

Chapter 14

# Non-Aboriginal heritage



## 14 Non-Aboriginal heritage

This chapter outlines the potential non-Aboriginal heritage impacts associated with the project. Detailed non-Aboriginal heritage assessments have been carried out for the project and are included in Appendix J (Technical working paper: Non-Aboriginal heritage) and Appendix K (Technical working paper: Maritime heritage).

The Secretary's environmental assessment requirements as they relate to non-Aboriginal heritage, and where in the environmental impact statement these have been addressed, are detailed in Table 14-1 (Secretary's environmental assessment requirements checklist).

The proposed environmental management measures relevant to non-Aboriginal heritage are included in Section 14.5.

**Table 14-1 Secretary's environmental assessment requirements – Non-Aboriginal heritage**

Secretary's requirement	Where addressed in EIS
<p>1. The Proponent must identify and assess any direct and/or indirect impacts (including cumulative, vibration and visual impacts) to the heritage significance of listed (and nominated) heritage items inclusive of:</p> <ul style="list-style-type: none"> <li>c. environmental heritage, as defined under the <i>Heritage Act 1977</i> (including potential items of heritage value, conservation areas, open space heritage landscapes, built heritage landscapes and archaeology);</li> <li>d. items listed on the State, National and World Heritage lists (including Cockatoo Island);</li> <li>e. heritage items and conservation areas identified in local and regional planning environmental instruments covering the project area; and</li> <li>f. marine items of potential heritage significance within Sydney Harbour, such as any shipwrecks within proximity to the Balls Head Coal Loader wharf.</li> </ul>	<p>A summary of listed heritage items within the study area is presented in <b>Section 14.3</b>.</p> <p>Consideration of direct and/or indirect impacts (including potential items of heritage value, conservation areas, open space heritage landscapes, built heritage landscapes and archaeology) to the heritage significance of listed (and nominated) heritage items are presented in <b>Section 14.4.1</b>.</p> <p><b>Section 14.4.2</b> includes assessment of maritime items of potential heritage significance within Sydney Harbour. Further details are provided in <b>Appendix K</b> (Technical working paper: Maritime heritage).</p> <p>Cockatoo Island is located outside of the study area defined in <b>Appendix J</b> (Technical working paper: Non-Aboriginal heritage), and the maritime heritage values of this site would not be impacted (direct or indirectly).</p>
<p>2. Where impacts to State or locally significant heritage items or archaeology are identified, the assessment must:</p> <ul style="list-style-type: none"> <li>a. include a significance assessment and statement of heritage impact for all heritage items (including any unlisted places that are assessed of heritage value);</li> <li>b. provide a discussion of alternative locations and design options that have been considered to reduce heritage</li> </ul>	<p>Significance assessment and statements of heritage impact are presented in <b>Section 14.4</b>, and Section 4 of <b>Appendix J</b> (Technical working paper: Non-Aboriginal heritage).</p> <p>A discussion of alternative locations and design options Section 5.1, Section 5.2 and Section 5.4 of <b>Appendix J</b> (Technical working paper: Non-Aboriginal heritage) and <b>Section 4.4</b> and <b>Section 4.5</b> of <b>Chapter 4</b></p> <p>Mitigation measures are presented in <b>Section 14.5</b> which includes consideration of</p>

Secretary's requirement	Where addressed in EIS
<p>impacts;</p> <p>c. in areas identified as having potential archaeological significance, undertake a comprehensive archaeological assessment and management plan in line with Heritage Council guidelines which includes a methodology and research design to assess the impact of the works on the potential archaeological resource and to guide physical archaeological test excavations and include the results of these excavations. This is to be carried out by a suitably qualified archaeologist and is to discuss the likelihood of significant historical, maritime and Aboriginal archaeology on the site, how this may be impacted by the project, and includes measures to mitigate any impacts;</p> <p>d. consider potential impacts to the Balls Head Coal Loader particularly associated with vibration and disturbance as part of the ongoing works. Due to the potential significance of this site, options to ensure that it is not impacted must be considered;</p> <p>e. consider impacts to the item of significance caused by, but not limited to, vibration, demolition, archaeological disturbance, altered historical arrangements and access, increased traffic, visual amenity, landscape and vistas, curtilage, subsidence and architectural noise treatment (as relevant);</p> <p>f. provide a comparative analysis to inform the rarity and representative value of any heritage places proposed for demolition;</p> <p>g. outline mitigation measures to avoid and minimise identified impacts in accordance with the current guidelines; and</p> <p>h. be undertaken by a suitably qualified heritage consultant(s) (note: where archaeological excavations are proposed the relevant consultant must meet the NSW Heritage Council's Excavation Director criteria).</p>	<p>areas identified as having potential archaeological significance.</p> <p>Potential impacts to Balls Head Coal Loader are discussed in <b>Section 14.4</b> and <b>Section 14.5</b>.</p> <p>Discussion of impacts as a result of vibration, demolition, archaeological disturbance, altered historical arrangements and access, increased traffic, visual amenity, landscape and vistas, curtilage, subsidence and architectural noise treatment (as relevant) are provided in <b>Section 14.4</b> and <b>Section 5.2</b> to <b>Section 5.4</b> of <b>Appendix J</b> (Technical working paper: Non-Aboriginal heritage). A comparative analysis is not required for the reasons stated in <b>Appendix J</b> (Technical working paper: Non-Aboriginal heritage). This is summarised in <b>Section 14.4.1</b>.</p> <p>Environmental management measures are presented in <b>Section 14.5</b>.</p> <p><b>Section 14.2</b> and <b>Section 1.4</b> of <b>Appendix J</b> (Technical working paper: Non-Aboriginal heritage) provides details of qualification held by heritage consultants.</p>

## 14.1 Legislative and policy framework

The *NSW Heritage Act 1977* (the Heritage Act) is the primary piece of State legislation affording protection to all items of environmental heritage (natural and cultural) in NSW. Under the Heritage Act, 'items of environmental heritage' include places, buildings, works, relics, moveable objects and precincts identified as having heritage significance based on historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic values. Items of identified heritage at a level of State significance are listed on the NSW State Heritage Register and are afforded automatic protection against any activities that may damage an item or affect its heritage significance under the Heritage Act.

The Heritage Act also provides protection for 'relics', which includes archaeological material or deposits. Sections 139 to 145 of the Heritage Act prevent the excavation or disturbance of land known or likely to contain relics, unless under an excavation permit. However, the project is subject to Division 5.2 (State Significant Infrastructure) provisions of the *Environmental Planning and Assessment Act 1979*, and therefore excavation or exception permits would not be required.

For the purposes of the Heritage Act, the State of NSW also includes the bed of the harbour and the water column up to three nautical miles from the coast. Shipwrecks currently under the jurisdiction of the Heritage Act are identified in the Historic Shipwrecks Register, maintained by the NSW Heritage Council. Part 3C of the Heritage Act also contains specific provisions for the protection of shipwrecks more than 75 years old. This section is included in the Act to provide a link to and consistency with the *Historic Shipwrecks Act 1976* (Commonwealth).

The *Environmental Protection and Biodiversity Conservation Act 1999* (Commonwealth) applies to those items which are of World, Commonwealth or National heritage significance. Significant impact to World or National heritage items constitute a matter of national environmental significance and require a referral to the Minister for Environment and Energy.

The *Environmental Planning and Assessment Act 1979* establishes the framework for cultural heritage values to be formally assessed in the land use planning and development consent process. The *Environmental Planning and Assessment Act 1979* requires that environmental impacts are considered before land development. This includes impacts on cultural heritage items and places as well as archaeological sites and deposits.

The requirement to consider potential impacts on Non-Aboriginal heritage is given effect through the following guidelines:

- *UNESCO Convention on the Protection of the Underwater Cultural Heritage* (2001)
- *Australia ICOMOS Charter for Places of Cultural Significance* (Burra Charter) (Australia ICOMOS, 2013)
- *NSW Heritage Manual* (NSW Heritage Office and Department of Urban Affairs and Planning, 1996) including the following sections:
  - Investigating History – used in undertaking research into historical context and history of individual heritage items
  - Investigating Fabric – used in surveying and recording individual heritage items
- *Assessing Heritage Significance* (NSW Heritage Office, 2001) – updated section of 1996 *NSW Heritage Manual* used to review existing significance assessment and carried out significance assessment for new heritage items
- *Investigating Heritage Significance* (draft guideline) (NSW Heritage Office, 2004) – updated section of *NSW Heritage Manual* used to carry out significance assessment for new heritage items

- *Statements of Heritage Impact* (NSW Heritage Office, 2002) – used in preparation of Statements of Heritage Impact
- *Guidelines for the Management of Australia’s Shipwrecks* (Australian Institute for Maritime Archaeology Inc. and the Australian Cultural Development Office, 1994)
- Criteria for the Assessment of Excavation Directors (NSW Heritage Council, 2011)
- *Cultural Heritage Guidelines* (Roads and Maritime, 2015c).

## 14.2 Assessment methodology

Impacts on heritage are defined as either:

- Direct impacts, resulting in a planned and intentional physical change to a heritage item from project activities within the heritage item boundary
- Potential direct impacts, resulting from incidental physical impacts occurring as a result of activities adjacent to or within the heritage item boundary
- Indirect impacts, resulting in changes to the heritage item or its surroundings from project activities outside of the heritage boundary, such as vibration, settlement, visual impacts, social impacts, impacts to landscapes and vistas, changes to ongoing use, changed associations, or change to access.

The level of impact on the heritage significance of each heritage item in the study area has been assessed as major, moderate, minor or negligible based on the definitions and framework for assessing severity of impacts from the *EPBC Act Significant Impact Guidelines 1.2* (Department of Sustainability Environment Water Population and Communities, 2013). Where the heritage significance of an item is unknown, such as for potential maritime heritage items identified during field surveys and investigations, items have been assigned a heritage sensitivity level which combines heritage potential of the item with its potential significance.

A Statement of Heritage Impact has been prepared for each State or locally significant terrestrial heritage item impacted by the project in accordance with the *Statements of Heritage Impact guidelines* (NSW Heritage Office, 2002). Where relevant, the impact assessment has incorporated Commonwealth heritage guidelines including *Matters of National Environmental Significance Significant Impact Guidelines 1.1* (Department of the Environment, 2013).

For the purpose of the heritage assessments, all areas within 50 metres of the project construction footprint have been considered (the study area). The maritime heritage assessment is limited to the immersed tube tunnel alignment between Birchgrove and Waverton, the area around the Sydney Harbour south and Sydney Harbour north cofferdams (WHT5 and WHT6), the temporary construction support site at Berrys Bay (WHT7), and around the White Bay construction support site (WHT3) (refer to Chapter 6 (Construction work)).

The terrestrial and maritime heritage assessments have been informed by searches of NSW and Commonwealth heritage registers and supplemented by a literature review of previous assessments and heritage studies. Heritage items and areas of archaeological potential not already identified on registers are also identified as part of the assessment. Field surveys were carried out in May, June, September and December 2017 by qualified heritage specialists to inspect items of known heritage value and areas of potential heritage value.

Further detail on the assessment methodology is provided in Appendix J (Technical working paper: Non-Aboriginal heritage) and Appendix K (Technical working paper: Maritime heritage).

## 14.3 Existing environment

### 14.3.1 Historical context of the project area

#### ***Rozelle to Birchgrove***

The original people to occupy the Balmain area were part of the Darug language group, who occupied the region for about 20,000 years prior to European occupation. The local Aboriginal population was substantially reduced following the arrival of European settlers, caused by an epidemic of smallpox from 1789-1790 and violent conflicts over resources between settlers, convicts, soldiers and the Aboriginal population.

Between 1790 and 1819, land grants were made within the Balmain area to civilians, the military and the clergy. Increased subdivision occurred within the region in the early 1800s, along with an improvement in transportation to the area (Tanner Architects, 2011). During the Depression in the 1920s-1930s, many of the 'fine old homes' were taken over by government departments as institution offices, hostels and boarding houses (Tanner Architects, 2011).

The waterfront of Rozelle, Glebe, and Balmain was used for maritime industry, and was fundamental to the development of these suburbs through much of the mid-19th and twentieth centuries (Tanner Architects, 2011). By the 1990s, the population expanded as the area's industrial zones underwent extensive redevelopment to become residential zones (Australian Bureau of Statistics, 2011; Inner West Council, 2013).

#### ***Sydney Harbour***

The First Fleet arrived in Sydney Harbour on 26 January 1788 and settled in Sydney Cove (Godden Mackay, 1991). The Sydney Cove settlement developed in the mid-19th century as a major port and trade centre, with residential and industrial development expanding into the Glebe, Balmain and Ultimo areas. Small maritime industries and wharves for dockyards, ship building, light industrial, gas works and power stations were developed along the foreshores of these areas, and continued into the early 20th century (Godden Mackay, 1991).

The industrial character of Sydney Harbour declined from the 1960s onwards when Port Botany was developed as Sydney's main container terminal and cargo handling port. However, the waterway remained busy into the 21st century with passenger ferries and a range of recreational functions.

Maritime development on the North Shore around Berrys Bay began in the early to mid-19th century, with the foreshore occupied by various industrial companies and government occupants such as the NSW Torpedo Corps, the Anglo-Persian Oil Refineries (subsidiary of British Petroleum (BP)), Woodley's Shipyard, a Commonwealth Department of Health Quarantine Station, timber works and a range of boat builders. These uses resulted in the construction of various maritime infrastructure along the foreshore, including slipways, wharves, mooring facilities, cranes, storage tanks, sea walls and industrial buildings. Industrial activities were wound down in the 1990s, with the northern and western section of Berrys Bay, associated with Carradah Park and former coal loader site, converted to recreational open space and some of the southern section reserved for waterfront industrial use.

## ***Waverton to Cammeray***

At the time of European arrival, the North Shore area of Sydney was inhabited by the Cammeraygal (also known as Gamaraigal and Kameragal) people with groups camped at Milsons Point, Manly and Lane Cove (Morris, 1986). The first record of contact with Aboriginal people in this area was on the Lane Cove River in 1788 and later in Middle Harbour.

Between the 1790s and 1831, thousands of hectares of land were granted to politicians, merchants, ex-convicts, and settlers (North Sydney Council, n d-a). The township of St Leonards (now North Sydney) was gazetted in 1838, and its town centre was established in the same year. By the mid-1880s, the township had a commercial and civic centre, a tramline, and a ferry wharf at Milsons Point, which boosted development. A tramline extension was added along Falcon Street from North Sydney to Crows Nest in 1893, which was replaced by an electric tramline in 1898, attracting a larger population to the area (Godden Mackay, 1994).

The opening of the Sydney Harbour Bridge in 1932 transformed the township into a large commercial area and a popular shopping destination, and saw a marked increase in land values (City of Sydney, 2016; Warne, 2005). By the 1960s, many townhouses and apartments were built in an effort to house the population. During the 1970s and 1980s, commercial growth accompanied residential development, and the 1990s and 2000s saw a substantial increase in population (City of Sydney, 2016).

The Cammeray area was slow to develop due to its steep topography and remote location, with little growth in the area until the early 1900s when the tramway was extended along Miller Street (North Sydney Council, 2012; n d-b). In 1886, the mayor of St Leonards dedicated a portion of land as a reserve, comprising present-day Cammeray Park, Cammeray Golf Course, Green Park, and ANZAC Park (North Sydney Council, 2016a).

Bushland on Berrys Island and Balls Head Reserve was declared public parkland in 1926 and protected from surrounding maritime industrial and commercial development, and by the 1980s the land opened as public foreshore parkland (Hoskins, 2010; Spindler, 2011; North Sydney Council, 2016a; 2016b; n d-c).

## **14.3.2 Heritage items and conservation areas**

### ***Listed heritage items and conservation areas***

Two hundred and forty-six items with heritage listings were identified within the study area. These include one of world heritage significance (Sydney Opera House buffer zone), one of national heritage significance, 10 of state heritage significance, and the remainder of local heritage significance. Six of the listed heritage items have maritime heritage elements. Heritage listed items within the study area are shown in Figure 14-1 to Figure 14-4. In addition, one indicative place, the Sydney Harbour Landscape Area, is located within the study area. This item is not listed on any of the statutory registers, and so no additional assessment was carried out. Further detail on heritage items and heritage listings of each item are provided in Appendix J (Technical working paper: Non-Aboriginal heritage).

### ***Additional potential terrestrial heritage items***

Two additional items of potential heritage significance were identified during the field investigations. These were ANZAC Park at Cammeray and a seating area at the eastern end of Ridge Street in North Sydney.

ANZAC Park was assessed as being of social value due to the location of the war memorial within the park, and its association with the former North Sydney Tramway Depot and its personnel who served during World Wars I and II. The impact of the project on ANZAC Park is assessed in Section 14.4.1.

The seating area was not considered to meet the significance criterion thresholds for local or state listings and has not been considered further in this assessment.

No additional areas of archaeological potential were identified during the field survey.

Overall, one additional item, ANZAC Park, was included in this assessment, bringing the total number of heritage items identified within the study area to 247.

### ***Additional maritime heritage items***

Three unidentified shipwrecks of potential heritage significance were identified at Balls Head in database searches (refer to Figure 14-5). These are considered to be of local heritage significance for their rarity and research potential. As such, the impact of the project on these items has been assessed in Section 14.4.

Nine unverified anomalies were identified between Yurulbin Park and Balls Head through review of remote sensing data from field surveys and from review of existing sources (refer to Figure 14-5). These are considered to have low to medium potential heritage sensitivity. As the heritage significance cannot be verified, the impact of the project on these items has been assessed in Section 14.4 for completeness.

There is potential within the project construction footprint for archaeological remains to occur, associated with maritime infrastructure, shipwrecks and vessel activity that were not identified during the field surveys due to the limitations of visual and remote sensing investigations. A summary of maritime archaeological potential is provided in Table 14-2.

**Table 14-2 Maritime archaeological potential within the project construction footprint**

Potential archaeological site type	Location		
	Sydney Harbour between Birchgrove and Waverton	Berrys Bay	White Bay, Johnstons Bay and Glebe Island
Maritime heritage infrastructure (and associated deposits)	Certain	Certain	Very likely
Shipwrecks (and associated deposits)	Certain	Very likely	Not applicable
Discard	Certain	Certain	Likely
Built heritage	Not applicable	Not applicable	Certain



## 14.4 Assessment of potential impacts

### 14.4.1 Potential terrestrial heritage impacts

Of the 247 heritage items identified within the study area, 134 items would either have no impact or a negligible impact from the project due to either the low impact activities proposed or the distances between these items and the project construction works. These items are located within 50 metres of surface works in Annandale and Rozelle, in North Sydney, and in the vicinity of the Warringah Freeway Upgrade. Impacts on these 134 items would be limited to temporary noise, vibration and/or visual impacts during construction, and managed through the implementation of minimum working distances for vibration intensive construction activities and other standard construction management measures. As such, impacts to these heritage items have not been carried forward for further detailed assessment.

A heritage assessment for the remaining 113 heritage items and conservation areas that would be potentially impacted is included in Table 14-3, with items shown in Figure 14-1. The following items have been assessed as groups due to their proximity, the similarity of impacts and similarity of mitigation measures:

- Three items including St Leonards Park, W. Tunks Memorial Fountain and the War Memorial (Item 10)
- 93 heritage items situated above the tunnel alignment (Item 19).

Six terrestrial heritage items considered in Table 14-3 have maritime heritage elements. These items are:

- Glebe Island Bridge
- Yurulbin Park
- Former Balls Head Coal Loader
- Railway Electricity Tunnel
- Former BP Site
- Former Woodleys Shipyard.

These items have been considered as terrestrial items in their entirety in Table 14-3, and do not appear in the maritime heritage assessment in Section 14.4.2.

Within Heritage Conservation Areas (Items 2, 15 and 18), demolition of a small number of buildings is proposed. These buildings are situated on the margins of the Heritage Conservation Areas and would not equate to demolition of the entire heritage place. As such comparative analysis to determine the rarity of the buildings to be demolished have not been prepared.

**Table 14-3 Potential impacts on terrestrial heritage items**

Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
1	Glebe Island Bridge, Pyrmont	<ul style="list-style-type: none"> <li>• State Heritage Register</li> <li>• Roads and Maritime Section 170 Register</li> <li>• Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005</li> <li>• Register of the National Estate</li> <li>• National Trust of Australia (NSW).</li> </ul>	State	<p>No direct impacts</p> <p>Potential direct impacts:</p> <ul style="list-style-type: none"> <li>• Potential physical impacts to the heritage item due to operation of construction vehicles and equipment in close proximity to the heritage item.</li> </ul> <p>Indirect impacts</p> <ul style="list-style-type: none"> <li>• Temporary vibration impacts due to construction activities in the vicinity of the heritage item</li> <li>• Temporary visual impacts due to construction activities in the vicinity of the heritage item.</li> </ul>	<p><b>Negligible</b></p> <p>With the implementation of the management measures described in Section 14.5, the level of impact on the heritage item would be negligible, as the proposed works would remain outside the heritage boundary.</p>
2	The Valley heritage conservation area	Leichhardt Local Environmental Plan 2013	Local	<p>No direct impacts</p> <p>Potential direct impacts:</p> <ul style="list-style-type: none"> <li>• Potential physical impacts to the conservation area due to operation of construction vehicles and equipment in close proximity to the heritage boundary.</li> </ul> <p>Indirect impacts:</p> <ul style="list-style-type: none"> <li>• Temporary and permanent visual impacts due to the demolition of buildings adjacent to the conservation area, and temporary</li> </ul>	<p><b>Minor</b></p> <p>The proposed project works would be of small scale and of low intensity. With the implementation of the management measures described in Section 14.5, the level of impact on the heritage item would be minor.</p>

Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
				<p>establishment and operation of the Victoria Road construction support site (WHT2)</p> <ul style="list-style-type: none"> <li>• Temporary vibration impacts due to construction activities adjacent to the conservation area</li> <li>• Slight permanent settlement and ground movement impacts to the heritage item caused by tunnel excavation.</li> </ul>	
3	Railway electricity tunnel under Sydney Harbour, Birchgrove and Greenwich	<ul style="list-style-type: none"> <li>• State Heritage Register</li> <li>• Leichhardt Local Environmental Plan 2013</li> <li>• Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005</li> <li>• Transport for NSW Section 170 Heritage and Conservation Register.</li> </ul>	State	<p>No direct impacts</p> <p>No potential direct impacts</p> <p>Indirect impacts:</p> <ul style="list-style-type: none"> <li>• Temporary vibration impacts due to construction activities in the vicinity of the heritage item at the Sydney Harbour south and Sydney Harbour north cofferdams (WHT5 and WHT6)</li> <li>• Very slight permanent settlement and ground movement impacts to the heritage item.</li> </ul>	<p><b>Negligible</b></p> <p>With the implementation of the management measures described in Section 14.5, the level of impact on the heritage item would be negligible.</p>
4	Yurulbin Park, Birchgrove	Leichhardt Local Environmental Plan 2013	Local	<p>Direct impacts:</p> <ul style="list-style-type: none"> <li>• Planned physical impacts to the heritage item due to the temporary establishment and operation of the Yurulbin Park construction support site (WHT4) and the Sydney</li> </ul>	<p><b>Major</b></p> <p>The proposed works would be of medium-large scale and of moderate intensity, with some changes being permanent and</p>

Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
				<p>Harbour south cofferdam (WHT5)</p> <ul style="list-style-type: none"> <li>Planned physical impacts to areas of archaeological potential due to the temporary establishment and operation of WHT4 and WHT5.</li> </ul>	<p>irreversible.</p> <p>The design of the project works at Yurulbin Park have been developed in consultation with Bruce Mackenzie AM, the original designer of the park. This has resulted in a design that minimises impacts to significant features and changes to the permanent landform at Yurulbin Park. Some mature trees within the park would be directly impacted, but areas of exclusion have been identified and replacement plantings would be provided on completion of construction as part of the redesign. Opportunities to temporarily remove, store and reinstate certain elements such as stone flagging, stone walls and steps would be investigated and implemented if these elements need to be temporarily removed.</p> <p>While permanent impacts would occur to areas of archaeological potential during site establishment, specialist investigations would provide an opportunity to obtain information about the archaeology and history of the site not available from other sources. Reinstatement works following the completion of</p>
				<p>Potential direct impacts:</p> <ul style="list-style-type: none"> <li>Physical impacts to the heritage item due to operation of construction equipment within the heritage boundary</li> <li>Physical impacts to elements of the heritage item due to the temporary establishment of the Yurulbin Park construction support site (WHT4)</li> <li>Physical impact to maritime elements of the heritage item from anchoring of project vessels on or around the item</li> <li>Physical impact to the heritage item from potential collision of project vessels</li> <li>Physical impact to maritime elements of the heritage item by water turbulence from the operation of project vessels.</li> </ul>	
				<p>Indirect impacts:</p> <ul style="list-style-type: none"> <li>Temporary visual impacts due to the temporary establishment and operation of the Yurulbin Park construction support site (WHT4)</li> </ul>	

Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
				<p>and the Sydney Harbour south cofferdam (WHT5)</p> <ul style="list-style-type: none"> <li>• Temporary vibration impacts due to construction activities within and adjacent to the heritage boundary</li> <li>• Slight permanent settlement and ground movement impacts to the heritage item caused by tunnel excavation.</li> </ul>	<p>construction would be designed in consultation with Bruce Mackenzie. The new design would seek to retain and enhance the existing character and the original design intent as much as possible. These works would also improve the quality and long-term viability of landscaping and useability of the park.</p> <p>The implementation of the management measures described in Section 14.5 and Chapter 20 (Land use and property) will ensure that direct impacts are minimised and that disturbed areas would be reinstated following the completion of construction in a manner that is consistent with the heritage values of the item.</p>
5	Former coal loader, Waverton	<ul style="list-style-type: none"> <li>• North Sydney Local Environmental Plan 2013</li> <li>• Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005</li> <li>• Register of the National Estate.</li> </ul>	Local	<p>No direct impacts</p> <p>Potential direct impacts:</p> <ul style="list-style-type: none"> <li>• Permanent physical impacts to the heritage item due to operation of construction equipment in close proximity to maritime elements of the heritage item</li> <li>• Permanent physical impacts to elements of the heritage item due to the temporary installation of the</li> </ul>	<p><b>Minor</b></p> <p>With the implementation of the management measures described in Section 14.5, the level of impact on the heritage item would be minor. Visual impacts would be temporary, and vibration and settlement risks minimised.</p>

Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
				<p>Sydney Harbour north cofferdam (WHT6)</p> <ul style="list-style-type: none"> <li>• Permanent physical impact to maritime elements of the heritage item from anchoring of project vessels on or around the item</li> <li>• Permanent physical impact to the heritage item from potential collision of project vessels</li> <li>• Permanent physical impact to maritime elements of the heritage item by water turbulence from the operation of project vessels.</li> </ul>	
				<p>Indirect impacts:</p> <ul style="list-style-type: none"> <li>• Temporary visual impacts due to the temporary establishment and operation of the Sydney Harbour north cofferdam (WHT6)</li> <li>• Temporary vibration impacts due to construction activities adjacent to the heritage item</li> <li>• Slight permanent settlement and ground movement impacts to the heritage item caused by tunnel excavation.</li> </ul>	
6	Woodleys Shipyard, Waverton	<ul style="list-style-type: none"> <li>• North Sydney Local Environmental Plan 2013</li> <li>• Roads and</li> </ul>	Local	<p>Direct impacts:</p> <ul style="list-style-type: none"> <li>• Planned temporary impacts to existing structures within the heritage boundary due to the temporary establishment and</li> </ul>	<p><b>Minor</b></p> <p>The proposed works would be of medium-large scale and of low intensity. The implementation of the management measures described</p>

Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
		Maritime Section 170 Register <ul style="list-style-type: none"> <li>• Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005.</li> </ul>		<p>operation of the Berrys Bay construction support site (WHT7)</p> <ul style="list-style-type: none"> <li>• Planned impacts to maritime heritage elements and areas of archaeological potential within the heritage boundary due to the construction of a temporary wharf at the Berrys Bay construction support site (WHT7).</li> </ul> <p>Potential direct impacts:</p> <ul style="list-style-type: none"> <li>• Physical impacts to structures within the heritage boundary due to operation of construction vehicles and equipment in close proximity to maritime elements of the heritage item</li> <li>• Physical impacts to elements of the heritage item due to the temporary establishment and operation of the Berrys Bay construction support site (WHT7)</li> <li>• Physical impact to maritime elements of the heritage item from anchoring of project vessels on or around the item</li> <li>• Physical impact to maritime elements of the heritage item by water turbulence from the operation of project vessels.</li> </ul> <p>Indirect impacts:</p> <ul style="list-style-type: none"> <li>• Temporary visual impacts due to</li> </ul>	<p>in Section 14.5 will ensure that impacts to the heritage item are temporary and reversible, and that any maritime archaeology is salvaged prior to construction.</p>

Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
				<p>the temporary establishment and operation of the Berrys Bay construction support site (WHT7)</p> <ul style="list-style-type: none"> <li>• Temporary vibration impacts due to construction activities within the heritage boundary</li> <li>• Very slight permanent settlement and ground movement impacts to the heritage item caused by tunnel excavation.</li> </ul>	
7	BP site, Waverton	<ul style="list-style-type: none"> <li>• North Sydney Local Environmental Plan 2013</li> <li>• Roads and Maritime Section 170 Register</li> <li>• Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005.</li> </ul>	Local	<p>Direct impacts:</p> <ul style="list-style-type: none"> <li>• Temporary and permanent impacts to existing structures and areas of archaeological potential within the heritage boundary due to the temporary establishment and operation of the Berrys Bay construction support site (WHT7)</li> <li>• Permanent impacts to maritime heritage elements and areas of archaeological potential within the heritage boundary due to the construction of a temporary wharf at the Berrys Bay construction support site (WHT7).</li> </ul> <p>Potential direct impacts:</p> <ul style="list-style-type: none"> <li>• Physical impacts to structures within the heritage boundary due to operation of construction vehicles and equipment in close proximity to maritime elements of the heritage</li> </ul>	<p><b>Minor</b></p> <p>The proposed project works would be of medium-large scale and of low intensity. While the changes to the subsurface archaeology of the heritage item would be permanent and irreversible, changes to the heritage significance would be temporary and reversible, subject to the implementation of the mitigation measures described in Section 14.5. Mitigation measures would protect existing heritage components, record information about the physical nature of the heritage item as it currently exists and salvage any land-based and maritime archaeology prior to construction.</p>



Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
				<p>item</p> <ul style="list-style-type: none"> <li>Physical impacts to elements of the heritage item due to the temporary establishment and operation of the Berrys Bay construction support site (WHT7)</li> <li>Physical impact to maritime elements of the heritage item from anchoring of project vessels on or around the item</li> <li>Physical impact to maritime elements of the heritage item by water turbulence from the operation of project vessels.</li> </ul> <p>Indirect impacts:</p> <ul style="list-style-type: none"> <li>Temporary visual impacts due to the temporary establishment and operation of the Berrys Bay construction support site (WHT7)</li> <li>Temporary social impacts due to limited access to the heritage item during construction</li> <li>Temporary vibration impacts due to construction activities within the heritage boundary</li> <li>Slight permanent settlement and ground movement impacts to the heritage item caused by tunnel excavation.</li> </ul>	

Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
8	Sydney Harbour Bridge, approaches and viaducts (road and rail), Milsons Point/Dawes Point	<ul style="list-style-type: none"> <li>National Heritage List</li> <li>State Heritage Register</li> <li>North Sydney Local Environmental Plan 2013</li> <li>Roads and Maritime Section 170 Heritage and Conservation Register</li> <li>Register of the National Estate</li> <li>National Trust of Australia (NSW) Register.</li> </ul>	National	<p>Direct impacts within the National listing boundary:</p> <ul style="list-style-type: none"> <li>Permanent impacts to the heritage item due to road upgrade works within the heritage boundary.</li> </ul> <p>Direct impacts within the State listing boundary:</p> <ul style="list-style-type: none"> <li>Planned temporary impacts to the heritage item due to the temporary establishment and operation of the Blue Street construction support site (WFU1).</li> </ul> <p>No potential direct impacts within the National listing boundary.</p> <p>Potential direct impacts within the State listing boundary:</p> <ul style="list-style-type: none"> <li>Physical impacts to the heritage item due to operation of construction vehicles and equipment within and in close proximity to the State heritage boundary.</li> </ul> <p>Indirect impacts within the National listing boundary:</p> <ul style="list-style-type: none"> <li>Temporary visual impacts due to road upgrade activities within the heritage boundary</li> <li>Temporary social impacts due to limited access to the heritage item</li> </ul>	<p><b>Minor</b></p> <p>The proposed works would be of small-medium scale and of moderate intensity. Works associated with the establishment and operation of the Blue Street construction support site (WFU1) would be temporary and reversible. While the road upgrade works within the heritage boundary would be permanent and irreversible, they would not impact the heritage significance of the item and would allow for continued use of the heritage item as a major road and rail connection.</p> <p>Implementation of the mitigation measures described in Section 14.5 would ensure that the level of impact on this heritage item would be minor.</p>

Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
				<p>during construction.</p> <p>Indirect impacts within the State listing boundary:</p> <ul style="list-style-type: none"> <li>• Permanent visual impacts due to the potential construction of a toll gantry within the heritage boundary and noise barrier adjacent to the boundary</li> <li>• Temporary visual impacts due to the temporary establishment and operation of the Blue Street construction support site (WFU1).</li> </ul>	
9	<p>North Sydney Bus Shelters</p> <p>BS008 'Falcon' – Miller Street, North Sydney</p> <p>BS010 'Miller' – corner of Miller and Falcon Streets, North Sydney</p> <p>BS025 'Berrys Bay' – Woolcott Street, Waverton</p> <p>BS038 'St Johns' – Brought Street, Kirribilli</p> <p>BS050 'St Leonards</p>	North Sydney Local Environmental Plan 2013	Local	<p>Direct impacts:</p> <ul style="list-style-type: none"> <li>• Temporary relocation of BS008, BS010 and BS050 during construction due to construction works directly adjacent to the heritage items.</li> </ul> <p>Potential direct impacts:</p> <ul style="list-style-type: none"> <li>• Potential physical impacts to BS038 due to operation of construction vehicles and equipment in close proximity.</li> </ul> <p>Indirect impacts:</p> <ul style="list-style-type: none"> <li>• Temporary visual impacts due to the relocation of BS008, BS010 and BS050 during construction</li> <li>• Temporary vibration impacts to heritage items remaining in situ due</li> </ul>	<p><b>Negligible</b></p> <p>The proposed works would be of small/localised scale, low intensity, and temporary.</p> <p>With the implementation of the management measures described in Section 14.5, the level of impact on BS008, BS010 and BS050 would be minor. Impacts to BS025 and BS038 would be negligible.</p>

Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
	Park' – corner of Falcon and Miller Streets, North Sydney			<p>to construction activities in close proximity</p> <ul style="list-style-type: none"> <li>• Very slight permanent settlement and ground movement impacts to BS025 caused by tunnel excavation.</li> </ul>	
10	St Leonards Park (including W. Tunks Memorial Fountain, War Memorial, and North Sydney Oval), North Sydney	<ul style="list-style-type: none"> <li>• State Heritage Register</li> <li>• North Sydney Local Environmental Plan 2013</li> <li>• Register of the National Estate</li> <li>• National Trust of Australia (NSW) Register.</li> </ul>	State	<p>Direct impacts:</p> <ul style="list-style-type: none"> <li>• Physical impacts to the heritage item due to the temporary establishment and operation of the Ridge Street north construction support site (WHT9)</li> <li>• Addition of operational infrastructure within the heritage boundary.</li> </ul> <p>Potential direct impacts:</p> <ul style="list-style-type: none"> <li>• Physical impacts to the heritage item due to operation of construction vehicles and equipment within and in close proximity to the heritage boundary.</li> </ul> <p>Indirect impacts:</p> <ul style="list-style-type: none"> <li>• Temporary and permanent visual impacts due to the construction of permanent operational infrastructure within and in the vicinity of the heritage boundary</li> <li>• Temporary vibration impacts due to construction activities within and in</li> </ul>	<p><b>Minor</b></p> <p>The proposed works would be of small scale and of low intensity. While impacts associated with the establishment and operation of Ridge Street north construction support site (WHT9) would be temporary, those associated with road upgrade works to the Warringah Freeway would be permanent and irreversible.</p> <p>Kerb and footpath adjustment works would occur on Miller Street southbound around the intersection with Falcon Street. These works would provide a new dedicated lane for left turning traffic from Falcon Street westbound to Miller Street southbound. Further review of the impacts in this area is currently being carried out and permanent impacts to St Leonards Park would be minimised or, where possible eliminated.</p> <p>The implementation of the</p>

Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
				<p>the vicinity of the heritage boundary</p> <ul style="list-style-type: none"> <li>Slight permanent settlement and ground movement impacts to the heritage item caused by tunnel excavation.</li> </ul>	management measures described in Section 14.5 will minimise disturbance and ensure that disturbed areas are reinstated to retain as much of the existing character and design as possible.
11	North Sydney Sewer Vent, North Sydney	<ul style="list-style-type: none"> <li>State Heritage Register</li> <li>North Sydney Local Environmental Plan 2013</li> <li>Sydney Water Section 170 Heritage and Conservation Register</li> <li>Register of the National Estate</li> <li>National Trust of Australia (NSW) Register.</li> </ul>	State	<p>No direct impacts</p> <p>Potential direct impacts:</p> <ul style="list-style-type: none"> <li>Physical impacts to the heritage item due to operation of construction vehicles and equipment in close proximity to the heritage item.</li> </ul> <p>Indirect impacts:</p> <ul style="list-style-type: none"> <li>Temporary and permanent visual impacts due to the construction of permanent operational infrastructure in the vicinity of the heritage item</li> <li>Temporary vibration impacts due to construction activities in the vicinity of the heritage item</li> <li>Very slight permanent settlement and ground movement impacts to the heritage item caused by tunnel excavation.</li> </ul>	<p><b>Negligible</b></p> <p>The proposed works would be of small scale and of low intensity. While some permanent and irreversible changes would occur on the roadways adjacent to the heritage item, they are not planned to impact the heritage item.</p>

Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
12	ANZAC Park, Cammeray	Unlisted	Local	Direct impacts	<p><b>Negligible</b></p> <p>The proposed works would be restricted to a small area along the south, southeast and eastern boundary of the park. While changes would be permanent and irreversible, they would not impact significant heritage components or the overall heritage significance of the item.</p> <p>With the implementation of the management measures described in Section 14.5, the level of impact on the heritage item would be negligible.</p>
				<ul style="list-style-type: none"> <li>Planned physical impacts to the heritage item due to the construction of permanent operational infrastructure within the heritage boundary.</li> </ul>	
				Potential direct impacts:	
				<ul style="list-style-type: none"> <li>Potential physical impacts to the heritage item due to operation of construction vehicles and equipment within and in close proximity to the heritage boundary.</li> </ul>	
				Indirect impacts:	
				<ul style="list-style-type: none"> <li>Temporary vibration impacts due to construction activities within the heritage boundary</li> <li>Temporary and permanent visual impacts due to the construction of permanent operational infrastructure within and adjacent to the heritage boundary.</li> </ul>	
13	Northern Suburbs Ocean Outfall Sewer, Blacktown to Manly	Sydney Water Section 170 Register	Local	Direct impacts:	<p><b>Negligible</b></p> <p>The proposed works would be of small scale and of low intensity, with the changes to the heritage item being permanent and irreversible. The changes would affect a small portion of the heritage item and are necessary for the continued</p>
				<ul style="list-style-type: none"> <li>Planned permanent adjustment to the maintenance access to the heritage item due to the construction of permanent operational infrastructure.</li> </ul>	
				Potentially direct impacts:	

Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
				<ul style="list-style-type: none"> <li>Potential physical impacts to the heritage item due to operation of construction vehicles and equipment within and in close proximity to the heritage boundary.</li> </ul>	<p>operation of the heritage item.</p> <p>With the implementation of the management measures described in Section 14.5, the level of impact on the heritage item would be negligible.</p>
				<p>Indirect impacts:</p> <ul style="list-style-type: none"> <li>Temporary vibration impacts due to construction activities within and adjacent to the heritage boundary</li> <li>Slight permanent settlement and ground movement impacts to the heritage item caused by tunnel excavation.</li> </ul>	
14	Cammeray Park (including Golf Course), Cammeray	North Sydney Local Environmental Plan 2013	Local	<p>Direct impacts:</p> <ul style="list-style-type: none"> <li>Planned physical impacts to the heritage item due to the construction of permanent operational infrastructure within the heritage boundary.</li> </ul>	<p><b>Moderate</b></p> <p>The proposed works would be of small-medium scale and of moderate intensity, with the changes to the heritage item being permanent and irreversible. The heritage item would lose a large portion of its significance as a relatively intact open space.</p> <p>With the implementation of the management measures described in Section 14.5, the level of impact on the heritage item would be moderate.</p>
				<p>Potentially direct impacts:</p> <ul style="list-style-type: none"> <li>Potential physical impacts to the heritage item due to operation of construction vehicles and equipment within and in close proximity to the heritage boundary.</li> </ul>	
				<p>Indirect impacts:</p> <ul style="list-style-type: none"> <li>Temporary and permanent visual impacts due to the construction of</li> </ul>	

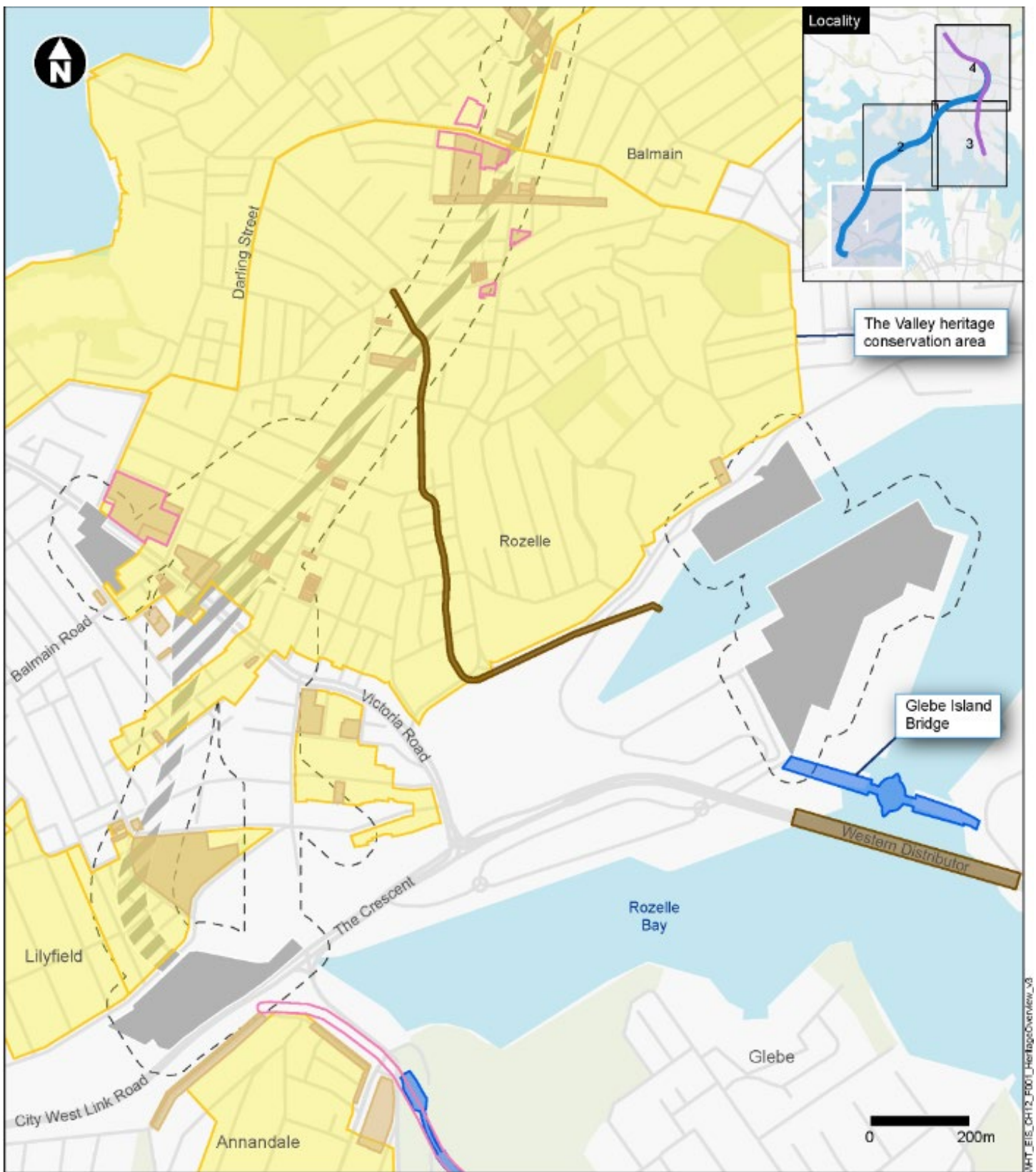
Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
				<p>permanent operational infrastructure within the heritage boundary</p> <ul style="list-style-type: none"> <li>• Permanent social impacts due to the repurposing of a large section of the heritage item for permanent operational infrastructure</li> <li>• Temporary vibration impacts due to construction activities within the heritage boundary</li> <li>• Slight permanent settlement and ground movement impacts to the heritage item caused by tunnel excavation.</li> </ul>	
15	Cammeray Conservation Area, Cammeray	<ul style="list-style-type: none"> <li>• North Sydney Local Environmental Plan 2013</li> <li>• Register of the National Estate.</li> </ul>	Local	<p>Direct impacts:</p> <ul style="list-style-type: none"> <li>• Planned physical impacts to the heritage item due to the demolition of two buildings within the heritage boundary.</li> </ul> <p>Potential direct impacts:</p> <ul style="list-style-type: none"> <li>• Potential physical impacts to the heritage item due to operation of construction vehicles and equipment within and in close proximity to the heritage boundary.</li> </ul> <p>Indirect impacts:</p> <ul style="list-style-type: none"> <li>• Temporary and permanent visual impacts due to the removal of heritage fabric and the construction</li> </ul>	<p><b>Minor</b></p> <p>The proposed works would be of small scale and of low intensity, with the direct impacts to the heritage item being permanent and irreversible.</p> <p>With the implementation of the management measures described in Section 14.5, the level of impact on the heritage item would be minor.</p>



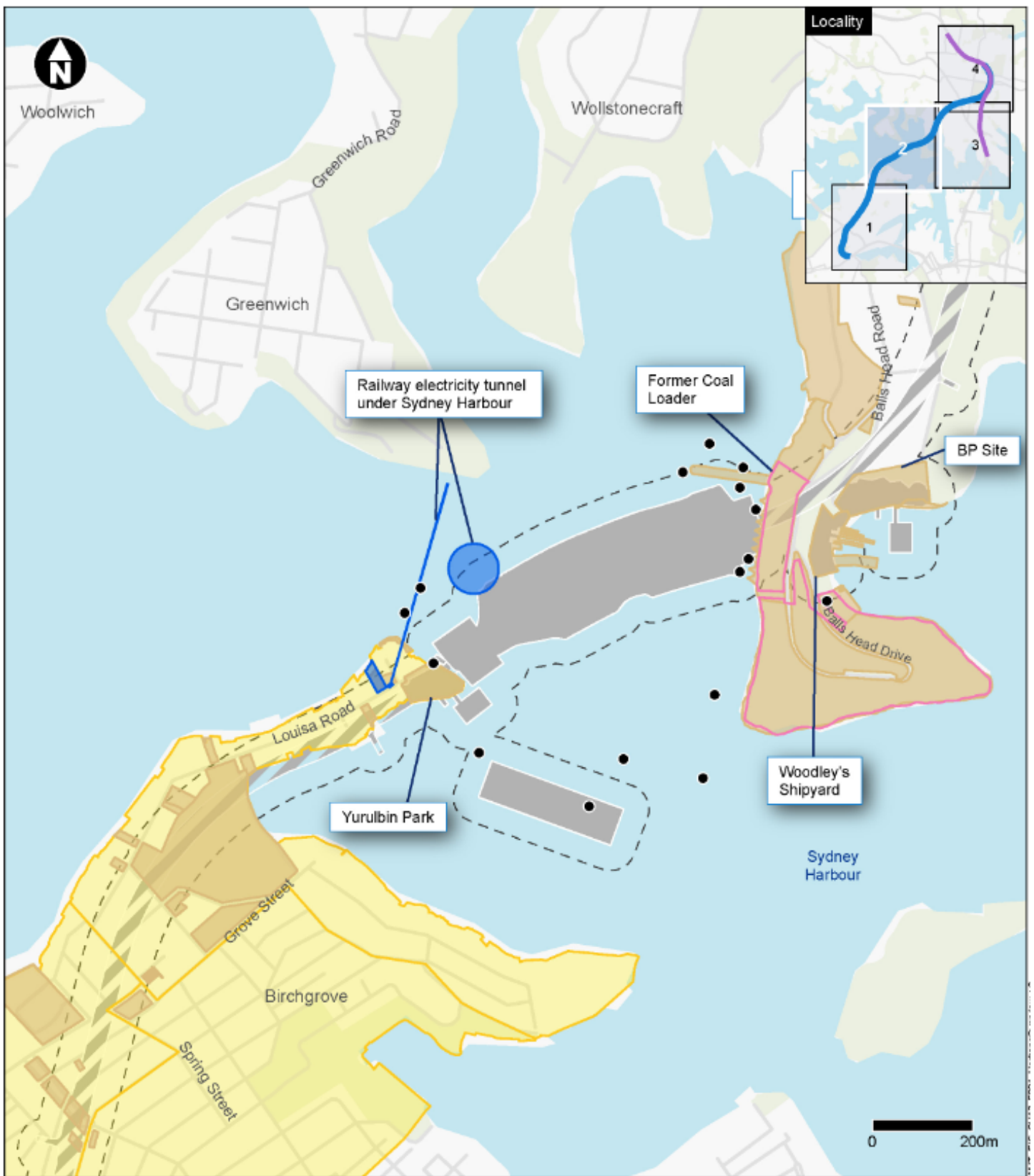
Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
				<p>of permanent operational infrastructure within and adjacent to the heritage boundary</p> <ul style="list-style-type: none"> <li>• Temporary vibration impacts due to construction activities within and adjacent to the heritage boundary.</li> </ul>	
16	Tarella, Cammeray	<ul style="list-style-type: none"> <li>• State Heritage Register</li> <li>• North Sydney Local Environmental Plan 2013</li> <li>• Register of the National Estate</li> <li>• National Trust of Australia (NSW) Register.</li> </ul>	State	<p>Direct impacts:</p> <ul style="list-style-type: none"> <li>• Planned physical impact due to the implementation of architectural noise treatments for the heritage item.</li> </ul> <p>No potential direct impacts</p> <p>Indirect impacts:</p> <ul style="list-style-type: none"> <li>• Temporary vibration impacts due to construction activities in close proximity to the heritage boundary.</li> </ul>	<p><b>Negligible</b></p> <p>Eligibility for architectural noise treatment for the heritage item would be confirmed during detailed design and in consultation with the landowner. Should architectural noise treatment be required, this would be done in such a way to minimise heritage impacts, while preserving owner amenity and heritage values of the item.</p> <p>With the implementation of the management measures described in Section 14.5, the level of impact on the heritage item would be negligible.</p>
17	St Thomas Rest Park, North Sydney	<ul style="list-style-type: none"> <li>• North Sydney Local Environmental Plan 2013</li> <li>• National Trust of Australia (NSW).</li> </ul>	Local	<p>No direct impacts</p> <p>No potential direct impacts</p> <p>Indirect impacts:</p> <ul style="list-style-type: none"> <li>• Temporary vibration impacts due to construction activities in close proximity to the heritage boundary.</li> </ul>	<p><b>Negligible</b></p> <p>With the implementation of the management measures described in Section 14.5, the level of impact on the heritage item would be negligible, as the proposed works would remain outside the heritage boundary.</p>

Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
18	Holtermann Estate A Conservation Area, Crows Nest	<ul style="list-style-type: none"> <li>North Sydney Local Environmental Plan 2013</li> <li>Register of the National Estate.</li> </ul>	Local	<p>Direct impacts:</p> <ul style="list-style-type: none"> <li>Planned physical impact due to the implementation of architectural noise treatments for a number of residences within the conservation area.</li> </ul> <p>No potential direct impacts</p> <p>Indirect impacts:</p> <ul style="list-style-type: none"> <li>Temporary and permanent visual impacts due to the construction of permanent operational infrastructure in proximity to the conservation area.</li> </ul>	<p><b>Negligible</b></p> <p>Eligibility for architectural noise treatment at a number of residences within the conservation area would be confirmed during detailed design and in consultation with the landowner. Should architectural noise treatment be required, this would be done in such a way to minimise heritage impacts, while preserving owner amenity and heritage values of the conservation area.</p> <p>With the implementation of the management measures described in Section 14.5, the level of impact on the heritage item would be negligible.</p>
19	Heritage items situated above the tunnel alignment – including various commercial premises (shops and hotels), civic buildings (court house, post office, police station, council chambers), churches, schools, a theatre, trees and streetscapes, parks,	Various	State ('Raywell' House) / Local (all other items)	<p>No direct impacts</p> <p>No potential direct impacts</p> <p>Indirect impacts:</p> <ul style="list-style-type: none"> <li>Slight or very slight permanent settlement and ground movement impacts to heritage items within the conservation area caused by tunnel excavation.</li> </ul>	<p><b>Negligible</b></p> <p>With the implementation of the management measures described in Section 14.5, the level of impact on the heritage items would be negligible.</p>

Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
	railway station, Birchgrove Colliery, and Former Quarantine Boat Depot.				



**Figure 14-1** Location of all heritage items and potential heritage items within the study area (map 1)



**Figure 14-2** Location of all heritage items and potential heritage items within the study area (map 2)

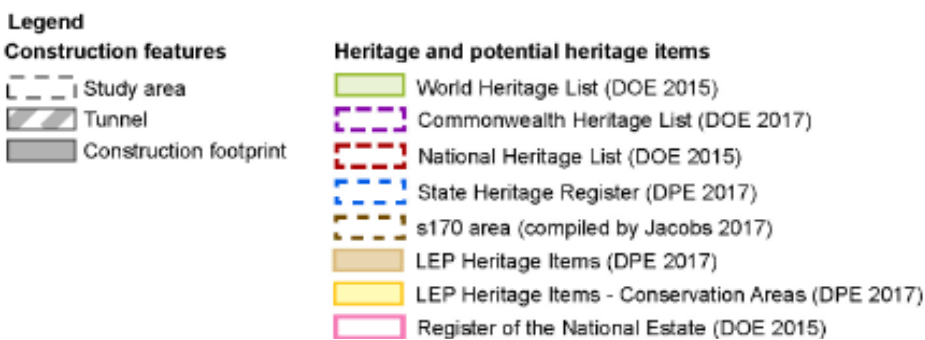
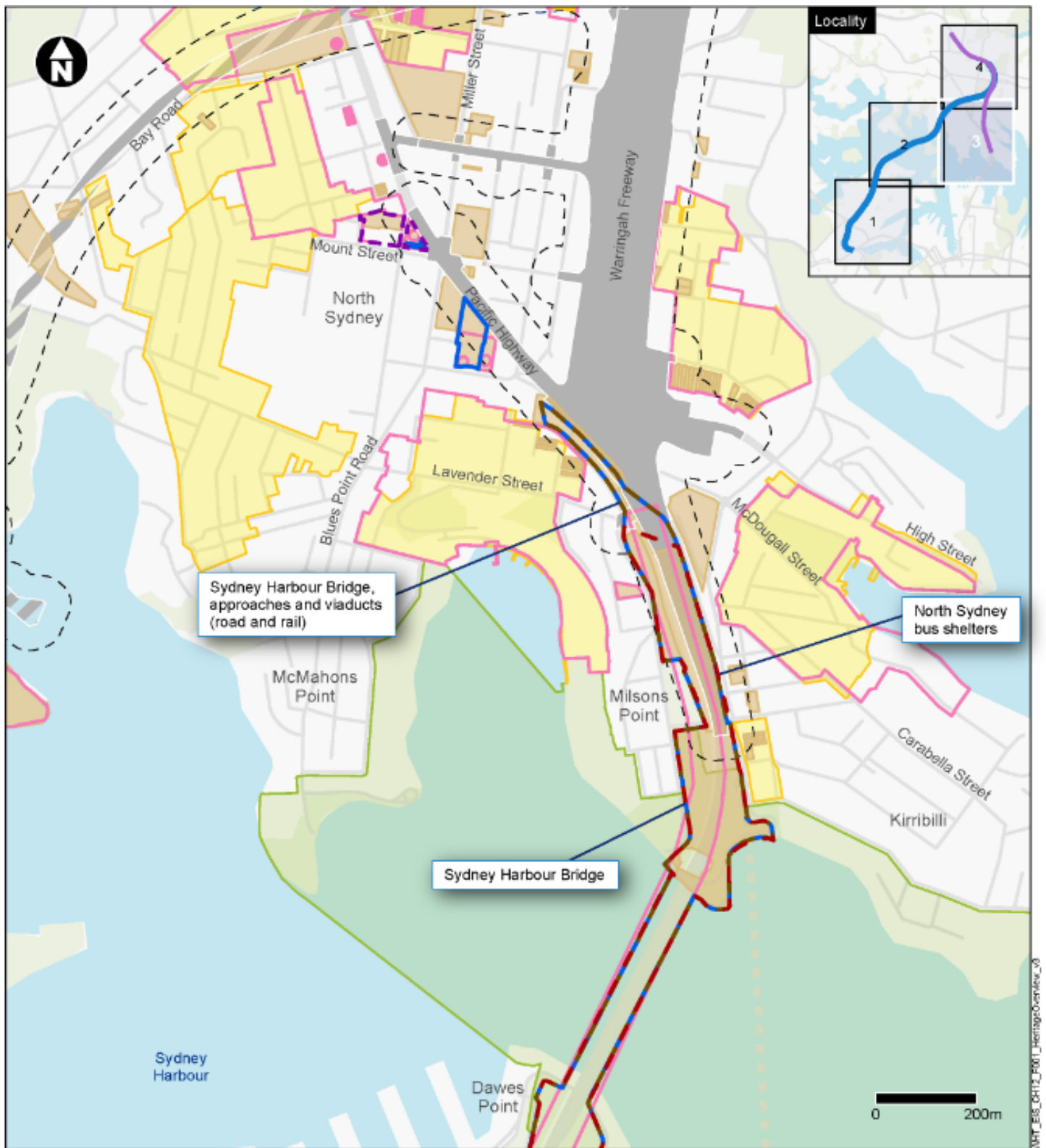
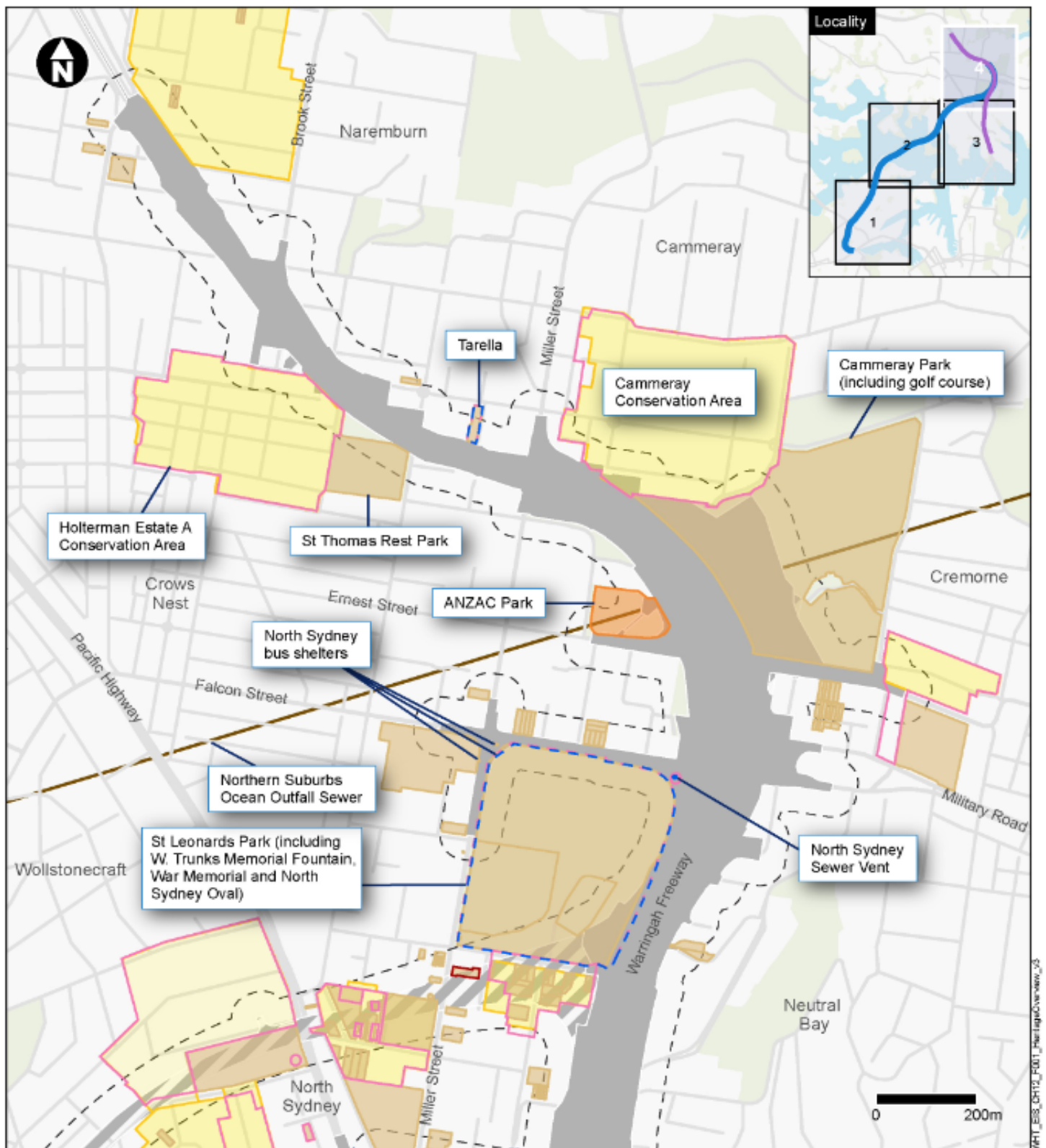


Figure 14-3 Location of all heritage items and potential heritage items within the study area (map 3)



**Legend**

**Construction features**

- Study area
- Tunnel
- Construction footprint

**Heritage and potential heritage items**

- State Heritage Register (DPE 2017)
- s170 area (compiled by Jacobs 2017)
- LEP Heritage Items (DPE 2017)
- LEP Heritage Items - Conservation Areas (DPE 2017)
- Register of the National Estate (DOE 2015)
- Potential non-Aboriginal heritage items
- National Heritage List (DOE 2015)
- Potential maritime heritage item

**Figure 14-4 Location of all heritage items and potential heritage items within the study area (map 4)**

## 14.4.2 Potential maritime heritage impacts

Of the 18 maritime heritage items identified within the study area, 12 items would not be impacted by the project, including (refer to Figure 14-5):

- Balls Head Reserve, western foreshore
- Unidentified Balls Head Bay 1 shipwreck
- Balls Head #1 Unknown shipwreck
- ANZAC Bridge
- Wreck 1241
- Sidescan Sonar anomalies 1 to 7.

A heritage assessment for the remaining six heritage items that would be potentially impacted is included in Table 14-4 and shown in Figure 14-5. Areas of archaeological potential have also been assessed (Items 7, 8 and 9).



**Table 14-4 Potential impacts on maritime heritage sites**

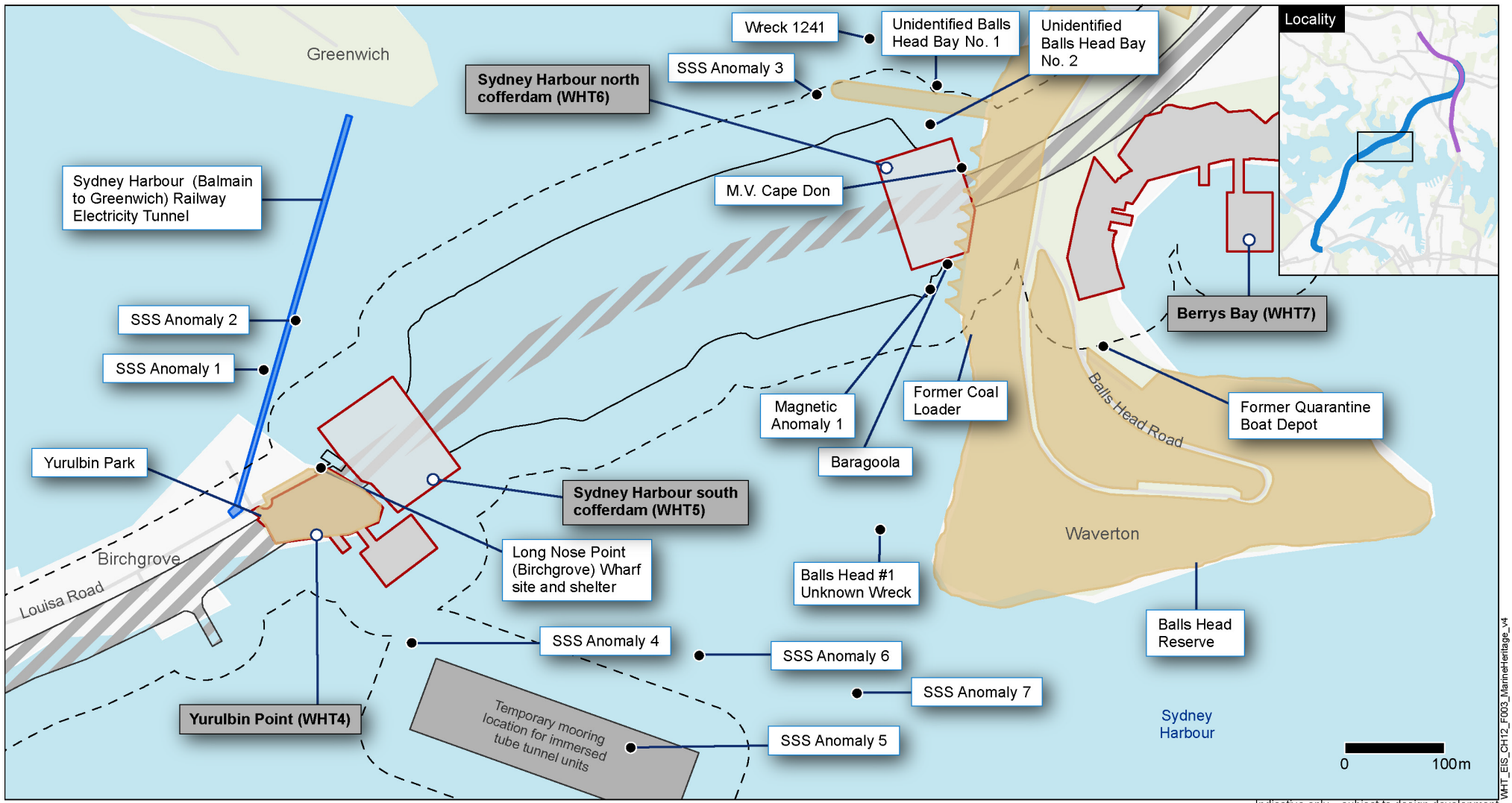
Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
<b>Heritage items</b>					
1	Long Nose Point (Birchgrove) Wharf site and shelter	Sydney Regional Environmental Plan (Sydney Harbour Harbour Catchment) 2005	Local	<p>Direct impacts:</p> <ul style="list-style-type: none"> <li>No planned direct impacts.</li> </ul> <p>Potential direct impacts:</p> <ul style="list-style-type: none"> <li>Permanent physical impact to the heritage item from anchoring of project vessels on or around the item</li> <li>Permanent physical impact to the heritage item from potential collision of project vessels</li> <li>Permanent physical impact to the heritage item by water turbulence from the operation of project vessels.</li> </ul> <p>Indirect impacts:</p> <ul style="list-style-type: none"> <li>Temporary vibration impacts to the heritage item due to the construction of the Sydney Harbour south cofferdam (WHT5)</li> <li>Temporary visual impacts due to the location of the Sydney Harbour south cofferdam (WHT5)</li> <li>Permanent settlement impacts to the heritage items due to the construction of the immersed tube tunnels.</li> </ul>	<p><b>Minor</b></p> <p>The proposed works may result in partial loss of site integrity and reduction in heritage values. Potential direct and indirect impacts to the heritage item would be minimised with the implementation of the management measures described in Section 14.5.</p>
2	Unidentified Balls Head Bay 2	NSW Maritime Heritage Sites	Local	<p>No direct impacts</p> <p>No potential direct impacts</p>	<p><b>Minor</b></p> <p>The proposed works may result in partial loss of site integrity and</p>

Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
				Indirect impacts: <ul style="list-style-type: none"> <li>• Temporary vibration impacts to the heritage item due to the construction of the Sydney Harbour north cofferdam (WHT6).</li> </ul>	reduction in heritage values. Potential direct and indirect impacts to the heritage item would be minimised with the implementation of the management measures described in Section 14.5 to collect archaeological information from the site before construction and to establish an exclusion zone before construction.
3	<i>Baragoola</i>	Australian Register for Historic Vessels	State	Direct impacts: <ul style="list-style-type: none"> <li>• Relocation of vessel to a different berthing facility.</li> </ul> No potential direct impacts	<b>Negligible</b> With the implementation of the management measures described in Section 14.5, the level of impact on the heritage item would be negligible. Vessel owners would be provided with reasonable notice to find a suitable alternate berthing within Sydney Harbour before construction commences.  Transport for NSW should take no action that results in the degradation of the heritage significance of the items until relocation occurs.
				Indirect impacts: <ul style="list-style-type: none"> <li>• Ability to maintain and repair the vessels could be reduced if relocated to unsuitable berth facilities.</li> </ul>	
4	<i>M.V. Cape Don</i>	Australian Register for Historic Vessels	State	Direct impacts: <ul style="list-style-type: none"> <li>• Relocation of vessel to a different berthing facility.</li> </ul>	<b>Negligible</b> With the implementation of the management measures described in

Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
				No potential direct impacts	Section 14.5, the level of impact on the heritage item would be negligible. Vessel owners would be provided with reasonable notice to find a suitable alternative berthing within Sydney Harbour before construction commences. Transport for NSW should take no action that results in the degradation of the heritage significance of the items until relocation occurs.
				Indirect impacts: <ul style="list-style-type: none"> <li>Ability to maintain and repair the vessels could be reduced if relocated to unsuitable berth facilities.</li> </ul>	
5	Former Quarantine Boat Depot	North Sydney Local Environmental Plan 2013	Local	No direct impacts	<b>Minor</b> Impacts to the heritage item would be limited to temporary indirect visual impacts. With the implementation of the management measures described in Section 14.5, the level of impact on the heritage item would be minor.
				No potential direct impacts	
				Indirect impacts: <ul style="list-style-type: none"> <li>Temporary visual impacts due to the location of construction equipment and infrastructure at Berrys Bay construction support site (WHT7).</li> </ul>	
<b>Unverified anomalies – potential heritage items</b>					
6	Magnetic anomaly 1	Unlisted	Unknown – low heritage sensitivity	Direct impacts: <ul style="list-style-type: none"> <li>Planned permanent physical impacts to the entire item due to dredging for the immersed tube tunnels.</li> </ul>	<b>Minor</b> Assuming the magnetic anomaly has heritage value, the proposed dredging works for the immersed tube tunnels would result in loss of site integrity and reduction in
				No potential direct impacts	

Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
				No indirect impacts	heritage values. As the expected heritage sensitivity of the site is low, the implementation of the pre-dredge management measures described in Section 14.5 would result in a minor impact if any.
<b>Potential archaeological sites</b>					
7	Potential archaeological sites in Sydney Harbour between Birchgrove and Waverton	Unlisted	Unknown – low to medium heritage sensitivity	<p>Direct impacts:</p> <ul style="list-style-type: none"> <li>Planned permanent physical impacts to the bed of the harbour in this area due to dredging for the immersed tube tunnels and construction of the Sydney Harbour south and Sydney Harbour north cofferdams (WHT5 and WHT6).</li> </ul> <p>Potential direct impacts:</p> <ul style="list-style-type: none"> <li>Permanent physical impact to the bed of the harbour in this area from anchoring of project vessels on or around the item</li> <li>Permanent physical impact to the bed of the harbour in this area by water turbulence from the operation of project vessels.</li> </ul> <p>Indirect impacts:</p> <ul style="list-style-type: none"> <li>Temporary vibration impacts to potential archaeological remains in this area due to the construction of the Sydney Harbour south and Sydney Harbour north cofferdams (WHT5 and WHT6).</li> </ul>	<p><b>Minor</b></p> <p>The proposed works may result in partial loss of site integrity and reduction in heritage values of potential archaeological sites. Impacts to potential archaeological sites would be minimised with the implementation of the management measures described in Section 14.5 to identify any further heritage items before construction.</p>

Item No.	Item name	Listing	Heritage significance	Impact type	Impact rating
8	Potential archaeological sites in the western portion of Berrys Bay	Unlisted	Unknown – low to medium heritage sensitivity	<ul style="list-style-type: none"> <li>No direct impacts</li> </ul>	<b>Minor</b> The proposed works may result in partial loss of site integrity and reduction in heritage values of potential archaeological sites. Impacts to potential archaeological sites would be minimised with the implementation of the management measures described in Section 14.5.
				Potential direct impacts: <ul style="list-style-type: none"> <li>Permanent physical impacts to the bed of the harbour in this area due to the construction of temporary wharves at Berrys Bay construction support site (WHT7)</li> <li>Permanent physical impact to the bed of the harbour in this area from anchoring of project vessels on or around the item</li> <li>Permanent physical impact to the bed of the harbour in this area by water turbulence from the operation of project vessels.</li> </ul>	
				No indirect impacts	
9	Potential archaeological sites in White Bay	Unlisted	Unknown – low heritage sensitivity	No direct impacts	<b>Minor</b> The proposed works may result in partial loss of site integrity and reduction in heritage values of potential archaeological sites. Impacts to potential archaeological sites would be minimised with the implementation of the management measures described in Section 14.5.
				Potential direct impacts: <ul style="list-style-type: none"> <li>Permanent physical impacts to the bed of the harbour in this area due to the construction of a temporary wharf at the White Bay construction support site (WHT3).</li> </ul>	
				No indirect impacts	



Indicative only – subject to design development

- Legend**
- |                              |  |
|------------------------------|--|
| <b>Construction features</b> | <b>Heritage and potential heritage items</b> |
| --- Study area               | ■ State Heritage Register (DPE 2017)         |
| ▨ Tunnel                     | ■ LEP Heritage Items (DPE 2017)              |
| ■ Surface features           | ● Potential maritime heritage item           |
| ■ Construction support site  |  |

**Figure 14-5 Location of maritime heritage items impacted by the project**

## 14.5 Environmental management measures

Environmental management measures relating to non-Aboriginal heritage are outlined in Table 14-5.

**Table 14-5 Environmental management measures for non-Aboriginal heritage impacts**

Ref	Phase	Impact	Environmental management measure	Location
<b>Terrestrial heritage</b>				
NAH1	Design	Sydney Harbour Bridge	The Lavender Street toll gantry will be designed to avoid direct impact with the heritage item and to minimise visual obstruction of the Lavender Street arch in consultation with relevant stakeholders. All works potentially affecting the Sydney Harbour Bridge will be carried out in accordance with <i>Sydney Harbour Bridge Conservation Management Plan 2007</i> .	WFU - Sydney Harbour Bridge
NAH2	Design	Non-Aboriginal heritage impacts	Appropriate heritage interpretation will be incorporated into the urban design for the project in accordance with the <i>NSW Heritage Manual</i> (NSW Heritage Office and Department of Urban Affairs and Planning, 1996), <i>Interpreting Heritage Places and Items: Guidelines</i> (Roads and Maritime, 2005f), and the <i>Heritage Interpretation Policy</i> (NSW Heritage Council, 2005).	WHT/WFU
NAH3	Design / construction	ANZAC Park	Impacts to areas of archaeological potential will be avoided by the project. In the event that works are required in the location of the air raid trenches, an archaeological excavation will be required with a test excavation methodology prepared in consultation with relevant stakeholders prior to the disturbance of this area.	WFU - ANZAC Park
NAH4	Pre-construction	Ongoing non-Aboriginal heritage impacts	Should at-property noise treatment be required at a premises that is heritage listed, this will be carried out in a manner to minimise heritage impact, and advice of a heritage conservation architect will be sought prior to undertaking the works. Any treatment will be sympathetic to the heritage values of the item, designed with heritage architect input and be reversible where feasible and reasonable.	WHT/WFU

Ref	Phase	Impact	Environmental management measure	Location
NAH5	Pre-construction	Impacts on specific non-Aboriginal heritage items	<p>Archival recording will be carried out in accordance with the <i>Photographic Recording of Heritage Items Using Film or Digital Capture</i> guideline for areas/items subject to change within the following terrestrial items, in accordance with Appendix J (Non-Aboriginal heritage working paper):</p> <ul style="list-style-type: none"> <li>a) Item 2: The Valley Heritage Conservation Area, Rozelle and Balmain</li> <li>b) Item 4: Yurulbin Park, Birchgrove</li> <li>c) Item 7: BP site, Waverton</li> <li>d) Item 9: North Sydney Bus Shelters</li> <li>e) Item 10: St Leonards Park (including W. Tunks Memorial Fountain, War Memorial, and North Sydney Oval), North Sydney</li> <li>f) Item 14: Cammeray Park (including Golf Course), Cammeray</li> <li>g) Item 15: Cammeray Conservation Area, Cammeray.</li> </ul> <p>Archival recording will be completed prior to any works that have the potential to impact upon the items, and deposited with appropriate stakeholders as determined during detailed design (eg local councils).</p>	WHT/WFU - Specific sites listed
NAH6	Pre-construction	Yurulbin Park	A condition survey will be completed prior to works commencing. Opportunities to temporarily remove, store and reinstate these elements on completion of construction work will be investigated and implemented if these elements need to be temporarily removed.	WHT - Yurulbin Park
NAH7	Pre-construction	Woodleys Shipyard	Should heritage buildings be changed externally, such as by adding cladding or extensions, further assessment will be carried out to identify approaches to avoid heritage fabric and/or minimise impact on heritage significance. This will include consideration of how works can be carried out to facilitate subsequent adaptive reuse or to minimise incremental impacts.	WHT - Woodleys Shipyard
NAH8	Pre-construction	Cammeray Golf Course	A thematic heritage study of golf courses in Sydney will be prepared for the region north of the Sydney Harbour. This study will assist in identifying other potential	WFU – Cammeray Golf Course



Ref	Phase	Impact	Environmental management measure	Location
			heritage items in the region that demonstrate the same or similar significance as the Cammeray Golf Course.	
NAH9	Pre-construction / construction	Impacts on archaeology	Archaeological investigations will be carried out at: a) Item 4: Yurulbin Park, Birchgrove b) Item 7: BP site, Waverton.	WHT
NAH10	Construction	Unexpected discovery of historical heritage materials, features, or deposits	If at any time during construction of the project, historical heritage materials, features and/or deposits are encountered, the <i>Standard Management Procedure: Unexpected Archaeological Finds</i> (Roads and Maritime, 2015d) will be followed.	WHT/WFU
NAH11	Construction	Unexpected discovery of human remains	In the event that construction of the project reveals possible human skeletal material (remains), <i>Standard Management Procedures – Unexpected Heritage Items</i> (Roads and Maritime, 2015e) will be implemented.	WHT/WFU
NAH12	Construction	Heritage impacts during construction	Non-Aboriginal historical heritage awareness training will be provided for contractors prior to commencement of construction works to ensure understanding of potential heritage items that may be impacted during the project, and the procedure required to be carried out in the event of discovery of historical heritage materials, features or deposits, or the discovery of human remains.	WHT/WFU
NAH13	Construction	BP Site	The heritage item will be rehabilitated and returned to an equivalent state as soon as practicable. Reinstatement of the site will include investigating the adaptive reuse of the site for the wider community.	WHT - BP Site
NAH14	Construction	Impacts to North Sydney bus shelters	The North Sydney bus shelters (Item 9) will be temporarily removed, stored and relocated on completion of construction work with council.	WFU
<b>Maritime heritage</b>				
NAH15	Design and Construction	Maritime non-Aboriginal	Investigation into the potential to relocate or redesign the temporary wharves at the proposed temporary construction facility	WHT – Berrys Bay

Ref	Phase	Impact	Environmental management measure	Location
		heritage impacts – Berrys Bay	WHT7 in Berrys Bay will be carried out to minimise impact on maritime heritage. Where this is not feasible then appropriate mitigation will be implemented before construction in accordance with the <i>Maritime Heritage Management Plan</i> (Mitigation Measure NAH16). Such mitigation will include carrying out archaeological excavation and documentation under the direction of a qualified archaeologist across all areas of impact at the site.	
NAH16	Pre-construction	Maritime non-Aboriginal heritage impacts	<p>A Maritime Heritage Management Plan that details the objectives and methodologies to conserve maritime heritage and mitigate impacts will be prepared by a qualified and experienced maritime archaeologist. The Maritime Heritage Management Plan should specify:</p> <ol style="list-style-type: none"> <li>Unexpected finds protocols relevant to each type of activity such as dredging or piling</li> <li>Artefact management procedures, including identification of approved submerged reburial locations</li> <li>Relevant work method requirements and maritime heritage inductions tailored for each type of work activity such as dredging or piling</li> <li>Exclusion zone, archival, baseline and periodic monitoring protocols including before and during construction, and final site inspections within three months of completion of works for the following maritime heritage sites: <ul style="list-style-type: none"> <li>Balls Head Coal Loader wharf</li> <li>Yurulbin Park maritime infrastructure</li> <li>Unidentified Balls Head Bay 2 wreck</li> <li>Collapsed wharf, BP site, Berrys Bay</li> </ul> </li> <li>Requirements for any mitigation recovery or archaeological excavations.</li> </ol>	WHT
NAH17	Pre-construction	Maritime non-Aboriginal heritage	Any pre-dredge clearance of the bed of the harbour in Sydney Harbour will be carried out in the presence of a qualified maritime archaeologist who will identify any additional inspection or	WHT

Ref	Phase	Impact	Environmental management measure	Location
		impacts	documentation that should be carried out during the clearance dives. This may include inspecting the locations of known or suspected submerged cultural heritage, detailed recording, or recovery and relocation of heritage objects.	
NAH18	Pre-construction	Maritime non-Aboriginal heritage impacts	<p>Archival recording of the following maritime heritage sites will be carried out prior to works commencing in order to mitigate against predicted or potential impacts, and to establish a baseline against which to measure any changes to these sites due to works at:</p> <ul style="list-style-type: none"> <li>a) Balls Head Coal Loader wharf</li> <li>b) Unidentified Balls Head Bay 2 wreck</li> <li>c) Yurulbin Park maritime infrastructure</li> <li>d) Collapsed timber wharf, BP site, Berrys Bay</li> <li>e) Slipway No. 1, former Woodleys Shipyard, Berrys Bay.</li> </ul> <p>The archival recording will include:</p> <ul style="list-style-type: none"> <li>a) Creation of a detailed site plan by a surveyor for Balls Head Coal Loader, Yurulbin Park maritime infrastructure, collapsed timber wharf and Slipway No. 1, former Woodley's shipyard</li> <li>b) Detailed recording and inventory of all site elements</li> <li>c) Detailed diver survey and recording of submerged sites and site elements, primarily in the form of video and photography.</li> </ul> <p>All archival recordings are to be prepared consistently with the current NSW Heritage Council endorsed standards and guidelines.</p>	WHT
NAH19	Pre-construction	Maritime non-Aboriginal heritage impacts	<p>A sidescan sonar survey will be prepared for sections of the Sydney Harbour crossing not already included in the sidescan sonar coverage in Area A in Appendix K (Technical working paper: Maritime heritage).</p> <p>A qualified maritime archaeologist will assess the results of the sidescan survey to identify any additional potential heritage items requiring investigation and assessment.</p>	WHT
NAH20	Pre-construction	Maritime non-Aboriginal heritage	Transport for NSW will give reasonable time and notice for the owners of the historic vessels <i>M.V Cape Don</i> and <i>Baragoola</i> to find a suitable alternate	WHT

Ref	Phase	Impact	Environmental management measure	Location
		impacts	berthing within Sydney Harbour before construction commences. Transport for NSW will take no action that results in the degradation of the heritage items until relocation occurs.	
NAH21	Construction	Maritime non-Aboriginal heritage impacts	An exclusion zone will be established around the former Balls Head Coal Loader wharf extending at least 15 metres from the edge of the wharf apron and thus also covering the Unidentified Balls Head Bay 1 and 2 wrecks.	WHT - Balls Head Coal Loader Wharf

Western Harbour Tunnel = WHT, Warringah Freeway Upgrade = WFU

