Roads and Maritime Services/Sydney Airport Corporation Limited

Sydney Gateway Road Project

Environmental Impact Statement/ Preliminary Draft Major Development Plan

Technical Working Paper 9

Statement of Heritage Impact

November 2019

Sydney Gateway Road Project

Technical Working Paper 9 – Statement of Heritage Impact

Report prepared for Gateway to Sydney Joint Venture for Roads and Maritime Services

November 2019

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ACRONYMS

Acronym	Definition
ACI	Australian Consolidated Industries
AGM	Australian Glass Manufactures
ARD	Archaeological Research Design
ARTC	Australian Rail Track Corporation
CBD	Central Business District
CHL	Commonwealth Heritage List
CMP	Conservation Management Plan
DPIE	Department of Planning, Infrastructure and Environment
EP&A Act	*Environmental and Planning Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
HMP	Heritage Management Plan
ICOMOS	International Council on Monuments and Sites
LEP	Local Environment Plan
LGA	Local Government Area
LRS	Land Records Services
MDP	Major Development Plan
NHL	National Heritage List
NLA	National Library of Australia
NSW	New South Wales
OLS	Obstacle Limitation Surface
PAR	Photographic Archival Recording
REF	Review of Environmental Factors
RNE	Register of National Estate
RNT	Register of the National Trust
SACL	Sydney Airport Corporation Limited
SEARs	Secretary's Environmental Assessment Requirements
SHI	State Heritage Inventory

SHR	State Heritage Register
SLNSW	State Library New South Wales
SoHI	Statement of Heritage Impact
SSI	State Significant Infrastructure
TfNSW	Transport for New South Wales
TPZ	Temporary Protection Zone
WHL	World Heritage List

1.0 INTRODUCTION

1.1 Overview

1.1.1 Sydney Gateway and the project

Sydney Kingsford Smith Airport (Sydney Airport) and Port Botany are two of Australia's most important infrastructure assets, providing essential domestic and international connectivity for people and goods. Together they form a strategic centre, which is set to grow significantly over the next 20 years. To support this growth, employees, residents, visitors and businesses need reliable access to the airport and port, and efficient connections to Sydney's other strategic centres.

The NSW and Australian governments are making major investments in the transport network to achieve this vision. New road and freight rail options are being investigated to cater for the forecast growth in passengers and freight through Sydney Airport and Port Botany. Part of this solution is Sydney Gateway, which comprises the following road and rail projects:

- Sydney Gateway road project (the subject of this assessment)
- Botany Rail Duplication.

Sydney Gateway will expand and improve the road and freight rail networks to Sydney Airport and Port Botany to keep Sydney moving and growing. The Sydney Gateway road project forms part of the NSW Government's long-term strategy to invest in an integrated transport network and make journeys easier, safer and faster.

Transport for NSW and Sydney Airport Corporation propose the Sydney Gateway road project (the project). The project comprises new direct high capacity road connections linking the Sydney motorway network at St Peters interchange with Sydney Airport's terminals and beyond. It involves constructing and operating new and upgraded sections of road connecting to the airport terminals, four new bridges over Alexandra Canal, and other operational infrastructure and road connections.

The project and its location is shown on Figure 1.1.

1.1.2 Overview of approval requirements

The project is subject to approval under NSW and Commonwealth legislation. Parts of the project located on Commonwealth-owned land leased to Sydney Airport (Sydney Airport land) are subject to the Commonwealth Airports Act 1996 (the Airports Act). In accordance with the Airports Act, these parts of the project are major airport development. A major development plan (MDP), approved by the Australian Minister for Infrastructure, Transport and Regional Development, is required before a major airport development can be undertaken at a leased airport.

Parts of the project located on other land are State significant infrastructure in accordance with the NSW Environmental Planning and Assessment Act 1979 (EP&A Act). As State significant infrastructure, these parts of the project require approval from the NSW Minister for Planning and Public Spaces. An environmental impact statement (EIS) is required to support the application for approval for State significant infrastructure under the EP&A Act.

A combined EIS and preliminary draft MDP is being prepared to:

- Support the application for approval of the project in accordance with NSW and Commonwealth legislative requirements

- Address the environmental assessment requirements of the Secretary of the Department of Planning and Environment (the SEARs), issued on 15 February 2019
- Address the MDP requirements defined by section 91 of the Airports Act.

This report was prepared on behalf of Transport for NSW and Sydney Airport Corporation to support a combined EIS/preliminary draft MDP.

The project is located within both State legislated and Commonwealth owned land. As a result, separate approvals are required for impacts on heritage items of potential archaeological remains within these boundaries. These are discussed in Section 2.0.

1.2 Purpose and scope of this report

The purpose of this report is to assess potential Non-Aboriginal heritage impacts that may incur as a result of the operation and construction of the project. This SoHI will:

- Address the relevant SEARs (issued on 15 February 2019) for the EIS, as outlined in Table 1-1
- Address Agency comments on the SEARs (none provided for Non-Aboriginal heritage)
- Address community and stakeholder consultation comments (none provided for Non-Aboriginal heritage)
- Address Heritage, Department of Planning, Infrastructure and Environment (DPIE) comments
- Address relevant requirements under the Sydney Airport Master Plan 2039 and Environment Strategy 2019-2024, as outlined in Table 1-2
- Provide a historical background for the SoHI study area
- Undertake an analysis of the listed and unlisted heritage items and their built fabric that may be impacted by the project
- Provide significance assessments for listed and unlisted heritage listed items within and in view of the study area
- Assess potential impacts on listed and unlisted heritage items that may occur as a result of project
- Assess the non-Aboriginal archaeological potential of the study area
- Outline heritage management and mitigation strategies for the proposal.

The SoHI guidelines, prepared by the NSW Heritage Office (2002) and contained within the NSW Heritage Manual, have been used as a guide in preparing this report.

Table 1-1 SEARs requirements relevant to this assessment

SEARs Requirements 7 – Heritage	Where addressed in this report
7.1 – Heritage: The Proponent must identify and assess any direct and/or indirect impacts (including cumulative impacts) to the heritage significance of:	
(c) environmental heritage, as defined under the *Heritage Act 1977* (d) items listed on the State, National and World Heritage lists (e) heritage items and conservation areas identified in local and regional environmental planning instruments applicable to the proposal area	Heritage impact assessments for any direct and/or indirect impacts (including cumulative impacts) have been carried out in section 8.5 The cumulative impact assessment for these items is outlined in section 0
7.2 – Heritage: Where impacts on 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	Significance assessments for these items are included in section 6.2 and 6.3 Heritage impact assessments for these items are included in section 8.5, Table 8-1 and Table 8-2 A historical archaeological assessment is provided in section 0 The Statement of Heritage Impact for the project is provided in section 8.9
(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)	Relevant Conservation Management Policies for the Alexandra Canal, Sydney Airport and Cooks River Intermodal Terminal and the consistency of the project with these policies are outlined in Appendix B, section 13.2.1 An assessment of the project's consistency with these conservation policies is provided in section 8.8.
(c) consider impacts on 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)	A Non-Aboriginal (Historical) Archaeological Assessment is provided in section 0 Heritage impacts as a result of the project are included in section 8.5, Table 8-1 and Table 8-2
(d) outline measures to avoid and minimise those impacts during construction and operation in accordance with the current guidelines; and	Mitigation measures to avoid and minimise impacts on heritage items such as potential archaeological remains are outlined in section 10.0
(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)	This report has been prepared by suitably qualified heritage consultants and historical archaeologists. Qualifications and authors are identified in section 1.3 (report authorship and technical review)

Table 1-2 MDP 2039 requirements relevant to this assessment

MDP Requirements	Where addressed in this report
Assessment of environmental impacts	
(d) if a final master plan for the airport is in force – whether or not the development is consistent with the final master plan; and	This has been addressed in the Heritage Impact Assessment: section 8.8.1
(h) the airport-lessee company's assessment of the environmental impacts that might reasonably be expected to be associated with the development	This is addressed in the Heritage Impact Assessment in section 8.8.1 and Conservation Management Policy assessment: Appendix B, section 13.2.2
Plans for dealing with environmental impacts	
(j) the airport-lessee company's plans for dealing with the environmental impacts	This is addressed in the Recommended Mitigation Measures section 10.1
(h) (including plans for ameliorating or preventing environmental impacts)	This is addressed in the Recommended Mitigation Measures section 10.0

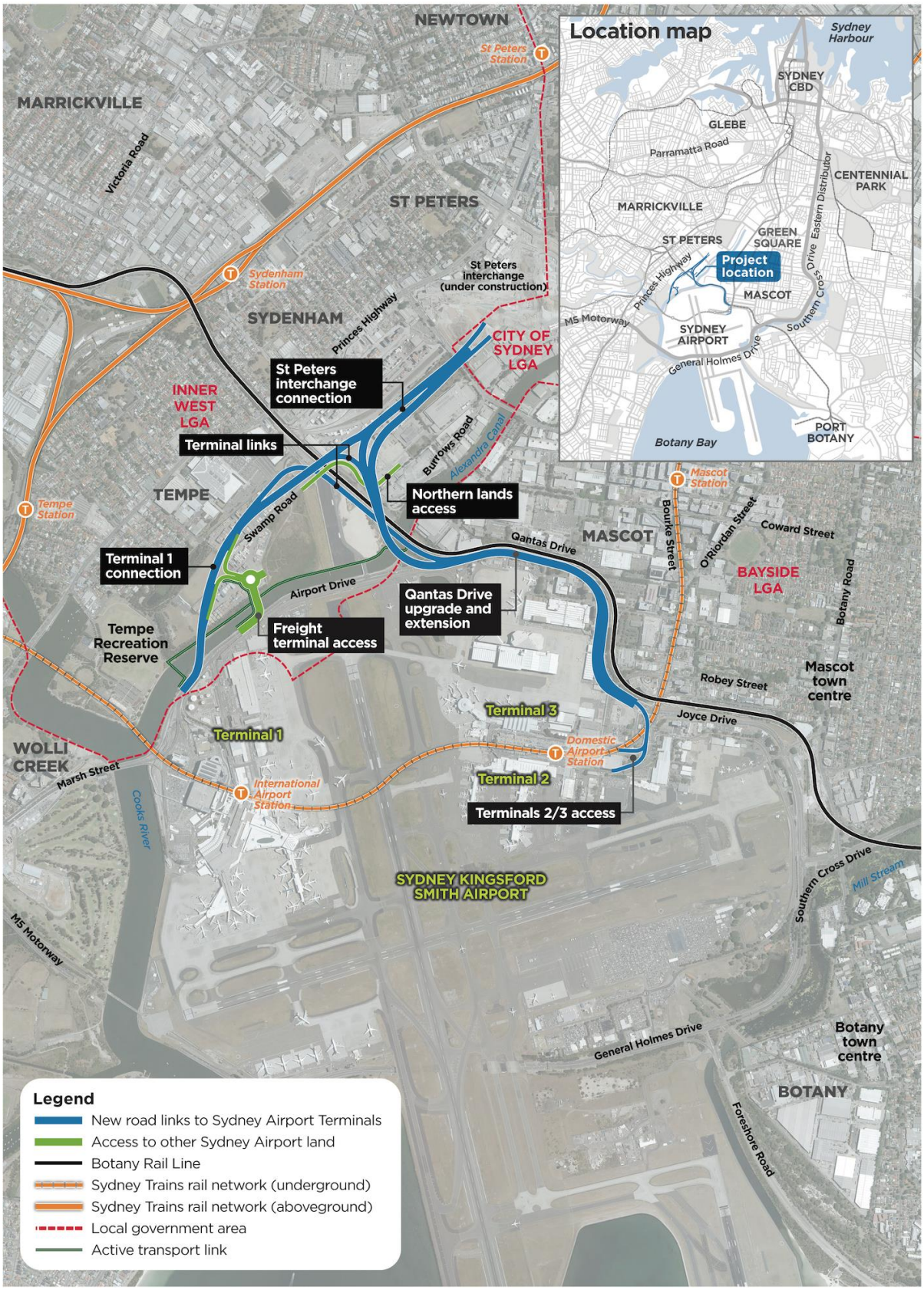

Figure 1-1 The project.

1.3 The project

1.3.1 Location

The project is located about eight kilometres south of Sydney's central business district and to the north of Sydney Airport on both sides of Alexandra Canal. The northern extent of the project is located at St Peters interchange, which is currently being constructed to the north of Canal Road in St Peters. The western extent of the project is located near the entrance to Sydney Airport Terminal 1 on Airport Drive, to the north of the Giovanni Brunetti Bridge and south-west of Link Road. The eastern extent of the project is located near the intersection of Joyce Drive, Qantas Drive, O'Riordan Street and Sir Reginald Ansett Drive.

The project is located mainly on government owned land in the suburbs of Tempe, St Peters and Mascot, in the Inner West, City of Sydney and Bayside local government areas.

1.3.2 Key design features

The project provides a number of linked road connections to facilitate the movement of traffic between the Sydney motorway network, Sydney Airport Terminal 1 (Terminal 1) and Sydney Airport Terminals 2 and 3 (Terminals 2/3). The project would connect Terminal 1 and Terminals 2/3 with each other and with the Sydney motorway network. The project would also facilitate the movement of traffic towards Port Botany via General Holmes Drive. It would provide three main routes for traffic:

- Between the Sydney motorway network and Terminal 1, and towards M5 motorway and Princes Highway
- Between the Sydney motorway network and Terminals 2/3, and towards General Holmes Drive, Port Botany and Southern Cross Drive
- Between Terminal 1 and Terminals 2/3.

The key features of the project include:

- Road links to provide access between the Sydney motorway network and Sydney Airport's terminals, consisting of the following components:
  - St Peters interchange connection – a new elevated section of road extending from St Peters interchange to the Botany Rail Line, including an overpass over Canal Road.
  - Terminal 1 connection – a new section of road connecting Terminal 1 with the St Peters interchange connection, including a bridge over Alexandra Canal and an overpass over the Botany Rail Line.
  - Qantas Drive upgrade and extension – widening and upgrading Qantas Drive to connect Terminals 2/3 with the St Peters interchange connection, including a high-level bridge over Alexandra Canal
  - Terminal links – two new sections of road connecting Terminal 1 and Terminals 2/3, including a bridge over Alexandra Canal.
  - Terminals 2/3 access – a new elevated viaduct and overpass connecting Terminals 2/3 with the upgraded Qantas Drive.
- Road links to provide access to Sydney Airport land:
  - A new section of road and an overpass connecting Sydney Airport's northern lands either side of the Botany Rail line (the northern lands access)

  - A new section of road, including a signalised intersection with the Terminal 1 connection and a bridge connecting Sydney Airport's existing and proposed freight facility either side of Alexandra Canal (the northern lands access)

- An active transport link approximately 1.3 kilometres in length along the western side of Alexandra Canal to maintain connections between Sydney Airport, Mascot and the Sydney central business district.
- Intersection upgrades or modifications.
- Provision of operational ancillary infrastructure including maintenance bays, new and upgraded drainage infrastructure, signage and lighting, retaining walls, noise barriers, flood mitigation basin, utility works and landscaping.

1.3.3 Construction overview

A conceptual construction methodology has been developed based on the preliminary project design to be used as a basis for the environmental assessment process. Detailed construction planning, including programming, work methodologies, staging and work sequencing would be undertaken once construction contractor(s) have been engaged.

1.3.3.1 Timing and work phases

Construction of the project would involve four main phases of work. The indicative construction activities within each phase are outlined below:

Phase	Indicative construction activities
Enabling works	• construction of the temporary active transport link, • modification of various road intersections to facilitate main construction works.
Site establishment	• installing site fencing, hoarding and signage, • establishing construction compounds, work areas and site access routes.
Main construction works	• clearing/ trimming of vegetation, • removal (or partial removal) of a number of buildings and other existing infrastructure e.g. concrete hardstand areas, drainage infrastructure, sheds, advertising structures, containers, etc, • roadworks, including bridge and viaduct construction and drainage works, • utility works.
Finishing works	• erecting lighting, signage and street furniture, landscaping works and site demobilisation and rehabilitation in all areas.

Specific construction issues which will require careful planning and management and close co-ordination with relevant stakeholders include:

- Works within the prescribed airspace of Sydney Airport
- Works interfacing with the Botany Rail Line
- Piling in the vicinity of the T8 Airport and South line underground rail tunnels
- Works within the former Tempe Tip site and Alexandra Canal which are subject to remediation orders and specific management plans
- Excavation, storage and handling of contaminated soils generally within the project site and contaminated groundwater from the Botany Sands aquifer.

Construction is planned to start in mid-2020, subject to approval of the project, and is expected to take about three and a half years to complete. Further information on construction is provided in Chapter 8 (Construction) of the EIS.

The project would include work undertaken during recommended standard hours as defined by the Interim Construction Noise Guideline (DECC, 2009):

- Monday to Friday: 7am to 6pm
- Saturday: 8am to 1pm
- Sundays and public holidays: no work.

It would also include work outside these hours (out-of-hours work) to minimise the potential for aviation and rail safety hazards.

1.3.3.2 Construction footprint

The land required to construct the project (the construction footprint) is shown on Figure 1-2. The construction footprint includes the land needed to construct the proposed roadways, bridges and ancillary infrastructure and land required for the proposed construction compounds. Utility works to support the project would generally occur within the construction footprint; however, some works (such as connections to existing infrastructure) may be required outside the footprint.

1.3.3.3 Compounds, access and resources

Construction would be supported by five construction compounds located to support the main construction works (shown on Figure 1-2). Construction compounds would include site offices, staff amenities, storage and laydown areas, workshops and workforce parking areas.

Materials would be transported to and from work areas via construction haul routes, which have been selected to convey vehicles directly to the nearest arterial road.

The construction workforce requirements would vary over the construction period based the activities underway and the number of active work areas. The workforce is expected to peak at about 1,000 workers for a period of about 13 months, indicatively from the fourth quarter of 2021. Either side of this peak, workforce numbers are expected to reduce to about two thirds.

1.4 Structure of this report

The structure of this SoHI is outlined below:

- Section 1 – Introduction
- Section 2 – Legislative context
- Section 3 – Existing environment
- Section 4 – Methodology
- Section 5 – Historical background
- Section 6 – Significance assessment overview
- Section 7 – Non-Aboriginal archaeological assessment
- Section 8 – Heritage impact assessment
- Section 9 – Conclusions and recommendations
- Section 10 – Mitigation measures
- Section 11 – Findings and conclusions

- Section 12 – Reference list
- Appendix A – Significance assessments (listed and unlisted items)
- Appendix B – Relevant conservation management plans
- Appendix C – Historical background
- Appendix D – Site inspection

1.5 Statement of Heritage Impact – study area

For the purposes of this report, the SoHI study area (the study area) is defined by the project site boundary (and project construction footprint). A 150 metre buffer zone has been included to adequately assess indirect impacts on heritage listed items located outside the study area. This is illustrated in Figure 1-3.

The study area has been divided into three key sections, as shown in Figure 1-3:

- **Section A** – Western portion encompassed by the suburb of Tempe, Alexandra Canal and part of Airport Drive
- **Section B** – Northern portion encompassed by the suburbs Sydenham and St Peters
- **Section C** – Eastern portion encompassed by Sydney Airport and the suburbs of Mascot and Botany.

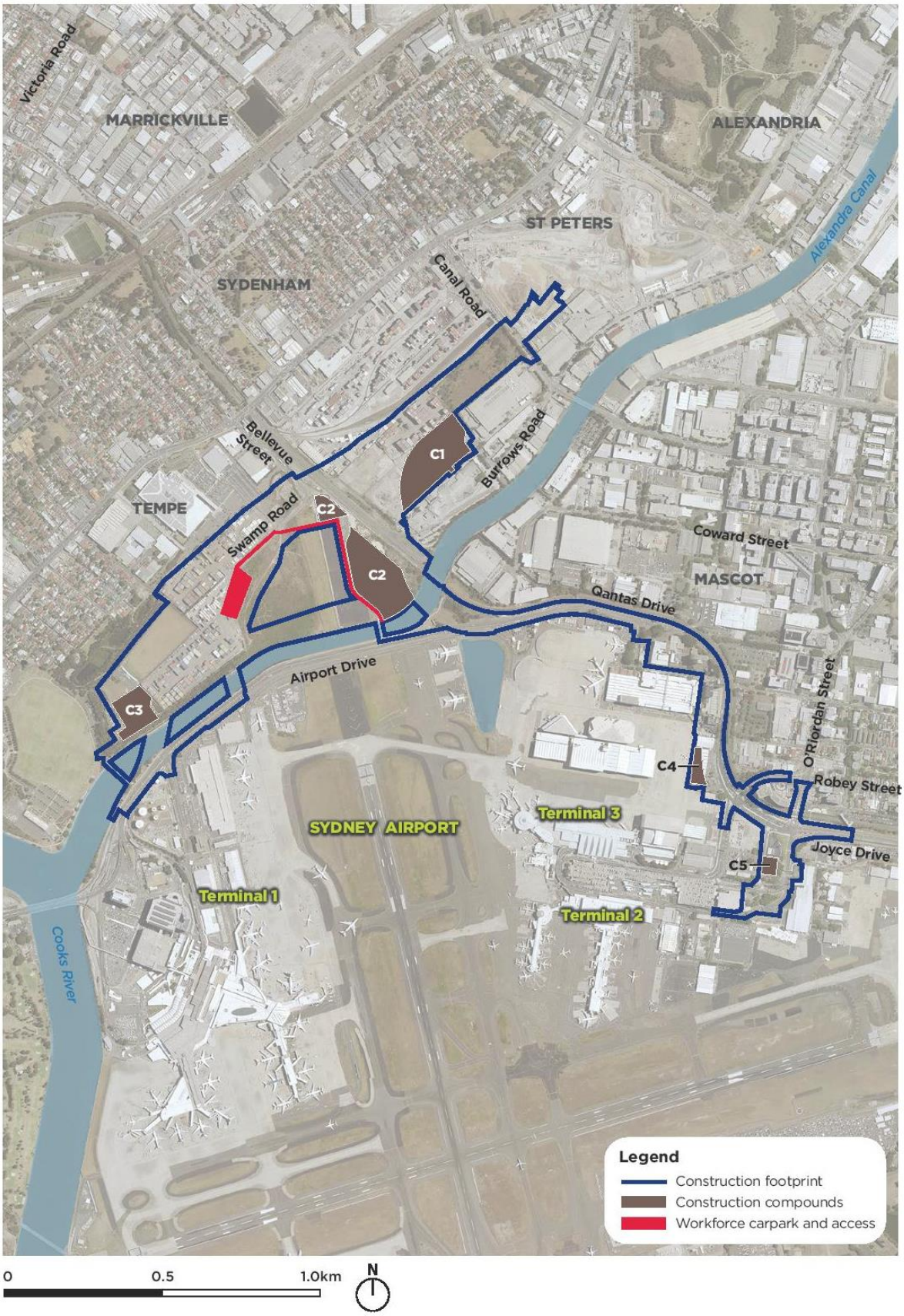

Figure 1-2. Construction footprint and facilities.

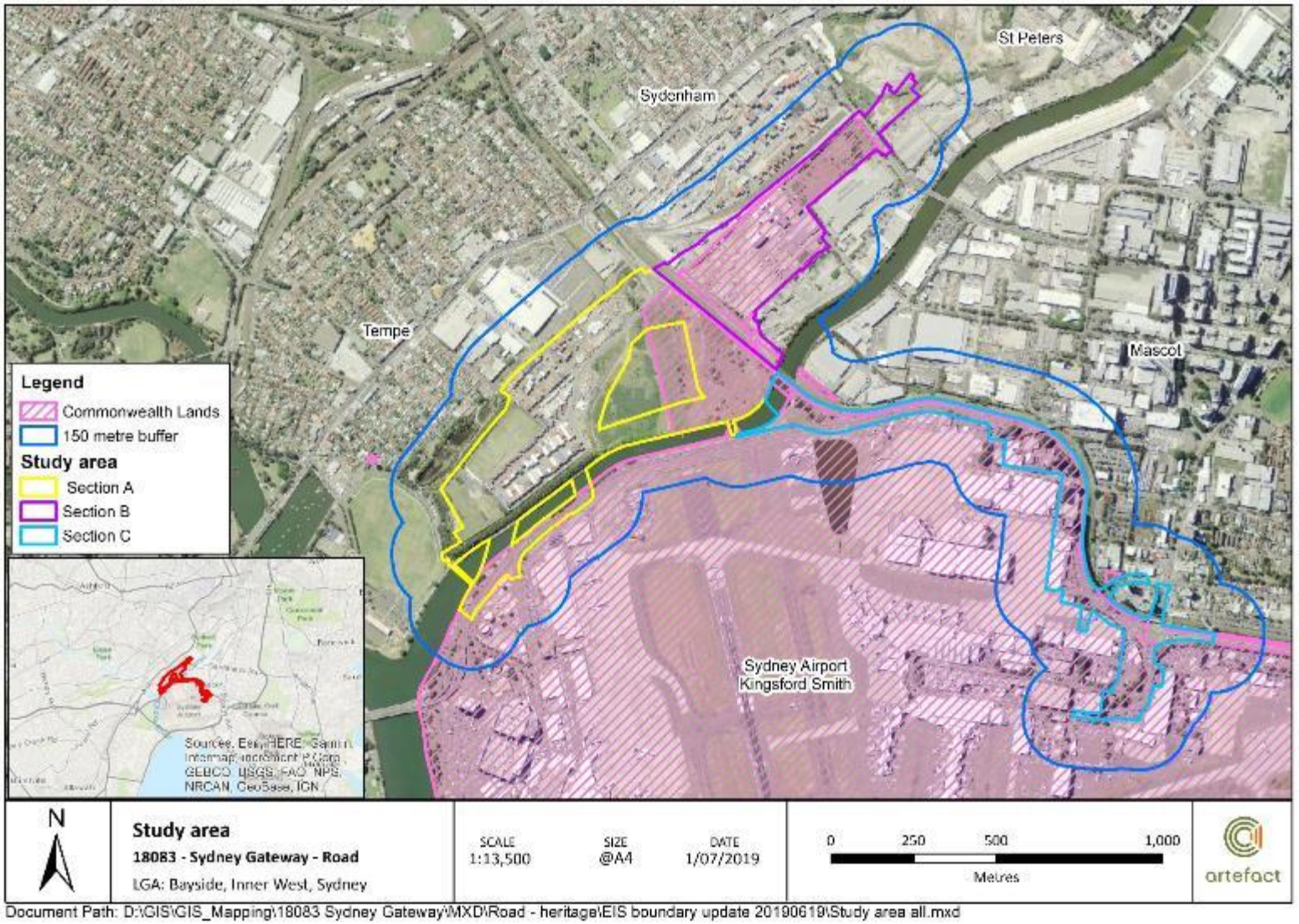

Figure 1-3 Location of the study area and 150 metre buffer.

1.6 Personnel

This Statement of Heritage Impact (SoHI) was prepared by Adele Zubrzycka, Sarah Hawkins and Sandra Wallace from Artefact.

Staff qualifications and years of experience are presented in Table 1-3.

Table 1-3 Staff and qualifications

Name	Position/Role on project	Qualifications	Relevant experience
Adele Zubrzycka	Senior Heritage Consultant/Lead Author	MArchSci	Seven years' experience in heritage consulting in NSW
Sarah Hawkins	Graduate Heritage Consultant/Author	Honours and MArch	One years' experience in heritage consulting in NSW
Dr Sandra Wallace	Technical Reviewer	Honours (first class) and PHD	Fifteen years' experience in heritage consulting in NSW

1.7 Acknowledgments

The authors would like to acknowledge the assistance of:

- Glyn Diwell (Principal Environmental Scientist, WSP)
- Philip Burns (Senior Environmental Scientist, WSP)
- Tim Rann (Airfield Design Engineer, Sydney Airport)
- Sarah Barker (Transport for NSW)
- Susan Lampard (AECOM)
- Denis Gojak (Transport for NSW).

2.0 LEGISLATIVE CONTEXT

2.1 The World Heritage Convention

The Convention Concerning the Protection of World Cultural and National Heritage (the World Heritage Convention) was adopted by the General Conference of the United Nations Educational, Scientific and Cultural Organisation (UNESCO) on 16 November 1972 and came into force on 17 December 1975. The World Heritage Convention aims to promote international cooperation to protect heritage that is of such outstanding universal value that its conservation is important for current and future generations. It sets out the criteria that a site must meet to be inscribed on the World Heritage List (WHL) and the role of State Parties in the protection and preservation of world heritage and their own national heritage.

The concept of a buffer zone was first included in the operational guidelines for the implementation of the World Heritage Convention in 1977 and recognises the value of the environment that surrounds a site.

There are no WHL items within the study area or the study area's 150 metre buffer zone.

2.2 Commonwealth legislation

2.2.1 Airports Act 1996 and associated regulations

The project site includes areas of Commonwealth-owned land leased by Sydney Airport Corporation Ltd. The *Airports Act 1996* (the Airports Act) and associated regulations provide the assessment and approval process for development on Commonwealth-owned land for the operation of Sydney Airport.

Section 89 of the Airports Act specifies types of development that constitute 'major airport development'. A major development plan (MDP) approved by the Australian Minister for Infrastructure and Transport is required before major airport development can be undertaken at a leased airport.

The Airports Act and regulations are the statutory controls for ongoing regulation of development activities on Commonwealth-owned land leased from the Australian Government for the operation of Sydney Airport. Section 70 of the Airports Act requires there to be a final master plan for the airport that has been approved by the Australian Minister for Infrastructure and Transport.

Part 5 of the Act also requires that each airport develops an environment strategy which is included in its master plan. Once approved, Sydney Airport and all persons who carry out activities at the airport are obliged to take all reasonable steps to ensure compliance with the environment strategy.

The consistency of the project with the Airports Act, the associated master plan and environment strategy is provided in Section 8.8.1.

2.2.2 Airports (Environment Protection) Regulations 1997

The objective of *the Airports (Environment Protection) Regulations 1997* (the regulations) is to establish a system of regulation for activities at airports that generate or have potential to generate pollution or excessive noise. The regulations impose a general duty to prevent or minimise environmental pollution and have as one of their objects, the promotion of improved environmental management practices at Commonwealth-leased airports. The regulations contain detailed provisions setting out:

- Definitions, acceptable limits and objectives for air, water and soil pollution, and offensive noise
- General duties to prevent or minimise pollution, preserve significant habitat and cultural areas as well as to prevent offensive noise

- Monitoring and reporting requirements for existing pollution.

Part 2 of the regulations defines pollution in relation to air (including odour), water, soil and offensive noise. Schedules 1-4 of the regulations provide the acceptable limits of pollutants and offensive noise, which, in conjunction with other national environment protection measures, provide the system of environmental regulation at airports.

Part 2, Division 2 *Preservation of Habitat, etc*, Schedule 4.04(1) *General duty to preserve* states that:

> *1. The operator of an undertaking at an airport must take all reasonable and practicable measures to ensure that, in the operation of the undertaking, and in the carrying out of any work in connection with the undertaking:*
>
> *a. there are no adverse consequences for:*
>
> *ii. existing aesthetic, cultural, historical, social and scientific (including archaeological and anthropological) values of the local area.*

The consistency of the project with the Airports Act, associated master plan and environment strategy is provided in Section 8.8.1.

2.2.3 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is administered by the Australian Department of the Environment and Energy and provides a legal framework to protect and manage nationally important flora, fauna, ecological communities and heritage places defined as 'matters of national environmental significance' (MNES).

Under the EPBC Act, proposed actions (i.e. activities or projects) with the potential to significantly impact matters protected by the EPBC Act must be referred to the Australian Minister for the Environment to determine whether they are controlled actions, requiring approval from the Minister. The following matters are defined as protected matters by Part 3 of the EPBC Act:

- Matters of national environmental significance
- The environment of Commonwealth land
- The environment in general if the actions are being carried out by an Australian Government agency.

Under Part 9, approval under the EPBC Act is required for any action occurring within, or outside, a heritage place that has, will have or is likely to have a 'significant impact' on the heritage values of a World, National or Commonwealth heritage listed property (referred to as a 'controlled action' under the Act). A 'significant impact' is defined as:

> *an impact which is important, notable, or of consequence, having regard to its context or intensity. If an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts.*

The EPBC Act stipulates that a person who has proposed an action that will, or is likely to, have a significant impact on a site that is listed on the WHL, National Heritage List (NHL) or Commonwealth Heritage List (CHL) must refer the action to the Minister for Environment (hereafter the Minister). The

Minister will then determine if the action requires approval under the EPBC Act. If approval is required, an environmental assessment would need to be prepared. The Minister would approve or decline the action based on this assessment.

2.2.3.1 Authorisation of a Major Development Plan

The EPBC Act (s160 (1) and (2c)) requires advice to be sought and considered from the Minister prior to a decision being made on the approval of an MDP. If significant impacts are considered likely on any matter of national environmental significance, and the action is deemed to be a controlled action, then the referral to the Minister will proceed to environmental assessment and approval under the EPBC Act.

For proposed actions situated on Commonwealth land or actions which may impact Commonwealth land, the Significant Impact guidelines 1.2 – Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies (Department of the Environment and Energy 2013) are applicable. The guidelines require the proponent to undertake a self-assessment process to decide whether the action is likely to have a significant impact on the environment, including the heritage value of places.

As part of the assessment of the draft MDP, the Australian Department of Infrastructure, Transport, Cities and Regional Development will, on behalf of the Minister for Infrastructure, Transport and Regional Development, seek advice from the Australian Minister for the Environment under section 160 of the EPBC Act.

National Heritage List

The NHL was established under the EPBC Act, which provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places. Under the EPBC Act, nationally significant heritage items are protected through listing on the NHL.

There are no NHL items located within the study area or the study area's 150 metre buffer zone.

Commonwealth Heritage List

The CHL has been established to list heritage places that are either entirely within a Commonwealth area or outside the Australian jurisdiction and owned or leased by the Commonwealth or a Commonwealth Authority. The CHL includes natural, Indigenous and historic heritage places that the Minister for the Environment is satisfied have one or more Commonwealth Heritage values.

One item registered as an Indicative Place on the CHL lies within the study area:

- Sydney (Kingsford Smith) Airport Group – 105542

Items listed under the Indicative Place status have not been formally nominated for the CHL. Rather, data associated with the item has been provided to, or obtained by, the Heritage Branch and entered into the Australian Heritage Database. The Australian Heritage Database contains information about over 20,000 natural, historic and Indigenous places in Australia.

2.2.4 Sydney Airport Master Plan 2039

As part of the planning framework established by the Airports Act, airport operators are required to prepare a master plan for the coordinated development of their airport. The *Sydney Airport Master Plan 2039* (Master Plan 2039) outlines the strategic direction for Sydney Airport's operations and development over the next 20 years. It acknowledges that the continued growth of Sydney Airport is

vital to achieving local, state and national employment, tourism and development objectives. In accordance with the requirements of the Airports Act, the Master Plan 2039:

- Establishes the strategic direction for efficient and economic development at Sydney Airport over the planning period
- Provides for the development of additional uses of the Sydney Airport site
- Indicates the intended uses of the Sydney Airport site to the public
- Reduces potential conflicts between uses of the Sydney Airport site, to ensure that uses of the site are compatible with the areas surrounding the airport
- Ensures that operations at Sydney Airport are undertaken in accordance with relevant environmental legislation and standards
- Conserves significant items of natural, Indigenous or heritage value
- Establishes a framework for assessing compliance with relevant environmental legislation and standards
- Promotes continual improvement of environmental management at Sydney Airport.

2.2.5 Sydney Airport Environment Strategy 2019-2024

The Airports Act requires that airport operators provide an assessment of the environmental issues associated with implementing the airport master plan and the plan for dealing with those issues. *The Sydney Airport Environment Strategy 2019–2024* (the Environment Strategy), which forms part of Master Plan 2039, provides strategic direction for the environmental performance and management of Sydney Airport for the five-year period between 2019 and 2024. The purpose of the Environment Strategy is to:

- Establish a framework for assessing compliance and ensuring that all operations at Sydney Airport are undertaken in accordance with relevant environmental legislation and standards
- Promote the continual improvement of environmental management and performance at Sydney Airport and build on the achievements and goals of previous strategies
- Realise improvements in environmental sustainability by minimising Sydney Airport's environmental footprint and working towards a more efficient and resilient airport
- Ensure that items listed in the Heritage Management Plan for the airport as having heritage value are managed appropriately and in accordance with applicable legislation

The Sydney Airport Environment Strategy (2019-2024) is addressed in Section 8.8.1 of this report.

2.3 State legislation

2.3.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) establishes the framework for cultural heritage values to be formally assessed in the land use planning and development consent process. The EP&A Act requires that environmental impacts on land subject to the EP&A Act is considered prior to development; this includes impacts on cultural heritage items and places as well as archaeological sites and deposits. Land owned by the Commonwealth is not subject to the EP&A Act.

The EP&A Act also requires that Local Governments prepare planning instruments (such as Local Environmental Plans (LEPs)) and policies such as Development Control Plans (DCPs) in accordance with the Act to provide guidance on the level of environmental assessment required.

As the project has been declared state significant infrastructure it will approved under Section 5.2, Part 5 of the EP&A Act.

2.3.2 New South Wales Heritage Act 1977

The New South Wales (NSW) *Heritage Act 1977* (Heritage Act) is the primary piece of State legislation affording protection to heritage items in New South Wales. Under the Heritage Act, 'items of environmental heritage' include places, buildings, works, relics, moveable objects and precincts identified as significant based on historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic values. State significant items can be listed on the NSW State Heritage Register (SHR) (discussed in Section 2.6.1) and are given automatic protection under the Heritage Act against any activities that may damage an item or affect its heritage significance.

2.3.2.1 Relics provisions

The Heritage Act also provides protection for 'relics', which includes archaeological material or deposits. According to Section 139 (Division 9: Section 139, 140-146):

(1) A person must not disturb or excavate any land knowingly or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, damaged or destroyed unless the disturbance is carried out in accordance with an excavation permit.

(2) A person must not disturb or excavate any land on which the person has discovered or exposed a relic except in accordance with an excavation permit.

(3) This section does not apply to a relic that is subject to an interim heritage order made by the Minister or a listing on the State Heritage Register.

(4) The Heritage Council may by order published in the Gazette create exceptions to this section, either unconditionally or subject to conditions, in respect of any of the following:

a. Any relic of a specified kind or description,

b. Any disturbance of excavation of a specified kind or description,

c. Any disturbance or excavation of land in a specified location or having specified features or attributes,

d. Any disturbance or excavation of land in respect of which an archaeological assessment approved by the Heritage Council indicates that there is little likelihood of there being any relics in the land.

Section 4 (1) of the Heritage Act defines a relic as:

...any deposit, artefact, object or material evidence that:

relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and is of State or local heritage significance

A relic has been further defined as:

Relevant case law and the general principles of statutory interpretation strongly indicate that a 'relic' is properly regarded as an object or chattel. A relic can, in some circumstances, become part of the land be regarded as a fixture (a chattel that becomes permanently affixed to land).[1]

2.3.2.2 Works

The Heritage Act defines 'works' as being in a separate category to archaeological 'relics'. 'Works' refer to remnants of historical structures which are not associated with artefactual material that may possess research value. 'Works' may be buried, and therefore archaeological in nature, however, exposure of a 'work' does not require approved archaeological excavation permits under the Heritage Act.

The following examples of remnant structures have been considered to be 'works' by the NSW Heritage Council:

- Former road surfaces or pavement and kerbing
- Evidence of former drainage infrastructure, where there are no historical artefacts in association with the item
- Building footings associated with former infrastructure facilities, where there are no historical artefacts in association with the item
- Evidence of former rail track, sleepers or ballast
- Evidence of former rail platforms and former platform copings.

Where buried remnants of historical structures are located in association with historical artefacts in controlled stratigraphic contexts (such as intact historic glass, ceramic or bone artefacts), which have the potential to inform research questions regarding the history of a site, the above items may not be characterised as 'works' and may be considered 'relics'. The classification of archaeological remains as a 'work' therefore is contingent on the predicted remains being associated with historical structures as well as there being no prediction of the recovery of intact artefactual deposits which may be of research interest.

State Heritage Register

The SHR was established under Section 22 of the Heritage Act and is a list of places and objects of particular importance to the people of NSW, including archaeological sites. The SHR is administered by the NSW Heritage Division of the Office of Environment and Heritage (OEH) and includes a diverse range of over 1,500 items, in both private and public ownership. To be listed, an item must be deemed to be of heritage significance for the whole of NSW.

There is one SHR listed item located within the study area:

- Alexandra Canal – 01621.

[1] *Assessing Significance for Archaeological Sites and 'Relics'*, Heritage Branch, Department of Planning, 2009:7.

2.3.3 Section 170 registers

The Heritage Act requires all government agencies to identify and manage heritage assets in their ownership and control. Under Section 170 of the Heritage Act, government instrumentalities must establish and keep a register (s170 register hereafter), which includes all items of environmental heritage listed on the SHR, an environmental planning instrument or which may be subject to an interim heritage order, that are owned, occupied or managed by that government body.

There are five items listed on Sydney Water Corporation, ARTC and Railcorp s170 registers within the study area:

- Alexandra Canal No. 89AZ – Sydney Water Corporation – 4571712
- Mascot (O'Riordan Street) Underbridge – ARTC (formerly Railcorp) – 4801830
- Mascot (Sheas Creek) Underbridge – ARTC (formerly Railcorp) – 4805743
- Mascot (Robey Street) Underbridge – ARTC (formerly Railcorp) – 4801848
- Cooks River Container Terminal – NSW Ports – 4630046.

There are three items listed on the NSW Ports s170 register located within the study area's 150 metre buffer zone:

- Cooks River Container Terminal: Electric Overhead Travelling Crane – NSW Ports – 4630052
- Cooks River Container Terminal: Lay Down Points Lever – NSW Ports – 4630051
- Cooks River Container Terminal: Precast Concrete Hut 1 – NSW Ports – 4630047.

2.4 Local Environmental Plans

The study area falls within three Local Government Areas (LGAs):

- Bayside Council
- Inner West Council
- Sydney Council.

2.4.1 Botany Bay Local Environmental Plan 2013

The Botany Bay Local Environmental Plan 2013 (Botany Bay LEP 2013) was gazetted on 21 June 2013 and came into effect on 26 June 2013, repealing in part the former Botany LEP 1995. It applies to all land within the suburb of Botany in the Bayside LGA, excluding some industrial zoned areas such as those covered by the State Environmental Planning Policy (Three Ports) 2013 and individual addresses in Mascot and one in Botany.

Clauses applying to heritage items, land within the vicinity of heritage items and historic archaeological relics or sites within land subject to the Botany Bay LEP 2013 can be found under Schedule 5.10 of the LEP's written instrument.

There is one item listed on the Botany Bay LEP 2013 within the study area:

- Sydney (Kingsford Smith) Airport group – I170.

There are two items listed on the Botany Bay LEP 2013 located within the study area's 150 metre buffer zone:

- Alexandra Canal (incl sandstone embankment) – I1

- House – “Daktari” – I131

There is one item listed on the Botany Bay LEP 2013 and located within the study area’s 150 metre buffer zone and has been removed for private development since its 2013 listing:

- Mature Ficus – I130

The study area is also partially located within the shared curtilage of the following items listed on the Botany Bay LEP 2013:

- Commonwealth Water Pumping Station and Sewerage Pumping Station – I3
- Ruins of the former Botany Pumping Station – I168.

However, the Commonwealth Water Pumping Station and Sewerage Pumping Station is located one kilometre from the study area and Ruins of the former Botany Pumping Station are 500 metres away. Therefore, they will not be considered in this SoHI. The above items share the same curtilage which is encompassed by the Sydney Airport property boundary (see Figure 3-4).

2.4.2 Marrickville Local Environmental Plan 2011

The north-eastern extent of the study area is located within the Inner West LGA. The Inner West Council was created by a merger of Ashfield, Leichhardt and Marrickville councils in 2016. The study area is located within what was the Marrickville LGA. Until a combined set of codes and policies are developed for the new Inner West Council, the codes and policies from the former councils still apply within their former boundaries. Therefore, the Marrickville Local Environmental Plan 2011 (Marrickville LEP 2011) and Marrickville Development Control Plan 2011 continue to guide development within the study area.

Clauses applying to heritage items, land within the vicinity of heritage items and historic archaeological relics or sites within land subject to the Marrickville LEP 2011 can be found under Schedule 5.10 of the LEP’s written instrument.

There is one item listed on the Marrickville LEP 2011 located within the study area:

- Alexandra Canal – I270.

There are two items listed on the Marrickville LEP 2011 within the study area’s 150 metre buffer zone:

- Moreton Bay fig tree – I303
- Cooks River Container Terminal – I366.

2.4.3 Sydney Local Environmental Plan 2012

Sydney Local Environmental Plan 2012 (Sydney LEP 2012) was gazetted on 14 December 2012 and aims to make local environmental planning provisions for land in the City of Sydney in accordance with the relevant standard environmental planning instrument.

Clauses applying to heritage items, land within the vicinity of heritage items and historic archaeological relics or sites within land subject to the Sydney LEP 2012 can be found under Schedule 5.10 of the LEP’s written instrument. There are no items listed on the Sydney LEP 2012 within the study area or its 150 metre buffer zone.

2.5 Non-statutory considerations

2.5.1 National Trust of Australia (NSW)

The National Trust of Australia (NSW) maintains a register of landscapes, townscapes, buildings, industrial sites, cemeteries and other items or places which the National Trust determines have cultural significance and are worthy of conservation. Items registered on the National Trust are not protected by statutory legislation. However, if an item is listed on the register, it is generally an indication that the item is held in esteem by the heritage community.

There are no items listed on the National Trust located within the study area.

2.5.2 Register of the National Estate

The Register of the National Estate (RNE) was closed in 2007 and is no longer a statutory list. However, it remains available as an archive.

There are two items registered on the RNE interim list within the study area:

- Alexandra Canal – 103889
- Sydney (Kingsford Smith) Airport Group – 102669.

Items on the RNE's interim list were publicly proposed for entry on the register; however, the register closed before their nomination could be assessed.

2.6 Relevant databases and management policies

2.6.1 State Heritage Inventory

The State Heritage Inventory (SHI) is a database containing a list of heritage items in New South Wales including Aboriginal Places, SHR, Interim Heritage Orders, State Agency Heritage Registers and Local Environmental Plans (LEPs). It is maintained by the NSW Heritage Division and is not a statutory list.

2.6.2 Australian Heritage Database

The Australian Heritage Database in a publicly accessible online database that contains information about more than 20,000 natural, historic and Indigenous places across Australia and overseas.

2.6.3 Alexandra Canal Conservation Management Plan, 2004

The Alexandra Canal Conservation Management Plan (CMP) was developed in accordance with the Burra Charter and various guidelines produced by the NSW Heritage Office (now Office of Environment and Heritage). It was endorsed by the NSW Heritage Office in 2004. The CMP provides policies and practical guidance for a balanced approach to conserving and managing the significance of the canal.

The project's compliance with policies within the CMP are discussed in section 8.8.3 and Appendix B, section 13.2.1.

Elements listed in the plan's schedule of significant fabric are outlined in section 6.2.1.1 and illustrated in Figure 6-2 – Figure 6-5.

2.6.4 Sydney Airport Heritage Management Plan, 2009

The Sydney Airport Heritage Management Plan was commissioned by Sydney Airport Corporation Limited for the Sydney Airport site. It provides principles, policies and guidelines for managing and preserving Sydney Airport's heritage values '*during ongoing operations and during any future proposed development, sale or lease of the site or part of the site'*.[2]

The Heritage Management Plan identified potential Commonwealth heritage values for the airport as a whole and identified and assessed the significance of its individual elements including eleven buildings within the project footprint. These are outlined in Appendix B and Section 3.2.

The project's compliance with policies within the Heritage Management Plan are discussed in section 8.8.2 and Appendix B, of this report.

Items listed in the plan's schedule of significant fabric are outlined in section 3.2.

2.6.5 Draft Sydney Airport Heritage Management Plan, 2018[3]

The Draft Sydney Airport Heritage Management Plan was prepared in 2018 in order to update the 2009 Sydney Airport Heritage Management Plan. The aim of the plan is to recognise pressures on existing heritage items associated with continued growth of the airport, the need to conserve significant heritage elements within the airport and implement a strategic and holistic interpretation of the airport's history.

The plan informs the Sydney Airport Masterplan 2018 and also addresses proposed developments outlined within the Sydney Airport Master Plan 2039, particularly within the North East Sector of the airport. This area contains a number of structures including buildings and hangars relevant to this SoHI such as the Jet Base and the Lauriston Park Estate street layout, which contain heritage significance.

2.6.6 Maritime Container Services Cooks River Intermodal Terminal Heritage Items Maintenance Plan[4]

The Maritime Container Services (MCS) Cooks River Intermodal Terminal Heritage Items Maintenance Plan was prepared to ensure items of heritage significance within the Cooks River Intermodal Terminal site are sufficiently maintained. It provides a list of items considered to contain heritage significance within the site and outlines key maintenance and management requirements for each building. This includes items located within the study area's 150 metre buffer zone, including the Marrickville LEP 2013 and NSW Ports s170 register listed 'Precast concrete Hut 1', 'Modified Thompson Points Lever to lay down position' and 'Electric overhead travelling crane gantry'.

[2] Godden Mackay Logan, 2009. Sydney Airport Heritage Management Plan. Report prepared for SACL, p. 1.
[3] Godden Mackay Logan, 2018. Draft Sydney Airport Heritage Management Plan. Report prepared for SACL.
[4] MCS Cooks River Intermodal Terminal Heritage Items Maintenance Plan, 2018. Version 1.4. Prepared for Qube Logistics and maritime Container Services.

3.0 EXISTING ENVIRONMENT

3.1 Summary of relevant heritage listed items

Table 3-1 provides a summary of heritage listed items within the study area. Table 3-2. The location of these items is shown in Figure 3-1 – Figure 3-4.

Table 3-1 Summary of heritage items within the study area

Item name	Listing no. and address/location	Significance	Relationship to study area	Commonwealth land or land subject to the EP&A Act
Mascot (O'Riordan Street) Underbridge	ARTC s170 register SHI no. 4801830 Extends over O'Riordan Street, Mascot	Local	Within	Land subject to the EP&A Act
Mascot (Robey Street) Underbridge	ARTC s170 register SHI no. 4801848 Extends over Robey Street, Mascot	Local	Within	Land subject to the EP&A Act
Mascot (Sheas Ck) Underbridge	ARTC s170 register SHI no. 4805743 Extends over Alexandra Canal, Mascot	Local	Within	Land subject to the EP&A Act
Cooks River Container Terminal	NSW Ports s170 register SHI no. 4560046 Marrickville LEP 2011 LEP no. I366 20 Canal Road, St Peters	Local and State	Within	Land subject to the EP&A Act
Sydney (Kingsford Smith) Airport Group	Botany Bay LEP 2013 LEP no. I170 Commonwealth Heritage List Indicative Place item no. 105542 RNE Item no. 102669 Part Lot 8, DP 1050923	Local	Within	Commonwealth
Alexandra Canal	SHR SHR no. 01621 Lot 3, DP 878489/ Part Lot 13, DP 1050464	State	Within	Land subject to the EP&A Act
Alexandra Canal	Marrickville LEP 2011 LEP no. I270 Canal Road, St Peters – Part Lot 13, DP 1050464	State	Within	Land subject to the EP&A Act

Item name	Listing no. and address/location	Significance	Relationship to study area	Commonwealth land or land subject to the EP&A Act
Alexandra Canal No.89AZ	Sydney Water s170 register SHI no. 4571712 Adjacent to Burrows Road Alexandria, St. Peters, Mascot, Tempe – Lot 13, DP 1050464	State	Within	Land subject to the EP&A Act
Alexandra Canal	RNE interim list Item no. 103889 Airport Drive, Sydney Airport	State	Within	Land subject to the EP&A Act

Table 3-2 Summary of heritage listed items within the study area's 150 metre buffer zone

Item name	Listing no. and address/location	Significance	Relationship to study area	Commonwealth land or land subject to the EP&A Act
Commonwealth Water Pumping Station and Sewerage Pumping Station	Botany Bay LEP 2013 LEP no. I3 General Holmes Drive (west of Engine Pond, within the boundary of Sydney (Kingsford Smith) Airport)	State	The LEP heritage curtilage for the item is within the study area. However, the structures themselves are located 1 kilometre south of the study area and outside of the 150 metre buffer zone As no impacts on this item are likely, this item is not assessed further in this SoHI	Commonwealth
Ruins of the former Botany Pumping Station	Botany Bay LEP 2013 LEP no. I168 Within the boundary of Sydney (Kingsford Smith) Airport – Part Lot 8, DP 1050923	Local	The heritage curtilage for the item is within the study area. However, the ruins of the pumping station are located 500 metres south of the study area and outside the 150 metre buffer zone As no impacts on this item are likely, this item is not assessed further in this SoHI	Commonwealth
Alexandra Canal (including sandstone embankment)	Botany Bay LEP 2013 LEP no. I1 Alexandra Canal, Mascot	State	Located within the study area's 150 metre buffer zone Approximately 15 metres east of the study area boundary	Land subject to the EP&A Act
House – "Daktari"	Botany Bay LEP 2013 LEP no. I131 114 High Street, Mascot	Local	Located within the study area's 150 buffer zone Located at the edge of the buffer zone, approximately 100 metres north-east of the study area.	Land subject to the EP&A Act

Item name	Listing no. and address/location	Significance	Relationship to study area	Commonwealth land or land subject to the EP&A Act
Mature Ficus	Botany Bay LEP 2013 LEP no. I130 112 High Street, Mascot	Local	Removed Was located at the edge of the buffer zone, approximately 100 metres north-east of the study area.	Land subject to the EP&A Act
Moreton Bay Fig Tree	Marrickville LEP 2013 LEP no. I303 South Street, Tempe	Local	Located within the study area's 150 metre buffer zone, approximately 115 metres north of the study area boundary	Land subject to the EP&A Act
Cooks River Container Terminal: Electrical Overhead Travelling Crane	NSW Ports s170 register SHI no. 4560052 20 Canal Road, St Peters	Local	Located within the study area's 150 metre buffer zone, approximately 20 metres north of the study area boundary	Land subject to the EP&A Act
Cooks River Container Terminal: Lay Down Points Lever	NSW Ports s170 register SHI no.4560051 20 Canal Road, St Peters	Local	Located within the study area's 150 metre buffer zone, approximately 130 metres north of the study area boundary	Land subject to the EP&A Act
Cooks River Container Terminal: Precast Concrete Hut 1	NSW Ports s170 register SHI no. 4560047 20 Canal Road, St Peters	Local	Located within the study area's 150 metre buffer zone, approximately 120 metres north of the study area boundary	Land subject to the EP&A Act

3.2 Sydney Airport: schedule of significant fabric

The 2009 Heritage Management Plan and Draft 2018 Heritage Management Plan for Sydney Airport contain a schedule of significant buildings, trees, view lines and elements.[5] The Heritage Management Plans use a ranking system to assist in assessing the significance of these items. These are outlined in Table 3-3 below:

Table 3-3 Relative Heritage Value Rankings – Precincts and Elements within Sydney Airport[6]

Ranking	Justification	Status
Exceptional	Rare or outstanding elements that significantly embody and demonstrate Commonwealth heritage values in their own right and demonstrate that they directly and irreplaceably contribute to a place's significance/value	Fulfils criteria for heritage listing
High	Elements that demonstrate Commonwealth heritage values in their own right and demonstrate that they significantly contribute to the overall significance/value of the place	Fulfils criteria for heritage listing
Moderate	Elements that demonstrate Commonwealth heritage values and contribute to the site's heritage value	Fulfils criteria for heritage listing
Little	Elements that reflect some heritage values but only contribute to the overall significance/value of the place in a minor way	Does not fulfil criteria for heritage listing
Neutral	Elements that do not reflect or demonstrate any Commonwealth heritage values	Does not fulfil criteria for heritage listing

Table 3-4 outlines buildings included in the 2009 Heritage Management Plan's schedule of significant fabric that will be removed as part of the project. It includes their construction date, current and former use and assessed significance against the definitions provided in Table 3-3.

Table 3-4 Precincts and Elements within Sydney Airport to be removed as part of the project

Building	Historical use	Current use	Construction phase/date	Significance
133	Aircraft kitchens	Qantas Jet Base Administrative Tower	Post-war redevelopment, Intermediate Phase 1956-1962	**Little**
146	Canteen	Qantas Jet Base	Post-war redevelopment, Intermediate Phase 1956-1962	**Little**
148	Qantas Jet Base technical training	Qantas Jet Base technical training	Post-war redevelopment, Intermediate Phase 1956-1962	**Little**
151	n/a	Qantas Jet Base services control plant	Post-war redevelopment, Intermediate Phase 1956-1962	**Little**
166	Pump house	Pump house	Post-war redevelopment, Intermediate Phase 1956-1962	**Little**

[5] GML, 2009. Sydney Airport Heritage Management Plan.
[6] GML, 2018. Draft Sydney Airport Heritage Management Plan, p. 60.

Building	Historical use	Current use	Construction phase/date	Significance
167	n/a	Workshop	Post-war redevelopment, Intermediate Phase 1956-1962	**Little**
171	n/a	Air cargo store	Post-war Redevelopment Phase 2 1963-1972	**Little**
203	Boiler house	Not operational	Post-war Redevelopment Phase 2 1963-1972	**Neutral**
217	n/a	Administration tower and plant room	Post-war Redevelopment Phase 2 1963-1972	**Neutral**
221	n/a	Substation J	Post-war Redevelopment Phase 2 1963-1972	**Neutral**
235	n/a	Former Customs Offices	Post-war Redevelopment Phase 2 1963-1972	**Little**

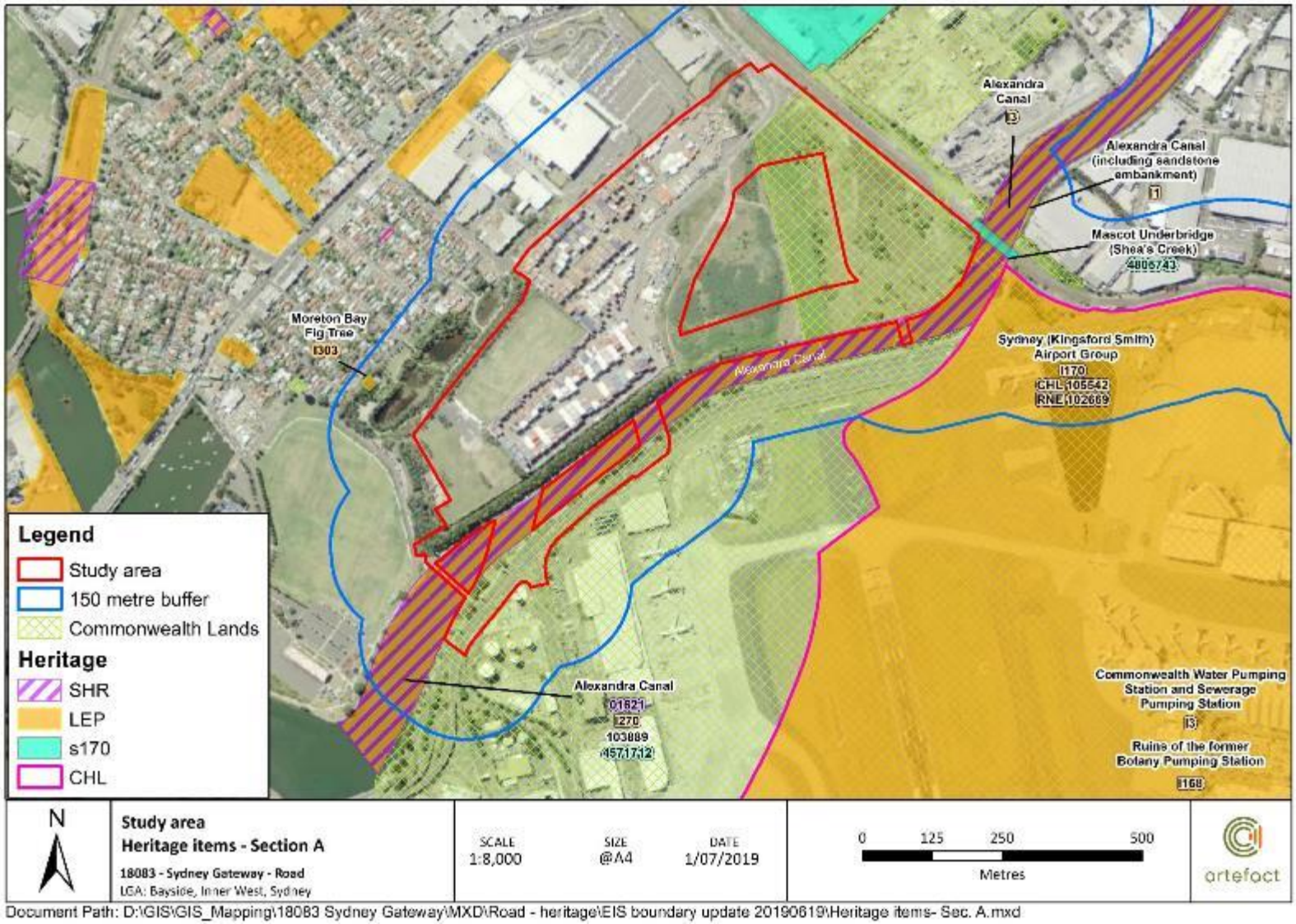

Figure 3-1 Detail of heritage listed items Section A of the study area and 150 metre buffer zone

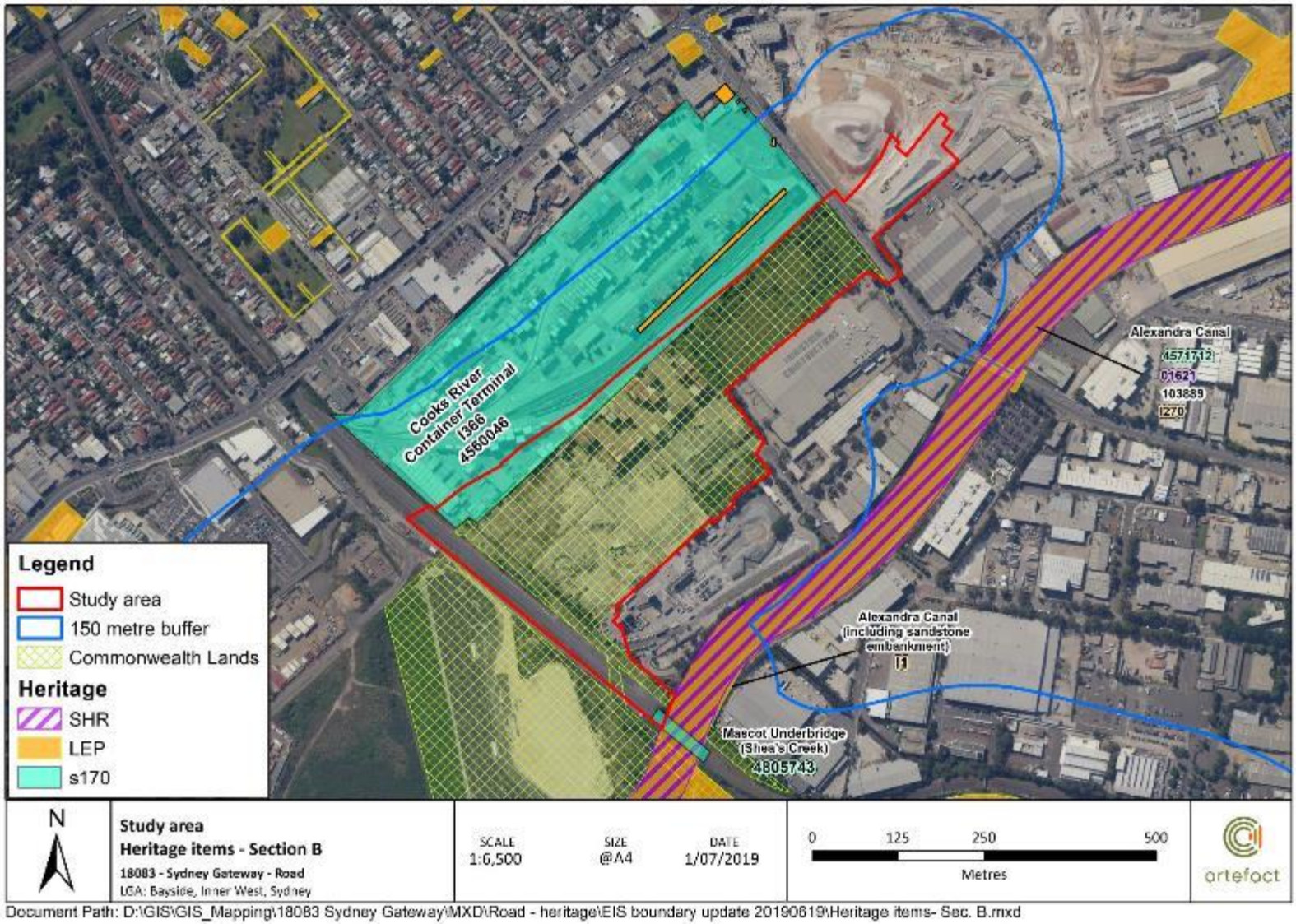

Figure 3-2 Detail of heritage listed items in Section B of the study area and 150 metre buffer zone

Figure 3-3 Detail of heritage listed items in Cooks River Terminal (Section B) and 150 metre buffer zone

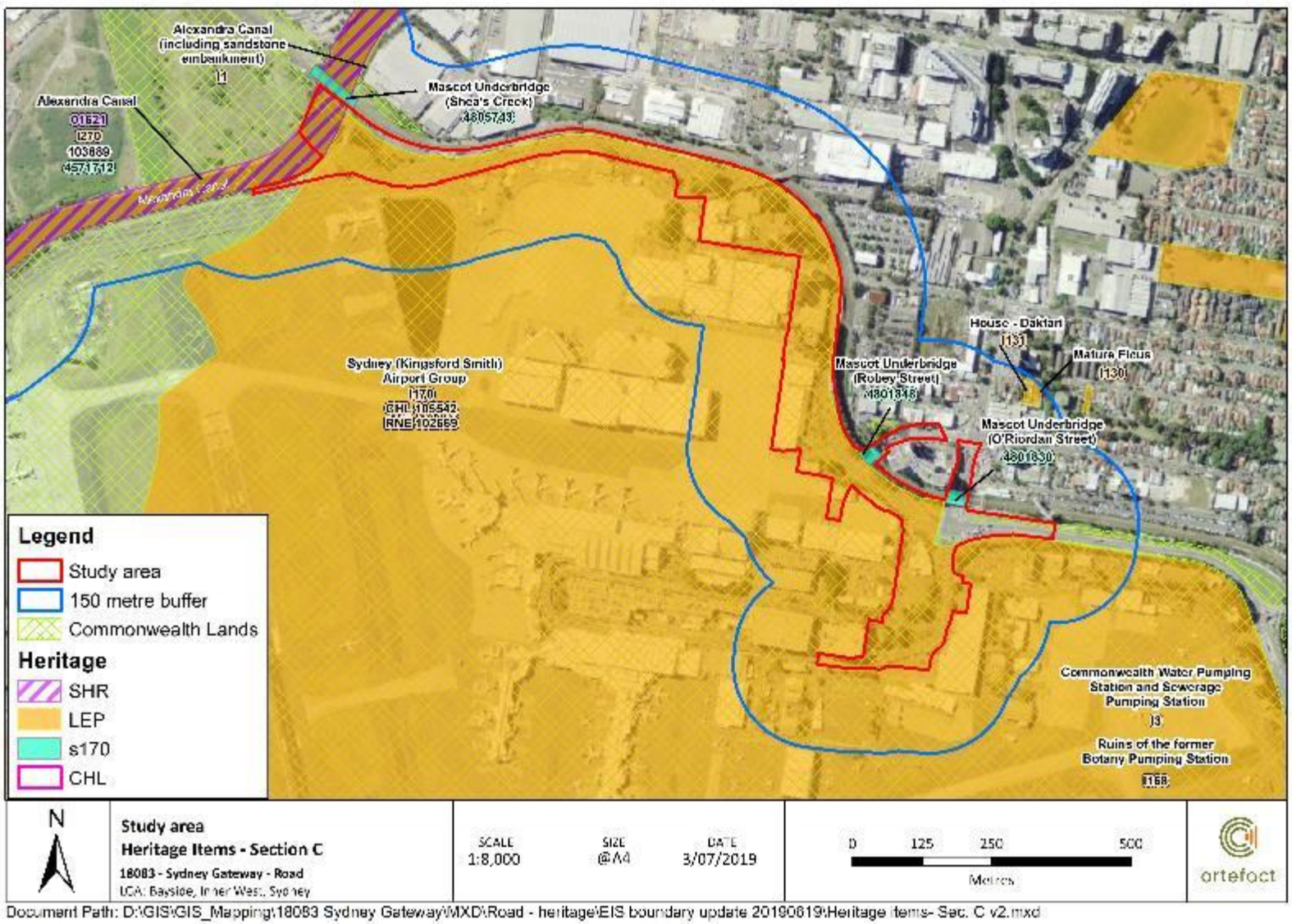

Figure 3-4 Detail of heritage listed items in Section C of the study area and 150 metre buffer zone

4.0 METHODOLOGY

4.1 Statement of Heritage Impact preparation

This SoHI has been prepared in accordance with the following guidelines:

- *Statements of Heritage Impact* 2002, *NSW Heritage Manual* 2002 (NSW Heritage Office)
- *Historical Archaeology Code of Practice* 2006 (Heritage Office, Department of Planning)
- *Assessing Significance for Historical Archaeological Sites and Relics* 2009 (Heritage Branch, Dept. of Planning)
- *Burra Charter* 2013 (Australia ICOMOS).

4.2 Heritage register search

Heritage listed items within the study area and its 150 metre buffer zone were identified through searching statutory and non-statutory databases comprising of the following:

- NSW State Heritage Register
- Botany Bay Local Environmental Plan 2013
- Heritage Conservation Development Control Plan No.37
- Roads and Maritime s170 Register
- Sydney Water s170 Register
- RailCorp s170 Register
- ARTC s170 Register
- NSW Fire Brigades s170 Register
- Ausgrid s170 Register
- National Heritage List
- Commonwealth Heritage List
- Register of the National Estate
- National Trust Register (NSW)
- Australian Heritage Database
- NSW State Heritage Inventory (SHI)
- State Heritage Register (SHR)
- Sydney Airport Heritage Management Plan, 2009

An initial heritage register search for the project and this SoHI was carried out in August 2018. In order to ensure amendments and/or updates to heritage register listings was appropriately managed for the project, an updated search of all registers was carried out on 3 July 2019. Findings from the revised search have been incorporated into this document.

4.3 Heritage significance assessments

Statements of significance for listed and unlisted heritage items and potential archaeological remains have been drawn from existing heritage assessments and registers, such as the SHI, where possible. Detailed heritage assessments for areas of archaeological potential and listed/unlisted heritage items are provided in Appendix A.

Determining the heritage significance of items, landscapes or archaeological remains is undertaken by using a system of assessment centred on the Burra Charter of Australia ICOMOS. This SoHI will assess items using criteria outlined in the *NSW Heritage Manual: Assessing heritage significance* (NSW Heritage Office 2001). These are outlined in Table 4-1. Criteria adopted to assess items on the NHL have also been used to assess items on the CHL where relevant and are included in Table 4-1. If an item meets one of the eight heritage criteria, and retains the integrity of its key attributes, it can be considered to have significance.

Table 4-1 NSW Heritage Manual and Commonwealth Heritage List heritage assessment criteria

Criteria	Description
A – Historical significance	An item is important in the course or pattern of the local area's cultural or natural history
B – Associative significance	An item has strong or special associations with the life or works of a person, or group of people, of importance in the local area's cultural or natural history
C – Aesthetic and/or technical significance	An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in the local area
D – Social significance	An item has strong or special association with a particular community or cultural group in the local area for social, cultural or spiritual reasons
E – Research potential	An item has potential to yield information that will contribute to an understanding of the local area's cultural or natural history
F – Rarity	An item possesses uncommon, rare or endangered aspects of the local area's cultural or natural history
G – Representativeness	An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or environments (or the cultural or natural history of the local area)
H – Indigenous tradition	The place has significant heritage value because of the place's importance as part of Indigenous tradition.

4.4 Significance grading of elements

This report includes an assessment of the relative contributions of individual elements of the study area (i.e. Botany Rail Line) to its heritage value. Components are assessed according to the grading in Table 4-2.

Table 4-2 Standard grades of significance

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

4.5 Heritage impact assessments

Impacts on items of heritage significance and potential archaeological remains have been graded on a scale from 'major' to 'neutral'. Definitions for each grade of impact are outlined in Table 4-3. Visual impact assessments are based on heritage items with direct site lines to and from the study area. These site lines were assessed during the site inspection.

Table 4-3 Terminology for assessing the magnitude of heritage impact

Grading	Definition
Major	Actions that would have a long-term and substantial impact on the significance of a heritage item. Actions that would remove key historic building elements, key historic landscape features, or significant archaeological materials, thereby resulting in a change of historic character, or altering of a historical resource. These actions cannot be fully mitigated.
Moderate	Actions involving the modification of a heritage item, including altering the setting of a heritage item or landscape, partially removing archaeological resources, or the alteration of significant elements of fabric from historic structures. The impacts arising from such actions may be able to be partially mitigated.
Minor	Actions that would result in the slight alteration of heritage buildings, archaeological resources, or the setting of an historical item. The impacts arising from such actions can usually be mitigated.
Negligible	Actions that would result in very minor changes to heritage items.
Neutral	Actions that would have no heritage impact.

4.6 Site inspection

A site inspection of the study area was carried out on 18 December 2018 and Friday 8 February 2019 by Adele Zubrzycka (Senior Heritage Consultant, Artefact Heritage) and Ryan Taddeucci (Senior Heritage Consultant, Artefact Heritage). The aim of the inspection was to evaluate the existing environment within the study area and assess visual impacts as well as direct and indirect physical impacts on all heritage listed items outlined in section 3.1. The inspection also aimed to identify potential non-Aboriginal archaeological sites and unlisted heritage items within the study area.

Land occupied by Tyne Container Services, 9 Canal Road, St Peters (Lot A DP 391775), 30 Canal Road, St Peters (Lot 4 DP 555771 and Lot 3 DP 825649) and the Cooks River Intermodal Terminal were not accessed during the inspection. Lot A DP 391775, Lot 4 DP 555771, Lot 3 DP 825649 and the Cooks River Intermodal Terminal have potential to contain archaeological remains, as outlined in section 0.

The inspection was undertaken on foot and a photographic record was made. GPS coordinates were collected in areas where items that may contain heritage significance or areas where archaeological potential were identified. Results of the site inspection are provided in Appendix D.

4.7 Archaeological potential

The identified levels of archaeological potential referred to in this document are based on the definitions outlined in Table 4-4.

Table 4-4 Definition of assessed archaeological potential.

Grading	Definition
High Potential	Where there is evidence of multiple phases of historic development and structures, with minimal or localised twentieth-century development impacts, and where it is likely that archaeological resources would remain intact.
Moderate Potential	Where analysis has demonstrated known historical development with some previous impacts, but where it is likely that archaeological remains would survive with localised truncation and disturbance.
Low Potential	Where research has indicated little historical development, or where there have been substantial previous impacts which may not have removed deeper subsurface remains entirely.
Nil to Low Potential	Where there has only been low intensity historical activity, such as land clearance or informal land use, with little to no archaeological 'signature' expected; or where previous impacts were extensive, such as large-scale bulk excavation which would leave isolated and highly fragmented deposits.
Nil Potential	Where there is no evidence of historical development or use, or where previous impacts such as deep basement structures would have removed all archaeological potential.

4.8 Limitations

This report provides an assessment of non-Aboriginal heritage and archaeological potential only. Assessments of heritage significance and archaeological potential are based on available primary and secondary source documents.

Land currently occupied by Qube (Tyne Container Services) at 9 Canal Road, St Peters (Lot A DP 391775), 30 Canal Road, St Peters (Lot 4 DP 555771 and Lot 3 DP 825649), Boral Recycling St Peters, Boral Concrete St Peters and the Cooks River Intermodal Terminal was not accessed during the site inspection.

5.0 HISTORICAL BACKGROUND

The following section provides a summary of historical occupation within the study area. A detailed history is provided in Appendix C.

5.1 Phase 1 – c1796–1830

Phase 1 land use is associated with early European occupation and land grants within the Tempe, Mascot, St Peters and Botany areas. Land use activities included timber getting, shell lime mortar production, farming and scattered residential development.

There is no evidence to suggest structures occupied the study area at this time. However, the southernmost extent of Section C was located within land grants given to, and occupied by, ex-convicts Andrew Byrne and Mary Lewin (as shown in Figure 5-1). Botany Road (now O'Riordan Street) had also been established by this time.

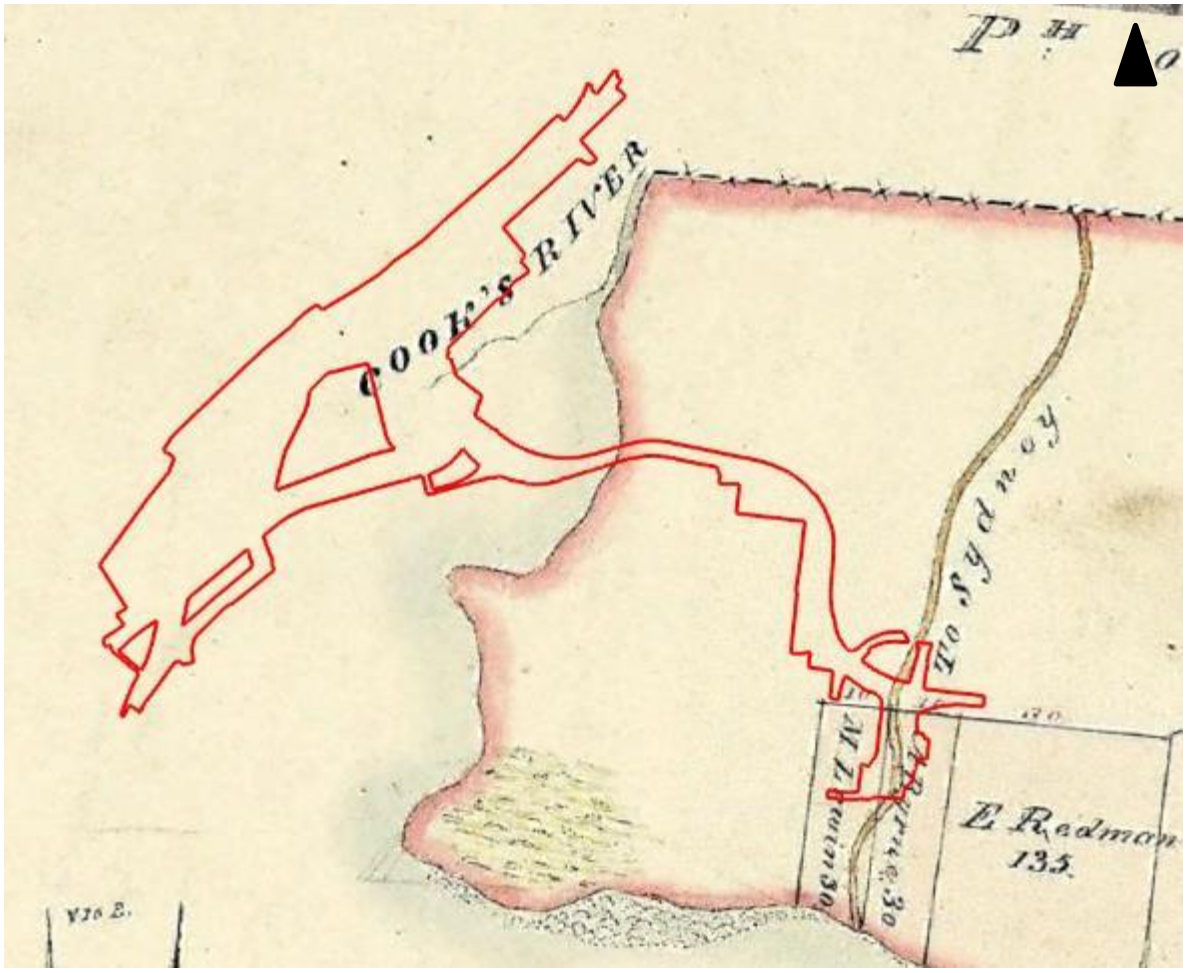

Figure 5-1 Undated parish of Botany plan showing early land grants within Section C of the study area. Source. State Library of NSW

5.2 Phase 2 – c1830–1870

Phase 2 occupation is associated with industrial and agricultural activities, specifically market gardens and scattered residential development (Figure 5-2). Land development was heavily influenced by the introduction of the *Noxious Industries Act* in 1848. Soon, Botany, Mascot, Tempe and St Peters was being heavily utilised for wool washing, meat works, candle works, leather tanning, paper making, soap making, boiling down works and brick making.[7]

Residences associated with market gardens may have occupied Section C during this phase and unrecorded agricultural and industrial activities may have occurred in Sections A and B. The extent of the latter would have been limited by the swampy nature of the landscape. An embankment surrounding Sheas Creek was also established in Section B at this time.

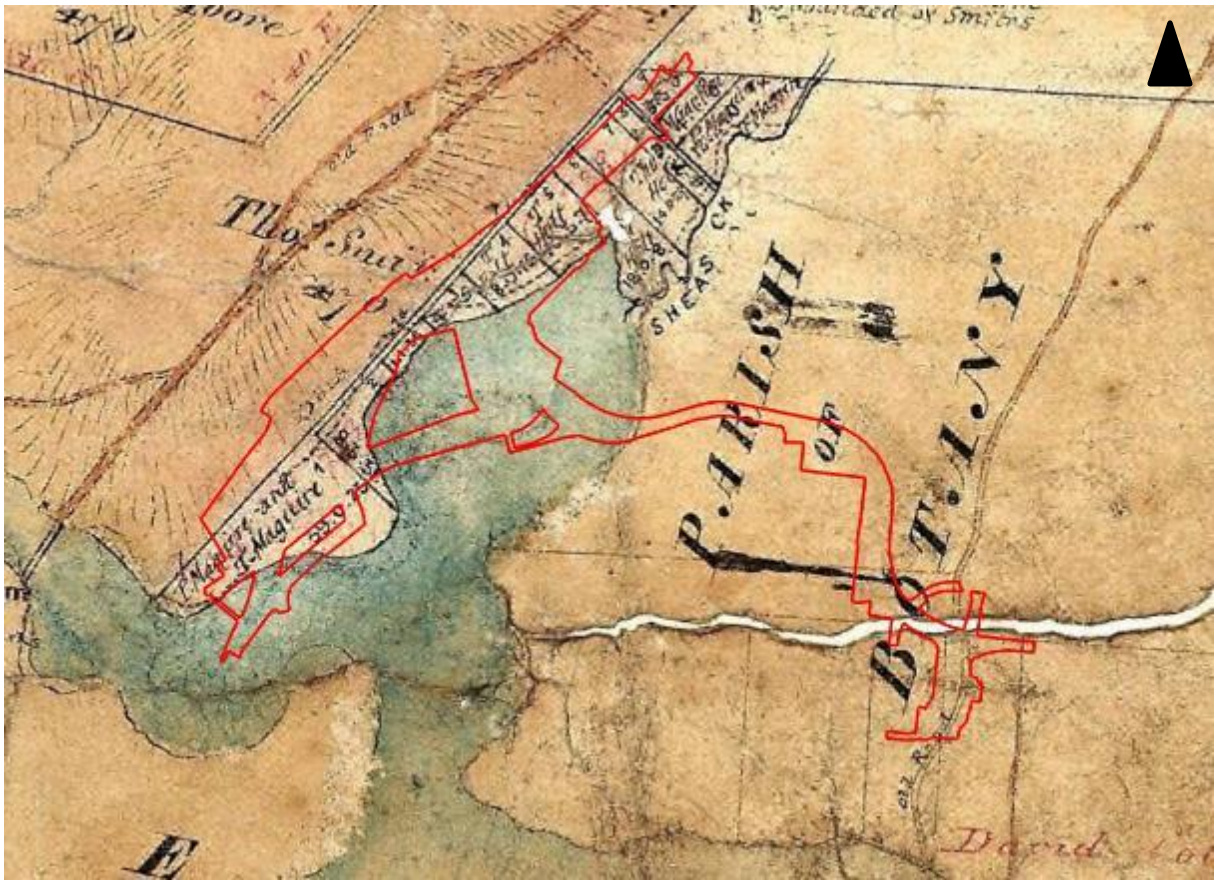

Figure 5-2 Undated parish of Lewisham map showing nine allotments along Cooks River and Thomas Smith 470 acre grant. Source. Land Registry Services (LRS)

[7] Lawrence, J. 2001. p. 9 and Thorp, W. 1999. Archaeological Assessment. Former Chubb Factory Site, Waterloo. Prepared on Behalf of St Hilliers Pty Ltd, p. 11.

5.3 Phase 3 – 1870–1919

Phase 3 occupation is associated with the establishment of the Botany and Petersham municipalities, the Botany Goods Line (partial) and the Alexandra Canal. Residential development continued to occur within Section C alongside Chinese run market gardens. The Lauriston Park estate was established on land now occupied by the airport in 1902. The north-western extent of Section A was used as a gravel quarry from the late 1800s to early 1900s. By 1910, the quarried landscape was being used to dump landfill by the local council. Land use in Section B most likely continued in the form of unrecorded agricultural activities.

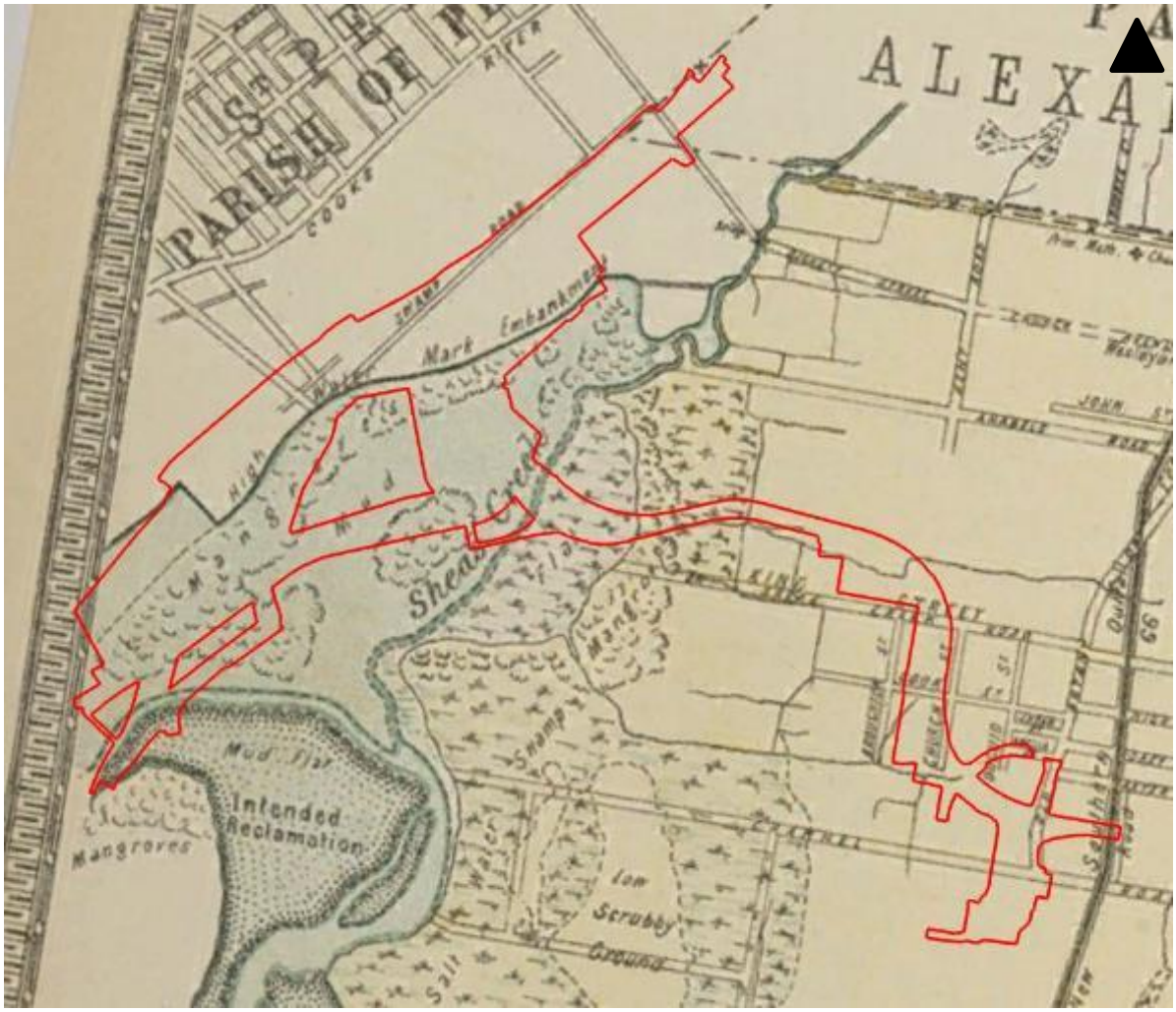

Figure 5-3 Higginbotham and Robinson plan prepared in 1880-1899 showing the nature of the study area prior to the construction of the Alexandra Canal. Source. State Library of NSW

5.4 Phase 4 – 1919–1946

Phase 4 occupation included the completion of the Botany Rail Line in Section B and C, continued residential occupation and market gardening in Section C and establishment of warehouses, brick production buildings and market gardens in Section B.

A gravel quarry and industrial buildings occupied Section A, activities that would have involved extensive excavations and landscape modification.

Sydney Airport was developed during this period, although this occurred outside the study area. The extent of development by 1943 is shown in Figure 5-4.

Figure 5-4 Aerial photograph taken in 1943 showing the gravel quarry and industrial buildings in Sections A, markets gardens and warehouses in Section B and market gardens and residential development (including Lauriston Park) in Section C. Source. SixMaps.

5.5 Phase 5 – 1946–1990

Phase 5 occupation was associated with the expansion of Sydney Airport into Section C subsequent deviation of the Botany Rail Line and demolition of Lauriston Park estate and market gardens.

Land use in Section A was associated with Tempe Tip, which was established in about 1910 and ceased operations in the 1990s (Section A).

St Peters brickworks buildings continued to occupy land in the easternmost extent of Section B while land to the west remained occupied by Phase 4 warehouses and post-1943 warehouses. The latter had been constructed over land used for Phase 3 and 4 farming. The expansion of Sydney Airport required the in Section C.

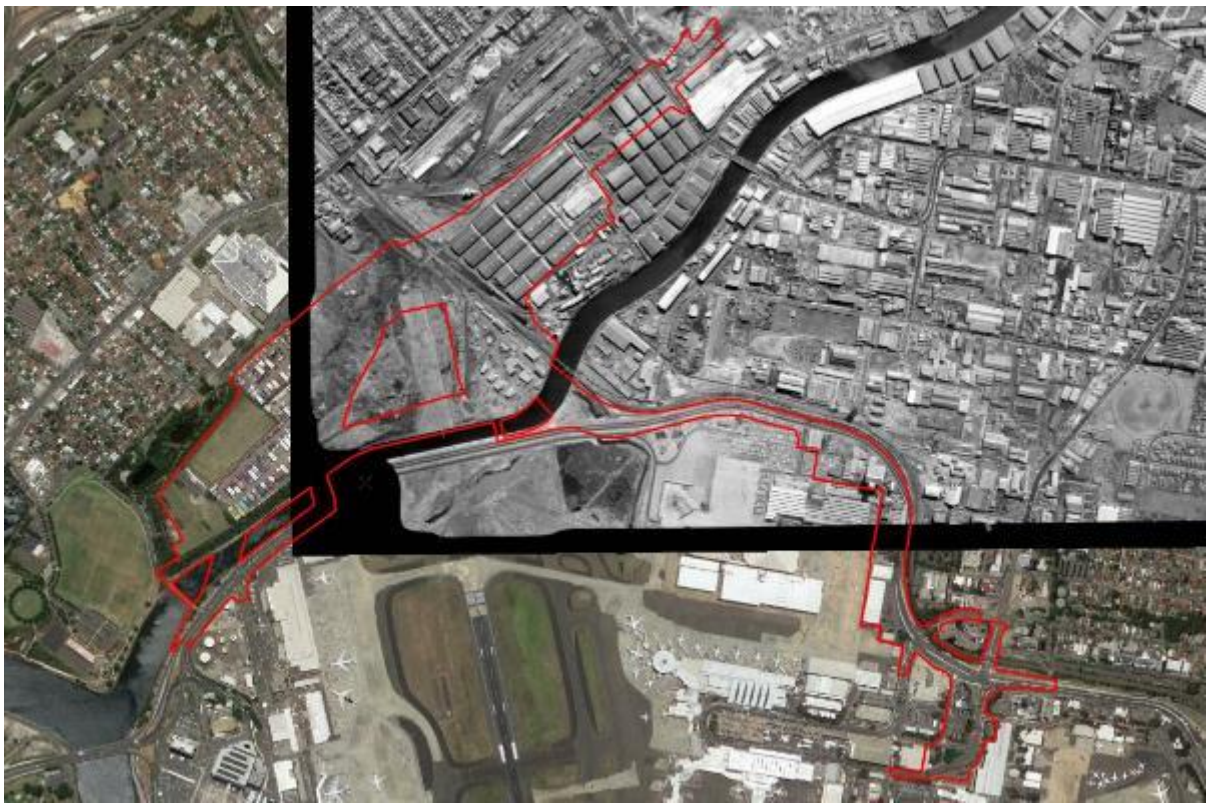

Figure 5-5 Aerial photograph taken in 1970 showing general character of the study at the time. Parts of Section A is occupied by scattered industrial buildings along the Botany Rail Line and Section B is occupied by industrial buildings. Section C has been redeveloped to accommodate the Sydney Airport expansions alongside the Alexandra Canal.

5.6 Phase 6 – 1990–present

Phase 6 represents contemporary management and use of the Botany Rail Line, ongoing development and expansion of Sydney Airport and the establishment of modern industrial and commercial premises within Sections A, B and C.

Recreational parklands were established in the north-west corner of Section A during this period, formalising land once occupied by Tempe Tip.

6.0 SIGNIFICANCE ASSESSMENT

6.1 Introduction

The heritage significance assessment is separated into three distinct sections in order to adequately assess heritage impacts that may be incurred as a result of the project:

- Listed heritage items:
  - Section 6.2 – Listed items in, and partially within, the study area
  - Section 6.3 – Items within the 150 metre buffer zone.
- Unlisted heritage items:
  - Section 6.4 – Unlisted items within the study area.

All assessments are taken from SHI listing for the items unless noted otherwise. Text quoted directly from external sources is shown in italics and sources are referenced.

6.2 Listed items in the study area

6.2.1 Alexandra Canal[8]

Alexandra Canal	
Listing and number	SHR no. 01621 Sydney Water s170 register SHI no. 4571712 RNE no. 103899 Marrickville LEP 2011 no. I270
Commonwealth land or land subject to the EP&A Act	Land subject to the EP&A Act
Significance	State
Description and condition	The canal is an artificial waterway adapted from Sheas Creek used for stormwater drainage. It stretches 4.5 kilometres from Cooks River to Huntley Street. Its banks are formed by sandstone capping and there are four bridges which overpass the canal.
Curtilage boundary	*The curtilage covers the item and extends from the former course of Sheas Creek in south-eastern Sydney to the north-west at the intersection with the Cooks River, terminating 200 metres south of Huntley Street in Alexandria, as shown on the curtilage plan. The curtilage includes the Canal stone walls, the Canal and 3 metres above the Canal. Heritage impacts should be considered for any new construction within 10 metres of the Canal.*[9]
History	Sheas Creek, a tributary of the Cooks River, was dredged in 1887 to become a canal for the shipment of cargo to industry in the area. The canal was originally lined with a fascine dyke and originally extended from the Sydenham to Botany Rail Bridge to the Canal Road Bridge. Northern extensions occurred in 1894, reaching Huntley Street in Alexandria. The canal was substantially completed in 1900. Between 1947 and 1970, the canal experienced major changes as the airport was constructed, including altering its course near the Cooks River. The canal however was never successful due to its shallow depth, silting, tides, and the popularity of road transport. By the 1940s, use of the canal had decreased to the extent that wharves along the canal were demolished.

[9] This information has been sourced from the Sydney Water s170 heritage register listing for the Alexandra Canal No. 89AZ. Viewed on 3/07/2019 at: http://www.sydneywater.com.au/SW/water-the-environment/what-we-re-doing/Heritage-search/heritage-detail/index.htm?heritageid=4571712

Alexandra Canal	
	Plans to revitalise the area around the canal have been repeatedly abandoned and coal seam gas exploration beside the canal has heavily polluted the water. In 2018 the canal area has become the location of City of Sydney Council depots and is central to a 40 million-dollar Sydney Water naturalisation project.
Statement of significance	*Alexandra Canal is of high historic, aesthetic and technical/research significance. It is one of only two navigable canals built in NSW and is characterised by its controlled route, defined edges and sandstone embankment walls. The Alexandra Canal route has been influential in determining the planning of the district including street layout and the positioning of industrial buildings along its route. The Canal is also associated with Sheas Creek Wool Sheds and bridges that cross it, which provide a layering of images of an unusual industrial urban landscape. Historically, it is a rare example of 19th century navigational canal construction in Australia, being one of only two purpose built canals in the state. It has the ability to demonstrate the NSW Government's initiative to create water transport as a means of developing an industrial complex in the Alexandria and Botany areas and exploiting the use of unemployed labour to achieve its scheme. It played a seminal role in the changing pattern and evolution of the occupation and industrial uses of the local area and nearby suburbs, which included filling large areas of low lying land for development. Aesthetically, intact original sections of the canal, comprising pitched dry packed ashlar sandstone, provide a textured and coloured finish which is aesthetically valuable in the cultural landscape. It is a major landmark and dramatic component of the industrial landscape of the area, particularly as viewed from the Rickety Street Bridge and along Airport Drive. Scientifically, the excavation of the canal provided a valuable contribution to the understanding of the changing sea-levels along the eastern seaboard and the antiquity of the aboriginal presence in the area. Intact original sections of the fascine dyke sandstone construction are rare examples of late 19th century coastal engineering works.*[10]

Figure 6-1 The physical curtilage plan for Alexandra Canal. Source. Sydney Water

[10] Sydney Water s170 heritage register listing for the Alexandra Canal No. 89AZ.

6.2.1.1 Alexandra Canal: Schedule of significant fabric

The CMP for the Alexandra Canal contains a schedule of significant fabric. Fabric and areas of archaeological potential identified in the CMP and relevant to this SoHI are shown in Figure 6-2 – Figure 6-5 and detailed in Table 6-1. The Alexandra Canal is located within land subject to the EP&A Act.

Table 6-1 Schedule of significant fabric associated with the Alexandra Canal[11]

Material	Significance	Location and bank	Notes	Management
Sandstone remnants (or sandstone remnant wall)	High	Tempe reach West bank	Original sandstone embankment wall laid using normal stretcher or running bond. Associated with early Cooks River works[12]	Preservation and/or restoration of fabric Should be treated as an archaeological item Should be documented prior to works being carried out on the wall
Broken Range Bond Ashlar	High	Bridges West bank	Includes intrusive concrete block Original sandstone embankment wall laid in broken range bond Footing of embankment wall comprises of rubble at the quantities of one cubic yard to the lineal foot. A rubble base was also laid behind the stone blocks as a substrate	Preservation and/or restoration of fabric
Wharves and other structures (including drains)	High	Canal Road, downstream from Canal Road bridge West bank	A number of wharves were built along the length of the Canal; only one survives to any extant above ground	Preservation and/or restoration of fabric Any new wharves should be reconstructed for interpretive purposes only and should be located on original positions Any excavation in the areas of wharves, landings or slipways should include archaeological input and permits
Rail Bridge East	High	Canal Road downstream from Canal Road bridge West bank	Piles were uncovered during the construction of the Alexandra Canal Cycleway	Preservation and/or restoration of fabric Any new wharves should be reconstructed for interpretive purposes only and should be located on original positions Any excavation in the areas of Wharves, Landings or Slipways should include archaeological input and permits

[11] Alexandra Canal CMP, 2004.
[12] Alexandra Canal CMP, 2004, p. 35.

Material	Significance	Location and bank	Notes	Management
Rubble	Moderate	Tempe East bank	Intrusive shotcrete and matting over rubble Rubble is associated with 1931-41 extension of Sydney Airport and the diversion of the Cooks River[13]	Restoration of the fabric
Concrete block	Little	Bridges East bank	Mixed with sandstone Comprises of a pre-cast concrete block with cast joggle end use to repair the embankment wall on the East bank of the canal. Possibly associated with the construction of the rail bridge Inspections for the CMP show that it has mainly been used as a repair material and the Broken Range Bond Ashlar is still in place at the lower courses	Replacement is desirable with approved alternative fabric (preferably sandstone)
Fabricon	Intrusive	Tempe East bank	-	Replacement of the intrusive fabric required when the opportunity exists with an approved alternative fabric (preferably sandstone)
Shotcrete	Intrusive	Tempe and Runway West bank	May be associated with the Sydney Airport facilities upgrade Considered intrusive as it does not encourage the natural establishment of a marine habitat.	Replacement of the intrusive fabric is required (when the opportunity exists) with an approved alternative fabric such as sandstone

[13] Alexandra Canal CMP, 2004, p. 37.

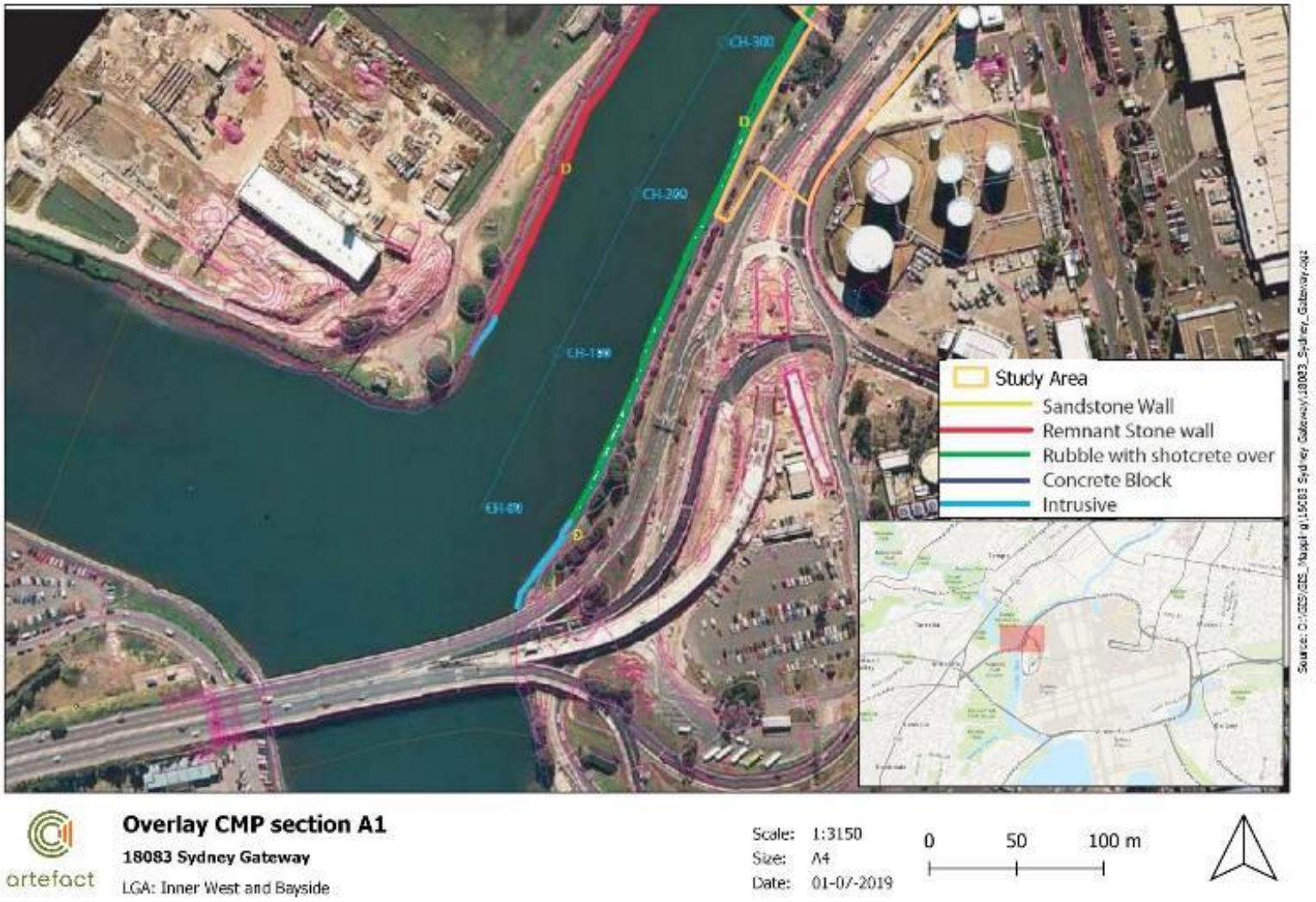

Figure 6-2 Significance of fabric associated with the Alexandra Canal in Section A of the study area (outlined in orange). Source. Alexandra Canal, CMP 2004.

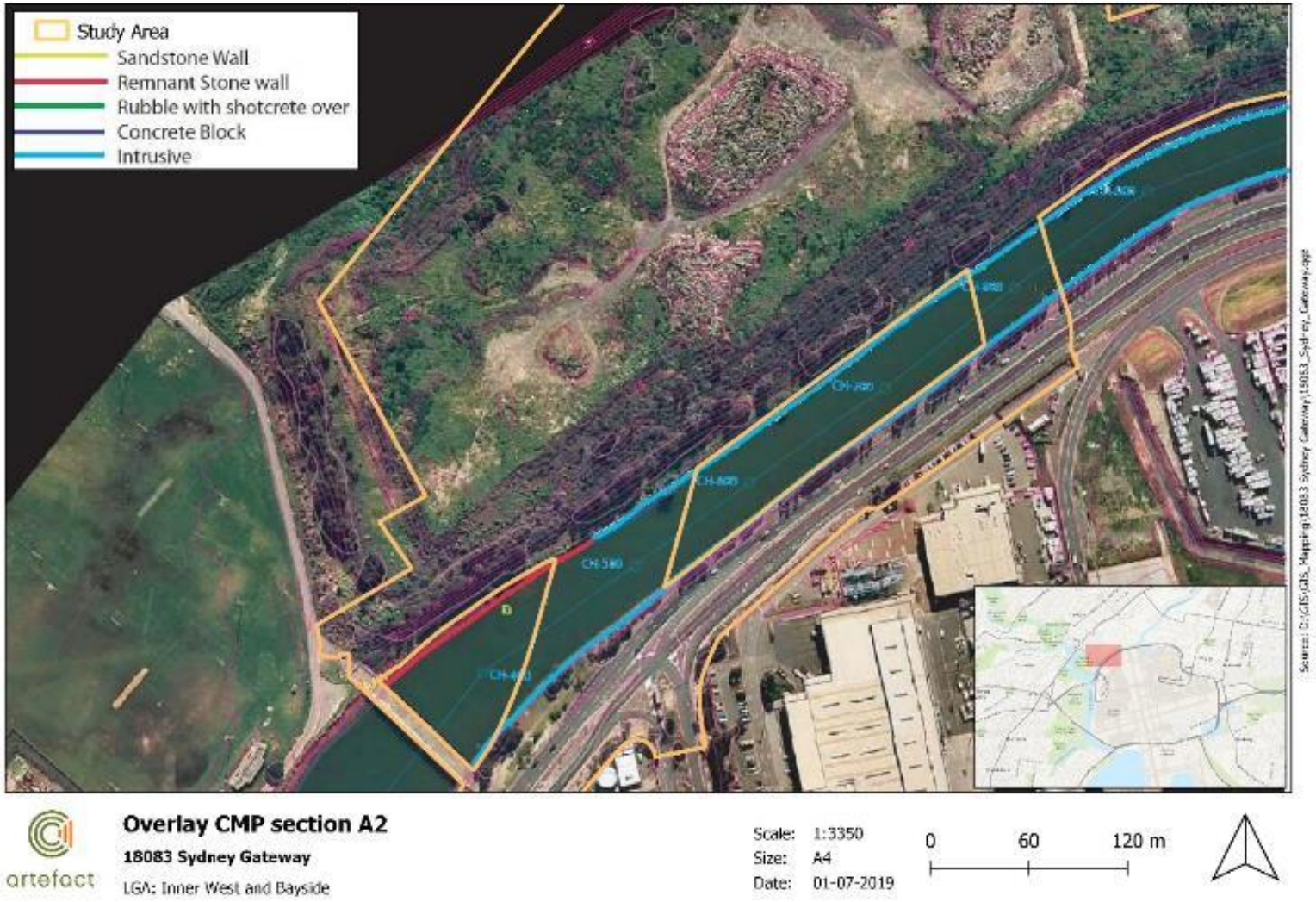

Figure 6-3 Significance of fabric associated with the Alexandra Canal in Section A of the study area (outlined in orange). Source. Alexandra Canal, CMP 2004.

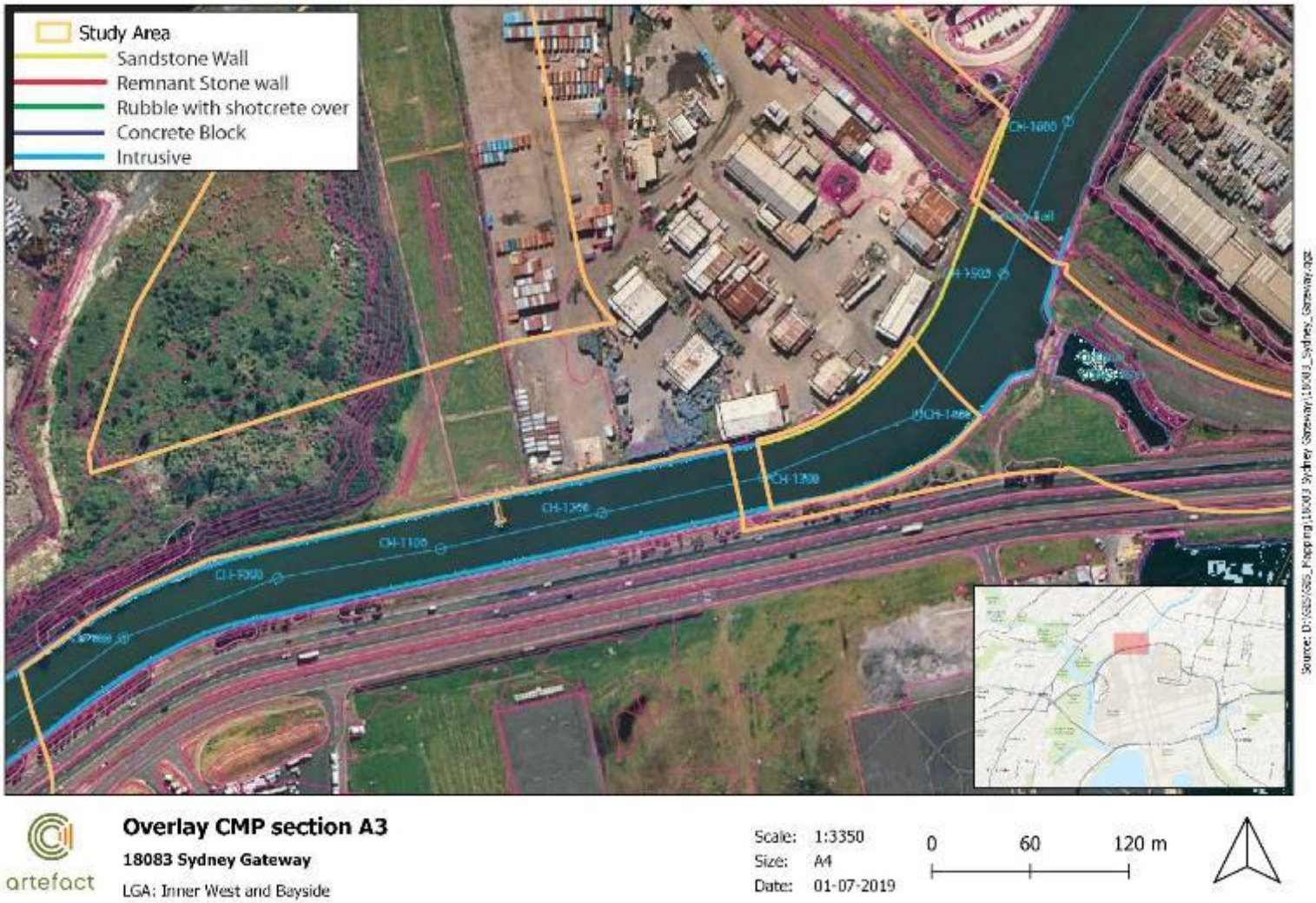

Figure 6-4 Significance of fabric associated with the Alexandra Canal in Section A and B of the study area. Source. Alexandra Canal, CMP 2004.

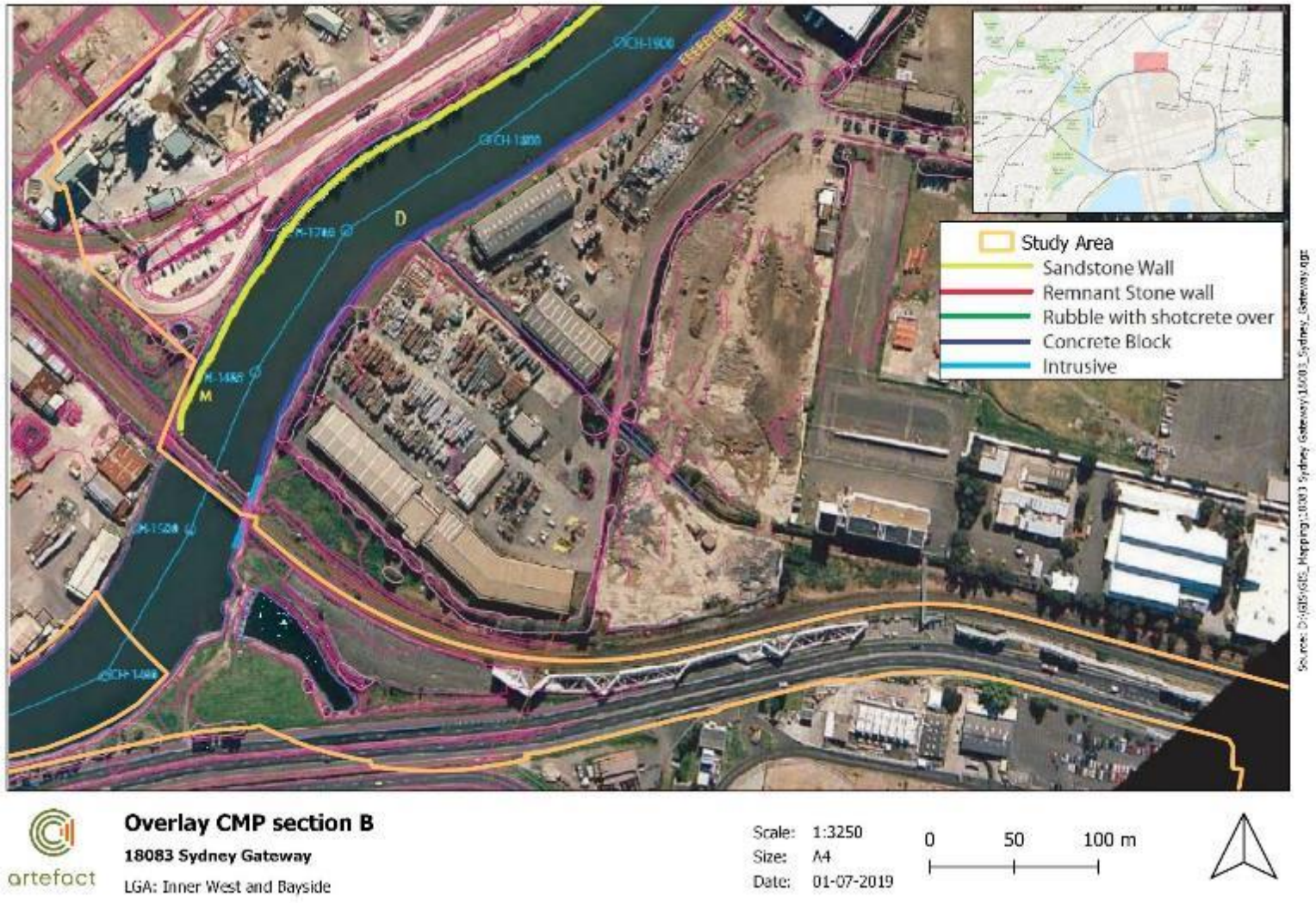

Figure 6-5 Significance of fabric associated with the Alexandra Canal in Section A and B of the study area. Source. Alexandra Canal, CMP 2004.

6.2.2 Mascot (Sheas Creek) Underbridge[14]

Mascot (Sheas Creek) Underbridge	
Listing and number	ARTC s170 register no. 4805743
Commonwealth land or land subject to the EP&A Act	Land subject to the EP&A Act
Significance	Local
Description and condition	The Sheas Creek Underbridge is a five span double track railway bridge which was originally a Bascule bridge. It is in good condition; however, it does have deteriorated bearings, decayed transoms and a cracked abutment.
Curtilage boundary	*The curtilage is limited to the footprint of the bridge, piers and abutments. North: Edge of steel girder bridge. South: Edge of steel girder bridge. East: Rear of abutment. West: Rear of abutment.*[15]
History	*A goods line from Marrickville to the industrial area at Botany was planned c.1914, as an extension of the Metropolitan Goods Lines, but was deferred until after World War I. In the early 1920s the project was resumed. All the bridges were erected prior to the earthworks being carried out because the fill material was at the Botany end of the line. Construction began at the Botany end of the line and proceeded towards Marrickville. For the last high level section from Sydenham to Marrickville, the embankment was formed by a method commonly used in the USA. A temporary timber trestle viaduct was built such that the ballast trains from Botany could tip the sandy material through the open transom deck to gradually build up the embankment. Eventually the temporary trestle viaduct was filled over and abandoned. The Botany Line was opened on 11 October 1925.* *The Sheas Creek Underbridge was completed in 1925 in time for the line opening on 11 October 1925, constructed with a bascule operated 50-foot movable, deck plate web girder span which gave a clearway of 42 feet for vessels to pass through. The bascule towers were removed in the 1990s.*
Statement of significance	*The Sheas Creek Underbridge is of local significance as part of the original infrastructure for the Botany Line. The bridge is of bascule construction, an historic adaption of an earlier design for road bridges for railway used. The bascule towers were removed in the 1990s; however some mechanical components remain to exhibit the technique of the bascule mechanism.*[16]

[15] This information has been sourced from the OEH, SHI listing for the Mascot (Sheas Creek) Underbridge. Viewed 04/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4805743
[16] OEH, SHI listing for the Mascot (Sheas Creek) Underbridge.

Mascot (Sheas Creek) Underbridge

Figure 6-6 Curtilage for Mascot (Sheas Creek) Underbridge. Source. NSW Office of Environment and Heritage

6.2.3 Mascot (O'Riordan Street) Underbridge[17]

Mascot (O'Riordan Street) Underbridge	
Listing and number	ARTC s170 register no. 4801830
Commonwealth land or land subject to the EP&A Act	Land subject to the EP&A Act
Significance	Local
Description and condition	The Mascot (O'Riordan Street) Underbridge is a two span, single track, reinforced concrete girder railway bridge with original 14.33 metre western span supported on brick abutment with angled wing walls and central brick pier. The bridge includes a later addition eastern 16.20 metre span supported on central brick pier and concrete abutments with crib wing walls. The bridge is in good condition with minor defects including damage to the base of the girders, spalling concrete with exposed reinforcement on the internal face of the girders.
Curtilage boundary	*The curtilage is limited to the footprint of the 1925 bridge, pier, abutment and wing walls. North: Edge of concrete girder bridge. South: Edge of concrete girder bridge. East: Rear of brick pier and junction of original and new (1982) bridges. West: Rear of abutment.*[18]
History	The Mascot (O'Riordan Street) Underbridge was constructed by NSW Government Railway engineers from 1924–1925 and is listed on the ARTC s170 register as having local significance. Designed by John England, the O'Riordan Street Underbridge is a rare example of a reinforced concrete girder railway bridge constructed within the NSW rail network. The bridge serves the Botany Rail Line, which was planned in c1914, as an extension of the Metropolitan Goods Lines. Construction of the line was deferred until after World War I. In the early 1920s the project was resumed. All the bridges were erected prior to the earthworks being carried out because the fill material was at the Botany end of the line. Construction began at the Botany end of the line and proceeded towards Marrickville. The Botany Line was opened on 11 October 1925. The introduction of reinforced concrete bridges into railway service was a slow process. It began tentatively in 1919 with a small slab bridge over Bellevue Street, Glebe. The O'Riordan Street bridge was the second reinforced concrete structure used for railway lines but was a major structure compared to its predecessor at Bellevue Street. In 1982, an additional span was added to the bridge and the original western span was widened to accommodate future duplication to the line. As part of these works, the east abutment was converted to a central pier and new track abutments and crib walls incorporated into the structure. In 2007, the south-eastern crib wall was replaced and in 2012, management of the bridge was transferred from RailCorp to ARTC.
Statement of significance	*The original 1925 O'Riordan St Underbridge is significant as part of the original infrastructure of the Botany Line. Due to the high self-weight to load capacity ratio of conventionally reinforced concrete bridges, their use was abandoned within the NSW rail network after a few attempts. The O'Riordan St Underbridge is therefore a rare example of reinforced concrete girder railway bridge construction within the NSW rail network with a significantly longer span than that of its predecessors (Bellevue St and Eddy Ave).* *The 1982 additional span does not contribute to the underbridge's significance.*[19]

[18] This information has been sourced from the OEH, SHI listing for the 'Mascot (O'Riordan St) Underbridge'. Viewed 03/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4801830.
[19] OEH, SHI listing for 'Mascot (O'Riordan St) Underbridge'.

Mascot (O'Riordan Street) Underbridge

Figure 6-7 View south to the O'Riordan Street Underbridge from O'Riordan Street, February 2019

6.2.4 Mascot (Robey Street) Underbridge[20]

Mascot (Robey Street) Underbridge	
Listing and number	ARTC s170 register no. 4801848
Commonwealth land or land subject to the EP&A Act	Land subject to the EP&A Act
Significance	Local
Description and condition	The Mascot (Robey Street) Underbridge consists of a single span, double track, welded steel half-through plate web girder, with 24.38 metre span between concrete abutments. The bridge is in moderate condition although peeling paint was noted on its abutments in 2009, as was scraped girders and spalling concrete deck. It is also noted that advertising signage has been added to its parapets.
Curtilage boundary	*The curtilage is limited to the footprint of the bridge and abutments. Northwest: Rear of abutment. Southeast: Rear of abutment. Northeast: Edge of steel girder bridge. Southwest: Edge of steel girder bridge.*[21]
History	The Mascot (Robey Street) Underbridge was constructed in 1960 by Engineering staff of the Way and Works Branch, NSW Government Railways .and is listed on the ARTC s170 register as having local significance. The bridge serves the Botany Rail Line, which was planned in c1914, as an extension of the Metropolitan Goods Lines. Construction of the line was deferred until after World War I. In the early 1920s the project was resumed. All the bridges were erected prior to the earthworks being carried out because the fill material was at the Botany end of the line. Construction began at the Botany end of the line and proceeded towards Marrickville. The Botany Line was opened on 11 October 1925. Electric arc welding was developed overseas in the 1920s, and first used in NSW for the strengthening of the Hawkesbury River Bridge, becoming an established method for the repair and strengthening of existing steel bridges. Welded steel was used for the construction of buildings, power stations and light structural framework, but was slow in being adopted for rail use due to lingering fears of the dynamic loading of rail use producing fatigue failure in bridges. In the late 1950s a new road was built around the northern side of the Airport and Robey Street was extended from O'Riordan Street, under the Botany Line, to meet it. In 1960, the new underbridge was completed, the first welded steel plate web girder bridge on the New South Wales railway network and built for future duplication of the line. The construction of the Robey Street Underbridge holds local significance as being a marker for the change from riveted to welded steel construction of railway bridges within NSW. In 2012, management of the bridge was transferred from RailCorp to ARTC.
Statement of significance	*The Robey Street Underbridge is of local significance as the first welded steel railway bridge on the NSW rail network. Prior to the construction of the Robey St Underbridge there were concerns over the ability of welded structures to withstand the dynamic loading of rail traffic. The success of the fabrication and service of the Robey Street Underbridge initiated the change over from riveted to welded steel construction, and bolts displaced rivets wherever non-welded joints were required. The bridge is a landmark structure over Robey Street; however, the significant fabric has been covered by signage, reducing its aesthetic quality.*[22]

[21] This information has been sourced for the OEH, SHI listing for the 'Mascot (Robey Street) Underbridge'. Viewed 03/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4801848Ibid.
[22] OEH, SHI listing for 'Mascot (Robey Street) Underbridge'.

Mascot (Robey Street) Underbridge

Figure 6-8 The Robey Street Underbridge deck looking south from Robey Street, February 2019

6.2.5 Sydney (Kingsford Smith) Airport Group[23]

Sydney (Kingsford Smith) Airport Group	
Listing and number	Botany Bay LEP 2013 no. I170 CHL indicative place item no. 105542 RNE interim list item no. 102669
Commonwealth land or land subject to the EP&A Act	Commonwealth
Significance	Local
Description and condition	The Sydney (Kingsford Smith) Airport Group occupies over 900 hectares of land within the Botany Bay and Marrickville LGAs. The airport was first established on land occupied by Ascot Racecourse (near today's east-west runway) in 1911. It was opened as an aerodrome in 1919 and expanded gradually over time, increasing after WWII. Today, the airport includes various landscapes, structures, features and elements that contribute to its significance. Those relevant to the study area consist of Engine and Mill Ponds, Mill Stream, potential archaeological remains of Simeon Lord's Mills, Dams and House, the Botany Water Pumping Station Ruins and Chimney Ruins, Sewage Pumping Station No. 38, Main North–South Runway and East–West Runway, various ornamental plantings and street layouts. The SHI listing for the item notes that '*modifications, alterations and expansion to the airport site has been continual and ongoing'.*[24]
Curtilage boundary	The heritage curtilage for the item covers land bounded by portions of reclaimed land associated with the airport to the west and south, General Holmes to the south and east, Joyce and Qantas Drive to the east and north and Airport Drive to the north and west (as shown in Figure 3-4). The curtilage for the item also includes the Botany LEP listed Commonwealth Water Pumping Station and Sewerage Pumping Station which are located outside the study area.
History	The Sydney (Kingsford Smith) Airport was established in 1911 on land originally granted to Andrew Byrne, Mary Lewin and Edward Redmond in 1809. Portions of the area were later acquired by Simeon Lord who established textile and flour mills along the Botany Swamps and Botany Bay. Over time this area became associated with the Botany Water Pumping Station (1859–1886). Land to the west of the wetlands was associated with Lauriston Park, an early area of European settlement which later became a working-class suburb containing modest fibro and weatherboard cottages. An aerodrome was established at the site in 1919 and was officially recognised by the government in 1920. Over time, the airport expanded to accommodate changes during WWII and the growing popularity of long-haul passenger flights. The main north runway was extended over reclaimed land in Botany Bay in 1968 and again in 1972. A third runway was opened in 1994. The airport was privatised in 2002 and is now the busiest airport in Australia.
Statement of significance	*The Kingsford Smith Airport Group at Mascot is a complex cultural landscape that demonstrates strong historical, historic association, social, aesthetic and technological significance. It includes both the values associated with contemporary airport and the heritage values associated with the layers of use of the area. The site is owned by the Commonwealth Government so for more information about the national heritage values of the airport refer to the Australian Government's Commonwealth Heritage List. The northernmost part of the airport is located within Marrickville LGA. This Heritage Inventory Form focuses on the local heritage values of the airport to the former Botany Bay LGA.*

[24] This information has been sourced from the OEH, SHI listing for the 'Sydney (Kingsford Smith) Airport Group. Viewed 03/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5063218

Sydney (Kingsford Smith) Airport Group

The airport is also historically significant for its association with pioneers of the professional aviation industry, including Charles Kingsford-Smith from 1920 and after whom the airport is named; and one of his best-known pupils at his Mascot flying school, aviatrix Nancy Bird Walton in the 1930s.

Mascot is historically significant as the location of some of the earliest experiments in powered flight in Australia, the earliest of which appear to have used the turf of the Ascot Racecourse (at the eastern end of the current east-west runway) rather than the more commonly described 'paddocks' and areas of market gardens to the west where the formal Mascot Aerodrome was established in 1920. The interface with the local area was at first tentative, with a level crossing at the intersection of the main runway and the Botany Goods Rail Line, but the airport soon started to dominate the cultural landscape of both Mascot and Botany.

The airport is a complex cultural landscape that includes not only the runways and terminals but also the large area of supporting infrastructure and areas that contribute to the Item's particular environmental and historic significance. It extends over the whole of the four original grants made in the Botany Bay area, being Edward Redmond's 135 acres; Mary Lewin's 50 acres, Andrew Byrne's 50 acres, and Thomas Walker's 50 acres, which together formed the locality known as Mudbank. The curtilage extends over the whole of the airport site and includes evidence and historically significant evidence of the earlier land uses in the area, including Simeon Lord's residence, dams, mills and factory; the Sydney Waterworks and the South Western Sydney Ocean Outfall Sewer (no.1) (SWSOOS1). Evidence of many of these has survived and can still be interpreted, although some, such as Lord's house and factories, have been demolished or covered by later development. Refer to the individual State Heritage Inventory forms for each of these items for details of their intrinsic heritage significance to the former Botany Bay area.

The airport is significant for the degree to which it has been the catalyst for, and provides evidence of, the significant changes it has brought to the wider Mascot and Botany areas since it was officially recognised as Mascot Aerodrome in 1920. The rapid expansion of the site was achieved by overwriting earlier uses in the area, including the suburb of Lauriston Park and the small industries to the west of the residential area such as F.T Wimble's Ink and Varnish Factory. Wimble was a major producer of printing inks in the early 20th century who had established his factory complex in 1916 on the northern side of Vickers Avenue between Fifth and Sixth Streets. These buildings have survived, and, along with one building on the northern side of Ross Smith Avenue, are historically significant as the only pre-1943 structures visible on the aerial photos to have survived apart from the SWSOOS1 pipeline and the remains of the Sydney Waterworks Pumping Station. The essential road pattern of these earlier uses has also survived as the skeleton of the current T2–T3 loop road system.

The physical environment of the airport has considerable aesthetic presence as a 'big sky' landscape which, with the added aesthetic impacts of the plane movements, dominates the local area. The runway areas include the prominent landmarks of the control tower (no.5), clearly visible from General Holmes Drive and included on the Commonwealth Heritage List for its technological heritage values. The most aesthetically distinctive part of the airport, the runways, have undergone considerable evolution since the original grass strip with level crossing. By 1943 three intersecting strips were in place and notably the pattern of extensive reclamation of waterways to allow for the extension of the runways had begun, with the 1943 aerial photographs revealing the south-western edge to the Cooks River, and the eastern side of its mouth to Botany Bay, walled and back-filling with silt. The configuration and length of the runways have undergone ongoing adaptation since this time including the diversion of the Alexandra Canal and Cooks Rivers, and infilling of a considerable proportion of Botany Bay through successive reclamations.

The Airport also demonstrates significant local heritage values that relate more directly to its influence on the course of Botany's physical, economic and social development; most notably as the catalyst for the transformation of the area from a cultural landscape dominated by noxious industries to acting as the hub for Sydney's transportation industry, specifically the aviation industry and businesses associated with the movement of people and cargo. Secondary businesses associated with the airport now dominate the industrial and commercial landscape of the area.

Its physical presence dominates the landscape of the area, being the largest single land use with a notable aesthetic prominence due to its expanses of largely undeveloped, flat grass, distinctive elements such as the control towers, and the

Sydney (Kingsford Smith) Airport Group	
	impact of the aircraft, both visual and acoustic, on the wider area. The need to ameliorate noise associated with aircraft operations has also impacted on the fabric of many of the historic buildings in the surrounding area through loss of original timber windows and insertion of double glazing in prefabricated frames. *The reclamation of the foreshore of the Bay, originally as part of the realignment of the mouth of the Cooks River to extend the main north–south runway, and more recently to build a road along the foreshore between the airport and Port Botany, have together had a significant impact on the aesthetic qualities of Botany's setting and its historic relationship with the waters of Botany Bay.* *The social heritage values of the Airport are notable, being a place of arrival and departure for millions of passengers annually and as the primary portal for international migration since the 1960s. It is also of social heritage value to members of the plane-spotting community, with areas known as Shep's Mound and The Beach providing particular vantage points on each side of the main runway and interpretative signs have been provided. This social heritage value extends beyond the boundaries of the former LGA.* *The terminal buildings are visually prominent elements within this landscape and are representative examples of contemporary airport design. Ancillary buildings are generally nondescript, although their functions and fit outs may have technological or historic heritage values (not investigated).*[25]

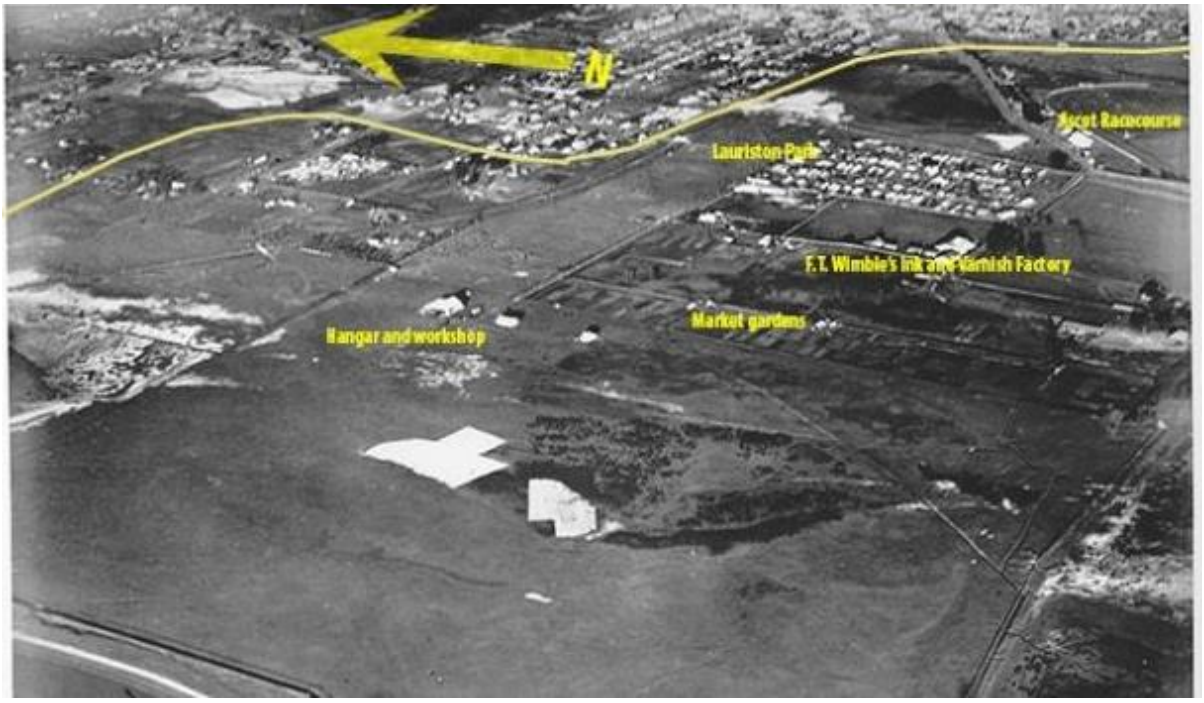

Figure 6-9 Sydney Airport in the 1940s showing built features that have since been removed. Source. Sydney Airport Heritage Management Plan 2009

[25] OEH, SHI listing 'Sydney (Kingsford Smith) Airport Group'.

6.2.6 Cooks River Container Terminal

Cooks River Container Terminal	
Listing and number	Marrickville LEP 2011 no. I366 NSW Ports s170 register no. 4560046
Commonwealth land or land subject to the EP&A Act	Land subject to the EP&A Act
Significance	State and local
Description and condition	The site is comprised of shipping containers stacked up to five high, enclosed by a 1.8 metre cyclone fence. There are remnant stone garden beds at the Canal Road gate with mature she oaks planted on the boundary fence. The roads within the site have been regularly upgraded due to heavy transport movement. Rail lines have also been replaced and re-laid. There are concrete slabs east of line 1 which were used during the handling of steel. The site can be divided into pre-1962 and post-1962 elements: the post-1962 elements have little heritage significance. There has been continual modification of the site and some elements retain little original fabric. *Built elements erected from 1947–1962 during the management of the site by the Department of Railways include: Precast Concrete Hut 1-single panel; Precast concrete Hut 2-Triple panel; Former Station Masters Office and MCS Human resources and Training Building (formerly Yard Administration Building and attached brick toilet block; Lay Down Points Lever; Remnant Electric Overhead Travelling Crane Siding Numbers 1,2,3; Remnant self-propelled travelling crane siding number 14; remnant signage; and brick toilet block. The latter assessed as having no heritage significance.*[26]
Curtilage boundary/ location	Bounded by Princes Highway to the north, Canal Road to the east, the Botany Freight Line to the west and industrial land to the south (as shown in Figure 3-3). Lot 22, DP 1069118; Part Lot 1, DP 1048243
History	The Cooks River Goods Yard was developed when the original goods yards in Sydney had reached maximum capacity and could not be extended. It was announced that a new yard would be constructed at Cooks River in 1946. The yard was fitted with tracks, buildings and roadways, and was opened in December 1947. An annual report prepared at the time noted the following: *nearly all the filling for the reclamation of the whole area necessary to accommodate tracks, roadways and buildings was provided. Five siding with the vehicular roadway adjacent to and serving these were completed*.[27] In 1962 the yard was opened for through traffic, with large containers being transferred from road trailers to railways vehicles and vice versa, without using overhead cranes. Container traffic was so successful that additional equipment was needed. By the mid-1990s there were seventeen sidings in the terminal. Since 2000, more modifications to layout, trackwork, roadways and buildings have occurred, providing better access for road trucks.
Statement of significance	*The Cooks River Container Terminal, 20 Canal Road St Peters, established in 1947 as a goods yard, is of local historic significance as an integral part of the Sydney Goods Rail system from which the first through-freight service between Sydney and Perth departed the yard on 12th January 1970. Continually used as a freight site since its inception in 1946/7, it was one of the first railway goods yards to be converted to accommodate containerisation and is currently a road-rail transfer terminal for containerised inter and intra-state freight. The Terminal was the first of its kind in Sydney containing a number of parallel, dead end*

[26] This information has been sourced from the OEH, SHI listing for the 'Cooks River Container Terminal'. Viewed 03/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4630046
[27] Annual Report Dept of Railways 1946/47, p. 38.

Cooks River Container Terminal

sidings. This experiment in layout, driven by the paucity of suitable land, has proved impractical with long loads requiring assembly on the Botany Branch goods line.
The site has Aboriginal archaeological potential as it is likely that the underlying marshland, below the 1.0–4.4 metre fill layer, was utilised by the original owners of the country. It has European archaeological potential due to its variety of uses since c 1804, including farming, residential, army, wool storage and a goods yard.[28]
Elements that contribute to the significance of the site include:

- *Pre-cast concrete Hut 1* (within study area buffer zone)
- *Pre-cast concrete Huts 2* (within study area buffer zone)
- *Former Station Masters Office* (outside study area buffer zone)
- *MCS HR & T Site Administration Building* (outside study area buffer zone)
- *Lay Down Points Lever* (within study area buffer zone). [29]

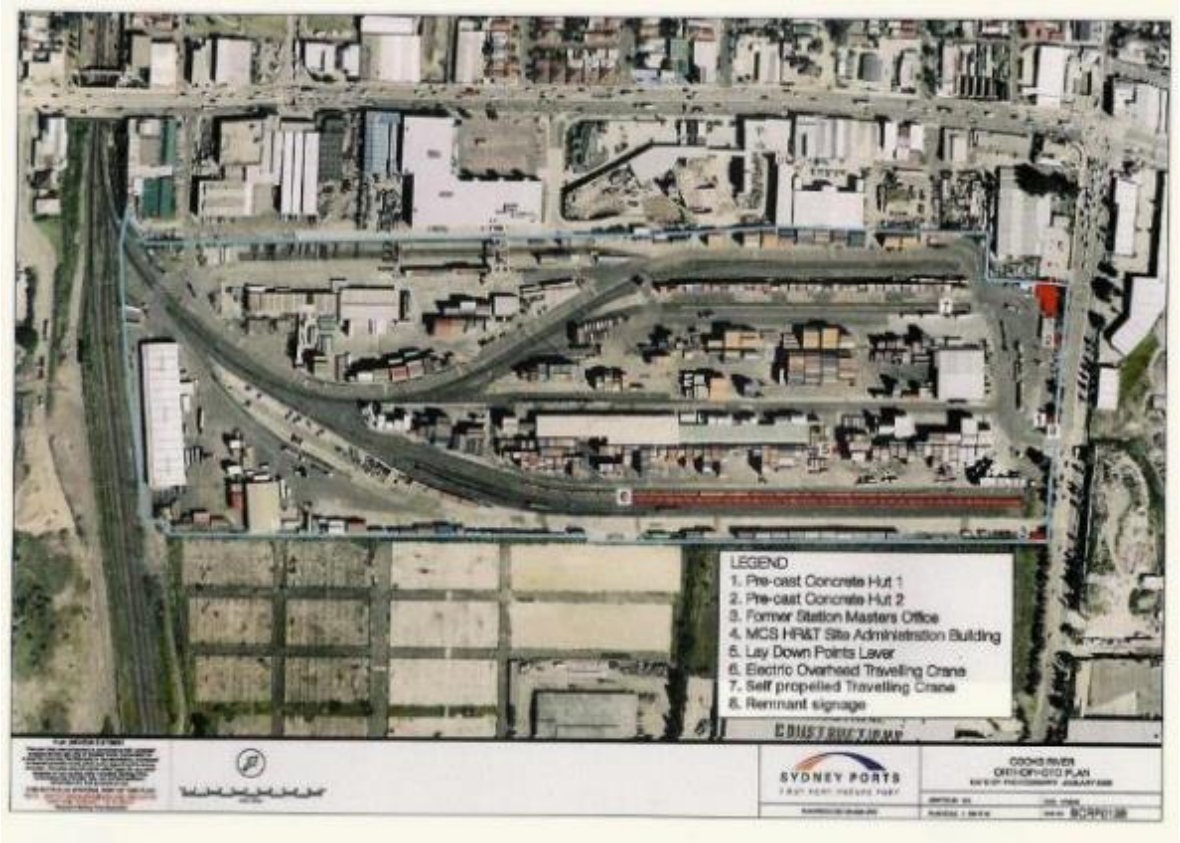

Figure 6-10 Aerial photograph of site showing significant elements and buildings within the Cook River Container Terminal. Source. NSW OEH.

[28] Conybeare Morrison Pty Ltd. 2006. Cooks River Container Terminal: Heritage Assessment Report. Prepared for NSW Ports.
[29] OEH, SHI listing for 'Cooks River Container Terminal'.

6.3 Listed heritage items within the 150 metre buffer zone

6.3.1 Cooks River Container Terminal: Electric Overhead Travelling Crane[30]

Cooks River Container Terminal: Electric Overhead Travelling Crane	
Listing and number	NSW Ports s170 register no. 4560052
Commonwealth land or land subject to the EP&A Act	Land subject to the EP&A Act
Significance	Local
Description and condition	*The cranes travelled on elevated runways which were supported on vertical steel columns. Only the western side steelworks and pole mounted electrical control switches are extant between no 3 and no 4 siding.* *The physical condition is poor. Some rust due to lack of maintenance.*
Curtilage boundary	The item is located within the Cooks River Container Terminal, 20 Canal Road, St Peters, as illustrated in Figure 3-3.
History	*The first four 10-tonne electric overhead travelling cranes were ordered for installation at Cooks River Goods Yard in 1953-54 (Annual Report Depart of Railways 1953/4, p42.)* *The Electric Overhead Travelling Crane serving sidings No 1, 2 and 3 were installed on the site by 1955. These cranes were not suitable to use with containers and were phased out by the 1980s.*
Statement of significance	*Of little significance but contributes to an understanding of freight handling systems at Cooks River Terminal prior to containerisation*.

[30] This information has been sourced from the OEH, SHI listing for the Cooks River Container Terminal: Electric Overhead Travelling Crane. Viewed 03/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4630052

Cooks River Container Terminal: Electric Overhead Travelling Crane

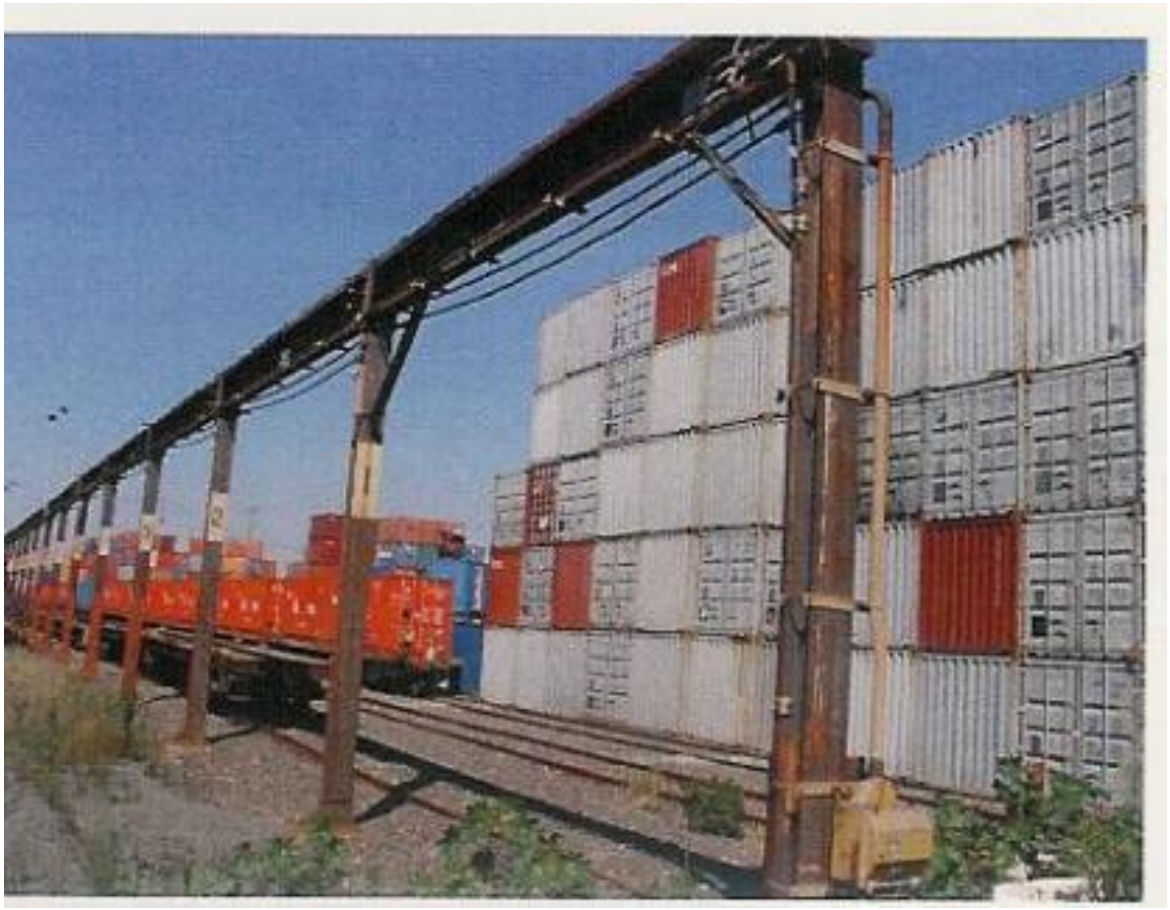

Figure 6-11 Remnant of electric overhead travelling crane at sidings 1, 2 and 3. Facing south-west. Source. NSW OEH

6.3.2 Cooks River Container Terminal: Lay Down Points Lever[31]

Cooks River Container Terminal: Lay Down Points Lever	
Listing and number	NSW Ports s170 register no.4560051
Commonwealth land or land subject to the EP&A Act	Land subject to the EP&A Act
Significance	Local
Description and condition	The item comprises an intact Lay Down Points Lever associated with track equipment for the former Cooks River goods yard. The SHI listing for the item describes it as 'intact'.
Curtilage boundary	The item is located within the Cooks River Container Terminal, 20 Canal Road, St Peters, as illustrated in Figure 3-3.
History	*Provision of track and yard equipment at Cooks River was advised during the 1947/8 period including the installation of Thompson Levers and Throw-over levers at points and sidings. Continual improvements to track and siding arrangements were carried out between 1955 and 1979, mostly associated with relocation of point levers, cross overs and lever frames. A modified version of a Thompson Points Lever to a lay down design was used wherever it was necessary to drive over the point of where the points were a trip hazard while loading rail cars at ports of freight loading facilities. As such these are relatively rare point levers.* *One lay down points lever on which the switch rails have been spiked off so it can no longer be used was located on the Cooks River site. David Barrington, the former Yard Manager believes there is another set in the MCS area which continues to be used. The latter was not located during the site inspection by Conybeare Morrison. The historical evidence indicates that any modified Thompson Points Levers on the site were installed early in the Goods Yard era, possibly as early as 1947/48.*
Statement of significance	*A spiked down and now redundant relatively rare points lever that is specific to special locations such as ports and goods yards such as Cooks River Container Terminal*.

Figure 6-12 The spiked down modified Thompson lay down points lever at Road 7. Source. NSW OEH

[31] This information has been sourced from the OEH, SHI listing for the Cooks River Container Terminal: Lay Down Points Lever. Viewed 03/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4630051

6.3.3 Cooks River Container Terminal: Precast Concrete Hut 1 [32]

Cooks River Container Terminal: Cooks River Container Terminal: Precast Concrete Hut 1	
Listing and number	NSW Ports s170 register no.4560047
Commonwealth land or land subject to the EP&A Act	Land subject to the EP&A Act
Significance	Local
Description and condition	*Precast Concrete Hut 1 is located to the west of the Canal Road entrance gate. It contains communication and telephone equipment.* *It is one of two precast concrete huts on the site.* *It was constructed using a precast modular system of reinforced concrete framework with a series of precast panels cemented into place. The top dropped panel has a cast central vent. The gabled roof has asbestos cement sheet cladding, gable ends and ridge capping with no guttering.* *Two railway lines at the base of the concrete structure are supported by concrete pads. The doors on the eastern side are clad in painted corrugated ripple iron.*
Curtilage boundary	The item is located within the Cooks River Container Terminal, 20 Canal Road, St Peters, as illustrated in Figure 3-3.
History	Between 1916 and 1987, hundreds of drop panel Signal Relay Huts were constructed to house electrical equipment for the NSW rail system. The huts were manufactured at Chullora and Goulburn, and they were constructed in the precast concrete system as it was portable and did not require painting. A single door was included on one side, generally made of iron or asbestos cement sheets. The huts were not considered aesthetically pleasing enough to be placed on suburban railway stations; they became exclusive to country stations between 1925 and 1932. The huts are not visible on any drawings of the site. It is likely that they were installed in the 1950s when extensive telecommunications services and substations were installed in the site.
Statement of significance	*This single panelled Precast Concrete Hut 1 is of moderate local significance. It is representative of intact Department of NSW Railways signal relay huts from around 1950. It was utilised at Cooks River Container Terminal to house communications and electrical equipment.*[33]

Figure 6-13 Precast concrete hut #1. Source. NSW OEH

[32] This information has been sourced from the OEH, SHI listing for the Cooks River Container Terminal: Precast Concrete Hut 1, extracted from Conybeare Morrison 2006. Viewed 03/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4630047
[33] OEH, SHI listing for the Cooks River Container Terminal: Precast Concrete Hut 1

6.3.4 Moreton Bay Fig Tree [34]

Moreton Bay Fig Tree	
Listing and number	Marrickville LEP 2011 no I303
Commonwealth land or land subject to the EP&A Act	Land subject to the EP&A Act
Significance	Local
Description and condition	*Large spreading tree to approximately 30 metres high, Evergreen Australian Native Tree; it has smooth grey heavily buttressed trunk, large glossy leaves and produces a fig like fruit. Surrounding the base and in a circle with a radius of approximately 7km from the tree there is a low, dry stone wall.* *Physical condition appears to be good.*
Curtilage boundary	The tree's primary address is 43 South Street, Tempe. It is located on the south side of the road. The tree's curtilage comprises the tree itself and is shown in Figure 3-1.
History	*In 1866, Tempe was "a small village lying on the northern side of the Cooks River". By 1890 the road that is now South Street was in existence. This tree appears to have been planted shortly after the subdivision that created South Street.*
Statement of significance	*Planted late 19th century/early 20th century, a prominent feature of the landscape and probably planted shortly after the subdivision of this part of Tempe.*

Figure 6-14 Moreton Bay Fig Tree. Source. NSW OEH.

[34] This information has been sourced from the OEH, SHI listing for the 'Moreton Bay Fig Tree'. Viewed 03/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2030204

6.3.5 Alexandra Canal (including sandstone embankment)[35]

Alexandra Canal (including sandstone embankment)	
Listing and number	Botany Bay LEP 2013 no. I1
Commonwealth land or land subject to the EP&A Act	Land subject to the EP&A Act
Significance	State
Description and condition	*Alexandra Canal is an adapted artificial waterway (formally known as Sheas Creek) which stretches 4.5 kilometres from its southern point at Cooks River to the north near Huntley Street, Alexandria. Its banks are formed by pitching comprising sloping dry sandstone capped with a sandstone coping.* *Much of the fabric which belonged to the original section of the canal is in fair condition. Some sections of the walling appear to have been damaged or are missing. The fabric belonging to the Cooks River section of the canal is in poor condition.* *Modifications and dates: The south-western walling of the canal beyond the Shell bridge is rendered rubble walling. The south-eastern face is rendered rubble walling almost to the railway bridge. These alterations to original fabric reflect alterations to the course of the canal near its junction with the Cooks River during the three phases of airport expansion.* [36]
Curtilage boundary/ location	Located along the east bank of the canal, bounded by the Mascot (Sheas Creek) Underbridge to the west and extending about 160 metres east of the Ricketty Street vehicle bridge. *It extends from approximately 0.5 metres below low water mark to approximately 1.5 metres above high water mark. It is spanned by four bridges: Shell pipeline bridge, Sydenham to Botany Railway line, Canal Road Bridge and a small footbridge*.[37] Lot 13 DP 1050464
History	See section 13.3.5.4.
Statement of significance	*The Botany LEP 1995 listed both the embankment and the canal separately. The items were combined in the Botany Bay LEP 2013.* *Alexandra Canal is of high historic, aesthetic and technical/research significance. Historically, it is a rare example of 19th century navigational canal construction in Australia, being one of only two purpose built canals in the State, with one other known example in Victoria. It has the ability to demonstrate the NSW Government's initiative to create water transport as a means of developing an industrial complex in the Alexandria and Botany areas and exploiting the use of unemployed labour to achieve its scheme.* *It played a seminal role in the changing pattern and evolution of the occupation and industrial uses of the local area and nearby suburbs, which included filling large areas of low lying land for development.* *Aesthetically, intact original sections of the canal, comprising pitched dry packed ashlar sandstone, provide a textured and coloured finish which is aesthetically valuable in the cultural landscape. It is a major landmark and dramatic component of the industrial landscape of the area, particularly as viewed from the Ricketty Street Bridge and along Airport Drive.* *Scientifically, the excavation of the canal provided a valuable contribution to the understanding of the changing sea levels along the eastern seaboard and the antiquity of the Aboriginal presence in the area. Intact original sections of the fascine dyke sandstone construction are rare examples of late 19th century coastal engineering works.*[38]

[35] This information has been sourced from the OEH, SHI listing for the 'Alexandra Canal (including Sandstone Embankment)'. Viewed 03/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=1210001
[36] OEH, SHI listing for the 'Alexandra Canal (including Sandstone Embankment)'
[37] Ibid.
[38] Ibid.

Alexandra Canal (including sandstone embankment)

Figure 6-15 Alexandra Canal (including Sandstone Embankment). Source. Botany Bay Council

6.3.6 House - Daktari[39]

House - Daktari	
Listing and number	Botany Bay LEP 2013 no I131
Commonwealth land or land subject to the EP&A Act	Land subject to the EP&A Act
Significance	Local
Description and condition	*Intact timber Victorian vernacular bungalow with hipped roof and short ridge. Pair of intact brick chimneys – oriented parallel to the ridge, which is an unusual detail. Apart from re-sheeting of the roof, the cottage is intact (with a traditional addition to the rear under a skillion roof). The front elevation is shiplap profile, the sides are weatherboard. Oblique view of the weatherboards in the sun shows that they are showing signs of deterioration. The verandah roof is a simple skillion form set below the gutter line. Windows are timber double-hung with simple glazing. Architraves below the front windows are delicately carved. The front door is timber with glazing to the upper panels. Verandah posts are simple stop-chamfered with iron lace fringe. The verandah floor has been concreted. Side windows are also original timber sash-opening with central glazing bar. One of the windows to the skillion addition is a distinctive triangular shape. The front boundary is marked by a replica picket fence and original gate, and a low hedge planted behind. A double gate leads to the side setback area.*
Curtilage boundary	The item curtilage is the property boundary of 114 High Street, Mascot NSW 2020
History	*The property is located within a 65-acre Crown Grant (by purchase) to John Roby Hatfield in c.1839. Hatfield acquired several parcels in North Botany, forming an amalgamated holding that extended from Old Botany Road (O'Riordan Street) to Botany Road. (He appears to have lived in 'Surrey House', Surry Hills) Hatfield's grant was subdivided into allotments by Pile and Maxwell which were released for sale from the 1890s. 114 High Street, Mascot is located on Lot 34 in Section 4 of this subdivision.*
Statement of significance	*The property 114 High Street, Mascot, of local historic and aesthetic heritage significance as a substantially intact example of a traditional 19th century double-fronted weatherboard cottage. It was the residence of the Grant family for at least 50 years from its construction and the cottage has remained substantially intact since this time, providing very rare evidence of the pattern of development in Mascot in the late 19th century as one of the few surviving 19th century dwellings on the western side of Botany Road; despite this area being the first part settled in the early 19th century.* *The house is aesthetically significant as a very good example of a traditional vernacular timber cottage. The hipped roof form, pair of intact chimneys which are distinctive for their orientation, deeply profiled shiplap weatherboards, timber windows, simple stop chamfered timber posts and simple iron lace detailing are all characteristic of the type and contribute to its aesthetic heritage values. The setting in the streetscape of High Street is also intact and the integrity of the cottage, and its siting close to the front boundary, allow the property's heritage values to be interpreted by the casual viewer. The property is a distinctive element in this rapidly changing streetscape near O-Riordan Street.*

[39] This information has been sourced from the OEH, SHI listing for 'House - Daktari'. Viewed 03/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=1210136

House - Daktari

Figure 6-16: House - Daktari. Source. NSW OEH.

6.4 Unlisted items of heritage significance within the study area

The Botany Rail Line was identified as an item of potential heritage significance during the site inspection carried out for the project.

6.4.1 Botany Rail Line

Botany Rail Line	
Item name	Botany Rail Line
Commonwealth land or land subject to the EP&A Act	Land subject to the EP&A Act
Assessed significance	Local
Description and condition	The Botany Rail Line comprises a 9.2 kilometre long, single line freight corridor running from Marrickville Junction through to the wharves at Botany. The line has been upgraded and deviated over time and contains various sidings for surrounding industries. Some of these sidings have been removed to reflect changes in the occupancy and transport methods. The line is still in use and well maintained.
History	The Botany Rail Line is a freight railway corridor envisioned in 1861 and gradually constructed between 1902 and 1925. Once construction was complete, various private sidings were incorporated into the goods line to serve industries throughout Botany and Mascot, some of which, such as Kellogg's and Boral Concrete's St Peters facility continue to exist today. The line has undergone some deviations in the past, the most noteworthy of which occurred in 1960 and moved the corridor north of the Sydney Airport curtilage between O'Riordan Street and the Alexandra Canal. Additional upgrades to the line occurred in 1999–2002 as part of the Botany Operational Enhancement Project and in 2017–2018 as part of the WestConnex and Airport East Precinct projects. Despite these modifications and upgrades, the line continues to retain some of its original elements including timber sleepers and rails, signal huts, the Robey Street, O'Riordan Street and Botany Road underbridges and aspects of its original environment including Mill Pond.
Statement of significance	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. The line is considered to contain research significance due to its ability to yield information regarding economic, industrial and residential growth and recession over time. In addition, the use of freight transport within areas of Sydney occupied by both residential, industrial, natural and aeronautical landscapes is becoming rare, thanks to the ongoing use of motor transport since the 1950s.

Figure 6-17 Part of the Botany Rail Line, Mascot in August 2018. Source. Artefact Heritage

6.4.1.1 Significance of individual elements – Botany Rail Line

The following assessment of individual elements associated with the Botany Rail Line has been carried out to grade impacts associated with the project to the Botany Rail Line as a whole.

The Botany Rail Line is located within land subject to the EP&A Act.

Element	Significance assessment	Assessed significance
Rails and sleepers	The majority of rails and sleepers associated with the Botany Rail Line have been replaced or relocated over time, especially in the case of the rail corridor's 1960s deviation. However, many original elements of the corridor survive, some of which are located within the study area. These are considered to contain local significance due to their associations with the rail line and its historical development. They provide evidence for early 20th century rail construction techniques and materials.	Little
Culverts and water management structures	Culverts and water management structures, such as the one identified during the site inspection (Appendix C), represent efforts to formalise the natural landscape along the route of the Botany Rail Line during its construction. They form part of the item's engineering heritage and inform questions regarding methods of landscape modification and formalisation required during its construction.	Moderate

7.0 NON-ABORIGINAL (HISTORICAL) ARCHAEOLOGICAL ASSESSMENT

7.1 Historical archaeology

This section assesses the historical archaeological potential within the study area based on historical and contemporary land use, information derived from early maps and plans, archival research and analysing levels of ground disturbance (outlined in section 7.1.1).

The significance of any potential archaeological remains has been assessed in section 7.2 against the NSW Heritage Criteria. Findings derived from this assessment will inform recommendations for archaeological management throughout the project.

7.1.1 Previous disturbance

The study area has been subject to various disturbance activities that may have removed archaeological evidence if earlier occupation phases. These historical activities are discussed in detail in Appendix C and summarised in Table 7-1 below:

Table 7-1 Known impacts within the study area

Occupation phase	Known impacts
Section A	The majority of land within Section A has undergone significant subsurface disturbance due to its use as a gravel quarry and rubbish tip in the 20th century. These activities are likely to have removed archaeological remains associated with Phases 1–3. However, land within the south-eastern corner of Section A was used for industrial purposes from at least 1930 onwards and appears to have remained relatively undeveloped. Therefore, it may contain archaeological remains associated with Phase 2–4 occupation. The southwestern boundary of Section A may contain archaeological remains associated with the construction and use of the Alexandra Canal. These have potential to contain State significance.
Section B	Land within Section B has been subject to agricultural disturbance associated with market gardening (Phase 3) and development impacts associated with warehouse construction, the St Peters brickworks development and the establishment of the Botany Rail Line (Phases 2–6). These activities are likely to have removed shallow and fragile archaeological remains associated with Phase 1 and 2 occupation. However, archaeological remains associated with Phase 3 and 4 occupation may survive below modern development.
Section C	The expansion of Sydney Airport, construction of airport buildings and establishment of Qantas Drive during Phase 5 occupation is likely to have disturbed or removed archaeological remains associated with Phase 1–4 occupation within Section C. However, building footings or deep remains such as wells, cesspits, and cisterns associated with Phase 1–4 occupation may survive.

7.1.1 Assessment of historical archaeological potential

Table 7-2 provides an overview of the potential archaeological remains that may survive in the study area today. This is based on previous impacts, known land use and findings from the site inspection. They are preliminary in nature.

The identified levels of archaeological potential referred to in this section are based on the definitions outlined in Table 4-4 and findings from Table 7-1.

Potential archaeological remains associated with **Phase 6** occupation will not be assessed due to their contemporary and ubiquitous nature.

The preliminary assessment of archaeological potential within the study area is illustrated in Table 7-2.

Table 7-2 Summary of potential historical archaeological remains

Section	Phase and associated land use	Nature of potential historical archaeological remains	Potential
A	**1 – c1796–1830** Mudflat and mangroves	Environmental data including pollen, seeds and phytoliths surviving within intact soil profiles	**Former quarry/tip site** – Nil **Remainder** – Nil
	2 – c1830–1870 Farming, mudflats and mangroves	Environmental data including pollen, seeds and phytoliths surviving within intact soil profiles	**Former quarry/tip site** – Nil **Remainder** – Nil
	3 – 1870–1919 Early establishment of the Alexandra Canal, land reclamation and quarrying	Evidence of landscape modification such as levies, drainage lines or redeposited soils associated with Alexandra Canal construction in areas along original banks of the canal Evidence of landscape modification associated with quarrying activities such as refuse material dumps or truncated landforms in areas once occupied by Tempe Tip and a gravel quarry	**Former quarry/tip site** – Nil **Remainder** Moderate – High
	4 – 1919–1946 Modifications to the Alexandra Canal, gravel quarrying, Tempe Tip and industrial buildings.	Ephemeral evidence of landscape modification such as levies, drainage lines or redeposited soils associated with Alexandra Canal modifications Evidence of landscape modification associated with quarrying activities such as refuse material dumps or truncated landforms Early to mid-20th century domestic and commercial refuse associated with Tempe Tip Brick or concrete footings associated with industrial buildings located along south-eastern corner of Section A	**Former quarry/tip site** – Nil **Remainder** Moderate – High

Section	Phase and associated land use	Nature of potential historical archaeological remains	Potential
	5 – 1946–1990 Alexandra Canal, Tempe Tip and industrial buildings	Ephemeral evidence of landscape modification such as levies, drainage lines or redeposited soils associated with Alexandra Canal modifications Late-20th century domestic, commercial and building refuse associated with later use of Tempe Tip Brick or concrete footings associated with industrial buildings located along south-eastern corner of Section A	**Former quarry/tip site** – High **Remainder** Moderate – High
B	**1 – c1796–1830** Mudflat and mangroves	Environmental data including pollen, seeds and phytoliths surviving within intact soil profiles	Nil
	2 – c1830–1870 Farming, mudflat and mangroves	Ephemeral environmental data including pollen, seeds and phytoliths surviving within intact soil profiles Embankment along Sheas Creek Plough and fence lines	Low
	3 – 1870–1919 Alexandra Canal, land reclamation, market gardens	Ephemeral environmental data including pollen, seeds and phytoliths surviving within intact soil profiles associated with market gardens Plough and fence lines Evidence of landscape modification such as levies, drainage lines or redeposited soils associated with construction of the Alexandra Canal Land reclamation fill containing 19th and 20th century commercial, domestic and building waste	Low
	4 – 1919–1946 Market gardens, Botany Rail Line, St Peters brickworks buildings[40] and warehouses at 30 Canal Road	Ephemeral environmental data including pollen, seeds and phytoliths surviving within intact soil profiles associated with market gardens Plough and fence lines Evidence of rail infrastructure such as sidings, rails, sleepers and ballast along the Botany Rail Line corridor Evidence of brick or concrete footings, flues, kilns, refuse deposits, drains and brick or cement floors to the east and west of Canal Road	Moderate
	5 – 1946–1990 St Peters brickworks buildings and warehouses at 30 Canal Road	Evidence of brick or concrete footings, flues, kilns, refuse deposits, drains and brick or cement floors	Moderate

[40] Based on findings from excavations at the Lithgow Valley Colliery Co. Ltd, and its Pottery, Brick and Pipeworks in Higginbotham, E. 1982. *Lithgow Valley Colliery Co. Ltd, and its Pottery, Brick and Pipeworks. Report on the Excavation of Part of the Brick and Pipeworks, Archival Report, Vol. 1.*

Section	Phase and associated land use	Nature of potential historical archaeological remains	Potential
C	**1 – c1796–1830** Mangroves, mudflats, land grants, roads and scattered residential development	Ephemeral environmental data including pollen, seeds and phytoliths surviving within intact soil profiles Early road surfaces containing sandstone or gravels Evidence of residential development including refuse deposits, fence lines, shell lime production and landscape modifications	Nil – Low
	2 – c1830–1870 Market gardens, roads and scattered residential development	Environmental data including pollen, seeds and phytoliths surviving within intact soil profiles Early road surfaces containing sandstone or gravels Evidence of residential development including refuse deposits, fence lines, shell lime production and landscape modifications	Low
	3 – 1870–1919 Land reclamation, market gardens and residential development (Lauriston Park and market garden dwellings/structures)	Land reclamation fill containing 19th and 20th century commercial, domestic and building waste Ephemeral environmental data including pollen, seeds and phytoliths surviving within intact soil profiles Early road surfaces containing sandstone or gravels Evidence of residential occupation including refuse deposits, fence lines, brick, cement or masonry footings, post holes, yard surfaces	Low – Moderate
	4 – 1919–1946 Botany Goods Line, market gardens and residential development (Lauriston Park and market garden dwellings/structures)	Evidence of rail infrastructure such as rails, sleepers and ballast associated with the Botany Rail Line Land reclamation fill containing 19th and 20th century commercial, domestic and building waste alongside Ephemeral environmental data including pollen, seeds and phytoliths surviving within intact soil profiles Evidence of residential occupation including refuse deposits, fence lines, brick, cement or masonry footings, post holes, yard surfaces	Moderate
	5 – 1946–1990 Botany Goods Line, market gardens and residential development (Lauriston Park and market garden dwellings/structures)	Evidence of rail infrastructure such as rails, sleepers and ballast Land reclamation fill containing 19th and 20th century commercial, domestic and building waste Environmental data including pollen, seeds and phytoliths surviving within intact soil profiles Evidence of residential occupation including refuse deposits, fence lines, brick, cement or masonry footings, post holes, yard surfaces	Moderate

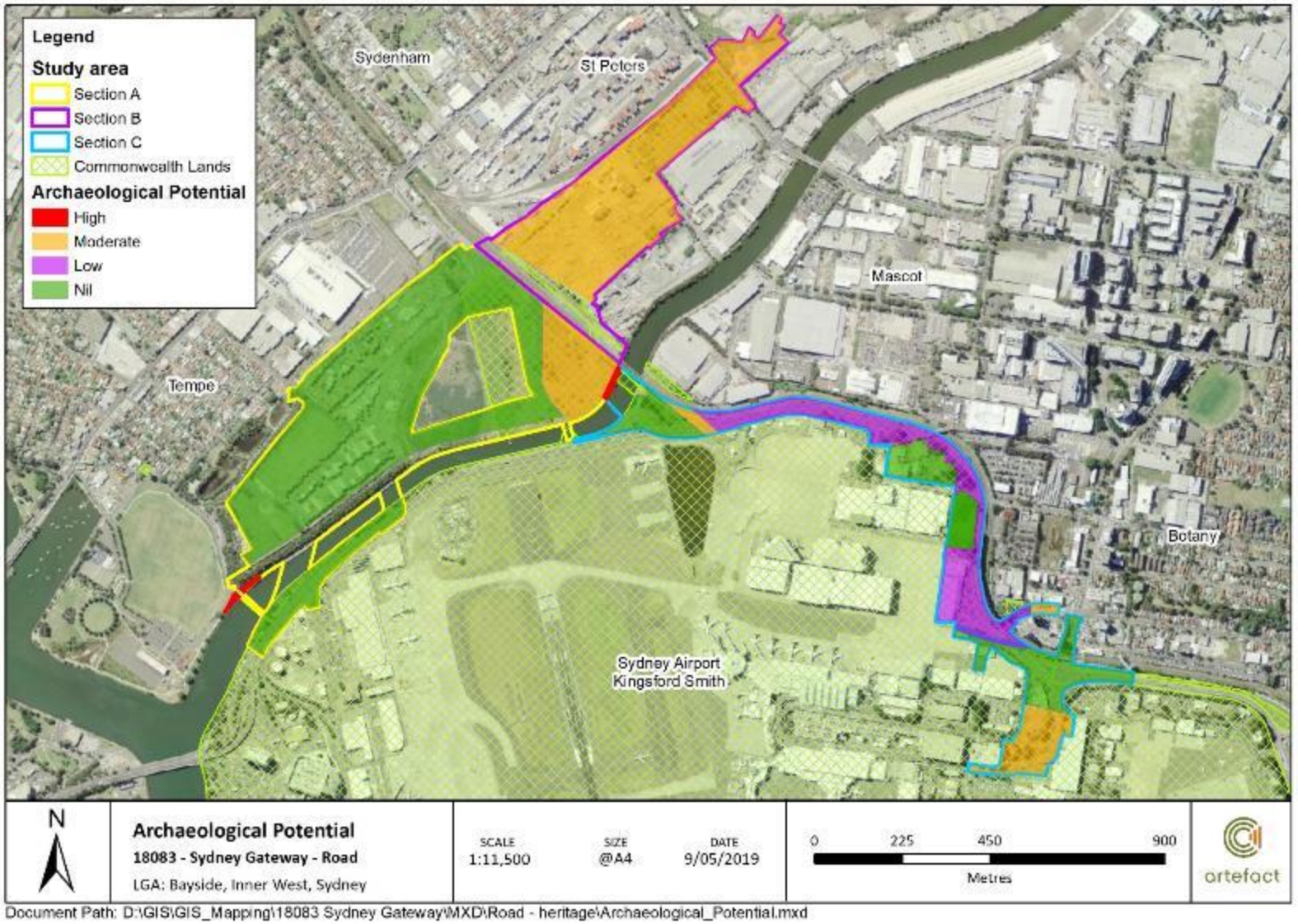

Figure 7-1 Preliminary assessment of historical archaeological potential within the study area.

7.2 Archaeological significance

The overall aim of assessing archaeological significance is to identify whether an archaeological resource, deposit, site or feature has cultural value. The assessment results in a succinct statement of heritage significance that summarises the values of the place, site, resource, deposit or feature.

Table 7-3 provides a significance assessment of potential Phase 1, 2, 3, 4 and 5 archaeological remains that may be present within the study area which have been assessed against the NSW Heritage Criterion.[41] Potential archaeological remains associated with Phase 6 occupation have not been included due to their contemporary and ubiquitous nature.

Table 7-3 Significance assessment for archaeological remains within the study area.

Criteria	Discussion
A – Historical Significance	Potential archaeological remains associated with **Phase 1** occupation may have historical significance for their associations with early European residential and agricultural activities in NSW. Archaeological remains associated with land grants in **Section C** would represent land use by Byrne and Lewin who are known to have produced lime on their property using shells collected from Aboriginal middens and cheniers. Such remains may reach the threshold for State significance if intact and recognisable features were identified. However, the likelihood of this is low due to subsequent impacts and a lack of evidence to suggest such activities took place within the study area. No evidence for land use in **Sections A** or **B** during this period has been found as they primarily consisted of mudflats and mangroves. Potential archaeological remains associated with **Phase 2** occupation and land use have historical significance for their associations with market gardens in **Section C**. These were established by Europeans in the 1830s and Chinese following the end of the Gold Rush. If intact remains were identified, they would represent early European and Chinese agricultural practices and domestic settlement in Botany and Mascot and may contain significance at a local level. No evidence for land settlement in **Sections A** or **B** during this period has been found. However, farming may have occurred. As no structures are known to have occupied the study area and remains are likely to have been heavily disturbed by subsequent development, these remains would not reach the threshold for significance at a local or state level. Potential archaeological remains associated with **Phase 3** occupation in **Sections A**, **B** and **C** would represent the construction of the Alexandra Canal, land reclamation, farming, market gardening, scattered residential development and the establishment of Lauriston Park. Potential features associated with the Alexandra Canal (**Section A**) would represent its construction methods and materials alongside evidence of the natural landscape at the time. These would reach the threshold for significance at a State level. Potential archaeological remains associated with land reclamation, farming, market gardening, scattered residential development and the establishment of Lauriston Park in **Sections B** and **C** would represent late-19th and early 20th century development and land use in Botany and Mascot. This was a formative period in the area's cultural history and remains would be significant at a local level. Potential archaeological remains associated with **Phase 4** occupation would represent the construction of the Botany Rail Line (**Sections B** and **C**), industrial development (**Sections A** and **B**), evidence of ongoing residential occupation (**Section C**) and the continued use of Mascot and Botany for market gardening (**Sections B** and **C**). Although these are considered historically significant activities, their significance is unlikely to be realised via the archaeological record alone. This is largely due to their continued presence in the area (for example the Botany Rail Line) and lack of archaeological research potential. However, if found to represent early examples of industrial activities and brick production, archaeological remains buildings that once occupied land in **Section A** and **B** may contain significance at a local level. There is no evidence to suggest potential archaeological remains associated with **Phase 5** occupation would meet the threshold for significance under this criterion.

[41] NSW OEH, 2015. Assessing Heritage Significance. Viewed on 04/07/2019: https://www.environment.nsw.gov.au/research-and-publications/publications-search/assessing-heritage-significance

Criteria	Discussion
	Intact or recognisable archaeological remains associated with Phases 1 and 2 could reach the threshold for significance under this criterion at a State and local level. **Intact or recognisable archaeological remains associated with Phase 3 would reach the threshold for significance under this criterion at a State (Alexandra Canal only) or local level. Potential archaeological remains associated with Phase 4 occupation are unlikely to reach the threshold for significance under this criterion, unless early examples of industrial buildings in Sections A and B are identified and represent notable commercial operations, in which case they may contain significance at a local level.** **Potential archaeological remains associated with Phase 5 are unlikely to reach the threshold for significance under this criterion.**
B – Associative Significance	Potential archaeological remains of **Phase 1** occupation may have significance for their associations with early European residential and agricultural activities in NSW, most specifically ex-convicts Byrne and Lewin who are known to have produced lime on their property using shells collected from Aboriginal middens or cheniers (**Section C**). Such remains may reach the threshold for State significance if intact and recognisable remains were identified. There is no evidence to suggest that archaeological remains in **Sections A** and **B** would contain significance under this criterion. Potential archaeological remains of **Phase 2** occupation and land use would have significance for their associations with market gardens in **Section C**. These were established by Europeans in the 1830s and Chinese following the end of the Gold Rush. If intact remains were identified, they would represent early European and Chinese agricultural practices and domestic settlement in the Botany and Mascot areas and may contain local or State significance. Archaeological remains in **Sections A** and **B** are unlikely to be significant under this criterion. Potential archaeological remains of **Phase 3** occupation in **Sections A**, **B** and **C** would have significance for their associations with the Alexandra Canal, land reclamation, farming, market gardening, scattered residential development and the establishment of Lauriston Park. Potential archaeological remains associated with the Alexandra Canal (**Section A**) would be associated labour initiatives during the 1890s depression, industrial development along Sheas Creek and designs influenced by Indian and British canal construction.[42] Although such remains have some associative significance for their role in the development of suburbs within the study area, they are unlikely to meet the threshold for local or State significance under this criterion. Potential archaeological remains associated with **Phase 3** land reclamation, farming, market gardening, scattered residential development and the establishment of Lauriston Park (**Sections B** and **C)** would be associated with late-19th and early 20th century working class development and land use. Although such remains have some associative significance for their role in the development of suburbs within the study area, they are unlikely to meet the threshold for local or State significance under this criterion. Potential archaeological remains associated with **Phase 4** occupation would have significance for their associations with the Botany Rail Line (**Sections B** and **C**), 20th century industrial development (**Sections A** and **B**), ongoing residential occupation and the continued use of Mascot and Botany for market gardening (**Section B**). These groups are associated with the economic development and cultural history of Botany and Mascot. Potential archaeological remains of the Botany Goods Line would be associated with the individuals employed to construct portions of the corridor and its associated infrastructure and evidence of modern industrial activities that began following the First World War. Although such remains have some associative significance for their role in the development of suburbs within the study area, they are unlikely to meet the threshold for local or State significance under this criterion. Potential archaeological remains associated with **Phase 5** occupation would not have any strong associations with individuals or groups considered to have played an important role in the cultural history of Botany, Mascot, Tempe or St Peters. **Intact or recognisable archaeological remains associated with Phases 1 and 2 could reach the threshold for significance under this criterion at a State and local level. Potential archaeological remains associated with Phases 3, 4 and 4 occupation are unlikely to reach the threshold for significance under this criterion.**

[42] Sydney Water, listing for Alexandra Canal No. 89AZ.

Criteria	Discussion
C – Aesthetic Significance	Although it is recognised that exposed *in situ* archaeological remains may have distinctive/attractive visual qualities, it is unlikely that these potential features within the study area would be considered 'important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement'. **Potential archaeological remains associated with Phases 1, 2, 3, 4 and 5 are unlikely to reach the threshold for significance under this criterion.**
D – Social Significance	Potential archaeological remains of **Phase 1** occupation are unlikely to have social significance for the local community. Land use was minimal during this period and no visible evidence survives to inform communities of their former presence. Therefore, there is no evidence to suggest that archaeological remains in **Sections A**, **B** and **C** would contain significance under this criterion. Potential archaeological remains of **Phase 2** occupation and land use may have social significance among the local Chinese community and Botany and Mascot residents at a local level (**Section C**). Descendants of the men and women who ran market gardens may still reside in the area and could hold a special connection to this period of Sydney's history. However, there is no evidence to suggest that archaeological remains in **Sections A** and **B** would contain significance under this criterion. Potential archaeological remains of **Phase 3** occupation in **Sections A**, **B** and **C** would have social significance for their associations with the Alexandra Canal and Lauriston Park. Many members of the public use the Alexandra Canal cycleway and it is a landmark in the area. Any archaeological remains associated with its construction or development would have considerable significance among the community at a local level. In addition, it is likely that descendants of the men, women and children who once occupied Lauriston Park would hold particularly strong and special associations with its archaeological remains. This would be at a local level. Potential archaeological remains associated with **Phase 4** occupation would have social significance among members of the community who have a special interest in railway history, industrial heritage and Chinese market gardens. These remains could reach the threshold for significance at a local level. Potential archaeological remains associated with **Phase 5** occupation would not have any strong associations with individuals or groups considered to have played an important role in the cultural history of Botany, Mascot, Tempe or St Peters. **Intact or recognisable archaeological remains associated with Phase 2 could reach the threshold for significance under this criterion at a local level. Intact or recognisable archaeological remains associated with Phase 3 could reach the threshold for significance under this criterion at a local level. Potential archaeological remains associated with Phase 4 occupation may contain significance at a local level. Potential archaeological remains associated with Phases 1 and 5 are unlikely to reach the threshold for significance under this criterion.**
E – Research Potential	Potential archaeological remains associated with **Phase 1** land use would have research potential for their ability to yield information regarding early agricultural and industrial activities in the Botany and Mascot area (**Section C**). These may provide information regarding landscape modification practices in Botany and early lime production methods carried out by ex-convicts. Depending on their integrity, condition and legibility, these remains could represent rare examples of these activities, many of which are not recorded in detail in available historical or cartographic records. Therefore, Phase 1 archaeological remains may reach the threshold for significance at a State level, however the likelihood of such remains surviving in the study area are nil to low. There is no evidence to suggest that Phase 1 archaeological remains in **Sections A** and **B** would contain significance under this criterion. Potential archaeological remains associated with **Phase 2** occupation in **Section C** would have the ability to yield information regarding early residential land use and domestic activities in the Mascot area as well as market gardening practices. These would provide researchers with information regarding Chinese immigrants, members of the working class community, living conditions and crops being grown at the time. These remains could reach the threshold for significance at a local level. If intact and legible archaeological evidence of farming and embankment construction in **Section B**, along the northern banks of Sheas Creek, were

Criteria	Discussion
	identified, these too would provide rare insights into early European landscape modification and agricultural activities. However, the likelihood of these remains surviving in the study area is low. There is no evidence to suggest that archaeological remains in **Section A** would contain significance under this criterion. Potential archaeological remains associated with **Phase 3** occupation in **Sections A**, **B** and **C** would represent the construction of the Alexandra Canal, land reclamation, farming, market gardening, scattered residential development and the establishment of Lauriston Park. Potential archaeological remains associated with, or in the vicinity of, the Alexandra Canal (**Section A**) would have high research value due to its potential to contain evidence of pre-European arrival environmental and cultural data. Archaeological remains may also have the ability to yield information about the canal's construction methods. These remains would reach the threshold for significance at a State level. Potential archaeological remains associated with market gardens, residential development and industrial buildings in **Sections B** and **C** are unlikely to have research significance as early 20th century living conditions and architectural designs are well documented, as is the evolution of the market garden industry during this period. These remains would not reach the threshold for significance under this criterion. Potential archaeological remains associated with **Phase 4** occupation would represent the construction of the Botany Rail Line (**Sections B** and **C**), industrial development (**Sections A** and **B**) and evidence of ongoing residential development and market gardening in **Sections B** and **C**. If undocumented evidence of industrial and Botany Rail Line construction methods or activities were identified within **Section C**, they may contain research potential and significance at a local level. However, the remaining potential archaeological remains associated with this phase would not meet the threshold for significance under this criterion due to their ubiquitous nature and well documented development. Potential archaeological remains associated with **Phase 5** land use and occupation are unlikely to reach the threshold for significance under this criterion. This is largely due to the nature and date of structures and land use associated with this phase, which represents common and existing forms of construction, market gardening and railway infrastructure. These items could be well documented in the archival record. **Intact or recognisable archaeological remains associated with Phases 1 and 2 could reach the threshold for significance under this criterion at a State and local level.** **Intact or recognisable archaeological remains in Section A and associated with Phase 3 could reach the threshold for significance under this criterion at a State or local level (Alexandra Canal only). Potential remains within Sections B and C would not reach the threshold of significance under this criterion.** **Potential archaeological remains associated with Phase 4 occupation may contain significance at a local level.** **Potential archaeological remains associated with Phase 5 are unlikely to reach the threshold for significance under this criterion.**
F – Rarity	Potential archaeological remains associated with **Phase 1** land use would represent rare evidence of early industrial activities (lime production) and farming in NSW, especially the Botany and Mascot area (**Section C**). These could have significance at a State level. There is no evidence to suggest that archaeological remains in **Sections A** and **B** would contain significance under this criterion as land use was constrained by Sheas Creek and surrounding mudflats. Potential archaeological remains associated with **Phase 2** occupation would represent early residential development, market gardening and the construction of an embankment wall around Sheas Creek in **Sections B** and **C**. These remains have the potential to reach the threshold for local significance under this criterion as there are very few intact examples of market gardens in from this period surviving today (in the vicinity of the study area). There is no evidence to suggest that archaeological remains in **Section A** would contain significance under this criterion as land use was constrained by Sheas Creek and surrounding mudflats. Potential archaeological remains associated with **Phase 3** occupation in **Section A** would represent rare evidence associated with the construction of the Alexandra Canal and pre-European arrival environment. This would be considered significant at a State level. Potential archaeological remains of land reclamation, farming, market gardening, scattered residential development and the establishment of Lauriston Park (**Sections B** and **C**) would be considered fairly common and would not reach the threshold for significance under this criterion.

Criteria	Discussion
	Archaeological remains associated with **Phase 4** and **5** structures and land use in **Sections A**, **B** and **C** would not be considered rare or uncommon. Remains would represent 20th century residential development, industrial activities and construction of the Botany Goods Line, all of which are unlikely to be considered unique due to their frequency across the area, common design and construction methods and extant nature. **Intact or recognisable archaeological remains associated with Phases 1 and 2 could reach the threshold for significance under this criterion at a State and local level.** **Intact or recognisable archaeological remains associated with Phase 3 would reach the threshold for significance under this criterion at a State (Alexandra Canal only) and local level.** **Potential archaeological remains associated with Phases 4 and 5 are unlikely to reach the threshold for significance under this criterion.**
G – Representative	Due to the levels of previous disturbance and localised nature of proposed subsurface excavations for the works, it is unlikely that any surviving archaeological material within the subject site would be highly intact or extensive and it is therefore not likely to be significant for representative qualities. **Potential archaeological remains associated with Phases, 1, 2, 3, 4 and 5 would not reach the threshold for significance under this criterion.**

7.2.1 Statement of archaeological significance

The potential archaeological resource associated with **Phase 1** may represent early agricultural, industrial and residential land use in **Section C**. These remains could have historical, associative and social significance at a State and local level. They could also contain research potential for their ability to yield information regarding rare and early industrial and agricultural activities in NSW. However, the likelihood of such remains surviving is nil-low. Due to land use constraints associated with Sheas Creek in **Sections A** and **B**, potential archaeological remain associated with Phase 1 occupation are unlikely to meet the threshold for significance under the NSW heritage criteria.

The potential archaeological resource associated with **Phase 2** occupation would be associated with farming, the construction of an embankment along Sheas Creek early residential development and Chinese market gardens in the Botany and Mascot area (**Sections B** and **C**). These remains could have historical, associative and social significance at a local level. They could also contain research potential for their ability to yield information regarding rare and early residential and agricultural activities carried out by Chinese and European communities. Due to land use constraints associated with Sheas Creek in **Section A**, potential archaeological remain associated with Phase 2 occupation are unlikely to meet the threshold for significance under the NSW heritage criteria.

The potential archaeological resource associated with **Phase 3** occupation would be associated with the construction of the Alexandra Canal (**Section A**), land reclamation (**Section B**) and ongoing early residential development, Chinese market gardens and the Lauriston Park estate (**Section C**). These remains would have historical, associative and social significance at a State (Alexandra Canal only) and local level. They could also contain research potential for their ability to yield information regarding the pre-European environmental and Aboriginal land use, landscape modifications, agricultural activities carried out by Chinese and European communities and working class development.

The potential archaeological resource associated with **Phase 4** occupation would be associated with use of the Botany Goods Line (**Section B**), evidence of residential occupation and the continued use of Mascot and Botany for market gardening (**Section C**) and industrial and agricultural activities in **Section B.** These remains could have historical and social significance at a local level. However, they are not considered rare or likely to contain archaeological research potential largely due to their continued presence in the area, ubiquitous nature and availability of associated archival resources.

The potential archaeological resource associated with **Phase 5** occupation in **Sections A**, **B** and **C** is not considered to reach the threshold for significance due to the contemporary nature and date of structures and land use, which represents common and existing forms of construction, landscape modification and railway infrastructure. These items would be well documented in the archival record and, as a result, their archaeological remains are unlikely to contain research significance.

7.3 Summary of archaeological potential and significance within the study area

In summary, the study is considered to contain the following areas of archaeological potential and significance. These are illustrated in Figure 7-1:

- **Nil archaeological potential**:
  - Land formerly occupied by a gravel quarry and Tempe Tip (in **Section A**) for Phase 1–5 archaeological remains
  - Some areas within Sydney Airport and along Qantas Drive (in **Section C**) for Phase 1–5 archaeological remains containing local or State significance
- **Low archaeological potential**:
  - Some areas within Sydney Airport and along Qantas Drive (in **Section C**) for Phase 1–5 archaeological remains containing local significance
  - Vacant ground located at 30 Canal Road (Lot 4 DP 555771 and Lot 3 DP 825649) (in **Section B**) for Phase 2 archaeological remains containing local significance
- **Moderate archaeological potential**:
  - Vacant ground located at 30 Canal Road (Lot 4 DP 555771 and Lot 3 DP 825649) (in **Section B**) for Phase 3–4 archaeological remains containing local significance
  - Land currently used as a stockpile area for the WestConnex project at 9 Canal Road St Peters (**Section B**, Lot A DP 391775, Lot B DP 394647 and Lot 2 DP1168612) for Phase 3–4 archaeological remains containing local significance
  - Land within Lot 1 DP 826101 (southeast corner of **Section A**) immediately south of Swamp Road, Tempe and north of the Alexandra Canal for Phase 3–4 archaeological remains containing local significance.
  - Some areas within Sydney Airport (in Section C) for Phase 1–5 archaeological remains containing local significance
- **High archaeological potential**:
  - Land along the western bank of the Alexandra Canal (on either side of an existing pedestrian footbridge and the Mascot (Sheas Ck) Underbridge in **Section A** and **B**) to contain Phase 3 archaeological remains having State significance.

7.4 Archaeological testing

Archaeological testing is generally required to inform design or gather further information for assessment of significance to input into an impact assessment. In the case of the project, there is sufficient information in the historical documents to provide a robust assessment of significance for potential archaeological remains.

There is nil–low potential for State significant archaeology to be encountered within the study area boundary. If such remains were found, they would represent early land use practices which would be localised and ephemeral. Therefore, they would not be easily identified through a testing program. The archaeology that may be present within the study area would primarily relate to twentieth century industrial structures. These type of remains would not reach the threshold of State significance. As locally significant remains that are not rare, an appropriate mitigation for impacts would be to record through salvage excavations, therefore testing is not considered necessary.

8.0 HERITAGE IMPACT ASSESSMENT

8.1 Introduction

This section assesses direct (physical) and indirect (visual, vibration and noise treatment) impacts on potential archaeological remains as well as listed and unlisted heritage items as a result of construction and operational impacts of the project. It also assesses impacts of the project against the EPBC Act guidelines, which govern land owned by the Commonwealth (Section 8.3).

The items assessed for impacts are located within the study area (direct impacts) and the study area's 150 metre buffer zone (indirect impacts).

Impacts are graded in accordance with the terminology outlined in Table 4-3 and are based on findings of the detailed impact assessment and Conservation Management Policies for the Alexandra Canal, Sydney (Kingsford Smith) Airport and Cooks River Intermodal Terminal (provided in Appendix B, sections 13.2.1, 13.2.2 and 13.2.3, respectively).

8.2 Overview of the project's potential impacts on significant heritage items

The project involves constructing new road corridors, road connections, bridges over the Alexandra Canal, nine drainage outlets within the Alexandra Canal embankment walls, and establishing compound areas and other ancillary infrastructure.

A detailed project description including construction and operation components is included in Chapters 7 and 8 of the EIS and summarised in Section 1.2 of this report.

It is noted that project impacts are generally construction impacts (initiated during the construction phase), although non-temporary visual impacts such as impacts of the new bridges across the Alexandra Canal are assessed as operational.

The location of drainage outlets in relation to the study area are shown in Figure 8-1.

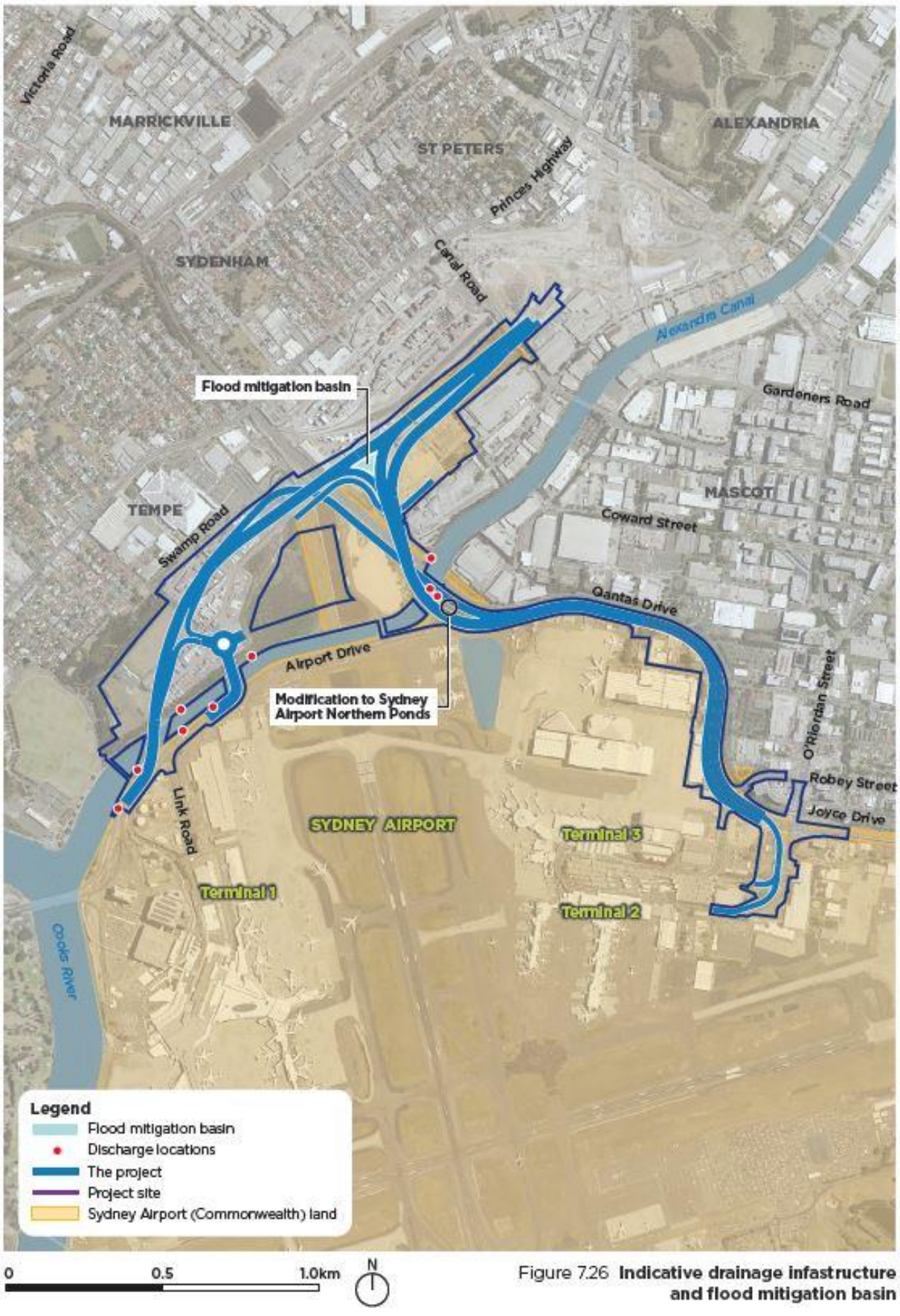

Figure 7.26 **Indicative drainage infastructure and flood mitigation basin**

Figure 8-1. Indicative location of drainage infrastructure and flood mitigation basin. Source. WSP.

8.3 Assessment of impact under the EPBC Act guidelines

8.3.1 Introduction

The Significant Impact Guidelines outlined in Section 1.2 of the *Significant impact guidelines Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* prepared in 2013,[43] provide information on how to assess whether impacts on heritage values are significant in terms of the EPBC Act. Under these guidelines, the following impacts on National Heritage place with cultural heritage values should be considered:

- Is there a real chance or possibility that the action will:
  - permanently destroy, remove or substantially alter the fabric (physical material including structural elements and other components, fixtures, contents, and objects) of a heritage place
  - involve extension, renovation or substantial alteration of a heritage place in a manner which is inconsistent with the heritage values of the place
  - involve the erection of buildings or other structures adjacent to, or within important sight lines of, a heritage place which are inconsistent with the heritage values of the place
  - substantially diminish the heritage value of a heritage place for a community or group for which it is significant
  - substantially alter the setting of a heritage place in a manner which is inconsistent with the heritage values of the place
  - substantially restrict or inhibit the existing use of a heritage place as a cultural or ceremonial site?

Under the Significant impact criteria outlined in the *Matters of National Environmental Significance – Significant impact guidelines* prepared in 2013, an action is likely to have a significant impact on the National Heritage values of a National Heritage place if there is a real chance or possibility that it will cause:

- One or more of the National Heritage values to be lost
- One or more of the National Heritage values to be degraded or damaged, or
- One or more of the National Heritage values to be notably altered, modified, obscured or diminished.[44]

8.3.2 Assessment of impact under the EPBC Act guidelines against the project

Parts of Sections A, B and C of the study area occupy land owned by the Commonwealth. Therefore, the project has potential to impact land subject to the above EPBC Act guidelines. This section will assess these impacts against the guidelines. Impacts are graded in accordance with the terminology outlined in Table 4-3. In order to simplify the assessment, impacts will be divided by the study area Section:

- **Section A** – No heritage listed items in Section A, yet contains an area of moderate potential to contain archaeological remains that may reach the threshold for local significance

[43] Australian Government, Department of the Environment, 2013. *Significant impact guidelines Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies*.
[44] Australian Government, Department of the Environment, 2013. Matters of National Environmental Significance Significant impact guidelines, p. 19.

- **Section B** – No items listed on the National Heritage List in Section B, yet contains an area of moderate potential to contain archaeological remains that may reach the threshold for local significance and is partially located within an item listed on the NSW Ports s170 heritage register
- **Section C** – Contains the Botany Bay LEP 2013 listed Sydney (Kingsford Smith) Airport and CHL indicative place Sydney (Kingsford Smith) Airport group. It also contains areas of low and moderate potential to contain locally significant archaeological remains.

8.3.2.1 Impact on Commonwealth land in Section A

There are no heritage listed items in Section A. However, the section contains areas of moderate potential for archaeological remains that may reach the threshold for local significance. Impacts on locally significant archaeology or the heritage listed item would not impact national heritage values.

8.3.2.1 Impact on Commonwealth land in Section B

There is one item partially located within Section B. This item is listed on the NSW Ports s170 heritage register and contains local significance. The section also contains an area of moderate potential for archaeological remains that may reach the threshold for local significance. Impacts on locally significant archaeology or the heritage listed item would not affect national heritage values.

8.3.2.2 Impact on Commonwealth land in Section C – Sydney Airport

As discussed in Section 2.2, Sydney Airport is not listed on the NHL and is registered as an Indicative Place on the CHL.

The project will involve the permanent removal of eleven buildings within the Sydney Airport site and modifications to the landscapes associated with the former Lauriston Park Estate. Of these structures, eight are considered to contain ‘little’ significance as elements of the item and three are considered to contain ‘neutral’ significance.

As the majority of these items contain ‘little’ or ‘neutral’ significance and are not considered to meet the threshold of significance under the Commonwealth heritage criteria, it is unlikely their removal would significantly impact the heritage values of the Sydney Airport site. Therefore, impacts associated with the project to Commonwealth land are not considered to meet the threshold of ‘significant impact’ under the Significant Impact Guidelines 1.2.

8.4 Summary of construction impacts on Commonwealth land

In summary, impacts as a result of the project to Commonwealth land within the study area would not have a major impact on its heritage values. Impacts would be limited to the removal of buildings and archaeological remains that are not considered to meet the threshold for National significance under the Commonwealth Heritage Criteria.

Therefore, overall impacts associated with the project to Commonwealth land are not considered to meet the threshold of ‘significant impact’ under the Significant Impact Guidelines 1.2.

8.5 Heritage impact assessment

Table 8-1 Heritage impact assessment for Sydney Gateway – Road

Heritage item and listing	Commonwealth/ land subject to the EP&A Act	Visual (indirect) impacts	Impacts on fabric (direct)	Impact on potential archaeological remains (direct)	Overall impact
Sydney (Kingsford Smith) Airport Group Botany Bay LEP 2013 I170 CHL indicative place 105542 RNE interim list 102669	Commonwealth	The project will involve the removal of eleven existing structures, their associated landscapes and mature fig trees within Sydney Airport's heritage curtilage. Eight of these buildings are assessed as having little heritage value in the Sydney Airport Heritage Management Plan. Three are assessed as having neutral significance (shown in Table 3-4). Despite their grades of significance, they visually contribute to the Airport's post-war development history and their removal is not in keeping with Heritage Management Plan Policy 7.4.8, which states it is preferable that items of little significance are retained and conserved.[45] The removal of these items and landscape elements would significantly alter the existing appearance of Sydney Airport when viewed from Qantas Drive and the Qantas Jet Base. This would be a permanent visual impact during the construction and operation phase of the project. Works associated with their removal and the establishment of new road corridors during the construction phase would also be	The project will involve the removal of eight existing buildings assessed as containing little heritage value and three buildings assessed as having neutral heritage value in the Sydney Airport Heritage Management Plan (2009). Land associated with these buildings would be replaced by road corridors. The Sydney Airport Heritage Management Plan states that it is preferable that items of little heritage value be retained and conserved under Policy 7.4.8. Therefore, the proposed works are not in keeping with Heritage Management Plan policies and would permanently remove evidence of the Airport's post-war history and architecture which is represented by these structures. This is considered a **moderate** impact on the item as a whole.	Subsurface excavations associated with the project have the potential to impact locally and State significant archaeological remains associated with market gardens (Phases 2–4), the Lauriston Park Estate (Phases 3–5) and Byrne's land grant which may have been subject to lime production activities and early colonial occupation (Phase 1). Depending on the nature of archaeological remains, and extent of impacts, these works would have a **minor** to **moderate** impact on the significance of the item.	**Moderate** **Not considered a significant impact as defined in the EPBC Act Significant Impact Guidelines 1.2**

[45] GML, 2009. Sydney Airport Heritage Management Plan, p. 128.

Heritage item and listing	Commonwealth/ land subject to the EP&A Act	Visual (indirect) impacts	Impacts on fabric (direct)	Impact on potential archaeological remains (direct)	Overall impact
		considered a temporary visual impact as hoarding, stockpiles and machinery would alter the existing nature of the airport. However, as they are not considered elements of moderate or high significance in the Sydney Airport Heritage Management Plan, impacts would be considered **moderate** rather than major.			
Cooks River Container Terminal and associated items Marrickville LEP 2011 I366 NSW Ports s170 register SHI no. 4560052, 4560051, 4560047, 4560048, 4560046	Land subject to the EP&A Act	The proposed works would involve the removal of a warehouse, fencing and trees within the heritage curtilage of the Cooks River Intermodal Terminal. The project would also involve the establishment of new road corridors within view of the individual items associated with the listing and property acquisition in the south-west corner of its heritage curtilage. These works would modify the item's immediate and surrounding landscape; however, the majority of its significant landscape features would be retained. As a result, these works are considered a **minor** to **moderate** impact on the overall heritage significance of the item.	The proposed works would involve acquiring land within the south-west corner of the item's curtilage to accommodate the project. They will also include the removal of existing warehouses and landscape features such as fences and vegetation. This will permanently alter the heritage curtilage of the item. Warehouses that are proposed to be removed are not considered to have heritage significance and items 4560052, 4560051, 4560047, 4560048 would not be directly impacted. Significant landscape features associated with the item would be retained. Therefore, the project would have a **minor** impact fabric contributing to	The statement of significance for the Cooks River Container Terminal notes that the site has potential to contain Aboriginal archaeological remains below a 1.0–4.4 metre fill layer, alongside evidence of European land use (commencing from circa 1804). The Aboriginal archaeological potential of the areas is discussed in the Aboriginal Cultural Heritage Assessment for the project. Evidence of European land use includes evidence of farming, residential occupation, army activities, wool storage and the goods yard itself.[46] This SoHI has assessed land within the study area as having moderate potential to contain evidence of Phase 3-5 land use.	**Minor**

[46] OEH SHI listing for the Cooks River Container Terminal. Accessed online at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4630046 on 01/04/2019

Heritage item and listing	Commonwealth/ land subject to the EP&A Act	Visual (indirect) impacts	Impacts on fabric (direct)	Impact on potential archaeological remains (direct)	Overall impact
			the heritage significance of the item.	However, only a small portion of the item's curtilage would be impacted for the project, limiting impacts on potential archaeological remains within the heritage curtilage. Therefore, impacts on potential archaeological resources are considered **minor,** depending on the extent of works and nature of archaeological remains.	
Alexandra Canal SHR 01621 Marrickville LEP 2011 I270 Sydney Water s170 register no. 4571712 RNE interim list 103889 Botany Bay LEP 2013 I1	Land subject to the EP&A Act	The proposed construction of four bridges over the Alexandra Canal will result in permanent modifications to its existing landscape, obstruct view lines towards, and along, the canal and alter the 'open sky' character of the canal. The proposed construction of four bridges would increase the number of crossings over the canal from three to seven. In addition, the installation of nine drainage outlets would alter the existing appearance of the canal walls, require the addition of new fabric and removal of original sandstone embankment walls. In addition, these works would not be in keeping with the Alexandra Canal CMP Policies 36, 37, 54. Therefore, the project would have a **major** visual impact on the item.	The installation of nine drainage outlets along the Alexandra Canal would directly impact fabric associated with the item. This fabric varies in significance from intrusive (shotcrete) to high (remnant and broken range sandstone), as assessed in the Alexandra Canal CMP. Under CMP Policy 63, all broken range ashlar embankment walls are to be retained. Under Policy 64, all items of high and moderate significance are to be conserved or restored. As works associated with drainage outlets will impact this fabric, the works would not be consistent with the conservation policies of the CMP. Therefore, depending on the significance of fabric impacted by the works, they would have a **minor** to **major** impact on the item.	Works associated with the installation of nine drainage outlets along the canal walls and establishment of piers/abutments associated with four bridges have potential to impact State and locally significant archaeological remains associated with the Alexandra Canal (Phase 3 onwards) and Aboriginal occupation of the area prior to European arrival (addressed in the Aboriginal Cultural Heritage Assessment Report prepared for the project). The Alexandra Canal CMP does not contain an in-depth archaeological assessment for land associated with the canal. However, land along the west bank, on either side of a pedestrian footbridge in Section A is identified as having potential to be occupied by remains of an Aboriginal midden. It should be noted that no significant subsurface impacts	**Major**

Heritage item and listing	Commonwealth/ land subject to the EP&A Act	Visual (indirect) impacts	Impacts on fabric (direct)	Impact on potential archaeological remains (direct)	Overall impact
				would occur in this area for the project. This SoHI has assessed land along the canal as containing various levels of archaeological potential including some portions with high potential to contain State significant remains and others assessed as containing nil to low potential for state and locally significant archaeological remains. Depending on the nature of archaeological remains, their level of significance and extent of impacts, these works would have a **moderate** impact on the significance of the item.	
Botany Rail Line Unlisted	Land subject to the EP&A Act	The proposed works would involve the construction of three bridges and overpasses over the existing Botany rail corridor alongside the establishment of road corridors along its western boundary. This would be considered a **moderate** impact on the item as it would alter its existing and historic landscape.	The proposed works have the potential to impact a brick culvert/water management structure associated with the Botany Rail Line as well as land within the rail corridor which would be directly impacted by piles and blade wall piers to support viaducts over the rail line. The brick culvert is considered to be an element of moderate heritage value to the overall significance of the Botany Rail Line. The existing alignment of the rail line will be preserved. As the majority of the Botany Rail Line corridor would be retained,	The extent of subsurface excavations associated with viaduct, road and drain construction have not been finalised. However, only a small portion of land associated with the Botany Rail Line would be impacted by the proposed works. Therefore, this would be considered a **minor** impact on archaeological remains, depending on the extent of the works and significance of the remains.	**Minor** to **moderate**

Heritage item and listing	Commonwealth/ land subject to the EP&A Act	Visual (indirect) impacts	Impacts on fabric (direct)	Impact on potential archaeological remains (direct)	Overall impact
			impacts associated with the project are considered **minor**.		
Mascot (Sheas Ck) Underbridge ARTC s170 heritage register 4801848	Land subject to the EP&A Act	The proposed works will involve the addition of a new bridge (Terminal Link Bridge) immediately west of the item. This is considered a **moderate** impact as it will alter the existing landscape associated with the bridge and views to and from the item.	The proposed works will not directly impact fabric associated with the item. Therefore, impacts on fabric associated with the Mascot (Sheas Ck) Underbridge would have a **negligible** impact.	Archaeological remains associated with the construction of the Mascot (Sheas Ck) Underbridge may be impacted for the works. These are unlikely to be considered 'relics' under the Heritage Act. Impacts on potential archaeological remains associated with the item are considered **minor** to **negligible.**	**Minor**
Mascot (O'Riordan Street) Underbridge ARTC s170 heritage register SHI 4801830	Land subject to the EP&A Act	The Mascot (O'Riordan Street) Underbridge will not be impacted as part of the Sydney Gateway Road component of the project. Visual impacts associated with the proposed works in this SoHI are therefore considered **negligible**.	The Mascot (O'Riordan Street) Underbridge will not be impacted as part of the Sydney Gateway Road component of the project. Impacts on fabric associated with the proposed works in this SoHI are therefore considered **negligible**.	Subsurface excavations will not occur within the footprint of the Mascot (O'Riordan Street) Underbridge. Therefore, impacts on significant archaeological remains associated with the item are unlikely. Impacts on potential archaeological remains associated with the item are considered **negligible**.	**Negligible**
Mascot (Robey Street) Underbridge ARTC s170 heritage register SHI 4801848	Land subject to the EP&A Act	The Mascot (Robey Street) Underbridge will not be impacted as part of the Sydney Gateway Road component of the project. Visual impacts associated with the proposed works in this SoHI are therefore considered **negligible**.	The Mascot (Robey Street) Underbridge will not be impacted as part of the Sydney Gateway Road component of the project. Impacts on fabric associated with the proposed works in this SoHI are therefore considered **negligible**.	Subsurface excavations will not occur within the footprint of the Mascot (Robey Street) Underbridge. Therefore, impacts on significant archaeological remains associated with the item are unlikely. Impacts on potential archaeological remains associated with the item are considered **negligible**.	**Negligible**

Heritage item and listing	Commonwealth/ land subject to the EP&A Act	Visual (indirect) impacts	Impacts on fabric (direct)	Impact on potential archaeological remains (direct)	Overall impact
House – Daktari Botany Bay LEP 2013 I131	Land subject to the EP&A Act	There is no visual relationship between the item and land within the study area. Views to and from the item will not be impacted by the project as they are obstructed by trees. Therefore, visual impacts on the item are considered **negligible**.	The proposed works will take place about 10 metres north-east of the item/s curtilage. No direct impacts on the item would occur. Therefore, direct physical impacts on the item are considered **nil**.	The proposed works will take place about 100 metres north-east of the item/s curtilage. No direct impacts on the item would occur. Therefore, impacts on archaeological remains associated with the item are considered **nil**.	**Negligible**
Moreton Bay Fig Tree Marrickville LEP 2013 I303	Land subject to the EP&A Act	There is no visual relationship between the Moreton Bay Fig Tree and land within the study area. Views to and from the item will not be impacted by the project as they are obstructed by trees. Therefore, visual impacts on the item are considered **negligible**.	The proposed works will take place about 120 metres south of the item/s curtilage. No direct impacts on the item would occur. Therefore, direct physical impacts on the item are considered **negligible**.	The proposed works will take place about 120 metres south of the item/s curtilage. No direct impacts on the item would occur. Therefore, impacts on archaeological remains associated with the item are considered **negligible**.	**Negligible**

Heritage item and listing	Commonwealth/ land subject to the EP&A Act	Visual (indirect) impacts	Impacts on fabric (direct)	Impact on potential archaeological remains (direct)	Overall impact
Potential archaeological remains					
Potential archaeological remains Section A	Land subject to the EP&A Act	N/A	N/A	The south-east corner of Section A and intact components of the Alexandra Canal have been assessed as having moderate and high potential to contain State and locally significant archaeological remains associated with Phase 3 occupation. Therefore, subsurface excavations in these areas have potential to disturb or remove significant archaeological resources. Depending on the extent of impacts and nature of remains, the project would have a **moderate** impact on potential archaeological remains within Section A.	**Moderate**
Potential archaeological remains Section B	Commonwealth land and land subject to the EP&A Act	N/A	N/A	Section B has been assessed as having moderate potential to contain locally significant archaeological remains associated with Phase 3 and 4 occupation and low potential for remains of Phase 2 occupation. The majority of these remains would exist within land currently occupied by 30 Canal Road. Therefore, subsurface excavations associated with road construction have potential to disturb or remove significant archaeological resources.	**Moderate** **Not considered a significant impact as defined in the EPBC Act Significant Impact Guidelines 1.2**

Heritage item and listing	Commonwealth/ land subject to the EP&A Act	Visual (indirect) impacts	Impacts on fabric (direct)	Impact on potential archaeological remains (direct)	Overall impact
				Depending on the extent of impacts and nature of remains, the project would have a **moderate** impact on potential archaeological remains within Section B.	
Potential archaeological remains Section C	Commonwealth land and land subject to the EP&A Act	N/A	N/A	Section C has been assessed as having low to moderate potential to contain State and locally significant archaeological remains associated with Phase 2 and 3 occupation. Therefore, subsurface excavations associated with the project have potential to disturb or remove significant archaeological resources. Depending on the extent of impacts and nature of remains, the project would have a **moderate** impact on potential archaeological remains within Section C.	**Moderate** **Not considered a significant impact as defined in the EPBC Act Significant Impact Guidelines 1.2**
Commonwealth land (subject to the EPBC Act)	Commonwealth land	The project would visually alter the existing landscape through the construction of road corridors, bridges, overpasses and the removal of trees and buildings. Although these are considered an overall moderate impact on the area as a whole, it would not be defined as a 'significant impact' under the EPBC Act Significant Impact Guidelines 1.2.	The project would involve the removal of trees and buildings within the Sydney Airport site. Although these are considered an overall moderate impact on the area as a whole, it would not be defined as a 'significant impact' under the EPBC Act Significant Impact Guidelines 1.2.	The project has potential to impact archaeological remains containing local significance within Sections A, B and C. Although these are considered an overall moderate impact on the area as a whole, it would not be defined as a 'significant impact' under the EPBC Act Significant Impact Guidelines 1.2.	**Not considered a significant impact as defined in the EPBC Act Significant Impact Guidelines 1.2**

8.6 Summary of heritage impacts

Table 8-2 provides a summary of impacts on potential archaeological remains, listed and unlisted heritage items within the study area and its 150 metre buffer zone based on findings from Table 8-1.

Table 8-2 Heritage impact assessment and mitigation measures for listed and unlisted heritage items in and within view of the study area

Item name, listing and listing number	Significance	Commonwealth/ land subject to the EP&A Act	Location	Impacts as a result of the proposed works	Impact on fabric	Visual impact	Archaeological impact	Overall impact
Listed items								
Mascot (O'Riordan Street) Underbridge ARTC s170 heritage register SHI 4801830	Local	Land subject to the EP&A Act	Within the study area	The Mascot (O'Riordan Street) Underbridge will not be impacted as part of the Sydney Gateway Road component of the project	N/A	N/A	N/A	N/A
Mascot (Robey Street) Underbridge ARTC s170 register SHI 4801848	Local	Land subject to the EP&A Act	Within the study area	The Mascot (Robey Street) Underbridge will not be impacted as part of the Sydney Gateway Road component of the project	N/A	N/A	N/A	N/A
Alexandra Canal SHR 01621, Marrickville LEP 2011 I270, Sydney Water s170 register no. 4571712, RNE interim list 103889	State	Land subject to the EP&A Act	Portions of the project area are located within the curtilage of this item.	Construction of four bridges, nine drainage outlets, roads and connections and stormwater drainage within and immediately adjacent to the item	Major	Major	Moderate to minor (depending on extent of works)	**Major construction and operational impact**

Item name, listing and listing number	Significance	Commonwealth/ land subject to the EP&A Act	Location	Impacts as a result of the proposed works	Impact on fabric	Visual impact	Archaeological impact	Overall impact
Sydney (Kingsford Smith) Airport Group Botany Bay LEP 2013 I170, Commonwealth Heritage List 105542, RNE 102669	State/local	Commonwealth	Portions of the study area are located within the curtilage for this item	The construction boundary for the proposed works will extend five to 200 metres within the heritage curtilage for the item, along its eastern boundary. Works within the curtilage may involve vegetation clearing, building removal and the expansion of Qantas Drive	Moderate	Moderate	Moderate to minor (depending on extent of works and significance of remains)	**Moderate construction impact** **Not considered a significant impact as defined in the EPBC Act Significant Impact Guidelines 1.2**
Mascot (Sheas Ck) Underbridge ARTC s170 heritage register SHI no. 4805743	Local	Land subject to the EP&A Act	Portions of the study area are located within the curtilage for this item	The construction boundary for the proposed works will extend five to 200 metres within the heritage curtilage for the item, along its western boundary. Works within the curtilage may involve vegetation clearing, building removal and the expansion of Qantas Drive.	Negligible	Moderate	Minor to negligible	**Minor construction impact**
Moreton Bay Fig Tree Marrickville LEP 2013 I303	Local	Land subject to the EP&A Act	Located within the 150 metre buffer zone	Visual impacts as a result of construction of bridges, overpasses, compounds and roads	Neutral	Neutral	Neutral	**Neutral**

Item name, listing and listing number	Significance	Commonwealth/ land subject to the EP&A Act	Location	Impacts as a result of the proposed works	Impact on fabric	Visual impact	Archaeological impact	Overall impact
Cooks River Container Terminal and associated items Marrickville LEP 2011 I366 NSW Ports s170 register no. 4560046, 4560048, 4560051, 4560052	Local	Land subject to the EP&A Act	Partially within the study area	The proposed works will involve the acquisition of the south-west corner of the property and removal of existing infrastructure within the study area	Minor	Minor	Minor	**Minor construction impact**
Unlisted heritage items								
Botany Rail Line	Local	Land subject to the EP&A Act	Within	Construction of bridges, overpasses, roads, drainage and other civil works within and adjacent to the rail corridor	Minor	Moderate	Minor (depending on the extent of the works and significance of the remains)	**Minor to moderate construction and operation impact**
Potential archaeological remains								
Phase 1 (c1796–1830)	State and local	Commonwealth	Within	Subsurface excavations in areas of nil and low potential.	-	-	Minor (due to nil–low potential for remains to survive)	**Minor construction impact**
Phase 2 (c1830–1880)	Local	Commonwealth and land subject to the EP&A Act	Within	Subsurface excavations in areas of nil–low, low or moderate potential.	-	-	Minor to moderate (depending on the extent of the works and significance of the remains)	**Moderate construction impact**

Item name, listing and listing number	Significance	Commonwealth/ land subject to the EP&A Act	Location	Impacts as a result of the proposed works	Impact on fabric	Visual impact	Archaeological impact	Overall impact
Phase 3 (1880–1919)	State (Alexandra Canal) and local	Commonwealth and land subject to the EP&A Act	Within	Subsurface excavations in areas of low, moderate and high potential.	-	-	Minor to moderate (depending on the extent of the works and significance of the remains)	**Moderate construction impact**
Phase 4 (1919–1946)	Local	Commonwealth and land subject to the EP&A Act	Within	Subsurface excavations in areas of low or moderate potential.	-	-	Minor to moderate (depending on the extent of the works and significance of the remains)	**Moderate construction impact**
Phase 5 (1946–1990)	Not significant	Commonwealth and land subject to the EP&A Act	Within	N/A	-	-	N/A	N/A
Phase 6 (1990–present)	Not significant	Commonwealth and land subject to the EP&A Act	Within	N/A	-	-	N/A	N/A

8.7 Justification for impacts on items or archaeological remains contain heritage significance

This section contains justifications for impacts on potential archaeological resources and heritage items that will be impacted by works associated with bridge piers, overpass footings and drainage outlets 04 and 05. Drainage outlets 04 and 05 will impact intact sections of sandstone embankment walls associated with the Alexandra Canal. Justification for these impacts is provided in section 8.7.3.

Detailed justification for the project can also be found in Chapter 5 of the EIS. This chapter outlines the strategic context of the project's development, including the key issues, demands and strategic planning driving the need for the project.

8.7.1 Options assessment

An options assessment for the project can be found in Chapter 6 of the EIS. It provides background information in relation to the history of the project and how it has developed. It describes the alternatives to the project as a whole as well as the options and design refinements considered as part of the design and construction planning process.

8.7.2 Bridge piers and overpass footings

Bridge piers have potential to impact archaeological remains within the following areas:

- Vacant ground located at 30 Canal Road (Lot 4 DP 555771 and Lot 3 DP 825649) (in **Section B**) with low potential to contain Phase 2 and moderate potential to contain Phase 3 locally significant archaeological remains
- Land currently used as a stockpile area for the WestConnex project at 9 Canal Road, St Peters (**Section B**, Lot A DP 391775, Lot B DP 394647 and Lot 2 DP1168612) with moderate potential to contain Phase 3–4 locally significant archaeological remains
- Land within Lot 1 DP 826101 (southeast corner of **Section A**) immediately south of Swamp Road, Tempe and north of the Alexandra Canal with moderate potential to contain Phase 3 locally significant archaeological remains.

8.7.2.1 Justification

Qantas Drive Bridge piers have been located to ensure the structural integrity of the bridge and follow the existing property boundaries of both Boral Concrete and Boral Recycling and the freight railway corridor.

Additional bridge piers and overpass footings have also been designed ensure the structural integrity of the item and follow existing property boundaries. This will reduce the requirement for land acquisition as well as the size of the project footprint.

The location and size of piers and footings are considered to be the most sympathetic option for constructing these items as their footprints avoid direct impacts on the Alexandra Canal and structures within the Cooks River Intermodal Terminal.

8.7.3 Drainage Outlets

A total of nine drainage outlets will be established along the Alexandra Canal. Seven of these will be installed along contemporary deviations of the item, where embankment wall fabric is not considered to be a significant element of the canal (see section 6.2.1.1 for a detailed discussion on significant fabric).

However, drainage outlets 04 and 05 will directly impact and remove sections of intact sandstone embankments associated with the Alexandra Canal. These are some of the few surviving examples of the original Alexandra Canal embankments constructed using Broken Range bond in the late 19th century.

Drainage outlets 04 and 05 are located immediately east and west of the Mascot (Sheas Creek) Underbridge (respectively). Land surrounding these outlets is flat with minor slopes from north-west to south-east, towards the Alexandra Canal. The existing drainage catchment within the project site is bordered by Canal Road, the Cooks River Intermodal Terminal, Botany Rail Line and the Alexandra Canal. Currently, an open channel on the western side of the catchment drains water along the Botany Rail Line towards Alexandra Canal. The existing open channel connects to a drainage system which runs inside Boral Concrete St Peters.

8.7.3.1 Justification and options analyses

Drainage outlets throughout the project area are designed to enable the efficient removal of stormwater from the roadway and provide safe driving conditions for motorists. The drainage corridor and outlet design for the project is principally governed by the location and geometry of the new road infrastructure and the ability to either connect to existing stormwater drainage or a receiving waterbody. Alexandra Canal is the main floodway for all catchment stormwater.

With regard to drainage outlets 04 and 05, investigations were carried out to assess options to avoid impacts to the Alexandra Canal. These aimed to determine the capacity of existing drainage infrastructure within and adjacent to the canal catchment. They concluded that there was limited capacity for this infrastructure cope with increased drainage flows without substantial network augmentation being required. Additionally, work to divert stormwater to another catchment or connect to these networks would require extensive excavations outside of the current project area and incorporation of additional stormwater drainage networks.

Given it was not feasible to pipe local stormwater to nearby catchments, options were considered in terms of using the existing local drainage network, including the existing outlets into Alexandra Canal:

- Option 1 – augmenting existing stormwater outlets in their current location. If augmentation is not possible, providing additional (new) outlets
- Option 2 - consolidating existing outlets and where possible, removing surplus outlets.

In reviewing the above options, consideration was given to a range of construction, engineering and environmental issues, including:

- The heritage significance of the canal, particularly the original fabric of the canal walls
- Potential (additional) flooding impacts
- Disturbance of contaminated sediments in the canal due to operational stormwater discharges (energy dissipating structures may be required)
- Construction methods and the potential to temporarily disturb sediment during construction.

Based on the results of flood modelling, which included the performance of the existing and proposed new road drainage infrastructure, Option 1 was identified as the only feasible design solution because the existing drainage system is already near capacity.

In regard to drainage outlet 04, it has been located outside private property to minimise impact on existing commercial operations and with consideration of existing electrical distribution mains (6x 11kV). An alternative and more sympathetic option for locating drainage outlet 04 further north on the western side of the Botany Rail Line was considered. This would avoid the original Broken Range bond sandstone embankment wall (element of high significance). However, this was discarded due to the complexity and cost of constructing a culvert beneath an active freight railway line. This option would also encounter flooding issues, due to the canal backing up in the drainage system.

8.7.4 Bridges over the Alexandra Canal

The construction of four new bridges over the Alexandra Canal is considered a major impact on the heritage significance of the item as it will alter the item's existing landscape and 'open sky' character.

8.7.4.1 Justification

The four new bridges are required to allow the project's road alignment to tie-in with the new WestConnex road corridors at St Peter's Interchange. They will also provide two access routes to Terminal 1 and Terminal 2 at Sydney Airport.

More sympathetic options for road alignments and location of the bridges for the project were considered. However, these were limited by the topography, existing and proposed road alignments and land-use constraints associated with the former Tempe Tip. Their location and design were also constrained by the Obstacle Limitation Surface (OLS) and safety requirements for the Sydney Airport. OLS required that airspace surrounding Sydney Airport be protected from obstacles to ensure aircraft flying in the vicinity of the airport can do so safely.

8.8 Assessment of the project's consistency with relevant conservation management plans

8.8.1 Assessment of the project's consistency with the Draft Sydney Airport Master Plan 2039 and Environment Strategy 2019-2024

Section 14.6.7 of the Sydney Airport Master Plan 2039 lists the following initiatives:

- Conserve the significant places of the airport, in line with the Heritage Management Plan HMP
- Actively conserve heritage elements listed as Environmentally Significant under the Airports Act 1996
- Deliver and continually build upon the online experience centre to tell the history of the airport site, detail its significance and its aviation history
- 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
- Implement the management plan for the fig trees and the Sydney Airport Wetlands, located in the South-East Sector.

The recommended mitigation measures outlined below (section 10.0) have been produced in line with the initiatives outlined by the Sydney Airport Master Plan 2039.

8.8.2 Assessment of the project's consistency with the Airport Heritage Management Plan

A review of Heritage Management policies in the Sydney Airport Heritage Management Plan is outlined in Appendix B.

It found that although the Project complies with policies relating to preservation of the original Lauriston Park estate layout, the proposed removal of items containing little value would not be in keeping with Policy 7.4.8 (Appendix B). If designs cannot be modified to avoid these items, mitigation measures outlined in Section 10.0 would be followed to reduce the extent of impacts on the heritage significance of the item and comply with the Heritage Management Plan.

The updated HMP, prepared in 2018 and still in draft, was not assessed during the preparation of this SoHI. If finalised, it would be accounted for in the submissions report.

8.8.3 Assessment of the project's consistency with the Alexandra Canal Conservation Management Plan 2004

A review of Heritage Management Policies in the Alexandra Canal Conservation Management Plan is outlined in Appendix B, Section 13.2.1.

This found that various aspects of the project, including the installation of drainage outlets in areas containing fabric of high significance, and the addition of bridges over the canal do not comply with the CMP policies. Mitigation measures outlined in this SoHI would be followed to reduce the number of policies in which the Project is non-compliant.

8.9 Statement of heritage impact

The SoHI summarised in Table 8-3 has been developed from the Heritage Division's guidelines for *Statements of Heritage Impact* (2002).

Table 8-3 Statement of heritage impact for the proposal

Heritage Consideration	Discussion
What aspects of the proposal respect or enhance the heritage significance of the study area and nearby heritage items?	The overall aim of the project is to reduce traffic congestion in Botany, Mascot, St Peters and Tempe. This will increase the liveability of these suburbs and allow their heritage items to be appreciated within a safer and quieter environment. The inclusion of heritage interpretation and landscape, bridge and ancillary structure designs that incorporate the Aboriginal and historic heritage of the area within the project boundary, would also enhance significance of heritage listed items and create an engaging narrative for its long and diverse history. If implemented, this would have a positive impact on the study area as a whole. The project also aims to create a uniform and visually captivating landscape that will improve the overall nature of land on either side of the canal. If carried out sympathetically and with consideration given to incorporating the area's history into its bridge and landscape designs, this would have a positive impact on the study area (most significantly the suburbs of Tempe and St Peters). In addition, the project has avoided direct impacts on heritage listed items where possible, including the: • Marrickville LEP 2011 and NSW Ports s170 listed Cooks River Container Terminal (and associated items) • Marrickville LEP 2011 listed Moreton Bay fig tree • ARTC s170 listed Mascot (Sheas Ck) Underbridge.

Heritage Consideration	Discussion
	It has also avoided direct impacts on elements of high and moderate heritage significance within the Botany LEP 2013, CHL indicative place and RNE interim listed Sydney (Kingsford Smith) Airport Group. Bridge designs have been prepared to avoid direct impacts on the Alexandra Canal and land within its 3 metre buffer zone and direct impacts on fabric of high significance associated with the Alexandra Canal (as a result of drainage outlet installations) have been avoided where possible. The majority of subsurface excavations required for the proposed works will take place within areas considered to contain nil or low–moderate archaeological potential for Phases 1, 2, 3 and 4 archaeology. Therefore, care has been taken to avoid impacts on unrecorded archaeological resources within the study area, where possible.
What aspects of the proposal could have a detrimental impact on the heritage significance of the study area and nearby heritage items?	The project will require the construction of four bridges over the Alexandra Canal and installation of nine drainage outlets within the canal's embankment walls. This would have a major impact on the existing visual character of the canal and may require the removal of fabric considered to contain high significance. This would alter the existing landscape and character of the canal, which is used recreationally by members of the public and represents the area's industrial history. The project will also require the removal of eleven buildings and ancillary structures within the LEP, CHL indicative place and RNE interim listed Sydney Airport. These are considered to contain little or neutral significance as elements of the airport. The Heritage Management Plan for Sydney Airport recommends that buildings and other elements within the airport assessed as containing 'little' significance be retained. As a number of buildings in the study area containing 'little' significance will be removed for the project, it would have a negative impact on the overall significance of the item. This is primarily because removal will alter the existing nature of the airport and remove a large portion of its mid-twentieth century buildings which represent post-war development of the Airport. The construction of a dual carriageway along Airport and Qantas Drive will require the removal of about 15 mature and prominent trees including figs and eucalypts. These are prominent features within Sydney Airport's Qantas Jet Base precinct and the Qantas Drive road corridor, and their removal would significantly alter the existing historic and natural character of the area and have a detrimental impact on the heritage significance of the item.
How is the impact of the new development on the heritage significance of the item or area to be minimised?	The majority of the proposed development's design footprint has been prepared to avoid direct impacts on areas of high Non-Aboriginal archaeological potential and significant buildings and landscapes within the study area.
Why is the new development required to be adjacent to a heritage item?	The project is required to address vehicular access issues to Sydney Airport and surrounding suburbs. Roads surrounding Sydney Airport are becoming increasingly congested and this pattern is expected to continue over the next two decades. Congestion has an economic, social and environmental impact on the area and restricts the movement of freight, causes delays for local residents accessing their home or work and has implications in the safety or drivers and pedestrians. The project is therefore aimed at expanding capacity and improving connections to Sydney Airport. This will assist with meeting the predicted growth in passenger, freight, employee and general traffic movements. The Alexandra Canal is located immediately north of Sydney Airport and borders its northern boundary. In order to facilitate further development of Sydney Airport's freight handling and transport facilities, a bridge network is required.

9.0 CUMULATIVE IMPACTS

Cumulative impacts represent the incremental loss of, or modifications to, a historical or environmental resource over time. These can result from individually minor, but collectively significant, actions and must therefore be considered in the wider developmental context to minimise impacts.[47]

The following sections summarise the heritage impacts of major rail and road infrastructure projects in the Sydney region. Cumulative impacts of these project and the Sydney Gateway road projects are then described in section 9.1.4.

9.1.1 Botany Rail Duplication

The Botany Rail Duplication project would result in the following heritage impacts:[48]

- Removal of two s170 listed bridges – Mascot (O'Riordan Street) Underbridge and Mascot (Robey Street) Underbridge
- Modifications to one Botany LEP 2013 listed bridge – Mascot (Botany Road) Underbridge
- Alterations to the locally significant Botany Rail Line
- Potential impacts on State and locally significant archaeology.

9.1.2 WestConnex M4–M5 Link

The WestConnex M4–M5 Link project will result in the following heritage impacts:[49]

- Removal of street trees including Moreton Bay Figs and contributory trees. Although the total number is not known, satellite imagery suggest at least forty trees were removed for the works
- Demolition of sixteen locally-listed or s170 listed heritage items and ten potential heritage items
- Demolition of contributory items within the Powell's Estate and Haberfield heritage conservation areas
- Impacts on archaeological relics within eleven historical archaeological management units
- Encroachment on existing public recreational areas/parklands, namely Sydney Park.

9.1.3 WestConnex New M5

WestConnex New M5 project has or will result in the following heritage impacts:[50]

- Direct and indirect impacts on 57 non-Aboriginal heritage items
- Demolition of three heritage listed buildings
- Modifications to the SHR, s170, RNE and LEP listed Alexandra Canal (due to the addition of crossings over the canal), RNE listed St Peters Brickpit Geological Site, LEP listed Service Garage and LEP listed Goodsell Estate Conservation Area
- Partial and direct impact on eight conservation areas

[47] Washington State Department of Transportation 2008. Guidance on Preparing Cumulative Impact Analyses, p. 3.
[48] Artefact Heritage, 2018. *Draft Sydney Gateway Rail: Statement of Heritage Impact*.
[49] Roads and Maritime Services, 2017. WestConnex M4-M5 Link Environmental Impact Statement.
[50] Roads and Maritime Services, 2015. WestConnex M5 Environmental Impact Statement.

- Construction vibration impacts on twenty three heritage listed items
- Construction of two bridges over the Alexandra Canal
- Visual impacts on 21 heritage listed items.

9.1.4 Assessment of cumulative impacts

The Sydney Gateway road project and the Botany Rail Duplication will result in direct impacts on three heritage listed underbridges, indirect impacts on two heritage listed underbridges, removal of buildings, modifications to the Botany Rail Line and impacts on potentially State or locally significant archaeological remains. Cumulatively, these works will result in moderate and irreversible impact on significant items, view lines and archaeological remains within the project area.

The M4–M5 Link and New M5 footprints are located in close proximity to the study area and include works associated with road construction, bridge construction and stockpile areas in St Peters, Botany and Mascot. In addition, the New M5 project will result in modifications to the Alexandra Canal (through the construction of two bridges over the canal), heritage listed items near the study area, visual impacts on heritage items and modifications to heritage conservation areas. This will result in major and permanent impacts on heritage items, view lines and archaeological remains within their greater footprint. Cumulative impacts alongside the project would be moderate as they involve impacts on the Alexandra Canal and the suburbs of Botany, Mascot, Tempe and St Peters, which are undergoing increased development pressure. The construction of two bridges over the Alexandra Canal for the New M5, alongside the construction of four bridges for the Sydney Gateway Road project, would have the most significant cumulative impact on the item and surrounding landscape. This is primarily due to the loss of the canal's existing industrial and recreational character, which has remained relatively open since its establishment in the late 19th century, and replacement with road corridors and crossings. The addition of six crossings will permanently and significantly alter these characteristics and reduce its function as a recreational landscape used by cyclists, runners and walkers due to the diminished extent of foot and bike paths on either side of the canal.

In conclusion, the increase in projects associated with the development of new roads is altering historic streetscapes in and around the study area through the removal of trees, heritage features and buildings. These items inform the historic character of this part of the Inner West, Bayside and Sydney LGAs. Continued development associated with the WestConnex projects, primarily in the form of road corridors replacing residential and natural landscapes and addition of vehicle crossings over the Alexandra Canal, will further impact the cultural, historical and social values of these areas. The Sydney Gateway Road project will add to these cumulative impacts by further modifying historic landscapes and replacing vacant or developed areas (such as Sydney Airport buildings) with road corridors. It should however be noted that the project will assist in diverting heavy vehicle traffic away from residential areas and funnelling industrial land use into defined areas.

Therefore, the cumulative impacts of the current project along with the New M5, M4–M5 Link and Botany Rail Duplication projects are therefore considered moderate.

10.0 RECOMMENDED MITIGATION MEASURES

10.1 Mitigation measures

The following mitigation measures have been designed to manage heritage impacts on significant items and landscapes within the study area.

10.1.1 Photographic archival recording

To mitigate direct and indirect impacts on listed and unlisted heritage items within the study area, and comply with Conservation Management Plan and Heritage Management Plan policies, it is recommended that a photographic archival recording be carried out for the affected sections of the following items:

- Alexandra Canal:
  - To comply with CMP Policies 13, 14 and 82
  - The recording methodology would consider additional recording techniques such as a video flyover of the canal
  - Would include measured drawings of elements to be modified, for example, embankments walls where drainage outlets are proposed to be installed to comply with Policy 13
  - Would be carried out '*before, during and after any major changes'* as per Policy 82
- Sydney (Kingsford Smith) Airport Group:
  - To comply with Heritage Management Plan Policy 7.6.5
  - Would include a record of internal and external features of buildings that are proposed to be removed for the project
  - Would include a recording of the built landscape as it appears today
- Cooks River Container Terminal:
  - Would include a recording of the landscape as it appears today with specific focus on areas that will be modified for the project
- Mascot (Sheas Ck) Underbridge
  - Would include a recording of the landscape as it appears today with specific focus on areas that will be modified for the project
- Botany Rail Line:
  - Would include a recording of the landscape as it appears today with specific focus on areas that will be modified for the project.

The photographic archival recording of each item would be carried out prior to works commencing, and in some cases, during the construction program. It should be prepared in accordance with the NSW Heritage Office's *How to Prepare Archival Records of Heritage Items* (1998), and *Photographic Recording of Heritage Items Using Film or Digital Captur*e (2006) by a suitably qualified heritage consultant using archival-quality material.

Once complete, the recording of each item would be accompanied by a report 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, local library, local historical society and the owner of the asset.

10.1.2 Heritage protection zones and barriers

Heritage protection zones and protective barriers would be established around items and landscapes containing heritage significance prior to and during the proposed construction program. This will ensure that significant fabric, landscapes and potential archaeological remains are protected and SHR, LEP and s170 register heritage curtilage boundaries are easily recognisable to contractors and staff.

Protection zones would be placed around individual items, item curtilage and plantings for the following heritage listed items (where works are anticipated to take place within 10 metres of the items):

- Alexandra Canal (significant fabric and gazetted curtilage)
- Sydney (Kingsford Smith) Airport Group – fabric of high significance, trees and plantings
- Cooks River Container Terminal – fabric of high significance, trees and plantings
- Mascot (Sheas Ck) Underbridge – Fabric associated with the bridge.

10.1.3 Archaeological management

A Historical Archaeological Assessment and Research Design (HAARD) and Excavation Methodology would be prepared for the following locations:

- Intact alignments of the Alexandra Canal (Section A) along the western bank of the Alexandra Canal (on either side of an existing pedestrian footbridge and the Mascot (Sheas Ck) Underbridge)
- Vacant ground located at 30 Canal Road (Lot 4 DP 555771 and Lot 3 DP 825649) (Section B)
- Land currently used as a stockpile area for the WestConnex project at 9 Canal Road St Peters (Lot A DP 391775, Lot B DP 394647 and Lot 2 DP1168612)
- Land considered to contain low or moderate archaeological potential within Sydney Airport (Section C)
- Land considered to contain low or moderate archaeological potential along Qantas Drive (Section C)
- Land within Lot 1 DP 826101 (southeast corner of Section A) immediately south of Swamp Road, Tempe and north of the Alexandra Canal.

The HAARD would recommend appropriate archaeological management in the form of monitoring, testing and salvage for any potential remains that may be impacted during the construction phase of the project.

10.1.4 Vibration assessment

This SoHI has found that there is potential for minor heritage (indirect) impacts as a result of vibrations associated with the construction and operational of the project to the following items:

- Alexandra Canal
- Cooks River Intermodal Terminal.

It is therefore recommended that the potential for vibration impacts on these heritage items would be formally assessed during detailed construction planning. Specific measures to mitigate any indicated impacts on these items would be included in relevant management plans for the project.

10.1.5 Architectural Noise Treatment assessment

An architectural noise treatment assessment would be prepared as part of the CEMP, which would consider and manage impacts on heritage items identified in this SoHI.

This would be carried out prior to works commencing and address operational impacts. This would allow for an assessment of potential impacts associated with architectural noise treatments and provide detailed recommendations on how to mitigate and prevent potential impacts on fabric.

This would focus on impacts on the following items:

- Alexandra Canal
- Cooks River Intermodal Terminal.

10.1.6 Design of bridges over the Alexandra Canal

The design of bridges over the Alexandra Canal would by sympathetic to the industrial landscape of the canal and surrounds and designed to minimise physical impact on the canal. High quality architectural design with use of suitable material and forms would be required and incorporate consultation with a heritage architect. The bridge design would consider the minimisation of cumulative impacts, aim to retain the open character of the canal and be designed to enhance the urban environment consistently with an urban design vision. The NSW Heritage Council (or delegate) and Sydney Water should be consulted during the design process.

10.1.7 Design of drainage outlets along Alexandra Canal

In order to meet Policy 68 of the Alexandra Canal CMP, the *Strategic Bank Stabilisation Plan for Alexandra Canal* prepared by DPWS in 2002 would be followed during the design and construction of nine drainage outlets along the Alexandra Canal. This would be carried out in consultation with Sydney Water and adhere to its CMP policies.

The design of drainage outlets along the Alexandra Canal would be sympathetic to the industrial landscape of the canal and its existing fabric. Outlets would be designed with use of suitable material and forms, consider the minimisation of cumulative impacts and would aim to avoid fabric of high significance or highly visible areas.

The NSW Heritage Council (or delegate) and Sydney Water should be consulted during the design process. Designs would also incorporate consultation with a heritage architect or heritage engineer.

10.1.8 Avoidance of significant fabric – Alexandra Canal

Significant fabric associated with the Alexandra Canal would be avoided where possible and works would be in keeping with conservation management policies in the CMP.

10.1.9 Reuse of significant fabric

Where significant fabric is to be removed from the Alexandra Canal, it would be removed and stored for interpretation or repair and maintenance of other sections of the canal as per policies in the CMP. Sydney Water would be consulted about potential reuse.

10.1.10 Involvement of a heritage architect

An appropriately qualified and experienced heritage architect would provide independent review periodically throughout the detailed design phase for bridges over the Alexandra Canal. This would also be carried out in consultation with Sydney Water and adhere to its CMP policies.

10.1.11 Impact avoidance

Where possible, consideration would be given to avoiding heritage significant fabric, locally and State significant archaeological remains and landscapes (including trees, plantings and public recreation areas) during the detailed design phase. Designs would also endeavour to reduce visual impacts by considering sympathetic and unobtrusive fabric, colour, form and size.

This would include consideration of avoiding direct impacts on significant fabric associated with Alexandra Canal and Sydney Airport.

10.1.12 Compliance with Heritage Conservation Policies

Two items located within the study area would be directly and indirectly impacted by the project:

- Alexandra Canal
- Sydney (Kingsford Smith) Airport.

In order to mitigate these impacts, and comply with the item's conservation policies outlined and reviewed in Appendix B, Sections 13.2.1 and 13.2.2 respectively, recommendations made in the document would be followed where feasible.

10.1.13 Heritage Management Plan

A Heritage Management Plan would be prepared as part of the Construction Environmental Management Plan in consultation with appropriate stakeholders. Specific measures would be identified in consultation with a qualified heritage specialist. The objectives and strategies of the sub-plan in relation to built heritage would include the following:

- Minimise impacts on items or places of heritage value
- Details of management measures to be implemented preventing or minimising direct and indirect impacts on heritage items (including archival recordings and/or measures to protect unaffected sites during construction works in the vicinity)
- Procedures for the reinstatement of areas of heritage value that would be temporarily impacted by construction following the completion of construction
- Heritage monitoring and auditing requirements
- Management guidelines that are consistent with NSW heritage guidelines and the Airport Heritage Management Plan.

10.1.14 Sympathetic design

The design of ancillary structures, bridges, viaducts, drainage outlets, retaining walls, noise screens, headlight barriers, traffic barriers, new rail corridors, access roads and other items associated with the project would aim to be as sympathetic to the existing landscape and heritage items as possible.

Care should be taken to minimise visual impacts on heritage items in the vicinity of the project and to respect the history of the study area. Where appropriate, form, fabric and palette respond to place and context, and respect the heritage values of the area.

A heritage architect would be consulted for the design of bridges over the Alexandra Canal and any urban and landscape designs for the project. Designs would incorporate policies and principles outlined in the Roads and Maritime Services (now Transport for NSW) Beyond the Pavement document.[51] Consistency with urban design principles utilised for adjacent Transport for NSW projects should be considered in regard to heritage.

Where possible, the recommendations of the heritage interpretation plan (outlined below) would be incorporated into landscape and infrastructure designs.

Ancillary works required by the project related to power supply, drainage facilities, lighting and pavements should be designed to minimise impacts on heritage items and areas of archaeological potential as much as feasible within the context of the project.

Consultation with Sydney Water would be carried out regarding any landscaping works along the Alexandra Canal. All designs and construction methods must adhere to the Alexandra Canal CMP policies.

10.1.15 Heritage interpretation

Appropriate heritage interpretation would be incorporated into the design for the project in accordance with the NSW Heritage Manual, the NSW Heritage Office's Interpreting Heritage Places and Items: Guidelines (August 2005) and the NSW Heritage Council's Heritage Interpretation Policy. This would focus on generating public use throughout the area which can recognise the historical role of the following items and also their continuing use:

- Alexandra Canal (as per Conservation Management Plan Polices 74, 79, 80, 83, 85 and 86)
- Sydney (Kingsford Smith) Airport Group (as per Heritage Management Plan Policy 7.6.4)
- Cooks River Container Terminal
- Mascot (Sheas Ck) Underbridge
- Botany Rail Line.

10.1.16 Arborist

During detailed design and construction planning, opportunities to reduce direct impacts on trees that contribute to the heritage significance of items or streetscapes would be explored in consultation with a suitability qualified arborist, particularly those of high retention value and trees and plantings associated with heritage items (such as those located with Sydney Airport). Where the loss of trees is unable to be avoided and trees cannot be replanted, trees removed as a result of the project would be offset in accordance with Transport for NSW's *Vegetation Offset Guide* (2016).

10.1.17 Consultation with stakeholders

Consultation with appropriate stakeholders such as the Bayside Council, Inner West Council, City of Sydney Council, NSW Heritage Council (or delegate), Sydney Trains, Sydney Water and NSW Ports would be carried out prior to the completion of proposed bridges, viaducts, drainage outlets, road, landscaping, shared path and construction compound designs.

This will allow relevant organisations to provide feedback and ensure their heritage assets are appropriately managed throughout the design, construction and implementation phase of the project.

[51] Transport for NSW (formerly RMS), n. d. Beyond the Pavement. Accessed online at: https://www.rms.nsw.gov.au/projects/planning-principles/centre-for-urban-design/index.html on 01/04/2019.

10.1.18 Heritage induction

A heritage induction would be delivered with all personnel involved in the project including contractors and subcontractors. This would include making contractors aware of areas of high archaeological potential, areas containing highly significant fabric, relevant strategies to minimise potential impacts on archaeological remains and heritage fabric, information regarding the identification and management of unexpected archaeological and heritage finds and their obligations under NSW heritage legislation and the conditions of approval for the project.

The induction would also be prepared in compliance with the Alexandra Canal Conservation Management Plan and Sydney Airport Heritage Management Plan. This would include the preparation of a document detailing specifications for works to the Alexandra Canal as per Policy 58. The induction would be provided to relevant contractors and subcontractors and prepared, or its preparation overseen and approved, by a suitably qualified heritage professional.

10.1.19 Unexpected finds

The *Roads and Maritime Standard Management Procedure for Unexpected Heritage Items* (2015) would be implemented in the case of unexpected structural and archaeological finds.

11.0 FINDINGS AND CONCLUSIONS

Roads and Maritime Services and Sydney Airport Corporation Ltd propose to build the Sydney Gateway road project. The project comprises new direct high capacity road connections linking the Sydney motorway network at St Peters interchange with Sydney Airport's terminals and beyond.

This will include the construction of four bridges and nine drainage outlets over and along the Alexandra Canal, new road corridors and connections within Tempe, St Peters and Mascot and the establishment of bridges and overpasses over the Botany Rail Line and proposed road corridors. The project site includes freehold land and Commonwealth-owned land leased by Sydney Airport Corporation Ltd.

This SoHI has been prepared in accordance with the NSW Heritage Manual to assess the Non-Aboriginal heritage impacts from the operation and construction of the project as well as addressing the project SEARs and the requirements for an MDP under the Airports Act.

The key findings of this assessment are as follows:

- There are no Heritage Conservation Areas listed on the SHR, Botany LEP 2013, Marrickville LEP 2011, Sydney LEP 2012, s170 heritage registers, CHL, NHL or RNE located within the study area or its 150 metre buffer zone
- The study area has been assessed as containing the following archaeological potential and significance:
  - **Nil archaeological potential**:
    - Land formerly occupied by a gravel quarry and Tempe Tip (in Section A) for Phase 1–5 archaeological remains containing State or local significance
    - Some areas within Sydney Airport and along Qantas Drive (in Section C) for Phase 1–5 archaeological remains containing State or local significance
    - All land within Section B for Phase 1 archaeological remains containing local significance
  - **Low archaeological potential**:
    - Some areas within Sydney Airport and along Qantas Drive (in Section C) for Phase 1–5 archaeological remains containing local significance
    - All land within Section B for Phase 2 archaeological remains containing local significance
  - **Moderate archaeological potential**:
    - Vacant ground located at 30 Canal Road (Lot 4 DP 555771 and Lot 3 DP 825649) (in Section B) for Phase 3–4 archaeological remains containing local significance
    - Land currently used as a stockpile area for the WestConnex project at 9 Canal Road, St Peters (Section B, Lot A DP 391775, Lot B DP 394647 and Lot 2 DP1168612) for Phase 3–4 archaeological remains containing local significance
    - Land within Lot 1 DP 826101 (southeast corner of Section A) immediately south of Swamp Road, Tempe and north of the Alexandra Canal for Phase 3–4 archaeological remains containing local significance

        - Some areas within Sydney Airport (in Section C) for Phase 2–5 archaeological remains containing local significance
    - **High archaeological potential**:
        - Land along the western bank of the Alexandra Canal (on either side of an existing pedestrian footbridge and the Mascot (Sheas Ck) Underbridge in Section A) to contain Phase 3 archaeological remains containing State significance

- The project will have a **major** heritage impact on:
    - *Alexandra Canal (No.89AZ)* – SHR, Sydney Water s170 register and Marrickville LEP 2011 (01621, 457172 and I270)
- The project will have a **moderate** heritage impact on the:
    - *Sydney (Kingsford Smith) Airport Group* – Botany Bay LEP 2013, CHL and RNE (I170, 105542 and 102669)
- Provided all mitigation measures (detailed in Section 10.0) are followed, the project will have a **minor** heritage impact on the:
    - *Mascot (Sheas Ck) Underbridge* – ARTC s170 register (4805743)
    - *Cooks River Container Terminal* – NSW Ports s170 register (4560046)
    - *Cooks River Container Terminal* – Marrickville LEP 2013 (I366)
    - *Botany Rail Line* – unlisted item of local significance
    - *Mascot (Robey Street) Underbridge* – ARTC s170 register (4801848)
    - *Mascot (O'Riordan Street) Underbridge* – ARTC s170 register (4801830)
    - *Alexandra Canal (including sandstone embankment)* – Botany Bay LEP 2013 (I1)
- Provided all mitigation measures are followed, the project will have a **neutral** heritage impact on:
    - *Moreton Bay Fig Tree* – Marrickville LEP 2013 (I303)
    - *Cooks River Container Terminal: Lay Down Points Lever* – NSW Ports s170 register (4560051)
    - *Cooks River Container Terminal: Precast Concrete Hut 1* – NSW Ports s170 register (4560047)
- Overall, the project has potential to have a minor to moderate impact on State and locally significant archaeological remains associated with Phase 1, 2, 3 and 4 occupation
- Overall, cumulative impacts associated with the project, the Botany Rail Duplication, New M5 and M4–M5 Link would be moderate
- Heritage impacts on Commonwealth land as a result of the project would be not be defined as a 'significant impact' under the EPBC Act Significant Impact Guidelines 1.2. Therefore, referral of the project to the minister is not required.

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13.0 APPENDICES

13.1 Appendix A – Significance assessments (listed and unlisted items)

13.1.1 Mascot (O'Riordan Street) Underbridge (ARTC s170 no. 4801830)

Table 13-1 Significance assessment – Mascot (O'Riordan Street) Underbridge

Criteria	Description
A – Historical Significance	The O'Riordan St Underbridge has historical significance as part of the original infrastructure for the Botany Line.
B – Associative Significance	There is no evidence to suggest that the O'Riordan St Underbridge has any strong or special associations with the life or works of a person, or group of persons, of importance in the local area's cultural or natural history.
C – Aesthetic Significance	The O'Riordan St Underbridge is technically significant as at 14.33 metres (45 feet) span, the bridge was a major increase on its predecessor at Bellevue Street, Glebe, and was a technically superior structure. The bridge has aesthetic significance as a landmark structure across O'Riordan Street, however, has been obscured by advertising signage.
D – Social Significance	There is no evidence to suggest that the O'Riordan St Underbridge has strong or special association with a particular community or cultural group in the local area for social, cultural or spiritual reasons.
E – Research Potential	The O'Riordan Street Underbridge has research significance as an early example of reinforced concrete girder construction, a technique which was eventually abandoned by the NSW railways.
F – Rarity	Due to the high self-weight to load capacity ratio of conventionally reinforced concrete bridges their use was abandoned within the NSW rail network after a few attempts. The O'Riordan St Underbridge is therefore a rare example of reinforced concrete girder railway bridge construction within the NSW rail network.
G – Representativeness	The O'Riordan St Underbridge is representative of a reinforced concrete girder rail underbridge constructed in the early 20th century within a semi industrial and residential setting.

13.1.2 Mascot (Robey Street) Underbridge (ARTC s170 no. 4801848)

Table 13-2 Significance assessment – Mascot (Robey Street) Underbridge[52]

Criteria	Description
A – Historical Significance	The Robey Street Underbridge has historical significance as part of the original infrastructure for the Botany Line.
B – Associative Significance	There is no evidence to suggest that the Robey Street Underbridge has any strong or special associations with the life or works of a person, or group of persons, of importance in the local area's cultural or natural history.
C – Aesthetic Significance	The Robey Street Underbridge has technical significance as the first welded steel railway bridge in New South Wales. The success of the fabrication and service of the Robey Street underbridge initiated the change over from riveted to welded steel construction, and bolts displaced rivets wherever non-welded joints had to be used.

[52] OEH, SHI listing for the Mascot (Robey Street) Underbridge. Accessed online on 04/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4801848

Criteria	Description
	The Robey Street Underbridge has aesthetic significance as a landmark structure over Robey Street, however the significant fabric has been covered by advertising signage, reducing its aesthetic quality.
D – Social Significance	There is no evidence to suggest that the Robey Street Underbridge has strong or special association with a particular community or cultural group in the local area for social, cultural or spiritual reasons.
E – Research Potential	The Robey Street Underbridge has research significance as evidence of early welding technique for steel bridge construction.
F – Rarity	The Robey Street underbridge is not considered a rare example of its type in NSW.
G – Representativeness	The Robey Street Underbridge is a good and early representative example of welded steel girder construction.

13.1.3 Alexandra Canal (SHR 01621, Sydney Water s170 register no. 4571712; Marrickville LEP 2011 I270, Botany Bay LEP 2013 I1, Sydney LEP 2012 I3, RNE 103889)

Table 13-3 Significance assessment – Alexandra Canal [53]

Criteria	Description
A – Historical Significance	Alexandra Canal was built during the 1890s depression using unemployed labour. It is one of two navigational canals built in NSW and is the only canal built to provide access for water transport for the delivery of cargo in NSW. The canal, the warehouses and factories around it, the bridges that cross it and the remains of the wharves are evidence of attempts by the Government to encourage development in the area.[54]
B – Associative Significance	The Canal has a strong historic link with the development of industries in the South Sydney/ Botany Bay area of Sydney. The Alexandra Canal was built to service industry located along Sheas Creek as a result of the Slaughter House Act of 1848, which required all noxious trades to be operated more than one mile from the city area. Today the entire area is still well defined by this precedence. The association of these with watercourses and the pollution of them is an issue which is current today. The Canal was built by unemployed labour to help provide relief work during the 1890s and so is a direct result of Government work programmes of a nature that would be repeated during the 1930s Depression. The Canal is associated with an ambitious plan to transport coal, blue metal and building materials more cheaply than by rail; and also to act as a sewerage outfall to provide drainage for the surrounding areas. The land on which the Canal has been constructed is associated with Chinese Market Gardeners. The Canal is associated with Sheas Creek Wool Sheds, located at the northern end of the Canal. The construction of the Canal was one of a number of grand ideas for Canal construction in and around the Cooks River and Botany Bay. These ideas were clearly influenced by overseas activities and experiences in English and Indian Canal construction.[55]

[53] Sydney Water, n. d. Heritage listing for the Alexandra Canal No. 89AZ. Accessed online on 04/07/2019 at: https://www.sydneywater.com.au/SW/water-the-environment/what-we-re-doing/Heritage-search/heritage-detail/index.htm?heritageid=4571712&FromPage=searchresults
[54] Ibid.
[55] Ibid.

Criteria	Description
C – Aesthetic Significance	The Alexandra Canal is characterised by its controlled route, defined edges, stone embankment walls and its identification as a canal. The Canal route has determined the planning of the district, including street layout and the positioning of industrial buildings along its route. The Sydenham to Botany Railway Bridge over the canal had the first lifting span used in a railway bridge in Australia. Sections of the canal exhibit relatively intact sections of ashlar stonework which are excellent examples of late 19th century coastal engineering works that provide a pleasantly textured and coloured finish to the canal. The canal is a major visual landmark in the area and has a strong landmark appeal, particularly as viewed from the Ricketty Street Bridge.
D – Social Significance	The Alexandra Canal is a major part of the physical environment of the Alexandria and Mascot region. The area around the Alexandra Canal is described as having a strategic location in relation to the city, the Airport and Port Botany. The area has seen significant redevelopment as a light industrial premises have been replaced by warehousing with a higher proportion of office area. The airport has contributed to the changing face of the region and the Canal as well as having generated the need for airport support functions. The new rail link to the Airport has created the potential for new urban centres around Green Square and Mascot Stations.[56]
E – Research Potential	The canal bed may contain examples of extinct flora and fauna species. 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 food source of Aboriginal occupation in the Botany Basin and a scientific understanding of the changing sea levels along the area. The Canal was built for navigational purposes, and this feature is important in understanding its history, design and function. The Canal has been formed from a natural water course (Sheas Creek) which is still active as a drainage system and provides for an estuarine environment.
F – Rarity	Alexandra Canal is one of two extant navigational canals in NSW and one of the few built in Australia in the 19th and 20th century. It was the only purpose built canal constructed to provide navigational access in industrial areas in NSW.
G – Representativeness	Alexandra Canal is a representative example of a late 19th century coastal navigational canal.[57]

13.1.4 Sydney (Kingsford Smith) Airport Group (Botany Bay LEP 2013 I170, Commonwealth Heritage List 105542, RNE 102669)

Table 13-4 Significance assessment – Sydney (Kingsford Smith) Airport Group[58]

Criteria	Description
A – Historical Significance	*The airport is also historically significant for its association with pioneers of the professional aviation industry, including Charles Kingsford-Smith from 1920 and after whom the airport is named; and one of his best-known pupils at his Mascot flying school, aviatrix Nancy Bird Walton in the 1930s.* [59]

[56] Sydney Water, n. d. Heritage listing for the Alexandra Canal No. 89AZ. Accessed online on 04/07/2019 at: https://www.sydneywater.com.au/SW/water-the-environment/what-we-re-doing/Heritage-search/heritage-detail/index.htm?heritageid=4571712&FromPage=searchresults
[57] Ibid.
[58] OEH, SHI listing for the Sydney (Kingsford Smith) Airport Group. Accessed online on 04/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5063218
[59] OEH, SHI listing for the Sydney (Kingsford Smith) Airport Group. Accessed online on 04/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5063218

Criteria	Description
	Mascot is historically significant as the location of some of the earliest experiments in powered flight in Australia, the earliest of which appear to have used the turf of the Ascot Racecourse (at the eastern end of the current east-west runway) rather than the more commonly described 'paddocks' and areas of market gardens to the west where the formal Mascot Aerodrome was established in 1920. The interface with the local area was at first tentative, with a level crossing at the intersection of the main runway and the Botany Goods Rail Line, but the airport soon started to dominate the cultural landscape of both Mascot and Botany. *The airport is a complex cultural landscape that includes not only the runways and terminals but also the large area of supporting infrastructure and areas that contribute to the Item's particular environmental and historic significance. It extends over the whole of the four original grants made in the Botany Bay area, being Edward Redmond's 135 acres; Mary Lewin's 50 acres, Andrew Byrne's 50 acres, and Thomas Walker's 50 acres, which together formed the locality known as Mudbank. The curtilage extends over the whole of the airport site and includes evidence and historically significant evidence of the earlier land uses in the area, including Simeon Lord's residence, dams, mills and factory; the Sydney Waterworks and the South Western Sydney Ocean Outfall Sewer (no.1) (SWSOOS1). Evidence of many of these has survived and can still be interpreted, although some, such as Lord's house and factories, has been demolished or covered by later development. Refer to the individual State Heritage Inventory forms for each of these items for details of their intrinsic heritage significance to the former Botany Bay area.* *The airport is significant for the degree to which it has been the catalyst for, and provides evidence of, the significant changes it has brought to the wider Mascot and Botany areas since it was officially recognised as Mascot Aerodrome in 1920. The rapid expansion of the site was achieved by overwriting earlier uses in the area, including the suburb of Lauriston Park and the small industries to the west of the residential area such as F.T Wimble's Ink and Varnish Factory. Wimble was a major producer of printing inks in the early 20th century who had established his factory complex in 1916 on the northern side of Vickers Avenue between Fifth and Sixth Streets. These buildings have survived, and, along with one building on the northern side of Ross Smith Avenue, are historically significant as the only pre-1943 structures visible on the aerial photos to have survived apart from the SWSOOS1 pipeline and the remains of the Sydney Waterworks Pumping Station. The essential road pattern of these earlier uses has also survived as the skeleton of the current T2–T3 loop road system.* *The Airport also demonstrates significant local heritage values that relate more directly to its influence on the course of Botany's physical, economic and social development; most notably as the catalyst for the transformation of the area from a cultural landscape dominated by noxious industries to acting as the hub for Sydney's transportation industry, specifically the aviation industry and businesses associated with the movement of people and cargo. Secondary businesses associated with the airport now dominate the industrial and commercial landscape of the area.* [60]
B – Associative Significance	*The airport is also historically significant for its association with pioneers of the professional aviation industry, including Charles Kingsford-Smith from 1920 and after whom the airport is named; and one of his best-known pupils at his Mascot flying school, aviatrix Nancy Bird Walton in the 1930s.* [61]

[60] OEH, SHI listing for the Sydney (Kingsford Smith) Airport Group. Accessed online on 04/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5063218
[61] OEH, SHI listing for the Sydney (Kingsford Smith) Airport Group. Accessed online on 04/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5063218

Criteria	Description
C – Aesthetic Significance	*The physical environment of the airport has considerable aesthetic presence as a 'big sky' landscape which, with the added aesthetic impacts of the plane movements, dominates the local area. The runway areas include the prominent landmarks of the control tower (no.5), clearly visible from General Holmes Drive, and included on the Commonwealth Heritage List for its technological heritage values. The most aesthetically distinctive part of the airport, the runways, have undergone considerable evolution since the original grass strip with level crossing. By 1943 three intersecting strips were in place and notably the pattern of extensive reclamation of waterways to allow for the extension of the runways had begun, with the 1943 aerial photographs revealing the south-western edge to the Cooks River, and the eastern side of its mouth to Botany Bay, walled and back-filling with silt. The configuration and length of the runways have undergone ongoing adaptation since this time including the diversion of the Alexandra Canal and Cooks Rivers, and infilling of a considerable proportion of Botany Bay through successive reclamations.* *Its physical presence dominates the landscape of the area, being the largest single land use with a notable aesthetic prominence due to its expanses of largely undeveloped, flat grass, distinctive elements such as the control towers, and the impact of the aircraft, both visual and acoustic, on the wider area. The need to ameliorate noise associated with aircraft operations has also impacted on the fabric of many of the historic buildings in the surrounding area through loss of original timber windows and insertion of double glazing in prefabricated frames.* *The reclamation of the foreshore of the Bay, originally as part of the realignment of the mouth of the Cooks River to extend the main north-south runway, and more recently to build a road along the foreshore between the airport and Port Botany, have together had a significant impact on the aesthetic qualities of Botany's setting and its historic relationship with the waters of Botany Bay.* *The terminal buildings are visually prominent elements within this landscape and are representative examples of contemporary airport design. Ancillary buildings are generally nondescript, although their functions and fitouts may have technological or historic heritage values (not investigated).* [62]
D – Social Significance	*The social heritage values of the Airport are notable, being a place of arrival and departure for millions of passengers annually, and as the primary portal for international migration since the 1960s. It is also of social heritage value to members of the plane-spotting community, with areas known as Shep's Mound and The Beach providing particular vantage points on each side of the main runway and interpretative signs have been provided. This social heritage value extends beyond the boundaries of the former LGA.* [63]
E – Research Potential	There is no evidence to suggest that Sydney Airport contains research significance. However, future investigations may find that the item has potential to yield information that can contribute to our understanding of the aviation industry and the evolution of airport design over time.
F – Rarity	Sydney Airport is not considered to possess uncommon, rare or endangered aspects of the local area's cultural or natural history.
G – Representativeness	Sydney Airport demonstrates principle characteristic of an aviation site that has grown organically since the development of aviation technology from the 1920s onwards.

[62] OEH, SHI listing for the Sydney (Kingsford Smith) Airport Group. Accessed online on 04/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5063218
[63] OEH, SHI listing for the Sydney (Kingsford Smith) Airport Group. Accessed online on 04/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5063218

13.1.5 House – "Daktari" (Botany Bay LEP 2013 I131)

Table 13-5 Significance assessment – House – "Daktari"[64]

Criteria	Description
A – Historical Significance	The property at 114 High Street, Mascot contains historical significance as it represents a rare form of 19th century residential architecture within the Mascot area. It is associated with the Grant family, the patriarch of which, was a leather dresser. The family constructed and lived in the residence for over five decades and it included a tannery building and ten sheds. The latter reflect the area's use for small scale industrial development which continue alongside residential occupation today.
B – Associative Significance	There is no evidence to suggest that property at 114 High Street, Mascot has strong or special associations with the life or works of a person, or group of persons, of importance in the local area's cultural or natural history.
C – Aesthetic Significance	The property at 114 High Street, Mascot has aesthetic significance as it represents "*substantially intact example of a traditional 19th century double-fronted weatherboard cottage*". It is considered to be a "*very good example of a traditional vernacular timber cottage. The hipped roof form, pair of intact chimneys which are distinctive for their orientation, deeply profiled shiplap weatherboards, timber windows, simple stop chamfered timber posts and simple iron lace detailing are all characteristic of the type and contribute to its aesthetic heritage values. The setting in the streetscape of High Street is also intact and the integrity of the cottage, and its siting close to the front boundary, allow the property's heritage values to be interpreted by the casual viewer. The property is a distinctive element in this rapidly changing streetscape near O-Riordan Street*."
D – Social Significance	There is no evidence to suggest that the property at 114 High Street, Mascot has social significance among the local community. However, a formal study would be required to confirm this statement.
E – Research Potential	There is no evidence to suggest that the property at 114 High Street, Mascot has potential to yield information that will contribute to an understanding of the local area's cultural or natural history. It represents a relatively common form of residential construction in the Mascot and Sydney area during the late 19th century. However, the property's use for industrial purposes associated with leather tanning (and later chemical production), may provide insights into these small scale industries and the property's residential and manufacturing land use over time.
F – Rarity	The property at 114 High Street, Mascot is considered to represent rare evidence of Mascot's residential development patterns that ensued in the late 19th century. It is "*one of the few surviving 19th century dwellings on the western side of Botany Road; despite this area being the first part settled in the early 19th century*."
G – Representativeness	The property at 114 High Street, Mascot is representative of late 19th century residential weatherboard cottages in Mascot and the surrounding area. It is in good condition and has retained its integrity.

[64] OEH SHI listing House - Daktari. Accessed online on 04/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=1210136

13.1.6 Moreton Bay Fig Tree (Marrickville LEP 2011 I303)

Table 13-6 Significance assessment – Moreton Bay Fig Tree

Criteria	Description
A – Historical Significance	The Moreton Bay Fig Tree has historical significance at a local level as it represents early residential subdivisions in Tempe and the laying out of South Street. Much of Tempe's early European history has been lost to 20th century industrial development.
B – Associative Significance	There is no evidence to suggest that the Moreton Bay Fig Tree has strong or special associations with the life or works of a person, or group of persons, of importance in the local area's cultural or natural history.
C – Aesthetic Significance	The Moreton Bay Fig Tree is demonstrative of tree species planted in residential and recreational settings in 19th century Sydney. It has a prominent presence on South Street and contributes to the street's historic nature.
D – Social Significance	There is no evidence to suggest that the Moreton Bay Fig Tree has social significance among the local community. However, a formal study would be required to confirm this statement.
E – Research Potential	There is no evidence to suggest that the Moreton Bay Fig Tree has potential to yield information that will contribute to an understanding of the local area's cultural or natural history. It represents a relatively common form of planting during the time Tempe was being settled and subdivided for residential properties.
F – Rarity	The tree is considered to be a rare example of an established Moreton Bay Fig tree in the Tempe area and is associated with a dry-stone wall which appears to have been constructed at the same time the tree was planted. [65] Much of Tempe's early European history has been lost to 20th century industrial development.
G – Representativeness	The Moreton Bay Fig Tree is representative of popular 19th century plantings in NSW. It is in good condition and has retained its integrity.

13.1.7 Cooks River Container Terminal (NSW Ports s170 register 4560046, Marrickville LEP 2011 I366)

Table 13-7 Significance assessment – Cooks River Container Terminal[66]

Criteria	Description
A – Historical Significance	The Cooks River Container Terminal: • Is of local historic significance as an integral part of the Sydney Goods Rail System from which the first through freight service between Sydney and Perth departed on 12 January 1970 • Was continually used as freight site since its inception in 1947, and was one of the first railway goods yards to be converted to accommodate containerisation and is currently a road-rail transfer terminal for containerised intrastate and interstate freight • Was first of its kind in Sydney containing a number of parallel, dead end sidings. This experiment in layout driven by the paucity of suitable land has proved impractical with long haul loads requiring assembly on the Botany Branch goods line.

[65] OEH SHI listing for Morton Bay Fig Tree accessed online on 04/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2030204
[66] OEH SHI listing for the Cooks River Container Terminal accessed online on 04/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4630046

Criteria	Description
B – Associative Significance	The site location (although not the terminal) has local historical associations with colonial community leaders including: • The man considered to be the father of St Peters – Alexander Brodie Spark, who laid out the village in the 1840s; • Robert Campbell Senior who made a significant contribution to the establishment of St Peters Church and • Thomas Smyth who held various government positions including Provost Marshall in 1796. [67]
C – Aesthetic Significance	The Cooks River Container Terminal is not considered to contain aesthetic or technical significance.
D – Social Significance	There is no evidence to suggest that the Cooks River Container Terminal has social significance among the local community. However, a formal study would be required to confirm this statement.
E – Research Potential	The site has archaeological potential because: • It is likely that the underlying marshland below 1.0–4.4 m fill layer was utilised by the Aboriginal owners of the country and therefore naturally higher /drier areas around the fringe of the marshland may contain evidence of such use.; • The site had a variety of uses by the European community including farming, residential, army, wool storage prior to its development as a goods yard; and • The fill deposits brought into the site as preparation for the goods yard mean that potential evidence of prior uses may be sealed below them. [68]
F – Rarity	The Cooks River Container Terminal was 'one of the first railway goods yards to be converted to accommodate containerisation and is currently a road/rail transfer terminal for containerised inter and intra-state freight'. It is therefore considered to contain uncommon aspects of the local area's cultural history.
G – Representativeness	The Cooks River Container Terminal is demonstrative of a mid-20th century railway goods yard which has evolved over time to accommodate containerisation. As the Cooks River Intermodal Terminal, it is still used for this purpose.

13.1.8 Laydown Points Lever (NSW Ports s170 register no. 4630051)

Table 13-8 Significance assessment – Lay Down Points Lever[69]

Criteria	Description
A – Historical Significance	As an individual element, the Lay Down Points Lever has historical significance for its associations with the Cooks River Container Terminal and its railway sidings. Laydown levers were installed in 1947/8 and are unique to goods yards and ports. The surrounding area is heavily associated with the Botany Freight Line which continues to serve the Cooks River Container Terminal (formerly the Cooks River Goods Yard). The Lay Down Point Lever is redundant.
B – Associative Significance	There is no evidence to suggest the Lay Down Points Lever has strong or special associations with the life or works of a person, or group of persons, of importance in the local area's cultural or natural history.

[67] OEH SHI listing for the Cooks River Container Terminal. Accessed online on 04/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4630046
[68] OEH SHI listing for the Cooks River Container Terminal.
[69] OEH SHI listing for the Lay Down Points Lever. Accessed online on 04/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4630051

Criteria	Description
C – Aesthetic Significance	The Lay Down Points Lever is not considered to demonstrate aesthetic characteristics and/or a high degree of creative or technical achievement in the local area.
D – Social Significance	There is no evidence to suggest the Lay Down Points Lever has social significance among the local community.
E – Research Potential	The Lay Down Points Lever is not considered to contain potential to yield information that will contribute to an understanding of the local area's cultural or natural history.
F – Rarity	The Lay Down Points Lever is considered to represent a relatively rare example of point levers as many were replaced by a modified version over time.[70]
G – Representativeness	The Lay Down Points Lever is considered to represent *'a spiked down and now redundant relatively rare points lever that is specific to special locations such as ports and goods yards such as Cooks River Container Terminal'*[71]

13.1.9 Electric Overhead Travelling Crane Rail (NSW Ports s170 register 4630052)

Table 13-9 Significance assessment – Electric Overhead Travelling Crane Rail[72]

Criteria	Description
A – Historical Significance	As an individual element, the Electric Overhead Travelling Crane Rail has historical significance for its associations with the Cooks River Container Terminal and its railway sidings. The crane served the Cooks River goods yard sidings No. 1, 2 and 3 which were installed in c1950. The surrounding area is heavily associated with the Botany Freight Line which continues to serve the Cooks River Intermodal Terminal (formerly the Cooks River Goods Yard).
B – Associative Significance	There is no evidence to suggest the Electric Overhead Travelling Crane Rail has strong or special associations with the life or works of a person, or group of persons, of importance in the local area's cultural or natural history.
C – Aesthetic Significance	The Electric Overhead Travelling Crane Rail is not considered to demonstrate aesthetic characteristics and/or a high degree of creative or technical achievement in the local area.
D – Social Significance	There is no evidence to suggest the Electric Overhead Travelling Crane Rail has social significance among the local community.
E – Research Potential	The Electric Overhead Travelling Crane Rail is not considered to contain potential to yield information that will contribute to an understanding of the local area's cultural or natural history.
F – Rarity	The Electric Overhead Travelling Crane Rail is not considered to possess uncommon, rare or endangered aspects of the local area's cultural or natural history.
G – Representativeness	The Electric Overhead Travelling Crane Rail is considered to be '[o]*f low significance but contributes to an understanding of freight handling systems at Cooks River Terminal prior to containerisation*.'[73]

[70] OEH SHI listing for the Lay Down Points Lever.
[71] OEH SHI listing for the Lay Down Points Lever.
[72] OEH SHI listing for the Cooks River Container Terminal: Electric Overhead Travelling Crane accessed online on 04/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4630052
[73] OEH SHI listing for the Cooks River Container Terminal: Electric Overhead Travelling Crane.

13.1.10 Precast Concrete Hut 1 (NSW Ports s170 register 4630047)

Table 13-10 Significance assessment – Precast Concrete Hut 1[74]

Criteria	Description
A – Historical Significance An item is important in the course or pattern of the local area's cultural or natural history	As an individual element, the Precast Concrete Hut 1 has historical significance for its associations with the Cooks River Container Terminal (formerly the Cooks River Goods Yard). It was used to house electrical relay and other electrical equipment for telecommunication purposes. The suburbs of Tempe and St Peters are heavily associated with the Botany Freight Line which continues to serve the Cooks River Container Terminal and other industries in the area.
B – Associative Significance An item has strong or special associations with the life or works of a person, or group of persons, of importance in the local area's cultural or natural history	There is no evidence to suggest the Precast Concrete Hut 1 has strong or special associations with the life or works of a person, or group of persons, of importance in the local area's cultural or natural history.
C – Aesthetic Significance An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in the local area	The Precast Concrete Hut 1 contain some aesthetic and creative technical achievement as they represent early use of precast concrete construction. This was useful as the hut did not need to be painted and was transportable (in theory).
D – Social Significance An item has strong or special association with a particular community or cultural group in the local area for social, cultural or spiritual reasons	There is no evidence to suggest the Precast Concrete Hut 1 has social significance among the local community. However, past and present employees of the Cooks River Container Terminal and former Cooks River Goods Yard may have strong or special association with the building.
E – Research Potential An item has potential to yield information that will contribute to an understanding of the local area's cultural or natural history	The Precast Concrete Hut 1 is not considered to contain potential to yield information that will contribute to an understanding of the local area's cultural or natural history.
F – Rarity An item possesses uncommon, rare or endangered aspects of the local area's cultural or natural history	The Precast Concrete Hut 1 is not considered to possess uncommon, rare or endangered aspects of the local area's cultural or natural history. Hundreds of precast concrete railway huts were manufactured by the Department of NSW Railways between 1916 and 1987. Many of these survive today, although they are no longer in use.
G – Representativeness	The Cooks River Container Terminal: Precast Concrete Hut 1 is '[r]*epresentative of NSW Department of Railway Signal relay huts from around the 1950s. Used at Cooks River Terminal to house communication and electrical equipment.* [75]

[74] OEH SHI listing for the Cooks River Container Terminal: Pre Cast Concrete Hut 1 accessed online on 04/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4630047
[75] OEH SHI listing for the Cooks River Container Terminal: Pre Cast Concrete Hut 1.

13.1.11 Mascot (Sheas Ck) Underbridge (ARTC s170 register no. 4805743)

Table 13-11 Significance assessment – Mascot (Sheas Ck) Underbridge[76]

Criteria	Description
A – Historical Significance	The Sheas Creek Underbridge has historical significance as part of the original infrastructure for the Botany Line. [77]
B – Associative Significance	There is no evidence to suggest the Sheas Creek Underbridge has strong or special associations with the life or works of a person, or group of persons, of importance in the local area's cultural or natural history
C – Aesthetic Significance	The Sheas Creek Underbridge has technical significance as the curved track bascule was an historic adaption of an earlier design for road bridges for railway use on the Botany Line. [78]
D – Social Significance	There is no evidence to suggest the Sheas Creek Underbridge has social significance among the local community.
E – Research Potential	The Sheas Creek Underbridge has some research potential as the remnant hinges and lifting brackets of the bascule mechanism remain, as well as some of the original girders, providing insight to the operation of the original bascule bridge. [79]
F – Rarity	The Sheas Creek Underbridge is not considered to possess uncommon, rare or endangered aspects of the local area's cultural or natural history. It represents are relatively common form or rail underbridge constructed in NSW in the early 20th century.
G – Representativeness	While the Sheas Creek Underbridge is demonstrative of an early 20th century rail underbridge constructed to serve a freight corridor, its distinctive towers were removed in the 1990s, resulting in a loss of integrity. Therefore, it is not considered to meet the threshold for significance under this criterion.

13.1.12 Botany Rail Line

Table 13-12 Significance assessment – Botany Rail Line

Criteria	Description
A – Historical Significance	The Botany Rail Line has historical significance for its association with industrial development throughout Botany and Mascot during its earliest years of European settlement and its associations with the State Abattoir, established in Homebush in 1907 and closed in 1988. Some of the earliest industries in Botany and Mascot included noxious trades such as tanneries, wool scourers and soap makers. These later evolved into scrap metal yards, concrete manufacturers (such as Kandos and Boral Concrete), and cereal factories (most notably Kellogg's). The continued use of the Botany Rail Line has allowed many industries in the area to continue production and efficiently transport goods to Port Botany, therefore contributing to the local economy and cultural landscape of Mascot, Botany and Sydenham. The Botany Rail Line meets this criterion at a local level.

[76] OEH SHI listing for the Mascot (Sheas Ck) Underbridge. Accessed online on 04/07/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4805743
[77] OEH SHI listing for the Mascot (Sheas Ck) Underbridge.
[78] Ibid.
[79] Ibid.

Criteria	Description
B – Associative Significance	The Botany Rail Line is associated with the earliest development of the NSW railways, Metropolitan Goods Line network, evolving industries in Botany, Mascot, Marrickville and Sydenham and the NSW government run Homebush Abattoir. Its establishment and ongoing use have assisted in shaping the local area's cultural, economic and architectural history. The Botany Rail Line meets this criterion at a local level.
C – Aesthetic Significance	The Botany Rail Line represents a partially intact example of an early 20th century goods line surrounded by industrial, natural and residential landscapes. The line has retained original and new elements that contribute to its significance including the O'Riordan Street, Robey Street, Botany Road and Shae's Creek underbridges as well as landscape features such as embankments, cuttings and structural features (rails, sleepers, signal huts). The O'Riordan and Robey Street underbridges are technically significant in their own right, representing some of the first cast concrete and welded steel bridge structures in NSW. The Botany Rail Line meets this criterion at a local level.
D – Social Significance	No formal studies of social significance surrounding the Botany Rail Line are known to have been carried out as of October 2018. Therefore, the ability to assess the social significance of the item is restricted to information yielded from secondary sources and the general history of the line. However, it is likely that the Botany Rail Line does have social significance among some members of the community, primarily those who are employed in industries which regularly use the line, members of the community interested in rail history and heritage, and members of the community who live in close proximity to the line. This is evidenced by information and photographs of the line uploaded to websites such as NSWrail.net,[80] the Dictionary of Sydney[81] and Flickr group 'Goods Lines Sydney'.[82] The Botany Rail Line meets this criterion at a local level.
E – Research Potential	The Botany Rail Line has potential to yield information regarding the growth and evolution of industrial activities, transport methods, economic growth and recession and residential settlement in the Botany, Mascot and Marrickville areas from 1925 to present. These questions could be addressed by assessing use of the line over time, establishment and removal of sidings, deviations to the corridor and changes in industries in the area. The Botany Rail Line meets this criterion at a local level.
F – Rarity	The Botany Rail Line represents a method of freight transport that is slowly being phased out within urban and suburban areas of Sydney in favour of road transportation. Other examples of Goods Lines in Sydney are no longer used for their original purpose, for example, the Goods Line which is now partly used for the Light Rail network and has also been transformed into a shared pedestrian and cycle path, and green public space in Ultimo and Darling Harbour. The Botany Rail Line meets this criterion at a local level.
G – Representativeness	The Botany Rail Line demonstrates principle characteristics of the use of freight transport in NSW from 1925 onwards. Although some portions of the line have been deviated and upgraded over time, it continues to contain original elements such as railway under bridges and various sections of its original route. The Botany Rail Line meets this criterion at a local level.

[80] NSWrail, n.d. Botany Goods Line. Viewed on 11/10/2018 at: https://www.nswrail.net/lines/show.php?name=NSW:botany
[81] Dictionary of Sydney, n. d. Botany Goods Line. Viewed on 11/10/2018 at: https://dictionaryofsydney.org/structure/botany_goods_line
[82] Flickr, n. d. Goods Lines Sydney: Rail services along the Metropolitan Freight Network (MFN) in Sydney. Viewed on 11/10/2018 at: https://www.flickr.com/photos/highplains68/albums/72157630651449084

13.2 Appendix B – Relevant Conservation Management Policies

13.2.1 Alexandra Canal Conservation Management Plan, 2004

Works associated with the Sydney Gateway – Road project should be in accordance with Conservation Management Plan policies for the Alexandra Canal prepared by Heritage Design Services in 2004. As stated in the Conservation Management Plan, 'successful reuse of the site will be contingent upon the effective and timely implementation of the recommendations and policies'.[83] Policies relevant to this SoHI from the Conservation Management Plan are outlined in Table 13-13 below.

Table 13-13 Alexandra Canal – Relevant Conservation Policies.

Policy	Project consistency with policy	Assessment and recommendation
Policy 3 Using the CMP *Ensure conservation, maintenance and associated works to significant areas are undertaken in accordance with accepted best-practice conservation and planning methods.*	**Consistent**	If any conservation, maintenance and associated works are carried out in tandem with the project they would be in keeping with philosophies, methodologies and guidelines set out in the Burra Charter (2013).
Policy 4 Using the CMP *Ensure all proposed works, including new works or works to retained items, are undertaken in a manner which recognises the cultural significance of the site and the NSW Government Heritage Asset Management Guidelines as part of the Total Asset Management Guideline*	**Consistent**	In order to comply with Policy 4, all modifications to the Alexandra Canal, including its walls, banks, and impacts on potential Aboriginal and Non-Aboriginal archaeological remains. This would be carried out in a sympathetic manner and avoid highly significant fabric such as original sandstone walls. For example, care should be taken to avoid impacts on significant fabric and heritage values of the canal during the design and construction of proposed drainage outlets, as well as the number, location and design of bridges over the canal. Inadvertent impacts on the canal would be avoided where possible and protected throughout the construction program. Impact avoidance would be ensured through the establishment of protective barriers and/or exclusion zones. All works associated with the project would be guided by the *NSW Government Heritage Asset Management Guidelines* (2005) as part of the *Total Asset Management Guideline.*
Policy 13 Maintaining Records *Prepare appropriate archival records of the site prior to any major alterations or demolitions. This should include photographic and/or measured drawing recording of buildings, landscaping and site features.*	**Consistent**	As the project will require major alterations to the Alexandra Canal, a Photographic Archival Recording (PAR) and reporting would be carried out in accordance with the NSW Heritage Office's *How to Prepare Archival Records of Heritage Items* (1998), and *Photographic Recording of Heritage Items Using Film or Digital Capture* (2006) prior to, and during, the construction works. Where possible, options for flyover footage of the canal for the PAR would also be considered. This is a recommended mitigation measure for the project. This will ensure the existing nature of the Alexandra Canal is recorded and would also provide a detailed understanding of its construction methods.

[83] Heritage Design Services, 2009. Alexandra Canal CMP, p. 61.

Policy	Project consistency with policy	Assessment and recommendation
Policy 14 Maintaining Records *Prepare all archival recording work in accordance with the Heritage Council of NSW 'Guidelines for the Photographic Recording of Heritage Items' and 'How to Prepare Archival Records'*	**Consistent**	The PAR and associated reporting would be carried out in accordance with the NSW Heritage Office's *How to Prepare Archival Records of Heritage Items* (1998), and *Photographic Recording of Heritage Items Using Film or Digital Captur*e (2006). This is a recommended mitigation measure for the project.
Policy 16 Funding *Any development within the curtilage of the Alexandra Canal should form partnerships to fund conservation works of the Canal and any other conservation works, within the curtilage, deemed appropriate to the Canal's significance.*	**Not consistent**	At present, the project does not include provisions for developing partnerships with appropriate agencies to fund conservation works (where appropriate) for the Alexandra Canal, as per Policy 16. In order to comply with the policy, Transport for NSW would ensure that other stakeholders including government agencies, local government and communities are involved in the development of the urban design and heritage interpretation for the project. In particular, the built form of the project should encourage the continued engagement, use and stewardship of these items. This is a recommended mitigation measure for the project. As per this policy and requirements outlined in Policy 3, it is recommended that such partnerships be considered during the detailed design, planning and development phase of the project.
Policy 19 Asset Management *Any development within the defined curtilage of the Canal should accordingly take responsibility for the conservation of the listed heritage items within that curtilage. Stabilisation of the Canal walls should be conducted ahead of any construction or redevelopment within the curtilage area. Responsibility for any conservation/ stabilisation work should fall equally with the SWC [Sydney Water Corporation] and the development proponent*	**Consistent**	The project will include construction works and modifications to the Alexandra Canal and land within its curtilage. Therefore, in order to comply with Policy 19, conservation/stabilisation of significant fabric and associated heritage items would be developed during the detailed design and planning phase of the project and carried out during the construction phase.
Policy 22 Future Use *Secondary Recreation Standard contact, in the long term, to the water is an appropriate goal for future use of the Alexandra Canal.*	**Consistent**	Policy 22 requires that all designs that would have a direct impact on the Alexandra Canal's water quality should consider its ongoing and future use as a Secondary Recreation Standard contact (paddling, wading, boating and fishing). It is understood that nine new drainage outlets would be installed along the Alexandra Canal for the project. These have been designed to reduce the movement of sediment in the canal and would be constructed to slow down the speed of flow as it enters the waterway. Sediment would be directed to enter the canal at the surface level to prevent disturbance of contaminated sediment at the base of the canal. It is therefore considered that Policy 22 has been met.
Policy 23 Community and Public Access	**Not Consistent**	The project would involve the removal/diversion of part of the existing Alexandra Canal Cycleway that is used recreationally by cyclists, walkers and runners.

Policy	Project consistency with policy	Assessment and recommendation
Ensure that continued public access is available to the site regardless of the ownership or management or use(s) of the site		
Policy 28 Conservation Planning *Any development proposal within the site curtilage of the Alexandra Canal must also plan for the conservation of the canal. This includes programming restoration works with the development, stabilisation of the canal walls, reversal of intrusive fabric in the canal and responsibility for water treatment and water disposal in the canal.*	**Consistent**	In order to meet the requirements of Policy 28, conservation, restoration and stabilisation of canal walls and embankments would be included in the detailed design and planning phase of the project and carried out during the construction phase. Where intrusive fabric is impacted, the reversal of intrusive fabric would be carried out. For example, where shotcrete has been used to stabilise walls, this would be removed and replaced with sandstone blocks in keeping with the historic nature of the item. As discussed in Policy 22, design measures for drainage outlets have addressed responsible water disposal into the canal.
Policy 29 Planning Controls *Ensure that all proposed work to this site is assessed for heritage impacts against the policies of the CMP.*	**Consistent**	This SoHI has been prepared to assess heritage impacts against the policies of the Conservation Management Plan and therefore meets requirements under Policy 29.
Policy 30 Planning Controls *Where heritage impacts fall outside the scope of policies in the CMP or the 'standard exemptions', ensure that all appropriate statutory processes are followed to obtain approval for proposed works. This includes applications under Section 57 of the Heritage Act and applications under local planning controls*	**Consistent**	Proposed works for the project, including the installation of nine drainage outlets and construction of bridges over the canal are outside the 'standard exemption' definitions. Therefore, appropriate SSI approvals must be sought prior to works commencing and must be in keeping with the SEARs outlined in Section 1.1.2
Policy 34 Works, Development Zones and New Structures *Any new developments within the curtilage of the site should prepare a statement of heritage impact and outline all positive and negative impacts on the significance of the Alexandra Canal and any of the heritage items within the curtilage area associated with the canal. It must outline a strategy that protects the stability of the embankment walls.*	**Consistent**	This SoHI has been prepared to meet requirements under Policy 34. The preparation of a strategy to protect the stability of the embankment walls is outside the scope of this document. However, this SoHI includes a recommendation that a strategy for embankment protection be preparation in the detailed design and planning phase of the project, as outlined in Section 10.1

Policy	Project consistency with policy	Assessment and recommendation
Policy 34 Works, Development Zones and New Structures *Should intensive uses be desired for the site and a Heritage Impact Statement considers the use would be detrimental to the heritage significance of the Canal the proposed use should not be approved*	**Not Consistent**	The project would not explicitly involve 'intensive uses' of the site as works would comprise the addition of bridges which would cross over the canal. However, these items can be interpreted as an intensive use of the canal's immediate landscape as they will involve the addition of large vehicle crossings over the canal and reduce the amount of recreational and publicly accessible space along its embankments. Therefore, the project does not wholly comply with Policy 34 and consideration should be given to reducing the visual and physical impact of proposed bridges and modifications to the Alexandra Canal cycleway. Options could include reducing the number of crossings over the canal.
Policy 36 Works, Development Zones and New Structures *Any new development should be of a small enough scale so as to not overwhelm the existing landscape, in terms of form, scale or height.*	**Not Consistent**	The proposed addition of four new bridges over the canal is not considered to meet the requirements under Policy 36 and it would involve the construction of modern bridges over the waterway. In addition, the establishment of nine new drainage outlets have the potential to overwhelm the existing nature of the canal if outlets are constructed along sections of original stone walls. Therefore, the project does not meet requirements under Policy 36.
Policy 37 Works, Development Zones and New Structures *The open air space over the canal should be retained as far as possible and bridges over the canal should be restricted.*	**Not Consistent**	The project involves the addition of four new bridges over the canal. This will significantly reduce the 'open air' nature of the canal and modify the surrounding landscape. Therefore, the project does not meet requirements under Policy 37. In order to comply with Policy 37, consideration should be given to reducing the number of crossings over the canal.
Policy 38 Works, Development Zones and New Structures *Before any new crossings or bridges are undertaken, existing crossings should be considered to see if they can have a dual function. Any new crossings should be designed to have a multipurpose function such as a pipe/pedestrian bridge if possible*	**Not Consistent**	At the time of preparing this SoHI, no options assessments regarding the use of an existing footbridge (within Section A) or other crossings over the Alexandra Canal had been provided. In order to meet Policy 38, consideration would be given to the dual function of existing crossings and bridges over the canal, while allowing for their existing use (for example as pedestrian/bicycle crossings) to continue.
Policy 39 Works, Development Zones and New Structures *Any new and replacement crossings or bridges must maintain a minimum 2 metre freeboard height above Mean High Water Spring Tide to allow the Canal to remain navigable to small craft.*	**Consistent**	At the time of preparing this SoHI, final designs had not been provided for the proposed bridges but it is assumed that the proposed bridges would maintain a minimum two metre freeboard height above Mean High Water Spring Tide.

Policy	Project consistency with policy	Assessment and recommendation
Policy 40 Works, Development Zones and New Structures *Any new and replacement crossings or bridges must maintain pedestrian access along the banks and be set back off the significant sandstone embankment walls as set down in the engineering report Appendix A to protect the stability of the walls.*	**Consistent**	In order to meet Policy 40, pedestrian access along the canal banks must be maintained and be set back off the significant sandstone embankment walls. It is understood that the design of bridges for the project has ensured that they are set back from the embankment walls. However, the engineering report provided in Appendix A of the Conservation Management Plan would also be followed to ensure the policy is complied with a significant fabric conserved and protected during the construction program.
Policy 41 Works, Development Zones and New Structures *All fabric of Exceptional, High and Moderate grading of significance shall be conserved to protect it at a State Significant level.*	**Not Consistent**	The majority of significant fabric associated with the Alexandra Canal would be avoided where possible in order to meet requirements under Policy 41. This would include original sandstone walls, embankments and potential Aboriginal and Non-Aboriginal archaeological remains. For example, bridge designs do not require direct (physical) impacts on the canal, and eight of the nine drainage outlets will impact fabric considered to contain little to no significance. However, it is understood that Drainage Outlet 04, which is located northeast of the Mascot (Sheas Ck) Overbridge, on the western bank of the canal would impact remnants of sandstone wall embankments considered to contain high significance. Alternative options for the location of the drain have been considered, however these were not considered feasible due to restrictions associated with costs and land acquisition. As a result, some components of Policy 41 have not been met. In order to comply with the policy, consideration would be given to relocating Drainage Outlet 04. If not feasible, Policies 13, 14, 16 and 28 would be followed to mitigate these impacts.
Policy 43 Character and Treatment of the Landscape *Seek to retain evidence of the continuous pattern of development of the landscape by retaining the entire canal.*	**Consistent**	The project will not involve direct impacts on the existing shape or alignment of the canal. Therefore, requirements under Policy 43 have been met.
Policy 44 Character and Treatment of the Landscape *The canal should be retained as a hard-edged landscape distinct in character from a natural river system except in the Tempe Reach which should encourage a Marine eco-system.*	**Consistent**	The project would not involve direct impacts on the existing form or hard-edged landscape associated with the Alexandra Canal. Therefore, requirements under Policy 44 have been met.
Policy 45 Character and Treatment of the Landscape *The existing widths of the canal should be retained.*	**Consistent**	The project will not impact the width or length of the canal. Therefore, requirements under Policy 45 have been met.

Policy	Project consistency with policy	Assessment and recommendation
Policy 46 Character and Treatment of the Landscape *The abrupt hard edge of the canal where it finishes and meets Sheas Creek inlet should be retained. No bridge, wharf or development should be permitted to be constructed over the canal edge or soften the distinctive corner.*	**Consistent**	No works for the project would be carried out at the abrupt hard edge of the canal where it finishes and meets the Sheas Creek Inlet. Therefore, requirements under Policy 46 have been met.
Policy 47 Character and Treatment of the Landscape *No terracing of the Canal walls should be approved below the existing capping stone or the existing wall height, in the case of capping stones not existing.*	**Consistent**	Terracing of the canal walls is not required under the project. Therefore, requirements under Policy 47 have been met.
Policy 48 Vegetation Systems *Future species consistent with the character of the region and the canal as well as indigenous vegetation should be established for the reaches of the canal.*	**n/a**	Detailed landscaping designs have not been prepared at this stage of the project. However, it is recommended that Policy 48 be considered during the detailed design and planning phase to ensure this condition is met.
Policy 52 Vegetation Systems *Plantings should consider the views and vistas from and to the canal and be consistent with such axis.*	**n/a**	Detailed landscaping designs have not been prepared at this stage of the project. However, it is recommended that Policy 52 be considered during the detailed design and planning phase to ensure this condition is met.
Policy 53 Panoramas and Views *Retain the views along the Canal from road crossings.*	**Not Consistent**	The addition of four new bridges would obstruct views towards the canal from existing road crossings within and outside of the study area. Therefore, requirements under Policy 53 have not been met.
Policy 54 Panoramas and Views *Future development along the canal should enable visual corridors to and from the canal to be retained.*	**Not Consistent**	The addition of four new bridges would obstruct views towards the canal from existing road crossings within and outside of the study area Therefore, requirements under Policy 53 have not been met.
Policy 58 Conservation of Fabric: Undertaking works *Prepare specifications for works to the site using the CMP as a guiding document. Ensure specifications are prepared by a suitably qualified heritage professional*	**Consistent**	This SoHI has been prepared to provide recommendations that are in keeping with those outlined in the Conservation Management Plan. In order to comply with Policy 58, all conservation works that may be required under the project would be carried out under appropriate heritage supervision and advice prepared/provided by a qualified heritage specialist/engineer.

Policy	Project consistency with policy	Assessment and recommendation
Policy 59 Undertaking works *Ensure all works to the site are undertaken by skilled tradespeople with experience working on heritage sites.*	**n/a**	In order to comply with Policy 59, all conservation or construction works to the Alexandra Canal embankment walls would be carried out under the supervision of a heritage specialist and by trades people qualified to work with heritage fabric. Strategies to ensure the Policy are met would be outlined in the Construction Environment Management Plan for the project.
Policy 60 Undertaking works *Ensure all environmental safeguards and approvals are undertaken prior to Conservation Works starting so that no damage is caused to the Alexandra Canal or curtilage. This must include requirements and impacts from the disturbance of contaminated sediments.*	**n/a**	In order to meet Policy 60 requirements, a Work Method Statement would be prepared prior to the commencement of conservations works within the Alexandra Canal curtilage or to its significant fabric. Strategies to ensure the Policy are met would be outlined in the Construction Environment Management Plan for the project.
Policy 61 Undertaking works *Continue to minimise silt and refuse intake into the catchment area of the Alexandra Canal and the Canal itself.*	**Consistent**	The project includes designs and guidelines for culverts and drainage outlets which minimise silt and refuse intake into the catchment area of the Alexandra Canal and the Canal. Therefore, requirements under Policy 61 have been met.
Policy 62 Undertaking works *Undertake a program of recovering and storing any dislodged sandstone for future conservation works on the Canal.*	**Consistent**	In order to meet Policy 62 requirements, a program would be designed to ensure that all original masonry removed during the establishment of drainage outlets be recovered and stored for future conservation works on the Canal. This is a recommended mitigation measure. Strategies to ensure the Policy are met would be outlined in the Construction Environment Management Plan for the project and implemented throughout the design and construction phase.
Policy 63 Undertaking works *All Broken Range Ashlar embankment walls of Alexandra Canal is to be conserved.*	**Not consistent**	In order to meet Policy 63 requirements, all Broken Range Ashlar embankment walls of Alexandra Canal are to be conserved where possible. However, works associated with the installation of a drainage outlet (04) west of the Mascot (Sheas Ck) Underbridge would directly impact these walls. Therefore, this component of the project is not in keeping with Policy 63.
Policy 64 Undertaking works *All items of High and Moderate Significance are to be conserved or restored to their original format.*	**Not consistent**	In order to meet Policy 64 requirements, consideration would be given to restoring or conserving fabric of high and moderate significance. For example, drainage outlets would be designed to be installed along rubble walls rather than original sandstone or concrete block walls. Although consideration would be given to conservation and restoration, it is likely that some impacts would be required to install the drainage into the canal walls.

Policy	Project consistency with policy	Assessment and recommendation
Policy 65 Undertaking works *All embankment wall fabric of little significance may be renewed with an appropriate material that is sympathetic with the significance of the Canal. A new membrane should be designed of the necessary engineering, aesthetic and ecological qualities required to form an embankment wall for the Canal. The new membrane should not try to mimic the original fabric but be designed in its own right so that it can be easily identified. The installation of the new membrane should reflect the original Canal form and course.*	**Consistent**	In order to meet Policy 65 requirements, designs associated with any works to embankments walls of little significance (rubble or shotcrete) would follow its specific recommendations. This is a recommended mitigation measure. Strategies to ensure the Policy are met would be outlined in the Construction Environment Management Plan for the project and implemented throughout the design and construction phase.
Policy 67 Undertaking works *No new structures should be constructed which rely on the Canal embankment walls for structural support*	**Consistent**	The project does not require the construction of new structures that would rely on the canal embankment walls for structural support. Therefore, Policy 67 has been met.
Policy 68 Undertaking works *All new pipes entering Alexandra Canal will follow the Engineering guidelines set down in "Strategic Bank Stabilisation Plan for Alexandra Canal" DPWS 2002. All existing pipes entering Alexandra Canal that are causing damage to the Gauged Bond Ashlar should be replaced so that they will follow the Engineering guidelines*	**Consistent**	The project requires the installation of nine new drainage outlets to enter the canal. It is therefore recommended that in order to meet Policy 68, the Strategic Bank Stabilisation Plan for Alexandra Canal prepared by DPWS in 2002 be followed.
Policy 69 Undertaking works *All new crossings of the Canal are to be set back off the embankment wall and cause no structural damage to the embankment wall during construction. All new crossings will allow for the Canal to be navigable for vessels with clearance of 2 m above Mean Spring High Tide and have pedestrian access to the bank.*	**Consistent**	It is understood that designs for the project have included provisions for bridges to be set-back from the embankment wall. The height of proposed bridges is not known. It is therefore recommended that requirements under Policy 69 be followed during the detailed design and planning phase for the project.
Policy 70 Archaeology *Recognise the potential presence and significance of archaeological remains within the site.*	**Consistent**	This SoHI contains a Non-Aboriginal archaeological assessment which recognises the potential presence and significance of remains (outlined in Section 0). This SoHI also includes recommendations and mitigation measures designed to avoid or minimise impacts on these features.

Policy	Project consistency with policy	Assessment and recommendation
Policy 71 Archaeology *Ensure excavation works are avoided in areas of archaeological sensitivity wherever possible. If excavation in these areas is SWC essential and are of a minor nature, ensure works are supervised by a qualified historical or Aboriginal archaeologist.*	**Consistent**	This SoHI contains a Non-Aboriginal archaeological assessment which recognises the potential presence and significance of remains (outlined in Section 0). This SoHI also includes recommendations and mitigation measures designed to avoid or minimise impacts on these features.
Policy 72 Archaeology *If major excavation works are proposed in areas of archaeological sensitivity, prepare an Archaeological Research design and make application under Section 57 of the Heritage Act for approval.*	**n/a**	As the project is being carried out under SSI, an application under Section 57 of the Heritage Act for approval is not required. However, in order to comply with Policy 71, appropriate measures would be taken to ensure any major excavation works in areas of archaeological potential would be appropriately managed.
Policy 73 Archaeology *Should artifact* [sic] *deposits be unexpectedly discovered during any unsupervised ground disturbance, cease work until the discovery can be assessed by a qualified historical or Aboriginal archaeologist. If necessary, make application under the Heritage Act to continue with excavation works in the area(s) of discovery.*	**Consistent**	This SoHI includes a requirement for the Roads and Maritime Services (now Transport for NSW) Unexpected Items Procedure (2015) to be implemented and followed for the duration of the construction program. Therefore, Policy 73 has been met.
Policy 74 Archaeology *Use artifact* [sic] *collections recovered during archaeological works to improve the understanding and interpretation of the site.*	**Consistent**	This SoHI includes a recommendation that appropriate heritage interpretation be incorporated into the design for the project in accordance with the *NSW Heritage Manual*, the *NSW Heritage Office's Interpreting Heritage Places and Items: Guidelines* (August 2005), and the *NSW Heritage Council's Heritage Interpretation Policy*. This would include provisions for any archaeological artefacts, materials or features recovered during archaeological management of the project.
Policy 75 Services *Locate new services in existing access trenches and conduits, to minimise disturbance of the landscape*	**n/a**	In order to meet requirements under Policy 75, it is recommended that areas of previous disturbance are considered where excavation is required. This would also include avoiding any potential intact archaeological remains or ground surfaces.
Policy 76 Services *New penetrations to the Canal should be kept to an absolute minimum and should be reviewed by a suitably qualified heritage professional and follow the Engineering guidelines included in "Strategic Bank Stabilisation Plan for Alexandra Canal" DPWS 2002*	**Consistent**	In order to meet requirements under Policy 76, consideration would be given to reducing the number of drainage outlets required to enter the canal through its existing embankment walls. Designs for these outlets would be prepared in consultation with a qualified heritage engineer or architect and follow guidelines outlined in the *Strategic Bank Stabilisation Plan for Alexandra Canal* (2002). This is a recommended mitigation measure.

Policy	Project consistency with policy	Assessment and recommendation
Policy 77 Disabled Access *Recognise that not all areas of the site will have disabled access and plan access accordingly as part of the overall management of the Canal including any interpretive viewing points and cycleways.*	**n/a**	In order to meet requirements under Policy 77, designs associated with publicly accessible areas along the Alexandra Canal including cycleways, shared paths and greenspaces would include provisions for disability access such as ramps, tactile surfaces and heritage interpretation strategies. This recommendation is outside the scope of the heritage assessment.
Policy 79 Recording and Interpreting Cultural Significance *The pattern of development of the place from Aboriginal occupation through first European settlement to the present day shall be interpreted.*	**Consistent**	This SoHI includes recommendations for appropriate heritage interpretation to be incorporated into the design for the project in accordance with the *NSW Heritage Manual*, the *NSW Heritage Office's Interpreting Heritage Places and Items: Guidelines* (August 2005), and the *NSW Heritage Council's Heritage Interpretation Policy*. This would include all aspects of the canal's Aboriginal and European occupation and use. In order to meet requirements under Policy 77, the above recommendations would be followed during the detailed design and construction phase of the project.
Policy 80 Recording and Interpreting Cultural Significance *Interpretation of the values of a place should be planned in collaboration with key stakeholders, including the local community as part of an overall strategy for conservation and tourism.*	**Consistent**	In order to meet requirements under Policy 80, the recommended heritage interpretation strategy would be prepared in collaboration with key stakeholders including Bayside, Sydney and Inner West Councils, Local Aboriginal Land Councils and local historical societies.
Policy 82 Recording and Interpreting Cultural Significance *Photographically record the site and Canal before, during and after any major changes and use this record in the site's interpretation. Place copies of this record with the Botany, South Sydney and Marrickville Library Local Studies Collection*	**Consistent**	As the project will require major alterations to the Alexandra Canal, this SoHI has recommended a PAR be carried out in accordance with the NSW Heritage Office's *How to Prepare Archival Records of Heritage Items* (1998), and *Photographic Recording of Heritage Items Using Film or Digital Captur*e (2006) prior to, and during (where feasible), the construction works. This is a recommended mitigation measure. In order to meet requirement under Policy 82 this would be submitted to the Bayside, Inner west and City of Sydney Council library's Local Studies Collection.
Policy 83 Recording and Interpreting Cultural Significance *Ensure interpretive material addressees all significant elements of the site's history, provisionally including: Natural, Aboriginal, Chinese, Industrial and Local Residents.*	**Consistent**	In order to meet this Policy, this SoHI has included recommendations that heritage interpretation include all significant elements of the site's history including natural, Aboriginal, Chinese, Industrial and Local Residents. This is a recommended mitigation measure.
Policy 85 Recording and Interpreting Cultural Significance *Ensure that the Maintenance Plan for the site includes policies for the cyclical maintenance of any interpretive media.*	**Consistent**	In order to meet requirements under Policy 85, this SoHI has included a provision in its heritage interpretation recommendation that a Heritage Management Plan be prepared to ensure any interpretative media be maintained.

Policy	Project consistency with policy	Assessment and recommendation
Policy 86 Recording and Interpreting Cultural Significance *Integrate the interpretation of this site with the interpretation of the surrounding area.*	**Consistent**	In order to meet requirements under Policy 86, this SoHI has included a provision in its heritage interpretation recommendation that any existing interpretation in the surrounding area be considered and incorporated into the strategy.

13.2.2 Sydney Airport Heritage Management Plan, 2009

The Sydney Airport Heritage Management Plan was prepared to comply with requirements under the Airports Act 1997 and manage the Sydney Airport site in accordance with its Commonwealth heritage values. It also provided guidance during the development of the Sydney Airport Masterplan (2009).

In 2018, an updated Heritage Management Plan (in draft) was prepared by Godden Mackay Logan for Sydney Airport Corporation Limited. As this plan was in draft at the time of preparing this SoHI, this document has reviewed the 2009 policies.

Management Policies from the Sydney Airport 2009 Heritage Management Plan relevant to this SoHI are outlined in below.

Table 13-14 Sydney Airport – Relevant Heritage Management Policies (2009)

Policy	Project consistency with Policy	Assessment and recommendations
Policy 7.4.2 Location, layout and form *The original urban form of Lauriston Park estate layout is a defining development pattern which should be respected and retained and should form an integral part of any development within the eastern area of the Domestic Precinct*	**Consistent**	The project would involve some modifications to the original Lauriston Park estate layout; however, these would be minor and the original street layout retained.
Policy 7.4.2 Location, layout and form *The layout, form and orientation of new roads and access routes should reflect current and associated alignment, in particular the relationship of Keith Smith Avenue to the Lauriston Park estate street layout.*	**Consistent**	The project would involve minor modifications of Keith Smith Avenue to the Lauriston Park estate street layout and existing alignments would be retained.
Policy 7.4.3 Setting and Landscape *An appropriate visual and physical setting should be maintained for the built elements of heritage value at Sydney Airport. The view corridors between individual heritage elements should be retained where possible.*	**Consistent**	The project would not involve the removal or alteration of any existing buildings considered to contain high or moderate heritage value within the Sydney Airport. No construction work within Sydney Airport would obstruct view corridor between individual elements.
Policy 7.4.8 Elements of Little Heritage Value *It is preferable that built or landscape elements with Little heritage value be retained and conserved, but they may be adapted through physical change or change of use.*	**Not Consistent**	The project will involve the removal of buildings considerate to contain Little heritage value. Therefore, requirements under this policy have not been met.

Policy	Project consistency with Policy	Assessment and recommendations
Policy 7.4.9 Elements of Neutral Heritage Value *Although it is possible that with some time elements of Neutral heritage value may develop higher levels of contributory heritage value to Sydney Airport, the following policies are appropriate for their management: Elements of Neutral heritage value may be retained or removed as convenient*	**Consistent**	The project will involve the removal of buildings considerate to contain Neutral heritage value. As the HMP permits their removal, these works are considered to meet requirements under the HMP policy.
Policy 7.5.1 New development in the Domestic Precinct *New development in the Domestic Precinct should respect identified heritage values, in particular the underlying urban form of the Domestic precinct represented by its road pattern and reflect the original street pattern of the Lauriston Park estate layout, former grid orientation and key views lines*	**Consistent**	The project would involve minor modifications to the Keith Smith Avenue to the Lauriston Park estate street layout. However, any existing alignments would be retained.
Policy 7.5.1 New development in the Domestic Precinct New development in the Domestic Precinct should: *include interpretation of the heritage value including significant structures and road alignments.*	**Consistent**	The preparation of a heritage interpretation strategy and heritage interpretation plan is included in the recommendation and mitigation measures section of this document. In order to comply with Policy 7.5.1, these would be prepared during the detailed design and construction phase and would reflect the history of Sydney Airport (including Lauriston Park estate) where required. This is a recommended mitigation measure for the project.
Policy 7.5.2 New development in the Qantas Jet Base Any new development in the Qantas Jet Base should: *be considered on the basis of a thorough understanding of heritage impact – on heritage structures in the vicinity and on Sydney Airport as a whole*	**Consistent**	This SoHI includes an assessment of heritage impacts on items within, and 150 metres outside of, the study area that would be impacted under the project. It also contains a cumulative impact assessment which discussed the removal of buildings associated with Sydney Airport. Therefore, requirements under Policy 7.5.2 have been met.
Policy 7.6.2 Historical Archaeology (Non-Indigenous) *In the event that any non-Indigenous archaeological remains are revealed during ground disturbance works at Sydney Airport, work should cease while the advice of an archaeologist is obtained*	**Consistent**	This SoHI includes a requirement for the *Roads and Maritime Unexpected Items Procedure* (2015) to be implemented and followed for the duration of the construction program. Therefore, requirements under Policy 7.62 have been met.

Policy	Project consistency with Policy	Assessment and recommendations
Policy 7.6.2 Historical Archaeology (Non-Indigenous) *Contractors should be made aware prior to any ground disturbing works commencing, If the potential for the survival of non-Indigenous relics. Provisions should be made for delays in the event that relics are exposed to allow for additional research and investigation of any archaeological features, if appropriate.*	**Consistent**	This SoHI includes recommendations that heritage inductions to be carried out prior to, and during, construction work for the project. This would be carried out with all contractors to ensure there is an understanding of the project's statutory heritage obligations and prevent impacts on potential archaeological remains.
Policy 7.6.3 Records and Collections *A comprehensive set of records relating to the development and history of the site should be kept should be kept on site, or in lieu thereof, index references to archival collection relating to the airport should be maintained and available at the site*	**Consistent**	As the project will require the removal of buildings within Sydney Airport and modifications to existing road corridors, this SoHI has recommended a PAR be carried out in accordance with the NSW Heritage Office's *How to Prepare Archival Records of Heritage Items* (1998), and *Photographic Recording of Heritage Items Using Film or Digital Captur*e (2006) prior to, and during (where feasible), the construction works. This is a recommended mitigation measure for the project. In order to meet requirements under Policy 7.6.3, this would be submitted to Sydney Airport upon the completion of works and catalogued and stored appropriately on site. This is a recommended mitigation measure for the project.
Policy 7.6.5 Archival Recording *As standard conservation practice, archival recording should be undertaken of buildings and movable elements with heritage values before and during any significant alterations or refurbishment works. Archival recording should not be considered to be an alternative to the conservation and maintenance of significant fabric. The aim of the archival recording is to record details of the site as it evolves and to capture any features that cannot be evaluated or understood except during the redevelopment of the site.* *As there is no Commonwealth standard, the archival recording should be undertaken in accordance within the standards identified in the NSW Heritage Office guidelines How to Prepare Archival Records of Heritage Items (1998) and the Photographic Recording of Heritage Items Using Film or Digital Capture (2006).*	**Consistent**	As modifications will be made to Sydney Airport's existing landscape and buildings will be removed, an archival recording must be carried out prior to and during the project to adhere to this policy. This is a recommended mitigation measure for the project.

13.2.3 Maritime Container Services Cooks River Intermodal Terminal Heritage Items Maintenance Plan, 2018[84]

The Maritime Container Services (MCS) Cooks River Intermodal Terminal Heritage Items Maintenance Plan was prepared to ensure items of heritage significance within the Cooks River Intermodal Terminal site are sufficiently maintained.

The Heritage Management Plan does not address impacts on sight lines to or from these items as a result of future development. Instead, it outlines key maintenance and management requirements for the buildings and includes 0.5–2 metre buffer zones around each item.

As the study area is outside of theses buffer zones, the Project is considered to comply with management policies in the document.

[84] MCS Cooks River Intermodal Terminal Heritage Items Maintenance Plan, 2018. Version 1.4. Prepared for Qube Logistics and maritime Container Services.

13.3 Appendix C – Historical Background

13.3.1 Aboriginal occupation

The study area is within the lands of the Metropolitan Local Aboriginal Land Council (LALC) and closely associated with the Cooks River. The Cooks River played a vital role in the life of Aboriginal people prior to – and after – European arrival. Occupation along the river is thought to have begun tens of thousands of years ago when sea levels were lower and the environment vastly different to the landscape we see today. As the environment changed in the between eighteen to five thousand years ago, water levels receded, and Botany Bay was formed.[85]

Archaeological remains of a butchered dugong along today's Alexandra Canal (uncovered during its construction); middens containing oysters, cockles and mussels at Kendrick Park, Tempe and hearth stones with residual fish fat found on hearth stones at Randwick provide evidence for the types of resources available during this period.[86]

Broadly, Aboriginal people in the area practiced a predominantly mobile lifestyle, often within the bounds of estate and range (country). Where seasonal abundances occurred, groups (or bands) likely remained in one place longer to utilise these resources, to share them with visiting groups, and to take part in the social and religious activities that could be undertaken when sufficient food was at hand. As is thematically evident from early sources, including Tench, the elements of landscape that were most attractive to European colonists were often the camping places and resources of the Aboriginal people.[87] From earliest contact with Europeans, Aboriginal people in the Sydney area were driven from their preferred areas of habitation by colonists eager for their resources.

Figure 13-1 Botany Bay, NSW in c1842 by John Skinner Prout. Source. National Library of Australia (NLA).

[85] Attenbrow, V. 2010. *Sydney's Aboriginal Past: Investigation the Archaeological and Historical Records*, University of New South Wales Press, Sydney, pp 37–39.
[86] Irish, P, 2013. *First people of the Cooks River*, Dictionary of Sydney, 2013, http://dictionaryofsydney.org/entry/first_people_of_the_cooks_river, viewed 28 Nov 2018
[87] Tench, W. 1789. Sydney's First Four Years: Being a reprint of 'A narrative of the expedition to Botany Bay' and 'A complete account of the Settlement at Port Jackson', Angus & Robertson: Sydney.

13.3.2 Early exploration of the region

Land within Botany Bay, Mascot and Tempe was first explored by Europeans in 1770 when Captain James Cook, the *Endeavour's* botanist Joseph Banks, and assistant Daniel Solander visited the area.[88] The group journeyed inland by foot for three to four miles describing the landscape as “mostly a barren heath diversified with marshes and Morrases”. Upon the arrival of the First Fleet eighteen years later, Lieutenant King observed Botany Bay and the surrounding environment as consisting “chiefly of deep bays and sandhills, interspersed with a vast number of rocks”, much like the landscape illustrated in Figure 13-2.[89] Dr George Worgan, a naval surgeon who had accompanied King on the journey, concluded that “on the whole it was tedious”.[90]

Although sparsely vegetated, woodlands containing cabbage tree palms, mahogany trees, blackbutts and eucalypts occupied low lying ground east and south of the study area. These attracted timber getters early on.[91] A water system known as the Botany Wetlands dissected land to the east of the study area. Another primary water course – Sheas Creek – ran through Section A and B. Together these formed Sydney’s largest freshwater resource at the time.[92]

Figure 13-2 View near Botany Bay towards Sydney by William Leigh in 1853 showing the natural environment at the time. Source. State Library of NSW (SLNSW).

[88] Butler, M, 2011. Dictionary of Sydney: Botany. Accessed online at: https://dictionaryofsydney.org/entry/botany#ref-uuid=6eae1772-7b4e-77cf-d9d8-1da1f7176317 on 16/08/2018.
[89] Lawrence, J. 2001. A Pictorial History of Randwick, p. 2.
[90] Lawrence, J. 2001, p. 2.
[91] Cumming, S. 2004. Post-European environmental impacts in Green Square in Histories of Green Square, p. 13.
[92] City of Botany Bay Council, 'Botany Wetlands: a guide to the Botany Wetlands', undated brochure, p 2

13.3.3 Phase 1 – Early occupation and land use (circa 1796–1830)

Phase 1 occupation is associated with early European settlement and land grants along the Cooks River and Botany Bay alongside the establishment of early forms of industry such as timber getting, the collection of shells for lime production, pastoralism and agriculture.

13.3.3.1 Early land grants

13.3.3.1.1 SECTION A AND B

During the early years of settlement, land in and surrounding Tempe, St Peters, Botany and Mascot comprised thick scrub and forest, marshy swamps and sand banks. These were dissected by streams and creeks associated with Sheas Creek and the Cooks River (illustrated in Figure 13-3 and Figure 13-4).

Section A was located within what was once the mouth of the Cooks River, as shown in Figure 13-4 and consequently unoccupied until the late 19th century. Section B was located immediately east of Thomas Smith's (also known as Smyth) 470 acre allotment, granted to him in 1796 and which would eventually become the Village of Tempe. Smith's grant represented a 'southward spread of the colony towards Botany Bay' in the late 18th century.[93] It was taken over by merchant Robert Campbell in 1808 following Smith's death in 1804 and the land was leased to graziers and farmers.[94] In 1810 the Cooks River Road (today's Princes Highway) was established alongside a dam and crossing over the Cooks River (located about 500 metres southwest of the study area). This is visible in Figure 13-5. The advent of this new transport route promoted settlement in the area and allowed goods to be transported from surrounding farms into town.[95]

Land within Sections A and B of the study area remained unoccupied at this time, although informal land use such as timber getting is likely to have taken place in wooded areas.

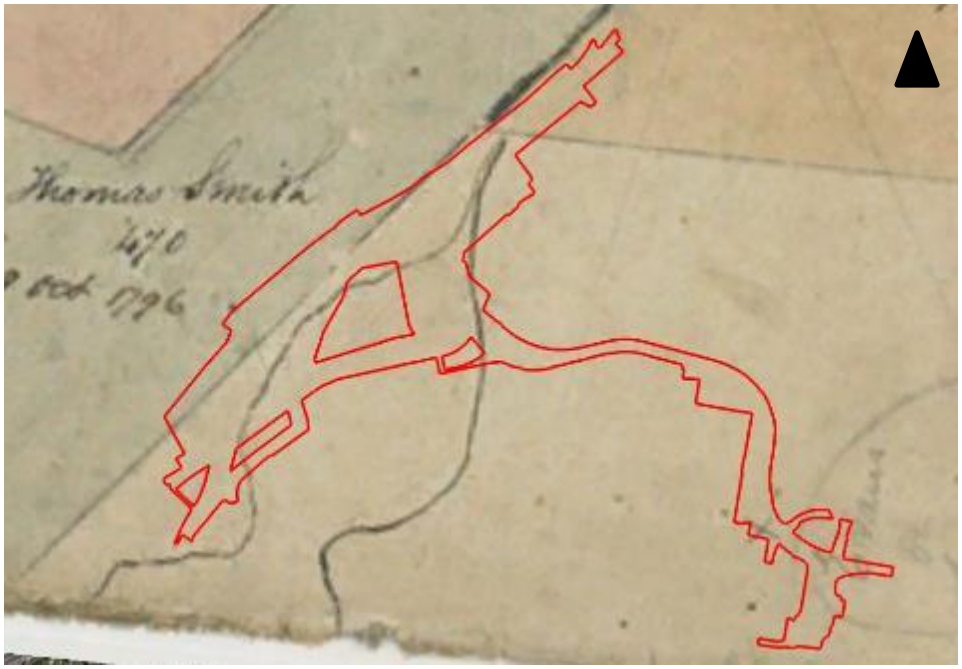

Figure 13-3 1833 or 1834 plan of the Alexandria and Petersham parishes showing indicative location of Smyths grant and extent of the Cooks River within the study area. Source. State Library of NSW.

[93] Costin, C. 2003. The Changing Landscape of Smyth's Land Grant From 1788-1900, p. 41.
[94] Costin, C. 2003. The Changing Landscape of Smyth's Land Grant From 1788-1900, p. 43.
[95] Costin, C. 2003, p. 44.

13.3.3.1.2 SECTION C

The eastern extent of Section C (now occupied by the intersections of O'Riordan Street, Robey Street, Qantas Drive and Sir Reginald Ansett Drive), was located within two 30 acre grants given to ex-convicts Andrew Byrne and Mary Lewin in September 1809 (Figure 13-4).[96] These were dissected by the Old Botany Road (now O'Riordan Street). The western extent was not unoccupied during this period.

Byrne appears to have married Mary Lewin in 1812; however, Mary died two years later at the age of 45.[97] Various newspaper reports suggest that Byrne established a farm called 'Sea View' or 'Byrne's Bush' on his property, while Mary's allotment was called 'Newcastle'.[98] Byrne produced lime on his property using 'botany shells' that were collected from Aboriginal middens along the shoreline of Botany Bay.[99] Byrne put his property up for sale in 1819.[100] It is not known whether any structures occupied land within the study area during this period.

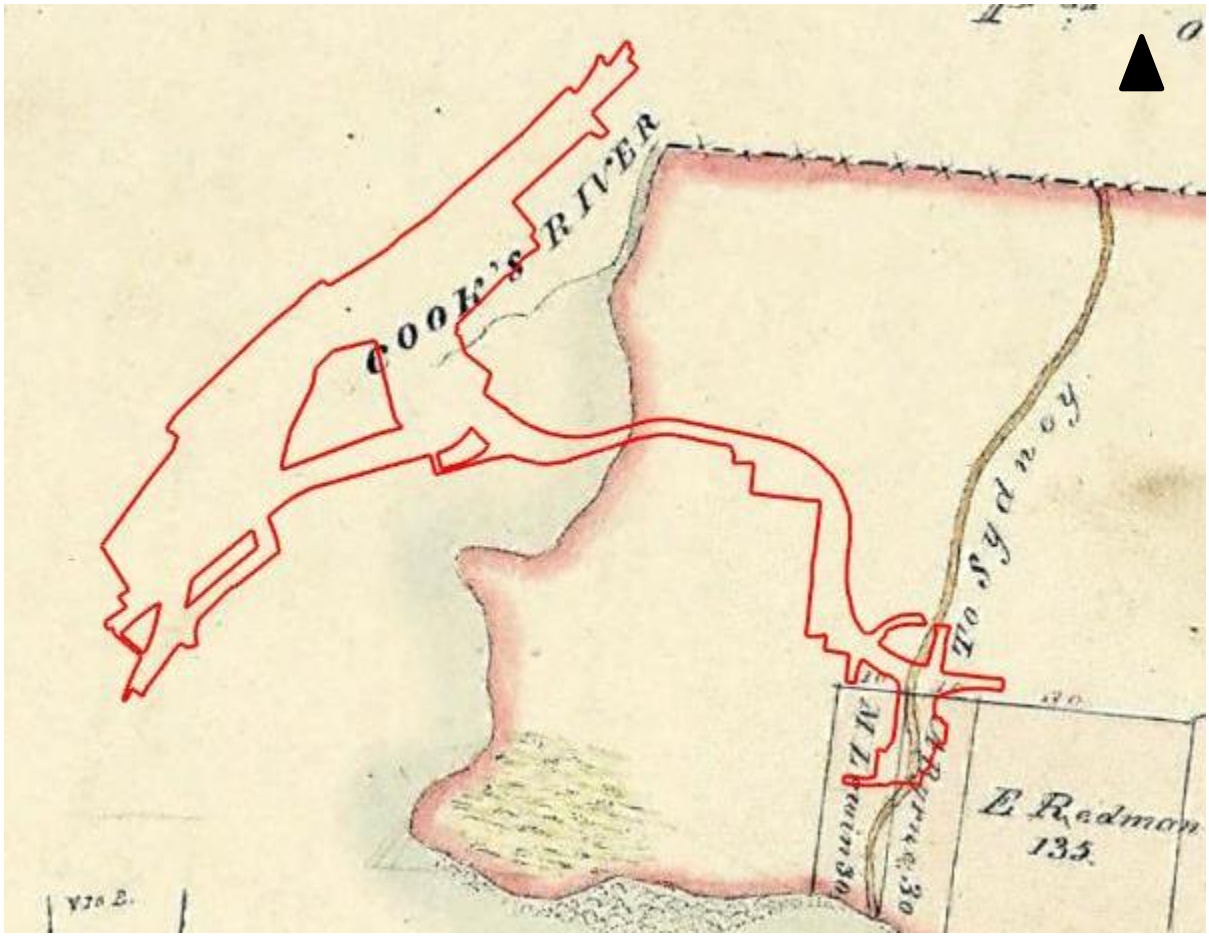

Figure 13-4 Undated parish of Botany plan showing early land grants within Section C of the study area. Source. State Library of NSW.

[96] OEH, SHI listing for the Botany Fire Station. Accessed on 15/02/2019 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=1210005.
[97] Australian Royalty, n. d. Mary Lewin. Accessed online on 15/02/2019 at: https://australianroyalty.net.au/individual.php?pid=I7123&ged=purnellmccord.ged
[98] Horton, R. n. d. Botany Exhumed, pp. 5, 7-8. Accessed online on 12/02/2019 at: http://13.55.60.193/sites/default/files/2017-10/Horton_Robert_Entry_0.pdf
[99] Horton, R. n. d., p. 9 and Sippel, J. 2013. Booralee fishing town, Dictionary of Sydney. Accessed online on 15/02/2019 at http://dictionaryofsydney.org/entry/booralee_fishing_town.
[100] Sydney Gazette, Saturday 6 March 1819, Advertisements, p 2.

13.3.4 Phase 2 – Market gardens and noxious industry (c1830–1870)

13.3.4.1 Sections A and B – Gentleman's Estates and farming

Robert Campbell subdivided and sold Smith's allotment in the 1830s. It was during this period that Tempe House was established on A B Spark's grant, adjoining Smiths to the west. Although outside of the study area, it was this property that gave the suburb of Tempe its name. This period also represents the establishment of various 'Gentlemen's Estates' occupied by grand villas that were built along the Cooks River in the 1830s, west of the study area.[101]

Sheas Creek, which wound its way through Section A and B, was flanked by swamps, mudflats and marshes in areas close to the Cooks River. As noted in Section 13.3.3, Europeans would collect shells from the many Aboriginal middens and cheniers along its banks during the early years of settlement. These were then used to produce lime for mortar and subsequently the construction of various buildings in colonial Sydney.[102]

The Tempe Estate was subdivided and put up for sale in 1856. Interest was low and the property was subdivided again in 1859 and sold to brothers Patrick and Thomas Maguire (or McGuire), as shown in Figure 13-5 and Figure 13-6. A plan prepared at the time shows Section A within their land holdings and Section B belonging to F Mitchell (Figure 13-5). Land within the study area was described as 'mud flats with mangroves' in the plan and an embankment can be seen running parallel to the river. No structures are shown to occupy the study area at the time. A parish map prepared after 1859 shows land within Section B was later owned by Thomas Holt (Figure 13-6).

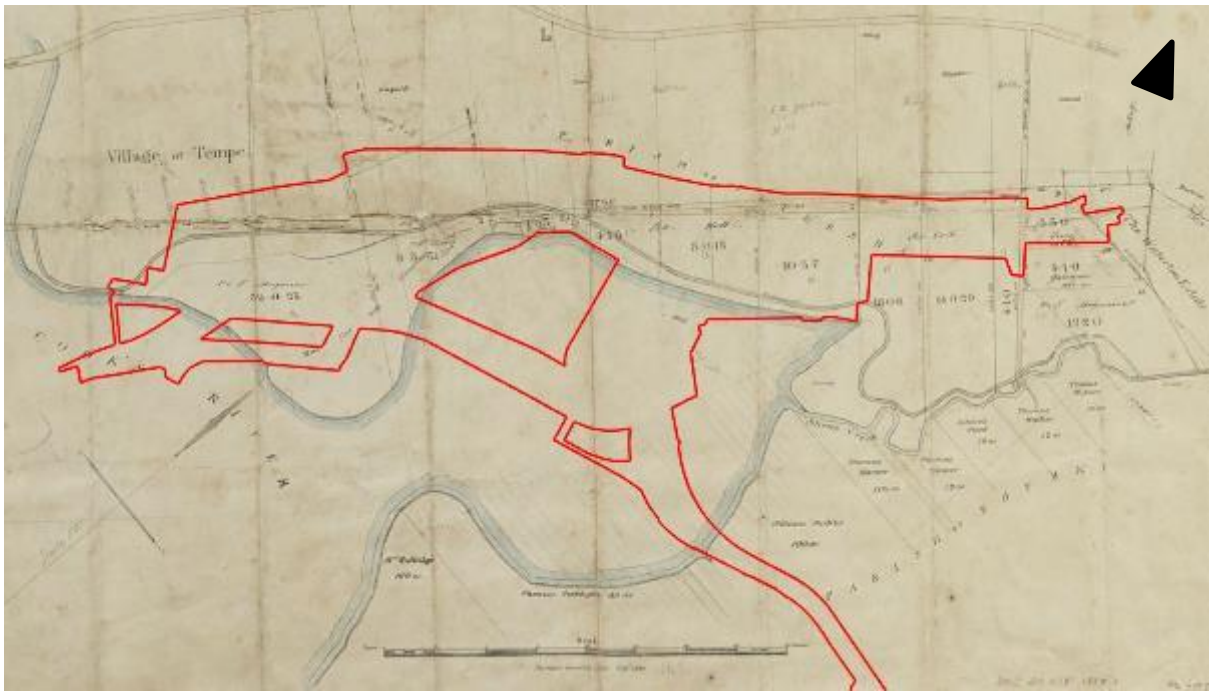

Figure 13-5 Plan of portions 1 to 11 at Sheas Creek Cook's River, prepared in March 1859 showing nine allotments and an embankment to the west of the Cooks River. The Cooks River Road is also visible. Source. State Library of NSW.

[101] Costin, C. 2003, p. 49.
[102] Ringer, R. 2013. From Sheas Creek to Alexandra Canal, Dictionary of Sydney, http://dictionaryofsydney.org/entry/from_sheas_creek_to_alexandra_canal, viewed 29 Nov 2018

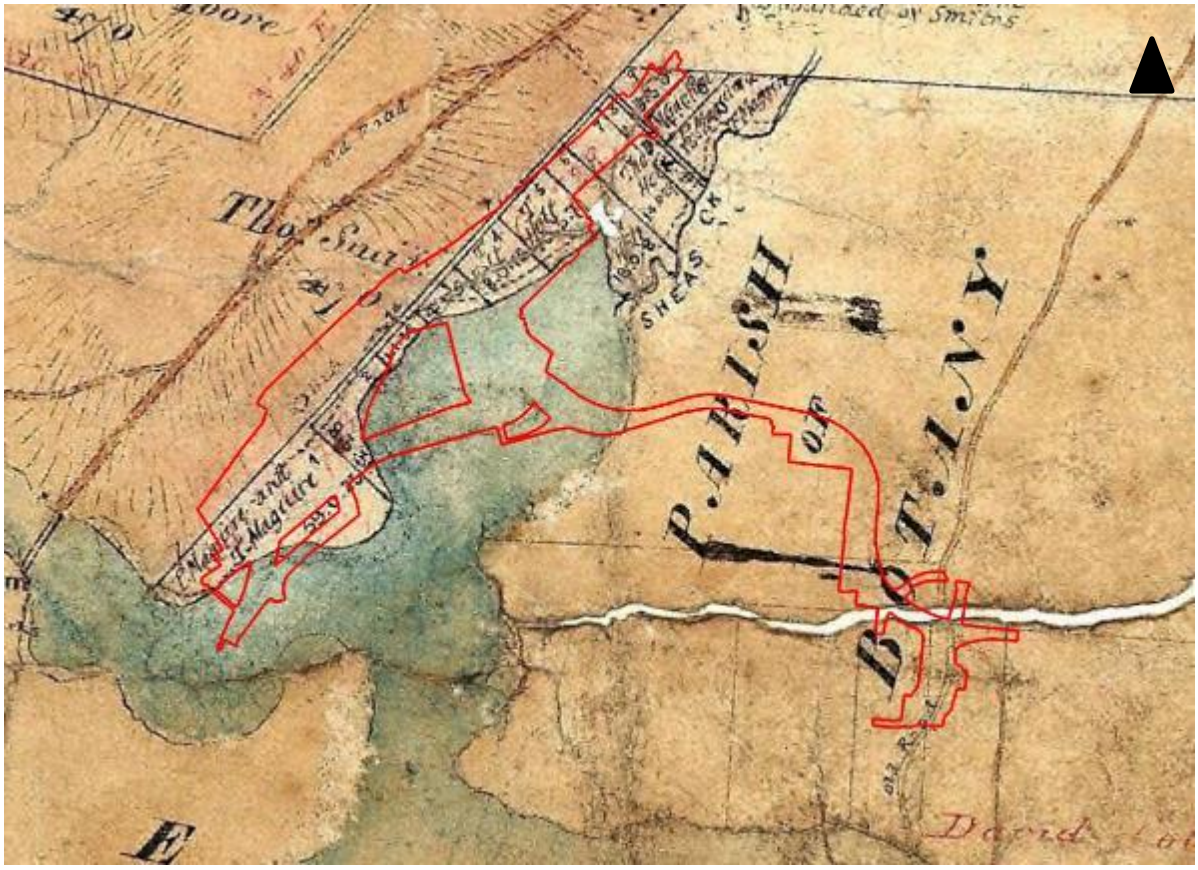

Figure 13-6 Undated parish of Lewisham map showing nine allotments along Cooks River and Thomas Smith's 470 acre grant. Source. Land Registry Services (LRS)

13.3.4.2 Section C – Land grants and market gardens within the Botany and Mascot area (1830 onwards)

Land within Section C appears to have been formally granted to Thomas Stubbs (100 acres), Thomas Torkington (50 acres) and J R Hatfield (89 acres) by 1850 (alongside the Byrne and Lewin grants), as shown in Figure 13-4, Figure 13-7 and Figure 13-11. Land use associated with these grants is unknown, however they may have been used for market gardens.

Market gardens were first established around Botany and Mascot in the 1830s and became common in the 1870s following the end of the Gold Rush and accompanying influx of Chinese immigrants.[103] Market gardens became so popular that Botany was known as Sydney's 'backyard vegetable garden' by the early 20th century.[104] 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. This relationship is most evident in an aerial photograph taken in 1943 and shown in Figure 13-20.

Due to Mascot and Botany's sandy soils, 'night soils' and sewerage were often used as a fertiliser. This were generally collected from cesspits and earth closets by night soil carters and dumped at a night soil depot near the Victoria Barracks or sold directly to market gardeners.[105]

[103] Butler, M., 2011 and Tyrrell, I. 2018. *River Dreams: The people and landscape of the Cooks River*, p. 72.
[104] Larcombe, F. 1970. *The History of Botany 1788–1970*, The Council of the Municipality of Botany, Mascot, p 10.
[105] Asset Management and Sydney Water Corporation, 2003. *Botany Wetlands Draft Conservation Management Plan*, p. 17.

As cesspits were often used to discard general household waste, archaeological remains of these early market gardens are likely to contain 19th century rubbish collected from households across the city.[106]

The general arrangement of a market garden property comprised of what were likely living quarters and sheds along the allotment boundary – fronting onto private access roads for each lot. The gardens themselves were located to the rear of the buildings and took up most of the land. These were divided into smaller cultivation fields with drainage channels running along their borders. No market gardens were located directly along the southern banks of Sheas Creek due to the nature of soils in the area. However, land to the north of Canal Road and south-east of Section B, where the creek was narrow, was occupied by Chinese market gardens in the 1880s.

Figure 13-7 1853 plan of the Parish of Botany showing the Lachlan and Botany watersheds and grants within Section C of the study area. Source. National Library of Australia.

13.3.4.3 Sections A, B and C – Noxious industries (1848 onwards)

The mid-19th century saw significant changes to land use in and around the study area which was heavily influenced by the introduction of the 1848 *Noxious Industries Act*. The Act pushed industries out of the city limits and into Botany, Tempe, St Peters and Mascot. Soon, Botany, Mascot, Tempe and St Peters was being heavily utilised for wool washing, meat works, candle works, leather tanning, paper making, soap making, boiling down works and brick making.[107] Many of these industries were established along Sheas Creek and the Cooks River.

[106] Gojak. D. pers. comm. Email, Friday 21/09/2018.
[107] Lawrence, J. 2001. p. 9 and Thorp, W. 1999. Archaeological Assessment. Former Chubb Factory Site, Waterloo. Prepared on Behalf of St Hilliers Pty Ltd, p. 11.

13.3.5 Phase 3 – Establishment of the Alexandra Canal, market gardens, Municipalities, industrial and residential development (1870–1919)

13.3.5.1 Sections A and B – Formation of the Municipalities and evolution of the brick industry

Following the introduction of the *Municipalities Act* of 1867, St Peters council was proclaimed in 1871 (Sections A and B) and the Borough of North Botany was proclaimed in 1888 (Section C). By the 1880s, large scale subdivision activities were occurring in the Tempe and St Peters areas, and the majority of the large Gentleman's Estates were broken up to make way for residential allotments.

13.3.5.2 Section A

Land within Section A comprised undeveloped swamp land during this phase, as illustrated in Figure 13-10 and Figure 13-13. The only structures in the area consisted of storage tanks and industrial buildings immediately north of the Alexandra Canal and west of the Botany Rail Line. Their construction date and use are unknown; however, they were likely associated with early 20th century industry. Clay pits (serving the brick industry) and a gravel quarry established in the late 1800s and occupied the northern boundary of the study area in land now associated with the IKEA carpark and Tempe Park.

By around 1910, the former quarries were being used as a landfill site where domestic and industrial waste was dumped until the 1970s.

13.3.5.3 Section B

By 1890, there were eighteen dairies in St Peters, however it was becoming increasingly industrial and predominantly consisted of brickworks.[108] Development of the brick making industry had a strong influence on the built landscape during this period, primarily due to the large amount of land required to manufacture and extract the clay itself (an activity that required large clay open area clay pits to be dug into adjoining land).[109]

Although the study area itself was not occupied by brick pits, the easternmost extent of Section B abutted the St Peters brickworks which was bounded by Campbell Road, the Princes Highway and Canal Road, as shown in Figure 13-8. Land within the study area appears to have been used for market gardening purposes in the early 20th century, as evidenced by an aerial photograph taken in 1930 (Figure 13-19). The house associated with the gardens is located just outside of the study area, to the south.

A later aerial photograph taken in 1943 shows part of Section B (now occupied by 30 Canal Road) occupied by warehouses (Figure 13-20). A series of buildings constructed after 1930 are also shown in the 1943 aerial, immediately east of Canal Road. These were associated with the St Peters Brickworks and may have been use for brick production or administrative purposes. This area is now occupied by the WestConnex stockpile area shown in Figure 13-76. Land west of the warehouses at 30 Canal Road continued to be used as a market garden. The Botany Rail Line extended along Section B's western boundary.

[108] Costin, C. 2003, p. 77.
[109] Costin, C. 2003, p. 81.

Figure 13-8 1970 aerial photograph showing the extent of the St Peters brickworks pits immediately north-east of Section B and buildings associated with the brickyard within the study area, east of Canal Road.

13.3.5.4 Sections A, B and C – Establishment of the Alexandra Canal (1880s-1919)

13.3.5.4.1 EARLY CONSTRUCTION PHASES

Construction of the Alexandra Canal began in an ad hoc fashion and was driven by efforts to reduce contamination in Sheas Creek. The watercourse had been utilised as a wastewater outlet by surrounding industry for over four decades. Dredging was carried out at the junction of Sheas Creek and the Cooks River, immediately south of the Botany Rail Line in 1887. Further dredging was carried out under unemployment relief schemes established during the 1890s depression.[110]

In 1889, the southern extent of Sheas Creek, near today's Tempe Recreation Reserve, was widened to 61 metres and the surrounding mud flats reclaimed (as shown in Figure 13-11).[111] This practice continued into the 1890s and suggests that large portions of land on either side of the canal would comprise redeposited spoil laid over (and effectively capping) the original swamp and marshland. Fascine dykes and floodgates were also established near Ricketty Street at the time.[112]

13.3.5.4.2 CONSTRUCTION WORKS

The year 1891 saw major construction works begin for the canal. This involved formalising Sheas Creek and land along the mouth of the Cooks River to create a wider and deeper channel which could be used to transport goods up and down the canal.[113] Excavations occurred on either side of Sheas Creek and spoil material was used to raise the ground level above the high tide line to provide level

[110] Ringer, R. 2013. From Sheas Creek to Alexandra Canal.
[111] Alexandra Canal, CMP. 2009, p. 11.
[112] Alexandra Canal, CMP. 2009, pp. 9-13.
[113] Ringer, R. 2013.

ground for surrounding industries. Sandstone blocks were then used to form a 45 degree angled bank along either side with rubble placed at the base of the walls (see Figure 13-9). Sandstone was also laid at the Sheas Creek and Cooks River Junction and bascule bridges were built along the canal – the latter have since been removed. Various wharves were also constructed along the canal between 1892 and the early 1900s.[114] These were located outside of the study area, to the north.

Originally designed to join the Cooks River with the Parramatta River, the depression of the 1890s halted works and construction never extended past Huntley Street, Alexandria (about 1.5 kilometres north of the study area). Despite this set back, the canal allowed surrounding creeks and swamps to be drained and consequently created land that could be used for further industrial activities and residential development especially in Waterloo and Alexandria.

Unfortunately, the canal's tendency to collect silt deposits at its base made the movement of large vessels impossible at low tide. Dredging was regularly carried out to address this issue; however, the silt would eventually return.[115] As a result, the canal was never used for its original purpose and eventually became a waste and stormwater outlet for surrounding industrial and residential development.

13.3.5.4.3 PREHISTORIC DISCOVERIES

Excavations for the canal uncovered remains of early Aboriginal occupation along the watercourse including butchered 7,000 year old dugong bones, two stone hatchets and remains of "an ancient forest in estuarine clays below the low tide level".[116] These were found several metres below the creek bed and examined by palaeontologist and curator at the Australian Museum Robert Etheridge and government palaeontologist William Dun (illustrated in Figure 13-12).

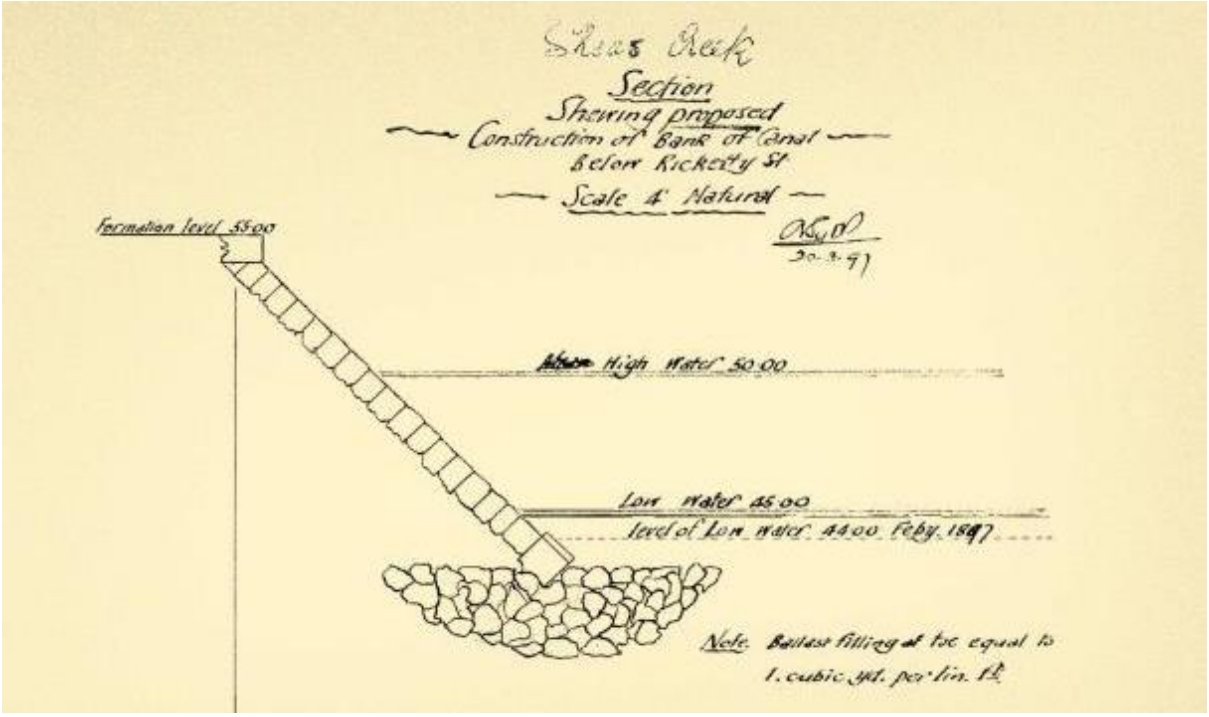

Figure 13-9 Alexandra Canal Wall cross section diagram illustrating the proposed construction of the canal's bank before Rickety Street and ballast filling at the base of the canal walls. Source. Sydney Water.

[114] Alexandra Canal, CMP. 2009, p. i.
[115] Ringer, R. 2013.
[116] Ringer, R. 2013.

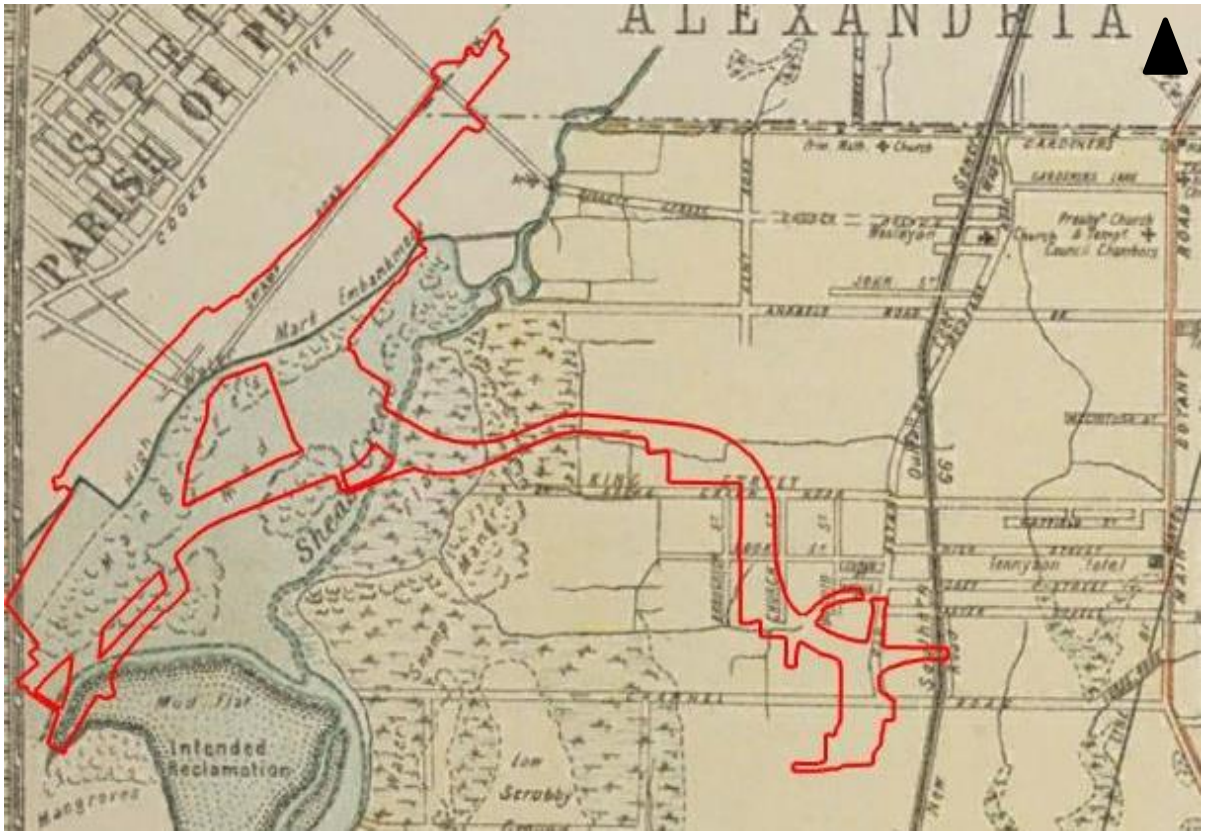

Figure 13-10 Higginbotham and Robinson plan prepared in 1880-1899 showing the nature of the study area prior to the construction of the Alexandra Canal. Source. State Library of NSW.

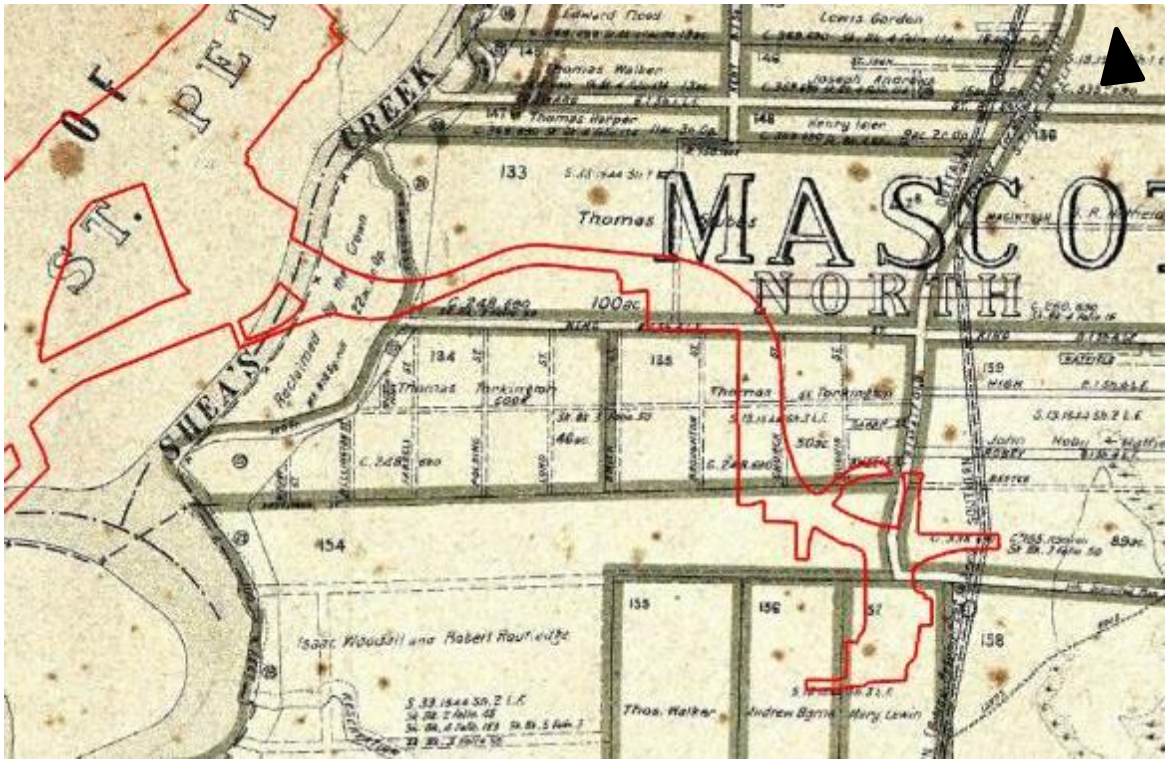

Figure 13-11 1898 parish map showing the newly established Alexandra Canal, location of land reclaimed by the Crown to the east of Sheas Creek and various subdivisions within Section C of the study area. The Main Southern Outfall Sewer alignment can be seen running along the easternmost extent of the study area. Source. Land Registry Services.

Figure 13-12 William Sutherland Dun excavating dugong remains at Sheas Creek for the Alexandra Canal 1896. Source. Australian Museum.

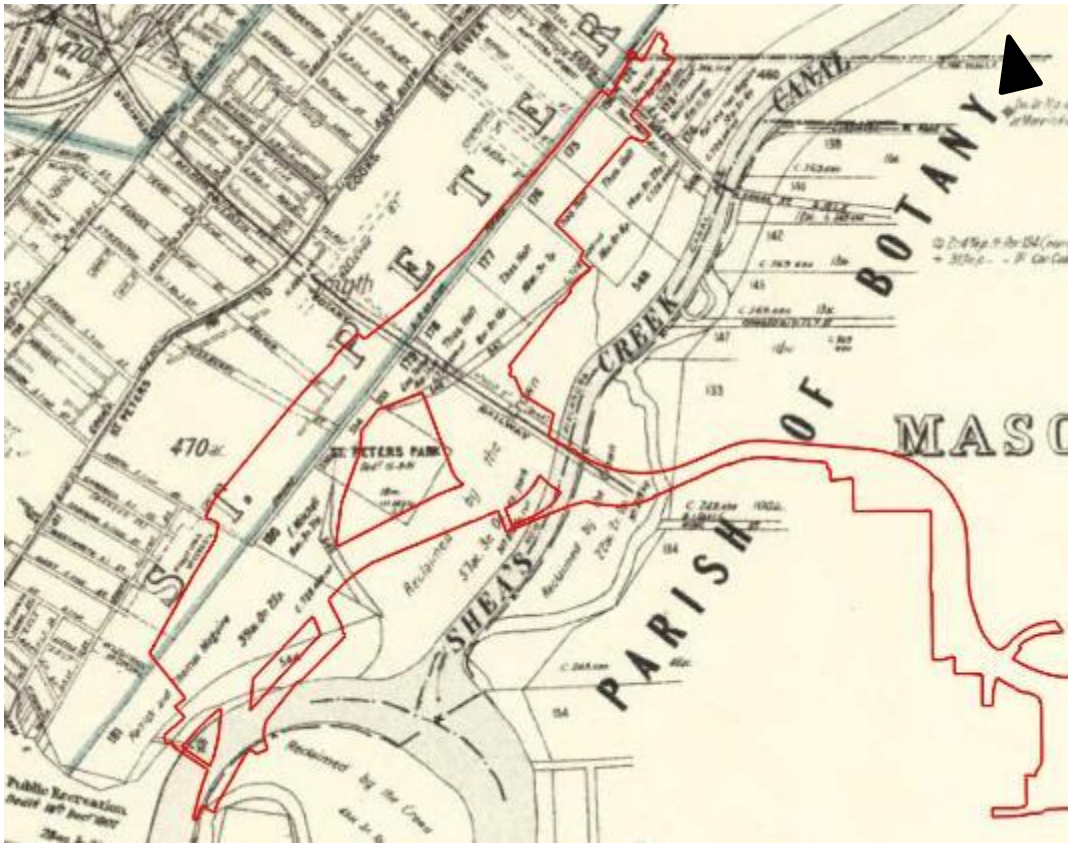

Figure 13-13 1916 parish map showing development within Sections A and B of the study area. Part of Mitchell's grant had been reclaimed by the Crown while six allotments in Section B had been granted to Thomas Holt. The Botany Rail Line is also recorded. Source. State Library of NSW.

13.3.5.5 Sections B and C – Construction of the Botany Rail Line

The Botany Rail Line was approved in 1863 and completed in 1925 (Phase 4).[117] It was designed to carry goods from Sydney's western industrial sites (more specifically a new abattoir in Homebush) to tanneries at Botany and shipping services at Port Botany[118]. Although partially constructed by 1915, it wasn't until an additional line linking Marrickville to Botany was completed in 1925 that the route was finally opened.[119] All culverts and major earthworks were almost completed in 1922 and all steel bridges were completed by 1924.[120]

These included a reinforced concrete bridge over O'Riordan Street and a bascule bridge over the Alexandra Canal (today's Mascot (Sheas Creek) Underbridge). The O'Riordan Street Underbridge was the first reinforced concrete underbridge constructed in NSW.[121] The line was completed at an estimated £241,000 – £377,000 over its original budget.[122] The extent of the line within the study area during Phase 3 is shown Figure 13-16 and Figure 13-19.

13.3.5.6 Section C – Market gardens and Lauriston Park

13.3.5.6.1 MARKET GARDENS

While works were ongoing for the Alexandra Canal, a plan prepared in 1887 shows land on either side of O'Riordan Street (formerly Mudbank Road) occupied by market gardens (recorded as vegetable gardens) and associated structures (Figure 13-14).

Two structures occupy the study area; one within Lot 47 and one within Lot 48. These are divided by a 'levee on mud wall'. A sewer can be seen running in a north-south alignment to the east of Mudbank Road (now O'Riordan Street).

13.3.5.6.2 LAURISTON PARK

Land within what is now Sir Reginald Ansett Drive, Ninth Street and Eleventh Street was occupied by the Lauriston Park subdivision, which was surveyed by EH Cowdry in 1902. The subdivision was designed to accommodate working-class men and women, many of whom were employed by industries along the Cooks River, such as wool-scouring factories, tanneries and Wimbles Inks Factory as well as the nearby Ascot Racecourse and the airport (Figure 13-15, Figure 13-19 and Figure 13-24).[123]

The subdivision comprised three blocks of fibro and weatherboard houses bounded by Channel Street to the north (not Ross Smith Street), Vickers Road (formerly Lord's Road) to the south and the present day Ninth Street (then Roslyn Street) and Tenth Streets (then Melrose Street) to the east and west, receptively.[124] The estate constrained four shops – two on Melrose, one on Roslyn Street and one on Ross Smith Avenue.

Lauriston Park was gradually resumed for Sydney Airport expansion from 1947 onwards. The estate's last residents were moved out in 1990 to accommodate the construction of a third runway.[125]

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[117] Butler, M, 2011.
[118] Pollard, N, 1988. *Offal, Oil and Overseas Trade: The Story of the Sydenham to Botany Railway*. Australian Historical Society New South Wales Division, p. 4.
[119] Butler, M, 2011.
[120] Pollard, N, 1988, p. 7.
[121] Drew, D. 11 October 2002. *The History and Development of the Botany Goods Line*, p. 48. Permanent Way Institute Inc, Convention Journal.
[122] Pollard, N, 1988, p. 7.
[123] GML, 2009. Sydney Airport Heritage Management Plan, p. 10, PocketOz, 2017 and Allen Windross, 2004. Growing up on the Lauriston Park Estate, Sydney. Reminiscences by Allen Windross. Accessed online on 07/02/2019 at: http://www.adastron.com/adastra/people/lauriston-park.htm
[124] GML, 2009, p. 10.
[125] GML, 2009, p. 11.

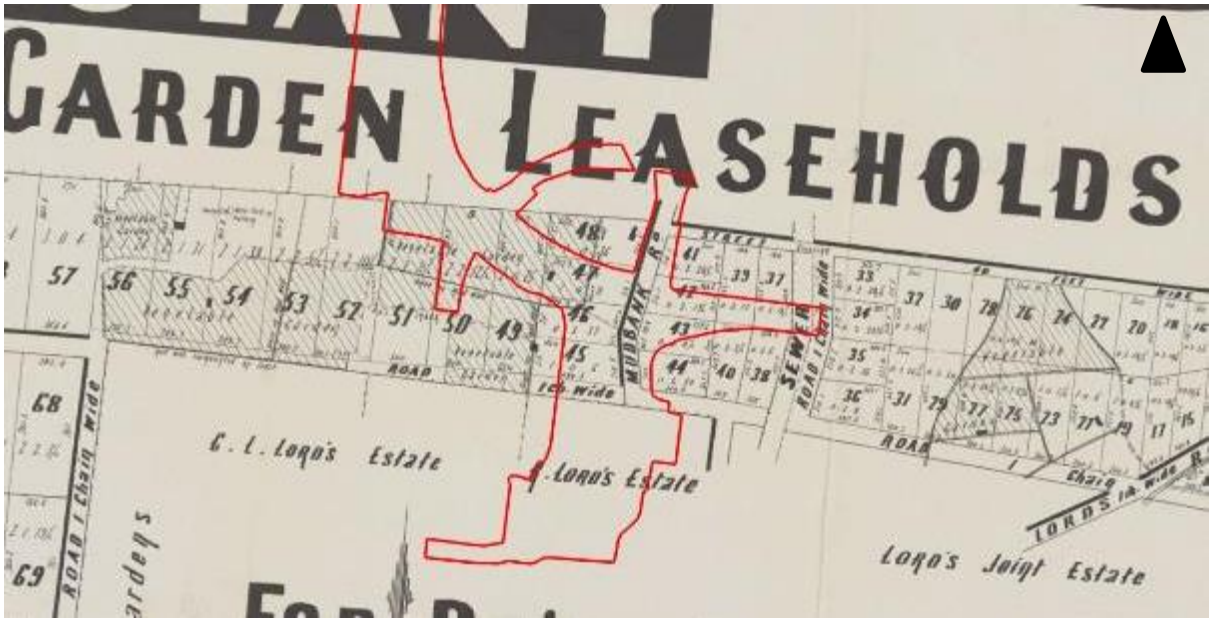

Figure 13-14 c1887 plan showing Edward Lord's Estate and Botany market garden leaseholds within Section C of the study area, Richardson & Wrench, auctioneers. Source. National Library of Australia.

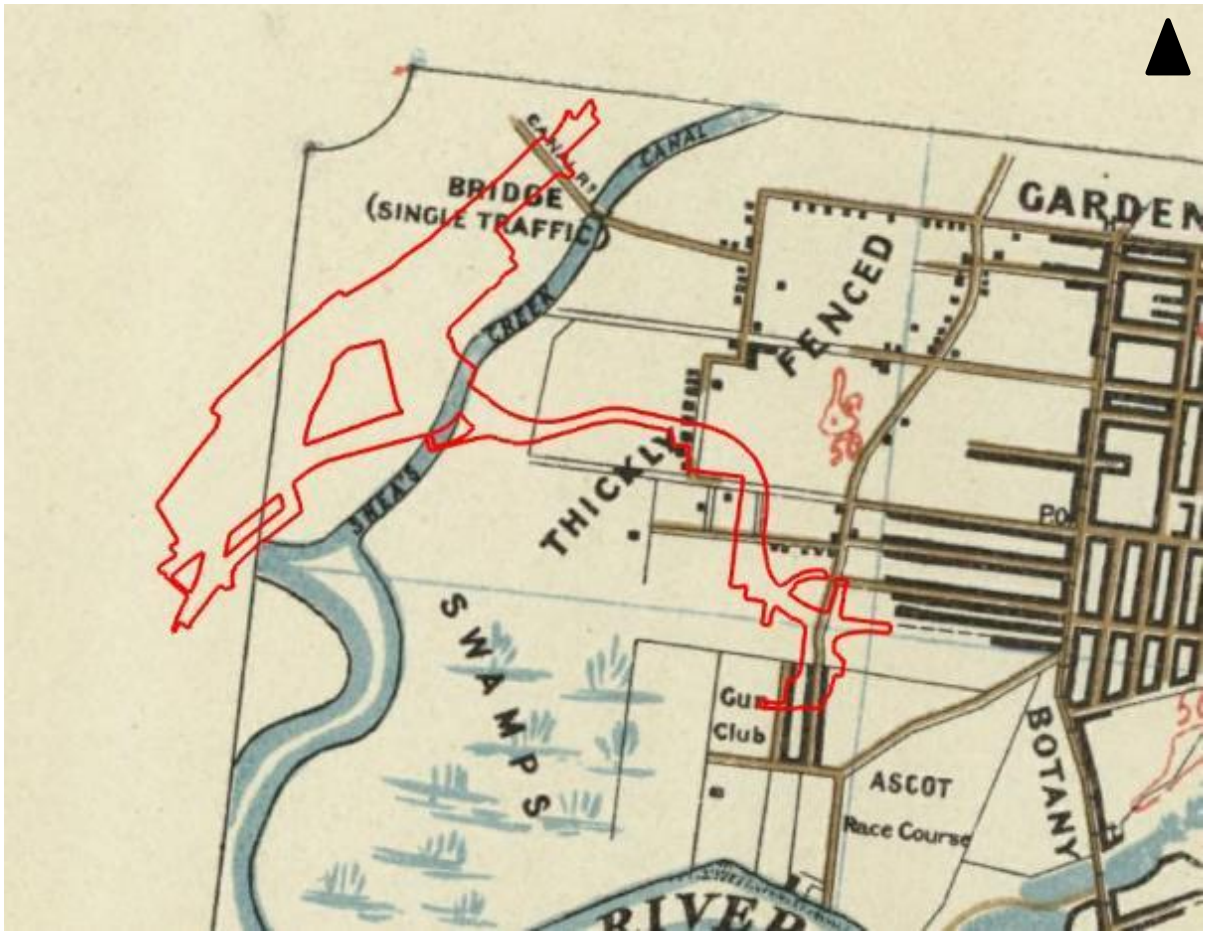

Figure 13-15 Reconnaissance map of Botany prepared by the Australian Intelligence Corps in 1913 showing the Botany Gun Club, Ascot Race Course and Swamps within and surrounding Section C. Source. NLA.

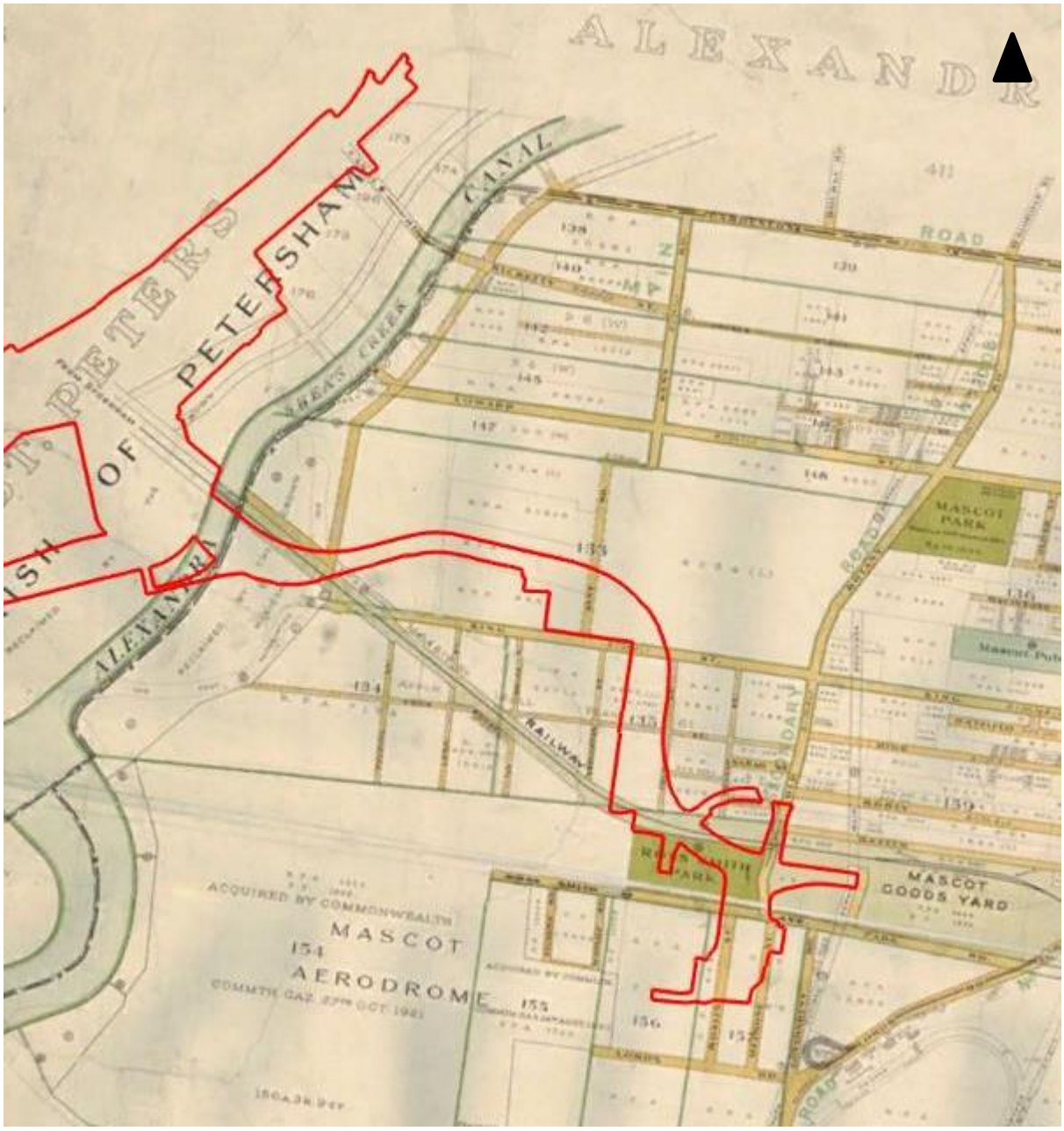

Figure 13-16 1917 Municipality maps series, Sydney Metropolitan Area showing land within Section B. The Botany Rail Line has been established and the study area is occupied by Ross Smith Park and the Lauriston Park Estate. Sydney Airport is referred to as the Mascot Aerodrome and has not extended into the area at this time. Source. State Library NSW.

13.3.6 Phase 4 – Sydney Airport expansion, World War Two and industrial development (1919–1946)

13.3.6.1 Section A – Quarrying and Tempe Tip

The western half of Section A was used as a gravel quarry from 1920, while the eastern half was occupied by the same industrial structures as those discussed Section Figure 13-19 (Phase 3). Land to the north was used as a greyhound racing track in the 1940s (shown in Figure 13-20).[126]

[126] Inner West Council, 2019. Tempe Lands. Accessed online at: https://www.innerwest.nsw.gov.au/explore/parks-sport-and-recreation/parks-and-playgrounds/parks-by-suburb/tempe-parks/tempe-lands on 27/02/2019.

13.3.6.2 Sections B and C – Expansion of Sydney Airport (Kingsford Smith Airport)

Sydney Airport was originally located immediately south-west of the study area and comprised a small 400-acre cow paddock used as an aerodrome and leased to returned World War One service airman Nigel Love, Harry Broadsmith and Jack Warneford by the Kensington Race Club in 1920. In 1921, an additional 161 acres was purchased by the Australian government for the construction of a formalised airport (Figure 13-17). The airport began serving regular flights in 1924 and contained three landing strips by 1938 (illustrated in Figure 13-18).[127]

The advent of World War Two required the airport to expand to nine times its original size. Land within the study area was not affected by this expansion and continued to be occupied by market gardens, their associated buildings and Lauriston Park estate, as shown in Figure 13-21.

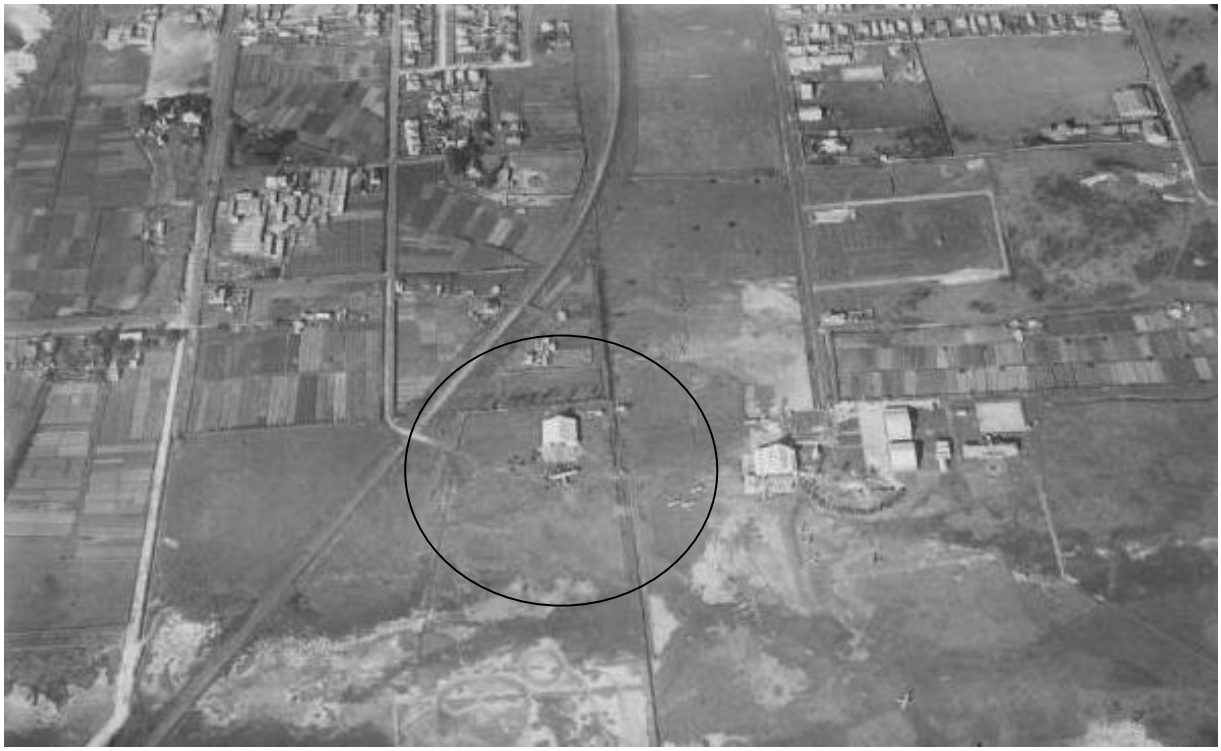

Figure 13-17 Aerial view of Mascot Aerodrome in c.1928 (circled). Note the various market gardens in the area and recently established Botany Rail Line to the left. Source. NLA.

[127] Chaffey, M. *'A review of Botany'* undated pamphlet, local history files, Botany Library, p 5 in Butler, M, 2011.

Figure 13-18 DH 60s outside Mascot Airport in 1930–1940 by Charles Daniel Pratt. Source. State Library of Victoria.

13.3.6.1 Sections B and C – Completion of the Botany Rail Line

The Botany Rail Line crossed the Alexandra Canal in 1922 and was completed in 1925. Soon, various private and government owned sidings were incorporated into the line to serve companies such as Kellogg's, Kandos Cement, Thomas Nationwide Transport (TNT), Southern Portland Cement Company and Hardies, a bark extraction plant.[128] No sidings were located within the study area during Phase 4 occupation; however, the easternmost extent of Section C was located within the Mascot Goods Yard which is shown in Figure 13-16.

13.3.6.2 Section B – Market gardens and warehouses

Land to the west of Canal Road in Section was used for market gardens in the 1930s, as evidenced by an aerial photograph taken of the site at the time (Figure 13-19). No structures are shown to occupy the study area. By 1943, a group of warehouses, similar to woolstores fronting onto the Alexandra Canal had been established immediately west of Canal Road (see Figure 13-20). Market gardening continued on land between the warehouses and Botany Rail Line.

By 1951, warehouse development had expanded west, replacing the markets gardens shown in 1930 and 1943 aerial photographs (Figure 13-21). Aerial photographs also show a series of smaller buildings occupying land to the east of Canal Road, at the St Peters Brickworks site.

[128] Pollard, N, 1988, pp. 7-22.

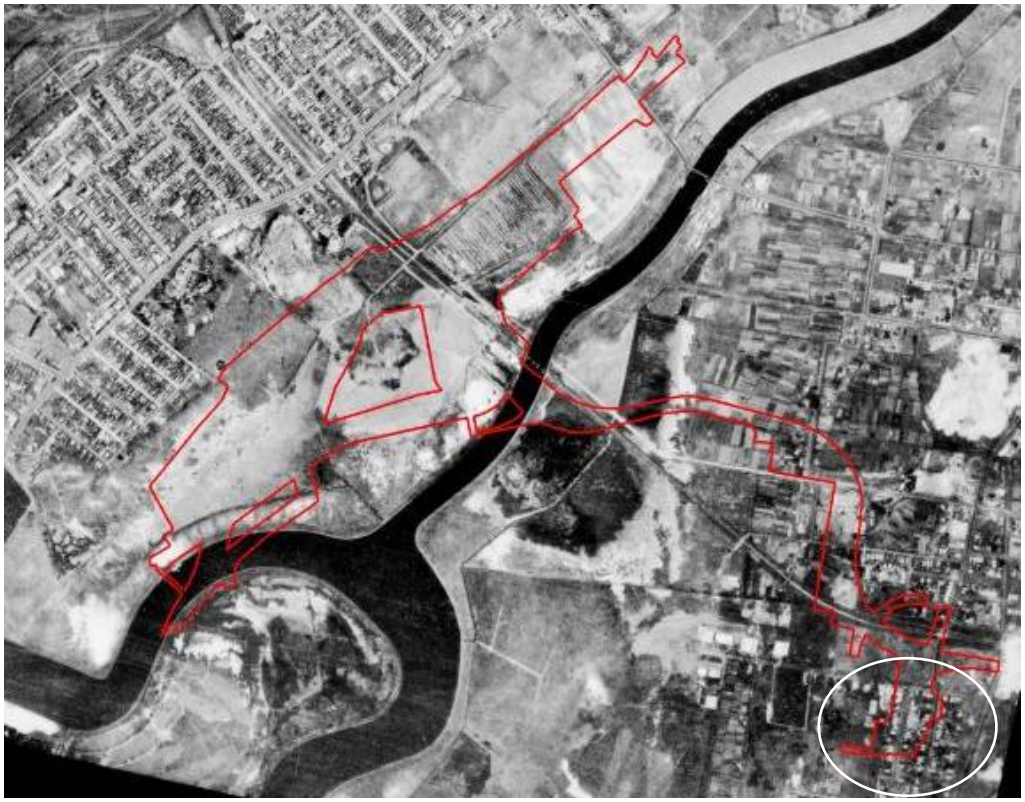

Figure 13-19 Aerial photograph taken in 1930 showing the general character of the study area at the time. Sections A and B are relatively undeveloped. Lauriston Park Estate (circled).

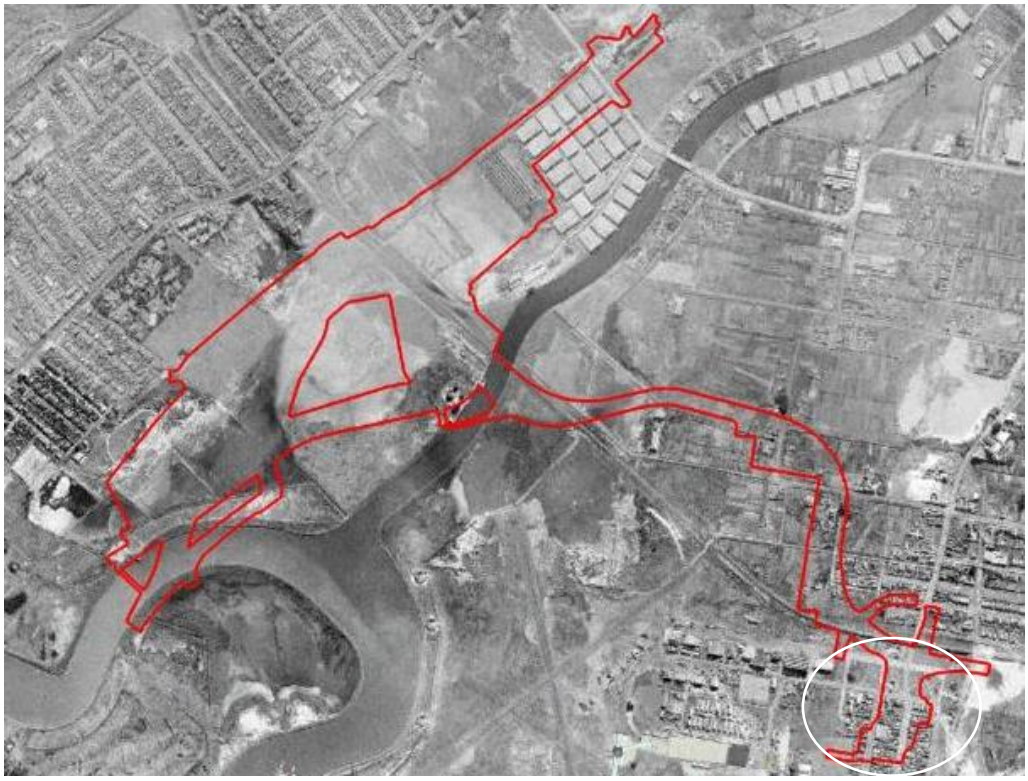

Figure 13-20 Aerial photograph taken in 1943 showing the gravel quarry and industrial buildings in Sections A and B and residential development including Lauriston Park (circled) in Section C. Source. SixMaps.

13.3.7 Phase 5 – Post-war development and Tempe Tip (1946–1990)

13.3.7.1 Section A – Tempe Tip

By 1970, land associated with Phase 3 gravel and clay quarries and landfill was being used by Council for green waste and demolition materials associated with road works and the construction industry. This was gradually phased out from the 1990s onwards when it was used to dispose ash from the nearby Bunnerong Power Station and Sydney Airport expansion activities. Land within the majority of Section A is within the tip site.

13.3.7.2 Section B – Warehouses and industry

Section B was occupied by warehouses between the Botany Rail Line and Canal Road during this period, as shown in Figure 13-21 – Figure 13-23. Land to the east of Canal Road continued to be associated with a group of structures used by St Peters brickworks. The goods siding that currently serves Boral Concrete is present in a 1951 aerial photograph (Figure 13-24).

A brick culvert or water management feature shown in a 1961 aerial photograph (Figure 13-22) was identified during the site inspection.

Figure 13-21 Aerial photograph taken in 1951 showing warehouses and new goods siding for the Botany Rail Line west of Canal Road and structures associated with St Peters brickworks east of Canal Road in Section B. Source. Andy Brill, Flickr.

Figure 13-22 Aerial photograph taken in 1961 showing parts of Section A occupied by scattered industrial buildings along the Botany Rail Line and Section B completely occupied by warehouses. Section C has been redeveloped to accommodate the Sydney Airport expansions and the rail line has been diverted.

Figure 13-23 Detail of Section B in 1961. Warehouses and St Peters brickworks structures can be seen occupying Section B. A brick culvert/water management structure is also visible to the west of the warehouses.

13.3.7.3 Section C – Expansion of Sydney Airport and deviation of the Alexandra Canal and Botany Rail Line (1955-1990)

Following the end of World War Two, Sydney Airport was once again enlarged, this time requiring the resumption of residential subdivisions, market gardens, the Sydney sewerage farm and two golf courses.[129]

In 1960, large scale expansions of Sydney Airport required that a portion of the Botany Rail Line be deviated 100 and 400 metres north of its original alignment between O'Riordan Street and the Alexandra Canal (within Section C of the study area). [130] This alignment represents the route of Botany Rail Line today. The extent of the deviation is illustrated in Figure 13-20 (before) and Figure 13-25 (after). Prior to this, part of the line was located within the airport. Although the arrangement was generally seamless, a train and aircraft collided near Runway 11-29 in 1950. No fatalities were reported.

Deviation of the line also required the construction of a new underbridge over Robey Street. The Robey Street Underbridge was the first welded steel railway bridge in the state.[131] Although only one railway track was installed, an additional deck was provided in anticipation of any future duplication. The bridge and deck remain within the study area today.

The expansion of Sydney Airport required the lower portion of the Alexandra Canal, within Section C of the study area, to be filled and diverted to the northwest. The extent of these works is illustrated in Figure 13-26 and evidenced today by differing materials used in the canal's embankments, which consist of concrete and building rubble.

Diversion works also involved the removal of wharves and other infrastructure built along the canal to accommodate the surrounding industry, much of which was now using road and rail transport to move their goods.[132] Additional works associated with expansion of airport included diverting a large portion of the Cooks River to the west for the new east-west runway. This required land reclamation along its original alignment and backfilling part of the earlier Alexandra Canal with sand.[133] The construction of the north-south runway between 1963 and 1972 included further deviation of the canal to the northwest.

[129] Chaffey, M., p 5 in Butler, M, 2011 and data provided by SixMaps 1943 aerial photographs at: https://maps.six.nsw.gov.au/
[130] Pollard, N, 1988, p. 17.
[131] OEH, 2008. SHI listing for the Mascot (Robey Street) Underbridge. Accessed online at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4801848 on 30/08/2018.
[132] Alexandra Canal CMP, 2009, p. 20.
[133] Alexandra Canal CMP, 2009, p. 20.

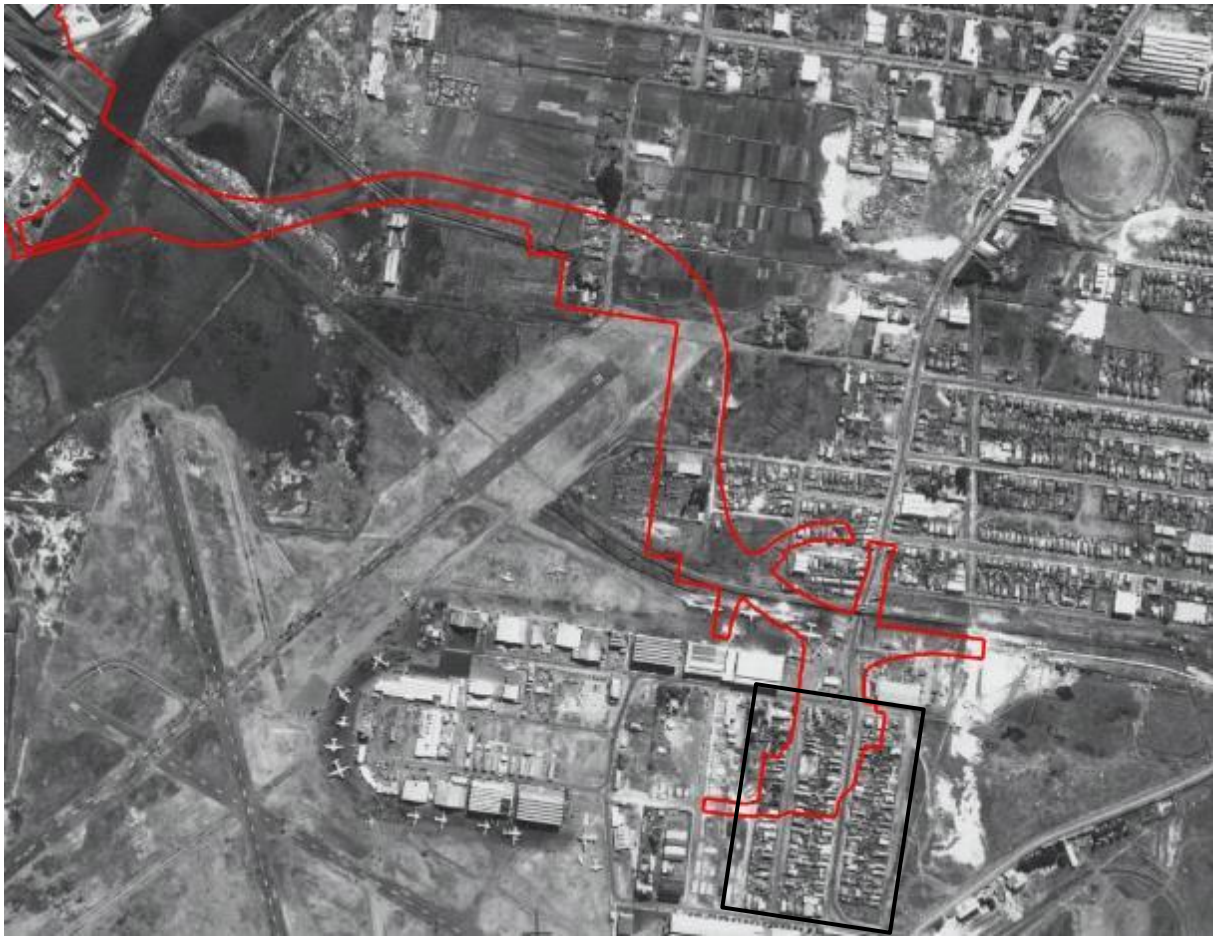

Figure 13-24 Aerial photograph taken in 1951 showing the extent of post-war expansion in Section C. Some markets gardens and buildings continue to survive within study area, as does Lauriston Park (outlined). The Botany Rail Line has not been deviated at this time and can be seen running through Runway 11-29. Source. Andy Brill, Flickr.

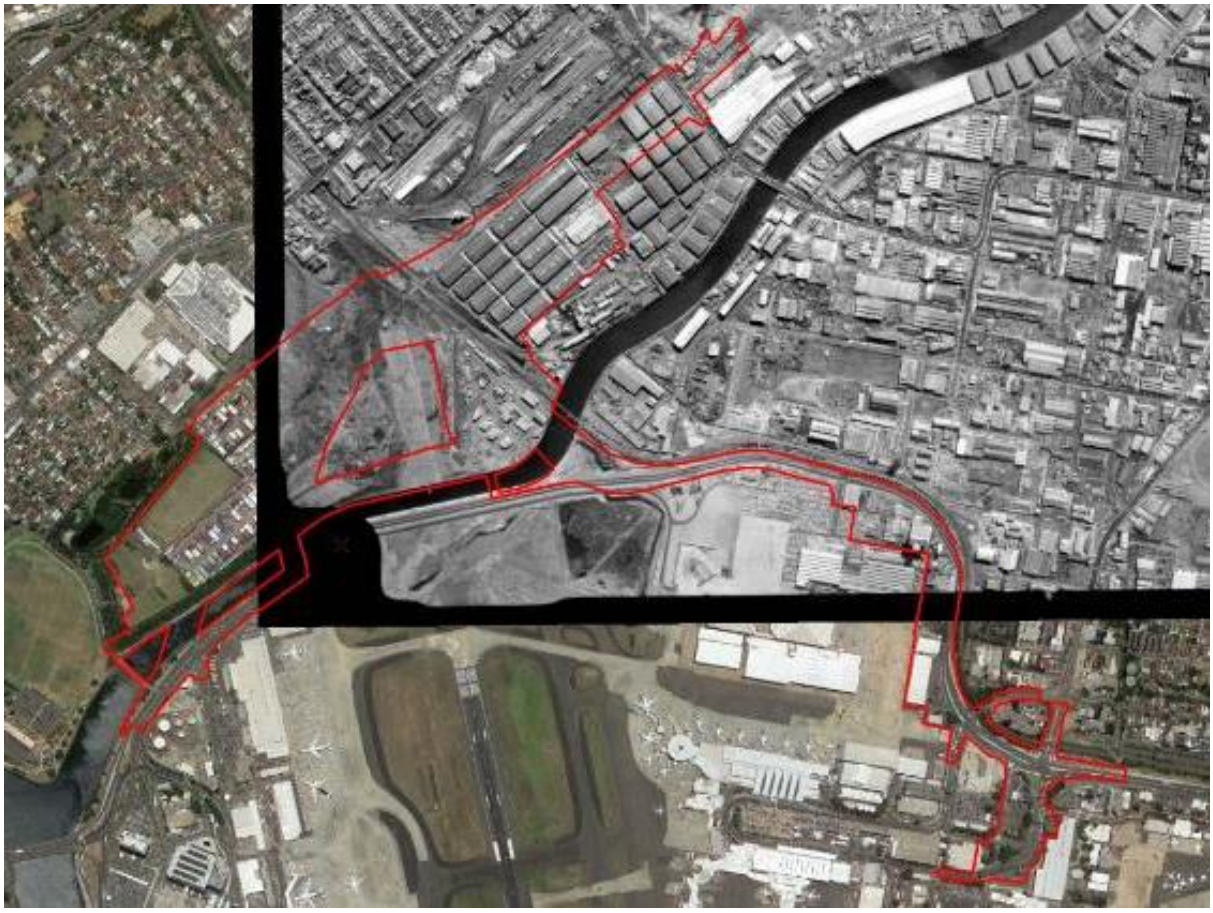

Figure 13-25 Aerial photograph taken in 1970 showing general character of the study at the time. Parts of Section A is occupied by scattered industrial buildings along the Botany Rail Line and Section B is occupied by industrial buildings. Section C has been redeveloped to accommodate the Sydney Airport expansions alongside the Alexandra Canal.

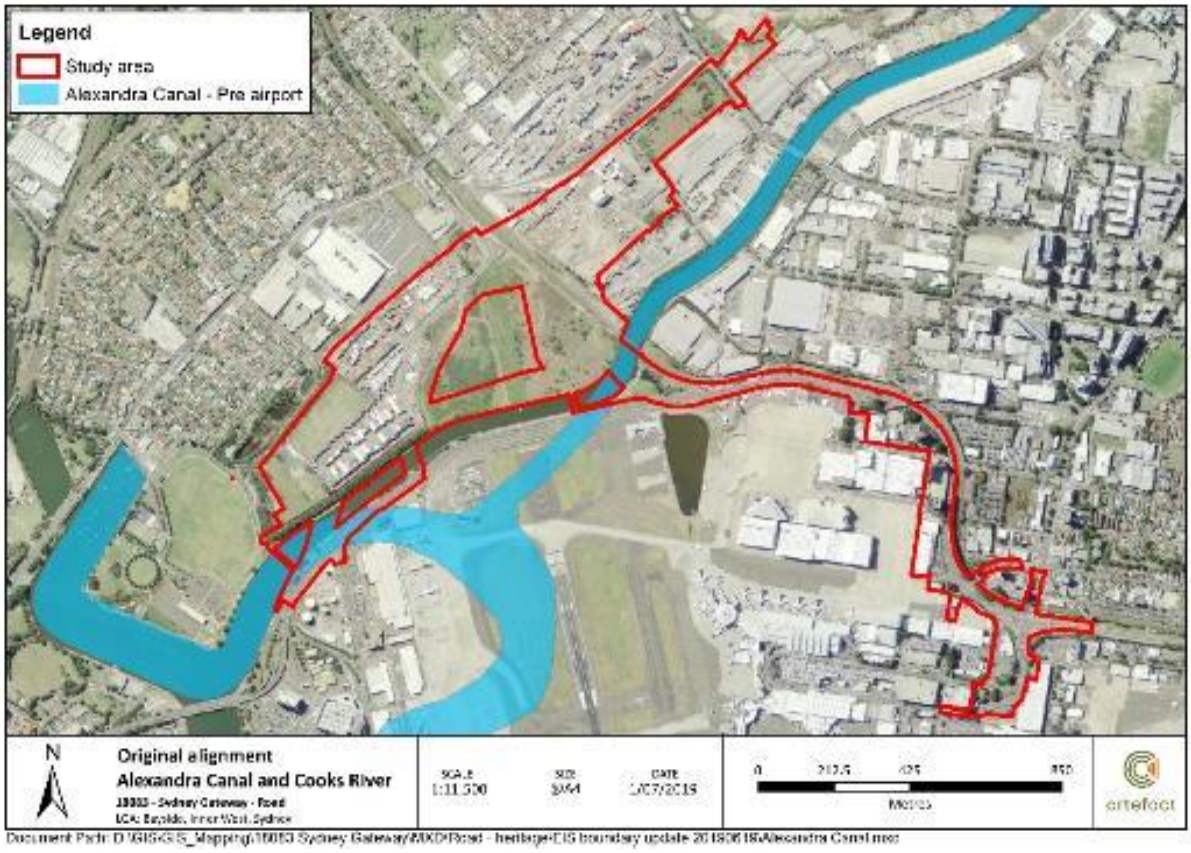

Figure 13-26 Visual representation showing the original alignment of the Alexandra Canal prior to its deviation in the 1960s.

13.3.8 Phase 6 – Contemporary land use (1990–present)

13.3.8.1 Section A – Post-Tempe Tip

In 2000, Tempe Tip was closed and declared a remediation site. Land within and surrounding the former tip remained generally undeveloped with the exception of the Tyne Container Services property which can be seen within its northern boundary in a 2000 satellite image (Figure 13-27). The industrial buildings once located along its south-eastern boundary had been demolished by this phase.

In 2004, Marrickville Council (now the Inner West Council) remediated the site and formed what is now the Tempe Recreation Reserve. This contains a Tempe Golf Driving Range and Academy, off-leash dog exercise area, wetlands and walking paths, as shown in Figure 13-28.

13.3.8.2 Section A and B – Efforts to revitalise the Alexandra Canal

The 1990s saw a surge in public interest relating to the natural and urban environment within the Tempe, Marrickville, St Peters, Botany and Mascot areas and in 1997 the South Sydney Council announced a refurbishment plan for the Alexandra Canal. The plan carried out in the shadow of additional revitalisation plans taking place in Sydney's southeast, where industrial areas were being redeveloped for residential settlement.[134]

[134] Ringer, R. 2013.

In 1998, Sydney Water announced a $4 million dollar upgrade to the canal, although this did not eventuate. A series of redevelopment schemes were subsequently commissioned between 1998 and 2008, including a Government funded design program with the University of New South Wales to transform the canal into a 'stunning water and green recreation corridor between Sydney Harbour and Botany Bay'[135] in 1998 and Masterplan which would turn the waterway into the 'Venice of Sydney' in 2001.[136]

In 2008, a report published by New South Wales Environment Protection Authority (EPA) stated that the canal was 'the most severely contaminated canal in the southern hemisphere' and 'sediments are toxic'.[137] These findings halted any momentum that had been created to revitalise the water course.

13.3.8.3 Sections B and C – Botany Operational Enhancement Project

An increase in container traffic to Port Botany in the 1990s and pre-Olympic Games upgrades to Sydney Airport in 1999 made it necessary to upgrade and duplicate portions of the Botany Goods Line to allow for updated signalling at General Holmes Drive and additional trains.[138]

13.3.8.4 Section C – WestConnex and Airport East Works (2015 – present)

The WestConnex and Airport East projects have been ongoing since 2015. These works were designed to ease congestions along some of Sydney's busiest roads. As part of the works, portions of Airport Drive have been widened within Section C.

Figure 13-27 The study area in 2000. Warehouses continue to occupy parts of Section B and land within Section A has been filled. The Tyne Container Services property can be seen extending into the northern extend of the study area. Source. Google Earth.

[135] Totaro, P 'Fetid drain to become a clean, green corridor', The Sydney Morning Herald, 30 June 1998, p 8 in Ringer, R. 2013.
[136] 'Promise of Little Venice washed away', The Sydney Morning Herald, 25 April 2008 in Ringer, R. 2013.
[137] Ringer, R. 2013.
[138] Drew, D. 2002, p. 56.

Figure 13-28 The study area in April 2019 showing extent of development since 2000, primarily in Sections A and B. Source. Google Earth.

13.4 Appendix D – Site inspection and overview of the existing environment

13.4.1 Section A

Section A is located within the suburb of Tempe, in the Inner West LGA and the following land:

- Land subject to the EP&A Act
  - Tempe Recreation Reserve: 2-14 Smith Street, Tempe
  - Tempe Golf Driving Range and Academy: 17 Swamp Road, Tempe
  - Off-leash dog exercise area
  - Tyne Container Services: 2 Swamp Road, Tempe
  - Alexandra Canal
  - Vacant ground: Swamp Road, Tempe
- Commonwealth Land
  - Vacant ground (vegetated): Swamp Road, Tempe
  - Car park: Swamp Road, Tempe
  - Vacant ground (sealed): Swamp Road, Tempe.

13.4.1.1 Heritage listed items

The following heritage listed items are located in, or within the 150 metres of, Section A of the study area:

- Land subject to the EP&A Act
  - Alexandra Canal – Marrickville LEP 2011 item no. I270, SHR no. 01621, Sydney Water s170 no. 4571712, Botany Bay LEP 2011 I1 and RNE no. 103889
  - Moreton Bay fig tree – Marrickville LEP 2011 item no. I303
  - Mascot Sheas Creek Underbridge – ARTC s170 no. 4805743

13.4.1.1.1 LAND SUBJECT TO THE EP&A ACT

Tempe Recreation Reserve, Tempe Golf Driving Range and Academy and off-leash dog exercise area

The site inspection commenced at Tempe Recreation Reserve (Figure 13-29), off-leash dog exercise area (Figure 13-30 – Figure 13-34) and the Tempe Golf Driving Range and Academy (Figure 13-33), which are located on a slight rise between the Alexandra Canal and South Street, Tempe. The Tempe Recreation Reserve and off-leash dog exercise area consists of an open, grassed field with trees along its southern, western and northern boundaries which obstruct views from the park towards the Alexandra Canal (Figure 13-32). The off-leash dog exercise area was being used at the time of the site inspection.

Tyne Container Services, the Tempe Golf Driving Range and Academy and its car park form its eastern boundary (Figure 13-31). A small, fenced off stockpile area containing sandstone blocks and other building materials is located within the eastern boundary of the Tempe Recreation Reserve, outside of the study area (Figure 13-34). The Tempe Golf Driving Range and Academy comprises a modern, fenced-in driving range accessed via a demountable shed along its northern boundary. Tyne Container Services abuts the range to the west.

Figure 13-29 View west towards Tempe Recreation Reserve from public access road and study area boundary.

Figure 13-30 View north east towards Tempe Recreation Reserve from the Tempe Golf Driving Range and Academy.

Figure 13-31 View southeast towards Tyne Container Services and off-leash dog exercise area.

Figure 13-32 View southwest towards Sydney Airport from off-leash dog exercise area. View lines towards the project area are obstructed by trees.

Figure 13-33 View east towards Tempe Golf Driving Range and Academy from car park. Tyne Container Services can be seen to the right.

Figure 13-34 Stockpile area containing sandstone blocks and other building materials within the eastern boundary of Tempe Recreation Reserve, outside the study area.

Tyne Container Services

The Tyne Container Services property occupies an irregular Z-shaped property bounded by the Alexandra Canal to the south, Tempe Recreation Reserve and Tempe Golf Driving Range and Academy to the west (Figure 13-36), vacant ground to the east (Figure 13-37) and 634 Princes Highway, Tempe (IKEA, Decathlon and the Salvation Army) to the north. It is located on a slight rise (Figure 13-38) and is also used by Tiger Containers which sells, hires and modifies containers.

Tyne Container Services has occupied the northern extent of the property since c1975 and expanded south at some time between 2001 and 2005.[139] The area was previously part of Tempe Tip. The property is currently used to store shipping containers and is accessed via Swamp Road, Tempe. It does not contain any items of heritage significance.

Figure 13-35 View southeast towards Tyne Container Services from Smith Street, Tempe

Figure 13-36 View southeast towards Tyne Container Services from Tempe Park. The Tempe Gold Driving Range is to the left.

Figure 13-37 View west towards Lot 202 DP1097238 from Swamp Road.

Figure 13-38 View northwest towards Tyne Container Services from the Alexandra Canal Cycleway.

Vacant ground: Swamp Road, Tempe

Vacant ground along Swamp Road, Tempe comprises low lying marshy ground occupied by scattered trees and scrub. It rises gradually to the west, as shown in Figure 13-39. It is bounded by Tyne Container Services to the north and west, the Sydney Airport approach lighting to the east and Alexandra Canal to the south. Tempe Tip occupied the land until the late 20th century. No items of heritage significance occupy the property.

[139] Tiger Containers, n. d. Who Are We? Accessed online on 12/02/2019 at: https://www.tigercontainers.com/about-us/

Figure 13-39 View west towards vacant ground and Tyne Container Services from SACL carpark. The Sydney Airport approach lighting is represented by yellow poles in the background.

Alexandra Canal and Mascot (Sheas Creek) Underbridge

The portion of the Alexandra Canal within Section A is located immediately south of Tempe Park, Tyne Container Services and SACL land, west of the Mascot (Sheas Creek) Underbridge and north of Airport Drive and the Alexandra Canal Cycleway. It was modified between 1940–1970 to accommodate Sydney Airport and the majority of its course in this area has been altered (Figure 13-26).

The west bank of the canal, between the pedestrian footbridge (shown in Figure 13-40) and northern extent of Tyne Container Services property, is bordered by well-established pine trees and a gravity sewer, as shown in Figure 13-42 and Figure 13-44. These block views to the canal from adjoining properties.

A section of the west bank of the canal (around 125 metres in length), located immediately east of the pedestrian footbridge, has retained its original sandstone wall (Figure 13-43). This has been partially modified through the construction of a modern culvert. The remainder of the canal within Section A is bounded by rubble walls (Figure 13-45). The intact sandstone wall is considered to contain high significance, while the rubble walls are considered to contain moderate significance (as outlined in Section 6.2.1.1).

Views towards Sydney Airport from the canal, Tempe Recreational Reserve shared path (immediately west of the study area) and Alexandra Canal Cycleway are generally unobstructed, as shown in Figure 13-46 – Figure 13-49. Views along the canal are unobstructed with the exception of the pedestrian footbridge, Nigel Love Bridge and s170 listed Mascot (Sheas Creek) Underbridge. However, the distance between these items and their low lying nature mean they are generally unobtrusive elements with the canal.

The Alexandra Canal Cycleway and Airport Drive border the canal's east bank to the south. These are characterised by a modern shared path and infrastructure associated with the roadway as shown in Figure 13-52 and Figure 13-53. A steel fence separates the cycleway from the canal (Figure 13-51). Shell material (likely redeposited) is visible in areas of exposed ground near the base of the fence (Figure 13-50).

Figure 13-40 Pedestrian footbridge over Alexandra Canal, immediately south of Tempe Park. View south.

Figure 13-41 View southeast towards Sydney Airport from the pedestrian footbridge.

Figure 13-42 View east along the Alexandra Canal from the pedestrian footbridge showing original sandstone retaining wall to the left.

Figure 13-43 Detail of modern culvert installed along west bank of the Alexandra Canal between original sandstone wall. Taken from pedestrian footbridge, facing north.

Figure 13-44 View north towards northern wall of the Alexandra Canal from Qantas Drive and Alexandra Canal Cycleway showing water pipeline and modern retaining wall.

Figure 13-45 Detail of modern Alexandra Canal retaining wall along south side of the canal. Note modern brick used as aggregate during construction.

Figure 13-46 View east towards the Nigel Love Bridge from the Alexandra Canal Cycleway

Figure 13-47 View west along the Alexandra Canal from the Nigel Love Bridge. Sydney Airport can be seen to the left.

Figure 13-48 View southwest of the ARTC s170 heritage listed Mascot (Sheas Creek) Underbridge taken from the Alexandra Canal Cycleway.

Figure 13-49 View east of the ARTC s170 heritage listed Mascot (Sheas Creek) Underbridge taken from the Alexandra Canal Cycleway. The Boral Concrete St Peters can be seen in the background (indicated).

Figure 13-50 Detail of what is likely to be redeposited shell (circled) and sand between Alexandra Canal Cycleway and Alexandra Canal. View north.

Figure 13-51 General location of shell and sand material. Facing northeast toward Alexandra Canal from the cycleway.

Figure 13-52 View southwest towards Airport Drive from the Alexandra Canal Cycleway showing existing nature of the area.

Figure 13-53 View east towards Airport Drive from the Alexandra Canal Cycleway showing existing nature of the area.

Moreton Bay Fig Tree

The Marrickville LEP 2011 listed Moreton Bay fig tree occupies a relatively large private property at 43 South Street, Tempe. It is located about 115 metres north of the study area and would not be impacted by the proposed works.

Figure 13-54 View of property associated with the LEP listed Moreton Bay fig tree (LEP no. I303), looking southwest from South Street.

Figure 13-55 Heritage listed Moreton Bay fig tree (LEP no. I303).

13.4.1.1.2 COMMONWEALTH LAND

Vacant ground and carpark

This portion of the study area is bounded by the Alexandra Canal to the south, Botany Freight Line to the east and Swamp Road to the north. Topography is flat and has been heavily cleared to accommodate the SACL car park (Figure 13-56 and Figure 13-58) and a vacant ground (Figure 13-57).

No evidence of industrial structures that once occupied the southern half of Section B were identified during the inspection, and no items of heritage significance occupy the area.

Figure 13-56 View north along access road to SACL car park (Lot 643 DP 727045, Lot 2 DP790186)

Figure 13-57 View northwest towards vacant ground (Lot 1 DP826101) from car park access road. Boral Concrete can be seen in the background.

Figure 13-58 View northeast from the southwest corner of the SACL car park looking towards Section B including Boral Concrete's and Boral Recycling's St Peters facilities and the Qube site.

13.4.2 Section B

Section B is located within the suburb of St Peters, in the Inner West LGA and the following allotments and Commonwealth Land:

- Commonwealth Land
  - Boral Recycling St Peters: 6-10 Burrows Road, St Peters
  - Cooks River Intermodal Terminal (Qube)
  - Vacant Ground (vegetated): 30 Canal Road, St Peters

- Land subject to the EP&A Act
  - Boral Concrete St Peters: 25 Burrows Rd, St Peters
  - Cooks River Intermodal Terminal (Qube)
  - WestConnex Stockpile Area
  - Botany Rail Line.

13.4.2.1 Heritage listed items

The following heritage listed items are located in, or within the 150 metres of, Section B of the study area and located within land subject to the EP&A Act:

- Cooks River Container Terminal Cooks River Container Terminal – Marrickville LEP 2011 I366 and NSW Ports s.170 no. 4560046
- Cooks River Container Terminal: Electrical Overhead Travelling Crane – NSW Ports s.170 no. 4560052
- Cooks River Container Terminal: Lay Down Points Lever – NSW Ports s.170 no.4560051
- Cooks River Container Terminal: McS Hr T Administration Building – NSW Ports s.170 no. 4560050
- Cooks River Container Terminal: Precast Concrete Hut 1 – NSW Ports s.170 no. 4560047

13.4.2.1.1 COMMONWEALTH LAND

Boral Recycling St Peters: 6-10 Burrows Road, St Peters

The Boral Recycling St Peters is located immediately east of the Botany Freight Line, north of the Boral Concrete St Peters, west of Burrows Road and south of the Cooks River Intermodal Terminal (which is currently occupied by Qube). The Boral Recycling St Peters property is within Commonwealth Land and leased to Boral by the Sydney Airport Corporation. In turn, parts of the site are leased to Visy, a recycling firm (shown in Figure 13-59 and Figure 13-61).

Land between the recycling facility and Botany Rail Line is occupied by a cleared and grassed strip and remnants wetlands, shown in Figure 13-67 and Figure 13-69. The remnant wetlands are bordered by introduced and native tree and shrub species and land appears to be generally undisturbed (Figure 13-67 – Figure 13-64).

A brick weir or water management structure was identified immediately south-west of the recycling facility and remnant wetlands (shown in Figure 13-59). It appears to be directly associated with the wetlands and is visible in 1943 and 1961 aerials (Figure 13-23 and Figure 13-20). The feature has been constructed using machine made bricks bonded with hard cement mortar. Its close proximity to the Botany Rail Line suggests it may represent infrastructure associated with a culvert which ran below the line or associated access road for former industrial properties also shown in the 1943 aerial.

With the exception of the brick weir/water management structure, no items of heritage significance were identified in the area.

Figure 13-59 View northeast towards Boral Recycling St Peters and vegetation along its western perimeter.

Figure 13-60 Example of remnant wetlands to the west of Boral Recycling St Peters and east of the Botany Rail Line.

Figure 13-61. View northeast towards Boral Recycling St Peters (background) the brick weir/water management structure (circled) located to east of the Botany Rail Line.

Figure 13-62 Detail of brick weir/water management structure (0.5 metre scale).

Figure 13-63 View south towards the Alexandra Canal from the southern boundary of Section A, immediately east of the Botany Goods Line and Mascot (Sheas Creek) Underbridge. Note the high pressure gas main in the foreground.

Figure 13-64 View south towards the Alexandra Canal, Botany Rail Line and Mascot (Sheas Creek) Underbridge from the southern boundary of Section A, immediately east of the Botany Goods Line.

Vacant Ground (vegetated): 30 Canal Road, St Peters

The property at no. 30 Canal Road, St Peters was not accessed for the site inspection and is not occupied by any structures or heritage listed items. It is bounded by Cooks River Intermodal Terminal to the north and west, the Goodman Business Park to the south and Canal Road to the east. Its eastern boundary is bordered by a line of mature Eucalypts trees, low lying scrub and a pedestrian footpath as shown in Figure 4 49.

Figure 13-65 View south along Canal Road showing the study area in the foreground and trees bordering no. 30 Canal Road to the right.

13.4.2.1.2 LAND SUBJECT TO THE EP&A ACT

Boral Concrete St Peters: 25 Burrows Road, St Peters

Boral Concrete St Peters is bounded by Boral Recycling St Peters to the north, Alexandra Canal to the south, Botany Rail Line to the west and Burrows Road to the east. It is owned by Boral and contains concrete processing facilities. The project will require partial acquisition of the south-western corner of the site where its vehicle washing facilities are currently located.

Land along the southern boundary the facility and Section B of the study area, between the west bank of the Alexandra Canal and the Botany Rail Line is occupied by vegetation and has been partially disturbed through the installation of a high pressure gas main (Figure 13-63). The ground surface immediately east of the Botany Rail Line is covered with rail ballast and gravels (Figure 13-64). Boral Concrete St Peters is currently occupied by modern infrastructure, buildings and a siding which is served by the Botany Rail Line (Figure 13-66 – Figure 13-68).

Cooks River Intermodal Terminal (Qube) and associated SW Ports and Marrickville LEP 2011 heritage listed items

The Cooks River Intermodal Terminal could not be accessed for the site inspection. However, the eastern boundary of the property is visible from Canal Road alongside heritage listed items relevant to this SoHI. The western boundary was partially visible from the Botany Rail Line and Bellevue Street (Figure 13-74). An existing warehouse located within the terminal and study area is shown in Figure 13-74. It is not shown in 1943 aerials (Figure 13-20). This will be impacted as part of the project.

The Cooks River Intermodal Terminal is bounded by Canal Road to the east, vegetated vacant ground at 30 Canal Road to the south, Bellevue Street and commercial properties to the north and the Botany Rail Line to the west. It is used as a container storage terminal and associated with a series or interconnected roads and railway sidings.

The Cooks River Container Terminal: Lay Down Points Lever (4560051) could not be viewed from Canal Road. Heritage listed items visible from Canal Road consist of the:

- Cooks River Container Terminal itself (I366 and 4560046), shown in Figure 13-71
- Travelling Electrical Overhead Travelling Crane (4560052 and I366), shown in Figure 13-72 and located within the study area's 100 metre buffer zone
- Cooks River Container Terminal: Precast Concrete Hut 1 (4560047 and I366), shown in Figure 13-73 and located within the study area's 100 metre buffer zone

Based on findings from the site inspection, these items would not be directly impacted by the proposed works and have not retained their visual relationship with the land that would be modified for the project. However, indirect impacts associated with vibrations may occur and would be managed through appropriate mitigation measures. No additional heritage items were visible during the inspection.

Figure 13-66 Boral Concrete St Peters building viewed from the Botany Rail Line.

Figure 13-67 View north towards Boral Concrete St Peters and land that would be modified for the project from the Botany Rail Line. Introduced and native tree species can be seen between the facility and cleared strip of land.

Figure 13-68 Train departing Boral Concrete St Peters using the Botany Rail Line siding, view south towards Alexandra Canal.

Figure 13-69 View southwest towards the Alexandra Canal and Botany Rail Line showing existing nature of the area and cleared strip between the rail corridor and Boral Concrete St Peters.

Figure 13-70 Example of introduced and native trees and shrubs bordering remnant wetlands to the west of Boral Concrete St Peters (in the background) and east of the Botany Rail Line.

Figure 13-71 View south towards the Cooks River Container Terminal (I366 and 4560046). The Travelling Electrical Overhead Travelling Crane (4560052 and I366) is indicated. The northeast boundary of no. 30 Canal Road is represented by the large tree to the left.

Figure 13-72 Detail of the travelling Electrical Overhead Travelling Crane (4560052 and I366). No. 30 Canal Road is to the left, near the two trees. Viewed from Canal Road.

Figure 13-73 Cooks River Container Terminal: Precast Concrete Hut 1 (4560047 and I366) viewed from Canal Road.

Figure 13-74 View east towards the Cooks River Intermodal Terminal from Bellevue Street. The warehouse which will be impacted by the project is indicated.

Figure 13-75 General view of the Canal Road entrance to the Cooks River Intermodal Terminal looking south towards 30 Canal Road (indicated) and project area.

WestConnex Stockpile Area

The property currently occupied by a WestConnex stockpile area is bounded by Canal Road to the west, Princes Highway to the north, Campbell Street to the east and commercial buildings to the south.

Land within the study area has been extensively modified since the WestConnex project began and no items of heritage significance such as those shown in historical aerials (Figure 13-19, Figure 13-20, Figure 13-21, Figure 13-22, Figure 13-24 and Figure 13-25) were identified during the site inspection.

Figure 13-76 View north towards the WestConnex Stockpile Area from Canal Road.

Figure 13-77 View east towards access gate to the WestConnex Stockpile Area from Canal Road

13.4.3 Section C

Section C is located within the suburbs of Mascot and Botany, in the Bayside LGA:

- Commonwealth Land
  - Sydney Airport including Qantas Drive
- Land subject to the EP&A Act
  - O'Riordan Street and Mascot (O'Riordan Street) Underbridge

- Mascot (Robey Street) Underbridge.

13.4.3.1 Heritage listed items

The following heritage listed items are located in, or within the 150 metres of, Section B of the study area:

- Commonwealth Land
  - Sydney (Kingsford Smith) Airport Group – Botany Bay LEP 2013 I170, CHL 105542 and RNE 102669
- Land subject to the EP&A Act
  - Mascot (O'Riordan Street) Underbridge – ARTC s170 no. 4801830
  - Mascot (Robey Street) Underbridge – ARTC s170 no. 4801848.

13.4.3.2 Results

13.4.3.2.1 COMMONWEALTH LAND

Sydney Airport including Qantas Drive

The portion of Sydney Airport within Section C of the study area is occupied by Qantas Drive and the Sydney Airport Qantas Base.

Qantas Drive

Qantas Drive is characterised by a four-lane road corridor bounded by Sydney Airport to the west and the Botany Rail Line to the east. A series of billboards run along the eastern side of the road, separating it from the rail corridor (Figure 13-79). Land to the west is occupied by large fig trees and Eucalypts which are located within the Qantas Jet Base and associated nature strip (Figure 13-78-Figure 13-81). These are prominent landmarks along the road corridor and provide shade along the corridor and provide a visual link to the areas natural and European settlement history.

A vehicle access bridge crosses over Qantas Drive about 140 metres south of the Qantas Drive and Lancastrian Road intersection. This is flanked by fig trees and shown in Figure 13-81.

With the exception of the mature trees along the Sydney Airport side of the road, no items of heritage significance were identified during the site inspection.

Figure 13-78 View west along Qantas Drive from O'Riordan Street. Trees to the right are bordering the Botany Rail Line. Buildings occupying the Qantas Jet Base can be seen to the left.

Figure 13-79 View north along Qantas Drive showing land within the study area. The large fig trees to the left are located within Sydney Airport's Qantas Jet Base and would be removed under the project. Billboards can be seen to the right.

Figure 13-80 View south-west towards vehicle bridge over Qantas Drive.

Figure 13-81 View south-east along Qantas Drive, below vehicle bridge showing large fig trees that would be removed under the proposal.

Sydney Airport

The following buildings and landscape features located within the project area were identified during the site inspection. All buildings were visible from Qantas Drive and/or within the Qantas Jet Base runway. These will be removed for the project:

- Building 235 – Former Customs Office. Brick building constructed between 1963 and 1972 and currently unoccupied (Figure 13-82 and Figure 13-83)
- Building 167 – Workshop. Sawtooth roofed, brick and iron building constructed between 1956 and 1962 and still in use (Figure 13-84 – Figure 13-88)
- Building 171 – Air Cargo Store. Iron warehouse constructed between 1963 and 1972 and still in use (Figure 13-89 – Figure 13-92)
- Building 221 – Substation J. Brick and iron building constructed between 1963 and 1972 and still in use (Figure 13-93 and Figure 13-94)
- Building 203 – Boilerhouse constructed between 1963 and 1972 and still in use (Figure 13-95)
- Building 151 – Qantas Jet Base Services Control Plant. Brick building constructed between 1956 and 1962 and still in use (Figure 13-95 – Figure 13-98)

- Building 133 – Former Aircraft Kitchen. Brick building constructed between 1956 and 1962 and currently used as an administrative building (Figure 13-99 – Figure 13-101)
- Building 166 – Pump house. Metal structure constructed between 1956 and 1962 and still in use (Figure 13-102 and Figure 13-103)
- Building 217 – Administration tower and plant room. Brick building constructed between 1963 and 1972 and still in use
- Building 148 and 146 – Qantas Jet Base technical training and Canteen. Brick and iron building constructed between 1956 and 1962 still in use (Figure 13-107- Figure 13-110)
- Building 217 - Administration tower and plant room. Brick building constructed between 1956 and 1962 and still in use (Figure 13-102-Figure 13-106).

The assessed significance of each building based on the Heritage Management Plan for Sydney Airport is outlined in Table 3-4. Together, the buildings form a significant composition that represent post-war development within Sydney Airport, specifically Building 167 with its prominent sawtooth roof and Building 217 which is the tallest single brick structure in Sydney.

Figure 13-82 View of Building 235 from Qantas Drive.

Figure 13-83 Building 235 eastern elevation.

Figure 13-84 View of Building 167 taken from Qantas Drive.

Figure 13-85 View south of Building 167 entrance taken from staff car park. Building 171 can be seen in the background.

Figure 13-86 Building 167 taken from Qantas Jet Base runway, view south-east.

Figure 13-87 Building 167 taken from Qantas Jet Base runway, view north.

Figure 13-88 Interior of Building 167 taken from Qantas Jet Base runway.

Figure 13-89 Eastern elevation of Building 171 viewed from Qantas Drive.

Figure 13-90 View south-west towards Building 171 and 167 from Qantas Drive.

Figure 13-91 Western elevation of Building 171 viewed from the Qantas Jet Base runway.

Figure 13-92 General view of Buildings 171 and 167 (to the left) from the Qantas Jet Base runway, view south.

Figure 13-93 Western elevation of Building 221 taken from Qantas Jet Base.

Figure 13-94 General location of Building 221 within the Qantas Jet Base, facing east. Building 171 is to the right and Buildings 151 and 203 are to the left.

Figure 13-95 View north-east towards Buildings 203 (foreground), 151 and 133. Building 203 is indicated.

Figure 13-96 Western elevation of Building 151.

Figure 13-97 View north towards western elevation of Building 151 from Building 171.

Figure 13-98 View south-west towards Buildings 151 (left) and ground floor of Building 133 (right) from Qantas Drive.

Figure 13-99 View north-west towards Building 133 from Qantas Drive. Note the single and multi-storey buildings are both Building 133.

Figure 13-100 General view of Qantas Drive showing Building 133 to the right, looking north.

Figure 13-101 General view of Building 133 north and west elevations taken from Qantas Jet Base, view south-east.

Figure 13-102 Pump house (Building 166) viewed from Jet Base, looking south-east from Building 217.

Figure 13-103 View north-west towards brick wall associated with the Pump house (Building 166) looking towards Building 217.

Figure 13-104 View north-west towards Building 217 from Qantas Drive.

Figure 13-105 Entrance to Building 217 from Qantas Jet Base.

Figure 13-106 Garden located outside of Building 217.

Figure 13-107 View of Building 148 and 146 from Constellation Road, Qantas Jet Base.

Figure 13-108 Interior of Building 148 and 146 showing flight simulator being deconstructed.

Figure 13-109 Exterior of Building 148 and 146.

Figure 13-110 Door to Building 148 and 146.

Figure 13-111 General view of Constellation Road, Qantas Base. View west.

13.4.3.2.2 LAND SUBJECT TO THE EP&A ACT

Mascot (Robey Street) Underbridge

The ARTC s170 listed Robey Street Underbridge is located approximately 140 metres north-west of the O'Riordan Street Underbridge and comprises a 24.38 metre long single-span double-track welded steel half-through plate web girder rail bridge which site upon concrete abutments (Figure 13-113). Although in relatively good condition, the structure has also been subject to vandalism and modern advertising billboards along the eastern and western spans are an intrusive element to the item. Robey Street is flanked by trees to the north and modern development to the south and leads towards Qantas Drive.

Figure 13-112 View towards the Mascot (Robey Street) Underbridge looking southwest towards Sydney Airport.

Figure 13-113 Southern abutment of Mascot (Robey Street) Underbridge.

O'Riordan Street and Mascot (O'Riordan Street) Underbridge – Lot 55 DP648871

The ARTC s170 listed O'Riordan Street Underbridge O'Riordan Street in an east–west alignment. O'Riordan Street is a busy thoroughfare which is bounded by modern development and infrastructure (Figure 13-114).

The bridge, constructed in 1925, comprises a 14.3 metre long two-span reinforced concrete girder railway bridge. The western span is supported on brick abutments. The eastern span, constructed in 1982, is 16.20 metres long and supported by a central brick pier and concrete abutments (Figure 13-115). The O'Riordan Street Underbridge has capacity to accommodate duplication of the Botany Rail Line. The bridge is in generally good condition, although come concrete is spalling along its abutments and the structure has been subject to vandalism. Large billboards at each approach to the bridge are considered intrusive (Figure 4 42).

Figure 13-114 View south towards the Mascot (O'Riordan Street) Underbridge from O'Riordan Street.

Figure 13-115 Eastern deck of the O'Riordan Street Underbridge looking east in August 2018.

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