general, contextual and detail shots and a north arrow and scale where relevant. The form, dimensions and condition of the exposed sections of the drain should also be recorded by the archaeologist(s) on site.

The opportunity should also be taken to monitor initial disturbance and excavation along the full extent of the tunnel so that any of the features which are revealed may also be recorded.

5.5 Other Requirements

5.5.1 Occupational Health and Safety Requirements

Occupational health and safety requirements would need to be adhered to at all stages of the project. The proposed archaeological investigation would need to consider site constraints that may arise throughout the course of the project, such as levels of contamination of subsurface deposits that may preclude manual excavation or structural instability of areas of the site that would prevent safe access. Such constraints may constrain the areas of the site that may be investigated or the degree to which these areas may be investigated or recorded. Such safety constraints would necessarily override any heritage requirements.

5.5.2 Training of On-site Personnel

All relevant site personnel would attend a site induction prior to commencement of works to ensure they were aware of the heritage issues associated with the site and the role of the archaeologist(s) on site.

5.5.3 Site Recording

The entire archaeological investigation process would be recorded photographically. Provision should also be made for detailed site recording (photography, measured drawings, context sheets) as required, if and when archaeological deposits and features are encountered. The nature and extent of recording required would be determined by the archaeologist on site in response to site conditions.

5.5.4 Artefacts

Where practical, processing of any artefacts recovered and other preliminary analysis would occur on site during the excavation phase. Artefacts would be collected and provenanced according to their contexts. Those that are recovered would be labelled, cleaned, conserved and catalogued as appropriate. These artefacts (and any samples that may be collected) would be returned to the client for storage pending completion of the project.

5.5.5 Post-excavation Reporting

A report of the results of the fieldwork would be produced at the completion of the archaeological investigation program in accordance with standard conditions of approval of excavation permits. This report would include:

- a description of the results of the investigation, including a discussion of the nature of the archaeological remains recorded;
- a response to the research questions raised in this Archaeological Research Design, including the results of post-excavation analysis undertaken and artefact or sample analysis;
- site records, including measured drawings and photographs where appropriate;
- conclusions relating to the nature and extent of surviving archaeological remains; and
- recommendations for further archaeological work or site interpretation, as appropriate.

The final archive of archaeological material would consist of all site records produced throughout the physical investigation including context sheets, artefact sheets, photographs, slides, drawings and artefacts (inventoried, boxed, labelled and catalogued).

5.5.6 Interpretation

Opportunities to interpret any evidence discovered during site works should be considered as part of a holistic approach to interpreting the site.

The proposed on-site works are likely to generate a great deal of interest owing to their visibility in a popular public domain. It is therefore recommended that:

- an online resource be established (eg a dedicated web page as part of Sydney Opera House's existing website) to provide information about the proposed works before they commence, in anticipation of public interest in visible on-site works; and
- signage be erected in relation to the proposed works to inform site visitors of the nature and extent of site works. (Any signage would need to be consistent with the requirements and restrictions identified in the Sydney Opera House Management Plan and Signage Manual.)

The online resource and on-site signage could provide information about the research that has been done for the site, the proposed archaeological investigation and its results, and any ongoing site management and interpretation.

Any artefacts recovered from the site during site works and a full set of archaeological investigation records (including this report) should be included in the Sydney Opera House's moveable heritage collection.

Figure 5.1 Plan showing areas of proposed excavation where archaeological investigation and recording would be required. (Source: GML)

6.0 Conclusions and Recommendations

6.1 Conclusions

- The area of proposed works is located within the curtilage of the World Heritage listing and the State Heritage Register listing of the Sydney Opera House. Approval from the Minister for Planning (under the *Environmental Planning and Assessment Act 1979* (NSW)) and the Heritage Council of New South Wales (under the *Heritage Act 1977* (NSW)) is required for any works within this curtilage that would affect the significance of the site.
- The Sydney Opera House site has potential to contain significant historical archaeological remains associated with various phases of the historical development of Bennelong Point.
- The proposed works would require at least partial removal of some of these remains.
- Construction of the proposed new basement level to Sydney Opera House would generally result in only minor archaeological impacts. The proposed new basement level would be constructed at a depth that would be below the majority of the site's potential archaeological remains. Proposed new lifts connecting the basement to existing levels of Sydney Opera House would generally avoid any areas of archaeological potential.
- Construction of the proposed vehicular access tunnel would generally result in only minor archaeological impacts, as the proposed route of excavation has only limited archaeological potential and research potential.
- The option to construct part of the proposed basement loading dock turning zone using cut-and-cover excavation would be the element of the proposed works with the greatest potential to result in major archaeological impacts. The proposed area of bulk excavation has potential to contain significant archaeological remains associated with various phases of the site's history.
- If cut-and-cover excavation of this area is required, it should be preceded by archaeological testing to determine the nature and extent of any archaeological remains. Further archaeological investigation and recording may then be required, dependent on the findings of the testing program.
- The proposed excavation for the vehicular tunnel would require removal of an original section of the Bennelong stormwater channel (oviform brick construction) and a later diversion constructed in association with the construction of Sydney Opera House. Any sections of the channel (original or later diversion) or any other historic features that are exposed during site works would be recorded prior to their removal.
- The proposed works would not affect any known Aboriginal sites and the study area has low potential to contain in-situ Aboriginal archaeological evidence.
- The proposed works would not have an adverse impact on the State, National or World Heritage values of the Sydney Opera House site.
- The proposed works are consistent with the management policies identified in the 2003 Conservation Plan and 2005 Management Plan for Sydney Opera House.

6.2 Recommendations

Archaeological Investigation

- The program of archaeological investigation outlined in this report should be adopted as part of the mitigative strategy for these works to address the potentially adverse impacts that these works would have on the archaeological significance of the site.
- The proposed program of archaeological investigation includes:
  - Potential cut-and-cover excavation for loading dock construction—archaeological testing of this area prior to bulk excavation, followed by further archaeological investigation (open-area excavation or monitoring, if required).
  - Cut-and-cover excavation for vehicular tunnel—exposure and recording of sections of Bennelong stormwater channel (original section and later diversion) prior to removal of these elements, followed by monitoring of the initial stages of all excavation works.
- In the event that any archaeological remains were to be exposed during site works, they should be appropriately documented according to the procedures outlined in this report.
- Suitable clauses should be included in all contractor and subcontractor contracts to ensure that on-site personnel are aware of the heritage issues associated with the site and the role of the archaeologist(s) on site.
- Subsurface disturbance should be limited to those areas identified in the documentation of the proposed works so as to avoid disturbance of other potential archaeological remains at this site.
- In the event that unexpected historical archaeological evidence were to be encountered during site works, works should cease and the Heritage Branch, Department of Planning should be notified immediately. Further assessment and/or approval may be required before works could recommence.
- In the event that unexpected Aboriginal archaeological evidence were to be encountered during site works, works should cease and the Department of Environment, Climate Change and Water (DECCW) should be notified immediately. Further assessment and/or approval may be required before works could recommence.
- The proposed works do not allow for in-situ retention of any archaeological evidence in the areas of proposed excavation. In-situ retention of the potential archaeological evidence on this part of the site would not be viable as part of the proposed program of works.

Temporary Visual Impacts

- Management of the construction site should be such that temporary visual impacts for the duration of the proposed works are minimised. Appropriate hoardings (solid, clean, and well constructed) should be erected to contain all aspects of the proposed excavation and construction works.

Interpretation

- Opportunities to interpret any evidence discovered during the proposed forecourt works should be considered as part of a holistic approach to interpreting the site.
- An online resource should be established to provide information about the proposed works before they commence, in anticipation of public interest in visible on-site works.
- On-site signage should be provided during the proposed works to provide visitors with information about the nature and extent of the site works. (This signage should be consistent with the requirements and restrictions identified in the Sydney Opera House Management Plan and Signage Manual.)
- Any artefacts recovered from the site during site works and a full set of archaeological investigation reports (including this report) should be included in the Sydney Opera House's moveable heritage collection.
- Sydney Water should be consulted in relation to any preservation requirements, including the retention and storage of any fabric or artefacts recovered from the Sydney Water asset (Bennelong stormwater channel).

Aboriginal Consultation

- A copy of this report should be sent to the Metropolitan Local Aboriginal Land Council for their information. An assessment of the likely impact of the proposal on Aboriginal cultural heritage values and the protection measures to be adopted during the works are addressed in a separate report that is currently being prepared titled 'Sydney Opera House: Vehicle and Pedestrian Safety Project–Aboriginal Cultural Heritage Values'.

7.0 Appendices

Appendix A

Sydney Opera House—A Revised Plan for the Conservation of the Sydney Opera House and its Site (third edition) by James Semple Kerr—site history

http://www.sydneyoperahouse.com/uploadedFiles/About_Us/Corporate_Information/Content_AboutUs_ConservationPlan2003.pdf

Appendix B

World Heritage List citation—Sydney Opera House

http://whc.unesco.org/pg_friendly_print.cfm?cid=31&id_site=166&

Appendix C

National Heritage List citation—Sydney Opera House

http://www.environment.gov.au/cgi-bin/ahdb/search.pl?mode=place_detail;search=place_id%3D105738%3Bkeyword_PD%3Don%3Bkeyword_SS%3Don%3Bkeyword_PH%3Don%3Blatitude_1dir%3DS%3Blongitude_1dir%3DE%3Blongitude_2dir%3DE%3Blatitude_2dir%3DS%3Bin_region%3Dpart;place_id=105738

Appendix D

Register of the National Estate—Sydney Opera House

http://www.environment.gov.au/cgi-bin/ahdb/search.pl?mode=place_detail;search=place_id%3D2353%3Bkeyword_PD%3Don%3Bkeyword_SS%3Don%3Bkeyword_PH%3Don%3Blatitude_1dir%3DS%3Blongitude_1dir%3DE%3Blongitude_2dir%3DE%3Blatitude_2dir%3DS%3Bin_region%3Dpart;place_id=2353

Appendix E

NSW State Heritage Register—Sydney Opera House

http://www.heritage.nsw.gov.au/07_subnav_02_2.cfm?itemid=5054880

Appendix F

Sydney Water Section 170 Register—Bennelong SWC No. 29

http://urbx.org.au/Bennelong%20Drain.pdf

Appendix A

Sydney Opera House—*A Revised Plan for the Conservation of the Sydney Opera House and its Site* (third edition) by James Semple Kerr—site history

http://www.sydneyoperahouse.com/uploadedFiles/About_Us/Corporate_Information/Content_AboutUs_ConservationPlan2003.pdf

THIRD EDITION

SYDNEY OPERA HOUSE

A REVISED PLAN FOR THE CONSERVATION OF THE SYDNEY OPERA HOUSE AND ITS SITE

JAMES SEMPLE KERR

SYDNEY OPERA HOUSE TRUST

2003

UNDERSTANDING THE PLACE

Bennelong Point, 1788–1795

Following Governor Arthur Phillip's decision to locate the settlement at Sydney Cove, the first ship to arrive from Botany Bay was HMS *Supply,* with Phillip on board. The *Supply* anchored at nightfall on Friday 25 January 1788—about a cable's length from what was later to be known as Bennelong Point. The rest of the fleet arrived the following day.

The government cattle and horses were landed on the point the following Monday and it received the immediate but unofficial name of cattle point (Collins, I, 5; Stephenson and Kennedy, 94). Being a headland it made the beasts easier to contain. Such large and novel mammals would have made the point a place of particular interest to the Guringai people but there are only incidental European references to their visits to the place (Bradley, 84; Collins, I, 27). The livestock remained until they had cropped what little pasture the point provided and they were then removed to a spot at the head of the cove to the east where a government farm was established (Collins, I, 5).

Isabel McBryde notes that the peninsula was known to the Aboriginals as 'Tyubow-gule' (McBryde, 17), but most early correspondents simply referred to the place as 'the east point of the cove' and in common usage it became East Point. Its permanent name, however, arose indirectly from Phillip's attempts to understand and come to terms with the local Aboriginal people. In November 1789, because of his limited success, he took the drastic step of seizing two men: Coleby and Bennelong (Bradley, 181). Coleby soon escaped but Phillip spent considerable time endeavouring by 'kind treatment' to 'reconcile' Bennelong to the Europeans (HRNSW, I, part 2, 300).

Relaxed surveillance allowed Bennelong to decamp in May the following year (1790) but he appears to have retained some affection for Phillip. When the two met farther down the harbour in September, Bennelong made an ill-fated attempt to introduce Phillip to his compatriots. Phillip was speared in the shoulder by 'Wil-le-mer-ring', probably because he interpreted Phillip's advance to shake hands as an attempt to capture him (Collins, I, 110–112).

Despite this, Bennelong subsequently re-appeared at government house with three companions. David Collins, the judge advocate of the settlement, reported:

> The welcome reception they met… inspired the strangers with such a confidence in us, that the visit was soon repeated; and at length Bennillong solicited the government to build him a hut at the extremity of the eastern point of the cove. This, the governor, who was very desirous of preserving the friendly intercourse which seemed to have taken place, readily promised, and gave the necessary directions for its being built (Collins, I, 113).

The hut was built of brick, twelve feet square and was roofed with tiles (fig.1). Bennelong chose the site and took possession of it about the middle of November 1790 (Collins, I, 117 & Tench, 200).

1. Thomas Watling, detail of 'View taken from the Rocks' showing Bennelong's hut on the east point of Sydney Cove, 1793–95. Dixson Gallery.

All contemporary sketches show the house in splendid and exposed isolation on the point and from this time the headland was increasingly known as Bennelong's Point—initially with almost as many spellings as there are letters in the name. There is no evidence to suggest that Bennelong spent much time in the dwelling; when in the vicinity he preferred to sleep at government house and seems to have regarded his own house more as a symbol of his importance than a place of residence. The place did, however, have occasional use as a social centre for those Aborigines that were about the settlement (McBryde, 17). William Bradley gives an account of an evening 'entertainment' in March 1791 provided by Bennelong at his house for the governor and his party. At it twenty-four men, women and children danced to the accompaniment of beating sticks and hands (Bradley, 231).

2. Detail of Charles Grimes' 'Plan of Sydney' showing the semicircular redoubt, the Salt House and Boston's Mill in 1800. HRNSW.V.f.p.837.

Much to the distress of relatives and friends, Bennelong and a young compatriot 'Yem-mer-ra-wan-nie' agreed to return to England with Phillip. They left in December 1792. Of the two Aboriginals, only Bennelong survived the trip and it was not until 1795 that, homesick and unwell, he was able to return with the new governor, John Hunter (Collins, I, 211, 296, 331, 572). Bennelong left no record of what he thought of his meetings with England's erratic and unprepossessing monarch, George III. The trip and his European connections helped unsettle a volatile character and he found himself alienated from both Aboriginal and European cultures. This was exacerbated by bouts of intoxication whenever he could gain access to liquor. According to the *Sydney Gazette,* Bennelong died at Kissing Point in 1813 (ADB, I, 85).

During Bennelong's English trip the house was hardly used (McBryde, 17), and in March 1793 it was lent to the visiting Spanish expedition of Don Alexandro Malaspina. The expedition made astronomical observations from the point and used the structure for the safe-keeping of the instruments (Collins, I, 231). The house was demolished in 1795 and the bricks used elsewhere (McBryde, 17).

In 1795 there was a shortage of salt in the colony and Governor Hunter agreed to John Boston's proposal to make salt at Bennelong Point. He was allocated seven convicts and constructed a small works on the west side of the Point (ADB, I, 126; Collins, I, 355). Its location is confirmed by Grimes' plan of 1800 (fig.2) and by Charles-Alexandre Lesueur's engraved *Plan of Sydney* of 1802 in which the building is still known as the 'Saline' or salt works.

Boston was a free settler and staunch republican whose entrepreneurial spirit outran his competence. He only managed to produce 'three or four bushels of salt… in more than as many weeks' and the work was abandoned (ibid). The following year he turned his attention to brewing beer from corn, making soap and erecting a windmill on the ridge running south from Bennelong Point, approximately at the present location of the conservatorium of music. By June 1797 Hunter had come to the conclusion that Boston 'was one of those whom the colony will not derive any advantage from' (ibid, 127). In 1804 on a trading expedition Boston landed with seven others at Nukualofa. All were killed by the waiting Tongans as they stepped ashore (ADB, I, 127).

Early defence works and visitors, 1788–1802

Bennelong Point became the site of the first defensive work commenced in the colony. In April 1788 Phillip appointed marine officer and part-time astronomer, William Dawes, to act as artillery and engineer officer (Collins, I, 20) and he was requested to construct a small redoubt on the east point. David Collins notes that, in July, Dawes' labour force was made up of recently active thieves of whose guilt there was 'little doubt, though no positive proof' (ibid, 28). The work was finished by the end of the year and on new year's day 1789 two guns were placed in position (Harvey, 2.0). The redoubt would have been just sufficiently back from the northern tip of the point to attain a modest elevation and some command of the surrounding water.

Before the work was completed Phillip was obliged to send HMS *Supply* on an urgent quest for flour and, in order to increase its capacity, he removed eight of its guns. These were landed on the west (Dawes') point and a small breast work thrown up round them (Collins, I, 33). Both batteries fell into decay and the Bennelong Point battery was abandoned by 1791 (Harvey, 2.0). In December 1798, the ship's company of the *Supply* under Lieutenant Kent completed a half-moon battery 'on the east point (fig.2), where stood the house built by Governor Phillip for Bennillong' (Collins, II, 97-98, 100). It was armed with some of the guns from the *Supply*.

In October 1800, Governor Philip Gidley King's newly-appointed engineer officer, Edward Abbott, reported that the 'Bennelong Point or East Battery… consists of 4 [6-pounder] guns and 6 embrasures formed of wattle, casks, and earth, in a total state of decay' (HRNSW, IV, 198). No attempt was made to repair or reconstruct the work and instead the point was to become a de facto hospitality area for visiting survey and expedition vessels.

Nicholas Baudin's French expedition spent five months in Sydney from June to November 1802 and it was on the tip of Bennelong Point, south of the battery site, that King permitted Baudin to establish his shore tents 'to facilitate the work of the astronomers'. Matthew Flinders' tents erected from the *Investigator* were already nearby (Bonnemains, 57; HRNSW, IV, 948). One of Baudin's artists, Charles-Alexandre Lesueur, left a fine collection of reasonably accurate pencil sketches of Sydney and Bennelong Point (Bonnemains, 101–106). The Baudin visit was marked by the nice balance of courtesy, hospitality and suspicion which subsisted between the English officials and the French visitors.

If, as Collins suggests, Bennelong chose the site of his house, why was it in such an exposed location on the tip of the point, overlooked by headlands and ridges and visible from the waters of the harbour in three directions? In the absence of records of the local people's attitude to the point, it seems likely that Bennelong chose to give maximum visibility to the very solid evidence of the esteem in which he was held by the European visitors. The value of such a highly visible symbol of white benevolent intentions would not have escaped Phillip. Perhaps he guided Bennelong in his choice. Whatever the reason, the topographical characteristics which made it attractive to Bennelong also

made the vicinity useful for temporary defensive works and, when they were derelict, as a shore camp for visiting foreign expeditions. On the point, the foreigners could be held at a not inconvenient arm's length and at the same time be kept under easy surveillance.

For the first quarter century of European settlement, then, practical considerations arising from the topography determined the use of the northern part of the point. In the second decade of the nineteenth century, however, a new dimension was added to the way in which the place was perceived and Bennelong Point and its spinal ridge became the focus of a new official aesthetic.

Bennelong Point and the Picturesque, 1810–1843

The area now occupied by Bennelong Point, the gardens and Mrs Macquarie's Point was reserved for the crown by Phillip and was to continue as a government demesne free of leases or encroachments (Gilbert, 14–15). Under Hunter and King, however, a variety of leases and buildings were permitted. When Governor William Bligh took over in 1806 he would have none of such foolish or venal nonsense. He cancelled the leases and required the removal of the buildings (HRNSW, VI, 305). It was yet another act that failed to endear him to his 'mutinous' free subjects. Fortunately the next official governor, Lachlan Macquarie, reinforced and completed the clearance.

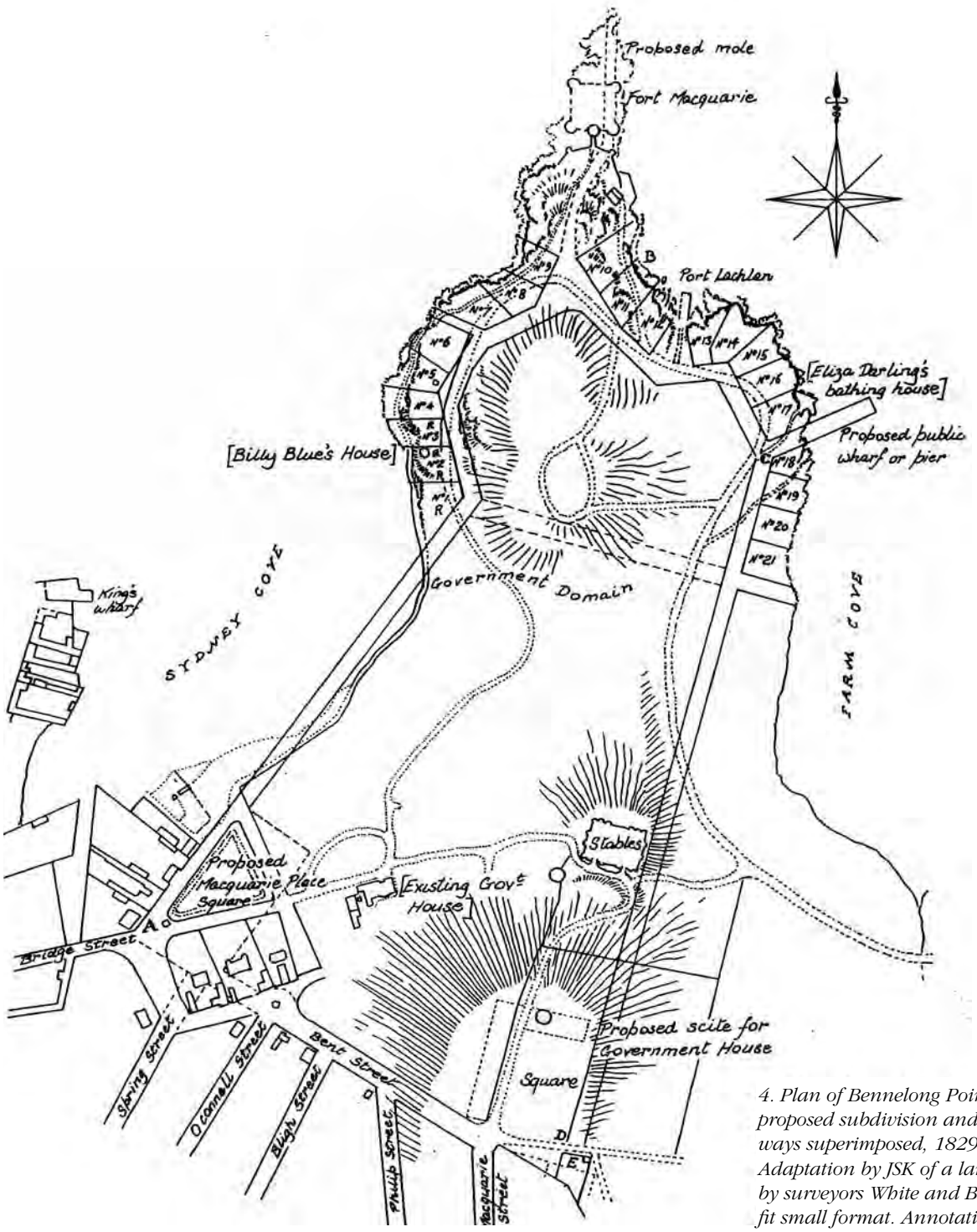
3. Billy Blue's house, detail of an engraving by S. Hall published in W.C. Wentworth's … Description of … NSW, 1820.

Macquarie and his wife Elizabeth did a lot more than return the government domain to its former shape: they also set out to embellish it. Elizabeth's taste for the Picturesque is now well documented (Kerr & Broadbent, chapter 3) and in Sydney she had one of the grandest water landscapes in the world to work on. Moreover she had a husband who shared her taste and was prepared to take responsibility for getting the work done.

The first fruit of the partnership on Bennelong Point was modest: a two-storey, vaguely castellated, octagonal cottage completed in 1812 on the west side of Bennelong Point (figs 3 & 4). It was built on Macquarie's orders as a dwelling for an eccentric black Jamaican known as Billy Blue. William Blue had been transported for stealing sugar and acted as a waterman, watchman and oyster seller. With his top hat and 'naval' uniform he was a highly visible member of Macquarie's marine menagerie (Ritchie, 165; Maclehose, 176–177).

In 1814 Macquarie received a never-to-be-repeated gift on the convict transport *General Hewitt*. It was the convicted forger, Francis Greenway, an architect capable of the stylish realisation of the Macquaries' dreams. Those dreams required castellated Gothic structures as embellishments of harbour views and these Greenway provided—although not without complaint at the occasional interference of his autocratic clients and the subversive activities of his military masters and convict craftsmen. The latter recognised his talent but couldn't stand his conceit.

Greenway clothed the Dawes Point Battery with a masonry screen and added a towered and castellated guard house, but his major defensive



4. Plan of Bennelong Point with proposed subdivision and roadways superimposed, 1829. Adaptation by JSK of a large plan by surveyors White and Benn to fit small format. Annotations in brackets have been added. (A/NSW Map SZ 454.)

work was to be commenced in 1818 across Sydney Cove on the tip of Bennelong Point. Macquarie had prepared a characteristic brief:

> **Memorandum for Mr Greenway, Gov^r^ Actg Civil Architect** 1st To draw out a Ground Plan and Elevation of a Neat Handsome Fort—intended to be erected, as soon as possible, on the lower part of Bennelong's Point, with Ten Embrasures, viz 4 in the North face, 4 in the East face and two in the West face; the South face of the Fort being the entrance and not requiring Embrasures. The Fort is to be entirely built of the best stone that can be procured near the spot. (ML, A1451, p1, Greenway Papers).

5. Detail from a Charles Bayliss photographic panorama of Sydney from the Garden Palace tower in 1879. Reading north along the Bennelong Point spine are the stables, government house and Fort Macquarie. National Library of Australia.

The fort was intended to prevent clandestine departures from Sydney Cove as well as repel 'surprise… attacks from an enemy' (ML, A3251, dispatch 25.3.1819).

The sixteenth of December 1817 was arguably the most satisfying day of Macquarie's official life. Mr Commissioner Bigge had not yet arrived to blight his public works program, he had breakfasted with friends to celebrate the completion of Greenway's South Head Light (named Macquarie Tower) and on his return he had stopped

> at Bennelong's Point where the ceremony was performed of laying the foundation stone of the new fort… and which was this day named Fort Macquarie.
>
> At 3 p.m. this same day I also laid the foundation stone of the new stable for Government House, etc, etc,…
>
> This being altogether a very interesting day and an auspicious one, I presented Mr Greenway… his emancipation dated this day, it being delivered to him at Macquarie Tower this morning before breakfast. (Ellis, 77, quoting Macquarie's Journal, 16.12.1817).

The third and largest element to be placed on the Bennelong Point ridge was to be Macquarie's government house. Fort, stables and house were to provide a grand Picturesque composition both from the harbour and from viewpoints on the walk earlier designed by Mrs Macquarie around Farm Cove to her 'chair' on Anson Point. The house was never built but Greenway cited the source of his design as Thornbury Castle, Gloucestershire (*Australian*, 4.4.1825). In 1803 Greenway had exhibited a work titled 'Thornbury Castle restored…' at the Royal Academy, so it is clear that he was familiar with the place (Kerr, Joan,

Designing a colonial church, Vol.1, 54–55). As the stables were to be stylistically consistent with the house it is not surprising that it too showed similarities to Thornbury. Even the tower of Fort Macquarie bore a family resemblance.

Governor Ralph Darling made a second attempt at achieving a new government house in 1827. He held a competition for a plan which his wife Eliza reputedly won. The project, like its predecessor, was stillborn but the Darlings did manage to erect a castellated bathing house with octagonal towers on the Farm Cove waterfront not far from Fort Macquarie (fig.4). Eliza Darling probably had a substantial hand in its design (Kerr & Broadbent, 47). Charles Rodius made an accurate pencil sketch of the bathing house and fort from Mrs Macquarie's Point in 1833.

6. George Halsted's watercolour of Bennelong Point from the Rocks showing Government House, the Tarpeian Rock face, Fort Macquarie and Fort Denison in 1863. Mitchell Library.

Bennelong Point's romantic marine landscape was finally completed in 1843 when the present government house was finished. It was designed in England by Edward Blore for the site selected by Macquarie but was actually built on the ridge halfway between the stables and Fort Macquarie (fig.5). The style was Late Gothic or Tudor. The 'genius' of the Point was still considered to be most peculiarly Gothic and a generation of artists, amateur and professional, never tired of depicting its elements (fig.6).

The prosaic James Maclehose, in his 1839 guide to Sydney, ends his description of Fort Macquarie with the following:

> the chief pride of this town is the excellent walks round the Domain, passing Fort Macquarie (Maclehose, 122).

A third of a century later Anthony Trollope added:

> I despair of being able to convey to any reader my own idea of the beauty of Sydney Harbour. I have seen nothing to equal it… (Trollope, 30).

He particularly commended

> a walk from the bottom of Macquarie Street… leading round by the fort, under the Governor's house, to the public gardens (Trollope, 33).

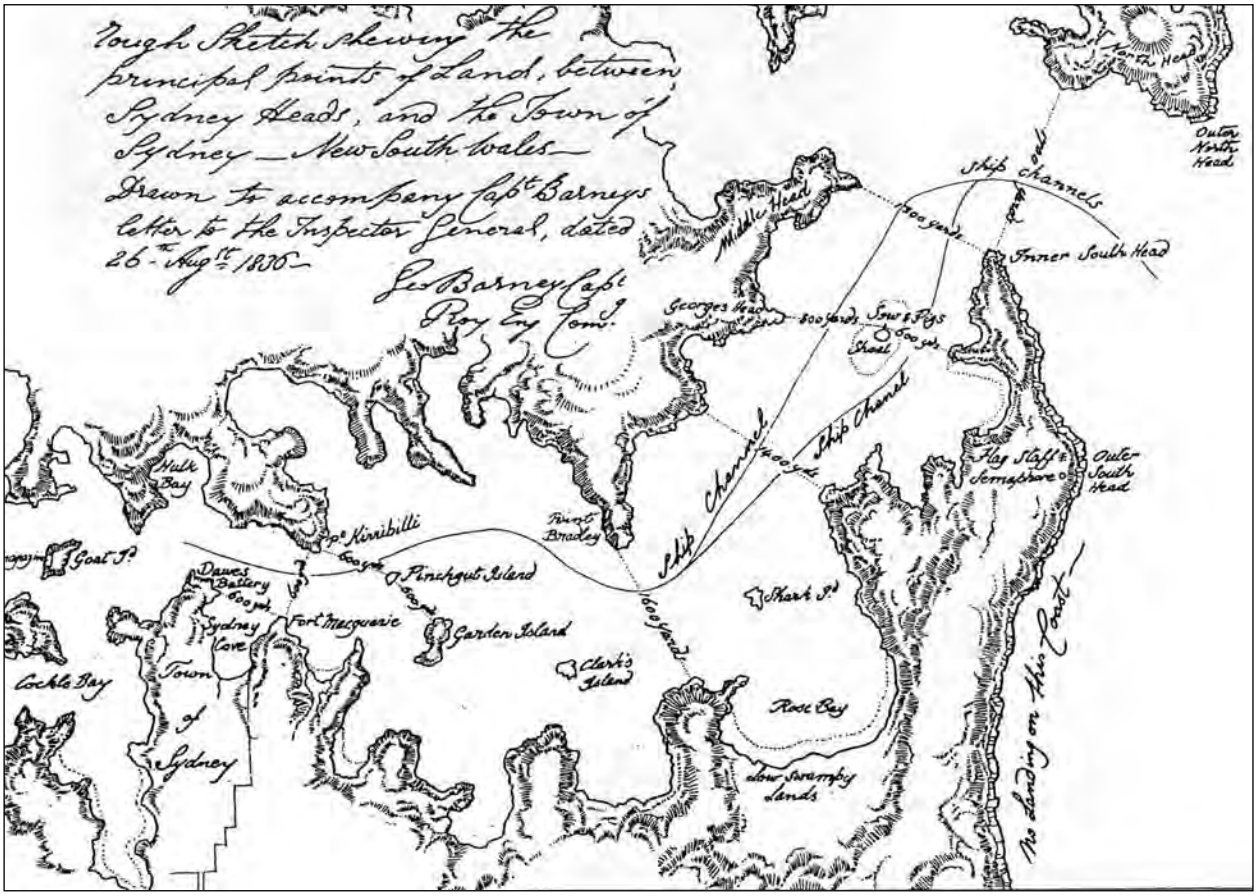
What the Macquaries had done (with prior help from Phillip and Bligh and some subsequent support from the Darlings and Bourke) was to create an environment which appealed to the Picturesque sensibilities of generations to come. It was enough to ward off the grosser demands for commercial and maritime developments which were sought throughout the nineteenth century.

Lionel Gilbert illustrates the point in his quote from William Charles Wentworth's 1819 lament that 'Government House and the adjoining

domain' denies 'facilities for the erection of warehouses and the various important purposes of commerce'. It was a plaint which was echoed by the 'political economist' (economic rationalist?) William Stanley Jevons in 1858:

> … in the original laying out of Sydney a great mistake was made; a large extent of land surrounding Farm Cove extending thence to the high ridge of Hyde Park and including both the promontories of Fort Macquarie and Lady Macquarie's Chair were reserved for parks or other purposes. The whole of this would be extremely valuable as affording both wharves for marine trade and a good central position for the other trades… (Gilbert, 177; ADB, IV, 481).

Such developments (and subdivisions (fig.4)) continued to be substantially resisted, making the government domain a fine and relatively intact legacy for twentieth century Sydney.



7. Adaptation of George Barney's sketch of Port Jackson, August 1836. Public Record Office, London, WO55.852.

Fort Macquarie and the use of the point, 1817–1901

While the landscape quality of Fort Macquarie with its Gothic towers was admired, its defensive capacity was not. The fort was a 130-feet square structure with circular bastions on the four corners. The bastions were each armed with a 24-pounder, smooth bore, muzzle-loading gun mounted *en barbette* on a traversing platform. This

enabled them to be discharged over the parapet with a wide field of fire. Other guns were mounted to fire through embrasures in the east, north and west parapets, three to each side. The fort was entered by a bridge over a dry moat and then through an octagonal Gothic guard tower. Similarly embellished towerlets sprouted from the east and west extremities of the counterscarp. A magazine capable of holding 350 barrels of gunpowder was built into the base of the tower and accommodation for an officer and twelve men was located in the upper part (Ellis, 104).

8. Fort Macquarie after the construction of the upper battery, sea wall and esplanade in the early 1860s. Unknown photographer about 1870. Private collection.

Most military observers regarded the fort as an ornamental and archaic toy. They were alarmed by the fact that its terreplein was only 22 feet above high water, thus unnecessarily exposing the gunners to enemy fire. They also objected to the tower which would become a source of flying splinters under bombardment. In 1836 the newly-arrived commanding royal engineer, George Barney, reported that both Dawes Point battery and Fort Macquarie were 'totally inadequate to the defence of Sydney Cove' (WO 55.852, f.75–77).

The subsequent life of the fort attests to the comparative soundness of its construction, but the process had been a painful one. At the time Greenway had a massive task of designing and supervising a range of public works in trying circumstances and each delay made his client more exigent. The artisan in charge of Fort Macquarie complained that Greenway had never given him a proper plan to follow and tended to change details while construction was underway (Kerr & Broadbent, 43). Greenway for his part became increasingly paranoid about the theft of his ideas and misuse of his plans by others and increasingly proceeded on a day-to-day 'need to know' basis (Havard, 168, quoting Bigge). It infuriated his builders. Despite the problems the fort was sufficiently completed to fire its first salute on the departure of Mr Commissioner Bigge in February 1821.

The arguments which occupied the next third of a century over the defence of Sydney and its harbour had little impact on Fort Macquarie and it continued to be used for drills and saluting, although without regular professional gunners. It was not until the Crimean war that Fort Macquarie was seriously reconsidered as a part of a defensive program. The imperial authorities had passed the title of the Sydney fortifications over to the colonial administration in 1851 (Kerr, *Fort Denison,* 18) largely to avoid the cost of long-overdue development. In 1856, however, the colony had a new (more or less) responsible government with a treasury swollen by the gold rushes, an active and pushful Barney in charge of harbour defence and a decisive royal engineer governor general, William Denison (ibid, 19–20). Works at Fort Denison, Mrs Macquarie's Point, Kirribilli Point, Dawes Point and Fort Macquarie were undertaken (LA, V&P, 1856–57, Vol.III, EC minute 56–60).

For an account of harbour defences in the period see J.S. Kerr, *Fort Denison,* 16–21.

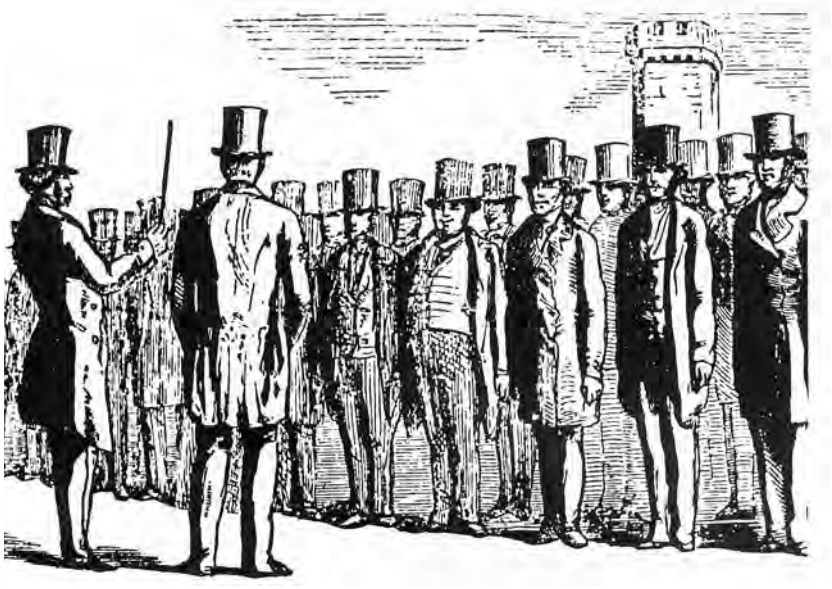
In 1861 a five-gun (42-pounder?) battery was completed on the eastern escarpment of Bennelong Point above and immediately adjacent to Fort Macquarie (fig.8). The date is confirmed by the returns of mounted and serviceable guns at the fort.

31 Dec'r	42pr	24pr carronade	12pr	6pr	Notes
1860	-	11	1	6	5 dismounted 42pr brought in
1861	4	-	-	-	-
1862	5	4	1	-	-

(Statistical returns, NSW.)

It was also at this time that an esplanade was created round the fort by erecting an encircling sea wall and filling the area formerly covered by high tides (fig.8). Later in the 1860s the fort was upgraded by the addition of 32-pounder shot and 10-inch and 8-inch shell guns, probably for training purposes.

In 1854 Fort Macquarie had become the drill ground of the colonial volunteer artillery, formed hastily to repel the Russian bear (fig.9). It was also used by elements of 7 battalion, royal artillery, who had arrived in October 1856 and had their headquarters at the Dawes Point battery, although much of their strength was despatched in 1858 and 1861 to fight in the Maori wars (Kerr, *Fort Denison,* 37). Late in the century the fort was occupied as a volunteer naval brigade depôt and lecture rooms and a drill shed were erected south of the guard tower (fig.10). The brigade and its more portable buildings were removed to Rushcutters Bay in 1900–1901 to make way for a tram depôt (PWD, AR, 1901).



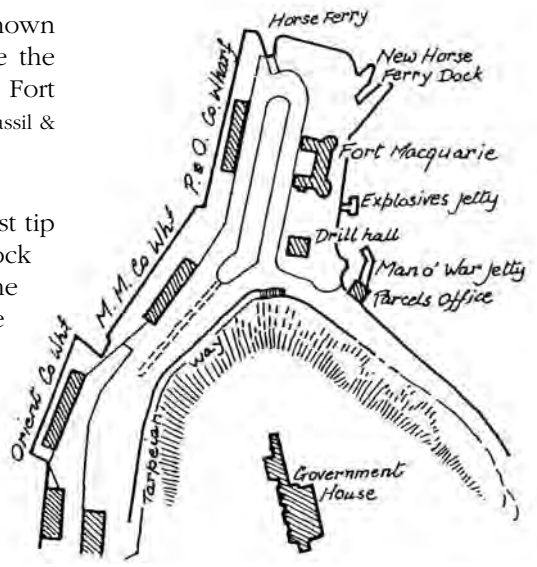
9. Drill of the Artillery Volunteers at Fort Macquarie, From the Illustrated Sydney News, *30.9.1854, p.264.*

Two other nineteenth century uses of the point are of interest. On 3 June 1858 the fort commenced firing a noon-day gun on the drop of the time ball at the new observatory. On 1 September it was altered to one o'clock and thereafter the government astronomer guaranteed that the timing was sufficiently accurate for the rating of ships' chronometers (Gov^{t} Gazette, 1.6.1858 & 24.8.1858).

Two years later a Milsons Point vehicular steam ferry was established from the west side of Bennelong Point near the dry moat (Stephenson & Kennedy, 137). The double-fronted vessel with a central smoke stack can be seen in Halsted's 1863 watercolour (fig.6). The ferry landing was demolished in 1889, presumably to make way for the completion of major longshore wool, mail and passenger wharves which, during the

1880s, extended along the east side of Sydney Cove. The best known and longest established were the Orient Company's wharf beside the former site of Billy Blue's house and, at the northern end beside Fort Macquarie, the wharf of the Peninsular and Oriental Company (Brassil & Le Maistre, 13).

The west side ferry was replaced by a horse ferry on the north-west tip of the point and this was in turn superseded by an elaborate dock for a large ferry north-east of the fort in 1898 (PWD, AR, 30.6.1899). The opening of the Sydney Harbour Bridge in 1932 put an end to the vehicle ferries. An odd piece of barbarism of the late 1890s was the demolition of the western rampart of the fort—presumably to provide carriage access and space for the burgeoning P&O passenger trade on the mail run to the United Kingdom.



10. Bennelong Point wharves, based on an unidentified plan of about 1899 from the Dennis Wolanski Library.

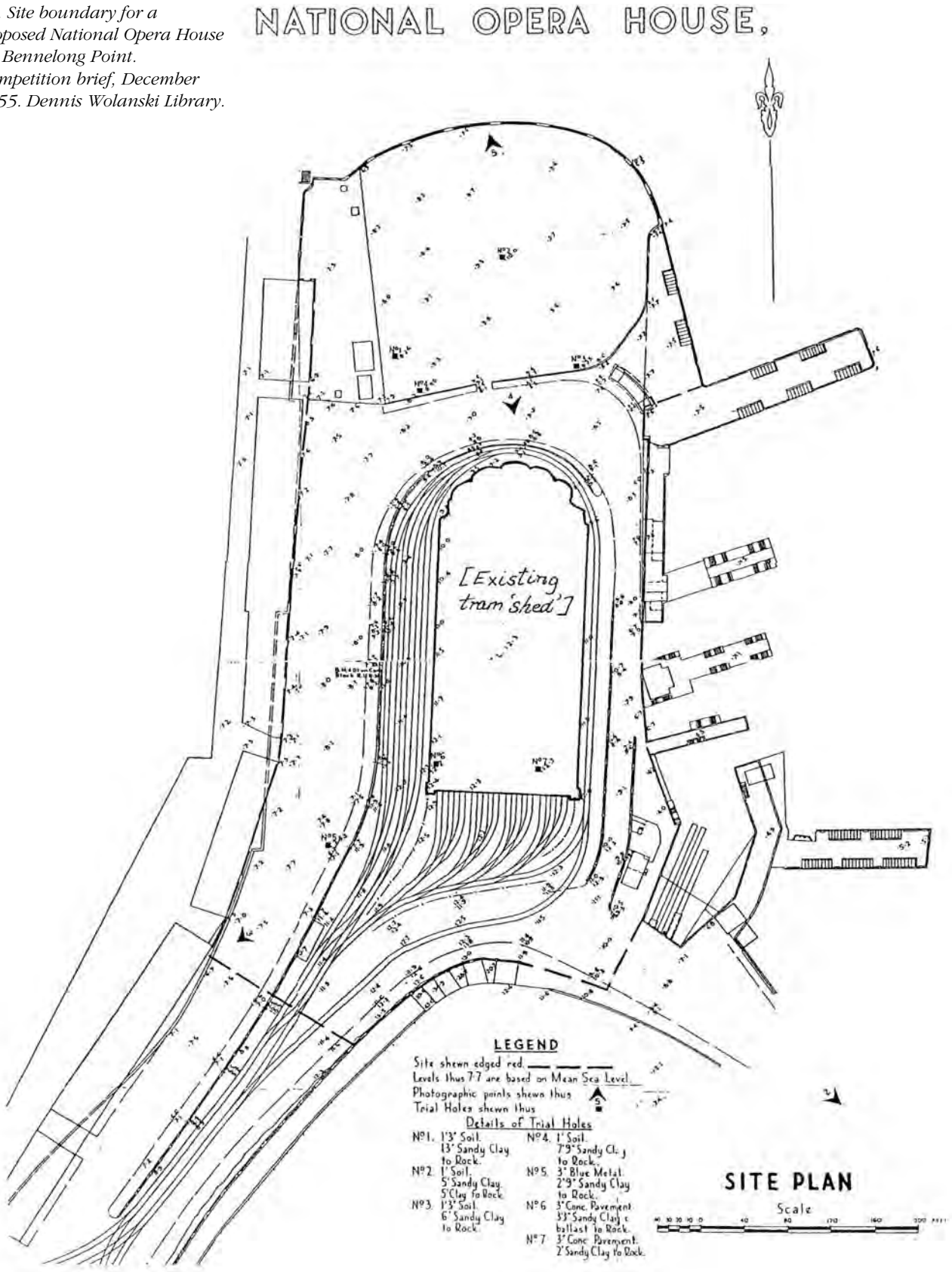
The 'Fort Macquarie' tram shed, 1901–1958

From 1879 Sydney was progressively covered by a tramway network. Horse-drawn at first, it was later powered by steam and, finally, electricity. In 1901 a new single track electric tramway was constructed linking Belmore Park to the Quay via Pitt, Hay, Castlereagh, Bligh, Bent and Loftus Streets. It then ran as a double track at the back of the East Circular Quay wharves to a new tram-car house simultaneously built on the site of Fort Macquarie. A loop line ran round the 'house' to facilitate heavy holiday traffic and serviced the new wharf and jetties constructed on the east side of the point by the Sydney Harbour Trust. The jetties had berths for excursion ferries and charter boats and were known as the picnic jetties. It was a very lively place at the weekend (ibid, 14). The entire works were completed and opened in September 1902 (PWD, AR, 1902, 1903).

11. Photograph of the northern apsidal elevation of the tram shed on Bennelong Point, about 1955, included in the competition brief. The 'shed' was designed by the NSW government architect. Dennis Wolanski Library.

The car-house, or 'shed' as the public preferred to call it, was substantial. It was designed to hold 72 of the largest trams on twelve parallel tracks and provided 200x120 feet of pit accommodation for overhaul work. While the function of the site had changed dramatically, the appreciation of its Picturesque quality had not, so the outer shell was built of brick and sandstone in a fortified Gothic mode. The Department of Public Works reported that it was designed to harmonise with the surroundings and was 'similar in style to the residence of the governor general, which is not far off' (PWD, AR, 1902). Hence the industrial saw-tooth roof was concealed behind crenellated parapet walls and the office and staff facilities were located in a north end with five apses in echelon—in the manner of the thirteenth century High Gothic cathedrals of Amiens, Rheims and Beauvais. This surprising arrangement was surmounted by an asymmetrically placed tower in the government architect's best Neo-Gothic mode (fig.11).

12. Site boundary for a proposed National Opera House on Bennelong Point. Competition brief, December 1955. Dennis Wolanski Library.



Genesis of the Opera House

The Fort Macquarie tram shed continued in use for over fifty years and finally became redundant during the 1950s when Sydney's trams were progressively phased out in favour of buses. Bennelong Point had already caught the attention of Eugene Goossens, the conductor of the Sydney Symphony Orchestra, as a splendid location for a performing arts centre. He was unhappy with the acoustics and facilities of the Sydney Town Hall and in October 1948 publicised a plan for an opera house on the site with an auditorium to accommodate 3,500 to 4,000 people (SOHIT quoting *SMH,* 7.10.1948).

It was not until 1952, however, that the idea gained political support in the person of the newly-elected Labor premier of NSW, John Joseph Cahill, who announced the need for an opera house. The following year Goossens and Cahill discussed the concept with the professor of architecture at Sydney University, Henry Ingham Ashworth. With only a slender parliamentary majority, Cahill had other preoccupations; nevertheless in November 1954 he convened a public meeting to appoint an opera house committee to advise government on ways to implement the government's intention to build an opera house.

The committee consisted of Goossens, Ashworth, Charles Moses (general manager of the ABC), Roy Hendy (Sydney City Council town clerk) and Stan Haviland (the head of the Department of Local Government) who served as chairman (SOHT, AR, 1961, Appendix). The committee recommended the Bennelong Point tram shed and park area as the site and an international competition to select the design (ibid).

The competition, 1955–1957

In January 1956 the government announced an international competition for the design of a 'National Opera House' to be erected on Bennelong Point. Site boundaries were shown on an attached plan (fig.12) and competitors warned that designs which exceeded the boundaries would be disqualified (Competition brief, 7). The brief noted that 'ample parking space' could be found 'within easy walking distance of the site' (ibid, appendix 3) and that space for approximately 100 cars was required on site for musicians, some staff and invalids attending performances (ibid, appendix 4).

Appendix 5 set out two mandatory requirements for the building:

1. There shall be two halls—one large and one small hall. The large hall should seat between 3,000–3,500 persons. The small hall should seat approximately 1,200 persons.

   The large hall to be designed for use for the following purposes:—

   (a) Symphony Concerts (including organ music and soloists).
   (b) Large-scale Opera.
   (c) Ballet and Dance.
   (d) Choral.
   (e) Pageants and Mass Meetings.

2. The small hall to be designed for use for the following purposes:
   (a) Dramatic Presentations.
   (b) Intimate Opera.
   (c) Chamber Music.
   (d) Concerts and Recitals.
   (e) Lectures.

> The requirements under 1 and 2 above, have been listed in order of priority with respect to the attention which should be given to their specialised building needs.
>
> It is expected that ideal conditions will be provided as far as possible acoustically, visually and in connection with stage and orchestral facilities. Compromises which will prejudice the entirely satisfactory performance of a function with a higher priority in the above list should not be made (ibid, 24).

There was no limit placed on the estimated cost of the project, instead competitors were

> allowed to use their discretion in submitting a design of the character and dignity associated with this type of building. At the same time they should bear in mind the necessity for sound judgment as to the financial implications (ibid, 6).

The assessors were Ashworth, John Leslie Martin (professor of architecture at Cambridge and a member of the design team for the Royal Festival Hall, London, and an Ashworth acquaintance from their Manchester days), Cobden Parkes (the NSW government architect) and Eero Saarinen (the renowned Finnish architect from Michigan, USA) (ibid, 4).

The combination of site and open brief proved irresistible: 933 competitors registered. They came from all over the world:

UK	220	Far East	28
Europe	219	Canada	25
Australia	193	New Zealand	20
USA	113	Eire	10
Middle East & Balkans	63	South America	6
South Africa	32	Other	4

(NLA, MS 4500, Ashworth papers, box 9).

Of these over 220 finally submitted entries. It was a competition which generated real international interest.

Judging took place in January 1957 and the entry of a Danish architect, Jørn Utzon, was the unanimous winner. Both the architectural fraternity and the public were amazed by the design. The *Architect's Journal* called it 'The epitome of romantic sculpture on the grand scale' (*AJ*, London, 14.2.1957). Most people found it a spectacular and appropriate development of the site.

There were a few dissenting voices: Cahill reacted with 'it looks like a bloody crocodile' but he was quickly pacified (Parsons, 342); the world-famous Italian engineer Pier Luigi Nervi, who had designed the interlace beams for Harry Seidler's Australia Square tower, objected to the evident lack of structural basis; Frank Lloyd Wright, grown somewhat crusty with age, demanded 'Australians are not going to let this

abomination happen, are they?' A more kindly and enigmatic Buckminster Fuller noted, 'it will give simple people pleasure' (Boyd, Now it can never be architecture). Second prize went to seven architects from Philadelphia, USA and third to Boissevan and Osmond of London, UK.

There are conflicting views of what took place during the jury's deliberations but all agree that Saarinen was a strong advocate of the winning design. His much quoted philosophy speaks for him: 'The only architecture which interests me is architecture as a fine art. That is what I want to pursue' (Jencks, 197). The Sydney Opera House design provided a splendid opportunity for that pursuit.

During public debate on a name for the building the following month, Paul Butz wrote to the *Sydney Morning Herald* (SOHIT, *SMH,* 19.2.1957) suggesting it be called Bennelong Hall and then abbreviated to Ben Hall, thus it 'would be in keeping with the bushranger prices that will no doubt be charged for admission'. It was exactly what Cahill feared and in August the same year, he promised:

> the building when erected will be available for the use of every citizen, the average working family will be able to afford to go there just as well as people in more favourable economic circumstances, there will be nothing savouring even remotely of a class conscious barrier and the Opera House will, in fact, be a monument to democratic nationhood in the fullest sense (Report of Trustees of SOH, 30.6.1963).

Utzon had arrived the previous month to see, for the first time, the site for which he had prepared the design. He charmed the natives and a sense of euphoria prevailed. The laconic entry in the chronology prepared for the Opera House library says it all:

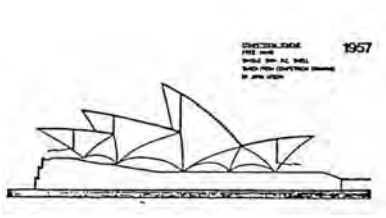
> 7 August 1957: Fundraising meeting at the Sydney Town Hall. Utzon cheered, model unveiled for the first time. Premier overcome with emotion. Public waved banknotes and cheques (SOHIT).

Utzon then returned to Denmark to work up his plans with the help of the engineering firm of Ove Arup and Partners of London. Arup was Utzon's choice but was responsible directly to the client. It was an arrangement suggested by Ashworth for the major consultants but it was later to contribute to the discord between architect and engineer (Baume, 12–13). A further recommendation by Ashworth to government which had unfortunate repercussions was that it was unnecessary for Utzon to work with an Australian architectural firm with local knowledge, as had been foreshadowed in the competition brief (Ashworth to Hall in conversation).

Utzon's evolving concept, 1957–1966

Greenway had designed a functional if somewhat old-fashioned fort for his client and embellished it with Picturesque borrowings from a Gothic past. Eighty-five years later the NSW government architect did the same for the tram shed. It was an approach which spanned the nineteenth and early twentieth centuries but, in the 1920s and '30s, was reviled and abandoned by followers of the Modern Movement. They

held, as an article of faith, that form must follow function. The tram shed almost outlasted the most puritanical phase of the Modern Movement in Australia and thus preserved the site for the work of a new generation of which Utzon, in his development of the Sydney Opera House, was the most expressive and dramatic exponent.

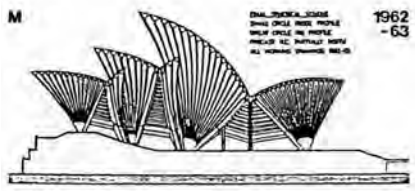


13. Utzon competition entry drawing, 1957. Arup & Zunz, SOH, 9.

The roof shells

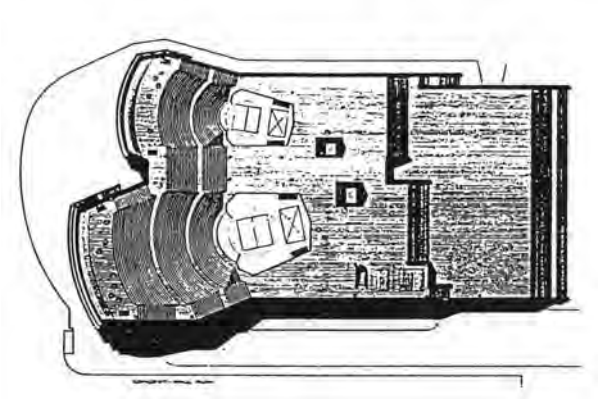
Utzon, like the designers that preceded him on Bennelong Point, was inspired by the site. It was clear that the building would be viewed from all angles—from water, land and even air. It would be a focal point in a grand waterscape: hence the roof was of 'major importance'. Utzon explained:

> … instead of making a square form, I have made a sculpture—a sculpture covering the necessary functions… If you think of a Gothic church, you are closer to what I have been aiming at.
>
> Looking at a Gothic church, you never get tired, you will never be finished with it—when you pass around it or see it against the sky… something new goes on all the time… together with the sun, the light and the clouds, it makes a living thing (Utzon, SOH, 49).



14. Final roof scheme, 1962–63. Arup & Zunz, SOH, 9.

The austere line sketches Utzon prepared for the 1957 competition show a roof of relatively squat, free form, concrete shells (fig.13). These were concept diagrams and did not prove to be structurally practical. Over the next five years Utzon, in conjunction with the Arup firm, developed a ribbed shell system based on the geometry of a sphere (fig.14). This system permitted each rib to be built up of a number of standard segments cast at the site. The segments were then lifted into place between the previous rib and a supporting telescopic steel arch devised by the contractor, M.R. Hornibrook. The complete rib was then stressed and the process repeated.



15. The platform or podium with steps and auditorium seating. Arup & Zunz, SOH, 6.

The development of the roof shell design was a difficult and lengthy process. The final solution was not evolved until 1962–63. As with so much of the Sydney Opera House work, it extended skills and pushed technology to the limit. Utzon was proud of having combined an expressive freedom of form with the precise technology of the machine age in a job of such complexity (Utzon, SOH, 49).

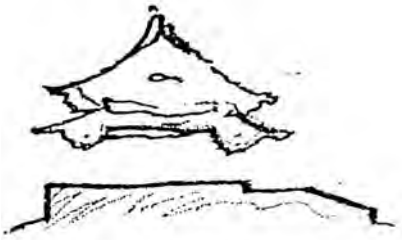
The platform

The past was not a foreign country to Utzon. He drew on it for inspiration—not in the nineteenth century way of recapturing styles by borrowing details but in the re-interpretation of long used ideas. One of these was the importance of the platform. In 1959 he wrote:

> The platform as an architectural element is a fascinating feature. I first fell in love with it in Mexico on a study trip in 1949, where I found many variations both in size and idea of the platform… a great strength radiates from them (Giedion, Utzon, 41, quoting Utzon).

Subsequent travel reinforced Utzon's conviction that 'the horizontal plane—the platform—[is] 'the backbone of architectural compositions" (ibid).

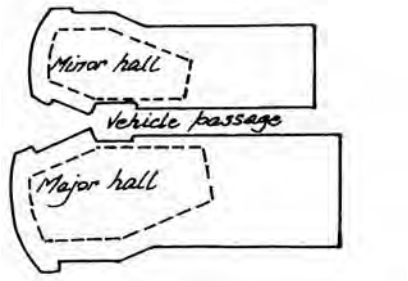
It is not surprising then that the shell structures of the Sydney Opera House are supported on a substantial, visually solid, platform or podium and that almost the entire south front is spanned by terraces of steps approximately 282 feet wide in the manner of Mayan temples. Giedion cites Yucatan as an example (Giedion, Utzon, 38–39). The major halls and public perambulation areas in the Opera House are placed upon the platform and the working parts of the complex are located underneath.



16. Utzon's sketch of a Japanese house with platform and roof elements only. Zodiac, *14, 40.*

The glass walls

By 1963 the problems of the platform (construction stage I) and the roof (construction stage II) had been resolved and the building design had arrived at the stage delightfully expressed by his earlier sketch of a Japanese house *sans* walls (fig.16). As the roof shells of the Opera House only touched the platform at certain springing points, the character of the infill between the platform and the roof had to be resolved. By 1964, Utzon wanted to glaze this in such a way that the glass appeared suspended from the shells, transparent and with no suggestion of a vertical load-bearing capacity (Utzon, SOH, 83). It was also to reflect something of the sculptural quality of the building and, most difficult, provide a link which would accommodate the very different geometry of the roof shells and the stepped platform. It was a problem finally left to the architects of stage III to solve.



17. Diagram of vehicle access passage below halls.

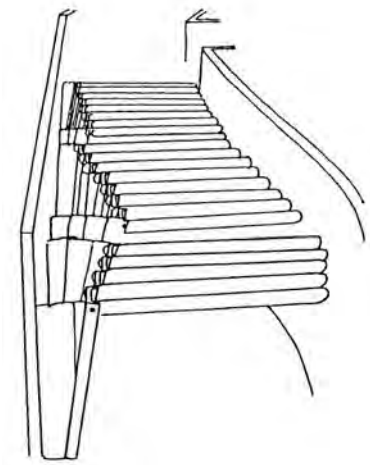
Interior relationships

Utzon's plan set the two largest halls side by side upon the platform. It made possible his dramatic sculptural elevations but it was not without some functional cost. The main item was the loss of conventional side and backstage space. Instead, access was contrived from below and vehicle deliveries were effected via a broad spinal passage under the platform at ground level (fig.17). The halls had their stages set to the south. This maximised views of the harbour from the northern foyers and from the glass-walled passages as the public passed round to the northern end.

Those people who arrived by car would enter the austere, low-lit, linear spaces of the stairway and booking hall under concrete beams of unusual span and form. The ascent of the remaining steps to the platform level rendered a continuation of Utzon's cathedral analogy entirely appropriate. It was to be like passing from a low narthex or crypt to a grand Gothic cathedral—light, airy and with a tall sculptural rib vault above.

Corridors

Utzon's vision of the building as a 'living thing' manufactured from simple mass-produced elements in a limited range of materials was to apply throughout the building. The intended design of the corridors under the platform was an off-beat example. The location and irregular



18. Sketch of Utzon's corridors based on mock-up model.

form of the corridors were determined by the structural and functional requirements of the halls and superstructure above, but their internal treatment was cunningly devised to conceal their additional function of distributing electrical, hydraulic and mechanical services.

Standard 16" ply panels were to be developed as a part of an overall manufacturing process. They were to sit on a rail at floor level on one side of the corridor and cover the otherwise exposed services on the wall. At the top they were pivoted to a plywood slat which was anchored to a rail on the opposite wall thus forming an additional visual barrier to the services on the ceiling (fig.18). The barrier was increased by using a dark colour above the slats and high intensity lighting between. It was still possible, however, to carry out a casual inspection by looking directly up between the slats (Utzon, Narrative, 1965, 20).

The sculptural effect was created by Utzon's pivot and by the irregular form and width of some corridors. This resulted in the wall and ceiling slats connected by the pivot being progressively inclined from their vertical and horizontal planes (ibid). The effect would have been rather like passing along the somewhat quadrilateral alimentary canal of a giant recumbent serpent.

Toil and trouble

In the early 1960s the architectural character of the proposed Sydney Opera House had already made it famous in professional circles. By the mid 1960s the controversy surrounding its time and cost overruns had spread that fame to almost all levels of society. In February 1966, with the roof structure more than half complete, Utzon 'resigned'. By April he had left Sydney and did not return. Like the building itself, the reasons for the Opera House troubles were complex and much discussed in a range of publications, some of which are listed in the bibliography.

A major factor was Premier Cahill's insistence on the building being commenced before the March 1959 election—long before the design for the shells and their supports had been resolved. With construction running ahead of design solutions, it set up a chain reaction which plagued all those concerned with the work during the fifteen year construction of the building. The most quoted example was the need to explode and reconstruct those foundations which were to bear the weight of the roof as finally designed. Cahill may have been right in insisting that the project would not have survived without an irrevocable early commitment, but it certainly proved a disastrous handicap to the building program.

A further problem lay in the committees appointed by Cahill in August 1957 to act for the client (SOHIT). They consisted of a large executive committee advised by two sub-committees: a music and drama panel and a technical advisory panel. The latter became the most relevant committee for the supervision of the building program. As with the other committees, the technical advisory panel was honorary and did not meet sufficiently frequently to give timely advice, so its chairman,

Ashworth, often made decisions. Indeed, he became the de facto client. In 1959 Arup wrote to Utzon, who was still working in Denmark:

> …no-one can afford to wait until the Committee formally approves your latest plans for the major hall stage area. When your scheme is fully worked out you should send it to Professor Ashworth stressing that he must give immediate authority to go ahead. From past experience the full Committee cannot be summoned in time nor induced to give an opinion positive enough to allow work to proceed… (Baume, 68)

It was a role Ashworth would have found gratifying. He was one of those persons whom the English have often been pleased to export to the colonies. As professor of architecture at the University of Sydney he took full advantage of a residual cultural cringe among the natives to become a great committee man and arbiter of taste in Sydney commercial and professional circles. Inclined to pomposity and dependent on others for informed advice, he was not in a position to provide the astute guidance necessary if Utzon's method of working was to survive in an alien cultural environment. Instead he provided enthusiastic and uncritical support for Utzon's proposals and progress payments were authorised without question (Baume, 93–94). After the new Liberal government took office in May 1965, Utzon's sheep were replaced by wolves.

Utzon was a natural problem-solver, working up solutions in consultation with technical experts and artisans by a process of trial and error. He made his method clear in a letter to the new minister for public works in July 1965.

> It was mutually agreed with the client [Ashworth's committee] that, every time a better solution was evolved on one point or another, it was necessary to incorporate the better solution. I have not compromised with either my previous client or the consultants in my search for perfection. This is what separates this building from any other—that it is being perfected at the same time as it is being built (Baume, 70, quoting Utzon to Hughes, 12.7.1965).

In his search for perfection Utzon was working to a very different agenda to that of the new government. He knew he could get there in the end, but in financial—and therefore political—terms it was not a process the government considered appropriate to jobs of the scale and complexity of the Sydney Opera House. Once the authorisation of fees was transferred from the executive committee to the minister for public works, Davis Hughes, in October 1965 (SOHIT) Utzon was in trouble. Utzon finally resigned in an oddly constructed letter in which he told Hughes that he had been 'forced… to leave the job' (Baume, 84, quoting Utzon to Hughes, 28.2.1966). The alacrity with which Hughes dispatched a formal acceptance of Utzon's 'resignation' belied the deep regret he expressed at receiving it (ibid, 84, Hughes to Utzon, 28.2.1966).

At the beginning of 1965 Ove Arup said:

> Utzon is a very charming and genial genius, but uncompromising… (Arup, Address, quoted in Baume, appendix 1).

In addition to this generally acknowledged charm and genius Utzon possessed that degree of artistic determination so necessary for the rigorous pursuit of an artistic ideal and this, combined with a distinct naivete in dealing with bureaucratic expectations, made conflict inevitable. Had he had a trusted Australian architectural firm to advise him on local culture as suggested in the competition brief, a showdown may have been averted.

There were a range of other factors, not least of which was the progressive breakdown of relations between Utzon and the Arup firm. Utzon believed that the firm's contact with the client should be only through him as architect. As Arups were directly engaged by the client this did not always happen. Utzon also came to believe that Arups arrogated to themselves too much credit for design solutions and he increasingly harboured dark thoughts about Arup's behaviour and intentions—thoughts which he finally expressed to Ove Arup in two letters written after his resignation (Baume, 41–43). In the later one he taxed Arup with not advising the client that his firm's services would be withdrawn unless Utzon was fully reinstalled. Whatever the rights of the matter, it was fortunate for the project that Arups did in fact continue their work.

Completing the Opera House, 1966–1973

In April 1966 Hughes announced the appointment of a panel of Sydney architects to complete the project. It consisted of Peter Hall from Public Works; Lionel Todd of Hanson, Todd and Partners; and David Littlemore of Rudder, Littlemore and Rudder. They became Hall Todd and Littlemore for the duration of the job. Hall was responsible for design (Yeomans, Progress, 1.7.1972). The fourth member was the government architect, Ted Farmer, who, by virtue of his office, acted as client.

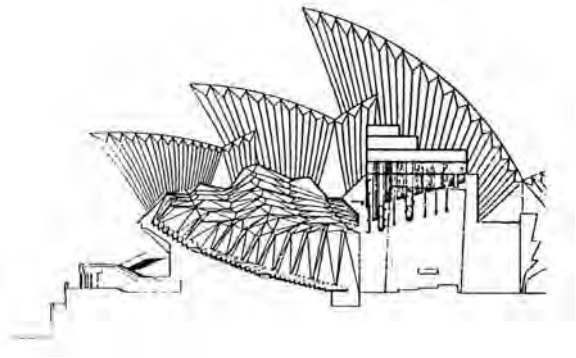
At the time, the structure of the podium was complete, the shells nearly so and the first tile lids were being placed on the shells. In May, following a partial resolution of a dispute over fees, Utzon handed over a batch of drawings relating to the proposed stage III. The drawings covered aspects of paving and cladding, glass walls, restaurant and major and minor halls. There were no schemes for the foyer spaces or louvre walls. Hall described the drawings as being without dimensions, identification of materials or indication of fixing points. They were, he said, 'not working drawings; they did not represent even a worked-out sketch scheme' (Hall, Monument, 2). While this made work difficult for Hall, Todd and Littlemore, it also emphasised the very different approaches of Utzon and his Australian successors. Utzon liked to work with consultants and contractors developing and adjusting three-dimensional prototypes, on the other hand the Australian tradition continued the primacy of the two-dimension drawing.

The recollections of the electrical consultant's man on the spot from 1963, Frank Matthews, provide an affectionate picture of Utzon at work. Matthews found him 'tremendously enthusiastic and a most inspiring person to work for'. He also noted:

> Utzon was the sort of person who carried a great deal of the design in his head and didn't always record his ideas in formal ways, so Hall, Todd and Littlemore often had to rely on people like ourselves who remained on the site to fill in detail and help them fit the pieces of the puzzle together (Anderson & Cochrane, Julius, Poole & Gibson, 83&86).

It was apparent that, in the absence of communication between Utzon and the new team, the Opera House was not going to be finished as Utzon might have intended.

Two problems beset the major hall: seating capacity and acoustics, the resolution of which was to have far-reaching effects within the building. The hall was a proscenium type theatre with a large stage and with the necessary tower above it under the main shell (fig.19). Seven elevators would provide access from below for props and equipment. The hall was intended (as set out in the brief) for both concert and opera performances (ibid, 3).



19. Proposed configuration of major hall, 1962. Zodiac, *14, 43.*

In June 1966, the Australian Broadcasting Commission, as the major commercial user of the space, produced a somewhat belated but specific set of requirements for the space. In precis they were:

- seating capacity of not less than 2,800 with comfortable seating and good sight lines;
- stage space for a large choir and orchestra in the same acoustical space as the audience;
- an organ of adequate proportions for concert work;
- acoustics suitable for symphonic concerts with 'a reverberation time at middle frequencies in the region of 2.0 seconds when fully occupied' without electronic assistance;
- character and diffusion of sound similar to that found in the Boston Symphony Hall, the Concertgebouw in Amsterdam, the old St Andrew's Hall, Glasgow and in the Grande Salle, Place des Arts in Montreal;
- quiet air conditioning;
- television, radio and announce control rooms;
- camera positions for television coverage.

In addition the ABC requested rehearsal, administrative and parking space (Duckmanton to Farmer, 7.6.1966).

The minister enjoined Hall, Todd and Littlemore to investigate the ABC's requirements and Hall set off on a tour of overseas performing arts centres and experts. This, together with a series of working groups later in the year, resulted in the presentation to the minister in January 1967 of a *First Review of Programme*. It was a nicely understated title for some dramatic recommendations. Hall later summarised those that affected the interior performing spaces:

> (a) The Major Hall should be made into a concert hall satisfying the ABC's criteria. It should no longer try

to be a multi-purpose hall. To gain the floor area needed for the increased seating and the volume needed to produce a reverberation time of about 2.0 seconds, the proscenium arch and the stage tower should be removed, allowing the ceiling to sweep uninterrupted from one end of the hall to the other.

(b) To use the Major Hall for a concert hall was reasonable only if a satisfactory alternative theatre could be offered for opera and ballet. The Minor Hall at 1,100 seats with its tiny orchestra pit, would not do. Its capacity could, however, be increased to 1,500 by the addition of galleries and an enlargement of the pit to accommodate around 80 musicians. The advantages of having a large auditorium for concerts and a reasonable-sized separate theatre for opera made this alteration seem sensible.

(c) The Drama Theatre (in the podium) should be designed as a proscenium theatre seating around 500, an excellent capacity for subsidised theatre.

(d) The area below the stage in the Major Hall (stage machinery space) should become a large rehearsal/recording studio, not otherwise available in the building and very important to its use.

(e) The set-changing area below and behind the Major Hall should become a fourth auditorium. We thought of a national film theatre, since film has developed into the major art of the century and is now often provided for in performing arts centres. (Hall, Monument, 6).

When the propositions were put to the Sydney Opera House Trust, the Elizabethan Theatre Trust and the ABC, a 'fierce and bitter' controversy erupted (ibid, 6). Bruce Petty produced a memorable image of heavily armed Wagnerian warriors, led by a redoubtable Brunhilde, furiously assailing enraged instrument-wielding members of the ABC's Sydney Symphony Orchestra (The *Australian,* 16.2.1967). The clash was brief and, despite the championship of H.C. 'Nugget' Coombes, the heavies of The Ring were defeated by the ABC's pocket stroke. General Manager Duckmanton made it clear that if the hall did not comply with concert performance requirements, the ABC would seek other venues.

To a government responsible for the viability of the Opera House, the loss of its major user would have been a financial nightmare. Cabinet decided to adopt the review recommendations and the director of public works advised the architects that:

- the major hall will be a special concert hall;
- the stage machinery designed and manufactured for that hall will not be installed;
- the minor hall will be designed to seat 1,500 and a careful examination of the orchestra pit and stage areas will be continued to ensure that the best practicable provisions are made therein for opera and ballet;
- the experimental theatre will be designed as a high standard drama theatre to seat 700–750 persons;

- provision will be made for a rehearsal hall for orchestra below the major hall stage area and, if practicable, it will also be designed as a recording studio for orchestra (Humphrey to Hall, Todd and Littlemore, 3.4.1967, included in Hall, SOH, 85).

Petty's last image was of Brunhilde, with her Elizabethan Theatre Trust banner, defiantly astride the peak of the major shell as the titanic bulk of the Opera House slid beneath the waters of the harbour (The *Australian,* 22.3.1967).

It was to be another eighteen months before Hall, Todd and Littlemore were able to present a 'detailed and estimated brief' to government for the formal approval of the stage III program (Hall, Monument, 6). When the third stage commenced early in 1969, it was ironical that Hughes, by then experienced in his portfolio, had agreed to a 'construction management' arrangement with the main contractor—the Hornibrook Group. Hornibrooks had shown themselves to be inventive and reliable in the stage II erection of the roof and had established working relationships with both the structure and its designers. In view of the problems yet to be solved, it was seen to be the most sensible arrangement although it was still to be the major cost of the project. H.R. 'Sam' Hoare, the Hornibrook director in charge of the project, provided the following approximations in 1973:

Stage I:	podium Civil & Civic P/L	approx $5.5m
Stage II:	roof shells M.R. Hornibrook (NSW) P/L	approx. $12.5m
Stage III:	completion The Hornibrook Group	$56.5m
Separate contracts: stage equipment, stage lighting and organ		$9.0m
Fees and other costs		$16.5m
		$100.0m

(Hoare, SOH, 4).

Apart from the changes to the performing spaces, stage III involved a major upgrading of mechanical and electrical services. For example, the air conditioning program designed in Utzon's time was modest and could not service the major and minor halls simultaneously, nor was it intended to supply backstage and dressing room areas at all. The government therefore authorised the doubling of capacity to cover all theatres and backstage at the same time. The massive ducting requirements would have led to a series of extensive structural changes. The problem was reduced by the provision of 'over 70 separate air handling systems located in 24 plant rooms around the building and fed with heated and chilled water from a central refrigeration system' (Todd, The end in sight, 3; Hoare, SOH, 4, 14).

In 1968, state cabinet was prepared to allocate $85 million as an all-up figure for the completion of the project. This led, in the words of Hall, to 'a healthy discipline in detail design that undoubtedly benefited the job' (Hall, SOH, 22). It also resulted in the establishment of a hierarchy of treatment which is reflected throughout the building:

20. Elevation of organ supplied by Ronald Sharp.

1. exterior and external works;
2. main auditoria;
3. other public spaces;
4. administration and artists' areas;
5. services areas (ibid).

It meant that 'quality where it counted most or was essential to performance was affordable' but that 'care was taken to economize where possible' (ibid). The schedule of interior finishes set out on pages 60–70 of David Littlemore's *Sydney Opera House* provides an account of what this meant in practice.

The major hall was always intended to be equipped with an organ although in its original proscenium configuration the placement of the organ remained a difficult acoustic problem. Once the decision was taken in 1967 to convert the major hall to a single space the problem was solved. The organ was simply placed in a traditional location, high on the axial southern wall where it presents a handsome face to the audience (fig.20). It was designed and built by Ronald Sharp of Sydney, assisted in the last months of construction by the Austrian organ-building firm of Gregor Hradetzky. Like the Opera House, the organ had a protracted and fraught construction history but it was finally completed in 1979 and, as well as being a comprehensive and flexible instrument, was probably the largest mechanical action organ in the world (Rowe & Hubble, *Organ,* 1 & 2; Sharp, *Organ,* 1).

In 1967 the target date for completion was December 1972 and in that month the first orchestral performance was given in the Concert Hall to test the acoustics. The Sydney Symphony Orchestra played to an audience of construction workers and invited guests. Work on the project was brought to a 'state of practical completion' on 31 August 1973 (Littlemore, SOH, 89). The first opera season began the following month, although the season had been preceded by a number of unofficially claimed 'first' performances at a variety of venues.

While Cahill did not live to see his project finished, it was his foresight in arranging a peculiarly Australian system of finance that ensured its success. His Opera House lotteries, announced in September 1957, contributed just over $100,000,000 to the construction of the building. The wowsers may have hated the idea of a cultural monument built on gambling, but it proved a painless way of parting the people of NSW from their money for an endeavour which could be considered elitist. Cahill was only half right in his prediction that the building would be 'a monument to democratic nationhood'—on completion the 'average working family' could afford to go there as tourists but not as patrons. To help redress the situation the Sydney Opera House Trust have introduced schemes which provide free or cheap access to a variety of activities within the building.

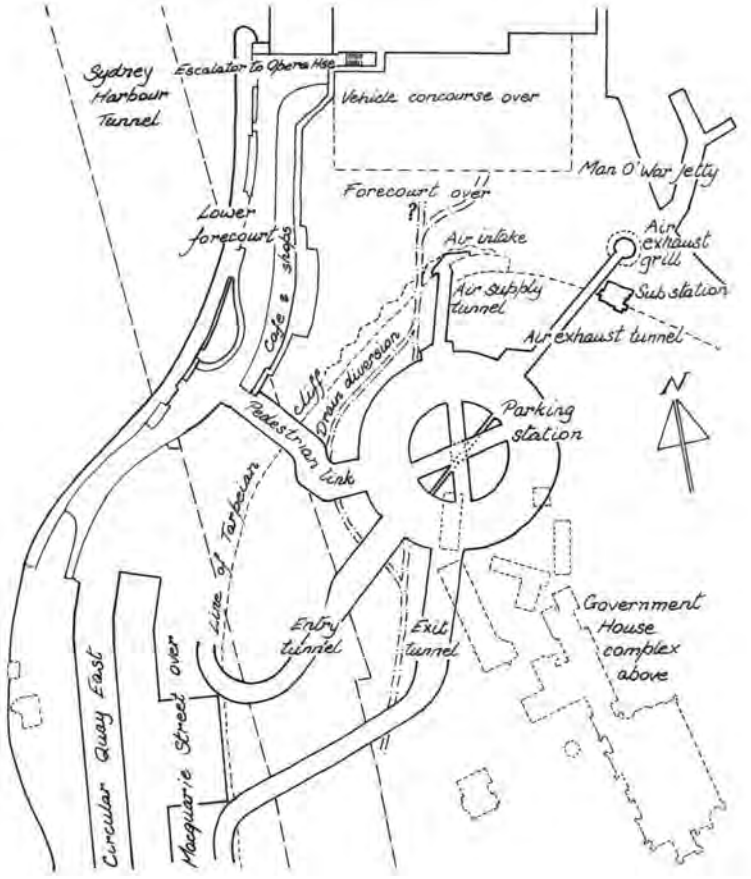
The opening: white elephant or sacred cow, 1973

The first public performance in the house was given in the Opera Theatre on 28 September 1973 by the Australian Opera Company and the following night in the Concert Hall Charles Mackerras conducted the Sydney Symphony Orchestra with Birgit Nilsson as soloist. The Opera House was formally opened by the Queen on October 20 (SOHT, AR, 1973–74). During the inaugural period 300 journalists from all over

the world arrived to see if the Sydney Opera House was to be a white elephant or a sacred cow. Martin Bernheimer, the music critic of the *Los Angeles Times,* spoke for most when he wrote:

> This, without question, must be the most innovative, the most daring, the most dramatic and in many ways, the most beautiful home constructed for the lyric and related muses in modern times (ibid).

By his own choice, Utzon was not at the opening nor did his name appear on the plaque in the entry concourse. Nevertheless from wherever the building is seen, harbour, city or air, it is remembered as Utzon's creation—a magical embellishment of one of the grand waterscapes of the world. Hall, Todd and Littlemore will be remembered for the difficult job of turning an incomplete aesthetic masterpiece into a performing arts centre with the full range of services required.



21. Sketch plan of proposed car park and its relationship to the lower forecourt, about 1990. Loosely based on an unidentified and undated plan supplied by NSW Public Works.

Completing the setting, 1986–1993

Two jobs remained to be done: the construction of an appropriate land approach and forecourt treatment, and the provision of convenient parking (fig.21). The first was completed as a part of the NSW government's bicentennial refit of Macquarie Street and the public areas flanking Sydney Cove. It was designed under the general superintendence of Andrew Andersons (the work near the Opera House involved Peter Hall) and was completed for the royal visit on Australia Day 1988.

The second was the long-overdue parking station. A park-and-ride scheme had existed since 1973 using the city council's Domain parking station but it was neither convenient nor profitable. The new station was an ingenious solution to a complex problem. It was in the form of a double helical coil set underground behind the Tarpeian cliff face. The vehicle entry and exits were in Macquarie Street, the air intake grills were along the base of the cliff and the air exhaust was a feature in the centre of the vehicle roundabout to the east of the forecourt. During the work part of the 1858 Bennelong drain had to be relocated and the harbour tunnel avoided. The pedestrian tunnel linked directly to the 1988 lower forecourt which gave undercover access to the Opera House. While this gave wet weather protection and serviced the lower forecourt shops it bypassed Utzon's grand external approach to the Opera House.

The process of adaptation, 1973–2002

Under the Sydney Opera House Trust Act the first and second clauses of the charter charges the Trust with:

- the administration, care, control, management and maintenance of the building and its site;
- the management of the Sydney Opera House as a performing arts and conference centre.

It is a dual function in which, in the long term, the performance of either one is dependent on the successful performance of the other.

At least in the early days of stewardship of the building, the Trust was anxious that the Opera House should be seen as 'Australia's premier performing arts centre and not the world's most expensive landmark' (SOHT, AR, 1973–74). The chairman of the day even noted that 'the Opera House's exterior beauty and uniqueness [would] continue to pose challenges to the activities of the theatres' (ibid). The spectacular success of the Opera House as a performing arts centre and in particular its ability to attract great artists from all over the world helped dispel these qualms but residual tensions between the care of the structure as a monument and its function as a performing arts centre will always exist. It is therefore important to emphasise the degree to which the quality of the building and its site and the popular and financial success of the events within it reinforce each other. Neither can be neglected.

During the first twenty years as a performing arts centre the Trust's approach to the building and its site was similar to the working up of any large complex. First came the contractual removal of defects arising from construction. The issue of defect lists for the Opera House began in mid-1973 and the last list appeared in February 1974 (Littlemore, SOH, 44). Bearing in mind the complexity of the work it was a fine achievement by all concerned. Next, cyclical maintenance was commenced. By 1976 the first repaint of the interior of the complex had been completed (SOHT, AR, 1975–76).

Right from the beginning the Sydney Opera House Trust started to adapt spaces, fabric and equipment. The work arose partly to rectify, or at least modify, perceived deficiencies (the enlargement of the Opera Theatre orchestra pit) and partly because of the increasingly flexible

role the performance spaces were called on to play (grand opera and pop concerts in the Concert Hall). Technological advances and fashion in lighting and sound amplification, particularly when combined with the requirements of hirers, added a further commercial imperative for change. For example, in 1985 the general manager reported:

> In January, two winches were installed in the crown of the Concert Hall ceiling for the Australian Opera's production of Norma. In April, an American-style lighting grid was suspended on six points from the main girders above the Concert Hall ceiling for the visiting performer Phil Collins. A new centre speaker cluster in the same venue has increased the intelligibility of amplified sound… (SOHT, AR, 1985)

There will always be a demand for adaptations to a performing arts centre if it is to remain in commercial use. One of the roles of a conservation plan is to recommend the ways in which adaptations and additions may be controlled so that the cumulative effect does not degrade the building and its interiors, and to identify the thresholds at which change will have an adverse effect on the significance of the building. These matters will be addressed in the policy section.

Upgrade program

In 1988, the Premier of NSW commissioned the NSW Public Works Department to carry out an upgrade program 'to restore the building to top condition' and to establish a system of asset management which would 'ensure the survival of the house for future generations' (SOHUP, Progress Report, 1993, 4–11).

Projects during the first decade of the program have included:

- conservation of the Concert Hall ceiling surfaces;
- excavation of additional facilities below the podium;
- resealing joints between roof tile lids;
- removing, renewing, waterproofing and reseating slabs on ceremonial stairs and parts of podium;
- resealing glass wall joints;
- refurbishing auditoria seating;
- further modification of Opera Theatre orchestra pit;
- development and adoption of a 'Total Asset Management Plan' (a complete preventative maintenance program for the building);
- major structural refurbishment of supports to the Broadwalk;
- upgrading of fire protection and suppression systems;
- installation of new winch control systems in the Drama and Opera Theatres and the Concert Hall;
- commencing development of new edge tiles for the roof shells.

The program was nearing completion in 1997 when it was estimated to cost $117,000,000 over the ten years (SOHT, AR, 1997, p.50).

Redesign of catering facilities

In September 1994, after a public tender process, an agreement was signed by the Trust with Gardner Merchant (Australia) for a new twelve year contract to operate the catering venues in the Opera House and the lower forecourt. An immediate consequence was the redesign of the Bennelong and Forecourt Restaurants and the Café Mozart. Some work was also done in the Harbour Restaurant and its adjacent takeaway facility was partitioned to create further dining accommodation and an enlarged kitchen.

Conservation Council

The Trust established a Conservation Council as 'an advisory group to assist and advise the Trust with particular reference to the care, control and maintenance of the building' (SOHT, AR, 1996, p.24). Five of the seven members were ex officio appointments and the first meeting was held in March 1996. The Council's advice was to be given 'in relation to the spirit and intention of the [1993 interim] conservation plan' (ibid.). Matters considered by the Council include the conversion of the original Rehearsal and Recording Studio (under the Concert Hall stage) to a 'new music' venue and an assembly floor for orchestra members and the development of improved access, lighting and acoustics. The Council had its last meeting in November 1997. It was not convened again as, in 1998, the Trust began negotiations for the return of Jørn Utzon as an advisor and believed that a successful outcome could make Council recommendations redundant. It was to be five years (November 2002) before the reconstituted Council met again. See pages 96 to 98.

World Heritage nomination

Following an agreement between the Commonwealth and NSW governments and the provision of a budget of $200,000 by the Commonwealth, a nomination was prepared for the inscription of 'the Opera House in its harbour setting' on the World Heritage list. It was prepared under the supervision of Joan Domicelj and delivered to the Prime Minister and Premier ready for submission to UNESCO in June 1996. The Prime Minister did not forward the nomination. A revised nomination was prepared for submission in mid-1999 but it was not forwarded to UNESCO either. It is not known when, or if, the nomination will be made.

Heritage and the decision making process

Partly as a result of the decade long upgrade program and partly following the wide dissemination of the first edition of this conservation plan, management in the mid-1990s was aware of, and incorporated, heritage requirements in the decision making processes. In speaking of the plan, the then General Manager, Lloyd Martin, remarked 'James Semple Kerr is our bible' (SMH, 10.2.1996, Spectrum, 1). While perhaps an extravagant acknowledgment, it did confirm that the plan was useful and used.

Since then, heritage consideration has become inconsistent and, occasionally, disregarded. Staff turnover has been one factor. Joseph

Skrzynski in his 'Report from the chair' noted how 'senior staff changes challenged the organisation's ability to provide continuity in high level leadership and service' (SOHTAR, 1998, 9). In the six years since late 1996 there have been four chief executive officers and two acting in that capacity. Other factors include the drive to reinvigorate the place as a lively performing arts centre, community and visitor gathering place and the need to increase revenue. While these are laudable they should not result in the loss of attention to heritage. After all, the first clause of the Sydney Opera House Act charges the Trust with care of the building and its site (see page 26) and everyone is well aware that the continuing success of both the building and its uses depends on achieving an equitable balance.

A new chief executive, Tim Jacobs, appointed in January 1997 wrote in his first annual report:

> As chief executive appointed to lead the Sydney Opera House into the 21st Century, the challenge is to take the most recognisable building in the world and turn it into one of the great art centres…
>
> Visitors and patrons expect to have a memorable experience and an exemplary standard of customer service. They deserve wider choices in quality retailing, tourism services, wining and dining. In terms of amenity, service, polish and smooth assurance, the building should feel and function like a six star hotel (SOHT annual report, 1997, p.10).

As Jacobs resigned within a year of his arrival he was not to lead the Opera House into the 21st Century but he did leave a legacy of impending change to the building. It was the development of a 'master plan' which 'set out a strategy for the building and site developments which will position the Sydney Opera House as one of the great arts centres of the world by the year 2000' (SOH Master Plan Report, 1997, p.1). The entire program was to be completed by 2007 at an estimated cost of $76,790,000 (ibid., p.30&31).

The 'master plan report' was prepared by the Department of Public Works and Services and drew on a 'value management' conference and study of July 1997. Unfortunately, the plan that subsequently emerged, although described as a 'comprehensive integrated approach to the development of the building and site' (ibid., p.29), was actually a wish list of improvements to the place unaffected by consideration of heritage issues. While it was useful as a developed indication of functional desires and was used as a basis for funding requests, it was dangerous in that it was likely to achieve a degree of de facto acceptance without the significance of parts of the place, or the original architects' intentions, having been understood or accepted. In this form its proposals were released to the press in December 1997 and received wide publicity (for example SMH 8.12.1997, pages 1 and 4).

This one-sided approach had a potential to create future adversarial situations between seemingly established operational requirements and heritage needs. It has always been conventional wisdom as well as prudent practice for a master plan to embody a co-ordinated approach in which all relevant issues have been considered. If it is not done it is not a master plan. In one other respect the master plan report was useful. It revealed procedural defects in the existing system of developing

and approving proposals for work on the Sydney Opera House. This led to the restructuring of the 1993 'interim' conservation plan policies and the inclusion of a section on the management of change.

An instance of disregarding heritage issues concerns the ill-considered treatment of the setting arising from the need to maximise customer service, enliven the site and increase revenue. The 2001 annual report announced:

> A range of new operators will be appointed throughout 2001–2002. By December 2002 all food and beverages on site will have been completely rejuvenated, delivering improved customer experiences as well as improved revenue to the Sydney Opera House (SOHTAR, 2001, 24).

The consequences included the letting of contracts for five ice-cream, coffee and food bars in the forecourt and the erection of a large venue for hire on the northern Broadwalk. See pages 47 to 48. Another example, at present under consideration and mentioned in the *Venue improvement plan* of May 2002, is the use of the forecourt as a performance venue. The duration, frequency and nature of the required infrastructure will be important heritage issues. If, for example, high opaque fences are to exclude public vision across the forecourt, the project would become unacceptable. See pages 48 to 49.

Alterations, improvements and investigations

In 1998–1999 the conversion of the original Rehearsal and Recording Room (fig.57) took place. The top of the 'room' became an assembly area for the orchestra (fig.59) and below it 'The Studio' was created (fig.58) 'to present innovative and exciting new music and contemporary performing arts (SOHTAR, 2001, 13). The work involved the removal of the plant between The Studio and the Broadwalk to the basement, and the opening up of a continuous foyer serving Playhouse, Studio and Drama Theatre. See pages 79 to 82.

As well as major construction works, substantial fabric replacement has been carried out over the last four years including:

- completion of the project to replace some 8,500 edge tiles;
- areas of pre-cast paving on the northern and western broadwalk, podium deck and steps.

Also, the external pre-cast wall panels were cleaned. Within the building there has been technical or control system work relating to lighting, airconditioning, hydraulics, fire and stage facilities, some of which became necessary to gain 'Place of Public Entertainment' certification. In addition, a series of acoustic studies of the Concert Hall has been carried out.

Richard Johnson of Denton Corker Marshall commissioned

In September 1998 the Chairman of the Sydney Opera House Trust, Joseph Skrzynski, announced the appointment of Richard Johnson of Denton Corker Marshall to 'advise on any future development works

affecting the Opera House and its site' and to 'establish planning principles… which were consistent with the design principles of Jørn Utzon'. The work included a review of the 1997 Master Plan Report (Sydney Opera House media release, 1.9.1998). Skrzynski also referred to the engagement of James Semple Kerr to 'update the conservation plan'. Kerr's revised plan was completed in May 1999 but it was overtaken by negotiations for the return of Utzon to advise on the Opera House and a further revision of the conservation plan was commissioned in 2002.

Jørn Utzon re-engaged

In August 1999 Utzon accepted the Premier's invitation to provide advice to the Sydney Opera House Trust. His commission included the preparation of a statement of design principles which, in his own words, was to 'be used as a permanent reference for the long-term conservation and management of the House and for any redevelopment of interiors as and when that becomes necessary.' He continued 'it is right that we should be looking forward to the future of the Sydney Opera House and not back to the past. For this reason, I believe Richard Johnson and future architects should have the freedom to use up-to-date technology to find solutions to the problems of today and tomorrow' (Utzon in the Sydney Opera House Trust Annual Report for 2000, pages 36–37).

A program developed

For the Trust, the appointment was a 'key element in the process of developing a Strategic Building Plan for the House and its site'. The first public fruits of this process were the simultaneous release in May 2002 of the *Design Principles* and a six-part *Venue Improvement Plan* (developed for the Trust by Richard Johnson, now of Johnson Pilton Walker, in collaboration with Utzon) together with the Premier's announcement of an allocation of $45,000,000 for major venue improvements (SOHT Press Release and Premier of NSW News Release, both of 29.5.2002; Skrzynski to Kerr, 3.6.2002). This was added to an earlier allocation of $24,300,000 to make a total of $69,300,000.

The proposed work covered the refurbishment of the Opera Theatre and alterations to make the orchestra pit habitable, the improvement of Concert Hall acoustics, the refurbishment of the Reception Hall, the partial opening of the western foyer at Broadwalk level to its harbour setting together with a covering loggia, and the development of the forecourt as a performance venue. The last is the only one that can create serious heritage problems and these are discussed on pages 48 and 49.

Appendix B

World Heritage List citation—Sydney Opera House

http://whc.unesco.org/pg_friendly_print.cfm?cid=31&id_site=166&

Sydney Opera House

Australia
Date of Inscription: 2007
Criteria: (i)
Property : 5.8 ha
Buffer zone: 438.1 ha
New South Wales
S33 51 24 E151 12 55
Ref: 166rev

Brief Description

Inaugurated in 1973, the Sydney Opera House is a great architectural work of the 20th century that brings together multiple strands of creativity and innovation in both architectural form and structural design. A great urban sculpture set in a remarkable waterscape, at the tip of a peninsula projecting into Sydney Harbour, the building has had an enduring influence on architecture. The Sydney Opera House comprises three groups of interlocking vaulted 'shells' which roof two main performance halls and a restaurant. These shell-structures are set upon a vast platform and are surrounded by terrace areas that function as pedestrian concourses. In 1957, when the project of the Sydney Opera House was awarded by an international jury to Danish architect Jørn Utzon, it marked a radically new approach to construction.

Outstanding Universal Value

The Sydney Opera House constitutes a masterpiece of 20th century architecture. Its significance is based on its unparalleled design and construction; its exceptional engineering achievements and technological innovation and its position as a world-famous icon of architecture. It is a daring and visionary experiment that has had an enduring influence on the emergent architecture of the late 20th century. Utzon's original design concept and his unique approach to building gave impetus to a collective creativity of architects, engineers and builders. Ove Arup's engineering achievements helped make Utzon's vision a reality. The design represents an extraordinary interpretation and response to the setting in Sydney Harbour. The Sydney Opera House is also of outstanding universal value for its achievements in structural engineering and building technology. The building is a great artistic monument and an icon, accessible to society at large.

Criterion (i): The Sydney Opera House is a great architectural work of the 20th century. It represents multiple strands of creativity, both in architectural form and structural design, a great urban sculpture carefully set in a remarkable waterscape and a world famous iconic building.

All elements necessary to express the values of the Sydney Opera House are included within the boundaries of the nominated area and buffer zone. This ensures the complete representation of its significance as an architectural object of great beauty in its waterscape setting. The Sydney Opera House continues to perform its function as a world-class performing arts centre. The Conservation Plan specifies the need to balance the roles of the building as an architectural monument and as a state of the art performing centre, thus retaining its authenticity of use and function. Attention given to retaining the building's authenticity culminated with the Conservation Plan and the Utzon Design Principles.

The Sydney Opera House was included in the National Heritage List in 2005 under the Environment Protection and Biodiversity Conservation Act 1999 and on the State Heritage Register of New South Wales in 2003 under the Heritage Act 1977. Listing in the National Heritage List implies that any proposed action to be taken inside or outside the boundaries of a National Heritage place or a World Heritage property that may have a significant impact on the heritage values is prohibited without the approval of the Minister for the Environment and Heritage. A buffer zone has been established.

The present state of conservation is very good. The property is maintained and preserved through regular and rigorous repair and conservation programmes. The management system of the Sydney Opera House takes into account a wide range of measures provided under planning and heritage legislation and policies of both the Australian Government and the New South Wales Government. The Management Plan for the Sydney Opera House, the Conservation Plan and the Utzon Design Principles together provide the policy framework for the conservation and management of the Sydney Opera House.

News

Jun 29, 2007 Twenty-two new sites inscribed on UNESCO's World Heritage List, and one deleted during Committee meeting in Christchurch

Jun 28, 2007 World Heritage Committee inscribes four new cultural sites on UNESCO's World Heritage List

Links

The Official Site for Australian Travel and Tourism Australia
South Wales Heritage Office
Sydney Opera House
Sydney Opera House (Department of the Environment, Water, Heritage and the Arts)

Appendix C

National Heritage List citation—Sydney Opera House

http://www.environment.gov.au/cgi-bin/ahdb/search.pl?mode=place_detail;search=place_id%3D105738%3Bkeyword_PD%3Don%3Bkeyword_SS%3Don%3Bkeyword_PH%3Don%3Blatitude_1dir%3DS%3Blongitude_1dir%3DE%3Blongitude_2dir%3DE%3Blatitude_2dir%3DS%3Bin_region%3Dpart;place_id=105738

Australian Heritage Database

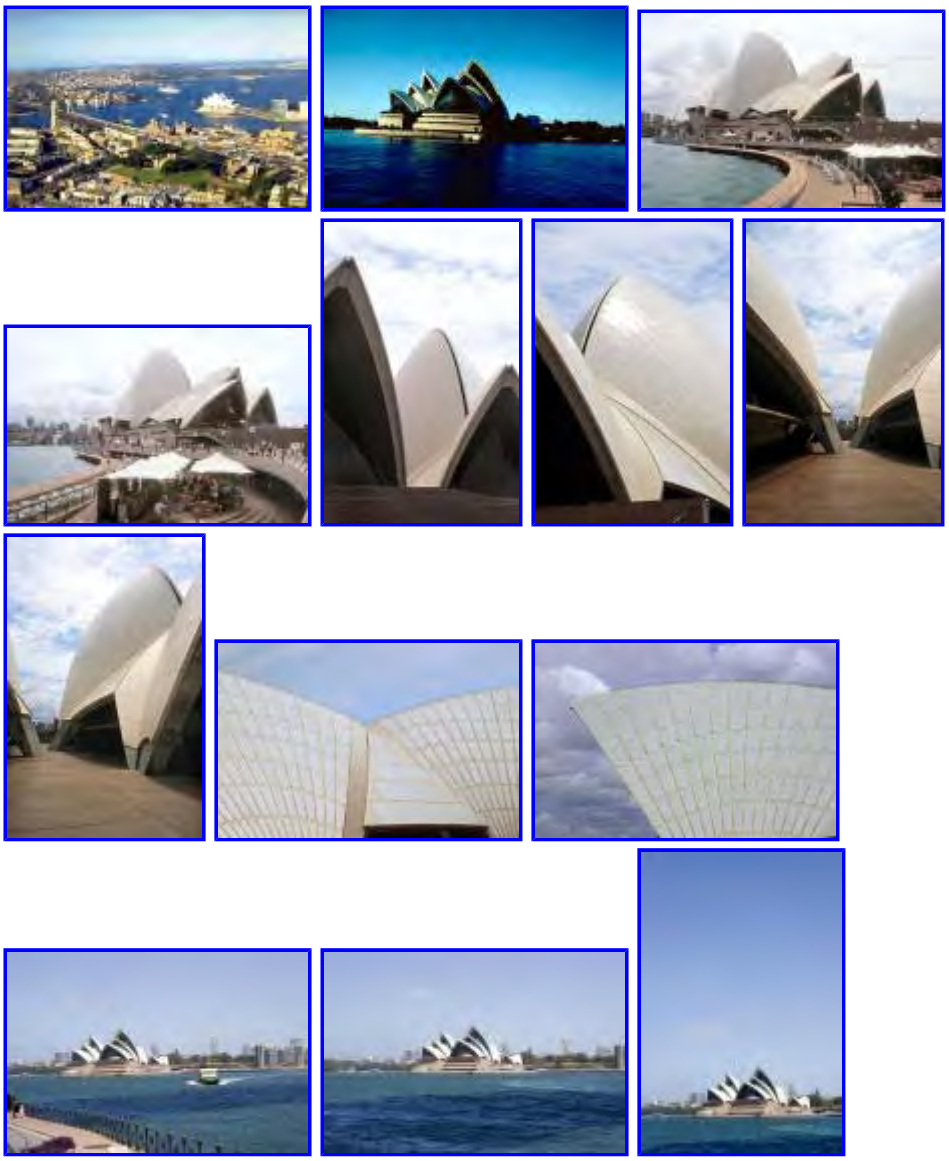
Place Details

edit search | new search | about the Australian Heritage Database | Heritage home | Australian Heritage Council home

Send Feedback

Sydney Opera House, 2 Circular Quay East, Sydney, NSW

Photographs:



List:	National Heritage List
Class:	Historic
Legal Status:	Listed place (12/07/2005)
Place ID:	105738
Place File No:	1/12/036/0449

Summary Statement of Significance:

The Sydney Opera House, constructed between 1957 and 1973, is a masterpiece of modern architectural design, engineering and construction technology in Australia. It exhibits the creative

genius of its designer, the Danish architect Jørn Utzon and the contributions to its successful completion by the engineering firm Ove Arup and Partners, the building contractors M.R. Hornibrook, and the architects Hall, Todd and Littlemore. It is an exceptional creative and technical achievement in the national history of building design and construction in Australia. Since its completion the Sydney Opera House has attracted world wide acclaim for its distinctive design, enhanced by its prominent location on Bennelong Point within a superb harbour setting. With its soaring white roof shells set above a massive podium, the Sydney Opera House is a monumental urban sculpture, internationally acclaimed as an architectural icon of the twentieth century. Its many national and international awards reflect its pivotal place in the national story of creative and technical achievement in Australia. The challenges involved in executing Utzon's design inspired innovative technical and creative solutions that were groundbreaking in the history of architectural design and building construction in Australia, particularly the roof shells that were based on the geometry of the sphere and demonstrated the extraordinary creative potential of the assembly of prefabricated, repeated components. The interior spaces also reflect the creative genius of Utzon and his successors, Todd, Hall and Littlemore, who completed the building after Utzon's departure from the project in 1966. The Sydney Opera House is the most widely recognised building in Australia, and is cherished as a national icon and world-class performing arts centre. It represents an enduring symbol of modern Sydney and Australia, both nationally and internationally, reflecting changing social attitudes towards Australian cultural life in the decades after World War II. The Sydney Opera House has played a seminal role in the development of Australia's performing arts, enhancing the cultural vitality of the nation. It continually attracts nationally and internationally acclaimed performers, and is a mecca for visitors from around Australia and overseas. The peninsula on which the Sydney Opera House now stands has a special association with Bennelong, an Aboriginal man who became a prominent and influential figure in the early colony and played a significant role in mediating interactions between Aboriginal people and early settlers.

Official Values:

Criteria	Values
A Events, Processes	The Sydney Opera House is significant in the course of Australia's cultural history, both for its place in the national history of building design and construction, as well as the history of the performing arts in Australia. The Sydney Opera House represents a masterpiece of modern architectural design, engineering and construction technology in Australia. It is a national icon that has become an internationally-recognised symbol of modern Australia and of Sydney, Australia's largest city. From the earliest concept drawings, the building's striking design, its quality as a monumental sculpture in the round, and its inspired design solution in response to its prominent setting on Bennelong Point in Sydney Harbour, have attracted national and international professional and public acclaim. The challenges involved in executing the design inspired innovative developments in technologies, construction engineering and building methods in Australia, creating the building's distinctive form, fabric and structural systems. Since the official opening on 20 October 1973 by Queen Elizabeth II, the Sydney Opera House has played a seminal role in Australia's performing arts history, enhancing the cultural vitality of the nation and continuously attracting nationally and internationally recognised performers from around the world. The achievement of its design and construction between 1957

	and 1973 is all the more remarkable because it marks a significant transitional period in Australian political and economic development, and changing social attitudes towards Australian cultural life in the decades following World War II.
B Rarity	The Sydney Opera House is a cultural icon that has no counterpart in Australia. With its distinctive sail-like concrete shell roofs standing boldly upon a massive granite-faced platform, located prominently on the Sydney Harbour foreshore, the Sydney Opera House is the most widely recognised building in Australia, and one of the most definitive national architectural icons of the twentieth century. It is also a rare example of a national cultural centre that has gained widespread recognition and respect as a performing arts venue.
E Aesthetic characteristics	The design, form, scale and location of the Opera House make it one of the most significant landmarks in Australia. The aesthetic qualities of the Sydney Opera House relate both to its topographical setting on Bennelong Point, and its distinctive architectural features. Its landmark qualities are enhanced by the building's juxtaposition with Sydney Harbour, its relationship with the Sydney Harbour Bridge, the garden landscape of Bennelong Ridge, the sandstone cliff face of Tarpeian Rock, and the vistas and views to and from The Rocks, Circular Quay, East Circular Quay, Macquarie Street, the Botanic Gardens and the harbour. The sculptural, billowing sail-like roof shells provide a visual link to and artistic representation of the yacht-scattered harbour waters. The ceramic white tiles of the roof further add to this relationship and provide a dramatic contrast with the blue waters of the harbour. The building with its strongly curved design emphasis is juxtaposed with the nearby Sydney Harbour Bridge which itself has a strongly emphasized curvature, and this visual relationship is a further element of the place's aesthetic appeal. The place's dramatic aesthetic appeal is enhanced by subtle floodlighting on the white roof shells at night. The building's ability to emotionally move people and invoke a strong aesthetic response is enhanced by the experience of approaching, entering and moving around the building and surrounds. The public promenades including the Forecourt, Broadwalk, and podium platform and steps contribute to the majestic qualities of the place. The large forecourt and sweeping podium steps prepare the visitor for the majestic quality of the soaring internal spaces including the folded concrete beams throughout the building, and the reinforced radial cranked beams in the northern foyers. These are complemented by the vast coloured glass panels in the main foyers of the Concert Hall and Opera Theatre wings, through which the harbour and city views reinforce the building's magnificent setting. The distinctive interiors including the foyers surrounding the major auditoria, the

	Reception Hall (now the Utzon Room), the Box Office foyer, and the Bennelong Restaurant designed by Utzon and Peter Hall, enhance the relationship between the interior and exterior of the building. The two large murals commissioned specifically for the Sydney Opera House, including John Olsen's 'Five Bells' and Michael Nelson Jagamara's 'Possum Dreaming', enhance the aesthetic values of the interior.
F Creative or technical achievement	The Sydney Opera House represents a masterpiece of architectural creativity and technical accomplishment unparalleled in Australia's history. In every respect, it is a structure at the leading edge of endeavour. Its many awards, including the Royal Australian Institute of Architects Gold Award given to architect Jørn Utzon in 1973, reflect its pivotal place in the national story of creative achievement providing, as Utzon envisioned, 'an individual face for Australia in the world of art' (Frampton and Cava 1995, 296). The design of the building reflects Utzon's intention to create a sculptural form that would be both a focal point in Sydney Harbour and a reflection of its character. 'The white sail-like forms of the shell vaults relate as naturally to the Harbour as the sails to its yachts' (Assessors Report cited in Norberg-Schulz 1980, 56). The 'hybrid' interior spaces of the Sydney Opera House reflect the creative genius of both Utzon and Todd, Hall and Littlemore, who completed the building and interior finishes after Utzon's departure. The major public spaces with outside views, for example were designed by Utzon (and completed by Peter Hall) to be finished in natural materials, textures and colours similar to those on the exterior of the building in order to bring the outside inside (Kerr 2003, 69). In his *Design Principles* booklet submitted to the Sydney Opera House Trust in 2002, Utzon revealed the two ideas of particular importance in his design: first, his use of organic forms from nature, evident in the leaf form pattern devised for the ceramic roof tiles, and second was the creation of sensory experiences to bring pleasure to the building's users, particularly the experience of approaching, mounting the grand staircase to the podium, passing through the low ribbed box office, up to the foyers flanking the auditoria with their harbour views, and the climax of the performance itself. 'Both ideas were…reinforced by Utzon's application of counterpointing techniques using light and dark tones, soft and hard textures and richly treated warm and cool interior colours. On a grander scale, the light toned shells of the building were to stand out against the (then) darker fabric of the city' (Kerr 2003, 44). The interior spaces designed by Peter Hall, including the

major auditoria known as the Concert Hall and Opera Theatre, and the minor performance spaces, performers' and staff areas, and rehearsal rooms, known collectively as 'Wobbly Land' because of the distinctive 'U' shaped timber paneling, demonstrate the distinctive design solutions that made the Opera House a functioning performing arts centre in the 1970s, and reflect the prevailing aesthetic values, building standards, and financial constraints of the day.

The process of building the Sydney Opera House resulted in the development of a number of innovative technical and creative solutions that were groundbreaking in the history of building design and construction in Australia. This is especially the case with the design and construction of the roof, based on the geometry of the sphere. The roof shells had to span large areas to accommodate the main hall and smaller hall. The solution to the structural challenges of the roof shells devised by Utzon and Ove Arup and Partners over a four year period involved the production of arched segments of varying curvature from the same range of precast modular units. The concrete shells were finally produced by cutting a three-sided segment out of a sphere and by deriving regularly modulated curved surfaces from this solid (Frampton and Cava 1995, 273). The roof shells with their vaulted concrete ribs were constructed using precast concrete segments fixed together with epoxy resin and held together by pre-stressing tendons, representing a considerable structural innovation for the period. The roof shells were faced in off-white Swedish Hoganas tiles inspired by the Chinese ceramic tradition. Using a European technique of prefabrication, over one million tiles were cast into precast concrete lids on the ground then bonded onto the ribbed superstructure of the shells (Frampton and Cava 1995, 280). From the point of view of science, the Opera House embodies within its structure the integration of sophisticated geometry, technology and art. It epitomizes the extraordinary creative potential of the assembly of prefabricated, repeated components (Norberg-Schulz 1996, 101).

The building was the first of its kind in Australia to use computer-based three-dimensional site positioning devices, geothermal pumps, tower cranes, chemical anchors, non-competitive tendering, life-cycle engineering, parametric design (such as the use of governing equations to model a design), and critical path methods. It gave rise to the establishment of a testing laboratory at the University of New South Wales that became one of the first organizations in the world to commercialise university research and support technology transfer. It also promoted Australian expertise internationally, and opened the way for international

	engineering construction firms such as Ove Arup to establish their operations in Australia. Utzon's approach to project management was instrumental in changing Australian building and building procurement practices, including *de facto* pre-qualification of bidders, use of scope drawings, performance-based design assistance from trade specialists, mock-up testing, and on-the-job skill development (Tombesi 2005).
G Social value	The Sydney Opera House is an enduring symbol of modern Sydney and Australia, both nationally and internationally. Indeed, the profile of the distinctive ceramic clad roof shells has become an instantly-recognisable national emblem. For example, it provided the inspiration for the logo used to promote the 2000 Olympic Games held in Sydney. The building's role as a cultural icon is also derived from the numerous performances conducted there (100,000 since 1973), and the place's role as a focal point for community events. The Sydney Opera House is a mecca for both Australian and international visitors to Sydney, attracting over 100 million visitors since the opening in 1973. The high cost of construction was met by a major public lottery that served to enhance its status as a place for the people.
H Significant people	The Sydney Opera House is directly associated with Jørn Utzon, whose design won an international competition in 1957 and was hailed by the architectural critic Sigfried Giedion as opening a new chapter in contemporary architecture. Utzon's design represented a significant development in the basic concepts of the Modern Movement in architecture associated with free plan and clear construction. It evolved during a period of experimentation in modern architecture occurring internationally in the 1950s. Utzon was influenced by the architecture of the ancient Mayans and Aztecs, as well as the work of earlier twentieth century architects including the Finnish architect, Alvar Aalto with whom Utzon worked in 1945, Frank Lloyd Wright, and Mies van der Rohe. Utzon's creative genius, exemplified in the Sydney Opera House, is widely acknowledged amongst national and international scholars of modern architectural history. Athough Utzon left the project in 1966, prior to the building's completion, the Sydney Opera House is nevertheless identified with him and he has attracted national and international acclaim. His professional recognition in Australia is reflected by awards such as the Royal Australian Institute of Architects' Gold Award mentioned above, and internationally in awards such as the prestigious Pritzker Prize for Architecture awarded to Utzon in 2003. The peninsula on which the Sydney Opera House now stands has a special association with Bennelong, an

Aboriginal man 'captured' by Governor Arthur Phillip in 1789. Bennelong became a prominent and influential figure in the early Sydney colony, sharing information about his culture with Governor Phillip and regularly visiting the Governor's residence. He was the first Aboriginal adult in the new colony to play a significant role in mediating interactions between Aboriginal people and the early settlers, and was reportedly highly regarded by both Aboriginal people and Europeans. Governor Phillip built the first structure - a house - on the peninsula for Bennelong's use, and from the 1790s the peninsula became known as 'Bennelong Point', and was known to Aboriginal people as Tyubow-gule (McBryde 1989, 17).

Description:

The Sydney Opera House is strategically located on Bennelong Point, giving the building added prominence in the Sydney Harbour vista. It is closely adjacent to Circular Quay, the harbour's main transport hub. It also forms an important visual relationship with the Sydney Harbour Bridge to the west – the strong curves of both are complementary.

The opera house complex is made up of two main buildings plus a smaller one, principally of reinforced concrete, which sit on a massive concrete platform on a foundation of piles. The three upper buildings are formed of clusters of reinforced concrete vaulted structures which contain a large hall for 2690 people (the Concert Hall) and a small hall for 1547 people (the Opera Theatre) plus theatrical spaces (Drama Theatre and Playhouse), the Studio, administration areas, a major restaurant (Bennelong) plus other areas. Utzon's plan set the two largest halls side by side on the platform. This made possible the building's dramatic sculptural elevations – the roofs resemble billowing sails and the whole ensemble has a singular freedom of form. The two halls have their stage set to the south which maximizes views of the harbour from the northern foyers and from the glass-walled passages as the public passes around to the northern end. The concrete platform is clad with precast panels faced in reconstituted red granite, and this material is also used for the paving of the waterfront promenade which surrounds the platform. The platform, both in its form and colour, contrasts with the roofs of the building. The building is entered from the southern forecourt and a wide sweeping set of stairs, which makes for a grand approach on foot.

Inside, the two main halls are constructed using a hidden steel framework which has been faced with timber. Plywood panels were designed as part of the internal lining to conceal the services. The Concert Hall includes a mechanical-action pipe organ. Linings in this hall are birch plywood, in radiating ribs on a suspended hollow raft ceiling, running down the walls to laminated brush box linings which match the floor. The Opera Theatre by contrast has black-stained ceilings and walls. Both of these main halls have proscenium curtains designed by John Coburn. The design of the interiors was completed by Todd, Hall and Littlemore after the departure of Utzon in 1966. The general experience of the interiors of the Sydney Opera House is one of majestic spaces defined by strong structural forms.

The glass walls, filling the external openings under the vaulted concrete shells of the roof, are constructed of a light steel framework supported off the concrete ribs, supporting laminated, topaz-tinted plate glass sheets with bronze fittings. The walls were designed after Utzon's departure from the project. These glass walls provide spectacular views from the main foyers out across Sydney Harbour. John Olsen's painting, inspired by the Kenneth Slessor poem 'Five bells', relates to the harbour and hangs in the main foyer and is a well known feature of the building's interior.

The most revolutionary feature of the building is the concrete roof. Utzon produced a design

utilizing ribbed shell vaults made of precast concrete. Utzon based the shape of the vaults on the curve of a sphere, so that all segments had the same curve and could be mass-produced. These segments were precast and lifted into place and held together with epoxy resin and prestressing tendons, an innovative method at the time of construction. The engineering firm on the project, Ove Arup and Partners, and the building contractors, M.R. Hornibrook, both made important contributions to the realization of Utzon's project. Conventional design, construction and finish methods were superceded by a range of innovative approaches to meet the challenges of the building's design. The roof segments, for example, were coated with small ceramic tiles. Utzon spent more than a year working with manufacturers in Sweden to develop tiles specifically suited to the building. The glazed tiles have a slightly irregular surface with a glasslike finish. The central tiles are glazed white and the border tiles matt cream. The standardized prefabricated method used on the roofs was both much less costly than other methods, and also allowed for very precise quality control.

History:

When the First Fleet arrived in 1788, and moved from Botany Bay to Port Jackson, it landed in Sydney Cove. The beginning of European settlement in Australia occurred within a short distance of the site of the future Sydney Opera House. Upon arrival, Governor Arthur Phillip's Instructions of April 1787 were to 'endeavour by every possible means to open an intercourse with the natives, and to conciliate their affections….' (McBryde, 1989:5). While initially friendly, Aboriginal people soon came to shun the Sydney cove settlement, threatening the 'plan he had so much at heart of conciliating and establishing a friendly intercourse with them' (Phillip, 1789:112). Taking initiative, Governor Arthur Phillip organised to take 'by force' an Aboriginal person. Arabanoo was captured in December 1788 but soon died from smallpox (April 1789). Two Aboriginal children (Nanbaree and Boorong) then acted as informants following a stay in the colony hospital (Attenbrow, 2002:14). In November 1789 Phillip decided to capture two more men, Bennelong (also known as Wolarawaree) and Colbee (Tenchs diary, Ch. 5). While both later escaped, they retained connections with Governor Phillip.

Bennelong became a particularly prominent Aboriginal figure in and around the settlement (e.g. Tench's journal, Bradley's journal). He and his relatives often stayed or dined at the Governors' residence when visiting the settlement, and on a number of occasions Phillip offered the shelter of his house to Aboriginal women seemingly at threat (McBryde, 1989:17). In time Bennelong solicited the government to 'build him a hut at the extremity of the eastern point of the cove. This, the governor, who was very desirous of preserving the friendly intercourse which seemed to have taken place, readily promised, and gave the necessary directions for its being built (Collins, I, 113). The hut, built of brick, twelve feet square, and roofed with tiles, was completed in November 1790. It is illustrated in a painting by Thomas Watling (Dixson Gallery), which shows its exposed, isolated position on the point. From this time the point, formerly called *Tubow-gule* (various spellings, Attenbrow, 2002:11) became known as Bennelong's Point. There is no evidence to suggest that Bennelong spent much time in the dwelling; rather, it seems that the house was more of a symbol of his importance (Kerr, 2003:1-2). The place was however occasionally used as a social centre for those Aboriginal people who were about the settlement (McBryde, 1989:17). William Bradley recounted an evening of 'entertainment' in March 1791 provided by Bennelong at his house for the governor and his party (Bradley, 231). Bennelong and another Aboriginal man returned to England with Governor Phillip, departing in 1792. Only Bennelong survived the trip, and in 1795 he returned with the new Governor John Hunter. During his absence, Bennelong's house was lent to a visiting Spanish expedition, and was demolisted in 1795. Upon his return, Bennelong's importance and status in both the Aboriginal and the European communities apparently remained high, and he was offered official protection as Governor Hunter's friend (McBryde, 1989:17). Records of his life in this period (early 1800s) are few and un-sympathetic. Bennelong died on 3 January 1813 (McBryde, 1989:27).

A defensive battery was built at Bennelong Point early in the colony's history, followed by the construction of Fort Macquarie in 1821 by order of Governor Lachlan Macquarie. It was designed

by Francis Greenway. By 1902 the fort had been replaced by a tramshed as part of Sydney's public transport system. The tramshed, built in Gothic style like the fort, stood until the 1950s when buses were increasingly used to replace trams throughout Sydney. A proposal was put forward for an opera house to be built in Sydney. This proposal was pursued by the conductor of the Sydney Symphony Orchestra, Eugene Goossens, on the advice of town planners Rosette Edmunds and Sydney Luker (Freestone 1995). Goossens published a conceptual plan for an opera house in 1948. It emphasised the place of high culture in the centre of Sydney, but the idea did not gain political support until 1952 when the then Premier of New South Wales, J.J. Cahill, announced the government's intention to build an opera house. The decision reflected a growing desire to change the public perception of Sydney as a former penal colony, and to put the city on the world map. According to Denis Winston, a professor of town planning, 'The building of the new Opera House on one of the grandest urban sites in the world – the headland where Governor Macquarie's old Fort used to be – will be a visible symbol of the coming of age of the capital of the Mother State.' (Winston 1957, 19). In November 1954 Cahill appointed an Opera House Committee to advise the State Government on ways to implement the proposal. The Committee recommended Bennelong Point for the site and an international competition in order to select a suitable design. The competition was announced in January 1956, attracting more than 220 final entries received from 32 countries. The competition brief called for a 'national opera house' on Bennelong Point with two halls designed for specific uses, but no limits on the estimated cost of the project. The judging panel included Henry Ashworth (Professor of Architecture at Sydney University), John Leslie Martin (Professor of Architecture at Cambridge University), Cobden Parks (the NSW Government Architect), and Eero Saarinen (the renowned Finnish architect). On 29 January 1957 the judges announced that Jørn Utzon of Denmark had won. The winning design attracted considerable public interest and, whilst there were some critics, Utzon's design was widely acclaimed for its spectacular presentation and suitability for the Bennelong Point site.

The spectacular and dramatic design was far ahead of its time. The influence of Utzon's father, a naval architect, had led to Utzon's interest in curved shapes and an attention to detail. Utzon was also inspired by Frank Lloyd Wright and Mies Van Der Rohe, as well as architectural traditions from a number of cultures. His design was particularly inspired by the harbour setting for the proposed building, and the first design drawings depicted shell-like entities, floating in space like clouds, rising above a grand ceremonial platform with staircases reflecting the form of Mayan temples. Utzon's guiding design principles emphasised the organic forms of nature and the creation of a pleasurable sensory experience (Kerr 2003, 44). He envisaged the Opera House as a sculpture that would be viewed from all angles – from water, land and air. It was to be the focal point in a grand waterscape. As Utzon explained, 'Instead of making a square form, I have made a sculpture – a sculpture covering the necessary functions…If you think of a Gothic church, you are closer to what I have been aiming at. Looking at a Gothic church, you never get tired, you will never be finished with it – when you pass around it or see it against the sky… Something new goes on all the time…Together with the sun, the light and the clouds, it makes a living thing' (Utzon, Descriptive narrative, Sydney Opera House, cited in Kerr 2003, 16).

During this period, new forms of expression were sought by architects worldwide. The pioneers of the Modern Movement in architecture during the early twentieth century, including Le Corbusier, Mies van der Rohe, and Frank Lloyd Wright, had developed new principles of architectural design. The basic intention of the Modern Movement was 'to realise an image of the new open and dynamic world' where people could participate in a world of freedom of movement and choice (Norberg-Schulz 1996, 167). It represented a departure from earlier architectural ideas that placed humans outside of the understood world and emphasised enclosed, static spaces. Instead, modern architecture sought to restore the human presence. In this way, the Sydney Opera House, is as an exemplar of the late Modern Movement, and demonstrated what Giedion called the 'humanisation of modern architecture' after the 'functional' achievements of early modernism. It reflected the world-wide demand for a 'new monumentality' and a 'new

regionalism' in architecture, and 'a humanised urban life, where the human settlement is served by a 'heart' which gathers its primary qualities. The Sydney Opera House is such a heart. In the rational context of the modern city, it represents a living core, that is, a place where life is revealed as being meaningful, not in the sense of a dogmatic centre, but a place where culture *takes place*' (Norberg-Schulz 1996, 172).

'The Sydney Opera House accomplishes what is the basic aim of modern art and architecture: the relinquishment of the split between thought and feeling. The word "modernity" has been used to denote the rational thought that has been dominant since the Enlightenment, and which implies a pragmatic attitude devoid of emotional qualities. "Modernism", on the contrary, is an artistic movement which his directed against mere reason, as was pointed out by Gropius when he in 1935 presented the Bauhaus approach to the British public: "…rationalization, which many people imagine to be the cardinal principle (of the new architecture), is really only its purifying agency…The other, the aesthetic satisfaction of the human soul, is just as important as the material. Both find their counterpart in that unity which is life itself." It is precisely this unity Utzon has accomplished in his works, and in the most significant way in the Sydney Opera House…in the Sydney Opera House Jørn Utzon realised the great synthesis of earth and sky, landscape and city, vista and intimacy, thought and feeling, in terms of a unity of technological and organic form. Hence we may safely say that the Sydney Opera House represents a masterpiece of human creative genius, and a most significant step in the history of modern architecture' (Norberg-Schulz 1996, 1972).

In September 1957, the New South Wales Government announced the establishment of an Opera House Lottery to pay for the construction costs of the building, and over the next 16 years it yielded just over $100 million for construction (SOH website). Utzon's designs for the Opera House were initially presented as concept diagrams that were not structurally feasible. Over a five year period, Utzon collaborated with the London-based Danish engineering firm Ove Arup and Partners to develop a method for constructing a ribbed shell roof system based on the geometry of a sphere. The system permitted each rib to be built up with standard segments cast on site. The segments were then lifted into place between the previous rib and a supporting telescopic steel arch devised by the contractor, M.R.Hornibrook. Design and construction of the Sydney Opera House was difficult, demanding innovative solutions that extended the boundaries of technological and building methods of the period (Kerr 2003, 16).

The design of the building had already attracted the attention of professionals, but by the mid-1960s the general public was aware of the controversy surrounding the project's time and cost overruns. There were also difficulties between Utzon and a new NSW Government elected in 1965. As a result Utzon resigned in February 1966, with the podium in place and the roof structure nearly complete. The reasons for Utzon's departure from the project were complex and have been widely discussed in the literature. A major factor was Premier Cahill's insistence on the building being commenced before the March 1959 election, before the design for the shells and their supports had been resolved. The problem of construction running pushing ahead of design solutions was to be a problem that beset the construction of the Opera House throughout its fifteen year construction period. Utzon encountered further difficulties with the technical advisory committee not providing timely advice to the project. In addition, Utzon's attention to detail and his approach to resolving design problems by developing solutions in consultation with technical experts and artisans through trial and error brought him into conflict with the new State Government, who viewed his methods as not conducive to the scale and complexity of the project. In April 1966, Utzon was replaced with a panel of Australian architects to complete the project, involving Peter Hall, Lionel Todd and David Littlemore in association with the NSW Government Architect, Ted Farmer. Utzon gave them drawings to assist them in completing construction, but Hall described these as incomplete. This made the task of completing the project difficult, and emphasised the different approaches preferred by Utzon and his Australian successors. Whilst Utzon worked with consultants and contractors to develop, test, and refine

three-dimensional prototypes, Hall, Todd and Littlemore followed the standard practice used in Australia of relying on two-dimensional drawings. Utzon's departure from the project meant that his plans for the major and minor halls, the glass infill walls and the public spaces were not realised. Instead, Hall, Todd and Littlemore contributed to the final design with innovative topaz-coloured glazing in bronze frames which enclose the ends of the roofs. In June 1966 the major intended commercial user of the main hall, the Australian Broadcasting Commission, belatedly produced a set of specific requirements. As a result, Hall, Todd and Littlemore produced a number of recommendations to the State Government, outlining radical changes to the interiors to accommodate the ABC's needs. Theses included making the main hall a dedicated Symphony or Concert Hall, and the smaller hall a dedicated Opera Theatre. The recommendations were approved in April 1967, and Hall, Todd and Littlemore developed the final designs for the interior. The interiors are largely attributed to Peter Hall.

In 1960 American actor and singer Paul Robeson climbed onto the scaffolding of the Sydney Opera House and during construction, and sang to the workers. The first official performance was given by the Australian Opera Company on 28 September 1973, and on the following night Charles Mackerras conducted the Sydney Symphony Orchestra in the Concert Hall. The Sydney Opera House was officially opened on 20 October 1973 by Queen Elizabeth II, and 300 journalists arrived from across the world 'to see if the Sydney Opera House was to be a white elephant or a sacred cow' (Kerr 2003, 24-5). Martin Bernheimer, the music critic of the Los Angeles Times, wrote: 'This, without question, must be the most innovative, the most daring, the most dramatic and in many ways, the most beautiful home constructed for the lyric and related muses in modern times' (cited in Kerr 2003, 24-5). By his own choice, Utzon did not attend the opening nor did his name appear on the plaque in the entry concourse. It was, however, widely acclaimed as Utzon's creation, with the outstanding contribution by Hall, Todd and Littlemore in turning his masterpiece into a fully-functioning performing arts centre. Since its opening, the Opera House has attracted great artists from across the world, and hosted performances by many nationally and internationally acclaimed performers. These include Joan Sutherland, Kiri Te Kanawa, June Bronhill, Joan Carden, Luciano Pavarotti, the Sydney Symphony Orchestra, the Australian Chamber Orchestra, the New York Philharmonic conducted by Leonard Bernstein, Yehudi Menuhin, Bob Hope, Bangarra Dance Theatre, Mikhail Barishnikov, Twyla Tharp, Ella Fitzgerald, Nana Mouskouri, Harry Secombe and Crowded House (SOH website). Since 1973 over 45 million people have attended over 100,000 performances, including classical and contemporary music, ballet, opera, drama and dance, events for children and outdoor activities. It is used as a venue by a wide range of organisations including performing arts companies, entrepreneurs, schools, community groups, corporations, individuals and government agencies. The harbour-side Broadwalk and some of the foyers are open to the public, and it has attracted an estimated 100 million visitors.

The construction of a forecourt, car parking, and an appropriate approach by land to the Opera House was undertaken between 1986 and 2003. The approach was designed under the supervision of Andrew Andersons and involved Peter Hall. It was undertaken as part of the State Government's bicentennial refit of Macquarie Street and the public areas flanking Sydney Cove, and completed in time for the visit by British Royalty on Australia Day 1988. The parking station was an ingenious design solution to the problem of car access to the site. It involved a double helical coil set underground behind the Tarpeian cliff face. The vehicle entry and exits were in Macquarie Street, the air intake grills along the base of the cliff and the air exhaust a feature in the centre of the vehicle roundabout east of the forecourt. Part of the 1858 Bennelong drain was relocated during the work, and the harbour tunnel avoided. The pedestrian tunnel linked the 1988 lower forecourt to provide undercover access to the Opera House. It offered protection from the elements and serviced the lower forecourt shops, although it bypassed the grand forecourt approach envisioned by Utzon (Kerr 2003, 26). Between 1988 and 1997, the NSW Government commissioned the Public Works Department to upgrade the building and establish an asset management system to 'ensure the survival of the house for future generations' (SOHUP

Progress Report 1993, 4-11, cited in Kerr 2003, 27). Further work was carried out in 1994 to accommodate catering venues in the Opera House and lower forecourt, including the redesign of the Bennelong and Forecourt Restaurants and the Café Mozart, and modifications to the Harbour Restaurant. The Sydney Opera House Trust established a Conservation Council to advise and assist the Trust on the care, control and maintenance of the building. Whilst Jørn Utzon never returned to Australia and nor saw his building completed, he accepted an invitation from the NSW Premier to provide advice to the Sydney Opera House Trust, including a set of design principles to guide the ongoing conservation and management of the opera house, including any future redevelopment of the interiors. These were delivered in 2002. Utzon wrote that 'it is right that we should be looking forward to the future of the Sydney Opera House and not back to the past. For this reason I believe…future architects should have the freedom to use up-to-date technology to find solutions to the problems of today and tomorrow (cited in Kerr 2003, 31). The refurbishment of the Reception Hall, now called the 'Utzon Room', was completed according to Utzon's advice, and includes a tapestry designed by Utzon.

The Sydney Opera House has received many awards for its design and construction. These include the United Kingdom Institution of Structural Engineers Special Award in 1973, the Royal Australian Institute of Architects Gold Award to Jørn Utzon in 1973, and a Commemorative Sulman Award in 1992. The Association of Consulting Engineers gave its Excellence Award for the glass walls in 1972. The Illuminating Engineering Society of Australia gave a Meretricious Lighting Award in 1974, and a Certificate of Commendation for the shell floodlighting in 1988. The Royal Australian Institute of Architects has also given a range of other awards including one for outstanding environmental design in 1974, a civic design award in 1980, the Lloyd Rees award in 1988 and a National Civic Design Award in 1988 for the design of the forecourt. In 2003 the NSW RAIA gave the inaugural 'NSW 25 year award' and in 1998 the Sydney City Council awarded Utzon the Keys of the City of Sydney. In 1982 Utzon was warded the A. Aalta Medal and in 2003 the prestigious international Pritzker Prize for his contributions to architecture and in recognition of his masterpiece, the Sydney Opera House. The Pritzer Prize Juror, architect Frank Gehry, observed that 'Utzon made a building well ahead of its time, far ahead of available technology, and he persevered through extraordinary malicious criticism to a building that changed the image of an entire country. It is the first time in our lifetime that such an epic piece of architecture gained such universal presence' (Pritzker Prize website, 2003).

Condition and Integrity:

The building is in good condition and has a high degree of integrity. It retains its original design appearance although the fabric has been restored in part with new compatible finishes. The building's interiors have been extensively remodeled although many significant spaces remain close to their original form.

Location:

2 Circular Quay and Macquarie Street, Bennelong Point, Sydney, comprising all of Lot 5 DP775888 and all of Lot 4 DP7879333, and including the sea walls abutting these lots.

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Sydney Opera House at http://www.sydneyoperahouse.com
Sydney Opera House, entry in the *New South Wales State Heritage Register* at http://www.heritage.nsw.gov.au
Australian Performing Arts Centres Association at http://www.apaca.com.au/Home.html
Australian Heritage Places Inventory at http://www.heritage.gov.au/ahpi (Australian Heritage Commission, Register of the National Estate Database No 002353, Sydney Opera House and Surrounds, Sydney NSW)

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Report Produced: Mon Sep 11 17:02:33 2006

Appendix D

Register of the National Estate—Sydney Opera House

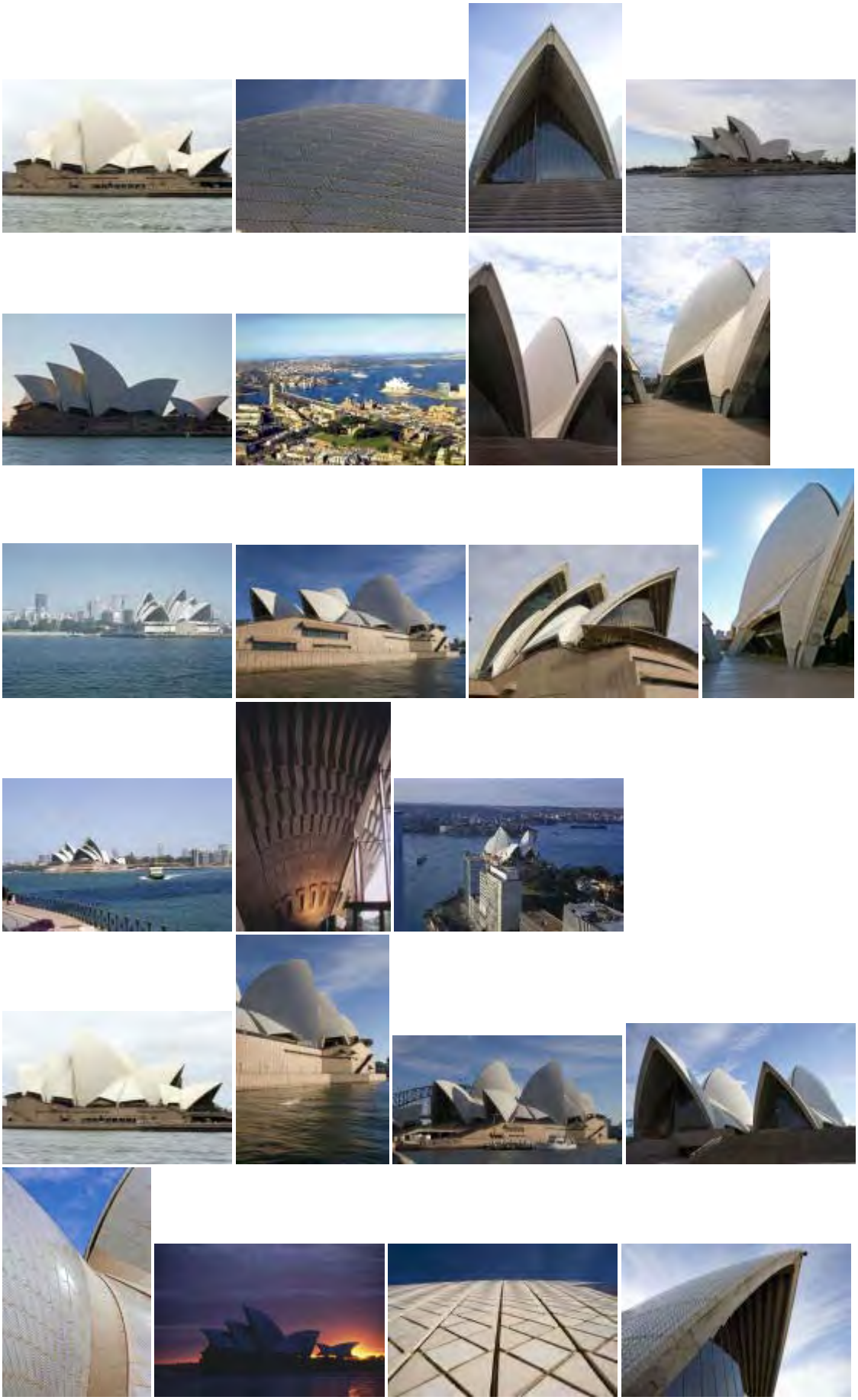
http://www.environment.gov.au/cgi-bin/ahdb/search.pl?mode=place_detail;search=place_id%3D2353%3Bkeyword_PD%3Don%3Bkeyword_SS%3Don%3Bkeyword_PH%3Don%3Blatitude_1dir%3DS%3Blongitude_1dir%3DE%3Blongitude_2dir%3DE%3Blatitude_2dir%3DS%3Bin_region%3Dpart;place_id=2353

Place Details

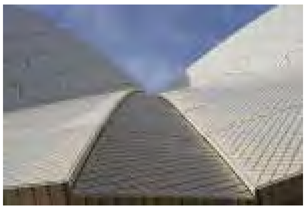
Send Feedback

Sydney Opera House and Surrounds, 2 Circular Quay East, Sydney, NSW, Australia

Photographs:











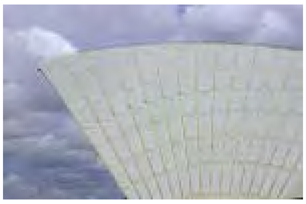




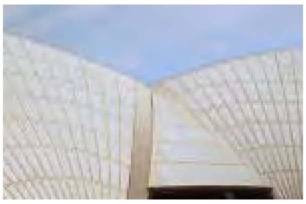


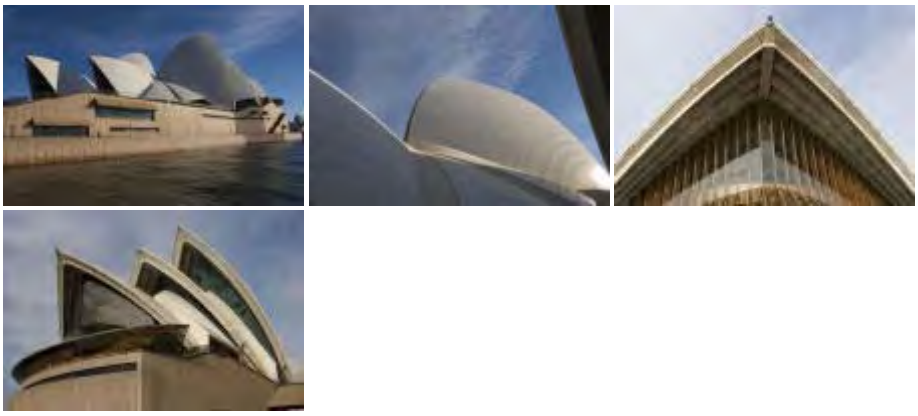






List:	Register of the National Estate
Class:	Historic
Legal Status:	Registered (21/10/1980)
Place ID:	2353
Place File No:	1/12/036/0449

Statement of Significance:

The Sydney Opera House is a magnificently sited building which has become an internationally recognised symbol of Sydney and of Australia (Criterion G.1). The building's exterior design is a great artistic achievement, with roof shapes echoing the billowing sails of the harbour. The interior design is functional and complements the high standard of the exterior design. Since its completion the Sydney Opera House has attracted world wide acclaim as an exceptional design, enhanced by the superb setting (Criterion E.1). The engineering design and construction of the Opera House, using vaulted concrete ribs to achieve a practical solution to the limitations of the shell concrete construction envisaged in Utzon's sketch, is a considerable technical accomplishment (Criterion F.1).
Since its completion, The Opera House has been the scene of many notable achievements in the performing arts and has associations with many important artistic performers (Criteria F.1 and H.1).

Official Values: Not Available

Description:

A reinforced concrete base, containing drama theatre, recording hall, rehearsal studios and administration areas, is surmounted by clusters of reinforced concrete vaulted sails in three groups which contain the Opera Hall, Concert Hall and a restaurant. The base is clad with precast panels faced in reconstituted red granite and this material is also used for the paving of the waterfront promenade which surrounds the base. The sails are clad in white ceramic coated tiles. Huge expanses of glazing provide dramatic views into and out of the foyers. Joern Utzon won an international competition with his design for the building in 1957. Construction was well underway when he resigned from the project. The interiors and glazing were designed by Hall, Littlemore and Todd, who took over as architects to complete the building.

History: Not Available

Condition and Integrity:

Good.

Location:

2 Circular Quay and Macquarie Street, Bennelong Point, Sydney.

Bibliography:

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RAIA 1990.

Report Produced: Tue Jun 2 12:50:48 2009

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Appendix E

NSW State Heritage Register—Sydney Opera House

http://www.heritage.nsw.gov.au/07_subnav_02_2.cfm?itemid=5054880

Sydney Opera House

Item

Name of Item: Sydney Opera House

Other Name/s: Opera House, National Opera House, The Opera House, Jubughalee, Bennelong Point

Type of Item: Built

Group/Collection: Recreation and Entertainment

Category: Theatre

Location: Lat:-33.8589 Long:151.2138

Primary Address: Circular Quay East, Sydney, NSW 2000

Local Govt. Area: Sydney

Property Description:

Lot/Volume Code	Lot/Volume Number	Section Number	Plan/Folio Code	Plan/Folio Number
LOT	5	-	DP	775888
LOT	4	-	DP	787933

All Addresses

Street Address	Suburb/Town	LGA	Parish	County	Type
Circular Quay East	Sydney	Sydney	St James	Cumberland	Primary
Bennelong Point	Sydney	Sydney			Alternate

Owner/s

Organisation Name	Owner Category	Date Ownership Updated
Attorney General, Minister for the Arts, Minister for the Environment	State Government	

Statement of Significance

The Sydney Opera House is of State significance as a twentieth century architectural masterpiece sited on a prominent peninsular in Sydney Harbour. In association with the Sydney Harbour Bridge it has become an internationally recognised symbol of Sydney and Australia, which is also widely admired by local citizens. Designed for the NSW Government by renowned Danish architect Jørn Utzon between 1957 and 1966, and completed in 1973 by Hall, Todd and Littlemore, the building has exceptional aesthetic significance because of its quality as a monumental sculpture in the round, both day and night, and because of the appropriateness of its design to its picturesque setting. Its public spaces and promenades have a majestic quality, endowed by powerful structural forms and enhanced by vistas to the harbour and the city. An icon of modern architecture, the Sydney Opera House uses the precise

technology of the machine age to express organic form. It has scientific and technical significance for the ways in which its construction continually pushed engineering and building technologies to the limit. It also has significance for the extensive associations of the site with many famous people and important themes in Australian history. Abutting the site of the first settlement of Europeans in Australia at Sydney Cove, the Sydney Opera House stands on Bennelong Point, Aboriginal land which was named after a Wangal Aboriginal man and which is of significance in the history of the entanglements and interactions between Aboriginal and non-Aboriginal cultures in Australia. Other historic themes associated with the site include the arrival of the First Fleet in Sydney Cove, scientific investigation, defence, picturesque planning, marine and urban transport and most recently, cultural showcasing. Since its official opening by the Queen in 1973, the Sydney Opera House has been the scene of many notable achievements in the performing arts and has associations with many nationally and internationally renowned artistic performers. The Sydney Opera House provides an outstanding visual, cultural and tourist focal point for Sydney and Australia.

Date Significance Updated: 21 Mar 05

Note: There are incomplete details for a number of items listed on the State Heritage Register. The Heritage Office intends to develop or upgrade statements of significance for these items as resources become available.

Description

Designer: Jørn Utzon, completed by Hall Todd & Littlemore

Builder: Engineers Ove Arup, contractor M.J. Hornibrook

Construction Years: 1957 - 1973

Physical Description: Located on the prominent peninsula of Bennelong Point in the heart of Sydney's central business district, the Sydney Opera House faces north into Sydney Harbour. Visually juxtaposed against the strong curves of the Sydney Harbour Bridge, the Sydney Opera House adjoins the city's historic Royal Botanic Gardens and overlooks Circular Quay, the transport hub of Sydney's ferries, trains and buses.

Jrn Utzon's design for the Sydney Opera House consists of a monumental platform surfaced with ochre granite, a massive horizontal base that contrasts with the white-tiled sail-like roofs. Its public spaces and promenades have a majestic quality endowed by powerful structural forms. A huge external stairway up the platform to the performance venues is an important element designed for a grand approach on foot. The publicly-accessible Broadwalk around the building allows pedestrians to promenade and appreciate the ever-changing outlook. Huge expanses of glazing provide dramatic views into and out of the foyers. As an icon of modern architecture it combines an expressive freedom of form with the precise technology of the machine age.

The NSW Government's international design competition brief of 1957 that resulted in the Sydney Opera House was visionary but vague. As the project materialized, the full extent of the functions of the complex had to be worked out, just as the problems inherent in the sculptural conception of Utzon's winning design had to be overcome. Inspired decisions by Utzon and the engineer Ove Arup to use vaulted concrete ribs based on the geometry of the sphere, and cast on site, achieved a brilliantly practical solution to the problem of roof construction. Australian architectural historian Max Freeland stated: "This Sydney Opera House was a voyage of architectural and engineering discovery in which new oceans were charted, new frontiers of knowledge and technology were conquered and the resources of science and technology were employed to solve design, erection and quality of finish problems beyond the capacity of conventional methods" (Freeland 1983).

Utzon's plan set the two largest performance venues side by side upon the platform. This made possible his dramatic sculptural elevations but came at a functional cost: the loss of conventional side and backstage space. Instead, access was contrived from below, using a broad passage under the platform at ground level. Utzon

explained: "The idea has been to let the platform cut through like a knife, and separate primary and secondary functions completely. On top of the platform the spectators receive the completed work of art and beneath the platform every preparation for it takes place" (DEST, 1996, 62)

The Sydney Opera House encompasses a complexity of structures including the Concert Hall, the Opera Theatre, the Drama Theatre and Playhouse, the Studio, administration areas and restaurants. The Concert Hall, the home of the Sydney Symphony Orchestra, is the largest venue. It seats 2,690 patrons and has a fine mechanical-action pipe organ. Birch plywood, formed into radiating ribs on the suspended hollow raft ceiling, extends down the walls to meet laminated brush box linings which match the floor. In the harbour foyer is John Olsen's acclaimed mural "Five Bells", itself inspired by a poem about the harbour by Kenneth Slessor. The Opera Theatre seats 1,547 people and is the performance base for Opera Australia. It is also used by the Australian Ballet and the Sydney Dance Company. It features black-stained ceilings and walls and red leather upholstery, although its acclaimed proscenium curtain designed by John Coburn, the "Curtain of the Sun", has been removed at least temporarily for repair. The Drama Theatre' s"Curtain of the Moon", also designed by John Coburn, is also removed at least temporarily. This theatre and the Playhouse are both theatrical venues and are primarily used by the Sydney Theatre Company. The Studio is the Sydney Opera House's newest performing space, having opened in March 1999, and is used for innovative and contemporary productions. There are also facilities for cinema, exhibitions, meetings, lectures, rehearsals, administration, restaurants and ancillary functions.

Physical Condition and/or Archaeological Potential:

The Sydney Opera House has great physical integrity and intactness. The building retains its original design appearance although the fabric has been restored in part with new compatible finishes. The building's interiors have been extensively remodelled although many significant spaces remain close to their original form. After the profound building effort required to construct the Sydney Opera House, it is unlikely that any archaeological potential is retained in relation to its historical associations with famous people and important themes in Australian history. Maritime archaeological work in preparation for the construction of the Sydney Harbour Tunnel found no evidence relating to the shipwreck site of the Three Bees,1814, just off the north west corner of Bennelong Point (Atkinson, 1988). The Three Bees was the earliest known wreck in NSW waters, and if found, would be the only submerged site representing the early convict trade to the colony. **Date Condition Updated:** 19 Aug 03

Modifications and Dates:

Ongoing adaptation of spaces, fabric and equipment to changing performance needs. 1976 - Repaint of interior. 1986-88 Construction of land approach and forecourt treatment under the supervision of Government Architect Andrew Andersons, with contributions by Peter Hall. 1988-1997 - Extensive repair and restoration work including: conservation of Concert Hall ceiling surfaces, extension of the stage of the Concert Hall, extension of the basement of the building to provide extra floor space, additional dressing rooms and storage space for the Playhouse Theatre, resealing joints between roof tiles, renewing slabs on ceremonial stairs and parts of podium, resealing glass wall joints, refurbishing auditoria seating, modifying the Opera Theatre orchestra pit, major structural refurbishment of supports to the Broadwalk, upgrading of fire protection and suppression systems, developing new edge tiles for the roof shells. (Kerr 2003: 26-27, Sydney Opera House website) 1993 - Conservation Plan commissioned from James Semple Kerr, updated in 2003. 1998-1999 - Conversion of the recording and rehearsal room into both an assembly area for the orchestra and "the Studio", for the presentation of innovative music and performing arts. 1999-2003 - Replacement of areas of pre-cast paving on the northern and western broadwalk, podium deck and steps, cleaning of external pre-cast wall panels, technical improvements to lighting, air-conditioning, hydraulics and fire and stage facilities, a series of acoustic studies of the Concert Hall. (Kerr, 2003, 30) 2003 - plans to refurbish the Opera Theatre and to redesign its orchestra pit, improvements to the Concert Hall acoustics, refurbishment of the Reception Hall, partial opening of the western foyer to its harbour setting, development of the forecourt as a performance venue (Kerr, 2003, 31).

Further Information:

As Kerr states, "There will always be a demand for adaptations to a performing arts centre if it is to remain in commercial use. One of the roles of a conservation plan is

to recommend the ways in which adaptations and additions may be controlled so that the cumulative effect does not degrade the building and its interiors, and to identify the thresholds at which change will have an adverse effect upon the significance of the building . . . Residual tensions between the care of the structure as a monument and its function as a performing arts centre will always exist. It is therefore important to emphasise the degree to which the quality of the building and its site and the popular and financial success of the events within it reinforce each other. Neither can be neglected." (Kerr, 1993, 27)

Former Use: Opera House

History

Historical Notes: The Sydney Opera House is sited on the peninsular of Bennelong Point in Sydney Harbour, part of the site of Australia's first European settlement at Sydney Cove near the contemporary Sydney CBD. Bennelong Point has extensive associations with many important themes in Australian history, including: the arrival of the First Fleet of British convicts in Sydney Cove in 1788, Aboriginal and European contact, scientific investigation, defence, picturesque planning, marine and urban transport and most recently, cultural showcasing.

EARLY ABORIGINAL ASSOCIATIONS WITH THE SITE
During the last ice age 20,000 years ago, the present Sydney Harbour was a complex river valley extending about 25 kilometres further east before meeting the ocean. Material in rock shelters reveals that Aboriginal people inhabited the surrounding region at least from that time. Some 6-7,000 years ago, melting ice had raised the sea-level to flood the valley system, to create a place approximating the present harbour, islands and foreshores and to cover any evidence of earlier human occupation along the valley floor (DEST & DUAP, 1996, 42) About 3,000 years ago there appears to have been a major population increase of Aboriginal people in the area (and elsewhere throughout Australia), suggested by the evidence of many camp sites that seem to have come into use from that time. Several different languages and dialects were spoken in the Sydney Harbour area before the arrival of the First Fleet. While 'Kuringgai' was the language spoken on the north shores, on the southern shores, including the peninsular now known as Bennelong Point, the language was 'Eora'. The Cardigal, who formed part of the Darug nation, were the Aboriginal traditional owners of this part of Sydney Harbour (Haglun, 1996, 135, 138). Bennelong Point was known to Aboriginal people as "Tyubow-gule" (Kerr, 1993, 1) or 'Jubgalee' (City of Sydney webpage).

The foundation of Sydney Town allied with the effects of a smallpox epidemic in 1789-1791 caused a massive disintegration of Aboriginal social structure around Sydney within the first decade of colonisation. The indigenous concepts of the religious meaning of the landscape and its features were not recorded by the British. It is thought that water, fire and creatures of the sea would have played important roles here as for other areas nearby (Haglund, 1996, 137). Other information about Aboriginal culture in Sydney Harbour before British colonisation is embedded in physical traces of their activities. Fire was used to modify the environment to suit human needs, a form of land husbandry noted in the journals of British officers when they commented on the park-like appearance of the landscape (DEST & DUAP, 1996, 42). Other evidence ranges from debris left behind during the daily round of getting, preparing and eating food, to expressions of beliefs and social organisation. Both aspects are still represented within view of the Sydney Opera House in shell middens middens and rock engravings (Haglund, 1996, 134). The Royal Botanical Gardens near Bennelong Point commemorates the culture and lifestyle of the Cardigal people in its 'Cadi Jam Ora: First Encounters' garden display (Royal Botanical Gardens website).

EARLY EUROPEAN ASSOCIATIONS WITH THE SITE AND INTERACTIONS WITH BENNELONG
The First Fleet arrived on the shores of NSW in January 1788 to form a British penal colony. Following Governor Arthur Phillip's decision that Botany Bay would not support the settlement, the ships began moving up the coast the few kilometres to Sydney Harbour. The HMAS Supply anchored at nightfall on Friday 25 January 1788

just inside Sydney Cove, about a cable's length from the eastern point of the cove that is now known as Bennelong Point. The rest of the fleet arrived the next day, 'Australia Day', 26 January 1788. Sloping and rocky, the eastern side of the cove was not attractive to habitation, although government cattle and horses were landed there temporarily. They remained until they had cropped what little pasture was available before being removed to a government farm nearby (Kerr, 1993, 1).

Bennelong Point was originally a small tidal island that largely consisted of rocks with a small beach on the western side (Wikipedia online, 2005). First known unofficially as 'Cattle Point', early correspondents were soon referring to Bennelong Point as "the east point of the cove" and in common usage it briefly became 'East Point'. Its permanent name, however, arose indirectly from Phillip's attempts to become acquainted with the local Aboriginal people. In November 1879, because of his limited success, he took the drastic step of seizing two indigenous men: Coleby and Bennelong. Coleby soon escaped but Phillip endeavoured by 'kind treatment' to 'reconcile' Bennelong to the Europeans. Although Bennelong soon escaped he appears to have retained some regard for Phillip. He paid several visits to Government House with companions, and apparently requested the government to build him a house on the eastern point of the cove. Phillip agreed and in mid-November 1790 Bennelong took possession of a brick and tile hut at the extremity of the point, about four metres square (Kerr, 1993, 1).

Contemporary sketches show the hut in exposed isolation on the point and from this time the headland has been known as Bennelong's Point. There is no evidence to suggest that Bennelong spent much time in the dwelling. He seems to have regarded the house more as a symbol of his importance than a place of residence. William Bradley gives an account of an evening's entertainment in March1791 provided by Bennelong at his house for the governor and his party, when 24 men, women and children danced to the accompaniment of beating sticks and hands. In December 1792 Bennelong and a young compatriot, Yem-mer-ran-wan-nie, departed for England with Phillip. Of the two Aboriginal men, only Bennelong survived the trip and it was not until 1795 that, homesick and unwell, he was able to return with the new governor, John Hunter. The trip helped to unsettle a volatile character and he died in1813, alienated from both Aboriginal and European cultures. During his English trip his house on Bennelong Point was hardly used and fell into disrepair. In March 1793 it was lent to a visiting Spanish expedition, which made astronomical observations from the point and stored their equipment in the dwelling. Bennelong's house was demolished in 1795 (Kerr, 1993, 2).

Bennelong Point was also the site of the first defensive structures in the colony. A couple of months after the First Fleet's landing, Phillip had appointed marine officer William Dawes to construct a small redoubt on the east point at its northern tip. The work was completed by the end of the year and on New Year's day 1789 two guns were placed in position. However the battery had fallen into decay by 1791. Another battery was built in December 1798 but by 1800 it too was reported to be in a 'total state of decay'. No attempt was made to repair the work and instead the point was to become a de facto hospitality area for visiting survey and expedition vessels (Kerr, 1993, 2-3). Kerr comments helpfully on these early uses of the point:

'If . . . Bennelong chose the site of his house, why was it in such an exposed location on the tip of the point, overlooked by headlands and ridges and visible from the waters of the harbour in three directions? In the absence of records of the local people's attitude to the point, it seems likely that Bennelong chose to give maximum visibility to the very solid evidence of the esteem in which he was held by the European visitors. The value of such a highly visible symbol of white benevolent intentions would not have escaped Phillip. . . Whatever the reason, the topological characteristics which made it attractive to Bennelong also made the vicinity useful for temporary defensive works and, when they were derelict, as a shore camp for visiting foreign expeditions. On the point, the foreigners could be held at a not inconvenient arm's length and at the same time be kept under easy surveillance' (Kerr, 1993, 3-4).

NINETEENTH CENTURY PICTURESQUE ASSOCIATIONS
Bennelong Point is close to the earliest known wreck in NSW waters. The Three Bees arrived in Sydney on 6 May 1814 with a cargo of 200 surviving male convicts. Two

weeks later she caught fire at anchor in Sydney Cove, but all aboard managed to escape before her guns or magazine began to explode. With the rigging ablaze she was cut free but drifted back to shore, burning to the waterline during the night, and finally sinking in shallow water off Bennelong Point. Maritime archaeological survey work, conducted in preparation for the construction of the Sydney Harbour Tunnel in 1988, searched the area near the north west tip of Bennelong Point where it was supposed that the Three Bees had sunk, but no relics were found (Atkinson, 1988).

The area encompassing Bennelong Point, the Botanical Gardens and Mrs Macquarie's Point had been reserved for the crown by Phillip, who meant it to continue free of encroachments. Under governors Hunter and King, however, a variety of leases and buildings were permitted. Thus in 1795 Governor Hunter agreed to a proposal by Mr John Boston to make salt at Bennelong Point. Boston was allocated seven convicts and constructed a small works on the west side of the point in a building that was known as the salt works, however the venture failed within months (Kerr, 1993, 2). When Governor Bligh took over in 1806 he cancelled these leases and had the buildings removed. Fortunately the next governor, Lachlan Macquarie, reinforced and completed the clearance. 'Macquarie and his wife Elizabeth did a lot more than return the government domain to its former shape: they also set out to embellish it' using their 'taste for the Picturesque' (Kerr, 1993, 4).

In 1812 the Macquaries built a castellated cottage on the west side of Bennelong Point as a dwelling for an eccentric Jamaican emancipist, Billy Blue, who acted as a watchman and 'waterman'. More importantly, in 1818, the Macquaries commissioned the recently emancipated English architect Francis Greenway to design 'a Neat Handsome Fort' in sandstone on Bennelong Point. It was meant to prevent clandestine departures from Sydney as well as to repel surprise attacks from an enemy. Between 1818 to 1821, the tidal area between Bennelong Island and the mainland was filled with rocks excavated from the peninsula. The entire area was leveled to create a low platform and to provide suitable stone for the construction of Fort Macquarie. While the fort was being built, a large portion of the rocky escarpment at Bennelong Point was also cut away to allow a road to be built around the point from Sydney Cove to Farm Cove, known as Tarpeian Way (Wikipedia online, 2005). Completed in 1821, Fort Macquarie was 40 metres square with circular bastions on the four corners, and was entered by a bridge over a dry moat and an octagonal guard tower. Fort Macquarie provided a picturesque focal point on the harbour throughout the nineteenth century but was generally considered inadequate for military purposes - 'an ornamental and archaic toy' (Kerr, 1993, 9). A notable further use of the Fort commenced in 1858 with the firing of a gun each day precisely at 1pm to enable the rating of ships' chronometers (Kerr, 1993, 10). Presumably this also alerted Sydneysiders to their lunch.

The Macquaries intended to build a grand governor's residence on Bennelong Point but only got as far as constructing the stables uphill, which were later converted to the Sydney Conservatorium of Music. During the late 1820s, Governor Ralph Darling and his wife Eliza built a castellated bathing house with octagonal towers on Bennelong Point facing east, not far from Fort Macquarie (Kerr, 1993, 5-7). An 1839 guide to Sydney stated that 'the chief pride of this town is the excellent walks round the domain, passing Fort Macquarie'. Kerr points out that 'The "genius" of the Point was still considered to be most peculiarly Gothic and a generation of artists, amateur and professional, never tired of depicting its elements' (Kerr, 1993, 7). In1843 the present Government House was completed in Late Gothic style, positioned further uphill toward the stables than the site chosen by Macquarie.

TRANSPORT ASSOCIATIONS WITH THE SITE
In 1860 a wharf was built on Bennelong Point for a ferry service crossing to the north side of the harbour at Milson's Point. This service became redundant with the opening of the Sydney Harbour Bridge in 1932. Major longshore wool, mail and passenger wharves were also built during the 1880s, extending towards Circular Quay. In the late 1890s the western rampart of the fort was demolished, presumably to provide carriage access for burgeoning P&O passenger trade. From 1879 Sydney was increasingly serviced by a tramway network. By 1902 Fort Macquarie had been demolished, replaced by a tram shed designed to hold 72 of the city's largest trams. In deference to the picturesque associations of the site, the tram shed was designed by the NSW Department of Public Works in Gothic style. As

Kerr describes it, 'the industrial saw-tooth roof was concealed behind crenelated parapet walls and the office and staff facilities were located in a north end with five apses in echelon - in the manner of the thirteenth century High Gothic cathedrals of Amiens, Rheims and Beauvais. This surprising arrangement was surmounted by an asymmetrically placed tower in the government architect's best Neo-Gothic mode' (Kerr, 1993, 11). The tram shed remained in use until the 1950s when buses began to progressively replace trams throughout Sydney.

PLANS FOR A NATIONAL OPERA HOUSE

Meanwhile the town planners Rosette Edmunds and Sydney Luker had convinced Eugene Goossens, the conductor of the Sydney Symphony Orchestra, that Bennelong Point was a fine potential location for a performing arts centre (SMH 19/10/73, p.6; Freestone, 1995). In October 1948 Goossens published a plan for an opera house with an auditorium to accommodate up to 4,000 people on the site. This was an ambitious plan to emphasise 'high culture' in a most prominent part of the city. The idea did not gain political support until 1952 when the Labor premier of NSW, J.J. Cahill, announced the government's intention to build an opera house. The decision to invest in such a building at this time may be seen as a timely attempt to shift perceptions of Sydney from being a ex-penal colony in a far-flung corner of the British Empire to Sydney as a world city with its own cultural maturity. Town planning professor Denis Winston wrote at the time that:

'The building of the new Opera House on one of the grandest urban sites in the world - the headland where Governor Macquarie's old Fort used to be - will be a visible symbol of the coming of age of the capital of the Mother State' (Winston, 1957, 19).

AN INTERNATIONAL DESIGN COMPETITION

In November 1954, Cahill appointed an 'Opera House Committee' to advise the government on ways to implement its intention to build an opera house. The committee - consisting of Goossens, Henry Ashworth (Sydney University's Professor of Architecture) and representatives of the Australian Broadcasting Commission, the Sydney City Council and the Department of Local Government - recommended Bennelong Point as the preferred site and an international competition to select the design. In January 1956 the NSW government announced the terms of a major international competition to design a 'national opera house' on Bennelong Point with two halls, each designed for a specific set of uses. No limits were set on the estimated cost of the project. This open-ended design brief attracted 933 registrations of interest from all over the world and more than 220 final submissions by architects from 32 countries. The judging panel consisted of Ashworth, John Leslie Martin (professor of Architecture at Cambridge UK), Cobden Parkes (the NSW Government Architect) and Eero Saarinen (the renowned Finnish architect). On January 29, 1957, the judges announced that Joern Utzon was the winner of the competition. There are conflicting views of what went on during the jury's deliberations but all agree that Saarinen was a strong advocate of the winning design (Kerr, 1993, 15). The jury stated, 'The drawings are simple to the point of being diagrammatic. Nevertheless we have returned again and again to the study of these drawings, we are convinced that they present a concept of an Opera House which is capable of being one of the great buildings of the world' (Sydney Opera House website, 2003).

Both the architectural fraternity and the public were amazed by the design. Although there were a few dissenting voices, initially including Cahill's, most people found Utzon's design a spectacular and appropriate development for the site. Utzon, like other designers who had worked on Bennelong Point, was inspired by the site. It was clear that the building would be viewed from all angles - from water, land and air, that the Sydney Opera House was to be the focal point in a grand waterscape. Utzon drew on the form of Mayan temples for his solid, grand ceremonial platform with staircases, from which spring the shells or roof structure. Two of his guiding design principles were the use of organic forms from nature, and the creation of sensory experiences that would bring pleasure to the users of the place (Kerr, 2003, 44). As Utzon explained:

'. . . Instead of making a square form, I have made a sculpture - a sculpture covering the necessary functions . . . If you think of a Gothic church, you are closer

to what I have been aiming at. Looking at a Gothic church, you never get tired, you will never be finished with it - when you pass around it or see it against the sky . . . Something new goes on all the time . . . Together with the sun, the light and the clouds, it makes a living thing' (Kerr, 1993, 16).

During public debate on a name for the building, concerns were expressed that the cost of admission would be too high for the average working family. Cahill had feared this perception and publicly promised that 'the building when erected will be available for the use of every citizen.' Furthermore, he declared, 'the Opera House will, in fact, be a monument to democratic nationhood in the fullest sense' (Kerr, 1993, 15). Rather than pay for the construction of the building from the usual tax revenues, Cahill announced the establishment of the 'Opera House Lottery' in September 1957. Over the next 16 years, the gambling public of NSW voluntarily contributed just over $100 million to the erection of the Sydney Opera House (Sydney Opera House website, 2003).

CONSTRUCTION DIFFICULTIES
The austere line sketches Utzon had prepared for the 1957 competition showed a relatively squat, free-form roof of concrete shells. These were concept diagrams and did not prove to be structurally practical. Over the next five years Utzon, in conjunction with the famous engineering firm of Ove Arup of London, developed a ribbed shell system based on the geometry of a sphere. This system permitted each rib to be built up of a number of standard segments cast at the site. The segments were then lifted into place between the previous rib and a supporting telescopic steel arch devised by the contractor, M.R. Hornibrook. The complete rib was then stressed and the process repeated. The development of this roof shell design was a difficult and lengthy process. As with so much of the Sydney Opera House work, it extended skills and pushed technology to the limit (Kerr, 1993, 16).

In the early 1960s the architectural character of the proposed Sydney Opera House had already made it famous in professional circles. By the mid 1960s the controversy surrounding the time and cost overruns had spread that fame to almost all levels in society. In February 1966, with the podium in place and the roof structure nearly complete, Utzon 'resigned'. By April he had left Sydney and did not return.

The reasons for these troubles were complex and have been much discussed in a range of publications. A major factor was Premier Cahill's insistence on the building being commenced before the March 1959 election - long before the design for the shells and their supports had been resolved. With construction running ahead of the design solutions, a chain reaction was set up which plagued all those concerned with the work for the fifteen year construction period. A further problem lay in the honorary committees appointed by Cahill. The technical advisory committee did not meet sufficiently frequently to give timely advice. Ashworth made an unfortunate recommendation that it would be unnecessary for Utzon to work with an Australian architectural firm with local knowledge, as had been foreshadowed in the competition brief (Kerr, 1993, 15, 18-19). Ashworth's suggestion that Arup be directly responsible to the client rather than to Utzon also contributed to discord.

Utzon approached the design problems by working up solutions in consultation with technical experts and artisans, by a process of trial and error. In his search for perfection, Utzon was working to a very different agenda to that of the new Liberal government that took office in May 1965. In financial - and therefore also political - terms Utzon's approach was not one the new government considered appropriate to jobs of the scale and complexity of the Sydney Opera House. When the authorisation of fees was transferred from the executive committee to the Minister for Public Works, Davis Hughes, in October 1965, Utzon was in trouble. Utzon finally resigned in February 1966 in an oddly constructed letter in which he told Hughes that he had been 'forced . . . To leave the job'. The alacrity with which Hughes dispatched a formal acceptance of Utzon's 'resignation' belied the deep regret he expressed at receiving it (Kerr, 1993, 19).

In April 1966 Hughes announced the appointment of a panel of architects to complete the project. It consisted of Peter Hall, Lionel Todd and David Littlemore. Hall was responsible for design. The fourth member was the government architect,

Ted Farmer, who by virtue of his office, acted as client. Utzon gave them some drawings but Hall described these as incomplete. While this made work difficult for Hall Todd & Littlemore, it also emphasised the very different approaches of Utzon and his Australian successors. Utzon liked to work with consultants and contractors developing and adjusting three-dimensional prototypes. By contrast the Australian tradition continued the primacy of two-dimensional drawing. It was apparent that, in the absence of communication between Utzon and the new team, the Sydney Opera House was not going to be finished as Utzon might have intended (Kerr, 1993, 20-21). His departure meant that his plans for the major and minor halls, the glass infill walls and the public spaces were never realised. Instead, the topaz-coloured glazing in bronze frames which enclose the ends of the roofs was a major innovation achieved by the Australian architects.

In June 1966, the Australian Broadcasting Commission (ABC) - as the intended major commercial user of the space - belatedly produced a set of specific requirements for the main hall, including a reverberation time of at least two seconds. In December 1966, Hall Todd and Littlemore presented a number of recommendations to the Minister that outlined radical changes to the interiors to accommodate these needs. These changes included turning the main hall into a dedicated Symphony or Concert Hall and turning the smaller hall into a dedicated Opera Theatre. The State Government approved the recommendations in April 1967 and the design of the interior of the structure was developed by Hall, Todd and Littlemore to comply with them (Sydney Opera House website). Thus the interiors are largely attributed to Peter Hall, within the spectacular exterior shell designed by Utzon.

OPENING PERFORMANCES

In 1960, the black American actor and singer Paul Robeson climbed on the scaffolding at the Sydney Opera House while it was under construction to sing to the workers. The first public performance was however given in the Opera Theatre on 28 September 1973 by the Australian Opera Company, while the following night in the Concert Hall Charles Mackerras conducted the Sydney Symphony Orchestra. A little after these first official performances, on 20 October 1973, the Sydney Opera House was officially opened by Queen Elizabeth II. During the inaugural period 300 journalists arrived from all over the world 'to see if the Sydney Opera House was to be a white elephant or a sacred cow'. The Los Angeles correspondent spoke for many when he wrote: 'This, without question, must be the most innovative, the most daring, the most dramatic and in many ways, the most beautifully constructed home for the lyric and related muses in modern times' (Kerr, 1993, 25).

Sydney author Ruth Park wrote about the Sydney Opera House in 1973 in an account that is suggestive of some of the perceptions of it at that time:

'To walk into the Opera House is to walk inside a sculpture, or perhaps a seashell, maybe an intricate, half-translucent nautilus. Morphology and the computers have composed a world of strange breathless shapes, vast, individual, quite unlike any other architecture I have ever seen. Palm ribs of steel, sea fans of concrete! And all of extraordinary height, all in harmonious dialogue one with another. The glassy declivities of the walls are an almost imperceptible amber; they bring the sun into the vast structure as they bring the sky and the harbour. It's such a nonesuch of a building, a white swan in a land of black swans. . . One of its dazzling features are the world's biggest theatre curtains (and woollen ones at that). Woven in the Aubusson style in the medieval French village of Felletin, from a design by Australian artist John Coburn, each curtain measures more than 1,000 square feet [93 sq.m] and requires six men to lift it. Expectedly, the bold blazing designs have been severely criticized as 'bathroom wallpaper', but I think them breathtaking. The curtain for the Opera Theatre, especially, is a perfect symbol of the city; a summer coloured curtain with vigorous leaping shapes that recall Sydney's resident demon, the bushfire. The central sun motif is of such energy and brilliance that one can almost hear the hissing roar of its prominences. You may well find yourself an ant inside the Opera House, but when you come out you're more than human. To know that this masterpiece comes from the materialistic sixties! And the worse seventies! One goes away full of justified faith' (Park, 1973, 29-30).

A NATIONAL CULTURAL CENTRE

Many famous artistic performers from Australia and overseas have been associated with the Sydney Opera House since its completion, indeed, its success as a performing arts centre has been described as 'spectacular' partly because of the building's 'ability to attract great artists from all over the world' (Kerr, 1993, 26). These performers include: opera singers Joan Sutherland, Kiri Te Kanawa, June Bronhill, Joan Carden and Luciano Pavarotti; orchestras such as the Sydney Symphony, the New York Philharmonic conducted by Leonard Bernstein, The Festival Orchestra with Yehudi Menuhin, the Chicago Symphony Orchestra and the Berlin Philharmonic; comedians Bob Hope, Paul Hogan, Billy Connolly and Judith Lucy; and dance shows by the Sydney Dance Company, the Aboriginal Islander Dance Theatre and the Bangarra Dance Theatre; ballet performers such as Natalia Makarova, Mikhail Barishnikov, Jiri Kylian, George Balanchine and Twyla Tharp; popular singers and musicians such as Paul Robeson, Ella Fitzgerald, Nana Mouskouri, Harry Secombe, Sammy Davis Jr, John Williams, Tiny Tim, Elvis Costello, kd lang, Michael Jackson and Crowded House (Sydney Opera House website).

As this range of names may indicate, the Sydney Opera House doesn't operate principally as a venue for opera, but hosts a wide range of performing arts. These include classical and contemporary music, ballet, opera, drama and dance, events for children and outdoor activities. It is used as a venue by a wide range of organisations including performing arts companies, entrepreneurs, schools, community groups, corporations, individuals and government agencies. Its harbour-side Broadwalk and some of its foyers are freely open to the public. Since it opened in 1973, over 45 million people have attended more than 100,000 performances at the Sydney Opera House and it is estimated that well over 100 million people have visited the site. Market research from 2003 indicated that the people who visited the Sydney Opera House numbered around 4.4 million per year, averaging nearly 85,000 visitors each week. Only about a quarter of those visiting came for performance-related reasons, while the remainder came to experience the building and its environment (Sydney Opera House webpage).

HONOURS BESTOWED
The Sydney Opera House and its designers have been awarded many honours. In Australia in 1972 the Association of Consulting Engineers gave Ove Arup & Partners the Annual Award for Excellence (for the design and construction of the glass walls). The Illuminating Engineering Society of Australia gave a Meretricious Lighting Award for the Opera Theatre in 1974 and a Certificate of Commendation of the shell floodlighting in 1988. n 1973 the Royal Australian Institute of Architects (RAIA) awarded Joern Utzon its prestigious Gold Medal, and in 1992 they gave him a Commemorative Sulman Award. From the RAIA also came a Merit Award for work of outstanding environmental design in 1974, a Civic Design Award in 1980, the Lloyd Rees Award in 1988 and a National Civic Design Award in 1988, both awarded for the design of the forecourt, which was remodelled as part of the Circular Quay and Macquarie Street revitalisation project. Also, in 2003, the NSW RAIA gave the inaugural "NSW 25 Year Award". In 1998 the Sydney City Council awarded Joern Utzon the Keys of the City of Sydney. The Sydney Opera House has been listed on the registers of the Australian Heritage Commission, the National Trust as well as on the Sydney City Council heritage LEP.

Internationally, in the Uk in 1969, Ove Arup & partners were given the Queen's Award to Industry (for technological innovation in prestressed concrete roofing). In 1973 the UK Institution of Structural Engineers made a Special Award to Ove Arup & Partners to acknowledge a physical achievement in its widest sense (for the contribution to the creation of the Opera House). Utzon has since been awarded the Aalto Prize, the Royal Institute of British Architects' Gold Medal and Denmark's highest cultural honour, the Sonning Prize. In 2003 the prestigious Pritzker Prize ('the architectural equivalent of a Nobel Prize') was awarded to Joern Utzon, recognising the Sydney Opera House as his masterpiece. As a jury member for Pritzker Prize in 2003, the American architect Frank Gehry commented:

'Utzon made a building well ahead of its time, far ahead of available technology, and he persevered through extraordinary malicious criticism to a building that changed the image of an entire country. It is the first time in our lifetime that such an epic piece of architecture gained such universal presence' (Frank Gehry quoted in the Architecture Bulletin, Jul/Aug 2003, 19).

UTZON'S RETURN
In 1998 the Sydney Opera House Trust began negotiations for the return of Joern Utzon as an advisor. In 1999, Utzon agreed to supply a statement of his 'design principles' for the building. These were delivered in 2002 and have been published as 'Sydney Opera House Utzon Design Principles' (2002). These are, in Utzon's words, 'to be used as a permanent reference for the long term conservation and management of the House and for any redevelopment of interiors as and when that becomes necessary'. He emphasised however that, 'it is right that we should be looking forward to the future of the Sydney Opera House and not back to the past. For this reason I believe . . . Future architects should have the freedom to use up-to-date technology to find solutions to the problems of today and tomorrow' (Kerr, 2003, 31).

The long-serving Labor premier of NSW, Bob Carr, has written about the Sydney Opera House as the primary symbol of 'our vigorous cultural life' that will enable Sydney 'to thrive in the new century'. In noting that 'Sydney and the architect of our city's icon, Joern Utzon, are reconciled', Carr proudly states that 'all future work on the Opera House will be guided by [Utzon's] original vision' (Carr, 2002, 225).

Historic Themes

Australian Theme (abbrev)	New South Wales Theme	Local Theme
2. Peopling - Peopling the continent	Aboriginal cultures and interactions with other cultures - Activities associated with maintaining, developing, experiencing and remembering Aboriginal cultural identities and practices, past and present.	All nations - places of interaction and entanglement between Aboriginal and non-Aboriginal peoples -
3. Economy - Developing local, regional and national economies	Commerce - Activities relating to buying, selling and exchanging goods and services	Operating a tourism venture -
3. Economy - Developing local, regional and national economies	Environment - cultural landscape - Activities associated with the interactions between humans, human societies and the shaping of their physical surroundings	Landscapes of sport and recreation -
3. Economy - Developing local, regional and national economies	Environment - cultural landscape - Activities associated with the interactions between humans, human societies and the shaping of their physical surroundings	Landscapes of cultural and natural interaction -
3. Economy - Developing local, regional and national economies	Environment - cultural landscape - Activities associated with the interactions between humans, human societies and the shaping of their physical surroundings	Landscapes of cultural and natural interaction -
3. Economy - Developing local, regional and national economies	Events - Activities and processes that mark the consequences of natural and cultural occurences	Providing a venue for significant events -
3. Economy - Developing local, regional and national economies	Events - Activities and processes that mark the consequences of natural and cultural occurences	Developing national landmarks -
3. Economy - Developing local, regional and national economies	Science - Activities associated with systematic observations, experiments and processes for the explanation of observable phenomena	Researching astronomy -
3. Economy - Developing local, regional and national economies	Technology - Activities and processes associated with the knowledge or use of mechanical arts and applied sciences	Technologies of new building materials and techniques -
3. Economy -	Transport - Activities associated with the moving of people and	Building and operating

Developing local, regional and national economies	goods from one place to another, and systems for the provision of such movements	industrial tramways -
3. Economy - Developing local, regional and national economies	Transport - Activities associated with the moving of people and goods from one place to another, and systems for the provision of such movements	Building and maintaining jetties, wharves and docks -
4. Settlement - Building settlements, towns and cities	Land tenure - Activities and processes for identifying forms of ownership and occupancy of land and water, both Aboriginal and non-Aboriginal	Exposed site for surveying foreigners -
7. Governing - Governing	Defence - Activities associated with defending places from hostile takeover and occupation	Repatriating returned service personnel -
7. Governing - Governing	Defence - Activities associated with defending places from hostile takeover and occupation	Building colonial forts -
7. Governing - Governing	Government and Administration - Activities associated with the governance of local areas, regions, the State and the nation, and the administration of public programs - includes both principled and corrupt activities.	Developing roles for government - parks and open spaces -
7. Governing - Governing	Government and Administration - Activities associated with the governance of local areas, regions, the State and the nation, and the administration of public programs - includes both principled and corrupt activities.	Building and operating public infrastructure -
8. Culture - Developing cultural institutions and ways of life	Creative endeavour - Activities associated with the production and performance of literary, artistic, architectural and other imaginative, interpretive or inventive works; and/or associated with the production and expression of cultural phenomena; and/or environments that have inspired such creative activities.	Designing structures to emphasise their important roles -
8. Culture - Developing cultural institutions and ways of life	Creative endeavour - Activities associated with the production and performance of literary, artistic, architectural and other imaginative, interpretive or inventive works; and/or associated with the production and expression of cultural phenomena; and/or environments that have inspired such creative activities.	Creating works of art -
8. Culture - Developing cultural institutions and ways of life	Creative endeavour - Activities associated with the production and performance of literary, artistic, architectural and other imaginative, interpretive or inventive works; and/or associated with the production and expression of cultural phenomena; and/or environments that have inspired such creative activities.	Building in response to natural landscape features. -
8. Culture - Developing cultural institutions and ways of life	Creative endeavour - Activities associated with the production and performance of literary, artistic, architectural and other imaginative, interpretive or inventive works; and/or associated with the production and expression of cultural phenomena; and/or environments that have inspired such creative activities.	Building in response to natural landscape features. -
8. Culture - Developing cultural institutions and ways of life	Creative endeavour - Activities associated with the production and performance of literary, artistic, architectural and other imaginative, interpretive or inventive works; and/or associated with the production and expression of cultural phenomena; and/or environments that have inspired such creative activities.	Building and using prefabricated structures -
8. Culture - Developing cultural institutions and ways of life	Creative endeavour - Activities associated with the production and performance of literary, artistic, architectural and other imaginative, interpretive or inventive works; and/or associated with the production and expression of cultural phenomena; and/or environments that have inspired such creative activities.	Technological innovation and design solutions -
8. Culture - Developing cultural institutions and ways of life	Creative endeavour - Activities associated with the production and performance of literary, artistic, architectural and other imaginative, interpretive or inventive works; and/or associated with the production and expression of cultural phenomena; and/or environments that have inspired such creative activities.	Architectural styles and periods - Late 20th Century Late Modern -
8. Culture - Developing cultural institutions and ways of life	Creative endeavour - Activities associated with the production and performance of literary, artistic, architectural and other imaginative, interpretive or inventive works; and/or associated with the production and expression of cultural phenomena; and/or environments that have inspired such creative activities.	Creating an icon -
8. Culture - Developing cultural	Leisure - Activities associated with recreation and relaxation	Visiting lookouts and places of natural beauty -

institutions and ways of life		
8. Culture - Developing cultural institutions and ways of life	Leisure - Activities associated with recreation and relaxation	Going to the theatre -
8. Culture - Developing cultural institutions and ways of life	Leisure - Activities associated with recreation and relaxation	Gathering at landmark places to socialise -
9. Phases of Life - Marking the phases of life	Persons - Activities of, and associations with, identifiable individuals, families and communal groups	Associations with Governor Arthur Philip, 1788-1792, -
9. Phases of Life - Marking the phases of life	Persons - Activities of, and associations with, identifiable individuals, families and communal groups	Associations with Governor Lachlan Macquarie, 1810-1821 -
9. Phases of Life - Marking the phases of life	Persons - Activities of, and associations with, identifiable individuals, families and communal groups	Associations with J.J. Cahill, NSW Premier -
9. Phases of Life - Marking the phases of life	Persons - Activities of, and associations with, identifiable individuals, families and communal groups	Associations with Jorn Utzon, architect -
9. Phases of Life - Marking the phases of life	Persons - Activities of, and associations with, identifiable individuals, families and communal groups	Associations with Eugene Goossens, orchestra conductor -
9. Phases of Life - Marking the phases of life	Persons - Activities of, and associations with, identifiable individuals, families and communal groups	Associations with H.I. Ashworth, architecture professor -
9. Phases of Life - Marking the phases of life	Persons - Activities of, and associations with, identifiable individuals, families and communal groups	Associations with Governor Ralph Darling and Eliza Darling -
9. Phases of Life - Marking the phases of life	Persons - Activities of, and associations with, identifiable individuals, families and communal groups	Associations with Bennelong -
9. Phases of Life - Marking the phases of life	Persons - Activities of, and associations with, identifiable individuals, families and communal groups	Associations with Ove Arup, engineer -
9. Phases of Life - Marking the phases of life	Persons - Activities of, and associations with, identifiable individuals, families and communal groups	Associations with Francis Greenway, emancipist architect -
9. Phases of Life - Marking the phases of life	Persons - Activities of, and associations with, identifiable individuals, families and communal groups	Associations with Billy Blue, Jamaican emancipist -
9. Phases of Life - Marking the phases of life	Persons - Activities of, and associations with, identifiable individuals, families and communal groups	Associations with theatre performers -
9. Phases of Life - Marking the phases of life	Persons - Activities of, and associations with, identifiable individuals, families and communal groups	Associations with musical performers -
9. Phases of Life - Marking the phases of life	Persons - Activities of, and associations with, identifiable individuals, families and communal groups	Associations with Eero Saarinen, architect -

Assessment of Significance

SHR Criteria a) [Historical Significance]

The Sydney Opera House has historical significance as a modern architectural masterpiece, recognised internationally as a symbol of Sydney and Australia, and created throughout many years of creative and financial controversy. Its historical significance is furthermore enhanced by the extensive associations of the site with major themes in Australian history such as Aboriginal and European contact,

scientific investigation, defence, picturesque planning, marine and urban transport, popular recreation and cultural icons. (Kerr 1993: 28)

SHR Criteria b) [Associative Significance]

The Sydney Opera House site is of significance for its many associations with people prominent in NSW's history including the early colonial governors of NSW, the Aboriginal man Bennelong, the architect Francis Greenway and many artists who have depicted the site. Many significant people are associated with the construction of the Sydney Opera House, including Eugene Goossens, Joe Cahill, Jørn Utzon, Eero Saarinen and Ove Arup. Many famous artistic performers from Australia and overseas have been associated with the Sydney Opera House since its completion, indeed, its success as a performing arts centre has been described as "spectacular" partly because of the building's "ability to attract great artists from all over the world".

SHR Criteria c) [Aesthetic Significance]

The Sydney Opera House has exceptional aesthetic significance because of its quality as a monumental sculpture in the round, both day and night, and because of the appropriateness of its design to its setting and the picturesque quality of the setting. Its public spaces and promenades have a majestic quality endowed by powerful structural forms and enhanced by vistas to the harbour and the city. Its aesthetic quality is largely attributed to the 1957 prize-winning design by Jrn Utzon. Utzon was then a relatively unknown Danish architect whose subsequent international fame has been in part a result of the success of the building. Its aesthetic quality was also enhanced by the high quality completion work by Hall, Todd & Littlemore, by the technical support given throughout by the internationally renowned engineering firm of Ove Arup & partners, and finally by M.R. Hornibrook, the contractor of stages two and three (Kerr, 2003, 32). Widely recognised as a masterpiece of twentieth century architecture, the Sydney Opera House combines an expressive freedom of form with the precise technology of the machine age. It has scientific and technical significance for the ways in which its construction continually pushed engineering and building technologies to the limit. Australian architectural historian Max Freeland stated: "This Sydney Opera House was a voyage of architectural and engineering discovery in which new oceans were charted, new frontiers of knowledge and technology were conquered and the resources of science and technology were employed to solve design, erection and quality of finish problems beyond the capacity of conventional method".

SHR Criteria d) [Social Significance]

The Sydney Opera House is of social significance as an internationally recognised symbol of Sydney, one of Australia's leading tourist attractions and a focal point for community events. It is also widely admired by Sydneysiders, and can be seen to contribute importantly to the sense of place in the Sydney CBD. As a world-class performing arts centre, the Sydney Opera House has enhanced the cultural vitality of the nation. It has also hosted many "everyday" cultural activities as well as providing free public access to its harbour-side Broadwalk. Of the 85,000 people estimated to visit each week in 2003, about a quarter came for performance-related reasons while the rest came to experience the building and its environment. In offering this remarkable accessibility to a broad public, Sydney Opera House can be seen to be fulfilling Cahill's hope that it would be "a monument to democratic nationhood".

SHR Criteria e) [Research Potential]

The Sydney Opera House is significant for its research potential as an internationally recognised icon of modern architecture. The development of the roof shell design was a difficult and lengthy process that extended skills and pushed technology to the limit. There is also research potential in investigating Utzon's design motivations and methods.

Furthermore there is research potential in investigating the role of the Sydney Opera House in the changing image of Sydney throughout the twentieth century, from being a colonial outpost to a world city. There is also scope for investigating the role of the Sydney Opera House in alerting an international audience to the existence of Sydney as a modern city, including the possibility that the Sydney Opera House may have helped in attracting migrants to Australia in the post World War II period. There is also potential for investigating the controversies surrounding the construction of the building as a reflection of "broader planning problems in the City" (Ashton, 1993, 83).

After the profound building effort required to build the Sydney Opera House, it is

unlikely that much archaeological potential is retained in relation to its historical associations with famous people and important themes in Australian history. A 1988 maritime archaeological survey found no remaining evidence of the shipwreck site of the Three Bees,1814, thought to have been near the north west corner of Bennelong Point.

SHR Criteria f)
[Rarity]

The Sydney Opera House has significance for its rarity as a twentieth century architectural masterpiece sited on a prominent peninsular in Sydney Harbour. It is an exceptional landscape (and seascape) monument because of its quality as a sculpture in the round, both day and night, and because of the appropriateness of its design to its setting and the picturesque quality of the setting. It is also unique in so far as it has become an internationally recognised symbol of Sydney and Australia, which is also widely admired by local citizens.

SHR Criteria g)
[Representitivenes]

The Sydney Opera House has significance for being an internationally recognised building representative of major performance arts centres. It is outstanding because of its innovative design appropriate both to its entertainment functions and to its harbour-side setting, and because of the esteem in which it is held in Australia and internationally. As an icon of modern architecture it combines an expressive, sculptural freedom of form with the precise technology of the machine age. Its success as a performing arts centre has been described as "spectacular" partly because of the building's "ability to attract great artists from all over the world" (Kerr, 2003, 26).

Integrity / Intactness:

The Sydney Opera House has great physical integrity and intactness. The building retains its original design appearance although the fabric has been restored in part with new compatible finishes. The building's interiors have been extensively remodelled although many significant spaces remain close to their original form.

Assessment Criteria

Items are assessed against the **State Heritage Register (SHR) Criteria** to determine the level of significance. Refer to the Listings below for the level of statutory protection.

Procedures / Exemptions

Section of Act	Description	Title	Comments	Action Date
21(1)(b)	Conservation Plan submitted for endorsement	Conservation Plan (Interim)	This CMP is an Interim CMP only - the HC resolution endorsing the document notes that exemptions from s57(1) will be developed once a finalised CMP has been endorsed. Exemptions can only be developed once the place is listed on the SHR - this has not occurred as at 8 April 2003. Revised CMP submitted for broad review April 2003.	Apr 4 1996
57(2)	Exemption to allow work	Standard Exemptions	I, the Minister for Planning, pursuant to section 57(2) of the Heritage Act 1977 on recommendation of the Heritage Council of New South Wales grant standard exemptions from section 57(1) of the Heritage Act, 1977 described in the schedule gazetted on 7 March 2003, Gaz No. 59 pages 4066-4070. To view the schedule click on the link below.	Mar 7 2003
21(1)(b)	Conservation Plan submitted for endorsement	HC endorsed 3rd ed. CMP by J.S.Kerr, 2003 with appendix of Utzon Design Principles, 2002.	5th November 2003 - Heritage Council endorsed the 'Sydney Opera House, A Revised Plan for the Conservation of the Sydney Opera House and Its Site (3rd ed.)', prepared by James Semple Kerr for the Sydney Opera House Trust, dated February 2003 with the addition as an appendix of Utzon Design Principles.	Nov 5 2003
57(2)	Exemption to allow work	Site specific exemptions- superceded, see below	Site specific exemptions gazetted alongside the SHR listing, December 2004 1. All development applications authorised or lodged before the gazettal date of the Sydney Opera House listing on the State	Dec 3 2003

Heritage Register. These are:
Proposed use of the northern broadwalk of the Opera House for events for a period of five years (DA444-2003)
The use of the southern forecourt of the Opera House for events (being low, medium and high impact events) for a potential maximum of 134 days per year (for a maximum 31 events per annum) over a three year period (DA445-10-2003)
2. The use of the roof/shells as a place from which to project broadcasts or fireworks, for limited periods and on infrequent occasions, where this has no adverse effect on fabric rated some, considerable or exceptional significance in the CMP.
3. The use of the roof/shells as a medium for the projection of colour or imagery where confined to exceptional, non-commercial occasions of brief duration, and only where this has no adverse effect on fabric rated some, considerable or exceptional significance in the CMP.
4. All maintenance that is consistent with the CMP.
5. All repainting in areas identified in the CMP as having some, considerable or exceptional significance, that employs the same colour scheme as an earlier scheme and maintains the general character.
6. All painting that is consistent with the CMP in areas identified in the CMP as having low significance or as being intrusive.
7. All repairs consistent with the CMP. Subject to Sydney Opera House assessment for heritage significance, the repair (such as re-fixing and patching) or the replacement of missing, damaged or deteriorated fabric that is beyond further maintenance, which matches the existing fabric in appearance, material and method of affixing, where this does not involve damage to or the removal of other fabric graded some, considerable or exceptional significance in the CMP
8. Subject to Sydney Opera House assessment for heritage significance, all improvements to the operational efficiency and all changes to the backstage infrastructure of performance venues (such as widening the loading door or updating flying systems) where these have no adverse effect on fabric rated some, considerable or exceptional significance in the CMP and do not obstruct views identified as significant in the CMP.
9. Subject to Sydney Opera House assessment for heritage significance, all improvements to update and maintain technology requirements for providing industry standard information technology, telecommunications infrastructure and technical infrastructure where these changes have no adverse effect on fabric rated some, considerable or exceptional significance in the CMP and do not obstruct views identified as significant in the CMP.
10. All internal and external design and fit-out of shops and restaurants on the lower concourse/ lower forecourt, including changes in the size and fabric of elements such as walls, doorways and windows, where these changes have no adverse effect on fabric rated some, considerable or exceptional significance in the CMP and do not obstruct views identified as significant in the CMP.
11. All changes to the size and shape of shop spaces on the lower concourse/ lower forecourt, including that of the tour office and visitor centre, where these have no adverse effect on fabric rated some, considerable or exceptional significance in the CMP and do not obstruct views identified as significant in the CMP.
12. While all efforts should be made to minimise visual impacts, all temporary security arrangements consistent with current and future risk/threat assessments provided by State and/or Commonwealth security agencies or by recognised security consultants commissioned by Sydney Opera House and the NSW Police.
13. All permanent security arrangements where these have no adverse effect on fabric rated of some, considerable or exceptional significance in the CMP and do not obstruct views identified as significant in the CMP. (Where a Development Application is required the Heritage Council will determine the

application as soon as possible, i.e. no more than 3 days after receipt of public submissions where these are required, 5 days if not required.)
14. Development consent for temporary or permanent security works is not required under s57(1) of the Heritage Act where;
a)Integrated development for which consent has been granted by the consent authority that is consistent with the general terms of proposed approval that have been provided to the consent authority by the Heritage Council, provided that all conditions included in the general terms of approval have been complied with,
b)Integrated development for which the consent has been modified by the consent authority pursuant to s96 of the Environmental Planning and Assessment Act 1979 in a manner that is consistent with any comments provided by the Heritage Council to the consent authority.
Note 1
Integrated development and consent authority have the same meaning as in the EP&A Act 1979. General terms of proposed approval means the general terms of any approval proposed to be granted by the approval body in relation to the development, as used in Division 5 of Part 4 of the EP&A Act 1979.
Note 2
Integrated development that is exempt under 14 b) above is not subject to the requirements in s65A of the Act in relation to modification of existing approvals.
15. All signage that conforms to a Signage Manual prepared by the Sydney Opera House Trust and endorsed by the Heritage Council.
16. All temporary signage and all permanent signage that conforms to current practices, is consistent with the CMP and does not obstruct views identified as significant in the CMP. This exemption to operate only until the implementation of a Signage Manual prepared by the Sydney Opera House Trust and endorsed by the Heritage Council within 12 months from the date of listing.
17. Minor changes and repairs to existing signage (such as replacing the poster in an illuminated box).
18. Removal of signage identified as intrusive or of low significance in the CMP.
19. All signage on and within lower concourse shop fronts, where this has no adverse effect on fabric rated some, considerable or exceptional significance in the CMP and does not obstruct views identified as significant in the CMP. This exemption to operate only until the implementation of Signage Manual prepared by the Sydney Opera House Trust and endorsed by the Heritage Council within 12 months from the date of listing.
20. All temporary signage associated with temporary structures which is generally consistent with the CMP and where this has no adverse effect on fabric rated some, considerable or exceptional significance in the CMP and does not obstruct views identified as significant in the CMP. This exemption to operate only until the implementation of a Signage Manual prepared by the Sydney Opera House Trust and endorsed by the Heritage Council within 12 months from the date of listing.
21. All semi-permanent plasma and flat screen displays for the purpose of promoting performances and sponsors, that are consistent with the CMP, have no adverse effect on fabric rated some, considerable or exceptional significance in the CMP and do not obstruct views identified as significant in the CMP. This exemption to operate only until the implementation of a Heritage Council-endorsed Signage Manual within 12 months from the date of listing.
22. Small long-stay structures to house on-line information, ticketing and banking services in interior and exterior spaces, that are consistent with the CMP, have no adverse effect on fabric rated some, considerable or exceptional significance in the CMP and do not obstruct views identified as significant in the CMP.

			23. The full-time operation of the Dolce Vita refreshment vending carts at six agreed locations around the site plus the short-term operation of additional vending carts as required for short periods for special events. This exemption is in force until 2012 when the vending cart contract concludes and this exemption can be reviewed. 24. Temporary structures (including stages, fencing, portable lavatories, food and beverage services and small marquees to display sponsorships) associated with special performance events to be erected on the forecourt, broadwalk, podium stairs and podium platform where they have no adverse effect on fabric rated some, considerable or exceptional significance in the CMP, minimise the impact on views identified as significant in the CMP and are consistent with the design terms of the CMP as far as possible. These structures may be erected for low, medium or high impact events with the following frequencies: a maximum of 12 low impact events per annum, each lasting a maximum of 2 days; a maximum of 9 medium impact events per annum, each lasting up to11 days for a total maximum of 50 days per annum; and a maximum of 5 high impact events per annum each lasting up to 7 days for a total maximum of 25 days per annum. Definitions Low Impact: minimal temporary infrastructure with limited visual impact Medium Impact: marked visual and/or site access impact during the event itself but the scale and nature of infrastructure minimises such impact outside the performance/event time. High Impact: requires infrastructure that has a marked visual and/or site access impact both during and around the event (the use of high fencing and/or temporary audience seating for more than 24 hours automatically makes an event High Impact). 25. A covered temporary structure on the western side of the northern forecourt of a maximum size of 400 square metres, inclusive of support infrastructure, to remain erected for a maximum of 21 days at a time and with a total maximum of 45 days per annum for infrequent special occasions, and to be consistent with the design terms of the CMP as far as possible. 26. A covered permanent temporary structure on the eastern side of the northern broadwalk, consistent with the design terms of the CMP, of a maximum size of 192 square metres, which can be expanded by another 192 square metres to 384 square metres in total. This expanded functions area may be erected on 12 days per month, generally in 3 blocks of 4 days for a maximum of 144 days per annum, where support infrastructure such as kitchens and toilets are situated inside the shells of the Opera House. 27. A covered temporary structure on the forecourt, which accommodates the design terms of the CMP as far as possible, of a maximum size of 2,500 square metres to be erected up to 6 times per annum, for a maximum of 7 days at a time or 28 days overall per annum, including installation and removal periods, where all associated support infrastructure such as kitchens, refrigeration and toilets are included under the main structure, and the impact on views identified as significant in the CMP is minimised, and public access is maximised.	
57(2)	Exemption to allow work	S57(2) 4 - Discovery of 'relics' during installation of a lift pit to service the Reception Hall	Archaeological relics were found during excavations for a lift pit in the basement of the Sydney Opera House. Relics include a sandstone wall and bones of mixed animal species (cow and sheep). Following a site visit the Heritage Office advised that recording of the relics would be required and an Exemption Application should be made under Section57(2) 4 (1) (b) for a minor impact on the archaeological resource. The relics uncovered during the work have been recorded and assessed by an archaeologist; the stone wall has been recorded and assessed by a conservation architect. The stone wall will be retained and will be isolated from the new works for the lift pit. Statements about these works have been supplied with the application. Full reports will be supplied in due course.	Nov 10 2004

57(2)	Exemption to allow work	Exemptions		Dec 8 2004
57(2)	Exemption to allow work	Site specific exemptions regazetted Dec 2004.		Dec 8 2004
57(2)	Exemption to allow work	Installation of 2 street lightpoles & replace lights/pole to existing lightpole on western broadwalk.		Nov 22 2005

Standard Exemptions for Works Requiring Heritage Council Approval

Listings

Heritage Listing	Listing Title	Listing Number	Gazette Date	Gazette Number	Gazette Page
Heritage Act - State Heritage Register		01685	03 Dec 03	190	10937
Local Environmental Plan	City of Sydney Heritage Inventory	1064	07 Apr 00		
National Trust of Australia register		6088	21 Nov 83		
Royal Australian Institute of Architects register		4702929	31 Aug 90		
Register of the National Estate		2353	21 Oct 80		
National Heritage List		105738	12 Jul 05		

References, Internet links & Images

Type	Author	Year	Title	Internet Links
Electronic	City of Sydney		Barani - Indigenous History of Sydney	**Click here**
Electronic	Great Buildings Online		"Sydney Opera House"	**Click here**
Electronic	Sydney Opera House	2003	Sydney Opera House web page	**Click here**
Management Plan	James Semple Kerr	2003	Sydney Opera House, An Plan for the Conservation of the Sydney Opera House and its Site	**Click here**
Map	NSW Heritage Office	2003	Draft Plan 1918 for Sydney Opera House curtilage	**Click here**
Written		2006	Sydney Opera House nomination by the government of Australia for inscription on the World Heritage List	
Written		1987	"Australians to 1788", Vol. 1 of Australians, A Historical Library	
Written	Australian Heritage Commission	1980	"Sydney Opera House" entry on the Register of the National Estate	
Written	Ben English	2003	Building on the harbour's legacy of	

			magnificence (DT 14/10/03)	
Written	Bob Carr	2002	Thoughtlines, Reflections of a Public Man	
Written	Daily Telegraph	2003	various articles celebrating 30 years of the Opera House (DT 17/10/03)	
Written	Denis Winston	1957	Sydney's Great Experiment	
Written	Department of Environment and Heritage	2005	Statement of Values for the Sydney Opera House on the National Heritage List	**Click here**
Written	DEST (Commonwealth Department of the Environment, Sports and Territories) and DUAP (NSW Department of Urban Affairs and Planning)	1996	Sydney Opera House in its Harbour Setting	
Written	Geesche Jacobsen & Joseph Kerr	2004	House beefs up security. SMH 9/1/04	
Written	J.M. Freeland quoted by B.P. Lennard & M. Lindfield	1983	"Sydney Opera House" entry	
Written	James Semple Kerr	1993	Sydney Opera House, an Interim Plan for the Conservation of the Sydney Opera House and Its Site, 3rd Ed.	
Written	Jørn Utzon	2002	Sydney Opera House Utzon Design Principles	**Click here**
Written	Karen Atkinson	1988	The Sydney Harbour Tunnel maritime archaeological survey	
Written	Lillian Saleh	2004	Lock up the house $9m security overhaul. DT 9/1/04	
Written	Matt Sun	2003	Harboured hopes as Opera House sets sail for listing (DT 23/9/03)	
Written	Paul Ashton	1993	The Accidental City, Planning Sydney Since 1788	
Written	Peter Fray & Christian Joergensen	2003	Regrets? Father of eighth wonder has none (SMH 20/10/03)	
Written	Philip Drew	2003	Building on past glory (Aust. 15/10/2003)	
Written	Richard Apperly, Robert Irving and Peter Reynolds	1989	Pictorial Guide to Identifying Australian Architecture	
Written	Robert Freestone	1995	"Women in the Australian Town Planning Movement 1900-1950" Planning Perspectives no. 10	
Written	Royal Australian Institute of Architects	2000	"Sydney Opera House" entry on their Register	
Written	Ruth Park	1973	The Companion Guide to Sydney	
Written	Simone Richards	2003	Opera House's new stage : heritage listing gets a lot closer [DT 4/12/03]	
Written	Sydney City Council	2000	"Sydney Opera House" heritage description for their LEP	
Written	Tony Stephens	2003	Artist who outshone the opera (the OH's John Coburn designed curtains) SMH 20/10/03	
Written	Troy Lennon & Paul Leigh	2003	Classmates series : Sydney Opera House (DT 16/10/2003)	

Note: Internet links may be to web pages, documents or images.

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Appendix F

Sydney Water Section 170 Register—Bennelong SWC No. 29

http://urbx.org.au/Bennelong%20Drain.pdf

Sydney Water S170 Heritage Register

Item Report

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Bennelong SWC No. 29

Item Details

Number:	4570854	
Current Name:	Bennelong SWC No. 29	
Other Name:	Fort Macquarie Sewer	
Primary Address	**Location:**	Bennelong Point Sydney NSW
	LGA:	Sydney City
	LGA Region:	Sydney
	DUAP Region:	Sydney South
	Parish:	
	County:	
Owner:	Sydney Water	
Current Use:	Stormwater Drain	
Former Use:	Combined Sewer	
Item Type:	Built	
Item Group:	Utilities - Drainage	
Item Category:	Storm Water Drain	
Curtilage/Boundary:	UBD Edition 31 Map 1 N7. The operational curtilage of the channel includes the channel beds, walls and coping.	
Statement of Significance:	The Bennelong Stormwater Channel is of high historical and technical significance as it was one of the five original combined sewers built in Sydney around 1857. The other four sewers were; Blackwattle Bay, Hay Street, Tank Stream and Woolloomooloo. These five sewers were responsible for greatly improving public health, hygiene and living standards for the city's residents. This was done by diverting stormwater and sewerage from the streets and discharging it out into the Harbour currents. The introduction of BOOS in 1889 diverted sewer flow to the ocean and eventually led to the drain being used predominantly for stormwater, hence further improving public health. Of the five combined sewers Bennelong is probably the most significant, as it is the most intact and was originally known as the "main sewer" because it serviced the CBD area. It was also the first oviform sewer to be built in Australia. Furthermore, the Margaret Street Sewer, which was once attached to the Bennelong system, contains the first sewer aqueduct to be built in Australia. This aqueduct runs along Hunter Street, which is part of the Bennelong catchment.	
Endorsed Significance:	Local	

Construction Information

Builder:	Colonial Government
Designer:	City Council
Year Started:	1856
Year Completed:	1857
Circa:	No

Sydney Water S170 Heritage Register

Item Report

Bennelong SWC No. 29

Physical Description: The system was a combined sewer/stormwater drain. It is oviform in shape with dimensions of 1.5m x 1.2m. The system was made of brick and some sections were tunnelled in sandstone along Tarpian Way (Circular Quay East). This Stormwater channel drains the Sydney Cove Slopes to as far south as Bathurst Street. and extending generally from Macquarie Street in the east to York Street in the west. In total an area of about 65 hectares. The most upper stream point is at the Obelisk ventshaft at Hyde Park. From here it works its way down along Pitt, Castlereagh, Elizabeth, Phillip and Macquarie Streets to the outlet at Bennelong Point. The channel contains the following branches; Macquarie Street, Phillip Street, Elizabeth Street, Castlereagh Street and Pitt Street.

Modifications Made: The Macquarie Street Branch was originally constructed by the old city council in 1856. In 191,6 54m was reconstructed during the construction of the City Railway. Modifications were also made to the channel in the early 1970's for the construction of the Opera House and during the late 1980's for the building of the Harbour Tunnel.

Historical Notes

In 1842 the City Council was formed to among other things establish a drainage system for Sydney. The Tank Stream, Sydney's first water supply, had by the 1840's become composed of foul water. This lead to the spread of disease and realisation that combined sewers needed to be constructed to take the place of polluted surface streams.

Around 1857 the construction of five combined sewers commenced in order to dispose of the city's stormwater and sewage into the Harbour. This project was initially undertaken by 3 city commissioners (appointed in 1854) and then completed by the city council. Bennelong sewer was the main sewer of these five, as it was built to service the Central Business District. The majority of the sewer was completed in 1856 by the old city council, the exception being the Pitt Street Branch which was completed in 1857.

It was probably the first of the five combined sewers to be completed. By the 1870's the Harbour was becoming extensively polluted from the discharge of stormwater and sewage, this lead to the formation in 1874 of the Sewerage and Health Board. The Board's principle task was to draw up a scheme to intercept the sewerage entering the Harbour.

One of the schemes formulated was the Bondi Ocean Outfall Sewer (BOOS) which would intercept most of the combined sewers discharge. In 1889 the BOOS was completed by the Government and this diverted the flow of sewage from all levels above the gravitatable limit to the ocean. Later around 1900 sewage pumping stations were introduced to divert sewage from low lying areas into the BOOS. Consequently, the volume of sewage in the combined sewer gradually diminished until the Bennelong channel was eventually used predominantly for stormwater.

The construction of the system was possible because of the wealth earned by the government from the Gold Rush of the mid nineteenth century.

Themes

National	State	Local	Local Description
Settlement	Utilities	(none)	
Phases of Life	Events	(none)	
Economy	Health	Water Supply	
Settlement	Land tenure	(none)	
Economy	Technology	(none)	
Economy	Environment - cultural landscape	(none)	

SHR Criteria

a) Historical: The initial channel was the main sewer of the first five original combined sewers built in Sydney around 1857. Additionally, a wall (Moriaty's Wall) was constructed around Farm Cove over a period of 30 years, from approximately 1857 to 1887. The function of the wall was to remove the mud flats, increase the area of the Royal Botanic Gardens, and to prevent any solids discharged from the Bennelong System from lying exposed.

c) Aesthetic: The stormwater channel has a relationship with cultural and historical structures. The sewer originally discharged adjacent to Fort Macquarie, one of the earlier Forts built in Australia. The stormwater channel now discharges adjacent to the Sydney Opera House, one of Australia's most famous landmarks.

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d) Social: The five combined sewers greatly improved the public health and living standard's of the community in the late 1800's by diverting stormwater and sewerage from the streets and discharging it into the Harbour currents.

e) Research: An excellent example of the engineering construction techniques of the mid and late 1800's and of the cities early infrastructure. The numerous extensions and modifications made throughout the years provide a good example of the advancement of drainage construction techniques. A unique aspect of this particular channel is a cast iron valve designed to prevent seawater from entering back up into the system. The technology used at the time was a first for Australia. It was manufactured by P.N. Russell, a well known industrialist and benefactor.

f) Rarity: One of the first five combined sewers built in Sydney around 1857. One of a number of oviform sewers to be built. It is the original oviform sewer of the five harbour sewerage systems in Sydney.

g) Representative: The Bennelong System was the first sewer tunnel constructed in Sydney, being oviform and underground. It was also probably the first oviform tunnel constructed.

Integrity Assessment: Considerably intact. It is probably the most intact of the first five combined sewers.

Heritage Listings

List Name: Heritage Act - s.170 NSW State agency heritage register
Item Reference Number: 005146
Date Listing Listed: 01-01-1900

Studies

Title: Sydney Water Heritage Study
Author: Graham Brooks and Associates Pty Ltd
Published: 1996

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Image Caption: Elizabeth St. Branch of Bennelong Sewer 3'6" x 2'4". Sewer exposed by excavation
Creation Date: 01-01-1963
Created By: SWC
Copyright Holder: SWC
Image Number: 630730-3

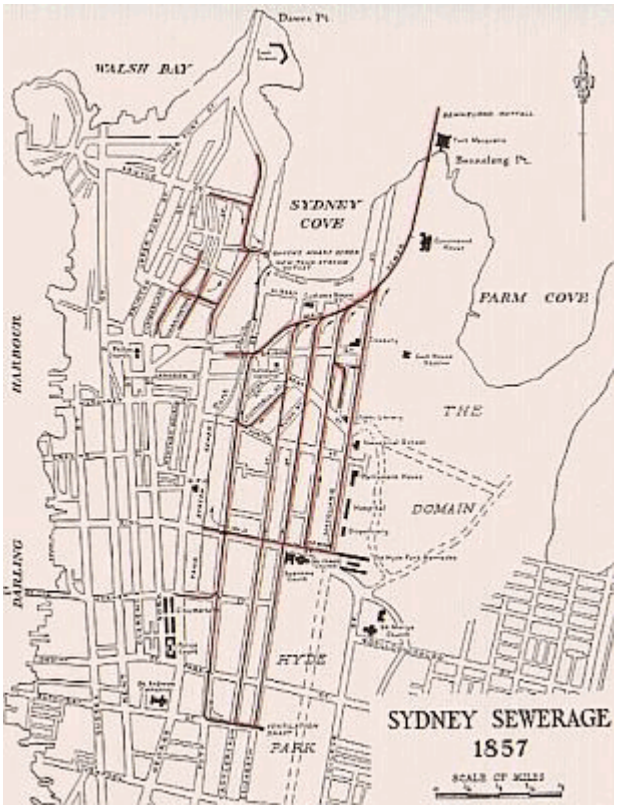

Image Caption: Location of Bennelong SWC
Creation Date: 01-06-1961
Created By: W.V Aird
Copyright Holder: W.V. Aird "The Water Supply, Sewerage and Drainage of Sydney, 1788 to 1960"

Administration

Data Entry Status: Completed

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Bennelong SWC No. 29

Entered: 03-06-1998
Updated: 12-02-2002