



Sydney Harbour Bridge

Conservation Management Plan 2007





Sydney Harbour Bridge Conservation Management Plan 2007

Prepared by Godden Mackay Logan Pty Ltd for the RTA

Godden Mackay Logan

Heritage Consultants

Contents

Page

1.0 Introduction.....	1
1.1 Background.....	1
1.2 Study Area	1
1.3 Existing and Proposed Listings	2
1.3.1 <i>Statutory Listings</i>	2
1.3.2 <i>Non-Statutory Listings</i>	3
1.4 Methodology and Terminology	3
1.5 Limitations.....	5
1.6 Author Identification	5
1.7 Acknowledgements	5
1.8 Endnotes.....	7
2.0 Historic Development	9
2.1 Pre-European Occupation	9
2.2 Dawes Point Battery.....	9
2.3 Planning the Sydney Harbour Bridge	11
2.3.1 <i>Early Proposals</i>	11
2.3.2 <i>John Job Crew Bradfield</i>	11
2.3.3 <i>The Design</i>	12
2.3.4 <i>Demolitions</i>	12
2.4 Building the Sydney Harbour Bridge.....	13
2.4.1 <i>Preparing for Construction</i>	13
2.4.2 <i>Construction of the Bridge</i>	15
2.4.3 <i>The Opening</i>	17
2.4.4 <i>The Workers</i>	18
2.5 Beyond 1932: The Working Life of the Bridge.....	20
2.5.1 <i>Traffic Management</i>	20
2.5.2 <i>Tenancies in the Bays</i>	22
2.5.3 <i>Illuminating the Bridge</i>	22
2.5.4 <i>Using the Towers and Pylons</i>	23
2.5.5 <i>Walking the Bridge</i>	23
2.5.6 <i>A Symbol of Sydney</i>	25
2.6 Summary	26
2.7 Endnotes.....	28
3.0 Sydney Harbour Bridge in Context	29
3.1 Physical Description	29
3.1.1 <i>Introduction</i>	29
3.1.2 <i>Setting</i>	29
3.1.3 <i>Individual Elements</i>	29
3.1.4 <i>Location and Public Access</i>	31
3.1.5 <i>Archaeology</i>	31
3.1.6 <i>Movable Heritage</i>	32
3.2 Contextual Analysis	33
3.2.1 <i>Introduction</i>	33
3.2.2 <i>Social Context</i>	34

3.3	Iconic Value	34
3.3.1	<i>Introduction</i>	34
3.3.2	<i>Events and Celebrations</i>	35
3.3.3	<i>Art and Culture</i>	35
3.4	Comparative Analysis.....	36
3.4.1	<i>Introduction</i>	36
3.4.2	<i>Understanding the Origins of the Bridge's Design</i>	36
3.4.3	<i>Hell Gate Bridge</i>	37
3.4.4	<i>Other Bridges</i>	38
3.4.5	<i>Towers and Pylons</i>	40
3.5	Endnotes.....	41
4.0	Analysis of Significance	43
4.1	Introduction	43
4.2	Identifying Heritage Values and Themes.....	43
4.2.1	<i>Heritage Values</i>	43
4.2.2	<i>Australian and State Historical Themes</i>	43
4.3	Assessment Criteria	44
4.3.1	<i>National Heritage Criteria</i>	44
4.3.2	<i>New South Wales State Heritage Register Criteria</i>	45
4.4	Evaluation	46
4.4.1	<i>Historic</i>	46
4.4.2	<i>Rarity</i>	48
4.4.3	<i>Scientific/Research</i>	48
4.4.4	<i>Representativeness</i>	49
4.4.5	<i>Aesthetic</i>	50
4.4.6	<i>Technical</i>	51
4.4.7	<i>Social</i>	52
4.4.8	<i>Association</i>	54
4.5	Statement of Significance.....	54
4.5.1	<i>National Heritage Values</i>	54
4.5.2	<i>State Heritage Values</i>	55
4.6	Grades of Significance	57
4.6.1	<i>Significance of Components</i>	57
4.6.2	<i>Schedule of Significance Forms and Fabric</i>	57
4.7	Endnotes.....	62
5.0	Curtilage Assessment.....	63
5.1	Introduction	63
5.2	Management Curtilage.....	63
5.3	Statutory Curtilage	64
5.4	2007 CMP Curtilage	65
5.5	2007 CMP Setting	65
6.0	Constraints and Opportunities	69
6.1	Introduction	69
6.2	Constraints and Opportunities Arising from Significance.....	69
6.2.1	<i>Generally</i>	69
6.2.2	<i>Conservation Principles</i>	70

6.3 Ownership.....	70
6.3.1 RTA Land.....	70
6.3.2 Sydney Harbour Foreshore Authority	71
6.3.3 Section 170 Obligations.....	72
6.4 Commercial Tenancies	72
6.5 Security, Safety and Access	73
6.5.1 Security Requirements	73
6.5.2 Access Requirements.....	74
6.5.3 Safety.....	74
6.6 Operational Requirements	75
6.6.1 Change of Use.....	76
6.6.2 Signs and Other Accretions.....	77
6.7 Physical Condition	77
6.7.1 Maintenance Requirements	77
6.7.2 Painting	78
6.7.3 Ageing Fabric.....	79
6.7.4 Asset Management Register and Record Keeping.....	79
6.8 Interpretation Opportunities.....	80
6.9 Statutory Requirements.....	81
6.9.1 Environment Protection and Biodiversity Conservation Act 1999	81
6.9.2 Heritage Act 1977 (NSW).....	81
6.9.3 Local Planning Schemes.....	84
6.9.4 Statutory Approvals Process.....	87
6.10 Endnotes.....	88
7.0 Conservation Policies	89
7.1 Introduction	89
7.1.1 Role of Conservation Policies	89
7.1.2 Approach.....	89
7.2 Guiding Principles.....	90
7.2.1 Introduction	90
7.2.2 Heritage Management Principles.....	90
7.3 General Policy Statement	91
7.4 Role of the Conservation Management Plan, including Adoption and Review of Policies.....	92
7.5 Conservation Methodology	94
7.5.1 Management Generally	94
7.5.2 Retention of Original Design and Setting.....	94
7.5.3 Maintenance and Repair Works.....	96
7.5.4 Operational Requirements and New Uses	98
7.5.5 Movable Heritage.....	101
7.5.6 Services, Security and Signage	102
7.5.7 Archaeology	103
7.6 Public Access, Engagement and Interpretation	103
7.6.1 Engagement with the Public.....	103
7.6.2 Interpretation.....	105
7.7 Relationship to Commonwealth, State and Local Authorities.....	106
7.8 Endnotes.....	107

8.0 Implementation.....	109
8.1 Introduction	109
9.0 Reference List.....	117
9.1 Legislation.....	117
9.2 Heritage Advice	117
9.3 Heritage Listings	117
9.4 Reports	118
9.5 Published Sources.....	118
9.6 Other Sources.....	119
10.0 Appendices.....	121
Appendix A—Heritage Register Entries	
<i>National Heritage List—Database Report: Sydney Harbour Bridge, Bradfield Hwy, Dawes Point–Milsons Point, NSW</i>	
<i>State Heritage Register—Database Report and curtilage map: Sydney Harbour Bridge, approaches and viaducts (road and rail)</i>	
<i>State Heritage Register—Database Report: Milsons Point Railway Station group</i>	
<i>State Heritage Register—Database Report: Dawes Point Battery remains</i>	
<i>RTA Heritage and Conservation Register—Database Report: Sydney Harbour Bridge, approaches and viaducts</i>	
<i>RTA Heritage and Conservation Register—Database Report: Sydney Harbour Bridge Memorabilia Collection</i>	
<i>RTA Heritage and Conservation Register—Database Report: Sydney Harbour Bridge Workshops Collection</i>	
<i>RTA Heritage and Conservation Register—Database Report: SHB South-East Pylon Museum Collection</i>	
<i>SHFA Heritage Register—Database Report: Dawes Point Battery remains</i>	
<i>Register of the National Estate—Database Report: Sydney Harbour Bridge, Bradfield Hwy, Sydney, NSW</i>	
Appendix B	
<i>Sydney Harbour Bridge Precinct Plans</i>	
Appendix C	
<i>Comparison of National Heritage and NSW Heritage Criteria</i>	
Appendix D	
<i>NSW Heritage Office, Heritage Information Series—Standard Exemptions for Works Requiring Heritage Council Approval, 2006</i>	
Appendix E	
<i>Sydney Harbour Bridge—Site Specific Exemptions for Works requiring Heritage Council of NSW Approval</i>	
Appendix F	
<i>EPBC Act Compliance Checklist</i>	
Appendix G	
<i>Sydney Harbour Bridge—The Social Side</i>	
Appendix H	
<i>The Burra Charter (The Australian ICOMOS Charter for Places of Cultural Significance)</i>	

1.0 Introduction

1.1 Background

This Conservation Management Plan ('CMP') for the Sydney Harbour Bridge ('the bridge') has been prepared to provide a framework for its ongoing care and management, including decisions about its conservation, use and development, and to provide a reference for future applications for works to the bridge.

The bridge is owned and managed by the Roads and Traffic Authority (RTA) on behalf of the NSW Government. Prior to 2007, the primary conservation management document for the bridge was the 1998 CMP¹, prepared by the Heritage Group, Department of Public Works and Services (and endorsed by the Heritage Council of NSW for five years). In 2006 the RTA commissioned an updated plan because the 1998 plan has exceeded its prescribed five year time frame, and also because since 1998 there have been changes to the regime of heritage listings and statutory planning controls that apply to the bridge. The bridge is listed on the NSW State Heritage Register (SHR) and the National Heritage List (NHL) and is therefore subject to the provisions of the *Heritage Act 1977* (NSW) and the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) ('EPBC Act'). Revised conservation policies that reflect the changing uses of the bridge are provided to facilitate the conservation of its cultural heritage values consistent with its maintenance and repair as a publicly-owned asset, and its ongoing use as the main vehicular, rail and pedestrian crossing for Sydney Harbour.

The first part of this CMP (Sections 1.0–4.0) includes a history of the bridge, an analysis of its current physical layout, context and fabric, and an assessment of its heritage significance, including comparison with comparable bridges.

The second part (Sections 5.0–8.0) examines the curtilage, constraints and opportunities applicable to the bridge, formulates conservation policies to guide its conservation, use and management, and sets out strategies for the implementation of these policies.

The report also includes analysis and policies developed as part of associated studies, including:

- Sydney Harbour Bridge—Assessment of National Heritage Values, Clive Lucas, Stapleton and Partners Pty Ltd, prepared for NSW Roads and Traffic Authority, February 2006.
- Sydney Harbour Bridge Interpretation Plan, Godden Mackay Logan Pty Ltd, prepared for NSW Roads and Traffic Authority, 2007.
- Sydney Harbour Bridge Movable Heritage Conservation Strategy, International Conservation Services, prepared for NSW Roads and Traffic Authority, 2007².

1.2 Study Area

The Sydney Harbour Bridge is part of the Bradfield Highway and links the southern and northern shores of Sydney Harbour, spanning from Dawes Point in the south to Milsons Point in the north (see Figure 1.1).

The bridge incorporates not only the arch, pylons and approach spans but also two railway lines, a cycleway, footpaths and roads between the northern and southern approaches. This assessment encompasses the setting and the views to and from the bridge within the Sydney Harbour, the fabric of

the bridge and other associated elements including the surrounding parklands, subsurface remains and the movable heritage associated with the bridge, its construction and its continuing operation.

Unless otherwise indicated, the use of the term 'SHB' or 'bridge' includes the whole of the study area.

1.3 Existing and Proposed Listings

1.3.1 Statutory Listings

Further information on the listings discussed below is included at Appendix A.

National Heritage List

The Sydney Harbour Bridge was placed on the National Heritage List (NHL) on 19 March 2007, on the 75th anniversary of the opening of the bridge. The legislative instrument that governs the management of places listed on the NHL is the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act).

State Heritage Register (SHR)

The *Heritage Act 1977* (NSW) affords protection for state significant items through the State Heritage Register (SHR). The 'Sydney Harbour Bridge, approaches and viaducts (road and rail)' was placed on the SHR in June 1999. The 'Milsons Point Railway Station group', which includes the area bounded by the bridge approach structure and reserves surrounding it, was also listed on the SHR in April 1999.

RTA Heritage and Conservation Register

In accordance with Section 170 of the Heritage Act, the RTA has established a register to record all heritage items in its ownership or under its control. The following items are listed on the RTA Heritage and Conservation Register:

- Sydney Harbour Bridge, approaches and viaducts;
- Sydney Harbour Bridge Workshops Collection;
- Sydney Harbour Bridge Memorabilia Collection; and
- SHB Southeast Pylon Museum Collection.

State Rail Authority Heritage Register

In accordance with Section 170 of the Heritage Act, the State Rail Authority (SRA) established a register to record all heritage items in its ownership or under its control. The following items are listed on the SRA Section 170 Register (the Heritage and Conservation Register):

- Sydney Harbour Bridge (Rail Property Only); and
- Sydney Harbour Bridge Approaches Concrete Underbridge (Group Entry).

Sydney Local Environmental Plan (LEP) 2005

The southern approach spans and curtilage are identified in Schedule 8 Part 1 of the *Sydney Local Environmental Plan (LEP) 2005*, which lists the heritage items within the LEP area. The site is also located within the Millers Point Conservation Area identified as a Special Area on the plans attached to the LEP.

North Sydney Local Environmental Plan (LEP) 2001

The Sydney Harbour Bridge and approach viaducts (NSHS No. 0030) and the north pylons (NSHS No. 0076) are listed on Schedule 3 Part 6 of the *North Sydney Local Environmental Plan (LEP) 2001*.

Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (NSW)

The 'Sydney Harbour Bridge, approaches and viaducts (road and rail)' is listed as a heritage item on the *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (NSW)* (REP) (Item 67).

1.3.2 Non-Statutory Listings

The bridge is included in the Register of the National Estate, which is maintained by the Australian Heritage Council under the *Australian Heritage Council Act 2003* (Cwlth). The bridge is also included in the Register of the National Trust of Australia (NSW).

In 1988, the bridge was declared an International Historic Civil Engineering Landmark during an official visit by a delegation from the American Society of Civil Engineers (ASCE). The ASCE plaque is fixed to the eastern wall of the southeast pylon adjacent to the entrance to the Pylon Lookout. At the same time, the bridge was declared a National Engineering Landmark under the Australian Historic Engineering Plaquing Program managed by Engineering Heritage Australia. This plaque is fixed to the parapet wall opposite the eastern doorway that leads to the Pylon Lookout.

1.4 Methodology and Terminology

The 2007 CMP has been prepared having regard to the methodology outlined in the *NSW Heritage Manual* guidelines for the preparation of Conservation Management Plans (NSW Department of Urban Affairs and Planning and the Heritage Council of NSW, November 1996, as amended July 2002). It also follows the approach set out in *The Conservation Plan*, by James Semple Kerr (National Trust of Australia (NSW), fifth edition, 2000) and the guidelines of *The Burra Charter: The Australia ICOMOS Charter for the Places of Cultural Significance 1999*.

Conservation terminology used in this report is consistent with the *NSW Heritage Manual*, prepared by the NSW Heritage Office, and the Burra Charter.

Technical terminology used in this report adopts the same system used in the previous 1988 CMP as follows (see also Figure 1.2):

Table 1.1 Technical Terminology used in this report.

Item	Description
Abutment tower	Granite-faced concrete structure between ground level and deck level (supports the pylons).
Approach spans	Series of steel trusses on piers supporting the deck from the abutment towers to the approaches.
Approaches	Rendered concrete viaducts at the northern and southern extremities of the bridge.
Arch chord	Large steel box section forming the upper and lower members of the arch trusses.
Arch truss	A structural frame with members in the vertical plane, supporting the main loads on the bridge.
Art Deco	A style originating in the 1920s in Paris, characterised by geometrical decoration and the use of eye-catching materials.
Balustrade	A row of balusters with a rail on top, but used in context of the bridge for any railing of handrail height beside a stair or walkway.
Battered	Inclined to the vertical (of walls).

Item	Description
Bearing	Main bearing: steel pivot supporting and allowing movement at base of arch.
Blockhouse	Small concrete enclosures with square windows on top of each pylon.
Cantilever	A projecting bracket. A cantilever bridge spans by balancing two arms either side of adjacent piers.
Catwalk	A narrow passageway or platform for maintenance access.
Cross girder	Main trusses spanning in an east–west direction between the hangers and supporting the deck.
Dead load	The weight of the structure itself.
Deck	Platform slung under the arch supporting the road and railway.
Diagonal	Inclined member of an arch truss.
Dressed stone	Stone worked to a smooth finish.
End post	One of the four vertical posts supporting the ends of the arch trusses (known also as ‘king post’ but End Post is the correct term).
Expanded metal	A mesh manufactured by cutting a pattern of slits in metal and opening up the holes.
Gantry	Moveable framework or platform, used for bridge maintenance Hanger Vertical member, suspending the deck structure from it.
In situ	In its original position.
Joist	Steel member supporting the arch trusses.
Joist laterals	Floor laterals: members of deck structure spanning in an east–west direction. Arch laterals: Members of the arch connecting the eastern and western.
Live load	Loads imposed upon the structure (usually moving loads).
Mezzanine	A floor inserted inside a building volume.
Panel	The portion of the arch truss between one pair of vertical members (the arch has 28 panels).
Parapet	A low wall at the edge of a roof or change in level.
Pilaster	A shallow pier or rectangular column projecting only slightly from a wall.
Portal frame	A frame constructed with rigid joints and hence no need for diagonal bracing.
Pylon	Granite faced concrete structure built on top of abutments tower, two at each end.
Retaining wall	A wall designed to support and retain a weight of earth filling behind it.
Rendered	Plastered externally with cement/sand render.
Rock faced	Masonry appearing rough-hewn and straight from the quarry.
Rusticated pilaster	A pilaster whose shaft is interrupted by plain or textured blocks.
Spandrel	The triangular space between the arch, the horizontal drawn from its apex and the vertical of its springing. The Sydney Harbour Bridge is termed a spandrel-braced arch because the bottom chord takes most of the load and the truss (or spandrel) above braces it.
Stringer	Steel beam spanning between cross girders under deck.
Transom	A large sleeper used to support railway tracks without the need for ballast.
Viaduct	Elevated structure consisting of a series of spans carrying the elevated roadway or railway.

1.5 Limitations

The study area for the 2007 CMP is limited to that established as the curtilage for the purpose of the application of the conservation policies of the plan, that is land and elevated bridge structure owned by the NSW State Government.

1.6 Author Identification

This report has been prepared by:

- Peter Romey, Senior Associate;
- Amy Nhan, Heritage Consultant;
- Karina Williams, Heritage Consultant; and
- Mark Dunn, Heritage Consultant.

Professor Richard Mackay, AM, Director of Godden Mackay Logan, provided specialist input and reviewed and edited the report.

1.7 Acknowledgements

Godden Mackay Logan acknowledge the assistance of the following people in the preparation of this report.

- Maria Whipp, Senior Environmental Officer, Planning and Heritage, Environment Branch, Roads and Traffic Authority (NSW);
- Peter Mann, Asset Manager, Sydney Harbour Bridge, Roads and Traffic Authority (NSW);
- Ross Walker, Manager Commercial Development, Real Estate Branch, Roads and Traffic Authority (NSW);
- Rod Carter, General Manager, Special Projects, Roads and Traffic Authority (NSW); and
- All those who contributed to the CMP during the Stakeholder workshop held on 21 September 2006.



Figure 1.1 Sydney Harbour Bridge—location plan.

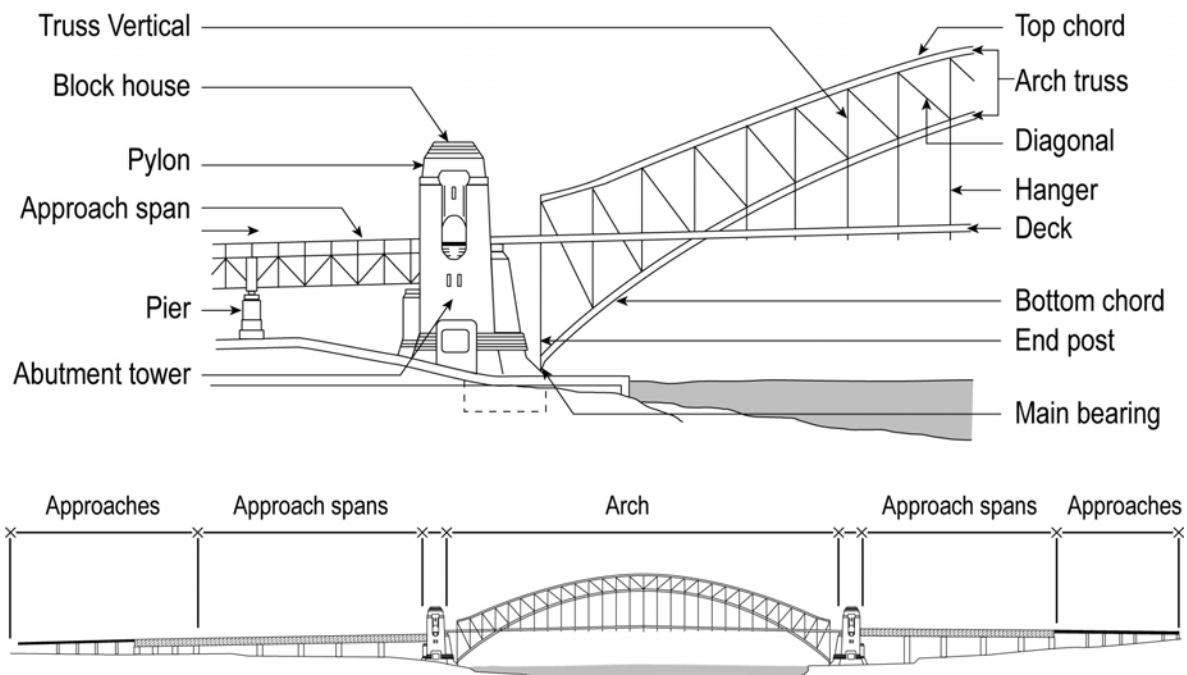


Figure 1.2 Illustration of technical terminology used in this CMP.

1.8 Endnotes

- ¹ Heritage Group, Department of Public Works and Services, Sydney Harbour Bridge Conservation Management Plan, prepared for NSW Roads and Traffic Authority, February 1998.
- ² Godden Mackay Logan provided heritage advice for the preparation of this report.

2.0 Historic Development

2.1 Pre-European Occupation

Before the arrival of Europeans in 1788, both sides of Sydney Harbour, where the Sydney Harbour Bridge would later be built, were the home of the Eora people. Their territory spread from the Georges River and Botany Bay, east to the coast and north to Pittwater and the mouth of the Hawkesbury River. At the arrival of the First Fleet in 1788, there were at least 1500 people living along the coast and harbour (with up to 3000 to 5000 by some estimates), distributed in family and clan groups. The name Eora was derived from *Ee*, meaning yes, and *ora*, meaning here or this place.¹ The word referred to the people of the Sydney region as a whole.

Within the Eora were separate language groups or clans, which were identified with specific areas around the harbour and along the coast. On the south side of the harbour, occupying the area of the city, The Rocks and down to the north shore of Botany Bay were the Gadigal or Cadigal people, and on the north shore, hugging the coast, including Milsons Point, were the Cameragal.

The earliest recorded Aboriginal site in the Sydney region has been dated to approximately 15,000 years before the present, although it is likely that people were living in the Sydney region earlier than this, based on evidence from other sites in southeastern Australia.²

The members of both groups were coastal people, reliant on the harbour for food, fishing from canoes and taking shellfish and other edibles from the shore line.

It was the members of both the Gadigal and Cameragal people that bore the brunt of the arrival of the First Fleet, with their lifestyle and communities being disrupted and dislocated almost immediately from January 1788. An outbreak of smallpox (or similar contagion) in the Aboriginal community in early 1789 had a serious impact on the Aboriginal population in the immediate zone of European settlement, and while numbers recovered over the next few years, the population of Aboriginal people in the Sydney area was in general decline.³ By the 1820s the number of Aboriginal people living a traditional lifestyle within the vicinity of the growing town of Sydney had been reduced to a remnant of the former numbers.

2.2 Dawes Point Battery

With the arrival of the First Fleet in 1788, work commenced on the establishment of a settlement on the southern shore of Sydney Cove. Trees were cleared and the ground leveled by convict labour, for the erection of the Governor's temporary house, the marquee of the officers, tents for the soldiers and shelters for the convicts themselves. In general, the fresh water stream running to the Cove, later called the Tank Stream, divided the new settlement between the official buildings of the Governor and his officials, and the living areas of the convicts, the barracks of their military guards and the hospital on the western side of the stream and rocky western shore of the Cove.

After the Governor's house, one of the first structures erected was a temporary shelter for the observatory of Lieutenant William Dawes. The timber shelter was built on the western headland of the Cove, known by Aborigines as Tarra, but renamed by Europeans Point Maskelyne after the then Astronomer Royal, and then re-titled once more as Dawes Point. This initial observatory was a two-storey timber building with rotating roof on the upper level and situated on a cleared rock platform, with stone cut to provide stability for the instruments.⁴

In 1789 work began on a replacement building for the observatory, built of stone quarried on the site. Dawes continued to take observations, among other duties, from the observatory, including weather and meteorological data, until he returned to England in November 1791.

By this time Dawes Point had already begun to be used by the military. In 1789 a powder magazine was under construction, and was joined by a signal station in 1790. Following Dawes' departure, it is unclear what became of the observatory buildings, but the site was designated for use by the military. By this time a small battery had been established for defence of the settlement at Dawes Point, with five cannon taken from the HMS Sirius.⁵

Between 1791 and 1799 little new development took place on Dawes Point. With no artillery officer in the colony following the return to England of the marines in 1791 (who had arrived with the First Fleet), the battery fell into disuse. In 1798 Governor Hunter ordered a review of the colony defences and an upgrade of the redoubts in Sydney. Between 1799 and 1817, work to upgrade the battery was undertaken by successive governors. It remained, however, a small complex used largely for ceremonial occasions.⁶



Figure 2.1 Dawes Point Battery, demolished to make way for the SHB. (Source: City of Sydney Council Archives CRS 51/363)



Figure 2.2 The guns of Dawes Point Battery. (Source: Mitchell Library GPO1-14011)

In 1819, Governor Macquarie assigned convict Colonial Architect Francis Greenway the task of upgrading Dawes Point. From 1820 up until the 1870s, Dawes Point battery was largely rebuilt and upgraded, with expansions to fit new guns, the addition of barracks and guard houses, as well as a lower battery down the slope from the main fort (see Figures 2.1 and 2.2).

Dawes Point Battery was one of a chain of inner harbour defences built during the nineteenth century to counter perceived threats from Britain's European rivals, most notably the French and Russians. By the 1880s, however, with larger forts and batteries built at Middle Head, North Head and other outer harbour locales, Dawes Point was used more for accommodation of administrative offices and residences than for defence. From 1909 until 1924, the site was used by the Water Police, with accommodation in the former Officers' Quarters on the northwest side of the Point. Part of the building was also in use by the Repatriation Department as a trades school between 1918 and 1924 to retrain returned servicemen from World War I.

Between 1924 and 1932, with work beginning on the construction of the Sydney Harbour Bridge (which would

ultimately pass directly over the top of the site of the battery), the offices of Dorman and Long were located in the Trades School buildings and former Officers' Quarters. Following the bridge construction, the remaining buildings on site were demolished and the area landscaped as a park. In 1995 (and again in 1999 and 2000), the site was excavated in an archaeological dig undertaken by the Sydney Cove Authority, revealing the foundations of a number of the buildings, as well as the gun positions, powder magazine and associated features. These have since been incorporated into a redesign of the park to commemorate the site's association with Australia's colonial history.

2.3 Planning the Sydney Harbour Bridge

2.3.1 Early Proposals

Throughout the nineteenth century, proposals had been mooted for the construction of a bridge to link the northern and southern shores of Sydney Harbour. As early as 1815, Francis Greenway had suggested to Governor Macquarie the construction of a bridge across the harbour, and while this had never formed into anything beyond an idea, it was the first plan of many to come.

The first known plan of any proposal dates from 1857 when the engineer Peter Henderson proposed the construction of a vast cast iron bridge, spanning from Dawes Point to Milsons Point. The bridge was to be supported by two pylons, one on either side of the harbour. Henderson's proposal was followed in 1878 by a proposal for a floating bridge by Commissioner WC Bennett, and in 1879 by a high level bridge designed by TS Parrott. Parrott's plan included a series of piers on either side of the harbour and two larger piers positioned in the harbour supporting the roadway above. A plan by JE Garbett was actually accepted by the government in 1881 but never implemented. John Fowler, who had been involved in the building of the Firth of Forth Bridge in Scotland, proposed a suspension bridge to cross the harbour. A tunnel was also suggested around the same period.⁷

Enough public interest had been raised by 1890 for a Royal Commission. The hearing examined eight schemes, including a tunnel, and set out a list of criteria for any future proposed harbour crossing. These included a requirement for a high level bridge with one clear span over the waterway (see Figure 2.29). Nothing further came of the ideas until 1900, when a design competition was called by the Minister for Works, EW O'Sullivan. At this point, JJC Bradfield became involved for the first time.

2.3.2 John Job Crew Bradfield

By the time John Job Crew Bradfield began working on the Sydney Harbour Bridge, he was already an accomplished and recognised civil engineer. Born in Queensland in 1867, Bradfield gained a medal for chemistry at senior school matriculation and the University Medal for Engineering at Sydney University in 1889. His first work experience was as a draftsman under the chief engineer, railways in Brisbane. In 1891 he was retrenched and moved to Sydney to begin work with the Roads and Bridges Branch of the NSW Department of Public Works as a temporary draftsman. Bradfield became an associate of the Institution of Civil Engineers in London and graduated first class honours with his second University Medal in 1896. He later received the first Doctor of Science in Engineering from Sydney University for his thesis on the design and construction of the Sydney Harbour Bridge and the city railway system in 1924. During his time at Sydney University, he also founded the Sydney University Engineering Society in 1895, serving as its president in 1902–03 and again in 1919–20.⁸

Between 1891 and 1911, Bradfield was involved in a wide range of engineering projects, including work on the Cataract Dam near Sydney and Burrinjuck Dam in the Murrumbidgee Irrigation Area. Although initially slow to advance in promotion in the NSW Public Works Department, by 1911 Bradfield was Principal Designing Engineer and was checking the designs being submitted to a succession of inquiries

regarding the harbour crossing. He himself was asked to design a bridge that would not impede navigation, and submitted three—a cantilever, a suspension and a cantilever arch combination—recommending the cantilever. His arch design was yet to be formulated.⁹ In 1912 Bradfield was appointed as Chief Engineer, Sydney Harbour Bridge, City Transit and Metropolitan Railway Construction. This began a formal 20 year association with the development of a harbour crossing and the associated city rail network that linked to it.

Bradfield was involved with the Sydney Harbour Bridge project from close to its inception until the opening day in 1932. In 1933 Bradfield retired from the public service. In the following year (1934), he was appointed as consulting engineer for the design, fabrication and construction of a bridge across the Brisbane River, which was opened in 1940 as the Story Bridge. He was also appointed as technical advisor to the construction of the Hornibrook Highway, also in Brisbane, and helped in the design of the University of Queensland's St Lucia site.

Outside his project work, Bradfield was involved in a wide range of engineering societies and associated groups. He was a founder of the Institution of Engineers, Australia in 1919, and represented it on the Australian Commonwealth Standards Association in 1927. He was a member of the Australian National Research Council and maintained continual close links with the University of Sydney. Bradfield was also recognised both nationally and internationally for his contribution to civil engineering, being awarded the Sir Peter Nicol Russell Medal by the Institute of Engineers Australia in 1932, the WC Kernot Memorial Medal by the University of Melbourne in 1933, and the Telford Gold Medal of the Institution of Civil Engineers, London 1934.¹⁰

2.3.3 The Design

In November 1922 the NSW State Parliament passed the Enabling Act, clearing the way for the construction of a harbour crossing from Dawes Point to Milsons Point. Bradfield had been sent overseas prior to this, in March 1922, to study bridge design and had seen the newly completed Hell Gate Arch in New York, which rekindled an earlier plan of a single steel arch. Bradfield's idea was further reinforced when preliminary feasibilities showed an arch could save up to 10% on the cost of a cantilever bridge.¹¹ Tenders were called in 1923 with specification set out by Bradfield. These included that designs were to be either cantilever or arch bridges, carry six lanes of traffic, four railway tracks (two on each side) and pedestrian footways (one on each side). The bridge was to link with the proposed city railway system and materials were to be sourced from New South Wales wherever possible.¹²

Twenty designs were received from six different companies, including a number of suspension bridges, outside the specifications. The arch design of English firm Dorman Long and Co Ltd was recommended by Bradfield and accepted by the government in March 1924 (see Figure 2.3).

2.3.4 Demolitions

To make way for the bridge and its approaches, large swaths of residential Sydney on the north and south side of the harbour were resumed and demolished. On the north side, 438 houses were resumed during the 1920s for the building of the bridge. At the time, a Sydney newspaper reported that each house had an average of 4.638 residents, making a total of 2032 people losing their homes.¹³ As well as the houses, the shops, pubs and businesses in the neighbourhoods were also removed. While owners of houses and businesses could get some compensation, most of the houses were in fact occupied by tenants, who were simply evicted. The demolition on the north shore was documented in a large part by the Reverend Frank Cash, rector of Christ Church at Lavender Bay. When Reverend Cash was alerted to demolitions by residents, he would grab his camera, make his way to the street in question and

photograph the demolition work. Reverend Cash used the demolitions and evictions in his sermons¹⁴ (see Figure 2.4).

On the southern side, the story was the same. Here, the approaches came through The Rocks. Sydney's oldest suburb, The Rocks, was in the 1920s only just recovering from demolitions, evictions and disruptions caused by the plague which had been detected in the suburb in 1901. Most of The Rocks area had been resumed by the Government after the plague and so any new resumptions for the bridge were made easier for a lack of private owners. As with the northern side, hundreds of homes and businesses in The Rocks were demolished and many of the residents moved away from the area. Princes Street, which ran along the ridge between The Rocks and Millers Point, and had once been one of Sydney's most fashionable addresses, was lost forever under the southern approaches (see Figure 2.5). The approaches to the bridge forever divided Millers Point and The Rocks.

2.4 Building the Sydney Harbour Bridge

2.4.1 Preparing for Construction

The first sod of the construction of the Sydney Harbour Bridge was turned at the site of the future North Sydney Railway Station on 28 July 1923 by the Honourable RT Ball, Secretary for Public Works and Minister for Railways and State Industrial Enterprises. The same day, a Land Tax, previously promised, was levied to assist in payment of the bridge project. Both events took place before a final tender had been chosen; however, they were seen as confidence boosters and assurances that a tender would soon be accepted.

Work on the approach ways from the north and south carried through 1923 and 1924, prior to the signing of the final contract for the bridge proper. The approaches were designed and built by the Sydney Harbour Bridge Branch of the Public Works Department and the Metropolitan Railway Construction Branch of the NSW Government Railways. Construction began at North Sydney with the excavation of tunnels for the railway, followed by bridges over Euroka, Bank, Fitzroy, Burton, Lavender and Arthur Streets (completed between 1924 and 1929), and retaining walls of stepped section concrete being built at Broughton and Alfred Streets, the Bradfield and Pacific Highways.¹⁵ Fill for the construction of the roadway and approaches were provided on the north side by the excavated material from the North Sydney railway site and tunneling operations.

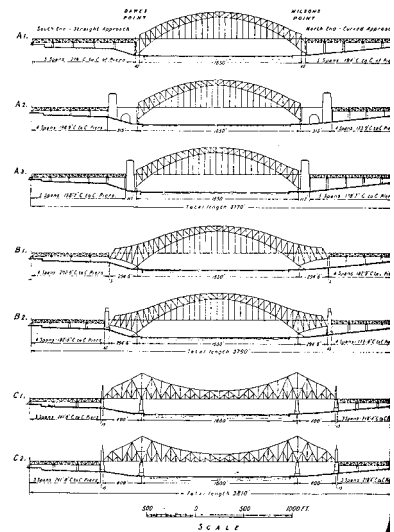


Figure 2.3 The seven designs submitted by Dorman Long. The third from the top was chosen. (Source: Lalor)



Figure 2.4 Buildings in Alfred Street North Sydney being demolished. (Source: Stanton Library LH REF PF 1059/5)



Figure 2.5 Princes Street prior to demolition. (Source: State Records 12685/87240000021)

On the southern approaches, work began from Wynyard Station in 1928, with open excavation and flat top construction (for roadways), although demolitions in The Rocks had begun some years previous to this. The only span within the southern approach was over Argyle Street, where an arch bridge crosses the Argyle Cut. Ornamental retaining walls and stairs for pedestrians were constructed in Cumberland Street, with a foot tunnel to Upper Fort Street also provided.

The tender process had been extended on the request of a number of companies involved and due to the sudden death of the Managing Director of Cleveland Bridge and Engineering Company, the leading tenderer. Dorman Long and Co Ltd, an English Engineering firm, took over the Cleveland Bridge tender at the request of the Cleveland Bridge and Engineering Company engineer Mr Ralph Freeman (Freeman was appointed consulting engineer to Dorman Long for the Sydney Harbour Bridge project).¹⁶ Tenders eventually closed in January 1924 and on 24 March 1924, Dorman Long signed the contract for the construction of the Sydney Harbour Bridge.

With the contract signed, work on the bridge itself began in earnest. Dorman Long brought 20 men from its London office to Sydney, including their Director of Construction (Lawrence Ennis) and their principal engineers, and established their site office in the former barracks at Dawes Point Battery. The fabrication workshops were constructed on the north side of the harbour on railway land at Milsons Point (now the site of Luna Park—see Figure 2.6) and the NSW Government quarry at Moruya, which had been closed, was re-opened for the extraction of granite to be used in the piers, abutment towers and pylons. Dorman Long placed orders with the State Dockyard in Newcastle for three iron steamers to transport granite from Moruya in July, and in the same month, a new train, tram and ferry terminal was opened at Milsons Point to replace the old terminals which were to be demolished.

Work began at Moruya on 1 December 1924 with the construction of a wharf, power house with water supply, stone dressing sheds with overhead cranes and a stone crushing and screening plant. In addition, standard gauge railway tracks were laid for two locomotive steam cranes and narrow gauge track for two petrol driven engines and tip trucks.¹⁷

In January 1925 Dorman Long began excavating at Dawes Point and built a ramp from George Street North to haul materials up from the wharf below. The foundation stone for the Southern Abutment Tower was laid in March 1925 and the first goods train of materials for the bridge arrived at North Sydney. By the end of March, the first shipment of steel had arrived from England and work to erect the fabrication workshops got underway. Two wharves were constructed in Lavender Bay where the steel was unloaded into a stockyard which contained angle benders, saws and croppers, before it was moved, via crane and light rail, first to the light workshops, where it was straightened or cut to length as required. Above the workshops was the template loft, where the templates for the bridge pieces were created. The steel was taken from the light workshops to the marking-out bay, and then to the drills for the holes needed for rivets and screws to be drilled through. From here, the pieces were transported to the heavy workshop where the steel was painted and then the pieces assembled into sections. The sections, most measuring up to 50 metres in length and weighing 100 tonnes, were then transported via overhead gantry crane to pontoons for transport out to the bridge site.¹⁸

The workshops were filled with specifically designed machines, each playing an important part in the overall production process. The light workshop had a cutting and edging machine over 20 metres long; the guillotine cutters in the stockyard, cutting steel up to 54mm thick, could reputedly be heard in Manly on a calm day, whilst amongst these, gangs of riveters and other construction workers went about the business of working the machines and putting the pieces together. Conditions were hot and incredibly noisy throughout the Lavender Bay workshops.

2.4.2 Construction of the Bridge

As the approaches advanced from north and south towards the harbour, five tonne steam locomotive cranes advanced with them, erecting temporary timber trestling to support the steel work. Behind each small crane was a larger electric crane of 25 tonnes, which lifted the steel into place. The cranes moved forward on the approaches as they were constructed, stopping as they reached the site for each pier, which they also helped erect.

While the approaches were being constructed, the abutment towers were also being built. Constructed on reinforced concrete, the abutment towers include the four main bearings at the base of the lower cord of the bridge: two at Milsons Point and two at Dawes Point. The bearings take the thrust of the arch, transmitting the pressure directly to the ground where the load is spread through an area of 68 x 49 metres, excavated to a depth of 19.2 metres to solid rock and then filled with hexagonal shaped concrete blocks to the base of the abutment towers¹⁹ (see Figures 2.7–2.9).

The towers, like the piers, have their concrete structure faced with granite from Moruya. The concrete was mixed by a gang of six men only for each side of the harbour and poured by another gang of six men for each tower. Each gang placed the reinforcing, poured the concrete and packed it by hand with rods. In total each gang poured and packed a total of 95,000 cubic metres.²⁰ Once the towers reached 47 metres from ground level, reinforced concrete floors were created to build and launch the creeper cranes which would be used to build the bridge's arch (see Figures 2.10 and 2.11)

Like the cranes for the approaches, the two creeper cranes erected their own track, the arch itself, in front of themselves to advance. One creeper crane worked from each side of the harbour and they were critical elements for the bridge construction. The cranes were supplied by Wellman Smith and Owen Engineering Corporation of Great Britain, and were designed specifically to travel along the top of the arch, moving forward as each section of the arch was completed.²¹ Each crane was in fact a collection of five cranes, grouped on a travelling frame, working together. The main crane consisted of a main hoist with a lifting capacity of 123 tonnes. Next was a 20 tonne jigger hoist to help control the heavy bridge members as they were erected. A five tonne walking crane operated across the front of the girder of the creeper crane to lift working cages, while two 2½ tonne cranes operated at the back of the frame to assist in the riveting stages of



Figure 2.6 The workshops at Milsons Point with the beginnings of the arch behind. (Source: State Records)



Figure 2.7 Preliminary framework for southern abutment tower at Dawes Point. The two storey building on the left was the Dorman and Long offices. (Source: Mitchell Library DG ON4/ 2237)



Figure 2.8 Piers 4 and 5 in 1929 on the southern side, faced in Moruya granite. (Source: State Records 12685/8727000080r)



Figure 2.9 Inside the abutment tower during construction. (Source: State Records)

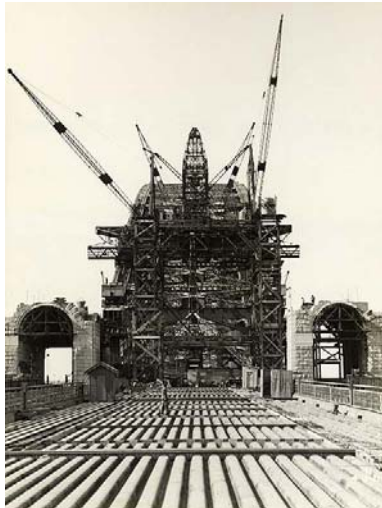


Figure 2.10 Constructing the pylons above the road deck, with the creeper crane returning to its start position, 1931. (Source: State Records 12685/8731000120r)



Figure 2.11 One of the two creeper cranes, returned to the base towards the end of the arch construction. The two cranes were critical to the construction. (Source: State Records 12685/8731000151r)



Figure 2.12 Closing the arch as seen from North Sydney. The dominance of the Bridge in the Sydney skyline is clearly illustrated. (Source: Mitchell Library DG ON4-2181)

construction. Once the first section was assembled, the two creeper cranes began to move forward towards each other. To prevent slipping back, each unit was also fitted with a special braking system.²²

The erection of the arch began on 26 October 1928.

Each side of the arch was held by 128 steel cables, anchored into the rock through horseshoe shaped tunnels placed between the first and second piers on each side of the harbour. The cables obviated the need for any other supports to be built during the construction phase. As the half-arches moved towards each other across the harbour, the cables were tensioned to suit the increasing weight of the structure.

The arches were manhandled by the crews working on the bridge structure. As each piece of steelwork was fabricated, it was transported from the workshops via barge out onto the harbour, where the creeper cranes would lift it into position. Up on the bridge, teams of riveters, steel fabricators, carpenters, riggers, form-workers, boilermakers, labourers and other tradesmen all worked to put the bridge pieces together. Once work started, the bridge moved quickly forward. By August 1930 the two half arches were ready to be joined. On 7 August the cables holding the giant arches back from each other were ready to be slackened. Before they were finally joined, a severe wind storm hit Sydney. With winds of over 110 kilometres per hour, the 15,000 tonne arches swayed (albeit only 7.5 cm) when less than one metre apart. Despite this excitement, at 4.15pm on 19 August 1930, the two spans touched for the first time. They briefly parted again as the cables contracted as they cooled, but were brought together finally at 10pm the same night.²³

The meeting of the halves was celebrated with a half day holiday for the workers, a gold sovereign for those involved in releasing the cables and two shillings for everyone else to drink a toast to their achievement (see Figure 2.12).

With the release of the cables, the arch underwent stress testing and final adjustments to bring the full load to bear on the two hinged bearings at the abutment tower bases.

As the two creeper cranes were now positioned in the middle of the arch, the construction of the deck and vertical hangers began from the centre and moved back towards the shorelines as the cranes returned to their starting positions. Each hanger section was lifted from a barge on the harbour directly below, using a special cradle which enabled them to be positioned underneath the arch not directly accessible to the crane lifting

cables (see Figure 2.13). A rigger rode each section up from the harbour to fit it to the arch chord. The cradle also acted as a brace for the hangers as they were lifted from the harbour and fitted. Once the hangers were attached, the deck cross girders were placed, followed by diagonal bracing and stringers, and steel troughings to take the roadway were formed. The construction of the hangers and deck took just nine months from the time the arch was closed.

In June 1931 the creeper cranes were dismantled and the remaining major tasks involved the completion of the pylons above the deck level and the surfacing of the deck with asphalt. The last stone, set in the northwest pylon, was set on 15 January 1932 and the last rivet on the bridge was driven on 21 January. In February the bridge was test loaded. To undertake this, the four rail lines were packed with 72 locomotives placed buffer to buffer, and then shifted, moved and removed in different patterns to test the stresses. The bridge passed its tests easily and was prepared for opening.

On completion the bridge was the largest man-made structure in Sydney and towered over the surrounding low rise city.

2.4.3 The Opening

The Sydney Harbour Bridge was officially opened on 19 March 1932 by the then Labor Premier Jack Lang (see Figure 2.14). Lang's decision to personally open the bridge, instead of having the Governor, Governor-General or other dignitary perform the role, had caused some consternation amongst his political opponents and was seen as one more example of Lang's provocative leadership style. On opening day, as Lang began to make his opening address from the official dais, Captain Francis de Groot, a member of the right wing New Guard, which was vehemently opposed to Lang and his apparent communist policies, dashed forward on a borrowed horse and slashed the ribbon with his sabre, declaring the bridge open on behalf of the decent and loyal citizens of New South Wales.²⁴

De Groot's grand gesture was captured by the cameras of Cinesound but little noticed by most others on the day.²⁵ The police reacted quickly, dragging him from his horse, and the ribbon was replaced with a spare, brought along in case of emergency. Although the de Groot incident was over in a matter of minutes, the fortuitous filming of the scene by Cinesound has meant that it is remembered as an integral part of the opening of the bridge and, more so, as part of the bridge's folklore. De Groot reappeared in pantomime form at



Figure 2.13 Lifting steel from a harbour barge to the bridge site above. (Source: Mitchell Library DG ON4/2211)



Figure 2.14 Premier Jack Lang opens the Bridge by cutting the ribbon on the southern side. The Governor and other dignitaries look on. (Source: Mitchell Library DG ON4/ 5282)



Figure 2.15 Francis de Groot's horse following his dramatic ribbon slashing and subsequent arrest. (Source: Mitchell Library DG ON4/2143)



Figure 2.16 De Groot returns during the anniversary celebrations in 1982. His actions on opening day are part of the Bridge mythology. (Source: National Library of Australia PIC/3992/1)

the fiftieth anniversary of the opening, with a street performer riding in the parade dressed as a caricature of de Groot on horseback. The incident did, however, underline the simmering, and very nearly boiling, political tensions between the left and the right wings of New South Wales politics exacerbated by the deepening economic depression in the early 1930s (see Figures 2.15 and 2.16).

The official opening took place later the same morning, with Jack Lang cutting the ribbon at the southern end to open the bridge, and the Mayor of North Sydney cutting the ribbon at the northern end to signify entry into North Sydney. Once the dignitaries had completed their speeches and official duties, a pageant and parade of over 750 participants got underway from near the Observatory and made its way across the bridge. Consisting largely of horse drawn floats, the parade sought to depict the significant moments in our history. The parade was followed by marching contingents of school children, a token Aboriginal group, returned soldiers, scouts, bridge workers and lady lifesavers. Overhead planes flew a fly-past, while ships and ferries sailed beneath sounding their sirens. Behind the parade, the public was allowed to walk across the bridge for the first time. Tens of thousands of people walked across the roadway of the bridge until it was opened for vehicular traffic at midnight. It was the last time for 50 years that pedestrians were permitted to walk on the roadway.

The opening day had attracted people from all across Sydney, New South Wales and beyond to witness the ceremony. Special trains had been advertised from Melbourne and Adelaide bringing people to Sydney for the big day. Once there, tickets could be purchased to cross in the first train, and members of the public could send a commemorative telegram from one of two post offices in either the south and north pylons or buy commemorative stamps of the day.²⁶ These items were the first in a long line of souvenirs produced with an image of the bridge.

At midnight, the bridge was opened for traffic while the remainder of the week was Bridge Week, with ongoing celebrations.

2.4.4 The Workers

During the construction of the bridge, through the design stage, in workshops, on the ground, in the quarries and on the structure, many thousands of workers had been directly or indirectly involved. Just about every trade had been

employed, from boiler makers to carpenters, as well as engineers, architects, stone masons (a community of 300 lived at the quarries in Moruya), draughtsmen, joiners, riveters, secretaries, crane drivers and a myriad of other occupations²⁷ (see Figure 2.17).

When work began in earnest in the middle and later 1920s, the Australian economy was beginning to slow, heading towards a worldwide depression. Despite the dangers of working on the bridge construction, it was one of the largest employment projects undertaken in Sydney, if not Australia, to that time. As the bridge grew and the economy contracted, the project came to be called the Iron Lung because it had kept so many people employed for so long.²⁸ As well as the prospect of a job, the project itself inspired the workers involved. Most were aware that they were part of a major engineering feat and one that Sydney was watching grow every day. As the arch began to extend, it quickly surpassed any other built structure in Sydney in size and height. The project was using techniques and methods never before used in construction in Australia. Even as it was being built, it was already inspiring art and poetry that responded to its sculptural form.

Oral histories of the workers recorded 50 years after the official opening of the bridge reveal that the project remained, for many, a major event in their working lives.²⁹

Although the bridge had been nicknamed the Iron Lung by many at the time, as it approached completion, men who were no longer required were laid off. Unfortunately, in 1932, the Depression was at its height and many who had worked on the bridge continually now found they could get no work at all. However, large numbers of men were still needed after it opened. The bridge continues to employ crews of riggers, maintenance workers, painters and other associated trades.

The dangers of working on the bridge were illustrated most graphically in the numbers killed and injured. In all, 16 men died on the construction of the bridge: 14 on the bridge site and two in the quarries at Moruya. At least one survived a fall from the bridge to the harbour below. Many more were injured, some permanently. Working without safety lines and harnesses, many workers were hit by falling rivets and tools, slipped from platforms, or were injured and maimed by machines and vehicles (see Figures 2.18 and 2.19). Since opening, another two workers have died on the bridge.³⁰



Figure 2.17 Carpenters working on sleepers for the train tracks. Most trades in the construction industry were represented amongst the Bridge workforce. (Source: State Records NRS 12685/4/8732)



Figure 2.18 Riggers above the void. Working on the Bridge was often a hazardous pastime, with long drops and no safety harness. (Source: Mitchell Library DG ON4/ 2270)



Figure 2.19 The finishing touches, laying granite on the pylon towers. (Source: Mitchell Library PXA 624 v.2)

2.5 Beyond 1932: The Working Life of the Bridge

2.5.1 Traffic Management

Since the opening of the Sydney Harbour Bridge in March 1932, there has been a variety of physical additions and alterations made to the structure, some great, some small, in response to changing uses and needs of the bridge.

The main working purpose of the bridge is to convey public and private transport across the expanse of Sydney Harbour, and it is in regard to the balance of public and private usage that has resulted in the most change to the bridge. In 1958 the most dramatic of these alterations was undertaken following the phasing out of trams from Sydney's streets. The bridge had been built to accommodate four rail tracks, two down each side, to carry trains. The tracks on the eastern side were to carry the proposed rail line to Manly and Warringah. Bradfield suggested using them temporarily for trams until such time as they were needed for trains, thereby allowing the extension of the tram service from Milsons Point to the city.³¹ Although opposed by the Railway Commissioners, tram tracks were installed along the eastern side, connecting trams to the underground terminus at Wynyard. On the north side, the tramway approached the bridge over a steel arch bridge that crossed Alfred Street (near Junction and Lavender Streets) and joined the bridge proper close to the current northeastern pedestrian stairway, which was built to access the Milsons Point tram island platform (see Figures 2.20 and 2.21).



Figure 2.20 Trams cross the bridge. The bridge was designed to accommodate four railway tracks, two each side. The eastern tracks were built for trams and removed in 1958. (Source: Keenan)



Figure 2.21 Trams on the tracks near the southern tram tunnels on their way to and from Wynyard. After 1958 the tramway was converted for vehicular traffic. (Source: Keenan)

The last tram crossed the bridge on the evening of 28 June 1958. After the closure of the tram service, a number of physical changes to the bridge were carried out. Most notably, the tramway was converted into lanes to carry road traffic, the entrances to the Wynyard tunnels were partially blocked by the relocation of the eastern footway, while the tunnels themselves were leased to the Railway Institute for a shooting range and to the Menzies Hotel for a carpark. The tunnels are still in use for carparking between Cumberland Street and Wynyard Station. On the northern side, the tram station was removed to make way for the road. By 1959 car usage was over 66,000 vehicles per day.³² In 1966 the former tramway arch on the northern side was also removed to allow for the connection of the Cahill Expressway and Warringah Expressway.

The creation and connection of the two expressways also created a number of major physical changes to the bridge and its immediate surrounds. On the southern side, the Cahill

Expressway had been started by the mid-1950s, and the first section from the bridge across Circular Quay to Conservatorium Place was opened in 1958. The Expressway was extended to Woolloomooloo in 1962.³³

In a reminder of the 1920s and 1930s demolitions undertaken to construct the bridge, a large number of residential and commercial properties were demolished on the northern side to make way for the Warringah Expressway approaches. Hundreds of rental properties were once more removed and families relocated away from their former neighbourhoods.³⁴ The new expressway also required the removal of the former tramway arch and bays 11–14 on Ennis Road (demolished 1966). The first stage of the Warringah Expressway, from the bridge to Miller Street, Cammeray, was opened by Sir Roden Culter in June 1968. This was extended in 1978 by a further 1.4 kilometres, extending as far as Naremburn.

In 1972 a new southern approach was also opened with the completion of the Western Distributor which gives access to motor traffic to and from Sydney's western and southern suburbs.

In 1992 a new harbour crossing was opened in the form of the Sydney Harbour Tunnel. While the various road extensions and freeways previously built had been to ease traffic onto the bridge, by the 1980s it was clear that the bridge alone was increasingly unable to cope with the load of traffic crossing it. A second crossing, which had been previously suggested, was considered as the most effective means to combat the congestion. Work commenced in January 1988 and the tunnel opened to traffic in August 1992. The tunnel crosses the harbour to the east of the bridge, running in a line from Bradfield Park to east Circular Quay. On the northern side, the tunnel is entered from the Warringah freeway and exits on the south side to join the Cahill Expressway in the Botanic Gardens.

Actual traffic management on the bridge between 1932 and 1951 consisted of police on point duty at both ends during peak hour. Between 1951 and 1985, lanes were marked out by removable rubber lane markers, placed and removed by hand twice daily for peak hours. From 1977 the system began to be modified with the introduction of movable median strips. In 1986 this was followed up with the erection of new overhead gantries with lane indicator lights and electric lane control signals, phasing out the rubber lane markers.

From the opening in 1932, tolls were charged from vehicles crossing the bridge. This was viewed with some consternation and objections from residents of the North Shore who had been paying an additional land tax to pay for the bridge since 1923. Toll collectors were initially installed on a traffic island with a small rail around them until December 1932 when toll booths and toll bars were added.³⁵ The toll bars were modified in 1959 and again in 1970, when automatic one way toll collection and movable toll cabins were installed, along with new toll offices and staff amenities. More recently, cashless e-tag toll collection has also been introduced.

In 1935 the protective barriers were added to the footways, primarily to discourage suicide attempts. While these were fitted to the water side of each footway, more recently (2005–2006) mesh fencing with barb wire strands have also been fitted to the roadway side of each footway to prevent pedestrian access to the road deck. As well as these protective barriers, roadway crash barriers were installed in 1958. During the later 1980s (1987), extra security was added at the entrance to the pylon lookout, the maintenance access gates on the arch and the fences at the main bearings. The purpose of these modifications has been to restrict unauthorised people from areas of the structure that present a danger, and to reduce risk and consequent liability for the RTA.³⁶

2.5.2 Tenancies in the Bays

On the southern side, between 1936 and 1938, the three arches at 1–5 Cumberland Street were fitted out for Darrell Lea, for use as a chocolate factory and store, with the middle arch being used by Century Press for their printing operations. The remaining bays on both sides of the harbour continue to be leased for commercial purposes. As mentioned above, a number of the northern approach bays were demolished in the 1960s to make way for the approaching expressways. Most of the northern approach bays had been utilised since soon after the bridge opening for shops, offices and other uses. In 1932, Bays 27–32 in Ennis Road were enclosed and fitted out as shops. These were followed in 1936 by Bays 1–4 on the north side being enclosed and converted to a motor showroom and repair workshops. Bays 5–10 had been enclosed and fitted out by 1941. Between 1949 and 1966, the remaining Bays 13–27 were all enclosed for various uses including by the Commonwealth Bank, a DMR Laboratory and later a toll office.

2.5.3 Illuminating the Bridge

The bridge, due to its size and positioning, is a landmark in Sydney and on Sydney Harbour. Even before work on its construction had begun, Bradfield recognised that the bridge could be used as a backdrop for events and specially lit to celebrate them. He had suggested the silhouette of the bridge could be used to represent the badge of the Australian Military Forces to commemorate the First World War as early as 1922.³⁷



Figure 2.22 The Bridge illuminated for the 1937 coronation of King George VI. Lighting the Bridge has played an important part in its role in celebrations. (Source: Mitchell Library NCY 37/127)

A feature of the bridge since its official opening has been its external lighting, used in both a functional and ceremonial way, which has contributed to its retention of landmark status in an increasingly illuminated night sky (see Figure 2.22). The bridge was originally lit by 292 two post and two bracket type fittings with the road lighting provided via overhead brackets on the arch section and smaller post fittings on the approaches.³⁸ Four large post fittings marked the north and south of the bridge, with eight large bracket fittings attached to the retaining walls on the northern side, two each side of the Lavender Street railway arch and the tramway arch bridge. The light fittings were all of an art deco inspired lantern design, designed by the NSW Public Works Department.

The lights were installed by the NSW Government Railways, powered from the Ultimo and White Bay Power Stations through substations at Argyle Street and in the north and southwest pylons.

In 1955 diffusers were added to the roadway lighting to direct light down on the roadway. Following the conversion of the tramway to a roadway, modern light standards and fittings were installed along the eastern side and then gradually fitted throughout the entire bridge and approaches. The traditional post type lanterns were left on the four sets of bridge stairs, as well as the wall bracket at Lavender Street.

The night time floodlighting is now a prominent feature of the bridge. The floodlighting was added as a permanent fixture on the eastern side in 1962, and the western side by 1984. Prior to this, floodlighting had been a temporary measure, with illumination on the opening night provided by the searchlights of the surrounding ships.³⁹ The flood lights were updated in 1988 and 1992, although both times their effects were negated by the brightness of the roadway.

Marine and Air navigation lights were also installed on the bridge in 1931 and 1949 respectively.

2.5.4 Using the Towers and Pylons

Some changes and alterations have also been undertaken within the abutment towers and pylons. Until 1990 the northern abutment tower was used for storage and as garage space. In 1990 part of the northern tower was converted to accommodate the exhaust from the Harbour Tunnel. The exhaust utilises the space in the northeast pylon. The remaining space in the abutment tower continues to be used as storage and garage space as well as by maintenance crews. The southern abutment tower is used by bridge crews, maintenance and the rigging department, for workshops and offices.

While all four pylons include large internal spaces, only the southern pylons were ever made available for a publicly accessible use. The southwest pylon included a post office at the opening ceremony so people attending could send an official commemorative postcard or telegram. On the upper levels was a museum consisting of plans, models, photographs, documents and memorabilia which was open to the public on weekends and public holidays. From 1933 the southeast pylon's upper levels were leased to Archer Whitford who opened a fun fair, which included animal exhibits, such as a rooster with an 18 foot tail, funny mirrors and penny peep shows.⁴⁰ Whitford lasted for nine years until 1941–1942, when the pylons were closed to the public, occupied by the military and anti-aircraft guns mounted to protect Sydney against air attack.

After the war, the southeast pylon, which included a lookout/observation deck, was leased to Mrs Yvonne Rentoul, who opened a shop (with a post office from 1953) inside the top of the pylon. Mrs Rentoul was also a cat lover, and at one stage had up to 60 cats within her pylon shop, selling kittens as well as souvenirs.⁴¹ The shop and lookout were accessed via an elevator entered from the ground level within the southern pylon. In 1971 Mrs Rentoul's lease expired and the lookout was closed. It was reopened in 1982 by the RTA as a museum of the bridge, accessed through the pylon via the pedestrian footway. The lookout and museum is still open to the public, and contains the contents of the original museum, relocated from the southwest pylon (see Figure 2.23 and 2.24).

2.5.5 Walking the Bridge

The bridge was originally opened with pedestrian walkways on both the eastern and western sides. In 1972 the western footway was converted to a cycleway, with ramps installed on the north and south side for access.

Crossing the bridge on foot, or by bicycle, has never been subject to a charge, although a small fee was levied to access the southeast pylon. Since October 1998, the company BridgeClimb has been taking paying tourists on tethered tours to the top of the bridge's upper arch. Starting from inside the northern most bays in Cumberland Street, the tours access the bridge via a catwalk beneath the road



Figure 2.23 Crowds on the observation deck soon after opening. The bridge was the tallest structure in Sydney until the 1960s and provided a view of the city rarely seen by its citizens of that time. (Source: Mitchell Library DG ON4/4033)



Figure 2.24 Observation deck in 1961. With a museum and the views, the observation deck remains a popular tourist destination. (Source: National Archives of Australia A1500/K6512)



Figure 2.25 Certificate to commemorate walking the bridge on opening day. (Source: National Library of Australia PIC P1060)

approaches, then through the upper level of the southern abutment tower, up a ladder on the end post of the arch to the stairs on the top chord. Climbing to the top on the eastern side for a photo at the top near the flag poles, the BridgeClimb groups cross a lateral girder to the western side and descend to the southern abutment tower and back to ground level.

The introduction of BridgeClimb necessitated a number of physical changes to the bridge for both safety and access. An opening was created in the abutment tower, directly beneath the roadway on the eastern side to allow walkers to access the approach span, while a steel cable, with associated braces and brackets, has been added to the top side of the steel arch to allow climbers to be securely tethered at all times.

BridgeClimb has been an incredibly successful venture. Within four years of starting, over one million people had paid to climb to the top of the bridge. This figure has climbed much higher since 2003 with an average of 1000 climbers on the bridge per day.⁴²

Before BridgeClimb, however, a long line of climbers had scaled the bridge, many as guests or employees of the Department of Main Roads, others scaling it unofficially, often at night and on the weekends. Illegally climbing the bridge was an urban mountaineering style adventure that had been ongoing from soon after it was opened up until the heightened security consciousness of the later 1990s and the tightened commercialisation of access after the establishment of BridgeClimb.⁴³

As well as attracting climbers to its lofty heights, the bridge has attracted pedestrians to walk across its roadways on the rare occasions that it has been closed to vehicular traffic. On 16 March 1932, the day of opening, the roadway was restricted to pedestrians, with estimates ranging between 300,000 and one million people walking across the bridge (see Figure 2.25). Three days prior to the opening day, school children from across New South Wales had been invited to walk over the bridge on children's day. It was estimated that 100,000 crossed this day, despite the rain.⁴⁴ The next time the bridge was opened for pedestrians was in June 1946 to celebrate Victory Day when 20,000 marched across. Then it was not until 1982, at the 50th birthday, and then again in 1992, at the 60th birthday celebrations, that the roadway was made available to pedestrians. As in the past, the opportunity to walk across the roadway of the bridge attracted enormous crowds, with over 500,000 in 1982 and over 300,000 in 1992. In May 2000, the bridge was again opened for pedestrians when over

200,000 protesters participated in a reconciliation march.⁴⁵ This was the first time the bridge had been the focus for a political demonstration of such magnitude, rather than for a commemoration or celebration. It is a mark of the bridge's position in the psyche of the people of Sydney that each time the opportunity has arisen to walk on its road surface, pedestrians have flocked to it.

Since 2000, the bridge has also been used annually for the Sydney marathon, first run during the 2000 Sydney Olympic Games, and a smaller bridge run event, both held on the same day.

2.5.6 A Symbol of Sydney

Since its opening day, the bridge has been a focus for celebrations. The first of many spectacular fireworks displays was held on the night of the opening day. Since then, fireworks for special occasions and New Years Eve have increasingly used the Sydney Harbour Bridge as a focal point, either with the bridge as backdrop or as the centre of the display. This has been especially the case since the 1988 Bicentenary. Using the arch itself, the fireworks were launched from the arch and showered down from the roadway. The spectacle has been reworked each year since, growing ever larger. For the turn of the millennium, the bridge provided the background for another piece of 1930s Sydney iconography. The word Eternity, made famous by eccentric Sydneysider Arthur Stace who had secretly scrawled the word across Sydney footpaths from the 1930s until the 1960s, was written large on the eastern face of the bridge. This opened the year 2000 for Sydney, which was the Olympic year, and later the bridge was again festooned with fireworks in the form of the Olympic rings (see Figure 2.26).

The fireworks display on New Years Eve over the bridge has become a de-facto symbol of New Year in Sydney and is an internationally recognised symbol of Sydney and the New Year.⁴⁶

While the fireworks display has meant that television images of the bridge are seen around the world on New Years Day, it has been a powerful symbol of and for Sydney since its inception. Prior to the building of the bridge, tourism posters for Sydney and for Australia often focused on the beach or the natural wonders, native animals or Aboriginal curios and culture to attract tourists. However, the bridge offered an engineering masterpiece to rival almost any other in the world to date and was extensively used as an iconic symbol of



Figure 2.26 Temporary Olympic rings during Sydney 2000 Olympics. The framework of the bridge and silhouette are the perfect backdrop for such illuminations. (Source: National Library of Australia PIC NL 38730-7)

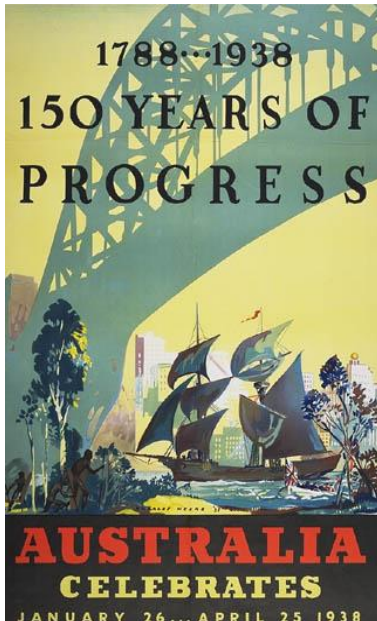


Figure 2.27 Poster for the sesquicentenary of European settlement. The bridge arches over the past, representing the progress of the nation. (Source: National Library of Australia PIC Poster Z156)



Figure 2.28 Capturing the moment. The building of the bridge was officially recorded by the Public Works Department and RTA. (Source: Mitchell Library GPO3-01264)

Sydney. It also spoke to Australians of their ability to match the creative and industrial endeavours of the world (see Figure 2.27).

The construction of the bridge inspired artists, photographers, writers, commentators and poets. The sheer size of the project dwarfed anything else Sydney had seen to that date in numbers of people involved and physical dimensions. As it was built, the structure became visible from a multitude of vantage points, and as the tallest structure in Sydney (by far), it could be seen above the roof tops of Sydney's suburban skirt for miles around (including suburbs such as Redfern, Pymble, Hunters Hill and Watsons Bay). Photographs taken of the work by Herni Mallard, Harold Cazneaux and the Department of Public Works in particular captured the iconic nature of the project, the technical achievement as well as the evocative artistic quality of the bridge. Hundreds of paintings, photographic studies and other visual representations have been created since its opening (see Figure 2.28).

As an additional bonus, the symmetry of the design made the structure perfect for kitsch tourist marketing and souvenirs. All manner of items were and have since been manufactured, from tea towels to snow domes, pencil sharpeners to ash trays, crochet patterns to jewellery.

2.6 Summary

The bridge is recognised nationally and internationally as a symbol of Sydney. Its position, spanning the harbour, and its scale afford it landmark status and pride of place in the conception of what is Sydney. During its construction phase, it was thought to be a life breath into the economies of Sydney and New South Wales when all around it was slowing down as a Depression took hold. Until the bridge was completed, Sydney had been divided physically by the harbour. Although the two sides were relatively close, for almost 150 years of European settlement the only way across the harbour was via boat or ferry, or the long way around. For some, the bridge project was seen symbolically as linking a divided city. The 'Australian Worker' commented on its opening that 'The Bridge unites what once was divided, it stands for oneness, unity, completion'.⁴⁷ The Sydney Morning Herald remarked that 'Its vast sweeping curves from wherever one may view it, gives a sense of rhythm and harmony, of strength combined with lightness and grace. In short, it is one of the finest and most typical products of the Age of Steel'.⁴⁸

The bridge has continued to be recognised for its excellence in engineering and design. It remains isolated in view with little development around it to hide its curving approaches and nothing to obscure its dominant arch. It has been recognised internationally as a significant engineering site, including being designated an International Engineering Landmark by the American Society of Engineers.⁴⁹

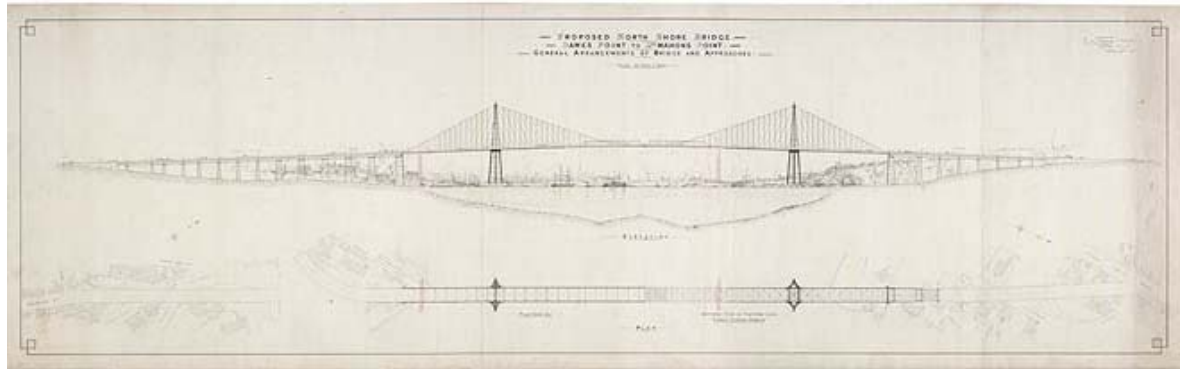


Figure 2.29 A proposed design for the North Shore Bridge in 1894. (Source: Mitchell Library PXD 318/4)

2.7 Endnotes

- ¹ Smith, KV 2006, *Eora: Mapping Aboriginal Sydney 1770–1850*, Exhibition Catalogue, State Library of NSW, Sydney, p 1.
- ² Attenbrow, V 2002, *Sydney's Aboriginal Past*, UNSW Press, Sydney, p 153.
- ³ Curson, PH 1985, *Times of Crisis: Epidemics in Sydney 1788–1900*, Sydney University Press, Sydney, p 49.
- ⁴ Johnson, AW 1995, Dawes Point Battery Archaeological Excavations Volume 1, prepared for the Sydney Cove Authority.
- ⁵ *ibid.*
- ⁶ *ibid.*
- ⁷ Fraser, D (ed), *Sydney: From Settlement to City*, Engineering Heritage Committee, Institution of Engineers, Sydney, p 111.
- ⁸ John Job Crew Bradfield, Australian Dictionary of Biography, online edition.
- ⁹ Fraser, *op cit*, p 112.
- ¹⁰ Australian Dictionary of Biography, *op cit*.
- ¹¹ *ibid.*, p 112.
- ¹² Roads and Traffic Authority, 1988, *The Story of the Sydney Harbour Bridge*, RTA, Sydney, p 6.
- ¹³ Lalor, P 2005, *The Bridge: The Epic Story of an Australian Icon—The Sydney Harbour Bridge*, Allen & Unwin, p 114.
- ¹⁴ Park, M 2000, *Building a Bridge for Sydney: The North Sydney Connection*, Historical Services Department, North Sydney Council, p 11.
- ¹⁵ Heritage Group, Department of Public Works 1998, *Sydney Harbour Bridge: Conservation Management Plan*, prepared for Roads and traffic Authority of New South Wales, p 35.
- ¹⁶ Lalor, *op cit*, p 16.
- ¹⁷ Heritage Group, *op cit*, p 35.
- ¹⁸ *ibid.*, p 34.
- ¹⁹ *ibid.*, p 37.
- ²⁰ *ibid.*, p 39.
- ²¹ Roads and Traffic Authority, *op cit*, p 10.
- ²² *ibid.*, p 11.
- ²³ *ibid.*, p 11.
- ²⁴ Lalor, *op cit*, p 311
- ²⁵ *ibid.*, p 312.
- ²⁶ Roads and Traffic Authority, *op cit*, p 17.
- ²⁷ Lalor, *op cit*, p 161.
- ²⁸ Heritage Group, *op cit*, p 54.
- ²⁹ *ibid.*, p46. The oral histories of the workers are referred to in some detail in the 1998 Conservation Management Plan and used extensively in Lalor's work.
- ³⁰ Heritage Group, *op cit*, p 56.
- ³¹ Keenan, D 1987, *The North Shore Lines of the Sydney Tramway System*, Transit Press, Sydney, p 57.
- ³² Lalor, *op cit*, p341.
- ³³ Roads and Traffic Authority 1988, *The Story of the Sydney Harbour Bridge*, RTA, Sydney, p 22.
- ³⁴ Spearritt, P 2000, *Sydney's Century: A History*, UNSW Press, Sydney, p 152.
- ³⁵ *ibid.*, p 58.
- ³⁶ *ibid.*, p 58.
- ³⁷ Prunster, U 1982, *The Sydney Harbour Bridge 1932–1982*, Angus and Robertson, Sydney, p 17.
- ³⁸ Heritage Group, *op cit*, p 60.
- ³⁹ *ibid.*, p 61.
- ⁴⁰ Lalor, *op cit*, p 346.
- ⁴¹ *ibid.*, p 347.
- ⁴² www.BridgeClimb.com
- ⁴³ Lalor, *op cit*, p 344.
- ⁴⁴ *ibid.*, p 329.
- ⁴⁵ *Ibid.*, p 353.
- ⁴⁶ The Bangkok Post edition of 1 January 2000 had a photo of the Bridge and its fireworks as its only front page photo for that edition.
- ⁴⁷ Prunster, *op cit*, p 16.
- ⁴⁸ Sydney Morning Herald (Supplement), 20 March 1932.
- ⁴⁹ Fraser, *op cit*, p 112.

3.0 Sydney Harbour Bridge in Context

3.1 Physical Description

3.1.1 Introduction

The Sydney Harbour Bridge (the bridge) spans Sydney Harbour, connecting Sydney's northern and southern shores at Milsons Point and Dawes Point. The bridge itself comprises the arch, four granite-faced pylons, approach spans, two railway lines, a cycleway, footpaths and roads between the northern and southern approaches.

The following description of the bridge considers the setting and the views to and from the bridge within Sydney Harbour, the fabric of the bridge and other associated elements including the surrounding parklands, subsurface remains and the movable heritage collections associated with the bridge, its construction and its continuing operation.

3.1.2 Setting

The full area of Sydney Harbour extends over 5500 hectares and is one of the world's most famous harbours. The bridge dominates most of the views within the Sydney Harbour and is visible from many places along both sides of Port Jackson, including The Rocks, Circular Quay and Bennelong Point on the southern side, and Kirribilli, Taronga Zoo and McMahon's Point on the northern side (see Figures 3.1 to 3.4).

The bridge itself offers some of the best views of the city of Sydney, the harbour and other iconic elements, including the Sydney Opera House and Luna Park.

The importance of the bridge and its setting as an icon of Sydney and Australia is discussed in Section 3.3.

3.1.3 Individual Elements¹

The fabric belonging to Sydney Harbour Bridge includes not only the steel arch and Bradfield Highway surface extending 2.2km across the harbour, but also:

long expanses of rendered retaining walls, enormous granite-faced pylons, interior spaces in the pylons, occupied tenancies under the approaches and a scattered assortment of items designed for the bridge such as commemorative plaques, light fittings and railings.²



Figure 3.1 View of Sydney Harbour Bridge from Bradfield Park.



Figure 3.2 View of Sydney Harbour Bridge from Dawes Point. (Source: Department of Urban Affairs and Planning)



Figure 3.3 View from Sydney Harbour Bridge looking east.



Figure 3.4 View of Sydney Harbour Bridge looking west. (Source: Department of Urban Affairs and Planning)

The bridge itself is constructed of silicon steel trusses and joists painted dark grey. 'The whole structure, while appearing to be curved, is made up of riveted straight steel angles and plates'.³ The deck is hung from the main arch truss by 40 silicon steel hangers, which are connected to latticed cross girders beneath the railway and road surface.⁴ The main dimensions of the bridge are listed in Table 3.1.

The roadway surface of the Bradfield Highway consists of steel troughing plates supported over carbon steel stringers, floor beams and cross girders, covered with coke concrete and rock asphalt. When tram travel across the bridge ceased, and the tramway rails and associated sleepers and elements were removed, the tramway was converted to an additional two roadways, with an asbestos fibre cement formwork and a reinforced concrete slab, creating the two easternmost (southbound) lanes, later named the Cahill Expressway.⁵

The southern and northern approaches are characterised by large reinforced concrete retaining walls that link the distributor roads on both the north and south shores onto the Bradfield Highway. The northern and southern approach spans comprise open work steel trusses which are mounted on concrete abutments and the northern and southern abutment towers and supported by granite-faced pillars.

The following definition of the abutments and their relationship to the pylons is provided in the Sydney Harbour Bridge CMP—Inventory Records, prepared for the bridge in August 1997:

The term 'pylons' is widely used to refer to the whole of the masonry construction at each end of the arch ... The abutment tower is the structure that supports the deck between the arch and the approach spans and takes the thrust of the main arch bearings at its base. The pylons are the two towers built on top of the abutment tower starting at deck level.⁶

The abutment towers are divided into three large compartments by thick internal walls. The large central and side interior spaces of the southern abutment tower are utilised by RTA SHB maintenance and security as workshops, amenities and office space. The northern abutment tower space is partially used for storage and workshop space by the crews that monitor and tow broken down vehicles on the bridge.

The southeast pylon is currently operated as a SHB museum and lookout, managed by BridgeClimb, and is the only publicly accessible pylon. Many of the items displayed in the museum form part of the SHB Movable Heritage Collection, which is discussed in Section 3.2.6 below.

Throughout the construction of the bridge, many opportunities to publicise and promote progress were taken, with numerous ceremonies and installations of foundation stones, plaques and tree plantings.⁷ Two foundation stones are located on the Southern Abutment Tower, and were laid in 1925.⁸ Thirteen bronze plaques have also been installed along the bridge and the approaches, commemorating a variety of events including the discovery of Australia, the foundation of the Commonwealth of Australia, Australia's participation in World War I, and the construction of the bridge itself.⁹ Other plaques were proposed and never installed or have been lost over time.

Other smaller elements located on and around the bridge include:

- a variety of bridge lighting fittings and lamps;
- fencing between the motor lanes, train tracks, cycleway and pedestrian access;
- toll booths and gantries associated with lane changes;
- stairs, ladders and catwalks (public and secured access); and
- maintenance cranes and gantries (used in construction, maintenance and ongoing painting works).

3.1.4 Location and Public Access

Vehicular access to the bridge (the Bradfield Highway) is via Grosvenor Street, Clarence Street, Kent Street, the Cahill Expressway, or the Western Distributor on the southern side, and the Pacific Highway and the Warringah Freeway on the northern side. The bridge has eight vehicular lanes in total, numbered one through eight from west to east: six on its main roadway and lanes seven and eight, formerly two tram tracks, on its eastern side. The bridge has a series of overhead gantries which indicate the direction of flow for each traffic lane. Lanes three, four and five are reversible, while lanes one and two always flow north. Lanes six, seven and eight, the latter a dedicated 24-hour bus lane, always flow south.

Toll booths are located at the northern end of the bridge to charge the toll for southbound traffic headed into the CBD. The Bradfield Highway toll booths located on the actual approach spans of the bridge cater for the two eastern-most southbound lanes which lead southeast onto the Cahill Expressway from the bridge. The tollbooths on the Warringah Freeway at the northern end of the Bradfield Highway cater for the remainder of the southbound traffic and collect cash and electronic tolls.

Two train lines are situated on the western side of the bridge, separated from the motor lanes by fencing and concrete barriers. The train lines form part of the North Shore Line, between the Milsons Point and Wynyard railway stations, on the north and south shores respectively.

A 2.5 metre wide cycleway is also located on the western side of the bridge, west of the North Line railway tracks. The cycleway is accessed near Milsons Point station in the north and Observatory Hill Park at Millers Point in the south.

The pedestrian footpath on the eastern side of the bridge can be accessed from the south via Bridge Stairs located near Gloucester Street and Cumberland Street in The Rocks, or the Cahill Walk, along the Cahill Expressway, via Circular Quay or the Botanical Gardens. Pedestrian access from the northern side is available via the Bridge Stairs at Milsons Point.¹⁰ The southeast Pylon Lookout is also accessible via the walkway and affords a 360 degree view over Sydney.

Since 1998, tourists and other customers of BridgeClimb can now also climb the bridge to gain a similar view, under strict instructions and security arrangements. The BridgeClimb premises are located within the bridge approaches in Cumberland Street, and from here climbers walk to the southeast pylon of the bridge, exit through the pylon and weave through catwalks and up ladders above the harbour and along the eastern arch of the bridge to the summit of the bridge. Climbers return to base descending along the western arch and around the southwest pylon.¹¹

As part of the ongoing operations and maintenance of the bridge, RTA personnel have extensive vehicular and pedestrian access to the bridge motorways, railway, pylons and catwalks.

3.1.5 Archaeology

Dawes Point

The history of the Dawes Point Battery site includes the demolition of most of the original structures and buildings during the construction of the bridge and the later landscaping of the area for a park. In 1995 (and again in 1999 and 2000), archaeological excavations were undertaken to investigate the nature of possible remains associated with the human occupation and military use of the Battery site.¹²

The archaeological excavations undertaken by the Sydney Cove Authority, later the Sydney Harbour Foreshore Authority (SHFA), revealed the foundations of a number of the buildings, as well as the gun

positions, powder magazine and associated features. These have since been incorporated into a redesign of the park to commemorate the site's association with Australia's colonial history.

Milsons Point

Milsons Point has traditionally been an important crossing point on Sydney Harbour. In 1788 early European settlers to the area reported the occupation of that part of Port Jackson by a Darug 'clan' group known as the Gamaragal. Midden campsites, rock engravings and rock shelter art demonstrate elements of the harbour based lifestyle of the Gamaragal.

Between the 1850s and 1890s, development at Milsons Point and the township of North Sydney included the establishment of a ferry terminal, cable tram and the extension of the North Shore railway line and the construction of domestic dwellings and shops. During the construction of the bridge in 1923–1932, the ferry and other transport terminal, along with other structures in the vicinity, were demolished and replaced with new train, tram and ferry terminals at Milsons Point.

The redevelopment of Bradfield Park included excavation and landscaping to create a sunken garden plaza featuring terraced garden beds leading to an open pedestrian plaza for community use, feature lighting of the bridge abutment and the plaza area and new toilet facilities. The introduction of extensive fill deposits associated with the landscaping of Bradfield Park, and works associated with the installation of the Harbour Tunnel ventilation ducts would have also modified the landscape of this area, so that any fragmentary remains associated with former site development or activities (including evidence associated with the construction of the bridge itself) would be likely to be located well below the existing ground surface.

On this basis, Bradfield Park, is considered to have little or no archaeological potential. This assessment has been confirmed by a recent archaeological assessment of the area beneath the bridge immediately south of Fitzroy Street in Bradfield Park currently being developed as a pedestrian plaza by the RTA and North Sydney Council.

3.1.6 Movable Heritage

The following movable heritage collections owned and maintained by the RTA are currently listed on the RTA Heritage and Conservation Register and are associated with the design, construction and ongoing maintenance and operation of the SHB:

- Sydney Harbour Bridge Memorabilia Collection;
- SHB Southeast Pylon Museum Collection; and
- Sydney Harbour Bridge Workshops Collection.

The listings for each on the RTA Heritage and Conservation Register are provided in Appendix A. In 2006, the RTA commissioned International Conservation Services¹³ to prepare a Conservation Strategy for the entire RTA-owned movable heritage collection associated with the bridge. The Sydney Harbour Bridge Movable Heritage Conservation Strategy 2007, prepared by International Conservation Services, provides management policies for the SHB Movable Heritage Collection, which comprises the three collections listed above.¹⁴

The Sydney Harbour Bridge Movable Heritage Collection comprises movable heritage items owned by the RTA and its predecessors, or from the public domain that are associated with the design, construction, official opening and early operations of the Sydney Harbour Bridge. The collection

contains a range of relics which are significant in their demonstration of aspects of the technical and engineering processes used in the construction of the bridge, including the only known relics of the temporary support structure utilised for the erection of the arch steelwork. It comprises technical instruments and documentation associated with the design and construction stages of the bridge, but also examples of specialised documents and objects used in association with the Opening Day social activities and celebrations, which are evidence of the social customs and attitudes of the time.

The Sydney Harbour Bridge Maintenance Cranes have also been previously assessed as movable heritage items. Due to the complexity of their conservation and maintenance requirements, these will be the subject of a separate Conservation Management Plan.¹⁵

There are also other various movable heritage and record collections associated with the Sydney Harbour Bridge that are displayed and owned by or lent to organisations other than the RTA, including the Historic Houses Trust, the Powerhouse Museum, State Records NSW and Mitchell Library (the State Library of NSW).

The RTA has commissioned the Historic Houses Trust to develop a major cultural exhibition at the Museum of Sydney to commemorate the 75th anniversary of the opening of the bridge. A number of RTA-owned items, including some from the Sydney Harbour Bridge Movable Heritage Collection, are on loan for inclusion in the exhibition.

3.2 Contextual Analysis

3.2.1 Introduction

Prior to the construction of the SHB, vehicular access to the north shore was undertaken via ferry services as well as a series of smaller bridges located further westwards along the Parramatta River. With increasing levels of traffic in the Sydney/North Sydney area, a royal commission determined in 1890 that a bridge was required to connect the two areas and relieve congestion. Although tunnels were proposed as an alternative, they did not have the same popular appeal. In the 1880s and 90s, the Brooklyn Bridge in New York (still one of the most famous bridges in the world today) made a huge impact internationally, including on the developing city of Sydney. Those responsible for planning Sydney's transport system at the time aspired to New York City as a model, and aspirational phrases such as 'the metropolis will become like New York with Mosman and North Sydney as a second Brooklyn'¹⁶ were common. It was envisaged that a bridge across the harbour would transform the city, so it is not surprising that the idea was the focus of improvement schemes for Sydney discussed before the First World War.

Any bridge has a dramatic visual impact on its surroundings and at the time of its construction, there were fears that the bridge would overwhelm the harbour. The height limit on city buildings at the time was 46 metres and the dominant city landmarks were the towers of the General Post Office and the Lands Building at 77 and 70 metres respectively. The scale of the bridge was overwhelming in comparison: the pylons were 87 metres high and the crown of the arch 47 metres higher. By the 1930s, however, there was almost universal approval of the design and agreement that the bridge would have positive effects on the harbour and on the landscape of the foreshores. Scholar Helen Proudfoot described it succinctly when she wrote, 'the city of Sydney suddenly crystallised with the building of the Sydney Harbour Bridge ... enhancing the sense of arrival, pulling the shores together and creating the twin amphitheatres, that are now an integral part of the central city'.¹⁷

The construction of SHB, however, changed the street pattern on the land at each side of the harbour. Whole residential communities in The Rocks/Millers Point and in Milsons Point/North Sydney were

demolished and the approach viaducts created a barrier between the suburbs to the east and west. This impact, however, was largely accepted at the time as an unavoidable part of progress.

The majority of people crossing the bridge in its first decade were travelling on public transport and it was not until 1959, after the tram tracks had been converted to roadway, that motor vehicles became the dominant mode.

3.2.2 Social Context

Today, the SHB continues to be the main means of crossing the harbour, carrying vehicular, rail and pedestrian traffic between the Sydney Central Business District (CBD) and North Sydney. Although the scale of buildings in the CBD and North Sydney has increased enormously since the 1930s, development of the harbour foreshores has been of a comparatively low scale. As the city's tallest structure until 1967 (when the 182.5 metre tall Australia Square building was constructed in George Street), the bridge still stands as a dominant feature in the harbour. The dramatic water vista focused on Sydney Cove was accentuated with the formal completion of the Sydney Opera House at Bennelong Point in 1973, and the combined engineering and natural landforms continue to give the place its memorable impact. Visually, the bridge and the Opera House, with the high rise city buildings as a backdrop to Circular Quay, have become an iconic image of both Sydney and Australia.

Coping with growing congestion on the bridge has been a continuing concern of the authority responsible for the bridge. Whilst the bridge encouraged the expansion of the northern residential suburbs, it also brought traffic into the city centre and in the view of some stopped the development of North Sydney as an alternative city centre.¹⁸ In hindsight, it has been suggested that Los Angeles might have been a better model for Sydney than New York, and that multiple tunnels would have distributed the traffic more evenly, easing the future centralisation and congestion of the CBD.¹⁹ However, as stated in the 1988 CMP, the road and railway network that Bradfield planned 'have never been completed so the bridge cannot be blamed in isolation for the traffic problems that have occurred since the 1950s'. Consequently, the motor vehicle has had to make up the shortfall in the public transport provision. 'Whether one views the bridge as a long awaited link or an environmental disaster, it was the most important event in the development of Sydney's transport system'.²⁰

3.3 Iconic Value

3.3.1 Introduction

The bridge has become an icon of both Sydney and Australia, with symbolic significance comparable to the Eiffel Tower in Paris, Mount Rushmore in South Dakota or the Taj Mahal in Agra. Widely recognised as the world's greatest single-arch bridge, the SHB has continued to be a focal point for tourism promotion and national pride since its opening.

The bridge was quickly adopted as the symbol of Australia, representative of modernity and the arrival of industrial maturity. Internationally, it was seen as a great achievement at a time of world-wide depression. The maximum use of Australian materials and labour was a requirement of the tender for its construction, and the fame of the bridge was reinforced by constant references in the British press and publishing industry—notwithstanding that it was often portrayed as an accomplishment of British engineering. In the words of Spearritt:

*The Bridge proved to Australians that they too could become a great industrial society, as the United Kingdom, western Europe and the United States before them. Built at a time when Australia relied heavily on primary exports, it was evidence of their growing technological prowess.*²¹

The bridge itself was regarded as a triumph over Depression times. Its opening ceremony included a vast display of floats and marching bands, a gun salute, a procession of passenger ships under the Bridge and ended with the public being allowed to walk across the roadway (see Figure 3.5). Other celebratory measures included the release of three postage stamps to commemorate the opening of the bridge on the 14 March 1932.

3.3.2 Events and Celebrations

Today, the bridge is the focus of national and local celebrations such as Sydney's New Year Eve and Australia Day celebrations, when hundreds of thousands of people crowd around the forshores of the harbour to view the fireworks set off from the arch. Spectacular fireworks were also set off for the Australian Bicentennial celebrations in 1988 and at the end of the closing ceremony of the Sydney 2000 Olympic Games. Throughout the duration of the Olympic Games, the bridge was also adorned with the Olympic Rings, included in the Olympic torch's route to the Olympic stadium and formed part of the men's and women's Olympic marathon events. During the millennium celebrations, the bridge was adorned with the word 'Eternity', as a tribute to the legacy of Arthur Malcolm Stace.²²

The bridge has also been closed to vehicles to allow pedestrians full access for a number of significant events including the celebration of Victory Day in 1946, the 50th anniversary of the opening of the bridge in 1982 (see Figure 3.6), the 60th anniversary in 1992 and the Walk for Reconciliation in 2000.

3.3.3 Art and Culture

The bridge is an iconic symbol in popular culture and the visual arts. Commencing in the 1920s with the early stages of its construction, the bridge in its harbour setting became the emblem of Sydney and an inspiration to artists and photographers (see Figure 3.7). The multitude of images of the bridge, its representation on souvenirs and clothing to its appearance in cartoons, painting, photography and film, are all evidence of its status as an instantly recognised symbol.

The bridge is often seen in the backdrop of wedding and tourist photos, and has been featured in many of the more famous works of Australian artists and photographers such as Grace Cossington Smith, David Moore and Brett Whitely.

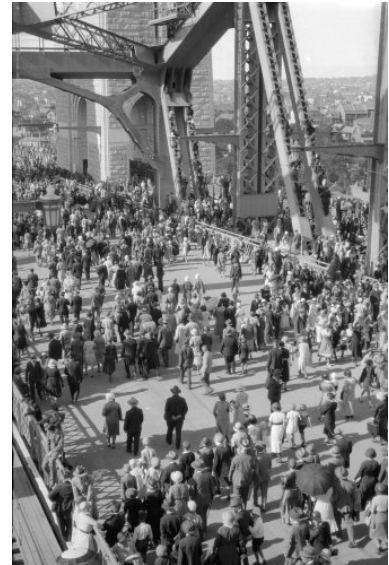


Figure 3.5 Sydney Harbour Bridge opening ceremony on the 14 March 1932. (Source: National Library, PIC HC/HB 832)



Figure 3.6 View of Sydney Harbour Bridge 50th Anniversary Celebrations. (Source: Stanton Library, LH REF PF 1641)

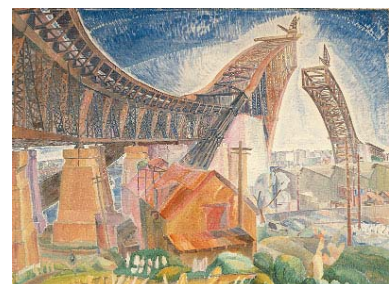


Figure 3.7 *The Bridge in Curve* (1926) painting by Grace Cossington Smith 1892–1984. Tempera on composition board. 83.6 x 111.8 cm. (National Gallery of Victoria, Melbourne)

3.4 Comparative Analysis

3.4.1 Introduction

This section compares the SHB with other major works of engineering with which it shares key features and characteristics, using the following broad categories:

- the Hell Gate Bridge in New York, on which the design of the SHB was based;
- bridges, particularly arch bridges and those in major cities and harbours across the world;
- Australian bridges;
- bridges designed by Bradfield and/or built by Dorman Long and Co; and
- other bridges with towers and pylons.

The discussion also examines the origins of the SHB design, comparing it closely with the Hell Gate Bridge in New York—the design concept upon which the bridge was based.

3.4.2 Understanding the Origins of the Bridge's Design

Before and following the Parliamentary Standing Committee on Public Works of 1913, there was ongoing discussion about the design of the SHB. John Job Crew Bradfield, the chief engineer for the bridge project, advocated a cantilever bridge and submitted two designs to the committee, one with a curved lower chord and the other with a horizontal one. However, the Institute of Architects of NSW and Walter Liberty Vernon (NSW Government Architect from 1980–1911) advised that Bradfield's cantilever design would be an 'eyesore'. Vernon favoured a suspension bridge and the Institute suggested that the cantilever design would be enhanced by the addition of 'tower-like formations in steel' and that 'terminal structures in masonry' be built at the junctions between the bridge and the approaches.

In 1921, contract documents were sent out to prospective tenderers for a bridge of a cantilever design with a horizontal bottom chord. However, during Bradfield's trip to assess the tendering firms in Europe and North America in 1922, he cabled a request that an arch bridge be included in the specifications and that the close of tenders be postponed. Use of an arch-type bridge would be more economical in terms of weight of steel and would also allow room for a curved railway on the north side, which would not have been possible with a cantilever or a suspension design. Bradfield's change in position on bridge type may have been triggered by suggestions by tenderers or by his first sight of the completed Hell Gate Bridge in New York. As described in the 1998 CMP:

The arch bridge included in the revised contract documents bears an unmistakable resemblance to Hell Gate Bridge designed by Gustav Lindenthal. The similarity, due partly no doubt to the short time available, is striking in all aspects of the structure: in the neoclassical design of the pylons, in the parabolic shape of the arch with the reverse curve at each end, in the odd number of panels with the middle panel cross-braced. Bradfield even showed the top chord extending past the end of the arch into the pylon just as at Hell Gate. Apart from the fact that the span was increased by 68% and the number of panels from 23 to 33, the design concept is identical to Lindenthal's.²³

By the early 1920s, the railway era was declining and the era of the private motor vehicle was rapidly emerging. The bridge's designs reflected the movement away from the heavy railway locomotive to higher volumes of small motor vehicles.

The successful tenderers were Dorman Long and Co of Middlesborough in England, who made some aesthetic and practical changes for the bridge, including:

- having the London firm Sir John Burnet and Partners redesign the pylons in a more contemporary, Art Deco style;
- reducing the number of panels in the arch truss from 33 to 28 and dispensing with the cross-braced central panel;
- lowering the deck level relative to the arch and adjusting the abutment towers to suit; and
- widening the gap between the end posts of the arch and the face of the pylons to over 18 metres at deck level, therefore introducing a visual separation between the arch and the pylons.

In 1929, as a result of a series of articles in the *Sydney Morning Herald* which described the consulting engineer to Dorman Long and Co, (Sir) Ralph Freeman, as 'the designer' of the bridge, controversy flared over who really designed the bridge.²⁴ Although modifications were made to the bridge design after Freeman's visit in 1926 (see list above), Bradfield wrote in a report on the matter, 'I originated the cantilever bridge design recommended by the public works committee in 1913 and subsequently the arch bridge design of 1650 feet span'; he went on to say that Freeman was not the designer and that tenders were called on his own design.²⁵ In Spearritt's writings on the matter, he describes that in 1932:

... Dorman Long threatened to sue the government if it erected a plaque naming Bradfield as the designer. One informed view was that the 'detail design was entrusted to Lawrence Ennis who became first Honorary Member of the Institution [of Engineers, Australia] in 1932'. Professor Crawford Munro also considered that Bradfield 'did not design the Sydney Harbour Bridge which we now behold'.

The controversy was never finally resolved, but when Bradfield retired in 1933, the Director of Public Works stated that Bradfield was the designer of the bridge and that 'no other person by any stretch of imagination, can claim that distinction'²⁶

Today, a plaque can be viewed on the bridge naming Bradfield as the designer.

3.4.3 Hell Gate Bridge

The design of the SHB was based on the Hell Gate Bridge, New York, developed ten years earlier by Gustav Lindenthal. During the development of the Hell Gate design, Lindenthal considered two arched proposals: crescent-shaped and spandrel-braced versions. While the crescent-shaped arch was expected to use less steel, the spandrel braced arch was chosen because it looked better and was easier to erect. Lindenthal's two-hinged, spandrel-braced arch was itself based on previous German bridges such as those designed by R Krohn to span the Rhine at Bonn and Düsseldorf. It has been suggested that the general ignorance about the intellectual origins of the SHB is due to the strong Germanic influence on the design, at a time when Germans were seen as enemies.²⁷ While there were economic and practical reasons why an arch form was used in both bridges, a major consideration was that the arch made for 'a more monumental entrance' than other forms.

Although of the same design concept as the Hell Gate Bridge (see Figure 3.8), the increase in sheer size of the SHB should not be overlooked. The span of SHB was 205 metres greater than the Hell Gate Bridge and contains the heaviest steelwork of its kind ever constructed. The 1998 CMP describes the rectangular box sections of the SHB as being of an 'unprecedented size ... using steel plate of the extraordinary thickness of 50mm'. Although a similar thickness and form was adopted as for the Hell Gate Bridge, 'the sections were of a flatter shape and nearly twice as massive'.²⁸

Table 3.1 Comparison of Steelwork between Hell Gate Bridge and Sydney Harbour Bridge.²⁹

Dimensions	Hell Gate Bridge	Sydney Harbour Bridge
Maximum chord dimension	2.0 x 3.15m	3.4 x 2.5m
Maximum steel plate thickness	50mm	50mm
Maximum steel angle size	200mm x 200mm x 25mm	300mm x 300mm x 32mm
Maximum gross cross-sectional area of steel in member	0.9m ²	1.7m ²



Figure 3.8 Hell Gate Bridge in New York, USA, constructed in 1917. (Source: Heritage Group, Department of Public Works and Services, Sydney Harbour Bridge Conservation Management Plan, prepared for NSW Roads and Traffic Authority, February 1998, p 84)



Figure 3.9 New Tyne Bridge in Newcastle-upon-Tyne, England, constructed in 1928. (Source: Heritage Group, Department of Public Works and Services, Sydney Harbour Bridge Conservation Management Plan, prepared for NSW Roads and Traffic Authority, February 1998, p 84)

Apart from its greater size and its picturesque setting, the main characteristics that distinguish the SHB from the Hell Gate Bridge are the changes made by the successful tenderers, Dorman Long and Co, as discussed above.

3.4.4 Other Bridges

In terms of international recognition, the SHB compares with the Tower Bridge in London, the Brooklyn Bridge in New York and the Golden Gate Bridge in San Francisco. In the previous section, comparisons were made between the SHB and the Hell Gate Bridge. It is also worth noting that the SHB resembles the New Tyne Bridge in Newcastle-upon-Tyne, England and the Bayonne Bridge in New Jersey, USA constructed in 1928 and 1931 respectively. Whilst the former bridge was also constructed by Dorman Long and Co using a similar erection technique, both bridges were of a much smaller scale and did not incorporate any pylons.

Recorded in the 2006 Guinness World Records as the widest long-span bridge in the world, the SHB ranks as the third longest steel arch bridge in the world. It is also considered by some to be 'the world's greatest steel arch', because of its combination of span, width and load bearing capacity, and for the difficulties overcome in its erection.³⁰

Within the Australian context, no other bridge compares with the SHB's level of technical and social significance. However, there are other bridges which are significant for their age and other characteristics, such as:

- the Richmond Bridge, Tasmania—built in 1825, it is entered in the National Heritage List as Australia's earliest large stone arch bridge; and
- the Story Bridge, Brisbane—also designed by Bradfield, the large steel symmetrical cantilever bridge was completed in 1940. Whilst the bridge is symbolic of Brisbane, it not as well known nationally as the SHB and does not symbolise Australia internationally.

The following table allows for the comparison of SHB in relation to the development of long span bridges and to other notable examples of bridge design since the eighteenth century.

Table 3.2 Chronology of bridges.

Date	Item
1758	Bridge at Schaffhausen. 129m timber arched truss designed by Hans Ulrich Grubenmann. Longest span in the world at the time.
1779	Ironbridge, Coalbrookdale, England. 31m cast iron semi-circular arch by Abraham Darby III. First iron bridge.
1826	Menai Bridge, Wales. 177m suspension designed by Thomas Telford. Longest span in the world at the time. Had problems with excessive movement.
1866	Cincinnati Bridge, Ohio River, USA. 322m suspension designed by J Roebling. Longest span in the world at the time.
1874	Eads' Bridge, St Louis, Missouri, USA. First major structure to use steel. Three steel arched trusses: 153, 159 and 153m designed by James B.Eads. Longest arches in the world at the time.
1878	Tay Bridge Disaster, Scotland. Iron trusses designed by Sir Thomas Bouch. Collapsed due to faulty materials and construction.
1883	Brooklyn Bridge, New York. 486m suspension bridge designed by John Roebling. Longest span in the world at the time. Designed for two rail lines, two tram tracks, two road lanes and a footway.
1884	Garabit Viaduct, France. 165m wrought iron crescent-shaped arch with hinged supports, designed by Gustave Eiffel. World's longest arch span at the time.
1890	Forth Railway Bridge, Firth of Forth, Scotland. 521m steel cantilever trusses (two spans) designed by Sir John Fowler and Sir Benjamin Baker. Used riveted steel tubes 3.6m diameter and construction adopted from ship building.
1897	Niagara Clifton Bridge. 256m span steel arch, longest arch span of its day.
1898	Bridges over the Rhine, Bonn and Düsseldorf. 181m and 187m steel spandrel-braced arches designed by R Krohn. Major influence on the design of the Hell Gate Bridge.
1898	Niagara Falls Bridge. 256m span arch bridge, wrecked 40 years later by ice jam in river.
1905	Victoria Falls Bridge. 152m braced arch carrying railway across Zambezi river. Designed by Ralph Freeman under GA Hobson and built by Cleveland Bridge Co. The first of Freeman's steel arch bridges.
1917	Quebec Bridge, St Lawrence River, Canada. Span 549 m cantilever. Collapsed during construction in 1907, rebuilt in 1917. Specification for steelwork used on Sydney Harbour Bridge. ³¹
1917	Hell Gate Bridge, New York. Span 298m. Two-hinged spandrel-braced steel arch with heavy masonry towers designed by Gustav Lindenthal. Erected by holding back half arches with cables. Suitable for sharp curve on adjoining railway. Granite-faced masonry towers justified mainly on visual grounds.
1926	Camden Bridge, Delaware River, Philadelphia, USA. Span 533m. Suspension bridge with granite-faced anchorage towers and design similarities with Sydney Harbour Bridge. Architect Paul Cr��t.

Date	Item
1928	New Tyne Bridge, Newcastle-upon-Tyne, England. Span 162m. Steel, crescent-shaped arch, designed by Mott, Hay and Anderson. Heaviest arch bridge in Europe.
1931	George Washington Bridge, Hudson River, New York. Span 1067m suspension bridge designed by OH Ammann for a 27m road way, two 3 metre walkways, future lower-deck to support four rail tracks. Steel towers supposed to be clad in masonry. Cladding was controversial and did not proceed.
1931	Bayonne Bridge, Kill van Kull, New Jersey. Span 503.5m two-hinged steel arch designed by OH Ammann for 20m roadway and two 2m walkways. Roadway suspended from wire ropes. Arch erected on series of temporary towers placed in channel. Purely decorative, granite-faced pylons planned but not built.
1932	Sydney Harbour Bridge. Span 502.9m. Two-hinged steel spandrel arch designed by JJC Bradfield and Ralph Freeman for 17.4m roadway, four railway lines and two footpaths. Design shown in tender documents similar to Hell Gate Bridge.
1935	Birchenough Bridge, Sadi River, Southern Rhodesia. Span 329m steel arch by Ralph Freeman. Similar design to Hell Gate Bridge.
1937	Golden Gate Bridge, San Francisco. Span 1280m suspension bridge. Designed for 18m roadway and two walkways.
1940	Tacoma Narrows Bridge, Washington. Span 853m suspension bridge. The bridge became famous for a dramatic wind-induced structural collapse four months after its opening. A replacement bridge was built later in 1950.
1964	Port Mann Bridge, Vancouver, British Colombia. Span 366m steel arch.
1965	Bridge over Niagara River, Queenston to Lewiston. Span 305m steel rib arch.
1966	Orlick Reservoir Bridge, Czechoslovakia. Span 380m steel arch.
1973	Freemont Bridge, Portland, Oregon. Span 383m steel arch.
1977	New River Gorge Bridge, Fayetteville, West Virginia. Span 518.5m steel arch.

3.4.5 Towers and Pylons

The masonry abutment towers and pylons of the SHB, together with the arch itself, contribute to the powerful physical presence of the bridge (see Figure 3.10). The visual need for the towers is not explicitly stated by Bradfield in his Report on Tenders, although he goes to some length to justify the extra cost of granite compared with concrete facing.³² Nevertheless, it is surprising that there was not more debate about their inclusion as the ‘additional cost of the towers was estimated at £750,000’. In the case of the Hell Gate Bridge, Lindenthal was criticised for ‘sullyng the structural art of bridge-making with subjective, visual considerations’³³, whereas others praised the non-functional towers of Hell Gate. In the paper written by Lindenthal’s assistant, OH Ammann, the heavy, granite-faced pylons are justified by saying that they ‘give expression to the solidity of the abutments to resist the great thrust of the arch.’ As a secondary argument, he added that they had a structural function in that they steepened the thrust of the arch.³⁴ Bradfield uses this same argument later, although the likelihood of any actual slippage in the strata either side of the harbour was remote.

Several of the great American bridges of the time have masonry abutment towers, with granite as the favoured cladding material. The pylons of Camden Bridge in Philadelphia (a 533 metre span suspension bridge completed in 1926) have a number of similar design elements to the SHB pylons, including the use of granite facing, contrasting rock-faced and smooth stone, the stepped battered walls and the projecting central balcony (see Figure 3.11). Granite-faced abutments were also planned for the Bayonne Bridge in New Jersey but they were never built.³⁵

The original architectural style proposed for the pylons was neo-classical. This style, however, was considered to be dated, and as Freeman said in reviewing the tender documents for the bridge, 'capable of improvement architecturally'. On his advice, Sir John Burnet and Partners were given responsibility for the architectural treatment of all the designs submitted by Dorman Long and Co.³⁶ The partner responsible for the work was Thomas Tait, who proposed an accomplished stripped classical treatment with strong Art Deco overtones. He also made refinements to the form of the pylon, recommending that the height of the pylons be reduced by 8.3 metre and the front face of the abutment tower be angled so as to be roughly parallel with the first arch diagonal.³⁷

Although minimal decoration was used in the design of the pylons, the level of decoration was considered appropriate for an engineering project. As described in the 1988 CMP, there are:

*... unmistakable Art Deco influences: the use of granite with its lustre and obvious expense, the powerful massing with stepped, battered, symmetrical facades. Perhaps what gives the pylons such a strong Art Deco flavour is their pairing with the zig-zag pattern of the steel arch, an effect that has been simplified and accentuated in a thousand souvenir ashtrays.*³⁸

In comparison with pure Art Deco buildings soon to appear in Sydney, such as the City Life Assurance Society Building (1936 by Emil Sodersten) and the Anzac War Memorial (1934 by C Bruce Dellit), the design of the pylons is appropriately restrained, given their role in complimenting an internationally recognised work of engineering in steel.

3.5 Endnotes

- ¹ The items identified in Section 3.2.3 Individual Elements are listed in the Sydney Harbour Bridge Conservation Management Plan—Inventory Records, prepared by the Heritage Group, Department of Public Works and Services, for NSW Roads and Traffic Authority in August 1997. Full inventory records for most of the items can be found in that report.
- ² Heritage Group, Department of Public Works and Services, Sydney Harbour Bridge Conservation Management Plan—Inventory Records, prepared for NSW Roads and Traffic Authority, August 1997, p 3.
- ³ Ibid, Inventory Record 3.1, p 3.
- ⁴ Ibid, Inventory Record 3.1, p 3.
- ⁵ Ibid, Inventory Record 0.3, pp 1–3.
- ⁶ Ibid, Inventory Record 08, p 1.
- ⁷ Ibid, Inventory Record 0.5, p 1.
- ⁸ Ibid.
- ⁹ Ibid, Inventory Record 0.5 p 2.



Figure 3.10 View of Sydney Harbour Bridge Dawes Point Pylon. (Source: Greg O'Beirne, 2006)

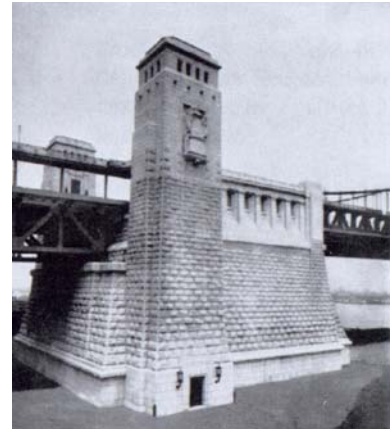


Figure 3.11 View of Camden Bridge pylon in Delaware, USA, constructed in 1926. (Source: Heritage Group, Department of Public Works and Services, Sydney Harbour Bridge Conservation Management Plan, prepared for NSW Roads and Traffic Authority, February 1998, p 84)

- 10 Heritage Group, Department of Public Works and Services, Sydney Harbour Bridge Conservation Management Plan—Inventory Records, prepared for NSW Roads and Traffic Authority, August 1997, Inventory Record 0.3, p 2.
- 11 Ottito Holdings (Aust.) Pty Ltd trading as BridgeClimb, Australia, viewed 9 November 2006 <http://www.bridgeclimb.com/Route.htm>
- 12 Johnson, AW 1998, Dawes Point Battery Archaeological Excavations Volume 1, prepared for the Sydney Cove Authority (no page numbers).
- 13 Heritage input provided by Godden Mackay Logan.
- 14 International Conservation Services, Sydney Harbour Bridge Movable Heritage Collection Conservation Strategy, 2007, p 7.
- 15 International Conservation Services, Sydney Harbour Bridge Movable Heritage Collection Conservation Strategy, 2007, p 5.
- 16 Cazneau et al 1932, *The Second Bridge Book*, Ure Smith for Art in Australia, Sydney.
- 17 Proudfoot, Helen 1988, *Sydney Harbour Paradise of Waters*, Proudfoot Press, Sydney.
- 18 Heritage Group, Department of Public Works and Services, Sydney Harbour Bridge Conservation Management Plan, prepared for NSW Roads and Traffic Authority, February 1998, p 88.
- 19 Jones, Michael 1988, *North Sydney 1788–1988*, Allen & Unwin, Sydney, p 197.
- 20 Heritage Group, Department of Public Works and Services, Sydney Harbour Bridge Conservation Management Plan, prepared for NSW Roads and Traffic Authority, February 1998, p 88.
- 21 Spearritt, Peter 1982, *The Sydney Harbour Bridge A Life*, Allen & Unwin, Sydney, p 103.
- 22 Stace, otherwise known as Mr Eternity, was a homeless man who converted to Christianity and spread his form of gospel by writing the word 'Eternity' on sidewalks in chalk.
- 23 Ibid, p 79.
- 24 Spearritt, Peter 1979, 'Bradfield, John Job Crew (1867–1943)', Australian Dictionary of Biography, Volume 7, Melbourne University Press, pp 381–383.
- 25 Ibid.
- 26 Ibid.
- 27 Ammann, OH 1918, 'The Hell Gate Arch Bridge and Approaches', in Transactions of American Society of Civil Engineers, Vol.82, p 871.
- 28 Heritage Group, Department of Public Works and Services, Sydney Harbour Bridge Conservation Management Plan, prepared for NSW Roads and Traffic Authority, February 1998, p 81.
- 29 Ibid.
- 30 Encyclopedia Britannica, 1992 (Bridges, Construction and History of).
- 31 Freeman, Ralph 1933–4, *Sydney Harbour Bridge: Design of the Structure and Foundations*, Inst. C.E, London, Vol.238, Part 2, p 160.
- 32 Bradfield, Sydney Harbour Bridge: Report on Tenders, Government Printer, 1924.
- 33 Heritage Group, Department of Public Works and Services, Sydney Harbour Bridge Conservation Management Plan, prepared for NSW Roads and Traffic Authority, February 1998, p 87.
- 34 Ammann, OH 1918, 'The Hell Gate Arch Bridge and Approaches', in Transactions of American Society of Civil Engineers, Vol. 82 p 865.
- 35 Heritage Group, Department of Public Works and Services, Sydney Harbour Bridge Conservation Management Plan, prepared for NSW Roads and Traffic Authority, February 1998, pp 86–87.
- 36 Ibid.
- 37 Bradfield, John 1933–34, 'The Sydney Harbour Bridge and Approaches', in Minutes of Proc Inst CE, London, Vol. 238, Part 2, p 333.
- 38 Heritage Group, Department of Public Works and Services, Sydney Harbour Bridge Conservation Management Plan, prepared for NSW Roads and Traffic Authority, February 1998, p 87.

4.0 Analysis of Significance

4.1 Introduction

The Sydney Harbour Bridge is listed on the NSW State Heritage Register (SHR No. 00781), and is therefore subject to the provisions of the *Heritage Act 1977* (NSW), which affords protection for State heritage significant items. In March 2007, the bridge was placed on the National Heritage List (NHL). The legislative instrument that governs the management of a place listed on the NHL is the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act).

The National Heritage criteria established under Regulation 10.01A of the EPBC Regulation and the State Heritage criteria established by the Heritage Council of NSW have been used to identify the National and State Heritage values for the bridge for the purposes of this CMP. The SHR and NHL listings for the bridge are provided in Appendix A.

The bridge is also listed (in part) as a heritage item under the *Sydney Local Environmental Plan 2005* and the *North Sydney Local Environmental Plan 2001*.

4.2 Identifying Heritage Values and Themes

4.2.1 Heritage Values

The heritage assessment process endeavours to identify whether a place has heritage values, to establish what those heritage values are, and why the place or element of a place is considered important and of value to the community. Heritage value (also called cultural significance or heritage significance) is embodied in the location, configuration and fabric of a place and/or an element of a 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.

Identifying the heritage value(s) or heritage significance of a place relies on understanding and analysing documentary evidence, the context and historic themes that apply to a place or item, the way in which its extant fabric demonstrates and embodies its function, and its associations and formal or aesthetic qualities.

The heritage assessment in this section makes references where required to supporting evidence in the earlier sections of this CMP, including Section 2.0 Historic Development and Section 3.0 Sydney Harbour Bridge in Context.

4.2.2 Australian and State Historical Themes

The Australian Historic Themes Framework provides the basis for considering how the historic themes developed by the states and territories link, overlap and/or integrate places across Australia. The framework is comprised of nine theme groups which encompass and are elaborated by a network of more specific sub-themes. The *NSW Heritage Manual* identifies a specific set of 'Historical Themes relevant to New South Wales' within which the heritage values of the place can be examined.

The themes developed in the Sydney Harbour Bridge Interpretation Plan 2007¹ emphasise the need to understand the building of the bridge in its immediate landscape context—from the extensive demolitions for the approaches on both sides of the harbour—to its ongoing functional role in Sydney's overall transportation system. Relevant themes for the Sydney Harbour Bridge are summarised in the table below:

Table 4.1 Australian and NSW Historical Themes in relation to the SHB.

Australian Theme	NSW Theme
Economy—Developing local, regional and national economies	Events—Activities and processes that mark the consequences of natural and cultural occurrences Technology—Activities and processes associated with the knowledge or use of mechanical arts and applied sciences Transport—Activities associated with the moving of people and goods from one place to another, and systems for the provision of such movements
Settlement—Building settlements, towns and cities	Towns, suburbs and villages—Activities associated with creating, planning and managing urban functions, landscapes and lifestyles in towns, suburbs and villages
Working—Working	Labour—Activities associated with work practises and organised and unorganised labour
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.
Phases of Life—Marking the phases of life	Persons—Activities of, and associations with, identifiable individuals, families and communal groups

4.3 Assessment Criteria

This section outlines the current assessment criteria for evaluating whether a place has National Heritage values and State Heritage values.

4.3.1 National Heritage Criteria

A place identified as having outstanding heritage values is eligible for inclusion in the National Heritage List. In addition to governing the assessment and management of a state place's heritage values, the EPBC Act prescribes that a place has National Heritage value if the place meets one of the National Heritage criteria specified in EPBC Regulation 10.01A. The reason that causes a place to meet the criteria is defined in Section 324C of the EPBC Act as the National Heritage value of the place.

The EPBC Regulation 10.01A defines nine National Heritage criteria for evaluating, identifying and assessing the National Heritage values of a place. The threshold for inclusion on the NHL is that a place meets one or more of the National Heritage criteria listed below:

Criterion A—Historic: the place has outstanding heritage value to the nation because of the place's importance in the course, or pattern, of Australia's natural or cultural history;

Criterion B—Rarity: the place has outstanding heritage value to the nation because of the place's possession of uncommon, rare or endangered aspects of Australia's natural or cultural history;

Criterion C—Scientific: the place has outstanding heritage value to the nation because of the place's potential to yield information that will contribute to an understanding of Australia's natural or cultural history;

Criterion D—Representative: the place has outstanding heritage value to the nation because of the place's importance in demonstrating the principal characteristics of:

- (i) a class of Australia's natural or cultural places; or*
- (ii) a class of Australia's natural or cultural environments;*

Criterion E—Aesthetic: the place has outstanding heritage value to the nation because of the place's importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;

Criterion F—Creative/Technical: the place has outstanding heritage value to the nation because of the place's importance in demonstrating a high degree of creative or technical achievement at a particular period;

Criterion G—Social: the place has outstanding heritage value to the nation because of the place's strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;

Criterion H—Associative: the place has outstanding heritage value to the nation because of the place's special association with the life or works of a person, or group of persons, of importance in Australia's natural or cultural history;

Criterion I—Indigenous: the place has outstanding heritage value to the nation because of the place's importance as part of Indigenous tradition.

In February 2006, Clive Lucas, Stapleton and Partners Pty Ltd completed a report² commissioned by the RTA to assess the potential National Heritage values of the bridge. The report identified that the bridge merited inclusion on the NHL and in August 2006, the bridge was nominated for inscription on the NHL. In March 2007, on the 75th anniversary of the opening day celebrations, the Minister for the Environment and Water Resources announced the listing of the bridge on the NHL. The NHL listing for the bridge is provided in Appendix A.

For places listed on the NHL, the National Heritage values should be managed by conservation policies prepared to protect these values. The conservation policies for the National Heritage values of the SHB are set out in Section 7.0.

The National Heritage values identified in the Clive Lucas, Stapleton and Partners report, and the Commonwealth Department of the Environment and Water Resources NHL assessment, were reviewed in the process of preparing this CMP. A summary of the National Heritage values of the bridge is provided in Section 4.4 below.

4.3.2 New South Wales State Heritage Register Criteria

To be assessed for listing on the NSW State Heritage Register, an item will, in the opinion of the Heritage Council of NSW, meet one or more of the following criteria:

Criterion A: An item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area).

Criterion B: An item has strong or special association with the life or works of a person, or group of persons, of importance in the cultural or natural history of NSW (or the cultural or natural history of the local area).

Criterion C: An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area).

Criterion D: An item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons.

Criterion E: An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area).

Criterion F: An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area).

Criterion G: An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or environments (or a class of the local area's cultural or natural places or environments).

For places listed on the NSW State Heritage Register, conservation policies need to be prepared to protect the values identified under these criteria. The policies formulated for the SHB are set out in Section 7.0 of this CMP.

4.4 Evaluation

The thresholds required to meet each of the National and State Heritage criteria establish varying levels of importance for each type of value (eg History, Rarity etc). For example, at a National level, a place must have outstanding heritage values; at a State level, a place must be important to New South Wales.

The following assessment considers the SHB under both the National Heritage and State Heritage criteria, and evaluates how the SHB may meet each of these. In this assessment, if a place meets National Heritage criteria, it is assumed that it meets the State Heritage criteria. However, a place that meets a criterion at the State level will not necessarily meet that (or a related) criterion at the National level.

The bridge is measured against each criterion, and this analysis is incorporated in the Statement of Significance in Section 4.5.

The assessment draws on the conclusions of:

- Heritage Group, Department of Public Works and Services, *Sydney Harbour Bridge Conservation Management Plan*, prepared for NSW Roads and Traffic Authority, February 1998;
- Clive Lucas, Stapleton and Partners Pty Ltd, *Sydney Harbour Bridge Assessment of National Heritage Values*, prepared for NSW Roads and Traffic Authority, February 2006;
- International Conservation Services, *Sydney Harbour Bridge Movable Heritage Conservation Strategy*, 2007; and
- heritage listing information provided in Appendix A.

4.4.1 Historic

NHL—Criterion A: The place has outstanding heritage value to the nation because of the place's importance in the course, or pattern, of Australia's natural or cultural history

SHR—Criterion A: An item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area).

National Heritage Values

- The SHB was a remarkable feat of bridge engineering and construction, especially for a young nation that had previously not taken on a project of this scale and complexity. Even today, it continues to be the widest long-span bridge in the world and is recognised as the world's greatest steel arch bridge because of its combination of size, load bearing capacity and the difficulties overcome in its construction.
- The bridge is a symbol of national pride. At the time of its construction, it represented progress and modernity and symbolised Australia's industrial maturity, particularly as it was constructed with extensive use of Australian engineering expertise, materials and labour.
- The distinctive form and scale of the bridge has become a cultural landmark and national icon of Australia.
- For Australians, the bridge was seen as a great achievement and a symbol of hope at a time of world-wide depression.

State Heritage Values

- The bridge was the outcome of the personal vision and commitment of Dr JJC Bradfield, Chief Engineer, Sydney Harbour Bridge, City Transit and Metropolitan Railway Construction, and the leading figure in the development of Sydney's transport system in the first part of the twentieth century.
- The bridge has been in continuous use since 1932 as the main road and rail connection across Sydney Harbour. Together with the city railway system, it constituted a radical expansion of Sydney's transportation network.
- The construction of the bridge allowed a major acceleration in the growth of the northern residential suburbs of metropolitan Sydney, particularly in the post-World War II years, as well as the extension of the Central Business District into North Sydney in the 1960s and 1970s.
- The bridge approach spans provide the physical evidence of extensive urban redevelopment within The Rocks/Milsons Point precinct and the wider North Sydney precinct. Large parts of the early subdivision patterns and built forms in both of these early parts of Sydney were demolished prior to the construction of the bridge.
- The bridge approach spans and roadways (especially the Warringah Freeway at North Sydney) truncated established and homogeneous neighbourhoods, creating distinctive precincts whose landuse and built forms developed separately.
- The construction of the bridge consumed a major portion of the public works capacity and budget of New South Wales, and was a very significant undertaking for the public sector at the time.
- The bridge became an early focal point for political tensions and national celebrations, starting with the 'De Groot' incident in 1932, and more recently the 'Walk for Reconciliation' in 2000, the Sydney Olympic Games in 2000 and the annual role it continues to play as part of New Year's Eve and Australia Day celebrations.
- The SHB Movable Heritage Collection comprises a range of components and materials which are physical evidence of the construction of the Sydney Harbour Bridge, and which illustrate aspects of the technologies in use at the time. The collection also contains journals and documents which provide a historical record of the presence and activities of individual people involved in the construction of the Bridge in both Australia and England. The range of original material, such as newspaper 'special' supplements, published books and souvenir editions, as well as badges, postcards and pictures, manufactured during and following the construction of the Bridge, illustrate the role and the perceptions of the Bridge in the community at the time.
- The SHB Movable Heritage Collection includes evidence of the activities associated with the celebrations in 1982 for the fiftieth anniversary of the opening of the Bridge, a major public event in its day and an important affirmation of the singular attachment that Sydneysiders have for the Bridge, both as a public facility and as an icon of the city. The collection also contains evidence of the activities associated with the celebrations for the Australian Bicentennial in 1988.

- The SHB Movable Heritage Collection includes a range of toll collection equipment, maintenance equipment, redundant operating fittings and workshop memorabilia which provide evidence of the on-going activities carried out in regard to the Sydney Harbour Bridge and are demonstrative of the Bridge's ongoing historical and other importance to Sydney and New South Wales.
- The SHB Movable Heritage Collection comprises items that were specifically set aside for preservation as part of the record of the construction of the Sydney Harbour Bridge. Collectively the items represent the society in which the Bridge was built and the reaction of that community to the completion of the Bridge. The items associated with the Opening Day ceremonies provide a unique and original record of Sydney society in the period, illustrating elements of the organisation of the Opening Day commemorations, including the production of a range of small and personal items expressive of the human scale and of the individuals that were involved.

4.4.2 Rarity

NHL—Criterion B: The place has outstanding heritage value to the nation because of the place's possession of uncommon, rare or endangered aspects of Australia's natural or cultural history.

SHR—Criterion F: An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area).

National Heritage Values

- The scale and engineering expertise evident in the structure of the bridge is unique in Australia.

State Heritage Values

- The bridge is a uniquely important development in Sydney's transportation network.
- As it introduced a main road and rail connection across Sydney Harbour, the bridge was the single most important factor in the expansion of metropolitan Sydney north of the harbour.
- The SHB Movable Heritage Collection is a collection of rare surviving relics relating to the construction methodology, technology and materials of the bridge, assembled as part of the overall construction program, the first time in Australia that the construction of a bridge had been approached in this manner.
- The SHB Movable Heritage Collection comprises original relics of the ceremonies and celebrations for the Opening Day of the Bridge and represents a rare record of Sydney society in the period during the construction of the Bridge. It also contains rare surviving relics of the fiftieth birthday celebrations of the Bridge and of the Bicentennial celebrations in 1988.

4.4.3 Scientific/Research

NHL—Criterion C: The place has outstanding heritage value to the nation because of the place's potential to yield information that will contribute to an understanding of Australia's natural or cultural history.

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

National Heritage Values

- The bridge has the potential to contribute to the understanding of very large scale construction methods and materials of the 1920s and 1930s, especially the use of high quality structural steel.

State Heritage Values

- The bridge allows for the understanding of working conditions in the 1930s.
- The archaeological remains in Dawes Point have the potential to yield further information about the early development of this very historic area of Sydney, particularly the Dawes Point Battery and later alterations.
- The SHB Movable Heritage Collection contains original fabric elements such as the samples of original steel shavings and rivets, which provide a future opportunity for materials testing and analysis without the requirement for taking samples directly from the standing structure.

4.4.4 Representativeness

NHL—Criterion D: the place has outstanding heritage value to the nation because of the place's importance in demonstrating the principal characteristics of (i) a class of Australia's natural or cultural places; or (ii) a class of Australia's natural or cultural environments

SHR—Criterion G: An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or environments (or a class of the local area's cultural or natural places or environments).

National Heritage Values

- The bridge is representative of a conventional two-hinged arch bridge design, but of a scale and detail execution that makes it an outstanding work of engineering at the international level.
- Although completed in 1932, the bridge is substantially unaltered, retaining the clarity and integrity of the original design of the arch, pylons, approach spans and detail components.



Figure 4.1 Closing of the Sydney Harbour Bridge arch in 1930. (Source: Mitchell Library, Hood Collection DG ON4 2185)



Figure 4.2 Photograph of traffic on the Sydney Harbour Bridge taken by David Moore in 1947. (Source: National Library of Australia, PIC P2102/1-85)



Figure 4.3 Working conditions in 1949 for bridge painters. (Source: Roads and Traffic Authority)



Figure 4.4 Working conditions in 1998 for bridge painters. (Source: Roads and Traffic Authority)

- The image of the bridge in its harbour setting has become an internationally recognised emblem representing both Australia and the city of Sydney.
- The bridge is representative of a range of major public works projects undertaken in Australia and in other countries during the Depression era.

State Heritage Values

- The bridge is representative of a significant stage in the development of Sydney and associated changes in modes of transport, including the growing reliance on private motor vehicles.
- The SHB Movable Heritage Collection comprises components and materials which are representative of the technologies in use at the time and utilised for the construction of the bridge. It contains tools, instruments, documents and equipment used in the fabrication and construction of the bridge which are representative of the specialised technology of the period and which illustrate typical processes used during the manufacture, installation and testing of the bridge. The collection also comprises equipment representative of the ongoing operation and maintenance operations of the bridge, including toll collection.
- The SHB Movable Heritage Collection contains original memorabilia of the ceremonies and celebrations for the Opening Day of the Bridge, such as newspaper special supplements, published books and souvenir editions, as well as badges, postcards and pictures. This material is representative of the aesthetic and cultural context during the construction of the bridge, as well as of the media technologies and materials prevalent at the time.

4.4.5 Aesthetic

NHL—Criterion E: The place has outstanding heritage value to the nation because of the place's importance in exhibiting particular aesthetic characteristics valued by a community or cultural group.

SHR—Criterion C: An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or in local area).

National Heritage Values

- The steel arched form, Art Deco inspired granite pylons and composite approach spans create an iconic and dramatic composition that consistently evokes a positive response from observers.
- The bridge is seen as a major element of one of the most internationally recognised views of Australia and the city of Sydney, which also comprises the Sydney Opera House, the harbour and its foreshores and the city skyline.
- The bridge is a popular motif for tourist products and other items intended to portray an 'Australian' image.
- The dramatic aesthetic quality of the bridge and its setting has, since the commencement of its construction, been an inspiration to artists, photographers and film makers. It has and continues to be the subject of many works of Australian art, captured by acclaimed artists such as Grace Cossington-Smith and Roland Wakelin.

State Heritage Values

- The bridge is a monumental landmark in the centre of the city of Sydney and an important visual element in the cityscape when viewed from many key points within the city.
- The pylons and abutment towers designed by English architect Thomas Tait exhibit a sophisticated degree of Art Deco design influence comparable with other examples in Sydney and New South Wales, such as the former Maritime Services Board building and the Hyde Park War Memorial.
- The sweeping curve of the northern approach spans exhibits a dramatic aesthetic quality and is the subject of many works of art and photos.
- The consistent detail treatment of the components that make up the approaches (ie arched and flat-topped voids utilised as tenancies, retaining walls, balustrades, steps, lighting) is of a high quality and makes a major contribution to the streetscapes of Milsons Point and The Rocks/Millers Point.
- The SHB Movable Heritage Collection contains a range of items which are expressive of the precision of work and attention to detail undertaken for the construction of the bridge. The collection provides a human dimension to the bridge, highlighting the people involved in its design, manufacture and construction.
- The SHB Movable Heritage Collection comprises documentary and photographic evidence of the progressive construction of the bridge, and is illustrative of the people and fabric of Sydney at the time of its construction and opening. The collection includes documentary evidence of the style, materials and presentation of official and government invitations, certificates and programmes from the time of the completion of the Bridge.

4.4.6 Technical

NHL—Criterion F: The place has outstanding heritage value to the nation because of the place's importance in demonstrating a high degree of creative or technical achievement at a particular period.

SHR—Criterion C: An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or in local area).

National Heritage Values

- The bridge demonstrates outstanding engineering design and technical achievement, especially given the difficulties overcome in its construction. This achievement is particularly notable for a young nation that had previously not taken on a project of this scale and complexity.
- The bridge is recognised as the world's greatest example of a two-pin steel arch design, with its combination of size, load bearing capacity and the use of high quality structural steel in the construction of the arch. The bridge also contains the heaviest steelwork of its kind ever constructed. Although designed during the 1920s and 1930s, the bridge still retains excess loading capacity.



Figure 4.5 View of the Sydney Harbour Bridge arch.



Figure 4.6 View of the Sydney Harbour Bridge deck.



Figure 4.7 View of the Sydney Harbour Bridge approach spans.



Figure 4.8 View of the Sydney Harbour Bridge piers at Bradfield Park and the bridge curve.

State Heritage Values

- The approach span arches, slabs and retaining walls of the bridge are important examples of the use of in situ reinforced concrete on a massive scale, combined with the fine scale use of the material for detail components such as balustrades, step and bass relief decoration.
- The scale and design of the viaducts forming the approach spans to the bridge are notable within the New South Wales context.
- The masonry pylons and abutments of the approach spans designed by the English architect Thomas Tait exhibit a sophisticated degree of Art Deco design influence comparable with other examples in Sydney and New South Wales.
- The SHB Movable Heritage Collection commemorates the technical achievement evident in the design and construction of the Sydney Harbour Bridge. It contains steel samples, rivets, bolts and examples of the instruments utilised for the fabrication of components for the bridge. The tools and equipment used by Dorman Long Company in the fabrication and construction of the bridge are also illustrative of the processes used during the manufacture, installation and testing of the Bridge.

4.4.7 Social

NHL—Criterion G: The place has outstanding heritage value to the nation because of the place's strong or special association with a particular community or cultural group for social, cultural or spiritual reasons

SHR—Criterion D: An item has strong or special association with a particular community or cultural group in NSW (or local area) for social, cultural or spiritual reasons.

National Heritage Values

- Since 1932, the bridge has been an internationally recognised symbol of modern Australia, and its iconic shape has been used as the inspiration for countless decorative objects, ornaments and tourist products.
- The bridge is synonymous with the names of a broad range of personalities associated with either its construction or subsequent history, eg Premier Jack Lang, De Groot, Paul Hogan.

State Heritage Values

- The bridge is a focal point for cultural events and national celebrations, as exemplified by the 'Walk for Reconciliation' in 2000, the Sydney Olympic Games in 2000, the Sydney Running Festival, Bicycle NSW's Spring Cycle and the annual role it continues to play as part of New Year's Eve and Australia Day celebrations.
- As a major public work of the time, the bridge represented a substantial investment by the taxpayers of New South Wales, and the toll still paid by motorists crossing the bridge is a constant reminder to the citizens of New South Wales of the huge cost burden imposed by its construction.
- The construction of the bridge affected the lives of almost a generation of workers, and its role during the Depression as the so-called 'iron lung' which provided employment and protected workers and their families from hardship or the dole is still remembered.
- The bridge was an important factor in the pattern of growth of metropolitan Sydney, particularly in allowing the opening up of the northern suburbs for residential development.
- The SHB Movable Heritage Collection contains items which are family heirlooms and memorabilia associated with the Sydney Harbour Bridge that were collected or retained by members of the public and which would continue to be considered valuable to the families of these people.
- The bridge provides a reference point for the families and descendants of those who worked on its design and construction, its opening and subsequent operation over seventy years.
- Movable heritage items associated with the Sydney Harbour Bridge have a strong social significance for those who worked on the bridge, the staff of the RTA as the custodians of the bridge and to residents of Sydney who in the past watched the bridge being constructed and still use the bridge today.



Figure 4.9 View of NLA crowds crossing Sydney Harbour Bridge during the 'Walk for Reconciliation' in 2000. (Source: National Library of Australia PIC NL 38683/20/24a)



Figure 4.10 View of fireworks from bridge during New Years Eve celebrations in 2006-2007. The theme, "A Diamond Night In Emerald City" was created to celebrate the bridge's 75th anniversary or Diamond Jubilee in 2007. The coathanger in the display is in reference to the bridge's nickname. (Source: City of Sydney Council)

4.4.8 Association

NHL—Criterion H: The place has outstanding heritage value to the nation because of the place's special association with the life or works of a person, or group of persons, of importance in Australia's natural or cultural history.

SHR—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 (or the cultural or natural history of the local area).

National Heritage Values

- The image of the bridge in its setting, including the Sydney Opera House and the harbour, is recognised internationally as an icon of Australia and the city of Sydney.
- The bridge has strong associations with Dr JJC Bradfield, who was primarily responsible for its conception, design and construction. Bradfield was the Chief Engineer, Sydney Harbour Bridge, City Transit and Metropolitan Railway Construction and involved in a number of other engineering projects. His involvement has left a lasting legacy for Sydney and Australia.

State Heritage Values

- The construction of the bridge is also associated with the British team of engineers, Sir Ralph Freeman and contractors Dorman Long and Co. The bridge was the outstanding work of Freeman's career but his contribution was marred by a dispute with Bradfield regarding who was actually responsible for its design.
- The bridge has strong associations with the families and descendents of the workers who built it, and who recognise its role during the Depression as the so-called 'iron lung' in providing employment and protection from hardship or the dole (see Figure 4.11).
- The items in the SHB Movable Heritage Collection are memorabilia of the ceremonies and celebrations for the Opening Day of the bridge and are associated with the people from all classes who participated in the Opening Day events and activities.
- The technical items and instruments within the SHB Movable Heritage Collection were used by staff and workers associated with the construction and maintenance of the Sydney Harbour Bridge, sometimes over many years.

4.5 Statement of Significance

The following Statements of Significance summarises the National and State Heritage values of the bridge as determined under the criteria listed above.

4.5.1 National Heritage Values

The Sydney Harbour Bridge is of outstanding heritage value as a feat of bridge engineering and construction, especially for a young nation that had previously not taken on a project of this scale and complexity. Even today, it continues to be the widest long-span bridge in the world and is recognised as the world's greatest steel arch bridge because of its combination of size, load bearing capacity and the difficulties overcome in its construction.

The bridge is a symbol of national pride. At the time of its construction, it represented progress and modernity and symbolised Australia's industrial maturity, particularly as it was constructed with extensive use of Australian engineering expertise, materials and labour. For Australians, the bridge was seen as a great achievement and a symbol of hope at a time of the world-wide Depression.

The steel arched form, Art Deco inspired granite pylons and composite approach spans create an iconic and dramatic composition that consistently evokes a positive response from observers. The bridge is seen as a major element of one of the most internationally recognised views of Australia and the city of Sydney, which also comprises the Sydney Opera House, the harbour and its foreshores and the city skyline. Its iconic shape has been used as the inspiration for countless decorative objects, ornaments and tourist products.

The dramatic aesthetic quality of the bridge and its setting has, since the commencement of its construction, been an inspiration to artists, photographers and film makers. It has and continues to be the subject of many works of Australian art, captured by acclaimed artists such as Grace Cossington-Smith and Roland Wakelin.

4.5.2 State Heritage Values

The bridge is a monumental landmark in the centre of the city of Sydney and an important visual element in the cityscape when viewed from many key points around the harbour.

The bridge was the outcome of the personal vision and commitment of Dr JJC Bradfield, Chief Engineer, Sydney Harbour Bridge, City Transit and Metropolitan Railway Construction, and the leading figure in the development of Sydney's transport system in the first part of the twentieth century. It is also associated with the British team of engineer Sir Ralph Freeman and contractors Dorman Long and Co. Its construction consumed a major portion of the public works capacity and budget of New South Wales, and was a very significant undertaking for the public sector at the time.

The bridge remains synonymous with the names of a broad range of personalities associated with either its construction or subsequent history, eg Premier Jack Lang, De Groot, Paul Hogan.

The approach span arches, slabs and retaining walls of the bridge are important examples of the use of in situ reinforced concrete on a massive scale, combined with the fine scale use



Figure 4.11 View of Sydney Harbour Bridge with the Sydney Opera House in the foreground. (Source: National Library of Australia)



Figure 4.12 View looking towards the Sydney CBD from Sydney Harbour Bridge.

of the material for detail components such as balustrades, step and bass relief decoration, and the scale and design of the viaducts forming the approach spans to the bridge are notable within the New South Wales context. The masonry pylons and abutments of the approach spans designed by the English architect Thomas Tait exhibit a sophisticated degree of Art Deco design influence comparable with other examples in Sydney and New South Wales.

The bridge has been in continuous use since 1932 as the main road and rail connection across Sydney Harbour. Together with the city railway system, it constituted a radical expansion of Sydney's transportation network, and allowed a major acceleration in the development of the northern residential suburbs, particularly in the post-World War II years, as well as the extension of the Central Business District into North Sydney in the 1960s and 1970s.

The bridge approach spans provide the physical evidence of extensive urban redevelopment within The Rocks/Milsons Point precinct and the wider North Sydney precinct where large parts of the early subdivision patterns and built forms were demolished prior to the construction of the bridge. The bridge approach spans and roadways (especially the Warringah Freeway at North Sydney) truncated established neighbourhoods, creating distinctive precincts whose landuse and built forms developed separately.

The construction of the bridge affected the lives of almost a generation of workers, and its role during the Depression as the so-called 'iron lung' which provided employment and protected workers and their families from hardship or the dole is still remembered.

The bridge became an early focal point for political tensions and national celebrations, starting with the 'De Groot' incident in 1932, and more recently the 'Walk for Reconciliation' in 2000, the Sydney Olympic Games in 2000 and the annual role it continues to play as part of New Year's Eve and Australia Day celebrations.

In terms of archaeological value, the surviving standing walls at Bradfield Park have the potential to yield further information about the early residential and commercial occupation of Milsons Point, and the archaeological remains in Dawes Point have the potential to yield further information about its early development, particularly the Dawes Point Battery and later alterations.

The SHB Movable Heritage Collection is significant as a collection of relics associated with the design, construction, official opening and ongoing operation of the bridge. The collection contains the only known relics of the temporary support structure utilised for the erection of the arch steelwork, and evidence of the operations carried out in England for the construction of the bridge.

The collection includes items which are significant as representative examples of the materials, technical instruments, technical documentation, components and manufacturing outputs associated with the construction of the Sydney Harbour Bridge. It also contains examples of unique and specialised documents and objects used in association with the Opening Day social activities and celebrations, which are themselves evidence of the social customs and attitudes of the time. The collection contains exhibits which showcase the wide range of objects, activities and publications inspired by or produced in association with the operations of the Sydney Harbour Bridge throughout its history.

Some exhibits in the collection also have value as relics of their period, illustrating aspects of the social context, mores and activities of Sydney at the time of the construction of the Bridge. The SHB Movable Heritage Collection demonstrates the ways in which icons of the era were commemorated through retention of specific materials and objects, and illustrates the social importance of the Bridge at the time of construction.

4.6 Grades of Significance

4.6.1 Significance of Components

Different components of a place may make a different relative contribution to its heritage value. Loss of integrity or poor condition may also diminish significance. Specifying the relative contribution of an item or its components to overall significance provides a useful framework for decision-making about the conservation of and/or changes to the place. The NSW Heritage Office's publication *Assessing Heritage Significance* (2001) sets out terms used to describe the degrees (or grades) of significance for different components of a place (see Table 4.2 below).

Table 4.2 Standard grades of significance and their application to the SHB.

Grading	Justification	Status
Exceptional (E)	Rare or outstanding element directly contributing to an item's local and State significance.	Fulfil criteria for Local or State listing
High (H)	High degree of original fabric. Demonstrates a key element of the item's significance. Alterations do not detract from significance.	Fulfil criteria for Local or State listing
Moderate (M)	Altered or modified elements. Elements with little heritage value, but which contribute to the overall significance of the item.	Fulfil criteria for Local or State listing
Little (L)	Alterations detract from significance. Difficult to interpret.	Does not fulfil criteria for Local or State listing
Intrusive (I)	Damaging to the item's heritage significance.	Does not fulfil criteria for Local or State listing

By applying the standard gradings to the major components of the bridge, the arch, pylons and approach spans are of **Exceptional** significance and the approaches are of **High** significance. The arch and pylons are the main recognisable components of the bridge and contribute directly to its significance. Although the approach spans are less significant structurally than the arch and the pylons, they form the connection to the shores on each side and are a vital component of the bridge. The approaches are of High significance because, although subsidiary to the arch section of the bridge and of less engineering interest, they are an integral part of the bridge construction.

4.6.2 Schedule of Significance Forms and Fabric

Tables 4.3 and 4.4 provide a schedule of the bridge's significant fabric and forms. The tables have been compiled using the information extracted from Section 4.5 of the 1998 CMP.³

Table 4.3 Grading of significant forms.

Bridge Component	Grading				
	Exceptional (E)	High (H)	Moderate (M)	Little (L)	Intrusive (I)
Arch, pylons and abutments	<p>Overall form of the arch, pylons and abutments, including:</p> <ul style="list-style-type: none"> the pattern of the steel structural members; the exterior form and detail of the granite clad pylons and abutments; the clear spaces between the arch end posts and pylons; and the clear space between the deck and the water. 	The main interior configuration and spaces of the pylons and abutments.			
Approach spans	<p>Overall form of the approach spans, including:</p> <ul style="list-style-type: none"> the pattern of the steel structural members; the exterior form and detail of the granite clad piers; and the open spaces under the approach spans. 				

Bridge Component	Grading				
	Exceptional (E)	High (H)	Moderate (M)	Little (L)	Intrusive (I)
Approaches		<p>Overall form of the approaches, including:</p> <ul style="list-style-type: none"> the rendered retaining walls divided into bays; the 10 flat-topped occupancies between Middlemiss Street and Pacific Highway; the 17 bays of flat-topped occupancies in Ennis Road; the three arched occupancies in Cumberland Street; and the arch bridges over Arthur, Burton, Fitzroy, Lavender and Argyle Streets. 			
The setting	<p>Existing unobstructed views of the bridge and approach spans, including:</p> <ul style="list-style-type: none"> views of the bridge end-on from the northern and southern approach roads; views of the bridge from ground level nearby and from the water; and views of the steel structure and pylons from deck level. 				

Table 4.4 Grading of significant fabric.

Bridge Component	Grading			
	High (H)	Moderate (M)	Little (L)	Intrusive (I)
Arch and approach spans	<p>All steelwork of the trusses, lateral bracing and hangers, portal frames at end posts, floor laterals, cross girders, stringers, joists and bearings.</p> <p>Lattice steel parapets, balustrades, lighting/overhead cable supports, steel cantilever arms.</p> <p>All original access equipment, painting cranes, gantries, stairs, ladders and handrails.</p> <p>Coke concrete filling on pressed steel troughs.</p> <p>Steel curb plates, cast iron scuppers and gratings.</p> <p>Any original railway components: 'trainstop' devices, signals, signage.</p> <p>Bronze plaques.</p>	<p>Suicide fences and security barriers.</p> <p>Steel tower supporting the air navigation beacon.</p> <p>Evidence of conversion from tramway to roadway.</p> <p>Pitched-roofed sheds at mid-span.</p>	<p>Roadway crash barriers.</p> <p>Communication equipment, navigation beacons and lights.</p> <p>Wearing surfaces of road, rail, foot and cycleways.</p> <p>Railway tracks, concrete sleepers, timber transoms, overhead power cables, signalling equipment.</p> <p>Steel lamp posts with curved arms.</p>	<p>Full weight concrete over area of previous tramtracks.</p> <p>Modern light fittings on cantilever brackets.</p>
Pylons, abutments, piers and associated elements	<p>Granite facing and concrete structure of walls, piers, floors and roofs.</p> <p>Original windows and doors.</p> <p>Bronze plaques.</p> <p>Elevator in south abutment tower.</p> <p>Pylon interior stairs, handrails and balustrades.</p> <p>External sandstone and concrete stairs, handrails and balustrades.</p>	<p>Timber windows in blockhouses on top of pylons.</p> <p>World War II parapets and evidence of gun emplacements on top of pylon blockhouses.</p> <p>Evidence of the public use of pylon lookouts (eg brass direction finder on balustrade of lookout, vestiges of the Bradfield museum).</p> <p>Early fitout of pylons for maintenance staff use, including tools and machinery (more detailed survey of machinery required).</p>	<p>Recent internal alterations to pylons (eg State Rail Signals Communications Room in southwest pylon, tunnel ventilation equipment, internal roof and amenities in north tower and pylon).</p> <p>Roof over southern workshop area.</p> <p>South pylon works office and amenities from the 1960s.</p>	<p>Rust stains on pylons (mostly due to brake dust from trains).</p>

Bridge Component	Grading			
	High (H)	Moderate (M)	Little (L)	Intrusive (I)
Approaches	<p>All original structural elements supporting the railway viaducts and roadway: retaining walls, concrete arched occupancies and bridges, flat-topped beam and slab construction and dividing walls.</p> <p>Rendered architectural elements, eg walls, parapets, pilasters, spandrels.</p> <p>Old tollhouse near Argyle Street.</p> <p>Structure and original finishes of Milsons Point station.</p> <p>Bridge stairs in Cumberland Street, Observatory Hill, Ennis Road and Alfred Street.</p> <p>Date crest over both entrances to station.</p> <p>Vestiges of tram station (eg stairs).</p> <p>Bronze plaques.</p> <p>Original bridge lighting: bronze lanterns on Lavender Street bridge, cast iron lanterns and concrete posts on bridge stairs and elsewhere.</p> <p>Hickson Road retaining wall.</p>	<p>Occupancy front and rear walls, concrete canopies, steel windows and awnings.</p> <p>Internal mezzanines, services and other internal alterations.</p> <p>Original stormwater drainage systems.</p> <p>Toll booths from 1950s on north side.</p>	<p>Recent alterations to occupancies.</p> <p>Wearing surfaces of road, rail, foot and cycleways.</p> <p>Movable toll plazas, toll booths on south side.</p> <p>Toll collection office from 1970s on north side.</p> <p>Road gantries and signage.</p> <p>Flood lighting.</p> <p>Washes.</p> <p>Plant growth, dirt, water staining and lime deposits.</p>	<p>Face-fixed services, air-conditioners.</p> <p>Aluminium windows.</p> <p>Advertising on surfaces of original render.</p> <p>Paint finishes, graffiti, cement.</p>
Argyle Street substation and switch house	<p>Rendered walls, tiled roofs, steel windows, doors.</p> <p>Original internal divisions, mezzanines etc.</p> <p>Travelling crane.</p>	<p>Original electrical equipment in switch house (subject to contamination study).</p>		<p>External substation equipment.</p>

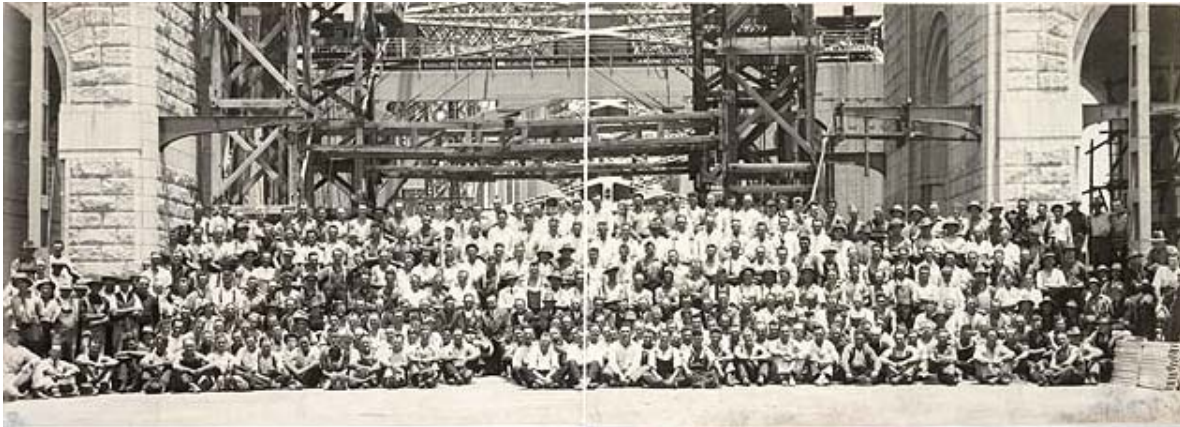


Figure 4.13 Photograph of iron workers who worked in the Sydney Harbour Bridge in 1932. (Source: Mitchell Library)

4.7 Endnotes

- ¹ Godden Mackay Logan, *Sydney Harbour Bridge Interpretation Plan*, prepared for NSW Roads and Traffic Authority, 2007.
- ² Clive Lucas, Stapleton and Partners Pty Ltd, *Sydney Harbour Bridge Assessment of National Heritage Values*, prepared for NSW Roads and Traffic Authority, February 2006.
- ³ Heritage Group, Department of Public Works and Services, *Sydney Harbour Bridge Conservation Management Plan* 1998, prepared for NSW Roads and Traffic Authority, pp 100–103.

5.0 Curtilage Assessment

5.1 Introduction

The Sydney Harbour Bridge crosses Sydney Harbour between Dawes Point in the south and Milsons Point in the north. It is listed as a heritage item under a number of jurisdictions (see Section 6.9), namely the Commonwealth Department of the Environment and Water Resources and the Heritage Council of NSW (the bridge in its entirety), the City of Sydney Council (southern approaches), North Sydney Council (northern approaches and approach spans), and the Sydney Harbour Foreshore Authority (southern approach spans). The extent to which the statutory provisions of each of these jurisdictions apply to the bridge is determined in each case by a map and, in some cases, a property description.

The 1998 CMP establishes a curtilage for the bridge in its entirety, which is divided into precincts to facilitate the ongoing management and maintenance of the bridge, including cross-referencing to other documentation. In some cases, these statutory and management curtilages overlap and there are some minor inconsistencies in their boundaries. This section of the 2007 CMP proposes a revised curtilage that is determined by the extent of land and structure that is in the ownership of the New South Wales Government.

This section of the 2007 CMP also addresses the issue of an appropriate buffer zone to protect the cultural values of the bridge within its harbour and city setting. The objective of the buffer zone is to establish a visual curtilage around the bridge, within which inappropriate development would have the potential to affect these values.

5.2 Management Curtilage

The 1998 CMP considers the bridge as a number of distinct elements which collectively constitute the bridge in its generally recognised extent. These elements are:

- the arch, deck and associated steel structure;
- the granite-clad reinforced concrete pylons;
- the steel approach spans which are supported on granite-clad reinforced concrete piers, and (on the south side) a number of sandstone and concrete stairs, handrails and balustrades; and
- the cement rendered reinforced concrete approaches, including tunnels, tenancy spaces (on the south side), substation and (on the north side) Milsons Point railway station.

The 1998 CMP divides the bridge into five precincts (attached in Appendix B) based on the breakdown of elements discussed above. This approach facilitates cross referencing to the Inventory Records document that contains specific conservation policies and basic guidelines for maintenance and minor repairs to the bridge. These precincts are:

- Precinct 1—Northern approaches including tenancy spaces and Milsons Point railway station.
- Precinct 2—Northern approach spans and pylon, located in Bradfield Park.
- Precinct 3—Arch, deck and associated steel structure.

- Precinct 4—Southern approach spans and pylon, located in Bradfield Park, plus sandstone and concrete stairs, handrails and balustrades.
- Precinct 5—Southern approaches including tenancy spaces and Milsons Point railway station.

In the period since the adoption of the 1998 CMP, the precinct-based approach to conservation policy implementation (including maintenance and minor repairs), set out in the Inventory Records document, has proved effective and has achieved broad acceptance by RTA personnel responsible for the ongoing care and management of the bridge. It is proposed that the precinct-based structure contained in the Inventory Records be retained, and that this continue to provide the basis for the ongoing care and management of the bridge until such time as it is reviewed and possibly incorporated with the proposed SHB Asset Register which is currently in preparation by the RTA.

5.3 Statutory Curtilage

Sydney Harbour Bridge, Bradfield Hwy, Dawes Point–Milsons Point, NSW was placed on the National Heritage List (NHL) in March 2007. Under the EPBC Act, any action which would be likely to have a significant impact on the National Heritage values of a place listed on the NHL requires approval of the Minister for the Environment and Water Resources.

The National Heritage List description for the Sydney Harbour Bridge, provided in Appendix A, includes the following location description.

Bradfield Highway, Dawes Point in the south and Milsons Point in the north, comprising bridge, including pylons, constructed approaches and parts of Bradfield and Dawes Point Parks, being the area entered in the NSW Heritage Register, listing number 00781, gazetted 25 June 1999, except that part of this area north of the southern alignment of that part of Lavender Street between Harbourview Crescent and Cliff Street, Milsons Point.

A map indicating this area and establishing a curtilage for the jurisdiction of the provisions of the EPBC Act is also provided in Appendix A.

The boundary of the NHL curtilage has been slightly reduced from that of the 1998 CMP, but still includes land that is not in the ownership of the New South Wales Government, such as Bradfield Park, which is owned and managed by North Sydney Council.

The 'Sydney Harbour Bridge, approaches and viaducts (road and rail)' was placed on the State Heritage Register (SHR) in 1999 (gazetted 25 June), as was 'Milsons Point Railway Station group', which includes the area bounded by the bridge approach structure and reserves surrounding it from the Burton Street underbridge to the Lavender Street underbridge (gazetted 2 April). The SHR is established under Section 22 of the *Heritage Act 1977*, and pursuant to Section 57(1) of the Act, the approval of the Heritage Council of NSW is required for any proposed development within the site including subdivision, works to the grounds or structures or disturbance of archaeological 'relics'. The boundary of the SHR curtilage is slightly larger than the area indicated in the NHL map, including not only land not in the ownership of the New South Wales Government, such as Bradfield Park, but also the area north of the NHL boundary between Harbourview Crescent and Cliff Street in Milsons Point that has been deliberately excluded from the NHL listing curtilage. The SHR database entry and curtilage map for the bridge is provided in Appendix A.

The EPBC Act has provisions for an approved management plan to be adopted and implemented for places listed on the NHL. The advantage of this approach is that the approval process is simplified and the need for duplication of approvals at the Commonwealth and State level can be avoided. Moreover,

the approved management plan is a critical component of the Bilateral Agreement process, by which the State Government, through its various agencies that own land within the NHL curtilage, might agree to manage the place so that the identified NHL values are not prejudiced.

Section 57(2) of the *Heritage Act 1977* provides for works to be exempted from the need for approval by the Heritage Council of NSW. Exemptions are of two types: standard and site specific.

Standard Exemptions, which apply to all items on the SHR, generally include minor and non-intrusive works and are subject to some qualifications. Specific Exemptions include minor works approved for places such as the SHB, and are determined in accordance with the recommendations of a CMP approved by the Heritage Council of NSW. The Specific Exemptions for works to the SHB, approved by the Minister for Planning and gazetted on 13 July 2007, are listed in Appendix E.

This 2007 CMP has been prepared to be an appropriate Management Plan for the purposes of the EPBC Act. It can also form the basis for a range of Specific Exemptions for works under Section 57(2) of the *Heritage Act 1977*. It is desirable therefore that there is consistency between the SHR and NHL curtilages and the 2007 CMP curtilage. However, as noted in Section 5.2, the CMP policies may not be enforceable in regard to parcels of land that are not in the ownership of the State Government, and therefore the CMP curtilage has been determined accordingly.

5.4 2007 CMP Curtilage

The 2007 CMP curtilage map is shown in Figure 5.1. It is based on the map included in the 1998 CMP, but excludes those parcels of land not in the ownership of the NSW State Government (particularly Bradfield Park).

The curtilage map is not consistent with that of the SHR map or the NHL map, notwithstanding that, as discussed in Section 5.3, it would be preferable for this to occur. If 2007 CMP were to be used as the basis of a Bilateral Agreement between the New South Wales and Commonwealth Governments to facilitate the approval process under the EPBC Act, it would be administratively advantageous for the SHR and NHL curtilages to be revised so that they are consistent with that of the CMP. Whether or not the curtilages are brought into alignment, the jurisdiction of the Heritage Act will continue to apply to protect the cultural values of the bridge within the SHR curtilage, irrespective of the ownership of the land.

5.5 2007 CMP Setting

The bridge in its setting is one of the most internationally recognised views of Australia and the City of Sydney. The setting includes such other iconic elements such as the Sydney Opera House, the city skyline, and the harbour and its foreshores. The steel arched form, Art Deco inspired granite pylons and composite approach spans create an iconic and dramatic composition that consistently evokes a positive response from observers.

Views of the bridge, because of its scale and pivotal location across a narrow section of Sydney Harbour adjacent to the most intensively developed area of Sydney, are available from many key points around the harbour and its hinterland. The protection of these views is an essential component of the overall strategy for conserving the cultural values of the bridge. Inappropriate development within this setting, dependent upon the type and location of the development, has the potential to affect these values.

The listing of the bridge on the SHR and the NHL provides statutory protection for the bridge and its component parts. The main instrument for the protection of the bridge setting is the *Sydney Regional*

Environmental Plan (Sydney Harbour Catchment) 2005 (NSW) (the REP). The 'Sydney Harbour Bridge, approaches and viaducts (road and rail)' is listed as a heritage item on the REP (Item 67), and the provisions of the REP therefore apply to the bridge. In particular, Division 2 of the REP requires that the

...matters to be taken into consideration in relation to the maintenance, protection and enhancement of views are as follows: ... (b) development should minimise any adverse impacts on views and vistas to and from public spaces, landmarks and heritage items ... (Cl.28).

The REP curtilage extends from the entrance to Sydney Harbour in the east to Parramatta in the west, and includes land that varies in its distance from the harbour shoreline. Notwithstanding the extent of locations around the harbour and its hinterland from which views of the bridge are possible, the setting map attached at Figure 5.2 outlines that section within the REP curtilage within which inappropriate development could impact upon the cultural values of the bridge in its setting, and where the provisions of the REP that apply to 'impacts on views and vistas to and from ... heritage items' should be rigorously applied.

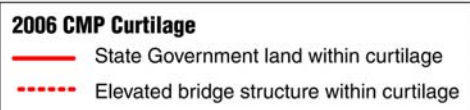
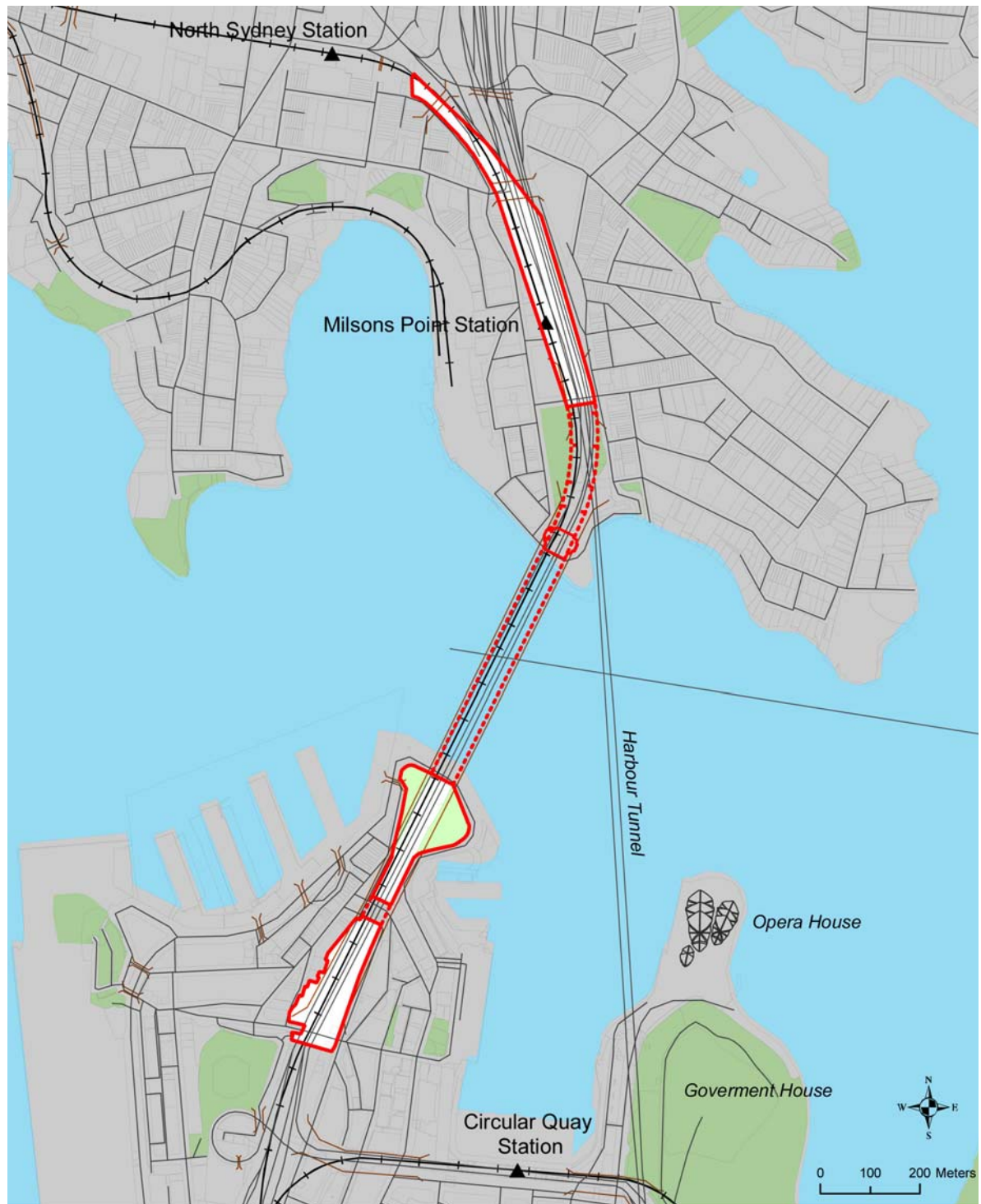


Figure 5.1 Sydney Harbour Bridge Curtilage Map. (Adapted from the Sydney Harbour Bridge, approaches and viaducts map, produced by the Heritage Division, Department of the Environment and Heritage, 2006)

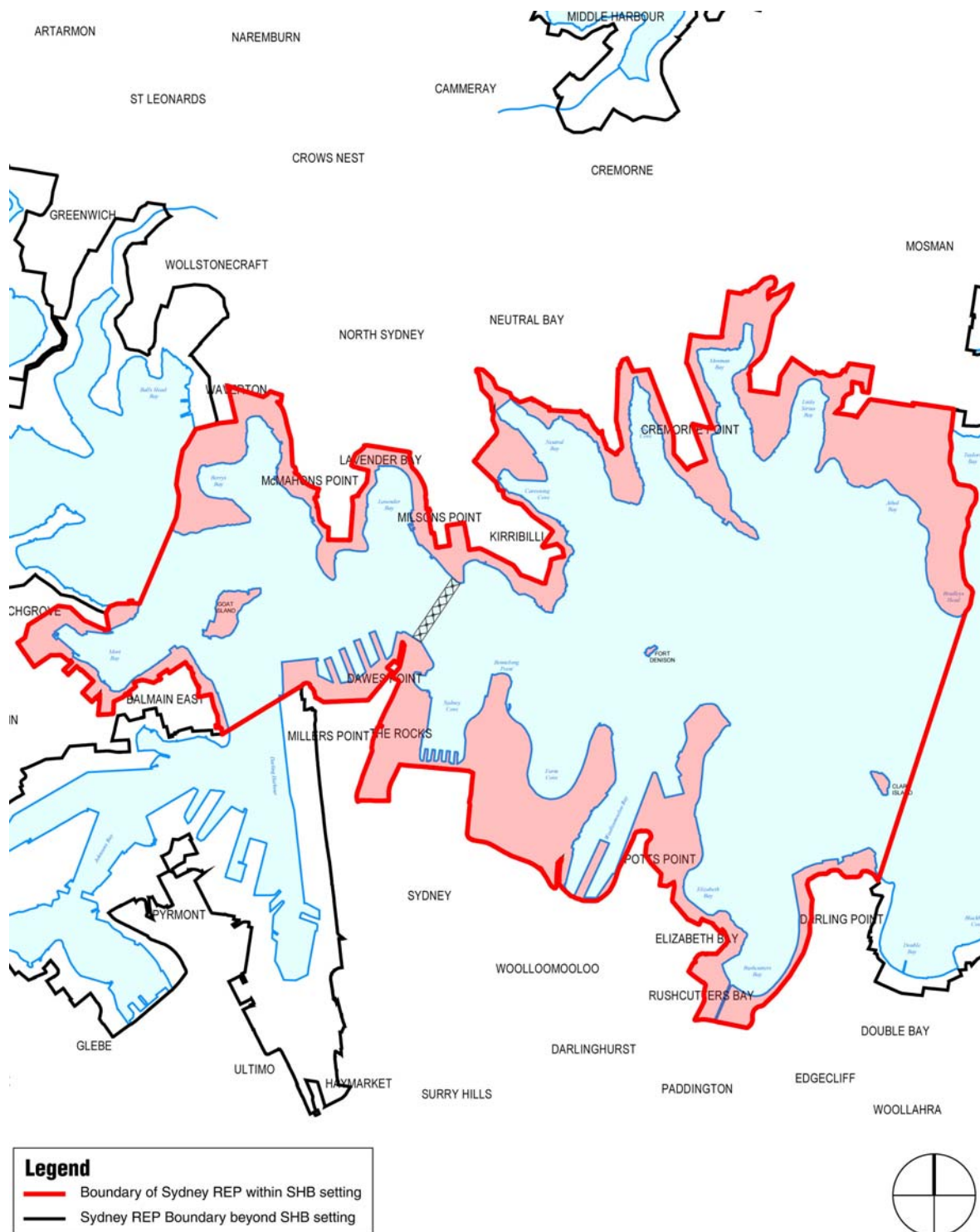


Figure 5.2 Sydney Harbour Bridge Setting Map. (Adapted from the Sydney Regional Environmental Plan (REP) Foreshores and Waterways Area Map, Sheet 3 of 5. Department of the Infrastructure, Planning and Natural Resources, 2005)

6.0 Constraints and Opportunities

6.1 Introduction

The National and State Heritage values of the Sydney Harbour Bridge described in Section 4.0 result in constraints and opportunities that may apply to the future use and management of the SHB, and must be taken into account in the ongoing conservation and maintenance of the bridge.

The following sections outline the principal heritage constraints and opportunities which may arise from relevant state and local legislation, as well as the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth). Other constraints and opportunities that may be due to legislative compliance are also briefly outlined. Potential constraints and opportunities will arise from the following:

- heritage values/significance;
- ownership;
- commercial tenancies;
- security, safety and access;
- operational requirements;
- physical condition and maintenance;
- statutory requirements; and
- interpretation.

6.2 Constraints and Opportunities Arising from Significance

The following statements are not conclusions or recommendations but, rather, observations relevant to the circumstances of the site and matters that require consideration and resolution.

6.2.1 Generally

The establishment of requirements for the retention of the heritage significance of the bridge is the essential first step in the development of both an overall conservation policy and more detailed, individual conservation policies. These requirements are based on the aspects of significance identified in the Statement of Significance set out in Section 4.0 of this CMP, as well as the more detailed assessments set out in the various heritage listing forms included in Appendix A.

The future conservation, development and ongoing management of the SHB should take account of constraints arising from the identified heritage values of the site and its setting. Opportunities to retain, reinstate and interpret these heritage values should also be investigated and implemented, particularly where they can be integrated into the daily use and ongoing care of the place. Other obligations that arise from the assessed heritage values of the place are:

- The physical evidence of the bridge, including its current setting, should be retained and conserved.

- The many historical associations of the place—with people, processes and events—should be maintained and be able to be interpreted.
- Archaeological resources, both above and below ground, and collections of artefacts and records should be protected and conserved.
- Records and other information, such as oral histories and employee reminiscences, should be recognised as important elements of the place and appropriately maintained and managed.
- Interested persons and organisations, such as the family of former labourers involved in building the bridge and local residents, should be encouraged to be involved in the care and conservation of the place.
- The history and significance of the place should be interpreted to visitors and communicated to the wider community.

6.2.2 Conservation Principles

Protection of the heritage significance of the place should accord with the principles of *The Burra Charter: The Australia ICOMOS Charter for the Places of Cultural Significance 1999*. The Burra Charter provides specific guidelines for physical and procedural actions that should occur in relation to significant places. The Burra Charter is provided in full in Appendix B; however, particular measures relevant to the place include:

The maximum amount of significant fabric, uses, associations and meanings should be preserved and conserved.
(Article 3, Burra Charter)

Works to the fabric should be planned and implemented taking into account the relative significance of the elements of the place. Unavoidable intervention should be carried out on elements of lesser significance in preference to those of higher significance. Alterations to interior spaces, such as removal of original finishes, partitioning or construction of new openings and installation of new services should be carried out in spaces of lesser significance to those of higher significance. (Article 5.2, Burra Charter)

Uses should, if possible, be related to the cultural significance rather than uses that do not take advantage of the interpretative potential of the place. (Article 7, Burra Charter)

The proponent should engage an experienced conservation practitioner at an early stage of any proposal that is identified as having the potential to result in a heritage impact. In this way the heritage constraints and opportunities can be identified from the outset and an appropriate approach developed that is consistent with the Burra Charter methodology. The conservation practitioner should continue to provide advice throughout the project and the extent of intervention for existing site components, fabric, and visual and functional relationships should be related to the assessed level of significance, as set out in Section 4.6.

6.3 Ownership

6.3.1 RTA Land

Ownership of the bridge and approaches is vested with the Roads and Traffic Authority (RTA)¹, with the exception of the area of land under the control of the Sydney Harbour Foreshore Authority (addressed in Section 6.3.2). Although the RTA's Asset Management Branch (Sydney Region) is the nominal

manager of the bridge, responsibilities for major bridge operations are divided between various branches of the RTA and RailCorp as follows:

- Property Services and Land Information Branch—the fabric belonging to all the leased occupancies below the approaches to the bridge, ie front and rear walls and internal subdivisions, but not internal fitout;
- Public Relations Section—internal fabric of the pylon lookout;
- Sydney Harbour Bridge Toll Office—toll booths and administrative buildings;
- Sydney Harbour Bridge Traffic Management—old toll office, which is now used for traffic surveillance and control;
- Environment Branch—care of the bridge as an item of environmental heritage; and
- RailCorp—the railway system (two tracks) across the bridge and old tram tunnel and the south approach electrical substation building.

The RTA's corporate commitment to environmental heritage is embodied in its Policy for the Management of Heritage Items:

To ensure that the Authority identifies and takes appropriate action in relation to all heritage items which it affects; that the Authority identifies and manages all heritage items which it owns or for which it has care and control; and that the heritage significance of the Authority's assets is established and maintained; in accordance with the requirements of relevant NSW and Federal legislation.²

A management position responsible for the bridge as a whole has been established within the RTA, with overall responsibility for all work affecting the bridge, however minor. As has been the case historically, a variety of proposals for change will continue to emanate from different stakeholders (both RTA sections and from other sources), but a single manager or management unit will coordinate and implement the correct procedure to be followed in each case.

6.3.2 Sydney Harbour Foreshore Authority

The Sydney Harbour Foreshore Authority (SHFA) is one of the biggest landholders in Sydney and manages over 400 hectares. Its land holdings include the major precincts of The Rocks and Darling Harbour, as well as foreshore sites in Pyrmont and Ultimo, Rozelle and Ballast Point. SHFA is responsible for the management of some of 'the most valuable, prestigious and historically significant harbour foreshore land in Sydney'.³

With regard to the Sydney Harbour Bridge, SHFA controls all the land surrounding the Bradfield Highway and Western Distributor roads on the southern side of the harbour, including the Dawes Point Battery archaeological remains on Hickson Road, The Rocks, which is listed on the State Heritage Register. The heritage listings for the Dawes Point Battery site are provided in Appendix A.

As the custodian of The Rocks, SHFA is required to maintain and conserve existing and potential archaeological sites, landscapes, buildings and movable heritage in their landholdings, and oversee the following issues:

- *The development and maintenance of the precinct for a sustainable future.*
- *Urban design, retail mix and customer relationship with all retail, commercial and residential tenants.*

- *Preservation of its heritage buildings.*
- *Creation and development of its events.*
- *Marketing.*
- *Management of its operation and capital costs and revenues.⁴*

The conservation policies in this CMP take into account the requirements for SHFA in regard to its landholdings and responsibilities to land that falls within the curtilage of the bridge.

6.3.3 Section 170 Obligations

Section 170 of the *Heritage Act 1977* (NSW) requires government agencies to list items of environmental heritage under their ownership. A number of items related to the Sydney Harbour Bridge are included in the Heritage and Conservation Registers of the RTA and the SRA (these items are listed in Section 1.3). Further requirements under the Heritage Act are discussed in Section 6.9.2.

6.4 Commercial Tenancies

Although the southeast pylon lookout was once leased and operated as a shop, post office and café, it is currently operated as the SHB museum and lookout, managed by BridgeClimb, and is the only publicly accessible pylon. The other areas of the bridge currently being leased by the RTA for commercial uses include:

- the ten bays in Middlemiss Street;
- properties on the western side of Ennis Road between property numbers 2 and 22;
- a carpark at Blue Street, North Sydney;
- four shops on the pedestrian concourse of Milsons Point Railway Station (owned by the RTA but under the control of RailCorp);
- all the bays in the southern approaches; and
- four licenses to telecommunication carriers for installation on the SHB.

Consideration must be given for new (commercial or non-commercial) uses that facilitate public engagement with the cultural heritage values of the bridge and do not impact on either the integrity of its original design or significant fabric, or its operational and security requirements. Policies are also required to control the extent of change allowed to tenancies and whether certain changes can be exempt.

Situated under the approaches, the bays are leased to shops, offices and workshops. The commercial tenants who occupy the various bays leased by the RTA are responsible for the maintenance of the spaces they lease. Maintenance and capital works responsibilities need to be clearly established between the RTA and tenants, so that ongoing maintenance and repair is adequately undertaken. It would be appropriate that the RTA monitor the condition of the bays and contribute to ongoing repairs to the basic structure of the arches and external front and rear glazed walls as required, in order to maintain the general condition of the bays as important components of the bridge overall.

6.5 Security, Safety and Access

The SHB is an access corridor shared by road and rail users, pedestrians and cyclists, all in relatively close proximity. Other users of the bridge include tourists, employees of the Pylon Museum, BridgeClimb, RailCorp, RTA, and other appropriate maintenance authorities.

Providing appropriate and safe access for all these users is central to the function of the bridge. With more rigorous safety standards and increasing security concerns, suitable policies and procedures are required to ensure that the conservation of the heritage values of the bridge are balanced with the need for the bridge to evolve with the changing environment. Policies and procedures established will need to recognise that the safety and security of the bridge and its users is of highest priority.

Specific requirements and issues associated with security, access and safety are discussed below.

6.5.1 Security Requirements

The increasing security concerns that prevail at any major public asset such as the SHB require that additional measures be put in place to ensure the security of both the bridge itself and its users. In 2006, work was undertaken by the RTA and RailCorp to upgrade security on the cycleway on the western side of the bridge. The project included the installation of full height fencing from Milsons Point station to the Argyle portal and emergency exits at a spacing of 90 metres along the rail corridor. The fencing was required to deter unauthorised access to the roadway, railway and bridge steelwork, and the emergency exits were required for the safe exit of workers and passengers in the event of an emergency in the rail corridor.⁵

Further security upgrades will be required on an ongoing basis as part of the continuing operation of the bridge. The management of the bridge must reflect the provision of security as integral to the protection of the users of the bridge, the bridge as an asset, and the cultural heritage values of the bridge.

Policies must ensure that the adequacy of the security arrangements is assessed on a regular basis.

It is also necessary that the design, discussion and implementation of some security procedures and installations for the bridge that information regarding these issues is not placed in the public domain. Discussion of the heritage



Figure 6.1 North approach shops on Ennis Road, Milsons Point. (Source: Mitchell Library – Home and Away 14920)



Figure 6.2 BridgeClimb tenancy in southern approach bays.

impacts of proposed security measures on the bridge must be treated in a confidential manner where an open process could increase the security risk.

The conservation policies should adequately reflect these requirements and include provisions for employee and visitor access to vital areas of the bridge as required. Reference should also be made to the internal RTA Critical Infrastructure Security Masterplan document.

6.5.2 Access Requirements

Pedestrians crossing the bridge do so via the designated walkway on the eastern side of the bridge, and cyclists use the cycleway on the western side. While the separation provides a solution to the safety issues associated with sharing of walkways by both cyclists and pedestrians, it limits opportunities to view and appreciate the harbour from both vantage points. Opportunities for the shared use of walkways by cyclists and pedestrians need to be considered so that these key views can be shared by both groups. However, consideration of shared facilities should be governed by the safety of both user groups as well as the feasibility of providing a path width commensurate with existing and future uses.

The connections to the approaches and the bridge facilities need to be more clearly defined. Opportunities to improve directional and information signage along the walkway and cycleway as well as the areas immediately adjacent to the bridge are necessary. Currently, signs advising the function of the walkway and cycleway are limited to the commencement of each route and visitors that find themselves on the wrong side of the bridge are unable to conveniently cross to the correct walkway.

Opportunities to improve access for wheelchairs, prams and cyclists should be investigated. Currently, there is no ramp at the northern end of the cycleway and although the cycleway has a ramp at the southern end, these ramps do not comply with the minimum standards as they are too steep and too narrow. Consideration has been given to the construction of a ramp at the northern end of the cycleway that could also provide for wheelchair access. This would mean that the existing southern ramp would require significant alterations to meet relevant standards. There would also be inherent dangers associated with cyclists and wheelchairs (and possibly their carers) sharing the cycleway if the path is not properly designated.

In mid-2006, as part of requirements to upgrade security and safety, the cycleway was narrowed to a width of 2.5 metres. Works undertaken for increased safety, security and access need to be considered together within the same context and solutions developed comprehensively. Opportunities to link with existing bike plans and footpaths in Sydney City Council and North Sydney Council should also be considered. In this way, alterations and additions that may impact on the integrity of the bridge's fabric and form can be minimised.

6.5.3 Safety

The safety of workers and users of the bridge needs to be ensured at all times. With more stringent safety requirements, changes and upgrades will be required which have the potential to diminish the integrity of the bridge. For example, an integral part of the original bridge fabric is the original access equipment provided for bridge maintenance, including the cranes, gantries and ladders. Whilst important examples of 1930s engineering technology, despite modifications some of the equipment either fails to comply with modern work practices or is difficult to use efficiently. In 1997, four new arch cranes were commissioned, and a new access lift was installed, leaving much of the equipment redundant. A procedure is required to not only manage the commissioning of new equipment but also to determine what redundant equipment can be removed. The policies will also need to address what historically significant equipment would need to be conserved as vital components of the bridge's fabric.

In all cases, the form and fabric of alterations and additions should be carefully selected and be of a similar design to those functional devices already on the bridge, in order to minimise adverse effects upon the significance of the place.

6.6 Operational Requirements

Subject to State and Commonwealth legislation governing areas such as motor traffic and transport, heritage and telecommunications, a number of operational constraints arise from RTA's primary role of keeping the road system across the SHB operating efficiently. Activities which form the basis of traffic and transport management include the:

- provision and operation of movable medians;
- provision and replacement of overhead lane indicators and lights;
- pavement marking and general signposting;
- toll collection;
- removal/re-arrangement of the toll booths and the introduction of cashless toll booths;
- collection of automated and manual traffic data;
- identification of special purpose lanes such as the existing bus lane;
- installation and maintenance of Intelligent Transport Systems (ITS), Closed Circuit Television (CCTV) and Variable Message Signs (VMS); and
- tow truck and patrol operations.

Apart from the bridge's structural function in supporting the transport systems, the fabric directly affected by operational requirements listed above is mainly confined to deck level elements such as signage and toll collection. As these elements tend to be upgraded regularly, they have potential implications for the heritage values of the bridge where those works affect the overall form of the structure, or where it involves changes to those parts of the fabric listed as having a certain degree of significance.



Figure 6.3 View of main span gantry adjacent to walkway on the eastern side of the bridge.



Figure 6.4 View of lane status gantry built in the 1990s.



Figure 6.5 View to the eastern side of the bridge of security fencing used on walkway.



Figure 6.6 View of additional walkways constructed as part of bridge access for BridgeClimb.



Figure 6.7 View of original system of collecting tolls (Source: Mitchell Library—Home and Away 5251).



Figure 6.8 View of current system of collection tolls.



Figure 6.9 View of pedestrian plaza area beneath the northern abutment of the Sydney Harbour Bridge at Bradfield Park.

Current activities that need to be maintained on the bridge that do not relate to traffic management include:

- licence arrangements with telecommunication companies with antennae and cable facilities on the bridge;
- use of radio antennae to monitor security on the Sydney Ferries;
- use of the northern pylons to house the ventilation stacks for the Sydney Harbour Tunnel;
- use of the walkways by pedestrians and cyclists;
- use of the bridge by RailCorp, who maintain the railway system across the bridge; and
- use of the bridge for local and national celebrations.

6.6.1 Change of Use

Since 1932, there have been some significant alterations to the traffic lanes, toll collection and traffic control on the bridge deck in response to increases in traffic volume and measures to accommodate this such as the replacement of the tramways in 1958 and the creation of bus lanes in 1972. The approaches have also been very significantly modified by the connection with the Cahill Expressway in 1958 and the Warringah Expressway in 1968. RailCorp and the RTA, as part of their operations and with new technologies, will continue to expand, upgrade and enhance infrastructure, which may impact upon the significance of the bridge. For example, RailCorp would need to upgrade the rail sleepers and there may be a need to incorporate bus transit lanes in the future. Appropriate policies need to be formulated to guide the decision making process for these types of changes.

Similar procedures should be developed to deal with proposals for new uses into prominent parts of the bridge fabric. As stated in the previous 1998 CMP, 'any such scheme should be examined not only in terms of its impact upon the bridge's significance but also for its compatibility with the use of the place'.⁶ Examples of compatible uses include the introduction of a museum about the bridge in the southeast pylon, and the introduction of BridgeClimb in 1998, which allows for small escorted groups clipped to a safety cable to climb the bridge. Minor alterations were made to the bridge to allow for this later use including an opening in the southeast abutment, the construction of additional walkways and the installation of safety cables.

Clear policies that relate to the assessed level of significance set out in Section 4.6 are required to define the tolerance of change. In all cases of change, the policy implementation process should take into consideration the original design of the bridge as well as the impact upon significant fabric.

6.6.2 Signs and Other Accretions

Policies and guidelines will need to be formulated to ensure that signs and other accretions do not adversely impact upon the heritage values of the bridge. In addition to the potential to diminish the aesthetic significance of the bridge, additions to the bridge fabric, whether to the masonry or steelwork, could cause physical damage through their fixings etc. Attention should also be given to the possible accumulative impacts of changes to the aesthetics of the bridge.

The bridge is already used as a support for items such as mobile phone aerials, telecommunications cables and other services. Under the EPA Act, the RTA has a process in place to assess the potential heritage impact of proposed works prior to implementation. The heritage impact of any further fixing of permanent to semi-permanent equipment to the bridge should be thoroughly assessed.

The use of the bridge for commercial advertising signage or other installations is not fundamental to its function or heritage significance. An approach that prohibits commercial advertising on the bridge is warranted.

6.7 Physical Condition

6.7.1 Maintenance Requirements

As described in the 1998 CMP:

... compared with modern engineering practice, the bridge is a high maintenance structure composed of many thousands of individual steel sections connected by means of millions of rivets. In the marine environment of Sydney Harbour it must be recognised that the inspection and maintenance of such a structure will always be a demanding and labour-intensive operation.⁷

The RTA has an established comprehensive maintenance program, which addresses general bridge maintenance requirements such as painting, road maintenance and the protection of the steelwork from corrosion etc. The program also incorporates constant inspection and the involvement of a variety of tradespeople including ironworkers, boilermakers, fitters, electricians, plasterers, carpenters, plumbers, riggers and painters. Opportunities for co-operative maintenance programs with the City of Sydney and North Sydney Council should be considered. This would ensure a consistent approach to maintenance and potentially provide economic benefits. For example, if the RTA was to consider improving lighting requirements on the bridge, they should check if the City of Sydney or North Sydney Council have an existing lighting strategy that could be implemented at SHB. Alternatively, if road closures were planned by the Council for maintenance works near the bridge, opportunities to minimise disturbances to the public could be achieved if the RTA carried out necessary work in that vicinity at the same time.

The control of drainage needs to be managed more appropriately in the maintenance program as uncontrolled drainage has become an increasingly serious problem as it is affecting the integrity of the bridge's fabric in the vicinity of areas such as the stonework in The Rocks.



Figure 6.10 View of efflorescence caused by water penetration into the masonry capillaries of the southern approach bays.



Figure 6.11 View of problems to stonework in The Rocks caused by uncontrolled drainage from the southern approach spans.



Figure 6.12 View of a work platform on the southern approach spans used as part of repainting works. (Source: Roads and Traffic Authority)



Figure 6.13 View of work platform specially designed to move along the approach spans. (Source: Roads and Traffic Authority)

6.7.2 Painting

When the bridge was erected, protection of the steelwork was ensured through painting, depending upon:

... the careful application of a number of coats of red primer and top coats inside and outside the members. In the workshop all surfaces of the members, including contact surfaces, were given at least one coat of red lead. On site, at least two further top coats were applied of a grey paint with a high lead content.⁸

Since then, maintenance of the steelwork has been undertaken through a strategy of spot repair and overall repainting. Red lead primer was used up until 1985 when the environmental and health hazards associated with the use of lead paints made their continual use unacceptable. Currently, repainting utilises two paint systems, both of which make use of zinc based primers.

Nevertheless, the task of maintaining the bridge has become increasingly difficult due to:

- the lead paint already on the bridge;
- the fact that there is a limit to the thickness of paint that can be applied to a surface before it starts to fall off under its own weight; and
- the fact that each new coat of paint adds to the dead load on the bridge structure.

In March 2003, the RTA commenced the progressive removal of existing lead-based paint and the application of a replacement high performance paint system to all steel members of the southern approach spans. The removal of the existing paint was achieved by an abrasive blasting process within fully self-contained work platforms suspended under the deck level which allowed for access to the steelwork, the control of noise and the safe removal of lead waste. Attached to each platform were air compressors and other equipment. The work platforms were designed to move along the approach spans as each section of work was completed. The need for full repainting (including the removal of existing layers) will need to be considered in the future for the remaining sections of the bridge.

Policies are required to ensure that the colours and types of paint used on all areas of the bridge are appropriate. The use of paints with anti-graffiti properties is an important maintenance strategy, but it is important that these do not affect the integrity of the fabric.

6.7.3 Ageing Fabric

Although the bridge is maintained in excellent structural condition, a growing concern which needs to be addressed is the ageing fabric of the bridge, particularly the cement render used on the masonry abutments adjacent to the approach spans on both the northern and southern sides of the bridge. Management of ageing fabric should be seen as an ongoing process and its incorporation into the maintenance program is essential to prevent ad-hoc repairs from occurring. A procedure for continual monitoring of the bridge's fabric and to maintain the integrity of the fabric is essential. Previously, sections of the original deck have been replaced with normal weight concrete. This may have long-term implications on the dead load of the bridge. It is important that these types of issues are considered during maintenance works and in conservation policies, which should also be related to the assessed level of significance, as set out in Section 4.6.

6.7.4 Asset Management Register and Record Keeping

In the period since the adoption of the 1998 CMP, conservation policy implementation (including maintenance and minor repairs) has been based on the Sydney Harbour Bridge Conservation Management Plan—Inventory Records 1997. This approach has proved effective and has achieved broad acceptance by RTA personnel that are responsible for the ongoing care and management of the bridge. It is proposed that the precinct-based structure contained in the Inventory Records be retained and that they continue to provide the basis for the ongoing care and management of the bridge until such time as it is reviewed.

The RTA is currently preparing an Asset Register for the bridge, which is expected to be completed in 2007. The register would supplement, or be subsumed into the Inventory Records document, using the same asset numbering system and will include all non-heritage assets such as mechanical equipment, utilities and new gantries. The boundary for the register incorporates the area used to develop the Inventory Records document, but may be extended further south to take into account the viaduct over the Circular Quay tunnel cutting and retaining walls.



Figure 6.14 View of stone deterioration beneath the southern approach spans.



Figure 6.15 View of the old tram tunnels.



Figure 6.16 View of interpretation facilities in the Pylon Museum.



Figure 6.17 Repainting of the bridge—an opportunity to provide interpretation facilities during maintenance works.

A condition rating system incorporated into this register would assist in maintenance planning. The RTA maintains works records and it would be appropriate to incorporate these into the register, particularly useful information such as:

- when the component or item was last inspected or repaired or had work undertaken;
- who supplies and installs the replacement component or part and its specifications;
- what approvals need to be obtained before any works commence; and
- reference to the associated Inventory Records sheet and/or conservation policies in the CMP.

The register would include work procedures that are essential to the ongoing management and maintenance of the bridge. The register would need to be regularly updated and accessible by key members of the SHB Asset Management team.

Any photographs taken associated with works on the bridge should be lodged with the RTA photo library and included in the register if considered appropriate or useful.

6.8 Interpretation Opportunities

An Interpretation Plan⁹ for the bridge has been prepared and should be implemented as opportunities arise. There is significant opportunity to further develop interpretation facilities at the bridge. In the past, interpretation has been lacking in the following areas:

- the relationship between the SHB and the adjacent areas (The Rocks and Millers Point);
- the contemporary social significance of the bridge, such as its public and private uses (fireworks, weddings etc);
- old tram tunnels; and
- the cultural diversity of visitors to the bridge.

There are also opportunities to use interpretation during major maintenance works. This would allow for the explanation of the issues associated with the conservation and maintenance of the bridge. For example, the removal of lead red paint and repainting of the bridge necessitates the blockage of part of the bridge walkway. The installation of signage or similar

interpretive devices would help to communicate to the public the significance of the works and the problems associated with the maintenance and conservation of the bridge.

6.9 Statutory Requirements

6.9.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* establishes an environmental and heritage assessment and approval system that is separate and distinct from state systems.

National Heritage Listing

The bridge was placed on the National Heritage List (NHL) in March 2007. Under the EPBC Act, anyone undertaking actions which are likely to have a significant impact on the National Heritage values of a place listed on the NHL requires approval of the Minister for the Environment and Water Resources.

The EPBC Act also has provisions for an appropriate management plan to be adopted and implemented for places listed on the NHL. This CMP is an appropriate Management Plan for the purposes of the EPBC Act.

If a place listed on the NHL is under private or state ownership, the Commonwealth Government may enact powers of protection under the EPBC Act where it has the appropriate constitutional power to do so. Places may otherwise also be protected under state legislation (through a bilateral agreement) or under a conservation agreement with the Commonwealth. The NHL database report and plan are provided in Appendix A.

Register of the National Estate

The Register of the National Estate (RNE) has been retained as an indicator of heritage values and is maintained by the Australian Heritage Council. Section 391A of the EPBC Act requires that any decision made under the EPBC Act must have regard to the listing of an affected place on the RNE. The EPBC Act also specifically states that a place on the RNE is included in the definition of environment, and so the heritage values addressed in the RNE listing for the bridge still place some obligations on the RTA under the EPBC Act. However, the RNE will cease to be statutory heritage list in 5 years from the commencement of the amendments to the EPBC Act which were enacted in February 2007.

The Sydney Harbour Bridge, Bradfield Hwy, Sydney, is listed on the RNE as a Registered Place.

6.9.2 Heritage Act 1977 (NSW)

The *Heritage Act 1977* (NSW) includes a range of provisions for identifying and protecting items of environmental heritage. In addition to the establishment of the State Heritage Register, a list of items assessed as being of 'State' significance, these provisions include Interim Heritage Orders, Orders to Stop Work, State Authority Registers (Section 170) and 'relics' provisions.

State Heritage Register Listing and Heritage Council of NSW Approvals

The State Heritage Register (SHR) is a list of heritage items of particular importance to the people of New South Wales. It includes items and places (buildings, works, relics, movable objects or precincts) of State heritage significance endorsed by the Heritage Council of NSW and the Minister.

'Sydney Harbour Bridge, approaches and viaducts' is included on the SHR (gazetted 25 June 1999), as is 'Milsons Point Railway Station group', which includes the area bounded by the bridge approach structure and reserves surrounding it from the Burton Street underbridge to the Lavender Street

underbridge (gazetted 2 April 1999). The SHR is established under Section 22 of the Heritage Act, and pursuant to Section 57(1) of the Act, the approval of the Heritage Council of NSW is required for any proposed development within the site including subdivision, works to the grounds or structures or disturbance of archaeological 'relics'. The SHR database reports and map are provided in Appendix A.

The Heritage Act requires the minimum standards of maintenance and repair apply to items included on the SHR to ensure that heritage significance is maintained. These standards are set out in the *Heritage Amendment Regulation 1999*, and relate to weatherproofing, fire protection, security and essential maintenance.

Exemptions from Heritage Act Approval

Section 57(2) of the Heritage Act provides for a number of Exemptions to Section 57(1) approval requirements. Exempted development does not require prior Heritage Council of NSW approval, nevertheless an exemption notification form needs to be completed and submitted to the Executive Director of the Heritage Office, Department of Planning. Exemptions are of two types: Standard and Specific.

Standard Exemptions which apply to all items on the SHR generally include minor and non-intrusive works and are subject to some qualifications in some instances. Typical exempt works include maintenance (to buildings and gardens), minor repairs and repainting in approved colours. The Heritage Council of NSW's current Standard Exemptions are provided in Appendix D. Standard Exemptions do not apply to the disturbance, destruction, removal or exposure of archaeological 'relics'.

Specific Exemptions include those works specifically approved for a site on the SHR. There are a number of gazetted Specific Exemptions for works to the bridge which, when carried out in accordance with the recommendations of a CMP, do not require approval by the Heritage Council of NSW.

In summary, these works include:

- maintenance and minor repair works:
 - related to the function and operation of the bridge as a transport and services corridor;
 - related to the function of the bridge, such as drainage, road modifications and traffic management;
 - associated with ongoing security requirements of the bridge; and
 - associated with the structural integrity of the bridge;
- temporary works necessary for enhancement, maintenance or upgrade works;
- installation of signage not being for commercial or advertising purposes;
- temporary and reversible works for the operation of special events;
- maintenance of roadways, footpaths, parklands and vegetation;
- minor subdivision;
- change of use (from approved uses to similar permissible uses); and
- minor security works that need to remain confidential, and which would be approved by the Executive Director of the Heritage Office, Department of Planning.

The full list of gazetted Specific Exemptions for the Sydney Harbour Bridge, as approved by the NSW Minister for Planning in July 2007, is provided in Appendix E.

Additional applications for Specific Exemptions may be made to the Heritage Council of NSW for particular works or activities in certain areas of the site and/or for some or all of the works specified in a CMP which has been endorsed by the Heritage Council of NSW.

Section 170 of Heritage Act

Section 170 (S170) of the Heritage Act requires government agencies to identify, conserve and manage heritage assets owned, occupied or managed by that agency. S170 requires that the government agencies keep a register of heritage items (Heritage and Conservation Register). The progress of agencies in preparing registers and managing their heritage assets is monitored by the Heritage Council of NSW.

In accordance with the Heritage Act, the RTA has established a Heritage and Conservation Register to record all heritage items in its ownership or under their control, including the following items:

- Sydney Harbour Bridge, approaches and viaducts;
- Sydney Harbour Bridge Workshops Collection;
- Sydney Harbour Bridge Memorabilia Collection; and
- Sydney Harbour Bridge South-East Pylon Museum Collection.

The following items are listed on the State Rail Authority Heritage and Conservation Register:

- Sydney Harbour Bridge (Rail Property Only); and
- Sydney Harbour Bridge Approaches Concrete Underbridge (Group Entry).

The following items are listed under the Sydney Harbour Foreshore Authority Heritage Register:

- Dawes Point Battery remains, Hickson Road, The Rocks.

Movable Heritage

Three collections of movable heritage associated with the Sydney Harbour Bridge are listed on the RTA Heritage and Conservation Register. The Sydney Harbour Bridge Workshops Collection; Sydney Harbour Bridge Memorabilia Collection and the SHB South-East Pylon Museum Collection are addressed in the Sydney Harbour Bridge Movable Heritage Conservation Strategy, 2007 which assesses the three collections as one Sydney Harbour Bridge Movable Heritage Collection. The current RTA Heritage and Conservation Register listings are provided in Appendix A.

Management and conservation strategies for the movable heritage collections associated with the bridge need to address some interpretation uses and concepts for display of the items. An additional current issue for the RTA is the need for a policy or procedure regarding the management and curation of items that are currently acquired by or donated to the RTA. Collections associated with the bridge that are currently owned and maintained by other authorities, including the Powerhouse Museum and the State Library, could also be investigated to see if a relationship of loan and display could be undertaken to ensure public understanding and appreciation of the items.

Archaeology

The *Heritage Act 1977* (NSW) currently affords automatic statutory protection to 'relics' that form part of archaeological deposits. The Act defines a 'relic' as:

any deposit, object or material evidence relating to the settlement of the area that comprises New South Wales, not being Aboriginal settlement and which is 50 or more years old.

Under the Heritage Act, any excavation or works to a site listed on the SHR would require an excavation permit application under Section 60 of the Heritage Act for approval to carry out a Section 57(1) activity, except in accordance with a gazetted exemption or an excavation permit issued by the Heritage Council of NSW

In Section 3.1.5 the archaeological assessments that have been undertaken on the northern and southern shores of Sydney Harbour are discussed. On the basis of these assessments, other than known archaeological remains on the Dawes Point remains site, Hickson Road, The Rocks, which is listed on the SHR, the boundary area of the SHB (also listed on the SHR) is unlikely to contain any material that would be considered as relics as defined under the Heritage Act.

In the event that substantial or unexpected archaeological relics are encountered within the State Heritage Register area (of either of the listed items), the Heritage Office, Department of Planning should be notified, pursuant to Section 146 of the Heritage Act. Further assessment, and possibly further approval, may be required at the discretion of the Heritage Office, Department of Planning.

6.9.3 Local Planning Schemes

The *Environmental Planning and Assessment Act 1979* (NSW) (EPA Act) provides for the preparation of planning instruments intended to guide land use and management at state, regional and local levels. The EPA Act establishes a process for making and determining development applications. The main features of the EPA Act, with relevance to cultural heritage, is the requirement for assessment of development proposals and a mechanism for the inclusion of heritage conservation provisions in planning instruments. The bridge is currently partly located within the City of Sydney and North Sydney Council areas.

Sydney Local Environmental Plan 2005

The *Sydney Local Environmental Plan 2005* (LEP) is the main planning instrument for the City of Sydney. It also includes the provisions of *Central Sydney Heritage Local Environmental Plan 2000*, so that all land use and heritage controls are now within a single LEP. The southern approach spans and curtilage of the SHB are identified in Schedule 8 Part 1 of the LEP (CSHI No. 1010), which lists the heritage items within the LEP area. The site is also located within the Millers Point Conservation Area identified as a Special Area on the plans attached to the LEP.

Chapter 2 Part 6 of the LEP contains the Heritage Provisions. Clause 68 (1) states that development consent is required for the:

- (a) demolition of a heritage item or building in a heritage streetscape,*
- (b) structural or non-structural alterations to the exterior or interior of a heritage item,*
- (c) structural or non-structural alterations to the exterior of a building in a heritage streetscape that is not a heritage item,*
- (d) erection of a sign or advertising structure on a heritage item,*

(e) erection of a building on the site of a heritage item or building in a heritage streetscape,

(f) subdivision of a site of a heritage item.

Clause 69 requires a Heritage Impact Statement or CMP to be prepared for Council to assess that the impact of any proposed development would be acceptable. The LEP also makes provision for the carrying out of minor works on heritage items such as the SHB by including Clause 68 (2), which states that development consent is not required if:

(a) the proposed development is maintenance or is of a minor nature and, in the opinion of the consent authority, will not adversely affect the heritage significance of the heritage item concerned or of the heritage streetscape concerned, or

(b) the proposed development is consistent with a heritage conservation plan that has been approved by the consent authority, if it involves a heritage item, or

(c) in the opinion of the consent authority, the proposed development is required as a matter of urgency to ensure public safety.

North Sydney Local Environmental Plan 2001

The *North Sydney Local Environmental Plan 2001* (LEP) is the main planning instrument for North Sydney Council. Schedule 3 Part 6 of the LEP identifies the heritage items within the Council area and shows the section of the SHB situated within the North Sydney LEP boundary. Schedule 3 Part 6 of the LEP identifies the following as heritage items:

- The Sydney Harbour Bridge and approach viaducts, including 2–74 Middlemiss Street bays and 2–4 Ennis Road bays (NSHS No. 0030).
- Sydney Harbour Bridge, north pylons (NSHS No. 0076)

Part 4 of the LEP contains the heritage provisions. Clause 45 (1) states that development consent is required for:

(a) disturbing or excavating any land while knowing, or having reasonable cause to suspect, that the disturbance or excavation will or is likely to result in an Aboriginal site or an archaeological resource being discovered, exposed, moved, damaged or destroyed, or

(b) damaging, demolishing, defacing, moving or altering a relic, or

(c) demolishing or moving a heritage item or a building, work or place within a conservation area, or

(d) altering a heritage item or a building, work or place within a conservation area by making structural or non structural changes to its exterior, such as changes to its external detail, fabric, finish or appearance, or

(e) making:

(i) structural changes to the detail or fabric of the interior of a heritage item, or

(ii) non-structural changes to the detail, fabric, finish or appearance of the interior of a heritage item listed in Schedule 3 as having an interior of heritage significance, or

(f) erecting a building on, or subdividing, land that is a heritage item or is within a conservation area.

Clause 48(4) identifies that a Heritage Impact Statement or CMP may be required for Council to assess the impact of any proposed development. The LEP also makes provision for the exempt development by including Schedule 6 Part 6.

Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005

The *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (NSW)* (REP) is the main planning instrument with regard to the Sydney Harbour Catchment area.

Clause 15 of the Part 2, Planning Principles, states the planning principles for heritage conservation:

(a) Sydney Harbour and its islands and foreshores should be recognised and protected as places of exceptional heritage significance,

(b) the heritage significance of particular heritage items in and around Sydney Harbour should be recognised and conserved,

(e) significant fabric, settings, relics and views associated with the heritage significance of heritage items should be conserved.

The 'Sydney Harbour Bridge, approaches and viaducts (road and rail)' is listed as a heritage item (Item 67) on the REP.

Part 3, Division 2 provides matters for consideration in the Foreshores and Waterways Area. Clause 26 requires that:

The matters to be taken into consideration in relation to the maintenance, protection and enhancement of views are as follows: ...

b) development should minimise any adverse impacts on views and vistas to and from public places, landmarks and heritage items.

Part 1, Clause 5 of the REP identifies the consent authority for development as 'the council of the local government area in which, or nearest to which, the land on which the development is proposed be carried out'. This indicates that both North Sydney Council and the City of Sydney act as the consent authority with regard to developments on the north and south sides of the bridge respectively.

Sydney Harbour Foreshore Authority Act 1999

The Sydney Harbour Foreshore Authority (SHFA) was formed in February 1999 under the *Sydney Harbour Foreshore Authority Act 1998* (NSW) (SHFA Act), which consolidated the former Sydney Cove Authority and City West Development Corporation, and later the Darling Harbour Authority in January 2001, into the SHFA.¹⁰

As a New South Wales statutory authority, SHFA has the capacity to make legally enforceable decisions and regulations but is subject to the control and direction of a government department. The Minister for Planning is the consent authority for all development identified in the *State Environmental Planning Policy (Major Projects) 2005* (SEPP (Major Projects)), which covers much of the foreshore area under SHFA control.

Under the SHFA Act, most development or works within the SHFA control, including the Dawes Point park area which forms part of the Sydney Harbour Bridge boundary, requires approval under a development application (DA) or, depending on the capital investment cost, as a Major Project

Application under Part 4 or Part 3A of the *Environmental Planning and Assessment Act 1979* (NSW) (EPA Act).

Since 1999, SHFA has exercised various delegations to process and determine certain types of DAs within the foreshore area. These delegations have been granted by the Minister under Section 23 of the EPA Act. Under the current delegations from the Minister for Planning and the Director-General of the Department of Planning, SHFA receives, processes, and reports on all DAs and Modification Applications within its areas where the Minister is the consent authority.¹¹

The Minister has also delegated the role of determining 'minor' development applications to SHFA. All applications for works within SHFA control should therefore be lodged with SFHA.

6.9.4 Statutory Approvals Process

Depending on their scope and location, works on the Sydney Harbour Bridge may require approvals from the Heritage Council of NSW and either the City of Sydney Council or North Sydney Council. Consequently, there is duplication in the approvals process in some areas and concerns that the current approvals process is too time consuming and resource intensive. There is a need for more co-ordination between statutory groups involved.

One method of dealing with dual approval requirements would be to use the Integrated Development Application (IDA) procedures of the EPA Act which provides for a Development Application (DA) to be referred to the Heritage Council of NSW for comment, and for those comments to be considered by the consent authority before it determines a DA. An application must still be made for Heritage Council of NSW approval under Section 60 of the *Heritage Act 1977*, following the exercise of IDA procedures. If, however, Section 60 approval is obtained prior to lodgement of the Development Application, the application is no longer an Integrated Development (as no further approval under the Heritage Act is required).

IDAs and Section 60 Applications generally need to be accompanied by a CMP or a Heritage Impact Statement (HIS), particularly for large and/or complex sites and/or where a significant level of development is proposed. A HIS assesses the impacts of the proposed development on the significance of the place and consistency of the proposal with the CMP or other relevant documents.

The listing of the SHB on the SHR also means that the owner is required to meet the minimum maintenance requirements set out in Section 118 of the Heritage Act to ensure the long-term conservation. In a situation where the item remains in constant use (as for the SHB), these maintenance requirements should not represent any additional requirement other than keeping it in sound and secure condition.

The listing of the bridge on the NHL also has implications for the management of the bridge. Projects with the potential to impact upon the National Heritage values of the bridge may also need approval under the EPBC Act.

In order to facilitate and simplify the approvals process, a Bilateral Agreement will be prepared between the Commonwealth and State governments. The Bilateral Agreement should include a provision that all projects designed to protect the security and integrity of the bridge, and which will not adversely affect its National Heritage values, should be exempt from the requirement for referral to the Commonwealth. It should also respect all heritage values of the place and seek to integrate Commonwealth, State and local government jurisdictions with the aim to streamline the assessment and approvals process.

6.10 Endnotes

- ¹ Letters from Crown Solicitor's Office dated 18 September 1995 and 7 November 1995, Ref RTA144. 580 and RTA144.592.
- ² NSW Roads and Traffic Authority, 'Heritage' <http://www.rta.nsw.gov.au/environment/heritage/index.html> Last Updated: 15 June 2006
- ³ Sydney Harbour Foreshore Authority, Australia, Viewed 17 November 2006 <<http://www.shfa.nsw.gov.au.htm>>
- ⁴ Ibid.
- ⁵ NSW Roads and Traffic Authority, 'Upgrade to security on the rail corridor and cycle path', Sydney Harbour Bridge cycleway, *Community Update*, December 2005.
- ⁶ Ibid.
- ⁷ Heritage Group, Department of Public Works and Services, Sydney Harbour Bridge Conservation Management Plan, prepared for NSW Roads and Traffic Authority, February 1998, p 113.
- ⁸ Ibid, p 114.
- ⁹ Godden Mackay Logan Pty Ltd, Sydney Harbour Bridge Interpretation Plan, prepared for the RTA, 2007.
- ¹⁰ Sydney Harbour Federation Trust, Australia, Viewed 21 November 2006 <<http://www.shfa.nsw.gov.au.htm>>
- ¹¹ Ibid.

7.0 Conservation Policies

7.1 Introduction

7.1.1 Role of Conservation Policies

The policies in this section provide for the care and management of the Sydney Harbour Bridge to ensure its conservation as a State Heritage item and a National Heritage place. The policies take into account key issues and opportunities arising from the heritage values of the bridge, the National Heritage management principles, the Burra Charter, statutory requirements, and the physical condition and integrity of major components and elements.

The policies provide for the retention and enhancement, through appropriate conservation and interpretation, of the heritage values of the bridge and approach structures, including its setting, views, ongoing operations and historical and social associations. The policies provide for appropriate consultation with the community and training of staff.

7.1.2 Approach

The conservation policies have been developed as a result of historical and site based research, including a review of the previous 1998 CMP prepared for the bridge and other existing documentation.

The policies are based in part on the 1998 CMP conservation policies. These have been revised and amended in the light of the passage of time and changing heritage best practice, changes in the use of the bridge for activities such as BridgeClimb, increased security requirements, and operational considerations and requirements. The preparation of the conservation policies and implementation strategies has also further addressed the management considerations in regard to movable heritage associated with the bridge, the management of the archaeological resources and the listing of the bridge to the National Heritage List. Where possible, the original policy wording used in the 1998 CMP has been retained and policies augmented.

The conservation policies also take into account input provided by representatives of the RTA, RailCorp, BridgeClimb, North Sydney City Council and the City of Sydney Council during the 'Stakeholder Workshop' and other consultation undertaken during the preparation of this CMP.

The conservation policies are organised as follows:

- Heritage management principles providing the framework and basis of the conservation policies.
- General policy statements relating to conservation of the cultural significance of the place.
- General policies relating to the role of the CMP and associated administrative requirements.
- Specific policies for the conservation of the place, including significant character, features and fabric and relationship to its wider setting.
- Policies for use, managing change, new development and access for the place and particular components.
- Policies for interpretation and engagement with the public.
- Policies to deal with the statutory requirements of national, state and local government legislation.

General policies and guiding heritage principles are identified in the first instance to provide the framework for more detailed policies relating to specific aspects and components of the place which follow.

7.2 Guiding Principles

7.2.1 Introduction

The cultural heritage values of the Sydney Harbour Bridge relate to its historical and social associations, its fabric and associated components, and its setting. The purpose of the CMP is to facilitate the conservation of these values consistent with the maintenance and repair of the bridge as a publicly-owned asset, and its ongoing use as the main vehicular crossing across Sydney Harbour.

The bridge is listed on the New South Wales State Heritage Register (SHR) and the National Heritage List (NHL) and is therefore subject to the provisions of both the *Heritage Act 1977* (NSW) (Heritage Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act). An obligation is created under the Heritage Act and the EPBC Act to retain and conserve those parts or aspects of the bridge that contribute to its significance at the state and national levels respectively. However, these listings do not prohibit change or alteration to the existing fabric and components. The ongoing management of the bridge is affected by a number of constraints and opportunities which are outlined in Section 6.0. These include the physical condition of the bridge and its components, but also include traffic, rail and pedestrian requirements and increasing security concerns as a State Government asset and a highly visual symbol of both the city of Sydney and Australia.

Any response to this set of potentially conflicting constraints necessitates recognition of the need for change, mostly in the form of traffic management, security installations, repair and maintenance of the bridge. Such change can and should be consistent with the heritage values of the site and should be planned and managed such that design decisions are informed by a thorough understanding of heritage value. Structured heritage management principles and conservation policies specific to the Sydney Harbour Bridge should guide appropriate policy development and future site planning.

7.2.2 Heritage Management Principles

Heritage management principles set the standard and the scope for the way places should be managed in order to protect heritage values for future generations. These principles should be used when preparing and implementing management plans and programs for the National Heritage place to guide the management of heritage values of a National Heritage place.

The following National Heritage management principles are set out in the *Environment Protection and Biodiversity Conservation Regulations 2000* (Schedule 5B) of the EPBC Act.

Schedule 5B National Heritage management principles (Regulation 10.01E)

1 The objective in managing National Heritage places is to identify, protect, conserve, present and transmit, to all generations, their National Heritage values.

2 The management of National Heritage places should use the best available knowledge, skills and standards for those places, and include ongoing technical and community input to decisions and actions that may have an adverse impact on their National Heritage values.

3 The management of National Heritage places should respect all heritage values of the place and seek to integrate, where appropriate, any Commonwealth, State, Territory and local government responsibilities for those places.

4 The management of National Heritage places should ensure that their use and presentation is consistent with the conservation of their National Heritage values.

5 The management of National Heritage places should make timely and appropriate provision for community involvement, especially by people who:

(a) have a particular interest in, or association with, the place; and

(b) may be affected by the management of the place.

6 Indigenous people are the primary source of information on the value of their heritage and the active participation of indigenous people in identification, assessment and management is integral to the effective protection of indigenous heritage values.

7 The management of National Heritage places should provide for regular monitoring, review and reporting on the conservation of National Heritage values.

The requirements for the preparation of a management plan for a National Heritage place are contained in the EPBC Act and the *Environment Protection and Biodiversity Conservation Regulations 2000*. Appendix F provides an EPBC Act Compliance Checklist, which shows how this CMP fulfils the requirements for a management plan.

7.3 General Policy Statement

Policy 1—Retention of Cultural Significance

- 1.1 The Sydney Harbour Bridge is a place of outstanding cultural significance in the local, state and national context which should be conserved.
- 1.2 Any change in ownership, future uses, maintenance, repair and/or adaptation works and asset management program should include retention and appropriate care of the significant elements and attributes of the place as a matter of highest priority.
- 1.3 All current and future owners, managers and consent authorities responsible for the care and management of the Sydney Harbour Bridge and/or its setting should be advised of, and be jointly responsible for, the conservation of the heritage significance of the bridge.
- 1.4 Conservation of the Sydney Harbour Bridge should accord with the definitions and principles of *The Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance 1999*, and include all significant components and attributes of the place, including its setting, fabric, movable items, archaeological relics and non-tangible values.
- 1.5 Alternatives to actions with adverse heritage impacts to the heritage values of the Sydney Harbour Bridge must be explored before such actions are undertaken.
- 1.6 The Sydney Harbour Bridge must be protected from physical or environmental damage by appropriate security, maintenance and management procedures.

7.4 Role of the Conservation Management Plan, including Adoption and Review of Policies

The following policies relate to the role of the 2007 CMP and the associated administrative requirements in its preparation and endorsement.

Policy 2—Adoption of Policies

- 2.1 The conservation policies set out in this document should be reviewed by all relevant parties and after any required adjustment the CMP should be adopted as a guide to future conservation and development of the Sydney Harbour Bridge.

Explanatory Note

The primary 'relevant party' in this context is the NSW Roads and Traffic Authority (RTA), the current owner/operator of the bridge. Other Commonwealth, state or local government agencies that currently have the jurisdiction over or responsibility for the site's care, management or heritage protection include: the Department of the Environment and Water Resources, Heritage Office, Department of Planning, City of Sydney Council, North Sydney Council, the Sydney Harbour Foreshore Authority and the State Rail Authority.

Policy 3—Coordination with Management Plans

- 3.1 The analysis and recommendations of the CMP should be checked against and coordinated with any associated management plans for the place to ensure consistency of aims, approach and outcomes.

Explanatory Note

The primary role of this CMP is to provide updated conservation management policies and implementation strategies for current and future management of the bridge. The CMP has been prepared using the 1998 CMP for the Sydney Harbour Bridge as a basis, and in recognition of the inclusion of the bridge on the State Heritage Register and the National Heritage List.

Associated management plans that should be coordinated with this CMP include the following documents:

- Sydney Harbour Bridge Conservation Management Plan—Inventory Records 1997, prepared by the Heritage Group, Department of Public Works and Services.
- RTA Heritage Guidelines 2004—Version 2, prepared by RTA Environment Branch.
- Sydney Harbour Bridge Interpretation Plan 2007, prepared by Godden Mackay Logan.
- Sydney Harbour Bridge Movable Heritage Conservation Strategy 2007, prepared by International Conservation Services.

Policy 4—Distribution of the CMP

- 4.1 Copies of the completed CMP should be lodged with all relevant administrative, maintenance, heritage and archival bodies/agencies, as well as being held by the Roads and Traffic Authority, and be readily available for public reference.

Explanatory Note

This policy enables records to be kept for sites of heritage significance which are also available for ongoing consultation, review and use/modification over time. The policy also seeks to encourage ongoing community consultation and communication, which is critical to the implementation of any management plan for the bridge, by making appropriate information readily available (including at the offices of the RTA and on the RTA web site).

Copies of the final report should be lodged with the Department of the Environment and Water Resources (Canberra), the Mitchell Library (Sydney) and the Heritage Office Library.

Policy 5—Monitoring and Review of the CMP

- 5.1 Implementation of the Conservation Management Plan should be continuously monitored and the document formally reviewed at intervals of three to five years to ensure management policies and works planned or being carried out conform to its policies and to take account of changed conditions.

Policy 6—Professional Advice on Policies

- 6.1 The conservation management of the bridge must be undertaken in consultation with heritage practitioners with relevant expertise as required.
- 6.2 Appropriate professional advice from heritage practitioners with relevant expertise should be obtained to review and/or amend specific policies as required.

Policy 7—Conformity with National and International Conservation Principles

- 7.1 The future conservation and development of the place should be carried out in accordance with nationally and internationally recognised heritage conservation principles, including:
 - *The Burra Charter: The Australia ICOMOS Charter for the Conservation of Places of Cultural Significance 1999*; and
 - National Heritage management principles as set out in the *Environment Protection and Biodiversity Conservation Regulations 2000* (Schedule 5B) of the EPBC Act (Section 7.2.2 above).

Policy 8—Excellence in Heritage Management

- 8.1 The Sydney Harbour Bridge should provide a national example of excellence in heritage conservation management and practice.

Explanatory Note

The Sydney Harbour Bridge's combination of heritage attributes, its role as a major part of Sydney's transport network and wide ranging opportunities for recreation and cultural tourism provides a unique opportunity to implement and actively promote the highest standards of heritage conservation management and practice. This goal, however, needs to be specifically recognised, built into and supported by all relevant management and works planning and procedures.

Interpretation, research and educational activities should also include promotion of its role in implementing 'best practice standards' as part of the conservation and management of the bridge and (in the context of this CMP) of its components, uses and associations in particular.

7.5 Conservation Methodology

The following policies relate to the conservation of the Sydney Harbour Bridge, including retention of its significant character, features and fabric and relationship to its wider setting.

7.5.1 Management Generally

Policy 9—Management Objectives

- 9.1 Ongoing management of the bridge should provide for:
- retention of the fundamental cultural heritage values and attributes of the bridge;
 - conservation (including ongoing maintenance) of significant elements;
 - enhanced opportunities for presentation and interpretation of the bridge and its history for public appreciation; and
 - continued and enhanced linkage with associated elements adjacent to the bridge, including Bradfield Park and Plaza, Dawes Point and other foreshore areas within the view lines of the bridge (via interpretation, related activities, transport routes etc).

Policy 10—Priority of Cultural Heritage Value

- 10.1 Decisions regarding change to the bridge should be based on a clear and balanced understanding of the impacts on its cultural heritage values, positive and negative, and measures taken to either remove and or mitigate adverse impacts.

7.5.2 Retention of Original Design and Setting

Policy 11—Maintaining Key Views of the Sydney Harbour Bridge in its Setting

- 11.1 The significant physical and visual character of the Sydney Harbour Bridge within its harbour setting should be appropriately conserved.
- 11.2 Views and vistas to and from Sydney Harbour Bridge to the north, south, east and west should be maintained.
- 11.3 Buildings or large plantings on the harbour foreshores of Dawes Point and Milsons Point should not obscure the visual form and setting of the Sydney Harbour Bridge.
- 11.4 Buildings or large plantings on the northern or southern sides of the harbour should not obscure or detract from the views from the Sydney Harbour Bridge toward the Sydney Harbour and the city.

Explanatory Note

Key attributes which contribute to the significant physical and visual character of the bridge in its harbour setting include:

- the overall size of the bridge, including the main arch, approaches, abutment towers and pylons; and
- its visual impact and landmark role in the topography of the Sydney Harbour (particularly in views from and across the harbour).

In the context of the policy requirements, these site attributes should be specifically acknowledged, protected and interpreted in future planning and development for the place, particularly those areas visible in key views from the harbour. Proposed changes and/or development that would adversely impact on these attributes or their inter-relationships (and thus affect the extent to which they help locate and distinguish the bridge within its harbour setting) should also be prohibited and/or strictly limited.

Sub-policies 11.3 and 11.4 will require a cooperative approach between the New South Wales Government, on behalf of the RTA and the Heritage Office, Department of Planning, the Sydney Harbour Foreshore Authority and local councils (particularly North Sydney and the City of Sydney), to ensure that inappropriate development along the north and south shores does not have an adverse impact on the heritage values of the bridge.

The provisions and coverage of the *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005* (NSW) provides the statutory means to achieve compliance with these policies.

Policy 12—Retention of Existing Open Space for Public Use/Recreation

- 12.1 The existing park areas adjacent to the Sydney Harbour Bridge should remain public parks for passive recreation and unimpeded views to the bridge.
- 12.2 The future management of the Sydney Harbour Bridge, approaches and parklands should appropriately conserve its character and the scale whilst retaining the existing open spaces historic viewing areas.

Explanatory Note

As with Policy 11, this policy will require a cooperative approach between the New South Wales Government on behalf of the RTA and the Heritage Office, Department of Planning, the Sydney Harbour Foreshore Authority and local councils (particularly North Sydney and the City of Sydney), to ensure that development along the north and south shores does not have an adverse impact on the heritage values of the bridge.

Policy 13—Integrity of Original Design

- 13.1 The clarity of the structural form and silhouette of the bridge, and its associated elements when viewed from key points around the harbour, should be maintained and not obscured.
- 13.2 Views of the original form of the granite pylons and piers should be maintained, and any new uses accommodated within the existing design.
- 13.3 Views of the original form of the rendered masonry approaches should be maintained and not obscured.

- 13.4 The fabric and design integrity of the main components of the bridge, comprising the arch, hangers, roadway, pylons, approach spans, piers and approaches including tunnels, tenancy spaces and Milsons Point railway station, should be conserved.
- 13.5 Original decorative and/or functional minor elements, such as cast iron railings, steel windows, rainwater elements, pressed metal awnings, balustrades, lighting, steps and decoration, should be conserved.
- 13.6 The arrangement of internal spaces in the abutment towers, pylons and approach structures should be conserved.

7.5.3 Maintenance and Repair Works

Due to the age of the bridge and nature of the physical environment (and the corrosive environment of the harbour setting to the materials of the bridge), and the importance of its continued operation as the main Sydney Harbour vehicular crossing, ongoing maintenance should be a fundamental priority for the care and management of the significant components and fabric of the Sydney Harbour Bridge.

Policy 14—Maintenance and Repair Works Generally

- 14.1 Appropriate repair and maintenance works should be carried out on an ongoing basis. The works should seek to secure fabric against further deterioration and retain as much as possible of the integrity and historical fabric and construction methods.
- 14.2 The Sydney Harbour Bridge Conservation Management Plan—Inventory Records 1997 should continue to be used as the basis for ongoing maintenance and repair of the bridge. It should, however, be reviewed within the next twelve months to ensure that contemporary approaches to conservation are incorporated, that changes to statutory heritage listings that have occurred since the adoption of the 1998 CMP, as well as other relevant changes are included. As part of the review, the Inventory Records document may be incorporated with the proposed SHB Asset Register which is currently in preparation by the RTA.
- 14.3 Structures, machinery/equipment and other elements should be regularly inspected and maintained.
- 14.4 A maintenance program should be prepared and regularly revised to provide the basis for the ongoing care and management of the bridge as a publicly-owned asset, and to conserve its cultural heritage significance.
- 14.5 A schedule of maintenance and repair works which can be undertaken without approval by the Heritage Council of NSW should be prepared pursuant to the standard or site specific exemptions under Section 57(2) of the Heritage Act (Appendices D and E).

Explanatory Note

Maintenance and repair works should be based on the philosophy of 'doing as much as necessary but as little as possible'. This includes retaining existing significant attributes and fabric wherever possible, rather than replacing elements. New work should take particular care to retain (by restoration and/or reconstruction) original/early detailing, as well as the historic patina and particular idiosyncrasies of existing fabric and features. Works should be supervised by appropriately experienced conservation specialists and evidence of previous elements, fabric and detailing should be recorded during the works.

The review of the Inventory Records document in combination with the preparation of an Asset Register for the bridge (possibly consolidated as a single document), will provide a concise and accessible resource for the RTA personnel responsible for the ongoing maintenance and repair of the bridge. The register would include work procedures that are essential to the ongoing management and maintenance of the bridge. It would need to be regularly updated and accessible by key members of the SHB Asset Management team.

The maintenance program for the bridge should be prepared in consultation with appropriately qualified heritage specialists and include both inspection checklists and works specifications for all relevant areas, elements and fabric of the place. The maintenance and repair works recommendations should be based on an understanding of the significance of the place, the policies of the CMP and appropriate conservation philosophy and repair techniques. The program should seek to meet the minimum standards of maintenance and repair for items of identified state significance as required by Section 118 of the Heritage Act.

In order to keep the bridge well maintained and operating efficiently, there must be facilities for bridge maintenance and other staff. This includes equipment for safe access to all parts of the fabric and implies periodic upgrading of the equipment.

Policy 15—Use Appropriate Specialist Personnel

- 15.1 Conservation and maintenance works should be undertaken by experts or firms with proven expertise in the relevant field and under adequate supervision.
- 15.2 A conservation specialist should be involved in work affecting the granite or concrete structures.
- 15.3 Specialist advice and training on the heritage value of machinery and equipment on the bridge should be obtained from an industrial archaeologist or specialist heritage consultant.
- 15.4 Significant fabric should be retained in situ and in its current state and form, and be maintained.

Explanatory Note

RTA personnel responsible for maintaining the steelwork of the bridge should implement training in conservation methods and philosophy of the Burra Charter and familiarity with the CMP.

Policy 16—Records of Intervention and Maintenance

- 16.1 All works to the Sydney Harbour Bridge should be appropriately recorded and permanently stored as part of the archival recording of the history and significance of the item.
- 16.2 Documentation of conservation works should include the rationale and methods employed and monitor performance.

Explanatory Note

‘Conservation’ work includes all activities ascribed to it in the Burra Charter, from basic maintenance and repair works through to reconstruction and adaptation. Site components include all built elements and other structures, open areas, movable items and archaeological sites within the CMP curtilage.

Policy 17—Exemptions

- 17.1 Maintenance works and minor repairs should be undertaken in compliance with the standard exemptions under Section 57(2) of the Heritage Act which do not require the approval of the

Heritage Council of NSW (standard exemptions attached at Appendix D). No application to or agreement with the Heritage Council of NSW is required to invoke these exemptions; however, an exemption notification form needs to be completed and submitted to the Executive Director, Heritage Office, Department of Planning.

- 17.2 Other minor works and repairs should be undertaken in compliance with site specific exemptions under Section 57(2) of the Heritage Act, which do not require the approval of the Heritage Council. The site specific exemptions for the Sydney Harbour Bridge are discussed in Section 6.9.2, and the full list of exemptions as gazetted is at Appendix E.

Explanatory Note

Places listed on the National Heritage List have been listed for their outstanding heritage value to the nation. Items listed on the State Heritage Register have been identified as having particular importance to the people of New South Wales. If a place is listed on a statutory heritage list, then any major changes need to be approved by the relevant consent authority to ensure the cultural heritage values of the place are not damaged by the works.

However, minor and ongoing works such as routine maintenance, repairs and upgrading of services do not normally require approval if they fall under the definition of works under the standard or site specific exemptions for the Sydney Harbour Bridge.

The purpose of the standard and site specific exemptions for places on the State Heritage Register is to clarify for owners, the Heritage Office, Department of Planning and local councils the scope of maintenance and minor works that can be undertaken without needing Heritage Council of NSW approval. This process ensures that owners are not required to make unnecessary applications for minor maintenance and repair.

There are two types of exemptions which can apply to the Sydney Harbour Bridge as a State Heritage Register item:

1. *Standard exemptions for all items on the State Heritage Register. Typical activities that are exempted include building maintenance, minor repairs, alterations to certain interiors or areas and change of use).*
2. *Site specific exemptions for a particular heritage item can be approved by the Minister on the recommendation of the Heritage Council.¹*

Site specific exemptions have been developed to cover those activities and works to the bridge that will not have an adverse impact on its heritage values, or which are essential for security and must be dealt with on a confidential basis. These site specific exemptions have been approved by the NSW Minister for Planning, and are provided in Appendix E.

7.5.4 Operational Requirements and New Uses

Policy 18—Management of Adaptation and Change

- 18.1 All decisions for intervention and change should be evaluated in terms of the nature of the proposal, its purpose, long term context and how this relates to the identified cultural heritage values of the bridge. Protection and enhancement of the fundamental significant elements of the place through appropriate adaptation and change for new or additional necessary functions should be a key management goal.

Explanatory Note

The imperatives for the continued operation, security and safety of the bridge as part of the Sydney transport network and as a tourist icon must be reconciled against the obligation to conserve its cultural heritage values. The challenge is to protect and manage all of these objectives through an ongoing process of adaptation and change.

Policy 19—New Development

- 19.1 New development should enhance the function and use of the bridge without obscuring or damaging the integrity of the original design or significant fabric.
- 19.2 New work should be designed to respond to the character of the existing significant design and fabric.
- 19.3 Before committing to any proposal for change to the bridge, including the introduction of new uses, the impact of the proposed changes on the cultural heritage values of the bridge as a whole, any operational and security requirements, and other relevant agreements regarding the use of the bridge, should be assessed.

Explanatory Note

Adaptation and change as part of the ongoing operational requirements for the bridge are principally generated by transport, security, safety and health requirements. The implementation of these changes needs to be achieved without compromising the cultural heritage values of the bridge as a whole.

Policy 20—Minimising Impacts of Change

- 20.1 Any adverse impacts related to proposed change/development on the heritage values of the place, as a whole or particular components, should be minimised by:
 - exercising caution and reviewing the necessity and/or role of any decision with potentially adverse heritage impacts;
 - examining alternative solutions and their relative impacts to determine the outcome with least detrimental effects; and
 - ensuring, where possible, that changes (to use, layout and fabric) are reversible and/or have minimal adverse impacts on the cultural heritage significance of the bridge.

Explanatory Note

Decisions about maintenance works, intervention and the installation of new services and requirements, which may have adverse impacts on the heritage values of the bridge, should carefully review the scope of the works, the extent of physical intervention and possible alternative solutions, and to ensure that the approach with the least heritage impact is implemented.

In situations where an appropriately balanced outcome is not achievable and the major heritage ‘values’ will be adversely impacted on, heritage conservation requirements should prevail over the proposed change/development unless by doing so the security, structural stability or basic operational viability of the bridge is compromised.

Policy 21—Changes due to Operational Requirements

- 21.1 Changes to the bridge due to the primary use of the bridge as a critical component of Sydney's transport system (road, rail, pedestrian and cycle) should be given priority over changes determined by the needs of secondary uses such as tourism and recreation.
- 21.2 Changes to the fabric essential to maintain this primary use do not obviate the requirement to assess and to minimise the impact of physical alterations on the cultural heritage significance of the bridge, particularly where these changes are outside the standard or site specific exemptions under Section 57(2) of the Heritage Act.

Explanatory Note

Typical operational alterations would include lighting, lane marking, safety barriers and fences, toll booths as well as the regular maintenance activities such as road resurfacing. Such changes should first be justified on the grounds of improving safety and amenity of the transport systems, and their impact on the cultural heritage significance of the bridge assessed. Such changes will be mainly confined to the deck level and should not adversely impact upon the overall structural form of the bridge.

Policy 22—Fireworks, Banners and Decorations

- 22.1 The bridge should continue to be used for selected displays, banners and fireworks where these are relevant to the community at large and where the theme is not detrimental to the cultural heritage significance of the bridge.
- 22.2 The attachment of selected displays, banners and fireworks to the bridge should not damage its fabric, nor should the associated structure compromise the basic form and geometry of the bridge. All such attachments should be in place for a fixed time frame and be fully reversible.

Policy 23—Use of Approaches

- 23.1 The bays in the bridge approaches should continue to be available for lease by appropriate businesses and organisations whose spatial and fit-out requirements are compatible with the character of these spaces. The design of tenancy fitouts (including the insertion of mezzanines and walls) to the Middlemiss Street (north side) and Cumberland Street (south side) bays in particular should respond to these large internal spaces. The original reinforced concrete framed and steel framed glazing end walls to the bays should be retained with minimal alterations.
- 23.2 External advertising associated with the leased areas of the approaches should be minimised, and its size and placement should be designed to fit within the basic modules of the end walls.

Explanatory Note

The bridge approaches, including the Middlemiss Street and Ennis Street (north side) and Cumberland Street (south side) tenancy bays are of high significance, particularly because they retain their aesthetic values which emanate from the original design of the bridge as constructed. The bays should continue to be available for lease by a range of businesses and organisations. However, particular care should be taken with the design of tenancy fitouts for the full height spaces that characterise the (arched) Cumberland Street and (flat) Middlemiss Street bays, which largely retain these internal spatial qualities. This approach does not preclude subdivision, if well designed to respond to the spatial qualities of the bays.

Policy 24—Argyle Street Substation and Switch House

- 24.1 The Substation and Switch House should continue to be used for electrical power, signalling and other uses associated with the road and rail operations of the bridge.

Policy 25—Advertising

- 25.1 The bridge, including the arch, pylons, approach spans and approaches, should not be used for commercial advertising in any form including signage, except for that associated with tenancies as discussed in Policy 23.2.

7.5.5 Movable Heritage

Policy 26—Movable Items

- 26.1 All equipment or elements considered redundant or surplus to requirements and assessed to be of heritage significance must be suitably archived and recorded on the RTA Heritage and Conservation Register.
- 26.2 Management of equipment or elements of movable heritage should be undertaken with reference to the Sydney Harbour Bridge Movable Heritage Conservation Strategy 2007, the RTA Heritage Guidelines 2004—Version 2 and the Sydney Harbour Bridge Interpretation Plan 2007.
- 26.3 A separate conservation management plan should be prepared for the management and maintenance of the original maintenance cranes which have been removed and are currently stored in the RTA Rockdale Works Centre.

Policy 27—Collections Management

- 27.1 A collections management policy should be prepared for all movable heritage associated with the Sydney Harbour Bridge that is owned or acquired by the RTA, and be compliant with the policies and recommendations in the RTA Heritage Guidelines 2004—Version 2. The collections policy should include recommendations for the on-going management of the material including donation, loan and repatriation policies and catalogue standards.
- 27.2 Consideration should be given to the appointment of internal collection management staff to manage and coordinate the acquisition, curation, maintenance and conservation of the wide variety of bridge related material.
- 27.3 Collaborative opportunities should be investigated for curating artefacts associated with the Sydney Harbour Bridge.

Policy 28—Contents of Abutment Towers and Pylons

- 28.1 Original or early fixtures within the Abutment Towers and Pylons, including staircases, balustrades, mezzanines and elevators, should be retained and conserved.
- 28.2 Operational maintenance equipment and workshop machinery should be retained in its historic (if not current) location. If machinery or equipment is required to be removed, relocated or altered for functional, safety or other specific reasons, the particular item(s) should be recorded in detail prior to the change.

- 28.3 If equipment or elements are considered redundant or surplus to requirement, an assessment should be made of their heritage significance (advice from a heritage specialist may be required). If considered significant, the material must be considered as movable heritage and entered onto the RTA Heritage and Conservation Register (see Policy 26).
- 28.4 Where machinery and equipment is considered redundant or surplus to requirements and removed from its original location, it should be considered for use as part of the interpretation of the bridge.
- 28.5 The existing 'Workshop space' in the interior of the abutment towers and its historic association with the maintenance of the bridge should be retained. Should the use of the workshop areas be discontinued, future uses should seek to maintain and enhance the previous functions and traditions and minimise physical changes to the spaces and fabric.

7.5.6 Services, Security and Signage

Policy 29—Services

- 29.1 The introduction of new services should be designed to be as unobtrusive as possible. Redundant original or early services should be recorded prior to removal.
- 29.2 The attachment of services to steelwork should be minimised and located as unobtrusive as possible. Existing services, such as electrical power and compressed air, should be relocated where possible to reduce visual impact on significant fabric.
- 29.3 Services should not be fixed to the external surfaces of granite or rendered exterior surfaces.

Policy 30—Lighting

- 30.1 All remaining original bridge lighting should be retained, conserved and used.
- 30.2 The design and installation of new light fittings for use on the bridge should complement the character of bridge fabric and be reversible.

Policy 31—Security

- 31.1 Security requirements and installations that fall under the standard exemptions for works requiring Heritage Council of NSW approval under Section 57(2) of the Heritage Act can be undertaken. No application to or agreement with the Heritage Council of NSW is required to invoke these exemptions; however, an exemption notification form needs to be completed and submitted to the Executive Director, Heritage Office, Department of Planning.
- 31.2 Security requirements and installations that fall under the site specific exemptions under Section 57(2) of the Heritage Act can be undertaken without Heritage Council of NSW approval. No application to or agreement with the Heritage Council of NSW is required to invoke these exemptions; however, an exemption notification form needs to be completed and submitted to the Executive Director, Heritage Office, Department of Planning.

Explanatory Note

In some cases the details of additional security measures for the bridge may need to remain confidential. The Executive Director of the Heritage Office, Department of Planning should be consulted in order for these works to be implemented within the scope of site specific exemptions.

Policy 32—Signs

- 32.1 Any new signs installed on the bridge and approaches should form part of an integrated range of signs of a design that complements its history and character.
- 32.2 Historic signs inside the workshops and elsewhere on the bridge should, if possible, be retained in situ, or otherwise conserved for use as part of the interpretation of the bridge.
- 32.3 All signage should conform to Occupational Health and Safety requirements.

7.5.7 Archaeology

Policy 33—Conservation of Archaeological Resources

- 33.1 The surviving archaeological resources of the area within the curtilage of the 2007 CMP, particularly the remains of the Dawes Point Battery and associated material, should be conserved and managed in accordance with their cultural heritage values.
- 33.2 Opportunities should be investigated and appropriate measures implemented to interpret to the public the archaeological resources of the area within the curtilage of the 2007 CMP.
- 33.3 Any subsurface disturbance of land that may have archaeological potential should be carried out in accordance with the RTA Heritage Guidelines 2004—Version 2 and the archaeological provisions of the Heritage Act.
- 33.4 In the event of archaeological investigations being carried out on land within the curtilage of the 2007 CMP, appropriate measures should be implemented to interpret the purpose, process and outcomes of the investigation to the public.

Explanatory Note

The description of the archaeological resources within the curtilage of the bridge in Section 3.1.5 concludes that the construction of the bridge and the demolition that occurred in the Bradfield Park area at Milsons Point disturbed any potential sub-surface remains relating to the previous Aboriginal and European occupations on the site. The archaeological excavations carried out at Dawes Point suggest that little archaeological potential remains in that area, although the relics and the site itself should continue to be retained and conserved. Should archaeological relics be excavated within the CMP curtilage during works to the bridge, the archaeological provisions of the Heritage Act will be invoked.

7.6 Public Access, Engagement and Interpretation

7.6.1 Engagement with the Public

Policy 34—Existing Access Provisions

- 34.1 The current circulation functions of the bridge, including roads, rail tracks, cycleways, and pedestrian paths and stairs, should be retained for use by the public.

- 34.2 Entry/exit points for access to and across the bridge (particularly for pedestrian and cyclists) should be used to focus interpretation of both its tangible and intangible heritage values, including historic or other associational links between different circulation routes and/or components.
- 34.3 Interpretation measures should inform public users of the bridge (particularly for pedestrian and cyclists) of changes in its circulation functions since its opening in 1932, particularly the removal of the tram route and associated tunnels and other infrastructure.
- 34.4 Signs for visitor orientation (in The Rocks, Dawes Point and Milsons Point), visitor interpretation of the bridge and associated sites (eg where the opening ceremonies took place) should be developed with regard to the recommendations of the Sydney Harbour Bridge Interpretation Plan 2007.

Explanatory Note

The bridge and its associated road and rail connections are critical components of the Sydney transport network, providing the main connection for motor vehicles, trains, cyclists and pedestrians across Sydney Harbour. The introduction of new leisure activities such as BridgeClimb has also created a secondary use by the public as a tourist attraction, with access to hitherto restricted areas including catwalks and stairs within the bridge itself.

The control of access onto and across the bridge provides the opportunity for an evolving and structured interpretation of its history, development, associations and cultural heritage values.

The importance of both current and historic circulation functions of the bridge, including roads, rail tracks, cycleways, tram route and pedestrian paths and stairs, should be interpreted for public users of the bridge.

Policy 35—Engagement with the Public

- 35.1 Active engagement by the RTA with the public in regard to the Sydney Harbour Bridge should be undertaken with reference to the Sydney Harbour Bridge Interpretation Plan 2007, and with regard to the operational and security requirements of the bridge.
- 35.2 Regular user surveys should be undertaken to assess the effectiveness of visitor management, interpretation, access and safety measures.
- 35.3 Opportunities for additional leisure-based alternative uses such as BridgeClimb that do not adversely impact on the cultural heritage values of the bridge as a whole should be investigated.
- 35.4 An ongoing oral history collection program for the SHB should be established in cooperation with the NSW State Library.
- 35.5 Publication opportunities with regard to the oral histories and social experiences of past bridge workers and operators should be explored.

Explanatory Note

Alternative uses of the bridge include tourism and leisure-based activities such as BridgeClimb, a venue for celebrations (New Year's Eve fireworks), a location for film and television productions, and other possible commercial uses such as the installation of a night club/cinema complex in the southern abutment tower. While public access and interpretation of the bridge should be encouraged and

facilitated, alternate uses that adversely impact on the integrity of the original design or significant fabric should not be permitted.

The use of the bridge for symbolic or event walks and the use of the bridge as an iconic symbol of Sydney, New South Wales and Australia should be encouraged as it increases the sense of public and community ownership.

A professional oral history program in relation to the Sydney Harbour Bridge should be considered. Many former Sydney Harbour Bridge workers will now be of an age where documenting their recollections will be important, and of particular relevance to the 75th anniversary of the bridge opening in 2007.

A substantial collection of oral histories on the Sydney Harbour Bridge was held by Richard Raxworthy. The collection was used by author Peter Lalor to write his book 'The Bridge', published by Allen and Unwin in 2005.² The oral histories are held in the State Library of NSW. A collaboration by the RTA with the State Library Oral History Program is an appropriate oral history strategy.

7.6.2 Interpretation

Policy 36—Interpretation Requirements

- 36.1 Measures to appropriately interpret the major aspects of significance of the bridge should be considered in conjunction with all future proposals for change and development.
- 36.2 The Sydney Harbour Bridge Interpretation Plan 2007 should be referred to as an essential input to the development of detailed site management policies and decision making about future site use and development. The concepts and actions put forward in the Interpretation Plan should be implemented as an essential component of all planned activities and works for the place.

Explanatory Note

This policy identifies the fundamental need to implement the Interpretation Plan through the development of site management and planning policies, integrating interpretation concepts at an early stage of the preparation of detailed planning schemes or works proposals.

Because of the unique nature of the site, as well as its complexity and high heritage values, the Interpretation Plan is of particular importance for its meaningful inclusion into site and management planning. Just as high standards of conservation work and management ('Excellence in Heritage Management' policy) and innovation in building adaptation and new construction ('Design of New Development' policy) are to be implemented, active and innovative measures to interpret the site's past and heritage values provide an important measure of distinguishing and celebrating the bridge within both national and international contexts.

Methods of interpretation include conserving original features and fabric, reconstructing missing or damaged elements based on documentary and/or archaeological evidence, introducing interpretative devices such as discrete signage, the use of historic photographs, preserving evidence of original finishes, fit-out (including equipment) and fabric, and allowing access for specialist study and/or presentation in publications, websites, podcasts etc.

An interpretation action matrix is included in the Sydney Harbour Bridge Interpretation Plan 2007, together with project partners and logistical advice.

Policy 37—Machinery and Equipment

- 37.1 The history and heritage significance of machinery and equipment specifically related to the bridge should be actively interpreted to the public.

Explanatory Note

Interpretation should include the role of particular machinery and equipment items in their bridge/workshop contexts, their operation and purpose. The role of these elements in representing the character and functions of former industrial workplaces, technologies and labour practices should also be integrated into the interpretation approach.

7.7 Relationship to Commonwealth, State and Local Authorities

Policy 38—Coordination of Statutory Compliance

- 38.1 A range of individuals and organisations have an ongoing interest in the future heritage management of the Sydney Harbour Bridge. Ongoing consultation with these is integral to effective heritage management of the site. The following must be consulted and involved in heritage management decisions:
- heritage agencies, eg Department of the Environment and Water Resources; Heritage Office, Department of Planning (NSW); Department of Environment and Climate Change (NSW); and
 - community organisations (National Trust of Australia (NSW)).
- 38.2 The Commonwealth and State Governments should enter into a Bilateral Agreement to encourage a coordinated approach between consent authorities and to minimise duplication of assessment and approval processes, especially for actions that do not affect the National Heritage values of the bridge and do not require approvals under the EPBC.
- 38.3 The policies of this CMP and associated management plans for the Sydney Harbour Bridge should be coordinated with the relevant requirements and guidelines of statutory heritage instruments under which the bridge is listed. Potential areas of conflict between these documents which relate to conservation requirements/imperatives should be subject to discussion/negotiation to ensure consistency in process and outcomes.

Explanatory Note

The primary statutory documents in this context refer to the:

- *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth);
- *Heritage Act 1977* (NSW);
- *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005* (NSW);
- *Sydney Harbour Foreshore Authority Act 1999* (NSW);
- *Sydney Local Environmental Plan 2005*; and
- *North Sydney Local Environmental Plan 2001*.

7.8 Endnotes

- ¹ NSW Heritage Office, Heritage Information Series—*Standard Exemptions for Works Requiring Heritage Council Approval*, New Edition 2006.
- ² Pers comm., RTA staff member Vince Taranto.

8.0 Implementation

8.1 Introduction

The conservation policies in Section 7.0 provide for the ongoing care and management of the Sydney Harbour Bridge, so as to ensure the conservation of its diverse cultural heritage values. Effective policy implementation requires a range of strategies to be developed and put into place to provide the necessary link between particular policies and actual management actions.

In this final section of the CMP, five implementation strategies are identified to provide key management outcomes for the bridge.

Strategy 1

The Roads and Traffic Authority and the New South Wales Government should formally adopt the Sydney Harbour Bridge Conservation Management Plan.

The CMP should be integrated with all other RTA documents, site planning and management processes related to ongoing care for the bridge.

Strategy 2

A coordinated approach should be adopted by the Commonwealth (Department of the Environment and Water Resources), State (Heritage Office, Department of Planning, and Sydney Harbour Foreshore Authority) and local government authorities (especially North Sydney Council and the City of Sydney Council) to ensure statutory protection for the Sydney Harbour Bridge.

Strategy 3

The cultural heritage values (including design integrity and fabric) of the Sydney Harbour Bridge should be actively conserved by appropriate maintenance, repair and the management of change as part of a program with both short and long term strategies.

Strategy 4

The conservation of the setting and visual catchment of the Sydney Harbour Bridge within Sydney Harbour will require a cooperative approach between the Commonwealth, State and local government authorities to implement the provisions of the *Environment Protection and Biodiversity Conservation Act 1999*, the *Heritage Act 1977 (NSW)*, the *Sydney Harbour Foreshore Authority Act 1999 (NSW)*, and the *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (NSW)*.

Strategy 5

The community should be provided with a wide range of opportunities to engage with the history and heritage of the Sydney Harbour Bridge through a program of interpretation and public engagement.

1

Finalisation and Integration

The Roads and Traffic Authority (RTA) and the New South Wales Government should formally adopt the Sydney Harbour Bridge Conservation Management Plan (CMP).

The CMP should be integrated with all other RTA documents, site planning and management processes related to ongoing care for the bridge.

Recommendations

1. The CMP should be adopted in principle by the RTA and submitted to the Department of the Environment and Water Resources and the NSW Heritage Office, Department of Planning for review and endorsement.
2. Responsibility for implementation of each policy in the CMP should be allocated to a specific position/role or section within the RTA, and in Railcorp and SHFA, as appropriate.
3. The CMP should be the first point of reference for both the RTA and RailCorp in undertaking new works in regard to maintenance, repair or installation of new services.
4. Copies of the CMP should be provided to Operations and Bridge Managers, as well as Asset Managers, lessees and tenants. The CMP should be readily accessible for all staff involved in working on the site or projects/decisions which affect it.
5. Appropriate training programs should be introduced to ensure all personnel working on the site are familiar with the role and contents of the CMP and can apply it to their particular work tasks.
6. All distributed copies of the CMP should be updated when the document is reviewed.

Policies

Policy 1—Retention of Cultural Significance	Policy 8—Excellence in Heritage Management
Policy 2—Adoption of Policies	Policy 9—Management Objectives
Policy 3—Coordination with Management Plans	Policy 10—Priority of Cultural Heritage Value
Policy 4—Distribution of the CMP	Policy 16—Records of Intervention and Maintenance
Policy 5—Monitoring and Review of the CMP	Policy 17—Exemptions
Policy 6—Professional Advice on Policies	Policy 38—Coordination of Statutory Compliance
Policy 7—Conformity with National and International Conservation Principles	

Outcome

The general asset management and operational requirements of the Sydney Harbour Bridge will be integrated with procedures for statutory approvals and conservation of cultural heritage values.

2

Statutory Compliance

A coordinated approach should be adopted by the Commonwealth (Department of the Environment and Water Resources), State (Heritage Office, Department of Planning, and Sydney Harbour Foreshore Authority) and local government authorities (especially North Sydney Council and the City of Sydney Council) to ensure statutory protection for the Sydney Harbour Bridge.

Recommendations

7. All RTA documents and policies relevant to the management of Sydney Harbour Bridge and its heritage values should be reviewed and adjusted/amended as necessary to include specific references to the CMP and ensure alignment and mutually supportive aims, procedures and outcomes.
8. The curtilage for the 2007 CMP should be consistent with that of the NSW State Heritage Register and the National Heritage List (NHL). The RTA, the Department of the Environment and Water Resources, and the Heritage Office should consider and resolve the area within the curtilage.
9. The RTA, RailCorp and SHFA should ensure that all works and development within the curtilage of the bridge are determined under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999*, the *Heritage Act 1977* (NSW), the *Sydney Harbour Foreshore Authority Act 1999*, and the *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005* (NSW).
10. The Commonwealth and State Governments should enter into a Bilateral Agreement to minimise duplication of assessment and approval processes, especially for actions that do not adversely affect the National Heritage values of the bridge.
11. The RTA should work with Commonwealth, State and local government authorities to ensure that all works and development within the setting of the bridge are determined under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999*, the *Heritage Act 1977* (NSW), the *Sydney Harbour Foreshore Authority Act 1999*, and the *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005* (NSW), as appropriate.

Policies

Policy 2—Role of the Conservation Management Plan, including Adoption and Review of Policies

Policy 7—Conformity with National and International Conservation Principles

Policy 11—Maintaining Key Views of the Sydney Harbour Bridge in its Setting

Policy 17—Exemptions

Policy 33—Conservation of Archaeological Resources

Policy 38—Coordination of Statutory Compliance

Outcome

The cultural heritage values of the Sydney Harbour Bridge and its setting will be protected through the coordination of a range of statutory instruments implemented by national, state and local authorities.

3

Conserve and Maintain the Place

The cultural heritage values (including design integrity and fabric) of the Sydney Harbour Bridge should be actively conserved by appropriate maintenance, repair and the management of change as part of a program with both short and long term strategies.

Recommendations

12. The current program of maintenance and repair for the bridge and the use of RTA staff should be continued but will require review to incorporate the recommendations of the 2007 CMP. Maintenance and repair work should conform to both the general and specific policies in Section 7.0 and the Inventory Records 1997 document. Specialist input should be provided for assessment, documentation and carrying out of works on site.
13. The review of the maintenance program should incorporate identified limitations, problem areas, new requirements and methods. A condition audit of site components and fabric and a review of responsibilities for implementation and oversight of maintenance works should occur at this time.
14. The Inventory Records 1997 document should be reviewed within twelve months to ensure that contemporary approaches to conservation are incorporated, that changes to statutory heritage listings that have occurred since adoption of the 1998 CMP are noted and that other relevant changes are included. As part of the review, the document may be incorporated with the proposed SHB Asset Register which is currently in preparation by the RTA.
15. The RTA should adopt a cooperative approach with other authorities, organisations and tenants who are users of the bridge to ensure that they are aware of their responsibilities and statutory obligations to respond to and work with the cultural heritage values of the bridge.
16. Care of the Sydney Harbour Bridge Movable Heritage Collection (which comprises the Sydney Harbour Bridge Workshops Collection, the Sydney Harbour Bridge Memorabilia Collection; and Sydney Harbour Bridge South-East Pylon Museum Collection) should be undertaken in accordance with the Sydney Harbour Bridge Movable Heritage Conservation Strategy 2007.
17. The acquisition and management of SHB artefacts and movable heritage related to the bridge should be undertaken in accordance with the Collections Policy in the RTA Heritage Guidelines 2004—Version 2.
18. A separate CMP should be prepared for the management and maintenance of the Maintenance Cranes.
19. In the case of the excavation or disturbance of archaeological resources within the SHB boundary, the RTA should first refer to the RTA Heritage Guidelines document and seek heritage advice, including an internal (RTA) or external archaeological expert.

Policies

Policy 1—Retention of Cultural Significance	Policy 19—New Development
Policy 7—Conformity with National and International Conservation Principles	Policy 20—Minimising Impacts of Change
Policy 9—Management Objectives	Policy 21—Changes due to Operational Requirements
Policy 10—Priority of Cultural Heritage Value	Policy 22—Fireworks, Banners and Decorations
Policy 13—Integrity of Original Design	Policy 23—Use of Approaches
Policy 14—Maintenance and Repair Works	Policy 26—Movable Items

Generally	Policy 27—Collections Management
Policy 15—Use Appropriate Specialist Personnel	Policy 28—Contents of Abutment Towers and Pylons
Policy 16—Records of Intervention and Maintenance	Policy 29—Services
Policy 17—Exemptions	Policy 30—Lighting
Policy 18—Management of Adaptation and Change	Policy 31—Security
	Policy 33—Conservation of Archaeological Resources
Outcome	The conservation of the cultural heritage values of the Sydney Harbour Bridge will be a priority of the management, maintenance and repair programs for the bridge.

4

Setting

The conservation of the setting and visual catchment of the Sydney Harbour Bridge within Sydney Harbour will require a cooperative approach between the Commonwealth, State and local government authorities to implement the provisions of the *Environment Protection and Biodiversity Conservation Act 1999*, the *Heritage Act 1977* (NSW), the *Sydney Harbour Foreshore Authority Act 1999* (NSW), and the *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005* (NSW).

Recommendations

20. The listing of the Sydney Harbour Bridge on the SHR and the NHL should include specific reference to its setting and its place in the visual context of the Opera House, the city of Sydney, North Sydney and Sydney Harbour.
21. The RTA should work with Commonwealth, State and local government authorities within the setting of the bridge to ensure that all works and development within the setting of the bridge are determined under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999*, the *Heritage Act 1977* (NSW), the *Sydney Harbour Foreshore Authority Act 1999*, and the *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005* (NSW), as appropriate.

Policies

Policy 1—Retention of Cultural Significance

Policy 2—Adoption of Policies

Policy 4—Distribution of the CMP

Policy 9—Management Objectives

Policy 11—Maintaining Key Views of the Sydney Harbour Bridge in its Setting

Policy 12—Retention of Existing Open Space for Public Use/Recreation

Policy 13—Integrity of Original Design

Policy 38—Coordination of Statutory Compliance

Outcome

The setting and visual catchment of the Sydney Harbour Bridge will be protected and by a cooperative approach between authorities responsible for the application of relevant legislation.

5

Interpretation and Public Engagement

The community should be provided with a wide range of opportunities to engage with the history and heritage of the Sydney Harbour Bridge through a program of interpretation and public engagement.

Recommendations

22. The Sydney Harbour Bridge Interpretation Plan 2007 should be formally adopted by the RTA. Responsibility for implementation of the Interpretation Plan should be allocated to a specific position/role or section within the RTA.
23. Implementation of the Sydney Harbour Bridge Interpretation Plan 2007 should involve representatives from RTA and other stakeholders (eg RailCorp, BridgeClimb, the Heritage Office, Sydney Harbour Foreshore Authority, North Sydney Council, the City of Sydney Council, The Rocks Walking Tours, Tourism Sydney and Metropolitan Local Aboriginal Land Council).
24. The RTA and SHFA should address the provision of improved physical access to the bridge, including improved signs or modifications where necessary to the walkway and the cycleways, and clarifying SHB access information with maps or additional tourist information.
25. The RTA and SHFA should cooperate to develop interpretive signs and other media which is consistent throughout the bridge and associated areas. Signs should be reviewed and upgraded and design standards for bridge signs and publications developed.
26. The RTA should develop, create, support and maintain a SHB website, which will provide accurate and easily accessible resources for visitors, tour guides, teachers, students and others.
27. The RTA should develop and produce a range of print and electronic media (eg brochures, posters and interactive media) to provide easily accessible introductory interpretation of the bridge. Information should be available on the SHB website, displayed in public transport or on or near the bridge.
28. The RTA and other stakeholders should develop a collaborative Tour Guide Network between commercial tour operators, independent guides and other commercial tourism ventures and public agencies. Procedures should be put in place to ensure the information provided in commercial tours, spoken and/or printed self-guided tours, and specialist tours focusing on technical and heritage aspects of the bridge is consistent with the Interpretation Plan.

Policies

Policy 3—Coordination with Management Plans
 Policy 12—Retention of Existing Open Space for Public Use/Recreation
 Policy 22—Fireworks, Banners and Decorations
 Policy 27—Collections Management

Policy 34—Existing Access Provisions
 Policy 35—Engagement with the Public
 Policy 36—Interpretation Requirements
 Policy 37—Machinery and Equipment

Outcome

The cultural heritage values of Sydney Harbour Bridge will be relayed to the public and community via a range of media.

9.0 Reference List

9.1 Legislation

Australian Heritage Council Act 2003 (Cwlth)

City of Sydney, Central Sydney Heritage Local Environmental Plan 2000

City of Sydney, Sydney Local Environmental Plan 2005, December 2005

Environmental Planning and Assessment Act 1979 (NSW)

Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)

Environment Protection and Biodiversity Conservation Regulations 2000 (Cwlth)

Heritage Act 1977 (NSW)

North Sydney Local Environmental Plan 2001

Sydney Harbour Foreshore Authority Act 1999 (NSW)

Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005

9.2 Heritage Advice

Australia ICOMOS Inc, *The Burra Charter: The Australian ICOMOS Charter for Places of Cultural Significance* 1999, Burwood Victoria 2000.

Australian Government Department of Environment and Heritage, July 2005, 'Heritage Strategies—A guide for Commonwealth agencies'.

NSW Heritage Office 2006, *Heritage Information Series—Standard Exemptions for Works Requiring Heritage Council Approval*, Sydney.

9.3 Heritage Listings

National Heritage List—Database Report: Sydney Harbour Bridge, Bradfield Hwy, Dawes Point—Milsons Point, NSW, Australia.

RTA Heritage and Conservation Register—Database Report: Sydney Harbour Bridge, approaches and viaducts.

RTA Heritage and Conservation Register—Database Report: Sydney Harbour Bridge Memorabilia Collection.

RTA Heritage and Conservation Register—Database Report: Sydney Harbour Bridge Workshops Collection.

RTA Heritage and Conservation Register—Database Report: SHB South-East Pylon Museum Collection.

Register of the National Estate—Database Report: Sydney Harbour Bridge, Bradfield Hwy, Sydney, NSW.

SHFA Heritage Register—Database Report: Dawes Point Battery remains.

State Heritage Register—Database Report and curtilage map: Sydney Harbour Bridge, approaches and viaducts (road and rail).

State Heritage Register—Database Report: Milsons Point Railway Station group.

State Heritage Register—Database Report: Dawes Point Battery remains.

9.4 Reports

Godden Mackay Logan, Sydney Harbour Bridge Interpretation Plan, prepared for NSW Roads and Traffic Authority, February 2007.

Heritage Group, Department of Public Works and Services, Sydney Harbour Bridge Conservation Management Plan—Inventory Records, prepared for NSW Roads and Traffic Authority, August 1997.

Heritage Group, Department of Public Works and Services, Sydney Harbour Bridge Conservation Management Plan, prepared for NSW Roads and Traffic Authority, February 1998.

International Conservation Services, Sydney Harbour Bridge Movable Heritage Conservation Strategy, prepared for NSW Roads and Traffic Authority, 2007.

Johnson, AW, Dawes Point Battery Archaeological Excavations 1995 Volume 1, prepared for the Sydney Cove Authority, 1998.

RTA Environment Branch (Eds Nicole Secomb and Rachel McMullan), RTA Heritage Guidelines 2004—Version 2.

9.5 Published Sources

Ammann, OH 1918, 'The Hell Gate Arch Bridge and Approaches', in *Transactions of American Society of Civil Engineers*, Vol 82.

Attenbrow, V 2002, *Sydney's Aboriginal Past*, UNSW Press, Sydney.

Bradfield, John 1933–34, 'The Sydney Harbour Bridge and Approaches', in *Minutes of Proceedings of the Institution of Civil Engineers*, London, Vol 238, Part 2.

Cazneaux et al 1932, *The Second Bridge Book*, Ure Smith for Art in Australia, Sydney.

Curson, PH 1985, *Times of Crisis: Epidemics in Sydney 1788–1900*, Sydney University Press, Sydney.

Encyclopedia Britannica, 1992 (Bridges, Construction and History of).

Fraser, D (ed), *Sydney: From Settlement to City*, Engineering Heritage Committee, Institution of Engineers, Sydney.

Freeman, Ralph 1933–4, Sydney Harbour Bridge: Design of the Structure and Foundations, *Minutes of Proceedings of the Institution of Civil Engineers* Vol 238, Part 2.

Lalor, P 2005, *The Bridge: The Epic Story of an Australian Icon—The Sydney Harbour Bridge*, Allen & Unwin.

Proudfoot, Helen 1988, *Sydney Harbour Paradise of Waters*, Proudfoot Press, Sydney.

Jones, Michael 1988, *North Sydney 1788–1988*, Allen & Unwin, Sydney.

Keenan, D 1987, *The North Shore Lines of the Sydney Tramway System*, Transit Press, Sydney.

Park, M 2000, *Building a Bridge for Sydney: The North Sydney Connection*, Historical Services Department, North Sydney Council.

Prunster, U 1982, *The Sydney Harbour Bridge 1932–1982*, Angus and Robertson.

Roads and Traffic Authority, 1988, *The Story of the Sydney Harbour Bridge*, RTA.

Sneddon, A 2004, 'Development or Sale of Identified Cultural Heritage Sites', *Law Society Journal*, Vol 42, No. 11.

Spearritt, Peter 2000, *Sydney's Century: A History*, UNSW Press, Sydney.

Spearritt, Peter 1982, *The Sydney Harbour Bridge: A Life*, Allen & Unwin, Sydney.

Spearritt, Peter 1979, 'Bradfield, John Job Crew (1867–1943)', *Australian Dictionary of Biography*, Volume 7, Melbourne University Press.

Sydney Morning Herald (Supplement) 20 March 1932.

9.6 Other Sources

Bradfield, Sydney Harbour Bridge: Report on Tenders, Government Printer, 1924.

NSW Roads and Traffic Authority, 'Heritage' <http://www.rta.nsw.gov.au/environment/heritage/index.html>
Last Updated: 15 June 2006.

Otto Holdings (Aust) Pty Ltd trading as BridgeClimb, Australia, viewed 9 November 2006
<<http://www.bridgeclimb.com/Route.htm>>.

Sydney Harbour Federation Trust, Australia, viewed 17 November 2006
<http://www.shfa.nsw.gov.au/sydney-About_Us-Our_Environment.htm>.

Smith, KV 2006, *Eora: Mapping Aboriginal Sydney 1770–1850*, Exhibition Catalogue, State Library of NSW, Sydney.

10.0 Appendices

Appendix A—Heritage Register Entries

National Heritage List—Database Report: Sydney Harbour Bridge, Bradfield Hwy, Dawes Point–Milsons Point, NSW

State Heritage Register—Database Report and curtilage map: Sydney Harbour Bridge, approaches and viaducts (road and rail)

State Heritage Register—Database Report: Milsons Point Railway Station group

State Heritage Register—Database Report: Dawes Point Battery remains

RTA Heritage and Conservation Register—Database Report: Sydney Harbour Bridge, approaches and viaducts

RTA Heritage and Conservation Register—Database Report: Sydney Harbour Bridge Memorabilia Collection

RTA Heritage and Conservation Register—Database Report: Sydney Harbour Bridge Workshops Collection

RTA Heritage and Conservation Register—Database Report: SHB South-East Pylon Museum Collection

SHFA Heritage Register—Database Report: Dawes Point Battery remains

Register of the National Estate—Database Report: Sydney Harbour Bridge, Bradfield Hwy, Sydney, NSW

Appendix B

Sydney Harbour Bridge Precinct Plans

Appendix C

Comparison of National Heritage and NSW Heritage Criteria

Appendix D

NSW Heritage Office, Heritage Information Series—Standard Exemptions for Works Requiring Heritage Council Approval, 2006

Appendix E

Sydney Harbour Bridge—Site Specific Exemptions for Works requiring Heritage Council of NSW Approval

Appendix F

EPBC Act Compliance Checklist

Appendix G

Sydney Harbour Bridge—The Social Side

Appendix H

The Burra Charter (The Australian ICOMOS Charter for Places of Cultural Significance)

Appendix A – Heritage Register Entries

National Heritage List—Database Report: Sydney Harbour Bridge, Bradfield Hwy, Dawes Point–Milsons Point, NSW

State Heritage Register—Database Report and curtilage map: Sydney Harbour Bridge, approaches and viaducts (road and rail)

State Heritage Register—Database Report: Milsons Point Railway Station group

State Heritage Register—Database Report: Dawes Point Battery remains

RTA Heritage and Conservation Register—Database Report: Sydney Harbour Bridge, approaches and viaducts

RTA Heritage and Conservation Register—Database Report: Sydney Harbour Bridge Memorabilia Collection

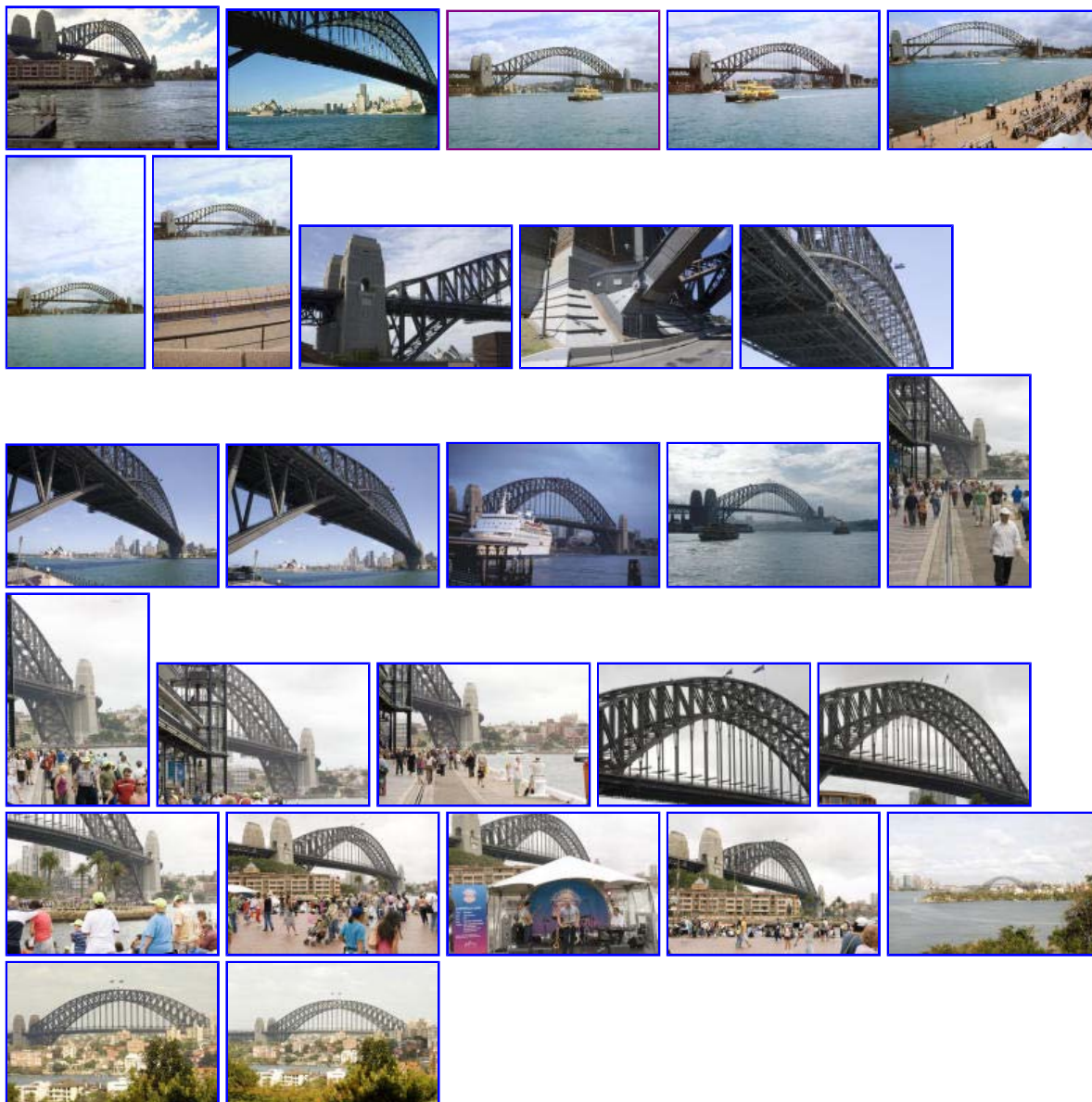
RTA Heritage and Conservation Register—Database Report: Sydney Harbour Bridge Workshops Collection

RTA Heritage and Conservation Register—Database Report: SHB South-East Pylon Museum Collection

SHFA Heritage Register—Database Report: Dawes Point Battery remains

Register of the National Estate—Database Report: Sydney Harbour Bridge, Bradfield Hwy, Sydney, NSW

Australian Heritage Database

Place Details[new search](#) | [about the Australian Heritage Database](#) | [Heritage home](#) | [Australian Heritage Council home](#)[Send Feedback](#)**Sydney Harbour Bridge, Bradfield Hwy, Dawes Point - Milsons Point, NSW,Australia****Photographs:**

List: National Heritage List
Class: Historic
Legal Status: [Listed place](#) (19/03/2007)
Place ID: 105888
Place File No: 1/12/036/0065

Summary Statement of Significance:

The building of the Sydney Harbour Bridge was a major event in Australia's history, representing a pivotal step in the development of modern Sydney and one of Australia's most important cities. The bridge is significant as a symbol of the aspirations of the nation, a focus for the optimistic forecast of a better future following the Great Depression. With the construction of the Sydney Harbour Bridge, Australia was felt to have truly joined the modern age, and the bridge was significant in fostering a sense of collective national pride in the achievement.

The Sydney Harbour Bridge was an important economic and industrial feat in Australia's history and is part of the nationally important story of the development of transport in Australia. The bridge is significant as the most costly engineering achievement in the history of modern Australia, and this was extraordinary feat given that it occurred at the severest point of the Great Depression in Australia.

The bridge is also significant for its aesthetic values. Since its opening in 1932, the Sydney Harbour Bridge has become a famous and enduring national icon, and remains Australia's most identifiable symbol. In its harbour setting, it has been the

subject for many of Australia's foremost artists, and has inspired a rich and diverse range of images in a variety of mediums – paintings, etchings, drawings, linocuts, photographs, film, poems, posters, stained glass - from its construction phase through to the present.

The Sydney Harbour Bridge is also significant as one of the world's greatest arch bridges. Although not the longest arch span in the world, its mass and load capacity are greater than other major arch bridges, and no other bridge in Australia compares with the Sydney Harbour Bridge in its technical significance. In comparing Sydney Harbour Bridge with overseas arch bridges, Engineers Australia has drawn attention to its complexity in combining length of span with width and load carrying capacity. The construction of Sydney Harbour Bridge combined available technology with natural advantages provided by the site. The designers took advantage of the sandstone base on which Sydney was built, which enabled them to tie back the support cables during construction of the arch, and to experiment with massive structures. Although designed more than 80 years ago, the bridge has still not reached its loading capacity.

The bridge is also significant for its important association with the work of John Job Crew Bradfield, principal design engineer for the New South Wales Public Works Department, who ranks as one of Australia's greatest civil, structural and transport engineers.

Official Values:

Criteria

A Events, Processes

Values

The building of the Sydney Harbour Bridge as a transport facility linking the city with the north shore was a major event in Australia's history, and represented a pivotal step in the development of modern Sydney and one of Australia's most important cities. The bridge became a symbol for the aspirations of the nation, a focus for 'optimistic prognostications of a better future' following the Depression. The bridge represented an important step in transforming the city of Sydney into a modern metropolis. Internationally, the bridge was recognised as a symbol of progress and a vision of a splendid future.

The building of the Sydney Harbour Bridge was an important part of the technical revolution of the 1930s and seen as evidence of Australia's industrial maturity. The bridge represented the mechanical age displacing the pastoral and agricultural way of life on which Australia's economy had been based. The scale of the operations was enormous and at the time of its construction, it was the widest long-span bridge in the world.

The Sydney Harbour Bridge includes a steel arch spanning the harbour between Milsons Point on the north side and Dawes Point on the south side, and elevated approaches to the arch from both the north and south sides. The arch is made up of two 28-panel arch trusses set in vertical planes, 30 metres apart centre to centre, and braced together laterally. Two granite-faced concrete pylons, with a height of 89 metres above mean sea level, are located at each end of the arch. A deck carrying road and rail traffic is suspended from the arch. Pairs of hangers, ranging in length from 7.3 metres to 58.8 metres, support cross-girders, each weighing 110 tonnes, which support the deck. The northern and southern approaches each contain five spans, constructed as pairs of parallel-chord, six-panel steel trusses. The spans are supported by pairs of concrete piers faced with granite. The combined length of the approach spans is 646 metres.

The Sydney Harbour Bridge is an outstanding cultural landmark for the nation and represents a highly significant place in Australia's cultural history. The opening of the Sydney Harbour Bridge was a momentous occasion, drawing remarkable crowds estimated at nearly one million people.

Since its opening in 1932, the Sydney Harbour Bridge has become a famous and enduring national icon and symbol of Australia. The bridge remains one of Australia's most identifiable symbols.

E Aesthetic characteristics

Sydney Harbour Bridge is an integral component of the Sydney Harbour vista and represents one of the most recognisable and iconic images in the world. It is the picturesque blending of the natural environment and man-made structures around the harbour foreshores that has proved an inspiration for generations of artists and writers. In its harbour setting, it has inspired a rich and diverse range of images in a variety of mediums – paintings, etchings, drawings, linocuts, photographs, film, poems, posters, stained glass - from the date of its construction through to the present day.

The bridge is conceivably one of Australia's most-photographed cultural landmarks, and striking images of the bridge have been captured by some of Australia's best-known photographers.

The Sydney Harbour Bridge has also been replicated in tourist posters, postcards, crafts and the folk arts, its image reproduced in media including glass, ceramic, metal, shells and crochet cotton, embroidery and etchings in a huge array of objects.

F Creative or technical achievement

The Sydney Harbour Bridge may be considered the world's greatest arch bridge. Although not the longest arch span in the world, its mass and load capacity are greater than other major arch bridges. No other bridge in Australia compares in its technical significance with the structure of the Sydney Harbour Bridge and its pylons and constructed approaches between Argyle Street in the south and Arthur Street in the north.

The construction of Sydney Harbour Bridge combined available technology with natural

advantages provided by the site. The bridge is an outstanding technical and construction achievement of the Twentieth Century. The designers took advantage of the sandstone base on which Sydney was built - which enabled them to tie back the cables during construction of the arch and to experiment with massive structures. Although designed during the 1920s and 1930s the bridge has still not reached its loading capacity.

G Social value

It was part of John Job Crew Bradfield's vision for the bridge that it be used at times of national rejoicing. Since its opening it has regularly supported flags, banners, and especially fireworks, becoming a focus for national and local celebrations. Community ceremonial and celebratory occasions centred on Sydney Harbour Bridge, either for the people of Sydney or the broad Australian community, are well recognised and have been widely noted. Since 1932, the broad Australian community has identified the Sydney Harbour Bridge as one of the most nationally and internationally recognised symbol of Australia and the bridge in its harbour setting represents a composite national symbolic image.

H Significant people

John Job Crew Bradfield ranks with other engineers whose close involvement in a broad range of projects contributed to Australia's national development. As principal design engineer for the New South Wales Public Works Department, Bradfield was largely responsible for finally bringing the Sydney Harbour Bridge to fruition. As Chief Engineer, he prepared the general design specification and supervised the whole project on behalf of the Government of New South Wales, also integrating the bridge into the Sydney road, tram and rail system.

Bradfield was nationally recognised through his appointments to the Australian National Research Council and the Australian Commonwealth Standards Advisory Committee. The Institution of Engineers, Australia awarded him the Peter Nicol Russell Memorial Medal in 1932, and he also received the Kernot Memorial Medal from the University of Melbourne in 1933, and the Telford Gold Medal from the Institution of Civil Engineers, London in 1934.

Description:

The Sydney Harbour Bridge includes a steel arch spanning the harbour between Milson's Point on the north side and Dawes Point on the south side, and elevated approaches to the arch from both the north and south sides.

The total length of the bridge, including the approach spans, is 1149 metres. The arch is made up of two 28-panel arch trusses set in vertical planes, 30 metres apart centre to centre, and braced together laterally; it is 57 metres deep beside the pylons and 18 metres deep in the middle of the arch (Godden Mackay, 1992: ref no 0076). It is anchored by two bearings at each end, which take the weight of the bridge and allow for expansion and contraction of the steel. Under maximum load, the thrust is approximately 20,000 tonnes on each bearing (Australian Government, Culture and Recreation Portal).

The span of the arch is 503 metres and the top of the arch is 134 metres above mean sea level. The arch is founded on sandstone rock excavated to a depth of 12 metres and filled with mass concrete. A total of 39,000 tonnes of structural steel was used in the arch, over two-thirds of it silicon steel ([Australian Academy of Technological Sciences and Engineering](#), 2000). Two granite-faced concrete pylons, with a height of 89 metres above mean sea level, are located at each end of the arch (Australian Government, Culture and Recreation Portal).

A deck carrying road and rail traffic is suspended from the arch. Pairs of hangers, ranging in length from 7.3 metres to 58.8 metres, support cross-girders, each weighing 110 tonnes. The cross-girders support the concrete bridge deck (Nicholson, 2000: 26-27). The width of the deck is almost 49 metres and the clearance for shipping is also 49 metres. The deck currently caters for eight lanes of road traffic, two railway tracks, and two pedestrian footways.

The northern and southern approaches each contain five spans, constructed as pairs of parallel-chord, six-panel steel trusses. The spans are supported by pairs of concrete piers faced with granite (Nicholson, 2000: 10-11). The combined length of the approach spans is 646 metres.

History:

Convict architect Francis Greenway proposed a bridge over Sydney Harbour to Governor Macquarie as early as 1815. In January 1900, tender designs and financial proposals were sought for a bridge to span the harbour. All of the 24 schemes were criticised and thought unsatisfactory. The 1903 design by the firm of J Stewart and Co for a single arch bridge without pylons was rejected as being 'too huge' and 'objectionable' from an artistic point of view (Jahn, 1997: 123).

In 1912, the New South Wales government appointed J J C Bradfield Chief Engineer for Metropolitan Railway Construction and the Sydney Harbour Bridge (Nicholson, 2000: 5). Bradfield submitted preliminary designs for three types of bridge, cantilever, suspension and arch; he favoured cantilever, but after travelling overseas he concluded that an arch bridge would be cheaper (Carroll, 1988: 156). He completed a formal arch design for the bridge in 1916. The bridge was to carry six lanes of road traffic, railway and tram tracks and a footpath on each side. Bradfield's design, involved more than the bridge, which was the key element of an integrated transport system including an extensive network of railways and roadways leading to the bridge, these in turn were integrated into the broader Sydney road, rail and tram system. Known as the Bradfield Scheme, the project also involved the construction of an underground railway in the Sydney CBD. The Bradfield Scheme was a visionary urban transport planning scheme including the world's second underground railway outside of western Europe or North America and the largest single span steel bridge in the world (Lee, 2003: 43).

In 1922 the New South Wales Parliament passed the Sydney Harbour Bridge Act and designs and tenders were invited for a bridge to satisfy Bradfield's broad requirements. The contract was let on 24 March 1924 to Dorman Long & Company of Middlesbrough, England, and included extensive approaches on either side of the arch. While Bradfield was responsible for the

concept and the general design, Dorman Long and Company retained the services of English consulting engineer Sir Ralph Freeman for the detailed design of the structure. Dorman Long's tender price, including the distinctive granite pylons, was just under £4¼ million ([Australian Academy of Technological Sciences and Engineering](#), 2000). Bradfield was responsible for overall management of the project and Lawrence Ennis was Director of Construction for the contractors (O'Connor et al, 1987: 11).

Preparatory works for the construction of the bridge approaches were undertaken by the Railways and Public Works Department, and commenced on the North Shore in late 1923, before the tender process was completed (Lalor, 2005:108). These works included the demolition of buildings, mainly houses, in the path of the bridge approaches. Owners of the properties were compensated but not housing tenants (Nicholson, 2000: 6). The concrete piers which were to support the approach spans were completed in September 1926 and the spans in September 1928 (Nicholson, 2000: 11-13).

The arch of the bridge was to be built from both ends, Milson's Point and Dawes Point, and joined in the middle. Each half-arch was built using a creeper crane with a lifting capacity of 122 tonnes, which travelled on the top chords of the arch. The half arches were secured by wire cables, anchored in inclined U-shaped tunnels cut into the rock behind the abutments at each end of the arch ([Australian Academy of Technological Sciences and Engineering](#), 2000). Excavations for the abutments and pylons commenced in January 1925 (Nicholson, 2000: 11).

Most of the steel was manufactured in Dorman, Long's works in Middlesbrough, but the fabrication was carried out on-site in workshops specially constructed for the purpose at Milson's Point ([Australian Academy of Technological Sciences and Engineering](#), 2000). Barges transported the fabricated steelwork from the workshops to points beneath the creeper cranes for lifting up to the arch.

By Christmas 1928, the creeper crane on the southern side was ready to hoist the first steel for the arch into place, commencing with the bearings and pins which transfer the weight of bridge to the foundations. The first panel of the arch was in place by the following March and the creeper crane edged on to the bridge (Nicholson, 2000: 15). The two half-arches were completed in August 1930, and as the steel cables taking their weight were lengthened, the bottom chords were joined on 19 August. The top chord was joined and the arch completed on 9 September 1930.

The temporary wire rope anchorages were then removed and the creeper cranes returned down the arch, erecting the hangers and deck steelwork as they went along. Deck concreting and finishing then followed ([Australian Academy of Technological Sciences and Engineering](#), 2000). In 1931 the road and the two sets of tram and railway tracks were completed, and power and telephone lines and water, gas and drainage pipes were also installed.

The pylons, which serve a mainly aesthetic purpose, are concrete and faced with granite quarried at Moruya on the New South Wales south coast. Dorman Long recruited skilled stonemasons from Scotland and Italy to cut and shape the stone. The first block of stone was laid in October 1925 and the facing was completed by the end of 1931, after the tie-back cables had been removed from the abutments (Nicholson, 2000: 11-14, 28).

Sixteen workers died during construction, of whom seven were employed on the bridge structure itself (City of Sydney, History and Archives). Completion of the bridge in 1932 coincided with the darkest days of the Depression and many of the bridge workers released from their construction tasks swelled the growing ranks of the unemployed. The depth of the Depression in Australia stemmed from the huge debt accumulated during and after World War One. In addition to war borrowings, Australia borrowed vast amounts from Britain during the 1920s, much of it to fund urban development including ambitious works programs. By 1929 Australia owed more to the financial houses of London than all the governments of Europe, Africa, the Far East, Middle East and South America combined (Stone, 2005: 1). The actual cost of constructing the bridge was £6,250,000 which had been borrowed, adding to Australia's debt.

New South Wales Premier Jack Lang officially opened the Sydney Harbour Bridge on 19 March 1932 amid political controversy. Australia's perilous debt position had lead to a visit to Australia in August 1930 by Sir Otto Niemeyer, an emissary of the Bank of England to advise Australia's political leaders as to how the debt position could be best managed. Sir Otto Niemeyer advised that the budget should be balanced using thrift and good management to resolve the debt situation. A view that was in contrast to the newly emerging Keynesian economic model that supported increased public spending to prime the economy during periods of stagflation. Government incomes were declining due to falling tax revenues and the government's capacity to provide Depression relief would be severely restricted by further tightening its budget.

The Scullin led federal Labor Government took a conservative line and complied with Sir Otto's advice. The impact of pursuing this line worsened the Depression and threw more workers onto the dole. In NSW a change of government in October 1930 saw a Labor Government led by Lang swept to power. Lang championed the worker's cause promising to defy the agreement struck with Sir Otto Niemeyer and default on interest payments to British financial institutions. At the Premier's Conference in February 1931, Lang proposed that Australia not pay any further interest to British bondholders, until Britain dealt with Australian overseas debts in the same manner as she settled her own foreign debts with America. Britain had negotiated concessions from the Americans. Lang's actions divided the political scene including the Labor movement. Tensions rose and conservatives appealed to the Governor of New South Wales, Sir Philip Game to remove Lang.

The period also saw the emergence in New South Wales of the New Guard, a right wing militia organisation styling itself as a citizen's army to assist the police maintain civil order in times of unrest. Funded by the 'establishment' and drawing heavily on the veterans of the First World War, the New Guard saw it's role as defending the peace and keeping subdued any potential uprising by unionists, the unemployed and the working classes all of whom they viewed as communists. Lang with his support for the working classes and his defiance of the establishment's subservience to the financial institutions of Britain was an anathema to the New Guard who viewed him as a danger to Australian society.

Lang's decision, as the elected representative of the people, to preside at the opening of the Sydney Harbour Bridge was controversial in itself as it caused offence to the King who felt such a major occasion warranted royal participation or at the very least, the Governor officiating at the opening. The Governor already under pressure to remove Lang was faced with His Majesty's displeasure. Sir Philip's attempt to persuade the Premier to avoid offence to the monarch and permit him to officiate was unsuccessful. Premier Lang officiated at the opening, however, before he could cut the ribbon to open the bridge, Captain Francis

de Groot of the New Guard slashed it with his sword. This New Guard stunt was initiated by the Guard's leadership to thwart more radical action by some of the more extreme Guard members to kidnap Lang prior to the opening of the bridge. The opening of the bridge embodied all the political tensions of the time. This, however, did not stop large numbers of Sydneysiders and interstate visitors flocking to the opening.

The eastern pair of tramway tracks was converted to roadway in 1958 (Godden Mackay, 1992: ref no 0076). A panel which considered a proposal to add two double-lane decks over the outside lanes of the bridge, the railway and Cahill Expressway lanes, handed down its report in March 1987 (O'Connor et al, 1987). The proposal was not implemented, and the alternative of a tunnel under the harbour, which early in the twentieth century Sir John Sulman had suggested was a better option than a bridge (Jahn, 1997: 123), was adopted. The Sydney Harbour Tunnel was completed in August 1992.

Condition and Integrity:

Changes and modifications have been made to the Sydney Harbour Bridge over the years, mainly to meet the demands of modern traffic.

In 1958 the tram tracks on the eastern side were removed, replaced with two new traffic lanes and connected to the Cahill Expressway over Circular Quay. Other changes include removal of the tram viaduct at the northern approach; extensive reconstruction of the north and south approaches; the construction of the Warringah Expressway between the bridge and Miller Street, North Sydney in the 1960s; installation of toll plazas, overhead gantries and lane indicators, and many signboards; floodlighting of the bridge; and addition of an anti-suicide balustrade. There were also additions to the tops of the bridge pylons (O'Connor et al, 1987: 2-3).

After completion of the bridge, maintenance became, and still is, the responsibility of the New South Wales Government. This responsibility falls principally to the Roads and Traffic Authority of New South Wales, which may involve other bodies, such as the State Rail Authority of New South Wales, as appropriate. Conservation and maintenance policies for the bridge are outlined in the Sydney Harbour Bridge Conservation Management Plan 1998.

The principal consideration is the protection and maintenance of the steelwork by painting. Protection of the steelwork by painting was extremely thorough during the erection of the bridge. A strategy of spot repair and overall repainting has been used continuously ever since the opening of the bridge and it has protected the steelwork remarkably well since then. The environmental and health hazards associated with lead paints now make their use impossible and the task of maintaining the bridge has been made much more difficult due to the lead already on it. A major question is whether to completely remove the old paint and start from bare metal with modern materials. This is a significant issue as there is a limit to the thickness of paint that can be applied to a surface before it starts to fall off under its own weight and due to degradation over time (Sydney Harbour Bridge Conservation Management Plan, 1998: 114).

The Conservation Management Plan outlines other measures to conserve the integrity of the bridge, including that:

- the clarity of the structural form of the original steelwork be maintained
- priority be given to maintenance of the steelwork
- the original form of the granite-clad pylons and piers be maintained
- the fabric of the rendered masonry approach structures not be obscured or damaged
- the arrangement of internal spaces in the abutments, pylons and approach structures be conserved
- the visual form and setting of the bridge not be obscured by buildings or large plantings on the harbour foreshore
- views and vistas be maintained
- commercial advertising on the bridge be excluded (Sydney Harbour Bridge Conservation Management Plan, 1998: 126-137).

Location:

Bradfield Highway, Dawes Point in the south and Milsons Point in the north, comprising bridge, including pylons, constructed approaches and parts of Bradfield and Dawes Point Parks, being the area entered in the NSW Heritage Register, listing number 00781, gazetted 25 June 1999, except that part of this area north of the southern alignment of that part of Lavender Street between Harbourview Crescent and Cliff Street, Milsons Point.

Bibliography:

Davis, C W (1980) *Images of the Sydney Harbour Bridge* unpublished thesis Fine Arts, University of Sydney quoted in *The Sydney Harbour Bridge 1932-1982*.

Jahn, G (1997) *Sydney Architecture*, The Watermark Press, Sydney.

Nicholson, J (2000) *Building the Sydney Harbour Bridge*, Allen & Unwin, Sydney.

Browne, L (1996) *Bridges: Masterpieces of Architecture*, Universal International, Sydney.

Lalor, P (2005) *The bridge: the epic story of an Australian icon - the Sydney Harbour Bridge*, Sydney, Allen & Unwin.

Carroll, B (1988) *The Engineers, 200 Years at Work for Australia*, The Institution of Engineers, Melbourne.

Tanner, H and Dupain, M (1976) *Building the Sydney Harbour Bridge: The Photography of Henri Mallard*, Sun Books, Melbourne.

Prunster, U (1982) *The Sydney Harbour Bridge 1932 – 1982*, Angus & Robertson, Sydney.

Heritage Group, Department of Public Works and Services (NSW) (1998) *Sydney Harbour Bridge Conservation Management Plan*, Sydney, February.

Holder, J and Harris, G (2000) *Sydney Harbour Bridge Workers Honour Roll 1922-32 Pylon Lookout* Sydney Harbour Bridge, Sydney.

O'Connor, C, Webber, P, Crisp, C, and Fisher, J (1987) *Report on the Sydney Harbour Bridge Development Scheme*, March 1987.

Lee, R (2003) *Australia's Transport and Communications Heritage Sites: A Study for the Australian Heritage Commission*, 2003.

Stone, G (2005) *1932: A hell of a year*, MacMillan, Sydney.

[Australian Academy of Technological Sciences and Engineering](#), *Technology in Australia 1788-1988*, [Australian Science and Technology Heritage Centre](#), 2000
(reproduced at <http://www.austehc.unimelb.edu.au/tia/426.html>)

Godden Mackay (1992) *North Sydney Heritage Study Review*.

National Gallery of Australia (2006) *artonview, Issue No 45*, National Gallery of Australia, Canberra, autumn 2006

Internet sources

Sydney Harbour Bridge, The Institution of Engineers, Australia, 2000
<http://www.sydney.ieaust.org.au/heritage/PDFs/Harbour%20Bridge.pdf>

Australian Government, Culture and Recreation Portal
<http://www.cultureandrecreation.gov.au/articles/harbourbridge/>

City of Sydney, History and Archives
<http://www.cityofsydney.nsw.gov.au/AboutSydney/HistoryAndArchives/SydneyHistory/HistoricBuildings/SydneyHarbourBridge.asp>

University of Sydney Library, *Bradfield's Bridge*
<http://www.library.usyd.edu.au/libraries/rare/bridge/bridge.html>

<http://www.harbourbridge.com.au/hbpages/historycontent.html>

National Library of Australia, Papers of J.J.C. Bradfield, MS 4712, Biographical note <http://nla.gov.au/nla.ms-ms4712>

(National Library of Australia, <http://nla.gov.au/nla.mus-an6631851>; <http://nla.gov.au/nla.mus-an10787298>)

[Australian Science and Technology Heritage Centre](#), Bright Sparcs
<http://www.asap.unimelb.edu.au/bsparcs/biogs/P000958b.htm>

St Andrews College, University of Sydney,
http://www.standrewscollege.edu.au/html/john_bradfield.html

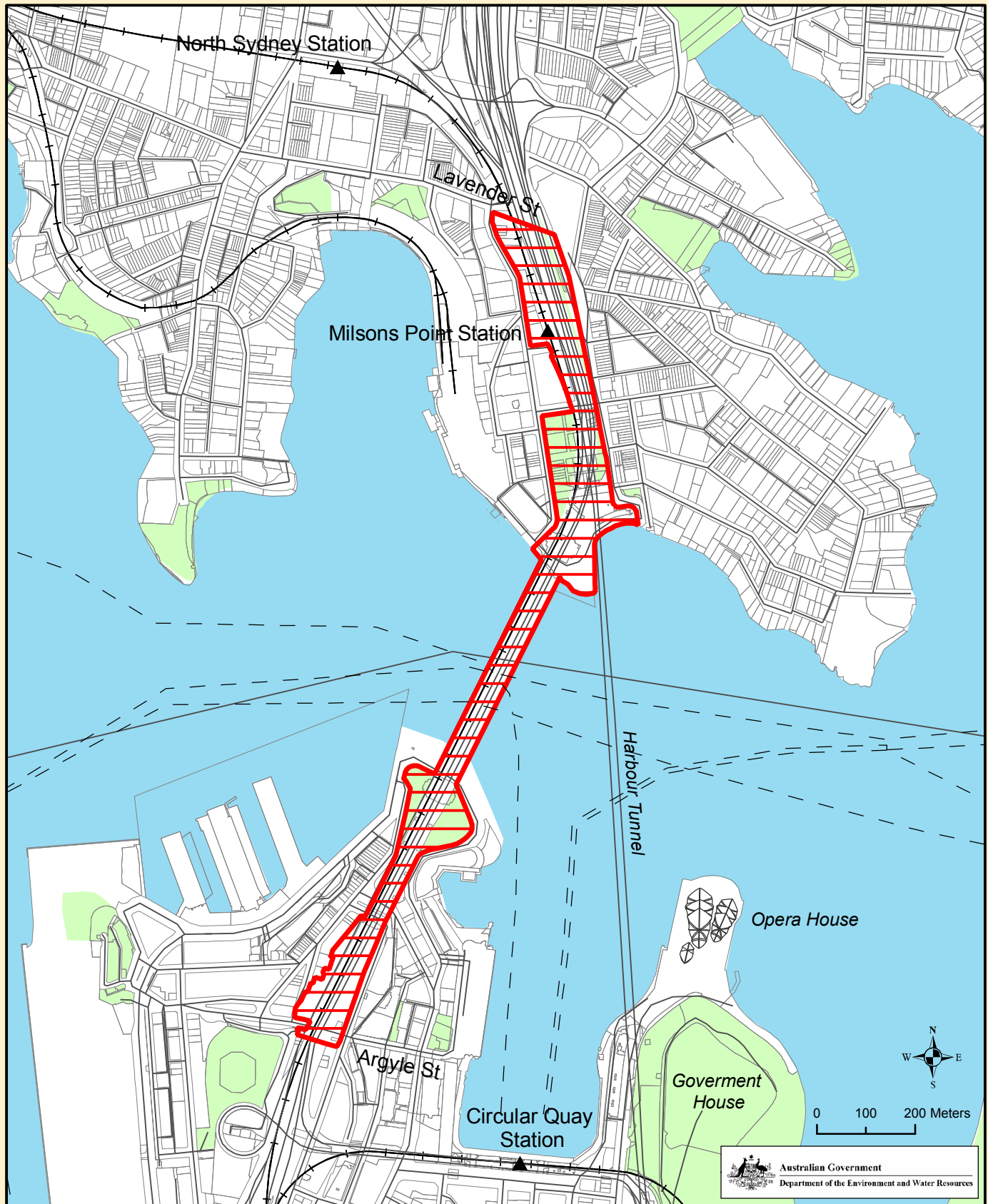
University of Sydney, Faculty of Engineering
http://www.usyd.edu.au/fstudent/postgrad/study/pub/prosp/pg_inter_engineering.pdf

Newcastle's Bridges and the Tyne River
<http://www.s-h-systems.co.uk/tourism/newcastle/bridges.html>

Bayonne Bridge historic overview
<http://www.nycroads.com/crossings/bayonne/>

New River Gorge Bridge
<http://www.nps.gov/neri/bridge.htm>

Report Produced: Thu May 10 14:42:04 2007



LEGEND



Listed Place

Sydney Harbour Bridge

National Heritage List
Place ID: 105888 File 1/12/036/0065

Sources:
RoadNet Comprehensive - Roads
Australia - Cadastre (Digital Cadastral Database DCDB)
© 2007 MapData Sciences Pty Ltd, PSMA

Produced by: Heritage Division
Department of the Environment and Water Resources
Projection: GDA94 Zone 56, Date: 20/3/2007
Canberra, © Commonwealth of Australia
Created in ArcGIS 9 using ArcMap

HERITAGE COUNCIL OF NEW SOUTH WALES

PLAN

ORDER THE HERITAGE ACT, 1977

DESIGNATION "TOWN OF SYDNEY" BRIDGE
AND APPROACHES

CITY OF SYDNEY AND
MILLS POINT, NEW SOUTH WALES
LOCALITY
FROM MILLERS POINT
TO THE CITY OF SYDNEY
CITY OF SYDNEY AND
MILLS POINT
COUNTY OF CUMBERLAND



Scale 1:4000

SUBJECT LAND SHOWN THIS

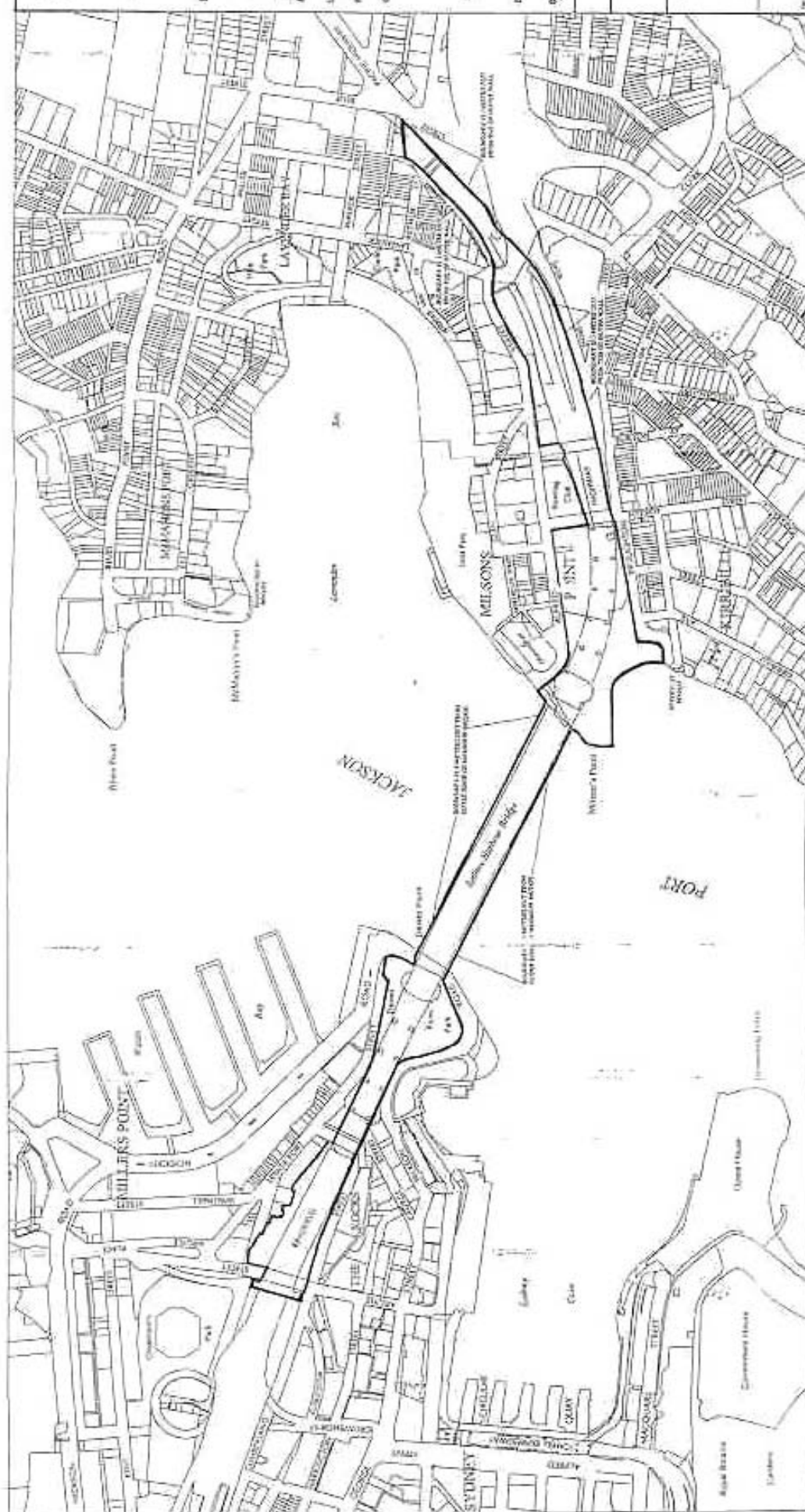
DATE BY
10/02/11 D. J. ALLEN (D.C.D.)
D. J. ALLEN

N.L.S. GOVERNMENT GAZETTE
No. 381

THIS IS THE PLAN REFERRED TO IN
MILLS POINT
CONSTITUTIONS ORDER No. 381

FILE NUMBER
H.C.
195/4

THE HERITAGE ACT, 1977





Working with the community to know, value and care for our heritage



[About Us](#)

[Heritage Council](#)

[About Heritage](#)

[Listings](#)

[Publications & Forms](#)

[Research](#)

[Development](#)

[Conservation](#)

[Funding](#)

[Home](#) ▶ [Listings](#) ▶ [Heritage Databases](#) ▶ [State Heritage Inventory Search](#) ▶ [Heritage Item](#)

Click on the BACK button of your browser to return to the previous page.

Milsons Point Railway Station group

Item

Name of Item: Milsons Point Railway Station group
Other Name/s: Sydney Harbour Bridge
Type of Item: Area/Complex/Group
Group/Collection: Transport - Rail
Category: Railway Platform/ Station
Primary Address: North Shore railway, Milsons Point, NSW 2061
Local Govt. Area: North Sydney

Property Description:

Lot/Volume Code	Lot/Volume Number	Section Number	Plan/Folio Code	Plan/Folio Number
-----------------	-------------------	----------------	-----------------	-------------------

Boundary: The listing boundary is the bridge approach structure and reserves surrounding it from Burton St underbridge to Lavender St underbridge.

All Addresses

Street Address	Suburb/Town	LGA	Parish	County	Type
North Shore railway	Milsons Point	North Sydney			Primary
Burton Street	Milsons Point	North Sydney			Alternate
Alfred Street	Milsons Point	North Sydney			Alternate

Owner/s

Organisation Name	Owner Category	Date Ownership Updated
Rail Infrastructure Corporation	State Government	

Statement of Significance

Milson's Point station is an integral part of the bridge approaches and adds to the completeness of the bridge environment. The form and detail of the subway and tunnels in particular is significant as part of one of the major engineering achievements in the world.

Note: There are incomplete details for a number of items listed in NSW. The Heritage Office intends to develop or upgrade statements of significance and other information for these items as resources become available.

Description

Physical Description: station building - part of Sydney Harbour Bridge approach, 1932
 STRUCTURES
 platform faces - in-situ concrete - 1932
 subway entrances including section under road - as above 1932
 LANDSCAPE
 bridge abutments and walls - 1932 concrete

Historic Themes


Australian Theme (abbrev)	New South Wales Theme	Local Theme
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	(none) -

Assessment of Significance

SHR Criteria f)
[Rarity]

This item is assessed as historically rare. This item is assessed as scientifically rare. This item is assessed as arch. rare. This item is assessed as socially rare.

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
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

 **Standard Exemptions** for Works Requiring Heritage Council Approval

Listings

Heritage Listing	Listing Title	Listing Number	Gazette Date	Gazette Number	Gazette Page
<i>Heritage Act - State Heritage Register</i>		01194	02 Apr 99	27	1546
<i>Heritage Act - s. 170 NSW State agency heritage register</i>					

Study Details

Title	Year	Number	Author	Inspected by	Guidelines Used
State Rail Authority Section 170 Register	1997	sra26	State Rail Authority		No

References, Internet links & Images

None

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

Data Source

The information for this entry comes from the following source:

Name: Heritage Office
Database Number: 5012106

Every effort has been made to ensure that information contained in the State Heritage Inventory is correct. If you find any errors or omissions please send your comments to the [Database Manager](#).

All information and pictures on this page are the copyright of the Heritage Office or respective copyright owners.

NSW Government

| [Contact](#) | [Copyright](#) | [Disclaimer](#) | [Privacy](#)



Working with the community to know, value and care for our heritage



[About Us](#)

[Listings](#)

[Development](#)

[Heritage Council](#)

[Publications & Forms](#)

[Conservation](#)

[About Heritage](#)

[Research](#)

[Funding](#)

[Home](#) ▶ [Listings](#) ▶ [Heritage Databases](#) ▶ [State Heritage Inventory Search](#) ▶ [Heritage Item](#)

Click on the BACK button of your browser to return to the previous page.

Dawes Point Battery remains

Item

Name of Item: Dawes Point Battery remains

Type of Item: Built

Group/Collection: Defence

Category: Fortification

Primary Address: Hickson Road, The Rocks, NSW 2000

Local Govt. Area: Sydney

Property Description:

Lot/Volume Code	Lot/Volume Number	Section Number	Plan/Folio Code	Plan/Folio Number
Crown Reserve	8283	-	-	3000

All Addresses

Street Address	Suburb/Town	LGA	Parish	County	Type
Hickson Road	The Rocks	Sydney	St Philip	Cumberland	Primary

Owner/s

Organisation Name	Owner Category	Date Ownership Updated
Sydney Harbour Foreshore Authority	State Government	

Statement of Significance

The Dawes Point Battery remains and site are of State heritage significance for their historical and scientific cultural values. The site and building are also of State heritage significance for their contribution to The Rocks area which is of State Heritage significance in its own right.

The post 1788 archaeological remains at Dawes Point revealed to date are extremely important for their research potential. Such archaeological sites from the 18th century are exceedingly rare with the remains of First Government House and parts of the Dockyard on the western side of the Cove being some of the few examples bearing witness to the first 10 years of white settlement at Sydney Cove.

Only a handful of the colonial architect Francis Greenway's structures survive. With the excavation of the semi-circular battery an interesting part of his work has been rediscovered. Likewise, Greenway's quarry on the site is the only example of the careful mining of stone from this period in Sydney. The archaeology of the Battery floor and underground magazines also reveals elements constructed under the direction of George Barney, one of Australia's most important Colonial Engineers in the

mid 19th century, such as the 1850s gun emplacements. Together with the presence of the cannon from this time, on their original timber block supports the Battery is an important archive of military history. The archaeological remains also have a strong aesthetic appeal as evocative ruins of Australia's colonial past.

Dawes Point is important for its cultural values to several identifiable groups within NSW society including present and former residents of the Rocks and Millers Point; people involved in the fight to save the Rocks in the 1970s; descendants of the many artillerymen and their families who were stationed at Dawes Point; and Bridge construction and maintenance workers, their families and descendants. Dawes Point, as a setting for the Harbour Bridge, is valued for its aesthetic and engineering significance by several identifiable groups including the Institution of Engineers (Australia) and the Royal Australian Institute of Architects

The 1789 Foundation Stone (now with the Mitchell Collection in the NSW State Library) and the five 1850s cannon on their upper gun carriages contribute strongly to the heritage significance of the Place, in addition to being significant in their own right.

Dawes Point maintains vestiges of all periods of its occupation. The Point has been terraced and filled with each successive land use. All of these land uses have been closely linked with the site's unique position, occupying as it does a prominent headland with vistas up and down the harbour. Dawes Point Park still encompasses more than 90% of the area set aside for military purposes in the 18th century. Very little of this area has been alienated from public use, allowing the potential for interpretation of this period of the site's history in particular. The layers of history at Dawes Point have great potential to be used as a rich educational, cultural and tourism resource.

Date Significance Updated: 24 Jun 02

Note: There are incomplete details for a number of items listed in NSW. The Heritage Office intends to develop or upgrade statements of significance and other information for these items as resources become available.

Description

Physical Description: The archaeological remains of the Dawes Point Battery (1791-1925) have been excavated during the past few years. They include the floor of the original powder magazine, the circular battery with evidence of 4 gun emplacements (5th emplacement probably under the path), underground magazines, a stone ramp and the footings of the officers' quarters.

Five cannon, muzzle loading, on wooden carriages incomplete and not in situ. Manufactured in 1843-1844, as indicated by date stamps on metal work. Military (See also: AM037; AM086; AM092-093).; Built By: 1788

Physical Condition and/or Archaeological Potential:

The first known building on the site was Dawes' observatory built in early 1788. A powder magazine was constructed in 1789 followed by the Battery in 1791. It was expanded substantially in 1819. Further buildings were constructed in the 1850s and at the end of the century. The site had also been used as a cemetery for prisoners executed at Old Sydney Gaol (1797-c1830). All buildings were levelled between 1925 and 1932 during the construction of the Sydney Harbour Bridge. The archaeological remains revealed to date are unparalleled in Australia because they represent a broad range of significant historical periods. Archaeological sites from the 18th century are exceedingly rare with only the remains of First Government House and parts of the Dockyard on the western side of the Cove bearing witness to the first 10 years of white settlement in the Sydney CBD. Only a handful of the colonial architect Francis Greenway's structures survive. With the excavation of the semi-circular battery floor an interesting part of his work has been rediscovered. Greenway's quarry

on the site is a good example of the careful mining of stone from this period in Sydney. The archaeology of the Battery floor and underground magazines also reveals elements constructed under the direction of George Barney, one of Australia's most important Colonial Engineers in the mid 19th century, such as the 1850s gun emplacements. Together with the presence of movable heritage associated with the site, the Battery is an important archive of military history. The archaeological remains also have a strong aesthetic appeal as evocative ruins of Australia's colonial past. Archaeological Assessment Condition: Partly disturbed. Assessment Basis: Battery exposed in 1995, along with remains of Officers Quarters (1856) and parts of Guardhouse (1819-1830s). Some remains of 1789 magazine and pre-1819 battery also revealed. Remains subject to conservation and interpretation 1997-8. Unexcavated area still have high archaeological potential. Investigation: Archaeological Excavation **Date Condition Updated:** 03 Nov 00

Former Use: Artillery

History

Historical Notes: Dawes Point is a prominent landmark in Sydney Harbour, terminating the western arm of Sydney Cove. It has a rich documented history beginning with the one of the earliest recorded cultural exchanges between the Eora Aboriginals and the First Fleet. Subsequently it remained in government ownership both as a place of strategic administration, defence and transport and as a place contributing to the magnificent landscape of our harbour city. The Point forms part of Sydney's historic Rocks precinct.

The first known building on the site was Dawes' observatory built in early 1788. A powder magazine was constructed in 1789 followed by the Battery in 1791. It was expanded substantially in 1819. Further buildings were constructed in the 1850s and at the end of the century. The site had also been used as a cemetery for prisoners executed at Old Sydney Gaol (1797-c1830). All buildings were levelled between 1925 and 1932 during the construction of the Sydney Harbour Bridge.

Assessment of Significance

SHR Criteria d)
[Social Significance]

Dawes Point is important for its cultural values to several identifiable groups within NSW society including present and former residents of the Rocks and Millers Point; people involved in the fight to save the Rocks in the 1970s; descendants of the many artillerymen and their families who were stationed at Dawes Point; and Bridge construction and maintenance workers, their families and descendants. Dawes Point, as a setting for the Harbour Bridge, is valued for its aesthetic and engineering significance by several identifiable groups including the Institution of Engineers (Australia) and the Royal Australian Institute of Architects

SHR Criteria e)
[Research Potential]

The post 1788 archaeological remains at Dawes Point revealed to date are extremely important for their research potential. Such archaeological sites from the 18th century are exceedingly rare with the remains of First Government House and parts of the Dockyard on the western side of the Cove being some of the few examples bearing witness to the first 10 years of white settlement at Sydney Cove.

Only a handful of the colonial architect Francis Greenway's structures survive. With the excavation of the semi-circular battery an interesting part of his work has been rediscovered. Likewise, Greenway's quarry on the site is the only example of the careful mining of stone from this period in Sydney. The archaeology of the Battery floor and underground magazines also reveals elements constructed under the direction of George Barney, one of Australia's most important Colonial Engineers in the mid 19th century, such as the 1850s gun emplacements. Together with the presence of the cannon from this time, on their original timber block

supports the Battery is an important archive of military history. The archaeological remains also have a strong aesthetic appeal as evocative ruins of Australia's colonial past.

The 1789 Foundation Stone (now with the Mitchell Collection in the NSW State Library) and the five 1850s cannon on their upper gun carriages contribute strongly to the heritage significance of the Place, in addition to being significant in their own right.

Dawes Point maintains vestiges of all periods of its occupation. The Point has been terraced and filled with each successive land use. All of these land uses have been closely linked with the site's unique position, occupying as it does a prominent headland with vistas up and down the harbour. Dawes Point Park still encompasses more than 90% of the area set aside for military purposes in the 18th century. Very little of this area has been alienated from public use, allowing the potential for interpretation of this period of the site's history in particular. The layers of history at Dawes Point have great potential to be used as a rich educational, cultural and tourism resource.

Integrity/Intactness: Archaeology partly disturbed.

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.

Recommended Management

The following is a summary of more detailed conservation policy and management recommendations contained in the Dawes Point CMP: Consult the Dawes Point Conservation Management Plan (draft 1999), and the CMP for the Sydney Harbour Bridge and its Inventory Records when considering conservation works and development proposals at Dawes Point.

All of the current fabric at Dawes Point should be conserved and enhanced, with the exception of some park furniture and landscaping works of the last 20 years.

New development work should be limited to that required to enhance the amenity of the public domain and interpret its heritage significance.

New work and maintenance work should respect the heritage significance of the place, in particular the public pedestrian accessibility; the Harbour Bridge and its setting; and the historic remains of the Dawes Battery. Keep all of Dawes Point in Public Ownership and primary use of precinct as public open space.

Do not allow commercial advertising in the public open space or on the Bridge structure except where an integral part of approved temporary uses.

Do not obscure the existing overall form of the Park, promenade and roads which reflect town planning initiatives from the 1890s to the 1930s, while allowing for appropriate conservation and interpretation of the Dawes Point Battery archaeological remains..

Maintain and enhance significant views and vistas to and from and within Dawes Point.

Maintain the current open landscape of Dawes Point as a setting for the monumental character of the Sydney Harbour Bridge.

Maintain and enhance the existing pedestrian network to and through Dawes Point reflecting its long term use as a place of promenading beside the Harbour.

Above and below ground archaeological remains: An archaeological conservation plan is recommended.

Procedures /Exemptions

Section of Act	Description	Title	Comments	Action Date
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
57(2)	Exemption to allow work	Installation of a dallas button as part of a touch probe security system		Jul 13 2004



Standard Exemptions for Works Requiring Heritage Council Approval

Listings

Heritage Listing	Listing Title	Listing Number	Gazette Date	Gazette Number	Gazette Page
<i>Heritage Act - State Heritage Register</i>		01543	10 May 02	85	2865
<i>Heritage Act - s.170 NSW State agency heritage register</i>	Sydney Harbour Foreshore Authority				

Study Details

Title	Year	Number	Author	Inspected by	Guidelines Used
SCA Register 1979-1998	1998	S044, AR002	Sydney Cove Authority (SCA)		Yes

References, Internet links & Images

Type	Author	Year	Title	Internet Links
Management Plan	A Wayne Johnson and Louise Zarmati	1995	History, Preliminary Archaeology and Research Design	

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



(Click on Thumbnail for Full Size Image and Image Details)

Data Source

The information for this entry comes from the following source:

Name: Heritage Office

Database Number: 5053114

Every effort has been made to ensure that information contained in the State Heritage Inventory is correct. If you find any errors or omissions please send your comments to the [Database Manager](#).

All information and pictures on this page are the copyright of the Heritage Office or respective copyright owners.

NSW Government

[Contact](#) | [Copyright](#) | [Disclaimer](#) | [Privacy](#)


[Motor registries](#)
[Contact us](#)
[About us](#)
[Sitemap](#)
[Related websites](#)

Sydney Harbour Bridge, approaches and viaducts

[Home](#) > [Environment](#) > [Heritage](#) > [Heritage and Conservation Register](#) > Heritage and conservation register

Item

Name of Item	Sydney Harbour Bridge, approaches and viaducts
Item Number	4301067
Type of Item	Built
Item Sub-Type	****
Roadloc	
Address	**** Bradfield Highway - MR 632, Milsons Point/Dawes Point 2000
Local Government Area	Sydney City North Sydney
Owner	Roads and Traffic Authority
Current Use	Bridge
Former Use	Bridge

In This Section

- ▣ [Heritage and conservation register](#)
- ▣ [Hunter region](#)
- ▣ [Northern region](#)
- ▣ [South West region](#)
- ▣ [Southern region](#)
- ▣ [Sydney region](#)
- ▣ [Western region](#)

Statement of significance

Statement of significance

The bridge is one of the most remarkable feats of bridge construction. The bridge, its pylons and its approaches are all important elements in townscape of areas both near and distant from it. The curved northern approach gives a grand sweeping entrance to the bridge with continually changing views of the bridge and harbour. The bridge has been an important factor in the pattern of growth of metropolitan Sydney, particularly in residential development in post World War II years. In the 1960s and 1970s the Central Business District had extended to the northern side of the bridge at North Sydney which has been due in part to the easy access provided by the bridge and also to the increasing traffic problems associated with the bridge (Walker and Kerr 1974).

The reputation of the Sydney Harbour Bridge as the world's greatest steel arch rests on its combination of span, width and load bearing capacity, and for the difficulties overcome in its erection. (Sydney Harbour Bridge Conservation Management Plan, p.vii, RTA 1998)

The Sydney Harbour Bridge has been assessed as being of State significance.

Date Significance Updated

13 March 2002

Description

Designer	J. Bradfield and R. Freeman
Builder	Dorman, Long and Co.
Construction years	1924 - 1932
Physical description	The bridge is constructed of silicon steel trusses and joists painted dark grey. The pylons are faced with granite. The portion of the approaches nearest the arch are constructed of open work steel joists which are

supported by granite-faced pillars. The remainder of the approaches are steel and masonry construction with render finish. The span of the arch, measured between the centres of the end pins, is 1650 feet. The arch is divided into 28 panels of open steel work, each panel being 58 ft. 11 in. The rise of the arch at its crown is 250 feet and the depth of the truss at the centre of the arch is 60 feet and at the end it is 188 feet.

Under the heaviest allowable load, the deflection at the centre of the bridge is 4 and half inches, and the maximum thrust at the hinges, (ie at the ends of the arch) is 435,000,000 lb. per hinge. The top of the arch is 445 ft. above water level and the roadway suspended below the arch is 172 feet 6 inches. above the water level. The 'roadway' is 150 ft wide and total length including the approaches is 3770 ft.

The steelwork was manufactured in New South Wales and fabricated in Sydney in shops especially erected on the shores of Lavender Bay. The granite facing the towers and pylons is from Moruya. (Walker and Kerr 1974)

Physical Condition and/or Archaeological Potential	Physical condition is excellent. Archaeological potential is low.
Modifications and dates	1924 - construction commenced. Opened 19 March 1932.
Date condition updated	30 September 1997

History

Historical notes

In 1815, government architect Francis Greenway, in a report to Governor Macquarie, proposed the building of a bridge from Dawes Point at the city's edge to the northern shore. However it was not until 1922 that legislation was passed and acted upon, authorising the construction of a bridge. Tenders were invited in 1923 in accordance with general plans and specifications prepared by Dr J.J.C. Bradfield, Chief Engineer, Sydney Harbour Bridge and Railway Construction. The plans and specification provided the alternatives of a cantilever bridge or an arch bridge.

Twenty proposals were received from six different companies for various types of design, including suspension bridges not covered by Dr Bradfield's specification. The tender of Dorman Long and Co. Ltd., of Middlesborough England for an arch bridge was accepted, the design being substantially in accordance with one of Dr Bradfield's proposals. The detailed design was carried out by the Contractor's Consulting Engineer, Sir Ralph Freeman, and the fabrication and construction were under the direct charge of Mr Lawrence Ennis, a director of the firm. The design and the construction of the bridge were supervised at all stages by Dr. Bradfield and his staff.

First work on the bridge commenced in 1924, with construction of the bridge approaches and the approach spans. While the approach spans were being built, the foundations on either side of the harbour were prepared to take four steel bearings consisting of large hinge pins and massive steel bases for support of the arches.

At each end of the arch span of the bridge, and just behind the bearings, large abutment towers supporting the pylons were constructed. The abutment towers with the pylons are not a necessary structural feature of the bridge. They do not support the arch and were built principally to enhance the appearance of the structure.

As the erection of the steelwork was proceeding, the approaches were being constructed, including Milsons Point and North Sydney railway stations, and roadway approaches on both sides of the harbour.

The bridge was opened to roadway, railway and pedestrian traffic by the then Premier of New South Wales, Mr J.T. Lang, on the 19th March 1932.

The time taken to complete the whole work, including bridge and approaches was eight years. The contract for the bridge construction provided for six months' maintenance by the

contractors from the date of opening, after which maintenance became the responsibility of the State. (GHD Transportation Consultant 1982:4)

Listings

Heritage Listing	Reference Number	Gazette Number	Gazette Page
Register of the National Estate			
Heritage Act - s.170 NSW State agency heritage register			
National Trust of Australia register			
Heritage Act - State Heritage Register	781	72	4438
Local Environmental Plan	1010	42	2467
Local Environmental Plan			

Assessment of Significance

Historical Significance	<p>The bridge is one of the most remarkable feats of bridge construction (Walker and Kerr 1974). Its reputation as the world's greatest steel arch rests on its combination of span, width and load bearing capacity, and for the difficulties overcome in its erection (Sydney Harbour Bridge Conservation Management Plan, p.vii, RTA 1998). HISTORICAL SIGNIFICANCE OF THE BRIDGE: The Bridge was seen as a symbol of Australia's industrial maturity. It is the link which promoted the development of the North Shore. Along with the city railway, the Bridge is the most important event in the development of Sydney's transport system and has been in continuous use as such for over 60 years. It is Dr J.J.C. Bradfield's crowning achievement, on which he spent more than half his working life. The credit for the realisation of the Bridge is also due to the contractors Dorman Long and to the English engineer Sir Ralph Freeman. It was Freeman's finest bridge but his contribution was marred by the famous dispute with Bradfield over who was the designer. The Bridge became the focus for political tensions as exemplified by the De Groot incident. HISTORICAL SIGNIFICANCE OF THE APPROACHES: The approaches are of considerable significance to the State because, although subsidiary to the bridge itself and of less engineering interest, they are an integral part of the bridge construction, an achievement of outstanding, international significance. All the fabric of the approaches dating from the original construction period is of considerable significance. It was on the northern and southern approaches that the Bridge was officially opened, the largest crowd ever seen in Sydney assembled and the De Groot incident took place. The viaducts, tunnels and bridges incorporated into the approaches are essential components of the most important single event in the development of Sydney's transport system i.e. the building of the Harbour Bridge. They are a part of Bradfield's greatest achievement and, although less glamorous than the steelwork of the Bridge itself, they are the parts for which he was wholly and directly responsible. Source: Sydney Harbour Bridge Conservation Management Plan, 1998, RTA.</p>
Aesthetic Significance	<p>The bridge, its pylons and its approaches are all important elements in townscape of areas both near and distant from it. The curved northern approach gives a grand sweeping entrance to the bridge with continually changing views of the bridge and harbour. (Walker and Kerr 1974)</p>
Social Significance	<p>The bridge has been an important factor in the pattern of growth of metropolitan Sydney, particularly in residential development in post World War II years.</p>

In the 1960s and 1970s the Central Business District had extended to the northern side of the bridge at North Sydney which has been due in part to the easy access provided by the bridge and also to the increasing traffic problems associated with the bridge. (Walker and Kerr 1974). THE APPROACHES: The occupancies under the Approaches have provided useful spaces for shops, workshops and offices serving the local community for the past 60 years. Source: Sydney Harbour Bridge Conservation Management Plan, 1998, RTA.

Technical Significance	
Integrity/Intactness	Good except for removal of railway works on eastern side.
Representativeness	****
Rarity	****
Assessed Significance	State

References

Type	Author	Year	Title
Written	GHD Transportation Consultants Pty Ltd	1982	Environmental Impact Statement for ninth lane and footway on Sydney Harbour Bridge Sydney NSW
Written	Walker and Kerr	1974	National Trust Classification Card - Sydney Harbour Bridge
Written	Heritage Group, Department of Public Works and Services	1998	Sydney Harbour Bridge Conservation Management Plan

Study details

Title	Year	Author	Inspected by	Guidelines used
Oral History - Sydney Harbour Bridge Cranes	1997	NSW RTA		No

Custom fields

RTA Region	Sydney
Bridge Number	226
CARMS File Number	****
Property Number	PIMS Image: F0628
Conservation Management Plan	CMP has been completed - DPWS, February 1998. Contact Steve Dunlop, Sydney Operations Directorate

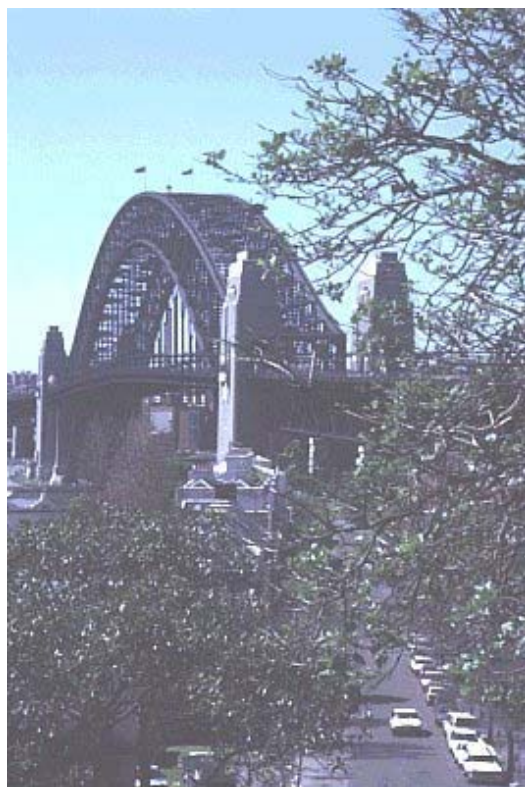
Images



The bridge is constructed of silicon steel trusses and joists painted dark grey.
The pylons are faced with granite.



The abutment towers with the pylons are not a necessary structural feature of the bridge. They do not support the arch and were built principally to enhance the appearance of the structure.



First work on the bridge commenced in 1924 with construction of the bridge approaches and the approach spans.



The bridge has been an important factor in the pattern of growth of metropolitan Sydney, particularly in residential development in post World War II years.



Sydney Harbour Bridge, approaches and viaducts



The bridge is one of the most remarkable feats of bridge construction. At the time of construction and until recently it was the longest single span bridge in the world and is still in a general sense the largest.

[↑ Back to top](#)

[Terms of Use](#) | [Online Privacy Policy](#) | [Copyright](#)

© Roads and Traffic Authority (NSW) Last Updated: 30 March 2004


[Motor registries](#)
[Contact us](#)
[About us](#)
[Sitemap](#)
[Related websites](#)

Sydney Harbour Bridge Memorabilia Collection

[Home](#) > [Environment](#) > [Heritage](#) > [Heritage and Conservation Register](#) > Heritage and conservation register

Item

Name of Item	Sydney Harbour Bridge Memorabilia Collection
Item Number	4309049
Type of Item	Movable/Collection
Item Sub-Type	Memorabilia, models and promotional material
Roadloc	
Address	260 Elizabeth Street, Surry Hills 2010
Local Government Area	Sydney City
Owner	Roads and Traffic Authority
Current Use	Items in storage
Former Use	Items on display

In This Section

- [Heritage and conservation register](#)
- [Hunter region](#)
- [Northern region](#)
- [South West region](#)
- [Southern region](#)
- [Sydney region](#)
- [Western region](#)

Statement of significance

Statement of significance	The Sydney Harbour Bridge Memorabilia Collection is historically significant as a collection of relics associated with the construction and opening of the Sydney Harbour Bridge. The collection demonstrates the ways in which icons of the era were commemorated through retention of specific materials and objects, and, as an example of items retained for future interest, it illustrates the social importance of the bridge at the time of construction. The collection has value as being representative of the specialised technology and commemorative traditions of the era. The collection is associated with, and commemorates the technical achievement evident in, the design and construction of the bridge and is a rare surviving example of the construction technology and commemorative traditions of the era. The Sydney Harbour Bridge Memorabilia Collection has been assessed as being of State significance.
Date Significance Updated	04 March 2005

Description

Designer	****
Builder	****
Construction years	**** - ****
Physical description	<p>This collection comprises of items that are reportedly associated with the construction and opening of the Sydney Harbour Bridge. The collection contains the following three items:</p> <ul style="list-style-type: none"> - A chrome-plated steel rivet. 31cm long. - A section of anchorage cable. 120mm long, 75mm in diameter, secured with two steel ties. - A segment of silk ribbon bearing the words 'Sydney Harbour Bridge, Official Opening, 19th March, 1932'. Ribbon: 94cm x 10.5cm. Ribbon has been mounted and framed.
Physical Condition and/or Archaeological Potential	In general, the items in the collection appear to be in very good condition.
Modifications and dates	<p>The rivet has been chrome plated. The silk ribbon was reportedly mounted and framed c1994.</p> <p>07 July 2000</p>

Date condition
updated

History

Historical notes

The Sydney Harbour Bridge is a steel arch and truss bridge built in 1932 from the northern to the southern side of the harbour. The general design was prepared by JJC Bradfield and the NSW Department of Public Works. In 1922, an English firm Dorman and Long and Co were awarded the tender as the principal engineer and contractor responsible for the construction of the bridge. Construction started in 1924 and continued for the next eight years. On 19 March 1932 the Sydney Harbour Bridge was officially opened.

Items in the Sydney Harbour Bridge Memorabilia Collection date from the construction and opening of the bridge.

Item specific notes:

Rivet: Over 6 million rivets were manufactured by McPhersons Pty Ltd for the construction of the Sydney Harbour Bridge. This rivet reportedly was made for the bridge but was never used. It is one of a number of commemorative rivets which were chrome-plated as souvenirs of the opening of the bridge and a full set of all the sizes of rivet forms part of the Sydney Harbour Bridge South Pylon Museum Collection.

Cable: The two arches of the Sydney Harbour Bridge were individually constructed and then lowered to meet in the centre. There were 128 cables required to hold back the half arch segments during the construction of the bridge. Once the half arches were complete (August 1930), the anchorage cables were slowly slackened to close the gap between the two arches and allow them to meet. Some sections of cable were retained as souvenirs of the opening of the bridge. A similar section of cable forms part of the Sydney Harbour Bridge South Pylon Museum Collection.

Ribbon: As part of the Sydney Harbour Bridge opening ceremonies, a ribbon was cut by Premier John T Lang (after some difficulty with a member of the crowd). It is believed that this ribbon is part of the one which was used in this ceremony.

Although it is reported that the Dr Bradfield's Museum was established in 1932 in the southwest pylon, and contained 'memorabilia, including...rivets, lengths of anchorage cable, opening ribbon and tools', it is unknown if any of the items in this collection were originally in Dr Bradfield's Museum.

Listings

Heritage Listing	Reference Number	Gazette Number	Gazette Page
Heritage Act - s.170 NSW State agency heritage register			

Assessment of Significance

Historical Significance	The Sydney Harbour Bridge Memorabilia Collection is historically significant because: - All of the items are associated with, and are relics of, the construction and opening of the Sydney Harbour Bridge. - The items demonstrate the ways in which icons of the era were commemorated through retention of specific materials, elements and objects. - The collection illustrates the social importance of the bridge at the time of construction.
Aesthetic Significance	The Sydney Harbour Bridge Memorabilia Collection is aesthetically significant because: - The collection commemorates the technical achievement evident in the design and construction of the Sydney Harbour Bridge.
Social Significance	Items associated with the Sydney Harbour Bridge have a strong social significance for those who worked on the bridge, the RTA as the custodians of the bridge, and to residents of Sydney who in the past watched the bridge being constructed and still use the bridge today.
Technical Significance	
Integrity/Intactness	****
Representativeness	The Sydney Harbour Bridge Memorabilia Collection has representative value because: - The items are representative of the specialised technology and commemorative traditions of the era. - The items are representative of the memorabilia/souvenirs that were made to mark the opening of a national icon.
Rarity	The Sydney Harbour Bridge Memorabilia Collection has rarity significance because: - The items in the collection are rare surviving examples of the construction technology and commemorative traditions of the Sydney Harbour Bridge.
Assessed Significance	State

References

Type	Author	Year	Title
Written	Heritage Group, Department of Public Works and Services	1998	Sydney Harbour Bridge Conservation Management Plan

Study details

Title	Year	Author	Inspected by	Guidelines used
RTA Phase 2 Movable Heritage Study	2005	Godden Mackay Logan		Yes

Custom fields

RTA Region	Sydney
Bridge Number	****
CARMS File Number	4M3624 Vol 1 Internal Custodian - Peter Roberts, Level 1
Property Number	****
Conservation Management Plan	****

Images



Chrome-plated steel rivet.



Section of anchorage cable.



Commemorative silk ribbon.

[↑ Back to top](#)

[Terms of Use](#) | [Online Privacy Policy](#) | [Copyright](#)

© Roads and Traffic Authority (NSW) Last Updated: 30 March 2004

Lights and Other Items

3. Model of Main Bearing and Encased Model of Bridge
4. North Pylon Mezzanine Steelwork and Removed Staircase
5. Royal Crest/Cipher for the Coronation of Queen Elizabeth II
6. Warning and Information Signage
7. Plans, Photographs, Photo Albums and Documentation
8. Painting Maintenance Schedule Display and Painters' Personal Signs
9. Remnant Electrical Fittings (including lights, telephones and other associated items)
10. Painters' Chairs, Electrical Test Panel, Painters' Masks, Rigging Material etc
11. 2 Strain Indicators in black metal boxes with leather straps - bearing SHB labels (in Works Engineers Office)

Physical Condition and/or Archaeological Potential	The condition of the items in the Collection vary from fair to excellent.
Modifications and dates	Unknown
Date condition updated	20 July 2000

History

Historical notes	The Sydney Harbour Bridge was constructed between 1923 and 1932 by Dorman Long and Co Ltd of England, to the specifications provided by the NSW Department of Public Works led by JJC Bradfield. Much of the detailed design work, plus most of the approach span design and construction, was undertaken by the Department of Public Works.
-------------------------	--

Listings

Heritage Listing	Reference Number	Gazette Number	Gazette Page
Heritage Act - s.170 NSW State agency heritage register			

Assessment of Significance

Historical Significance	The Sydney Harbour Bridge Collection has Historic significance because: - some items provide evidence of the detail used on some past fixtures on the Bridge and as such are indicative of the importance of design to the structure; - some items provide evidence of the past methods of maintenance of the bridge; - the painters' chairs, painters' masks and rigging material are able to demonstrate the equipment and technology needed to maintain the bridge and illustrates the dangers associated with this activity; - the Model of the Main Bearing of the Bridge is associated with the construction of the Sydney Harbour Bridge and is a remnant of the personal collection of items of Mr J. Bradfield, an important person in the development of NSW; - the Royal Crest/Cipher for the Coronation of Queen Elizabeth II provides evidence of the importance of this event to the Australian community and the role
--------------------------------	--

	the Sydney Harbour Bridge played to celebrate it; - the Royal Crest/Cipher for the Coronation of Queen Elizabeth II is a relic of the historic use of the Bridge as a place for signage for special events; - the plans, photographs, photo albums and documentation illustrate past management and administration methods of the bridge; and - the warning signs are indicative of past attitudes of safety relevant to the bridge.
Aesthetic Significance	The Sydney Harbour Bridge Workshops Collection is aesthetically significant for the following reasons: - it is a collection which is intimately associated with the Harbour Bridge and is indicative of past attitudes, functions and designs associated with it; and - the maintenance equipment is evocative of the procedures and danger which could be associated with that activity.
Social Significance	The Sydney Harbour Bridge Workshops Collection has social significance because: - it is associated with the Bridge itself, which is one of the most important and well-known symbols of Australia and which attracts enormous attention on any occasion which involves the public.
Technical Significance	
Integrity/Intactness	Varied
Representativeness	The Sydney Harbour Bridge Workshops Collection has representative value because: - it contains equipment which is representative of the range of equipment used in maintaining the bridge over its lifetime; - it contains signs which are representative examples of the wide range of signage needed to manage movement through the Bridge in its totality; and - the collection contains items which are representative of the stylistic and technological trends in the community at the time of their manufacture and which are representative of materials of their period generally.
Rarity	The Sydney Harbour Bridge Workshops Collection has rarity value because: - it contains rare relics from the construction and early operation of the Bridge; - it contains equipment and fixtures associated with the maintenance and operation of the Bridge, which are unique to the Sydney Harbour Bridge; and - it contains an example of a decorative structure manufactured solely for attachment to the Bridge to be utilised for a single occasion.
Assessed Significance	State

References

Type	Author	Year	Title
------	--------	------	-------

Study details

Title	Year	Author	Inspected by	Guidelines used
RTA Movable Heritage - Pilot Survey	2000	Godden Mackay Logan		Yes

Custom fields

RTA Region	Sydney
Bridge Number	****

CARMS File Number	****
-------------------	------

Property Number	****
-----------------	------

Conservation Management Plan	****
------------------------------	------

Images



The four type 'E' lanterns in storage.

[↑ Back to top](#)

[Terms of Use](#) | [Online Privacy Policy](#) | [Copyright](#)

© Roads and Traffic Authority (NSW) Last Updated: 30 March 2004


[Motor registries](#)
[Contact us](#)
[About us](#)
[Sitemap](#)
[Related websites](#)

SHB South-East Pylon Museum Collection

[Home](#) > [Environment](#) > [Heritage](#) > [Heritage and Conservation Register](#) > Heritage and conservation register

Item

Name of Item	SHB South-East Pylon Museum Collection
Item Number	4300733
Type of Item	Movable/Collection
Item Sub-Type	****
Roadloc	
Address	**** RTA Archives, Auburn 2144
Local Government Area	Auburn
Owner	Roads and Traffic Authority
Current Use	Exhibit
Former Use	Various

In This Section

- [Heritage and conservation register](#)
- [Hunter region](#)
- [Northern region](#)
- [South West region](#)
- [Southern region](#)
- [Sydney region](#)
- [Western region](#)

Statement of significance

Statement of significance

The Sydney Harbour Bridge Pylon Museum Collection is significant as a component of the heritage of the Harbour Bridge itself, a highly significant element in the economic and social development of NSW. The Collection includes items which are significant as representative examples of the materials, technical instruments, technical documentation, components and manufacturing outputs associated with the construction of the Bridge. It also contains examples of unique and specialised documents and objects used in association with the Opening Day social activities and celebrations, which are themselves evidence of the social customs and attitudes of the time. The collection contains exhibits which showcase the wide range of objects, activities and publications inspired by or produced in association with the operations of the Sydney Harbour Bridge throughout its history. Some exhibits also have value as relics of their period, illustrating aspects of the social context, mores and activities of Sydney at the time of the construction of the Bridge.

The Collection has importance for demonstrating aspects of the technical and engineering processes used in the construction of the Bridge and for memorialising the large and diverse collection of people who were involved in its design, manufacture and erection. It contains evidence of the operations carried out in England for the construction of the Bridge, an aspect which is not expressed in any other feature of the Bridge. It contains the only known relics of the temporary support structure utilised for the erection of the arch steelwork.

As a whole, the Sydney Harbour Bridge Pylon Museum Collection is of State significance. The Collection includes individual items and exhibits which are of either State or Local levels of significance.

Date Significance Updated

01 November 2004

Description

Designer	Various
Builder	Various
Construction years	1923 - ****
Physical description	<p>The Sydney Harbour Bridge South-East Pylon Museum Collection is an exhibition of items which relate to the construction and official opening of the Sydney Harbour Bridge. The items in the collection are as follows:</p> <ol style="list-style-type: none"> 1. Dorman Long and Company Letterhead 2. Ganger's Timebook (returned to care of lenders family)

3. Pyrometer
4. Two Hand-Written Notebooks
5. Sample of the 50mm thick silicon steel (as used in the webs of the lower chords in the Bridge arch)
6. Piece of arch Web Plate (as used on the Sydney Harbour Bridge) - CURRENTLY IN BRIDGECLIMB MUSEUM
7. Nine Rivets (of various sizes)
8. Ten Steel Shavings (left over from the fabrication of the Bridge steelwork)
9. POLDI Hardness Tester
10. Dial Gauge - CURRENTLY IN BRIDGECLIMB MUSEUM
11. Forged Steel Nut and Section of Bolt
12. Three Samples of Tensile and Bend Tests - CURRENTLY IN BRIDGECLIMB MUSEUM
13. Splayed Extremity of an Anchorage Cable Socket - CURRENTLY IN BRIDGECLIMB MUSEUM
14. Sample of Arch Support Anchorage Cable - CURRENTLY IN BRIDGECLIMB MUSEUM
15. Fifteen samples of Rivet Testing - CURRENTLY IN BRIDGECLIMB MUSEUM
16. Bridge Walker's Certificate
17. Special Issue of 'The Sydney Mail' with Harbour Bridge Supplement
18. Certificate of Appreciation
19. Autographed Souvenir Menu and Order of Proceedings for Bridge Banquet
20. The Official Souvenir and Programme of Opening Day Celebrations
21. Invitation Card for Thanksgiving Service
22. Invitation to the Lord Mayor's Ball
23. Two copies of the Opening Ceremony Publication
24. Invitation to Official Guests for the Bridge Opening
25. Programme of the Official Opening Ceremony
26. Invitation from NSW Governor to Bridge Opening Garden Party
27. Tin and Celluloid Picture of Bridge (with train and steamship)
28. Decorative Glass Butter Dish
29. Tin and Celluloid Picture of Bridge and Ferry
30. Brass Flower Vase
31. Cut Work Doily
32. Sterling Silver Letter Opener
33. Sydney Harbour Bridge Ashtray
34. Personal Scrapbook
35. Moulded Plaster Image of the Bridge
36. Commemorative Matchbox Cover
37. One copy of 'Parables of Sydney Harbour Bridge'
38. Copy of 'The Second Bridge Book' - CURRENTLY IN BRIDGECLIMB MUSEUM
39. Pictorial Souvenir of the Bridge Opening Day Celebrations
40. Copy of 'The Home' Magazine, March 1932
41. Postcard Showing Floral Float
42. Envelope with Harbour Bridge Opening Day Postmark and Stamp
43. Copy of 'Atkinsons Souvenir Bridge Book'
44. Reproduction of CJ Dennis Poem
45. Nine Souvenir Floral Procession Badges
46. Ten Bicentennial Paintings by Schoolchildren - CURRENTLY IN BRIDGECLIMB MUSEUM
47. Two Screen Printed Textile Tapestries of the 'Lifesaver' Bridge Poster
48. Plywood Model of the Junction of the Two Half Arches - CURRENTLY IN BRIDGECLIMB MUSEUM
49. Wooden framed original "Commemorative Scroll. Opening Sydney Harbour Bridge March 19th 1932" (760x990). (Added 28/7/04)
50. Wooden framed photograph of workman posed across the roadway between the sandstone pylons with the bridge in the background (625x260). (Added 28/7/04)

Physical

The condition of the items varies from fair to excellent.

Condition and/or Archaeological Potential**Modifications and dates**

Modifications are described in individual item listings.

Date condition updated

20 July 2000

History

Historical notes

The Sydney Harbour Bridge was constructed between 1923 and 1932 by Dorman Long and Company Ltd of England, to the specifications provided by the NSW Department of Public Works led by JJC Bradfield. Much of the detailed design work, plus most of the approach span design and construction, was undertaken by the Department of Public Works. Construction of the Harbour Bridge was delayed by the intervention of World War I. In 1919 letters appeared in the Press urging the construction of a North Shore Bridge as a War Memorial. In 1920 Premier John Storey promised a Deputation of North Shore MLAs and Mayors that he would call tenders for a bridge and levy a Land Tax to help pay for it, as proposed by the Chief Engineer, Mr Bradfield, and as they requested. Although Premier Storey died in office, world tenders were still advertised for a cantilever bridge in 1921. In 1922, city railway construction was restarted and Bradfield left Australia to talk to prospective tenderers in Europe and North America. Following a change of Government, Bradfield cabled a request urging that the close of tenders be postponed and the specifications be changed to either a cantilever bridge or an arch bridge.

Bradfield's request was granted and in 1923 fresh tenders were called for a cantilever or an arch bridge. The Managing Director of the leading tenderer, Cleveland Bridge, died and Dorman Long decided to take over the tender at the request of the Engineer, Ralph Freeman. Tenders closed on 16 January 1924 and the contract was signed by the Minister on 24 March. Dorman Long and Company's tender for a two-hinged arch with granite-faced piers and pylons was accepted from the twenty tenders by the six firms that tendered.

Items of interest were collected as part of 'Dr Bradfield's Museum' which, in 1932, was installed in the South-West Pylon and was open to the public at weekends and public holidays. In 1982 material from the Museum was moved to the South-East Pylon in conjunction with the Lookout.

Listings

Heritage Listing	Reference Number	Gazette Number	Gazette Page
Heritage Act - s.170 NSW State agency heritage register			

Assessment of Significance

Historical Significance

The Sydney Harbour Bridge South-East Pylon Museum Collection has historical significance because: - It contains components and materials which are remnants of the construction of the Bridge and which illustrate aspects of the technologies in use at the time. - It contains examples of components and materials which were specifically set aside for retention as part of the memorial record of the construction of the Bridge, illustrating the perceived social and technological importance of the Bridge at the time of its construction. - It contains tools and equipment used by the Dorman Long Company in the fabrication and construction of the Bridge. These are relics of the technologies of the period and illustrate aspects of the processes used during the manufacture, installation and testing of the Bridge. - It contains journals and documents which illustrate elements of the process of manufacture and which provide a record of the presence and activities of individual people involved in the construction of the Bridge in Australia and in England. - It contains original relics of the ceremonies and celebrations for the Opening Day of the Bridge, a major historical event in the history of Sydney and the development of Australia. The range of items in the collection illustrates the diversity of events and the range of people from all classes who participated in the Opening Day activities. - It contains original material, such as newspaper special supplements, published books and souvenir editions, as well as badges, postcards and pictures, manufactured during and following the construction of the Bridge, which illustrate the role and the perceptions of the Bridge in the community. These items also demonstrate aspects of the activities and cultural environment, as well as technologies and materials, prevalent at the time of the opening of the Bridge. - Collectively, the items in the Pylon Museum represent a snapshot illustration of the society in which the Bridge was built, and the reaction of that community to its completion. It provides not only a record of the construction of the Bridge itself, but also a unique and original record of Sydney society in the period; a record made more tangible and accessible by its representation of the process of construction and the organisation of the Opening Day commemorations through the exhibition of small and personal items, expressive of the human scale and of the individuals involved. - It contains elements which are relics of the fiftieth birthday celebrations of the Bridge, a major public event in its day

and an important affirmation of the singular attachment that Sydneysiders have for the Bridge, both as a public facility and as an icon of the city. - It contains a collection of paintings which were commissioned as part of a nationwide public school project to celebrate the bicentennial of European settlement in Australia and which illustrate a range of aesthetic expressions of the concept of nationhood, utilising the symbolism and imagery of the Harbour Bridge as a metaphor for unity and connection.

Aesthetic Significance	The Sydney Harbour Bridge South-East Pylon Museum Collection has aesthetic significance because: - It is a collection which is intimately associated with the Harbour Bridge and is displayed within the confines of the Bridge Pylons, forming an important part of any tourist experience of the Bridge through its association with the Pylon Lookout and the pedestrian footway. - It contains a range of items which are expressive of the precision of work and attention to detail undertaken for the construction of the Bridge. - The collection provides a human dimension to the Bridge, preserving and highlighting the people involved in its design, manufacture and construction. In this context, the intimacy and delicacy of some of the exhibits in the collection, as well as the enclosure of the exhibition area, provide a notable contrast to the scale, solidity and airiness of the steelwork and general massive structure of the Bridge. - The collection provides a notable illustration of certain aspects of the customs, attitudes and social behaviours of the Sydney community at the time of the opening of the Bridge.
Social Significance	The Sydney Harbour Bridge South-East Pylon Museum Collection has social significance because: - The collection contains items which are family heirlooms and memorabilia collected or retained by members of the public and which would continue to be considered valuable to the families of these people. - The collection provides a reference point for many English visitors to the Bridge, whose families worked for the construction company and provided the components to the Bridge. - The collection also provides a reference point for Australian people whose families were associated with the design and construction of the Bridge, its opening and its subsequent operation over seventy years. - It is associated with the Bridge itself, which is one of the most important and well-known symbols of Australia and which attracts enormous attention on any occasion which involves the public.
Technical Significance	
Integrity/Intactness	The collection appears to be intact
Representativeness	The Sydney Harbour Bridge South-East Pylon Museum Collection has representative value because: - It contains components and materials which are representative of the technologies in use at the time and utilised for the construction of the Bridge. - It contains tools, instruments, documents and equipment used in the fabrication and construction of the Bridge which are relics of the technologies of the period and which illustrate typical processes used during the manufacture, installation and testing of the Bridge. - It contains original relics of the ceremonies and celebrations for the Opening Day of the Bridge, which are representative of the many individual copies of these documents produced at the time. - It contains original material, such as newspaper special supplements, published books and souvenir editions, as well as badges, postcards and pictures, which individually and collectively illustrate the activities and cultural context for the construction of the Bridge, as well as the technologies and materials prevalent at the time of the opening of the Bridge. - The relics of the fiftieth birthday celebrations of the Bridge are representative of the larger set of activities and souvenirs produced for this occasion. - The relics of the bicentennial of European settlement celebrations are representative of the larger set of activities and souvenirs produced for this occasion.
Rarity	The Sydney Harbour Bridge South-East Pylon Museum Collection has rarity value because: - It contains rare relics of the construction of the Bridge. - It includes the components and materials which were specifically set aside for retention as part of the memorial record of the construction of the Bridge. - It contains original relics of the ceremonies and celebrations for the Opening Day of the Bridge. The Pylon Museum Collection represents the only known formal collection of this material. - Collectively, the items in the Pylon Museum represent a unique and original record of Sydney society in the period during the construction of the Bridge. - It contains rare surviving relics of the fiftieth birthday celebrations of the Bridge. - It contains a rare surviving collection of paintings associated with the bicentennial of European settlement in Australia.
Assessed Significance	State

References

Type	Author	Year	Title
Written	Godden Mackay Logan	2000	Sydney Harbour Bridge South-East Pylon Museum - Movable Heritage Items - Heritage Assessment

Study details

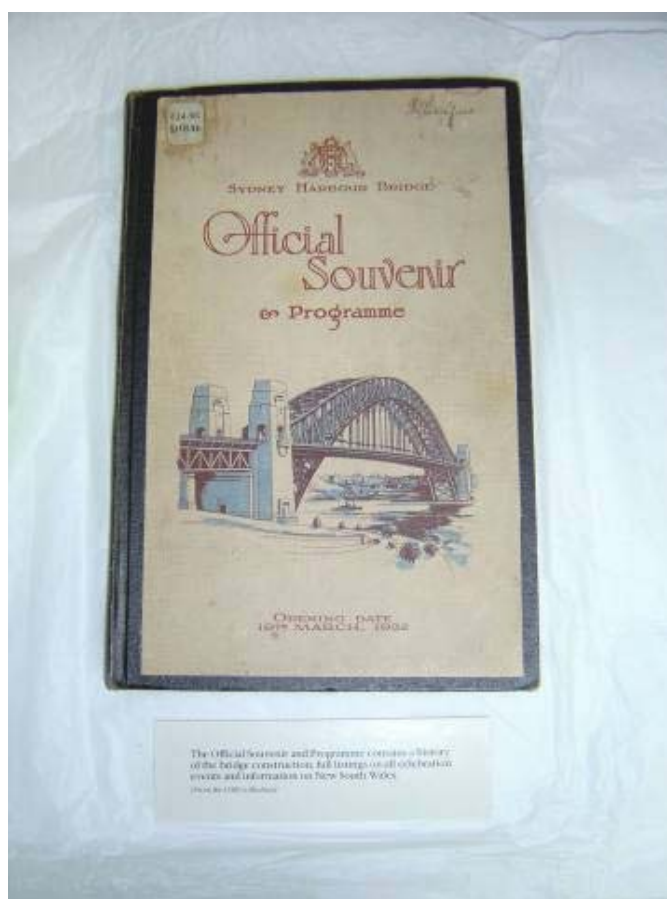
--	--	--	--	--

Title	Year	Author	Inspected by	Guidelines used
Sydney Harbour Bridge South-East Pylon Museum - Movable Heritage Items	2000	Godden Mackay Logan		Yes
RTA Movable Heritage - Pilot Survey	2000	Godden Mackay Logan		Yes

Custom fields

RTA Region	Sydney
Bridge Number	****
CARMS File Number	****
Property Number	****
Conservation Management Plan	****

Images



Lapel Badges commemorating the Sydney Harbour Bridge opening



Lapel Badges commemorating the Sydney Harbour Bridge opening

[↑ Back to top](#)

[Terms of Use](#) | [Online Privacy Policy](#) | [Copyright](#)

© Roads and Traffic Authority (NSW) Last Updated: 30 March 2004



17 November 2006

[eNews](#)[Related Websites](#)

Search our site:

☐ Include documents
[Home](#)[About Us](#)[Our Places](#)[For Business](#)[For Visitors](#)[For Community](#)[Resource Centre](#)

- Policies
- Permits
- Development Applications
- Event Applications
- Publications
- Media releases
- Image Gallery
- Virtual Tours
- Heritage materials
- Heritage Register
- Research & Statistics
- FAQs
- Maps
- New Contracts

[Subscribe for eNews](#)

Join our mailing list to
receive our eNewsletter.

[Subscribe](#)
[View latest eNewsletter
online](#)


Forecast for Sydney, NSW

Friday
Mostly sunny
Low 9°C High 20°C

[Click here for 7 Day
Weather Forecast](#)

Heritage Register

[HOME](#) > [RESOURCE CENTRE](#) > [HERITAGE MATERIALS](#) > [HERITAGE REGISTER](#)

Heritage Register

SHFA Heritage Register

Item Name: Dawes Point Battery remains

Location: Hickson Road , The Rocks

Primary Address: Hickson Road
The Rocks
NSW 2000

Alternate Addresses: Lower Fort Street The Rocks NSW 2000

Area/Group/Complex:

Group ID:

Item Type: Built

Group: Defence

Category

Owner: Sydney Harbour Foreshore Authority

Current Use: Recreation

Former Use: Artillery

Assessed 3

Endorsed Significance:

3

Significance:

Statement of Significance: The Dawes Point Battery remains and site are of State heritage significance for their contribution to the Rocks area which is of State significance in its own right (see item no. 4500458). The post 178 remains at Dawes Point revealed to date are extremely important potential. Such archaeological sites from the 18th century are exceptional remains of First Government House and parts of the Dockyard of the Cove being some of the few examples bearing witness to the white settlement at Sydney Cove. Only a handful of the colonial architecture of Greenway's structures survive. With the excavation of the semi-circular interesting part of his work has been rediscovered. Likewise, Greek site is the only example of the careful mining of stone from this period. The archaeology of the Battery floor and underground magazines also constructed under the direction of George Barney, one of Australia's Colonial Engineers in the mid 19th century, such as the 1850s gun turret. Together with the presence of the cannon from this time, on their supports the Battery is an important archive of military history. The remains also have a strong aesthetic appeal as evocative ruins of the past. Dawes Point is important for its cultural values to several individuals within NSW society including present and former residents of the Point; people involved in the fight to save the Rocks in the 1970s; many artillerymen and their families who were stationed at Dawes Point; construction and maintenance workers, their families and descendants as a setting for the Harbour Bridge, is valued for its aesthetic and significance by several identifiable groups including the Institution of Engineers (Australia) and the Royal Australian Institute of Architects. The 1788 (now with the Mitchell Collection in the NSW State Library) and their on their upper gun carriages contribute strongly to the heritage significance of the Place, in addition to being significant in their own right. Dawes Point has vestiges of all periods of its occupation. The Point has been terraced for each successive land use. All of these land uses have been closely related to its unique position, occupying as it does a prominent headland with views of the harbour. Dawes Point Park still encompasses more than 90% of the area used for military purposes in the 18th century. Very little of this area has been removed from public use, allowing the potential for interpretation of this place.

	history in particular. The layers of history at Dawes Point have been used as a rich educational, cultural and tourism resource.
Historical Notes or Provenance:	Dawes Point is a prominent landmark in Sydney Harbour, terminal of Sydney Cove. It has a rich documented history beginning with the earliest recorded cultural exchanges between the Eora Aboriginals. Subsequently it remained in government ownership both as a place of administration, defence and transport and as a place contributing to the landscape of our harbour city. The Point forms part of Sydney's historic precinct. The first known building on the site was Dawes' observatory in 1788. A powder magazine was constructed in 1789 followed by the Battery which was expanded substantially in 1819. Further buildings were constructed at the end of the century. The site had also been used as a cemetery executed at Old Sydney Gaol (1797-c1830). All buildings were levelled and 1932 during the construction of the Sydney Harbour Bridge.
National Themes:	2. Peopling 3. Economy 4. Settlement 6. Educating 7. Governing 8. Culture 9. Phases of Life
State Themes:	Birth and Death Convict Creative endeavour (Cultural sites) Defence Education Environment - cultural landscape Events Government and administration Land tenure Leisure Persons
Study Themes:	
Designer:	
Maker/Builder:	William Dawes, Robert Ross, Francis Greenway, George Barney, Sydney Harbour Bridge Trust
Year Started:	1791
Year Completed:	1925
Circa:	1791-1925
Physical Description:	The archaeological remains of the Dawes Point Battery (1791-1925) were excavated during the past few years. They include the floor of the powder magazine, the circular battery with evidence of 4 gun emplacement (probably under the path), underground magazines, the footings of the officers' quarters. Five cannon, muzzle loading, incomplete and not in situ. Manufactured in 1843-1844, stamped on metal work. Military (See also: AM037; AM086; AM092; AM1788)
Physical Condition:	The first known building on the site was Dawes' observatory built in 1788. A powder magazine was constructed in 1789 followed by the Battery which was expanded substantially in 1819. Further buildings were constructed at the end of the century. The site had also been used as a cemetery executed at Old Sydney Gaol (1797-c1830). All buildings were levelled and 1932 during the construction of the Sydney Harbour Bridge. The remains revealed to date are unparalleled in Australia because of the range of significant historical periods. Archaeological sites from the 18th century are exceedingly rare with only the remains of First Government House and Dockyard on the western side of the Cove bearing witness to the first settlement in the Sydney CBD. Only a handful of the colonial architecture survive. With the excavation of the semi-circular Battery an interesting part of his work has been rediscovered. Greenway's Battery is a good example of the careful mining of stone from this period in the history of the Sydney CBD. The archaeological remains of the Battery floor and underground magazines also constructed under the direction of George Barney, one of Australia's first Colonial Engineers in the mid 19th century, such as the 1850s gun emplacement. Together with the presence of movable heritage associated with the site, it is an important archive of military history. The archaeological remains have a strong aesthetic appeal as evocative ruins of Australia's colonial past. Assessment Condition: Partly disturbed. Assessment Basis: Battery along with remains of Officers Quarters (1856) and parts of Guard House. Some remains of 1789 magazine and pre-1819 battery also revealed. Conservation and interpretation 1997-8. Unexcavated area still has archaeological potential. Investigation: Archaeological Excavation 1997-8.
Modification Dates:	Powder magazine 1789, battery 1791, battery improvements 1800-1819, battery improvements 1856, military function ceases 1904, Bridge tree planting and park creation 1930's-40's, archaeological excavation and reconstruction 2000.
Recommended Management:	The following is a summary of more detailed conservation policy and recommendations contained in the Dawes Point CMP: Consult the Conservation Management Plan (draft 1999), and the CMP for the

Bridge and its Inventory Records when considering conservation and development proposals at Dawes Point. All of the current fabric at be conserved and enhanced, with the exception of some park furniture landscaping works of the last 20 years. New development work should that required to enhance the amenity of the public domain and its significance. New work and maintenance work should respect the setting of the place, in particular the public pedestrian accessibility; the Harbour setting; and the historic remains of the Dawes Battery. Keep all of Public Ownership and primary use of precinct as public open space commercial advertising in the public open space or on the Bridge should where an integral part of approved temporary uses. Do not obscure form of the Park, promenade and roads which reflect town planning 1890s to the 1930s, while allowing for appropriate conservation at the Dawes Point Battery archaeological remains. Maintain and enhance views and vistas to and from and within Dawes Point. Maintain the landscape of Dawes Point as a setting for the monumental character Harbour Bridge. Maintain and enhance the existing pedestrian network Dawes Point reflecting its long term use as a place of promenading. Above and below ground archaeological remains: An archaeological assessment is recommended.

Further Comments:

Historical Significance: The Battery was the first permanent fortification for the settlement of Sydney. It was a symbol of the British presence in the Pacific. Illustrates the construction of defence sites which are a

Historical Association:

Aesthetic/Technical Significance: Location on a prominent point of the harbour and set at the most picturesque and historic Rocks district.

Social Significance: Dawes Point is important for its cultural values to several identifiable NSW society including present and former residents of the Rocks and people involved in the fight to save the Rocks in the 1970s; descendants of artillerymen and their families who were stationed at Dawes Point construction and maintenance workers, their families and descendants as a setting for the Harbour Bridge, is valued for its aesthetic and significance by several identifiable groups including the Institution (Australia) and the Royal Australian Institute of Architects

Research Significance: The post 1788 archaeological remains at Dawes Point revealed to be important for their research potential. Such archaeological sites are exceedingly rare with the remains of First Government House Dockyard on the western side of the Cove being some of the few to witness to the first 10 years of white settlement at Sydney Cove. The colonial architect Francis Greenway's structures survive. With the semi-circular battery an interesting part of his work has been rediscovered. Greenway's quarry on the site is the only example of the careful masonry in this period in Sydney. The archaeology of the Battery floor and underground magazines also reveals elements constructed under the direction of one of Australia's most important Colonial Engineers in the mid 19th century the 1850s gun emplacements. Together with the presence of the cisterns, on their original timber block supports the Battery is an important part of military history. The archaeological remains also have a strong aesthetic value as evocative ruins of Australia's colonial past. The 1789 Foundation Stone (in the Mitchell Collection in the NSW State Library) and the five 1850s carriage gun carriages contribute strongly to the heritage significance of the site to being significant in their own right. Dawes Point maintains vestiges of its occupation. The Point has been terraced and filled with each successive land use have been closely linked with the site's unique character as it does a prominent headland with vistas up and down the harbour. Park still encompasses more than 90% of the area set aside for military use in the 18th century. Very little of this area has been alienated from public ownership. The potential for interpretation of this period of the site's history in the layers of history at Dawes Point have great potential to be used as a cultural and tourism resource.

Representativeness:

Rare Assessment:

Integrity/Intactness: Archaeology partly disturbed.

Consent as Owner: Before doing any building work to an item on this Register or lodging an application, the proponent should obtain the consent of the relevant authority, usually the SHFA. Early consultation is recommended.

Development Approval: Development work to any item on this Register, including internal alterations and signage, requires development approval under the EP&A Act. If the work is in The Rocks, the SHFA's town planning consent authority or if the work is in The Rocks, the SHFA's town planning consent authority.

Archaeology: Aboriginal and European cultural archaeological sites are protected under the National Parks and Wildlife Act 1974 and the Heritage Act 1977 respectively. A permit may be required. Contact the National Parks and Wildlife Service, for more information.

SHFA Policies: The SHFA has developed a number of policies which guide work to the site. These include Signage, Outdoor Seating & Telecommunications. Not prepared including Lighting; Building Services & Disabled Access. A

Conservation Plans: Before considering major changes to, or adjacent to, a heritage item a Conservation Management Plan should be prepared. Many of the items have Conservation Plans (see References). Copies can be obtained from the SHFA.

The Rocks: The Rocks Conservation Area is also on this Register. Work to any other heritage within this area needs careful consideration of the heritage and archaeological impacts.

References:	Author:	Title:	Year:
		Watson, "Early Fortifications", JRAHS, 1916, 398.	
		HRA, I, X, 687	
		Collins, I, 38, 45	
	O.H.M. Consultants, 1998	The Dawes Point Battery Guns: Condition Survey	1988
	Johnson, A.W. and Zarmati, L.	Dawes Point Battery, The Rocks. History, Preliminary Archaeology and Research Design. Report Prepared for SCA.	1995
	SHFA	Dawes Point Conservation Management Plan Final Draft Oct. 1999	1999
Studies:	Author:	Title:	Number:
	Sydney Cove Authority (SCA)	SCA Register 1979-1998	S044, AR0
Listings:	Name:	Title:	Number:
	Institution of Engineers (NSW) heritage register		
	Heritage Act - State Heritage Register		01543



[Motor registries](#)[Contact us](#)[About us](#)[Sitemap](#)[Related websites](#)

Sydney Harbour Bridge Workshops Collection

[Home](#) > [Environment](#) > [Heritage](#) > [Heritage and Conservation Register](#) > Heritage and conservation register

Item

Name of Item	Sydney Harbour Bridge Workshops Collection
Item Number	4300735
Type of Item	Movable/Collection
Item Sub-Type	****
Roadloc	
Address	Sydney Harbour Bridge, Bradfield Highway, Sydney City 2000
Local Government Area	Sydney City
Owner	Roads and Traffic Authority
Current Use	Storage
Former Use	Various

In This Section

- ▣ [Heritage and conservation register](#)
- ▣ [Hunter region](#)
- ▣ [Northern region](#)
- ▣ [South West region](#)
- ▣ [Southern region](#)
- ▣ [Sydney region](#)
- ▣ [Western region](#)

Statement of significance

Statement of significance	<p>The Sydney Harbour Bridge Workshops Collection is significant as a component of the heritage of the Harbour Bridge itself, a highly significant element in the economic and social development of NSW. The collection includes items which are significant as representative examples of past fixtures, plans and documentation associated with the Bridge. The collection also includes items which were important for the continued maintenance and function of the bridge. Some items demonstrate the past methods used to maintain the bridge and the innovation and danger which could associated with that activity.</p> <p>The collection contains evidence of the use of the bridge as a place for signage for special events over its lifetime. The collection also contains a construction model once owned by Mr J.J. Bradfield.</p> <p>The SHB Workshops collectionI has been assessed as being of State significance.</p>
Date Significance Updated	29 March 2005

Description

Designer	Various
Builder	Various
Construction years	1932 - ****
Physical description	<p>The Sydney Harbour Bridge Workshops Collection contains the following items:</p> <ol style="list-style-type: none">1. Bronze Bracketed Lanterns2. Toll Booth Indicator Boxes, Redundant Traffic

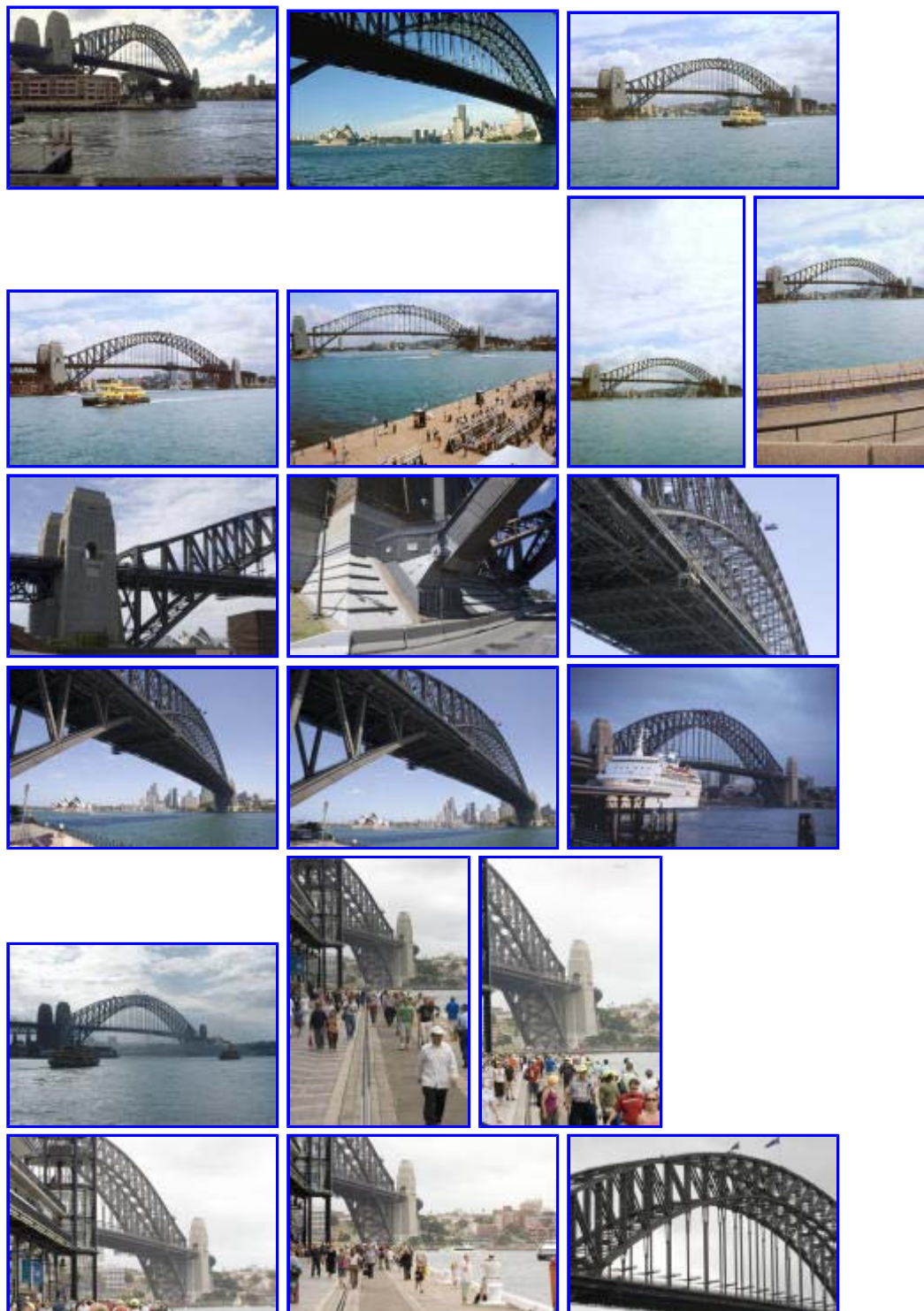
Australian Heritage Database

Place Details

[new search](#) | [about the Australian Heritage Database](#) | [Heritage home](#) | [Australian Heritage Council home](#)

[Send Feedback](#)

Sydney Harbour Bridge, Bradfield Hwy, Sydney, NSW,Australia



Photographs:



List: Register of the National Estate
Class: Historic
Legal Status: [Registered](#) (21/03/1978)
Place ID: 1857
Place File No: 1/12/036/0065

Statement of Significance:

The bridge is one of the most remarkable feats of bridge construction. At the time of its construction and until recently it was the longest single span bridge in the world. It has been an important factor in the growth of Metropolitan Sydney, particularly since World War Two. The bridge, its pylons and approaches are all important elements in the townscape of areas both near and distant from it. The curved northern approach gives a grand sweeping entrance to the bridge with continually changing views of the bridge and harbour.

(The Commission is in the process of developing and/or upgrading official statements for places listed prior to 1991. The above data was mainly provided by the nominator and has not yet been revised by the Commission.)

Official Values: Not Available

Description:

Single span steel arch bridge with suspended roadway and four non-structural pylons two at each end. Constructed of silicon steel trusses and joists painted dark grey. Approaches nearest the arch are of open work steel joists supported by granite faced pillars, remainder of approaches are steel and masonry construction with render finish. Pylons are faced with Moruya granite. Top of arch is 134.6m above water level, the roadway, which is suspended below, is 52m above water level. Roadway is 46m wide, carrying eight traffic lines, two railway lines, footpath and cycleway length including approaches is 1,163.12 m.

History: Not Available

Condition and Integrity: Not Available

Location:

Spanning between Dawes Point in the south and Milsons Point in the north. Boundaries: bridge and its approaches, including pylons, excluding Milsons Point Railway station. Northern boundary is immediately north of Lavender Street Vehicular underpass. Southern boundary is at southern end of the small park alongside upper Fort Street,

Sydney.

Bibliography:

"Sydney Harbour Bridge: report on tenders" Sydney: Government Printer 1924

Freeman, R.: "Sydney Harbour Bridge: Design of the structure and foundations" Min. Proc. Instn Civil Engrs, vol 238, 1935, pp153-193

Freeman, R. and Ennis, L.: "Sydney Harbour Bridge: Manufacture of the structural Steelwork and erection of the bridge" Min. Proc. Instn Civil Engrs, vol 238, 1935, pp194-255

Pain, J.F. and Roberts, G.: "Sydney Harbour Bridge: Calculations for the steel superstructure" Min. Proc. Instn Civil Engrs, vol 238, 1935, pp256-309

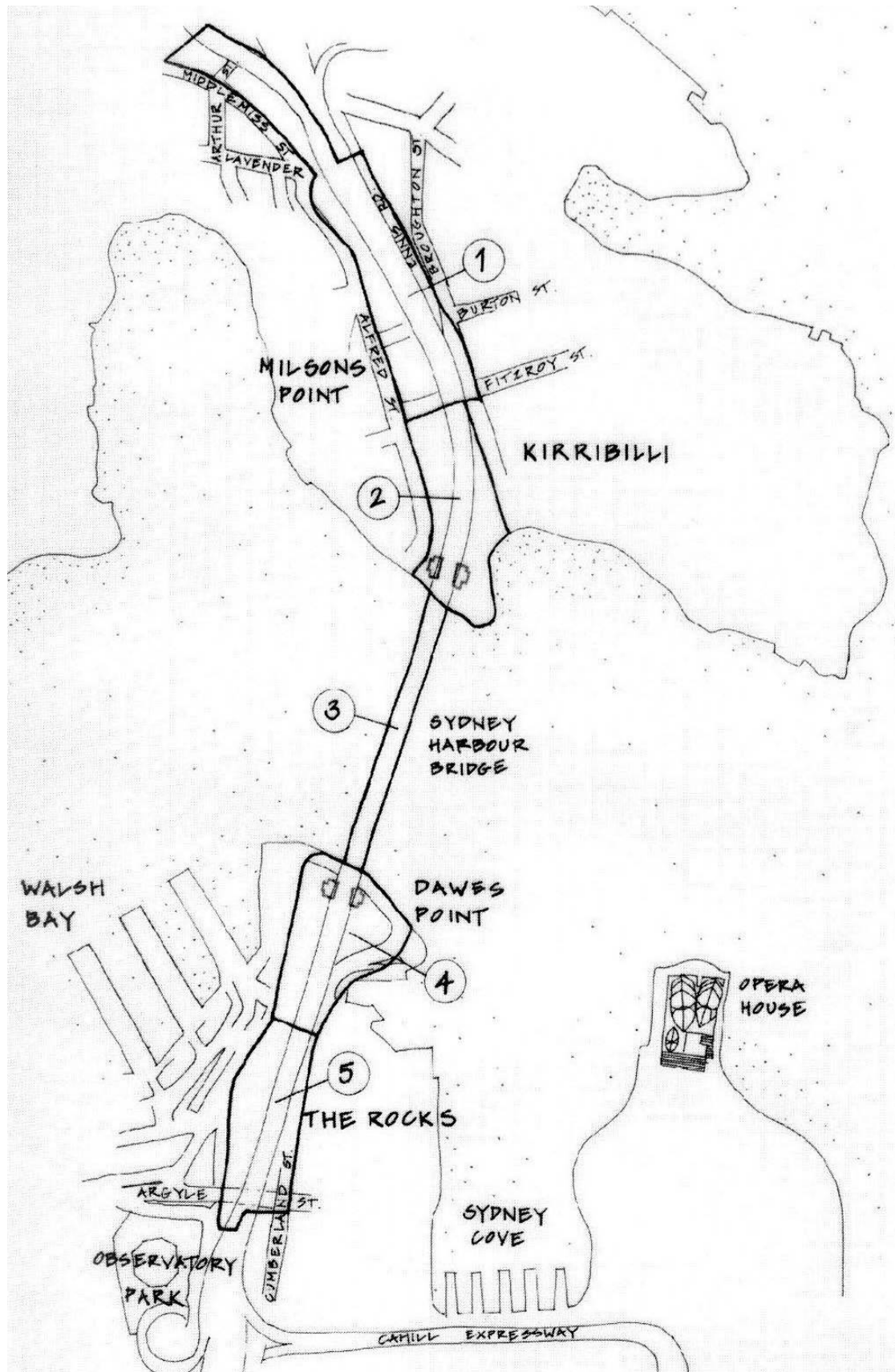
Bradfield, J.J.C.: "The Sydney Harbour Bridge and approaches" Min. Proc. Instn Civil Engrs, vol 238, 1935, pp310-401.

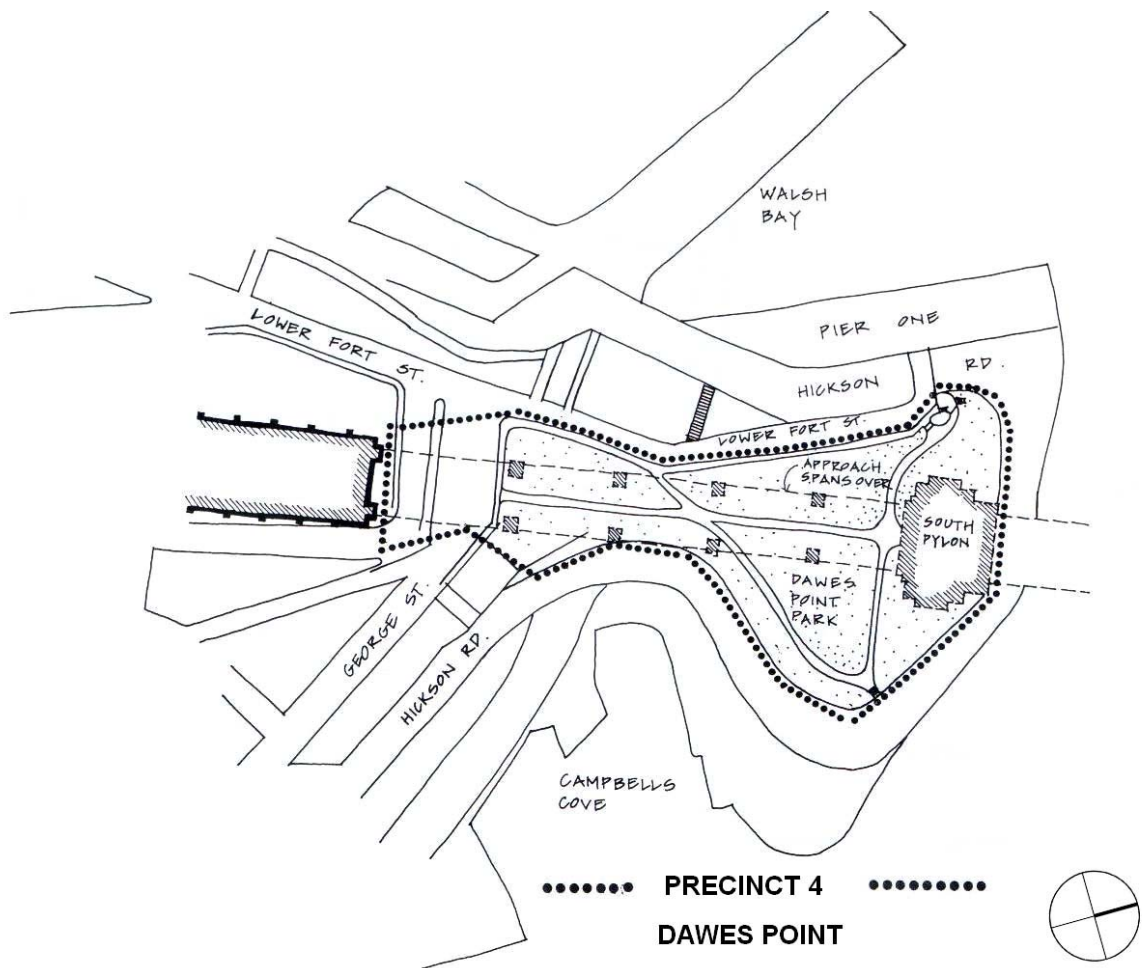
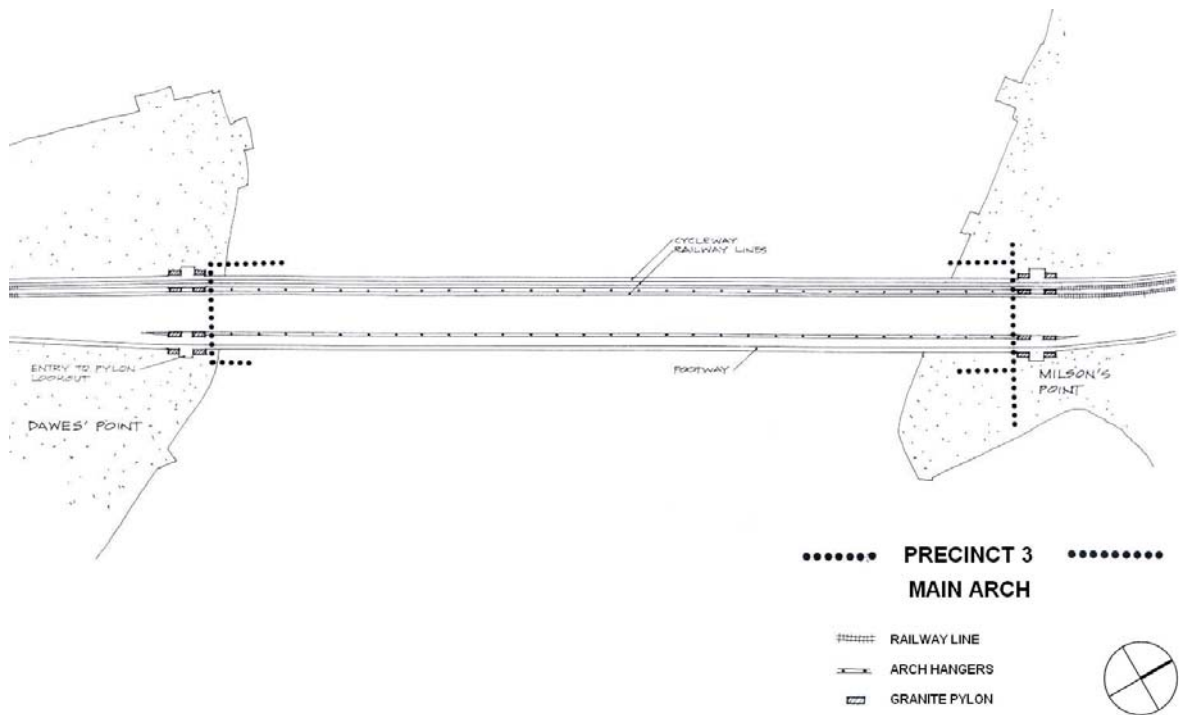
Report Produced: Fri May 25 09:38:14 2007

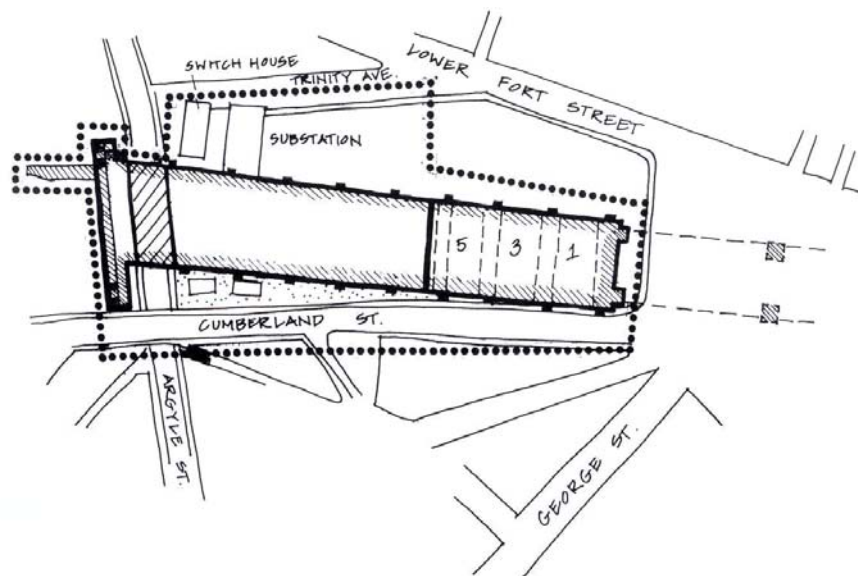
Appendix B

Sydney Harbour Bridge Precinct Plans

Appendix B Sydney Harbour Bridge—Precinct Plans







..... PRECINCT 5

SOUTHERN APPROACHES

- RENDERED APPROACH STRUCTURES
- RETAINING WALLS
- ARCH BRIDGE



Appendix C

Comparison of National Heritage and NSW Heritage Criteria

Appendix C Comparison of National Heritage and NSW Heritage Criteria

National Heritage Criteria	New South Wales Heritage Criteria
Criterion A (Historic) The place has outstanding heritage value to the nation because of the place's importance in the course, or pattern, of Australia's natural or cultural history.	Criterion (a) (Historic) An item is important in the course, or pattern, of NSW's cultural or natural history.
Criterion B (Rarity) The place has outstanding heritage value to the nation because of the place's possession of uncommon, rare or endangered aspects of Australia's natural or cultural history.	Criterion (f) (Rarity) An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history.
Criterion C (Scientific) The place has outstanding heritage value to the nation because of the place's potential to yield information that will contribute to an understanding of Australia's natural or cultural history.	Criterion (e) (Research Potential) An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history.
Criterion D (Representativeness) The place has outstanding heritage value to the nation because of the place's importance in demonstrating the principal characteristics of: (i) a class of Australia's natural or cultural places; or (ii) a class of Australia's natural or cultural environments.	Criterion (g) (Representativeness) An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or cultural or natural environments.
Criterion E (Aesthetic Significance) The place has outstanding heritage value to the nation because of the place's importance in exhibiting particular aesthetic characteristics valued by a community or cultural group.	Criterion (c) (Aesthetic) An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW.
Criterion F (Technical) The place has outstanding heritage value to the nation because of the place's importance in demonstrating a high degree of creative or technical achievement at a particular period.	Criterion (c) (Technical) An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW.
Criterion G (Social) The place has outstanding heritage value to the nation because of the place's strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.	Criterion (d) (Social) An item has strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons.
Criterion H (Associational) The place has outstanding heritage value to the nation because of the place's special association with the life or works of a person, or group of persons, of importance in Australia's natural or cultural history.	Criterion (b) (Historic Association) 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 I (Indigenous) The place has outstanding heritage value to the nation because of the place's importance as part of Indigenous tradition.	No corresponding State heritage criterion

Appendix D

NSW Heritage Office, Heritage Information Series—Standard Exemptions for Works Requiring Heritage Council Approval, 2006

HERITAGE INFORMATION SERIES

STANDARD EXEMPTIONS FOR WORKS REQUIRING HERITAGE COUNCIL APPROVAL



Heritage Office

DISCLAIMER

Any representation, statement, opinion or advice, expressed or implied in this publication is made in good faith but on the basis that the State of New South Wales, its agents and employees are not liable (whether by reason of negligence, lack of care or otherwise) to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement or advice referred to above.

NSW Heritage Office
Locked Bag 5020
Parramatta NSW 2124
Ph: (02) 9873 8500
Fax: (02) 9873 8599
www.heritage.nsw.gov.au

© Crown copyright 1999
New edition 2003, revised 2004, 2005
New edition 2006

ISBN 1 921121 03 3

HO 06/04

CONTENTS

INTRODUCTION	4
WHY HAVE STANDARD EXEMPTIONS?	5
HOW WILL EXEMPTIONS ALREADY IN PLACE BE AFFECTED BY THE NEW STANDARD EXEMPTIONS?	5
WHAT OTHER APPROVALS ARE NECESSARY TO DO WORK ON A HERITAGE ITEM?	5
HOW TO RELATE THE STANDARD EXEMPTION CLAUSES TO YOUR HERITAGE ITEM	6
SCHEDULE OF STANDARD EXEMPTIONS	7
GENERAL CONDITIONS	8
STANDARD EXEMPTION 1: MAINTENANCE AND CLEANING	10
STANDARD EXEMPTION 2: REPAIRS	11
STANDARD EXEMPTION 3: PAINTING	13
STANDARD EXEMPTION 4: EXCAVATION	15
STANDARD EXEMPTION 5: RESTORATION	16
STANDARD EXEMPTION 6: DEVELOPMENT ENDORSED BY THE HERITAGE COUNCIL OR DIRECTOR-GENERAL	17
STANDARD EXEMPTION 7: MINOR ACTIVITIES WITH NO ADVERSE IMPACT ON HERITAGE SIGNIFICANCE	18
STANDARD EXEMPTION 8: NON-SIGNIFICANT FABRIC	19
STANDARD EXEMPTION 9: CHANGE OF USE	20
STANDARD EXEMPTION 10: NEW BUILDINGS	21
STANDARD EXEMPTION 11: TEMPORARY STRUCTURES	22
STANDARD EXEMPTION 12: LANDSCAPE MAINTENANCE	23
STANDARD EXEMPTION 13: SIGNAGE	24
STANDARD EXEMPTION 14: BURIAL SITES AND CEMETERIES	26
STANDARD EXEMPTION 15: COMPLIANCE WITH MINIMUM STANDARDS AND ORDERS	28
STANDARD EXEMPTION 16: SAFETY AND SECURITY	29
STANDARD EXEMPTION 17: MOVABLE HERITAGE ITEMS	30

INTRODUCTION

In NSW important items of our environmental heritage are listed on the State Heritage Register. Any changes to those items should respect and retain those qualities and characteristics that make the heritage place special.

Any major works proposed for **State Heritage Register items** therefore need to be assessed and approved by the Heritage Council to ensure that the heritage significance of the item will not be adversely affected.

However, the assessment process can waste the time and resources of both the owner and the Heritage Council if the works are only minor in nature and will have minimal impact on the heritage significance of the place. The Heritage Act allows the Minister for Planning, on the recommendation of the Heritage Council, **to grant exemptions for certain activities** which would otherwise require approval under the NSW Heritage Act.

There are two types of exemptions which can apply to a heritage item listed on the State Heritage Register:

1. **standard exemptions** for all items on the State Heritage Register. Typical activities that are exempted include building maintenance, minor repairs, alterations to certain interiors or areas and change of use.
2. **site specific exemptions** for a particular heritage item can be approved by the Minister on the recommendation of the Heritage Council.

These guidelines have been prepared to inform owners and managers of heritage items listed on the State Heritage Register about the standard exemptions. They also explain how to develop site specific exemptions for a heritage item.

The State Heritage Register

Heritage places and items of particular importance to the people of New South Wales are listed on the State Heritage Register. The Register was created in April 1999 by amendments to the *Heritage Act 1977*.

The key to listing on the State Heritage Register is the level of significance. Only those heritage items which are of **state significance in NSW** are listed on the State Heritage Register.

To check whether an item is listed on the register, check the online heritage database on the Heritage Office homepage:

www.heritage.nsw.gov.au.

This online database lists all statutorily protected items in NSW.

WHY HAVE STANDARD EXEMPTIONS?

The standard exemptions apply to all items listed on the State Heritage Register. These exemptions came into force on 25 March 2006. They replace all previous standard exemptions.

The current exemptions replace those gazetted on 7 March 2003, 18 June 2004 and 8 July 2005. They relate to a broad range of minor development and will result in a more streamlined approval process.

The purpose of the standard exemptions is to clarify for owners, the Heritage Office and local councils what kind of maintenance and minor works can be undertaken without needing Heritage Council approval. This ensures that owners are not required to make unnecessary applications for minor maintenance and repair.

Heritage Council has drafted guidelines to help owners and managers to interpret and apply the standard exemptions. These guidelines were published in 2004 and have been incorporated into this document.

HOW WILL EXEMPTIONS ALREADY IN PLACE BE AFFECTED BY THE NEW STANDARD EXEMPTIONS?

1. **Standard Exemptions:** The new standard exemptions replace all existing standard exemptions.
2. **Site Specific Exemptions:** Some heritage items have site specific exemptions for works other than those in the standard list. Site specific exemptions will continue to remain in force.

WHAT OTHER APPROVALS ARE NECESSARY TO DO WORK ON A HERITAGE ITEM?

The exemptions only reduce the need to obtain approval from the Heritage Council, under section 60 of the Heritage Act, to carry out works to a heritage item listed on the State Heritage Register. You should check with your local council for information on additional development and building approvals, and with the Heritage Office for other approvals which may be required under the Heritage Act, such as an Excavation Permit.

HOW TO RELATE THE STANDARD EXEMPTION CLAUSES TO YOUR HERITAGE ITEM

The standard exemption clauses can be grouped under two headings:

- maintenance and repairs;
- alterations.

Clauses have been kept as concise as possible to avoid ambiguities. The terminology used is consistent with the Australia ICOMOS *Burra Charter*. Australia ICOMOS is the Australian Chapter of International Council on Monuments and Sites, a UNESCO-affiliated international organisation of conservation specialists. The *Burra Charter* is a nationally accepted standard for assessing and managing change to heritage items.

Before you develop firm proposals for changes to the heritage item, take the following actions:

- [1.] Check the boundaries of the item to which the State Heritage Register listing applies;
- [2.] Check the exemptions which apply to your heritage item;
- [3.] Read these explanatory notes to ensure that the work you propose is exempted;
- [4.] If the work is not exempted, apply to the Heritage Council for approval under section 60 of the Heritage Act;
- [5.] Check with the local council concerning other approvals that may be required;
- [6.] Check with the Heritage Office if the work you propose involves the disturbance of relics more than 50 years old.

SCHEDULE OF STANDARD EXEMPTIONS

HERITAGE ACT, 1977

Order Under Section 57(2) of the Heritage Act, 1977

I, the Minister for Planning, pursuant to section 57(2) of the Heritage Act 1977, on the recommendation of the Heritage Council of New South Wales, do by this Order:

1. revoke the Schedule of Exemptions to subsection 57(1) of the Heritage Act made under subsection 57(2) and published in the Government Gazette on 7 March 2003, 18 June 2004 and 8 July 2005; and
2. grant standard exemptions from section 57(1) of the Heritage Act 1977, described in the Schedule below.

FRANK SARTOR

Minister for Planning

Sydney, 25 March 2006

SCHEDULE OF EXEMPTIONS TO SUBSECTION 57(1) OF THE HERITAGE ACT 1977

MADE UNDER SUBSECTION 57(2)

GENERAL CONDITIONS

1. These general conditions apply to all of the following Exemptions.
2. Anything done pursuant to the following Exemptions must be carried out in accordance with relevant Guidelines issued by the Heritage Office including *“The Maintenance of Heritage Assets: A Practical Guide”* 1998, *“Movable Heritage Principles”* 2000 and *“The Heritage Council Policy on Managing Change to Heritage Items”*.
3. The following Standard Exemptions do not apply to anything affecting relics, places, items or sites of heritage significance to Aboriginal people or which affect traditional access by Aboriginal people.
4. The Executive Director, Director and Managers employed by the Heritage Office, Department of Planning; the Executive Director, Tenant and Asset Management Services, employed by the Sydney Harbour Foreshore Authority; the Executive Director Cultural Heritage employed by the Department of Environment and Conservation; and the Director of Planning employed by the Sydney City Council may perform any of the functions of the Director-General of the Department of Planning (Director-General) under these exemptions.

The authorisation to the Executive Director, Tenant and Asset Management Services of the Sydney Harbour Foreshore Authority is restricted to land for which it is the delegated approval body under section 169 of the Heritage Act, and the preparation and submission of information required to demonstrate that compliance with the criteria contained in these exemptions is satisfied, must not be carried out by the Executive Director, Tenant and Asset Management Services.

The authorisation to the Executive Director Cultural Heritage of the Department of Environment and Conservation is restricted to land for which it is the delegated approval body under section 169 of the Heritage Act, and the preparation and submission of information required to demonstrate that compliance with the criteria contained in these exemptions is satisfied, must not be carried out by the Executive Director Cultural Heritage.

The authorisation to the Director of Planning, Sydney City Council is restricted to land for which the Council is the delegated approval body under section 169 of the Heritage Act, and the preparation and submission of information required to demonstrate that compliance

with the criteria contained in these exemptions is satisfied, must not be carried out by the Director of Planning, Sydney City Council.

5. In these Exemptions, words shall be given the same meaning as in the *Heritage Act 1977* ("the Act") unless the contrary intention appears from the context of the exemption.
6. Anything done pursuant to the following Exemptions must be specified, supervised and carried out by people with knowledge, skills and experience appropriate to the work.

Guidelines

In addition to the above guidelines listed in paragraph two , the Heritage Council adopted further guidelines on 7 April 2004 for use in interpreting and applying the standard exemptions.

If it is unclear whether proposed development satisfies the requirements of these exemptions, an application will be required under section 60 of the Heritage Act.

STANDARD EXEMPTION 1: MAINTENANCE AND CLEANING

1. The following maintenance and cleaning does not require approval under s. 57(1) of the Act:

- (a) the maintenance of an item to retain its condition or operation without the removal of or damage to the existing fabric or the introduction of new materials;
- (b) cleaning including the removal of surface deposits, organic growths or graffiti by the use of low pressure water (less than 100 psi at the surface being cleaned) and neutral detergents and mild brushing and scrubbing.

NOTE 1: Traditional finishes such as oils and waxes must continue to be used for timber surfaces rather than modern alternative protective coatings such as polyurethane or acrylic which may seal the surface and can cause damage.

NOTE 2: Surface patina which has developed on the fabric may be an important part of the item's significance and if so needs to be preserved during maintenance and cleaning.

Guidelines

Maintenance is distinguished from repairs, restoration and reconstruction as it does not involve the removal of or damage to existing fabric or the introduction of new materials. It is a continuing process of protective care. Typical maintenance activity includes:

- *the removal of vegetation and litter from gutters and drainage systems;*
- *resecuring and tightening fixings of loose elements of building fabric;*
- *lubricating equipment and services which have moving parts;*
- *the application of protective coatings such as limewash, polish, oils and waxes to surfaces which have previously had such coatings applied; and*
- *cleaning by the removal of surface deposits using methods other than aggressive mechanical or chemical techniques such as high pressure, high temperature or strong solvents which may affect the substrate.*

This standard exemption applies to the maintenance of all types of heritage items including buildings, works, landscapes, cemeteries and movable heritage. Reference should be made to other relevant standard exemptions (#12, 14 and 17) for particular types of items.

STANDARD EXEMPTION 2: REPAIRS

1. Repair to an item which is of the type described in (a) or (b) below does not require approval under s. 57(1) of the Act:
 - (a) the replacement of services such as cabling, plumbing, wiring and fire services that uses existing service routes, cavities or voids or replaces existing surface mounted services and does not involve damage to or the removal of significant fabric;
 - (b) the repair (such as refixing 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 and does not involve damage to or the removal of significant fabric.

NOTE 1: Repairs must be based on the principle of doing as little as possible and only as much as is necessary to retain and protect the element. Therefore replacement must only occur as a last resort where the major part of an element has decayed beyond further maintenance.

NOTE 2: Any new materials used for repair must not exacerbate the decay of existing fabric due to chemical incompatibility, obscure existing fabric or limit access to existing fabric for future maintenance.

NOTE 3: Repair must maximise protection and retention of fabric and include the conservation of existing detailing, such as vents, capping, chimneys, carving, decoration or glazing.

Guidelines

This standard exemption is not intended to allow the cumulative replacement of large amounts or a high proportion of the fabric of an item. If replacement of large amounts of fabric is necessary, an application will be required to be submitted under s. 60 of the Heritage Act. If there is uncertainty about whether the proposed extent of repair is exempt from approval, advice should be sought from the NSW Heritage Office.

Repairs should have detailed specifications and carried out by licensed tradespeople with experience in the conservation of heritage buildings. It is essential that the composition of elements of the fabric such renders, mortars, timber species and metal types remain the same to assist with matching appearance and avoiding chemical incompatibility.

Repair may involve reconstruction which means returning an item to a known earlier state. This may involve the use of new or recycled materials.

Reconstruction must satisfy a four-part test to qualify for exemption from approval:

- 1. The nature of the earlier state being reconstructed must be known. Where there is conjecture about the earlier state of the fabric or where it is proposed to change the appearance, material or method of fixing of the fabric an application under s.60 of the Heritage Act will be required.*
- 2. The replacement fabric must be matching in appearance and method of fixing. The use of salvaged or recycled fabric can be a valuable resource in matching appearance in preference to the use of new fabric which may appear obtrusive. However the damage to other heritage buildings by the salvaging of fabric for reuse is unacceptable. Salvaged materials must be judiciously sourced so as not to encourage secondary damage to other heritage resources. The use of artificial ageing techniques to assist the matching of new with original fabric is only advocated where there is an obtrusive mismatch of materials which negatively impacts on the heritage significance of the item. Ideally, new and original fabric should be subtly discernable on close examination to assist interpretation of the history of change to the building.*
- 3. The fabric being replaced must be beyond further maintenance. The replacement of fabric may only occur where fabric is missing or it is so damaged or deteriorated that it is beyond further maintenance. In many cases the judgement about the level of deterioration and the effectiveness of further maintenance will require the advice of a person who is suitably experienced in similar heritage conservation projects. If it is unclear that the fabric is beyond further maintenance, its replacement will require the submission of an application under s. 60 of the Heritage Act.*
- 4. Significant fabric must not be damaged or removed. In all cases of repair, the damage or removal of significant fabric is not permitted without approval. Significant fabric is that which contributes to the heritage significance of the item. The identification of the level of significance of fabric will usually require the advice of a person who is suitably experienced in similar heritage conservation projects. The damage or removal of significant fabric will require the submission of an application under s. 60 of the Heritage Act.*

New material used in repairs should where possible be date stamped in a location which is not conspicuous but is legible on close examination. Archival recording of removed and replacement fabric is advocated and should be used in interpretative displays where practicable.

STANDARD EXEMPTION 3: PAINTING

1. Painting does not require approval under s. 57(1) of the Act if the painting:
 - (a) does not involve the disturbance or removal of earlier paint layers other than that which has failed by chalking, flaking, peeling or blistering;
 - (b) involves over-coating with an appropriate surface as an isolating layer to provide a means of protection for significant earlier layers or to provide a stable basis for repainting; and
 - (c) employs the same colour scheme and paint type as an earlier scheme if they are appropriate to the substrate and do not endanger the survival of earlier paint layers.
2. Painting which employs a different colour scheme and paint type from an earlier scheme does not require approval under s. 57(1) of the Act, provided that:
 - (a) the Director-General is satisfied that the proposed colour scheme, paint type, details of surface preparation and paint removal will not adversely affect the heritage significance of the item; and
 - (b) the person proposing to undertake the painting has received a notice advising that the Director-General is satisfied.
3. A person proposing to undertake repainting of the kind described in paragraph 2 must write to the Director-General and describe the proposed colour scheme, paint type, details of surface preparation and paint removal involved in the repainting. If the Director-General is satisfied that the proposed development meets the criteria set out in paragraph 2(a) the Director-General shall notify the applicant.

NOTE: Preference should be given to the re-establishment of historically significant paint schemes of the item that are appropriate to the significance of the building.

Guidelines

Painting of surfaces which have not previously been painted such as face brickwork, stone, concrete or galvanised iron is likely to adversely affect the heritage significance of the item and is not exempt from approval under this standard exemption. Likewise, the stripping of paint coatings which were intended to be protective may expose the substrate to damage and cause the loss of the historical record and significance of the building. In cases where surface preparation has revealed significant historic paint layers, repainting should facilitate the interpretation of the evolution of the building by displaying appropriately located sample patches of historic paint schemes. This

information should also be examined if it is proposed to recreate earlier finishes or paint schemes.

Paint removal of failed layers to achieve a stable base for repainting is exempt from approval but intervention should be minimised to avoid the loss of the significant historical record. Where old paint layers are sound they should be left undisturbed. The removal of paint with a high content of lead or other hazardous materials requires considerable care and use of experienced tradespeople as its disturbance can create health hazards. If the removal of such paint layers will adversely affect the heritage significance of the item, an application will be required under section 60 of the Heritage Act.

Reference should be made to The Maintenance Series, NSW Heritage Office, particularly Information Sheets 6.2 Removing Paint from Old Buildings, 7.2 Paint Finishes and 7.3 Basic Limewash. Available online at www.heritage.nsw.gov.au.

STANDARD EXEMPTION 4: EXCAVATION

1. Excavation or disturbance of land of the kind specified below does not require approval under s. 57(1) of the Act, provided that the Director-General is satisfied that the criteria in (a), (b) or (c) have been met and the person proposing to undertake the excavation or disturbance of land has received a notice advising that the Director-General is satisfied:
 - (a) where an archaeological assessment has been prepared in accordance with Guidelines published by the Heritage Council of NSW which indicates that any relics in the land are unlikely to have State or local heritage significance; or
 - (b) where the excavation or disturbance of land will have a minor impact on archaeological relics; or
 - (c) where the excavation or disturbance of land involves only the removal of unstratified fill which has been deposited on the land.
2. A person proposing to excavate or disturb land in the manner described in paragraph 1 must write to the Director-General and describe the proposed excavation or disturbance of land and set out why it satisfies the criteria set out in paragraph 1. If the Director-General is satisfied that the proposed development meets the criteria set out in paragraph (a), (b) or (c) the Director-General shall notify the applicant.

NOTE 1: Any excavation with the potential to affect Aboriginal objects must be referred to the Director-General of the Department of Environment and Conservation.

NOTE 2: If any Aboriginal objects are discovered on the site, excavation or disturbance is to cease and the Department of Environment and Conservation is to be informed in accordance with s. 91 of the National Parks and Wildlife Act, 1974.

NOTE 3: This exemption does not allow the removal of State significant relics.

NOTE 4: Where substantial intact archaeological relics of State or local significance, not identified in the archaeological assessment or statement required by this exemption, are unexpectedly discovered during excavation, work must cease in the affected area and the Heritage Office must be notified in writing in accordance with s. 146 of the Act. Depending on the nature of the discovery, additional assessment and possibly an excavation permit may be required prior to the recommencement of excavation in the affected area.

Guidelines

Excavation or disturbance to which clause 1(c) applies only involves the removal of unstratified fill material of minor heritage significance. Such fill will have been deposited in a single episode.

STANDARD EXEMPTION 5: RESTORATION

1. Restoration of an item by returning significant fabric to a known earlier location without the introduction of new material does not require approval under s. 57(1) of the Act.
2. The following restoration does not require approval under s. 57(1) of the Act, provided that the Director-General is satisfied that the criteria in (a) have been met and the person proposing to undertake the restoration has received a notice advising that the Director-General is satisfied:
 - (a) the restoration of an item without the introduction of new material (except for fixings) to reveal a known earlier configuration by removing accretions or reassembling existing components which does not adversely affect the heritage significance of the item.
3. A person proposing to undertake restoration of the kind described in paragraph 2 must write to the Director-General and set out why there is a need for restoration to be undertaken and the proposed material and method of restoration. If the Director-General is satisfied that the proposed development meets the criteria set out in paragraph 2(a), the Director-General shall notify the applicant.

Guidelines

Restoration in accordance with clause 1 of this standard exemption does not involve the removal of fabric and only relates to the return of fabric which has been removed to storage or has been dislodged from its original location.

STANDARD EXEMPTION 6: DEVELOPMENT ENDORSED BY THE HERITAGE COUNCIL OR DIRECTOR-GENERAL

1. Minor development specifically identified as exempt development which does not materially impact on heritage significance, by a conservation policy or strategy within a conservation management plan which has been endorsed by the Heritage Council of NSW or by a conservation management strategy endorsed by the Director-General does not require approval under s. 57(1) of the Act.
2. A person proposing to do anything of the kind described in paragraph 1 must write to the Director-General and describe the proposed development. If the Director-General is satisfied that the proposed development meets the criteria set out in paragraph 1, the Director-General shall notify the applicant.

Guidelines

This standard exemption does not exempt development that is consistent with a conservation policy or strategy contained in an endorsed conservation management plan or interim conservation management strategy other than development that is specifically identified as exempt development in that conservation plan or strategy.

STANDARD EXEMPTION 7: MINOR ACTIVITIES WITH NO ADVERSE IMPACT ON HERITAGE SIGNIFICANCE

1. Anything which in the opinion of the Director-General is of a minor nature and will not adversely affect the heritage significance of the item does not require approval under s. 57(1) of the Act.
2. A person proposing to do anything of the kind described in paragraph 1 must write to the Director-General and describe the proposed activity. If the Director-General is satisfied that the proposed activity meets the criteria set out in paragraph 1, the Director-General shall notify the applicant.

Guidelines

This standard exemption has the potential to relate to a wide range of minor development. In determining whether a proposed development is minor the Director may have regard to the context of the particular heritage item such as its size and setting. For instance a development may be considered to be minor in the context of Prospect Reservoir's 1200ha curtilage whereas a similar proposal affecting an item on a smaller site may not be considered to be minor.

In order to assess whether a proposal has an adverse affect on heritage significance it is necessary to submit a clear and concise statement of the item's heritage significance and an assessment of whether a proposal impacts on that significance.

STANDARD EXEMPTION 8: NON-SIGNIFICANT FABRIC

1. The following development does not require approval under s. 57(1) of the Act, provided that the Director-General is satisfied that the criteria in (a) have been met and the person proposing to undertake the development has received a notice advising that the Director-General is satisfied:
 - (a) the alteration of a building involving the construction or installation of new fabric or services or the removal of building fabric which will not adversely affect the heritage significance of the item.
2. A person proposing to do anything of the kind described in paragraph 1 must write to the Director-General and describe the proposed development. If the Director-General is satisfied that the proposed development meets the criteria set out in paragraph 1(a), the Director-General shall notify the applicant.

Guidelines

In order to assess the level of significance of fabric it is necessary to submit a clear and concise statement of the item's heritage significance and to grade the fabric of the place in accordance with its association with or impact on that significance. It may not always be concluded that more recent fabric is of less or no heritage significance.

STANDARD EXEMPTION 9: CHANGE OF USE

1. The change of use of an item or its curtilage or the commencement of an additional or temporary use does not require approval under s. 57(1) of the Act, provided that the Director-General is satisfied that the criteria in (a) and (b) have been met and the person proposing to undertake the change of use has received a notice advising that the Director-General is satisfied:
 - (a) the use does not involve the alteration of the fabric, layout or setting of the item or the carrying out of development other than that permitted by other standard or site specific exemptions; and
 - (b) the use does not involve the cessation of the primary use for which the building was erected, a later significant use or the loss of significant associations with the item by current users;
2. A person proposing to change the use of an item or its curtilage or to commence an additional or temporary use of an item or its curtilage in the manner described in paragraph 1 must write to the Director-General and describe the changes proposed. If the Director-General is satisfied that the proposed development meets the criteria set out in paragraph 1(a) and (b), the Director-General shall notify the applicant.

Guidelines

For the purposes of this standard exemption any change of use which is inconsistent with specific conditions of any previous approval or consent such as hours of operation or nature of conduct of an activity requires approval under section 57(1) or the modification of an approval under section 65A of the Heritage Act.

STANDARD EXEMPTION 10: NEW BUILDINGS

1. Subdivision under the *Strata Scheme (Freehold Development) Act* or *Strata Scheme (Leasehold Development) Act* of the interior of a building that has been constructed since the listing of the item on the State Heritage Register or the publication of an interim heritage order in the Gazette which applies to the land does not require approval under s. 57(1) of the Act.
2. Alteration to the interior of a building which has been constructed since the listing of the item on the State Heritage Register or the publication of an interim heritage order in the Gazette which applies to the land does not require approval under s. 57(1) of the Act.

Guidelines

Subdivision to which clause 1 of this standard exemption applies must not subdivide the curtilage of the exterior of a building other than approved car spaces. A strata plan which otherwise proposes the subdivision of the curtilage of a heritage item requires approval under section 57(1) of the Heritage Act.

For the purposes of clause 2 of this standard exemption, alterations to the interior of a building:

- *do not include internal alterations to additions to buildings which existed prior to the listing of the site on the State Heritage Register or publication of the interim heritage order;*
- *must not affect the external appearance of the building such as by balcony enclosure or window screening; and*
- *must not be inconsistent with any specific conditions of a previous approval.*

Such alterations require approval under section 57(1) of the Heritage Act.

STANDARD EXEMPTION 11: TEMPORARY STRUCTURES

1. The erection of temporary structures does not require approval under s. 57(1) of the Act, provided that the Director-General is satisfied that the criteria in (a) and (b) have been met and the person proposing to erect the structure has received a notice advising that the Director-General is satisfied:
 - (a) the structure will be erected within and used for a maximum period of 4 weeks after which it will be removed within a period of 2 days and not erected again within a period of 6 months; and
 - (b) the structure is not to be located where it could damage or endanger significant fabric including landscape or archaeological features of its curtilage or obstruct significant views of and from heritage items.
2. A person proposing to erect a structure of the kind described in paragraph 1 must write to the Director-General and set out the nature of the structure, the use for the structure and how long it will remain in place and the next occasion on which it is anticipated that the structure will be erected. If the Director-General is satisfied that the proposed development meets the criteria set out in paragraphs 1(a) and 1(b) the Director-General shall notify the applicant.

Guidelines

The cumulative impact of the multiple use of this standard exemption will be considered by the Director in the assessment of the simultaneous construction of a number of temporary structures or a succession of temporary structures which may have a prolonged adverse impact on heritage significance of the item.

STANDARD EXEMPTION 12: LANDSCAPE MAINTENANCE

1. Landscape maintenance which is of the type described below does not require approval under s. 57(1) of the Act:
 - (a) weeding, watering, mowing, top-dressing, pest control and fertilizing necessary for the continued health of plants, without damage or major alterations to layout, contours, plant species or other significant landscape features;
 - (b) pruning to control size, improve shape, flowering or fruiting and the removal of diseased, dead or dangerous material, not exceeding 20% of the crown of a tree within a period of 2 years; or
 - (c) tree surgery by a qualified horticulturist or tree surgeon necessary for the health of those plants.

NOTE 1: In relation to cemeteries, landscape features include monuments, grave markers, grave surrounds, fencing, path edging and the like.

Guidelines

Landscape features and gardens are fundamental to the setting of heritage items and are important to the appreciation of heritage significance. Landscape setting is by its nature evolving and often requires more regular maintenance than other elements of heritage fabric. Horticultural advice may be required to ensure a regime of maintenance appropriate to the retention of heritage significance of a place. General advice about landscape maintenance is provided by The Maintenance of Heritage Assets: A Practical Guide Information Sheet 9.1 Heritage Gardens and Grounds, printed versions available from the NSW Heritage Office.

STANDARD EXEMPTION 13: SIGNAGE

1. The erection of signage which is of the types described in (a) or (b) below does not require approval under s. 57(1) of the Act:
 - (a) temporary signage which is located behind or on the glass surface of a shop window which is not internally illuminated or flashing and is to be removed within eight weeks; or
 - (b) a real estate sign indicating that the place is for auction, sale or letting and related particulars and which is removed within 10 days of the sale or letting of the place;
2. The erection of signage which is of the types described in (a) or (b) below does not require approval under s. 57(1) of the Act, provided that the Director-General is satisfied that the criteria in (a) and (b) respectively have been met and the person proposing to erect it has received a notice advising that the Director-General is satisfied:
 - (a) the erection of non-illuminated signage for the sole purpose of providing information to assist in the interpretation of the heritage significance of the item and which will not adversely affect significant fabric including landscape or archaeological features of its curtilage or obstruct significant views of and from heritage items; or
 - (b) signage which is in the form of a flag or banner associated with a building used for a purpose which requires such form of promotion such as a theatre or gallery, which is displayed for a maximum period of eight weeks and which will not adversely affect significant fabric including landscape or archaeological features of its curtilage;
3. A person proposing to erect signage of the kind described in paragraph 2 must write to the Director-General and describe the nature and purpose of the advertising or signage. If the Director-General is satisfied that the proposed development meets the criteria set out in paragraph 2(a) or 2(b), the Director-General shall notify the applicant.
4. Signage of the kind described in paragraphs 1 and 2 must:
 - (a) not conceal or involve the removal of signage which has an integral relationship with the significance of the item;
 - (b) be located and be of a suitable size so as not to obscure or damage significant fabric of the item;
 - (c) be able to be later removed without causing damage to the significant fabric of the item; and
 - (d) reuse existing fixing points or insert fixings within existing joints without damage to adjacent masonry.

Guidelines

In addition to the requirements of clause 4 of the standard exemptions, signage may be controlled by development control plans or signage policies prepared by the relevant local council. The operation of the standard exemptions do not affect the requirements for consent by local councils or the need to satisfy any signage policies which may have been adopted by them.

Additional forms of signage not addressed by this standard exemption may not require approval under section 57(1) of the Heritage Act if they satisfy the requirements of other standard exemptions such as Standard Exemption 7 (Minor Activities with no Adverse Impact on Heritage Significance) or Standard Exemption 8 (Non-significant Fabric).

Signage in accordance with clause 2(a) of the standard exemption for the purpose of assisting the interpretation of heritage significance:

- requires approval under section 57(1) of the Heritage Act if additional information is provided which is unrelated to heritage interpretation such as commercial promotion or sponsorship; and*
- must be in accordance with Interpreting Heritage Places and Items published by the NSW Heritage Office and available online.*

STANDARD EXEMPTION 14: BURIAL SITES AND CEMETERIES

1. Development on land within a burial site or cemetery which is of the type described in (a), (b) or (c) below does not require approval under s. 57(1) of the Act:

- (a) the creation of a new grave;
- (b) the erection of monuments or grave markers in a place of consistent character, including materials, size and form, which will not be in conflict with the character of the place; or
- (c) an excavation or disturbance of land for the purpose of carrying out conservation or repair of monuments or grave markers;

provided that there will be no disturbance to human remains, to relics in the form of grave goods, associated landscape features or to a place of Aboriginal heritage significance.

2. A person proposing to carry out development in the manner described in paragraph 1(b) or (c) must write to the Director-General and describe the development proposed. If the Director-General is satisfied that the proposed development meets the criteria set out in paragraph 1, the Director-General shall notify the applicant.
3. This exemption does not apply to the erection of above-ground chambers, columbaria or vaults, or the designation of additional areas to be used as a burial place.

NOTE 1: Other standard exemptions apply to the maintenance, cleaning and repair of burial sites and cemeteries.

Guidelines

In addition to burial remains and artefacts, above ground cemetery elements may include headstones, footstones and other burial markers or monuments and associated elements such as grave kerbing, iron grave railings, grave furniture, enclosures and plantings. It is important that cemeteries listed on the State Heritage Register have a conservation policy or conservation management plan endorsed by the Heritage Council and that it records the history and significant fabric of the place with policies for conservation, relocation and the erection of new monuments and grave markers.

Additional advice about the management of heritage cemeteries is provided in:

- Cemeteries: Guidelines for their Care and Conservation, *NSW Heritage Office, 1992*;
- Skeletal Remains, *NSW Heritage Office, 1998*;
- Guidelines for Cemetery Conservation, *National Trust of Australia (NSW), 2002*.

STANDARD EXEMPTION 15: COMPLIANCE WITH MINIMUM STANDARDS AND ORDERS

1. Development which is required for the purpose of compliance with the minimum standards set out in Part 3 of the *Heritage Regulation 1999* or an order issued under either:
 - (a) section 120 of the *Heritage Act 1977* regarding minimum standards of maintenance and repair; or
 - (b) section 121S of the *Environmental Planning and Assessment Act 1979* regarding an order which is consistent with a submission by the Heritage Council under section 121S(6) of that Act;does not require approval under s. 57(1) of the Act.

Guidelines

This standard exemption is intended to facilitate and expedite compliance with orders and minimum standards of maintenance and repair.

The Minimum Standards of Maintenance and Repair replaced the “wilful neglect” provisions of the Heritage Act in 1999. The minimum standards are contained in Part 3 of the Heritage Regulation 1999 and are reproduced in the Heritage Information Series published by the NSW Heritage Office. The minimum standards only apply to items listed on the State Heritage Register and relate to:

- *weather protection;*
- *fire prevention and protection;*
- *security; and*
- *essential maintenance and repair to prevent serious or irreparable damage.*

Maintenance and repair which exceed the minimum standards in the Regulation may be exempt from approval under other standard exemptions (refer to #1 and #2).

Orders under s. 121S(6) of the EP&A Act are those given by a council or other consent authority in relation to an item listed on the State Heritage Register, land to which an interim heritage order applies or a heritage item listed under an environmental planning instrument. Orders must not be given in relation to items listed on the State Heritage Register or land to which an interim heritage order relates unless the consent authority has given notice of it to the Heritage Council and considered any submission made by it.

STANDARD EXEMPTION 16: SAFETY AND SECURITY

1. The following development does not require approval under s. 57(1) of the Act, provided that the Director-General is satisfied that the criteria in (a) or (b) have been met and the person proposing to undertake the development has received a notice advising that the Director-General is satisfied:
 - (a) the erection of temporary security fencing, scaffolding, hoardings or surveillance systems to prevent unauthorised access or secure public safety which will not adversely affect significant fabric of the item including landscape or archaeological features of its curtilage; or
 - (b) development, including emergency stabilisation, necessary to secure safety where a building or part of a building has been irreparably damaged or destabilised and poses a safety risk to its users or the public.
2. A person proposing to undertake development of the kind described in paragraph 1 must write to the Director-General and describe the development and, if it is of the kind set out in 1(b), provide certification from a structural engineer having experience with heritage items confirming the necessity for the development with regard to the criteria set out in 1(b) and any adverse impact on significant fabric. If the Director-General is satisfied that the proposed development meets the criteria set out in paragraph 1(a) or (b), the Director-General shall notify the applicant.

Guidelines

Development exempt under this standard exemption must be for the temporary or emergency securing of safety for users or the public. Permanent upgrading of site or building security may be exempt under other standard exemptions such as #7 (Minor Activities with no Adverse Impact on Heritage Significance) or #8 (Non-significant Fabric). Development described in 1(b) of this exemption is intended to apply in circumstances where there has been damage caused by a sudden change in circumstances of the building such as a catastrophic event, rather than safety risks which may arise from ongoing neglect of maintenance.

Emergency maintenance and repairs such as required following a storm event may be exempt under other standard exemptions such as #1 (Maintenance and Cleaning) and #2 (Repairs). More intrusive means of upgrading security which may damage significant fabric will require the submission of an application under section 60 of the Heritage Act.

Development in accordance with this exemption must be undertaken with minimal intervention to significant fabric.

STANDARD EXEMPTION 17: MOVABLE HERITAGE ITEMS

1. The temporary relocation of movable heritage items, including contents, fixtures and objects, to ensure their security, maintenance and preservation, for conservation or exhibition, to ensure health or safety, the need for a controlled environment for those heritage items, or to protect the place, and which are to be returned to their present location within six months, does not require approval under s. 57(1) of the Act.
2. A person proposing to relocate a movable heritage item as set out in paragraph 1 must advise the Director-General in writing of the proposed location and the reasons for its relocation. If the Director-General is satisfied that the temporary relocation meets the criteria set out in paragraph 1 the Director-General shall notify the applicant.

Guidelines

Movable heritage items or objects which are listed on the State Heritage Register must be specifically referred to in the gazetted listing. Unless specifically listed, the movable content of buildings such as furniture, paintings and other decoration is not movable heritage for the purposes of the Heritage Act which triggers approval requirements to “move, damage or destroy it”.

The permanent relocation of an item of movable heritage such as listed ships or railway rolling stock will require the submission of an application under section 60 of the Heritage Act.

Additional advice regarding movable heritage is provided by:

- Objects in Their Place: An Introduction to Movable Heritage, NSW Heritage Office, 1999; and
- Movable Heritage Principles, NSW Heritage Office and Ministry for the Arts, 1999.

END

Appendix E

Sydney Harbour Bridge—Site Specific Exemptions for Works requiring Heritage Council of NSW Approval

Appendix E Sydney Harbour Bridge—Specific Exemptions for Works requiring Heritage Council of NSW Approval (Gazetted 13 July 2007)

1. maintenance and minor repairs necessary to preserve and maintain the functioning of the structure as a transport and services corridor, for example pavement resurfacing, track laying, electric catenary replacement, traffic management, toll collection and navigational infrastructure, and pipework and cabling;
2. minor works necessary to preserve and maintain the functioning of the bridge, for example drainage modifications, modifications to road, rail, navigational, traffic management and toll collection and other infrastructure;
3. minor works necessary to preserve and maintain the functioning of utility supply and communications for example modifications and improvements to power supply systems, communications cabling and water supply systems including fire hydrants;
4. minor works necessary to preserve and enhance the security of the Bridge such as security fencing, video surveillance and detection systems;
5. minor works necessary to upgrade or enhance the structural integrity of the Bridge that do not alter its overall form or shape or significantly change the appearance of bridge elements;
6. minor works internal to the Bridge structure or structural members that do not physically change the external appearance of the Bridge or bridge members;
7. temporary works including containment areas, scaffolding and enclosures necessary for the carrying out of maintenance, enhancement or upgrading works;
8. minor internal changes to office spaces, retail and other tenancy spaces and recreational facilities;
9. installation of safety or information signage, not being for commercial or advertising purposes;
10. temporary and reversible works for the operation of special events;
11. maintenance of roadways, footpaths, parklands and vegetation;
12. minor subdivision in terms of State Environmental Planning Policy No. 4;
13. change of use from an approved use to a similar permissible use;
14. works that in the opinion of the Executive Director of the Heritage Office, Department of Planning, are required for the security of the Bridge and bridge users, and that need to remain confidential.

In exercising this provision, the Executive Director of the Heritage Office, Department of Planning shall have regard to the general conditions, guidelines and definitions regarding standard exemptions as issued and amended from time to time and in *Standard Exemptions for Works Requiring Heritage Council Approval*, as amended from time to time and published by the Heritage Office, in determining which works require approval under s57(2) of the *Heritage Act 1977*.

Appendix F

EPBC Act Compliance Checklist

Appendix F EPBC Act Compliance Checklist

EPBC Act Compliance Checklist

The Sydney Harbour Bridge is listed on the NSW State Heritage Register. This Conservation Management Plan has been prepared with regard to the methodology outlined in the *NSW Heritage Manual* guidelines for the preparation of Conservation Management Plans (NSW Department of Urban Affairs and Planning and the Heritage Council of NSW, November 1996, as amended July 2002) and the guidelines of *The Burra Charter: The Australia ICOMOS Charter for the Places of Cultural Significance 1999* in order to provide conservation policies and principles for the ongoing management and maintenance of the Sydney Harbour Bridge.

The Sydney Harbour Bridge has also been listed on the National Heritage List by the Australian Heritage Council. Consequently, the CMP has been prepared in order to obtain the endorsement of the Heritage Office, Department of Planning in regard to the conservation of a State significant item, as well as fulfilling the requirements for a Management Plan contained in the *Environment Protection and Biodiversity Conservation Act 1999* and the *Environment Protection and Biodiversity Conservation Regulations 2000*.

Regulation 10.01C

Regulation 10.01C of the Regulations states that:

A plan for a National Heritage place, made under section 324S of the Act, must address the matters set out in Schedule 5A.

The following table lists the requirements contained in Schedule 5A and the relevant sections of the Management Plan that address each listed item.

Schedule 5A: Management Plans for National Heritage Places

Regulation Reference	Schedule 5A: A management plan must:	Report Section
Schedule 5A (a)	Establish objectives for the identification, protection, conservation, presentation and transmission of the National Heritage values of the place;	Section 7.0
Schedule 5A (b)	Provide a management framework that includes reference to any statutory requirements and agency mechanisms for the protection of the National Heritage values of the place;	Section 8.0
Schedule 5A (c)	Provide a comprehensive description of the place, including information about its location, physical features, condition, historical context and current uses;	Section 2.0, 3.0 and 5.0
Schedule 5A (d)	Provide a description of the National Heritage values and any other heritage values of the place;	Section 4.0
Schedule 5A (e)	Describe the condition of the National Heritage values of the place;	Section 3.0
Schedule 5A (f)	Describe the method used to assess the National Heritage values of the place;	Section 4.0
Schedule 5A (g)	Describe the current management requirements and goals, including proposals for change and any potential pressures on the National Heritage values of the place;	Section 6.0

Regulation Reference	Schedule 5A: A management plan must:	Report Section
Schedule 5A (h)	Has policies to manage the National Heritage values of the place, and include in those policies, guidance in relation to the following:	Section 7.0
	(i) the management and conservation processes to be used;	Section 7.0
	(ii) the access and security arrangements, including access to the area for indigenous people to maintain cultural traditions;	Section 7.0
	(iii) the stakeholder and community consultation and liaison arrangements;	Section 7.0
	(iv) the policies and protocols to ensure that indigenous people participate in the management process;	Section 7.0
	(v) the protocols for the management of sensitive information	Section 7.0
	(vi) planning and managing of works, development, adaptive reuse and property divestment proposals;	Section 7.0
	(vii) how unforeseen discoveries or disturbing heritage values is to be managed;	Section 7.0
	(viii) how, and under what circumstances, heritage advice is to be obtained;	Section 7.0
	(ix) how the condition of National Heritage values is to be monitored and reported;	Section 7.0
	(x) how the records of intervention and maintenance of a heritage place's register are kept;	Section 7.0
	(xi) research, training and resources needed to improve management;	Section 7.0
	(xii) how heritage values are to be interpreted and promoted;	Section 7.0
Schedule 5A (i)	Include an implementation plan;	Section 8.0
Schedule 5A (j)	Show how the implementation of policies will be monitored;	Section 8.0
Schedule 5A (k)	Show how the management plan will be reviewed	Section 8.0

Appendix G

Sydney Harbour Bridge—The Social Side

Appendix G Sydney Harbour Bridge—The Social Side

The following text examines the social values of the bridge, and has been extracted from Section 2.5 of the 1988 CMP.¹

Working on the Bridge

Alf Shields worked in the Milsons Point light workshop and he remembered a few incidents when he worked with a dogman named Frenchie.

Yes, there was one occasion when we had a girder to turn around for the Drillers. It had been drilled and our job was to turn it right over so that the reaming job that was done by the Drillers would take all the rough edges off the holes. On one occasion the hoist started working and my hands were underneath the chains and tightening up all the time. And as I looked over to Frenchie - I didn't call out to him - but he saw apparently, just in time a look of fear in my eyes and he immediately blew his whistle and the ropes - the chain slackened. And I found that my hands although you could see that they'd been trapped, they were not hurt. Just really superficially bruised and I was very very thankful and I have always thought of that, that this man called Frenchie was probably the most alert dogman that I would ever hope to bump against.

Bert Payne, chargehand marker-off, told the secret of the accuracy on the Bridge.

Well as the men working for me marked the holes in the various angles and plates it was my responsibility to check them. Check every hole that they marked before the angles and plates were sent to the Drillers and I can virtually cross the bridge today and suggest that I've had my ruler on every one of the holes that those rivets fill up.

Bert Payne also remembered the communication skills of the Dorman Long Foreman, Alf Muttit.

Alf was a very fine fellow and I had quite a rapport with him. He was a north of England fellow - came over for Dorman and Long's - and I had quite a happy association with him, naturally he was in control of the whole workshops. I remember one particular feature of Alf, he made sure we understood what he said because, making a statement to it he would always qualify it by saying 'My meaning is' and repeat it, made sure we all got the right message.

Jack Edwards, assembly boilermaker, worked on the second shift in the Milsons Point Workshops.

What used to impress me was the size of the members. We had two big overhead travelling cranes that had a capacity of a hundred and twenty ton each and they would pick these members up that you see on the bridge now and they look tremendously bigger than what they look when they are out there on the site. But you'd see the two cranes, one at each end of a member and lift it up and carry it up from one end of the shop to the other. It was a tremendous amount of steel that you'd see lifted and taken up in one piece.

Vera Lawson was a twenty year old comptometer operator in the Dorman Long office when she visited the workshops.

I was taken over there when the central hanger was completed and my chief took me over in the launch. He said come on, before that goes up have a look at it and have a touch of it. And so we went over and we saw the central hanger and it seemed to go on forever as we were walking, it was lying of course on the side and it seemed to go on forever but that was indeed quite a privilege. But a privilege to be able to go through the workshops and to be able to see the work that the men were doing, it was such wonderful work and such exacting work. The rivets - there was so many many rivets - and each one had to be perfect in their setting. And they were all very, very skilled.

Incredible as it may seem, the foundations, abutment towers and pylons of the Sydney Harbour Bridge were built by only two gangs, one on the north side and one on the south. Each gang had only one

concrete mixer manned by five men. They each mixed sixty thousand cubic yards in five years. Two stonemasons and their labourers set all the stone, two dogmen and crane drivers lifted all the material, six carpenters handled the formwork and only three men positioned the reinforcing. Two labourers poured all the concrete and two men packed it in position.

Jack McCrae was a concrete packer.

They were awkward places and that concerned the main floor as it was called, which was about a hundred and fifty feet up. Somewhere near present deck level and the beams and struts on that were very awkward. I can remember being sent down in one of these beams and I think, what I can remember of it now it was about six feet square and perhaps about ten feet deep and that's also concrete reinforced steel rods and I can remember I had great difficulty getting down between these steel rods where I had to go because the concrete was being more or less poured down on top of me. I was equipped with an oilskin suit and also I remember I had to have a sou'wester on my head, to keep the stuff from, you know, being poured all over me. But that was one of the most awkward jobs I ever had there but still and all I know I got all over the thing correctly because, when it was stripped there was no - what they call boney stuff - everything had to be a good smooth finish.

Bill O'Brien worked as a carpenter on the pylons.

Here I was, with a job and on my way across the harbour in the ferry looking up at the structure. The timber of course - from down on the ferry - that I could see up there that I would be working on, seemed to be about six by six inches square and about twenty feet, maybe fifteen feet high. When I actually got up there I found that it was fifteen by fifteen inches, and some of it eighteen by eighteen inches and twenty five to thirty feet high. This was quite a surprise, I was wondering how we were going to move it around. It was then I found that all the cutting was done on the road level and these were taken up by crane into their position. It meant you only cut them once because when the crane did the job of lifting them up, they had to be right and it meant that quite a bit of thought had to go into the job that you were doing.

Now, I started up there on this construction of the supports that would hold the concrete of the arch on the pylons, they are called vaults - and they are a semi-circular or barrel type vaults. This created the ceiling of those portions where the traffic now passes through. While I was on that particular section there, I found that I had to do something that was a bit unusual to me.

The timber, to bore a hole through it, and some pieces were eighteen by eighteen sitting on another piece eighteen by eighteen which gave you three feet through; and as you had to bore holes through this for bolts, they had big air-driven drills and these drills had a mighty big hose connected to them. You had to stand up there with your legs apart and hold that drill in a hole that you had made in the timber with a thing called a 'wad punch' and this just simply chopped a piece of the timber out in round section so that the end of the drill which did not have a leading bit on it would sit in that hole then you had to hold that drill with this three feet long drill protruding out of the machine so that it was perfectly level and straight. If you were on top of it and your legs were apart, you had to hold it so that it was going to go through three feet of timber and come out somewhere near the middle on the other side, hopefully right in the middle. I found this was quite a job to do because you were aware that the drill would stick if you didn't lift it out and clear it and put it back in. Now, if it did stick that meant the drill went around and as you were pretty high up in the air, there was nowhere for you to go but down.

Tom Tomrop was the last of the tin hares, the select gangs of 12 steel erectors who, with the crane drivers, erected the Bridge. Born on a sailing ship in 1891, he had experience of rigging aeroplanes and building skyscrapers in America. For the Federated Ironworkers Association he became the star witness in the dispute for height money.

There was a lot of men working in the sheds, like in the workshop, like you know where the Luna Park is, you know where the shops were. They used to work day and night there too you know, and they used to cart it out on a big punt in the harbour you see, and then we'd pick it up. Sometimes we'd ride up, on a calm day we used to ride up, the people on

top, they used to take it off and there'd be one of our boys up there doing the slings, you know. See, one gang tightens the job up you see; it had to be thoroughly tight before you rivet it. Then you've got your cookers there heating the rivets and there'd be another gang of riveters and they are going all the time you know, the noise was terrific there at times; but you see as a rigger you're different, you're here, there and everywhere, you've got to do nearly everything you see, as a rigger.

To build the creeper crane, was one of the hardest jobs I've ever been on in all my life. You had to hang on by your eyelashes you know and you know, tricky, you couldn't stand up there, you had to hang on. A mate of mine asked me, you know, I used to be in the flying business and he was an officer you see, and I met him there, I only had started for a little while you know, and I was working on the creeper crane. I was only there about a week and so he says 'How are you going Tom' I said 'Oh, all right, how are you doing'. 'Oh' he says, 'I wonder if I could get a job there' (he's right down and out). I said 'Oh, you'll have to see the boss' I says 'You see that fellow Ben Tucker', you know Ben Tucker couldn't get him a job but he could ask someone else. Anyway, he got a job and he only stuck to it about three hours and he left, himself. He'd rather go on the dole than be on a creeper crane, you see he wasn't a Rigger or anything like that.

Tom was also in one of the gangs who got their sovereigns for working twelve hour shifts, slacking the cables to join the arch.

Well they had to jack each cable up you know, with this thousand ton jack, you know. Then we just had to turn the nuts just about half a turn or three quarters of a turn you see and then relax the jack again; and then you get the next cable and so on. You had to go day and night. It took us a good while you know, it must be about three weeks I think.

One of the twelve steel erectors, the Canadian Felix Faulkner, died tragically on deck level when the job was almost done.

Oh yes, that was a shame, you know. It was bad luck I suppose, this plate slipping down, and it happened to hit him and I'm only about a few yards away, he was laughing at us doing all the hard work you know, putting the troughings down on the roadway. And his job was just to signal to the crane driver, you know with the hand; he was laughing that he had got a good job because we had to do all the work. And it was just bad luck, you know.

Stan London, assembly boilermaker; was working with his mate, Sydney (Nipper) Addison the day he fell off the arch to his death.

The day he fell off, I had him by the sandshoe, grabbed him, there was just.... there's the chord coming up there; and of course that chord wasn't in one piece by the way, it came up in two sections. And there was a splice plate up the centre of it and we this is what we were doing, there's a picture there where I'm leaning over, he's inside and he's sticking the bolt on and I'm just spinning the washer and the nut on and he'd come out and we'd put the pipe on the spanner and he'd get down the bottom and I'd be up the top where the nut was, you know; and after we'd pulled right around he'd pull to the edge of the chord. See, the chord - what would it be, I don't know - eight or ten feet wide, I forget ... yeah it'd be somewhere, ten feet wide it could have been on the bottom chord. This is where he fell off the bottom chord, just where the railway comes out from the arch at that joint just below there, it's there. And he put his hand behind me and you know I said 'Right-o Nip, we'll take another purchase' and he must have put his hand - because Cooke, the Inspector, he was coming up the other side from a scaffolding he was on. And he let a yell out and soon as he did, I thought . . . this spanner hit me in the chest and I rolled because it was on an angle, you know, and I grabbed him by the sandshoe, but well you can imagine a man's weight, . . . I couldn't hold him. . . . Silly, isn't it?

Yes, he was younger than me, not much - but still, I should have held him. He had a brother on the bridge too, he was an ambulance officer. And I think that's how he came... how he got his job, you know, he spoke for him. He'd been at sea this young bloke and when he was sent to work with me, I thought gee, I'm young enough but he's younger still.

George Evernden, a holder-up on the arch, had a very near escape.

On one occasion when the first hanger went up for the roadway, the squad that I was working with, we were put on to that job and there was one rivet, well there was a few rivets, that I couldn't reach off the staging myself. I had to step on a box to reach them and when I put the machine on overhead and turned the air on, it threw me back over the staging and I fell, and as I fell I grabbed the staging and I held on like grim death and my two mates, the man who cooked the rivets and the boilermaker grabbed me. I think they got more of a shock than I did, but it happened on the Friday afternoon which gave me the weekend to overcome it and of course, naturally we knocked off straight away, the boilermaker, myself and the cooker; we were all upset and we went home.

George Evernden remembered the conditions inside the chords on the arch.

It was deafening and practically no lighting at all and as I just told you before, like, I used to stand on the heads of the rivets to try and get a balance to hold the rivet in firm position and sort of.... sometimes we'd have a bit of staging, but mostly we had to find our own footing. We had to wear leather gloves there to stop the sparks and that flying off the rivets and the scale that'd come off the rivets like, after you put them in. There was always like, when you turned the pneumatic rivetter on.... the machine on, the sparks used to fly and I'd often have burns on my neck and arms sort of thing, we had to wear these leather gloves.

Walter Ellis was a holder-up on the arch.

I had a very near escape and this one I must impress on you was half way over on the middle section we were working on the laterals. Which is in the middle of the bridge on the bottom section of the top chord and me being a holder-upper, I caught the rivet this morning to place in the hole for my mate to rivet down but unfortunately I did not change my spike-piece which is at the bottom of the machine that holds up the rivet and is like a piece of two inch water pipe, must be sharp to dig into the steel while the top section which is the plunger, holds the rivet up. Now this point being blunt, when I turned the trigger on for the air to go through for the plunger, it skated - but it took me with it and I went down from the scaffolding roughly about six foot which I hung on like grim death being so young, vigorous. There was two, I think they were riggers, were in the vicinity and they came racing over and they pulled me up by the rubber hose, now I regained my footing on the scaffolding. From then on, of course, naturally I went home for the day.

Hugh Dunn was a riveter on the arch.

Well, I'll say this much, it was as good a job as I've ever been on; they were wonderful the stagings were beautiful suited you lovely and I was very happy to work on the bridge. But there was one thing that struck me very funny, I always think about it too. When I got the job first I got the squad together and the tools and by this time the panel of the arch was out six panels and I got on the launch, they took us out to what they called the working punt. The cage came down, we got the gear in the cage and up we went and as we went up the Sydney ferries were getting smaller and smaller and smaller and I thought, 'Christ I'll never work on this job'. But as soon as I stepped on the chord I lost my fear and I had no more fear from that day on.

Asked if he had ever cut any rivets out, Hugh said:

Hell, I cut plenty of rivets out, I tell you. The Inspector came along and tested your job, right well then you get a chipping machine or a cutting machine and these your tools to cut the other bit out, punch it out, put new rivets in. Along came the Inspector again and he would test it again, had to be right before he let you go to.... he was, oh, they were terrific. And you couldn't have told the rivet was slack, it was just ajar. The whole time I worked on the job doing uphand rivets as you call them, I only had one to come out; on the other side maybe even downhand, you had more rivets to come out than what you'd have uphand.[overhead]

Peter Meichin worked under foreman rigger, Jimmy Campbell who was killed when he fell from the pylon.

Yes I remember it well, you'd never forget it. We were standing.... we were working the guy ropes and Jimmy was singing out which guy rope to loosen and which one to tighten while we were shifting the pole you see. This is the poles that were carrying the staging for the cleaners, the pylon cleaners. The pylon cleaners had finished on that pylon and we were taking the scaffolding down and the outriggers as well and on shifting the pole, we had to shift the guy ropes as well, you see. Well, this time he's singing out and we were losing so many guy ropes and a puff of wind came up and shifted that pole just as Jimmy was straddling it to get to the other side and it threw him up in the air and down and alongside the pylon. All the way down he hit that pylon. Jimmy was a big stout fellow you know and then those sleepers I suppose would be about nine inches apart but Jimmy went right through them, right through and into the centre of the pylon down underneath it and when they picked him up every bone in his body was broke. Then the bridge was stopped, everyone on the bridge stopped. They threw their ropes down the pylon, they wanted volunteers to go down on bosun's chairs - it was the only thing that was left, was the bosun's chairs to go down on you see. So another bloke and I went over on the bosun's chairs, down on a bosun's chair each, scrubbing down the pylon where the blood was. Otherwise it'd have been there forever you see, was all I could think about it.

Frank Villagrand was a carpenter on the formwork on the approaches at North Sydney. It is often forgotten that the bridge approaches built by the Public Works Department provided as much work as the bridge. Much of this was done hurriedly with unemployment relief funds on a rotating three or four day week.

It was a continual pour more or less, they kept it going until the thing was poured, they didn't wait. The columns of the buttresses that held the roadwork, they were built first of course and they had concealed bolts in them which we used for lifting our scaffold up. That's how our formwork was in and then we.... they were in cardboard containers - tubes - and they were pulled out when the pole pullers on and when they went to lift higher they were taken out and to hold the timber of the formwork they were re-put in again to hold the formwork together. And that's how the thing was built up itself, it was more or less ascending its type of scaffold.

Norm Schofield was one of the gang of twelve Public Works plasterers who covered the concrete on the Northern Bridge Approaches with two coats of cement render. He remembered how he finished up.

On getting towards the end I remember quite well the paycart used to come up on a Friday afternoon and he'd go right up to the steelwork. On one particular Friday afternoon, the panicking boss we called him, he came along to me and he said 'The pay cart's up at the ironwork I'll go up and tell him to wait for you' and I said 'Right-o' so he went up there and by that time I'd got the panel finished and everything was OK so I set off to go to the ironwork and when I got half way up he was coming down and he said 'I told them to wait', I said 'Right-o'. So I went up and got me pay, opened me envelope and it was O.K. and I'm walking back on to the job and he hasn't moved from where I'd first.... and he said to me 'Is your pay right' and I said 'Yes' and he said 'Have you got my ten bob?' and I knew. I knew what he was at and I said, 'There's no ten bob in my envelope for you', he said 'Well you finish tonight'.

Watching it Grow

Bill Brindle was assistant to the Public Works photographer, Bob Bowden, he therefore had an overview of the whole project, including even Dr. Bradfield himself.

We had standard negatives of the various designs for the bridges which were put away very carefully and on many occasions we'd get rush demands from Dr. Bradfield to make extra prints of these which he obviously had to present to cabinet or the government of the day, to make his point and we would stay back often late at night to get these through for him. He was a man, a very demanding fellow, he knew what he wanted and he always wanted everything yesterday.

Bill Brindle, like many others, caught the spirit of the Bridge builders.

If you talk about human relationships, my experience of the harbour bridge workers was always that I've never worked with such a more honest, hard-working crowd who were dedicated to their job. Their relationships with each other were, to my mind, excellent and I think that they knew that they were battling against the elements and against all the engineering problems to get this thing across and I think it gave them more or less a common cause.

Opening Day

On 19 March 1932, Sydney Harbour Bridge was officially opened for traffic. It was said that King George V had wanted to open the Bridge, but Premier Lang decided to open it himself. The Governor and the Governor General were included in the ceremonies, but there was considerable anger among the conservative part of the populace at Lang's attitude. The right wing organisation, the New Guard, which was behaving like a private army opposing socialist elements, declared that: 'Premier Lang will not open the Bridge'. Precautions were taken so that any New Guard stunt would not send the signal for the fly-past and other celebrations to begin. Captain FE de Groot, a World War I veteran of Irish extraction and a well known antique dealer, dressed in his army uniform and riding a borrowed horse, attached himself to the rear of the Governor's mounted escort, taking up his position near the ribbon.

The Governor and the Premier had made their official speeches opening the Bridge, when de Groot slashed the ribbon with his sword and shouted 'On behalf of the decent and loyal citizens of New South Wales, I now declare this bridge open.' He was pulled from his horse by the police and hurried away. The incident created a good deal of amusement, the ribbon was rearranged and duly cut by Premier Lang and celebrations by the largest crowd ever seen in Sydney, commenced. De Groot was detained for the weekend at the Darlinghurst Reception House and on Monday morning he was charged with being 'a person deemed to be insane and not under proper care and control'. Having been medically examined during the weekend, he was discharged, and then charged with damaging public property, to whit one ribbon, found guilty and fined five pounds.

Within 5 weeks, Premier Lang was dismissed from office by Governor Game, for issuing illegal orders. Lang had postponed payment of interest on foreign debt, because of the depression. The Commonwealth, under Prime Minister Lyons, had paid the interest and was taking over the State Savings Bank to recoup. Lang ordered that moneys owing to the State of New South Wales be paid in cash direct to the State Treasury, it was for this that he was dismissed.²

Tom Evans was a rigger on the Bridge. An ex-sailor, he remembered marching in the Opening Day Procession.

I remember a few girls, oh many girls, singing out while we were walking in the procession 'You'll soon be on the dole mate'. Little know, it was the most meanest thing ever I thought of was that dole. And I tell you, it was hard to find a shilling to put in the gas meter to do a bit of cooking.

The Iron Lung or the Dole

The bridge has a special place in the life of Sydney. It has been called many names. They used to call it 'The Iron Lung' because it kept so many people alive and in work for the 8 years of its construction. The City Railway construction lasted 10 years and employed more people, but there was no pride and affection there. The bridge, however, gives people a sense of awe and pride just to look at it, especially if they worked on it. The people interviewed remembered the time afterwards, when they were on the dole.

Archie Meek was an ironworker in the bridge fabrication workshops until he was put off. He spent the next years toeing the line for jobs twice a day, along the waterside.

We used to go down to Morts Dock and toe the line there, seven o'clock in the morning there'd be anything from five hundred to eight hundred people waiting for might be five or six jobs and then it was home, have a bit of lunch and then out again for the afternoon pick-up somewhere else.

Pat Crawley, after he worked on the Bridge as a labourer, was on the dole for nearly two years.

Oh, it was very hard being on the dole. When I first registered for the dole you had to go down to the wharf, I forget the number of the wharf, and you had to register there and you got a dole ticket and you came back, but I only had to do it once. I had to report at Quay Street, Railway Square and they used to give you.... hand you out the food and that, like, in a well you had a sugar bag, I had a sugar bag. I wasn't ashamed to carry a sugar bag, I was from the bush and the sugar bag was the bushman's portmanteau, that was his suitcase. Well, I had a sugar bag and I got me tucker in the sugar bag and brought it home to Mum.

We walked everywhere as I tell you, the fellowship was wonderful, the lorries used to go slow if there was three or four of us walking along the road the lorries'd slow up and we'd all hop on the back of the lorry. We never paid any fares and then he'd ease up and we'd all hop off and we'd sit around and they'd come out and say, you know, call the fellows in but the jobs was all spoken to, you had no hope.... people.... you'd go in and ask if there was anything doing and they'd say 'How long have you been out of work, you're keen, you got no hope of getting a job.

So in the finish you got disheartened, that's why I'm so sorry for younger people today, I understand and you get into a groove and you just don't want to do it. If anyone had've told me when I got out of work that two and a half years later I would have been satisfied to go up to Earlwood Oval and sit around all day and watch the unemployed cricket teams and football teams I would have told them that they were lunatics.

Hugh Dunn, boilermaker, had a run-in with the dole inspector when he was put off.

In fact one of the dole inspectors, somebody dobbed me in, doing this cleaning for this fellow and the inspector was waiting for me and I was able to satisfy him, the inspector was quite satisfied that what I was doing was alright. Well you had to do something, didn't you? Them days, what was the rent then - fifteen bob a week. Well you had to find your rent somewhere and that's the way you found it.

Chas Brown, an apprentice boilermaker in the Fabrication Workshops, was fired when he finished his apprenticeship.

I remember going to Sydney Steel looking for a job and they chased me out of the bloody place. There was no hope at all of getting a job. Rather than stop home under the conditions that existed then, I took to the bush. My first stop was Albury, from there with a cousin of mine, we travelled through Victoria and other parts carrying our swag and in fact on the day that the bridge was opened, the 19th of March 1932, I was camped under another much smaller bridge. It was the bridge over the Campaspe River at Ellmore in Victoria. I finished on the bridge without too much fuss, without too much glory, with a great future behind me and the wide open road in front of me.³

The bridge builders, the survivors, have told their stories but the sixteen men who died building the Sydney Harbour Bridge will tell no tales. Half of them, eight, were ironworkers, one was a carpenter, one a painter, two were quarrymen and four were labourers.

- Sydney Addison, 26, ironworker.
- James Campbell, 44, foreman rigger.
- Francis Chilvers, 52, dogman.

- Robert Craig, 64, braceman.
- Alfred Edmonds, 56, labourer.
- Felix Faulkner, 40, steel erector.
- Frederick Gillon, 33, labourer.
- Robert Graham, 41, labourer.
- Thomas McKeown, 48, rigger.
- August Peterson, 23, slinger.
- Percy Poole, 30, quarryman.
- Desmond Shirley, 27, carpenter.
- Edward McNiel, 22, ironworker (N Swandells).
- Henry Waters, 40, dogman.
- Henry Webb, 23, painter.
- William Woods, 42, ironworker.

Since the building of the bridge, two more men have died on maintenance:

- Charles Webb, 48, ironworker.
- Salie Scheffer, 62, painter.⁴

Jack Lang's Coathanger

Something about Sydney's Bridge gripped the human mind and there was (and still is) an outpouring of art of all kinds, poetry, paintings, prose, songs, cartoons, jokes and theatrical skits.

The Sydney Harbour Bridge

*Great Arch of steel that soars on high, Graceful and yet so full of power
With sweeping curve that glads the eye; 'A golden arch at sunset's hour.'
Here massive granite pylons stand Like sentinels to guard the arch
Which joins forever land to land And speeds progression's onward march.
When night's grey mantle drapes the skies A string of pearls doth softly glow
To light the path where swiftly flies The traffic shuttle to and fro.
'Tis said there is a hoard of gold Where rainbows rest on land and sea
Our 'Rainbow Bridge' will give untold Prosperity in years to be.
Sky-reaching buildings shall arise Where mean surroundings used to be
And one and all shall learn to prize Our glorious City by the sea.*

R Chas, G Coulter, March 1932.

The Bridge

*Twas well to make the crossing in the night.
To sense that more-than-vastness, dimly seen
Through faint-revealing whims of errant light
Draping the naked strength with shadow-screen
And just enough of star-beam drifting by
To drench it all in eerie fantasy.*

*So monstrous still, this leaping dream, ensteered,
Spanned the abyss, and up, beyond regard
In thick shroud-sables of the night concealed,
The topmost arches kept their stressful ward
And something from the soul within me ran
To seek the soul of this Leviathan.*

Albert Ross, 4 November, 1931.

My Name is De Groot

De Groot's Song

Air: 'When your hair has turned to silver'.

*I am de Groot, so shrewd and cute,
I opened the bridge that day;
Year after year, the fact's more clear,
No matter what Jack may say.*

Chorus:

*Long before my hair is silver,
They will make a bust of me,
They will set it up in Auburn,
So that all my friends can see;
With my fingers to my nose thus,
I will stand the livelong day;
And when Jack comes past I'll ask him:
'Got a bridge to open today?'*

University of Sydney Song Book, 1932.

The Bridge In Curve

Artists and photographers were inspired by the Bridge. Of the artists works, probably the most outstanding paintings are Grace Cossington Smith's *The Bridge in Curve*, and Rolond Wakelin's *The Bridge Under Construction*. Most of the outstanding photographers of the time are re-presented, Henri Mallard, Harold Cazneau, Rev. Frank Cash, R.P. Moore, Milton Kent the Aerial Photographer, and the Public Works Department Photographers of the day, Robert Bowden and Fred Degotardi.⁵

Endnotes

- ¹ Heritage Group, Department of Public Works and Services, Sydney Harbour Bridge Conservation Management Plan, prepared for NSW Roads and Traffic Authority, February 1998, pp 46–57.
- ² Ellyard & Raxworthy, 1982.
- ³ Raxworthy, Oral 1982.
- ⁴ Bridge Plaque Morgue Registers, AONSW.
- ⁵ Spearritt 1982 pp 92–111; RTA Photo Collection.

Appendix H

The Burra Charter (The Australian ICOMOS Charter for Places of Cultural Significance)

The Burra Charter

(The Australia ICOMOS Charter for Places of Cultural Significance)

Preamble

Considering the International Charter for the Conservation and Restoration of Monuments and Sites (Venice 1964), and the Resolutions of the 5th General Assembly of the International Council on Monuments and Sites (ICOMOS) (Moscow 1978), the Burra Charter was adopted by Australia ICOMOS (the Australian National Committee of ICOMOS) on 19 August 1979 at Burra, South Australia. Revisions were adopted on 23 February 1981, 23 April 1988 and 26 November 1999.

The Burra Charter provides guidance for the conservation and management of places of cultural significance (cultural heritage places), and is based on the knowledge and experience of Australia ICOMOS members.

Conservation is an integral part of the management of places of cultural significance and is an ongoing responsibility.

Who is the Charter for?

The Charter sets a standard of practice for those who provide advice, make decisions about, or undertake works to places of cultural significance, including owners, managers and custodians.

Using the Charter

The Charter should be read as a whole. Many articles are interdependent. Articles in the Conservation Principles section are often further developed in the Conservation Processes and Conservation Practice sections. Headings have been included for ease of reading but do not form part of the Charter.

The Charter is self-contained, but aspects of its use and application are further explained in the following Australia ICOMOS documents:

- Guidelines to the Burra Charter: Cultural Significance;
- Guidelines to the Burra Charter: Conservation Policy;
- Guidelines to the Burra Charter: Procedures for Undertaking Studies and Reports;
- Code on the Ethics of Coexistence in Conserving Significant Places.

What places does the Charter apply to?

The Charter can be applied to all types of places of cultural significance including natural, indigenous and historic places with cultural values.

The standards of other organisations may also be relevant. These include the Australian Natural Heritage Charter and the Draft Guidelines for the Protection, Management and Use of Aboriginal and Torres Strait Islander Cultural Heritage Places.

Why conserve?

Places of cultural significance enrich people's lives, often providing a deep and inspirational sense of connection to community and landscape, to the past and to lived experiences. They are historical records, that are important as tangible expressions of Australian identity and experience. Places of cultural significance reflect the diversity of our communities, telling us about who we are and the past that has formed us and the Australian landscape. They are irreplaceable and precious.

These places of cultural significance must be conserved for present and future generations.

The Burra Charter advocates a cautious approach to change: do as much as necessary to care for the place and to make it useable, but otherwise change it as little as possible so that its cultural significance is retained.

Articles

Article 1. Definitions

For the purposes of this Charter:

1.1 *Place* means site, area, land, landscape, building or other work, group of buildings or other works, and may include components, contents, spaces and views.

Explanatory Notes

The concept of place should be broadly interpreted. The elements described in Article 1.1 may include memorials, trees, gardens, parks, places of historical events, urban areas, towns, industrial places, archaeological sites and spiritual and religious places.

1.2 *Cultural significance* means aesthetic, historic, scientific, social or spiritual value for past, present or future generations.

Cultural significance is embodied in the *place* itself, its *fabric*, *setting*, *use*, *associations*, *meanings*, records, *related places* and *related objects*.

Places may have a range of values for different individuals or groups.

1.3 *Fabric* means all the physical material of the *place* including components, fixtures, contents, and objects.

1.4 *Conservation* means all the processes of looking after a *place* so as to retain its *cultural significance*.

1.5 *Maintenance* means the continuous protective care of the *fabric* and *setting* of a *place*, and is to be distinguished from repair. Repair involves *restoration* or *reconstruction*.

1.6 *Preservation* means maintaining the *fabric* of a *place* in its existing state and retarding deterioration.

1.7 *Restoration* means returning the existing *fabric* of a *place* to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.

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

1.9 *Adaptation* means modifying a *place* to suit the existing *use* or a proposed use.

1.10 *Use* means the functions of a place, as well as the activities and practices that may occur at the place.

1.11 *Compatible use* means a *use* which respects the *cultural significance* of a *place*. Such a use involves no, or minimal, impact on cultural significance.

1.12 *Setting* means the area around a *place*, which may include the visual catchment.

1.13 *Related place* means a *place* that contributes to the *cultural significance* of another place.

1.14 *Related object* means an object that contributes to the *cultural significance* of a *place* but is not at the place.

1.15 *Associations* mean the special connections that exist between people and a *place*.

1.16 *Meanings* denote what a *place* signifies, indicates, evokes or expresses.

1.17 *Interpretation* means all the ways of presenting the *cultural significance* of a *place*.

The term cultural significance is synonymous with heritage significance and cultural heritage value.

Cultural significance may change as a result of the continuing history of the place.

Understanding of cultural significance may change as a result of new information.

Fabric includes building interiors and sub-surface remains, as well as excavated material.

Fabric may define spaces and these may be important elements of the significance of the place.

The distinctions referred to, for example in relation to roof gutters, are:

- maintenance — regular inspection and cleaning of gutters;
- repair involving restoration — returning of dislodged gutters;
- repair involving reconstruction — replacing decayed gutters.

It is recognised that all places and their components change over time at varying rates.

New material may include recycled material salvaged from other places. This should not be to the detriment of any place of cultural significance.

Associations may include social or spiritual values and cultural responsibilities for a place.

Meanings generally relate to intangible aspects such as symbolic qualities and memories.

Interpretation may be a combination of the treatment of the fabric (e.g. maintenance, restoration, reconstruction); the use of and activities at the place; and the use of introduced explanatory material.

Conservation Principles

Article 2. Conservation and management

2.1 *Places of cultural significance* should be conserved.

2.2 The aim of *conservation* is to retain the *cultural significance* of a *place*.

2.3 *Conservation* is an integral part of good management of *places of cultural significance*.

2.4 *Places of cultural significance* should be safeguarded and not put at risk or left in a vulnerable state.

Article 3. Cautious approach

3.1 *Conservation* is based on a respect for the existing *fabric, use, associations* and *meanings*. It requires a cautious approach of changing as much as necessary but as little as possible.

3.2 Changes to a *place* should not distort the physical or other evidence it provides, nor be based on conjecture.

Article 4. Knowledge, skills and techniques

4.1 *Conservation* should make use of all the knowledge, skills and disciplines which can contribute to the study and care of the *place*.

4.2 Traditional techniques and materials are preferred for the *conservation* of significant *fabric*. In some circumstances modern techniques and materials which offer substantial conservation benefits may be appropriate.

Article 5. Values

5.1 *Conservation* of a *place* should identify and take into consideration all aspects of cultural and natural significance without unwarranted emphasis on any one value at the expense of others.

5.2 Relative degrees of *cultural significance* may lead to different *conservation* actions at a *place*.

Article 6. Burra Charter Process

6.1 The *cultural significance* of a *place* and other issues affecting its future are best understood by a sequence of collecting and analysing information before making decisions. Understanding cultural significance comes first, then development of policy and finally management of the *place* in accordance with the policy.

6.2 The policy for managing a *place* must be based on an understanding of its *cultural significance*.

6.3 Policy development should also include consideration of other factors affecting the future of a *place* such as the owner's needs, resources, external constraints and its physical condition.

Article 7. Use

7.1 Where the *use* of a *place* is of *cultural significance* it should be retained.

The traces of additions, alterations and earlier treatments to the fabric of a place are evidence of its history and uses which may be part of its significance. Conservation action should assist and not impede their understanding.

The use of modern materials and techniques must be supported by firm scientific evidence or by a body of experience.

Conservation of places with natural significance is explained in the Australian Natural Heritage Charter. This Charter defines natural significance to mean the importance of ecosystems, biological diversity and geodiversity for their existence value, or for present or future generations in terms of their scientific, social, aesthetic and life-support value.

A cautious approach is needed, as understanding of cultural significance may change. This article should not be used to justify actions which do not retain cultural significance.

The Burra Charter process, or sequence of investigations, decisions and actions, is illustrated in the accompanying flowchart.

7.2 A place should have a compatible use.

The policy should identify a use or combination of uses or constraints on uses that retain the cultural significance of the place. New use of a place should involve minimal change, to significant fabric and use; should respect associations and meanings; and where appropriate should provide for continuation of practices which contribute to the cultural significance of the place.

Article 8. Setting

Conservation requires the retention of an appropriate visual *setting* and other relationships that contribute to the *cultural significance* of the *place*.

New construction, demolition, intrusions or other changes which would adversely affect the setting or relationships are not appropriate.

Aspects of the visual setting may include use, siting, bulk, form, scale, character, colour, texture and materials.

Other relationships, such as historical connections, may contribute to interpretation, appreciation, enjoyment or experience of the place.

Article 9. Location

9.1 The physical location of a *place* is part of its *cultural significance*. A building, work or other component of a place should remain in its historical location. Relocation is generally unacceptable unless this is the sole practical means of ensuring its survival.

9.2 Some buildings, works or other components of *places* were designed to be readily removable or already have a history of relocation. Provided such buildings, works or other components do not have significant links with their present location, removal may be appropriate.

9.3 If any building, work or other component is moved, it should be moved to an appropriate location and given an appropriate *use*. Such action should not be to the detriment of any *place* of *cultural significance*.

Article 10. Contents

Contents, fixtures and objects which contribute to the *cultural significance* of a *place* should be retained at that place. Their removal is unacceptable unless it is: the sole means of ensuring their security and *preservation*; on a temporary basis for treatment or exhibition; for cultural reasons; for health and safety; or to protect the place. Such contents, fixtures and objects should be returned where circumstances permit and it is culturally appropriate.

Article 11. Related places and objects

The contribution which *related places* and *related objects* make to the *cultural significance* of the *place* should be retained.

Article 12. Participation

Conservation, *interpretation* and management of a *place* should provide for the participation of people for whom the place has special *associations* and *meanings*, or who have social, spiritual or other cultural responsibilities for the place.

Article 13. Co-existence of cultural values

Co-existence of cultural values should be recognised, respected and encouraged, especially in cases where they conflict.

For some places, conflicting cultural values may affect policy development and management decisions. In this article, the term cultural values refers to those beliefs which are important to a cultural group, including but not limited to political, religious, spiritual and moral beliefs. This is broader than values associated with cultural significance.

Conservation Processes

Article 14. Conservation processes

Conservation may, according to circumstance, include the processes of: retention or reintroduction of a *use*; retention of *associations* and *meanings*; *maintenance*, *preservation*, *restoration*, *reconstruction*, *adaptation* and *interpretation*; and will commonly include a combination of more than one of these.

There may be circumstances where no action is required to achieve conservation.

Article 15. Change

15.1 Change may be necessary to retain *cultural significance*, but is undesirable where it reduces cultural significance. The amount of change to a *place* should be guided by the *cultural significance* of the place and its appropriate *interpretation*.

When change is being considered, a range of options should be explored to seek the option which minimises the reduction of cultural significance.

15.2 Changes which reduce *cultural significance* should be reversible, and be reversed when circumstances permit.

Reversible changes should be considered temporary. Non-reversible change should only be used as a last resort and should not prevent future conservation action.

15.3 Demolition of significant *fabric* of a *place* is generally not acceptable. However, in some cases minor demolition may be appropriate as part of *conservation*. Removed significant fabric should be reinstated when circumstances permit.

15.4 The contributions of all aspects of *cultural significance* of a *place* should be respected. If a place includes *fabric*, *uses*, *associations* or *meanings* of different periods, or different aspects of cultural significance, emphasising or interpreting one period or aspect at the expense of another can only be justified when what is left out, removed or diminished is of slight cultural significance and that which is emphasised or interpreted is of much greater cultural significance.

Article 16. Maintenance

Maintenance is fundamental to *conservation* and should be undertaken where *fabric* is of *cultural significance* and its *maintenance* is necessary to retain that *cultural significance*.

Article 17. Preservation

Preservation is appropriate where the existing *fabric* or its condition constitutes evidence of *cultural significance*, or where insufficient evidence is available to allow other *conservation* processes to be carried out.

Preservation protects fabric without obscuring the evidence of its construction and use. The process should always be applied:

- where the evidence of the fabric is of such significance that it should not be altered;
- where insufficient investigation has been carried out to permit policy decisions to be taken in accord with Articles 26 to 28.

New work (e.g. stabilisation) may be carried out in association with preservation when its purpose is the physical protection of the fabric and when it is consistent with Article 22.

Article 18. Restoration and reconstruction

Restoration and *reconstruction* should reveal culturally significant aspects of the *place*.

Article 19. Restoration

Restoration is appropriate only if there is sufficient evidence of an earlier state of the *fabric*.

Article 20. Reconstruction

20.1 *Reconstruction* is appropriate only where a *place* is incomplete through damage or alteration, and only where there is sufficient evidence to reproduce an earlier state of the *fabric*. In rare cases, reconstruction may also be appropriate as part of a *use* or practice that retains the *cultural significance* of the place.

20.2 *Reconstruction* should be identifiable on close inspection or through additional *interpretation*.

Article 21. Adaptation

21.1 *Adaptation* is acceptable only where the adaptation has minimal impact on the *cultural significance* of the *place*.

21.2 *Adaptation* should involve minimal change to significant fabric, achieved only after considering alternatives.

Article 22. New work

22.1 New work such as additions to the *place* may be acceptable where it does not distort or obscure the *cultural significance* of the place, or detract from its *interpretation* and appreciation.

22.2 New work should be readily identifiable as such.

Article 23. Conserving use

Continuing, modifying or reinstating a significant *use* may be appropriate and preferred forms of *conservation*.

Article 24. Retaining associations and meanings

24.1 Significant *associations* between people and a *place* should be respected, retained and not obscured. Opportunities for the *interpretation*, commemoration and celebration of these associations should be investigated and implemented.

24.2 Significant *meanings*, including spiritual values, of a *place* should be respected. Opportunities for the continuation or revival of these meanings should be investigated and implemented.

Article 25. Interpretation

The *cultural significance* of many *places* is not readily apparent, and should be explained by *interpretation*. Interpretation should enhance understanding and enjoyment, and be culturally appropriate.

Conservation Practice

Article 26. Applying the Burra Charter process

26.1 Work on a *place* should be preceded by studies to understand the place which should include analysis of physical, documentary, oral and other evidence, drawing on appropriate knowledge, skills and disciplines.

26.2 Written statements of *cultural significance* and policy for the *place* should be prepared, justified and accompanied by supporting evidence. The statements of significance and policy should be incorporated into a management plan for the place.

26.3 Groups and individuals with *associations* with a *place* as well as those involved in its management should be provided with opportunities to contribute to and participate in understanding the *cultural significance* of the place. Where appropriate they should also have opportunities to participate in its *conservation* and management.

Adaptation may involve the introduction of new services, or a new use, or changes to safeguard the place.

New work may be sympathetic if its siting, bulk, form, scale, character, colour, texture and material are similar to the existing fabric, but imitation should be avoided.

These may require changes to significant *fabric* but they should be minimised. In some cases, continuing a significant use or practice may involve substantial new work.

For many places associations will be linked to use.

The results of studies should be up to date, regularly reviewed and revised as necessary.

Statements of significance and policy should be kept up to date by regular review and revision as necessary. The management plan may deal with other matters related to the management of the place.

Article 27. Managing change

27.1 The impact of proposed changes on the *cultural significance* of a *place* should be analysed with reference to the statement of significance and the policy for managing the place. It may be necessary to modify proposed changes following analysis to better retain cultural significance.

27.2 Existing *fabric, use, associations* and *meanings* should be adequately recorded before any changes are made to the *place*.

Article 28. Disturbance of fabric

28.1 Disturbance of significant *fabric* for study, or to obtain evidence, should be minimised. Study of a *place* by any disturbance of the fabric, including archaeological excavation, should only be undertaken to provide data essential for decisions on the *conservation* of the place, or to obtain important evidence about to be lost or made inaccessible.

28.2 Investigation of a *place* which requires disturbance of the *fabric*, apart from that necessary to make decisions, may be appropriate provided that it is consistent with the policy for the place. Such investigation should be based on important research questions which have potential to substantially add to knowledge, which cannot be answered in other ways and which minimises disturbance of significant fabric.

Article 29. Responsibility for decisions

The organisations and individuals responsible for management decisions should be named and specific responsibility taken for each such decision.

Article 30. Direction, supervision and implementation

Competent direction and supervision should be maintained at all stages, and any changes should be implemented by people with appropriate knowledge and skills.

Article 31. Documenting evidence and decisions

A log of new evidence and additional decisions should be kept.

Article 32. Records

32.1 The records associated with the *conservation* of a *place* should be placed in a permanent archive and made publicly available, subject to requirements of security and privacy, and where this is culturally appropriate.

32.2 Records about the history of a *place* should be protected and made publicly available, subject to requirements of security and privacy, and where this is culturally appropriate.

Article 33. Removed fabric

Significant *fabric* which has been removed from a *place* including contents, fixtures and objects, should be catalogued, and protected in accordance with its *cultural significance*.

Where possible and culturally appropriate, removed significant fabric including contents, fixtures and objects, should be kept at the place.

Article 34. Resources

Adequate resources should be provided for *conservation*.

The best conservation often involves the least work and can be inexpensive.

Words in italics are defined in Article 1.

The Burra Charter Process

Sequence of investigations, decisions and actions

