Roads and Maritime Services/Sydney Airport Corporation Limited

Sydney Gateway Road Project

Environmental Impact Statement/ Preliminary Draft Major Development Plan

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November 2019

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Non-Aboriginal heritage

This chapter provides a summary of the non-Aboriginal heritage assessment. It describes existing non-Aboriginal heritage, identifies potential impacts, and provides measures to mitigate and manage the impacts identified. Further information is provided in Technical Working Paper 9 (Statement of Heritage Impact).

The SEARs relevant to non-Aboriginal heritage are listed below. There are no MDP requirements specifically relevant to non-Aboriginal heritage; however, there is a requirement under section 91(1) of the Airports Act to assess the potential environmental impacts associated with a development (section 91(1)(h)), and to specify how those impacts may be dealt with (section 91(1)(j)). Full copies of the SEARs and MDP requirements, and where they are addressed in this document, are provided in Appendices A and B respectively.

Reference	Requirement	Where addressed
Key issue SEARs		
7	**Heritage**	
7.1	The Proponent must identify and assess any direct and/or indirect impacts (including cumulative impacts and visual impacts) to the heritage significance of:	
	(a) environmental heritage, as defined under the Heritage Act 1977;	This chapter
	(d) items listed on State, National and World Heritage lists;	Sections 17.3 and 17.4
	(e) heritage items and conservation areas identified in local and regional planning environmental instruments applicable to the proposal area.	Sections 17.3 and 17.4
7.2	Where impacts to State or locally significant heritage items are identified, the assessment must:	
	(a) include a significance assessment, a statement of heritage impact for all heritage items including the Alexandra Canal, Cooks River Container Terminal and Mascot underbridges (O'Riordan and Robey Streets) (including significance assessment) and a historical archaeological assessment;	Sections 17.3 and 17.4
	(b) assess the consistency of the proposal against conservation policies of any relevant conservation management plan, including the Conservation Management Plan for Alexandra Canal (NSW Department of Commerce, 2004);	Appendix B of Technical Working Paper 9
	(c) consider impacts to the item of significance caused by, but not limited to, vibration, demolition, archaeological disturbance, altered historical arrangements and access, visual amenity, landscape and vistas, curtilage, subsidence, architectural noise treatment, drainage infrastructure, contamination remediation and site compounds (as relevant);	Sections 17.3 and 17.4
	(d) outline measures to avoid and minimise those impacts during construction and operation in accordance with the current guidelines; and	Section 17.6

Reference	Requirement	Where addressed
	(e) be undertaken by a suitably qualified heritage consultant(s) and/or historical archaeologist (note: where archaeological excavations are proposed the relevant consultant must meet the NSW Heritage Council's Excavation Director criteria).	The assessment was undertaken by qualified heritage consultants (see section 1.6 of Technical Working Paper 9).

17. Non-Aboriginal heritage

17.1 Assessment approach

Heritage impact assessment for major infrastructure projects in NSW is carried out by skilled and experienced heritage consultants and archaeologists in accordance with relevant legislation, guidelines and policies. Where there is the potential to impact items of local or State heritage significance, a statement of heritage impact is prepared using a standard assessment approach and guidelines produced by the NSW Heritage Office. A statement of heritage impact needs to address:

- The heritage significance of items with the potential to be impacted by a project
- The significance of the potential impacts
- Why more sympathetic solutions are not viable
- The measures to mitigate negative impacts.

Any heritage impact assessment also needs to consider whether there is the potential for significant impact on items listed on the World Heritage List, National Heritage List or Commonwealth Heritage List. Where the potential for significant impact is identified a referral is then submitted to the Commonwealth Minister for Environment in accordance with the EPBC Act.

An overview of the approach to the assessment is provided below, including the legislative and policy context and a summary of the assessment methodology.

17.1.1 Legislative and policy context to the assessment

Relevant legislation, policies and guidelines

The assessment was undertaken in accordance with the SEARs and MDP requirements (provided in Appendices A and B) and with reference to the following:

- Relevant legislation, including the EP&A Act, *Heritage Act 1977* (NSW) (the Heritage Act), EPBC Act, and the Airports Act and associated regulations
- *Assessing Heritage Significance* (Heritage Office, 2001)
- *Statements of Heritage Impact* (Heritage Office, 2002)
- *Historical Archaeology Code of Practice* (Heritage Office, 2006a)
- *Assessing Significance for Historical Archaeological Sites and Relics* (NSW Heritage Division, 2009)
- *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (Australia ICOMOS, 2013) (the Burra Charter)
- *Significant impact guidelines 1.2 – Actions on, or impacting upon, Commonwealth land and Actions by Commonwealth Agencies* (DSEWPC, 2013)
- *Working Together Managing Commonwealth Heritage Places, A guide for Commonwealth Agencies* (Commonwealth of Australia, 2019)
- *Sydney Airport Master Plan 2039* (SACL, 2019a)
- *Sydney Airport Environment Strategy 2019-2024* (SACL, 2019b)
- *Sydney Airport Heritage Management Plan* (SACL, 2009).

17.1.2 Methodology

Study area

The study area for the assessment was defined as the project site (described in Chapter 2 (Location and setting)). The assessment also included consideration of a 150 metre wide buffer from the project site in relation to the potential for indirect impacts on heritage items as a result of works undertaken within the project site. The study area and buffer is shown on Figure 17.1.

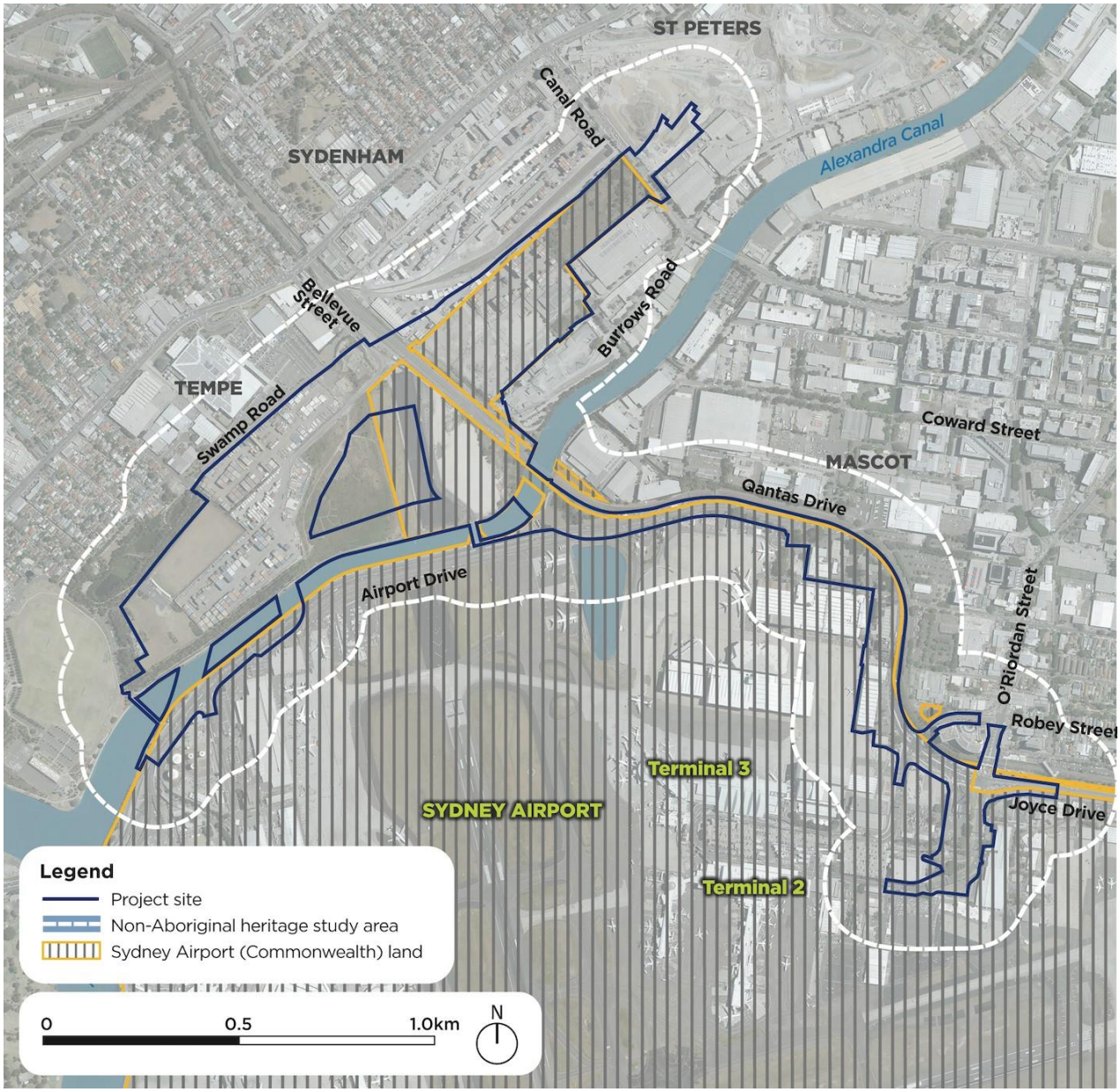

Figure 17.1 Non-Aboriginal heritage study area

Key tasks

The assessment involved:

- Background research on the historical context of the project site and heritage listed items, including reviewing previous assessments and relevant conservation/heritage management plans, and searching statutory and other heritage lists (described below)

- Site inspections undertaken in December 2018 and February 2019 to identify listed and potential heritage items and areas of archaeological potential
- Assessing the significance of heritage with the potential to be impacted by the project
- Assessing the significance of the potential impacts on listed and potential heritage items and areas of archaeological significance with consideration of the guidelines and requirements listed in section 17.1.1
- Identifying measures to manage and mitigate the identified impacts
- Preparing a statement of heritage impact to describe the results of the assessment.

Potential impacts on non-Aboriginal heritage were assessed based on impacts to 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 within the project site
- Potential direct impacts – caused by vibration or by removing adjoining structures within or outside the project site
- Visual impacts – caused by changes to the setting or curtilage of heritage items, places, historic streetscapes and views within or outside the project site.

The main potential for direct and potential direct impacts would occur during construction. These potential impacts are considered in section 17.3.1 and 17.3.2.

Visual impacts are generally associated with operational infrastructure and the permanent changes to landscape and setting that would occur during operation. These potential impacts are considered in section 17.4.

The following heritage lists and databases were searched in April 2019:

- World Heritage List
- Australian heritage lists (under the EPBC Act):
  - National Heritage List
  - Commonwealth Heritage List
- Register of the National Estate (it is noted that this is an archival list and is not a statutory heritage register)
- NSW heritage lists (under the Heritage Act):
  - NSW State Heritage Register
  - Section 170 NSW Government agency heritage and conservation registers
- Local heritage lists (under local environmental plans (LEPs)):
  - Botany Bay Local Environmental Plan 2013 (the Botany Bay LEP)
  - Marrickville Local Environmental Plan 2011 (the Marrickville LEP)
  - Sydney Local Environmental Plan 2012 (the Sydney LEP).

A detailed description of the assessment methodology is provided in section 3 of Technical Working Paper 9 (Statement of Heritage Impact).

17.1.3 Risks identified

An environmental risk assessment was undertaken as an input to the impact assessment (see Appendix G). This involved identifying potential environmental risks during construction and operation, and rating the potential risks according to likelihood, consequence and overall level of risk, in general accordance with *AS/NZS ISO 31000:2009 Risk management – Principles and guidelines*. Risks to non-

Aboriginal heritage with an assessed overall rating of medium or above, identified by the environmental risk assessment, included:

- Direct physical impacts on items listed on the State Heritage Register (Alexandra Canal) and other heritage items associated with construction of new road infrastructure
- Impacts on the heritage significance of Alexandra Canal as a result of the change to its landscape and visual context associated with the presence of new bridges over the canal
- Impacts on items of heritage significance at Sydney Airport.

The non-Aboriginal heritage assessment included consideration of these potential risks.

17.2 Existing environment

A summary of the non-Aboriginal historical context and existing non-Aboriginal heritage features of the study area is provided in this section. Aboriginal heritage is addressed in Chapter 18 (Aboriginal heritage).

17.2.1 Historical context

The study area has a long history of settlement and development, with significant historical features and activities including agriculture, modification of the Cooks River and Shea's Creek, dredging and reclamation, Sydney's drinking water supply, development of Sydney Airport and other transport infrastructure, and residential and industrial development.

During the early years of settlement, land in and surrounding Tempe, St Peters, Botany and Mascot comprised of thick scrub and forest, marshy wetlands and sand banks. These were dissected by streams and creeks associated with Shea's Creek and the Cooks River.

The first land grant occurred in 1796. Market gardens were first established around Botany and Mascot in the 1830s and became common in the 1870s. The majority of market gardens were established between the Alexandra Canal and O'Riordan Street, which acted as a boundary between residential subdivisions to the east and agricultural activity to the west. Figure 17.2 shows a plan of the study area (with the project site shown in red) prior to construction of Alexandra Canal.

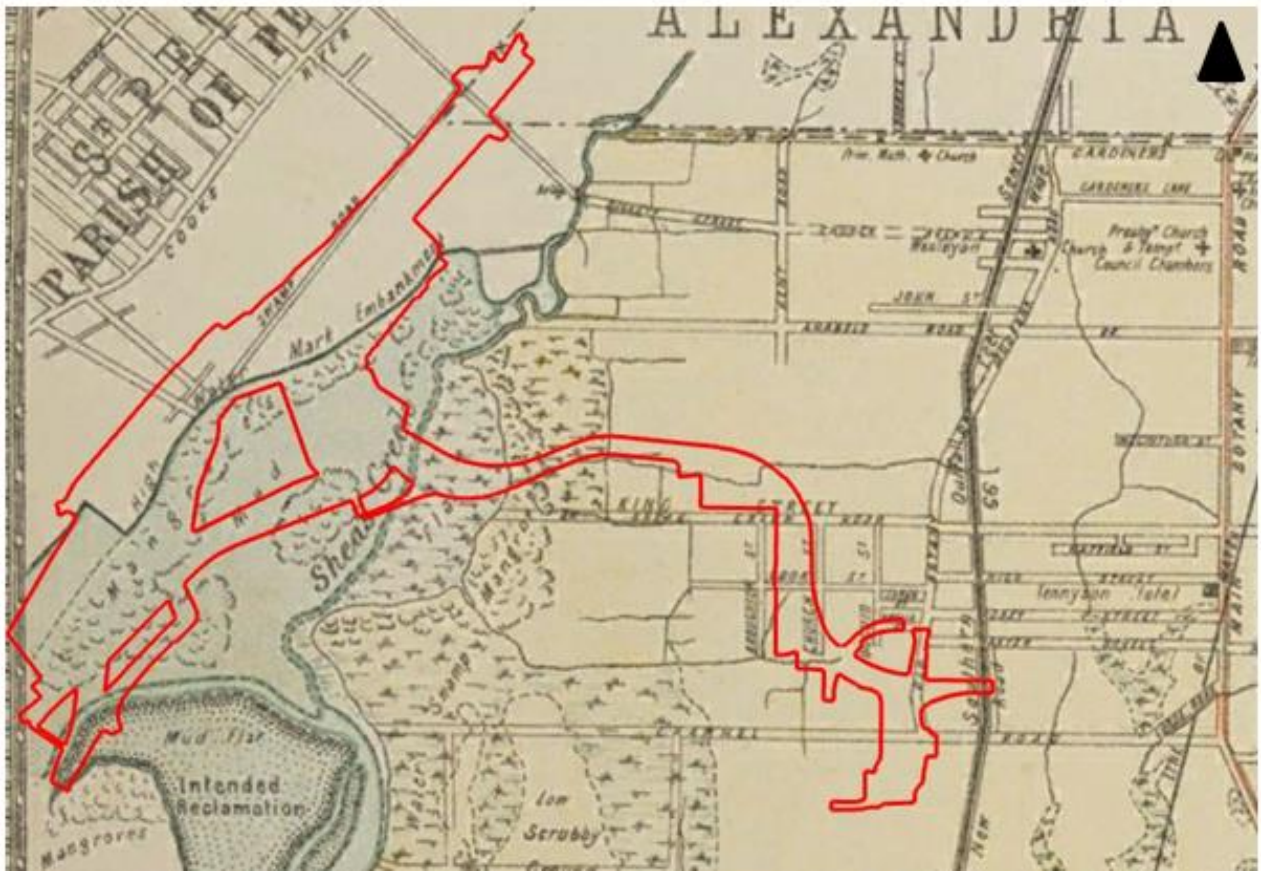

Figure 17.2 Historical plan of the study area from between 1880 and 1899

The mid-19th century saw significant changes to land use in and around the study area, with industrial development concentrated along parts of Alexandra Canal and Cooks River.

By the 1880s, residential subdivision was occurring in the Tempe and St Peters areas. This included the Lauriston Park Estate, near the existing location of Sydney Airport.

The Botany Rail Line, which was designed to carry goods from Sydney's western industrial sites to tanneries at Botany and to shipping at Port Botany, was completed in 1925.

Areas to the west of Alexandra Canal in Tempe were used as a gravel quarry from 1920. By 1970, land associated with the quarry was used by the then Marrickville Council to dispose of waste materials (mainly building waste). The use of this site as a landfill (the former Tempe landfill) was gradually phased out from the 1990s.

Significant developments in the study area are described below.

Alexandra Canal

Major construction works for the canal began in 1891. This involved formalising Shea's Creek and land along the mouth of the Cooks River to create a channel to ship goods up and down the canal. The original plan was to join the Cooks River with the Parramatta River. However, the depression of the 1890s halted works and construction of the canal stopped near Huntley Street in Alexandria.

The canal's tendency to collect silt deposits made the movement of large vessels difficult. As a result, the canal was never used for its intended purpose. It eventually became a waste and stormwater outlet for surrounding development.

The original wall of the canal was constructed from sandstone blocks, placed at an angle with rubble at the base of the walls to provide support. In the early 1960s, during the expansion of Sydney Airport, parts of the canal were filled and a section was realigned. The new sections of the canal were mostly constructed

of different materials, including concrete blocks. The *Alexandra Canal Conservation Management* (NSW Heritage Office 2004) has mapped the heritage significance of the canal wall, which varies based on the type of materials used in its construction and therefore has different management requirements based on the fabric being impacted.

Sydney (Kingsford Smith) Airport

The most significant development to occur in Mascot was the establishment of Sydney Airport. Originally an amateur private operation established on land occupied by Ascot Racecourse in 1911, it opened as an aerodrome in 1919. The airport expanded several times during the 20th century. Its development was associated with the re-alignment of Cooks River, the Botany Rail Line, Alexandra Canal and surrounding roads, as well as several major land reclamations.

Regular commercial services between Sydney, Melbourne and Adelaide began in 1924. Post-war increases in the demand for passenger flights resulted in the expansion of Sydney Airport in the 1950s and 1960s. Since this time, the airport has been subject to a range of developments and expansions. The main north–south runway was extended over reclaimed land in Botany Bay in 1968 and again in 1972. The third runway was opened in 1994.

Today, the airport includes various landscapes, structures, features and elements that contribute to its significance.

Historical photographs showing the (then) Mascot Aerodrome and surrounding development are shown on Figure 17.3 and Figure 17.4 (the project site is shown in red in Figure 17.4).

Figure 17.3 Aerial view of Mascot Aerodrome from 1928 (circled) and the adjoining Botany Rail Line

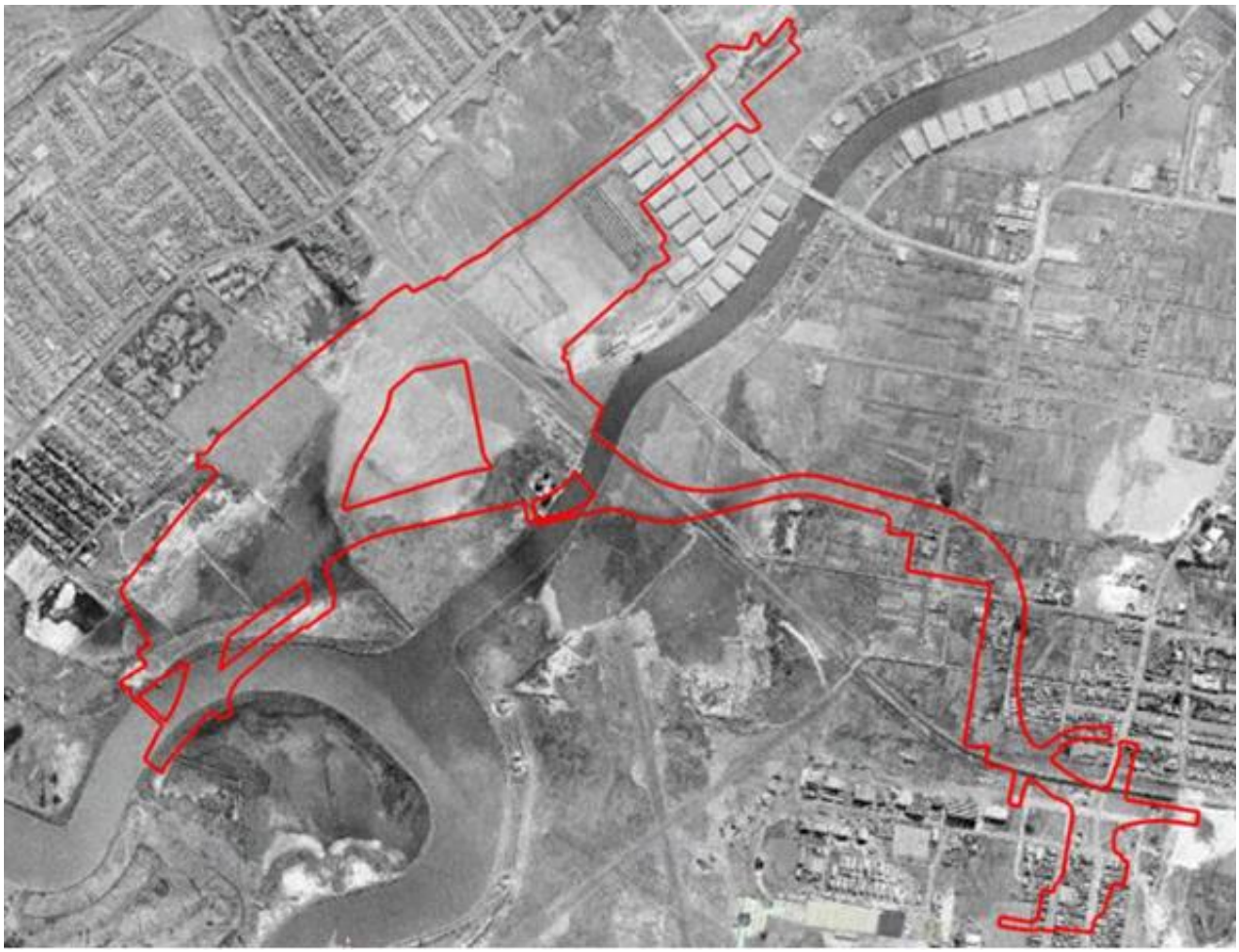

Figure 17.4 Aerial view of the study area from 1943

17.2.2 Heritage listed items

Heritage listed items within the study area and buffer are summarised in Table 17.1 and shown on Figure 17.5. A full list and detailed descriptions of items is provided in section 3 and 6 of Technical Working Paper 9 (Statement of Heritage Impact). In relation to the project site:

State Heritage Register

- One item listed on the State Heritage Register is located within the project site - Alexandra Canal

Local environmental plans and section 170 registers

- Six items listed on LEPs and/or section 170 registers are located within the project site:
  - Alexandra Canal
  - Sydney (Kingsford Smith) Airport Group
  - Mascot (O'Riordan Street) Underbridge
  - Mascot (Sheas Creek) Underbridge
  - Mascot (Robey Street) Underbridge
  - Cooks River Container Terminal (and associated items)

Other heritage lists and databases

- No listed heritage conservation areas are located in the study area
- No items on the World or National Heritage Lists are located in the study area
- The Australian Heritage Database records the Sydney (Kingsford Smith) Airport Group as an 'indicative place' on the Commonwealth Heritage List.

Table 17.1 includes a summary of the significance of heritage items within the study area and buffer, and their location with respect to the project site. Further information on these items and their significance is provided in section 6 of Technical Working Paper 9 (Statement of Heritage Impact).

Table 17.1 Heritage listed Items within the study area

Item	Listing	Approx. distance from project site	Summary of item and heritage significance
Items listed on the State Heritage Register			
Alexandra Canal	State Heritage Register Sydney Water section 170 register Marrickville LEP Botany Bay LEP *('Alexandra Canal (including sandstone embankment'))* Sydney LEP *('Alexandra Canal (between Cooks River and Huntley Street) including interior')* Register of the National Estate (interim) (non-statutory list)	Partly within the project site	A summary of the history and characteristics of this item is provided in section 17.2.1. The canal is of high historic, aesthetic and technical/research significance. It is one of only two navigable canals built in NSW. It is characterised by its controlled route, defined edges, and sandstone embankment walls. Historically, the canal is a rare example of 19th century navigational canal construction in Australia.
Other listed items			
Sydney (Kingsford Smith) Airport Group	Botany Bay LEP Indicative Place (Commonwealth Heritage List) Register of the National Estate (interim) (non-statutory list)	Partly within the project site	A summary of the history and characteristics of this item is provided in section 17.2.1. The airport group is a complex cultural landscape with local significance. It demonstrates strong historical, historic association, social, aesthetic and technological significance. It includes both the values associated with the contemporary airport and the heritage values associated with the layers of use of the area.
Mascot (O'Riordan Street) Underbridge	Transport for NSW (Railcorp) section 170 register	Within the project site (over O'Riordan Street)	The Mascot (O'Riordan Street) Underbridge is a two span, single track, reinforced concrete girder railway bridge, which carries the Botany Rail Line over O'Riordan Street. This item is of local significance as part of the original infrastructure of the Botany Rail Line.

Item	Listing	Approx. distance from project site	Summary of item and heritage significance
Mascot (Robey Street) Underbridge	Transport for NSW (Railcorp) section 170 register	Within the project site (over Robey Street)	The Mascot (Robey Street) Underbridge is a single span, double track steel railway bridge, which carries the Botany Rail Line over Robey Street. This item is of local significance as the first welded steel railway bridge on the NSW rail network.
Mascot (Shea's Ck) Underbridge	Transport for NSW (Railcorp) section 170 register	Partly within the project site (over Alexandra Canal)	The Sheas Creek Underbridge is a five-span double track railway bridge, which carries the Botany Rail Line over Alexandra Canal. It was opened in 1925. This item is of local significance as part of the original infrastructure for the Botany Rail Line.
Cooks River Container Terminal	NSW Port section 170 register Marrickville LEP	Partly within the project site, located off Cooks Road, St Peters	Originally known as the Cooks River Goods Yard, the terminal was developed in 1946 when the original goods yards in Sydney reached maximum capacity. The terminal site includes tracks, buildings and roadways, as well as features considered to be of individual significance. This item is of local historic significance as an integral part of the Sydney goods rail system. Continually used as a freight site since its inception, it was one of the first railway goods yards to be converted to accommodate containerisation.
Cooks River Container Terminal: Electric Overhead Travelling Crane	NSW Ports section 170 register	20 metres from the project site	The crane travelled on elevated runways supported on vertical steel columns. This item is of little significance but contributes to an understanding of freight handling systems at Cooks River Terminal prior to containerisation.
Cooks River Container Terminal: Lay Down Points Lever	NSW Ports section 170 register	130 metres from the project site	The item comprises an intact lay down points lever associated with track equipment for the former Cooks River goods yard. This item is a relatively rare points lever, which is specific to special locations such as ports and goods yards.
Cooks River Container Terminal: Precast Concrete Hut 1	NSW Ports section 170 register	120 metres from the project site	This single panelled precast concrete hut is of moderate local significance. It is representative of intact Department of NSW Railways signal relay huts from around 1950.

Item	Listing	Approx. distance from project site	Summary of item and heritage significance
Morton Bay fig tree	Marrickville LEP	110 metres from the project site on South Street, Tempe	This item is a prominent feature of the landscape and was probably planted shortly after subdivision of this part of Tempe in the late 19th century/early 20th century.
House - Daktari	Botany Bay LEP	100 metres from the project site on High Street, Mascot	This item of local historic and aesthetic heritage significance is a substantially intact example of a traditional 19th century double-fronted weatherboard cottage.

17.2.3 Other items of heritage significance

The assessment identified the Botany Rail Line as an item of potential heritage significance. Parts of the rail line are located in the project site (shown on Figure 17.5).

The assessment notes that the rail line is considered to be of local heritage significance. The statement of significance notes that 'The Botany Rail Line has historic, associative, social, aesthetic, technical and representative significance at a local level due to its relationship with surrounding industrial development (past and present), the Metropolitan Goods Line network and the use of freight transport in NSW'.

17.2.4 Archaeological sites and potential

The potential for a site to contain historical archaeology was assessed by identifying former land uses and associated features, and evaluating whether subsequent actions (either natural or human) may have impacted evidence for these former land uses. The significance of potential archaeological remains was then assessed.

The majority of the project site was considered to have nil to low archaeological potential and/or significance. The highest levels of archaeological potential and/or significance were identified at the following locations (shown on Figure 17.6):

- Alexandra Canal – short sections of the western bank and an adjacent area have moderate to high potential for remains of State significance from between 1870 and 1990, including evidence of landscape modification such as levies, drainage lines or redeposited soils and evidence of quarrying activities
- St Peters – an area to the north of the rail corridor has moderate potential for remains of local significance from between 1919 and 1990, including evidence of rail infrastructure, market gardens and brickwork buildings
- Sydney Airport and Mascot – an area to the east of Alexandra Canal has moderate potential for remains of local significance from between 1919 and 1990, including evidence of rail infrastructure, market gardens and residential development.

There are no listed archaeological sites within the study area.

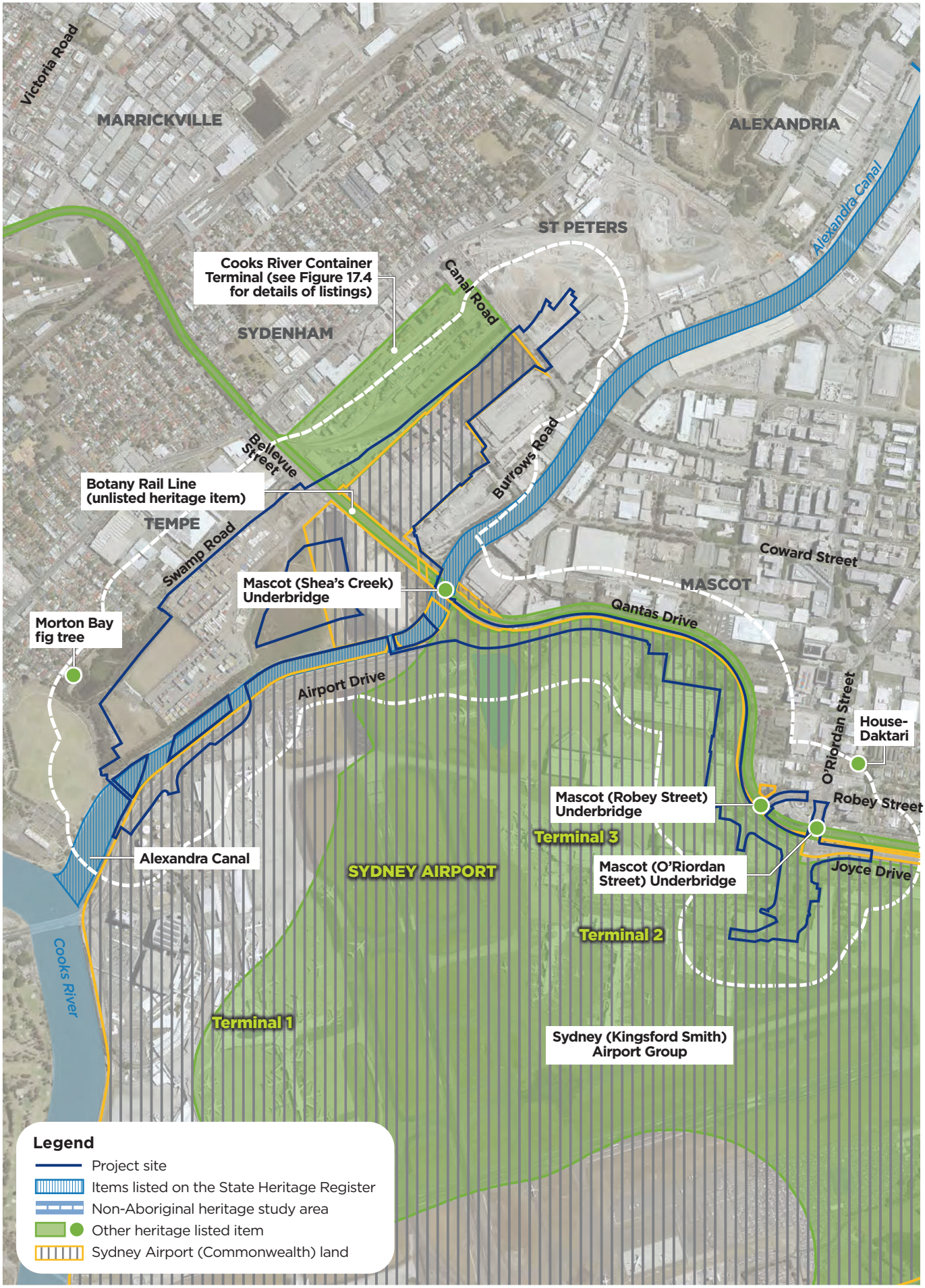

Figure 17.5 **Heritage items**

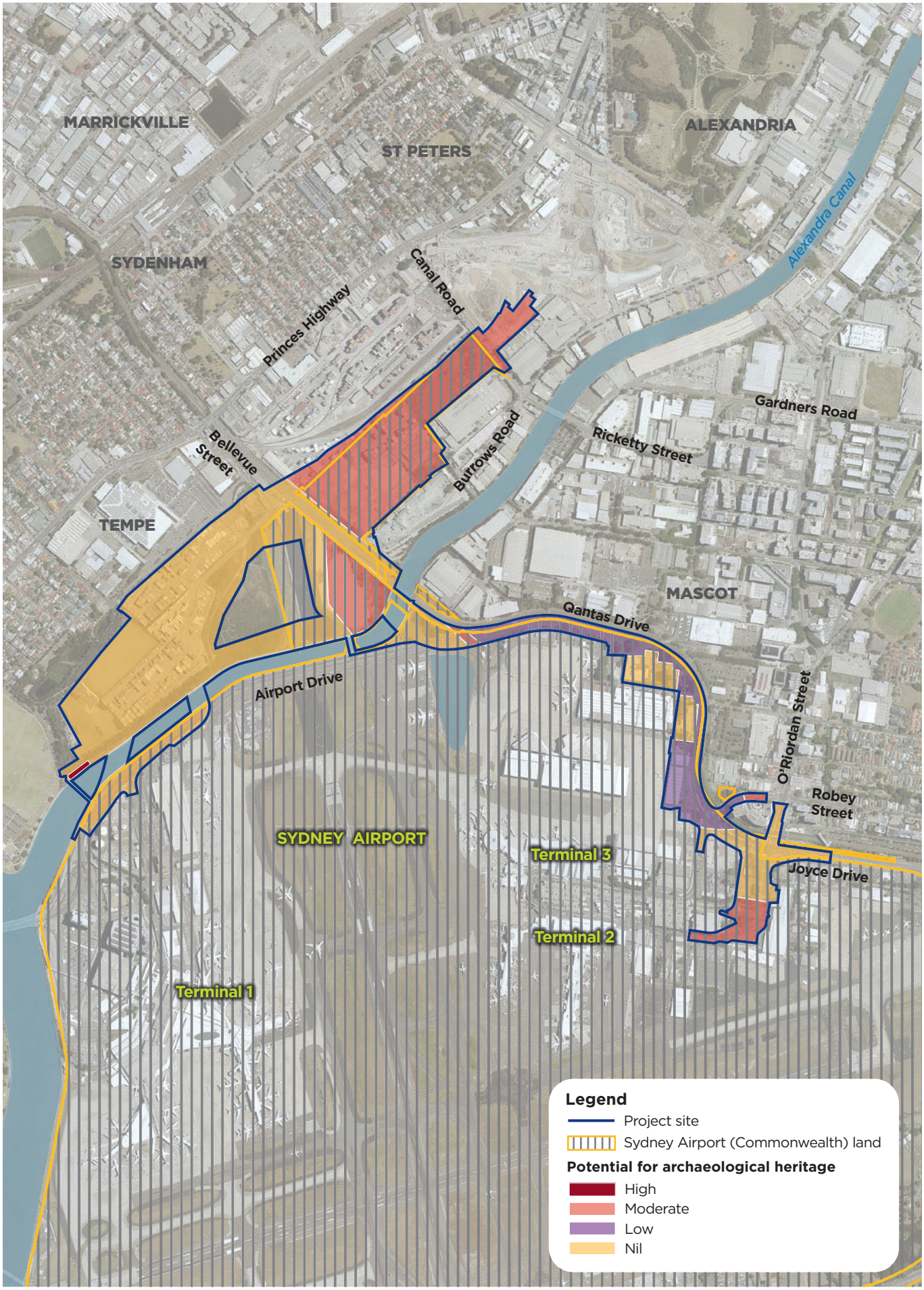

Figure 17.6 **Areas of archaeological significance**

17.2.5 Non-Aboriginal heritage on Sydney Airport (Commonwealth) land

Items and areas of heritage and archaeological significance within the project site that are located on Sydney Airport land, are summarised below.

Heritage listed items - Sydney (Kingsford Smith) Airport Group

The Sydney (Kingsford Smith) Airport Group is listed as a local heritage item by the Botany Bay LEP.

The Australian Heritage Database records the Sydney (Kingsford Smith) Airport Group as an 'indicative place' for listing on the Commonwealth Heritage List. This means that data associated with the item has been provided to, or obtained by, the Australian Government and entered into the Australian Heritage Database, but that the statutory obligations that apply to a formal listing do not apply. However, the potential impacts on this item have been considered as if it was formally listed.

Australian Government agencies that own or lease a Commonwealth heritage place are required to manage the place in accordance with Commonwealth heritage management principles (Commonwealth of Australia 2019). Under section 341S(1) of the EPBC Act, an agency with control or ownership of a Commonwealth heritage place is responsible for preparing a heritage management plan to protect and manage the heritage values of that place. In line with this requirement, the Sydney Airport Heritage Management Plan assesses the significance of individual elements within the Sydney (Kingsford Smith) Airport Group and provides a plan for managing heritage. This includes some of the buildings and elements located along the project site near Qantas Drive. The heritage management plan states that these buildings, which were developed between 1956 and 1972, have neutral or little heritage significance. The location of these buildings is shown on Figure 17.7.

Sydney (Kingsford Smith) Airport Group is also listed on the non-statutory Register of the National Estate (interim). Further information is provided in section 17.2.2.

Archaeological sites and potential

An area within the project site to the east of Alexandra Canal (shown on Figure 17.6) has a moderate potential for archaeological remains of local significance dating from between 1919 and 1990, including evidence of rail infrastructure, market gardens and residential development.

Figure 17.7 Direct impacts on the Sydney (Kingsford Smith) Airport Group

17.3 Assessment of construction impacts

17.3.1 Direct (physical) Impacts

The main potential for direct impacts on items of heritage significance would be to Alexandra Canal, the Sydney (Kingsford Smith) Airport Group and the Cooks River Intermodal Terminal.

The proposed bridges over Alexandra Canal have been designed to avoid direct impacts on the canal and its walls. However, nine drainage outlets in the canal wall would still be required, with three of these affecting the original sandstone fabric that has the highest significance (sandstone and remnant stone). Options have been investigated to avoid these impacts, as described in section 6.5, with the key principles being the need to drain stormwater efficiently, without substantially affecting surrounding areas or disturbing contaminated bed sediments within Alexandra Canal. Other options considered would include longer drainage lines and discharging into adjacent catchments, which would have resulted in other impacts, including the need to impact major infrastructure such as the Botany Rail Line.

Impacts on the Sydney (Kingsford Smith) Airport Group and the Cooks River Intermodal Terminal have been avoided as far as possible. The project would impact the northern edge of the Sydney (Kingsford Smith) Airport Group site along the southern side of Qantas Drive (an area of about 5.1 hectares). This area contains buildings that are described in Sydney Airport's Heritage Management Plan as having neutral or little heritage significance. Some of these buildings would be removed, and Qantas Drive would be widened at this location. The location of these potential impacts is shown on Figure 17.7. These impacts are unavoidable, as the location of the Botany Rail Line directly to the north of Qantas Drive constrains the direction in which the existing road corridor can be widened in this location.

The project would impact the south-eastern corner of the Cooks River Intermodal Terminal site. This area of land (about 0.9 hectares) would be acquired, and a small section of roadway (part of the St Peters interchange connection) would be constructed in this location. There would be no impacts on the individual elements associated with the heritage listing (which are also subject to individual listings). The location of these potential impacts is shown on Figure 17.8. These impacts are unavoidable, as the need to meet existing road standards coupled with the fixed connection points for the project means that the road alignment could not be completely contained within existing undeveloped Sydney Airport land on the western side of Alexandra Canal.

The majority of subsurface excavations required to construct the project would take place within areas considered to have nil or low potential for archaeological remains. However, subsurface excavation could potentially impact local and/or State significant archaeological remains associated with Alexandra Canal and the Sydney (Kingsford Smith) Airport Group. Additionally, there are some areas within and around Alexandra Canal, St Peters and Sydney Airport and Mascot that are considered to have moderate to high archaeological potential (described in section 17.2.4 and shown in Figure 17.6), which the project could have the potential to impact through direct ground disturbance.

A summary of the results of the assessment of the potential for direct impacts on heritage items and associated archaeological remains, and the assessed significance of these impacts, is provided in Table 17.2. Measures to manage and mitigate the impacts identified are provided in section 17.6.

Figure 17.8 Direct impacts on the Cooks River Intermodal Terminal

Table 17.2 Summary of affects to heritage significance as a result of direct (physical) impacts

Item	Proposed works	Impacts on heritage fabric	Impacts on potential archaeological remains
Items listed on the State Heritage Register			
Alexandra Canal	Construction of: ■ Four new bridges over the canal ■ Nine drainage outlets within the canal walls	Construction of the bridges would not directly impact the canal or its curtilage (which extends three metres from the banks of the canal). Construction of the drainage outlets would impact the canal walls. The impact to this element has been assessed as: ■ Minor when it relates to non-original fabric (concrete) – construction of eight of the drainage outlets would impact this fabric ■ Major when it relates to original sandstone fabric – construction of three of the drainage outlets would impact this fabric.	The overall impact to potential archaeological remains associated with this item has been assessed as moderate. Subsurface excavations have the potential to impact local and State significant archaeological remains associated with the canal.
Other items			
Sydney (Kingsford Smith) Airport Group	Construction of the Qantas Drive upgrade and extension. Eleven existing buildings and associated landscaping elements, which are considered to have heritage value by the Sydney Airport Heritage Management Plan, would be removed. Eight of these buildings are assessed as having little heritage value and three are assessed as having neutral heritage value.	The overall impact has been assessed as moderate as removing buildings rated as having little heritage value is inconsistent with the Sydney Airport Heritage Management Plan, and would remove evidence of Sydney Airport's post-war history and architecture.	The overall impact to potential archaeological remains has been assessed as minor to moderate. Subsurface excavations have the potential to impact local and State significant remains associated with market gardens and historical residential development.
Mascot (O'Riordan Street) Underbridge	None	The project would not directly impact this item as no works to this item are proposed.	Impacts on potential archaeological remains associated with the item has been assessed as minor to negligible.
Mascot (Robey Street) Underbridge	None	The project would not directly impact this item as no works to this item are proposed.	Impacts on potential archaeological remains associated with the item has been assessed as negligible.

Item	Proposed works	Impacts on heritage fabric	Impacts on potential archaeological remains
Mascot (Shea's Ck) Underbridge	Construction of a new bridge (the Terminal Link bridge) close to this item (five metres from the item at the nearest point).	The project would not directly impact this item as no works to this item are proposed.	Impacts on potential archaeological remains associated with the item has been assessed as negligible.
Cooks River Container Terminal and associated items	Construction of the western alignment of the St Peters interchange connection would affect part of the south-eastern corner of the site. Buildings and structures in this location would be removed.	The overall impact has been assessed as minor as: ■ The project would permanently alter the curtilage of the item ■ The structures proposed for removal are not considered to have heritage significance ■ The project would not directly impact individually listed items within the curtilage of the Cooks River Container Terminal.	The overall impact to potential archaeological remains has been assessed as minor. Only a small portion of the item's curtilage would be impacted, limiting impacts on potential archaeological remains.
Morton Bay fig tree	None	The project would not directly impact this item as no works to this item are proposed.	Impacts on potential archaeological remains associated with the item has been assessed as negligible.
Botany Rail Line	Construction of three overpasses over the existing rail corridor	The overall impact has been assessed as minor as: ■ The project has the potential to impact a brick culvert/water management structure, which is considered to have moderate heritage value ■ There would be minor impacts on land within the corridor and no direct impacts on the rail line itself.	The overall impact to potential archaeological remains has been assessed as minor. Only a small area of land associated with the rail corridor would be impacted, limiting impacts on potential archaeological remains.
House - Daktari	None	The project would not directly impact this item as the works would be undertaken about 10 metres north-east of the items curtilage.	Impacts on potential archaeological remains associated with the item has been assessed as negligible.

17.3.2 Other impacts

The potential for vibration impacts during construction was assessed by Technical Working Paper 3 (Noise and Vibration), and the results are summarised in Chapter 11 (Noise and vibration). Sections of Alexandra Canal, Cooks River Container Terminal, Mascot (O'Riordan Street) Underbridge, Mascot (Sheas Creek) Underbridge, and the Mascot (Robey Street) Underbridge have been identified as being within the cosmetic damage minimum working distances. As a result, there is the potential for vibration impacts, depending on how the works are managed in the vicinity of these items. Where heritage items are considered potentially sensitive to vibration impacts, more stringent requirements would be applied and monitoring undertaken to ensure that the potential for vibration impacts is low.

No other potential direct or significant visual impacts during construction were identified by the non-Aboriginal heritage assessment.

17.3.3 Summary of impacts on Sydney Airport (Commonwealth) land

The project would directly impact elements of the Sydney (Kingsford Smith) Airport Group. The widening of Qantas Drive near Sydney Airport would affect land near the northern boundary of the Sydney (Kingsford Smith) Airport Group. This would require the buildings in this location to be removed, as shown on Figure 17.7. Eight of these buildings are assessed as having some heritage value (rated as 'little') by the Sydney Airport Heritage Management Plan. Although the Sydney (Kingsford Smith) Airport Group is not subject to a statutory listing on the Commonwealth or National heritage lists, the potential impacts on this item have been assessed as if it was formally listed.

The *Significant impact guidelines 1.2* (DSEWPC, 2013) provides a guide to assessing whether impacts on Commonwealth heritage values are likely to be significant. The potential impacts on the Sydney (Kingsford Smith) Airport Group were also assessed in accordance with the Sydney Airport Heritage Management Plan.

The assessment concluded that direct impacts on the Sydney (Kingsford Smith) Airport Group would have the potential for moderate impacts on the significance of this item, as:

- Removing these buildings is inconsistent with the Sydney Airport Heritage Management Plan
- Evidence of Sydney Airport's post-war history and architecture represented by these structures would be removed.

Excavation at this location also has the potential to affect any archaeological remains that may be present. The assessment concluded that the impact to potential archaeological remains at this location would be minor to moderate. Subsurface excavations have the potential to impact remains associated with market gardens, historical residential development (the Lauriston Park Estate) and Byrne's land grant, which may have been subject to early colonial occupation.

Measures have been provided in section 17.6 to mitigate and manage the impacts identified.

17.4 Assessment of operation impacts

17.4.1 Impacts of the project as a whole

The main potential for impacts on non-Aboriginal heritage during operation would be as a result of visual impacts associated with the project, and how these impacts may affect the significance of heritage items. Potential visual impacts can occur as a result of changes to the landscape and/or the presence of new infrastructure in the vicinity of an item.

The main potential for effects to heritage significance as a result of visual impacts would be to Alexandra Canal and the Sydney (Kingsford Smith) Airport Group. The project includes four new bridges over the canal, which would affect the character of the canal and surrounding landscape. These impacts are unavoidable. As described in section 6.3, the proposed corridor and alignment for the project, which

includes a number of crossings of the canal, was selected as an outcome of an extensive options selection process that considered interfaces with surrounding projects and infrastructure. The additional crossings are required to enable the project to respond to the needs described in Chapter 5 (Strategic context and project need).

The findings of the assessment of the potential effects to heritage significance as a result of the visual impacts of the project during operation are summarised in Table 17.3.

Operational impacts such as increased noise, vibration or air quality are not considered likely to affect heritage. The potential for vibration impacts during operation was assessed by Technical Working Paper 3 (Noise and Vibration), and the results are summarised in Chapter 10 (Noise and vibration). No impacts on heritage listed items were identified.

Table 17.3 Summary of the effects to heritage significance as a result of visual impacts

Item	Summary of assessment results
Items listed on the State Heritage Register	
Alexandra Canal	The overall impact to this item is assessed as major as: ■ The addition of four new bridges over Alexandra Canal would result in permanent modifications to the existing landscape, obstruct view lines towards and along the canal, and alter its 'open sky' character of the canal ■ The new bridges would increase the number of crossings from three crossings (including one existing crossing and two to be constructed as part of the New M5) to seven crossings ■ The new drainage outlets would alter the existing appearance of the canal walls, removing a portion of the fabric in nine locations, one of these locations consist of original sandstone fabric that is considered to have the highest significance.
Other items	
Sydney (Kingsford Smith) Airport Group	The overall impact to this item is assessed as moderate as: ■ The buildings that would be removed visually contribute to Sydney Airport's post-war development history ■ The new road infrastructure together with the removal of these items and associated landscape elements (including mature trees) would alter the existing appearance of Sydney Airport when viewed from Qantas Drive ■ The buildings are not considered elements of moderate or high significance.
Mascot (O'Riordan Street) Underbridge	The overall impact to this item is assessed as negligible as it would not be impacted by the project.
Mascot (Robey Street) Underbridge	The overall impact to this item is assessed as negligible as it would not be impacted by the project.
Mascot (Shea's Ck) Underbridge	The overall visual impact to this item is assessed as moderate as a new bridge would be located in close proximity to this item, altering the existing landscape and views to and from the item.
Cooks River Container Terminal and associated items	The overall impact to this item is assessed as minor to moderate as: ■ The new road infrastructure would be visible from the individual items associated with the item's listing and would modify the item's immediate and surrounding landscape ■ The majority of its significant landscape features would be retained.
Morton Bay fig tree	The overall impact to this item is assessed as negligible as views to and from the item would not be impacted.
House-Daktari	The overall impact to this item is assessed as negligible as views to and from the item would not be impacted.

Item	Summary of assessment results
Botany Rail Line	The overall impact to this item is assessed as moderate as the project would alter the item's existing and historic landscape due to the presence of three bridges and overpasses that would be constructed over the rail corridor, and the new road corridor that would be constructed adjacent to the rail corridor's western boundary.

17.4.2 Overall level of impact on heritage items and archaeology

A summary of the overall impacts of the project on the identified items, taking into account the potential impacts of both construction and operation, is provided in Table 17.4. The assessment concluded that the overall impact on archaeology would be moderate.

Table 17.4 Overall level of impact

Item	Overall impact rating
Alexandra Canal	Major
Mascot (O'Riordan Street) Underbridge	Negligible
Mascot (Robey Street) Underbridge	Negligible
Mascot (Shea's Ck) Underbridge	Minor
Sydney (Kingsford Smith) Airport Group	Moderate
Cooks River Container Terminal and associated items	Minor
Morton Bay Fig Tree	Negligible
House - Daktari	Negligible
Botany Rail Line	Minor to moderate

17.4.3 Summary of impacts on Sydney Airport (Commonwealth) land

The project would change the visual appearance of the northern edge of the Sydney (Kingsford Smith) Airport Group as a result of the widened section of Qantas Drive and the removal of existing buildings and associated landscape elements (including mature trees). This would change the visual character in this area.

The assessment concluded that these impacts would have the potential for moderate impacts on the significance of the Sydney (Kingsford Smith) Airport Group.

Consistency with the Sydney Airport Master Plan

The *Sydney Airport Master Plan 2039* (SACL, 2019a) (the Master Plan) recognises the heritage values associated with Sydney Airport. The Master Plan states that 'These heritage values are associated with the airport as a whole and are embodied in the location, form and function of its individual elements. This includes the arrangement of streets, buildings and runways, and the ways in which these attributes reflect the airport's history of change and growth.' The Master Plan recognises the role of the Sydney Airport Heritage Management Plan in managing heritage at Sydney Airport.

The Master Plan notes that three heritage items have been identified as 'environmentally significant areas' under the Airports Act, and are also recognised as significant in the Heritage Management Plan:

- The location and form of Keith Smith Avenue
- The location and function of the main north–south and east–west runways
- Sydney Airport Wetlands (incorporating Engine Ponds East and West, Mill Pond and Mill Stream).

The project would not impact these items.

The Master Plan also notes that the Sydney Airport Heritage Management Plan identifies a number of other items of heritage significance. These include buildings in the Sydney Airport Jet Base, some of which are located in the project site. The impacts on these items have been assessed by the non-Aboriginal heritage assessment, and the results of the assessment are summarised above and in section 17.3.

The Master Plan recognises that proposed developments at the airport (as detailed in the Master Plan), particularly within the airport's North East Sector (the north-eastern area of the airport site to the south of Qantas Drive and Joyce Drive) '… will have significant impacts on a number of heritage significant structures including buildings and hangars within the Jet Base …'

The plan notes that Sydney Airport Corporation will pursue opportunities for the airport's history and significance to be interpreted as part of new development. Key relevant initiatives under the Master Plan include:

- Integrate heritage interpretation devices into new and existing Sydney Airport facilities, through delivery of an interpretation strategy
- Ensure that heritage items of recognised significance are recorded to an appropriate archival standard.

The measures provided in section 17.6 to mitigate and manage the impacts identified by the non-Aboriginal heritage assessment are consistent with the initiatives in the Master Plan. The potential impacts on the Jet Base as a result of the project are consistent with the types of impacts the Master Plan envisages would be likely as a result of development in this area. These impacts have been assessed in accordance with the Sydney Airport Heritage Management Plan.

17.5 Cumulative impacts

Cumulative heritage impacts represent the incremental loss of, or modifications to, a historical or environmental resource over time. The main nearby projects with the potential to directly or indirectly impact non-Aboriginal heritage are the proposed Botany Rail Duplication and the New M5 (which is under construction).

In the immediate vicinity of the project site, the Botany Rail Duplication would result in:

- Removal of two locally listed heritage items (the Mascot (O'Riordan Street) Underbridge and the Mascot (Robey Street) Underbridge)
- Modifications to one locally listed item (the Mascot (Botany Road) Underbridge)
- Alterations to the Botany Rail Line, which is identified as a potential heritage item
- Potential impacts on State and locally significant archaeology, including Alexandra Canal.

In the immediate vicinity of the project site, the impacts of the New M5 will include:

- Visual impacts on Alexandra Canal from two new bridges over the canal and additional drainage outlets
- Modifications to the St Peters Brickpit Geological Site (listed on the non-statutory Register of the National Estate).

The assessment concluded that the most significant potential cumulative impact would be as a result of the number of bridges over Alexandra Canal. This is mainly a result of the impacts on the canal's existing character, which has remained relatively 'open' since its establishment in the late 19th century. The addition of six new bridges (the combined impacts of the proposed Sydney Gateway road project and the approved New M5 would permanently alter these characteristics.

17.6 Management of impacts

17.6.1 Approach

Approach to mitigation and management

- The assessment identified that the project would have the potential for moderate to major impacts on the heritage significance of:
- Alexandra Canal
- Sydney (Kingsford Smith) Airport Group
- Areas with the potential for archaeological remains of moderate to high significance.

The project would also have the potential for minor to moderate impacts on the Botany Rail Line.

Approach to managing the key potential impacts identified

A key approach to minimising the potential for heritage impacts, and in particular cumulative impacts with other projects, would be designing the project in accordance with the urban design and landscape plan to be prepared for the project. The plan would include strategies and design principles to ensure that the design of project features and ancillary infrastructure is sympathetic to the existing landscape heritage significance of the study area. The design of the project, in particular the bridges over Alexandra Canal and heritage interpretation, would also seek to enhance the heritage significance of Alexandra Canal, which provides a link to the area's European and industrial heritage. Further information on the approach to urban design is provided in section 7.12.

Measures are provided in section 17.6.2 to ensure that the bridges over Alexandra Canal, and the drainage outlets in the canal walls, are designed to take into account the heritage significance of the canal and its landscape, and to integrate with the bridges and outlets that will be constructed as part of the New M5. This includes avoiding areas of significant fabric, or reusing this material within the canal where avoidance is not possible. Whilst these measures would reduce the impact to the canal, the assessment concluded the project would have a major impact to this item.

The approach to managing impacts at Sydney (Kingsford Smith) Airport Group would involve establishing protection barriers around heritage items and landscape elements to be retained to prevent accidental impacts during construction. Due to the requirement for the removal of buildings within the airport and construction of additional infrastructure, the project would have a moderate impact on this item. The approach for managing these impacts would include incorporating heritage interpretation into the design to recognise its historical significance.

For areas where potential impacts on archaeology have been identified, a Historical Archaeological Assessment and Research Design and Excavation Methodology would be prepared following approval to define the approach to archaeological assessment. 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.

With respect to the potential for vibration impacts, as described in Chapter 10 (Noise and vibration), the Construction Noise and Vibration Management Plan would outline the measures to manage construction vibration impacts for the project. 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).

Approach to managing other impacts

The potential for impacts during construction would be managed in accordance with a project-specific Heritage Management Plan, which would be implemented as part of the CEMP. The plan would detail processes and responsibilities to minimise potential impacts on heritage during construction. It would be prepared in accordance with relevant guidelines, standards, and the Alexandra Canal Conservation Management Plan and Sydney Airport Heritage Management Plan. It would be prepared in consultation with the agencies responsible for the heritage items that would be affected by the project. Further information on the CEMP, including requirements for the Heritage Management Plan, is provided in Chapter 27 (Approach to environmental management and mitigation).

Other mitigation measures are listed in section 17.6.2.

Expected effectiveness

Avoidance is considered to be the most effective strategy for preventing impacts. Through development of the project design and construction planning, a number of impacts on non-Aboriginal heritage have been avoided or reduced. However, not all impacts on heritage can be avoided entirely as this would result in additional impacts on other areas Therefore, further measures to mitigate impacts are required.

The measures provided in section 17.6.2 have been identified as an outcome of the non-Aboriginal heritage assessment and considering best practice approaches to managing potential impacts as defined by relevant heritage guidelines. The non-Aboriginal heritage assessment was prepared by a specialist heritage consultant.

The project aims to create a uniform and visually captivating landscape that would improve the overall nature of land on both sides of Alexandra Canal. If carried out sympathetically, and with consideration given to incorporating the area's history into the bridge and landscape designs, this will have a positive impact on the study area.

17.6.2 List of mitigation measures

Measures that will be implemented to address potential impacts on non-Aboriginal heritage are listed in Table 17.5.

Table 17.5 Non-Aboriginal heritage mitigation measures

Impact/issue	Ref	Mitigation measure	Timing
Avoiding impacts on heritage	NAH1	The design will avoid impacts on non-Aboriginal heritage items, significant heritage fabric, locally and State significant archaeological remains and landscapes (including mature trees) as far as reasonably practicable. This includes significant fabric associated with Alexandra Canal and the Sydney (Kingsford Smith) Airport Group.	Detailed design
Minimising impacts on heritage	NAH2	The design will be prepared in accordance with the urban design and landscape plan for the project, and will minimise the potential for visual impacts on heritage items by incorporating sympathetic fabric, colour and form in the design.	Detailed design
Design of the bridges over Alexandra Canal	NAH3	The bridges over Alexandra Canal will be designed to: ■ Be sympathetic to the heritage sensitivity and industrial landscape of the canal ■ Minimise physical impacts on the canal ■ Incorporate a high quality architectural design using suitable material and forms ■ Integrate with the bridges for the New M5 ■ Retain the open character of the canal as far as possible ■ Have regard to the Alexandra Canal Conservation Management Plan.	Detailed design

Impact/issue	Ref	Mitigation measure	Timing
		An appropriately qualified and experienced heritage architect or engineer will provide independent review of the designs, and the Heritage Council of NSW and Sydney Water will be consulted.	
Design of the drainage outlets at Alexandra Canal	NAH4	The drainage outlets at Alexandra Canal will be designed to: ■ Minimise impacts on significant original fabric and highly visible areas ■ Be sympathetic to the industrial landscape of the canal and its existing fabric ■ Use suitable material and forms ■ Have regard to the Alexandra Canal Conservation Management Plan. An appropriately qualified and experienced heritage architect or engineer will provide independent review of the design, and the Heritage Council of NSW and Sydney Water will be consulted.	Detailed design
Reuse of significant fabric at Alexandra Canal	NAH5	Where significant fabric is to be removed, consideration will be given to reusing the fabric for interpretation or repair and maintenance of other sections of the canal, in consultation with Sydney Water.	Detailed design
Heritage interpretation	NAH6	Appropriate heritage interpretation will be incorporated into the design in accordance with the *NSW Heritage Manual* (NSW Heritage Office and Department of Urban Affairs and Planning, 1996), *Interpreting Heritage Places and Items: Guidelines* (NSW Heritage Office, 2005), and the NSW Heritage Council's Heritage Interpretation Policy. This will focus on recognising the historical significance of the following items: ■ Alexandra Canal ■ Sydney (Kingsford Smith) Airport Group ■ Cooks River Container Terminal ■ Mascot (Shea's Ck) Underbridge ■ Botany Rail Line.	Detailed design
Managing heritage impacts during construction	NAH7	A Heritage Management Plan will be prepared prior to construction and implemented as part of the CEMP. It will include measures to manage non-Aboriginal heritage and minimise the potential for impacts during construction. The plan will take into account relevant conservation and heritage management policies in the Alexandra Canal Conservation Management Plan and the Sydney Airport Heritage Management Plan.	Pre-construction, construction
Impacts on archaeology	NAH8	A Historical Archaeological Research Design and Excavation Methodology will be prepared for, and implemented at, the following locations within the project site: ■ Intact sections of Alexandra Canal along the western bank of the canal on either side of the existing pedestrian and rail bridges ■ Vacant land at 30 Canal Road (Lot 4 DP 555771 and Lot 3 DP 825649) ■ Land located north of Canal Road that is currently used for the construction (stockpiling) of the New M5 (Lot A DP 391775, Lot B DP 394647 and Lot 2 DP1168612) ■ Sydney Airport land considered to contain low or moderate archaeological potential ■ Land along Qantas Drive considered to contain low or moderate archaeological potential	Pre-construction, construction

Impact/issue	Ref	Mitigation measure	Timing
		■ Sydney Airport land located east of Sydney Airport northern lands car park and west of Botany Rail Line (Lot 1 DP 826101) ■ Land to the west of Boral's St Peters facility and east of the Botany Rail Line. The Historical Archaeological Assessment and Research Design and Excavation Methodology will identify the specific features of archaeological significance that could be present at these locations, provide a scope for further investigations to confirm and specify appropriate archaeological management for any remains identified.	
Archival recording	NAH9	Photographic archival recording will be carried out for affected sections of the following items: ■ Alexandra Canal ■ Sydney (Kingsford Smith) Airport Group ■ Cooks River Container Terminal ■ Mascot (Shea's Ck) Underbridge ■ Botany Rail Line. Photographic archival recording will be carried out prior to works commencing in the vicinity of the item, and in accordance with *How to Prepare Archival Records of Heritage Items* (Heritage Office, 1998) and *Photographic Recording of Heritage Items Using Film or Digital Capture* (Heritage Office, 2006b). 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. This document would subsequently be held by the appropriate local council(s), local library, local historical society and the owner of the asset.	Pre-construction
Avoiding impacts during construction	NAH10	Heritage items and landscaping located outside the project site and associated with the following items will be marked on site plans contained within the CEMP as areas to be avoided during construction, where works are proposed within 10 metres of: ■ Alexandra Canal (significant fabric and gazetted curtilage as detailed in the conservation management plan for Alexandra Canal) ■ Sydney (Kingsford Smith) Airport Group – fabric of high significance (as identified in the Sydney Airport Heritage Management Plan), trees and plantings ■ Cooks River Container Terminal – fabric of high significance, trees and plantings ■ Mascot (Shea's Ck) Underbridge – fabric associated with the bridge. Protective barriers will be established prior to works at these locations.	Construction
Potential vibration impacts on heritage items	NAH11	Potential vibration impacts on features of heritage significance will be managed in accordance with the Construction Noise and Vibration Management Plan (measure NV1) and noise and vibration mitigation measure NV12.	Construction
Unexpected finds	NAH12	Any items of potential heritage conservation significance or human remains discovered during construction will be managed in accordance with the *Standard Management Procedure Unexpected Heritage Items* (Roads and Maritime, 2015e).	Construction

17.6.3 Managing residual impacts

Residual impacts are impacts of the project that may remain after implementation of:

- Design measures to avoid and minimise impacts (see sections 6.4 and 6.5)
- Construction planning and management approaches to avoid and minimise impacts (see sections 6.4 and 6.5)
- Specific measures to mitigate and manage identified potential impacts (see section 17.6.2).

Residual impacts on non-Aboriginal heritage would include impacts on Alexandra Canal as a result of the installation of three drainage outlets in significant fabric and the visual impacts of the new bridges over the canal. There would also be a moderate impact to the Sydney (Kingsford Smith) Airport Group from the removal of buildings. With the implementation of mitigation measures, residual impacts on all other non-Aboriginal heritage items would be neutral to minor.

Despite the residual impacts described above, these items would continue to retain heritage values. Heritage interpretation would assist in promoting the historical significance of the items. Opportunities to further reduce impacts on these items, including further avoidance of impacts, will be investigated during detailed design. The project also aims to create a uniform and visually captivating landscape that would improve the overall nature of land on both sides of Alexandra Canal. If carried out sympathetically and with consideration given to incorporating the area's history into its bridge and landscape designs, this will have a positive impact on the study area and enhance the significance of the Alexandra Canal.

Chapter 18

Aboriginal heritage

This chapter provides a summary of the Aboriginal heritage assessment. It describes existing Aboriginal heritage, identifies potential impacts, and provides measures to mitigate and manage the impacts identified. Further information is provided in Technical Working Paper 10 (Aboriginal Cultural Heritage Assessment Report).

The SEARs relevant to Aboriginal heritage are listed below. There are no MDP requirements specifically relevant to Aboriginal heritage; however, there is a requirement under section 91(1) of the Airports Act to assess the potential environmental impacts associated with a development (section 91(1)(h)), and to specify how those impacts may be dealt with (section 91(1)(j)). Full copies of the SEARs and MDP requirements, and where they are addressed in this document, are provided in Appendices A and B respectively.

Reference	Requirement	Where addressed
Key issue SEARs		
7	**Heritage**	
7.1	The Proponent must identify and assess any direct and/or indirect impacts (including cumulative impacts and visual impacts) to the heritage significance of:	
	(a) Aboriginal places, objects and cultural heritage values, as defined under the *National Parks and Wildlife Act 1974* and in accordance with the principles and methods of assessment identified in the current guidelines;	This chapter
	(b) Aboriginal places of heritage significance, as defined in the Standard Instrument – Principal Local Environmental Plan;	Section 18.2.2
7.3	Where archaeological investigations of Aboriginal objects are proposed these must be conducted by a suitably qualified archaeologist, in accordance with section 1.6 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010).	Section 18.6.1
7.4	Where impacts to Aboriginal objects and/or places are proposed, consultation must be undertaken with Aboriginal people in accordance with the current guidelines.	Sections 18.1.2 and 18.6.2.

18. Aboriginal heritage

18.1 Assessment approach

Aboriginal heritage assessment is an important component of infrastructure planning and assessment. It is undertaken in consultation with representatives of Aboriginal stakeholders and is respectful of the cultural knowledge they hold. The assessment of potential impacts on Aboriginal heritage considers cultural knowledge, and the results of background research and field investigations. This includes an assessment of the potential for Aboriginal heritage items to be located at depth where the surface ground is disturbed.

An overview of the approach to the Aboriginal heritage assessment is provided in this section, including the legislative and policy context and a summary of the assessment methodology.

18.1.1 Legislative and policy context to the assessment

The assessment was undertaken in accordance with the SEARs and MDP requirements (provided in Appendix A to B) and with reference to the following:

- Relevant legislation, including the EP&A Act, the Airports Act and associated regulations, the *National Parks and Wildlife Act 1974* (NSW), the EPBC Act, the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Cth) and the *Native Title Act 1993* (Cth)
- *Procedure for Aboriginal cultural heritage consultation and investigation* (Roads and Maritime, 2011b)
- *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011)
- *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW, 2010c)
- *Significant impact guidelines 1.2 - Actions on, or impacting upon, Commonwealth land and Actions by Commonwealth Agencies* (DSEWPC, 2013)
- *Sydney Airport Master Plan 2039* (SACL, 2019a)
- *Sydney Airport Environment Strategy 2019-2024* (SACL, 2019b).

18.1.2 Methodology

Study area

The study area for the assessment is the project site, as described in Chapter 2 (Location and setting). Background research, including database searches, was based on a wider search area of 14 by 14 kilometres centred on the project site.

Key tasks

The assessment involved:

- Background research on the Aboriginal archaeological and historical context of the project site and registered Aboriginal sites, including reviewing a previous Aboriginal heritage assessment undertaken between 2016 and 2018, and searching the Aboriginal Heritage Information Management System (AHIMS) database in December 2018
- Site inspections of identified areas of archaeological potential in July 2018
- Consultation with the Aboriginal community in accordance with the *Procedure for Aboriginal cultural heritage consultation and investigation* (Roads and Maritime, 2011) and the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW, 2010c)

- Assessing the Aboriginal heritage significance of the project site and areas of archaeological potential
- Assessing the potential impacts of the project
- Identifying measures to minimise impacts on Aboriginal heritage.

Aboriginal consultation

Aboriginal consultation was undertaken as an input to the assessment in accordance with the consultation guidelines listed in section 18.1.1. The purpose of consultation was to provide the Aboriginal community with an opportunity to input to the assessment and the Aboriginal Cultural Heritage Assessment Report. Aboriginal consultation included:

- Identifying, notifying and registering relevant Aboriginal parties by:
  - Contacting relevant organisations to identify Aboriginal parties with cultural interest/knowledge in the study area
  - Placing advertisements in newspapers, including the Koori Mail and local newspapers
  - Sending letters to Aboriginal parties to invite them to register their interest in the project – a total of 12 individuals representing 10 groups registered their interest
- Presenting information about the project and assessment at an Aboriginal focus group meeting held in December 2018
- Sending the draft Aboriginal Cultural Heritage Assessment Report to registered Aboriginal parties for review.

Further information on the assessment methodology, including the consultation activities, is provided in sections 3 and 4 of Technical Working Paper 10 (Aboriginal Cultural Heritage Assessment Report).

18.1.3 Risks identified

An environmental risk assessment was undertaken as an input to the impact assessment (see Appendix G). This involved identifying potential environmental risks during construction and operation, and rating the potential risks according to likelihood, consequence and overall level of risk, in general accordance with *AS/NZS ISO 31000:2009 Risk management – Principles and guidelines*.

The potential to impact identified areas of archaeological potential as result of ground disturbance during construction was the only risk identified by the environmental risk assessment that had an assessed overall risk rating of medium or above. The Aboriginal cultural heritage assessment included consideration of this potential risk.

18.2 Existing environment

18.2.1 Aboriginal historical and landscape context

Prior to European settlement, land in the study area was occupied by the Gadigal people. It is considered likely that the project site was occupied by the Wangal clan, whose territory extended between the Parramatta and Cooks rivers. In the study area, wetlands associated with the original alignment of Shea's Creek, the Cooks River and Gumbramorra Swamp were a source of reliable fresh water and food for Aboriginal people. Outcrops of Hawkesbury Sandstone around the Cooks River and surrounding environment would have provided shelter and materials.

Since early European settlement the study area has been subject to significant disturbance and development. However, deeper estuarine and fluvial soils remain intact in some areas, including surrounding some parts of Alexandra Canal. Within these deeper soils, shell material has been encountered at depths of up to five metres below ground level.

Alexandra Canal has been identified as having Aboriginal heritage values. The Sydney Water Section 170 heritage register listing for the canal notes that 'the discovery of the butchered Dugong, Aboriginal axes and the remains of an ancient forest in this area that were uncovered during construction have revealed both a species and a food source of Aboriginal occupation in the Botany basin and a scientific understanding to the changing sea levels along the area.'

18.2.2 Recorded Aboriginal sites and places

There are no listed Aboriginal sites recorded on the AHIMS database within the project site. The closest listed site is the Shea's Creek Dugong (AHIMS ID 45-6-0751), which is recorded to have been located about 250 metres from the project site. The AHIMS record indicates that this site has been destroyed.

No Aboriginal sites or places listed under the EPBC Act were identified in the project site.

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Cth) provides for the protection for intangible Aboriginal heritage within Australia, including places, objects and folklore that that 'are of particular significance to Aboriginals in accordance with Aboriginal tradition. No intangible Aboriginal heritage was identified in the project site.

There are no Aboriginal places declared under section 84 of the *National Parks and Wildlife Act 1974* (NSW), or Aboriginal places of heritage significance defined by the *Standard Instrument – Principal Local Environmental Plan*, located within or near the project site.

There are no native title claims relevant to the project site.

18.2.3 Archaeological survey results, potential and significance

Whilst the study area is likely to have been occupied by Aboriginal people, the likelihood of surviving evidence remaining is influenced by a range of factors, including the durability of material and amount of disturbance to the land. The large-scale removal and modification of the underlying geology and associated soils, during construction of Sydney Airport, Alexandra Canal, the Botany Rail Line and the surrounding urban environment, is likely to have significantly impacted or removed the original landforms and associated archaeological potential.

Two areas with archaeological potential were identified during the archaeological field surveys. These are referred to as Investigation Area 1 and Investigation Area 2. These areas are located close to Alexandra Canal, adjacent to the rail corridor on either side of the canal, and mainly within Sydney Airport land. Although evidence of surface disturbance was identified at these locations, geological data indicates that deeper soils (at a depth of about five metres below ground level) are undisturbed. These deeper soils have the potential to contain Aboriginal archaeological deposits due to the age of these soils. As such, Investigation Area 1 and Investigation Area 2 are considered to have archaeological potential.

The locations of Investigation Area 1 and Investigation Area 2 are shown on Figure 18.1. Photographs showing the areas are provided at Figure 18.2 and Figure 18.3.

Based on the results of the survey and review of existing conditions, the assessment of the archaeological significance of the project site concluded that:

- The majority of the project site has nil to low archaeological potential and does not have scientific significance
- Investigation Area 1 and Investigation Area 2 have moderate archaeological potential and moderate to high scientific significance as a result of the potential presence of undisturbed material beneath the ground surface
- Any archaeological remains would be rare and have the potential to add to knowledge of the Aboriginal heritage values of the study area.

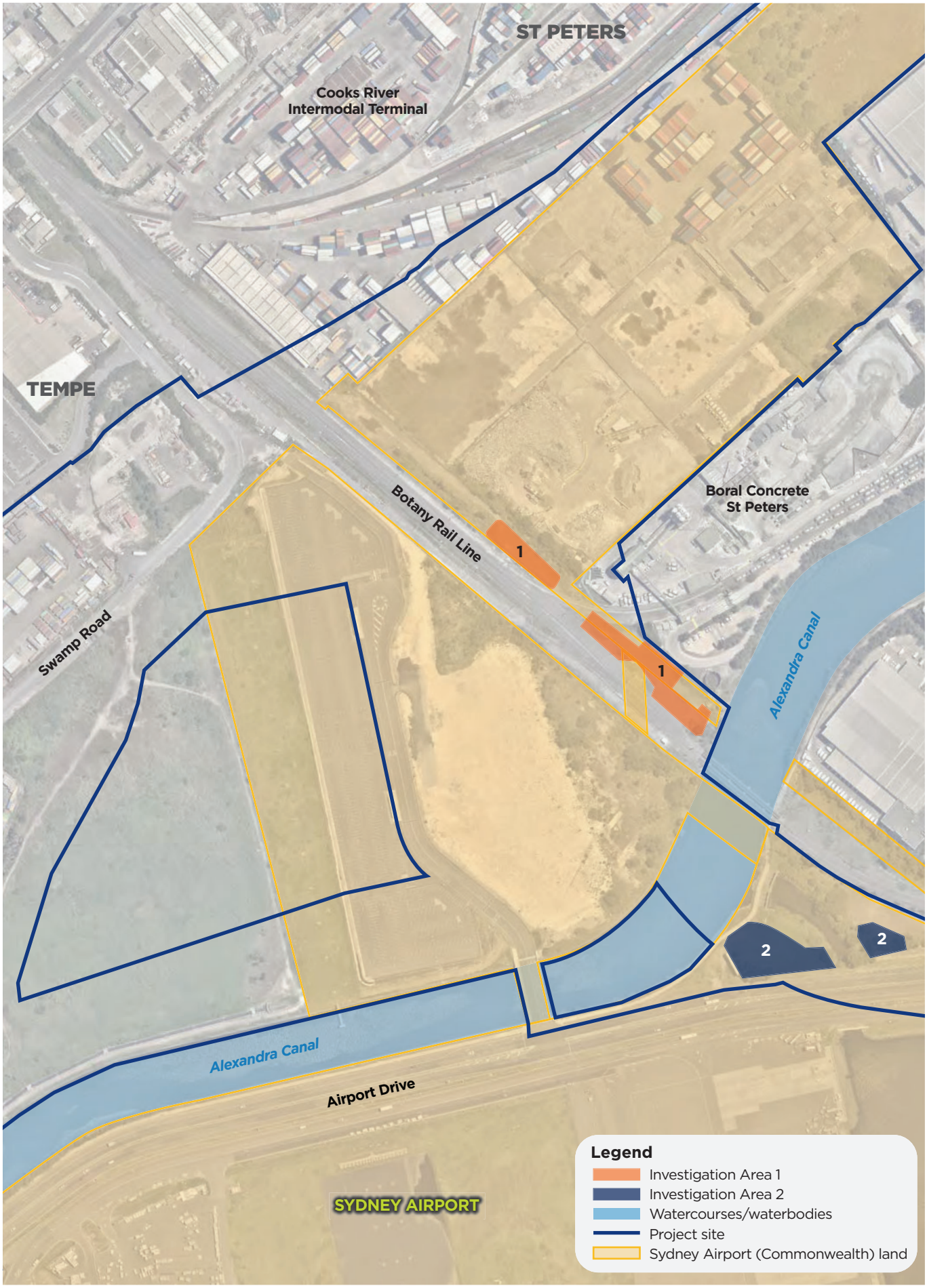

Figure 18.1 **Areas of Aboriginal archaeological potential**

Figure 18.2 Investigation Area 1

Figure 18.3 Investigation Area 2

18.2.4 Aboriginal heritage within Sydney Airport (Commonwealth) land

The majority of the project site within Sydney Airport land has been cleared and developed, and the former natural landforms and associated archaeological potential have been removed. Accordingly, the majority of the project site on Sydney Airport land is assessed as having nil to low archaeological potential and scientific significance.

However, the two areas of archaeological potential that have been identified, Investigation Area 1 and Investigation Area 2, are mainly located on Sydney Airport land (as shown on Figure 18.1). Parts of these areas have moderate archaeological potential and moderate to high scientific significance.

18.3 Assessment of construction impacts

18.3.1 Impacts on recorded Aboriginal sites and places

There would be no impacts on recorded Aboriginal sites or places as none were identified within the project site.

18.3.2 Impacts on areas with Aboriginal archaeological potential

Works associated with the project would disturb the ground within Investigation Areas 1 and 2. These works include constructing the piers associated for the Qantas Drive bridge (on both sides of Alexandra Canal) and the culvert connecting to the northern side of Alexandra Canal. Constructing this infrastructure would involve works at depths that could disturb the underlying sandy and clay estuarine deposits, which are considered to be archaeologically sensitive and potentially contain archaeological material. These works would directly and partially impact these areas of archaeological potential, resulting in a partial loss of the potential Aboriginal heritage values of these areas.

To mitigate these potential impacts, salvage excavation would be undertaken prior to construction as described in section 18.6.1.

18.3.3 Summary of impacts on Sydney Airport (Commonwealth) land

Construction would partially impact the potential archaeological values of the identified investigation areas. The *Significant impact guidelines 1.2* (DSEWPC, 2013) provide a guide to assessing whether impacts on heritage values are likely to be significant. The assessment concluded that:

- The project would result in a partial and localised impact to areas of potential Aboriginal heritage value on Sydney Airport (Commonwealth) land
- These potential impacts are not considered to be significant.

The approach to managing and mitigating the potential impacts are described in section 18.6.

Consistency with the Sydney Airport Master Plan 2039

The *Sydney Airport Master Plan 2039* (SACL, 2019a) (the Master Plan) recognises the Aboriginal heritage values of the land within and surrounding the Sydney Airport site. The Master Plan acknowledges the special significance that land in the area holds for Aboriginal people.

The plan notes that Sydney Airport Corporation will ensure potential impacts on heritage values associated with the airport are managed and reduced. Key relevant initiatives under the Master Plan include:

- Conserve the significant places of the airport, in line with the Heritage Management Plan
- Integrate heritage interpretation devices into new and existing Sydney Airport facilities, through delivery of an interpretation strategy
- Ensure that heritage items of recognised significance are recorded to an appropriate archival standard
- Establish an archive of historical records of the history of Sydney Airport and the site

The measures provided in section 18.6, which include developing an Aboriginal heritage interpretation strategy and including appropriate Aboriginal heritage interpretation in the design, are consistent with the Master Plan.

18.4 Assessment of operational impacts

Impacts on Aboriginal heritage would be limited to the construction stage of the project. No additional impacts on the areas of archaeological potential are predicted during operation.

18.5 Cumulative impacts

The main nearby projects with the potential to impact Aboriginal heritage are the Botany Rail Duplication and the New M5. The Botany Rail Duplication is not expected to impact any listed Aboriginal sites, places or areas of archaeological potential. No items or places of Aboriginal heritage significance in the vicinity of the project site have the potential to be impacted by the New M5 project.

While these projects would not impact Aboriginal heritage, Aboriginal archaeological remains are a rare and diminishing resource in urban areas. Impacts on any items of Aboriginal heritage significance present within the two areas of archaeological potential would have a cumulative impact on the regional archaeological landscape, although only a discrete area would be impacted by the project. Other locations along Alexandra Canal, which may contain buried soil landscapes, would not be impacted by the project. This means that a representative sample of these landscapes would be remain in the locality.

18.6 Management of impacts

18.6.1 Approach

Approach to mitigation and management

Approach to managing the key potential impacts identified

The assessment identified that impacts on the two areas of Aboriginal archaeological potential are unavoidable. It has not been confirmed whether any items of significance are located in these areas.

Salvage excavation would be undertaken prior to construction within those parts of Investigation Area 1 and Investigation Area 2 where deep sediments would be directly impacted by the project. The layers of archaeological interest are likely to be well below the water table in highly permeable soils. As such, carrying out hand held test excavations in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW, 2010d) would not be feasible as inflow volumes would be too great. There is also the risk that the sandy soils would collapse as the excavation progresses to the depths required. As described in Chapters 13 (Contamination and soils) and 15 (Groundwater), the groundwater is contaminated. While mitigation measures are proposed in Chapters 13 and 15 to manage groundwater, there is no way to prevent the inflow of contaminated groundwater into excavations. As a result, and to reduce the total number and duration of excavations, it is proposed that investigations to identify and remove any Aboriginal heritage material in the two areas of archaeological potential would proceed directly to salvage excavation.

The proposed methodology (detailed in Technical Working Paper 10 (Aboriginal Cultural Heritage Assessment Report)) provides for staged salvage excavation to be undertaken by qualified archaeologists with the participation of Aboriginal stakeholders. The aim of this excavation is to identify any Aboriginal heritage objects present in deeper estuarine deposits and, if any are found, to remove the objects from the area of potential impact.

Consultation with the Aboriginal community was undertaken to confirm the proposed salvage methodology and the process for the temporary and long-term care and management of any Aboriginal objects retrieved.

A staged salvage excavation is proposed to minimise impacts on the environment, including the generation of contaminated waste and the duration of time that any such waste is exposed. The excavation program would be undertaken in three stages:

- Stage 1 – Use of 14 push tubes in locations where excavation is proposed (see Figure 14.1 of Technical Working Paper 10)
- Stage 2 – This stage would be triggered if two adjacent locations investigated in stage 1 show the presence of estuarine deposits. Push tubes would then be used at 2.5 metre intervals between the confirmed locations of deposits
- Stage 3 – If significant archaeological objects are identified during stage 2, additional push tubes would be used around the stage 2 locations.

All material would be inspected to confirm the presence of any hazardous materials. Once material is cleared for investigation, the push tubes would be opened and recorded. The manner in which the material obtained is processed would depend on the nature of the material identified:

- Estuarine deposits would be hand sieved and samples taken where appropriate
- For shell middens, bulk samples would be taken and sieved if a low density of shell is present.

Post-excavation analysis and reporting would be undertaken in accordance with the methodology provided in Technical Working Paper 10.

An Aboriginal heritage interpretation strategy would be developed in consultation with registered Aboriginal parties and other relevant stakeholders. Regardless of whether any Aboriginal heritage objects are identified during salvage excavation, opportunities for Aboriginal heritage interpretation (identified by the interpretation strategy), would be integrated into the urban design and landscape plan. This plan would be developed during detailed design as described in section 7.12.

Other measures

The potential for impacts during construction would be managed in accordance with a project-specific Aboriginal Heritage Management Plan, which would be implemented as part of the CEMP. The plan would detail processes and responsibilities to minimise potential impacts on Aboriginal heritage during construction. It would be prepared in accordance with relevant guidelines, standards and Technical Working Paper 10 (Aboriginal Cultural Heritage Assessment Report). The plan would also include the unexpected finds procedure and the proposed salvage methodology. Further information on the CEMP, including requirements for the Heritage Management Plan, is provided in Chapter 27 (Approach to environmental management and mitigation).

Other mitigation measures are listed in section 18.6.2.

Expected effectiveness

The proposed salvage methodology has been developed based on best management practice, relevant standards and guidelines, and specialist knowledge. The strategy has been developed by suitably qualified archaeologists and in consultation with Aboriginal stakeholders. The strategy aims to remove any Aboriginal heritage items from within the project site while minimising impacts on currently unknown items. It has also considered the context of the project site and environmental conditions and constraints within the project site.

The Aboriginal cultural heritage assessment report (including the proposed mitigation measures) was prepared by a specialist Aboriginal heritage consultant in consultation with Aboriginal stakeholders. A suitably qualified archaeologist would be responsible for delivering the salvage excavation. Consultation would continue throughout the salvage excavation to ensure the effectiveness of those activities.

The potential loss of intrinsic Aboriginal cultural value linked to these impacted sites cannot be offset; however, any salvaged material will increase understanding, strengthen interpretation, and improve ongoing and future management of Aboriginal heritage in the area. The proposed approach to management is considered to be effective in reducing the potential impacts of the project on Aboriginal heritage as far as practicable, and providing for the appropriate management of Aboriginal heritage in the event that it is encountered.

18.6.2 List of mitigation measures

Measures that will be implemented to address potential impacts on Aboriginal heritage are listed in Table 18.1.

Table 18.1 Aboriginal heritage mitigation measures

Impact/issue	Ref	Mitigation measure	Timing
Archaeological investigation areas impacted by the project	AH1	Detailed design and construction planning will avoid direct impacts on Investigation Area 1 and Investigation Area 2 where practicable.	Detailed design
	AH2	Archaeological salvage excavation will be undertaken prior to construction within those parts of Investigation Area 1 and Investigation Area 2 where deep sediments would be directly impacted by the project. Archaeological salvage excavation (including post-excavation analysis and reporting) will be completed prior to any activities that may result in harm to Aboriginal objects in these areas.	Pre-construction

Impact/issue	Ref	Mitigation measure	Timing
Aboriginal heritage interpretation	AH3	An Aboriginal heritage interpretation strategy will be developed in consultation with registered Aboriginal parties and other relevant stakeholders. The interpretation strategy will have regard to *Sydney Airport Master Plan 2039* and the Sydney Airport Heritage Management Plan. Appropriate Aboriginal heritage interpretation will be incorporated into the project design in accordance with the interpretation strategy.	Detailed design
Managing heritage impacts during construction	AH4	An Aboriginal Heritage Management Plan will be prepared prior to construction and implemented as part of the CEMP. The plan will include measures to manage Aboriginal heritage and minimise the potential for impacts during construction. It will include the proposed salvage methodology, unexpected find procedure (see measure AH6) and process for additional consultation with Aboriginal stakeholders.	Pre-construction, construction
Aboriginal consultation	AH5	Aboriginal stakeholder consultation will continue to be undertaken in accordance with the *Procedure for Aboriginal cultural heritage consultation and investigation* (Roads and Maritime, 2011b) and *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW, 2010c).	Pre-construction, construction
Unexpected finds	AH6	If suspected Aboriginal heritage items or human remains are uncovered during construction they will be managed in accordance with the *Standard Management Procedure: Unexpected Heritage Items* (Roads and Maritime Services, 2015e).	Construction

18.6.3 Managing residual impacts

Residual impacts are impacts of the project that may remain after implementation of:

- Design measures to avoid and minimise impacts (see sections 6.4 and 6.5)
- Construction planning and management approaches to avoid and minimise impacts (see sections 6.4 and 6.5)
- Specific measures to mitigate and manage identified potential impacts (see section 18.6.2).

No residual impacts on Aboriginal heritage are predicted.