BOTANY RAIL DUPLICATION

TECHNICAL REPORT

Technical Report 9 –
Statement of Heritage Impact

Botany Rail Duplication

Statement of Heritage Impact

Report to Gateway to Sydney Joint Venture on behalf of ARTC

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artefact

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EXECUTIVE SUMMARY

Artefact Heritage Pty Ltd (Artefact Heritage) have been engaged by Gateway to Sydney Joint Venture (G2SJV) on behalf of the Australian Rail Track Corporation (ARTC) to prepare a Statement of Heritage Impact (SoHI) for the proposed Botany Rail Duplication (the project).

The project is generally located within the rail corridor for the Botany Rail Line, about eight kilometres south of the Sydney central business district, in the suburbs of Mascot, Botany and Pagewood, within the Bayside Council Local Government Area (LGA). For the purposes of this report, the project area is encompassed by the project's construction footprint, including compound sites and crane pads. A 100 metre buffer zone has been included to allow effective assessment of indirect and visual impacts.

Port Botany is one of Australia and NSW's most important infrastructure assets, with Port Botany the second largest container port in Australia, and NSW's largest bulk liquid and gas port and only container port.

The amount of container freight handled by Port Botany is predicted to significantly increase. The Australian and NSW Governments have identified clear objectives to increase the share of this freight that is moved by rail. Transporting more freight to and from Port Botany by rail will place additional demands on the existing Botany freight rail line (the Botany Rail Line), with freight that cannot be accommodated on rail placing demands on the surrounding congested road network.

ARTC proposes to upgrade and duplicate a section of the Botany Rail Line between Mascot and Botany to increase rail freight capacity to Port Botany.

The project requires approval from the NSW Minister for Planning under Division 5.2 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). This report has been prepared to form part of the Environmental Impact Statement (EIS) for the project. The EIS has been prepared to support the application for approval of the project and address the environmental assessment requirements of the Secretary of the Department of Planning and Environment (the SEARs), issued on 18 December 2018.

Overview of findings

General

- The study area comprises about three kilometres of the existing Botany Rail Line corridor which was established in 1925. Part of the line was diverted to accommodate the expansion of Sydney Airport in 1960.
- The study area has been subject to five phases of European occupation:
  - Phase 1 (circa 1809-1858) – Early European settlement, land grants, industry and Simeon Lord's estate
  - Phase 2 – (1858-1925) – Residential development, market gardens, Botany Water Pumping Station and Botany Rail Line development
  - Phase 3 Airport (1925-1960) – Botany Rail Line, Sydney Airport, market gardens and residential development
  - Phase 4 (1960-2002) – Post-War development and deviation of the Botany Rail Line
  - Phase 5 (2002-present) – Contemporary management and use of the Botany Rail Line.

Heritage and archaeology

- The study area is wholly or partially located within the curtilage of six heritage listed items containing local or state significance:
  - *Mascot (O'Riordan Street) Underbridge* – ARTC s170 register – SHI no. 4801830
  - *Mascot (Robey Street) Underbridge* – ARTC s170 register – SHI no. 4801848
  - *Railway Bridge over Botany Road/Mascot (Botany Road) Underbridge* – Botany Bay Local Environmental Plan (LEP) 2013 – I153 and ARTC s170 register – SHI no. 4800248
  - *Sydney (Kingsford Smith) Airport Group* – Botany Bay LEP 2013, Commonwealth Heritage List (CHL) and Register of the National Estate (RNE) – I170, 105542 and 102669.
  - *Commonwealth Water Pumping Station and Sewerage Pumping Station* – Botany LEP 2013 – I3
  - *Ruins of the former Botany Pumping Station* – Botany Bay LEP 2013 – I68
- Additionally, there are four heritage listed items containing local or state significance within the study area's 100 metre buffer zone:
  - *Streetscape – Verge plantings of Canary Island Date Palms (Phoenix Canariensis)* – Botany Bay LEP 2013 – I65
  - *Booralee Park* – Botany Bay LEP 2013 – I61
  - *Botany Water Reserves (also known as Botany Wetlands or Botany Swamps)* – State Heritage Register (SHR), Sydney Water s170 register, Botany Bay LEP 2013 and RNE – 01317, 4570025, I2 and 17854
  - *Beckenham Memorial Church* – Botany Bay LEP 2013 – I61
- This SoHI has assessed the Botany Rail Line as having local significance.
- The study area has been assessed as containing the following archaeological potential and significance in relation to the five phases of European occupation referred to above (and in Section 4.2-4.6).:
  - Phase 1 - Low potential for the Eastern extent of the study area to contain State significant archaeological remains and nil to low potential for the Central and Western extents of the study area to contain locally significant archaeological remains
  - Phase 2 - Low to moderate potential for the Central and Eastern extents of the study area to contain locally significant archaeological remains and nil to low potential for the Western extent of the study area to contain local or State significant archaeological remains
  - Phase 3 - Moderate to high potential for the Central, Eastern and Western extents of the study area to contain archaeological remains not considered to have research significance or be classified as 'relics' under the NSW Heritage Act
  - Phase 4 - High potential for the Central, Eastern and Western extents of the study area to contain evidence of the post-1960 Botany Rail Line infrastructure and sidings not considered to have research significance or be classified as 'relics' under the NSW Heritage Act

- Phase 5 - High potential for the Central, Eastern and Western extents of the study area to contain evidence of modern (2002-present) development not considered to have research significance or be classified as 'relics' under the NSW Heritage Act.

Project activities with the potential to impact heritage items

- The project involves the following:
  - Duplication of about three kilometres of the Botany Rail Line on the Down side
  - Upgrades to the existing Botany Rail Line track including the installation of new catchpoints, turnouts and crossovers
  - Establishment of temporary compound sites and materials storage and laydown areas
  - The construction of five new bridges at Mill Stream, Southern Cross Drive, O'Riordan Street, Robey Street and Botany Road.
  - Demolition of the existing *Mascot (O'Riordan Street) Underbridge* and *Mascot (Robey Street) Underbridge*
  - Modification to the *Mascot (Botany Road) Underbridge*
  - Construction of retaining walls and embankments along the project corridor, most significantly at Mill Stream, Southern Cross Drive, O'Riordan Street and Robey Street
  - Localised subsurface excavations to accommodate Combined Service Routes (CSR) and drainage routes
  - Utilities relocation and protection
  - Renewal, removal and alterations of signals and signal equipment rooms to facilitate the track duplication
  - Billboard adjustments
  - Land acquisition

Assessed impacts to heritage items and potential archaeological remains

- The project will have a major impact to the s170 listed *Mascot (O'Riordan Street) Underbridge* and *Mascot (Robey Street) Underbridge* and minor impact to the LEP listed *Railway Bridge over Botany Road*
- The project will have a minor to negligible impact to the SHR, LEP, RNE and s170 listed *Botany Water Reserves*
- The project will have a minor to negligible impact to the LEP, CHL and RNE listed *Sydney (Kingsford Smith) Airport Group*
- The project will have nil impact on the LEP listed *Commonwealth Water Pumping Station and Sewerage Pumping Station No 38, Streetscape – Verge plantings of Canary Island Date Palms (Phoenix Canariensis), Booralee Park,* and *Ruins of the former Botany Pumping Station*
- The project will have a negligible visual impact and nil physical and archaeological impact on the LEP listed *Beckenham Memorial Church*
- There are three locations within the study area with low and moderate archaeological potential for locally or State significant remains associated with Phase 1 and 2 occupation. These are proposed

to be used as compound sites and material laydown and storage areas. At present, the extent of subsurface impacts for these facilities is not known, however they are anticipated to be minimal and limited to localised excavations for building footings and services. Therefore, depending on the nature and depth of subsurface excavations, impacts to archaeological remains as a result of these works are considered to be negligible to minor

- Potential archaeological remains associated with Phases 3, 4 and 5 are not considered to contain archaeological research significance. Therefore, archaeological management (with the exception of an Unexpected Finds Procedure) is not required in areas assessed as having potential to contain subsurface remains of these phases
- Impacts to land owned or leased by the Commonwealth or a Commonwealth Authority (for example the Sydney (Kingsford Smith) Airport) as a result of the proposed works have been assessed as minor
- Overall, cumulative impacts associated with the project, including the Sydney Gateway Road project, Airport East and WestConnex, would be moderate to minor.

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ACRONYMS

Acronym	Definition
ACI	Australian Consolidated Industries
AGM	Australian Glass Manufactures
ARTC	the Australian Rail Track Corporation
ARD	Archaeological Research Design
CBD	Central Business District
CHL	Commonwealth Heritage List
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*
ICOMOS	International Council on Monuments and Sites
LEP	Local Environment Plan
LGA	Local Government Area
LRS	Land Records Services
NHL	National Heritage List
NLA	National Library of Australia
NSW	New South Wales
PAR	Photographic Archival Recording
REF	Review of Environmental Factors
RMS	Roads and Maritime Services
RNE	Register of National Estate
RNT	Register of the National Trust
SHI	State Heritage Inventory
SHR	State Heritage Register
SLNSW	State Library New South Wales
SoHI	Statement of Heritage Impact
TPZ	Temporary Protection Zone
TfNSW	Transport for New South Wales
WHL	World Heritage List

1.0 INTRODUCTION

1.1 Overview

Artefact Heritage Services Pty Ltd (Artefact Heritage) have been engaged by Gateway to Sydney Joint Venture (G2SJV) on behalf of the Australian Rail Track Corporation (ARTC) to prepare a Statement of Heritage Impact (SoHI) for the proposed Botany Rail Duplication (the project).

Port Botany is one of Australia and NSW's most important infrastructure assets, with Port Botany the second largest container port in Australia, and NSW's largest bulk liquid and gas port and only container port.

The amount of container freight handled by Port Botany is predicted to significantly increase. The Australian and NSW Governments have identified clear objectives to increase the share of this freight that is moved by rail. Transporting more freight to and from Port Botany by rail will place additional demands on the existing Botany freight rail line (the Botany Line), with freight that cannot be accommodated on rail placing demands on the surrounding congested road network.

ARTC proposes to upgrade and duplicate a section of the Botany Line between Mascot and Botany to increase rail freight capacity to Port Botany.

The project requires approval from the NSW Minister for Planning under Division 5.2 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

This report has been prepared as part of the Environmental Impact Statement (EIS) for the project. The EIS has been prepared to support the application for approval of the project and address the environmental assessment requirements of the Secretary of the Department of Planning and Environment (the SEARs), issued on 18 December 2018.

1.2 The project

1.2.1 Key features

The project would involve construction and operation of a new second track predominately within the existing ARTC rail corridor for a distance of about three kilometres between Mascot and Botany. This section of the existing Botany Line would be converted from one track to two parallel tracks. The proposed new second track would be located on the southern side of the existing track for the length of the duplication. Some sections of the existing single track would also be upgraded with sections proposed to be moved sideways (slewed) within the rail corridor to make room for the new second track.

The project would also involve upgrading existing rail bridges to meet necessary standards and provide for the new second track as well as other ancillary infrastructure upgrades such as signalling and drainage.

It is noted that the project scope described in this chapter is based on the level of design development which has occurred to date. Detailed design would include further engineering, construction planning and detailed assessment work, and would be subject to further input from key stakeholders and the community.

Further information on the project is provided in Section 8.0 of this report and Chapter 7 of the EIS.

1.2.2 Location

The project is generally located within the rail corridor for the Botany Line, about eight kilometres south of the Sydney central business district, in the suburbs of Mascot, Botany and Pagewood. The north-western extent of the project site is located in the vicinity of Qantas Drive, south of Coward Street in Mascot. The south-eastern extent of the project is located just to the north of the Stephen Road bridge in Botany.

The rail corridor is owned by the NSW Government (RailCorp) and leased to ARTC.

1.2.3 Study Area

For the purposes of this report, the study area (project area) is encompassed by the project's construction footprint, including compound sites and crane pads. The location of the study area is shown in Figure 1-3.

To adequately assess direct and indirect impacts to surrounding heritage listed items, a buffer zone of 100 metres has been incorporated into this SoHI.

To simplify the assessment, the study area has been divided into three key segments:

- **Eastern Extent**: Stephen Road, Botany to Southern Cross Drive
- **Central Extent**: Southern Cross Drive to O'Riordan Street, Mascot
- **Western Extent**: O'Riordan Street to Lancastrian Road, Mascot

These are also illustrated in Figure 1-3.

1.2.4 Timing

Subject to approval of the project, construction is planned to start at the end of 2020, and is expected to take about three years for the main construction works to be undertaken. Construction is expected to be completed in late 2023 with commissioning activities undertaken in early 2024

It is anticipated that some features of the project would be constructed while the existing rail line continues to operate. Other features of the project would need to be constructed during programmed weekend rail possession periods when rail services along the line cease to operate.

At this stage, it is assumed that construction activities would also intrude the Sydney Airport Obstacle Limitation Surface (OLS). It is assumed that these activities would be required to be undertaken outside the operational hours of Sydney Airport (between 11pm and 6am). Where work is required to be undertaken outside of this time, it is expected that ARTC and the construction contractor would consult with Sydney Airport to seek relevant approval exemptions and crane permits (as required).

1.2.5 Operation

The project would allow trains to run in both directions along the length of the Botany rail line. The project would include bi-directional signalling for the tracks within the project site to provide flexibility for operations. The design of the project (including signalling) allows for the operation of trains up to 1,300 metres in length, operating at speeds of up to 50 kilometres per hour.

It is estimated that once operational, 38 trains would travel along the line in 2025.

Operation of the Botany rail line would continue to be managed by ARTC. Trains would be operated by a variety of operators.

Figure 1-1. Location of the study area. Source. WSP.

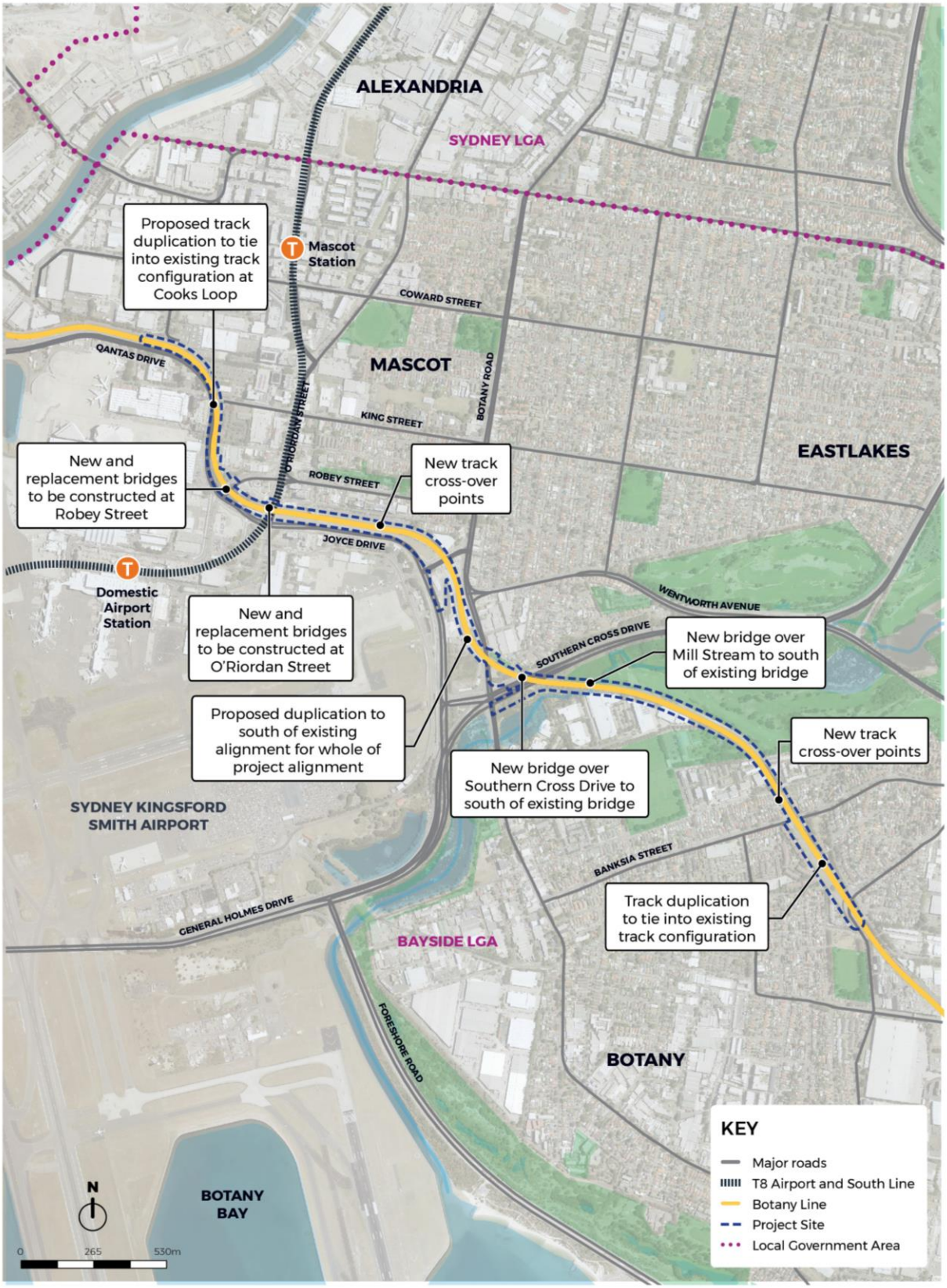

Figure 1-2. Key features and location of the project. Source. WSP.

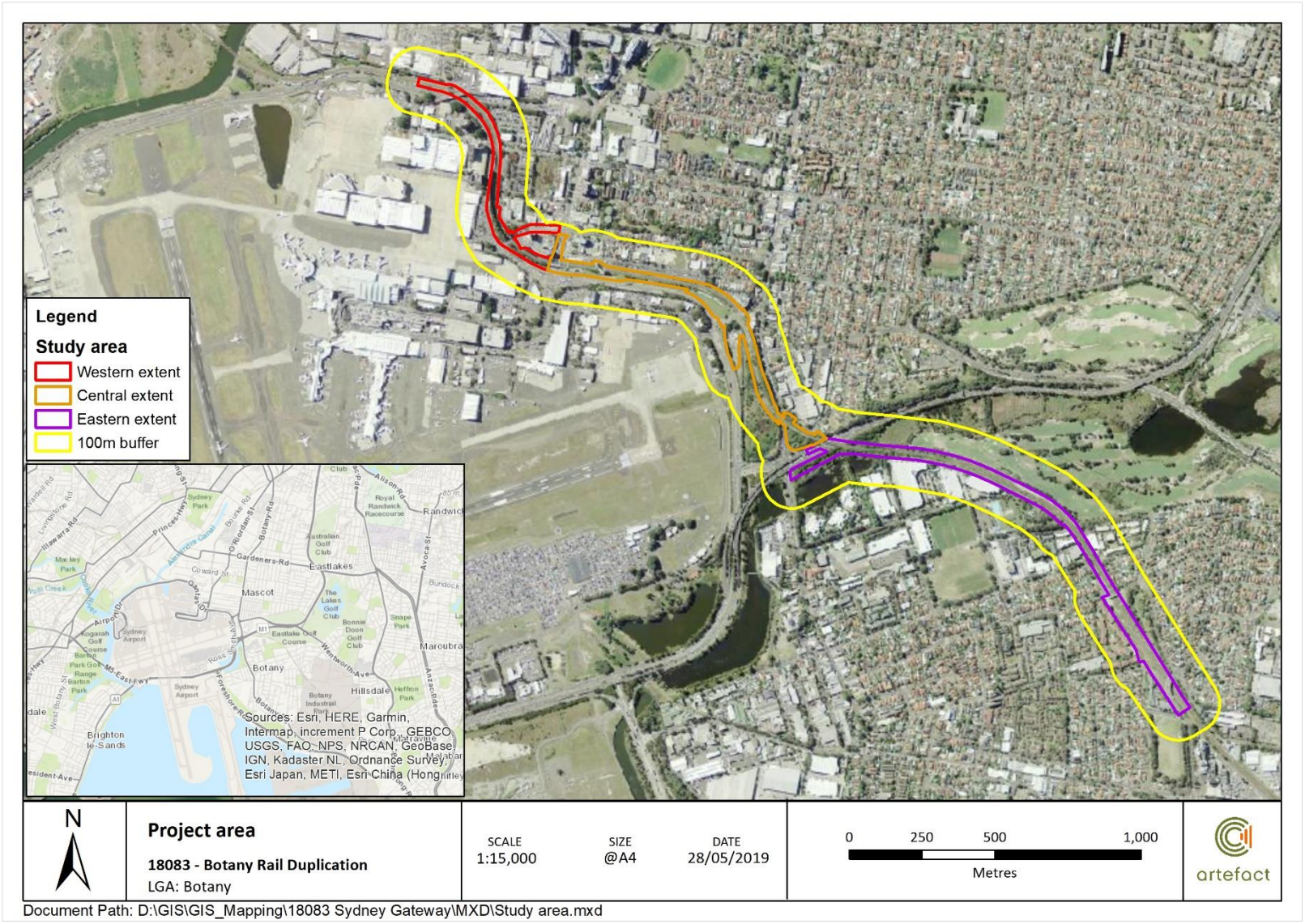

Figure 1-3. Location of the study area, 100 metre buffer zone and eastern, central and western extents.

1.3 Purpose and scope of this report

The purpose of this report is to assess the potential Non-Aboriginal heritage impacts from the operation and construction of the proposal. The purpose of this SoHI is to:

- Address the relevant Secretary's Environmental Assessment Requirements (SEARs) (issued on 18 December 2018) for the EIS, as outlined in Table 1-1
- Provide a historical background for the study area
- Undertake an analysis of the built heritage that may be impacted by the project
- Provide significance assessments for heritage listed items in, and in view of, the study area
- Assess potential impacts to heritage listed items that may occur as part of the proposed development
- Assess the non-Aboriginal archaeological potential of the study area
- Outline heritage management and mitigation strategies for the proposal.

1.3.1 SEARs

Table 1-1: SEARs for the Botany Rail Duplication Project (SSI 18-9714) relevant to this assessment

Requirements under Section 4: Heritage	Where addressed in this report
1) The Proponent must identify and assess any direct and/or indirect impacts (including cumulative impacts and visual impacts) to the heritage significance of: c) environmental heritage, as defined under the Heritage Act 1977; and e) heritage items and conservation areas identified in local and regional environmental planning instruments applicable to the project area	These requirements are addressed in the Heritage Impact Assessment in Section 9.0 and Cumulative Impacts in Section 9.4
2) Where impacts to State or locally significant heritage items are identified, the assessment must: a) include a significance assessment and statement of heritage impact for all heritage items including the Botany Water Reserves/Botany Wetlands and underbridges (Botany Road, O'Riordan Street and Robey Street) (including significance assessment); b) consider impacts to the item of significance caused by, but not limited to, vibration, demolition, archaeological disturbance, altered historical arrangements and access, visual amenity, landscape and vistas, curtilage, subsidence and architectural noise treatment (as relevant) c) outline measures to avoid and minimise those impacts in accordance with the current guidelines; and d) be undertaken by a suitably qualified heritage consultant(s) (note: where archaeological excavations are proposed the relevant consultant must meet the NSW Heritage Council's Excavation Director criteria).	These requirements are addressed in the Significance Assessments in Section 6.0, Heritage Impact Assessment in 9.0, Statement of Heritage Impact in Section 9.6, Mitigation Measures in Section 11.0 and Personnel in Section 1.6.

1.4 Structure

The structure of this SoHI is outlined below:

- Section 1 - Introduction
- Section 2 – Report methodology
- Section 3 – Legislative context
- Section 4 – Historical background
- Section 5 – Site inspection
- Section 6 – Significance assessment
- Section 7 – Non-Aboriginal archaeological assessment
- Section 8 – Project description
- Section 9 – Heritage impact assessment
- Section 10 – Mitigation measures
- Section 11 – Conclusions and recommendations
- Section 12 – Reference list

1.5 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 (diaries, maps, letters and manuscripts) and secondary (newspaper articles, books and commentaries) source documents.

1.6 Personnel

This SoHI was prepared by Adele Zubrzycka (Senior Heritage Consultant) and Jessica Horton (Heritage Consultant). Vanessa Edmonds (Principal) and Sandra Wallace (Managing Director) provided management input and review.

Staff qualifications and years of experience are presented in Table 1-2.

Table 1-2: 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
Jessica Horton	Graduate Heritage Consultant/Author	Honours and MArch	Two years' experience in heritage consulting in NSW
Vanessa Edmonds	Technical Reviewer	MArch	Thirty-five years' experience heritage consulting in Australia
Sandra Wallace	Technical Reviewer	Honours (first class) and PHD	Fifteen years' experience in heritage consulting in NSW

2.0 METHODOLOGY

2.1 Introduction

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

- *Statements of Heritage Impact* 2002, *NSW Heritage Manual* 2002 (NSW Heritage Office)
- *Assessing Significance for Historical Archaeological Sites and Relics* 2009 (Heritage Branch, Dept. of Planning)
- *Burra Charter* 2013 (Australia ICOMOS).
- *Criteria for the assessment of excavation directors* (NSW Heritage Council, 2011)

Heritage listed items within the study area and its 100 metre buffer zone were identified through searching the following statutory and non-statutory databases in July and October 2018:

- 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

2.2 Heritage significance assessments

Determining the heritage significance of items, landscapes or archaeological remains is undertaken by utilising a system of assessment centred on the Burra Charter of Australia ICOMOS. This SoHI will assess items using this system, alongside criteria outlined in the *NSW Heritage Manual: Assessing heritage significance* (NSW Heritage Office 2001). The *NSW Heritage Manual: Assessing heritage significance* replaced the *NSW Heritage Manual* (Urban Affairs and Planning, 1994), in 2001 following major amendments to the Heritage Act. These are outlined in Table 2-1.

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 State Heritage Inventory (SHI), where possible.

Criteria adopted to assess items on the CHL have been also used to assess items where relevant. These are also included in Table 2-1. If an item meets one of the eight heritage criteria, and retains the integrity of its key attributes, it can be considered to contain heritage significance.

Table 2-1: 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 persons, 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 of cultural or natural 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.

2.3 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 2-2.

Table 2-2. 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

Grading	Justification	Status
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

2.4 Heritage impact assessments

Impacts to 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 2-3. 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 2-3. 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.

2.5 Site inspection

A site inspection of the study area was carried out on Wednesday 18 July 2018 by Adele Zubrzycka (Senior Heritage Consultant, Artefact Heritage) and Vanessa Edmonds (Principal, Artefact Heritage). The inspection was undertaken on foot and a photographic record made. GPS co-ordinates were collected in areas where items that may contain heritage significance or areas where archaeological potential were identified.

The aim of the inspection was to evaluate the existing environment within the study area as well as assess visual, direct and indirect physical impacts to all heritage listed items outlined in Section 3.6. The inspection also aimed to identify or investigate potential non-Aboriginal archaeological sites and unlisted heritage items within the study area. Results of the site inspection are provided in Section 5.0.

2.6 Archaeological potential

The identified levels of archaeological potential referred to in this document are based on the definitions outlined in Table 2-4.

Table 2-4. 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.

3.0 LEGISLATIVE CONTEXT

3.1 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 and their own national heritage.

The concept of a buffer zone was first included in the Operational Guidelines for the Implementation of the Wold Heritage Convention in 1977 and recognises the value of the environment that surrounds a site. The buffer zone acts as an additional layer of protection for World Heritage sites. It is a space that is itself not of outstanding universal value, but that influences the value of a World Heritage site.

There are no heritage items listed on the World Heritage List within or in study area's 100 metre buffer zone.

3.2 National and Commonwealth Legislation

3.2.1 Airports Act 1996 and associated regulations

The study area 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 develop 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.

As the project will require temporary use of Commonwealth owned land during the construction phase, an assessment of the consistency of the project with the Airports Act and associated master plan and environment strategy is provided in Section 9.0.

3.2.2 Airports (Environment Protection) Regulations 1997

The objective of *the Airports (Environmental 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, and 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:*
>
> *existing aesthetic, cultural, historical, social and scientific (including archaeological and anthropological) values of the local area.*

As the project will require temporary use of Commonwealth owned land during the construction phase, consistency of the project with the Airports Act and associated master plan and environment strategy is assessed and provided in Section 9.0.

3.2.3 Environmental Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legislative framework for the protection and management of matters of national environmental significance, that is, flora, fauna, ecological communities and heritage places of national and international importance. Heritage items are protected through their inscription on the World Heritage List (WHL), Commonwealth Heritage List (CHL) or the National Heritage List (NHL).

Under Part 9 of the EPBC Act, 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, NHL or CHL must refer the action to the Minister for Sustainability, Environment, Water, Population and Communities (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.

3.2.3.1 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 Commonwealth Heritage List includes natural, Indigenous and historic

heritage places which the Minister for Sustainability, Environment, Water, Population and Communities is satisfied have one or more Commonwealth Heritage values.

There is one item registered as an Indicative Place on the CHL 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.

3.2.3.2 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 or the CHL.

There are no heritage items listed on the NHL located within the study area or the 100 metre buffer zone

3.2.3.3 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 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 held in esteem by the heritage community.

There are no items listed on the National Trust located within the study area or the 100 metre buffer zone.

3.3 State Legislation

3.3.1 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 are considered prior to land development; this includes impacts on cultural heritage items and places as well as archaeological sites and deposits.

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.

The project has been assessed as SSI (SSI 18_9714) under Part 5, Section 5.2 of the EP&A Act. Therefore, approval requirements under the EP&A Act do not apply to the current development consent process.

3.3.2 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 (natural and cultural) 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 SHR and are given automatic protection under the Heritage Act against any activities that may damage an item or affect its heritage significance. The Heritage Act also protects 'relics', which can include archaeological material, features and deposits.

The Heritage Act also provides protection for 'relics', which includes archaeological material or deposits. Section 4 (1) of the Heritage Act (as amended in 2009) 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*[1]

Sections 139 to 146 of the Heritage Act prevent the excavation or disturbance of land known or likely to contain relics, unless under an excavation permit. Section 139 (1) states:

> *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]

Excavation permits are issued by the Heritage Council of NSW, or its Delegate, under Section 140 of the Heritage Act for relics not within SHR curtilages, or under Section 60 for significant archaeological remains within SHR curtilages. In some circumstances, a Section 60 permit may not be required if works are undertaken in accordance with the Standard Exemptions for Works Requiring Heritage Council Approval or in accordance with agency specific exemptions.

The Heritage Act defines 'works' as being in a separate category to archaeological 'relics'. Works refer to past evidence of infrastructure. Works may be buried, and therefore archaeological in nature, however, exposure of works does not trigger reporting obligations under the Heritage Act. The following examples are commonly considered to be works:

- Former road surfaces or pavement
- Kerbing
- Evidence of former infrastructure (such as drains or drainage pits where there are no relics in association
- Building foundations

3.3.2.1 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 item listed on the SHR located within the study area's 100 metre buffer zone:

- Botany Water Reserves - 01317

3.3.2.2 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

[1] NSW Government, 1997 [2016]. *Heritage Act 1977 No. 136*. Accessed: https://www.legislation.nsw.gov.au/#/view/act/1977/136 (09/08/2017).
[2] NSW Government, 1997 [2016]. *Heritage Act 1977 No. 136*. Accessed: https://www.legislation.nsw.gov.au/#/view/act/1977/136 (09/08/2017).

establish and keep a register 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 three items listed on the ARTC s170 register within the study area:

- Mascot (O'Riordan Street) Underbridge - ARTC s170 heritage register - 4801830
- Mascot (Robey Street) Underbridge - ARTC s170 heritage register - 4801848
- Mascot (Botany Road) Underbridge - ARTC s170 heritage register - 4800248

There is one item listed on the Sydney Water s170 register within view of the study area's 100 metre buffer zone:

- Botany Wetlands - Sydney Water s170 heritage register - 4570025

3.4 Local legislation

3.4.1 Botany Bay LEP 2013

The Botany Bay LEP 2013 was gazetted on 21 June 2013 and came into effect on 26 June 2013, repealing in part the former Botany Local Environmental Plan 1995. It applies to all land within the Botany Bay 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. Schedule 5 of the Botany Bay LEP 2013 provides a list of heritage items and heritage conservation areas within the LGA.

The following item listed under Schedule 5 of the Botany Bay LEP 2013 is located within the study area:

Railway Bridge over Botany Road - I153 (Local significance) The study area is partially located within the curtilage of the following items:

- Commonwealth Water Pumping Station and Sewerage Pumping Station - I3 (State significance)
- Ruins of the former Botany Pumping Station - I168 (Local significance)
- Sydney (Kingsford Smith) Airport group - I170 (Local significance)

Additionally, there are four heritage listed items within the study area's 100 metre buffer zone:

- Streetscape - Verge plantings of Canary Island Date Palms (*Phoenix canariensis*) - I65 (Local significance)
- Booralee Park - I61 (Local significance)
- Beckenham Memorial Church - I52 (Local significance)
- Botany water reserves - I2 (State significance)

Two items in view of the study area and listed on the Botany Bay LEP 2013 have been demolished as part of the WestConnex Project since their 2013 listing:

- House - I50 (Local significance)
- House - I51 (Local significance)

3.5 Non-Statutory Considerations

3.5.1 Register of the National Estate

The Register of the National Estate (RNE) is no longer a statutory list; however, it remains available as an archive.

There is one item listed on the RNE within the study area:

- Botany Swamps - RNE place ID - 17854

Additionally, there is one item registered on the RNE interim list within the study area's 100 metre buffer zone:

- Sydney (Kingsford Smith) Airport Group - RNE place ID – 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.

3.6 Summary of relevant heritage listed items

Table 3-1 provides a summary of heritage listed items within the study area and its 100 metre buffer zone. The location of these items is shown in Figure 3-1 - Figure 3-4.

Table 3-1: Summary of heritage items in and within view of the study area.

Item	Address/location	Listing and listing no.	Significance	Relationship to study area
Mascot (O'Riordan Street) Underbridge	Extends over O'Riordan Street, Mascot	ARTC s170 heritage register SHI 4801830	Local	Within
Mascot (Robey Street) Underbridge	Extends over Robey Street, Mascot	ARTC s170 heritage register SHI 4801848	Local	Within
Mascot (Botany Road) Underbridge	Extends over Botany Road, Botany	ARTC s170 heritage register SHI 4800248	Local	Within
Railway Bridge over Botany Road	Extends over Botany Road, Botany	Botany Bay LEP 2013 I153	Local	Within
Sydney (Kingsford Smith) Airport Group	Part Lot 8, DP 1050923	Botany Bay LEP 2013 I170 Commonwealth Heritage List (Indicative Place) 105542 RNE Interim List 102669	Local	Partially within the study area and 100 metre buffer zone.

Item	Address/location	Listing and listing no.	Significance	Relationship to study area
Commonwealth Water Pumping Station and Sewerage Pumping Station	General Holmes Drive (west of Engine Pond, within the boundary of Sydney (Kingsford Smith) Airport)	Botany Bay LEP 2013 I3	State	The LEP heritage curtilage for the item is partially within the study area. However, the structures themselves are located 1 kilometre south of the study area, west of Engine Pond and outside of the 100 metre buffer zone.
Ruins of the former Botany Pumping Station	Within the boundary of Sydney (Kingsford Smith) Airport - Part Lot 8, DP 1050923	Botany Bay LEP 2013 I168	Local	The heritage curtilage for the item is partially within the study area. However, the ruins of the pumping station are located 500 metres south of the study area and outside of the 100 metre buffer zone.
Streetscape - Verge plantings of Canary Island Date Palms (*Phoenix canariensis*)	Brown Avenue, Botany	Botany Bay LEP 2013 I165	Local	Approximately 90 metres west of the study area and within the 100 metre buffer zone.
Booralee Park	Bounded by Sydenham Railway Line and Daniel, Bay, Lord, Myrtle and Jasmine Streets	Botany Bay LEP 2013 I61	Local	Approximately 110 metres southwest of the study area and within the 100 metre buffer zone.
Beckenham Memorial Church	1293–1295 Botany Road	Botany Bay LEP 2013 I52	Local	Approximately 40 metres east of the study area and within the 100 metre buffer zone.
House	1291 Botany Road	Botany Bay LEP 2013 I51	Local	Demolished Within the 100 metre buffer zone.
House	1289 Botany Road	Botany Bay LEP 2013 I50	Local	Demolished Within the 100 metre buffer zone.

Item	Address/location	Listing and listing no.	Significance	Relationship to study area
Botany Water Reserves (also known as Botany Wetlands or Botany Swamps)	About 200ha between Mascot and Botany extending from the northern shore of Botany Bay to Gardeners Road including the Lakes and East Lakes Golf Club and Mill and Engine Ponds	Botany Bay LEP 2013 I2 SHR 01317 Sydney Water s170 register 4570025 RNE 17854	State	Approximately 1-10 metres north and south of the study area and within the 100 metre buffer zone.

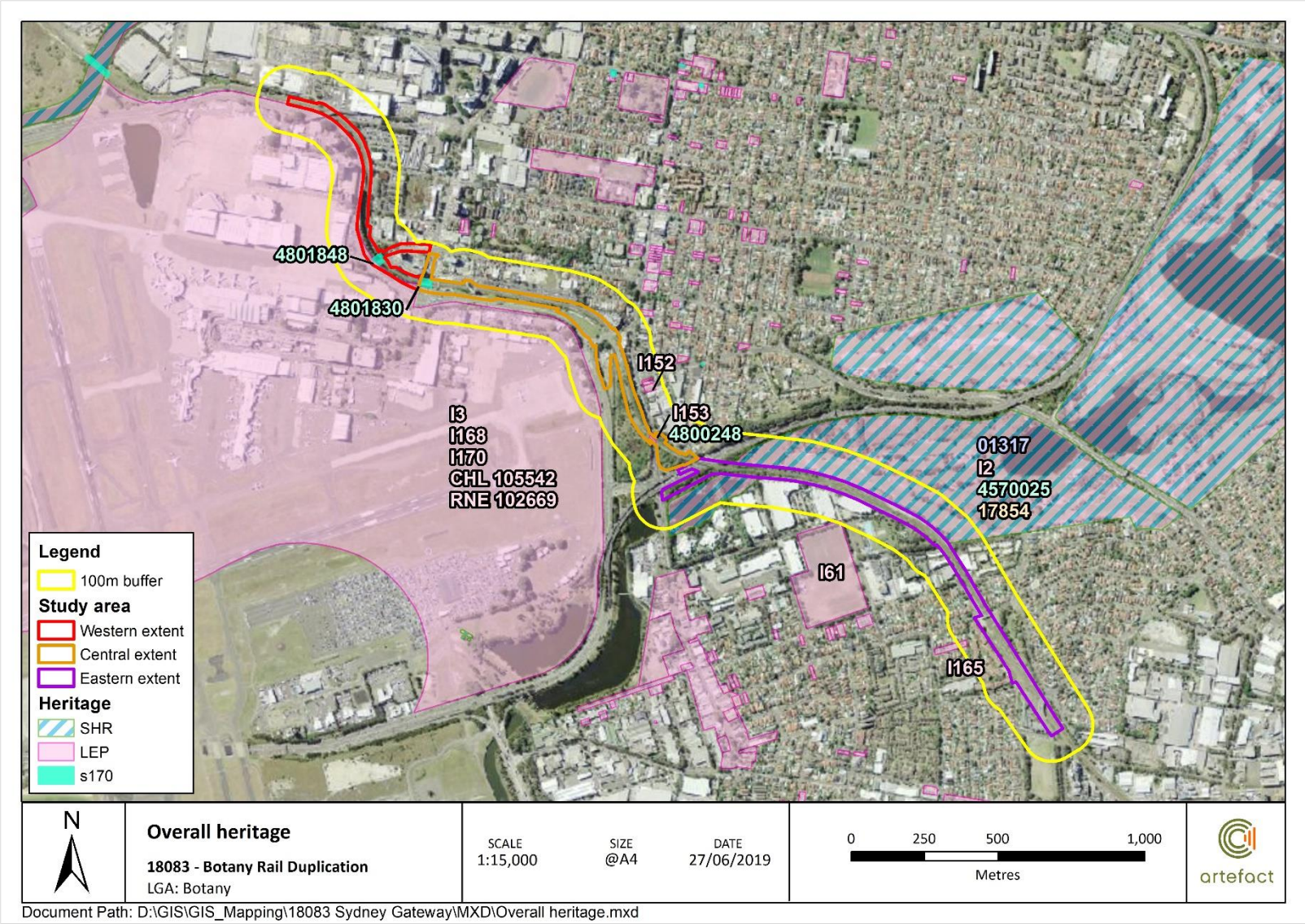

Figure 3-1: Overview of heritage listed items in the study area and within the 100 metre buffer zone.

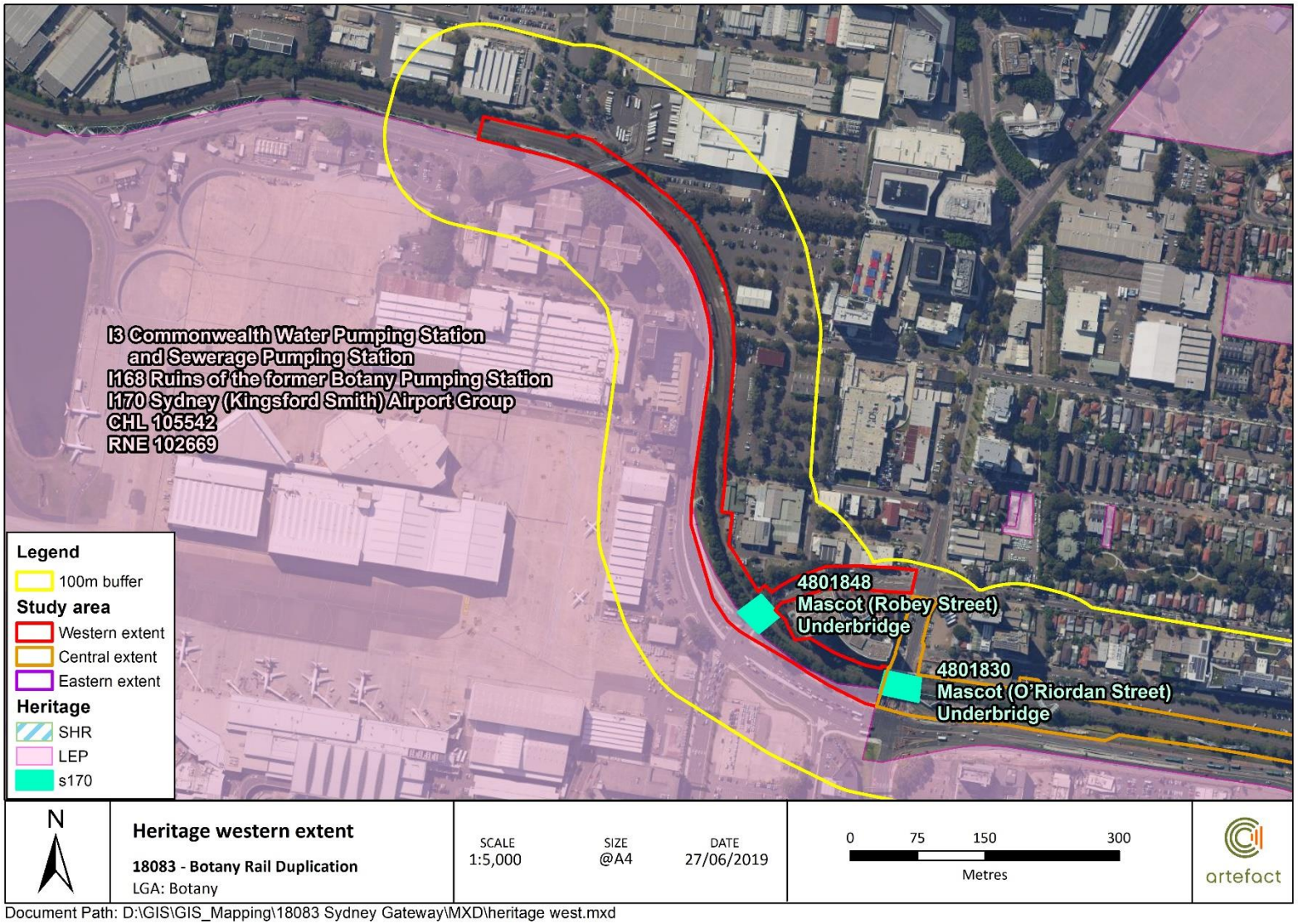

Figure 3-2: Detail of heritage listed items in the western extent of the study area and 100 metre buffer zone.

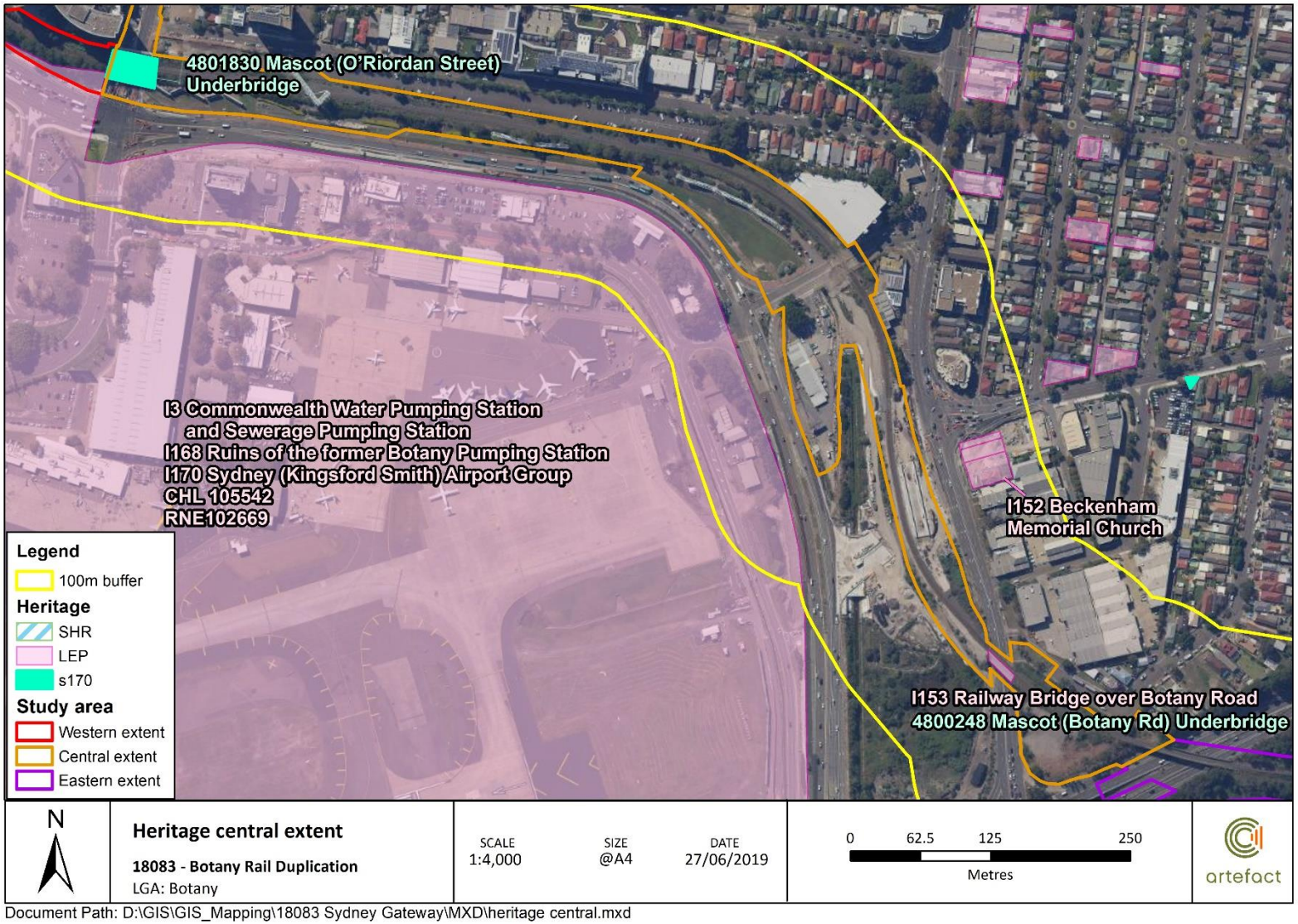

Figure 3-3: Detail of heritage listed items in the central extent of the study area and 100 metre buffer zone.

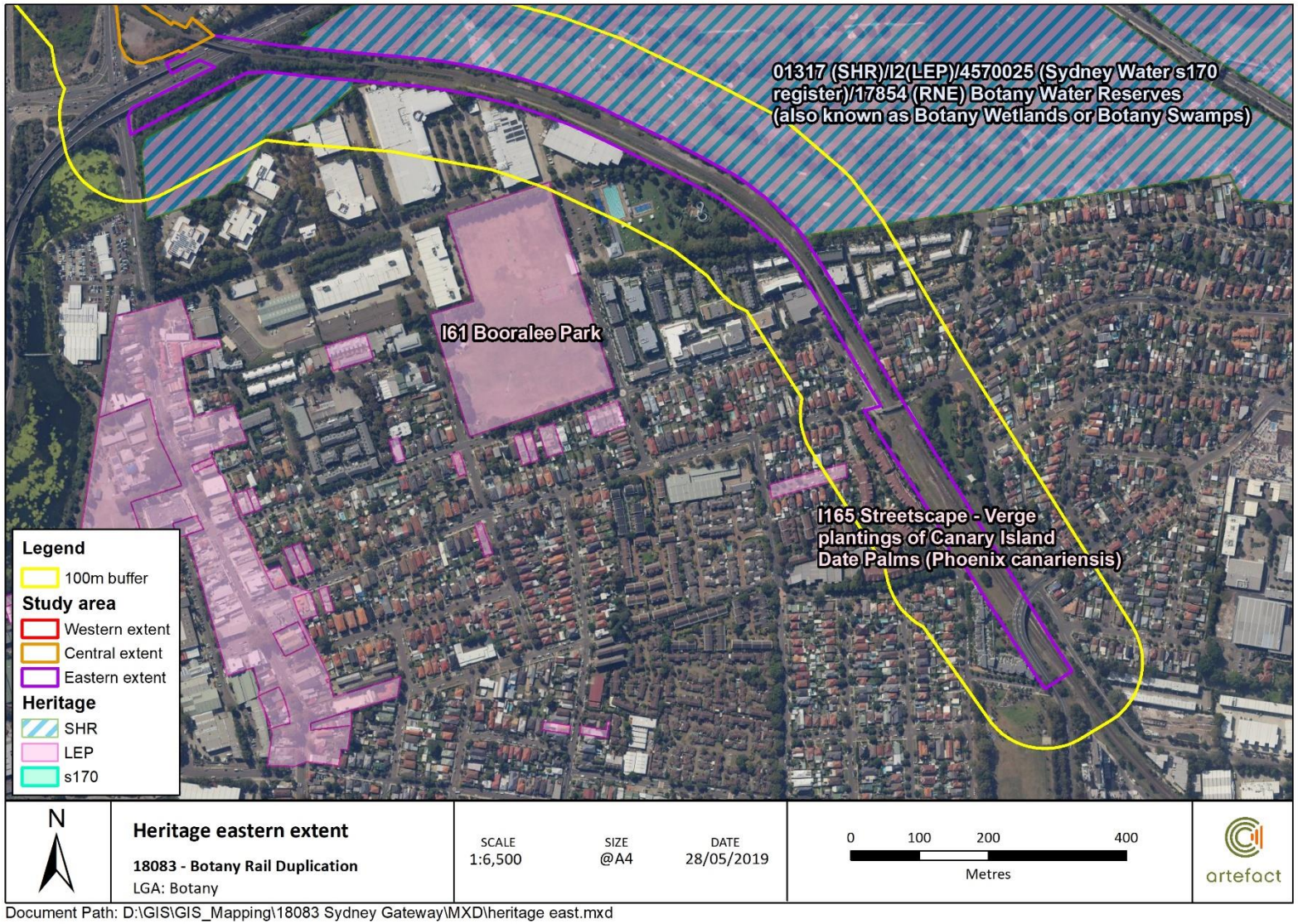

Figure 3-4: Detail of heritage listed items in the eastern extent of the study area and 100 metre buffer zone.

4.0 HISTORICAL BACKGROUND

4.1 General history of the study area

4.1.1 Aboriginal occupation

The study area is currently within the lands of the Metropolitan Local Aboriginal Land Council (LALC), to the east of the Eastern Distributor and in the lands of the La Perouse LALC to the west of the Eastern Distributor. The La Perouse Aboriginal community includes members who can trace their attachment to country through and before colonisation by the British. Families such as Timbury (Timbery) and Campbell have longstanding associations with the area recorded in both Aboriginal tradition and stories, and European documentary history.

Broadly, Aboriginal people in the area at the time of colonisation practiced a predominantly mobile lifestyle, often within the general bounds of estate and range (country). Where seasonal abundances occurred, groups 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 which 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.[3] 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 4-1: Botany Bay, NSW in c1842 by John Skinner Prout. Source. National Library of Australia (NLA).

[3] 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.

4.1.2 Early exploration of the region

The Botany Bay and the Mascot area was first explored by Europeans in 1770 when Captain James Cook, the *Endeavour's* botanist, Joseph Banks, and assistant, Daniel Solander visited the area.[4] 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 4-2.[5] Dr George Worgan, a naval surgeon who had accompanied King on the journey, concluded that “on the whole it was tedious”.[6]

Although sparsely vegetated, woodlands containing cabbage tree palms, mahogany trees, blackbutts and eucalypts occupied low lying areas east and south of the study area. These attracted timber getters early on.[7] A water system known as the Botany Wetlands dissected land within the southern section of the study area, now part of the East Lakes Golf Club. Another primary water course - Shea’s Creek - ran along the study area’s northern boundary. Together these formed Sydney’s largest freshwater resource.[8]

Figure 4-2: View near Botany Bay towards Sydney by William Leigh in 1853 showing the natural environment at the time. Source. State Library of NSW (SLNSW).

[4] 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.
[5] Lawrence, J. 2001. A Pictorial History of Randwick, p. 2.
[6] Lawrence, J. 2001, p. 2.
[7] Cumming, S. 2004. Post-European environmental impacts in Green Square in Histories of Green Square, p. 13.
[8] City of Botany Bay Council, 'Botany Wetlands: a guide to the Botany Wetlands', undated brochure, p 2

4.2 Phase 1 - Early occupation and industry (circa 1809-1862)

Phase 1 occupation is associated with early European settlement, land grants, industry and some scattered residential settlement.

4.2.1 Early land grants

During the early years of settlement, land within the study area consisted of marshy swamp land and sand banks dissected by streams and creeks associated with the Botany Wetlands and Shea's Creek (shown in Figure 4-4 and illustrated in Figure 4-5).

The earliest land grants in and surrounding the study area were Edward Redmond's 135 acre property called 'Cool Harbour' (granted in 1810), ex-convict Simeon Lord's 600 acre allotment (comprising the southern extent of the study area), J R Hatfield's adjoining 89 and 65 acre properties (comprising the western extent of the study area), and H Hollingshed's 53 acre plot (also within the study area), as shown in Figure 4-3. Smaller grants were later given in the north-western portion of the study area and belonged to L Gordon (sixteen and a half acres) and J R Hatfield (seventeen acres), as shown in Figure 4-4.

Lord's land was formally granted to him in 1823, although he had erected his first mill near the Lachlan Stream in 1815. Access to his and other properties was accomplished via horse and dray, or on foot along informal tracks.[9] The north western portion of the study area was accessible from 1821 via Botany Road, which at that time comprised of a bush track and ran in a north south alignment, as it remains today.

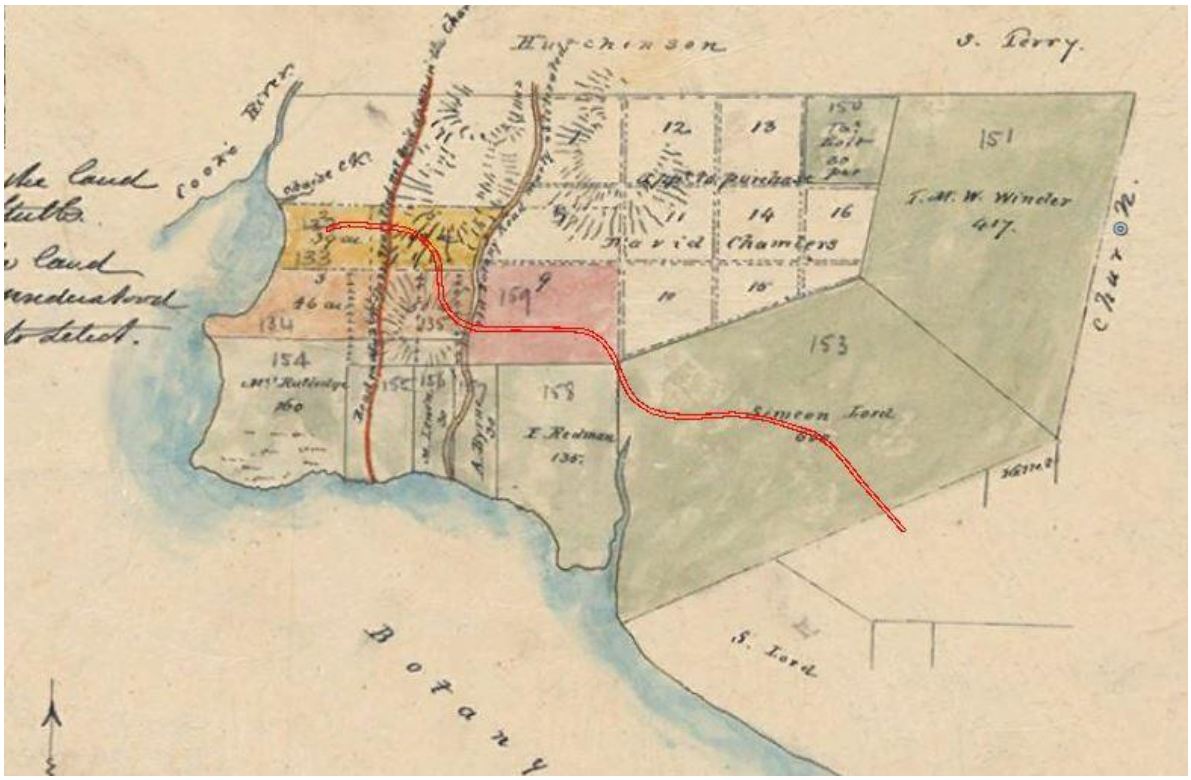

Figure 4-3: 1836 Map of Cumberland County Botany Parish showing the extent of land grants in 1836 and location of Old Botany Road (now O'Riordan Street) and present Botany Road in relation to the study area. Source. NSW State Archives, sketch book 3, folio 50.

[9] Evening News, 6 Aug 1904, p. 3.

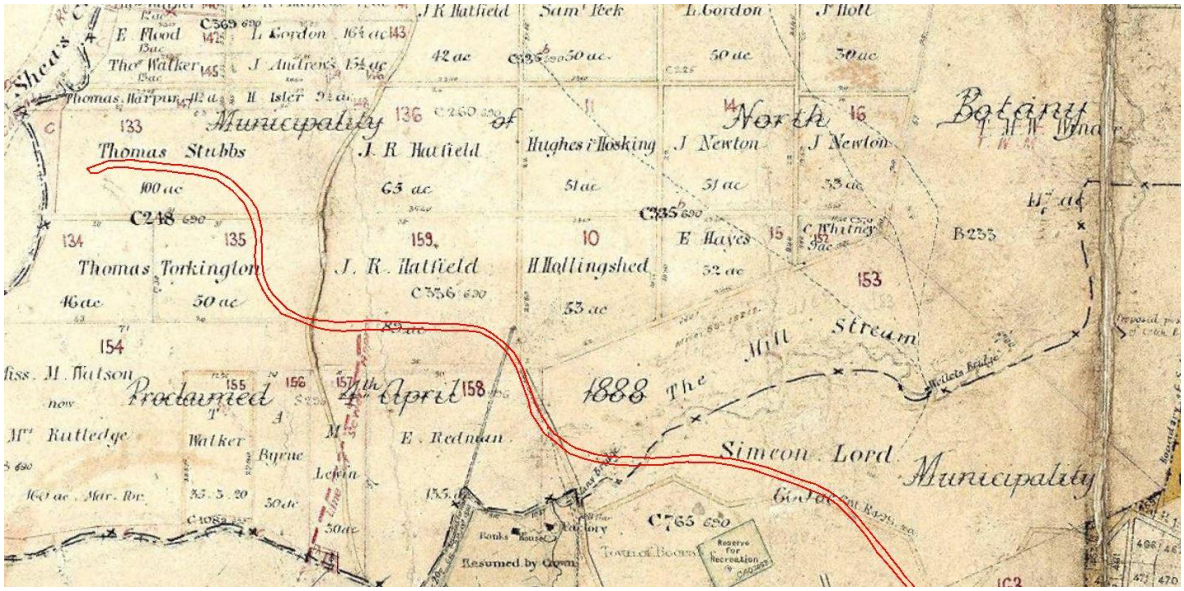

Figure 4-4: 1888 parish map of Botany showing location of later grants given in north-western extent of the study area. The study area is shown in red. Source. Land Registry Services (LRS).

4.2.2 Industrial mills and Simeon Lord

Botany's natural environment and the area's distance from the city attracted water reliant industries such as fishing, wool washing and grain and wool mills, which were established from the early 1800s onwards.[10] These were often built close to the water's edge, providing hydraulic power to power the mills and large bodies of water for washing and processing wool. An example of a wool washing estate in Botany is shown in Figure 4-5.

The earliest flour and wool mills in the area were established by Simeon Lord in 1815. Lord is reputed to have been the first person to export wool from Australia and went on to become a well-respected and wealthy timber merchant, retailer, sealer, auctioneer, pastoralist and manufacturer.[11] Lord's wool mill (shown in Figure 4-6) was built next to a man-made dam along the northern shoreline of Botany Bay, approximately two kilometres southwest of the study area (Figure 4-6). Lord's flour mill was situated close by, along a separate body of water. By 1823 he had acquired an additional 600 acres of land now occupied by the southern section of the study area and the Botany Wetlands. Here Lord built a new factory and home for his family and servants within his 600 acres grant (outside of the study area) and swiftly formalised the wetlands, creating what are now known as Mill Pond and Engine Pond.[12]

The south-eastern alignment of the study area crosses through Mill Pond, while Engine Pond is located approximately 700 metres outside of the study area to the southwest. Lord's mills ran until 1855, when land was resumed by the Government for the Botany Water Pumping Station which was established in 1858.

A plan of Botany prepared in 1858 shows several buildings associated with Lord's mills situated along mill stream to the northeast and southwest of the study area (Figure 4-8). No structures are located within the study area which is occupied by a stream and low lying sandhills. If any evidence of Lord's activities survives within the project footprint, they would most likely represent landscape modifications associated with formalising the water courses such as the construction of embankments and clearing of vegetation.

[10] Lawrence, J. 2001, p. 7.
[11] Hainsworth, D. R. 1967. 'Lord, Simeon (1771–1840)', Australian Dictionary of Biography, National Centre of Biography, Australian National University, http://adb.anu.edu.au/biography/lord-simeon-2371/text3115, published first in hardcopy 1967, accessed online 16 August 2018.
[12] Butler, M, 2011.

Figure 4-5: Wool washing estate, Botany. Watercolour. Undated - 1862-1873 by Samuel Elyard. Source. SLNSW

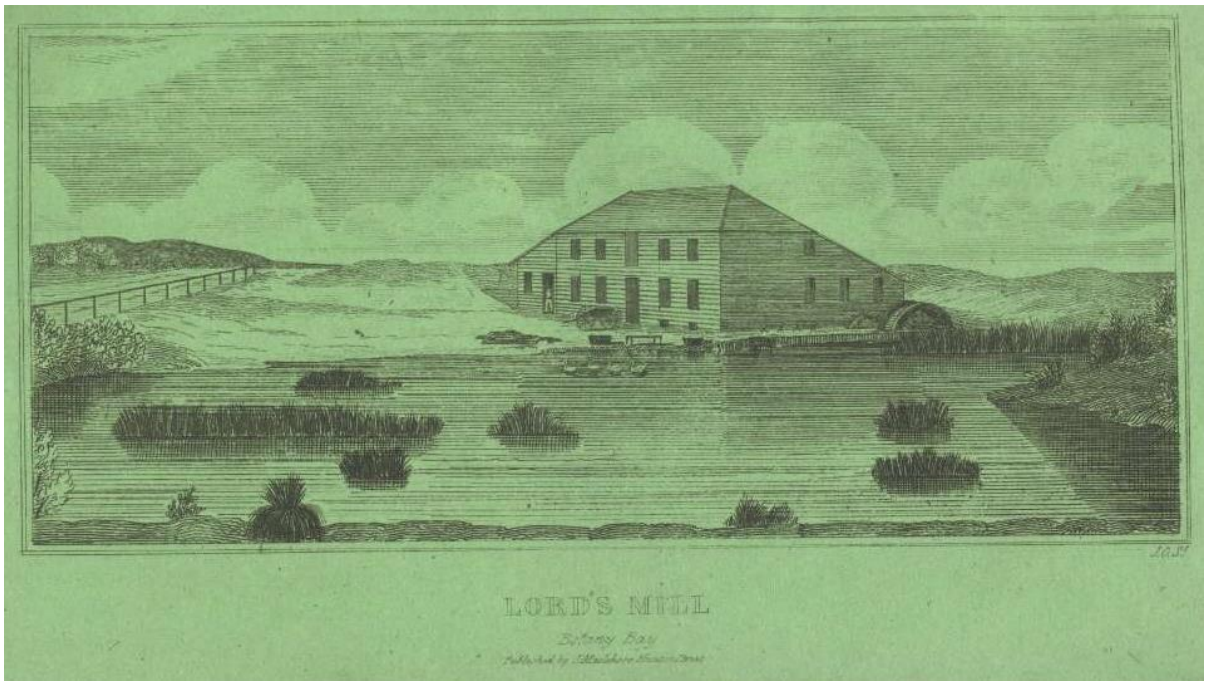

Figure 4-6: Lords Mill Botany 1838 by John Carmichael. Source. NLA.

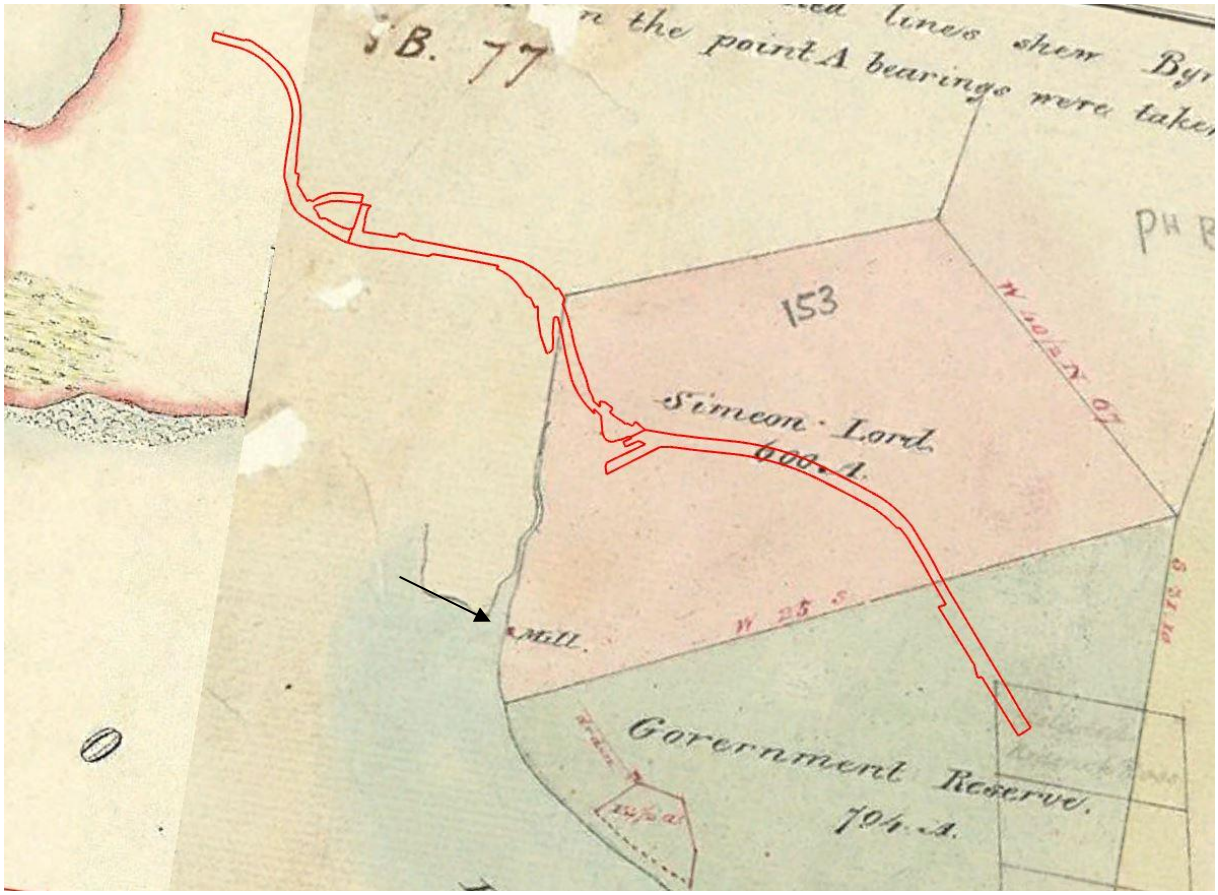

Figure 4-7: 1831 plan of the Cumberland County showing Simeon Lords 600 acres and location of his mill along the Botany Bay shoreline, south of the study area (outlined in red). Source. NSW State Archives, Sketch book 1 folio 77.

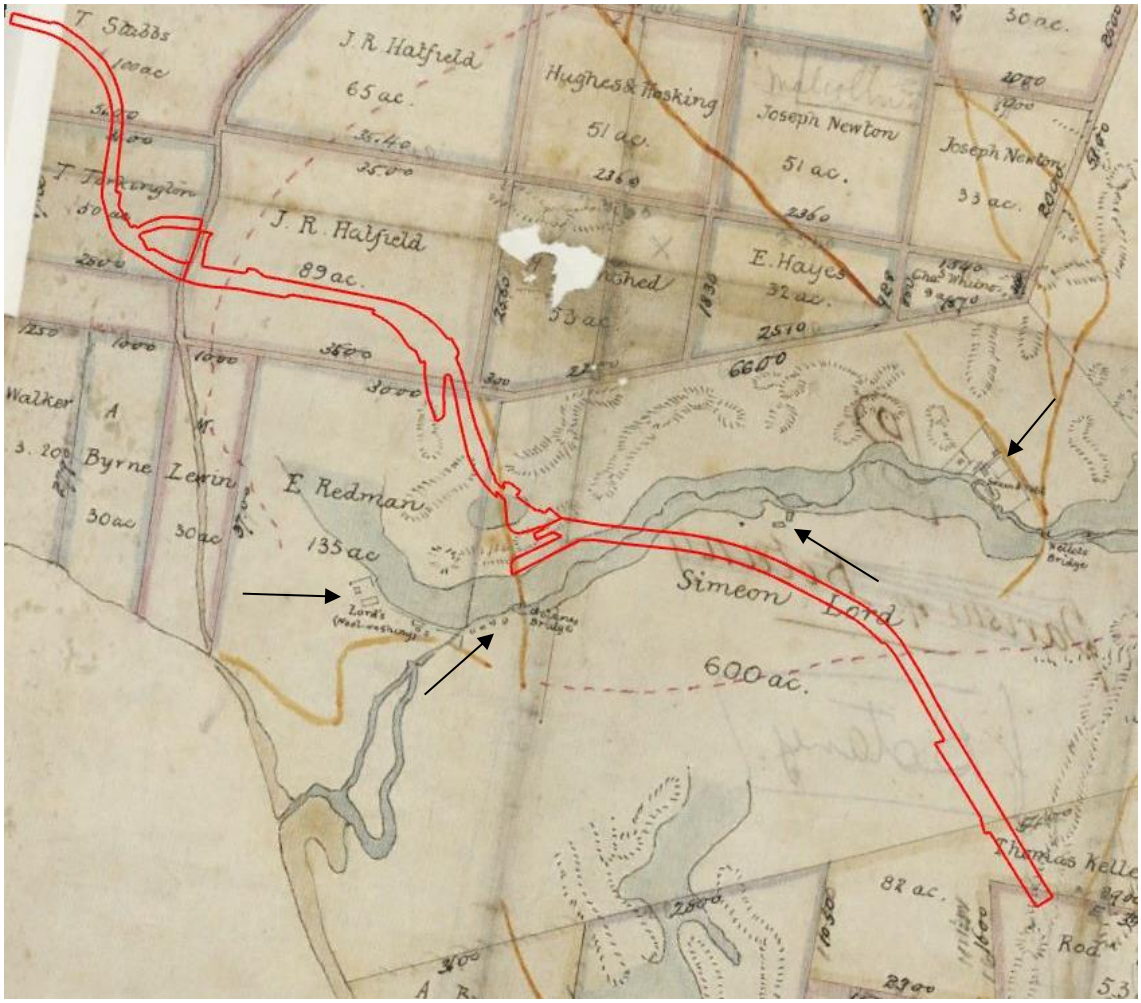

Figure 4-8. 1858 parish of Botany (Lachlan and Botany watersheds) plan showing location of Lord's mill and associated structures (indicated). The study area is outlined in red. Source. State Library of NSW.

4.2.3 Market gardens within the Botany and Mascot area (1830 onwards)

Market gardens were first established around Botany and Mascot in the 1830s and became common following the Gold Rush of the 1850s which brought Chinese immigrants to the area.[13] By the early 20th century, Botany was known as Sydney's 'backyard vegetable garden'.[14] 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 4-21.

Due the area's sandy soils, 'night soils' were often used as a fertiliser. These were generally collected from cesspits and earth closets across Sydney by night soil carters, dumped at a night soil depot near the Victoria Barracks or sold directly to market gardeners.[15] Cesspits were often used to discard general household waste and as a result, remains of these early market gardens are likely to contain 19th century rubbish collected from households across the city.[16] It is not known whether any Chinese or European run market gardens were located within the study area during this occupation phase.

[13] Butler, M., 2011.
[14] Larcombe, F. 1970. *The History of Botany 1788–1970*, The Council of the Municipality of Botany, Mascot, p 10.
[15] Asset Management and Sydney Water Corporation, 2003. *Botany Wetlands Draft CMP*, p. 17.
[16] Gojak. D. pers. Comm. Email, Friday 21/09/2018.

4.2.4 Noxious industries (1848 onwards)

The mid-19th century saw significant changes to land use in and around the eastern and central extent of the study area and Botany Wetlands as a result of the 1848 *Noxious Industries Act*. This pushed industries out of the city limits and into Botany, Waterloo and Alexandria and the area was soon being heavily utilized for wool washing, meat works, candle works, leather tanning, paper making, soap making and boiling down works.[17]

The central and eastern extent of the study area (between today's General Holmes Drive and Banksia Street) remained largely unoccupied during this period. However, a Higinbotham and Robinson 1888-1889 plan of North Botany shows Robertson and Co.'s Stearine and Candle Works occupying land just north of Southern Cross Drive (outside of the study area), as shown in Figure 4-9. Stearine (or Strearin) is derived from animal fats and is a by-product of the beef processing industry. In addition to candles, stearine is used to produce soap.[18] The factory (a large timber structure) was destroyed by fire in 1877.[19] There is no evidence to suggest structures associated with the factory occupied land within the study area.

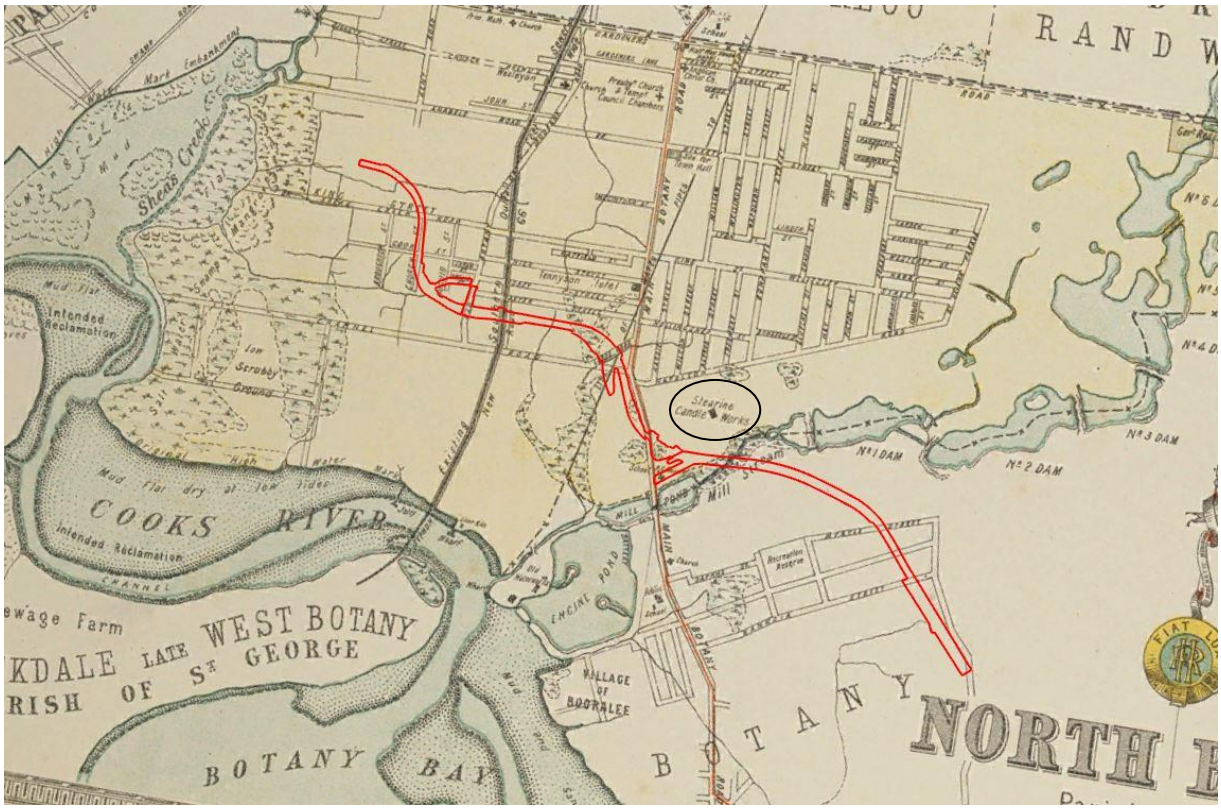

Figure 4-9: 1880-1899 plan of North Botany in the Parish of Botany showing Robertson and Co.'s Stearine and Candle Works to the north of the study area (circled) alongside surrounding development. Lithographed and published by Higinbotham & Robinson. Source. NLA.

[17] 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.
[18] Thomas, A.,2002. 'Fats and Fatty Oils'. Ullmann's Encyclopedia of Industrial Chemistry. Accessed online at: https://onlinelibrary.wiley.com/doi/abs/10.1002/14356007.a10_173 on 16/08/2018.
[19] The Sydney Morning Herald, DESTRUCTIVE FIRES AT BOTANY, Monday 24 December 1877, p. 5.

4.3 Phase 2 - Residential development, Chinese market gardens, Botany Water Pumping Station and Botany Rail Line development (1858-1925)

4.3.1 Botany Water Pumping Station (1859-1886)

In 1852, the Botany Wetlands (formerly mill stream) were chosen as Sydney's third fresh water source under what would be named 'The Botany Scheme'. The Botany Scheme replaced Busby's Bore, which had replaced the Tank Stream (Sydney's first fresh water source) and involved damming the wetlands and directing water downstream to a large pond and pumping station near today's Sydney Airport.[20] This required the construction of a pumping station, shown in Figure 4-11. A total of six dams were created as part of the scheme, all of which remain within the landscape today and are shown in a plan prepared in 1875 (Figure 4-10). Although some modifications to the wetlands were required for the dams, Mill and Engine Ponds were not altered for the scheme and have subsequently retained their original form. They therefore represent intact evidence of Lord's early industrial activities in the area.

The 1875 plan also records a building occupying land immediately north of Mill Pond and east of the former Botany Road alignment. Its purpose is unknown, and the area is now occupied by Southern Cross Drive.

Although the scheme was successful for over a decade, by 1869 water within the wetlands had become polluted and unreliable. The development of the Upper Nepean Scheme led to the decommissioning of the Botany Pumping Station in 1886. All machinery and boilers were dismantled in 1896 and sold at auction, leaving only the chimney stack intact. The conclusion of the Botany Scheme was followed by a short industrial renaissance, with factories and wool washing establishments taking over land and waterways once again.

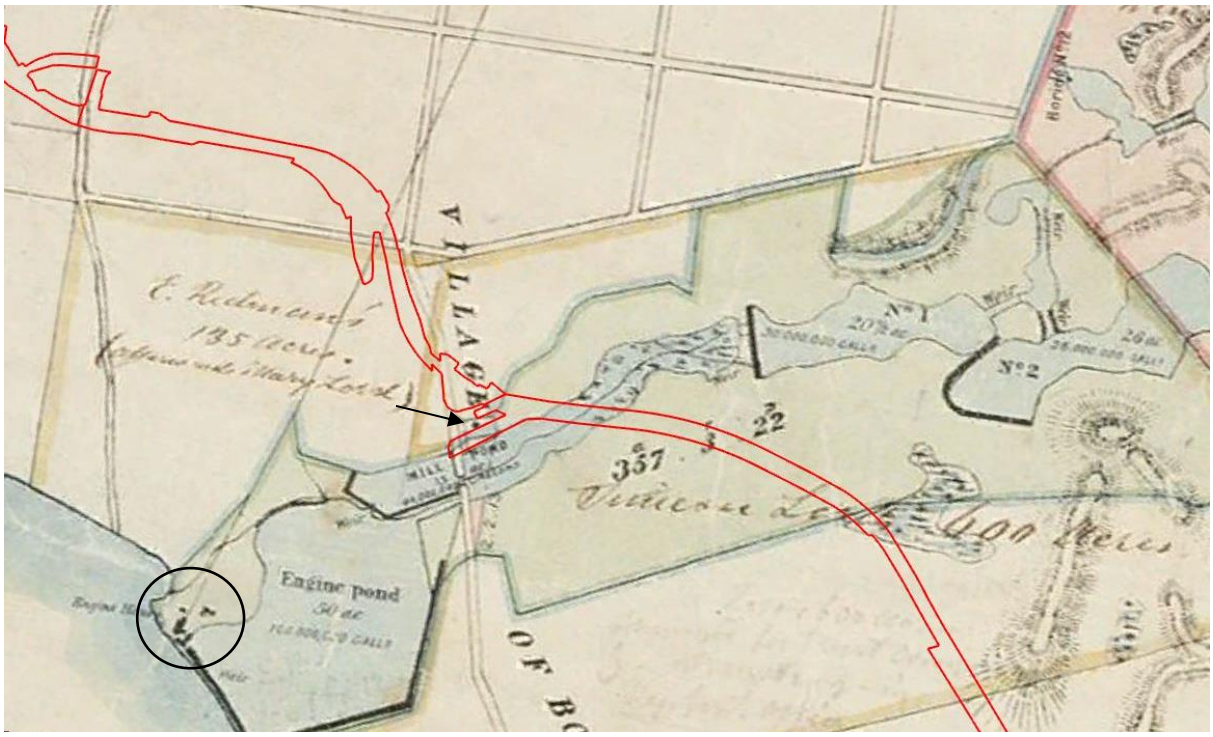

Figure 4-10: 1875 plan of the Botany and Lachlan Watersheds showing indicative location of dams within the Simeon Lord's 600 acre grant and the Engine House (circled), just west of Engine Pond. There is one structure (indicated) recorded on the plan, just north of Mill Pond, located in close proximity to the study area. Source. SLNSW.

[20] Henry 1939, p. 47-50.

Figure 4-11: Undated photograph of the Botany Water Pumping Station Near Botany Rd and Mill Pond before it was dismantled in 1896. Source. City of Sydney Archives.

4.3.2 Market gardens

The presence of early (Phase 1) market gardens in the study area cannot be confirmed through the available cartographic evidence; however, a plan prepared in 1887 shows the central portion of the study area between Botany Road and Robey Street partially occupied by two market gardens. Three structures are also shown on the plan to the east of Lords Road (now General Holmes Drive) and west of Botany Road (Figure 4-12). It is unclear whether they are associated with the nearby market gardens. This area is presently occupied by a car park and modern building.

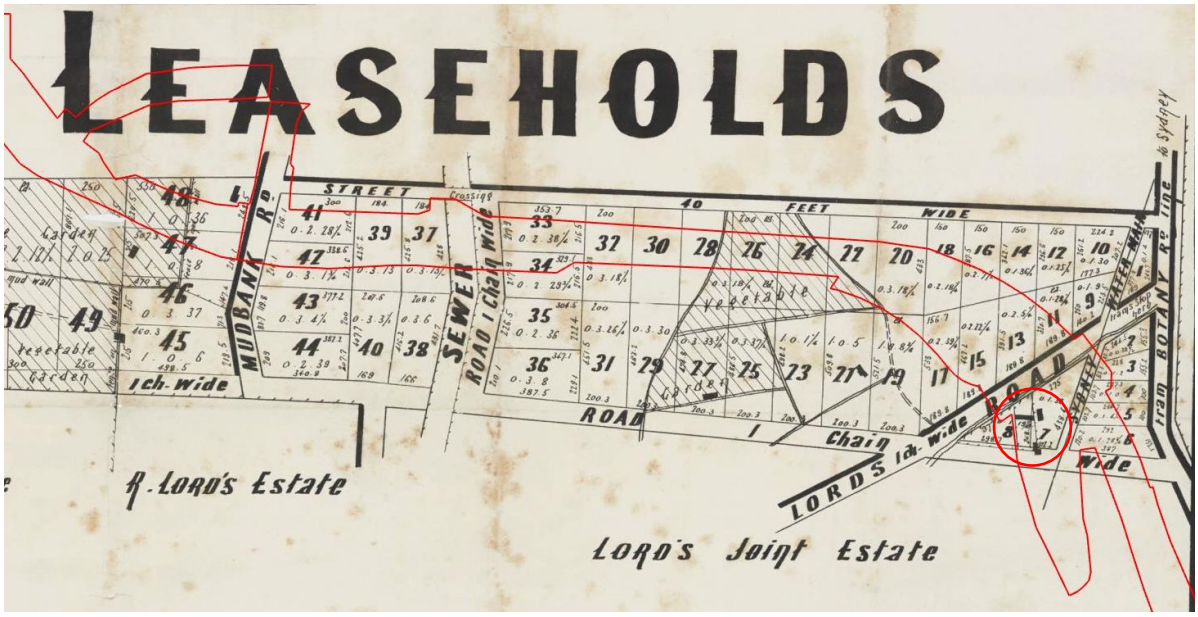

Figure 4-12. 1887 subdivision plan of Edward Lord's Estate, Botany showing the indicative location of two market gardens and three structures (circled) within the study area. Source. State Library of NSW.

4.3.3 Formation of the Municipalities of Botany, North Botany and West Botany

Following the introduction of the *Municipalities Act* of 1867, the Municipalities of Botany, North Botany and West Botany were formed.[21] These would later become the suburbs of Mascot (formerly North Botany), Rockdale (West Botany) and Botany, encompassing the western and central extent of the study area. During this period, Botany Council invested themselves in beautifying and formalising the area through residential subdivisions, parks, sports fields and community buildings.[22] The south-eastern section of the study area remained undeveloped during this period as shown in Figure 4-9.

4.3.4 Construction of the Botany Rail Line (1861-1925)

The Botany Rail line, which is encompassed by the majority of the study area, was first planned in 1861 and approved in 1863, however it was not completed until 1925.[23] The line followed Botany Road and was designed to carry goods from Sydney's western industrial sites (more specifically a new abattoir in Homebush to tanneries at Botany)[24] to Port Botany. A plan showing land proposed to be resumed for the line is shown in Figure 4-14.

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.[25] Figure 4-13 shows railway under construction in 1913. According to Pollard, all culverts and major earthworks were almost completed in 1922 and all steel bridges were completed by 1924.[26]

These included the single line steel girder bridge over Botany Road, a reinforced concrete bridge over O'Riordan Street and a single line wooden trestle bridge over Mill Pond. The O'Riordan Street Underbridge was the first reinforced concrete underbridge constructed in NSW.[27]

The construction of the rail line also required the establishing of a railway embankment to the north of Mill Pond, in a water body referred to in the Botany Wetlands CMP as 'New Pond'. New Pond comprises two ponds formed by the construction of a weir along their southern extent and the c.1925 construction of the embankment for the rail line. The Botany Rail Line was completed at an estimated £241,000 - £377,000 over its original budget.[28]

Two signal huts or signal location cases were identified during the site inspection. These may represent early signalling methods and were important communication points along the Botany Rail Line. One hut, located to the south of General Holmes Drive was established at its present location in sometime after 1943 as evidenced by an aerial photograph taken in that year (Figure 4-18).

[21] Kennedy, B. 1982. *Sydney and suburbs; a history and description, Reed, Frenchs.*
[22] Butler, M, 2011.
[23] Butler, M, 2011.
[24] 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.
[25] Butler, M, 2011.
[26] Pollard, N, 1988, p. 7.
[27] Drew, D. 11 October 2002. *The History and Development of the Botany Goods Line*, p. 48. Permanent Way Institute Inc, Convention Journal.
[28] Pollard, N, 1988, p. 7.

Figure 4-13: Construction of a cutting (foreground) and embankment (background) for the Botany Rail Line near Sydenham, 3 November 1916. Source. SLNSW (d1_49555 GPO1 49555)

Figure 4-14: Parish of Botany map showing early alignment of the Botany Rail Line, Botany Waterworks, Booralee Park and new subdivisions. The study area is outlined in red. Source. LRS.

4.4 Phase 3 - Botany Rail Line, Sydney Airport and residential development (1925-1960)

4.4.1 Establishment of the Sydney Airport (Kingsford Smith Airport)

Sydney Airport was originally located immediately west of the study area and comprised of a small 400-acre cow paddock used as an aerodrome and leased to returned WWI 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. The airport began serving regular flights in 1924 and contained three landing strips by 1938 (illustrated in Figure 4-17).[29]

The advent of WWII required the airport to expand to nine times its original size. Following the war, it was once again enlarged, this time requiring the resumption of residential subdivisions, farmland, the Sydney sewerage farm and two golf courses.[30] An example of land now occupied by the 1960 expansion of the airport as it appeared in 1943 is shown in Figure 4-16 and Figure 4-18.

4.4.1 Botany Rail Line (1925-1960)

Once the Botany Rail Line was complete, 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, Gelco (possibly the Gelatine Company), J Bayley and Sons Leatherworks (established near Lord's Road, within the Botany Water Reserves in 1924)[31] and Hardies, a bark extraction plant.[32] Those relevant to the study area included the Bayley and Sons siding, the Commonwealth and Hardies sidings and steel distributers Stewart and Lloyds sidings.[33] These are discussed further in Section 4.5.1.1 below. An example of sidings which once served warehouses to the south of the line and the East Lakes Golf Club are shown in Figure 4-19.

4.4.2 Residential development

The development of Sydney Airport and the Botany Rail Line encouraged further residential development around Botany and Mascot following the First and Second World Wars. This was fairly scattered until the 1940s, when large scale subdivision activities commenced, generally to the northeast of the study area. Despite these changes, market gardens and their associated structures continued to sit alongside medium density blocks.

Evidence of these development patterns is illustrated in Figure 4-15, Figure 4-16 and Figure 4-18. Figure 4-18, Figure 4-21 and Figure 4-25 show residential structures and market gardens within the project footprint. These have since been demolished or cleared and replaced by roads or modern structures.

[29] Chaffey, M. *'A review of Botany'* undated pamphlet, local history files, Botany Library, p 5 in Butler, M, 2011.
[30] Chaffey, M., p 5 in Butler, M, 2011 and data provided by SixMaps 1943 aerial photographs at: https://maps.six.nsw.gov.au/
[31] The Sydney Morning Herald Wed 30 Apr 1924, FACTORY PREMISES AT BOTANY, p. 10.
[32] Pollard, N, 1988, pp. 7-22.
[33] Pollard, N, 1988, p. 22.

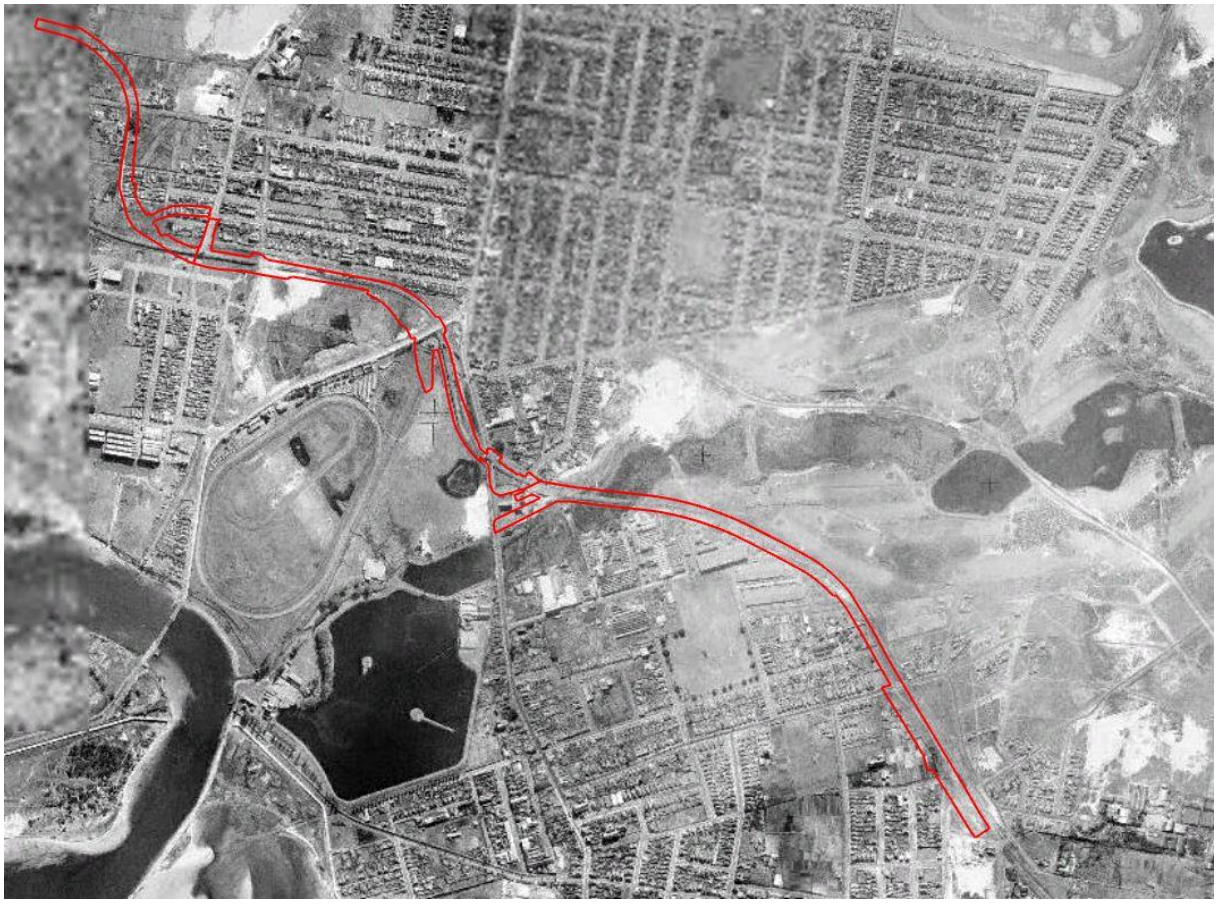

Figure 4-15. Aerial photograph taken in 1943 showing the general extent of residential and industrial at the time. Source. SixMaps.

Figure 4-16: Aerial view of Mascot Aerodrome, Mascot, New South Wales, ca. 1928, number 2. Note scattered residential development, market gardens and recently established Botany Rail Line. Source. NLA.

Figure 4-17: DH 60s outside Mascot Airport in 1930-1940 by Charles Daniel Pratt. Source. State Library of Victoria.

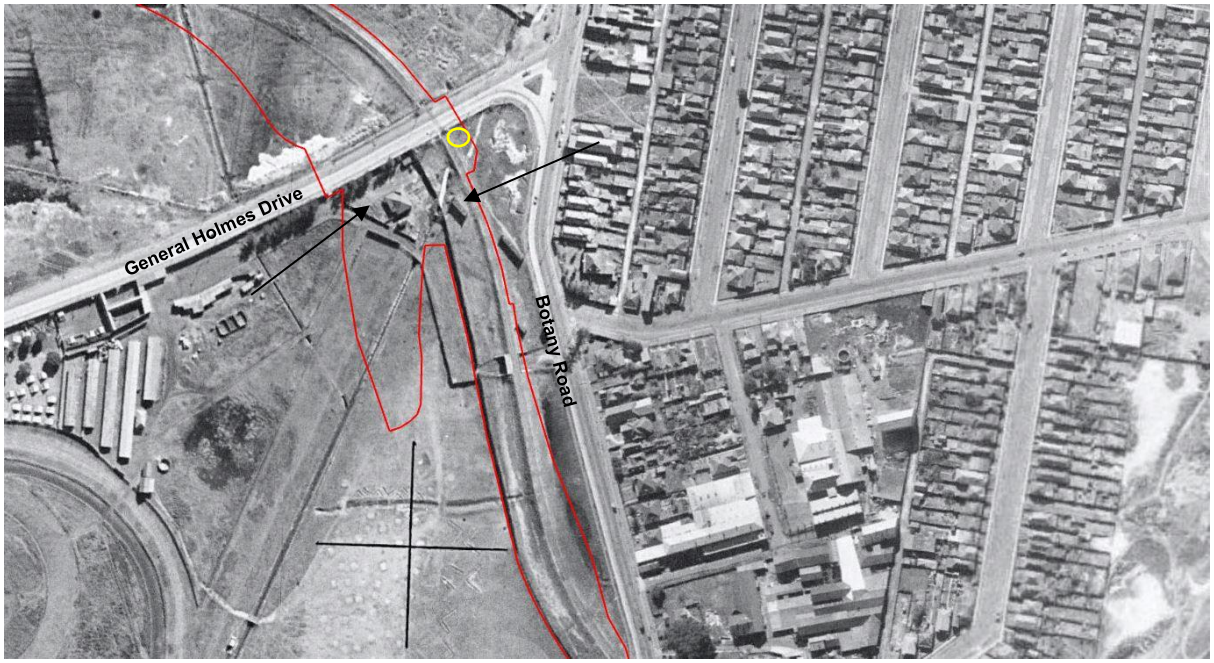

Figure 4-18: Aerial photograph showing land surrounding the study area between General Holmes Drive and Botany Road in 1943. The majority of properties to the west were resumed for Sydney Airport in 1960. The location of a signal hut/signal location case identified during the 2018 site inspection is circled. Two structures to the south of General Holmes Drive (indicated) within the study area have since been demolished. Source. SixMaps.

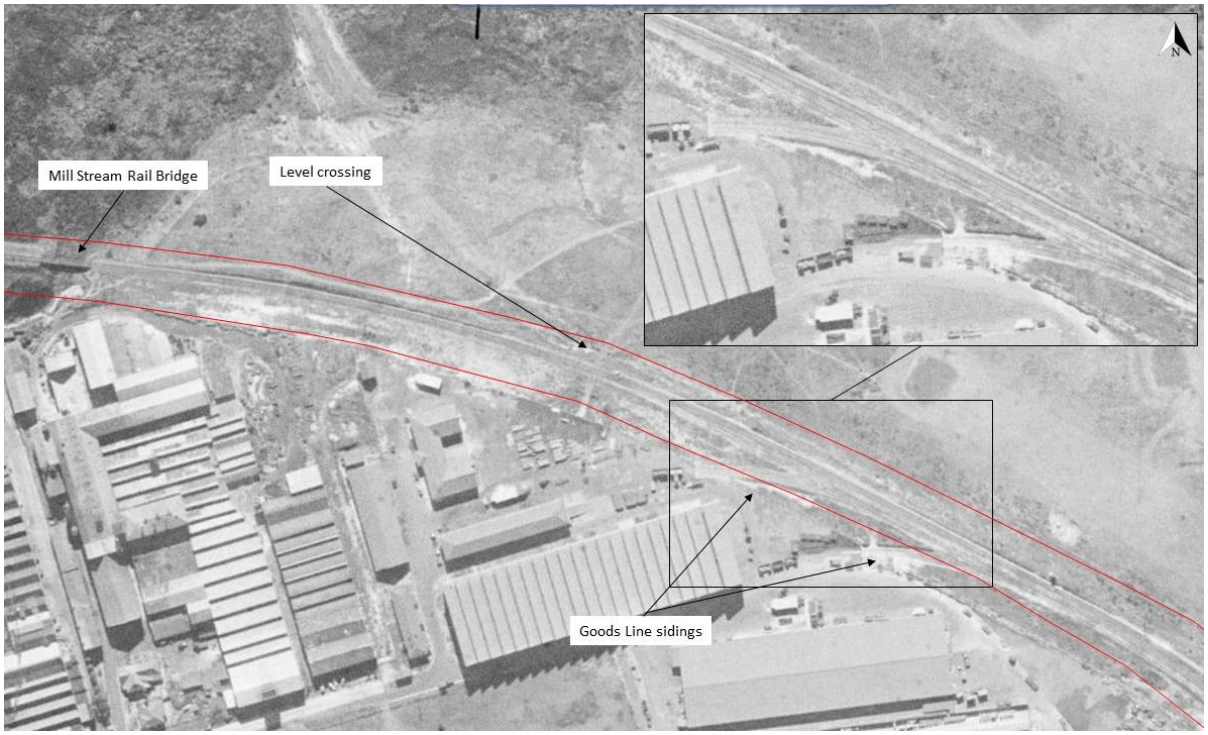

Figure 4-19: Location of a level crossing located east of the Botany Wetlands as well as sidings which once served nearby warehouses in 1943. Source. SixMaps.

4.5 Phase 4 - Post-War development and establishment of Port Botany (1960-2002)

4.5.1 Expansion of Sydney Airport, construction of Mill Pond Road and deviation of the Botany Rail Line (1960-1985) and Robey and O'Riordan Street Underbridge

In 1960, large scale expansions of Sydney Airport required that a portion of the rail line be deviated approximately 100 and 400 metres north of its original alignment between O'Riordan Street and the Alexandra Canal (located approximately 200 metres west of the study area). [34] This alignment represents the route of Botany Rail Line today. The extent of the deviation is illustrated in Figure 4-14 and Figure 4-21. Prior to this, part of the line was located within the airport, as shown in Figure 4-21. Although the arrangement was generally seamless, a train and aircraft collided near Runway 11-29 in 1950. No fatalities were reported.

By 1965, Mill Pond Road had been established between Engine Pond and McBurney Avenue, where it continues to exist today (alongside Southern Cross Drive). 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 (Figure 4-20).[35] 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.

[34] Pollard, N, 1988, p. 17.
[35] 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.

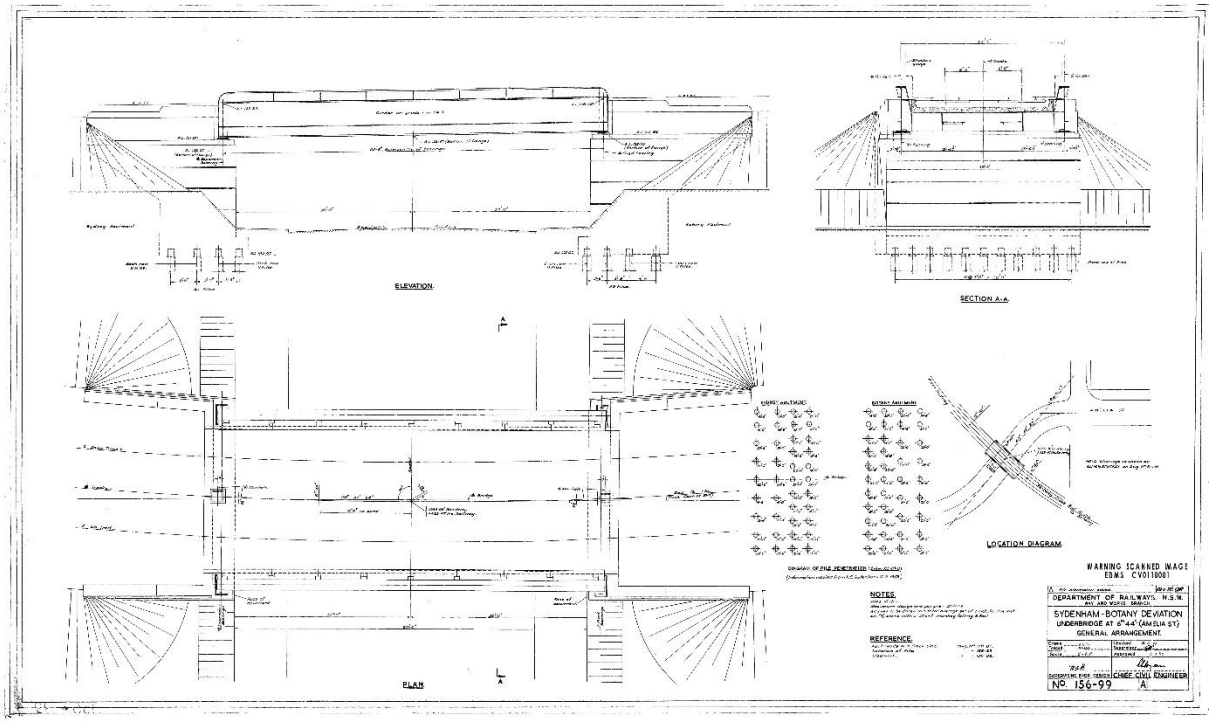

Figure 4-20: Designs for the Amelia Street (now Robey Street) Underbridge prepared in 1959. Source. ARTC.

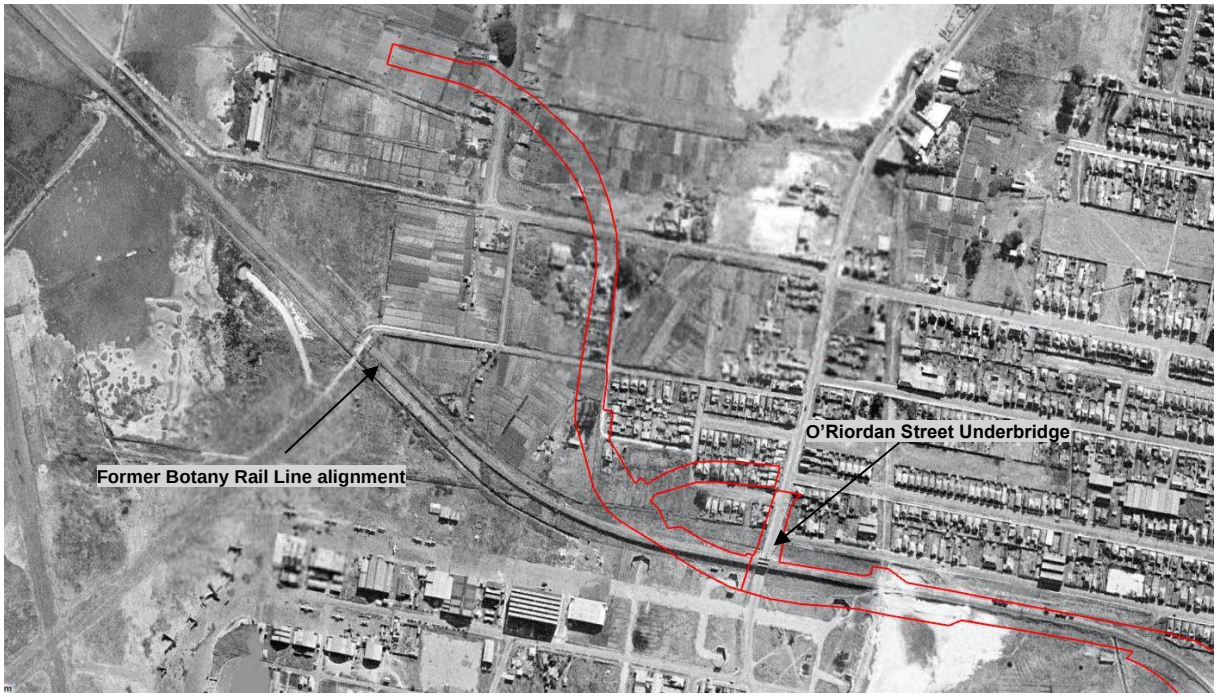

Figure 4-21: Mascot in 1943 showing abundance of market gardens between the Alexandra Canal and O'Riordan Street. The former alignment of the Botany Rail Line can be seen at the bottom of the image, prior to its deviation in 1960. The O'Riordan Street Underbridge is also visible in the bottom right-hand corner. Source. SixMaps.

4.5.1.1 Eastlake Golf Club (1960)

The Eastlake Golf Club was established to the east of the Botany Wetlands and north of the study area in 1960. Prior to this, the area comprised of cleared grassy sand dunes and scattered residential development. The Botany Rail Line was crossed via an informal level crossing in an area 246 metres east of the Mill Stream Bridge, as shown in Figure 4-19.

4.5.1.2 Industrial sidings (1961)

A total of three sidings were incorporated into this new portion of the line to serve A.G. Sims Scrap Metal, steel wholesalers J Murray Moore NSW Pty Ltd and Thomas Playfair (later known as the Australian Consolidated Glass siding) in 1961. No evidence of these sidings is visible within the study area today.

A. G. Simms Scrap Metal was established by Albert G Simms, the son of English immigrants, in the Sydney suburb of Newtown in 1917. His business was extremely successful and by 1949 he had listed Albert G. Simms on the Australian Stock Exchange for £1 per share.[36] His company exported its first shipment of ferrous steel scrap metal to Japan in 1956. The company was acquired by Peko Wallsend in 1979. Today it goes by the name Sims Metal Management Ltd after a merger with US company Metal Management, creating the '*largest publicly-listed metals recycling company in the world…'.*[37]

Figure 4-22: Northern side of the Mascot, Kingsford Smith Airport, in 1971- 75 after the Botany Rail Line was deviated north to accommodate airport's expansion. The O'Riordan and Robey Street rail underbridges can be seen along the railway line (circled). Source. National Library of Australia.

[36] Sims Metal Management, Annual Report 2017. Looking Forward, Looking Back. Accessed online on 30/08/2019 at: https://www.asx.com.au/asxpdf/20171009/pdf/43n1xckf1cdl1g.pdf
[37] Sims Metal Management, Annual Report 2017, p. 3.

4.5.2 Establishment of Port Botany Container Terminal

In the 1960s and 70s, the industrial nature of Botany and Mascot, their proximity to Botany Bay and the growing popularity of containerised shipping provided incentives for the NSW Government and private companies to establish a new shipping port in the area. Prior to this, Port Jackson had been the state's main port facility. Planning for the project began as early as the 1950s, yet wasn't commenced until 1977, when Neville Wran (the NSW Premier at the time) approved the development of two container terminals in what is now known as Port Botany.[38]

Port Botany is located approximately two kilometres south of the study area, as shown in Figure 4-23 and Figure 4-24. The south-eastern extent of the Botany Rail Line serves the port through sidings constructed soon after it was completed in 1979. Construction of Port Botany required extensive dredging and land reclamation and significantly altered the shape and nature of the coastline.

The port was initially managed by the Maritime Services Board (MSB), until they were replaced by the Sydney Ports Corporation in 1995. In April 2013, NSW Ports were awarded a 99-year lease of Port Botany. The port continues to play a major role in the state's economy and is still partly served by the Botany Rail Line.

Figure 4-23. 1943 aerial photograph showing Botany Bay prior to the enlargement of Sydney Airport and construction of Port Botany Container Terminal. Source. SixMaps.

[38] Afloat, April 2009. The Port of Sydney Part 3: Port Botany by Gregory Blaxell. Accessed online at: https://www.afloat.com.au/afloat-magazine/2009/april-09/Port_of_Sydney_Port_Botany#.XRGCGVMzaRs on 25/06/2019.

Figure 4-24. 2001 satellite image showing Botany Bay following the enlargement of Sydney Airport and construction of Port Botany Container Terminal. Source. Google Earth.

4.5.3 Construction of Southern Cross Drive and Botany Operational Enhancement Project 1984-2002

4.5.3.1 Southern Cross Drive and Mill Stream bridge construction (1985-1988)

Prior to 1988, roads to the city from Mascot and Botany were reached via Botany Road or O'Riordan Street. As the suburbs grew and airport expanded, various arterial roads were created to reduce traffic congestion and accommodate the changing shape of the area.[39] One of these new arterial roads - Southern Cross Drive - is crossed by the study area just north of Engine and Mill Ponds. Plans for the extension of Southern Cross Drive between Wentworth Avenue to Foreshore Road began in 1984. In order to construct the road, a new concrete bridge was required for the rail line to cross Southern Cross Drive and continue onto Mascot.

In order to accommodate these modifications, the c1925 timber bridge over Mill Stream was removed and replaced with the existing concrete rail bridge shown in Figure 4-32. A survey of the bridge and landscape surrounding Mill Stream was carried out in 1985, photographs of which are shown beside images taken during the 2018 site inspection in Figure 4-27 to Figure 4-30. They show the Mill Stream area containing sand dunes and low-lying scrub. The bridge is shown as a typical single line timber beam rail bridge with timber deck and vertical timber piles driven into the sandy banks on each side of mill pond and along the creek line (shown in Figure 4-29).

Land now occupied by Southern Cross Drive and its associated underbridge (which occupies the study area today) prior to their development is shown in Figure 4-33. Like that of Mill Stream, the surrounding environment comprises of bare sand dunes to the west and low-lying scrub to the east. Residential development along McBurney Avenue can be seen in the distance. The construction of Southern Cross Drive and the rail underbridge required extensive excavations and piling works to support the bridge and retaining walls on either side of the new road corridor (illustrated in Figure 4-35 and Figure 4-37). The bridge and surrounding landscape as they appeared in August 2018 are shown in Figure 4-34 and Figure 4-36.

[39] Oz Roads, n.d. Southern Cross Drive and General Holmes Drive: Part of the Sydney Orbital Motorway Network. Accessed online at: https://www.ozroads.com.au/NSW/Freeways/M1/m1.htm on 18/09/2018.

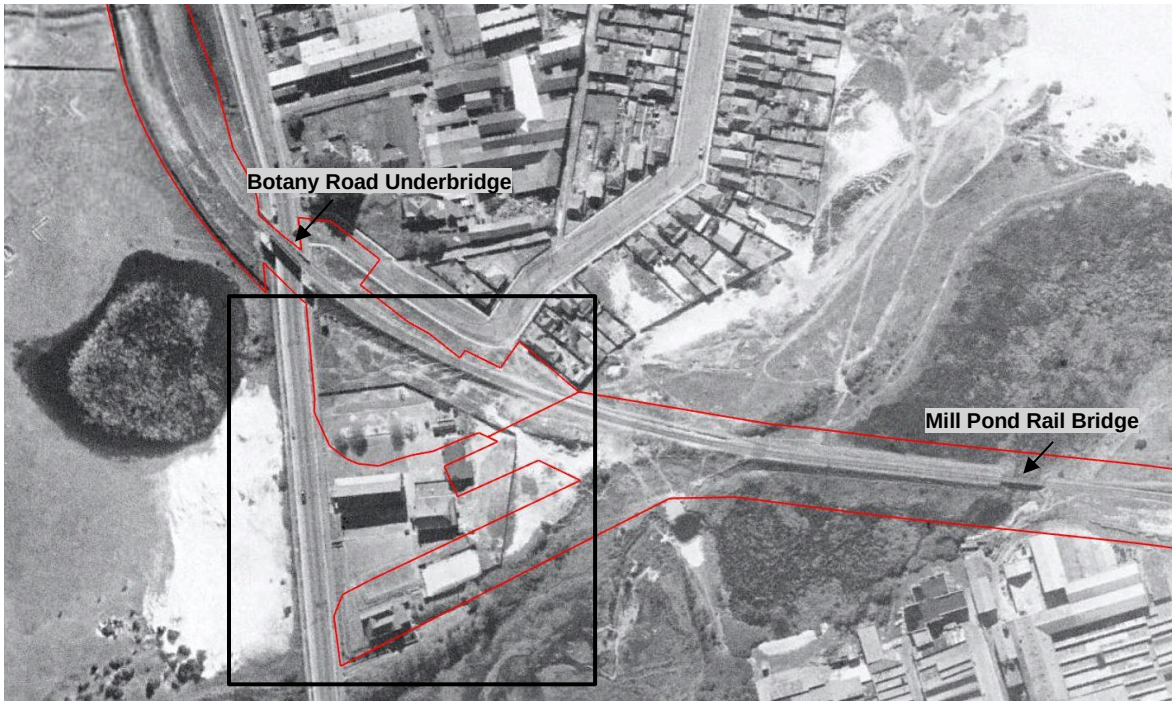

Figure 4-25: The Botany Rail Line in 1943 west of Engine Pond and east of Botany Road showing land prior to the construction of Southern Cross Drive showing group of buildings to the east of Botany Road (outlined). Source. SixMaps.

Figure 4-26: The Botany Rail Line as it appears today. Note the addition of Southern Cross Drive and demolished group of buildings that once stood to the east of Botany Road (outlined). Source. Google Earth, 2001.

Figure 4-27: View west along Mill Stream from the Botany Rail Line in 1985. Source. Maunsell 1985, Appendix A.

Figure 4-28: View west along Mill Stream from the Botany Rail Line in August 2018.

Figure 4-29: View southeast towards timber bridge over Mill Stream and now demolished industrial development in March 1985. Source. Maunsell 1985, Appendix A.

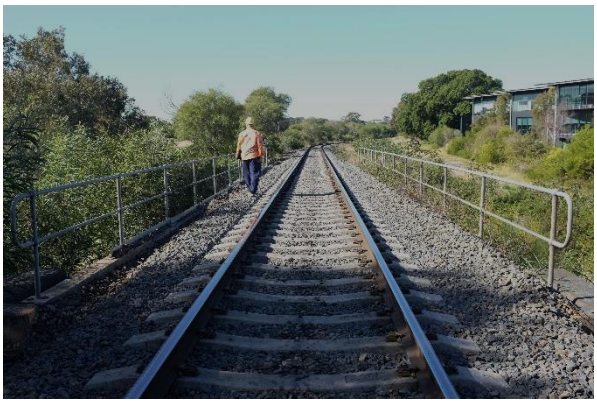

Figure 4-30: View southeast over Mill Stream from modern concrete rail bridge and modern development in August 2018.

Figure 4-31: View of the newly constructed Mill Stream underbridge, looking northwest towards McBurney Avenue. The Southern Cross Drive underbridge can be seen in the distance. Piles were cut to just above water level. Source. WSP.

Figure 4-32: View of modern concrete bridge over Mill Stream looking west and taken slightly north of the image to the left.

Figure 4-33: View west along the Botany Rail Line track towards McBurney Avenue in March 1985 prior to construction of Southern Cross Drive and Mill Pond Road. Source. Maunsell 1985, Appendix A.

Figure 4-34: View west along the Botany Rail Line track towards McBurney Avenue and Southern Cross Drive underbridge in August 2018.

Figure 4-35: View southeast of the Southern Cross Drive underbridge abutment during construction of abutment wing walls on the north-western side of the road in c1988 Source. WSP.

Figure 4-36: View southeast of the Southern Cross Drive underbridge abutment from north-western side of the road in August 2018.

Figure 4-37: View southeast of the Southern Cross Drive underbridge abutment during construction of abutment wing walls in c1988. Source. WSP.

4.5.4 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 Rail Line to allow for updated signalling at General Holmes Drive and additional trains. Most of these works took place outside of the study area, to the west.

However, re-signalling works, remote control of the line between Marrickville and Botany and duplication of the line between Botany and the Cooks River did occur.[40] This may have resulted in some localised subsurface disturbance within the rail corridor (especially around General Holmes Drive) as well as the removal of obsolete railway infrastructure, signals and sidings. Evidence of these upgrades in the form of duplicated lines and modern concrete sleepers were identified along the western extent of the study area during the site inspection (see Section 5.0).

4.6 Phase 5 - Contemporary management and use of the Botany Rail Line (2002-present)

Although much of the study area has remained undeveloped since the major upgrades discussed above, some changes associated with asset management and infrastructure upgrades have affected the Botany Rail Line and its associated bridges and surrounding landscape.

4.6.1 Sydney's Metropolitan Freight Network (2012)

In July 2012, the ARTC and RailCorp signed the Sydney's Metropolitan Freight Network (MFN) Deed of Lease and Licensee agreement. This agreement transferred the ownership, management and operation all rail infrastructure within the MFN to ARTC until 2064. This includes the Robey Street and O'Riordan Street Underbridges. ARTC leases the MFN land from RailCorp under this agreement.[41]

4.6.2 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, a new rail bridge (RMS ID: B11701) was constructed over Wentworth Avenue for the Airport East Works.[42] This involved the demolition of an original underpass associated with Botany Rail Line and diversion of the existing line to the west while the bridge was under construction. Construction of the bridge required 1,000 cubic metres of concrete and included a space for future duplication of the Botany Rail Line. The bridge was completed in June 2018 and was crossed by its first freight train on June 18 and recorded during the site inspection as detailed in Section 5.2.2.3.[43]

These works required extensive subsurface excavations and will permanently alter landscape characteristics to the west of the rail line in this area and the demolition of two items listed on the Botany Bay LEP 2013 located to the north of the LEP listed Beckenham Memorial Church (shown in Figure 5-25).

[40] Drew, D. 2002, p. 56.
[41] 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.
[42] Aurecon Australasia Pty Ltd, April 2016. *Airport East Precinct Addendum review of environmental factors*. Report prepared for Roads and Maritime Services.
[43] The Leader: St George and Sutherland Shire, *New Port Botany freight rail bridge at Wentworth Avenue completed,* June 15, 2018. Accessed online at https://www.theleader.com.au/story/5470447/new-port-botany-rail-freight-bridge-ready-to-take-first-train/ on 30/08/2018.

5.0 SITE INSPECTION

5.1 Introduction

A site inspection of the study area was carried out on Wednesday 18 July 2018 by Adele Zubrzycka (Senior Heritage Consultant, Artefact Heritage) and Vanessa Edmonds (Principal, Artefact Heritage).

There are four heritage listed items of local significance within the study area which were inspected during the site inspection:

- Mascot (O'Riordan Street) Underbridge - ARTC s170 heritage register
- Mascot (Robey Street) Underbridge - ARTC s170 heritage register
- Mascot (Botany Road) Underbridge (or Railway Bridge over Botany Road) - ARTC s170 Register and Botany Bay LEP 2013
- Sydney (Kingsford Smith) Airport Group – Botany Bay LEP 2013, Commonwealth Heritage List (Indicative Place) and RNE (Interim List)

There are five heritage listed items containing State or local significance within the study area's 100 metre buffer zone which were inspected during the site inspection:

- Streetscape - Verge plantings of Canary Island Date Palms (*Phoenix canariensis*) - Botany Bay LEP 2013 (Local significance)
- Booralee Park - Botany Bay LEP 2013 (Local significance)
- Botany Water Reserves (also known as Botany Swamps) -SHR, Sydney Water s170 register, Botany Bay LEP 2013 and RNE (Interim List) (State significance)
- Beckenham Memorial Church - Botany Bay LEP 2013 (Local significance)

5.2 Observations during the site inspection

5.2.1 Eastern Extent - Banksia Street Footbridge to Southern Cross Drive

The site inspection commenced at the Banksia Street footbridge (between the suburbs of Botany and Pagewood) and continued north towards the East Lakes Golf Club, Southern Cross Drive and SHR and LEP listed Botany Wetlands. This area is characterised by a mix of late 19th century and post-WWII residential development, modern semi-industrial and commercial developments (illustrated in Figure 5-4), the formalised grounds of the Lakes Golf Club and Southern Cross Drive and the Botany Wetlands. The corridor of the Botany Rail Line is represented by a well-maintained, single line railway occupying a slightly raised ballast bedding on levelled ground (see Figure 5-1 - Figure 5-3).

5.2.1.1 Streetscape - Verge plantings of Canary Island Date Palms (*Phoenix canariensis*) and Booralee Park - Botany Bay LEP 2013

Views towards the Botany LEP 2013 listed Streetscape - Verge plantings of Canary Island Date Palms (*Phoenix canariensis*) and Booralee Park from the study area were obstructed by buildings and vegetation (Figure 5-41 and Figure 5-2). It is therefore unlikely that the project will have an indirect visual impact on these items.

Figure 5-1. View northwest towards the Botany Rail Line and Banksia Street footbridge from vehicle access track. Views towards the heritage listed Canary Island Date Palm are obstructed by the residential development to the left.

Figure 5-2: View southeast towards the Botany Rail Line and Lakes Golf Club showing height of embankment to the west of the line compared to the railway corridor.

5.2.1.2 Botany Water Reserves and bridge over Mill Stream

Land to the west of the study area, near the East Lakes Golf Club, appears to have been raised to accommodate a vehicle access road and surrounding developments (shown in Figure 5-3) or cut down to provide a level ground for the railway. Land in the vicinity of the Botany Water Reserves is heavily vegetated with European-era plantings and weeds such as fig trees (shown in Figure 5-7), date palms and lantana (Figure 5-8).

Mill Stream, which is shown in Figure 5-11 and Figure 5-12, is crossed by a modern, single carriageway concrete rail bridge shown in Figure 5-8 - Figure 5-10. The concrete abutments of the bridge have been piled into the northern and southern banks of the pond and embankments have also been created accommodate the bridge (shown in Figure 5-10).

No evidence of earlier structures were identified near Mill Pond or in the vicinity of the East Lakes Golf Club, however evidence of modern land use such as discarded building material (Figure 5-6) and railway tracks (Figure 5-5) used to create boundaries across the line were identified along the southern side of the pond.

Figure 5-3: View northeast towards the State Significant Botany Water Reserves, East Lakes Golf Club and Botany Railway corridor from vehicle access road. Note the height of embankment to the west of the line compared to the railway corridor. Exposed sand is also visible along the golf club side of the line.

Figure 5-4: View northwest towards the State Significant Botany Water Reserves from vehicle access road showing modern commercial building along the water's edge. Views towards Booralee Park, which is located behind these buildings, are obstructed by trees and modern development.

Figure 5-5: Rails used to form boundary of live services along western side of the Botany Rail Line.

Figure 5-6: Discarded building debris found near Mill Stream.

Figure 5-7: Mature fig tree adjacent to the Botany Water Reserves and study area. View southeast.

Figure 5-8: View north towards the Mill Pond concrete rail bridge and northern banks of Mill Pond showing introduced plantings and weeds in the foreground.

Figure 5-9: View east along the deck of the Mill Stream bridge showing steel guard rails and concrete abutments.

Figure 5-10: View east showing concrete abutments and man-made embankments along the north-eastern banks of Mill Pond.

Figure 5-11. View south showing Mill Pond from the modern concrete rail bridge.

Figure 5-12: View north towards Mill Stream from the concrete rail bridge showing guard rails.

5.2.2 Central Extent - Southern Cross Drive to O'Riordan Street, Mascot

5.2.2.1 Southern Cross Drive rail bridge and McBurney Street

Southern Cross Drive and the Southern Cross Drive rail bridge are located to the north of Mill Stream and were constructed in 1988 following the development of Southern Cross Drive and Mill Pond Road in 1965.[44] Prior to this, the area consisted of sandy marsh lands (illustrated in Figure 4-25). The Southern Cross Drive bridge comprises an in-situ poured concrete single carriageway structure, approximately 55 metres long (shown in Figure 5-13). The bridge is bounded by the Botany Wetlands to the south,19th century residential development to the northeast (shown in Figure 5-14 and Figure 5-15) and a heavily vegetated reserve to the north west.

The 19th century residential development to the north east of the bridge face onto McBurney Street, Mascot and comprise of single storey weatherboard and brick late-Victorian cottages (Figure 5-14 and Figure 5-15). These are not listed on any heritage registers.

[44] OzRoads. *Southern Cross Drive & General Holmes Drive: Part of the Sydney Orbital Motorway Network*. Accessed online at: https://www.ozroads.com.au/NSW/Freeways/M1/m1.htm on 29/08/2018.

Figure 5-13: Deck of the modern concrete rail bridge over Southern Cross Drive. View southeast from McBurney Avenue

Figure 5-14: Example of late-19th century residential development along McBurney Avenue, Mascot. The Botany Rail Line and Southern Cross Drive rail bridge can be seen to the right.

Figure 5-15: View south east of 19th century residential development in McBurney Street from the Botany Rail line. Modern concrete bridge can be seen in the far right.

Figure 5-16: View northeast towards Sydney Airport and Botany Rail Line embankment near McBurney Avenue, Mascot.

5.2.2.2 Railway Bridge over Botany Road (Botany Bay LEP 2013 I153)

Approximately 135 metres northwest of the Southern Cross Drive rail bridge and McBurney Street residences is the Botany Bay LEP 2013 listed 'Railway Bridge over Botany Road' (item no. I153). This is shown in Figure 5-17 - Figure 5-23. The bridge comprises brick abutments and parapets along the northern deck (shown in Figure 5-17 and Figure 5-18) and steel parapets along the southern deck (shown in Figure 5-17). Although only the northern deck of the bridge is in use, it includes an additional carriage to the south, as illustrated in Figure 5-19, Figure 5-21 and Figure 5-23. This was included in the bridge's design in anticipation of any future duplication.

The bridge is in generally good condition, although brick and steel parapets have been vandalised and some brick work has been damaged (Figure 5-17, Figure 5-20 and Figure 5-22). The bridge itself is a prominent feature along Botany Road when travelling south in the direction of Southern Cross Drive of Mill Pond Road, as shown in Figure 5-17 and Figure 5-18.

Figure 5-17: View south/south-east towards the Botany Road Underbridge (Botany Bay LEP 2013) from Botany Road showing steel parapets and brick abutments and graffiti.

Figure 5-18: View south towards the Botany Road Underbridge (Botany Bay LEP 2013) from Botany Road.

Figure 5-19: View southeast along the deck of the Botany Road Underbridge (Botany Bay LEP 2013) showing additional steel deck and parapets for future duplication to the right. Photograph taken from maintenance footbridge.

Figure 5-20: Detail of the Botany Road Underbridge (Botany Bay LEP 2013) brick abutments and service lines looking towards south Mill Pond Road and Southern Cross Drive. Graffiti can be seen on the abutments.

Figure 5-21: Detail of Botany Road Underbridge maintenance footbridge

Figure 5-22: Detail of Botany Road Rail Underbridge brick abutments and graffiti facing south from northern end of bridge.

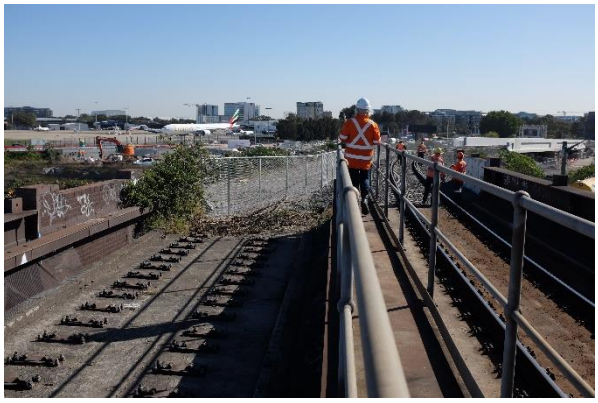

Figure 5-23: View northwest towards the Sydney (Kingsford Smith) Airport (LEP 0213, Commonwealth Heritage List and RNE) from Botany Road Underbridge (LEP 2013). Additional carriageway is visible to the left.

Figure 5-24: View northwest towards the Sydney (Kingsford Smith) Airport (Botany Bay LEP 2013, Commonwealth Heritage List and RNE) from the northern abutment of the Botany Road Underbridge.

5.2.2.3 Botany Road and Sydney Airport (Commonwealth Heritage List, RNE and Botany Bay 2013 LEP)

The rail corridor between the Botany Road bridge and O'Riordan Street is surrounded by undeveloped land bound by Botany Road to the northeast, General Holmes Drive and Sydney Airport to the south and mixed residential, commercial car parks and semi industrial development to the east. The study area has generally unobstructed views towards the airport, which is listed on the Commonwealth Heritage List, RNE and Botany Bay 2013 LEP as the 'Sydney (Kingsford Smith) Airport Group' and 'Commonwealth Water Pumping Station and Sewerage Pumping Station'. An example of these views are shown in Figure 5-16, Figure 5-23 and Figure 5-24.

5.2.2.4 Beckenham Memorial Church (Botany Bay LEP 2013 I52)

In addition, there is one Botany Bay LEP 2013 heritage listed item in view of this portion of the study area - Beckenham Memorial Church (shown in Figure 5-25). Land surrounding the church is currently under development and two other items listed on the Botany Bay LEP 2013 ('House' item no. I51 and 'House' item no. I50) have been demolished. This portion of the study area occupies a similar level to that of Botany Road and surrounding structures and is therefore visible from these thoroughfares.

No visual relationship between the Beckenham Memorial Church was identified during the site inspection and much of the surrounding area has been heavily altered as part of the WestConnex project and construction of a new rail bridge over Wentworth Avenue (discussed below).

Figure 5-25: View northeast towards the Beckenham Memorial Church (Botany Bay LEP 2013) from the study area.

5.2.2.5 RMS rail bridge and corridor between Botany Road and General Holmes Drive

A newly constructed concrete rail bridge is located just north of the Beckenham Memorial Church along the western side of Botany Road (Figure 5-26 and Figure 5-27). A plaque fixed to its eastern parapet reads 'Roads and Maritime Services - B11701 - 2018'. The bridge includes provisions for future line duplication as shown in Figure 5-27. Construction of this bridge and associated land clearance have resulted in the removal of trees on the eastern side of the line, along Botany Road. Some of these trees have however been retained just south of a property at 1010-1016 Botany Road Mascot, as shown in Figure 5-29. These trees are not shown in 1943 aerial photographs of the study area and represent post-1943 plantings.

As the study area approaches General Holmes Drive, the character of the surrounding area consists of semi-industrial development to the east (along Botany Road) and undeveloped land between General Holmes Drive and Sydney Airport to the west, where the proposed works will occur. This area is shown in Figure 5-28, while the Botany Rail Line and industrial buildings are shown in Figure 5-29.

Although the majority of earlier rail infrastructure of evidence of previous sidings is no longer present, a signalling hut/signal location case was identified along the eastern side of the line, approximately 11 metres south of General Holmes Drive (Figure 5-30 and Figure 5-31). The hut/case is constructed from in-situ cast concrete and sits on elevated concrete footings. A label fixed to the hut identified it as 'Nail in Hut UP – 235'. The signalling hut/location case is accessed from its northern elevation which faces onto General Holmes Drive. It is not shown on a 1943 aerial photograph (Figure 4-18). From the hut/case, the Botany Rail Line extends north over General Holmes Drive via a level crossing, shown in Figure 5-33 and Figure 5-34.

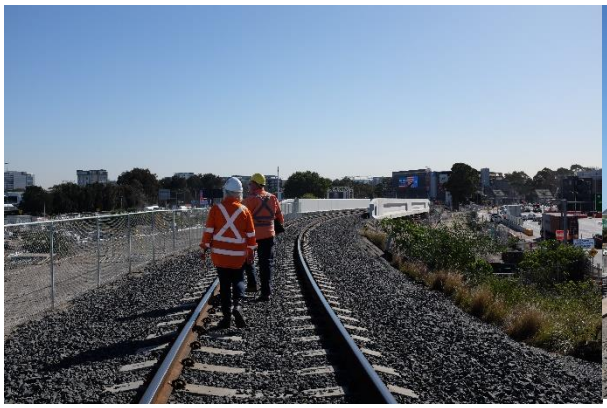

Figure 5-26: Recently completed concrete bridge (RMS B11701) just south of Wentworth Avenue, Mascot, looking north towards General Holmes Drive.

Figure 5-27: Detail of bridge (RMS B11701) facing south showing accommodations made for future duplication of the Botany Rail Line.

Figure 5-28: View towards Sydney Airport and undeveloped land west of the study area and north of recently completed bridge.

Figure 5-29: General view of Botany Rail Line corridor facing south from General Holmes Drive towards Wentworth Avenue and remnant line of trees.

Figure 5-30. Signalling hut/location case south of General Holmes Drive level crossing, view south.

Figure 5-31: Signalling hut/location case south of General Holmes Drive level crossing, view northeast.

Figure 5-32: Emergency switch box, manual operation switch and signal telephone fixed to the western elevation of the signalling hut/location case.

5.2.2.1 General Holmes Drive to O'Riordan Street

The rail corridor between General Holmes Drive and O'Riordan Street occupies level ground and a slightly raised bedding of ballast, as shown in Figure 5-35 and Figure 5-36. Concrete sleepers have been used for the line between General Holmes Drive and Ewan Street (Figure 5-35 and Figure 5-37). A series of billboards (proposed to be relocated for the project) extend over the line in this area (illustrated in Figure 5-36). Surrounding vegetation comprises native Eucalypts and long grasses and shrubs, some of which have created a thick blanket across the edges of the corridor (shown in Figure 5-39).

Figure 5-33: View west towards General Holmes Drive level crossing.

Figure 5-34: View northwest showing the Botany Rail Line crossing General Holmes Drive.

Figure 5-35: Example of the Botany Rail Line and surrounding landscape just north of General Holmes Drive, view north. Note concrete sleepers.

Figure 5-36: View west towards billboard located over the Botany Rail Line, between Baxter Road and Joyce Drive, Mascot.

Figure 5-37. Detail of concrete sleepers.

5.2.2.2 Fibre clad signalling hut/location case

A fibre clad signalling hut/location case was identified along the north side of the line, approximately 120 metres east of the O'Riordan and Baxter Road intersection (Figure 5-38 - Figure 5-39). The hut/case was surrounded by overgrown weeds and vines, making a detailed inspection difficult. No additional rail infrastructure was identified in the area.

Figure 5-38: Signalling hut/location case located 119 metres east of the O'Riordan and Baxter Road intersection, north of the railway corridor, view east.

Figure 5-39: Signalling hut/location case located 119 metres east of the O'Riordan and Baxter Road intersection, north of the railway corridor, looking south.

5.2.2.3 O'Riordan Street Underbridge

The ARTC s170 listed O'Riordan Street Underbridge is located 120 metres northwest of the signalling hut/location case and crosses O'Riordan Street in an east-west alignment (Figure 5-40 and Figure 5-41). 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. Like B11701 and the Botany Road Underbridge, the O'Riordan Street Underbridge has capacity to accommodate duplication of the line. The bridge is in generally good condition, although some concrete is spalling along its abutments (evidenced by exposed steel reinforcement on the internal face of the girders) and has been subject to vandalism (Figure 5-41). Large billboards at each approach to the bridge obstruct views towards the bridge, distracting from its unique structural design (Figure 5-42).

Figure 5-40: View north towards the O'Riordan Street Underbridge (ARTC s170) and billboards.

Figure 5-41: View south towards the O'Riordan Street Underbridge (ARTC s170), concrete parapets and graffiti.

Figure 5-42: View south of the O'Riordan Street Underbridge showing contemporary billboards obstructing views towards the heritage item.

5.2.3 Western Extent - O'Riordan Street to Lancastrian Street, Mascot

The section of the study area between O'Riordan Street and Lancastrian Street, Mascot runs parallel to Qantas Drive, along its eastern boundary. It is characterised by a duplicated portion of the Botany Rail Line and flanked by mature fig trees and Eucalypts. The rail corridor itself has been heavily modified to accommodate duplication works, although some early Botany Rail Line features such as 1937 and 1949 rails (discussed below) were identified during the site inspection.

The ARTC s170 listed Robey Street Underbridge is located approximately 140 metres northwest 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. The bridge and welded steel plates are shown in Figure 5-44 and Figure 5-45. 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, blocking views to the structure from nearby roads and footpaths.

To the north of the Robey Street Underbridge, the study area widens and becomes a double track corridor, as shown Figure 5-46 and Figure 5-47. The railway line within this portion of the study area comprises a mix of concrete and timber sleepers, reflecting upgrades to the line over time. Some rails along the western side of the track show manufacturing dates ranging from 1937 (Figure 5-48) to 1949 (Figure 5-49). No additional infrastructure associated with earlier phases of the line were identified in this area during the site inspection. It should be noted that timber sleepers and early 20th century rails and fasteners would not be impacted by the project. Some timber bearers at the Botany Yard end of the project may be affected.

Figure 5-43: View north towards the Robey Street Underbridge (ARTC s170)

Figure 5-44: Detail of Robey Street Underbridge (ARTC s170) steel member.

Figure 5-45: Detail of welded steel plates - Robey Street Underbridge

Figure 5-46: View south from the Botany Rail Line showing widening of rail corridor and additional lines.

Figure 5-47 View south from the Botany Rail Line showing widening of rail corridor and sidings.

Figure 5-48: Detail of rail fastener associated within siding showing a manufacture date of 1937. It should be noted this element of the Botany Rail Line would not be impacted for the project.

Figure 5-49: Detail of rail within northern end of the study area showing manufacture date of 1949 welded into the web. It should be noted this element of the Botany Rail Line would not be impacted for the project.

6.0 SIGNIFICANCE ASSESSMENT

6.1 Introduction

The following significance assessment has been separated into three distinct sections to adequately assess the significance of items that will be directly and indirectly impacted as a result of the project:

- Listed heritage items
  - Section 6.2.1 - Items within the study area
  - Section 6.2.2 - Items partially within the study area and 100 metre buffer zone
  - Section 6.2.3 - Items within the study area's 100 metre buffer zone

It should be noted that although the Botany LEP 2013 listed Booralee Park (I61) and Streetscape - Verge plantings of Canary Island Date Palms (*Phoenix canariensis*) (I65) are located within the study area's 100 metre buffer zone, the site inspection concluded that they would not be impacted by the project. Therefore, they have not be included in this section and significance assessment.

- Unlisted heritage items
  - Section 6.3 - Items within the study area

All significance assessments and item descriptions have been extracted from the SHI and Australian Heritage Database listings for the items, unless noted otherwise.

6.2 Significance of listed heritage items

6.2.1 Items within the study area

There are three heritage listed items within the study area:

- Mascot (O'Riordan Street) Underbridge - ARTC s170 heritage register
- Mascot (Robey Street) Underbridge - ARTC s170 heritage register
- Railway Bridge over Botany Road/Mascot (Botany Road) Underbridge - ARTC s170 heritage register and Botany Bay LEP 2013

6.2.1.1 Mascot (O'Riordan Street) Underbridge[45]

Mascot (O'Riordan Street) Underbridge	
Listing and number	ARTC s170 heritage register SHI no. 4801830
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 m western span supported on brick abutment with angled wing walls and central brick pier. The bridge includes a later addition eastern 16.20m 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.* [46]
History	The Mascot (O'Riordan Street) Underbridge was constructed by NSW Government Railway engineers between 1924-1925 and is listed on the ARTC s170 heritage 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.

[45] The majority of this significance assessment has been taken from the OEH SHI listing for the 'Mascot (O'Riordan St) Underbridge'. Viewed 24/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4801830
[46] OEH SHI, 2008. 'Mascot (O'Riordan St) Underbridge'. Viewed 24/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4801830

Mascot (O'Riordan Street) Underbridge	
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 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.'*[47]

Figure 6-1: The eastern deck of the O'Riordan Street Underbridge looking east in August 2018.

[47] OEH SHI, 2008. 'Mascot (O'Riordan St) Underbridge'.

6.2.1.2 Mascot (Robey Street) Underbridge [48]

Mascot (Robey Street) Underbridge	
Listing and number	ARTC s170 heritage register SHI no. 4801848
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 m 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.*
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 heritage 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.

[48] The majority of this significance assessment has been taken from the OEH SHI listing for the 'Mascot (Robey Street) Underbridge'. Viewed 24/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4801848

Mascot (Robey Street) Underbridge	
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.'*[49]

Figure 6-2: The Robey Street Underbridge deck looking north-west in August 2018.

[49] OEH SHI, 2008. 'Mascot (Robey Street) Underbridge'. Viewed 24/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4801848

6.2.1.3 Mascot (Botany Road) Underbridge (or Railway Bridge over Botany Road)[50]

Railway Bridge over Botany Road	
Listing and number	Botany Bay LEP 2013 item no. I153 ARTC s170 SHI no. 4800248
Significance	Local
Description and condition	*A single track steel riveted girder bridge spanning Botany Road. The bridge is somewhat unusual in that while it is a 'skewed' bridge across the road it was fabricated to be a right angle span across the road space, the girder length of 75 feet (22.9 metres) apparently not being sufficient for the necessary extra distance required. This was solved by building brick arched piers at the roadside and adding short reinforced concrete slabs at each end between piers and abutments. The bridge listing includes all of the existing original steelwork, brick abutments, piers and reinforced concrete support structures.*[51]
Curtilage boundary	The curtilage is limited to the footprint of the bridge and abutments.
History	The Railway Bridge over Botany Road was constructed in 1924-1925 as part of the initial Sydney goods railway expansion project. In 2012, management of the bridge was transferred from RailCorp to ARTC.
Statement of significance	*'The Mascot (Botany Road) Underbridge is historically significant as an integral component of the separate Botany Goods Line (1909 - 1925). The Goods Line is significant as part of the major Sydney goods railway expansion constructed in the early 20th Century to allow industry and shipping at Botany to be connected into the main network. The underbridge has aesthetic significance as a landmark structure over Botany Road with the brick arched piers and wing walls demonstrating fine workmanship. The bridge is unusual in its construction method, employing reinforced slabs and steel girders to accommodate the skew in the span across Botany Road.'*[52]

[50] The majority of this significance assessment has been taken from the OEH SHI listing for the Mascot (Botany Road) Underbridge. Viewed 24/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?id=4800248
[51] OEH, 2009. 'Mascot (Botany Road) Underbridge. Viewed 24/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?id=4800248
[52] OEH SHI, 2009. 'Mascot (Botany Road) Underbridge. Viewed 24/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?id=4800248

Railway Bridge over Botany Road

Figure 6-3: The Botany Road Underbridge in August 2018.

6.2.2 Listed heritage items partially within, or directly adjacent to, the study area and 100 metre buffer zone.

There are three heritage listed items partially within, or directly adjacent to, the study area:

- Sydney (Kingsford Smith) Airport Group – Botany Bay LEP 2013, CHL and RNE
- Commonwealth Water Pumping Station and Sewerage Pumping Station, Ruins of the former Botany Pumping Station and Sydney (Kingsford Smith) Airport Group – Botany Bay LEP 2013
- Botany Water Reserves – SHR, Botany Bay LEP 2013, Sydney Water and RNE

6.2.2.1 Sydney (Kingsford Smith) Airport Group[53]

Sydney (Kingsford Smith) Airport Group	
Listing and number	Botany Bay LEP 2013 item no. I170 CHL Indicative Place item no. 105542 RNE Interim List item no. 102669
Significance	Local
Description and condition	The Sydney (Kingsford Smith) Airport Group occupies over 900 hectares of land within the Bayside 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'*.[54]
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. The curtilage for the item also includes the Botany Bay LEP 2013 listed Commonwealth Water Pumping Station and Sewerage Pumping Station which is discussed separately in Section 0.
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

[53] The majority of this significance assessment has been taken from the OEH SHI listing for the 'Sydney (Kingsford Smith) Airport Group. Viewed 30/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5063218
[54] OEH, 2018. 'Sydney (Kingsford Smith) Airport Group. Viewed 11/10/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5063218

Sydney (Kingsford Smith) Airport Group	
	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 1991 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* (now Bayside Council). *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, 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*

Sydney (Kingsford Smith) Airport Group

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 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 fitouts may have technological or historic heritage values (not investigated).

Sydney (Kingsford Smith) Airport Group

Figure 6-4: View of Sydney Airport from the Botany Rail Line in August 2018.

6.2.2.2 Commonwealth Water Pumping Station and Sewerage Pumping Station No. 38[55]

Commonwealth Water Pumping Station and Sewerage Pumping Station No. 38	
Listing and number	SHR no. 01334 Botany LEP 2013 item no. I168
Significance	Local
Description and condition	The Commonwealth Water Pumping Station and Sewerage Pumping Station No. 38 was constructed in 1916 to serve the Southern and Western Suburbs Ocean Outfall Sewer (SWSOOS) No.1. All structures associated with the pumping stations are located approximately 1 kilometre south of the study area, west of Engine Pond and outside of the 100 metre buffer zone. *Sewerage pumping Station 38 is a conventional LLSPS* [low level sewerage pumping station] *with a circular concrete substructure housed within a single storey Federation Free Style industrial building. Adjacent to this is a 3-pump machinery well. Externally there is a slate gambrel roof with terracotta hip and ridge cappings, two timber louvered gambrel vents, projecting gable and exposed eaves with V-jointed T & G ponding boards. The masonry is well-burnt brown brick, timber framed double-hung windows with sandstone sills, brick arches and recent security grilles; entrance consisting of steel roller shutter door, recessed brick reveal and a rubbed sandstone lintel inscribed with the letters "MWS & DB 1915". Rainwater goods consist of fibre cement gutters, rainwater heads and downpipe. Internally the ceiling is lined with V-jointed T & G boarding with a large scotia cornice. There is a large ventilation grille centered on the ceiling; walls of painted brickwork and chequer plate flooring. SPS 38 is located adjacent to an inspection hall and substation which are of similar appearance. The buildings themselves stand alone in a grassed area adjacent to the old water pumping station. They can be prominently seen from General Holmes Drive and as a group have landmark value.*[56]
Curtilage boundary	The curtilage for the item consists of the superstructure only, however it is located within the Botany Bay LEP 2013 curtilage for the Sydney (Kingsford Smith) Airport Group. Land is owned and managed by Kingsford-Smith Airport. The Commonwealth Water Pumping Station and Sewerage Pumping Station No. 38, Ruins of the former Botany Pumping Station and Sydney (Kingsford Smith) Airport Group are all encompassed within the same Botany Bay LEP 2013 curtilage and located within the Sydney Airport property boundary, as shown in Figure 3-1.
History	In 1859 Sydney's sewerage system consisted of five outfall sewers which drained to Sydney Harbour. By the 1870's, the Harbour had become grossly polluted and, as a result, the government created the Sydney City and Suburban Health Board to investigate an alternative means of disposing of the City's sewage. This led to the construction of two gravitation sewers in 1889 by the Public Works Department: a northern sewer being the Bondi Ocean Outfall Sewer and a southern sewer draining to a sewage farm at Botany Bay. Low lying areas around the Harbour which could not gravitate to the new outfall sewers continued to drain to the old City Council sewers. Low level pumping stations were therefore needed to collect the sewage from such areas and pump it by means of additional sewers known as rising mains, to the main gravitation system. The first comprehensive low level sewerage system began when the Public Works Department built a group of 20 low level pumping stations around the foreshores of the inner harbour in the late 19th century, and in

[55] The majority of this significance assessment has been taken from the OEH SHI listing for the 'Sewage Pumping Station 38'. Viewed 30/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5051446
[56] OEH SHI, n.d. 'Sewage Pumping Station 38'. Viewed 30/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5051446

Commonwealth Water Pumping Station and Sewerage Pumping Station No. 38	
	the subsequent development of other outfall sewers to serve the southern, western and northern suburbs, greater Sydney now has over 600 low level sewage pumping stations. The construction of SP0038 coincided with the development of the Southern and Western Suburbs Ocean Outfall Sewer No 1 (SWSOOS No 1), which superseded the Botany-Rockdale Sewage Farm in 1919.
Statement of significance	*This Station was the first of an original group of low level Sewage Pumping Stations constructed to serve the SWOOS No.1 in 1916. It is a representative example of a simple, robust and well-proportioned Federation Free Style industrial building, the architectural expressions of which can be found in the structural detailing of the facade, superb brickwork, and roof forms. In addition, the mechanical components housed within the building have potential industrial archaeological value. Its architectural detailing makes a strong contribution to the visual catchment of the airport precinct and Botany area. The Station is currently in use as a LLSPS.*[57]

Figure 6-5: SP0038 - External view of screening building looking south. Source. James Stephany, Sydney Water Corporation.

[57] OEH SHI, n.d. 'Commonwealth Water Pumping Station and Sewage Pumping Station No. 38. Viewed 11/10/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5063196

6.2.2.3 Ruins of the former Botany Pumping Station[58]

Ruins of the former Botany Pumping Station	
Listing and number	Botany LEP 2013 item no. I3
Significance	Local
Description and condition	The ruins of the former Pumping Station are located along the south-western edge of the Botany Wetlands, approximately 500 metres south of the study area. The waterworks were constructed in 1855 after 75 acres of Simeon Lord's landholdings were resumed by the government to provide Sydney with its third fresh water source. The station worked by pumping fresh water to reservoirs in Surry Hills and Paddington and was constructed on a sandstone outcrop once occupied by Lord's flour mill.[59] The station closed in 1883 and many of the buildings and machinery dismantled and sold, although some structures such as the chimney were retained. This would later be adapted for ventilation required for the 1916 Southern and Western Suburbs Ocean Outfall Sewer (SWSOOS No. 1), discussed above. The remaining ruins are currently fenced off and surrounding area likely contain sub surface archaeological remains associated with the pumping station.[60]
Curtilage boundary	The Commonwealth Water Pumping Station and Sewerage Pumping Station No. 38, Ruins of the former Botany Pumping Station and Sydney (Kingsford Smith) Airport Group are all encompassed within the same Botany Bay LEP 2013 curtilage and located within the Sydney Airport property boundary, as shown in Figure 3-1. *The Pumping Station was originally located along the western edge of Engine Pond and eastern edge of Sydney Airport. Although a ruin, part of the chimney has survived and gives the site a prominence in the local landscape, including in low aerial views such as are available when taking off or landing on the adjacent runways and from General Holmes Drive (for passengers). The visual curtilage of the site is therefore extensive; and the historical curtilage includes the full extent of the system of dams and ponds formed to provide the water supply for its operation (see the separate listing for the Botany Wetlands). The current fence around the surviving structures does not reflect the curtilage of the item (the original Waterworks precinct), which extended to include the Managers' Residence to the north-east.* The SHI listing for the item notes that comments on the condition of the ruins are based on elements visible from the public domain. No detailed investigation of fabric has been possible due to fencing around the site.
History	In 1859 Sydney's sewerage system consisted of five outfall sewers which drained to Sydney Harbour. By the 1870's, the Harbour had become grossly polluted and, as a result, the government created the Sydney City and Suburban Health Board to investigate an alternative means of disposing of the City's sewage. This led to the construction of two gravitation sewers in 1889 by the Public Works Department: a northern sewer being the Bondi Ocean Outfall Sewer and a southern sewer draining to a sewage farm at Botany Bay. Low lying areas around the Harbour which could not gravitate to the new outfall sewers continued to drain to the old City Council sewers. Low level pumping stations were therefore needed to collect the sewage from such areas and pump it by means of additional sewers known as rising mains, to the main gravitation system. The first comprehensive low level sewerage system began when the Public Works Department built a group of 20 low level

[58] The majority of this significance assessment has been taken from the OEH SHI listing for the Commonwealth Water Pumping Station and Sewage Pumping Station No. 38. Viewed 30/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5063196
[59] OEH SHI, n.d. 'Commonwealth Water Pumping Station and Sewage Pumping Station No. 38.
[60] OEH SHI, n.d. 'Commonwealth Water Pumping Station and Sewage Pumping Station No. 38.

Ruins of the former Botany Pumping Station	
	pumping stations around the foreshores of the inner harbour in the late 19th century, and in the subsequent development of other outfall sewers to serve the southern, western and northern suburbs, greater Sydney now has over 600 low level sewage pumping stations. The construction of SP0038 coincided with the development of the Southern and Western Suburbs Ocean Outfall Sewer No 1 (SWSOOS No 1), which superseded the Botany-Rockdale Sewage Farm in 1919.
Statement of significance	*The ruins of the Botany Pumping Station are part of a highly significant cultural landscape that remains clearly legible in its historic context despite its ruinous state and the development of the airport to the north over part of its original setting. The Pumping Station formed the centrepiece of the Botany Waterworks, which was a unique engineering achievement that provided the mechanism by which the fresh water that percolated from the mouth of the Lachlan Swamps was pumped back to the city via reservoirs at Surry Hills and Paddington. Its operation facilitated the rapid expansion of Sydney's inner suburbs in the second half of the 19th century following the failure of the earlier water supplies of the tank Stream and Busby's Bore.* *The Waterworks is also historically significant for its association with early local government authorities in NSW, being established and operated by the Sydney Corporation, part of the newly-formed Sydney City Council, despite not being located within the City's boundaries. The original buildings of the Waterworks are now in ruin, but the surviving footings and other fabric and the aesthetic qualities of its setting provide important and interpretable evidence. Its significance is enhanced by the survival of the series of dams and ponds that contained and supplied the water to the pumping system and which continue to provide evidence of the bountiful supply afforded by the underlying aquifer (refer to the separate listing sheet for the Botany Wetlands).* *The Waterworks is also significant for its historical association the significant Colonial merchant and industrialist Simeon Lord. Lord had requested the grant of 600 acres of the Botany Wetlands, including the area on which the Waterworks was built, expressly in order to guarantee exclusive access to the water supply in perpetuity without interference by Government, the aim being documented in Lord's memorandum to Government Macquarie requesting the grant. This nexus was tested by his widow Mary Lord, son and heir George Lord, and tanner J.M. Darvall during the compulsory resumption of their land to build the waterworks and redirect the water for use by the town and inner suburbs of Sydney. They appealed successfully to the NSW Supreme Court in 1855-1856 for damages arising from the loss of what they saw as their historic entitlement to the water; and were awarded a total of £13,000 in addition to the land value, a decision that established legal precedent for future compensation cases.* *The waterworks has had a significant impact on the course and pattern of the growth and development of the former Botany Bay area. The establishment of the Pumping House and other infrastructure was the catalyst for the development of the Botany town centre immediately to the east of the Engine Pond. The site was later adapted for re-use as a woolscour, an industry identified in the 1856 Supreme Court case as the best use of the land and representative of the character of industrial development in the area at the time.* *The chimney is also historically significant for its adaptive re-use to provide a ventilation shaft for the adjacent 1916 pumping station for the Southern and Western Suburbs Ocean Outfall Sewer (SWSOOS) No.1., the next major employer to occupy the site. The ruins of the Waterworks also include the substantial base of the chimney and the lower part of its stack which remains an aesthetically distinctive and clearly visible element in the landscape of the eastern side of the airport and in views from General Holmes Drive.* *The ruin of the pumping house is similarly distinctive and, although limited to the footings, allows the original form and function to be interpreted on closer inspection, although access at present is limited by fencing. The mature trees are remnant of the original plantings; and the juvenile Canary Island Date Palms in the vicinity contribute to the aesthetic heritage values of the site as a landmark visible from the airport perimeter road, General Holmes Drive and unusually, at low altitude from commercial aircraft. The surviving fabric of the Waterworks*

Ruins of the former Botany Pumping Station

(including the footings and evidence of earlier structures piled or buried in the vicinity) represents a significant archaeological deposit that has the potential to be of considerable research value for the evidence that it may provide of mid-19th century industrial structures or of the later use as a woolscour.

The chimney has the potential to also be of archaeological/research significance for the evidence of its adaptation as a ventilation stack for the Southern and Western Suburbs Ocean Outfall Sewer I. It is possible also that archaeological evidence may have survived of the 1825 flour mill that originally stood in the immediate vicinity.[61]

Figure 6-6: Ruins of the former Botany Pumping Station. Source. Botany Council.

[61] The majority of this significance assessment has been taken from the OEH SHI listing for the 'Ruins of the former Botany Pumping Station'. Viewed 30/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=1210176

6.2.2.4 Botany Water Reserves[62]

Botany Water Reserves	
Listing and number	SHR no. 01317 Botany Bay LEP 2013 no. I2 Sydney Water item no. 4570025 RNE no 17854
Significance	Local and State
Description and condition	The Botany Water Reserves (also known as the Botany Wetlands or Botany Swamps) are located directly north and south of the study area and cover over 58 hectares of natural wetlands which have been modified over time. The SHI listing for the item contains the following description: *This item is comprised of an extensive tract of open space/parkland, with 58 ha of wetlands, including Sydney Airport, The Australian Golf Course, Lakes Golf Course, Eastlakes Golf Course, Bonnie Doon Golf Course and Mutch Park. Other areas of wetlands in the vicinity are substantially smaller in extent - the Eve Street wetlands, Arncliffe (south of Kogarah Golf Club) and the chain of ponds in Sir Joseph Banks Park, Botany.* *Important surviving elements of non-indigenous heritage include remnants of the water supply Engine House and chimney (late 1850s) (no longer owned by Sydney Water); spillway/weir, remnants of the Engine and Mill Ponds; the sequence of ponds between the Mill Pond and Gardeners Road; 1915 Sewer Pumphouse; twin sewer syphons and easements; partial evidence of old Cooks River edge (evident through comparing early and recent aerial photography; 1869 plantings of Norfolk Island Pines (Araucaria heterophylla), Moreton Bay Fig Trees (Ficus macrophylla) and Port Jackson Fig Trees (Ficus rubiginosa). Given the period, important government institutional use and the choice of tree species there is strong circumstantial evidence for the involvement of Charles Moore - Director of the Royal Botanic Gardens (1848-1896) in advising on these plantings. Canary Island Date Palms (Phoenix canariensis) also survive near the Engine Pond and may be remnants - or progeny - of 1910s plantings associated with the reuse of the site for the main southern sewer system. There is likewise strong circumstantial evidence for the involvement of Joseph Henry Maiden - Director of the Royal Botanic Gardens (1896-1924) in recommending the choice of these plantings.* *A comparison of current aerial photographs and the Sydney Water Commission's 1869 topographic plan of the Lachlan Swamp from No 6 Dam to Botany Bay shows that there is a substantial degree of correlation between the layouts of many of the dams. Despite the bisection of the Engine Pond by Southern Cross Drive, it is still possible to appreciate the basic outline of the earlier pond. A similar observation holds for the former Bridge Pond as the present Mill Pond and the western half of the 'New Pond' retain the earlier basic form. The embankment separating the Mill and New Ponds preserves part of the alignment of the old Sydney-Botany road (shown on the 1869 SWC plan) with its tollhouse site just south of the embankment. (Archaeological evidence of the former tollhouse may still exist). The present Nos 1 and 2 Ponds closely reflect the earlier form of the 1869 No 1 Pond while most of the present Nos 3a, 3 and 4/5 Ponds almost exactly retain the earlier form of the 1869 Nos 2, 3, 4 and 5 Ponds respectively. The northern part of the old No 6 Pond has been filled. Generally, the present wetland layout retains a close indication of the original 1860s dam forms. Earlier pond formations existed some decades before, and were absorbed into, this system however surviving evidence is difficult to discern from both (non-intrusive) site inspections and an analysis of aerial photography. Archaeological investigations - if ever required - may reveal evidence of these early 19th century structures.*

[62] The majority of this significance assessment has been taken from the OEH SHI listing for the 'Botany Water Reserves'. Viewed 30/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5051418

Botany Water Reserves	
	A 'Plan of the Botany & Lachlan Watersheds' signed by Francis Bell in June, 1875 shows that the Lachlan Water Supply (Centennial Park) links with the Botany Pond system as does the area of land containing the present Australian Golf Course. Several remnant areas of the famous and now rare Eastern Suburbs Banksia Scrub (still featuring the trademark Grass Trees [Xanthorrhoea resinosa]) as well as various communities of reed and sedgeland species are represented within the open space boundaries. Other important indigenous vegetation vestiges include areas of Paperbark swamp featuring Melaleuca quinquenervia, marshland and wet heath and large areas of the aquatic herb Ludwigia.
Curtilage boundary	The heritage curtilage for the item is bounded by the suburb of Kingsford to the north, Page wood to the east, Botany to the south and Mascot to the west, as shown in Figure 3-1.
History	*Botany was first planned as an agricultural district, and the principal industry was to be market gardening. Instead it became an industrial area, boasting a fellmonger's yard and a slaughter works. As early as 1809, Mr E Redmond came to settle in the district, but the first important developer was Simeon Lord (1771-1840), who built a fulling mill in 1815 on the site that later became that of the old water works. In 1823 he received a grant of 600 acres, followed by further grants. Part of the estate was subdivided by 1887. Lord, the 'merchant prince of Botany Bay', manufactured fine wool cloth, and was also one of the merchants instrumental in the founding of Sydney Hospital. He gave land for the sites of 2 early churches in Botany, and Lord Street is named after him. Banksia Street, Sir Joseph Banks Park and Booralee Park all commemorate those early days.* *The Sydney Water Works were established in Botany in 1858 and were fed by the many springs in the area. In 1886, the last year of full pumping, 1864 million gallons of water were supplied to Sydney from these water works. Although the scheme was Sydney's major source of water for 30 years, it did not supply water in the Botany area and local residents depended on natural sources and tanks. (Pollen, 1988, pp.35-6).* *Following European colonisation the first substantial interventions in the area occurred in 1815 when the enterprising merchant Simeon Lord had a dam constructed to the west of the present Botany Road for the purpose of establishing the colony's first woollen mill. A second dam was constructed near the present Engine House ruins for a flour mill (refer to 1869 Water Commission Plan). This mill continued operating until about 1847 while the textile factory was closed by about 1856.* *From 13 July, 1855 the City Council began resuming land around, and including, the Botany wetlands for the city's main water supply scheme - the first time land resumptions were made for this purpose. (The land was transferred to the Water Board in 1888.) Of this land about 75 acres of Lord's estate was resumed which included his house (demolished in the 1930s though the site of which is in the vicinity of the present heliport), the mill sites, various cottages and the earthworks associated with Lord's mill dams.* *The initial water supply scheme of the mid-1850s, by the City Engineer WB Rider, was abandoned with the appointment of Edward Bell to the position. The surviving Engine House and chimney date from the implementation, in the late 1850s, of Bell's scheme while the stone retaining walls for the Engine Pond and outlet sluice probably date from the 1870s work on the Engine Pond augmentation. Between 1866 and the mid-1870s six dams were constructed, and reconstructed for various reasons, from the Mill Pond to Gardeners Road using piling of sheet timber facing filled with sand forming a core of a turfed bank. In 1859 a 30" sand-cast iron main was completed between the Engine House and the Crown Street reservoir. The pipes were made in Scotland in 1856 and machined with such remarkably fine tolerance that, of the total length of 4 miles (6.4 km), the outside diameter varied by only 6mm and allowed the pipes to be laid without jointing material. Part of this easement coincides with the present study area in the vicinity of the Engine House.* *Drawing on a 1982 thesis of Margaret Simpson, the Thorp et al study indicates that about 80 trees - "Norfolk Pines, Moreton Bay Figs, Weeping Figs, Sweet Scented Pines and Stone Pines" - were planted along the access road from Botany and elsewhere on the site in 1869.*

Botany Water Reserves

Works for the augmentation of water storage at Botany continued throughout the 1870s including the addition of water stored in the Bunnerong Dam (1876-1877) by way of a pipe to the No 4 Pond. The then Bunnerong Road was moved and ran along the top of this dam wall.

By the early 1880s the Upper Nepean Scheme was well underway and in November 1886 the Nepean-supplied water effectively ended the general supply of Sydney's water from the Botany system. Even intermittent emergency use of the system ceased by 1893 so that the Engine House machinery was finally decommissioned with pumping equipment and boilers sold at auction in 1896. In 1894 various local industrial uses - such as wool scourers and tanners - were permitted to return to the wetland vicinity through leases until 1947.

While these major improvement programs for Sydney's water supply were being put into place it also became clear - chiefly from an increasingly polluted harbour - that substantial works were needed to deal with the sewage of Sydney and its immediate suburbs. After the Board of Water Supply and Sewerage was formed in 1888 the basis of what is presently Sydney's largest sewerage system was commenced. As part of its responsibilities the new Board assumed control of various recent works of the Public Works Department, one of which was the first of the new sewer mains from the City to the Botany Sewage Farm established about 1886. Another main was added in 1898 which linked various western suburbs to the Sewage Farm. However by the turn of the century the usefulness of the Farm was fast diminishing such that the southern and western sewerage systems were amalgamated and extended, from 1909, to a new ocean outfall at Malabar while the much expanded Botany Sewage Farm was closed. This work - known as the Southern and Western Sewer Ocean Outfall System or, usually, SWSOOS No 1 - was completed in 1916 under the direction of Chief Engineer EM de Burgh.

Further growth of Sydney's suburbs and resultant extensions to this sewerage network necessitated an augmentation of the system, by duplication known as SWSOOS No 2, during 1936 to 1941. Both mains were required to cross the Cooks River by inverted syphons. The current SWSOOS network represents Sydney's largest sewerage system and envelops mains that were constructed from the 1880s through the 1890s, 1900s, 1910s to 1940s. Other individually significant components of the SWSOOS network that occur in the vicinity of the present site include the twin major inverted syphons and syphonic overflows (now under Sydney Airport)(part of ID No SW 33?) and the 1896 sewer vent at West Botany Street, Arncliffe (ID No SW 31 - SHI 4571725).

Within the site the existing engine house chimney was retired for water supply use in 1888, left unused for 28 years then, after being shortened, re-used as a vent in 1916 as part of the work for the new SWSOOS. Various buildings, associated with the new sewerage system, were added to the west. During the 1940s the chimney was further truncated to its present height along with the diversion of the mouth of the Cooks River into Botany Bay and substantial filling of the Engine and Mill Ponds as part of a major expansion and upgrade of airport facilities. From the 1970s a greater appreciation of the special historical and environmental values of the place was apparent through the commissioning of a range of studies to record and assess its significance. However further incursions continued with the 1988 construction of Southern Cross Drive through the middle of the Engine Pond, reclamation by the DMR and more recent works associated with the pre-Olympics upgrade of the airport.

The Lakes Golf Club (1928)

In 1928 construction of a clubhouse near Gardeners Road was commenced for the Lakes Golf Club with the course - to the west and north of the chain of ponds - opening in 1930.

About 1960 the Eastlakes Golf Club was established with an 18-hole course on the eastern and southern side of the ponds. The neighbouring course to the northeast, the Australian Golf Club, was established in 1904 and in the same year it was host for the first Australian open golf title which was won by Michael Scott. Both the Lakes and Australian golf courses have been consistently ranked in the top five golf courses in New South Wales for many years.

The Lakes Golf Club practice precinct (east of the club house)

Botany Water Reserves	
	The practice precinct was excavated on a number of occasions from 1928 to 1970. In the early 1970s the south-eastern area of this land was bulldozed and redeveloped as part of the overall golf course design as a direct result of the state government requiring some of the golf course land to construct Southern Cross Drive. This included extensive excavation of the area of the practice precinct of the golf course. In the mid-1970s some of the practice precinct area formed part of the tennis court construction which required bulldozing the area to prepare the ground for new tennis courts. This was conducted as part of construction of the golf course clubhouse (Kirkman, 2016, 4) *In the early 2000s the practice precinct was renovated as part of a plan to improve course facilities for practice, and to have the course fit with the natural contours and appearance of the sandy dunes and lakes that dominate its site. This included extensive disturbance of the practice precinct area. In 2005 a new club house was built and this resulted in removal of the tennis courts. The practice precinct and some of the driving range tee was bulldozed to remove the tennis courts and then construct the practice chipping area (ibid, 2016, 4-5).* *From 2007-09 the entire Lakes Golf Course underwent a comprehensive renovation which included extensive construction works to the south-western section of the practice precinct area. This involved use of a bulldozer and other construction equipment to construct the 10th tees and the area in front of them. This included the small ridge between the driving range tee and the front of the current 10th hole tees (ibid, 2016, 4).*[63]
Statement of significance	*Botany Water Reserve holds considerable value for Sydney and NSW because it contains the only remaining major components - substantial layout and other important physical evidence from the 1850s through to the 1870s - of the unique water supply system that supported the expansion of the Sydney metropolis for most of the latter half of the 19th century, representing Sydney's third main water supply system since colonisation; and on account of the surviving remnants of the early 19th century industries associated with the prominent emancipist merchant Simeon Lord. The site includes land which, in 1855, was the subject of the first resumptions for the purpose of a water supply system by a government in Australia. Part of the original 1850s sand-cast iron water supply pipe remains within the site representing a remnant of the State's oldest main.* *This extant remnant of the water supply system also has high collective value as important evidence likewise remains of the two principal Sydney water supply systems (The Tank Stream and Busby's Bore) that predated the Botany system along with those superseding it (The Upper Canal and regional dam systems).* *The open space areas encompassed by the item include two regionally rare and distinct remnant vegetation communities known as Sydney Freshwater Wetlands and Eastern Suburbs Banksia Scrub that are both potentially of State significance and are the subject of separate listings as an Endangered Ecological Community under the NSW Threatened Species Conservation Act 1995. The wetlands also have recognised regional ecological value as native animal habitat and movement corridors and may include animal species of conservation significance.* *The item is of regional environmental importance as a major recharge source for the Sydney basin aquifer. It likely holds special interest as a landmark cultural and recreational landscape for the regional community.* *It also has regional importance on account of the substantial infrastructure it contains of the 1910s Southern and Western Suburbs Ocean Outfall Sewer System (SWSOOS No 1) - since augmented during 1936-1941 by SWSOOS No 2 - representing one of the first major separate sewers in Sydney as well as incorporating new ventilation technologies. This infrastructure includes use of the former Engine House chimney as a sewer vent, the viaduct to carry the vent pipe, Sewage Pumping Station No 38 of 1916 near the Engine House ruins and part of*

[63] OEH SHI, n.d. 'Botany Water Reserves'.

Botany Water Reserves

the SWSOOS Nos 1 and 2 mains. The overall SWSOOS network remains Sydney's largest sewer system.

Figure 6-7: SHR curtilage for the Botany Water Reserves. Source. Heritage Council for NSW.

6.2.3 Listed heritage items within the 100 metre buffer zone

The following item is located within the study area's 100 metre buffer zone and was assessed as having potential to be impacted by the project during the site inspection:

6.2.3.1 Beckenham Memorial Church[64]

Beckenham Memorial Church	
Listing and number	Botany Bay LEP 2013 no. I52
Significance	Local
Description and condition	The Beckenham Memorial Church was constructed along Botany Road in 1933 and is located approximately 40 metres east of the study area. Recent development associated with WestConnex has seen the demolition of several structures associated with the church, including the Church Hall and Sunday School (LEP no. I51 and I50). The following description of the item has been taken from the SHI: *The 1933 church is an unusual example of the Inter-War gothic style, with asymmetrical composition but crossed transepts and roof form, and the main entrance porch aligned diagonally, and similar diagonal features at each internal corner. The walls are supported by buttresses with bricks set at 45 degrees and masonry capping. The walls are of dark face bricks in variegated colours, and include a band of three courses of the darkest brick laid below sill height. The main elevation to Botany Road includes a large rose tracery window above three gothic arches with moulded brick surrounding. These windows are all slightly recessed behind a large arch with matching moulding. The northern elevation features a double-stacked group of six windows, with lancet heads to the upper row. A feature of the interior was the response to the atypical footprint of the church by arranging the pews radially around the pulpit.* *The setting of the former Beckenham Memorial Church is currently part of the Westconnex work site to all elevations except to the south, which is light industrial. The Church Hall and Sunday School were located immediately to the north of the Church and have been demolished as part of the Westconnex project. The retention of the Church building as part of the Westconnex project has allowed its heritage values to continue to be able to be appreciated and interpreted despite significant changes to its streetscape setting as a result of this project.*
Curtilage boundary	The physical curtilage for the item comprises the property boundary encompassed by Part Lot 6, DP 3280; Part Lot 7, DP 3280; Part Lot 8, DP 3280; Part Lot 9, DP 3280. The item also has a visual curtilage which is discussed in the SHI listing for the item: *The distinctive form and quality of the design of the church has retained a significant streetscape presence despite the erosion of its visual curtilage due to the recent demolition of the buildings to the north, which included the original Church Hall and the Sunday School. The surviving visual curtilage includes the roofscape of the church building when viewed from Botany Road. The final visual curtilage will need to be re-assessed when the roadworks are complete.*[65]

[64] The majority of this significance assessment has been taken from the SHI listing for Beckenham Memorial Church. Viewed on 11/10/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=1210052

[65] E. & R. Conroy, 2018. City of Botany Bay Heritage Review. Viewed on 11/10/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=1210052

Beckenham Memorial Church

History

The Beckenham Memorial Church at 1295 Botany Road is located in part within the third grant made in the Botany district, the 135 acres granted to Edward Redmond in 1809 and named originally 'Johns Town', but soon known as 'Mudbank'. The grant was purchased by magnate Simeon Lord in 1816 and became the centre of Lord's industrial empire after Lord was granted a further 600 acres and established several mills and cloth manufacturing factories on the wetlands. The eastern half of 1295 Botany Road is within this 600 acre grant. Lord kept tight hold of his estate and the area remained undeveloped. Following Simeon Lord's death the entire estate was subdivided by George Lord, Simeon's son, in 1854. The land on which the church was built is partly on Lot 42 and partly on Lot 43 of this subdivision. Access through Lord's estate at this time was by informal track that followed the edge of the ponds until 1864 when the current alignment was formalised. Lots 42 and 43 were well located at the northern corner of Lord's estate, and the 1864 Botany Road formed the western boundary of area that came to be known as Phill McCarroll's Paddock. The 1878 subdivision of this paddock was auctioned on 11 May 1878 by auctioneer William Henry Pritchard (snr), (SMH 10 May 1878 and subdivision plans (copies) held by Bayside Council). The sale appears to have had limited success and in June 1896 was re-subdivided into smaller lots and re-advertised as the 'Robertson's Estate" North Botany subdivision by Ernest C.V. Broughton. The Hall and Sunday School were built on Lots 6 and 7. The lots to the south (8-12 and 33-37) were bought by tanner William J. Lupton. Following Lupton's death they were re-offered in February 1918, and lots 8 and 9 were purchased by the Church, allowing the construction of the church building.

The first congregational services conducted in the Botany District had been held in 1911 at a local hall named Dudley Hall, just north of Park Road (now Wentworth Avenue). The meetings were presided over by the Rev. John Beckenham. The initial congregation was small, numbering just sixteen in the morning and forty-five at the evening meeting. Several weeks after commencing the gatherings, a Sunday School was opened. Patronage grew quickly and by 1914 the Congregational Church had opened a new church building just south of Park Road (Wentworth Avenue). This was on the site of 1293 Botany Road, and was later used as the Church's hall until being demolished in 2017 for the Westconnex road project.

When Rev. Beckenham died in 1916 a home missionary assumed management of the services until 1924 when Rev. S.S.W. Horner (M.M) was appointed to the church leadership, a position he held until his death in 1950. During Horner's administration a kindergarten hall and vestry were added to the church hall. Presumably the congregation continued to grow, because in 1930 architect A. Lanyon Clark was engaged to design a new church building. The new building was "to be erected upon a site adjoining the existing hall" (25 April 1933, The Sydney Morning Herald, p.2). This became the site of the third church building for this growing congregation in just under twenty years and is the building on the site of 1295 Botany Road. Built over two lots, it was described as a "church hall, with a school at the rear". (25 April 1933, The Sydney Morning Herald, p.2) The foundation stone was laid on Saturday 20 May 1933 by the chairman of the Union (Rev. R. B. Reynolds), Mrs J Beckenham, senior and the Rev. S.W. Horner. (SMH 20 My 1933.p.7)

The new church was built by G.L.Taylor and was designed to be able to seat 200 people. It featured a dark face brick gabled church building in a simple Inter-war Gothic style, with a gabled terracotta tiled roof, brick buttresses, stained glass windows and a large circular stained glass window on its façade. Its form was unusual, being radial, described in the Sydney Morning Herald at the time of its commissioning as:

"to overcome the effect of two attenuated buildings running back side by side, a cross roof and transept, with the main entrances placed diagonally on the front return of the transepts, have been planned. This plan has made practicable the arrangement of pews radially to the pulpit. The choir seats will also be arranged radially. The design is of simple Gothic, the openings generally having plain pointed arches, emphasises by label moulds at the main façade and at the entrances. ……. The main front gable is provided with a fine rose tracery window set over triple windows, the whole being recessed beneath the main arch feature. An effect of strength is gained by the arrangement of the buttresses at the front gable and by the introduction of horizontal bands." (25 April 1933, The Sydney Morning Herald, p.2)

Beckenham Memorial Church	
	In honour of the congregation's original pastor, the building was named the Beckenham Memorial Congregational Church and was opened in September 1933. *Rev. Horner who pastored the congregation during this time was also responsible for the establishment of another congregational church at Eastlakes (40 King Street) in 1936, and acted as minister for both. The name of the second church was the East Mascot Congregational Church.* *The Uniting Church in Australia was established on 22 June 1977 when most congregations of the Methodist, Presbyterian and Congregational Churches came together under the Basis of Union. From this time, the church at 1295 Botany Road became the Beckenham Memorial Uniting Church.* *The lower Mascot church on Botany Road was closed and land resumed in 2015 as part of the New South Wales WestConnex Project. The 1933 church building has been retained however the adjoining c.1914 church hall with adjoining school and vestry were demolished as part of the works. The services of the Mascot congregation relocated in 2015 to its sister church at Eastlakes. Today the church at Eastlakes is known as the Beckenham Horner Memorial Uniting Church – a name change actioned when the two congregations joined together.*
Statement of significance	*The (former) Beckenham Uniting Church at 1295 Botany Road is of local heritage significance to the Bayside area as a fine example of a substantial Interwar church designed by significant ecclesiastical architect Arthur Layton-Clark with an unusual and distinctive radial floor plan. Its Interwar Gothic form and detailing is emphasised by the traceried rose window to the Botany Road elevation and arched detailing in the brickwork, but is distinguished by the steeply pitched roof that extends below and behind the main gable in an Arts and Crafts reference, and the distinctive entrance porches set at 45 degrees to each corner of the main elevation.* *The church, built in 1933 as the Beckenham Memorial Congregational Church, has been a prominent element in the streetscape of Botany Road and makes a significant contribution to the ecclesiastical precinct between Mascot and Botany, which also includes Therese's Roman Catholic Church (now demolished), St Matthew's Anglican Church and the (former) Botany Methodist/Uniting Church.* *The Church is also likely to be of social heritage significance to its past and present congregations, the latter relocating to their sister church in King Street, Mascot as a result of the church's closure in 2015 following acquisition by the NSW State Government as part of the WestConnex road project.*

Figure 6-8: The Beckenham Uniting Church in August 2018.

6.3 Unlisted items of heritage significance within the study area

The study area encompasses about three kilometres of the Botany Rail Line, which as whole extends for a total of 9.2 kilometres between Sydenham and Port Botany. At the time this report was prepared, the Botany Rail Line was not listed as an item of heritage significance on any local, state or national heritage registers.

6.3.1.1 Botany Rail Line

Botany Rail Line	
Item name	Botany Rail Line
Assessed Significance	Local
Description and condition	The Botany Rail Line comprises an approximately 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 therefore well maintained.
History	The Botany Rail Line is a freight railway corridor envisioned in 1861 and gradually constructed between 1902 and 1925. Once complete, various private sidings were incorporated into the corridor to serve industries throughout Botany and Mascot, some of which, such as Kellogg's and Boral Cement continue to exist today. The line has undergone some deviations in the past, the most noteworthy of which occurred in 1960 when part of the corridor was moved north of the Sydney Airport curtilage towards O'Riordan Street and the Alexandra Canal. Additional upgrades occurred in the 1970s to accommodate the Port Botany development in 1999-2002 as part of the Botany Operational Enhancement Project and in 2017-8 as part of the WestConnex and Airport East Precinct projects. Despite these modifications and upgrades, the line continues to retain the majority of its original alignment, some of its original elements including early 20th century signal huts or signal location cases (identified during the site inspection), the Robey Street, O'Riordan Street and Botany Road underbridges and aspects of its original environment including Mill Pond. The significance of individual elements associated with the Botany Rail Line are discussed in Section 6.3.2
Significance assessment	
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), 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.

Botany Rail Line	
B – Associative Significance	The Botany Rail Line is associated with the earliest development of the NSW railways, Metropolitan Rail 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/technical 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 some elements that contribute to its significance including the O'Riordan Street, Robey Street and Botany Road underbridges as well as landscape features such as embankments, cuttings and early 20th century signal huts/signal location cases. 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 amongst 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,[66] the Dictionary of Sydney[67] and Flickr group 'Goods Lines Sydney'.[68] 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	There is no evidence to suggest the Botany Rail Line represents a rare or endangered feature within NSW's urban or rural landscapes. The Botany Rail Line does not meet this criterion at a local or state level.

[66] NSWrail, n.d. Botany Goods Line. Viewed on 11/10/2018 at: https://www.nswrail.net/lines/show.php?name=NSW:botany
[67] Dictionary of Sydney, n. d. Botany Goods Line. Viewed on 11/10/2018 at: https://dictionaryofsydney.org/structure/botany_goods_line
[68] 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

Botany Rail Line	
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.
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 6-9: Part of the Botany Rail line, Mascot in August 2018.

6.3.2 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.

Element	Significance assessment	Assessed significance
Mascot (Botany Road) Underbridge	The Mascot (Botany Road) Underbridge is an original element of the Botany Rail Line and represents an intact and original example of Sydney's goods railway expansion in the early 20th century. It contains local significance.	High
Mascot (O'Riordan Street) Underbridge	The Mascot (O'Riordan Street) Underbridge is an original element of the Botany Rail Line and represents an intact and original example of Sydney's goods railway expansion in the early 20th century. It is a rare example of reinforced concrete girder bridge construction. A span was added to the bridge in 1982 and south-east crib was replaced in 2007. It contains local significance.	Moderate
Robey Street Underbridge	The Mascot (Robey Street) Underbridge is associated with the 1960 deviation of the Botany Rail Line. It is the first welded steel railway bridge to be constructed on the NSW rail network and considered a landmark along Robey Street. It contains local significance.	Moderate
Signal Hut/Signal Location Case	The two signal huts/location cases identified during the site inspection are associated with early or mid-20th century signalling methods and were important communication points along the Botany Rail Line. They were established in their present location at some time after 1943 and provide evidence of developing rail technologies associated with the rail corridor. They contain local significance.	Moderate
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 and 1990s upgrades including concrete sleepers, rerailing and ballast cleaning. Therefore, they would not be considered to represent intact or original evidence of the Botany Rail Line and contain low significance as an element of the item.	Low

7.0 NON-ABORIGINAL ARCHAEOLOGICAL ASSESSMENT

7.1 Non-Aboriginal archaeology

This section assesses the non-Aboriginal (historical) archaeological potential within the study area based on historic and contemporary land use, early maps and plans, archival research and analysing levels of ground disturbance. The significance of any potential archaeological remains will also be assessed to inform recommendations for archaeological management throughout the project.

7.1.1 Previous land use and known impacts

7.1.1.1 Land use summary

The study area has been subject to numerous land use phases over time as outlined in the historical background of this report (Section 4.0). These are summarised in Table 7-1 below.

Table 7-1: Land use within the study area

Occupation phase	Known land use
1 c1809-1858	**Eastern Extent** - Industrial and agricultural activities associated with landscape modifications for Simeon Lord's wool and flour mills along Mill Stream **Central and Western Extent**– Early land grants, clearing of vegetation and establishment of Botany Road (former and present) and potential establishment of Chinese Market gardens
2 1858-1925	**Eastern Extent** - Establishment of the Botany Water Pumping Station and Botany Rail Line **Central Extent** - Residential development, market gardens and early construction of the Botany Rail Line **Western Extent** - Residential development and market gardens
3 1925-1960	**Eastern Extent** – Construction and completion of the Botany Rail Line and associated sidings/bridges. **Central Extent** – Residential development, construction and completion of the Botany Rail Line **Western Extent** - Residential development and market gardens
4 1960 - 2002	**Eastern Extent** – Botany Rail Line **Central Extent** – Botany Rail Line, construction of Southern Cross Drive and Mill Pond Creek bridges **Western Extent** - Expansion of Sydney Airport, construction of deviated section of the Botany Rail, construction of the Robey Street Underbridge, demolition of Phase 2 residential subdivisions and market gardens
5 2002 - present	Contemporary management and use of the Botany Rail Line. This involved upgrades to the line as well as the construction of an underbridge over Wentworth Avenue.

7.1.1.2 Known impacts

The study area has been subject to various impacts which may have removed archaeological evidence of earlier occupation phases. These are detailed in the historical background (Section 4.0) and site inspection (Section 5.0) sections of this report and summarised in Table 7-2 below:

Table 7-2: Known impacts within the study area.

Occupation phase	Known impacts
1 c1809-1858	**Eastern extent** - Vegetation clearance and landscape modifications for dam construction **Central and Western extent** - Vegetation clearance and landscape modification
2 1858-1925	**Eastern extent** - Landscape modification/clearance to accommodate construction of the Botany Rail Line and bridge over Mill Stream and Pond. This may have removed some evidence of Phase 1 occupation associated with Simeon Lord's mills **Central extent** - Landscape modification/clearance to accommodate construction of the Botany Rail Line and market gardens. This may have removed some evidence of early nineteenth century market gardening activities and structures **Western extent** - Late-19th century residential development and market gardens which is likely to have required localised land clearing and levelling. These activities may have removed archaeological remains associated Phase 1 occupation such as residential settlement and industry
3 1925-1960	**Eastern extent** - Although no significant impacts within the eastern extent of the study area are known to have occurred during this phase, the establishment of sidings across the rail corridor may have required landscape modification and vegetation removal, potentially disturbing archaeological remains of Phase 1 and 2 occupation **Central extent** – Minor impacts associated with rail corridor maintenance, construction of buildings to the north of Southern Cross Drive and south of General Homes Drive **Western extent** - The western extent of the study area was occupied by Phase 2 scattered residential development and market gardens during this period
4 1960 - 2002	**Eastern Extent** - The establishment of Southern Cross Drive and new bridges over Mill Pond and Southern Cross Drive required extensive bulk excavation that would have removed deep and shallow Phase 1, 2 and 3 archaeological remains. The establishment and removal of sidings across the rail corridor is also likely to have required landscape modification and vegetation removal **Central extent** - Some land within the study area also underwent significant impacts during the construction of Southern Cross Drive, including the demolition of a group of buildings located in an area bounded by Southern Cross Drive and Mill Pond to the southeast, the Botany Rail Line to the northeast and Botany Road to the west (shown in Figure 4-26). Although the majority of structural remains associated with these building are likely to have been removed some may have been retained and survive within two vegetated areas south and north of Southern Cross Drive **Western extent** - Demolition of Phase 2 and 3 residential and agricultural development to accommodate the deviation of the Botany Rail Line (to its current location). The level of impacts would have varied depending on the nature of construction works. For example, the construction of roads, the Robey Street underbridge and services would have required deeper excavations than the establishment of the Botany Rail Line corridor.

Occupation phase	Known impacts
5 2002-present	**Eastern extent** - No significant impacts within the eastern extent of the study area are known to have occurred during this phase, although the establishment of new services may have occurred and resulted in localised disturbances **Central extent** - The construction of a new underbridge over Wentworth Avenue would have resulted in significant subsurface disturbance and removed evidence of past land use. In addition, the establishment of new services within the study area would have resulted in localised disturbances **Western extent** - No significant impacts within the eastern extent of the study area are known to have occurred during this phase although the establishment of new services may have occurred and resulted in localised disturbances

Summary

Eastern Extent - The eastern extent of the study area has been occupied by the Botany Rail Line since 1925. Prior to this, the eastern extent was not occupied by any known structures, although it was within Simeon Lord's mill establishment (Phase 1) and Botany Pumping Station (Phase 2). Evidence of these phases may survive in the form of landscape modifications and unrecorded structures. However, they would have been highly impacted in areas now occupied by Southern Cross Drive, the Mill Pond Rail Bridge and Southern Cross Drive rail bridge.

Central Extent - The central extent of the study area has been occupied by the Botany Rail Line since 1925. Prior to this it was generally undeveloped, with the exception of three Phase 2 structures located to the south of General Holmes Drive (as shown in Figure 4-12). The central extent of the study area has also undergone some disturbance activities associated with the established of the Southern Cross Drive, Wentworth Avenue rail bridges (Phase 4 and 5), Botany Rail Line construction (Phase 2 and 3) and Phase 3 development associated with structures to the north of Southern Cross Drive and south of General Holmes Drive. Although fragile and ephemeral remains may not have survived these impacts, deep structural remains such as building footings, wells, rubbish pits or cesspits may be present within the area occupied by Phase 3 buildings.

Western Extent - The western extent of the study area has been subject to an accumulation of subsurface impacts over time, starting during Phase 2 occupation and ending when the Botany Rail Line was deviated and brought into its current alignment during Phase 4 occupation. Despite these impacts, structural remains of Phase 3 residences within the Robey Street road corridor and Botany Rail Line corridor are likely to have survived these activities.

7.1.1 Assessment of archaeological potential

The identified levels of archaeological potential referred to in this document are based on the definition provided in Section 2.6.

Table 7-3 provides an overview of the potential archaeological remains within the study area, based on assessment of previous land-use and subsequent in-ground impacts. An overview of potential archaeological resources is illustrated in Figure 7-1.

Table 7-3. Summary of potential archaeological remains

Phase	Archaeological remains	Assessed potential
Phase 1 c1809-1858	**Eastern Extent** Evidence of landscape modification and unrecorded structures associated with Simeon Lord's flour mill establishment in areas surrounding Mill Pond and south of Southern Cross Drive.	Low
	Central Extent Evidence of landscape modification, unrecorded structures and noxious industrial activities within small land grants given from 1809 onwards	Nil-low
	Western Extent Evidence of landscape modification, unrecorded structures and market gardens within small land grants given from 1809	Nil-low
Phase 2 1858-1925	**Eastern Extent** Evidence of landscape modification and unrecorded structures associated with the Botany Pumping Station in areas surrounding Mill Pond and south of Southern Cross Drive.	Nil to low
	Central Extent Evidence of landscape modification, market gardens and three structures north and south of General Holmes Drive	**Market gardens and three structures to the north and south of General Holmes Drive** Low and moderate **Remainder of Central Extent** Nil to low
	Western Extent Evidence of market gardens and scattered residential development	Nil to low
Phase 3 1925-1960	**Eastern Extent** Evidence of landscape modification for the Botany Rail Line and former sidings	Moderate to high

Phase	Archaeological remains	Assessed potential
	Central Extent Evidence of Phase 2 structures located to the north of Mill Pond and evidence of Botany Rail Line and associated sidings	**Land within Southern Cross Drive corridor** Nil
		Land outside Southern Cross Drive corridor Moderate to high
	Western Extent Evidence of market gardens, scattered residential development and industry along the Botany Rail Line and Robey Street	Moderate
Phase 4 1960 - 2002	**Eastern Extent** Evidence of former sidings	High
	Central Extent Evidence of Botany Rail Line and associated sidings	High
	Western Extent Evidence of market gardens, residential development and industry along the Botany Rail Line and Robey Street	Moderate to high
Phase 5 2002-present	**Eastern Extent** Evidence of former sidings along the study area	High
	Central Evidence of evidence of Botany Rail Line and associated sidings along the study area	High
	Western Evidence of evidence of Botany Rail Line and associated sidings along the study area	High

7.1.2 Assessment of archaeological significance

In 2009, the NSW Heritage Division of the Office of Environment and Heritage (OEH) issued a set of guidelines titled *Assessing Significance for Historical Archaeological Sites and 'Relics'*. These call for broader consideration of multiple values of archaeological sites beyond their research potential. Under the guidelines, the significance of a potential archaeological site can then be assessed as being of Local or State significance. If a potential relic is not considered to reach the Local or State significance threshold, then it is not a relic under the Heritage Act.

The overall aim of assessing archaeological significance is to identify whether an archaeological resource, deposit, site or feature is of cultural value. Table 7-4 provides a significance assessment of potential archaeological remains that have may be present within the study area (as summarised in Table 7-3).

Potential archaeological remains associated with **Phases 4** and **5** have not been included in this assessment, as remains of this age and type would not reach the local significance threshold due to their continued presence in the area and lack of archaeological research potential.

Table 7-4. Significance assessment for archaeological remains within the study area.

Criteria	Discussion
A - Historical Significance	If archaeological remains associated with structures or landscape modifications associated with Simeon Lord's wool and flour mill establishment (**Phase 1**) were present and intact within the study area, they would have potential to reach the threshold for State significance under this criterion. This is largely due to their association with Lord, a successful entrepreneur who was one of the first Europeans to privately produce and sell cloth garments in Australia.[69] His mill was one of the first industrial complexes in Botany and marked the beginning of the area's industrial development. These remains have potential to represent early modification activities required to prepare the area for these ventures. It should however be noted that the potential for such remains to survive within the study area are low and would be largely ephemeral in nature. There is nil to low potential for archaeological remains associated with other **Phase 1** activities to survive in the Central and Western Extents of the study area. This is largely due to the lack of recorded development or land use activities in the area at the time. If evidence of land use were to survive, it would be largely ephemeral and difficult to distinguish within the archaeological record. Therefore, they would not meet the threshold for local or state significance under this criterion. It is unlikely that potential archaeological remains associated with landscape modifications for the Botany Water Pumping Station **(Phase 2)** would reach the threshold for local significance under this criterion. Although it has historical significance for its role as Sydney's second source of fresh water, the pumping station itself was located outside of the study area and archaeological remains associated with it would likely be in the form of minor landscape modifications required for dam construction. These would be ephemeral in nature and may be difficult to distinguish from earlier modifications made for Lord's mill. If intact and recognisable archaeological remains associated with **Phase 2** residential development and market gardens were found to survive within the Central and Eastern Extents of the study area market gardens, they would contain historical significance at a local level. They would represent early Chinese market garden activities in Botany and Mascot which occurred following the Gold Rush and defined the area's cultural and built landscape into the mid-20th century. If structural remains associated with early residences were identified, they too would represent some of the earliest domestic settlement activities in Botany and the individuals associated with them. These have potential to meet the threshold of local significance under the criterion. Although sidings associated with the Botany Rail Line, evidence of residential occupation and the continued use of Mascot for market gardening (**Phase 3**) are all 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 and lack of archaeological research potential. **Significantly intact archaeological remains associated with Phase 1 would reach the State and local significance threshold under this criterion. Potential archaeological remains associated with Phase 2 and 3 occupation are unlikely to reach the local significance threshold under this criterion.**

[69] Rowland, E. C. 1944. *The Merchant Prince of Botany Bay: The story of Simeon Lord*, p. 20.

Criteria	Discussion
B - Associative Significance	If intact or recognisable archaeological remains associated with **Phase 1** were identified within the study area, they could potentially demonstrate an association with Simeon Lord. Lord played a vital in Sydney's economic, trade, manufacturing and industrial history in the early 19th century. They would reach the threshold for State significance under this threshold. However, the likelihood of such remains surviving within the study area itself is low. Potential archaeological remains of **Phase 2** land use such as the Botany Water Pumping Station would be associated with City Engineer Edward Bell and members of the Metropolitan Water Board. However, the likelihood of identifiable remains associated with this phase within the Eastern Extent of the study area is nil to low and they are unlikely to meet the threshold for local or state significance under this criterion. Potential archaeological remains of market gardens and residential development (**Phase 2**) within the Central Extent of the study area would be associated with members of the Chinese and European community. These groups are associated with the economic development and cultural history of Botany and Mascot and intact or legible archaeological remains may meet the threshold for local significance under this criterion. Potential archaeological remains associated with **Phase 3** occupation would not have any strong associations with individuals or groups considered to have played an important role in the cultural history of Botany and Mascot. **Significantly intact archaeological remains associated with Phase 1 would reach the threshold for significance under this criterion at a State and local level, while those associated with Phase 2 would reach the threshold for significance at a local level. Potential archaeological remains associated with Phase 3 occupation are unlikely to reach the threshold for significance under this criterion.**
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 in NSW'. **Potential archaeological remains associated with Phase 1, 2 and 3 are unlikely to reach the threshold for significance under this criterion.**
D – Social Significance	If archaeological material related to **Phase 1** occupation of the study area such as structures associated with Simeon Lord's mills or recognisable evidence of landscape modifications within the wetlands were encountered, they may contain social significance amongst the local community. This would be largely due to their associations with some of the first recorded industrial and agricultural land use within Botany and Mascot. These areas continue to be shaped by their early settlement history and would likely be of interest to local historical societies, schools and members of the general community. These remains would reach the threshold for significance at a local level. If intact or recognisable archaeological remains associated with **Phase 2** market gardens, residences or early forms of the Botany Rail Line survived in the study area they may contain social significance at a local level. This would likely be amongst the local Chinese community, men and women who have or continue to work within the industrial sector and members of rail history communities and groups. These remains would reach the threshold for significance at a local level. If archaeological remains associated with **Phase 3** occupation were identified within the study area, they would represent relatively common building remains such as 20th century brick footings. These are unlikely to contain social significance. However, members of the community interested in railway history and industrial activities may feel a strong association with evidence of early sidings established to serve early-mid 20th century industries in Mascot. These remains may reach the threshold for significance at a local level. However, they would be considered as

Criteria	Discussion
	a 'work' rather than a 'relic', under the Heritage Act and would not be protected under NSW legislation. **Significantly intact archaeological remains associated with Phase 1 and 3 would reach the threshold for significance under this criterion at a local level,. If archaeological remains associated with Phase 3 Botany Rail Line Railway sidings were identified, they may reach the threshold for significance under this criterion at a local level, however these would be considered 'works' and not 'relics' under the Heritage Act.**
E – Research Potential	If intact and recognisable archaeological remains associated with **Phase 1** landscape modification or unrecorded structures associated with Simeon Lord's mill survive within the study area they would have research significance at a state level. These remains have potential to yield information regarding early European landscape modification techniques and the nature of the landscape prior to their arrival. These would represent some of the earliest industrial and agricultural activities within NSW which were not significantly discussed in sources reviewed during the preparation of this document. If intact and recognisable archaeological remains associated with **Phase 2** market gardens and structures were found within the study area, they would contain research potential at a local level. These may have the ability to yield information regarding early residential land use and domestic activities in the Mascot area as well as market gardening practices that are unlikely to have been recorded at the time. Research topics could include landscape modification practices, crops being grown in 19th century market gardens, lifeways of their occupants/workers, consumption habits, construction methods and living conditions. The influence of European cultures and ideals on Chinese immigrants may also be distinguishable within the archaeological record in the form of building methods of evidence gathered from refuse materials. These remains would reach the threshold for significance at a local level. If undocumented evidence of **Phase 2** Botany Rail Line construction methods or activities were identified within the study area, they may also contain research potential. These remains would reach the threshold for significance at a local level. Potential archaeological remains associated with **Phase 3** 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 features associated with this phase, which represent prevalent, common and existing forms of construction, market gardening and railway infrastructure. These items would be well documented in the archival record. **Intact and/or recognisable archaeological remains associated with Phase 1 would reach the threshold for significance under this criterion at a State level, while those associated with Phase 2 would reach the threshold for significance at a local level. Potential archaeological remains associated with Phase 3 occupation are unlikely to reach the threshold for significance under this criterion.**
F – Rarity	If intact and recognisable archaeological remains associated with **Phase 1** landscape modification or unrecorded structures were found in the Eastern Extent of the study area they would meet the threshold for significance at a State level. They would represent rare evidence of early industrial activities associated with Simeon Lord's mill and modifications made to Mill Stream. These were some of the earliest private industrial activities carried out in NSW and may contain unique characteristics not present in larger scale Government run mills. Potential **Phase 1** archaeological remains within the remainder of the study area are unlikely to meet this threshold for local or State significance as they would represent common landscape formalising activities such as vegetation clearing and establishing land boundaries through fence lines or boundary markers. If intact and recognisable archaeological remains associated with **Phase 2** were found within the Central Extent of the study area they would represent rare examples of early residential development and market gardening in Mascot and Botany. These remains have the potential to reach the threshold for local significance under this criterion as there are very few intact market

Criteria	Discussion
	gardens from this period in the area and no archaeological excavations of market garden sites has been carried out in Mascot or Botany. It is unlikely that potential archaeological remains associated with the Botany Water Pumping Station (**Phase 2**) would meet the threshold for local or state significance under this criterion. Evidence of this period would be in the form of minor landscape modifications to an already altered environment. Archaeological remains associated with **Phase 3** land use would not be considered rare or uncommon. Remains would represent 20th century residential development, industrial activities and use of the Botany Rail Line, all of which are unlikely to be considered unique due to their frequency across the area, common design, known construction methods and extant nature. **Intact and/or recognisable archaeological remains associated with Phase 1 would reach the threshold for significance under this criterion at a State and local level, while those associated with Phase 2 would reach the threshold for significance at a local level. Potential archaeological remains associated with Phase 3 occupation 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 Phase 1, 2 and 3 would not reach the threshold for significance under this criterion.**

7.1.3 Statement of archaeological significance

If intact and recognisable remains associated with Simeon Lord's industrial activities (**Phase 1**) such as landscape modifications of unrecorded structures were to survive in the study area they would have historical, associative and social significance at a State level. They would also be considered rare and contain research potential for their ability to yield information regarding unrecorded landscape modification methods, the pre-European environment and extent of Lord's mill establishment. However, the likelihood of such remains surviving within the study area is low.

The potential archaeological resource associated with **Phase 2** occupation would be associated with landscape modifications for the Botany Water Pumping Station, Chinese market gardens, early residential development and construction of the Botany Rail Line. If intact and recognisable remains were uncovered, they would have historical, associative and social significance at a local level. They would also contain research potential for their ability to yield information regarding rare and early residential and agricultural activities in the Botany and Mascot area.

The potential archaeological resource associated with **Phase 3** occupation is associated with ongoing use of the Botany Rail Line, evidence of residential occupation and the continued use of Mascot for market gardening. These remains would have historical and social significance at a local level. However, they would represent common forms of infrastructure and land use during this period and are unlikely to contain research potential. Therefore, they would not reach the threshold for local or State significance under the NSW Heritage Criteria.

As discussed at the beginning of this chapter, potential archaeological remains associated with **Phases 4** and **5** would not meet the threshold for local or State significance. This is primarily due to their ubiquitous nature and lack of research potential.

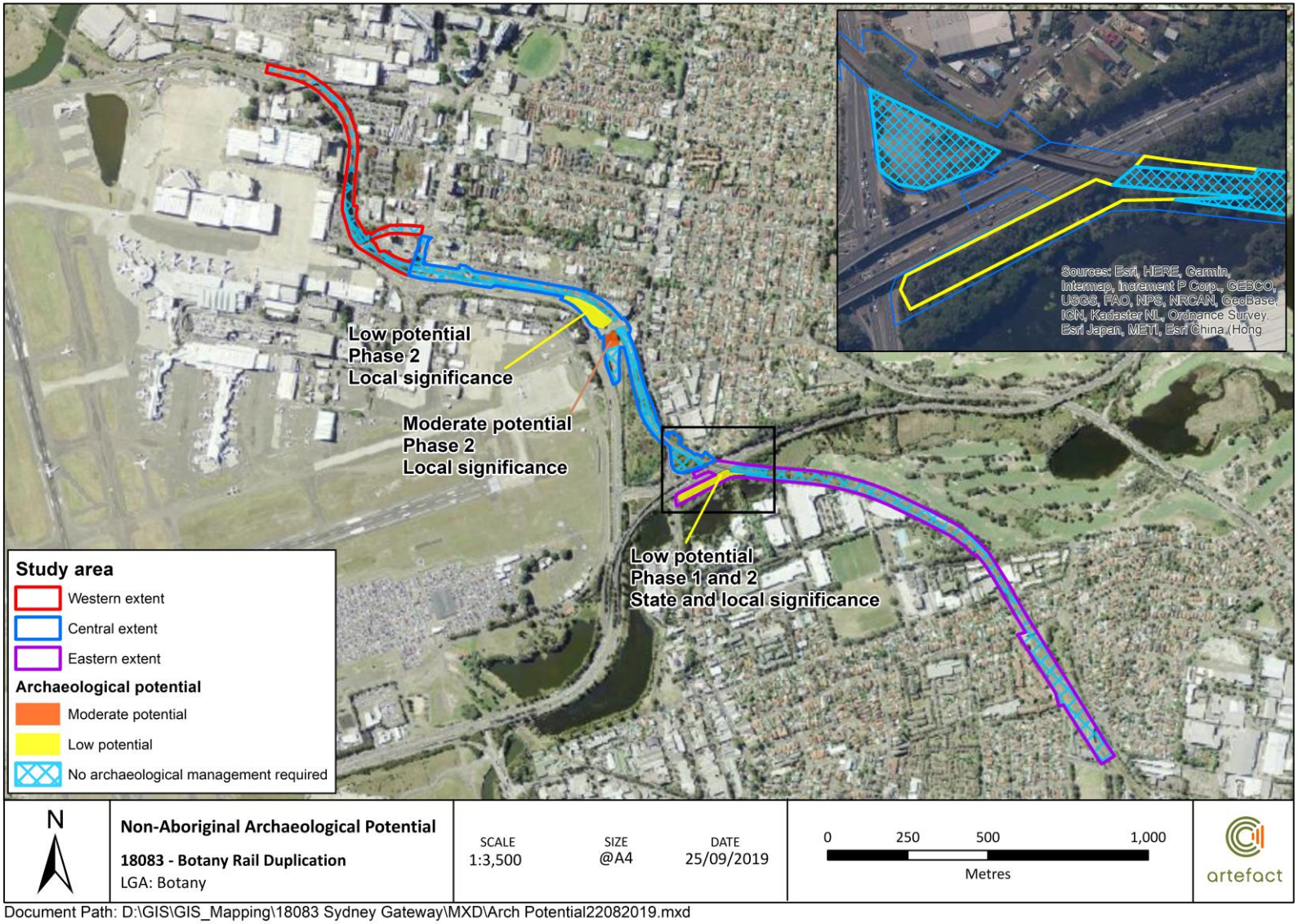

Figure 7-1. Archaeological potential and significance within the study area.

8.0 PROJECT DESCRIPTION

8.1 Proposed works

Table 8-1 provides a summary of the key project elements which make up the project. Their potential impacts on heritage items and archaeological remains within the study area are discussed in Section 9.0.

Table 8-1: Summary of the project

Project element	Summary of project element
Track infrastructure	
Track works	• A new track would be installed predominately within the rail corridor for the entire length of the project site on the southern side of the existing track • The new track would include the track formation, ballast and associated rail infrastructure • The existing track would be upgraded (where required) including raising/realigning (slewing) within the existing rail corridor • Four new crossovers would be constructed within the existing rail corridor at two locations • Existing track drainage within the rail corridor would be adjusted as required to suit the new or revised track levels.
Rail bridges	
Robey Street bridge	• Construction of two single span bridge structures One of the new structures would be located on the southern side of the existing bridge, while the other would be constructed in the position of the existing bridge (which would be removed as part of the project).
O'Riordan Street bridge	• Construction of two single span structures. One of the new structures would be located on the southern side of the existing bridge, while the other would be constructed in the position of the existing bridge (which would be removed as part of the project).
Botany Road bridge	• Some minor remediation works may be required to the abutments and headstock of the existing bridge. The existing bridge would however be retained as part of the project.
Southern Cross Drive bridge	• Construction of a new two-span bridge structure to be located to the south of the existing bridge • The existing bridge would be retained.
Mill Stream Bridge	• The proposed bridge works at Mill Stream would involve a new two-span bridge structure to be located to south of the existing bridge. The proposed bridge pier to be sited outside of the banks of Mill Stream • The existing bridge would be retained.

Project element	Summary of project element
Other structures	
Embankments, cuttings and retaining walls	• New embankments, embankment widening, and minor cuttings would be required along the following sections of the corridor – Between Southern Cross Drive and Botany Road (within the 'Botany triangle') on the southern side of the existing track – Between the eastern side of Mill Stream and Southern Cross Drive on the southern side of the existing track – Between Bay Street and the western side of Mill Stream on the southern side of the existing track • New retaining walls would likely be required in areas along the length of the project. The largest retaining walls, would likely be located between O'Riordan Street and west of Robey Street on the southern side of the rail corridor and, subject to detailed design, are not anticipated to exceed around 4.5 metres from road level.
Utilities relocation and protection	• Impacted utilities would be relocated or protected in line with the requirements of the utility provides and potential site constraints • Key utility works that would be required as part of the project include: – Relocation and/or protection of the existing Qenos high pressure ethylene pipeline – Protection of the existing APA group ethane pipeline – Protection or relocation of the existing Jemena gas mains – Protection or relocation of other minor utilities as required (to be determined during detailed design) – Protection or relocation of existing Ausgrid high voltage (HV) cables.
Billboard adjustments	• Temporary removal of a number of existing billboards during construction to allow for construction of the new second track and associated structures • Replacement of impacted billboards following completion of construction works. Where billboard(s) cannot be relocated within their original location due to space constraints, replacement billboard(s) would be installed within other sections of the corridor.
Land acquisition	
Land acquisition	• A series of minor, partial property acquisitions would be required adjacent to the existing corridor, generally between a point west of King Street and east of O'Riordan Street, Mascot. The land which would be required to be acquired to accommodate a wider rail corridor would consist of small portions of existing commercially-owned land parcels adjacent to the existing corridor.
Compound, materials laydown and storage areas	
Compound areas	• Compound areas will be established to the south of General Holmes Drive and an existing cleared portion of the railway corridor near Banksia Street. Small satellite compound areas will also be established along the corridor • These will contain site offices, amenities blocks, meal rooms, areas for plant and equipment storage, fencing and car parking. • The extent of subsurface impacts in these locations is not known, although excavations would likely be minimal.

Project element	Summary of project element
Materials laydown and storage areas	• A number of designated material laydown areas have been identified along the project site. Major stockpiling, materials storage and laydown facilities may be located at the General Holmes Drive compound (at the corner of Joyce Drive and General Holmes Drive) and at the Banksia Street compound. These areas would typically be used for the storage of materials and equipment only. This would include the storage of precast component of proposed bridges. • The extent of subsurface impacts in these locations is not known, although excavations would likely be minimal.
Operation of the project	
Train movements	• Expected train movements (per day, per direction) during operation would include: – 2020 – 32 trains – 2025 – 38 trains – 2030 – 45 trains.
Operational management	• The line would continue to operate during the existing operational hours which currently includes 24 hour a day operation.
Maintenance	• Standard ARTC maintenance activities would be undertaken during operations • Typically, activities would include minor maintenance works, such as bridge and culvert inspections, rail grinding and track tamping, through to major maintenance, such as reconditioning of track and topping up of ballast as required.

9.0 HERITAGE IMPACT ASSESSMENT

9.1 Introduction

This section will assess impacts to built heritage, potential archaeological remains and visual site lines to, and from, the study area as a result of the project.

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. Impacts to visual sightlines are outlined in Section 9.3 of this report. Listed and unlisted heritage items that will be directly impacted by the proposal are considered to be within the study area.

In order to consistently identify the potential impact of the proposed works, the terminology contained in Table 2-3 has been used throughout this assessment.

9.2 Heritage impact assessment

The following impact assessment is based on known impacts to listed and unlisted heritage items within the study area and its 100 metre buffer zone.

The following impact assessment is based on information provided in the *Botany Rail Duplication, DRAFT Environmental Impact Statement, Part A Background and project information*, prepared in May 2019 for the project. Detailed information regarding the extent of excavations or level of impact to structures is not known.

Table 9-1: Heritage impact assessment

Heritage item and listing	Visual impact (historical arrangements and access, visual amenity, landscape and vistas)	Impact to built heritage (vibration, demolition, direct impact to fabric)	Impact to potential archaeological remains (disturbance or removal of archaeological remains)	Overall impact to item
Mascot (O'Riordan Street) Underbridge ARTC s170 heritage register no. 4801830	Bridge demolition will have a **major** visual impact to the Mascot (O'Riordan Street) Underbridge as it will be permanently removed for the project. Views to and from the item will also be impacted.	Bridge demolition will have a **major** physical impact to the Mascot (O'Riordan Street) Underbridge and as it will be permanently removed for the project.	It is unlikely that archaeological remains would be associated with the Mascot (O'Riordan Street) Underbridge. The structure was built after 1924 and subsurface features associated with its construction would not be considered to contain archaeological research significance. Therefore, the potential for impact to a significant archaeological resource as a result of these works is considered to be **negligible**.	**Major**
Mascot (Robey Street) Underbridge ARTC s170 heritage register no. 4801848	Bridge demolition will have a **major** visual impact to Mascot (Robey Street) Underbridge as it will be permanently removed for the project. Views to and from the item will also be impacted.	Bridge demolition will have a **major** physical impact to the Mascot (Robey Street) Underbridge and as it will be permanently removed for the project.	It is unlikely that archaeological remains would be associated with the Mascot (Robey Street) Underbridge. The structure was built after 1924 and subsurface features associated with its construction would not be considered to contain archaeological research significance. Therefore, impacts to archaeological remains as a result of these works are considered to be **negligible**.	**Major**

Heritage item and listing	Visual impact (historical arrangements and access, visual amenity, landscape and vistas)	Impact to built heritage (vibration, demolition, direct impact to fabric)	Impact to potential archaeological remains (disturbance or removal of archaeological remains)	Overall impact to item
Mascot (Botany Road) Underbridge ARTC s170 heritage register no. 4800248 Botany Bay LEP 2013 I153	Minor remediation works to the abutments and headstock of the existing Mascot (Botany Road) Underbridge are proposed for the project. The remainder of the bridge will be retained. Due to the level of modifications proposed under the project, visual impacts to the bridge are considered to be **minor**.	Remediation works will require minor modifications to the abutments and headstock of the existing Mascot (Botany Road) Underbridge. They are therefore considered to be a **minor** impact to the item as a whole.	It is unlikely that remediation works to the Mascot (Botany Road) Underbridge would impact significant archaeological remains associated with the item. Therefore, impacts are considered to be **negligible**.	**Minor**
Botany Water Reserves (also known as Botany Swamps) Botany Bay LEP 2013 I2 SHR 01317 Sydney Water s170 register 4570025 RNE 17854	Track duplication works will occur outside of the heritage curtilage for the item and are unlikely to significantly alter the existing nature of the Botany Water Reserves. Therefore, visual impacts are considered to be **nil**.	Track duplication works will occur outside of the heritage curtilage for the item and will not directly impact fabric or vegetation associated with the Botany Water Reserves. Therefore, impacts are considered to be **negligible**.	Track duplication works will occur outside of the heritage curtilage for the item and will not directly impact archaeological remains associated with Phase 1 and 2 occupation within the Botany Water Reserves. Therefore, impacts are considered to be **negligible**	**Negligible to minor**
	The addition of a new bridge over Mill Stream will result in **minor** visual impacts to the Botany Water Reserves as it will involve the addition of a new element to the landscape. The extent of the impact is low as the existing bridge is associated with modern development and occupies an already modified visual landscape.	No impacts to fabric associated with the Botany Water Reserves is anticipated for the addition of a new bridge over Mill Stream. Therefore, impacts associated with these works are **negligible**.	The addition of a new bridge over Mill Stream has potential to impact State and locally significant archaeological remains associated with Phase 1 and 2 occupation within the Botany Water Reserves. However, these remains would be located outside of the SHR, LEP, S170 and RNE heritage curtilage for the item. Therefore, impacts to the item would be **negligible**.	

Heritage item and listing	Visual impact (historical arrangements and access, visual amenity, landscape and vistas)	Impact to built heritage (vibration, demolition, direct impact to fabric)	Impact to potential archaeological remains (disturbance or removal of archaeological remains)	Overall impact to item
	Although the proposed works would be located outside of the heritage curtilage for the item, visual impacts associated with the addition of a new rail bridge over Mill Pond, retaining walls and embankments would result in a **minor** visual impact to the Botany Water Reserves. Due to the location of the proposed works within the existing rail corridor between the two sections of the reserve, no alternative options were considered to be viable to minimise the potential minor visual impacts. Where possible, ARTC would seek to reinstate any vegetation within the existing corridor (where space and operational requirements permit).	It is unlikely the construction of embankments, cuttings and retaining walls would have a direct impact on fabric or vegetation associated with the Botany Water Reserves These proposed structures would be established outside of the SHR and LEP heritage curtilage for the Botany Water Reserves and would not impact or remove fabric associated with the Botany Rail Line. Therefore, impacts associated with these works to the heritage significance of each item is considered **negligible**.	Subsurface excavations associated with the construction of embankments, cuttings and retaining walls may impact areas of low - moderate potential for archaeological remains associated with Phase 1 and 2 land use within the Botany Water Reserves. However, these remains would be located outside of the SHR, LEP, S170 and RNE heritage curtilage for the item. Therefore, impacts to the item would be **negligible**.	
	Works associated with the establishment of construction compounds and utilities relocation and protection works would have a temporary minor visual impact to the Botany Water Reserves. They would require the addition of hoarding, trenches and some vegetation clearance and result in modifications to the existing landscape. However, these impacts would be temporary in nature. Therefore, they are considered a **negligible** visual impact.	It is unlikely utility relocation and protection works or the establishment of construction compounds would have a direct impact to fabric or vegetation associated with the Botany Water Reserves. Therefore, impacts associated with these works to the heritage significance of each item is considered **negligible.**	Subsurface excavations associated with construction compounds and utilities relocation and protection works may impact areas of low - moderate potential for archaeological remains associated with Phase 1, 2 and 3. This may have a moderate impact on archaeological remains in the area, for example, if State significant remains of Simeon Lord's mill or associated activities, were impacted. However, the localised nature of the works means impacts would be limited. In addition, potential archaeological	

Heritage item and listing	Visual impact (historical arrangements and access, visual amenity, landscape and vistas)	Impact to built heritage (vibration, demolition, direct impact to fabric)	Impact to potential archaeological remains (disturbance or removal of archaeological remains)	Overall impact to item
			remains would be located outside of the SHR, LEP, S170 and RNE heritage curtilage for the item. Therefore, impacts to the item would be **negligible**.	
Sydney (Kingsford Smith) Airport Group Botany Bay LEP 2013 I170 Commonwealth Heritage List (Indicative Place) 105542 RNE Interim List 102669	Visual impacts to the Sydney (Kingsford Smith) Airport Group would be limited to minor and temporary works associated with the establishment of crane pads and stockpile/materials storage areas. Although these activities would obstruct and modify views to and from the item, impacts would be temporary and only extend five to 20 metres within the heritage curtilage for the item, along its eastern boundary. Therefore, impacts associated with these works are considered **minor**.	Impacts to fabric associated with Sydney (Kingsford Smith) Airport Group would be limited to minor and temporary works associated with the establishment of crane pads, vegetation clearance and stockpile/materials storage areas. No structures or significant elements of the item would be directly impacted. Therefore, these works are considered to be a **negligible** impact to the overall significance of the Sydney (Kingsford Smith) Airport Group	It is unlikely that potential archaeological remains associated with the past and present use of land within the Sydney (Kingsford Smith) Airport Group would be impacted by the proposed works. Land within the study area has been heavily modified overtime and is unlikely to contain significant or early archaeological remains (for example, those associated with Phase 1 or 2 land use). Therefore, these works are considered to be a **negligible** impact to the overall significance of the Sydney (Kingsford Smith) Airport Group	**Negligible to minor**

Heritage item and listing	Visual impact (historical arrangements and access, visual amenity, landscape and vistas)	Impact to built heritage (vibration, demolition, direct impact to fabric)	Impact to potential archaeological remains (disturbance or removal of archaeological remains)	Overall impact to item
Commonwealth owned land and Sydney Airport Master Plan and Environment Strategy	Visual impacts to Commonwealth owned land and Sydney Airport would be limited to minor and temporary works associated with the establishment of crane pads and stockpile/materials storage areas. Although these activities would obstruct and modify views, impacts would be temporary and only extend five to 20 metres within Commonwealth owned land. Therefore, impacts associated with these works are considered **minor** and are in keeping with the Sydney Airport Master Plan and Environment Strategy.	Impacts to fabric associated Commonwealth owned land and Sydney Airport would be limited to minor and temporary works associated with the establishment of crane pads, vegetation clearance and stockpile/materials storage areas. No structures or significant elements on Commonwealth owned land and within Sydney Airport of the item would be directly impacted. Therefore, these works are considered to be a **negligible** impact and are in keeping with the Sydney Airport Master Plan and Environment Strategy.	It is unlikely that potential archaeological remains associated with the past and present use of land within Commonwealth owned land and Sydney Airport would be impacted by the proposed works. Land within the study area has been heavily modified overtime and is unlikely to contain significant or early archaeological remains (for example, those associated with Phase 1 or 2 land use). Therefore, these works are considered to be a **negligible** impact and are in keeping with the Sydney Airport Master Plan and Environment Strategy.	**Negligible to minor**
Botany Rail Line Unlisted item of local heritage significance	Track duplication works will have a **moderate** visual impact to the Botany Rail Line itself, as it will result in modifications to the existing landscape.	Track duplication works would include raising/realigning (slewing) the existing rail corridor and modifying some portions of the line's original alignment. They would require the removal and/or relocation of early or original sleepers, tracks, and signal huts/signal location cases. These items inform the Botany Rail Line's historical development. Therefore, these works are considered to be a **moderate** impact.	Track duplication works have potential to impact locally significant archaeological remains associated with Phase 2 structures and sidings associated with the construction and use of the Botany Rail Line. The largest impact to potential archaeological remains would be associated with adjustments to track drainage along the railway corridor. Due to the localised nature of these works, impacts to potential archaeological remains are likely to be **minor**, depending on the extent of subsurface excavations and nature of archaeological remains. However,	**Moderate**

Heritage item and listing	Visual impact (historical arrangements and access, visual amenity, landscape and vistas)	Impact to built heritage (vibration, demolition, direct impact to fabric)	Impact to potential archaeological remains (disturbance or removal of archaeological remains)	Overall impact to item
			remains associated with the Botany Rail Line would be considered 'works', rather than 'relics' under the NSW Heritage Act, and are unlikely to reach the threshold for local or State significance.	
	The demolition of two rail bridges would have a **major to moderate** impact to the significance of the item as it would visually alter the historic nature of the Botany Rail Line. Each bridge is considered an element of high significance and represents the rail line's evolution over time. They are also highly visible components of the rail corridor.	The demolition of two rail bridges and modifications to the Mascot (Botany Road) Underbridge would result in the permanent removal of fabric associated with the Botany Rail Line and its expansion and realignment in the mid-20th century. This is considered a **moderate** impact to the heritage significance of the item.	Impacts to potential archaeological remains associated with the Botany Rail Line as a result of modifications to rail bridges would be associated with the demolition and construction of existing and proposed rail bridges. These impacts are considered to be **negligible** as works would be limited to bridge locations containing nil-low archaeological potential.	
	The establishment of embankments, cuttings and retaining walls would alter the existing landscape associated with the rail corridor and in some cases, obstruct views to and from the item. This is considered a **minor to moderate** impact.	It is unlikely the construction of embankments, cuttings and retaining walls would have a direct impact on fabric or vegetation associated with the Botany Rail Line. These proposed structures would be established outside of the rail corridor and would not impact or remove fabric associated with the item. Therefore, direct (physical) impacts associated with these works to the heritage significance of each item is considered **nil**.	There is no evidence to suggest that significant archaeological remains associated with Phase 1, 2 and 3 occupation would survive within the existing Botany Rail Line corridor. Therefore, subsurface excavations associated with the establishment of embankments cutting and retaining walls would be **negligible**.	

Heritage item and listing	Visual impact (historical arrangements and access, visual amenity, landscape and vistas)	Impact to built heritage (vibration, demolition, direct impact to fabric)	Impact to potential archaeological remains (disturbance or removal of archaeological remains)	Overall impact to item
	Works associated with the establishment of construction compounds and utilities relocation and protection works would have a temporary **minor** visual impact to the Botany Rail Line. They would require the addition of hoarding, site offices, trenches and some vegetation clearance and result in modifications to the existing landscape.	Works associated with the establishment of construction compounds and utilities relocation and protection works are not anticipated to directly impact fabric associated with the Botany Rail Line. Therefore, heritage impacts associated with these works are considered to be **nil**.	There is no evidence to suggest that significant archaeological remains associated with Phase 1, 2 and 3 occupation would survive within the existing Botany Rail Line corridor. Therefore, subsurface excavations associated with construction compounds and utilities relocation and protection works would be **negligible**.	
	The temporary removal and/or permanent relocation of billboards would slightly alter the existing nature of the Botany Rail Line. However, existing billboards are modern additions to the study area and these works (depending on the location of relocated billboards) are unlikely to impact the heritage significance of these items. They are therefore considered to be a **negligible** impact.	Works associated with the temporary removal and/or permanent relocation of billboards are not anticipated to directly impact fabric associated with the Botany Rail Line. Therefore, heritage impacts associated with these works are considered to be **negligible**.	Subsurface excavations associated with the temporary removal and/or permanent relocation of billboards are unlikely to significantly impact potential Phase 4 or 5 archaeological remains assessed as containing no archaeological significance. Excavations would be limited to localised areas within portions of the corridor that were established after its 1960 realignment. Therefore, heritage impacts associated with these works are considered to be **negligible**.	

Heritage item and listing	Visual impact (historical arrangements and access, visual amenity, landscape and vistas)	Impact to built heritage (vibration, demolition, direct impact to fabric)	Impact to potential archaeological remains (disturbance or removal of archaeological remains)	Overall impact to item
	Land acquisition is required to accommodate rail corridor widening works adjacent to the Botany Rail Line, generally between a point west of King Street and east of O'Riordan Street, Mascot. Impacts to views and vistas to and from the Botany Rail Line are unlikely to be significantly altered for this component of the project. Therefore, impacts are considered **negligible**.	No direct impacts to the fabric associated with the Botany Rail Line are anticipated for the land acquisition component if the project. Therefore, impacts are considered to be **negligible**.	Land acquisition works would take place outside of the Botany Rail Line corridor. Therefore, potential archaeological remains associated with its construction and use over time would not be impacted by the works. Therefore, impacts are considered to be **negligible**.	

9.3 Summary of heritage impacts

Table 9-2 provides a summary of impacts to listed and unlisted heritage items within the study area and its 100 metre buffer zone. Impacts will be graded in accordance with the terminology outlined in Section 2.4 and are based on findings in the detailed impact assessment.

Table 9-2. 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	Location in regard to the study area	Commonwealth / land subject to the EP&A Act	Impacts as a result of the proposed works	Impact to fabric	Visual impact	Archaeological impact
Listed items							
Mascot (O'Riordan Street) Underbridge ARTC s170 heritage register SHI no. 4801830	Local	Within	Land subject to the EP&A Act	The Mascot (O'Riordan Street) Underbridge will be demolished and replaced with a dual carriageway rail underbridge	Major	N/A	N/A
Mascot (Robey Street) Underbridge ARTC s170 register SHI no. 4801848	Local	Within	Land subject to the EP&A Act	The Mascot (Robey Street) Underbridge will be demolished and replaced with a dual carriageway rail underbridge	Major	N/A	N/A
Mascot (Botany Road) Underbridge (or Railway Bridge over Botany Road) Botany Bay LEP 2013 no. I153 ARTC s170 heritage register SHI no. 4800248	Local	Within	Land subject to the EP&A Act	The Mascot (Botany Road) Underbridge would undergo some minor remediation works to the abutments and headstock of the existing bridge. The existing bridge would however be retained as part of the project.	Minor	Minor	N/A

Item name, listing and listing number	Significance	Location in regard to the study area	Commonwealth / land subject to the EP&A Act	Impacts as a result of the proposed works	Impact to fabric	Visual impact	Archaeological impact
Botany Water Reserves (also known as Botany Wetlands or Botany Swamps) Botany Bay LEP 2013 item no. I2 SHR no. 01317 Sydney Water s170 register no. 4570025 RNE no. 17854	State	Immediately adjacent	Land subject to the EP&A Act	Although the proposed works would be located outside of the heritage curtilage for the item, visual impacts associated with the addition of a new rail bridge over Mill Pond, retaining walls and embankments would result in a **minor** visual impact to the Botany Water Reserves. Due to the location of the proposed works within the existing rail corridor between the two sections of the reserve, no alternative options were considered to be viable to minimise the potential minor visual impacts. Where possible, ARTC would seek to reinstate any vegetation within the existing corridor (where space and operational requirements permit).	Nil	Minor	Nil
Sydney (Kingsford Smith) Airport Group Botany Bay LEP 2013 I170 Commonwealth Heritage List Indicative Place no. 105542 RNE Interim List no. 102669	State	Portions of the study area are located within the curtilage for this item	Commonwealth	The construction boundary for the proposed works will extend five to 20 metres within the heritage curtilage for the item, along its eastern boundary. Works within the curtilage may involve vegetation clearing and will include the establishment of stockpile areas and temporary crane pads.	Minor	Minor	Minor
Ruins of the former Botany Pumping Station	Local	The proposed works are located approximately 870 metres northeast of	Commonwealth	The proposed development will not involve direct or indirect impacts to the item.	Nil	Nil	Nil

Item name, listing and listing number	Significance	Location in regard to the study area	Commonwealth / land subject to the EP&A Act	Impacts as a result of the proposed works	Impact to fabric	Visual impact	Archaeological impact
Botany Bay LEP 2013 no. I168		the item, however, its LEP heritage curtilage is within the study area					
Commonwealth Water Pumping Station and Sewerage Pumping Station No 38 Botany Bay LEP 2013 no. I3	Local	The proposed works are located approximately 870 metres northeast of the item however, its LEP heritage curtilage is within the study area	Commonwealth	The proposed development will not involve direct or indirect impacts to the item.	Nil	Nil	Nil
Beckenham Memorial Church Botany Bay LEP 2013 no. I52	Local	Approximately 40 metres east of the study area	Land subject to the EP&A Act	The proposed development will not involve direct impact to heritage fabric associated with the item. However, works will alter existing views towards the Botany Rail Line from the item. This is unlikely to impact the item's heritage significance.	Nil	Negligible	Nil
Booralee Park Botany Bay LEP 2013 no. I61	Local	Approximately 110 metres southwest of the study area	Land subject to the EP&A Act	No direct impacts to the park will occur as part of the proposal. Views towards the study area from the park are obstructed by trees and buildings, therefore no visual impacts are anticipated as a result of the project.	Nil	Nil	Nil

Item name, listing and listing number	Significance	Location in regard to the study area	Commonwealth / land subject to the EP&A Act	Impacts as a result of the proposed works	Impact to fabric	Visual impact	Archaeological impact
Unlisted heritage items							
Botany Rail Line	Local	Within	Land subject to the EP&A Act	Impacts will involve the removal and modification of modern and historic fabric in the way of underbridges, signal hut/signal location cases associated with the Botany Rail Line. These items have been assessed as having moderate to high significance as contributing elements to the Botany Rail Line (see Section 6.3.2). These will be replaced with modern materials and infrastructure. The existing character of the line will also be altered due to the proposed duplication of the line. However, it should be noted that the Botany Rail Line was always intended to be a dual carriage corridor and the local significance of the item is likely to be retained.	Moderate	Moderate	Minor
Potential archaeological remains							
Phase 1 (c1809-1858) Potential archaeological evidence of landscape modifications and unrecorded structures associated with Simeon Lord's Mill	State	Within	Land subject to the EP&A Act	There is low potential for archaeological remains associated with Phase 1 occupation to survive within a small portion of the study area in, and adjacent to, the Botany Wetlands. These remains would include archaeological evidence associated with Simeon Lord's industrial activities, the pre-European environment, landscape modifications and unrecorded structures. The nature and survival of these resources is unknown.	N/A	N/A	Negligible to minor (depending on the location/extent of proposed works and nature of archaeological remains)

Item name, listing and listing number	Significance	Location in regard to the study area	Commonwealth / land subject to the EP&A Act	Impacts as a result of the proposed works	Impact to fabric	Visual impact	Archaeological impact
				The proposed installation of drainage lines, CSR routes, compound sites, materials storage and laydown areas, bridges and retaining walls all have potential to impact these archaeological resources.			
Phase 2 (1858-1925) Potential archaeological remains associated with early market gardens, residential development and construction of the Botany Goods Line	Local	Within	Land subject to the EP&A Act	The proposed establishment of a compound sites and materials storage and laydown area to the north and south of General Holmes Drive have potential to impact Phase 2 archaeological remains. However, it is unlikely that significant subsurface excavations will occur within these portions of the study area. Archaeological remains would include evidence of market gardens and structures associated with them. These may have local significance.	N/A	N/A	Negligible to minor (depending on the location/extent of proposed works and nature of archaeological remains)
Phase 3 (1925-1960) Potential archaeological remains associated with 20th century residential occupation, market gardens and the Botany Goods Line.	Not significant	Within	Land subject to the EP&A Act	The proposed installation of drainage lines, CSR routes, compound sites, bridges, retaining walls and establishment of compound sites, materials storage and laydown areas all have potential to impact Phase 3 archaeological remains including evidence of 20th century residential development and the Botany Rail Line. However, these remains are not considered to meet the criteria for 'relics' under the Heritage Act as they do not contain research potential. Therefore, their removal would not impact the overall heritage significance of the area.	N/A	N/A	Nil

Item name, listing and listing number	Significance	Location in regard to the study area	Commonwealth / land subject to the EP&A Act	Impacts as a result of the proposed works	Impact to fabric	Visual impact	Archaeological impact
Phase 4 (1960 – 2002) Modern redevelopment associated with airport expansion and demolition of Phase 2 and 3 buildings	Not significant	Within	Land subject to the EP&A Act	The proposed installation of drainage lines, CSR routes, compound sites, bridges, retaining walls and establishment of compound sites, materials storage and laydown areas all have potential to impact Phase 4 archaeological remains including evidence of 20th century residential development and the Botany Rail Line. However, these remains would represent modern development and land use and do not contain research potential. Therefore, they would not meet the criteria for 'relics' under the Heritage Act and their removal would not impact the overall heritage significance of the area.	N/A	N/A	Nil
Phase 5 (2002 - present) Modern development and land use	Not significant	Within	Land subject to the EP&A Act	The proposed installation of drainage lines, CSR routes, compound sites, bridges, retaining walls and establishment of compound sites, materials storage and laydown areas all have potential to impact Phase 5 remains. However, these remains would represent modern development and land use and do not contain research potential. Therefore, they would not meet the criteria for 'relics' under the Heritage Act and their removal would not impact the overall heritage significance of the area.	N/A	N/A	Nil

9.4 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.[70]

The following sections summarise the heritage impacts of major rail and road infrastructure projects in the Sydney region. The cumulative impacts of these project are then described in Section 9.4.6.

9.4.1 Sydney Gateway Road project[71]

The Sydney Gateway Road project will occur adjacent to and north of the study area. It would result in the following heritage impacts relevant to this SoHI:

- Construction of four bridges over the SHR listed Alexandra Canal (considered a major impact to the heritage significance of the item)
- Demolition of eleven existing structures, their associated landscapes and mature fig trees within the Sydney (Kingsford Smith) Airport Group's heritage curtilage
- Construction new road corridors and road connections in the suburbs of Tempe, St Peters and Mascot
- Construction of three bridges and overpasses over the existing Botany Rail Line
- Visual impacts to the Mascot (Shea's Ck) Underbridge
- Potential impacts to State and locally significant archaeology.

9.4.2 WestConnex M4-M5 Link[72]

The WestConnex M4-M5 Link project is occurring approximately 2.5 kilometres north of the study area. It has resulted in the following heritage impacts relevant to this SoHI:

- Removal of street trees including Morton 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 to archaeological relics within eleven historical archaeological management units
- Encroachment on existing public recreational areas/parklands, namely Sydney Park.

9.4.3 WestConnex New M5[73]

WestConnex New M5 project is occurring approximately 2.5 kilometres north of the study area. It has or will result in the following heritage impacts relevant to this SoHI:

- Direct and indirect impacts to 57 non-Aboriginal heritage items
- Demolition of three heritage listed buildings

[70] Washington State Department of Transportation 2008. Guidance on Preparing Cumulative Impact Analyses, p. 3.
[71] Artefact Heritage, May 2019. *Draft Sydney Gateway road: Statement of Heritage Impact*.
[72] Roads and Maritime Services, 2017. WestConnex M4-M5 Link Environmental Impact Statement.
[73] Roads and Maritime Services, 2015. WestConnex M5 Environmental Impact Statement.

- 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 to eight conservation areas
- Construction vibration impacts to 23 heritage listed items
- Construction of two bridges over the Alexandra Canal
- Visual impacts to 21 heritage listed items.

9.4.4 WestConnex Enabling Works – Sydney Airport East[74]

The WestConnex Enabling Works – Sydney Airport East project is occurring adjacent to the study area. It has resulted in the following heritage impacts relevant to this SoHI:

- Demolition and/or partial acquisition of four items listed on the Botany Bay LEP 2013 which were located within view of the study area:
  - Beckenham Memorial Church (I52)
  - Beckenham Church School Hall (I52)
  - House – 1289 Botany Road (I50)
  - House - 1291 Botany Road (I51)
- Removal of two unlisted heritage items which were located within view of the study area:
  - Sandstone kerbing
  - Tram tracks below road surface
- Partial acquisition of land within the Botany Bay LEP 2013, RNE and CHL listed Sydney (Kingsford Smith) Airport Group (I170)

9.4.5 Airport North Precinct[75]

The Airport North Precinct project is occurring adjacent to the study area, along O'Riordan Street, Robey Street and Qantas Drive.

No impacts to heritage items or potential archaeological remains were anticipated, or have occurred, as a result the project.

9.4.6 Assessment of cumulative impacts

As a whole, the Botany Rail Duplication, Sydney Gateway Road, M4-M5 Link, New M5, WestConnex Enabling Works – Sydney Airport East and Airport North Precinct projects will result in direct impacts to three heritage listed underbridges, indirect impacts to two heritage listed underbridges, demolition of buildings, modifications to the Botany Rail Line and impacts to potentially State or locally significant archaeological remains. Cumulatively these works will result in moderate and irreversible impact to significant items, view lines and archaeological remains within the project area.

The WestConnex Enabling Works – Sydney Airport East is located in close proximity to the study area and includes works associated with road construction, bridge construction, building demolition and impacts to listed and unlisted heritage items in Botany and Mascot. Most relevant to the rail component of the project are works along Wentworth Avenue for the WestConnex Airport East project which have involved the demolition of three heritage listed items (Botany Bay LEP 2013 item no. I50, I51 and I52) and construction of a new underpass and rail overbridge over the Botany Rail Line and

[74] RMS, February 2015. WestConnex Enabling Works – Sydney Airport East: Volume One Main Report and Appendix A-E pp. 135-148.
[75] RMS, May 2016. Airport North Precinct: Review of Environmental Factors, pp. 105-110.

Wentworth Avenue. These have already slightly modified the landscape within and surrounding the Botany Rail Line.

Therefore, the cumulative impact of the current project along with the New M5, M4-M5 Link and Sydney Gateway road project are considered to be moderate to minor.

In order to reduce these cumulative impacts, alternative options regarding the demolition of the Mascot (Robey Street) Underbridge and Mascot (O'Riordan Street) Underbridge have been considered. However, this is not considered a feasible option (see Section 9.5.1 below). Therefore, recommendations to mitigate these impacts, which are detailed in Section 11.0 of this report, should be followed.

In addition, future infrastructure projects in the area, or along historic goods railway lines, should aim to reduce impacts to items such as rail bridges and signal containing heritage significance. This will prevent additional cumulative impacts occurring and retain the historic nature of these significant forms of infrastructure.

9.5 Justification for major impacts to listed heritage items as a result of project activities

9.5.1 Mascot (Robey Street) Underbridge and Mascot (O'Riordan Street) Underbridge demolition

The new track alignment across both the Mascot (Robey Street) Underbridge and Mascot (O'Riordan Street) Underbridge requires the demolition and reconstruction of both bridges. Although both bridges have some form of passive provision for a second track, it does not align with the new track alignment for the project as new track alignments must comply with NSW track geometry standards. In addition, the headroom to both bridges must be raised to accommodate larger height vehicles and revised road geometry and lane configuration as required by TfNSW Gateway Road Project.

Retaining both bridges would require significantly difficult modification or strengthening works to each structure. For example, they are both through girder type structures (the structural elements are above the deck), therefore moving the track laterally clashes with the structural element – requiring complicated works to retain these elements.

The tracks are also lifted across both crossings and would either require additional ballast to lift the track, which would increase the structural load and reduce the capacity; or require lifting to meet the new alignment and clearances.

Also, for Mascot (Robey Street) Underbridge, the current desktop load capacity assessment indicates that if the bridge is properly maintained and there is no significant change in the traffic load it is currently servicing, it is reasonable to assume that the bridge could remain in service for another 25 years. This provides some indication that the bridge would need to be replaced sometime shortly after completion of Botany Rail Duplication project.

Therefore, due to the new track alignment, headroom requirements, and the significant difficulties in retaining/strengthening the bridges to comply with this alignment – each bridge must be replaced.

9.6 Statement of heritage impact

The SoHI summarised in Table 9-3 has been developed from the Heritage Division's guidelines for *Statements of Heritage Impact* (2002).

Table 9-3: Statement of Heritage Impact for the proposal

Heritage Consideration	Discussion
What aspects of the project respect or enhance the heritage significance of the study area, Botany Rail Line and nearby heritage items?	The majority of the project footprint will be limited to land within the existing Botany Rail Line corridor. Consequently, the design avoids direct impacts to the State significant Botany Wetlands. The locally significant Botany Rail Line was always intended to be duplicated. Therefore, the project will ensure ongoing use of the line and respect its significance and original design. The line will continue to reach the threshold of local significance. As the majority of works will not require significant above ground structures (with the exception of bridges and embankments/retaining structures), visual impacts to and from the study area will be minimal.
What aspects of the proposal could have a detrimental impact on the study area, Botany Rail Line and nearby heritage items	Subsurface excavations associated with construction compounds, material laydown and storage areas, bridge construction, drainage lines, CSR routes, embankments/retaining structures and asbestos removal have the potential to impact State and locally significant archaeological remains associated with Phase 1 and 2 occupation (if present). The demolition and replacement of the ARTC s170 listed Mascot (O'Riordan Street) Underbridge and Mascot (Robey Street) Underbridge would have a major impact on the heritage significance of the items and visually alter the existing nature and character of the Botany Rail Line. Modifications to the ARTC s170 listed Mascot (Botany Road) Underbridge would have a minor impact to the heritage significance of the item. The potential removal of elements associated with the Botany Rail Line (detailed in Section 6.3.2) would have a minor to moderate impact on the item's significance. The addition of embankments/retaining structures may result in visual impacts towards the Botany Rail Line and surrounding landscape, including the State significant Botany Wetlands.
How is the impact of the new development on the heritage significance of the item or area to be minimised?	The majority of the project's development construction footprint has been prepared to avoid direct impacts to areas of high archaeological potential, heritage curtilages and landscapes.
Why is the new development required to be adjacent to a heritage item?	The Botany Rail Line is an existing rail corridor that was established in 1925. In order to retain its alignment and ensure ongoing use of the line, the project boundary is required to be adjacent to the State significant Botany Wetlands and Sydney (Kingsford Smith) Airport group.

10.0 CONCLUSIONS

10.1 Summary of findings

This SoHI has found that study area comprises about three kilometres of the existing Botany Rail Line corridor which was established in 1925. Part of the line was diverted to accommodate the expansion of Sydney Airport in 1960. It occupies both Commonwealth regulated land and land subject to the EP&A Act

The study area has been subject to five phases of European occupation:

- Phase 1 (circa 1809-1858) - Early European settlement, land grants, industry and Simeon Lord's estate
- Phase 2 - (1858-1925) - Residential development, market gardens, Botany Water Pumping Station and Botany Rail Line development
- Phase 3 Airport (1925-1960) - Botany Rail Line, Sydney Airport, market gardens and residential development
- Phase 4 (1960-2002) - Post-War development and deviation of the Botany Rail Line
- Phase 5 (2002-present) - Contemporary management and use of the Botany Rail Line

The study area is wholly or partially located within the curtilage of six heritage listed items containing local or state significance and four heritage listed items containing local or state significance within the study area's 100 metre buffer zone. In addition, the study area is located within one unlisted item (the Botany Rail Line) which is considered to have local significance within the broader area.

In terms of non-Aboriginal archaeological remains, the study area has been assessed as containing the following archaeological potential and significance in relation to the five phases of European occupation referred to above (and in Section 4.2-4.6):

- Phase 1 - Low potential for the Eastern extent of the study area to contain State significant archaeological remains and nil to low potential for the Central and Western extents of the study area to contain locally significant archaeological remains
- Phase 2 - Low to moderate potential for the Central and Eastern extents of the study area to contain locally significant archaeological remains and nil to low potential for the Western extent of the study area to contain locally significant archaeological remains
- Phase 3 - Moderate to high potential for the Central, Eastern and Western extents of the study area to contain archaeological remains not considered to have research significance or be classified as 'relics' under the NSW Heritage Act
- Phase 4 - High potential for the Central, Eastern and Western extents of the study area to contain evidence of the post-1960 Botany Rail Line infrastructure and sidings not considered to have research significance or be classified as 'relics' under the NSW Heritage Act
- Phase 5 - High potential for the Central, Eastern and Western extents of the study area to contain evidence of modern (2002-present) development not considered to have research significance or be classified as 'relics' under the NSW Heritage Act

10.2 Conclusions

Based on the above findings, impacts to land owned or leased by the Commonwealth or a Commonwealth Authority (for example the Sydney (Kingsford Smith) Airport) as a result of the proposed works have been assessed as minor.

The duplication of about three kilometres of the Botany Rail Line on the Down side, demolition of two heritage listed underbridges (*Mascot (O'Riordan Street) Underbridge* and *Mascot (Robey Street) Underbridge*) and modifications to one heritage listed bridge (*Railway Bridge over Botany Road*) would result in moderate impacts to the unlisted Botany Rail Line, major impacts to the *Mascot (O'Riordan Street) Underbridge* and *Mascot (Robey Street) Underbridge* and minor impacts to the *Mascot (Botany Road) Underbridge*.

These works will also have a minor impact to the SHR, LEP, RNE and s170 listed *Botany Water Reserves* and minor to negligible impact to the LEP, CHL and RNE listed *Sydney (Kingsford Smith) Airport Group.*

They will have a negligible visual impact on the LEP listed *Beckenham Memorial Church* and nil physical, visual and archaeological impact on the *Commonwealth Water Pumping Station and Sewerage Pumping Station No 38*, *Streetscape - Verge plantings of Canary Island Date Palms (Phoenix Canariensis), Booralee Park* and *Ruins of the former Botany Pumping Station.*

In regard to archaeological impacts, the majority of the study area is not likely to contain significant archaeological remains associated with Phase 1 and 2 occupation. Therefore, localised subsurface excavations to accommodate the new rail corridor, CSR, drainage routes utilities relocation and protection, and the construction of retaining walls along the rail corridor would have a negligible impact to significant archaeological resources.

However, there are three areas that have been assessed as containing low and moderate potential for locally or State significant archaeological evidence of Phase 1 and 2 occupation within the project boundary. These are proposed to be used as compound sites and material laydown and storage areas. At present, the extent of subsurface impacts for these facilities is not known, however they are anticipated to be minimal and limited to localised excavations for building footings and services. Therefore, depending on the nature and depth of subsurface excavations, impacts to archaeological remains as a result of these works are considered to be negligible to minor.

11.0 MITIGATION MEASURES

In order to reduce assessed impacts to heritage items and significant archaeological remains, the following mitigation measures are recommended:

11.1 Impact management and avoidance

Impacts to significant fabric, locally and State significant archaeological remains and landscapes (including trees, plantings and public recreation areas) within and adjacent to the project footprint would be avoided where possible. Designs would also endeavour to reduce visual impacts by considering sympathetic and unobtrusive fabric, colour, form and size for new built elements.

In order to meet these recommendations, appropriate impact avoidance measures would be considered during the detailed design phase and included in the Construction Environment Management Plan (CEMP) for the project (where required). Site specific management measures for significant items within, and outside of, the study area are outlined below:

- **Botany Water Reserves (also known as Botany Wetlands or Botany Swamps):**
  - Establishment of fenced exclusion zones around the SHR curtilage to prevent inadvertent impacts to the item prior to, and during, the construction phase of the project
  - Engagement of an arborist to ensure significant plant species are not impacted during the construction phase if impacts outside of the project footprint are proposed
  - Archaeological monitoring in areas assessed as containing low potential for Phase 1 archaeological remains where subsurface impacts are proposed. This would be carried out in accordance with recommendations set out in Section 11.5 of this report

- **Mascot (Botany Road) Underbridge**
  - The CEMP will identify measures to specifically minimise the potential impact to the bridge during the construction phase of the project. This may include the establishment of protective barriers or pads around elements of the bridge to ensure impacts to fabric are avoided

- **Sydney (Kingsford Smith) Airport Group**
  - The CEMP will include measures to prevent inadvertent impacts to fabric within the curtilage of the Sydney Airport Group south of Qantas Drive. This may comprise the establishment of an exclusion zone around the LEP curtilage for the item or inclusion of its heritage curtilage in the project's Environmental Control Map

- **Potential archaeological remains shown in Figure 7-1:**
  - Archaeological monitoring or testing (where required) in accordance with recommendations set out in Section 11.5 of this report.

11.2 Heritage interpretation

A Heritage Interpretation Plan (HIP) including a heritage interpretation strategy would be prepared 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*. As noted in the *Heritage Interpretation Policy*:

> *Heritage interpretation is a means of sharing Australian culture and history within communities and with other communities, new citizens, visitors, and people*

> *overseas. It is also a means of passing on the knowledge and appreciation of Australian culture to new generations.*[76]

This would mitigate impacts associated with the modifications to the Botany Rail Line and the proposed demolition of the Mascot (Botany Road) Underbridge, Mascot (O'Riordan Street) Underbridge and Mascot (Robey Street) Underbridge.

Appropriate heritage interpretation (including, but not limited to, design elements, interpretive panels, inlays and signage) would be incorporated into the project design in accordance with the HIP. This would alleviate impacts to heritage items within the project footprint by drawing attention to the significance of the Botany Rail Line to members of the public who may not be aware of its importance to the area's local history. It would also highlight its links with Port Botany, for which the project is directly associated. Strategies for off-site interpretation such as web-based content or educational material may be appropriate as there will be no public access to the upgraded rail line. The HIP would focus on the study area's historic development and target items considered to contain heritage significance within the project footprint including:

- Mascot (Botany Road) Underbridge
- Mascot (O'Riordan Street) Underbridge
- Mascot (Robey Street) Underbridge
- Botany Rail Line and its associations with the development of industry and land use in the Botany and Mascot areas.

Preparation of these documents would include consultation with the following stakeholders:

- Bayside Council
- NSW Heritage Council
- Randwick and District Historical Society

11.3 Photographic archival recording

Photographic archival recording 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 Captur*e (2006) for the following items:

- Mascot (Botany Road) Underbridge
- Mascot (O'Riordan Street) Underbridge
- Mascot (Robey Street) Underbridge; and
- Existing nature and elements of the Botany Rail Line located within the study area.

The record would be prepared by a suitably qualified heritage consultant using archival-quality material prior to the demolition and construction phase of the project. Additional recording may also take place during bridge removal.

Records for LEP-listed items would be held by the local Council and local library. A copy of the record would be held by the owner of the asset.

[76] Heritage Council of NSW, 2005. Heritage Information Series: Heritage Interpretation Policy, p. 2.

11.4 s170 notification

As the following items listed on the ARTC s170 register would be demolished, a s170 notification would be provided to Sydney Trains and the NSW Heritage Division prior to their demolition.

- Mascot (O'Riordan Street) Underbridge
- Mascot (Robey Street) Underbridge

11.5 Archaeological management

In order to mitigate impacts to archaeological resources within the study area, it is recommended that the location of subsurface excavations are designed to avoid areas containing low or moderate potential for State and locally significant Phase 1 and 2 resources, as shown in Figure 7-1.

If these impacts cannot be avoided, a Historical Archaeological Assessment and Research Design (HAARD) and Excavation Methodology would be prepared once designs for the project have been finalised and the extent and depth of subsurface excavations are known.

This document has found that archaeological management is likely to be required in areas of low or moderate potential for locally significant archaeology and any areas with the potential to contain State significant archaeology. The locations of these areas and potential archaeological management are shown in Figure 7-1 and discussed below:

- **East**: Land surrounding Mill Pond and immediately south of Southern Cross Drive – archaeological monitoring and recording with potential for salvage
- **Central**: Land to the north and south of General Holmes Drive, west of the Botany Rail Line – archaeological test excavations or monitoring and recording to the south and archaeological monitoring and recording to the north, both with potential for salvage
- **West**: No archaeological resources considered to contain local or State significance are located within this portion of the study area – Unexpected Finds Procedure

The HAARD would recommend the appropriate archaeological management and research questions based on final detailed designs and a review of likely previous disturbances. It would also include a requirement that all archaeological monitoring and test excavations be led by a suitably qualified heritage consultant(s) who meets the NSW Heritage Council's Excavation Director criteria.

An Unexpected Finds Procedure would also be prepared for the project to manage any unexpected archaeological or structural remains encountered during the construction program.

11.6 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 to 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 be provided to relevant contractors and subcontractors and prepared or its preparation overseen and approved by a suitably qualified heritage professional.

11.7 Unexpected finds

An Unexpected Finds Procedure would be established and implemented in the case of unexpected structural and archaeological finds in areas not considered to contain archaeological potential for local or State significant remains within this report.

12.0 REFERENCES

Afloat, April 2009. *The Port of Sydney Part 3: Port Botany* by Gregory Blaxell. Accessed online at: https://www.afloat.com.au/afloat-magazine/2009/april-09/Port_of_Sydney_Port_Botany#.XRGCGVMzaRs on 25/06/2019.

Artefact Heritage, May 2019. *Draft Sydney Gateway Road: Statement of Heritage Impact*. Prepared for WSP on behalf of RMS.

Asset Management and Sydney Water Corporation, 2003. *Botany Wetlands Draft Conservation Management Plan*. Report prepared for Sydney Water.

Aurecon Australasia Pty Ltd, April 2016. *Airport East Precinct Addendum review of environmental factors*. Report prepared for RMS.

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.

Chaffey, M. '*A review of Botany'* undated pamphlet, local history files, Botany Library.

City of Botany Bay Council, *'Botany Wetlands: a guide to the Botany Wetlands'*, undated brochure.

Conroy, E. and R. 2018. *City of Botany Bay Heritage Review*. Viewed on 11/10/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=1210052

Cumming, S. 2004. *Post-European environmental impacts* in *Green Square in Histories of Green Square*, edited by Grace Karskens and Melita Rogowsky. UNSW Printing & Publishing Services.

Drew, D. 11 October 2002. *The History and Development of the Botany Goods Line*. Permanent Way Institute Inc, Convention Journal.

Dictionary of Sydney, n. d. *Botany Goods Line*. Viewed on 11/10/2018 at: https://dictionaryofsydney.org/structure/botany_goods_line

Evening News, 6 Aug 1904, p. 3.

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

Hainsworth, D. R. 1967. *'Lord, Simeon (1771–1840)*', Australian Dictionary of Biography, National Centre of Biography, Australian National University, accessed online 16 August 2018: http://adb.anu.edu.au/biography/lord-simeon-2371/text3115, published first in hardcopy 1967.

Heritage Council of NSW, 2005. *Heritage Information Series: Heritage Interpretation Policy*.

Kennedy, B. 1982. *Sydney and suburbs; a history and description*, Reed, Frenchs.

Larcombe, F. 1970. *The History of Botany 1788–1970,* The Council of the Municipality of Botany, Mascot, Sydney.

Lawrence, J. 2001. *A Pictorial History of Randwick*, Kingsclear Books, Alexandria, N.S.W.

The Leader: St George and Sutherland Shire, *New Port Botany freight rail bridge at Wentworth Avenue completed*, June 15, 2018. Accessed online at https://www.theleader.com.au/story/5470447/new-port-botany-rail-freight-bridge-ready-to-take-first-train/ on 30/08/2018.

NSWrail, n.d. *Botany Goods Line*. Viewed on 11/10/2018 at: https://www.nswrail.net/lines/show.php?name=NSW:botany

Office of Environment and Heritage, State Heritage Inventory listing for:

Mascot (Robey Street) Underbridge. Viewed 24/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4801848

Mascot (O'Riordan St) Underbridge'. Viewed 24/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4801830

Mascot (Botany Road) Underbridge. Viewed 24/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?id=4800248

Sydney (Kingsford Smith) Airport Group. Viewed 30/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5063218

Sewage Pumping Station 38'. Viewed 30/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5051446

Commonwealth Water Pumping Station and Sewage Pumping Station No. 38. Viewed 11/10/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5063196

Ruins of the former Botany Pumping Station'. Viewed 30/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=1210176

Botany Water Reserves'. Viewed 30/08/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5051418

Beckenham Memorial Church. Viewed on 11/10/2018 at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=1210052

Oz Roads, n.d. *Southern Cross Drive and General Holmes Drive: Part of the Sydney Orbital Motorway Network*. Accessed online at: https://www.ozroads.com.au/NSW/Freeways/M1/m1.htm on 18/09/2018.

Pollard, N, 1988. *Offal, Oil and Overseas Trade: The Story of the Sydenham to Botany Railway*. Australian Historical Society New South Wales Division.

Roads and Maritime Services, 2015. *WestConnex M5 Environmental Impact Statement*.

Roads and Maritime Services, February 2015. *WestConnex Enabling Works – Sydney Airport East: Volume One Main Report and Appendix A-E.*

Roads and Maritime Services, May 2016. *Airport North Precinct: Review of Environmental Factors*.

Roads and Maritime Services, 2017. *WestConnex M4-M5 Link Environmental Impact Statement* Sims Metal Management, *Annual Report 2017. Looking Forward, Looking Back*. Accessed online on 30/08/2019 at: https://www.asx.com.au/asxpdf/20171009/pdf/43n1xckf1cdl1g.pdf

The Sydney Morning Herald, DESTRUCTIVE FIRES AT BOTANY, Monday 24 December 1877, p. 5.

The Sydney Morning Herald Wed 30 Apr 1924, FACTORY PREMISES AT BOTANY, p. 10.

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.

Thomas, A.,2002. '*Fats and Fatty Oils'*. Ullmann's Encyclopedia of Industrial Chemistry. Accessed online at: https://onlinelibrary.wiley.com/doi/abs/10.1002/14356007.a10_173 on 16/08/2018.

Thorp, W. 1999. *Archaeological Assessment. Former Chubb Factory Site, Waterloo*. Prepared on Behalf of St Hilliers Pty Ltd.

Washington State Department of Transportation 2008. *Guidance on Preparing Cumulative Impact Analyses*.

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