

# Chapter 12

## Non-Aboriginal heritage



# Contents

<b>12.</b>	<b>Non-Aboriginal heritage</b>	<b>12.1</b>
12.1	Approach	12.1
12.1.1	Study area	12.1
12.1.2	Key tasks	12.2
12.1.3	How potential impacts have been avoided or minimised	12.2
12.2	Existing environment	12.3
12.2.1	Historical context	12.3
12.2.2	Listed heritage items	12.3
12.2.3	Potential heritage items	12.11
12.2.4	Archaeological sites and potential	12.11
12.3	Assessment of construction impacts	12.14
12.3.1	Built heritage	12.14
12.3.2	Land-based archaeology	12.19
12.3.3	Maritime archaeology	12.19
12.4	Assessment of operation impacts	12.21
12.5	Cumulative impacts	12.23
12.6	Mitigation and management measures	12.23
12.6.1	Approach to mitigation and management	12.23
12.6.2	List of mitigation measures	12.24

## Tables

Table 12.1	Listed heritage items within and adjacent to project site	12.4
Table 12.2	Preliminary assessment of significance of potential items within and close to the project site	12.11
Table 12.3	Historical archaeological management units with medium to high archaeological potential	12.12
Table 12.4	Summary of potential impacts (minor or greater) on built heritage items and listed archaeological sites	12.15
Table 12.5	Summary of potential impacts on medium to high potential HAMUs	12.20
Table 12.6	Summary of potential visual impacts on heritage items and their setting	12.21
Table 12.7	Non-Aboriginal heritage mitigation measures	12.24

## Figures

Figure 12.1	Listed and potential heritage items – map 1	12.7
Figure 12.2	Listed and potential heritage items – map 2	12.8
Figure 12.3	Listed heritage items (Parramatta CBD)	12.9
Figure 12.4	Photo of the Main House, part of the locally listed Bulla Cream Dairy (Willowmere)	12.9

Figure 12.5	Visible remains of the Ermington Wharf/Wharf/Former Pennant Hills Wharf (immediately adjacent to the Ermington Boat Ramp)	12.10
Figure 12.6	View of Federation era building within the State Abattoir locality	12.10
Figure 12.7	Historical Archaeological Management Units with medium to high potential (Camellia to Ermington)	12.13
Figure 12.8	Historical Archaeological Management Units with medium to high potential (Melrose Park)	12.13

## 12. Non-Aboriginal heritage

This chapter provides a summary of the non-Aboriginal heritage assessments. It describes existing non-Aboriginal heritage (including built heritage, and historic and maritime archaeology), identifies potential impacts, and provides measures to mitigate and manage the impacts identified. Further information is provided in Technical Paper 5 (Statement of Heritage Impact – Built Heritage) and Technical Paper 6 (Historical Archaeological Assessment).

### 12.1 Approach

The project has the potential to affect non-Aboriginal heritage of local and State significance. Heritage with the potential to be affected includes built heritage and archaeological sites, which encompass historical sites on the land and maritime archaeology in the Parramatta River.

Two assessments have been undertaken and reports prepared to document the potential impacts – a Statement of Heritage Impact and a Historical Archaeological Assessment. The assessments have been undertaken in accordance with the SEARs (see Appendix A), applicable legislation (including the *Heritage Act 1977* (NSW) (the Heritage Act), *Underwater Cultural Heritage Act 2018* (Cth) and associated regulations) and relevant guidelines, including:

- *Archaeological Assessments* (Heritage Office and Department of Urban Affairs and Planning, 1996)
- *Assessing Heritage Significance* (Heritage Office, 2001)
- *Statements of Heritage Impact* (Heritage Office, 2002)
- *Assessing Significance for Historical Archaeological Sites and Relics* (NSW Heritage Branch, 2009).

A detailed description of the legislative and policy context for the assessments is provided in section 2 of Technical Paper 5 (Statement of Heritage Impact – Built Heritage) and Technical Paper 6 (Historical Archaeological Assessment).

An overview of the approach to the assessments is provided below. Further information on the assessment methodologies is provided in section 1.4 of Technical Paper 5 and section 3 of Technical Paper 6.

#### 12.1.1 Study area

The study area for the assessments includes the project site for the EIS (as described in Chapter 2 (Location and setting)). The assessment also included consideration of a buffer around the project site to take into account the potential for indirect (vibration) impacts on built heritage items as a result of works within the project site. The buffer, which is 66 metres wide (based on the maximum distance of potential vibration impacts), also helps identify heritage items potentially located within the visual catchment of the project, where potential visual impacts may occur.

## 12.1.2 Key tasks

The built heritage and archaeology assessments involved:

- background research on the historical context of the study area, including reviewing previous assessments and relevant conservation/heritage management plans
- identifying heritage-listed items in the study area by searching local, NSW and Australian statutory and other heritage lists
- undertaking site inspections in September 2021 and January 2022 to identify listed and potential heritage items and areas of archaeological potential
- dividing the project site into 25 historical archaeological management units (HAMUs) and two maritime archaeological management units (MAMUs) and assessing each for archaeological potential (i.e., how likely it is for evidence of past activity to have survived into the present day)
- undertaking a sonar (multibeam echosounder) survey of the riverbed in March 2022 for MAMUs where more information was needed to understand archaeological potential and to identify any physical indicators of former structures, watercraft or other significant geomorphological features
- assessing the significance of heritage with the potential to be impacted by the project
- assessing the significance of the potential impacts on heritage items and areas likely to contain significant archaeology with consideration of relevant guidelines and requirements
- identifying measures to manage and mitigate identified impacts, including the preparation of an Archaeological Research and Excavation Framework to guide test excavations (planned to commence in late 2022)
- preparing reports (a Statement of Heritage Impact for built heritage and a Historical Archaeological Assessment (Technical Papers 5 and 6)) to provide the results of the assessments.

Potential impacts were assessed considering impacts on the significance of a heritage item as a result of:

- direct (physical) impacts – caused by removing or altering the item or fabric of heritage significance, or excavating in areas of the project site where potential for significant archaeology is anticipated
- potential direct impacts – caused by vibration or by removing adjoining structures within or outside the project site (the potential for vibration impacts was assessed by Technical Paper 3 (Noise and Vibration))
- visual impacts – caused by changes to the setting or curtilage of heritage items, places, historic streetscapes and views within or outside the project site.

## 12.1.3 How potential impacts have been avoided or minimised

The approach to design development has included a focus on avoiding and/or minimising the potential for impacts during all key phases of the design process. As described in Chapter 5 (Design development, alternatives and options) a project corridor and alignment options assessment process was undertaken to identify the preferred alignment. This process considered a range of factors, including the presence of listed heritage items.

The project design has been refined to avoid impacts on non-Aboriginal heritage where possible, including:

- maximising the use of existing road and rail corridors to minimise encroachment into the curtilages of adjacent heritage items and the amount of disturbance required
- selecting an alignment near the proposed Atkins Road stop in Melrose Park to avoid direct impacts on the Main House at the heritage-listed Bulla Cream Dairy (Willowmere)

- including a proposed area of public open space (with heritage appropriate paving and plant material) and section of green track in the vicinity of Bulla Cream Dairy (Willowmere) to sympathetically integrate the project with the heritage item
- minimising impacts on the banks of the Parramatta River and associated vegetation by locating the proposed bridges to make use of natural gaps in mangrove vegetation (which incorporates a locally listed heritage item (Wetlands (Item I1)) and proposing use of elevated temporary jetties to construct the bridges
- minimising disturbance within the Parramatta River where there may be potential maritime archaeology as far as practicable (e.g., avoiding dredging, minimising the number of bridge piers required).

## 12.2 Existing environment

### 12.2.1 Historical context

Most of the land within the study area was initially granted to settlers and freed convicts in the late 18th century. Over time, this land became part of large estates owned by significant families in the early history of NSW.

Historic land uses in the first decades following colonial settlement exploited fertile lands that were ideally suited to European agriculture and horticulture. From the late 19th and early 20th century, development was primarily characterised by subdivision and changed from farming to either industrial or residential development. Many of the subdivisions were slow to sell and large parcels of land retained rural characteristics until the 1940s. This made them prime candidates for the development of post-war housing estates, many of which continue to occupy the land today. Away from the areas of post-war housing, particularly in areas along the Parramatta River, private and state-owned industrial factories, refineries, and other works dominated the late 19th and 20th century landscape.

The Parramatta River was an important transport link connecting Sydney and Parramatta. Small rowing and sailing vessels carried passengers and mail to Parramatta from Sydney and carried farm produce to Sydney from Parramatta. The importance of the river as a transport route encouraged the growth of farming and industry along its banks. Marine vessels were soon carrying manufactured goods in addition to produce and passengers. However, the increasing popularity of the railway line to Parramatta in the late 1850s led to the decline of the river as a major arterial transport route. In 1993, the RiverCat ferry service was introduced and was immediately successful catering for growing demand for river travel as more housing developments have been completed along the river. Parramatta River also accommodates a range of private boating craft, with the Ermington Boat Ramp located at the end of Wharf Road in Melrose Park.

### 12.2.2 Listed heritage items

There are no items listed on World or National heritage registers located within or close to the project site. There are no items listed on the State heritage register located within the project site, those close to the project site are listed in Figure 12.1.

Five items listed on other heritage registers (local environmental plans and State environmental planning policies (SEPPs)) are located within the project site (see listing details in Figure 12.1):

- Tram Alignment
- Wetlands
- Bulla Cream Dairy (Willowmere)

- Ermington Wharf/Wharf/Former Pennant Hills Wharf
- State Abattoir locality.

All of the above items, with the exception of Bulla Cream Dairy (Willowmere), are located partially within the project site.

The project site crosses two heritage conservation areas (listed under State Environmental Planning Policy (Precincts – Central River City) 2021):

- Millennium Parklands Heritage Precinct (Item A) under Appendix 12 (it is noted that this area is also listed as Newington Armament Depot and Nature Reserve (Conservation Area B) under Appendix 4; however, is referred to in the EIS as the Millennium Parklands Heritage Precinct))
- State Abattoirs heritage conservation area (Area No.1 under Appendix 12, also listed as Conservation Area A in Appendix 4) (the conservation area has the same curtilage as the State Abattoir locality noted above).

Listed heritage items within and close to the project site are summarised in Table 12.1. Items located within/adjacent to the project site between Camellia and Sydney Olympic Park are shown on Figure 12.1 and Figure 12.2. Items in the vicinity of the project site in the Parramatta CBD are shown on Figure 12.3.

Further information on these items and their significance is provided in section 6 of Technical Paper 5 (Statement of Heritage Impact – Built Heritage).

Conservation management plans relevant to the project site comprise:

- Newington Armament Depot and Nature Reserve, Sydney Olympic Park Conservation Management Plan (Tanner Architects, 2013)
- Abattoir Heritage Precinct, Sydney Olympic Park Conservation Management Plan (Government Architect's Office, 2013)
- Millennium Parklands Heritage Precinct Conservation Master Plan (Graham Brooks and Associates, 2003).

Table 12.1 Listed heritage items within and adjacent to project site

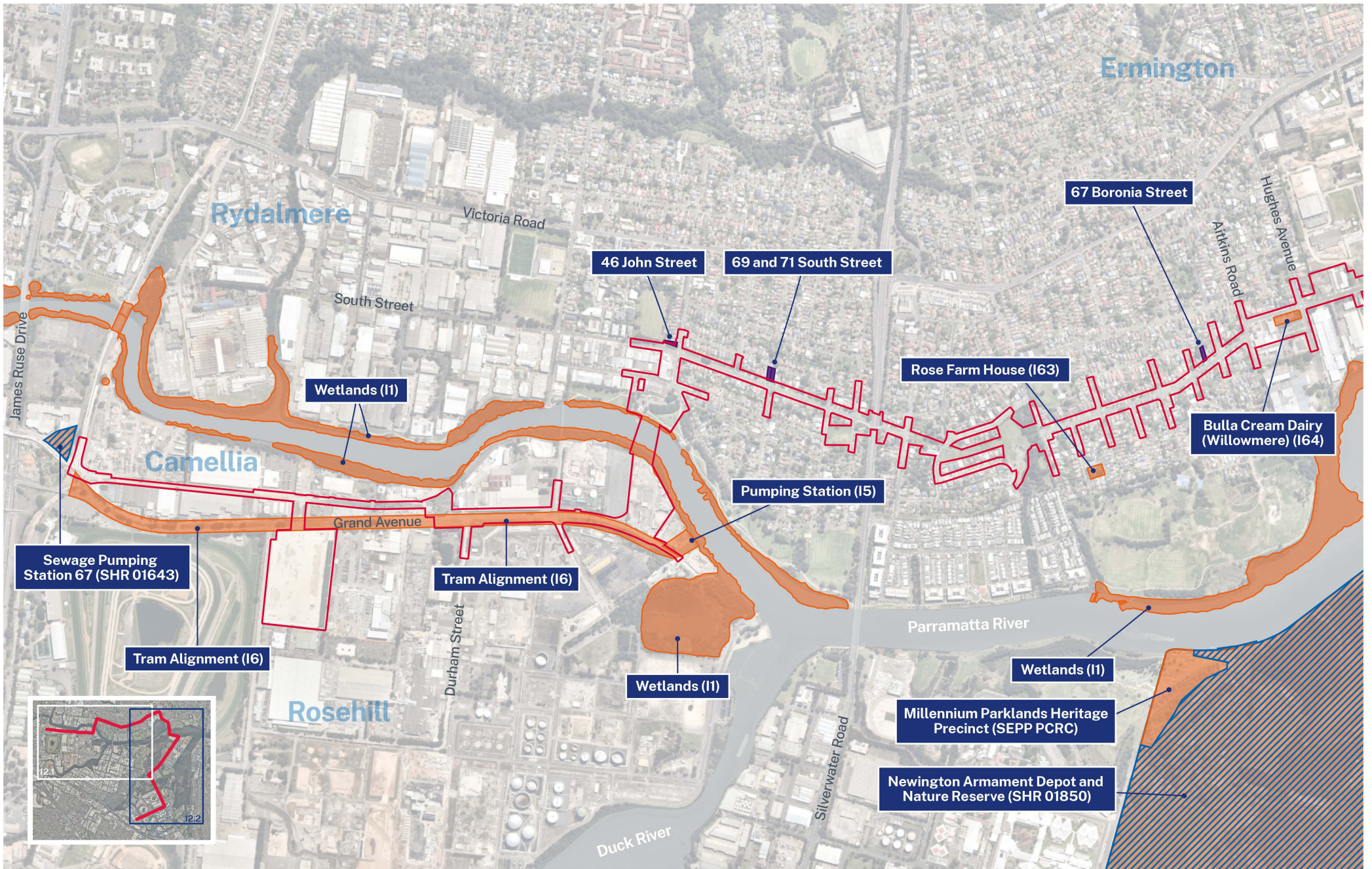
Location	Item	Listing (instrument and item number)	Significance	Location with respect to the project site
<b>Items listed on the State Heritage Register</b>				
Parramatta CBD	St John's Anglican Cathedral	State Heritage Register (01805) Parramatta Local Environmental Plan 2011 (Parramatta LEP) (I01805)	State	About 50 metres south of the project site
	Archaeological Site and Associated Artefacts	State Heritage Register (02027) Parramatta LEP (A11)	State	About 10 metres south of the project site
Camellia	Sewage Pumping Station 67	State Heritage Register (01643) Sydney Water Section 170 (4571724) Parramatta LEP (I01643)	State	About 20 metres west of the project site
Sydney Olympic Park	Newington Armament Depot and Nature Reserve	State Heritage Register (01850)	State	About 20 metres west of the project site

Location	Item	Listing (instrument and item number)	Significance	Location with respect to the project site
<b>Other listed items</b>				
Parramatta CBD	Parramatta Town Hall (and potential archaeological site)	Parramatta LEP (I650)	Local	About 50 metres south-east of the project site
	Bicentennial Square and adjoining buildings	Parramatta LEP (I1651)	Local	Immediately adjacent to the project site
	Murrays' Building (and potential archaeological site)	Parramatta LEP (I652)	Local	About 35 metres east of the project site
	Warden's cottage (verger's cottage)	Parramatta LEP (I653)	Local	About 50 metres south of the project site
	Centennial Memorial Clock	Parramatta LEP (I654)	Local	About 10 metres east of the project site
	Shop (and potential archaeological site)	Parramatta LEP (I655)	Local	Immediately adjacent to the project site
	Horse parapet façade (and potential archaeological site)	Parramatta LEP (I656)	Local	Immediately adjacent to the project site
	Telstra House (former post office) (and potential archaeological site)	Parramatta LEP (I657)	Local	About 50 metres north of the project site
	HMV (former Commonwealth Bank) (and potential archaeological site)	Parramatta LEP (I658)	Local	About 60 metres north of the project site
	St John's Parish Hall	Parramatta LEP (I713)	Local	About 50 metres south of the project site
Camellia	Pumping Station	Parramatta LEP (I5)	Local	Immediately adjacent to the project site
	Tram Alignment	Parramatta LEP (I6)	Local	Partially within the project site
Camellia, Rydalmere and Melrose Park	Wetlands	Parramatta LEP (I1)	Local	Partially within the project site
Ermington	Rose Farm House	Parramatta LEP (I63)	Local	About 50 metres south of the project site
	Bulla Cream Dairy (Willowmere) (see Figure 12.4)	Parramatta LEP (I64)	Local	Within the project site
Melrose Park	Ermington Wharf/Wharf/Former Pennant Hills Wharf (see Figure 12.5)	Parramatta LEP (I82 – Ermington Wharf) Ryde Local Environmental Plan 2014 (I65 – Wharf) State Environmental Planning Policy (Biodiversity and Conservation) 2021 (I40 – Former Pennant Hills Wharf)	Local	Partially within the project site
	Lockyers Wharf	NSW Maritime Heritage Database	Local	About 250 metres east of the project site



Location	Item	Listing (instrument and item number)	Significance	Location with respect to the project site
Sydney Olympic Park	Millennium Parklands Heritage Precinct	State Environmental Planning Policy (Precincts – Central River City) 2021 (Item A) in Appendix 12 (Also listed as Newington Armament Depot and Nature Reserve (Conservation Area B) in Appendix 4)	State	Partially within the project site
	Explosives Store	State Environmental Planning Policy (Precincts – Central River City) 2021 (Item 87)	State	About 350 metres west of project site
	State Abattoirs heritage conservation area State Abattoir locality (see Figure 12.6)	State Environmental Planning Policy (Precincts – Central River City) 2021 (Area No. 1 in Appendix 12 and Conservation Area A in Appendix 4, and Item No. 1 and 2)	State	Partially within the project site





**LEGEND**

- Project site
- Other heritage listed item
- Items listed on the State Heritage Register
- Potential heritage item

Figure 12.1 Listed and potential heritage items – map 1

0 500m





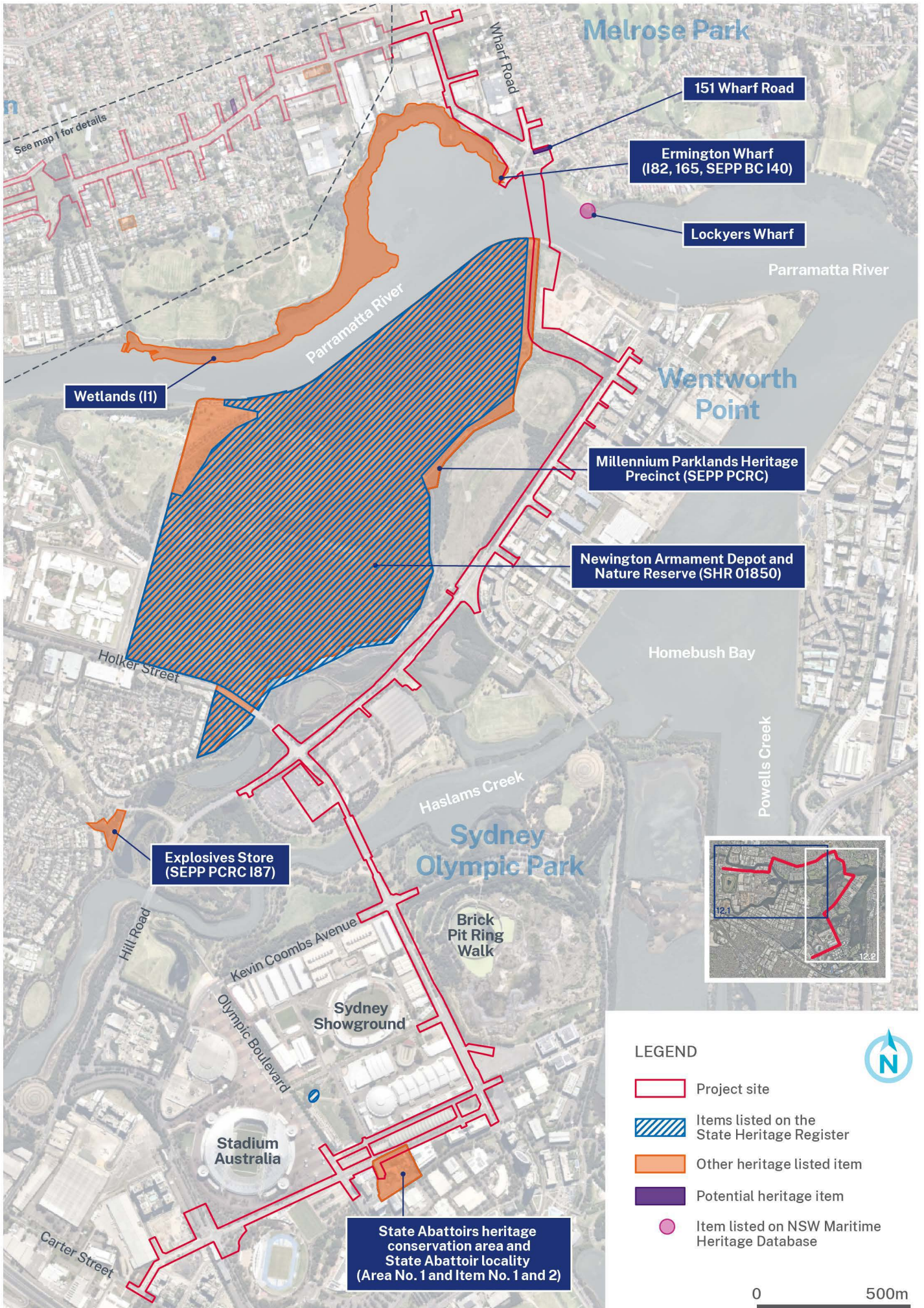


Figure 12.2 Listed and potential heritage items – map 2



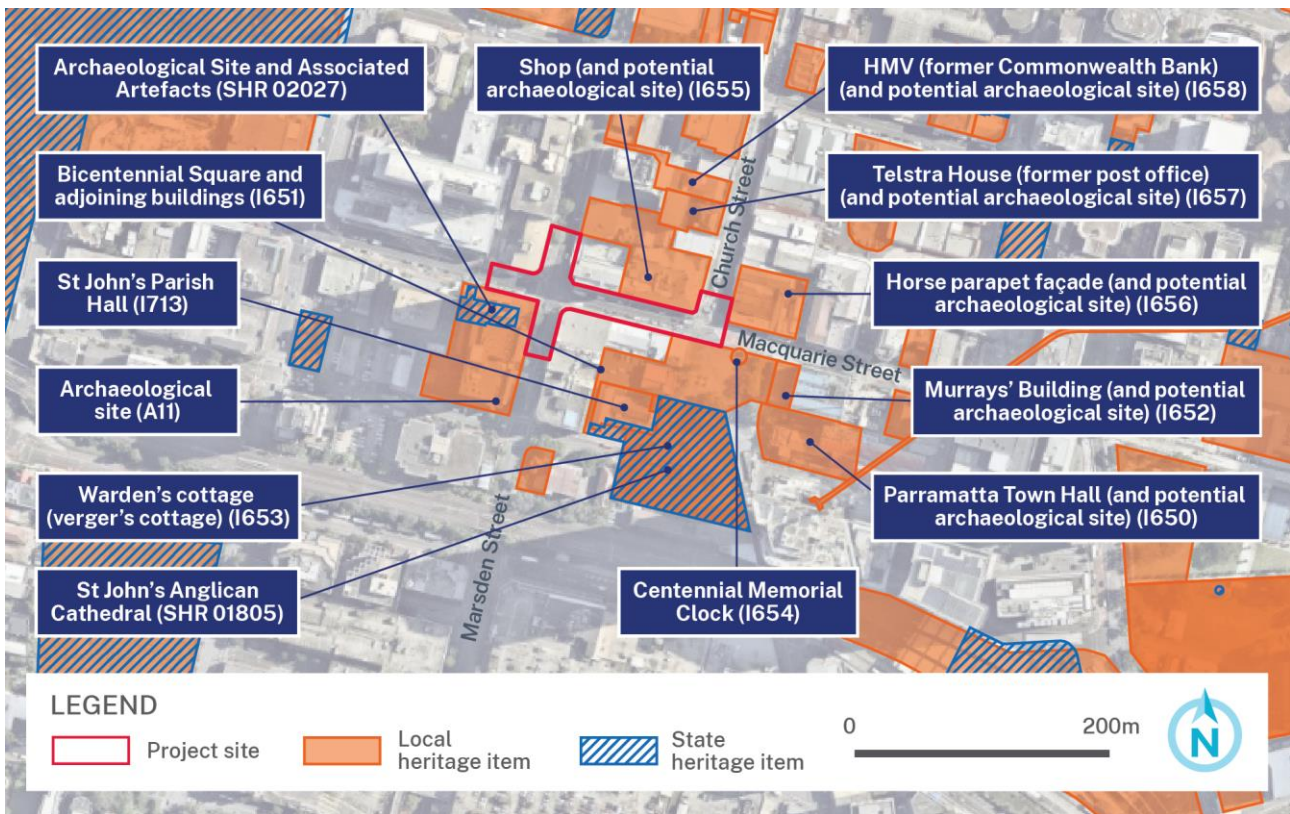


Figure 12.3 Listed heritage items (Parramatta CBD)



Figure 12.4 Photo of the Main House, part of the locally listed Bulla Cream Dairy (Willowmere)





Figure 12.5 Visible remains of the Ermington Wharf/Wharf/Former Pennant Hills Wharf (immediately adjacent to the Ermington Boat Ramp)



Figure 12.6 View of Federation era building within the State Abattoir locality

### 12.2.3 Potential heritage items

Technical Paper 5 (Statement of Heritage Impact – Built Heritage) identifies five potential heritage items within and close to the project site (see Table 12.2 and Figure 12.1). As summarised in Table 12.2, four of these items were assessed as having local heritage significance with one is located partially in the project site. Potential impacts on these items have been assessed in accordance with relevant heritage guidelines and the items would be managed as heritage-listed items for the purposes of the project.

Table 12.2 Preliminary assessment of significance of potential items within and close to the project site

Item	Location with respect to project site	Preliminary statement of heritage significance
1910-1930s Bungalow house, 46 John Street, Rydalmere	Partially within the project site	The house at 46 John Street is of <b>local</b> significance. It is of historical significance as one of the first houses constructed in association with the late 19th and early 20th century subdivision and subsequent residential development of Rydalmere. It is also both rare and aesthetically significant for its architectural style.
1910-1930s Bungalow house, 69 South Street, Rydalmere 1910-1930s Bungalow house, 71 South Street, Rydalmere	Both adjacent to the project site	The houses at 69 and 71 South Street are of <b>local</b> significance. These are of historical significance as some of the first houses constructed in association with the residential development of the Rydalmere area. They are fine examples of Californian bungalows and together create a rare streetscape as a group of bungalows in a neighbourhood typically characterised by later, post-war houses.
1910-1930s Bungalow house, 67 Boronia Street, Ermington	Adjacent to the project site	The house at 67 Boronia Street is of <b>local</b> significance. It is of historical significance as one of the first houses constructed in association with the early 20th century subdivision and subsequent residential development of Ermington. It is also both rare and aesthetically significant for its architectural style.
Weatherboard house 151 Wharf Road, Melrose Park	Within project site	The weatherboard house displays Edwardian features, including veranda and grouped windows. However aerial images of Melrose Park do not show a house at this location until 1951. Along with other supporting research it was concluded that the house was of post-war construction and does <b>not meet</b> the NSW assessment criteria for heritage significance.

### 12.2.4 Archaeological sites and potential

#### Archaeological sites

The *Parramatta Historical Archaeological Landscape Management Study* (Godden Mackay Logan, 2001) has been adopted by the City of Parramatta Council and Heritage NSW to guide the management of Parramatta's archaeological resources. The study divides the Parramatta LGA into 'Archaeological Management Units', which are land areas that have similar archaeological potential (based on their historical context and level of disturbance). The study also provides recommendations as to how archaeological issues should be assessed and managed, including the need for additional site-specific assessment, testing, avoidance and interpretation.

The project site partially overlaps three Archaeological Management Units in Camellia (numbers 2948, 2972 and 2996) and one in Rydalmere (number 3009). The Parramatta CBD section of the project site partially overlaps three Archaeological Management Units (numbers 3211, 3215, 3158) and there is also archaeological potential associated with some of the listed buildings located adjacent to the project site in this area (see Table 12.1 and Figure 12.3).



The Ermington Wharf/Wharf/Former Pennant Hills Wharf site is a listed heritage item with visible remains (see Table 12.1 and Figure 12.2). Technical Paper 6 (Historical Archaeological Assessment) notes that the visible wharf features likely date to the 1870s and are of local significance, as by this time wharves were commonplace. Any evidence of the circa 1820s wharf present in the curtilage or surrounding area would be of State significance, as evidence from this period is much rarer and has higher research potential.

### Archaeological potential – land-based

Technical Paper 6 (Historical Archaeological Assessment) adopted a similar methodology to the *Parramatta Historical Archaeological Landscape Management Study* and the Parramatta Light Rail Stage 1 EIS (Technical Paper 11 – Non-Aboriginal Archaeological Assessment (Artefact, 2017)) to identify areas with archaeological potential (HAMUs) in the project site.

Of the 25 HAMUs identified, the assessment found that there are five with a medium to high potential for State significant archaeological resources, or a high potential for locally significant archaeological resources (see Table 12.3). The locations of these HAMUs are shown on Figure 12.7 and Figure 12.8.

The assessment concluded that:

- the three HAMUs with high potential for State significant resources relate to early farming practises in the colony with one (HAMU 03) relating to John Macarthur’s Elizabeth Farm Estate and the other two (HAMU 15 and HAMU 16) relating to early farming near Ermington Wharf
- the two HAMUs with medium potential for State significant resources (HAMU 07 and HAMU 11) are also both in relation to early farming, with HAMU 07 being part of The Vineyard Estate and HAMU 11 being located in land not part of any large estate
- the two HAMUs with high potential for locally significant archaeological resources (HAMU 15 and HAMU 16) are both related to the development and use of Ermington Wharf.

Evidence relating to early farming practices could include plough marks, channels, gullies and ditches, fence lines and postholes, seeds, pollen or other structures. Evidence relating to the Ermington Wharf resource could include wharf structures, associated huts, sheds and other buildings, including a hut on the wharf.

Further information on the archaeological potential and significance of all HAMUs in the project site is provided in section 6 of Technical Paper 6 (Historical Archaeological Assessment).

Table 12.3 Historical archaeological management units with medium to high archaeological potential

HAMU No.	Site location	Phase of occupation with archaeological significance	Archaeological potential	Significance
HAMU 03	37 & 13 Grand Avenue, Camellia	Elizabeth Farm Estate (1793-1881)	High	State
HAMU 07	Broadoaks Park, Rydalmere	The Vineyard Estate (1791-1849)	Medium	State
HAMU 11	Ken Newman Park, Ermington	Early Farming (1792–1871)	Medium	State
HAMU 15	Ermington Wharf and Archer Park, Melrose Park	Early Farming and Edmund Lockyer (1792–1827)	High	State
		Ermington Wharf (circa 1820s–1930)	High	Local
HAMU 16	East of Wharf Road and Koonadan Reserve, Melrose Park	Early Farming and Edmund Lockyer (1792–1827)	High	State
		Ermington Wharf (circa 1820s–1930)	High	Local

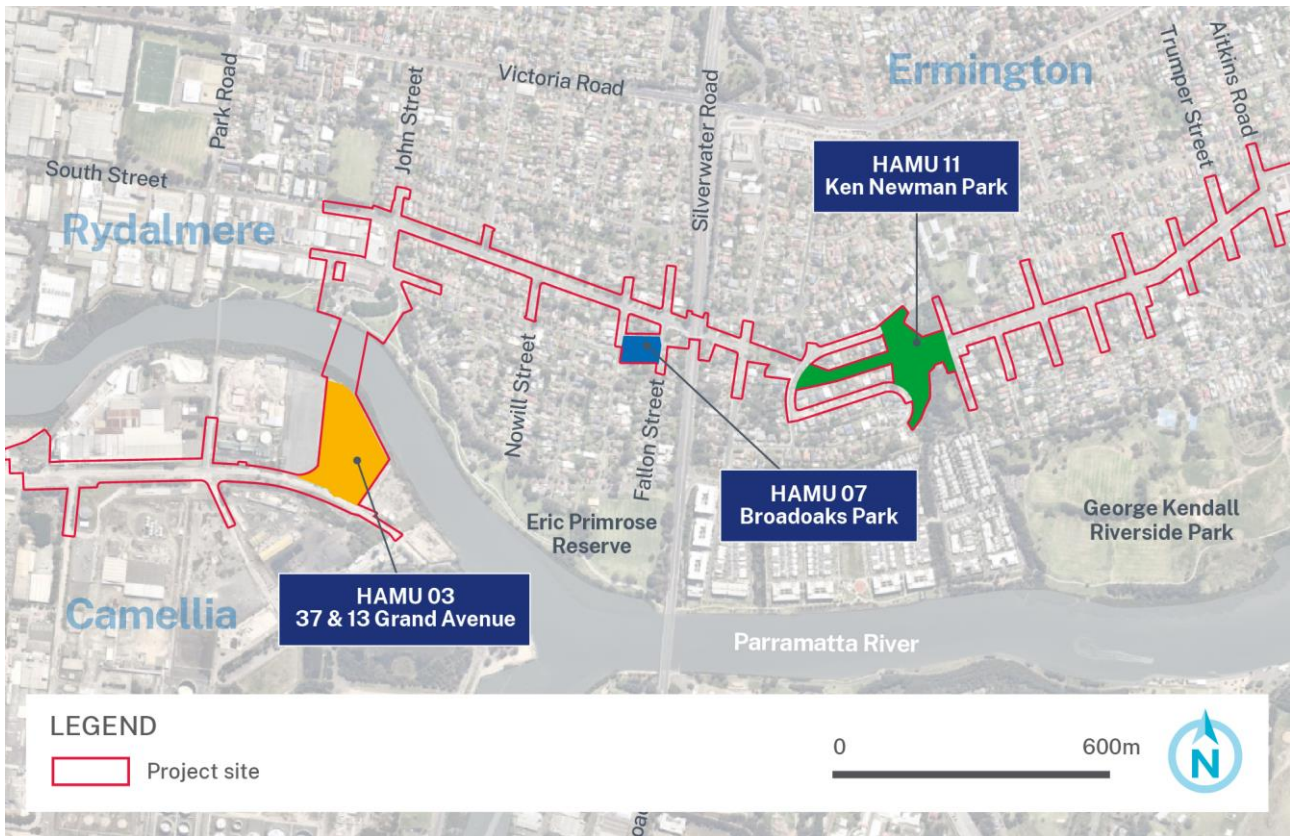


Figure 12.7 Historical Archaeological Management Units with medium to high potential (Camellia to Ermington)

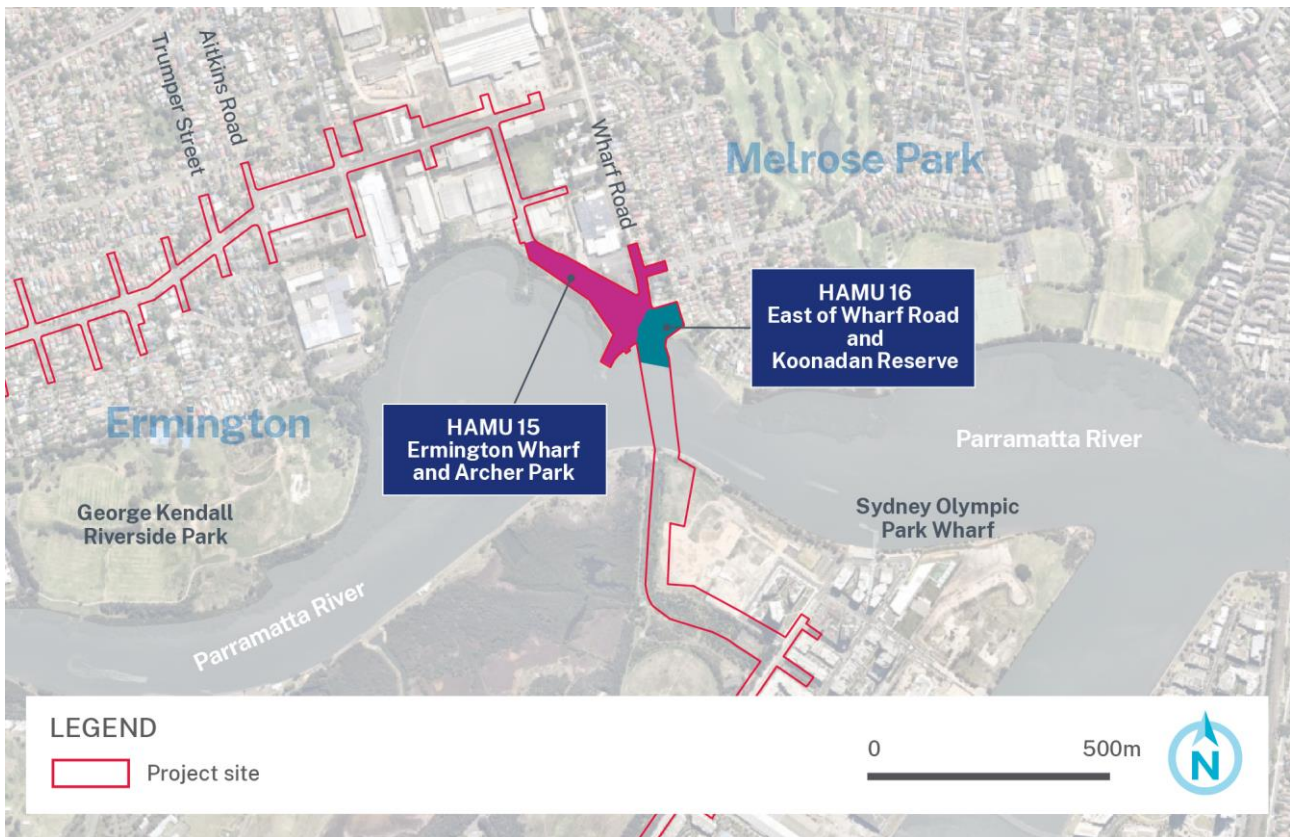


Figure 12.8 Historical Archaeological Management Units with medium to high potential (Melrose Park)



## Archaeological potential – maritime

Two maritime archaeological management units were identified:

- MAMU 01: section of riverbed between Camellia and Rydalmere
- MAMU 02 section of riverbed between Melrose Park and Wentworth Point.

Preliminary research indicated there is no development within or adjacent to MAMU 01. Previous archaeological investigations of the Parramatta River have shown that the river has high potential to reveal deposits relating to the refuse of Parramatta's residents, particularly institutions. However, these deposits have been contaminated by twentieth-century industrial waste, and subject to tidal disturbance, and dredging. As such, there is low potential for locally significant archaeological resources in MAMU 01 and no further survey or assessment was considered necessary.

As MAMU 02 is located close to Ermington Wharf, there is potential for archaeological evidence associated with the development and use of the wharf and additional survey and assessment was undertaken (see Appendix B of Technical Paper 6 (Historical Archaeological Assessment)). A sonar survey of MAMU 02 concluded that existing disturbance (including river currents, wave action from ferries, water erosion and dredging) has reduced the potential for archaeological remains to remain intact or in situ within the main river channel. As such, the potential for abandoned watercraft and associated relics or evidence of maritime infrastructure to be present within the main riverbed is considered low, although if present these would likely be of local significance.

### 12.3 Assessment of construction impacts

Potential impacts on non-Aboriginal heritage during construction were assessed based on impacts on the significance of a heritage item as a result of:

- direct (physical) impacts – caused by removing or altering the item or fabric of heritage significance or excavating in areas of archaeological potential
- potential direct impacts – incidental physical impacts from construction activities, such as damage from the movement of construction machinery or vibration impacts).

#### 12.3.1 Built heritage

The built heritage assessment (Technical Paper 5 (Statement of Heritage Impact – Built Heritage)) assessed the potential impacts on items of heritage significance located in, or close to, the project site. Impacts were assessed using the definitions from the *Material Threshold Policy* (Heritage NSW, 2020) which range from major, moderate, minor, little or no impacts. Potential impacts assessed as minor or greater are summarised in Table 12.4.

Where impacts on heritage items are predicted, most impacts are expected to be minor. The potential for moderate to major impacts has been predicted for three items – Tram Alignment, House at 46 John Street, Rydalmere and the Bulla Cream Dairy (Willowmere) (see Table 12.4).

Further information about the potential impacts is provided in Technical Paper 5 (Statement of Heritage Impact – Built Heritage).

Measures have been provided in section 12.6 to mitigate and manage the potential impacts identified.

Table 12.4 Summary of potential impacts (minor or greater) on built heritage items and listed archaeological sites

Location	Item	Works with the potential to affect item	Assessed impact	Significance of assessed impact
<b>Impacts on items listed on State Heritage Register</b>				
Parramatta CBD	Archaeological Site and Associated Artefacts (02027)	Construction of turnback facility (including excavation)	There is the potential for impacts on heritage remains as a result of vibration impacts, which modelling indicates may be above the screening level for cosmetic damage at this location.	The overall impact to this item has been assessed as <b>minor</b> .
Camellia	Sewage Pumping Station 67 (01643)	Construction of active transport links, road works and the Sandown Boulevard stop (including excavation)	There is the potential for impacts on heritage fabric as a result of vibration impacts, which modelling indicates may be above the screening level for cosmetic damage at this location.	The overall impact to this item has been assessed as <b>minor</b> .
<b>Impacts on other items</b>				
Parramatta CBD	Bicentennial Square and adjoining buildings (I651) Murrays' Building (and potential archaeological site) (I652) Centennial Memorial Clock (I654) Shop (and potential archaeological site) (I655) Horse parapet façade (and potential archaeological site) (I656) Telstra House (former post office) (and potential archaeological site) (I1657) St John's Parish Hall (I713)	Construction of turnback facility (including excavation)	Construction would not impact significant fabric, potential archaeological sites or the heritage curtilage. There is the potential for impacts on heritage fabric or remains as a result of vibration impacts, which modelling indicates may be above the screening level for cosmetic damage at these locations.	The overall impact to these items has been assessed as <b>minor</b> .

Location	Item	Works with the potential to affect item	Assessed impact	Significance of assessed impact
Camellia	Pumping Station (I5)	Road works in Grand Avenue and construction compound	There is the potential for impacts on heritage fabric as a result of vibration impacts, which modelling indicates may be above the screening level for cosmetic damage at this location.	The overall impact to this item has been assessed as <b>minor</b> .
	Tram Alignment (I6)	Road works in Grand Avenue	The project site partially encroaches on the heritage curtilage of this item. The project would have a minor to moderate adverse direct impact through the removal or covering of remnant tram tracks at the eastern end of Grand Avenue. This impact has been mitigated to some degree by retaining the wide street alignment of Grand Avenue, which is demonstrative of the former tramway line.  There is the potential for impacts on heritage fabric as a result of vibration impacts, which modelling indicates may be above the screening level for cosmetic damage at this location.	The overall impact to this item has been assessed as <b>minor to moderate</b> .
Camellia, Rydalmere and Melrose Park	Wetlands (I1)	Construction of bridges over Parramatta River	The project site partially encroaches on the heritage curtilage of this item. Construction of the bridge abutments and some piers would have a direct physical impact on limited areas of wetland vegetation between Camellia and Rydalmere. This impact has been minimised as far as practicable by making use of natural gaps in mangrove vegetation. Using temporary work platforms during construction would also create an elevated work area above the mangroves to limit disturbance.	The overall impact to this item has been assessed as <b>minor</b> .
Rydalmere	House at 46 John Street	Excavation for new rail light rail and John Street stop, road works	The project's land requirements have the potential to affect the heritage curtilage, period fence and mature plantings.  There is the potential for impacts on heritage fabric as a result of vibration, which modelling indicates may be above the screening level for cosmetic damage at this location.	The overall impact to this item has been assessed as <b>moderate</b> .
	House at 69 South Street	Excavation for new rail light rail and Nowill Street stop	Construction would not impact significant fabric or the heritage curtilage.  There is the potential for impacts on heritage fabric as a result of vibration impacts, which modelling indicates may be above the screening level for cosmetic damage at this location.	The overall impact to this item has been assessed as <b>minor</b> .

Location	Item	Works with the potential to affect item	Assessed impact	Significance of assessed impact
	House at 71 South Street	Excavation for new rail light rail and Nowill Street stop	Construction would not impact significant fabric or the heritage curtilage. There is the potential for impacts on heritage fabric as a result of vibration impacts, which modelling indicates may be above the screening level for cosmetic damage at this location.	The overall impact to this item has been assessed as <b>minor</b> .
Ermington	House at 67 Boronia Street	Excavation for new rail light rail and Atkins Road stop	Construction would not impact significant fabric or the heritage curtilage. There is the potential for impacts on heritage fabric as a result of vibration impacts, which modelling indicates may be above the screening level for cosmetic damage at this location.	The overall impact to this item has been assessed as <b>minor</b> .
	Bulla Cream Dairy (Willowmere) (I64)	Property acquisition, removal of built elements, tree and vegetation removal, excavation for new rail track and active transport, road works	There would be no direct impacts on the Main House, which is of high significance and would be retained. However, there is the potential for vibration impacts, which modelling indicates may be above the screening level for cosmetic damage at this location.  The project would have a direct impact on the overall item by reducing its heritage curtilage, removing the driveway, potential removal of significant fabric (Billiards Room, depending on the final construction methodology), and changes to its setting (including potential removal of tree plantings of high and moderate significance).  While the Swane family no longer live in the property, the house is still used as a private residence. The project is likely to result in a change in use of the building.  The residual land around the item is proposed to be used for public open space, with a section of green track provided in this location to sympathetically integrate the stop with the surrounding open space. Mitigation measures have been provided in section 12.6 to minimise the potential impacts on this item as far as practicable.	The overall impact to this item has been assessed as <b>moderate to major</b> .

Location	Item	Works with the potential to affect item	Assessed impact	Significance of assessed impact
Melrose Park	Ermington Wharf/Wharf/Former Pennant Hills Wharf (I82, 165 and I40)	Construction of bridges over Parramatta River	<p>While the project site encroaches on the heritage curtilage of the item, the proposed bridge and associated road and landscaping works would be located outside the curtilage, avoiding direct impacts on the visible wharf remains. However, there is the potential for vibration impacts on heritage fabric/remains, which modelling indicates may be above the screening level for cosmetic damage at this location.</p> <p>Impacts to the potential archaeological resource associated with Ermington Wharf in HAMU 15 and HAMU 16 are discussed in section 12.3.2.</p>	The overall impact to this item has been assessed as <b>minor</b> .
Sydney Olympic Park	Millennium Parklands Heritage Precinct (Item A) (Also listed as Newington Armament Depot and Nature Reserve (Conservation Area B))	Bridge abutment works and construction of light rail track and active transport link (including excavation)	<p>The project site encroaches on the heritage curtilage of the item and conservation area in a section used as an electricity easement for high voltage overhead powerlines. No significant built fabric or conservation landscape is present in this area.</p> <p>The project is consistent with the policies and guidelines outlined in the <i>Newington Armament Depot and Nature Reserve, Sydney Olympic Park Conservation Management Plan</i> (Tanner Architects, 2013) and <i>Millennium Parklands Heritage Precinct Conservation Master Plan</i> (Graham Brooks and Associates, 2003).</p>	The overall impact to this item has been assessed as <b>minor</b> .
	State Abattoirs heritage conservation area (Area No. 1/Conservation Area A) State Abattoir locality (Item No. 1 and 2)	Excavation for new light rail track and road works on Dawn Fraser Avenue	<p>The project would encroach on the heritage curtilage of the item and conservation area, but there would be no impact on significant building or landscape fabric.</p> <p>There is the potential for impacts on heritage fabric as a result of vibration impacts, which modelling indicates may be above the screening level for cosmetic damage at this location.</p> <p>The project is consistent with policies and guidelines outlined in the <i>Abattoir Heritage Precinct, Sydney Olympic Park Conservation Management Plan</i> (Government Architect's Office, 2013).</p>	The overall impact to this item has been assessed as <b>minor</b> .

### **12.3.2 Land-based archaeology**

The preliminary assessment of potential impacts to archaeological resources within the project site (as described in Technical Paper 6) would be updated following completion of the test excavation program (see section 12.6).

A summary of the potential impacts to HAMUs with a medium potential for State significant archaeological resource and high potential for local or State significant archaeological resources is summarised in Table 12.5. Of these, major impacts are predicted for four HAMUs – HAMU 03, HAMU 11, HAMU 15 and HAMU 16. Further information about potential impacts on all HAMUs is provided in Technical Paper 6 (Historical Archaeological Assessment).

Listed archaeological sites adjacent to the Parramatta CBD section of the project site would not be directly impacted. However, there is the potential for minor direct impacts from vibration (see Table 12.4).

Measures have been provided in section 12.6 to mitigate and manage the potential impacts identified.

### **12.3.3 Maritime archaeology**

Works associated with the proposed bridges over the Parramatta River (i.e., abutments, piers, temporary work platforms) would have an impact on any surviving archaeological deposits present. As no maritime archaeological resources have been identified within the riverbed, as part of the assessment described in Technical Paper 6, impacts on maritime archaeology are not anticipated.

Table 12.5 Summary of potential impacts on medium to high potential HAMUs

Location	HAMU No.	Description	Proposed works with the potential to affect item	Assessed impact	Significance of assessed impact
Camellia	HAMU 03	37 & 13 Grand Avenue	Remediation works, installation of light rail track, utilities installation, landscaping (including excavation)	Potential for direct impacts on archaeological remains as a result of extensive subsurface works. Potential for minor impacts due to compression and vibration caused by the movement and placement of heavy machinery and location of a compound.	The overall impact to potential archaeological resources has been assessed as <b>major</b> .
Rydalmere	HAMU 07	Broadoaks Park	Compound site	Potential for minor impacts due to compression and vibration caused by the movement and placement of heavy machinery.	The overall impact to potential archaeological resources has been assessed as <b>minor</b> .
Ermington	HAMU 11	Ken Newman Park	Installation of light rail track, construction of bridge structure, utility relocations, landscaping, compound site	Bridge works may have a major impact if extensive footings are required, or a moderate to minor impact if the structure is piled. Potential for minor impacts for compound areas due to compression and vibration caused by the movement and placement of heavy machinery.	The overall impact to potential archaeological resources has been assessed as <b>major</b> .
Melrose Park	HAMU 15	Ermington Wharf and Archer Park	Excavation for bridge foundations for abutment walls and approach ramps, installation of light rail track	Potential for direct impacts on archaeological remains as a result of extensive subsurface works. Potential for minor impacts due to compression and vibration caused by the movement and placement of heavy machinery.	The overall impact to potential archaeological resources has been assessed as <b>major</b> .
	HAMU 16	East of Wharf Road and Koonadan Reserve	Excavation for bridge foundations for abutment walls and approach ramps, installation of light rail track	Potential for direct impacts on archaeological remains as a result of extensive subsurface works. Potential for minor impacts due to compression and vibration caused by the movement and placement of heavy machinery.	The overall impact to potential archaeological resources has been assessed as <b>major</b> .

## 12.4 Assessment of operation impacts

The main potential for impacts on non-Aboriginal heritage during operation would be indirect (visual) impacts on a heritage item or its setting (where the surroundings contribute significantly to heritage values).

The project would have the potential for visual impacts on several heritage items as a result of a permanent change to their setting, from the presence of new infrastructure (such as bridges and light rail stops) and the movement of light rail vehicles. Potential impacts assessed as minor or greater are summarised in Table 12.6. The potential for moderate to major visual impacts has been predicted for eight items, which includes five heritage-listed items:

- Newington Armament Depot and Nature Reserve (01850)
- Wetlands (I1)
- House at 46 John Street (unlisted)
- House at 69 South Street (unlisted)
- House at 71 South Street (unlisted)
- Bulla Cream Dairy (Willowmere) (I64)
- Ermington Wharf/Wharf/Former Pennant Hills Wharf (I82, 165, I40)
- Millennium Parklands Heritage Precinct (Item A).

Other items are predicted to experience little to no, or negligible impacts.

The potential for vibration impacts on heritage structures during operation was considered by the noise and vibration assessment (Technical Paper 3 (Noise and Vibration)). The assessment concluded that there would be no measurable or perceptible ground-borne vibration from the operation of light rail vehicles that would impact heritage structures.

Operational impacts on archaeology are not anticipated.

Table 12.6 Summary of potential visual impacts on heritage items and their setting

Location	Item	Assessed impact
<b>Impacts on items listed on State Heritage Register</b>		
Sydney Olympic Park	Newington Armament Depot and Nature Reserve (01850)	<p>The bridge between Melrose Park and Wentworth Point would have the potential for a <b>moderate</b> visual impact on the visual landscape of this section of the Parramatta River through the introduction of a new built form. However, the bridge would be located away from areas of highest significance and would not impact any significant views or vistas associated with the heritage item, which are all internal views and vistas between significant elements.</p> <p>Proposed works along Hill Road would have a <b>little to no</b> visual impact on the items as the proposed alignment would not alter the current setting of, or views and vistas to and from, the items. The alignment would run along Hill Road, which is currently screened from the items by trees and shrubs. While some vegetation within the project site would need to be removed, the setting of the heritage item would be retained.</p>



Location	Item	Assessed impact
<b>Impacts on other items</b>		
Camellia, Rydalmere and Melrose Park	Wetlands (I1)	<p>Both the bridges would have the potential for a <b>moderate</b> visual impact on the item through the addition of a new built form interrupting views and vistas both to and from the item.</p> <p>The bridge between Camellia and Rydalmere would be located about 200 metres from the existing Thackeray Street pedestrian and utility bridge, which already interrupts views of the heritage item from the ground but provides an aerial view of the Parramatta River and the heritage item to pedestrians. The proposed bridge between Camellia and Rydalmere would further interrupt these aerial views of the heritage item to the east.</p> <p>Potential impacts have been mitigated to some degree for the bridge between Melrose Park and Wentworth Point, as it is located outside the curtilage of the heritage item. While the bridge between Melrose Park and Wentworth Point would visually dominate this section of the Parramatta River, it is located around 200 metres east of the eastern extent of the heritage item and would not interrupt internal views of the natural landscape in which the item sits.</p>
Rydalmere	House at 46 John Street	<p>The project would have the potential for a <b>moderate</b> visual impact on the setting of the house as a result of changes to the fence, grassed area and mature plantings fronting the property.</p> <p>Removing the adjacent industrial buildings and introduction of light rail infrastructure would affect the wider streetscape setting of the heritage item; however, this would not impact views of the item itself.</p>
	House at 69 South Street House at 71 South Street	<p>The project would have the potential for a <b>moderate</b> visual impact on the setting of these houses as a result of changes to the grassed area fronting the houses and placement of a retaining wall, along with the introduction of infrastructure associated with the nearby Nowill Street stop; however, this would not impact views of the item itself.</p>
Ermington	House at 67 Boronia Street	<p>The project would have the potential for a <b>minor</b> visual impact on the setting of the house as a result of changes to the grassed area fronting the property and introduction of light rail infrastructure. However, the project would not impact views to and from the item.</p>
	Bulla Cream Dairy (Willowmere) (I64)	<p>The project would have the potential for a <b>major</b> adverse visual impact on the significant setting of the item by reducing its heritage curtilage and potential removal of trees of high and moderate significance. This has been mitigated by retaining the highly significant Main House and the ability to view the house once again from two street frontages, as originally designed by the architect.</p> <p>Potential impacts would also be mitigated by the proposed creation of public open space around the heritage item, indicative of the former nursery and house setting. It is also proposed to relocate impacted significant trees of high or moderate significance, if feasible.</p>
Melrose Park	Ermington Wharf/Wharf/Former Pennant Hills Wharf (I82, I65, I40)	<p>The bridge between Melrose Park and Wentworth Point would have the potential for a <b>moderate</b> visual impact on the item through the addition of a new built form interrupting views and vistas to and from the item.</p>
Sydney Olympic Park	Millennium Parklands Heritage Precinct (Item A) (Also listed as Newington Armament Depot and Nature Reserve (Conservation Area B))	<p>The bridge between Melrose Park and Wentworth Point would have the potential for a <b>moderate</b> visual impact on the visual landscape of this section of the Parramatta River through the introduction of a new built form.</p> <p>However, the bridge would be located away from the high significance area of the original precinct/conservation area. It would not impact any significant views or vistas associated with the heritage item, as identified in the Conservation Management Plan.</p>

Location	Item	Assessed impact
	State Abattoirs heritage conservation area (Area No. 1/Conservation Area A) State Abattoir locality (Item No. 1 and 2)	The project would have a <b>minor</b> visual impact on the heritage item and conservation area. Non-significant planted tree species within the existing road reserve may need to be removed; however, the streetscape setting of the heritage item would be retained. To achieve this, wire-free track is proposed along Dawn Fraser Avenue adjacent to the heritage item to reduce visual clutter.

## 12.5 Cumulative impacts

The potential for minor cumulative impacts on built heritage, associated with the interactions between the project and other proposed developments, were identified as a result of:

- Construction of Sydney Metro West (Parramatta Station), which is located close to the turnback facility in the Parramatta CBD, with resulting potential for minor cumulative vibration and visual impacts.
- Future developments in Camellia (including development of the Camellia-Rosehill urban renewal precinct in accordance with the *Draft Camellia-Rosehill Place Strategy* and development of the Camellia Waste Facility) may also impact the Wetlands (I1); however, the proposed active transport links would provide the community better access to appreciate and enjoy the Wetlands.

The Parramatta LGA has been subject to a number of significant developments. As a result, important and rare archaeological resources from the 18th and 19th centuries are being removed, particularly in the Parramatta CBD and North Parramatta areas. However, the area of the project site within the Parramatta CBD has been assessed as having medium potential for locally significant resources and, if present and impacted, would not contribute to the cumulative decline in State significant deposits elsewhere in the Parramatta CBD.

For the remainder of the project site, some of the development sites in Camellia and Melrose Park are immediately adjacent and may share similar landscapes and phases of occupation with potential for archaeological resources, and there may be the potential for cumulative physical impacts.

## 12.6 Mitigation and management measures

### 12.6.1 Approach to mitigation and management

A key approach to minimising the potential for heritage impacts (both direct and visual) would be designing the project in accordance with the urban design requirements see Chapter 5 (Design development, alternatives and options and Chapter 15 (Landscape and visual impacts)). The urban design requirements would include strategies and design principles to ensure that the design of project features and ancillary infrastructure is sympathetic to the existing landscape and heritage significance. For example, it is proposed to retain significant fabric (the Main House) and retain or relocate trees of high and moderate significance associated with the Bulla Cream Dairy (Willowmere).

Other impacts would be managed by implementing the measures provided in Table 12.7. This would include a test excavation program (planned to commence in around late 2022) guided by an Archaeological Research and Excavation Framework (see Appendix B of Technical Paper 6 (Historical Archaeological Assessment)) led by an appropriately qualified Excavation Director, in accordance with the NSW Heritage Council's Excavation Director criteria. The testing would target areas with medium to high potential for State significance/high potential for local significance (see Figure 12.7 and Figure 12.8) and where ground disturbing works are proposed (in conjunction with Aboriginal archaeology) to confirm the presence of archaeology.

Following this, the design would continue to be refined to avoid direct impacts on archaeological sites of State significance, and minimise impacts on archaeological sites of local significance, as far as reasonably practicable. Unavoidable impacts would be managed in accordance with a detailed Research Design and Excavation Methodology to be prepared that would include details of appropriate management based on the rating system outlined in Technical Paper 6. Archaeological research designs provide an outline of the research framework for archaeological work on site and the methodologies to be used to realise the research potential of a site.

Measures to manage the potential for vibration impacts (including to heritage items) during construction are provided in section 10.7. Potential vibration impacts on items of heritage significance would be managed in accordance with the *Construction Noise and Vibration Strategy* (Transport for NSW, 2019a) and the noise and vibration management plan. Where vibration levels are predicted to exceed the screening criteria, the plan would provide for a more detailed assessment of the structure (including its heritage values) and vibration monitoring, to ensure vibration levels remain below appropriate limits for that structure. Further information on the management of potential vibration impacts during construction, including relevant mitigation measures, is provided in Chapter 10 (Noise and vibration).

### 12.6.2 List of mitigation measures

Measures that will be implemented to address potential impacts on non-Aboriginal heritage are listed in Table 12.7.

Table 12.7 Non-Aboriginal heritage mitigation measures

Impact/issue	Ref	Mitigation measure	Timing
<i>Avoiding and minimising impacts on non-Aboriginal heritage</i>	NAH1	The design will continue to be refined to avoid direct impacts on items/sites of non-Aboriginal heritage significance and archaeological sites of State significance, and to minimise impacts on archaeological sites of local significance, as far as reasonably practicable.	Design
	NAH2	For areas of archaeological significance where harm cannot be avoided, a Research Design and Excavation Methodology will be prepared to ensure there is appropriate management informed by significance and relevant research questions.  A management rating system will be adopted based on the approach provided in Technical Paper 6 (Historical Archaeological Assessment), which will be further refined following the outcomes of test excavations and site-specific research.	Design,
	NAH3	Test excavations will be undertaken to clarify significance, extent and integrity of deposits in accordance with the Archaeological Research and Excavation Framework (see Appendix B of Technical Paper 6 (Historical Archaeological Assessment)).  Where testing confirms that archaeological resources are present, additional site-specific research will be undertaken to refine the understanding of significance to ensure future management is in line with research values.	Design
<i>Visual impacts and heritage setting</i>	NAH4	The design will be prepared in accordance with the urban design requirements and recommendations in Technical Paper 5 (Statement of Heritage Impact – Built Heritage).  The design will minimise the potential for visual impacts on heritage items by incorporating sympathetic form, fabric and colour, where feasible.	Design

Impact/issue	Ref	Mitigation measure	Timing
<i>Impacts to Bulla Cream Dairy (Willowmere)</i>	NAH5	<p>Design refinement will be undertaken to minimise potential impacts on Bulla Cream Dairy (Willowmere) (Parramatta LEP Item No. I64) as far as practicable. This will include minimising encroachment of the curtilage, retaining significant heritage fabric (i.e. Billiards Room in addition to the Main House), and retaining or relocating significant tree plantings where practicable.</p> <p>Transport for NSW will work with the property owner and City of Parramatta Council to develop and implement adaptive reuse options for Bulla Cream Dairy (Willowmere) in accordance with <i>New Uses for Heritage Places: Guidelines for the Adaptation of Historic Buildings and Sites</i> (Heritage Council of NSW and Royal Australian Institute of Architects NSW Chapter, 2008).</p>	Design
<i>Heritage interpretation</i>	NAH6	<p>A heritage interpretation strategy will be developed to guide incorporating appropriate interpretation and integration of heritage in the design. The strategy will include interpretation requirements for specific parts of the project, particularly where heritage items will be impacted, or archaeological sites are proposed to be excavated.</p> <p>The strategy will be prepared and implemented in accordance with <i>Interpreting Heritage Places and Items: Guidelines</i> (NSW Heritage Office, 2005) and the <i>Heritage Interpretation Policy</i> (NSW Heritage Council, 2005) and developed in consultation with relevant stakeholders, including City of Parramatta Council, City of Ryde Council and Sydney Olympic Park Authority.</p> <p>The strategy will provide a framework for interpreting the heritage items impacted by the project, set out the key interpretative themes, identify communication strategies and the location and form of interpretation. These may include approaches such as interpretative signage, historical/artefact displays at local museums or visitor centres, and online media about heritage items and the history of surrounding suburbs.</p> <p>The design will include appropriate interpretation of non-Aboriginal heritage in accordance with the heritage interpretation strategy.</p>	Design
<i>Archival recording of built heritage items</i>	NAH7	<p>Photographic archival recording will be carried out for affected sections of the following items:</p> <ul style="list-style-type: none"> <li>• Bulla Cream Dairy (Willowmere) (Parramatta LEP Item No. I64)</li> <li>• house at 46 John Street, Rydalmere (unlisted).</li> </ul> <p>Photographic archival recording will be carried out prior to works commencing in the vicinity of the item, and in accordance with <i>How to Prepare Archival Records of Heritage Items</i> (Heritage Office, 1998a) and <i>Photographic Recording of Heritage Items Using Film or Digital Capture</i> (Heritage Office, 2006).</p> <p>Once complete, a report will be prepared detailing the history and significance of the item, relevant findings from the archival recording and an overview of the project.</p>	Pre-construction

Impact/issue	Ref	Mitigation measure	Timing
Avoiding impact to non-Aboriginal heritage (including archaeological resources) during construction	NAH8	<p>A heritage management plan will be prepared and implemented as part of the CEMP. The plan will include measures to manage non-Aboriginal heritage and minimise the potential for impacts during construction.</p> <p>The plan will be prepared in consultation with relevant heritage agencies (Heritage NSW, Sydney Olympic Park Authority, City of Parramatta Council and City of Ryde Council) and take into account the outcomes of further investigations, including test excavations and the Research Design and Excavation Methodology.</p> <p>The heritage management plan will define a requirement for non-Aboriginal historical heritage awareness training for site workers prior to commencement of construction works. The awareness training will promote an understanding of heritage items that may be impacted during the works.</p>	Pre-construction, construction
	NAH9	An unexpected finds procedure for land and maritime based archaeological resources will be developed as part of the heritage management plan, consistent with Transport for NSW's <i>Unexpected heritage items procedure (2022)</i> and <i>Skeletal remains: guidelines for the management of human skeletal remains under the Heritage Act 1977</i> (Heritage Office, 1998b).	Pre-construction, construction
	NAH10	Significant heritage fabric at the Bulla Cream Dairy (Willowmere) that is proposed to be retained and the fenced preservation area of Ermington Wharf/Wharf/Former Pennant Hills Wharf (and visible remnants) will be fenced and marked on site plans within the CEMP and heritage management plan as areas to be avoided/protected during construction.	Pre-construction, construction
Potential vibration impacts on built heritage items	NAH11	Potential vibration impacts on items of heritage significance will be managed in accordance with the <i>Construction Noise and Vibration Strategy</i> (Transport for NSW, 2019a) and mitigation measures NV12 to NV14.	Construction