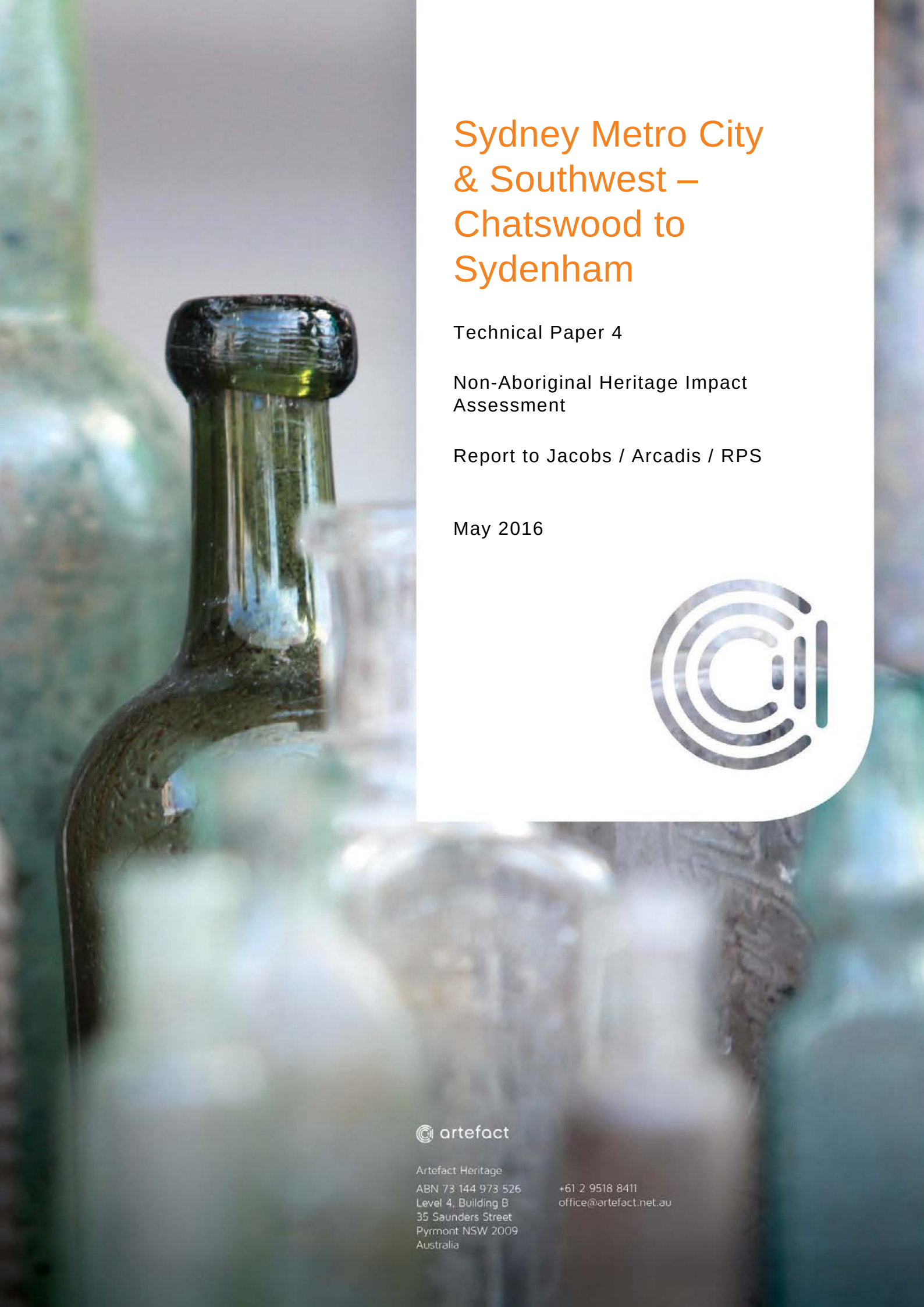
CHATSWOOD TO SYDENHAM

ENVIRONMENTAL IMPACT STATEMENT

MAY 2016

TECHNICAL PAPER 4: NON-ABORIGINAL HERITAGE IMPACT ASSESSMENT



Sydney Metro City & Southwest – Chatswood to Sydenham

Technical Paper 4

Non-Aboriginal Heritage Impact Assessment

Report to Jacobs / Arcadis / RPS

May 2016

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EXECUTIVE SUMMARY

Project overview

Sydney Metro is a new standalone rail network identified in Sydney's Rail Future. The Sydney Metro network consists of Sydney Metro City & Southwest and Sydney Metro Northwest.

The proposed Sydney Metro City & Southwest comprises two core components:

- The Chatswood to Sydenham project (the project), the subject of this technical paper, would involve construction and operation of an underground rail line between Chatswood and Sydenham
- The Sydenham to Bankstown upgrade would involve the conversion of the 13.5 kilometre Bankstown line to metro standards and upgrade of existing stations between Sydenham and Bankstown.

The Sydenham to Bankstown upgrade will be subject to a separate environmental impact assessment.

Investigations have also commenced on a potential extension of metro rail from Bankstown to Liverpool, which could cut travel times to the Sydney CBD by up to 15 minutes and reduce crowding on the existing T1 Western Line and T2 South Line.

The Sydney Metro Chatswood to Sydenham project (the project) involves the construction and operation of a metro rail line. The project would be mainly located underground in twin tunnels extending from Chatswood on Sydney's north shore, crossing under Sydney Harbour, and continue to Sydenham.

The key components of the project would include:

- About 15.5 kilometres of twin rail tunnels (that is, two tunnels located side-by-side) between Mowbray Road, Chatswood and north of Sydenham Station (near Bedwin Road, Marrickville)
- Realignment of the existing T1 North Shore Line surface track within the existing rail corridor between Chatswood Station and in the vicinity of Brand Street, Artarmon, including a new bridge for a section of the 'down' (northbound) track to pass over the proposed northern dive structure
- About 250 metres of aboveground metro tracks between Chatswood Station and the Chatswood dive structure
- A dive structure (about 400 metres long) and tunnel portal south of Chatswood Station and north of Mowbray Road, Chatswood (the Chatswood dive structure)
- A substation (for traction power supply) at Artarmon
- Metro stations at Crows Nest, Victoria Cross, Barangaroo, Martin Place, Pitt Street and Waterloo; and new underground platforms at Central Station
- A dive structure (about 400 metres long) and tunnel portal between Sydenham Station and Bedwin Road, Marrickville (the Marrickville dive structure)
- A services facility (for traction power supply and an operational water treatment plant) adjacent to the Marrickville dive structure.

The project would also include a number of ancillary components, including new overhead wiring and alterations to existing overhead wiring, signalling, access tracks / paths, rail corridor fencing, noise walls, fresh air ventilation equipment, temporary and permanent alterations to the road network, facilities for pedestrians, and other construction related works.

Approach to Non-Aboriginal heritage assessment

Artefact Heritage has been engaged to prepare a non-Aboriginal heritage assessment by the Jacobs / Arcadis / RPS team for inclusion in the EIS for the project.

This technical paper considers the construction and operational impacts on listed heritage items and potential archaeological resources within the study area and includes:

- Identification of items and areas of heritage significance that would be materially affected by the project during construction and operation, by field survey and research, including any buildings, works, relics, views, or places of heritage significance
- Consideration of the potential impacts on the values, settings and integrity of heritage areas and items and archaeological resources located within the project area. including items both above and below ground and, where such potential exists, the likely significance of those impacts
- An outline of the proposed mitigation and management measures (including measures to avoid significant impacts and an evaluation of the effectiveness of the mitigation measures) in accordance with relevant best practice guidelines.

Overview of potential impacts

The project has potential to have a moderate to major impact on 20 listed heritage items (being five state heritage listed sites and 15 sites of local heritage significance). The 20 listed heritage items are described, from north to south, in the table below.

Heritage item	Project site	Significance	Description of potential impact
Shop at 187 Miller Street	Victoria Cross station	Local	Direct impact: Major (complete demolition)
North Sydney bus stops	Victoria Cross Station Blues Point temporary site	Local	Direct impact: Moderate (removal and relocation)
Blues Point Waterfront Group	Blues Point temporary site	Local	Direct impact: Minor to moderate (shaft excavation) Archaeological impact – minor to major (shaft excavation) Temporarily indirect: Minor to moderate (views and vistas)
McMahons Point South Heritage Conservation Area	Blues Point temporary site	Local	Direct impact: Minor to moderate (shaft excavation) Archaeological impact – minor to major (shaft excavation) Temporarily indirect: Minor to moderate (views and vistas)
Millers Point & Dawes Point Village Precinct	Barangaroo station	State	Indirect impact: Minor to moderate (views and vistas) Archaeological impact – major (station box excavation)
Commonwealth Bank of Australia including interior	Martin Place station	State	Indirect impact: Moderate (views and vistas)

Heritage item	Project site	Significance	Description of potential impact
Flat building including interior	Martin Place station	Local	Direct impact: Major (complete demolition)
Martin Place	Martin Place station	Local	Direct impact: moderate (excavation) Archaeological impact –major (excavation) Indirect impact: Minor - moderate (views and vistas)
Martin Place Railway Station	Martin Place station	Local	Direct impact: Moderate (interchange)
Masonic Club	Pitt Street station	Local	Indirect impact: Minor to moderate (views and vistas)
Criterion Hotel including interior	Pitt Street station	Local	Indirect impact: Minor to moderate (views and vistas)
Former "Speedwell House" including interiors	Pitt Street station	Local	Indirect impact: Minor to moderate (views and vistas)
Edinburgh Castle Hotel	Pitt Street station	Local	Indirect impact: Minor to moderate (views and vistas)
Former Sydney Water Building	Pitt Street station	State	Indirect impact: Moderate to major (views and vistas)
Sydney Terminal and Central Railway Stations group	Central Station	State	Direct physical impacts: Moderate to major (excavation, demolition, construction, vibration) Archaeological impact –major (excavation) Indirect impact: Moderate to major (views and vistas)
Terrace Group including interior (99-105 Regent Street)	Central Station	Local	Indirect impact: Moderate (views and vistas)
Former Crown Hotel including interior	Central Station	Local	Indirect impact: Moderate (views and vistas)
Mortuary Railway Station	Central Station	State	Indirect impact: Moderate to major (views and vistas)
Former Co-Masonic Temple including interior	Central Station	Local	Indirect impact: Moderate to major (views and vistas)
Chippendale Heritage Conservation Area	Central Station	Local	Indirect impact: Moderate (views and vistas)

Nine sites are identified as having non-Aboriginal archaeological potential. Ground disturbance and excavation at these sites could impact on archaeological resources. The potential archaeological sites are:

Project site	Archaeological potential	Potential significance	Assessment of potential impact
Chatswood Dive Site (northern)	Study area has moderate potential to contain archaeological remains associated with mid to late 19th century residential and commercial development.	Local	Minor to moderate
Crows Nest station	Study area has low potential to contain archaeological remains associated with mid to late 19th century residential and commercial development.	Local	Major
Victoria Cross station	Study area has low to moderate potential to contain archaeological remains associated with mid to late 19th century residential and commercial development.	Local	Minor to major
Blues Point temporary site	Study area has low to moderate potential to contain archaeological evidence of pre-1850s foreshore development, mid to late 19th century shipbuilding industry and mid to late 19th century development of the site.	Local-State	Minor to major
Barangaroo station	Study area has low to high potential to contain archaeological evidence of pre 1850s foreshore development (industry and seawalls / reclamation), and post-1850's wharfage and warehousing.	Local-State	Major
Martin Place station	Study area has low to moderate potential to contain archaeological evidence associated with pre-1850's to early 20th century commercial and residential development of the study area	Local-State	Major
Pitt Street station	Study area has low to moderate potential to contain archaeological evidence associated with pre-1850's to early 20th century commercial and residential development of the study area	Local-State	Major
Central Station	Study area has low to moderate potential to contain archaeological remains associated with the Devonshire Street cemetery and earlier phases of Central Station.	Local-State	Major
Waterloo station	Study area has low to moderate potential to encounter archaeological remains associated with the pre-1850s through to late 19th century residential and commercial development of the study area.	Local	Major

Summary of mitigation response

Mitigation measures identified in other technical papers and other chapters of the Environmental Impact Statement that are relevant to the management of potential heritage impacts include:

- Chapter 10 (Construction noise and vibration) with respect to management of potential vibration impacts (Technical paper 2 – Noise and vibration)
- Chapter 16 (Landscape character and visual amenity) with respect to management of potential visual impacts during construction and operation (Technical paper 6 – Landscape character and visual amenity).

The location(s) applicable to each mitigation measure are identified by using a unique identifier as follows:

- STW – Surface track works
- CDS – Chatswood dive site
- AS – Artarmon substation
- CN – Crows Nest Station
- VC – Victoria Cross Station
- BP – Blues Point temporary site
- GI – Ground improvement works
- BN – Barangaroo Station
- MP – Martin Place Station
- PS – Pitt Street Station
- CS – Central Station
- WS – Waterloo Station
- MDS – Marrickville dive site
- Metro rail tunnels – Metro rail tunnels not related to other sites (eg TBM works)
- PSR – Power supply routes.

ID	Mitigation measure	Applicable location (s)[1]
NAH1	Archival recording and reporting of the following heritage items would be carried out in accordance with the NSW Heritage Office's *How to Prepare Archival Records of Heritage Items* (1998), and *Photographic Recording of Heritage Items Using Film or Digital Capture* (2006): • The internal heritage fabric and any non-original elements removed from within the curtilage of Mowbray House, Chatswood • The interior, exterior and setting of the shop at 187 Miller Street, North Sydney • The fabric and setting of the North Sydney bus shelters requiring removal and temporary relocation at Victoria Cross Station and Blues Point temporary site	CDS, VC, BP, MP, CS

ID	Mitigation measure	Applicable location (s)[1]
	• Any component of the Blues Point Waterfront Group and the McMahons Point South heritage conservation area to be directly affected or altered, including vegetation and significant landscape features • Hickson Road wall in the vicinity of proposed ventilation risers and skylights for Barangaroo Station • The interior, exterior and setting of the 'Flat Building' at 7 Elizabeth Street, Sydney • Martin Place, between Elizabeth and Castlereagh streets, Sydney • The heritage fabric of areas of the existing Martin Place Station affected by the project The Rolling Stock Officers Garden, Rolling Stock Officers Building and Cleaners Amenities Building in Sydney Yard and any other component of the Sydney Terminal and Central Railway Stations group to be removed or altered.	
NAH2	An archaeological research designs would be prepared and implemented to identify the need for archaeological testing or monitoring. Archaeological mitigation measures recommended in the archaeological research design would be carried out in accordance with Heritage Council guidelines, and where identified in the archaeological research design, would be supervised by a suitably qualified Excavation Director with experience in managing State significant archaeology.	CDS, CN, VC, BP, BN, MP, PS, CS, WS, PSR
NAH3	An *Exhumation Policy and Guideline* would be prepared and implemented. It would be developed in accordance with the *Guidelines for Management of Human Skeletal Remains* (NSW Heritage Office, 1998b).	All except metro rail tunnels
NAH4	The method for the demolition of existing buildings and / or structures at Chatswood dive site, Victoria Cross Station, Martin Place Station, Pitt Street Station, Central Station and Waterloo Station would be developed to minimise direct and indirect impacts to adjacent and / or adjoining heritage items.	CDS, VC, MP, PS, CS, WS
NAH5	Prior to total or partial demolition of heritage items at Victoria Cross and Martin Place stations, heritage fabric for salvage would be identified and reuse opportunities for salvaged fabric considered. This would include salvage and reuse of heritage tiles to be impacted at Martin Place Station.	VC, MP
NAH6	An appropriately qualified and experienced heritage architect would form part of the Sydney Metro Design Review Panel and would provide independent review periodically throughout detailed design.	All
NAH7	The project design would be sympathetic to heritage items and, where reasonable and feasible, minimise impacts to the setting of heritage items. The detailed design for Martin Place Station and Central Station would be developed with input from a heritage architect.	STW, CDS, CN, VC, BN, MP, PS, CS, WS, MDS

ID	Mitigation measure	Applicable location (s)[1]
NAH8	Appropriate heritage interpretation would be incorporated into the design for the project in accordance with the *NSW Heritage Manual*, the NSW Heritage Office's *Interpreting Heritage Places and Items: Guidelines* (August 2005), and the NSW Heritage Council's *Heritage Interpretation Policy*.	CDS, CN, VC, BP, BN, MP, PS, WS
NAH9	A Central Station heritage interpretation plan would be developed and implemented, consistent with the *Central Station Conservation Management Plan* (Rappoport and Government Architects Office, 2013) and in accordance with the guidelines identified in NAH8.	CS
NAH10	The design of the Sydney Yard Access Bridge would be sympathetic to surrounding heritage items and minimise impacts to sight lines, views and setting of surrounding heritage items, including to Mortuary Station and the Sydney Terminal and Central Railway Stations group. As a minimum the design would: • Incorporate materials and finishes sympathetic to the heritage context of the railway station • Minimise height and bulk of the structure.	CS
NAH11	Except for heritage significant elements affected by the project, direct impact on other heritage significant elements forming part of the following items would be avoided: • The Blues Point Waterfront Group (including the former tram turning circle, stone retaining wall, bollards and steps) • The Millers Point and Dawes Point Village Precinct • The existing Martin Place Station • Sydney Terminal and Central Railway Stations group • Sydney Yard (including the Shunters Hut and Prince Alfred Sewer).	BP, BN, MP, CS
NAH12	Power supply works would be designed and constructed to avoid impacts to the Tank Stream and Bennelong Stormwater Channel.	PSR
NAH13	The design and detailed construction planning of work at Central Station would consider the requirements of the *Central Station Conservation Management Plan* (Rappoport and Government Architects Office, 2013) and include consideration of opportunities for the retention, conservation and / or reuse of original and significant heritage fabric. Consultation would be carried out with Sydney Trains and the Heritage Council of NSW during design development.	CS

1 STW: Surface track works; CDS: Chatswood dive site; AS: Artarmon substation; CN: Crows Nest Station; VC: Victoria Cross Station; BP: Blues Point temporary site; GI: Ground improvement works; BN: Barangaroo Station; MP: Martin Place Station; PS: Pitt Street Station; CS: Central Station; WS: Waterloo Station; MDS: Marrickville dive site; Metro rail tunnels: Metro rail tunnels not related to other sites (eg TBM works); PSR: Power supply routes.

The following general mitigation measures apply to the management of the overall project.

Non-Aboriginal Archaeological Research Design

Where an archaeological research design is required, it would be prepared based on research information included in Technical Paper 4 (Non-Aboriginal heritage) and would be supplemented by additional detailed historical research of each site, with reference to the project design and proposed construction methods at each site. Based on the detailed literature review, the archaeological research designs would identify the need for, and provide a detailed methodology for undertaking:

- Archaeological test excavation or test and salvage excavation
- Archaeological monitoring.

Test excavation

Test excavation would not be undertaken prior to the preparation of an archaeological research design. For this project, it is likely that the archaeological research designs would recommend test excavation:

- In areas where access for excavation activities is not restricted by buildings or other structures, and
- Where additional information regarding the nature of subsurface deposits generated through test excavation could inform the assessment of archaeological potential and / or significance at that site.

Archaeological excavation can be undertaken prior to project approval as per the requirements of the Secretary's Environmental Assessment Requirements on the condition that archaeological relics are not removed.

Test and salvage excavation

Test and salvage excavation would not be undertaken prior to the preparation of an archaeological research design. For this project, it is likely that the archaeological research designs would recommend test and salvage:

- Where detailed archival research and understanding of modern disturbance (such as basement information) needs to be supplemented with more site-specific (on-ground) information to better define the archaeological potential and / or significance of the site
- In areas where access for excavation activities is restricted by buildings or other structures.

Test and salvage excavation would generally be recommended in areas where there is a moderate to high potential for relics of local or state significance to be present. It would involve locating and recording any relics found prior to their removal by construction. Test and salvage excavation could only be undertaken after project approval.

Archaeological monitoring

Archaeological monitoring involves the monitoring of construction phase excavation activities by a qualified archaeologist who would record any significant remains uncovered by excavation. Based on additional detailed historical research, the archaeological research design (see above) may identify areas where archaeological monitoring would be required. Examples of where archaeological monitoring may be required include:

- Low impact construction activities (such as narrow trenching) in areas of moderate to high potential for local or state significant relics
- Areas with low potential to contain remains of state significance.

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1.0 INTRODUCTION

1.1 Project background

Sydney Metro is a new standalone rail network identified in Sydney's Rail Future. The Sydney Metro network consists of Sydney Metro City & Southwest and Sydney Metro Northwest.

The proposed Sydney Metro City & Southwest comprises two core components:

- The Chatswood to Sydenham project (the project), the subject of this technical paper, would involve construction and operation of an underground rail line between Chatswood and Sydenham
- The Sydenham to Bankstown upgrade would involve the conversion of the 13.5 kilometre Bankstown line to metro standards and upgrade of existing stations between Sydenham and Bankstown.

Both components are subject to assessment and approval by the Minister for Planning under Part 5.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The Sydenham to Bankstown upgrade will be subject to a separate environmental impact assessment.

Sydney Metro Northwest (formerly the North West Rail Link) is currently under construction, services will start in the first half of 2019. This includes a new metro rail line between Rouse Hill and Epping and conversion of the existing rail line between Epping and Chatswood to metro standards.

Investigations have started on the possible extension of Sydney Metro from Bankstown to Liverpool. The potential extension would support growth in Sydney's south west by connecting communities, businesses, jobs and services as well as improving access between the south west and Sydney's CBD. It would also reduce growth pressure on road infrastructure and the rail network, including the potential to relieve crowding on the T1 Western Line, T2 South Line and T2 Airport Line.

The Sydney Metro Delivery Office has been established as part of Transport for NSW to manage the planning, procurement and delivery of the Sydney Metro network. The Sydney Metro rail network is shown in Figure 1.

1.2 The Sydney Metro network

The customer experience underpins how Sydney Metro is being planned and designed. The customer experience incorporates all aspects of travel associated with the transport network, service and project including:

- The decision on how to travel
- The travel information available
- The speed and comfort of the journey
- The range and quantity of services available at stations, interchanges and within station precincts.

A high quality 'door to door' transport product is critical to attract and retain customers and also to meet broader transport and land use objectives. This includes providing a system that is inherently safe for customers on trains, at stations and at the interface with the public domain; providing direct, comfortable, legible and safe routes for customers between transport modes; and provide a clean, pleasant and comfortable environment for customers at stations and on trains.

Key features of the metro product include:

- Comfortable carriages with space for customers to sit or stand
- A 'turn-up-and-go' service, with high frequency trains Reduced journey times with faster trains, and new underground routes through the Sydney CBD
- Increased capacity to safely and reliably carry more customers per hour due to the increased frequency of trains
- Reduced dwell times at stations as each carriage would be single-deck with three doors, allowing customers to board and alight more quickly than they can with double-deck carriages.

The Chatswood to Sydenham project would have the capacity to run up to 30 trains per hour through the Sydney CBD in each direction, which would provide the foundation for delivering a 60 per cent increase in the number of trains operating in peak periods, and cater for an extra 100,000 customers per hour.

Figure 1: The Sydney Metro network.

1.3 Overview of the project

1.3.1 Location

The Sydney Metro Chatswood to Sydenham project (the project) involves the construction and operation of a metro rail line. The project would be mainly located underground in twin tunnels extending from Chatswood on Sydney's north shore, crossing under Sydney Harbour, and continue to Sydenham.

1.3.2 Key features

The proposed alignment and key operational features of the project are shown in Figure 2 and would include:

- Realignment of T1 North Shore Line surface track within the existing rail corridor between Chatswood Station and Brand Street, Artarmon, including a new bridge for a section of the 'down' (northbound) track to pass over the proposed northern dive structure
- About 250 metres of aboveground metro tracks between Chatswood Station and the Chatswood dive structure
- A dive structure (about 400 metres long) and tunnel portal south of Chatswood Station and north of Mowbray Road, Chatswood (the Chatswood dive structure)
- About 15.5 kilometres of twin rail tunnels (that is, two tunnels located side-by-side) between Mowbray Road, Chatswood and Bedwin Road, Marrickville. The tunnel corridor would extend about 30 metres either side of each tunnel centre line and around all stations
- A substation (for traction power supply) in Artarmon, next to the Gore Hill Freeway, between the proposed Crows Nest Station and the Chatswood tunnel portal
- Metro stations at Crows Nest, Victoria Cross, Barangaroo, Martin Place, Pitt Street and Waterloo; and new underground platforms at Central Station
- A dive structure (about 400 metres long) and tunnel portal between Sydenham Station and Bedwin Road, Marrickville (the Marrickville dive structure)
- A services facility beside the Marrickville dive structure and tunnel portal, including a tunnel water treatment plant and a substation (for traction power supply).

The project would also include:

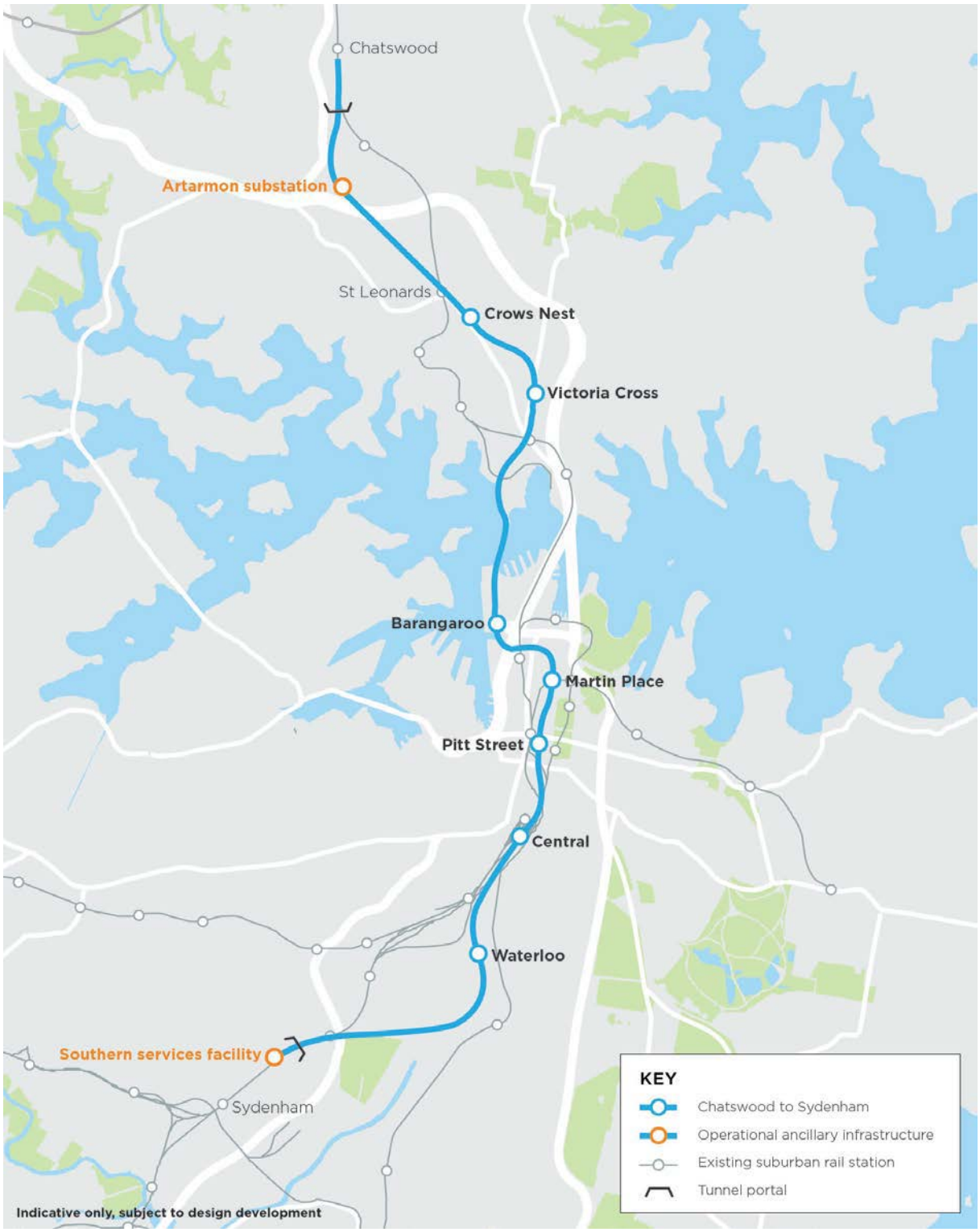
- Permanent closure of the road bridge at Nelson Street, Chatswood, and provision of an all-vehicle right turn movement from the Pacific Highway (southbound) into Mowbray Road (westbound)
- Changes to arrangements for maintenance access from Hopetoun Avenue and Albert Avenue, Chatswood as well as a new access point from Brand Street, Artarmon
- Underground pedestrian links at some stations and connections to other modes of transport (such as the existing suburban rail network) and surrounding land uses
- Alterations to pedestrian and traffic arrangements and public transport infrastructure (where required) around the new stations and surrounding Central Station
- Installation and modification of existing Sydney Trains rail systems including overhead wiring, signalling, rail corridor fencing and noise walls, within surface sections at the northern end of the project
- Noise barriers (where required) and other environmental protection measures.

The proposed construction activities for the project broadly include:

- Demolishing buildings and structures at the station sites and other construction sites
- Constructing tunnels, dive structures and tunnel portals
- Excavating, constructing and fitting out metro stations, fitting out tunnel rail systems and testing and commissioning of stations, tunnels, ancillary infrastructure, rail systems and trains
- Excavating shafts, carrying out structural work and fitting out ancillary infrastructure at Artarmon and Marrickville.

A number of construction sites would be required to construct the project. These include locations for tunnel equipment and tunnel boring machine support at Chatswood, Barangaroo and Marrickville as well as at station sites; a casting yard and segment storage facility at Marrickville and a temporary tunnel boring machine retrieval site at Blues Point.

Figure 2: Project overview



1.4 Purpose and scope of this report

The project has been declared state significant infrastructure and critical state significant infrastructure and is subject to assessment by the Department of Planning and Environment and approval by the Minister for Planning under Part 5.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

This technical paper, *Technical Paper 4: Non-Aboriginal Heritage* is one of a number of technical documents that forms part of the EIS. The purpose of this technical paper is to identify and assess the non-Aboriginal heritage impacts of the project during both construction and operation. In doing so it responds directly to the Secretary's Environmental Assessment Requirements (SEARs) outlined in Section 1.5.

This technical paper considers the construction and operational impacts on listed heritage items and potential archaeological resources within the study area and includes:

- Identification of items and areas of heritage significance that would be materially affected by the project during construction and operation, by field survey and research, including any buildings, works, relics, views, or places of heritage significance
- Consideration of the potential impacts on the values, settings and integrity of heritage areas and items and archaeological resources located near the project, including items both above and underground and, where such potential exists, the likely significance of those impacts
- Outlining the proposed mitigation and management measures (including measures to avoid significant impacts and an evaluation of the effectiveness of the mitigation measures) in accordance with relevant best practice guidelines.

1.5 Secretary's environmental assessment requirements

The SEARs relating to non-Aboriginal heritage, and where these requirements are addressed in this technical paper, are outlined in Table 1.

Table 1: SEARs – Non-Aboriginal heritage

Secretary's environmental assessment requirements	Where addressed
Where impacts to State or locally significant heritage items are identified, the assessment must:	
(a) include a statement of heritage impact for all heritage items (including significance assessment)	Section 6.0
(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)	Section 6.0
(c) outline measures to avoid and minimise those impacts in accordance with the current guidelines; and	Section 7.0
(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).	Section 3.6

2.0 LEGISLATIVE CONTEXT

2.1 Heritage legislation

There are several items of legislation, heritage registers and heritage management guidelines that are relevant to the project. A summary of these Acts and the potential legislative implications for the project follow.

2.1.1 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.

2.1.1.1 World Heritage List

The World Heritage List contains sites that have been listed by UNESCO as being of special cultural or physical significance.

2.1.2 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 inclusion on the World Heritage List, Commonwealth Heritage List or the National Heritage List.

The EPBC Act stipulates that a person who has proposed an action that will, or is likely to, have a significant impact on a World, National or Commonwealth Heritage site must refer the action to the Department of the Environment and Minister for the Environment (hereafter 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.

A significant impact is defined as “an impact which is important, notable, or of consequence, having regarded to its context or intensity”. The significance of the action is based on the sensitivity, value and quality of the environment that is to be impacted, and the duration, magnitude and geographic extent of the impact. If the action is to be undertaken in accordance with an accredited management plan, approval is not needed and the matter not need be referred to the Minister.

2.1.2.1 Commonwealth Heritage List

The Commonwealth Heritage List 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 is satisfied have one or more Commonwealth Heritage values.

2.1.2.2 National Heritage List

The National Heritage List has been established to list places of outstanding heritage significance to Australia. It includes natural, historic and Indigenous places that are of outstanding national heritage value to the Australian nation.

2.1.3 New South Wales Heritage Act 1977

The NSW *Heritage Act 1977* (Heritage Act) provides protection for items of 'environmental heritage' in NSW. 'Environmental heritage' includes places, buildings, works, relics, movable objects or precincts considered significant based on historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic values. Items considered to be significant to the state are listed on the State Heritage Register and cannot be demolished, altered, moved or damaged, or their significance altered without approval from the Heritage Council of NSW.

Archaeological relics

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:*
>
> *(a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and*
> *(b) is of State or local heritage significance"*

Sections 139 to 145 of the Heritage Act prevent the excavation or disturbance of land known or likely to contain relics, unless under an excavation permit. 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.

Excavation permits are issued by the Heritage Council of NSW, or its Delegate, under Section 140 of the Heritage Act for relics not listed on the State Heritage Register or under Section 60 for relics listed on the State Heritage Register. An application for an excavation permit must be supported by an Archaeological Research Design (ARD) and Archaeological Assessment prepared in accordance with the NSW Heritage Division archaeological guidelines. Minor works that would have a minimal impact on archaeological relics may be granted an exception under Section 139 (4) or an exemption under Section 57 (2) of the Heritage Act. However, the project is subject to Part 5.1 (State Significant Infrastructure) provisions of the EP&A Act, and therefore excavation or exception permits would not be required.

Definition of works

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 a 'work' does not trigger reporting obligations under the 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), tram and train tracks and ballast and evidence of former rail platforms and bridges.

2.1.3.1 State Heritage Register

The State Heritage Register 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 State Heritage Register is administered by the Heritage Division of the Office of Environment and Heritage (OEH) and includes a diverse range of over 1500 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.

2.1.3.2 Section 170 registers

Under the Heritage Act all government agencies are required to identify, conserve and manage heritage items in their ownership or control. Section 170 of the Heritage Act requires all government agencies to maintain a Heritage and Conservation Register that lists all heritage assets and an assessment of the significance of each asset. They must also ensure that all items inscribed on its list are maintained with due diligence in accordance with State Owned Heritage Management Principles approved by the Government on advice of the NSW Heritage Council. These principles serve to protect and conserve the heritage significance of items and are based on NSW heritage legislation and guidelines.

2.1.4 Environmental Planning and Assessment Act 1979

The EP&A Act establishes the framework for cultural heritage values to be formally assessed in the land use planning, development consent and environmental impact assessment processes. 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 Development Control Plans [DCPs]) in accordance with the EP&A Act to provide guidance on the level of environmental assessment required.

The study area falls within the boundaries of the Willoughby Local Government Area (LGA), North Sydney LGA, City of Sydney LGA and Marrickville LGA. The study area is therefore subject to the North Sydney LEP 2013, Willoughby LEP 2012, Sydney LEP 2012 and Marrickville LEP 2011.

The aim of the LEP's in relation to heritage is to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings, views and archaeological sites. The LEP's list items of heritage significance within the LGA and specify aims and objectives to be addressed in any development application.

3.0 ASSESSMENT METHODOLOGY

3.1 The study area

The indicative alignment for the project is shown in Figure 2. The alignment diverts from the North Shore Line rail corridor in the St Leonards area in an underground stratum towards Crows Nest and North Sydney to the east. For the purposes of assessment, works extend from a northern dive site at Chatswood to a southern dive site at Sydenham. The alignment extends under Sydney Harbour on the western side of the Sydney Harbour Bridge towards the Sydney CBD, before resurfacing north of Sydenham Station.

For the purpose of this investigation, an 'assessment boundary' has been defined as a 25 metre buffer around each of the sites that incorporates the proposed design footprint and ancillary works, facilities and access ways to each area during construction.

The application of a buffer helps to identify heritage items potentially within the visual catchment of the project where potential visual impacts on that item may occur. It also supports assessment of other potential indirect impacts on heritage fabric (for example, as a result of vibration). Any reference to the 'study area' in this chapter includes reference to the 25-metre buffer, unless otherwise stated.

In specific instances where a heritage item is identified in *Technical Paper 2: Noise and Vibration*, they have also been included in this document. Similarly, in some locations heritage items outside the buffer zone, but directly visible from the project footprint, have been included.

As well as above ground construction sites, the project footprint includes any underground work associated with station construction, such as mined platforms and underground pedestrian connections. Tunnel sections between stations would generally be too deep to affect heritage items or archaeological deposits and (with the exception of the northern and southern tunnel dives) are not included in the study area (refer Section 3.4.1 for further detail).

3.2 Identification of heritage listed items

Heritage listed items within the study area and buffer of each site were identified through a search of relevant state and federal statutory and non-statutory heritage registers:

- World Heritage List
- Commonwealth Heritage List
- National Heritage List
- State Heritage Register
- City of Sydney LEP 2012
- North Sydney LEP 2013
- Willoughby LEP 2012
- Sydney LEP 2012
- Marrickville LEP 2011
- Section 170 Heritage and Conservation Registers for Sydney Water, Roads and Maritime, Railcorp, Ausgrid and Department of Housing.
- NSW State Heritage Inventory database.

Items listed on these registers have been previously assessed against the NSW Heritage Assessment guidelines (as outlined in section 3.3.1). Statements of heritage significance, based on the NSW Heritage Assessment guidelines, as they appear in relevant heritage inventory sheets and documents, are provided throughout this assessment.

Where relevant Conservation Management Plans (CMP's) and other heritage management documents and guidelines have been utilised to provide additional information regarding heritage significance. Where used, these have been cited.

3.3 Archaeological assessment

An overview approach to the identification of potential archaeological resources has been adopted in this Heritage Impact Assessment. Historical archaeological potential is defined as the potential of a site to contain historical archaeological relics, as classified under the NSW *Heritage Act 1977*. The assessment of historical archaeological potential is based on the identification of former land uses and evaluating whether subsequent actions (either natural or human) may have impacted on archaeological evidence for these former land uses. Knowledge of previous archaeological investigations, understanding of the types of archaeological remains likely to be associated with various land uses, and the results of site inspection are also taken into consideration when evaluating the potential of an area to contain archaeological remains.

The assessment of archaeological potential contained in this Heritage Impact Assessment is based on analysis of historical plans and readily available secondary sources, such as archaeological zoning plans (refer to section 3.3.3) and archaeological investigations undertaken in the vicinity of the study area.

Assessments of significance are preliminary in nature and where possible significance has been assessed against the NSW Heritage Assessment Criteria. The assessment is informed by the NSW Heritage Division's 2009 guidelines *Assessing Significance for Historical Archaeological Sites and Relics.*

3.3.1 NSW Heritage assessment guidelines

Determining the significance of heritage items or a potential archaeological resource is undertaken by utilising a system of assessment centred on the *Burra Charter* of Australia ICOMOS. The principles of the charter are relevant to the assessment, conservation and management of sites and relics. The assessment of heritage significance is outlined through legislation in the Heritage Act and implemented through the *NSW Heritage Manual* and the *Archaeological Assessment Guidelines*.[1]

If an item meets one of the seven heritage criteria, and retains the integrity of its key attributes, it can be considered to have heritage significance. The significance of an item or potential archaeological site can then be assessed as being of local or state significance. If a potential archaeological resource does not reach the local or state significance threshold, then it is not classified as a relic under the Heritage Act.

'State heritage significance', in relation to a place, building, work, relic, moveable object or precinct, means significance to the State in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item.

'Local heritage significance', in relation to a place, building, work, relic, moveable object or precinct, means significance to an area in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item.[2]

[1] NSW Heritage Office 1996; 25-27
[2] This section is an extract based on the Heritage Office Assessing Significance for Historical Archaeological Sites and Relics 2009:6.

The overall aim of assessing archaeological significance is to identify whether an archaeological resource, deposit, site or feature is of cultural value. The assessment will result in a succinct statement of heritage significance that summarises the values of the place, site, resource, deposit or feature. The heritage significance assessment criteria are as follows:

Table 2: NSW 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 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).

3.3.2 Research potential

In 1984, Bickford and Sullivan examined the concept and assessment of archaeological research potential; that is, the extent to which archaeological resources can address research questions. They developed three questions which can be used to assess the research potential of an archaeological site:

- Can the site contribute knowledge that no other resource can?
- Can the site contribute knowledge that no other site can?
- Is this knowledge relevant to:
    - General questions about human history?
    - Other substantive questions relating to Australian history?
    - Other major research questions?

In the 2009 guidelines *Assessing Significance for Historical Archaeological Sites and 'Relics'*, the NSW Heritage Division has since provided a broader approach to assessing the archaeological significance of sites, which includes consideration of a site's intactness, rarity, representativeness, and whether many similar sites have already been recorded, as well as other factors. This document acknowledges the difficulty of assessing the significance of potential subsurface remains, because the assessment must rely on predicted rather than known attributes.[3]

A site can have high potential for archaeological remains, and yet still be of low research potential if those remains are unlikely to provide significant or useful information.

[3] NSW Heritage Branch 2009

3.3.3 Archaeological studies

There have been several historical archaeological investigations undertaken within, or close to, the study area that provide evidence which assists in evaluating the potential historical archaeological resource of the study area. In addition, portions of the study area were evaluated in various archaeological zoning and management plans. These have been listed below.

3.3.3.1 Central Sydney Archaeological Zoning Plan

The Plan provides the City of Sydney with an interim framework for the assessment and conservation of the identified archaeological resource in the study area, and presents guidelines for its management on an overall and case by case basis. The Plan identifies areas within Central Sydney which contain archaeological potential, and assesses this according to criteria based on their perceived physical potential (dependant on the level of ground disturbance), resulting from site inspections. The document also provides a schedule of these areas / sites for Council planning purposes. Items in the zoning plan relevant to the study area have been covered under the listings described in Chapter 5, with the exception of those items appearing under the general designation assigned to roadways in the Plan. The Plan lists all roadways within Sydney as Areas of Archaeological Potential, in terms of previous roadways or surfaces. However, any surviving archaeological evidence for former road surfaces or construction techniques within the study area would be expected to be of low research significance.

3.3.3.2 The Rocks and Millers Point Archaeological Management Plan

'The Rocks and Millers Point Archaeological Management Plan' was prepared by Dr E Higginbotham in 1991. The management plan includes an inventory of potential archaeological sites located throughout The Rocks and Millers Point, based on assessment of existing impacts and archaeological investigations undertaken previously. A series of plans were produced showing the condition of subsurface archaeological remains on all sites included in the Inventory. Streets not included in the Inventory were assessed as being partially disturbed.

3.4 Assessment of heritage impact

This Heritage Impact Assessment has been prepared using the document *Statement of Heritage Impact* 2002, prepared by the NSW Heritage Office, contained within the *NSW Heritage Manual,* as a guideline.

Impacts on heritage are identified as either:

- Direct impacts, resulting in the demolition or alteration of fabric of heritage significance
- Indirect impacts, resulting in changes to the setting or curtilage of heritage items or places, historic streetscapes or views
- Potential direct impact, resulting in impacts from vibration and demolition of adjoining structures.

Specific terminology and corresponding definitions are used in this assessment to consistently identify the magnitude of the project's direct, indirect or potentially direct impacts on heritage items or archaeological remains. The terminology and definitions are based on those contained in guidelines produced by the International Council on Monuments and Sites (ICOMOS) [4] and are shown in Table 3. It is assumed that all direct and potential direct impacts are a result of construction. Indirect impacts are assumed to be operational unless specified as temporary in which case they are related to construction.

[4] Including the document *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties*, ICOMOS, January 2011.

Table 3: Terminology for assessing the magnitude of heritage impact.

Magnitude	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	This would include actions involving the modification of a heritage, 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 results 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 results in very minor changes to heritage items.
Neutral	Actions that would have no heritage impact.

3.4.1 Assessment of vibration impacts

Vibration arising from construction or excavation work has the potential to impact on the fabric of heritage items, potentially causing subsidence, or affecting structural integrity.

In locations where heritage items would be located adjacent to demolition, construction or excavation works, an assessment of potential indirect impact through vibration has been undertaken.

A conservative vibration damage screening level of 7.5 millimetres per second peak particle velocity has been adopted for the project. This screening level has been established with reference to the minor cosmetic damage criteria in *British Standard BS 7385:2 – 1993*. The vibration levels specified in this standard are designed to minimise the risk of threshold or cosmetic surface cracks, and are set well below the levels that have potential to cause damage to the main structure.

The recommended screening level of 7.5 millimetres per second peak particle velocity is also applicable to heritage items unless it is known that the item is already structurally unsound – in which case, a lower screening level may be applicable.

During main tunnelling works, it is anticipated that ground-borne vibration associated with tunnel boring machine use would be much lower than the 7.5 millimetres per second peak particle velocity screening level. As such the study area for assessment of potential impacts to heritage items does not extend to areas above the tunnel alignment that are outside the nominated study area buffers for each construction site.

Vibration impacts to heritage items have been assessed based on a review of modelled vibration levels generated as part of the assessment in *Technical Paper 2: Noise and Vibration.*

Potential vibration impacts have been assessed by applying the following methodology:

- Where vibration levels are predicted to be below the relevant vibration screening level, potential vibration impacts are considered negligible and no further assessment of vibration-related impacts on that structure would be required.
- Where vibration levels are predicted to be at or above the vibration screening level, further investigation would be undertaken to ensure vibration levels remain below appropriate limits for that structure, including:
    - A more detailed assessment of the structure
    - Attended vibration monitoring would be undertaken from the structure's closest point to the vibration source
- Where the building is a heritage building, and the predicted vibration level is above the vibration screening level, the more detailed assessment of the structure would be undertaken that specifically considers the heritage values of the structure and sensitive heritage fabric would be identified in consultation with a heritage specialist to ensure it is adequately monitored and managed.

3.5 Limitations and constraints

This report provides an assessment of non-Aboriginal (historical) built heritage and potential archaeological resources only and does not provide a review of the potential for Aboriginal archaeological evidence in the area. The assessment of archaeological potential is preliminary only and based on broad assessments of potential significance for the project footprint.

Only those portions of the study area subject to proposed surface works and that are publically accessible were surveyed during preparation of this Heritage Impact Assessment.

As noted above, during main tunnelling works, it is anticipated that ground-borne vibration associated with tunnel boring machine use would be much lower than the 7.5 millimetres per second peak particle velocity screening level (the threshold at which cosmetic damage may occur). As such the study area for assessment of potential impacts to heritage items generally does not extend to areas above the tunnel alignment that are outside the nominated study area buffers for each construction site.

3.6 Investigator and contributors

This report was prepared by Jenny Winnett (Senior Heritage Consultant). Management input was provided by Dr Sandra Wallace (Director) and review by Dr Sandra Wallace and Abi Cryerhall (Principal).

Jenny Winnett has over 10 years' experience in archaeological and heritage management. Jenny is eligible to be nominated as an Excavation Director on permits from NSW Heritage Division for locally significant sites.

Abi Cryerhall has over 18 years' experience in archaeological and heritage management. She has directed numerous historical archaeological investigations in Sydney, including both local and State significant sites. Abi is eligible to be nominated as an Excavation Director on permits from NSW Heritage Division for local and State significant sites.

Sandra Wallace has over 13 years' experience in archaeology and cultural heritage management. Sandra has been nominated as heritage lead on a number of large infrastructure projects in the Sydney region.

4.0 CONSTRUCTION OF THE PROJECT

4.1 Tunnel construction

4.1.1 Tunnel elements

The project would involve the excavation of twin tunnels around 15 kilometres in length. The two bored tunnels would have a circular cross section with an internal lined diameter of about six metres and an excavated diameter of about seven metres.

In addition to the twin tunnels, the following underground features would also be excavated:

- Cross passages between the two tunnels would be provided at intervals of about 240 metres to allow for emergency access
- Stub tunnels from the twin tunnels near Victoria Cross Station and Sydenham to allow for future extensions to the metro network.

The depth of the twin tunnels, due to topography and the crossing of Sydney Harbour, would vary from about 20 metres to 60 metres deep. The shallower sections of the tunnel are generally approaching each tunnel portal.

4.1.2 Tunneling methods

Tunnel excavation is likely to be carried out using tunnel boring machines with roadheaders used for cross passages and stub tunnels.

Excavators with rock hammers would also be used to excavate cross passages and niches within the tunnels.

4.1.3 Ground improvement

Due to the expected ground conditions, ground improvement works may be required at specific locations underneath Sydney Harbour. Ground improvement works may be required at the rock-sediment transition zones to reduce construction risks associated with tunnel boring machine work.

For the purposes of assessment, ground improvement works involve jet grouting which comprises the injection of a cement grout into the harbour bed from barges on the harbour. The grout would be delivered to the barges from an on-shore grout facility and would be injected from the barge via a crane and drilling lead.

4.1.4 Tunnel boring machine launch and support sites

It is anticipated that the tunnel boring machine operations would occur from three sites. These sites are:

- A tunnel boring machine launch and support site in Chatswood (to the south of Chatswood Station and north of Mowbray Road), referred to as the Chatswood dive site
- A tunnel boring machine launch and support site north of Sydenham Station (south of Bedwin Road), referred to as the Marrickville dive site
- A tunnel boring machine launch and support site at the proposed Barangaroo Station construction site for the crossing of Sydney Harbour.

A temporary construction site would also be established at Blues Point for the retrieval of the cutter head and shields of the tunnel boring machine driven from the northern construction site and the Barangaroo Station construction site.

The three sites would require support services for the tunnel boring machines.

Additional information regarding tunnel construction work is provided in Chapter 7 of the EIS.

4.2 Station construction

New metro stations would be located at Crows Nest, Victoria Cross, Barangaroo, Martin Place, Pitt Street and Waterloo, with new metro platforms also included at Central Station. Table 4 outlines the methodology and approximate depth for the new stations.

The metro stations would be configured as either a large 'single span' cavern that accommodates tracks for both directions of travel and a central island platform or a 'binocular cavern' arrangement whereby each platform and track is housed in a single smaller cavern.

Single span cavern stations are proposed at Crows Nest, Victoria Cross, Barangaroo, Central and Waterloo. Binocular cavern stations are proposed at Martin Place and Pitt Street.

Table 4: Proposed stations and method of construction.

Proposed station	Methodology	Approximate depth (metres)
Crows Nest Station	Single span cut-and-cover	25
Victoria Cross Station	Single span mined	31
Barangaroo Station	Single span cut-and-cover	25
Martin Place Station	Binocular mined cavern	25-27
Pitt Street Station	Binocular mined cavern	17-20
Central Station	Single span cut-and-cover	18
Waterloo Station	Single span cut-and-cover	25

Further detail regarding station construction and the scope of construction activities at stations is provided in Chapter 7 of the EIS.

4.2.1 Construction sites

A number of construction sites would be required to construct the project. This includes locations for tunnel boring machine launch, support and retrieval, roadheader support, station construction, and operational ancillary facility construction. Generally, construction sites are located within the operational footprint to minimise impacts.

Site establishment activities would initially be carried out at each of the construction sites. These would include:

- Building demolition and clearing of landscaped vegetation, where required
- Protection and / or relocation of utilities
- Provision of services required for construction, eg power supply, water supply, sewer and communications

- Establishment of site compound and ancillary facilities such as offices, amenities and workshops
- Establishment of vehicle access and egress points
- Establishment of truck wheel wash or rumble grid
- Establishment of internal roads
- Establishment of hardstand areas for storage and car parking
- Establishment of site hoardings, noise barriers and / or fencing around the perimeter of the site.

4.2.2 Station elements

Above-ground buildings associated with station entry and exit points would generally be constructed following station structural works. Buildings would be constructed using conventional steel frame methods.

Each metro station would have a number of common elements or design features. These would include:

- Station service buildings – located to minimise the street frontage within important urban areas
- Signage and wayfinding within the station and the surrounding public domain
- Awnings for shade and shelter at street level station entries
- Retail space within the station building
- Landscaping and street furniture to maintain high quality urban design outcomes.

The architectural fit-out of the stations would occur on completion of the station structural works and involves the final finishes for the stations. The architectural fit-out would include elements such as glazing, wall and ceiling cladding, and floor finishes.

4.2.3 Surface rail works

Surface works would involve the provision of metro tracks and associated rail systems from the southern end of Chatswood Station to the northern dive structure. Adjustments would also be carried out to the T1 North Shore Line from the southern end of Chatswood Station to Brand Street, Artarmon. Full details of these works have been provided in Chapter 8 of the EIS.

4.3 Ancillary sites

4.3.1 Artarmon substation

The Artarmon substation would be constructed in the following sequence:

- Excavation of a vertical shaft to the tunnels below. This is likely to be carried out using excavators and rock hammers; however, drill and blast or penetrating cone fracture techniques may also be used
- Lining and reinforcement of the shaft
- Building works for aboveground components
- Installation of electrical equipment.

4.3.2 Southern services facility

The southern services facility would be constructed adjacent to the southern construction site and would incorporate a tunnel water treatment plant and a traction substation.

5.0 HISTORICAL AND ENVIRONMENTAL CONTEXT

5.1 Introduction

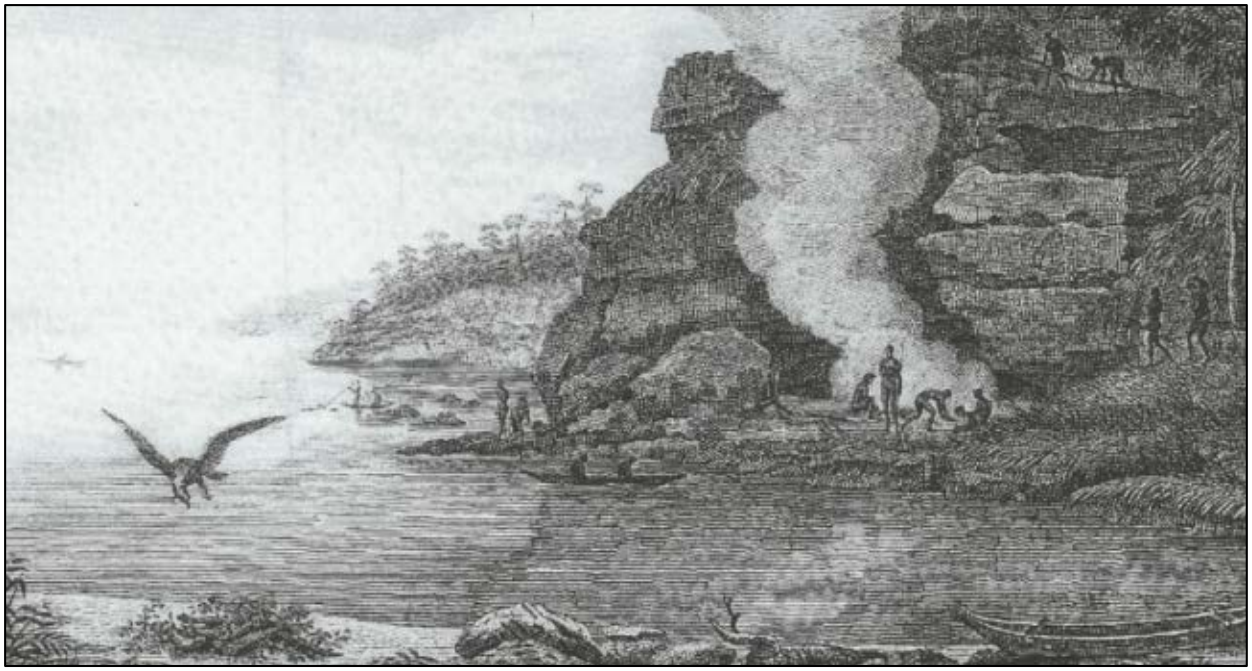
The following section provides the historical context for the early development of Sydney. Historical background specific to each of the study areas has been outlined in the relevant sub-sections of Section 5.0.

5.2 Aboriginal occupation and European contact

Prior to the appropriation of their land by Europeans, Aboriginal people lived in small family or clan groups that were associated with particular territories or places. It seems that territorial boundaries were fairly fluid, although details are not known. The language group spoken across Sydney was known as Darug (Dharruk – alternate spelling). This term was used for the first time in 1900, as before the 1800s language groups or dialects were not discussed in the literature.[5] The Darug language group is thought to have covered the area south from Port Jackson, north from Botany Bay, and west from Parramatta.[6]

The name Gadigal and its alternative spellings (Cadigal, Cadi) was used in the earliest historical records of the European settlement in Sydney to describe the Aboriginal band or clan that lived on the southern shore of Port Jackson, from South Head west to the Darling Harbour area. The term Eora is also used as a name for the Aboriginal people south of Port Jackson. The term Eora was likely a word used by the Gadigal people to refer to an Aboriginal person, rather than a reference to a clan or band in particular. However, it became a widespread term for the Aboriginal people on the southern shore of Port Jackson and is currently used by Gadigal people to refer to the central Sydney area – referred to as 'Eora Country'.[7]

Figure 3: Aboriginal activities on the shore of Port Jackson in 1824. Source: Peron and Freycinet 1824.



[5] Matthews and Everitt1900; Attenbrow 2010:31
[6] Attenbrow 2010:34
[7] Attenbrow 2010:22, 35-36

The study area was located across a landscape of varying subsistence resources. The tidally influenced mud flats associated with the mouth of the Tank Stream were in the vicinity of present-day Circular Quay, while fresh water was available from the stream itself to the south-west in the vicinity of Pitt Street. Archaeological and historical records indicate that marine and estuarine resources formed an important part of the subsistence activities of the Aboriginal people that inhabited the Port Jackson area (Figure 3). Shellfish not only formed an important subsistence resource, but were also utilised as tools. Shell tools included fish-hooks, shell hafted onto spears in various forms, as a tool to repair spears, and as a cutting edge.[8] Other locally available raw materials, including quartz, were also favoured for cutting edges, and in some areas bordering readily abundant shellfish in inner Sydney, quartz may have actually been favoured as a cutting edge. [9]

5.2.1 Initial interactions at Sydney Cove

The European colonisation of Australia began with the establishment of a colony at Sydney Cove by Captain Arthur Phillip in January 1788 on land inhabited by the Gadigal people. The subject site and immediately surrounding area were an integral part of the pre- and post-contact history of both the Gadigal people and the Aboriginal peoples across the surrounding region.

Many of the early interactions between the British and the Gadigal were amicable and inquisitive. Watkin Tench, Captain of the Marine with the First Fleet, documented his first meeting with the Gadigal people, when he and a landing party visited the south shore of Port Jackson. Tench noted that they were greeted by a dozen Aboriginal people, with the landing party and the Aboriginal people cautiously approaching each other before observing one another and exchanging items.[10]

Within days of the initial landing at Sydney Cove, visits by Aboriginal people to the settlers had dropped in frequency to the point where the colonists were aware that they were being deliberately avoided. In 1789, Watkin Tench noted that:[11]

> *The Indians for a little while after our arrival paid us frequent visits, but in a few days they were observed to be more shy of our company. From what cause their distaste arose we never could trace….. No quarrel had happened, and we had flattered ourselves, from Governor Phillip's first reception among them, that such a connection might be established as would tend to the interest of both parties.*

The reference to Governor Phillip seeking to establish a connection with the local Aboriginal inhabitants and treating them amicably stemmed from his instructions on setting out from England in 1787 to open a discourse with the 'Aborigines' and attempt to live in friendship without unnecessary interruption of their activities.[12]

[8] Attenbrow 2010:118
[9] Baker 2004:31
[10] Tench 1789
[11] ibid
[12] McBryde 1989:5

Other historical records also note the avoidance of the colony by Aboriginal people. By November 1788, Phillip noted that:[13]

> *The natives now avoid us more than they did when we first landed, and which I impute to the robberies committed on them by the convicts, who steal their spears and fish – gigs which they frequently leave in their huts when they go out a fishing and which the people belonging to the transports purchase, though every possible precaution has been taken to prevent it."*

With the exception of the first days of the colony at Sydney Cove, the remainder of 1788 was marked by the general avoidance of the area by the Aboriginal people.

Overall, British colonisation had a profound effect on the Aboriginal population of the Sydney region. In the early days of the colony Aboriginal people were disenfranchised from their land as the British claimed areas for settlement and agriculture. The colonists, often at the expense of the local Aboriginal groups, also claimed resources such as grasses, timber, fishing grounds and water sources. Overall the devastation of the Aboriginal culture did not come about through war with the British, but instead through disease and forced removal from traditional lands. It is thought that during the 1789 smallpox epidemic, over half of the Aboriginal people of the Sydney region died.

5.2.2 Establishing a colony

The First Fleet arrived in Sydney Cove on 26 January 1788. Upon arrival, they anchored in the rocky peninsula of what is today known as Argyle Street. The colony was founded around the mouth of a freshwater source provided by the Tank Stream, which flowed into the cove at the northern end of present day Pitt Street.

Initially, land tenure was granted in the form of grants and leases, however the majority of land settlement was associated with unofficial occupancy.[14] Even in the early years of the colony's growth geographical locations were soon becoming associated with class and social hierarchies. Therefore, the Governor and significant civil personnel lived to the east of the Tank Stream, and the convict population occupied the area further to the west of Sydney Cove. This part of Sydney Cove was characterised by a steep rocky climb to a north-south ridge line that ran like an arched spine along the sandstone peninsula. The contours of the landform would come to dictate the way people inhabited the area for the next century. This meant that structures occupied whatever appropriate land one could find with little thought set aside for street organisation or town planning. Soon, vehicle tracks were established on easy gradients that ran parallel to the ridge. These ridges included steps for pedestrians that made more direct ascents to the higher ground and created alleys and laneways that ran between the roughly parallel roads and cart tracks.

In the months following the first landing, First Government House was established on the corner of present-day Bridge and Phillip streets, with a government wharf built on the shoreline to the north of the house.[15] As the colony grew, land close to the water was used for government purposes including the construction of a hospital, gaol, Government dockyard, and Commissariat Stores. The first private wharf was built by Robert Campbell in the early 1800s, and by the 1820s the expansion and consolidation of trade saw the construction of wharves and warehouses around Dawes Point to Millers Point and Cockle Bay.[16]

[13] Governor Phillip 1788, quoted in McBryde 1989:7
[14] The Rocks Heritage management Plan. Volume 1. Sydney Harbour Foreshore Authority, p. 9.
[15] Thorp 1995
[16] Kass 1987

The western side of Sydney Cove was initially the site of the first convict encampment and contained a military camp, bakehouse and hospital. Later, when wealthier individuals had moved out, the area was settled by the colony's convict population who built houses and other structures on any available land they could find. The area was quickly named the 'Rocks' due to the tenacious footholds their homes had been built on. Many of the first houses were wattle and daub cottages constructed using readily available materials such as timber. Later, the sandstone bedrock running along the cove quickly converted into a popular quarry for the harbour's new residents and stone became a regular construction material, characterising much of the area we see today. These residences were built and located haphazardly along the landscape now home to George Street and were clustered around early grog and salt provisions stores.[17]

The initial growth of the settlement was largely unplanned, with streets and laneways developing organically, shaped by the natural topography. When Governor Macquarie took office in 1810, he attempted to impose some order on the development of the city and a grid pattern was superimposed on the southern, eastern, and western sides of the expanding town. As the city grew throughout the 19th century, most of the CBD was developed with commercial buildings, while warehouses and wool stores were located on or near the waterfront, and worker's housing was located in The Rocks and Millers Point area.

To the south of the CBD, industrial land uses began to define the area of Chippendale and Darlington, with the Kent Brewery established on Parramatta Road in 1835, and the Eveleigh Railway Workshops and various factories established in the latter half of the 19th century. By the end of the 19th century, this area was entirely built over with working-class terraces, most of poor quality.[18]

5.2.3 Development of the North Shore[19]

[17] Karskens, I. D. 1994. The Rocks: Historical Analysis. Report prepared by Godden Mackay and Logan, p. 9.
[18] Fitzgerald 2008a and b
[19] History taken from North Sydney Council 'At Home in North Sydney An Architectural History of a Locality' access via http://www.athomeinnorthsydney.com.au/estates.html 14/12/2015.

Along with the pressures of a growing population, North Sydney would be shifted more than ever before by the impact of two huge public works – the building of the Sydney Harbour Bridge from 1924 to 1932 and the construction of the Warringah Expressway from 1960 through to the 1970s. Between them these projects resulted in the demolition of as many as 1,000 buildings, most of them dwellings.

5.2.4 The development of water and sewerage services

Until the mid-19th century, town drainage in England and Australia was generally limited to surface drainage methods such as ditches and gutters, while sewage was usually managed using cesspits and ash middens. However, the increasing urban populations following the industrial revolution and a growing public expectation for improved sanitation resulted in the development of uniform drainage systems within cities.[20]

In Sydney, there was growing concern over sanitation during the mid-19th century, with overcrowded and dirty conditions being linked to social degradation. In 1858, a government assayer wrote an article about The Rocks entitled 'The Social Cesspools of Sydney', in which he described the:

> *…utter absence of all means of drainage or of removing filthy matter... that in many cases the foul drainage of one cottage trickles down the hill till it encounters... the back or front wall of the house below; here it accumulates, soaking down into the foundation, or sometimes actually running in at the door.*[21]

In 1842, the Sydney Municipal Council was formed, however the Council struggled to agree on a sewerage system to solve the city's sanitation problems. In 1852, the Council was dissolved and three Commissioners were appointed to be responsible for providing improved sanitation services. The Commission appointed W. B. Rider as City Engineer in 1854. Rider planned an underground sewerage system comprised of five main outfall sewers, which discharged into Blackwattle Bay, Sydney Cove, Darling Harbour, Bennelong Point, and Woolloomooloo Bay. The system used brick oviform drains and construction began in 1855 and was completed in 1857.[22]

In 1852, the process of covering the Tank Stream began with the enclosure of a 152 metre section downstream from Bridge Street, which was diverted and used as a sewer. The Tank Stream had been officially abandoned as a source of water in 1826, when a rock cut tunnel named 'Busby's Bore' was constructed to carry water into Sydney from the Lachlan Swamps (now Centennial Park), and it rapidly degenerated into an open sewer. In 1860, the Sydney City Council enclosed the section of the stream between Hunter Street and Curtin Place in a masonry archway, followed in 1867 by the construction of a brick oviform sewer between Hunter and King Street. In 1878, the section from Bridge Street to Alfred Street was enclosed in a sandstone archway with a brick oviform base. During the 20th century, steel pipes and concrete box drains were used.

[20] Wong 1999:58
[21] W. S. Jevons in The Sydney Morning Herald 7 October 1858:2
[22] Wong 1999:62

6.0 HERITAGE IMPACT ASSESSMENT

6.1 Introduction

The following sections discuss the study area as it relates to the project. A list of the heritage items located wholly, or partially, within the study area at each key project location is provided, as is an overview of archaeological potential, and an assessment of potential heritage impacts as a result of the project is also included.

6.2 Chatswood dive site (northern)

The Chatswood dive site would be about 24,000 square metres in area and located adjacent to the T1 North Shore Line in Chatswood (see Figure 4). The site is currently occupied by an Ausgrid depot and a number of commercial and retail buildings.

The Chatswood dive site would be used to:

- Support surface metro track works and adjustment to the T1 North Shore Line between Chatswood Station and Brand Street, Artarmon including track slewing and construction of the T1 North Shore Line 'Down' (northbound) track viaduct
- Excavate and construct the tunnel dive structure and portal
- Launch and support two tunnel boring machines for the major tunnelling works
- Support tunnel rail systems fit out works

Figure 4: Chatswood dive site (northern) layout.

The southern portion of the site would be used for offices, workshops and car parking; spoil storage and handling would be located at the northern end of the site adjacent to the existing rail line, with segment storage adjacent to the Pacific Highway. The dive structure would be constructed in the eastern portion of the site. The location and indicative layout of the Chatswood dive site, including vehicle access / egress is illustrated in Figure 4.

6.2.1 History of the study area

Chatswood, as it exists today, was largely created after WWII. In 1948 it was decided that the suburb would be developed as a district centre. The western side of the railway line was designated for commercial development and in the 1960s the first major retail stores were opened on the eastern side of the railway.

The original focus of Chatswood was centred on the intersection with Mowbray Road and Lane Cove Road, where the Bush Mission Society had constructed a small chapel and John Bryson established a timber yard and 'school of arts' hall by the 1870s. The Great Northern Hotel was opened by Henry Russell on this intersection in 1870. Following this a handful of general stores and Chatswood's first police station was established in the vicinity.

North Shore landowner Richard Hayes Harnett had acquired 900 acres from the King Plains Estate originally owned by Isaac Nicholls, and in 1876 he opened up a sub-division of the land called the Chatswood Estate. By this time the majority of the Blue Gum Forest had been cleared for farming and grazing. Harnett sold a portion of his estate to the government for the formation of the North Shore Railway, some 1200 yards to the north of the established town centre on Mowbray Road.

The North Shore Railway line was formally opened on the 1st of January 1890. As it had been constructed to serve the landholding of prominent North Shore citizens the railway traversed rugged terrain that required sharp curves and steep grades. The consequent expense of the railway line and subsidence of the economic boom of the 1880s resulted in the construction of simple timber station buildings (Figure 5).

Figure 5: Chatswood Railway Station in 1910. Image accessed online via Picture Willoughby, Willoughby City Council.

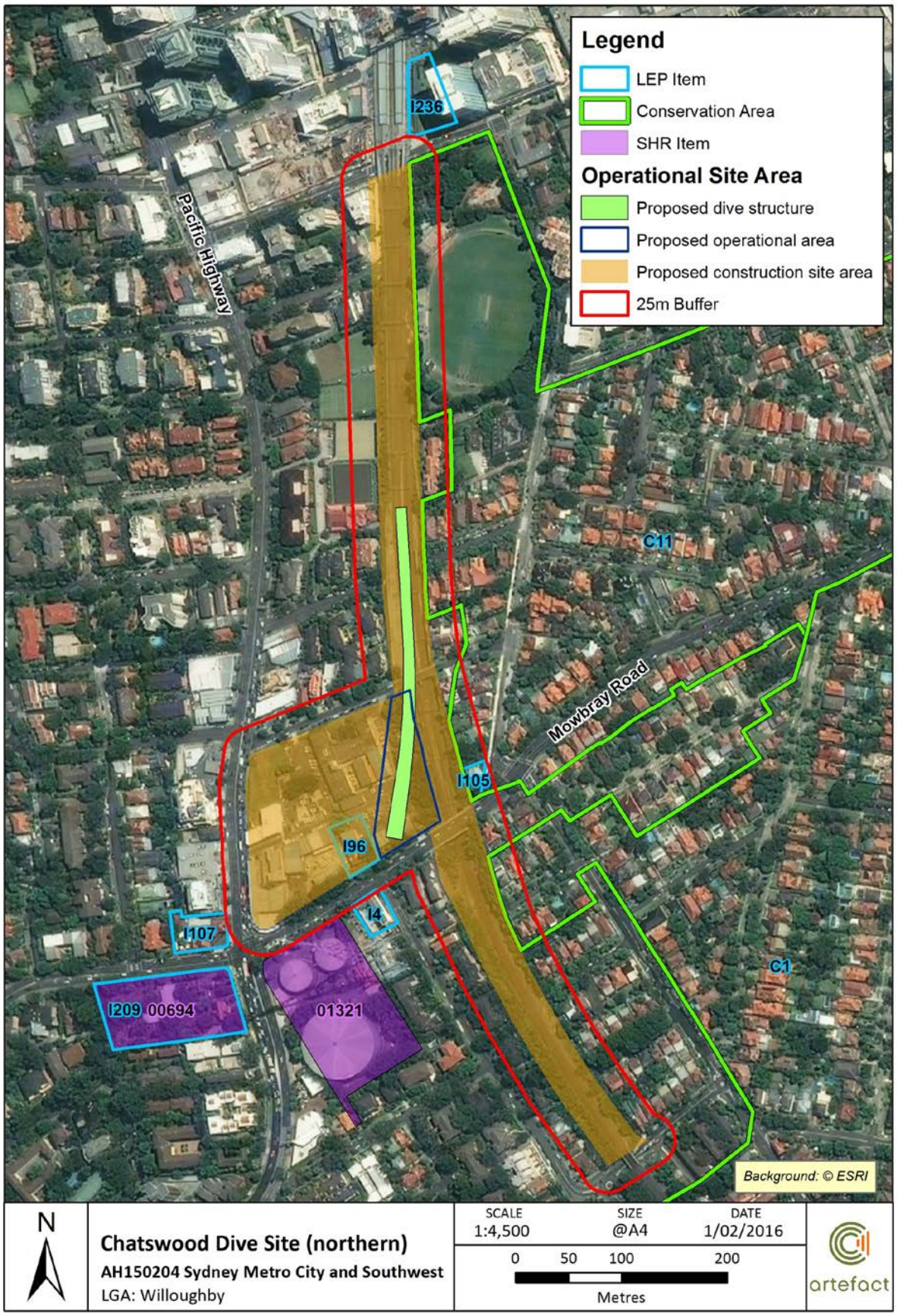
6.2.2 Heritage listed items

The following table outlines the heritage listed items within the study area which are shown on Figure 6.

Table 5: Heritage items within the Chatswood dive site (northern) study area and buffer.

Heritage item	Register listings	Significance	Relationship to the study area
Mowbray House	Willoughby LEP 2012 I96 Sydney Electricity S170 register	Local	Within construction site.
Great Northern Hotel	Willoughby LEP 2012 I107	Local	Partially within buffer zone, west of construction site and intersection works.
Chatswood South Uniting Church and Cemetery	SHR no. 00694 Willoughby LEP 2012 I209	State	Outside buffer zone, west of construction site and intersection works.
Garden of Remembrance	Willoughby LEP 2012 I236	Local	Partially within buffer zone, north of construction site.
South Chatswood Conservation Area	Willoughby LEP 2012 C11	Local	Partially within buffer zone, east of T1 North Shore Line works.
Artarmon Conservation Area	Willoughby LEP 2012 C1	Local	Partially within buffer zone, east of T1 North Shore Line works.
Chatswood Zone substation No 80 (building only)	Willoughby LEP 2012 I4 Ausgrid S170 register	Local	Partially within buffer zone, south of construction site.
Chatswood Reservoirs No. 1 and No. 2 (and associated curtilage)	SHR no. 01321 Willoughby LEP 2012 I5 Sydney Water S170 register	State	Partially within buffer zone, south of construction site.

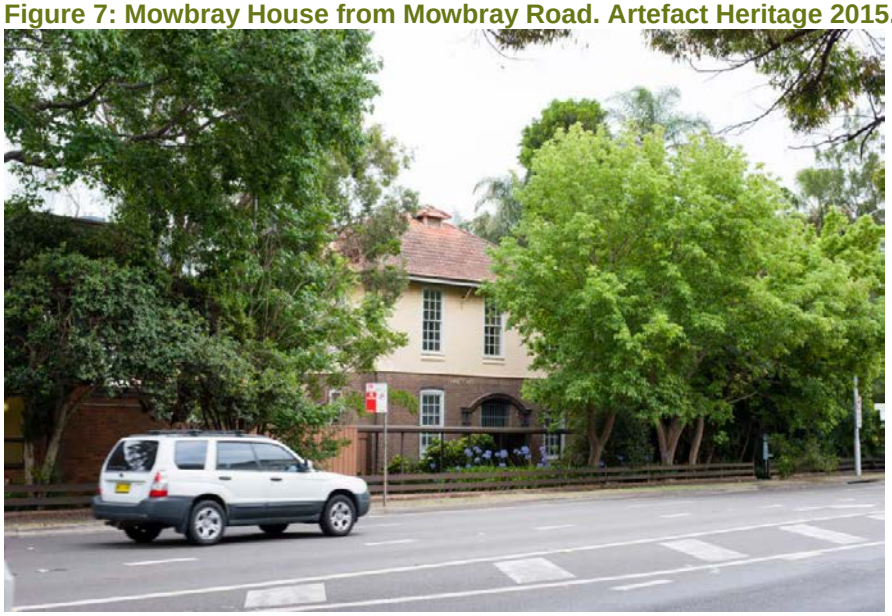
Figure 6: Heritage items within the Chatswood Dive Site (northern).



6.2.3 Detailed heritage impact assessments

Heritage items

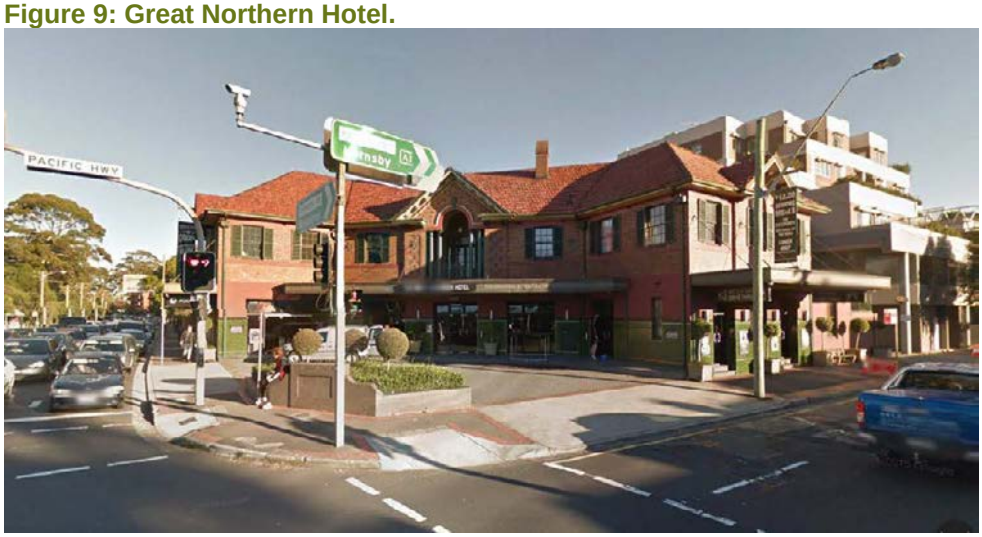
Table 6: Mowbray House and 10m curtilage heritage impact assessment

Mowbray House and 10m curtilage[23]	
Image	**Figure 7: Mowbray House from Mowbray Road. Artefact Heritage 2015.**  **Figure 8: Mowbray House with c.1957 first floor addition. SHI 'Mowbray House'** 
Significance	Local

[23] Description and Statement of significance extracted from State Heritage inventory sheet "Mowbray House" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=3430474 on 22/10/2015.

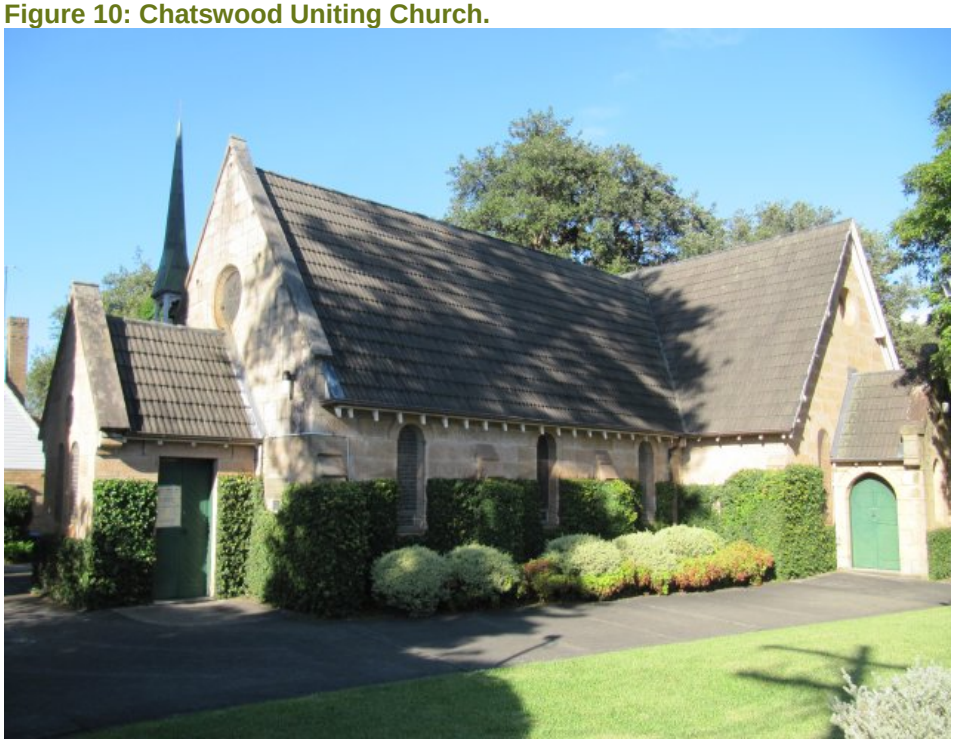
Mowbray House and 10m curtilage[23]	
Description	'Mowbray House' is a two storey tuck pointed face brick school building with a hipped tile roof and cream cement render on first floor level. It is designed in the Interwar Georgian Revival style evidenced by the regular multi paned windows and symmetrical form. Decorative elements include timber eaves brackets and unusual corner chimneys. It is located within the Artarmon Urban Conservation Area.
Statement of significance	Mowbray House is a modified but still recognisable example of an early 20th century Federation Arts and Crafts school building. Initially opened in 1906 as Chatswood Preparatory School, it operated as a school until 1954 and has been used as a part of an electricity depot since 1957. The site had been the location of previous schools (now demolished or relocated) since the 1870s. While the remainder of the site is heavily modified, Mowbray House remains reasonably intact and makes an important contribution to the streetscape.
Impact type	Direct impact: adaptive re-use Potential direct impact: vibration Indirect impact: views and vistas
Heritage impact assessment	Mowbray House is located within the proposed Chatswood dive site, immediately adjacent to the tunnel portal/dive structure. T1 North Shore Line works would not impact on this heritage item. Mowbray House, which has itself undergone numerous modifications and amalgamations throughout the 20th century, would be retained within the proposed construction site. Physical impacts would include the demolition of non-original outbuildings constructed in the later 20th century. Surrounding trees would also require removal. It is possible that temporary protective measures would need to be established internally to protect the retained structure and enable it to be used for potential site, or other purposes. It is assumed that the façade of the building would not be impacted by the proposed works, and that on finalisation of the works, any interior modifications would be reversible. **Direct impact: Minor** Tunnelling works and the dive structure would be excavated immediately east of the heritage item. Modelling indicates that the closest façade of this item would experience vibration levels above the screening level for cosmetic damage. **Potential direct impact: Minor** It is likely that a number of surrounding structures would need to be demolished in order to excavate and construct the dive structure, and establish the northern dive construction site. All trees within the construction site would also require removal. Visually, the surrounding buildings do not contribute to the heritage setting of Mowbray House, and represent a substantial modification of the original streetscape. The demolition of these buildings, if required, would have a minor impact on the heritage item. Following establishment of the northern dive site, the spoil facility and storage would be established to the north, and to behind/to the rear, of the heritage item. This would have a negligible visual impact on the heritage item and its significance as an important contributor to the streetscape. **Indirect impact: Minor**

Table 7: Great Northern Hotel heritage impact assessment

Great Northern Hotel	
Image	**Figure 9: Great Northern Hotel.** 
Significance	Local
Description	Opened in 1870 The Great Northern was the first hotel in the Willoughby Municipality. It was built by Henry Russell, an Alderman of Willoughby Council. The hotel was used as a staging stop and was briefly called the Artarmon Hotel around 1915, before being renamed The Great Northern once again. It was rebuilt in the 1930s.[24]
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The heritage item is located west of the construction site. In addition, works at the Pacific Highway and Mowbray Road intersection would occur immediately east of the curtilage of the heritage item. The works would involve minor modification and widening of a portion of Mowbray Road. Visually, these works would have a negligible impact on the heritage item. **Indirect impact: Negligible**

[24] Information obtained from 'Heritage Plaques' page on the Willoughby City Council website. Last access via http://www.willoughby.nsw.gov.au/your-neighbourhood/heritage/Place/heritage-plaques/7/ on 28/01/2016.

Table 8: Chatswood South Uniting Church and Cemetery

Chatswood South Uniting Church and Cemetery[25]	
Image	**Figure 10: Chatswood Uniting Church.** 
Significance	State
Description	The site is on a corner of a busy intersection with the Pacific Highway. The 0.8 hectare site slopes down gently from east to west and contains a scattering of large turpentine trees, possibly remnant specimens. The property boundary has been intact since purchase in 1871. A small sandstone church in simple Victorian Gothic style occupies the north-east corner of the site. A 1960s fellowship centre lies further west, adjacent to the Sunday school. A cemetery lies to the north-west. The south-west is used as a car park shaded by trees; the south-east contains the parsonage. A small graveyard lies to the west of the church, with burials dating from 1871 to 1924, with the majority being before 1910. Most monuments are of sandstone or marble and simple in design. The cemetery is not enclosed.
Statement of significance	This church group is of historic, aesthetic and social significance as a fine, intact rural church, graveyard and landscaped grounds indicative of the early rural settlement of Lane Cove in the eighteen seventies. It is the oldest remaining (the third built) Methodist church on Sydney's North Shore, and the first church to be built in Lane Cove. The graveyard contains the remains of early pioneer families such as the Forsythe, Bryson and French families). It is also of aesthetic significance as a landmark on the Pacific Highway.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The heritage item is located south-west of the construction site. In addition, works at the Pacific Highway and Mowbray Road intersection would occur immediately east of the curtilage of the heritage item. The works would involve minor modification and widening of a portion of Mowbray Road. Visually, these works would have a negligible impact on the historic, aesthetic and social significance of the heritage item. **Indirect impact: Negligible**

[25] Description and Statement of significance extracted from State Heritage Register inventory sheet "Chatswood South Uniting Church and Cemetery" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?id=5045420 on 28/10/2016.

Table 9: Garden of Remembrance heritage impact assessment

Garden of Remembrance[26]	
Image	**Figure 11: Garden of Remembrance, with Chatswood Railway Station in the background. Artefact Heritage 2014.** 
Significance	Local
Description	The Garden of Remembrance features roses with plaques inscribed with the names of Willoughby service personnel who lost their lives as the result of wars, Picardy Roses grown from budwood obtained from Villiers-Brettonneux and Delville-Wood War Cemeteries in the Somme area of France, and rosemary plants grown from a cutting brought back from Gallipoli by an injured serviceman in 1915. The garden is landscaped with formalised paths terminating at the northern end with a view towards the Boer War memorial, originally located in Chatswood Park, and focuses on a central memorial on a raised grassed mound. The setting of the Garden of Remembrance was subject to modification as part of the Epping to Chatswood Rail Link works and ongoing upgrades to Chatswood Railway Station.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The heritage item is located within the buffer zone to the north of the T1 North Shore Line works study area. Visual connection between the heritage item and the current rail corridor is limited (the rail corridor is elevated in this location). The track viaduct and trackworks would therefore have a negligible and temporary visual impact on the heritage item. **Indirect impact: Negligible**

[26] Description and Statement of significance extracted from State Heritage inventory sheet "St Leonards Centre" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2181335 on 22/10/2015.

Table 10: Chatswood Zone substation No.80 heritage impact assessment

Chatswood Zone substation No.80[27]	
Image	**Figure 12: Chatswood Zone substation No.80. Artefact Heritage 2015.** 
significance	Local
Description	Constructed in 1923, the substation consists of a large two storey tuck pointed brick building designed in the Interwar Art Nouveau style.
Statement of significance	The Chatswood Zone substation is a substantial and externally intact Interwar industrial building, which is a representative example of its type and one of only a few similar Interwar industrial buildings of its type remaining in the Willoughby area. It is an important link with the introduction of electricity to the North shore.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The substation building would be located above the tunnel alignment and approximately 50 metres to the south of the tunnel portal. Vibration levels would be under the cosmetic damage screening level. **Potential direct impact: Neutral** The retention of Mowbray House to the north would maintain surviving elements of heritage significance within the streetscape. The retention of street trees in this location would also screen the dive site from the substation. The demolition of existing warehousing and commercial buildings to the north of Mowbray Road would therefore have a negligible impact on views towards the dive site from the substation. **Indirect impact: Negligible**

[27] Description and Statement of significance extracted from State Heritage inventory sheet "Electricity Substation No.80" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=3430473 on 08/12/2015.

Table 11: Chatswood Reservoirs No. 1 and No.2 (and associated curtilage) heritage impact assessment

Chatswood Reservoirs No. 1 and No. 2[28]	
Image	**Figure 13: View of the Chatswood reservoirs No.1 and No.2. Artefact Heritage 2015.** 
Significance	State
Statement of significance	Chatswood Reservoir No.1 (WS 24) and Chatswood Reservoir No.2 (WS 25) are a pair of identical riveted steel reservoirs, built at Chatswood in 1888. Riveted steel reservoirs are rare in the Sydney Supply Area, this being one of the finest and earliest groups.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The reservoirs are located above the tunnel alignment and approximately 100 metres to the south of the tunnel portal. Vibration levels would be under the cosmetic damage screening level. **Potential direct impact: Neutral** The retention of Mowbray House to the north-east would maintain surviving elements of heritage significance within the streetscape. The demolition of existing warehousing and commercial buildings within the Chatswood dive site would therefore have a negligible impact on the setting of the reservoirs. **Indirect impact: Negligible**

[28] Description and Statement of significance extracted from State Heritage inventory sheet "Chatswood Reservoirs No. 1 and No.2" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5051422 on 08/12/2015.

Conservation Area

Table 12: South Chatswood Conservation Area heritage impact assessment

South Chatswood Conservation Area[29]
Image

Figure 14: Overview of the South Chatswood Conservation Area.

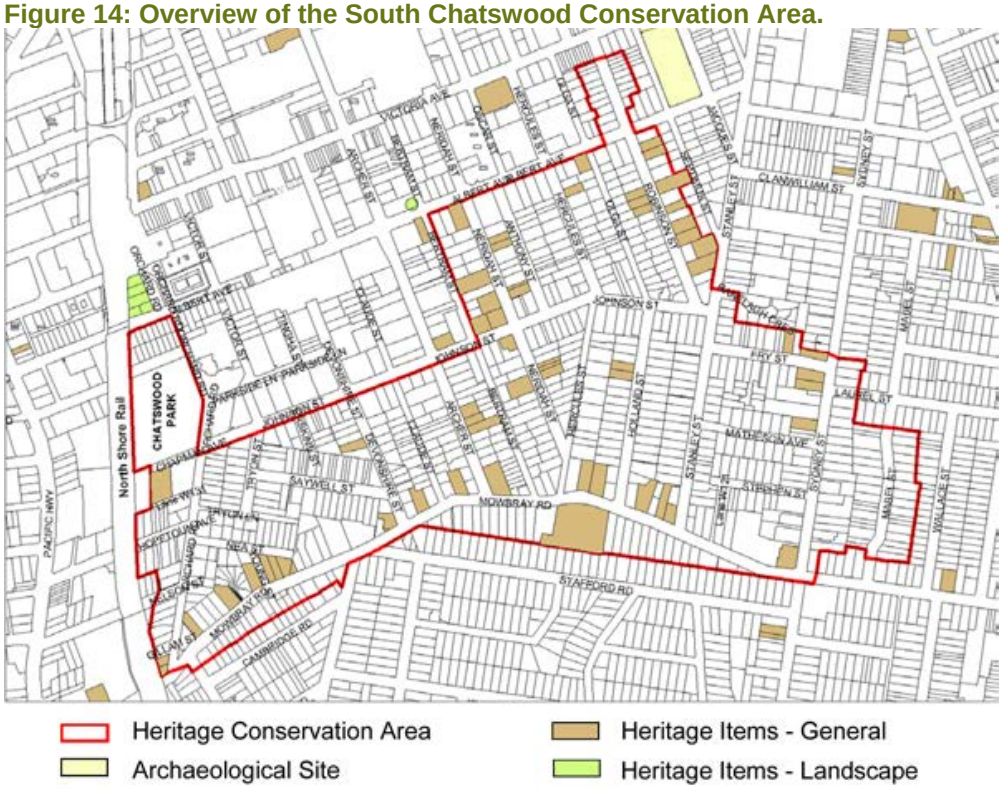
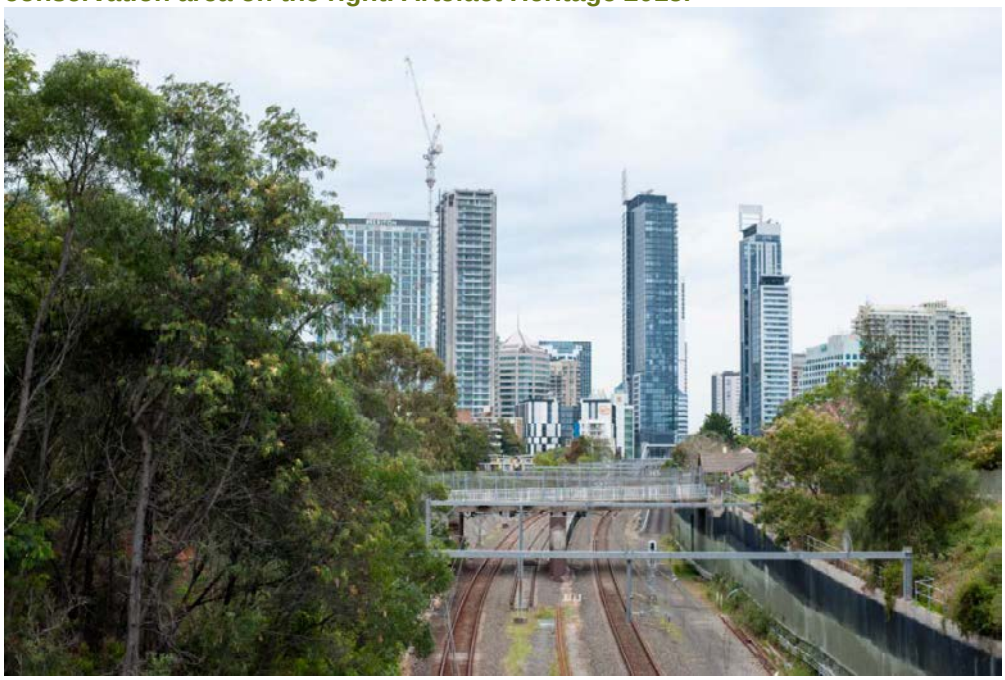


Figure 15: View to the north, towards Chatswood, from Mowbray Road, with conservation area on the right. Artefact Heritage 2015.



[29] Willoughby City Council "South Chatswood Heritage Conservation Area: C11" accessed via http://www.willoughby.nsw.gov.au/Development/Heritage---Conservation/conservation-areas/south-chatswood-heritage-conservation-area/ on 22/10/2015.

South Chatswood Conservation Area[29]	
Significance	Local
Description	As a whole, South Chatswood has a mixed character: styles range from California and Interwar bungalows, which are interwoven among the dominant Federation and late Victorian era buildings through the progressive resubdivision of what were often originally generous and gracious early estates. Victorian era house I105, shown in Figure 6 is an example of the late Victorian era buildings within the South Chatswood Conservation Area. As well as a few modest Victorian cottages, South Chatswood is remarkable for its concentration of imposing late Victorian mansions. Along Mowbray Road, their location on a prominent ridgeline and their well established gardens (including tall, highly visible exotic species), add to the landmark qualities of the more palatial buildings. These typically two storey mansions and many later Federation grand villas, are usually listed as individual Heritage Items. They also have considerable significance in their own right in addition to the distinctive qualities they impart to the streetscapes. There is great variety in the predominant Federation style from single storey semi detached cottages to rambling grand villas and rare two storey architect-designed mansions. Some streetscapes, as in Robinson and Neridah Streets, display a highly consistent Federation character, even where the scale and siting of buildings varies. The streetscapes of South Chatswood are unified by the generous landscaped settings of both the modest cottages and mansions. These gardens are characterised by mature exotic shrubbery and lawns, and low fencing allowing leafy vistas to and from the houses.
Statement of significance	South Chatswood Heritage Conservation Area is a good example of early North Shore residential development. Much of the dwelling stock retains its original detailing and distinctive architectural features. Most retain the original scale and basic form, which, apart from the two storey mansions, is predominantly single storey. The Mowbray Road streetscape is significant as one of Willoughby's earliest streets and most important routes, and because of this significance it displays a range of substantial and high quality residences from the early phase of development of the area, complemented by later development of the Interwar Period. The Heritage Conservation Area displays a high level of amenity and originality in its development as an early residential suburb up to the Second World War.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The development of the northern construction site and T1 North Shore line works would result in negligible visual impacts to the Heritage Conservation Area as a result of the construction of the dive structure in the eastern portion of the site and track viaducts within the rail corridor. Intersection works at the Pacific Highway and Mowbray Road intersection would occur immediately south-west of the curtilage of the conservation area. The works would include minor intersection works, resulting in the modification and widening of a portion of Mowbray Road. Visually, these works would have a negligible impact on the heritage item. **Indirect impact: Negligible**

Table 13: Artarmon Conservation Area heritage impact assessment

Artarmon Conservation Area[30]
Image

Figure 16: The Artarmon Conservation Area.

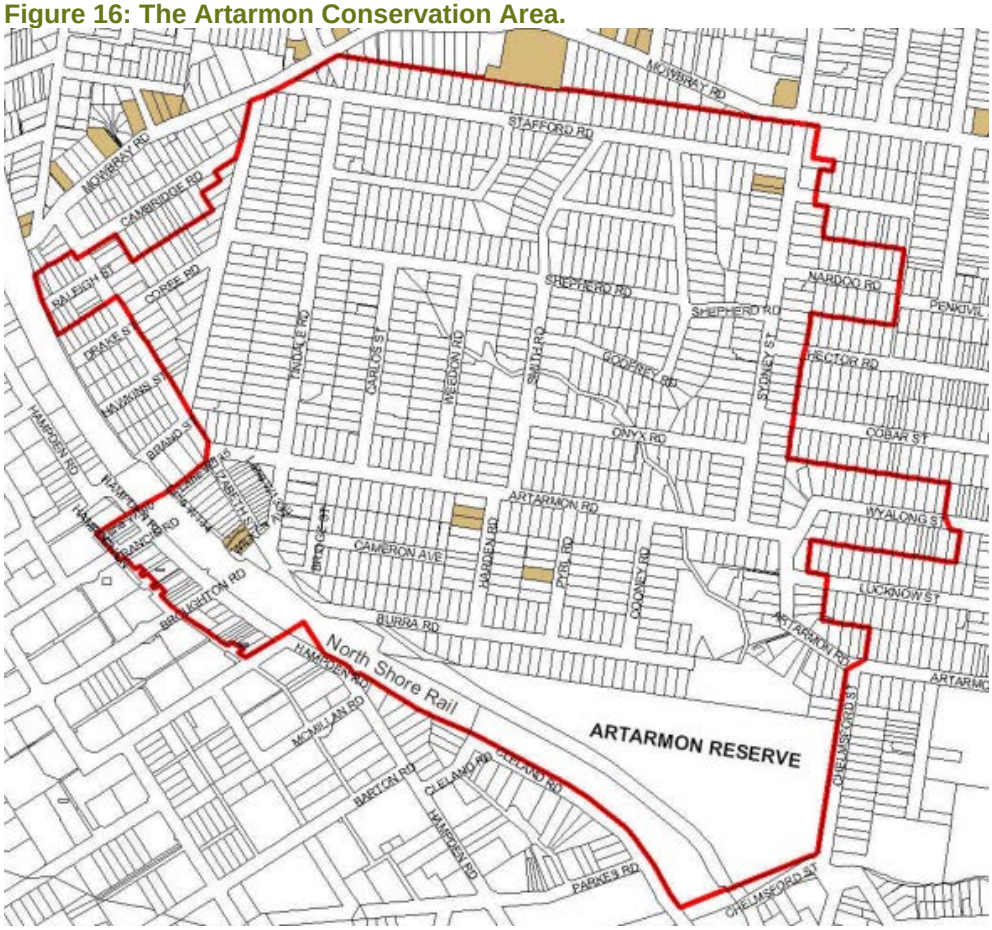


Figure 17:View to the south, towards Artarmon, from Mowbray Road, with the Artarmon Conservation Area to the left. Artefact Heritage 2015.

[30] Controls for Heritage Items and Heritage Conservation Areas Part H Willoughby LEP 2012; H3-2.

Artarmon Conservation Area[30]	
Significance	Local
Description	A rectilinear subdivision pattern has been superimposed on a hilly area of moderate slopes. The regularity of the lot layout is interrupted by several well vegetated drainage reserves flowing across to the remnant bushland of Artarmon Reserve. The original subdivision pattern of narrow carriageways and wide grassy verges (usually planted with mature street trees, such as brush box and jacaranda) prevails, except for Artarmon and Sydney Roads, which have wider carriageways taking the main traffic volumes to and from Artarmon Station and shopping centre. The denser pattern of settlement near Artarmon Station is a good example of Interwar flat development providing comfortable housing that is well integrated with nearby public transport and commercial opportunities. The well-proportioned flat buildings form a cohesive residential precinct of generally consistent two storey scale, of similar materials and with shared modest embellishments, including decorative brickwork. Such characteristics enhance their unity with the earlier group of Edwardian commercial buildings at Wilkes Plaza.
Statement of significance	The Heritage Conservation Area is outstanding for its intactness, with few unsympathetic intrusions occurring. The wide range of largely intact California and Interwar bungalows as well as Federation housing in generally good condition, occur in either groupings of consistent styles or subtle blends of successive periods to produce a mix of interesting and varied streetscapes. The area is significant as a harmonious and unified 1910 – 1920's lower North Shore residential area whose development relates to the development of the railway.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The T1 North Shore Line metro track works and adjustments would result in negligible visual impact to the Heritage Conservation Area. The construction of the dive structure in the eastern portion of the site, and the track viaduct would have a negligible visual impact through the introduction of additional infrastructure into the existing rail corridor, including the track viaduct. **Indirect impact: Negligible**

6.2.4 Archaeological assessment

6.2.4.1 Site inspection results

The Chatswood dive site consists of built environment intersected by Mowbray Road and the North Shore Line. The area is covered either by hard surfaces, such as concrete and bitumen, or built structures. Exotic plantings are located along road verges and associated with built structures.

The existing rail corridor is located within a cutting beneath Mowbray Road, and raised on an embankment and viaduct structure across the low-lying terrain north of Nelson Street. The proposed tunnel entrance and work site area between Mowbray Road, Pacific Highway and Nelson Road includes built structures and a large hardstand car park.

Discussion and analysis of site inspection results

Observations of the rail corridor during the survey indicate that any natural landform associated with the rail corridor is likely to have either been removed for the cutting or built over for the embankment and viaduct structure.

The area between Mowbray Road, Pacific Highway and Nelson Road consists of one – two storey built structures and a large hardstand car park. No evidence of basements or below ground car parks associated with any of those structures were observed.

Figure 18: View north along North Shore line towards Chatswood CBD

Figure 19: View north across hardstand car park bordering the Pacific Highway

6.2.4.2 Discussion of archaeological potential

Analysis of historic plans suggests that the northern construction site was occupied as early as 1836. During the early to mid-1800s the study area appears to have been occupied by at least one tenant farmer, a C. Webb (Figure 20). The main house associated with the farmer may have originally been located within the footprint of Mowbray Road, which was constructed in the later 1800s. A number of outbuildings may have been associated with this early property.

In the late nineteenth and early twentieth century the study area was on the eastern edge of Chatswood, and contained a number of commercial buildings including a cottage and store (1899; Figure 21), a residence and the council chambers/school of arts hall (1898) and a livery and stables (1905).

As the study area currently contains low-rise commercial development and open space (carparking), and appears to have done so throughout much of the twentieth century (according to historical aerial photographs of the study area), it can be assumed that the northern construction site study area would have some archaeological potential to contain remains associated with early nineteenth to early twentieth century occupation.

Figure 20: C. Webb's farm. Cottage within Mowbray Road corridor and the original fenceline is shown as being partially within the Pacific Highway road corridor. Source: MLNSW Copy of E.J.H. Knapp's Plan of Mr. Nichol's Estate at Hunters Hill. Z/M3 811.141/1936/1.

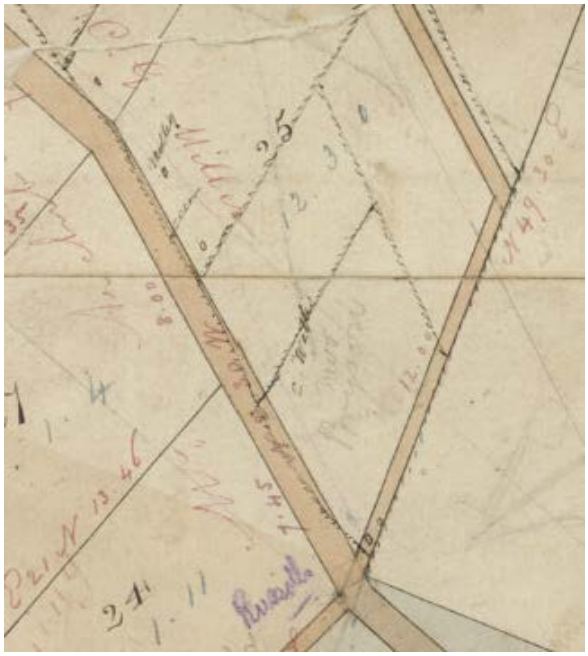
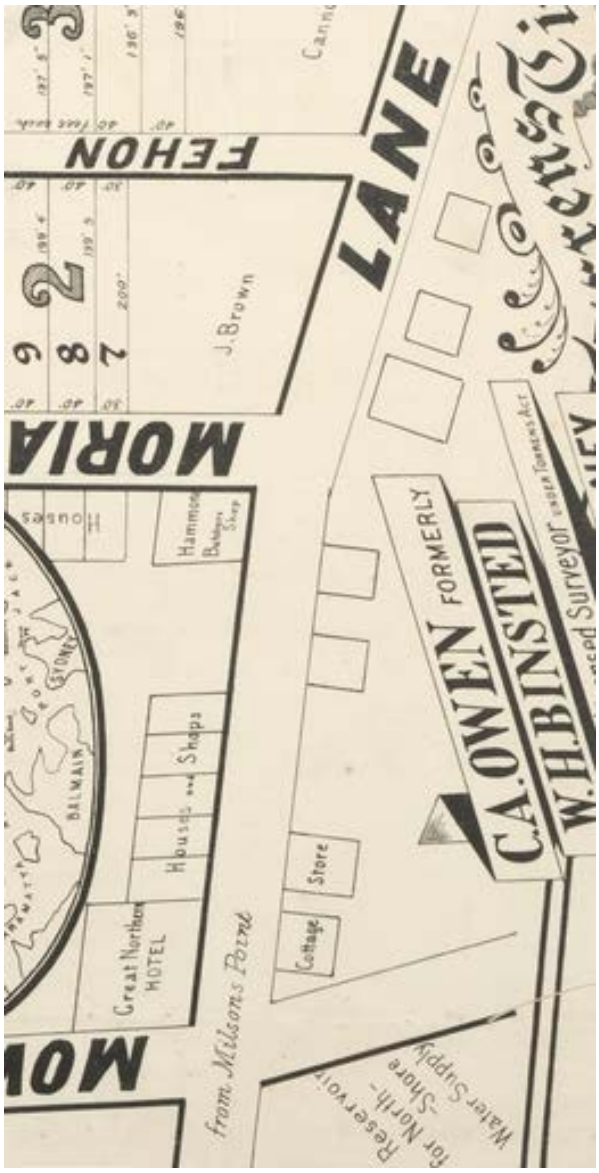


Figure 21: Cottage and store on Mowbray Road in 1899. Source: MLNSW C. A. Owen's plan of the North Shore Railway Estate. Z/SP/C15/11.



6.2.4.3 Assessment of significance

The following is a preliminary assessment of significance, informed by the NSW Heritage Criteria for *Assessing Significance related to Archaeological Sites and 'Relics'* (2009).

Archaeological research potential (NSW Heritage Criterion E):

- Archaeological remains associated with early residential and agricultural development of the study area may have some research potential dependant on the nature and extent of any remains.

Association with individuals, events, or groups of historical importance (NSW Heritage Criteria A, B & D):

- It is possible that evidence of early residential development of the study area may have associations with former residents and known local historical figures. Specific associations have not been identified at this stage.

Aesthetic or technical significance (NSW Heritage Criterion C):

- It is not possible at this stage to identify whether archaeological remains within the study area have potential to demonstrate aesthetic or technical values.

Ability to demonstrate the past through archaeological remains (NSW Heritage Criterion A, C, F & G):

- There is low to moderate potential, due to low intensity building that has occurred throughout the site, that the study area has the potential to demonstrate the past through archaeological remains.

Overall, the site may contain archaeological remans with potential to reach the local significance threshold.

6.2.4.4 Overview archaeological potential

Table 14 includes a summary of archaeological potential and significance and outlines recommendations.

Table 14: Summary of archaeological potential within study area

Potential archaeological resource	Potential	Significance	Heritage impact assessment
Mid-19th century occupation (C. Webb's property) – evidence of land clearance and cultivation, outbuildings, drains, cesspits, wells.	Low	Local	Excavation works within the study area have low potential to impact on archaeological remains.
Mid to late 19th century residential and commercial development	Low-moderate	Local	Excavation works within the study area have low-moderate potential to impact on archaeological remains
20th century residential and commercial development	Moderate	Unlikely to reach the local significance threshold.	Excavation works within the study area have moderate potential to impact on archaeological remains.

6.2.4.5 Archaeological impact assessment

Proposed works within the Chatswood dive site (northern) with the potential to impact on archaeological remains include:

- Excavation works associated with the removal of existing structures and the Nelson Street bridge
- Excavation required in the construction of the dive site
- Excavation to upgrade or install in-ground services required for the establishment of the water treatment plant, site offices, staff amenities and the spoil and dive works facilities
- Foundation works for the establishment of site amenities and facilities

Works with the potential to impact archaeological resources within the Chatswood dive site, excepting excavation for the dive structure (contained largely within the existing rail corridor), are likely to be limited to discrete locations and associated with minor activities.

Therefore, works are likely to have a minor to moderate impact on potential archaeological resources, dependant on the location and extent of the proposed excavation works.

6.2.5 Overview of constraints

The following table outlines the potential heritage constraints within the study area.

Table 15: Overview of constraints on heritage items and areas of archaeological potential

Heritage item	Potential heritage impacts		
	Direct impact	**Archaeological impact**	**Indirect impact**
Mowbray House	Direct impact: Minor (tree removal, demolition non-original outbuildings, internal modifications) Potential direct impact: Minor (vibration)	Neutral	Minor – views and vistas
Great Northern Hotel	Neutral	Neutral	Negligible – views and vistas
Chatswood South Uniting Church and Cemetery	Neutral	Neutral	Negligible – views and vistas
Garden of Remembrance	Neutral	Neutral	Negligible – views and vistas
Chatswood Zone Substation No.80	Neutral	Neutral	Negligible – views and vistas
Chatswood Reservoirs No. 1 and No. 2	Neutral	Neutral	Negligible – views and vistas
South Chatswood Conservation Area	Neutral	Neutral	Negligible – views and vistas
Artarmon Conservation Area	Neutral	Neutral	Negligible – views and vistas
Archaeological resource within the study area	N/A	Minor to moderate impact - moderate potential for locally significant archaeological remains	N/A

6.3 Artarmon substation

A traction substation is required between Chatswood and Crows Nest to support operation of the project. The proposed site is adjacent to the Gore Hill Freeway. The site is elevated above freeway level, with a retaining wall immediately below the site.

The Artarmon substation would be constructed in the following sequence:

- Excavation of a vertical shaft to the tunnels below
- Lining and reinforcement of the shaft
- Building works for aboveground components
- Installation of electrical equipment.

The location and indicative layout of the Artarmon substation construction site, including vehicle access / egress is illustrated in Figure 22 and Figure 23.

Figure 22: Artarmon substation construction site layout.

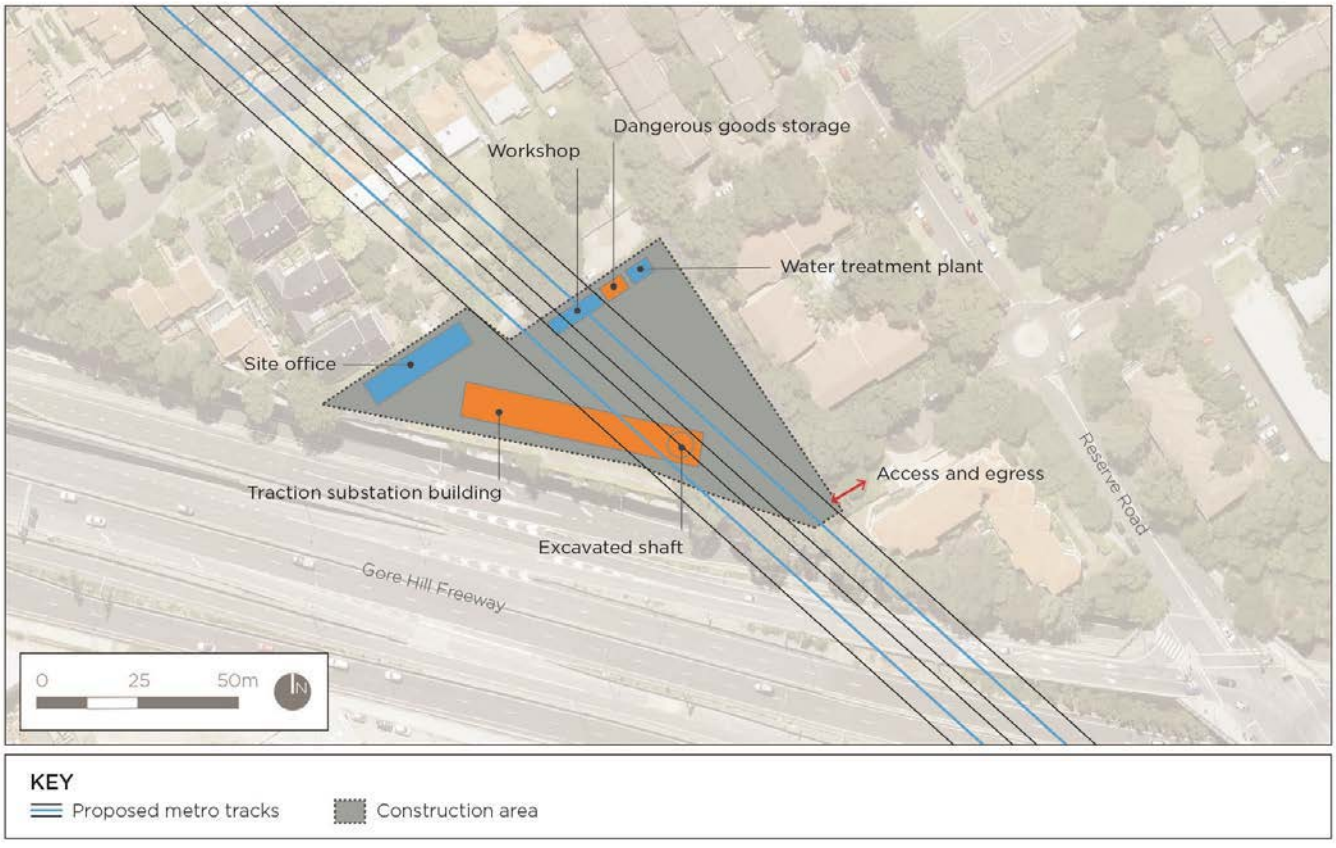
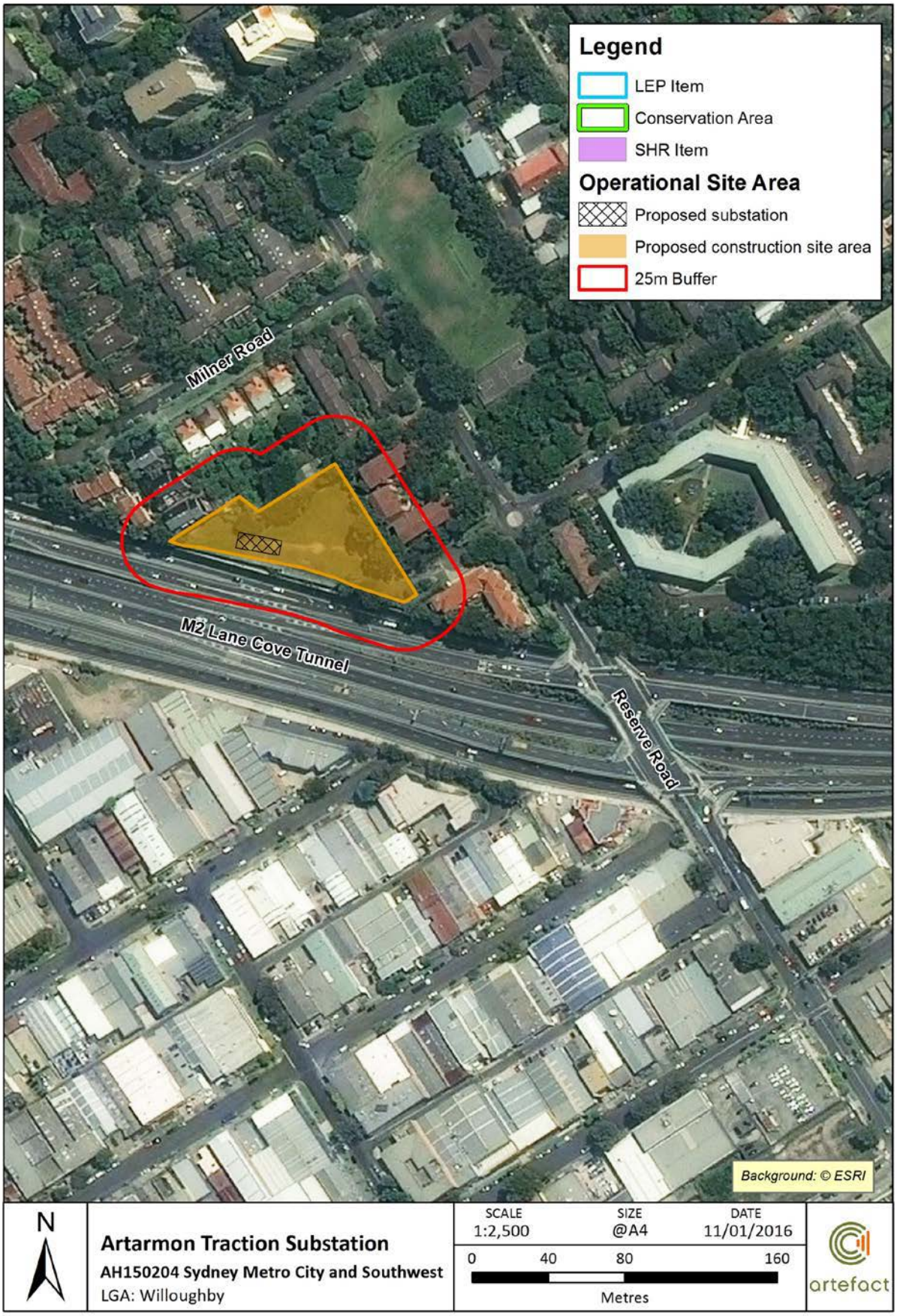


Figure 23: Location of the Artarmon Substation



6.3.1 History of the study area

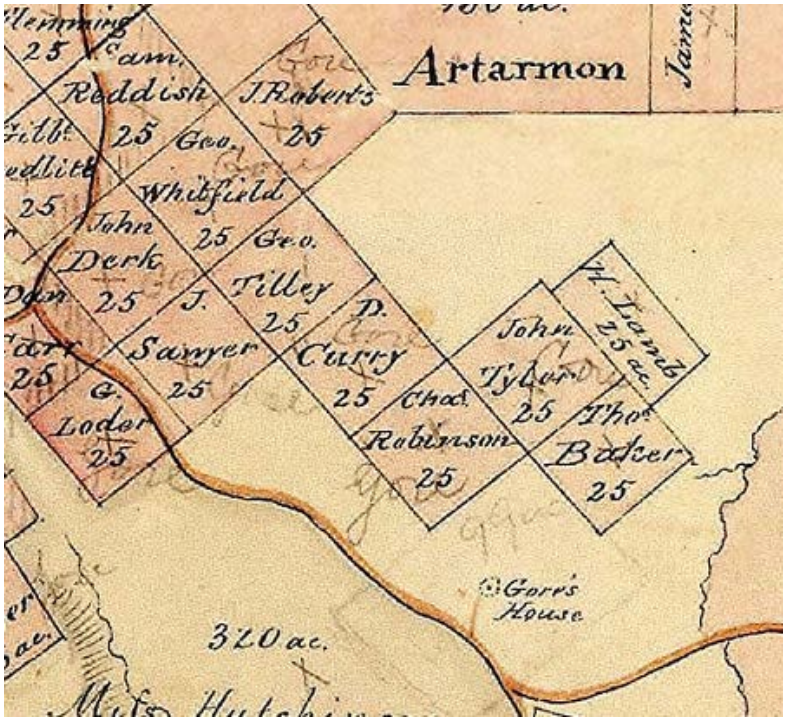
In 1794 the first land grants were made in the area that was to become known as Artarmon, although few of these were ever occupied and those that were occupied were generally not held for long. The landscape was a difficult one to utilise prior to the clearing of the land. [31] The present-day Pacific Highway, that demarcates the westernmost boundary of Artarmon and traverses the higher ground, was an original timber-getters route.

The suburb of Artarmon is believed to have been named for a 150 acre land grant made to Provost Marshal William Gore in 1810 by Governor Macquarie. Gore's family home was Ardthelmon Castle, in Ireland, the name of which was adopted by Gore as the Artarmon Estate. Gore was initially successful and acquired several farms in the area surrounding his original grant.[32] However, in 1818, Gore defaulted on his mortgage and was forced to sell most of his land, with the exception of a small portion on which he built a small cottage named Artarmon House (Figure 24).

Artarmon House was acquired by Richard Harnett who built a grand residence adjacent to the cottage in 1869. George Whiting later owned the estate, and called it Valetta. In 1922, on Whiting's death, the estate was purchased by the North Sydney Brick and Tile Company. The house was subsequently demolished in 1939. The estates stables remain standing in the grounds of Gore Hill College of Technical and Further Education.[33]

The study area is located on a land grant of 25 acres originally made to Geo. Tilley (Figure 24), in an area to the east of the suburb. Artarmon east remained less developed than the western side of the Pacific Highway into the early 20th century.[34]

Figure 24: Undated plan of the Parish of Willoughby, showing the 25 acre grant to Tilley, and the location of "Gore's House," to the south. Source: Lands and Property Information, Parish Preservation Project.



[31] Fallowfield, R. *Artarmon* for the Dictionary of Sydney, 2008.
[32] Ibid
[33] ibid
[34] Ibid.

During the 1850s the area was dominated by orchards and market gardens. Brickmaking was also a common industry in the area from the early 19th century. In 1869, when the Municipality of North Willoughby was proclaimed, there were 400 inhabitants in the district.[35] The North Shore Railway was opened in 1890, encouraging subdivision throughout the area, although it was not until the late 19th century that subdivision occurred on any real scale. The opening of the Artarmon Railway Station in 1898 encouraged the increasing urbanisation of the suburb. The late 1890s saw the introduction of some public utilities to the area, including gas, and later, electricity. Some areas were supplied with a sewer as early as 1899, but comprehensive coverage of the area did not occur until 1920.[36]Municipal garbage collection commenced in the 1920s.

A boom in the residential property market occurred throughout the 1920s and 1930s, and many Federation and Californian Bungalow style homes were constructed at this time.

6.3.2 Heritage listed items

There are no heritage listed items within the Artarmon traction substation study area.

6.3.3 Archaeological assessment

6.3.3.1 Site inspection results

The Artarmon substation site was an active construction site at the time of the site survey, and was not accessed.

Discussion and analysis of site inspection results

Observations of the work site from Barton Road support the background information that the site is extensively disturbed.

Figure 25: View northwest across the Artarmon construction site from Barton Crescent

Figure 26: View northwest across the Artarmon construction site from Barton Crescent

6.3.3.2 Overview of previous structures

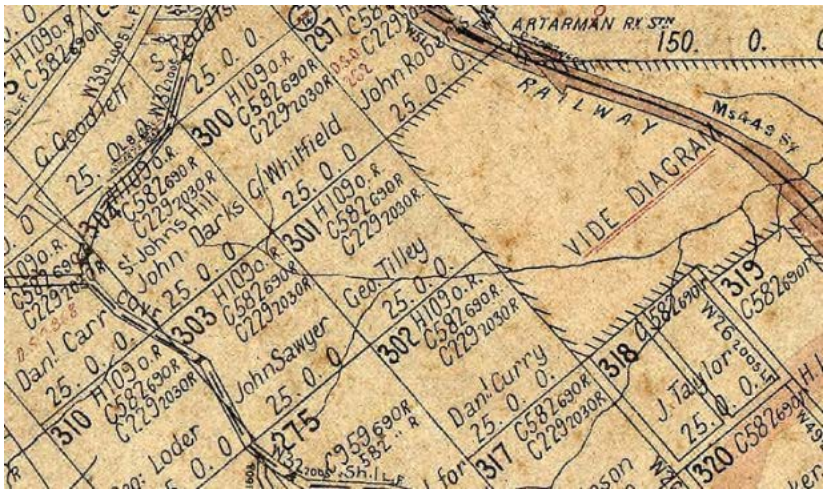
An analysis of historic plans of the Artarmon construction site study area indicates that was originally part of the Gore or Artarmon Estate, a substantial land grant made in the early 1800's. In the early to mid-nineteenth century it was part of 25 acres owned by George Tilley (Figure 27).

No evidence of earlier structures was found during this analysis, although it is possible that occupants of the land may have constructed sheds or similar structures on the property. An article in the Sydney

[35] Fallowfield, R. *Artarmon* for the Dictionary of Sydney, 2008.
[36] Ibid

Morning Herald dating to 1889 indicates that the land was held by a number of tenants throughout the mid nineteenth century and used for timber-getting.

Figure 27: Undated plan of the Parish of Willoughby, showing George Tilley's 25 acre grant.



The Artarmon study area is currently in use as a temporary educational/school site. In the mid twentieth century the study area was occupied by small-scale residential subdivision (Figure 28). It is likely that most of these residences were associated with the later nineteenth century expansion of the surrounding area. These residences appear to have been demolished for construction of the Gore Hill Freeway, which is likely to have resulted in substantial modification to the surrounding landscape. Archaeological remains of twentieth century housing are unlikely to reach the local significance threshold.

Figure 28: 1943 aerial of the study area, showing a number of residences.

6.3.3.3 Preliminary assessment of significance

The following is a preliminary assessment of significance, informed by the NSW Heritage Criteria for *Assessing Significance related to Archaeological Sites and 'Relics'* (2009).

Archaeological research potential (NSW Heritage Criterion E):

- Archaeological remains associated with early residential and agricultural development of the study area may have some research potential dependant on the nature and extent of any remains.

Association with individuals, events, or groups of historical importance (NSW Heritage Criteria A, B & D):

- It is possible that evidence of early residential development of the study area may have associations with former residents and known local historical figures. Specific associations have not been identified at this stage.

Aesthetic or technical significance (NSW Heritage Criterion C):

- It is not possible at this stage to identify whether archaeological remains within the study area have potential to demonstrate aesthetic or technical values.

Ability to demonstrate the past through archaeological remains (NSW Heritage Criterion A, C, F & G):

- There is low to moderate potential, due to low intensity building that has occurred throughout the site, that the study area has the potential to demonstrate the past through archaeological remains.

Overall, the site may contain archaeological remans with potential to reach the local significance threshold.

6.3.3.4 Overview archaeological potential

The study area has low potential to contain a substantial archaeological resource with the potential to reach the local significance threshold.

Table 16: Summary of archaeological potential within study area

Potential archaeological resource	Potential	Significance	Heritage impact assessment
Evidence of early development of the study area (Artarmon and Gore Estates) – for example, evidence of land clearance and cultivation, outbuildings, postholes associated with fencing.	Nil-low	Local	Excavation works within the study area have nil-low potential to impact on archaeological remains.
Mid-19th century development (Tilley's Grant) – evidence of timber getting or cultivation	Nil-low	Local	Excavation works within the study area have nil-low potential to impact on archaeological remains.
Late 19th and early 20th residential development	Low - moderate	Unlikely to reach the local significance threshold.	Excavation works within the study area have moderate potential to impact on archaeological remains.

6.3.3.5 Archaeological impact assessment

Proposed works within the Artarmon Substation site with the potential to impact on archaeological remains include:

- Excavation of a shaft (approximately 3 metres in diameter) to reticulate electrical cables to the tunnel below
- Foundation/ground slab excavation for construction of an aboveground building, workshops, site offices, wheel washing bay and water treatment plant.

Works with the potential to impact archaeological resources within the Artarmon substation are likely to be limited to discrete locations. Therefore, works in this location are likely to have a minor impact on potential archaeological resources, dependant on the location and extent of the proposed excavation works.

6.3.4 Overview of constraints

The following table outlines the potential heritage constraints within the study area.

Table 17: Overview of potential heritage constraints for Artarmon study area.

Heritage item	Potential heritage impacts		
	Direct impact	**Archaeological impact**	**Indirect impact**
Potential archaeological resource within the study area	N/A	Minor - nil to low potential for locally significant archaeological remains	N/A

6.4 Crows Nest Station

Crows Nest station is strategically located to the south of the existing St Leonards station and close to the entertainment and retail strip along Willoughby Road. The station box would site between the Pacific Highway, Oxley Street, Clarke Lane and Hume Street. The station entrances would be located on Clarke Street and the Pacific Highway (Figure 29 and Figure 30).

Figure 29: Location and indicative layout of Crows Nest Station.

6.4.1 Construction

The Crows Nest Station construction site would be about 6,000 square metres and would be located adjacent to the Pacific Highway to the south of Oxley Street. The site currently contains a variety of commercial and residential buildings.

This station would be constructed using a cut-and-cover methodology, resulting in a total of about 150,000 cubic metres of spoil being removed through the site. The site would function as two separate construction zones split by Hume Street. The cut-and-cover construction through Hume Street would be staged to allow two way traffic access to be maintained, although there may be some short term periods of closure.

Access and egress to and from the site would be to and from Hume Street and Clarke Street.

The station excavation would comprise the majority of the site, necessitating a street level temporary working platform to be installed. Support services including office, amenities, spoil handling and storage, and workshops would be provided on the working platforms.

Figure 30: Crows Nest Station construction site layout.

6.4.2 History of the study area

The majority of the lower North Shore is associated with large land grants given to free settlers in the early 19th century. Crows Nest occupies land originally granted to London born Edward Wollstonecraft in 1821. Wollstonecraft, a wealthy merchant and landowner, was a cousin to Mary Shelley, the author of *Frankenstein*. Wollstonecraft resented his connection to the 'unconventional' author and was eager to escape London. In 1812 he met Scottish merchant Alexander Berry (who would also become a wealthy New South Wales landowner) and the two men formed a friendship and business partnership. In addition, Berry, Wollstonecraft and his sister Elizabeth shared lodgings in London for six years. Berry would go onto marry Elizabeth. [37]

[37] Stephen, M. D. 1967. 'Wollstonecraft, Edward (1783–1832)', Australian Dictionary of Biography, National Centre of Biography, Australian National University. Site accessed on 3/6/2015 at: http://adb.anu.edu.au/biography/wollstonecraft-edward-2812/text4025

In 1819, Berry, Edward and Elizabeth Wollstonecraft sailed to New South Wales aboard separate ships. Governor Macquarie promised each man a 500 acre grant (Figure 31).[38] Wollstonecraft's grant was located on the North Shore, described as 'exclusive of rocks and sand' and named Crow's Nest.[39] Here he built a small cottage, on top of a hill, to the south west of the study area. Wollstonecraft, however, preferred to reside in the three storey shop he and Berry had established at The Rocks. Wollstonecraft passed away in 1832 at the age of 49, owning 30,000 acres with Berry. By this stage, Berry had married Elizabeth and the two were living on his south coast estate in Coolangatta, where he had become a large land holder. Wollstonecraft never married and his Crow's Nest estate was left to Berry and Elizabeth who returned soon after and resided in Crow's Nest.[40]

Figure 31 1846 Parish of Willoughby map showing Wollstonecraft's 548 acre grant. Published by W. Meadows Brownrigg, surveyor. Source. NLA.

Soon after moving into the estate, Berry renovated the small cottage at Crow's Nest. Over time, Berry accumulated land to the east of the estate, and a portion of the study area is located within one of these later grants. By this stage, Berry's landholdings were one of the largest in the North Shore, and he soon began selling and leasing land. In 1845 Elizabeth died and in 1850 the larger, and 'more conveniently located' Crows Nest House was completed.[41]

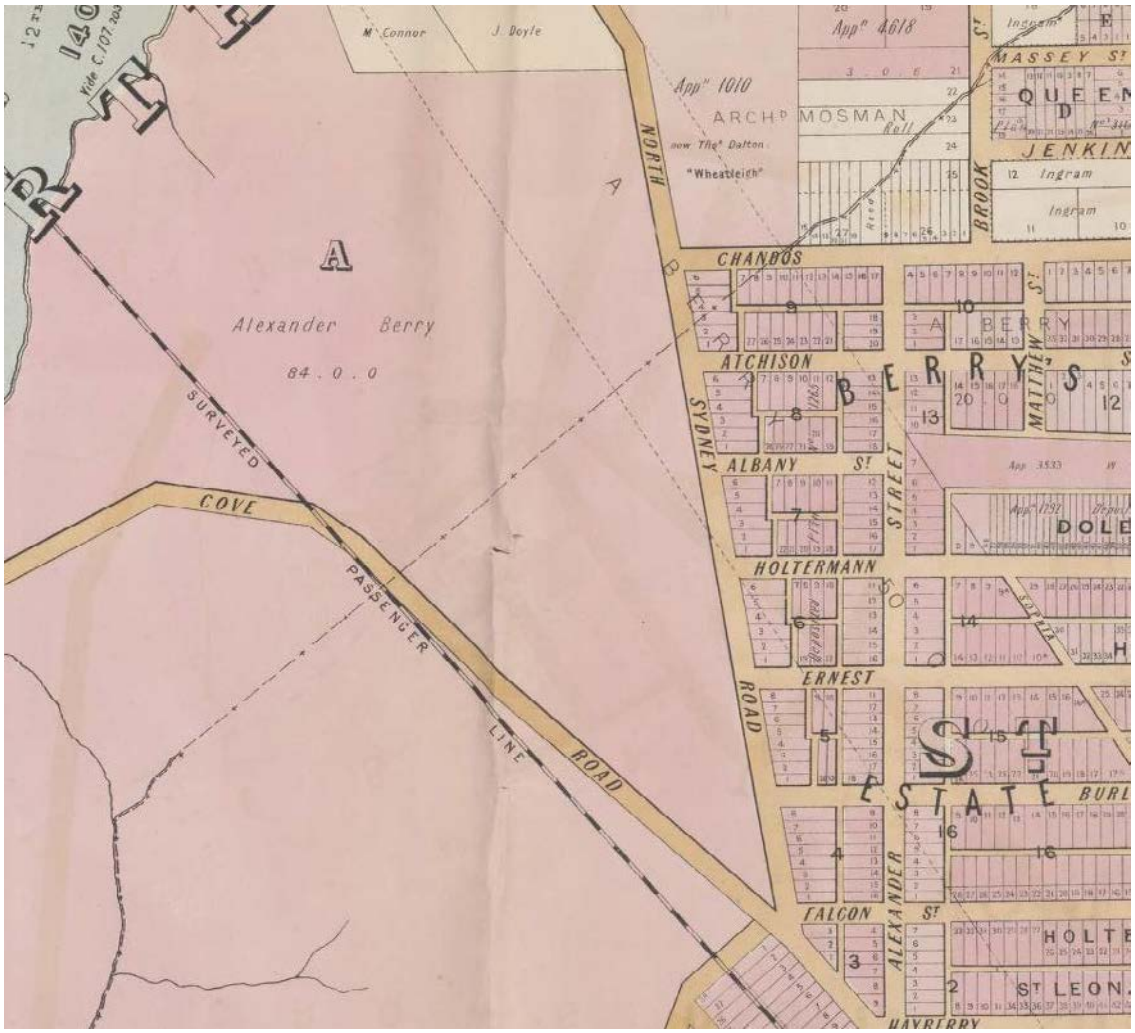
Berry began subdividing and selling off portions of the estate near Lane Cove Road (now the Pacific Highway) soon after Elizabeth's death. Despite subdivisions taking place elsewhere in the area, and

[38] Stephen, M. D. 1967. 'Wollstonecraft, Edward (1783–1832)', Australian Dictionary of Biography, National Centre of Biography, Australian National University. http://adb.anu.edu.au/biography/wollstonecraft-edward-2812/text4025
[39] North Sydney Council. From Land Grant to Subdivision. Site accessed on 3/6/2015 at: file:///C:/Users/artefact/Downloads/From_Land_Grant_to_Subdivision.pdf
[40] The Dirt on the Rocks, 2010. Wollstonecraft on the Rocks!. Site accessed on 3/6/2015 at: http://thedirton.therocks.com/2010_10_01_archive.html
[41] Historic Houses Trust. Crows Nest House. Site accessed on 3/6/2015 at: http://collection.hht.net.au/firsthhtpictures/picturerecord.jsp?recno=37906

the 1860s and 1880s lower North Shore land boom, land sales and development were slow. The location of these subdivisions, and the intact Crows Nest estate, can be seen Figure 32.

Berry resided in Crows Nest until his death in 1873, at which time the house was leased to District Court Judge Alfred McFarland until 1891. The house was then inherited by Berry's relative Sir John Hay and later, Lady Hay. In the early 1890s, John Hay donated a large portion of the estate to the Government for the construction of the Milsons Point to Hornsby railway line (part of the soon to be completed North Shore Line). This is located to the south west of the study area. Hay took the opportunity to put a number of large subdivisions on the market during this time. However, his timing was poor, and the economic depression of 1890-93 meant few allotments were sold.[42]

Figure 32: Higginbotham & Robinson. Map of St. Leonards on the North Shore Parish of Willoughby 1887 showing the relatively undeveloped Wollstonecraft and Berry estate and some subdivisions to the east. MAP RM 4458. Source. NLA.



6.4.2.1 1893 -1932

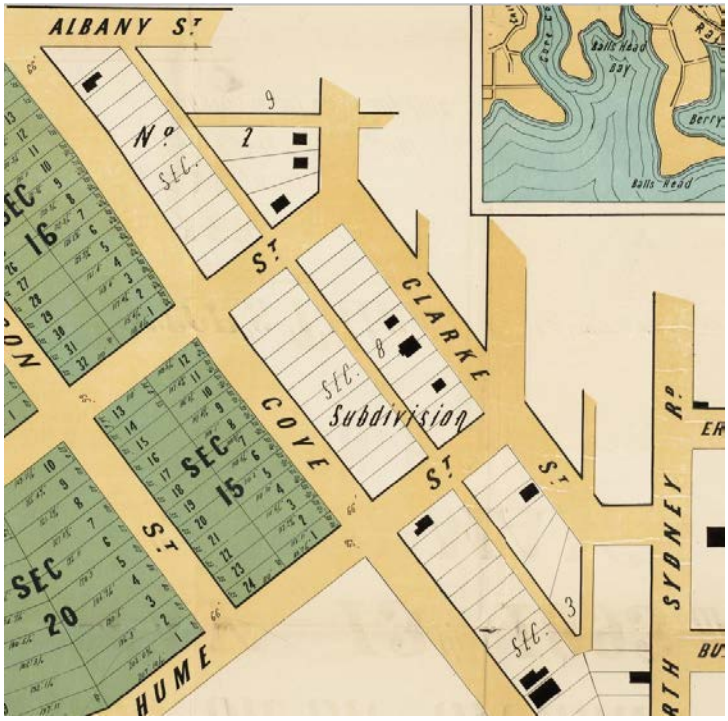
When the North Shore Line was completed in 1893 suburban settlement in the area continued. However, due to difficulties crossing the harbour, this was slow. This is evidenced by subdivision plans of the Berry Estate from 1893 showing land within the study area - to the east of the Pacific Highway (formally Lane Cove Road) - had been subdivided and only a few allotments sold (Figure 33). The study area contains a number of buildings at this time. Many of the dwellings in the surrounding area were larger, Victorian style houses. Nicholson Street had not yet been extended into

[42] North Sydney Council. From Land Grant to Subdivision. Site accessed on 3/6/2015 at: file:///C:/Users/artefact/Downloads/From_Land_Grant_to_Subdivision.pdf

land to the west of today's Pacific Highway, which remained part of Berry's Crow's Nest House and gardens.

In 1904, additional subdivisions were made to the east of the study area, creating wide streets such as Chandos Street, Atchison Street, Albany Street and Ernest Street. Sir John Hay died in 1909, leaving the remainder of the estate to Lady Hay. Lady Hay would go on to approve a series of subdivisions from 1911 until her death in 1931. By 1909, the number of buildings to the east of the Pacific Highway and along Clark Street had increased, however the Crows Nest House and gardens remained intact (Figure 34). The size and style of dwellings in the area appear to have varied, although the majority of structures were built near or on main streets such as Church Street, Lane Cove Road and Clark Street. By the 1920s, the majority of subdivisions were filled, many of which were occupied by Federation style bungalows, still present within the streetscape today.[43] In their analysis of the Lady Hay Estate, Thorp et al (1997) describes this time as a significant reflection of the suburbanisation of the lower North Shore influenced by the break-up of large estates that once occupied the area.[44]

Figure 33. Berry's Estate Subdivision Plan 1893 showing subdivided land to the east and undeveloped land to the west of the study area. MAP Folder 126, LFSP 1982. Source. NLA.



6.4.2.2 1932- present

In 1932, Crows Nest House was demolished for the North Sydney Demonstration School.[45] Between 1931 and 1934 three more subdivisions in the 'Lady Hay Estate' took place. The completion of the Sydney Harbour Bridge in 1932 created a minor increase in the Crow's Nest population as well as changes to street alignments. Lane Cove Road was extended and renamed the Pacific Highway.

Although the construction of the bridge led to an increase in property buyers in North Sydney and Crows Nest, the Depression meant development was slow and homes were modified rather than built. The majority of Federation bungalows and Victorian mansions - remnants of larger estates and subdivisions that originally defined the area - were soon converted into boarding houses.

[43] Staas, R., Thorp, W. and Wright, M. 1997. Conservation Area Studies. Holtermann Estate A,B,C,D and Lady Hay Estate (Crows Nest Road), North Sydney. Report prepared for North Sydney Council, p. 11.
[44] Staas, R., Thorp, W. and Wright, M. 1997, p. 6.
[45] Historic Houses Trust. Crow's Nest House. Site accessed on 3/6/2015 at: http://collection.hht.net.au/firsthhtpictures/picturerecord.jsp?recno=37906

Development following the Second World War was also slow and the population of North Sydney declined. Aerial photographs of the study area taken in 1947 indicate that the majority of the area consisted of Federation bungalows, although a number of empty lots remained or were in the process of being developed (Figure 35).

The land boom of the 1960s, driven by low land prices, led to a number of corporations establishing premises in North Sydney. They preferred the area over the CBD, where rent was expensive and building allotments small. The boom led to the demolition of many of Crows Nest's earlier architecture, and soon the local community began making public objections to the increase in development.[46] Today, Crows Nest is a well-known commercial district, predominantly made up of medium density and high density dwellings.[47]

Figure 34: Subdivisions of parts of Berry's Estate, North Sydney 1900 - 1909. Source. NLA MSP Folder 126, LFSP 1973.

[46] Masson, L. 2010. North Sydney. Dictionary of Sydney. Site accessed on 4/6/2015 at: http://dictionaryofsydney.org/entry/north_sydney
[47] Australian Bureau of Statistics, 2006. Census of Population and Housing Crows Nest. Site accessed on 4/6/2015 at: http://info.id.com.au/dosydney/Default.aspx?pg=1&gid=1720

Figure 35 1947 aerial, Crows Nest. Source: Lands & Property Information SixMaps.

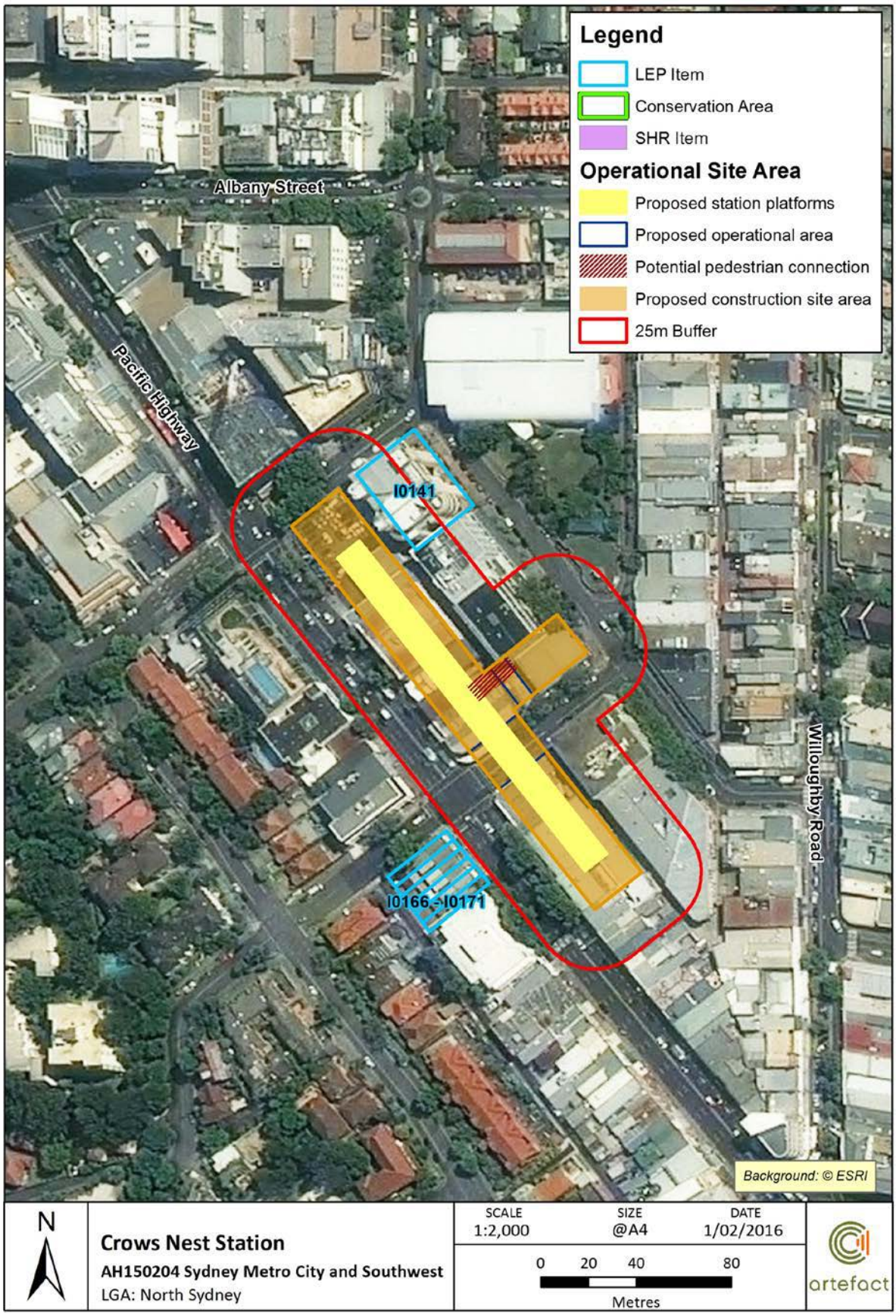
6.4.3 Heritage listed items

The following table outlines the heritage listed items within the study area and shown in Figure 36.

Table 18: Overview of heritage items within the Crows Nest Station study area

Heritage item	Register listings	Significance	Relationship to the study area
St Leonards Centre	North Sydney LEP 2013 I0141	Local	Partially within the buffer zone
Higgins Buildings	North Sydney LEP 2013 I0166-I1071	Local	Outside buffer zone, directly opposite construction site.

Figure 36: Heritage items within the Crows Nest study area.



6.4.4 Detailed heritage impact assessments

Heritage items

Table 19: St Leonards Centre heritage impact assessment

St Leonards Centre[48]	
Image	**Figure 37: The St Leonards Centre. View from Clarke Street. Artefact Heritage 2015.** 
Significance	Local
Description	Constructed c.1972, the heritage item consists of a six storey commercial building with four levels of car parking below ground. It is designed in the late Twentieth Century, Brutalist style, with expressed, curved risers to the perimeter in off form, fluted concrete with a deeply inset plan form that varies at each level. The elevations are heavily modelled in both directions with raking, metal framed glazing. The building sits on a pebblecrete plinth to the street with sloping walls, steps and sculptural air vents and seating. Above, the plan steps out at each level and at the roof there are several metal screen walls. The structure is infilled with aluminium framed glazing and there is extensive use of curved walls at the upper level with curved balconies to the front elevation. A dramatically assertive building marked by curvilinear plan bastion tower elements of textured off form reinforced concrete. Between these the storeys step outwards towards the top, bestowing upon the structure a character of great and not totally pleasant strength. It is a well-made and crafted building. This building is designed in the late twentieth century brutalist style.
Statement of significance	28 Clarke Street is an unusual example of a six storey, late Twentieth Century commercial building built c. 1972 designed by Kerr and Smith, Architects and Planners, in the late Twentieth Century Brutalist style and is a dominant building in the local streetscape. A building whose domineering presence and intrusive character is barely balanced by its intrinsic architectural interest.

[48] Description and Statement of significance extracted from State Heritage inventory sheet "St Leonards Centre" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2181335 on 22/10/2015.

St Leonards Centre[48]	
Impact type	Potential direct impact: Vibration Indirect impact: Views and vistas
Heritage impact assessment	The St Leonards Centre is located adjacent to the Crows Nest Station cut and cover box. The use of Clarke Lane (to the rear of the heritage item) for vehicle egress during construction, and demolition works required to construct Crows Nest Station, may result in minor vibration impacts. Vibration modelling indicates that the closest façade of this item would experience vibration levels above the screening level. **Potential direct impact: Minor** The northern station building would be constructed adjacent to the western boundary of the heritage item. The buildings currently located on the station site do not contribute to the setting of the heritage item, and consist largely of 20th century commercial buildings fronting the Pacific Highway. The heritage item is oriented to the north-east and away from the site of Crows Nest Station, and there are no direct view corridors between the heritage item and the proposed station site. Demolition of existing buildings in this location would therefore have a negligible impact on the heritage item. Above-ground station elements include the station entrances, oriented to the Pacific Highway and Clarke Street, and station service facilities. The service facilities in the northern portion of the station site would be located to the rear of the heritage item, to the west of Clarke Lane. These elements would not compete visually with the heritage item, and would constitute a negligible visual impact. **Indirect impact: Negligible**

Table 20: Higgins Buildings heritage impact assessment

Higgins Buildings[49]	
Image	**Figure 38: Higgins Buildings.** 
Significance	Local
Description	A group of six shopfronts (nos. 366, 368, 370, 372, 374, 376 Pacific Highway – individually listed) in a single building, with first floor offices or residences above.
Statement of significance	The buildings are examples of two storey brick and rendered masonry commercial buildings in the Inter War Free Classical style. The group is a good example of an Interwar commercial/retail building housing a group of shops which occupies an important corner location and which complements and reflects the type of development characteristic of this streetscape.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The Higgins Buildings are located on the western side of the Pacific Highway, directly opposite the proposed station site. Whilst the removal of the current mid to late 20th century commercial buildings in this location would alter views from the heritage items, this would result in a negligible heritage impact. From a heritage perspective, the buildings proposed for demolition currently constitute an unsympathetic addition to the streetscape, and do not contribute to the significance of the Higgins Buildings. **Indirect impact: Negligible**

[49] Description and Statement of significance extracted from State Heritage inventory sheet "Higgins Buildings" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2181335 on 28/01/2016.

6.4.5 Archaeological assessment

The following archaeological assessment will focus on the proposed locations of the station buildings and platforms, the construction of which would require the demolition of existing buildings, and construction of new station buildings, incorporating lift shafts and tunnelled access to the proposed platforms.

6.4.5.1 Site inspection results

The proposed Crows Nest Station site is located across a built environment between the Pacific Highway and Clarke Street. The station site is situated across a gentle slope down to the north.

Discussion and analysis of site inspection results

Due to the gentle slope across the proposed station site, many of the built structures are cut into the slope. This is likely to have removed sections of the natural ground surface and may have removed or impacted areas of archaeological potential.

Figure 39: View north along Clarke Lane from Hume Street

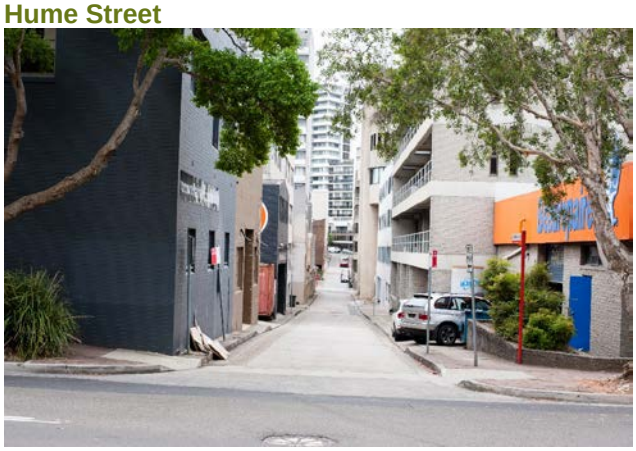


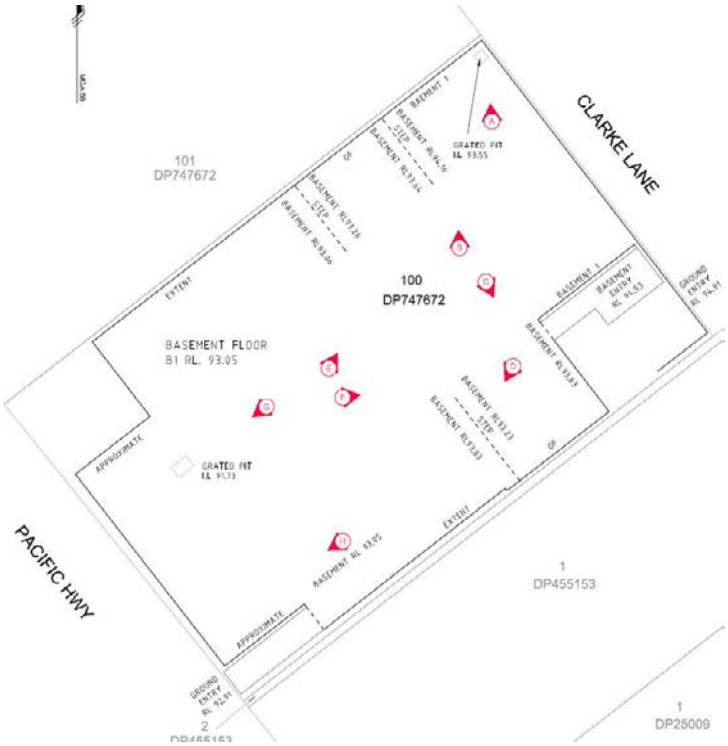
Figure 40: View southeast across the Pacific Highway towards the proposed station site

6.4.5.2 Known impacts

Subsurface impacts associated with former or current land uses have the potential to remove or damage potential archaeological remains. Previous impacts within the site need to be further understood and identified before more than a preliminary assessment of archaeological impact can be made. Based on the initial literature review and site inspection undertaken as part of this assessment, the following preliminary assumptions regarding archaeology at the site can be made:

- The construction of successive phases of buildings on the site would have impacted on archaeological remains. Typically, the earlier the building was constructed, the less impact it would have had on the potential archaeological resource.
- A basement covers the majority of the lot located at 477 Pacific Highway (Lot 100 DP747672; Figure 41). The rear of basement appears to be at the same level as Clarke Lane. The basement fronting Pacific Highway appears to be substantially cut in. It can be assumed that any archaeological resource in this location has been removed.
- Due to a gentle slope to the north, many of the buildings located on the site have been cut into the ground surface. This may have removed areas of archaeological potential.

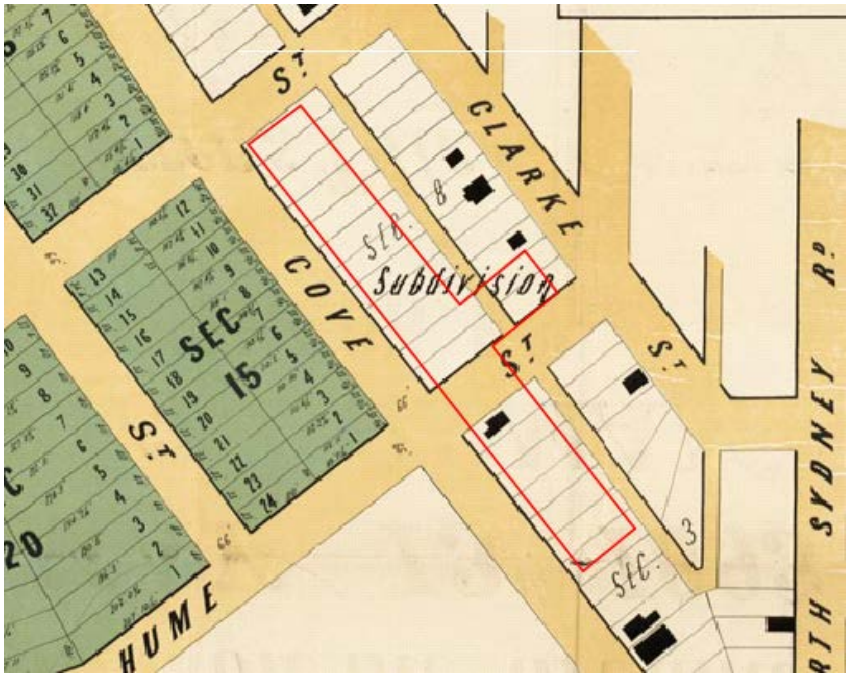
Figure 41: Basement plan of Lot 100 DP747672



6.4.5.3 Discussion of archaeological potential

There are few plans indicating the presence of structures within the study area prior to the late 19th century subdivision of the Berry estate. The earliest structure in the vicinity of the study area can be seen on an 1893 plan of the Berry's Estate subdivision (Figure 42). The study area has the potential to contain an archaeological resource associated with late 19th and early 20th century residential subdivision. Archaeological remains of this type, if found to be substantially intact and containing a substantial artefactual resource, may reach the local significance threshold.

Figure 42: Overlay of the approximate location of the study area on the 1893 plan of the subdivision of the Berry Estate. MAP Folder 126, LFSP 1982. Source. NLA.



6.4.5.4 Preliminary assessment of significance

The following is a preliminary assessment of significance, informed by the NSW Heritage Criteria for *Assessing Significance related to Archaeological Sites and 'Relics'* (2009).

Archaeological research potential (NSW Heritage Criterion E):

- Archaeological remains associated with early residential and agricultural development of the study area may have some research potential dependant on the nature and extent of any remains.

Association with individuals, events, or groups of historical importance (NSW Heritage Criteria A, B & D):

- It is possible that evidence of early residential development of the study area may have associations with former residents and known local historical figures. Specific associations have not been identified at this stage.

Aesthetic or technical significance (NSW Heritage Criterion C):

- It is not possible at this stage to identify whether archaeological remains within the study area have potential to demonstrate aesthetic or technical values.

Ability to demonstrate the past through archaeological remains (NSW Heritage Criterion A, C, F & G):

- There is low to moderate potential, due to low intensity building that has occurred throughout the site, that the study area has the potential to demonstrate the past through archaeological remains.

Overall, the site may contain archaeological remans with potential to reach the local significance threshold.

6.4.5.5 Overview archaeological potential

The study area has low potential to contain a substantial archaeological resource with the potential to reach the local significance threshold.

Table 21: Summary of archaeological potential within study area

Potential archaeological resource	Potential	Significance	Heritage impact assessment
Evidence of early occupation of the study area– for example, evidence of land clearance and cultivation, outbuildings, postholes associated with fencing.	Nil-low	Local	Excavation works within the study area have nil-low potential to impact on archaeological remains.
Mid to late 19th century residential and commercial development	Low-moderate	Local	Excavation works within the study area have low-moderate potential to impact on archaeological remains
20th century residential and commercial development	Moderate	Unlikely to reach the local significance threshold.	Excavation works within the study area have moderate potential to impact on archaeological remains.

6.4.5.6 Archaeological impact assessment

Proposed works within the Crows Nest Station site with the potential to impact on archaeological remains include:

- Excavation during demolition works
- Excavation of open shafts during construction phase
- Foundation/ground slab excavations for establishment of staff amenities, site offices, water treatment plant, wheel washing bays, workshops, dangerous goods and material storage buildings during construction phase
- Cut and cover excavation for station box

Whilst excavation works during the construction phase of the project are likely to be limited to discrete locations, the excavation of the cut-and-cover station would result in the complete removal archaeological remains within the station box footprint. Therefore, works in this location would have a major impact on the potential archaeological resources.

6.4.6 Overview of constraints

The following table outlines the potential heritage constraints within the study area:

Table 22: Overview of potential heritage constraints for Crows Nest study area.

Heritage item	Potential heritage impacts		
	Direct impact	**Archaeological impact**	**Indirect impact**
St Leonards Centre	Potential direct impact: Minor (vibration)	Neutral	Negligible – views and vistas
Higgins Buildings	Neutral	Neutral	Negligible – views and vistas
Potential archaeological resource within the study area	N/A	Major – low to moderate potential for locally significant archaeological remains	N/A

6.5 Victoria Cross Station

Victoria Cross Station is located in the heart of North Sydney central business district with the potential to serve the northern and eastern commercial centres of North Sydney. The station box would be located under Miller Street between Berry Street and McLaren Street. The station entry would be from Miller Street. The location of the station is illustrated on Figure 43 and Figure 44.

Figure 43: Location and indicative layout of Victoria Cross Station.

6.5.1 Construction

The proposed arrangements during construction phase at Victoria Cross include the northern and southern building shafts (site areas A & B) that would be serviced from a suspended working platform over the majority of the shaft area.

The proposed sequencing of the excavation works for the northern and southern shafts of Victoria Cross entails the following:

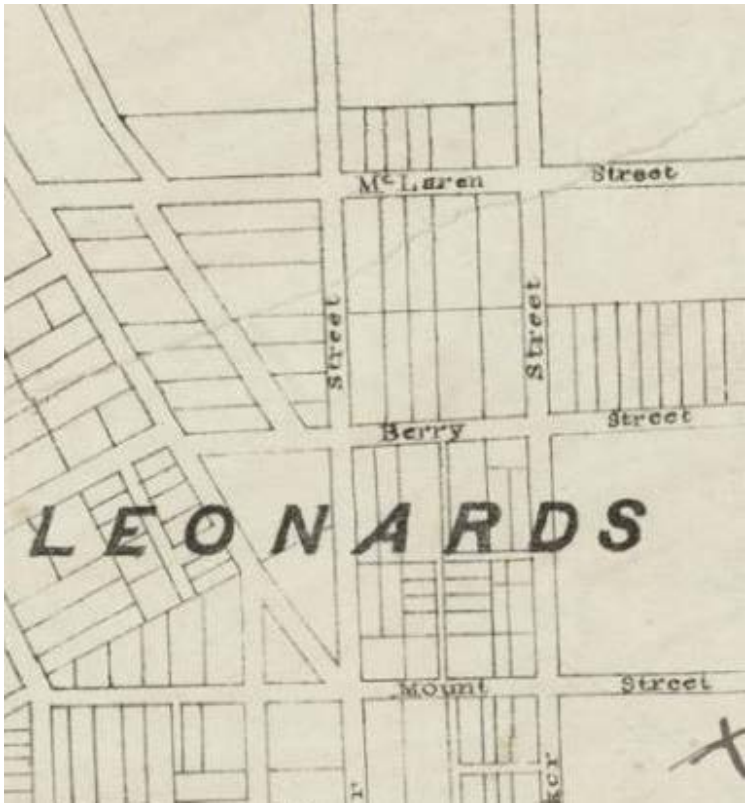
- Demolition of existing buildings to basement
- Working platforms are formed for piling rigs i.e. backfill pits if necessary
- Piling works – perimeter walls and long piles
- Initial excavation site to allow for the construction of the working platform
- Construction of suspended working platform over shafts, with a shaft opening of at least 15.0m x 20.0m for the removal of spoil and machinery access
- Construction of acoustic shed where necessary and site infrastructure i.e. site office, staff amenities, workshop
- Shaft excavation to required depth.

Figure 44: Victoria Cross construction site layout.

6.5.2 History of the study area

The majority of the lower North Shore, and land surrounding the study area, is associated with large land grants given to soldiers, convicts and free settlers in the early 19th century. Milson's Point (to the south east of the study area) was one of the earliest land grants given in the area and consisted of 120 acres given to soldier Robert Ryan in 1800.[50] Records of the grant indicate that the plot was described as 'lying in situate on the north side of the harbour opposite Sydney Cove. The name of the farm was 'Hunters Hill'.[51] No evidence exists of subdividing or farming taking place on Ryan's land until 1806, when prominent merchant Robert Campbell, at that stage the colony's largest private cattle owner, purchased the grant.[52] In the same year, this portion of the land was also granted as a permissive occupancy to a free settler, James Milson, after whom Milsons Point is now named. Milson constructed a slab cottage on the grant, that later became known as Milk House.[53] The cottage was located near todays Broughton Street. In 1826, Milk House, and the only existing record of his promissory grant, was destroyed by bush fire.[54] It was after this incident that a dispute arose between Milson and Campbell regarding ownership of the land.

Figure 45. 1858 Map of Sydney and its environs showing location of Berry, Mount, Blue, Walker and Lavender Streets. Drawn by J. Russell. Source. State Library of NSW.



[50] The Sydney Morning Herald, 'Famous Old Home: Admiralty House', Sydney, 28/1/1950.
[51] The World's News, 'Hunters Hill, Its Wandering Title', 31/12/1927 and Watson, J. J. Hunter's Hill: 1794-1861. In The Sydney Morning Herald, 7/6/1913.
[52] The Sydney Morning Herald, 'Famous Old Home: Admiralty House', Sydney, 28/1/1950.
[53] Thorp, W. 1999. North Sydney Olympic Pool, Milsons Point. Archaeological Assessment for Brian McDonald and Associates, p. 8.
[54] ibid

In early 1828, Government surveyor and explorer Sir Thomas Mitchell visited the property in order to provide a report on the land dispute. In doing so, he identified a suitable site for a Township, a few kilometres north of Milsons Point. Mitchell drew up a plan for the Township, including subdivisions, a reserve and a great road towards the north of the colony and Broken Bay.[55] In 1836, Mitchell's plan was revised and unreserved land resurveyed. By 1838, a basic design of the Township was produced, including a basic road structure on a traditional 10-chain grid.[56] The plan had Berry, Mount, Blue and Lavender streets running east-west, and Miller and Walker streets running north-south (Figure 45). Berry and Miller Street constitute portions of the study area. In 1838, the Township of St Leonards, in which the study area is located, was formally gazetted.

6.5.2.1 1838-1930

Once the town was gazetted, 48 half-acre building allotments in three sections were offered for purchase by application. In the 1840s, a few Crown lots were sold, and larger, more substantial sales took place in the north and north east portion of the Township. In the 1850s, the town was sold and divided into 35 additional sections. The study area is located in sections 3 and 7, on the south west edge of St Leonards township (Figure 46). A predicted real estate boom in the 1850s and 60s led to varying allotment sizes within these subdivisions. This allowed for villas and mansions to be built in the area, as well as terraces and cottages. During this time, St Leonards Park (north east of the study area) was also laid out.

Figure 46 Parish of Willoughby 1860-1869 showing St Leonards Town centre. The study area is located in allotment 7. Source. NLA.

In 1857, a number of businesses had been established along Miller Street, where the study area is today located. These are illustrated in Figure 47 and consisted of a Druggist, Bakery, Grocer, and

[55] Masson, L. 2010. North Sydney. Dictionary of Sydney. Site accessed on 4/6/2015 at: http://dictionaryofsydney.org/entry/north_sydney
[56] ibid

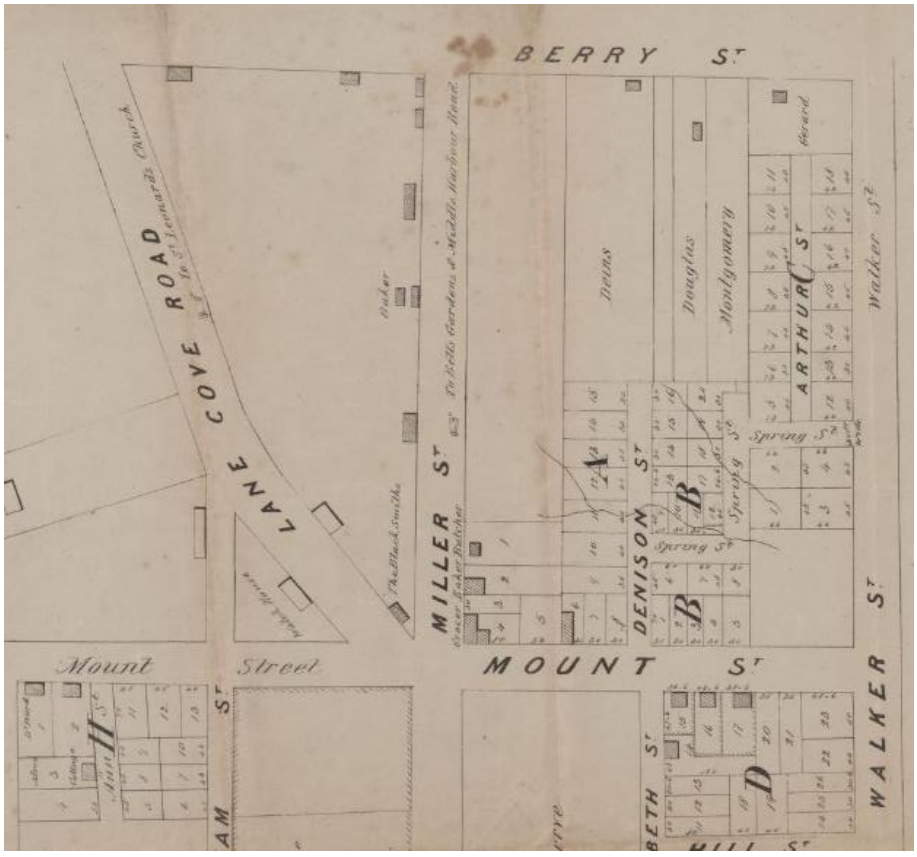
Butcher, although none are located within the study area. In 1869, the Borough of St Leonards was formed, and the provision of utilities such as gas, water, roads, garbage collection, sewerage and sanitation began to be carried out.[57]

By the 1880s, Miller Street was part of the commercial and civic centre of St Leonards. This was further influenced by the establishment of the cable tram that ran between Ridge Street (to the north) south to the ferry wharf at Milsons Point.[58] This area is today known as Victoria Cross, a name chosen through a competition set up by the North Sydney Council in 1939.[59] Settlement in the area increased dramatically during this time, and a number of public buildings, such as the former School of Arts, Post Office/Court House/Police Station complex and a Masonic Hall were built at this time.

By 1897 the northern portion of the study area was occupied by a property labelled as “Montrose” and the southern portion occupied by a number of individuals, including a H.W. Parker, J. Richard and Lewis Moore (Figure 48).

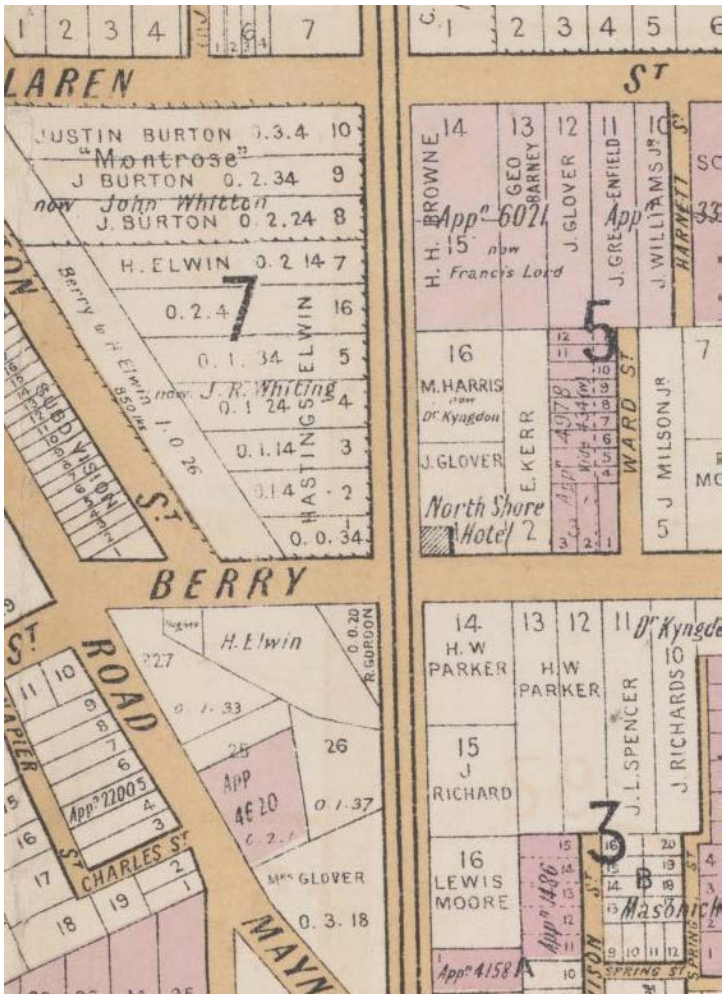
Between 1880 and 1920, St Leonards was occupied by a mixed variety of upper, middle and lower income workers. The study area and land between Miller, Berry and Ridge Streets, were settled by the North Sydney medical fraternity. The area would soon become known as the ‘Macquarie Street on the North Shore’.[60]

Figure 47 Plan of allotments, St Leonards, North Shore. 1857, showing various businesses along Miller Street. Source. NLA MAP F 683.



[57] Masson, L. 2010. North Sydney. Dictionary of Sydney. Site accessed on 4/6/2015 at: http://dictionaryofsydney.org/entry/north_sydney
[58] Ibid.
[59] The Sydney Morning Herald, 23 November 1939.
[60] Masson, L. 2010. North Sydney. Dictionary of Sydney. Site accessed on 4/6/2015 at: http://dictionaryofsydney.org/entry/north_sydney

Figure 48: Higginbotham & Robinson. Map of St. Leonards on the North Shore Parish of Willoughby 1887, showing the "Montrose" property within the northern study area, and land owned by Parker, Richard and Moore in the southern study area. MAP RM 4458. Source. NLA.



6.5.2.2 1930-present

The completion of the Sydney Harbour Bridge and start of the Depression stunted economic and population growth in St Leonards. Land prices dropped and the population remained static. The Sydney Harbour Bridge had dramatically changed the surrounding streetscapes, Lane Cove Road was extended, widened and renamed the Pacific Highway and Junction Street to the south was completely removed.

Redevelopment in the area was primarily associated with Art Deco architecture, although the majority of development was associated with the conversion of large Federation and Victorian houses into boarding houses. Verandahs and balconies were often enclosed to make more room, and earlier servant's quarters and outhouses were modified and turned into flats.[61]

The late 1950s and early 1960s saw a dramatic change in St Leonards with low land prices attracting large corporations into the area. During this period, substantial office blocks and towers were constructed in the area, many conglomerating along the Pacific Highway, taking over land on Berry and Miller Street. The boom of the 1960s continued into the 80s and was disastrous in terms of its effect on the historic character of the area. Many of the early low-rise Victorian and Federation buildings that occupied the area were demolished, replaced by buildings such as the Mutual Life and

[61] Masson, L. 2010. North Sydney. Dictionary of Sydney. Site accessed on 4/6/2015 at: http://dictionaryofsydney.org/entry/north_sydney

Citizens Assurance Company, AMP Building and offices occupied by Phillips, NRMA, Ampol and Transfield.[62]

The local community fought to slow down development through the 1970s and 80s. Today the study area is associated with various office buildings and towers built during the property boom. Development is continuing. The former Post Office/Court House/Police Station complex, built in the 1880s is still extant on the corner of Mount Street and the Pacific Highway.

6.5.3 Heritage listed items

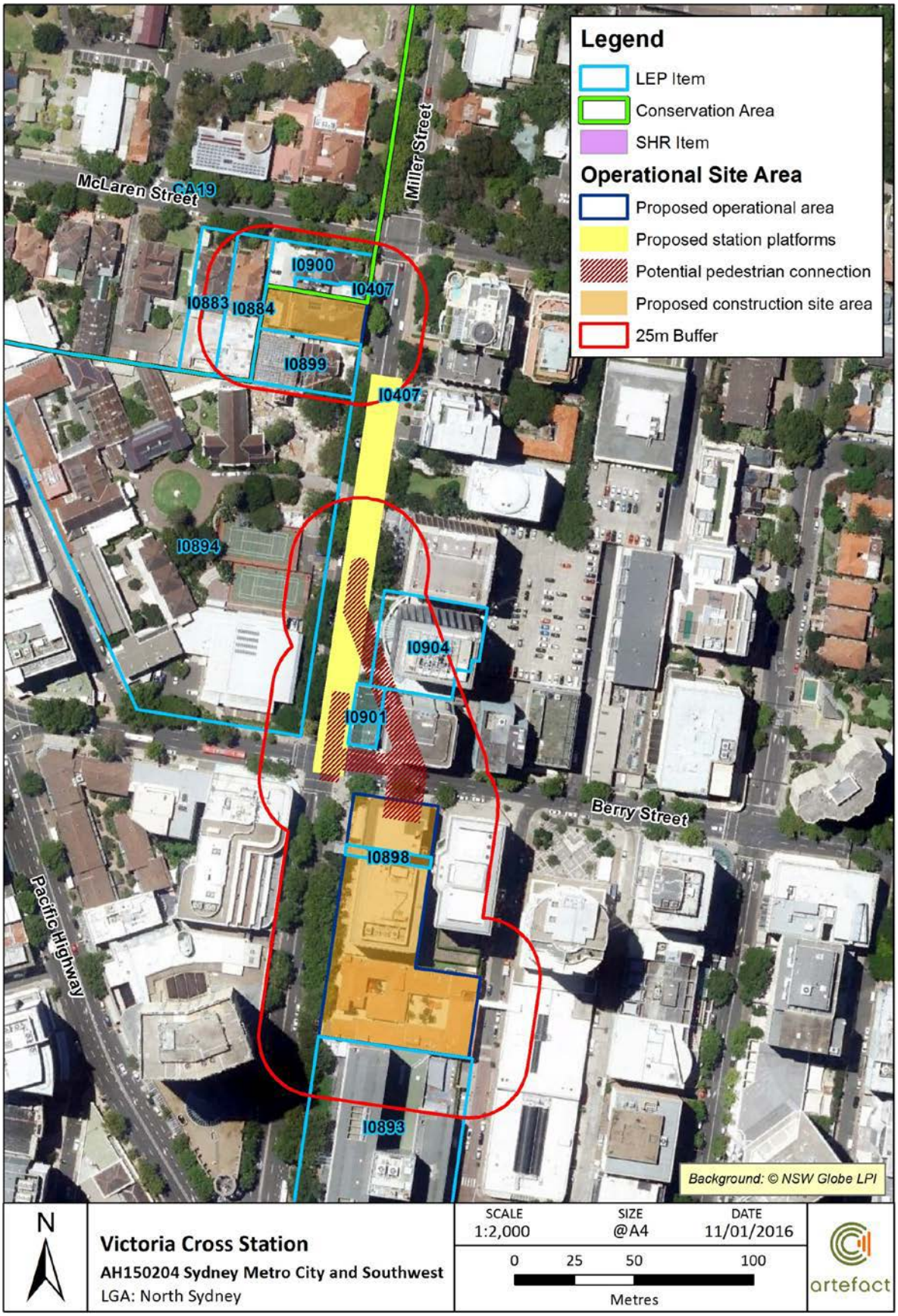
The following table outlines the heritage listed items within the study area which are shown in Figure 49.

Table 23: Overview of heritage items within the Victoria Cross study area

Heritage item	Register listings	Significance	Relationship to the study area
Restaurant	North Sydney LEP 2013 I0900	Local	Adjacent to Victoria Cross northern site, within buffer zone
“Fairhaven”	North Sydney LEP 2013 I0883	Local	Within buffer zone, Victoria Cross northern site
House (31 McLaren Street)	North Sydney LEP 2013 I0884	Local	Adjacent to Victoria Cross northern site, within buffer zone
“O’Regan”	North Sydney LEP 2013 I0889	Local	Adjacent to Victoria Cross northern site, within buffer zone
Monte Sant Angelo Group	North Sydney LEP 2013 I0894-I0897	Local	Partially within buffer zone, Victoria Cross northern site
Shop at 187 Miller Street	North Sydney LEP 2013 I0898	Local	Within Victoria Cross southern site
MLC Building	North Sydney LEP 2013 I0893	Local	Adjacent to Victoria Cross southern site, partially within buffer zone
Rag and Famish Hotel (199 Miller Street)	North Sydney LEP 2013 I0901	Local	Partially within buffer zone, Victoria Cross southern site
Commercial building (201 Miller Street)	North Sydney LEP 2013 I0904	Local	Partially within buffer zone, Victoria Cross southern site
North Sydney bus shelters	North Sydney LEP 2013 I0407	Local	Within Victoria Cross northern site buffer zone
McLaren Street Conservation Area	North Sydney LEP 2013 CA19	Local	Victoria Cross northern site and buffer zone within conservation area

[62] Ibid.

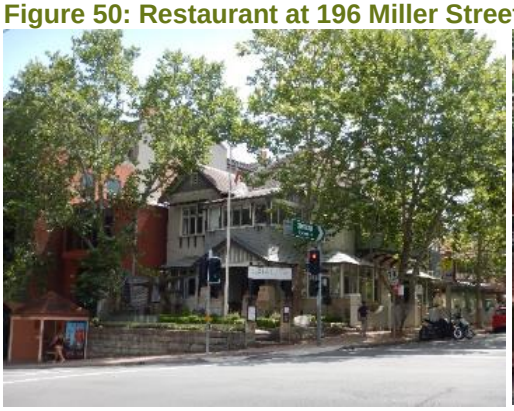
Figure 49: Heritage items within Victoria Cross Station study area



6.5.4 Detailed heritage impact assessments

Heritage items

Table 24: Restaurant heritage impact assessment

Restaurant[63]	
Image	**Figure 50: Restaurant at 196 Miller Street. Artefact Heritage 2015.**  
Significance	Local
Description	Federation era double storey building in the Federation Queen Anne style. Originally a doctor's residence, the item was named for the former 'Montrose' which was demolished for this subdivision.
Statement of significance	See McLaren Street Group - A fine group of buildings which contains individually interesting examples of Federation architecture which taken together, form an important period streetscape. The group relates well to the St. Thomas Church and Council Chambers and the majority being large houses with mature gardens, forms an important and attractive air of comfort and prosperity close to the encroaching commercial centre. Relic of nineteenth century character of vicinity.
Impact type	Potential direct impact: Vibration
Heritage impact assessment	The heritage item is located adjacent (north of) the Victoria Cross northern side. The northern mechanical and electrical services building would be constructed to the rear of the heritage property. The heritage item is oriented away from the proposed development, and there are no direct view corridors between the heritage item and the services building. The demolition and construction works would therefore have no visual impact on the heritage item. **Indirect impact: Neutral** Modelling indicates that the closest façade of this item would experience vibration levels above the screening level for cosmetic damage. Shaft excavation and the demolition of the adjoining building may result in minor vibration impacts to the heritage item. **Potential direct impact: Minor**

[63] Description and Statement of significance extracted from State Heritage inventory sheet “Restaurant” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2180865 on 22/10/2015.

Table 25: "Fairhaven" heritage impact assessment

"Fairhaven"[64]	
Image	**Figure 51: "Fairhaven." Artefact Heritage 2015** 
Significance	Local
Description	Constructed c1910, the heritage item is a Federation Bungalow, designed in the Federation Queen Anne style.
Statement of significance	See McLaren Street Group - A fine group of buildings which contains individually interesting examples of Federation architecture which taken together, form an important period streetscape. The group relates well to the St. Thomas Church and Council Chambers and the majority being large houses with mature gardens, forms an important and attractive air of comfort and prosperity close to the encroaching commercial centre. Relic of nineteenth century character of vicinity.
Impact type	Potential direct impact: Vibration
Heritage impact assessment	The Victoria Cross northern services and emergency access site would be constructed immediately west of the property. The heritage building is oriented away from the site, and there are no direct view corridors between the heritage item and the northern services and emergency access site. The works would therefore have no visual impact on the heritage item. **Indirect impact: Neutral** Modelling indicates that the closest façade of this item would experience vibration levels above the screening level for cosmetic damage. Therefore, shaft excavation and demolition immediately adjacent to the heritage item may result in minor vibration impacts to the heritage item. **Potential direct impact: Minor**

[64] Description and Statement of significance extracted from State Heritage inventory sheet "Fairhaven" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2180863 on 22/10/2015.

Table 26: "O'Regan" heritage impact assessment

"O'Regan"[65]	
Image	**Figure 52: O'Regan (192 Miller Street). Artefact Heritage 2015.** 
Significance	Local
Description	The heritage item is a two storey roughcast rendered house with hipped and gabled slate roof on a rusticated ashlar foundation, designed in the Federation Academic Classical style. Segmental arched window with sandstone archivolt, faceted corner bay with hipped faceted roof, parapeted gable end with horizontal moulded bands and circular and rectangular ventilator openings are features. The interior and landscape setting are also of significance.
Statement of significance	See Monte Sant' Angelo Group - Important regional private school since the 1880s. Contains a significant early mansion as it's central building. Chapel and Mercy Hall are both fine buildings from the turn of the century. O'Regan House is a complementary building to the rest and respectable in its own right. The group, all in sight of each other, form an impressive precinct. A two-storey dwelling in the Federation Academic Classical style that forms part of the Group of Monte Sant' Angelo. The building sits in dialogue with the Chapel and Mercy Hall. The interior is also of significance.
Impact type	Indirect impact: Views and vistas Potential direct impact: Vibration
Heritage impact assessment	The Victoria Cross northern services and emergency access site is located adjacent to the northern boundary of the heritage item. The demolition of existing buildings in this location, and construction of the proposed services and emergency access structures, would result in a negligible to minor impact to the setting of the heritage item. The setting of the heritage item is currently compromised by the modern building located within the proposed Victoria Cross northern site. This building does not contribute to the significance of the heritage item. **Indirect impact: Minor** Modelling indicates that the closest façade of this item would experience vibration levels above the screening level for cosmetic damage. Shaft excavation and demolition immediately adjacent to the heritage item may result in minor vibration impacts to the heritage item. **Potential direct impact: Minor**

[65] Description and Statement of significance extracted from State Heritage inventory sheet "O'Regan" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2180848 on 22/10/2015.

Table 27: House (31 McLaren Street) heritage impact assessment

House (31 McLaren Street)[66]	
Image	**Figure 53: House at 31 McLaren Street. Artefact Heritage 2015.** 
Significance	Local
Description	Two storey Federation house; gabled Marseilles - tiled roof; pebble dash treatment to gables; brown brick tuckpointed construction; timber sash windows with small panes above; shingled verandah treatment - upper portion filled in; modern fence. This building is designed in the Federation Queen Anne style.
Statement of significance	See McLaren Street Group - A fine group of buildings which contains individually interesting examples of Federation architecture which taken together, form an important period streetscape. The group relates well to the St. Thomas Church and Council Chambers and the majority being large houses with mature gardens, forms an important and attractive air of comfort and prosperity close to the encroaching commercial centre. Relic of nineteenth century character of vicinity.
Impact type	Potential direct impact: Vibration
Heritage impact assessment	The Victoria Cross northern services and emergency access site would be constructed immediately west of the property. The heritage building is oriented away from the site, and there are no direct view corridors between the heritage item and the northern services and emergency access site. The works would therefore have no visual impact on the heritage item. **Indirect impact: Neutral** Modelling indicates that the closest façade of this item would experience vibration levels above the screening level for cosmetic damage. Therefore, shaft excavation and demolition immediately adjacent to the heritage item may result in minor vibration impacts to the heritage item. **Potential direct impact: Minor**

[66] Description and Statement of significance extracted from State Heritage inventory sheet “House” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2180864 on 22/10/2015.

Table 28: Mont Sant' Angelo Group heritage impact assessment

Mont Sant' Angelo Group[67]	
Image	**Figure 54: Mont Sant' Angelo Group. Artefact Heritage 2015.** 
Significance	Local
Description	The school is contained behind a high brick wall along Miller and Berry Streets. Entry through the main gates is to a circular drive with the Chapel, Masalou and the Mercy Hall forming the northern side of the circle and O'Regan set back in the north-west corner. All these buildings are two storeys, with gabled slate roofs and are generally smooth or rough-cast rendered. Linking and ancillary buildings on the north side are generally sympathetic to the main structures. Their interiors and landscape setting are also of significance.
Statement of significance	Important regional private school since the 1880s. Contains a significant early mansion as its central building. Chapel and Mercy Hall are both fine buildings from the turn of the century. O'Regan House is a complementary building to the rest and respectable in its own right. The group, all in sight of each other, form an impressive precinct.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The Mont Sant' Angelo Group is located to the south of the Victoria Cross northern services and emergency access site. There are few direct view corridors between the station site and the significant buildings within the Mont Sant' Angelo group. Views towards the northern services and emergency access site are currently compromised by a modern building that does not contribute to the setting of the heritage item. Therefore, the demolition of the existing buildings and construction of the proposed station entrances would have a negligible impact to the setting of the heritage item. **Indirect impact: Negligible**

[67] Description and Statement of significance extracted from State Heritage inventory sheet "Mont Sant' Angelo Group" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2180844 on 22/10/2015.

Table 29: Shop (187 Miller Street) heritage impact assessment

Shop (187 Miller Street)[68]	
Image	**Figure 55: Shop at 187 Miller Street. Artefact Heritage 2015.** 
Significance	Local
Description	Two storey narrow-fronted shop building of rendered brick. Ground floor glass and metal shopfront. Corrugated-iron roofed awning and upper floor has triple semi-circular arched windows, central to facade between pilasters with horizontal course lines. Windows have label mould and facade is parapeted with corbelled cornice and flanking finials in the shape of square urns on circular pedestals. This building is designed in the Victorian Italianate style.
Statement of significance	One of the few remaining Victorian shopfronts on Miller Street and the last in this vicinity. An interesting example of it's type, with attractive detailing. Provides a strong contrast to the surrounding multi-storey commercial buildings. Important reminder of the continuity of retailing over time in this vicinity. The item has been assessed as locally significant under SHR assessment criteria g – representativeness.
Impact type	Direct physical impact: Complete demolition
Heritage impact assessment	As the heritage item would be demolished to facilitate construction of the station building, the work would result in the complete removal of heritage fabric, and would result in de-listing of the heritage item. The item would not retain its heritage significance and would no longer provide a representative example of its type. **Direct physical impact: Major – complete demolition**

[68] Description and Statement of significance extracted from State Heritage inventory sheet "Shop" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2180834 on 22/10/2015.

Table 30: MLC Building heritage impact assessment

MLC Building[69]	
Image	**Figure 56: MLC Building. Artefact Heritage 2015.** 
Significance	Local
Description	A fourteen storey cubiform office block of 450,000 feet of floorspace constructed on a rigid steel frame with hollow steel floors. Curtain walls of glass and anodized aluminium spandrels. Vermiculate plaster fireproofing, stamped metal ceilings. Double glazed using anti-actinic heat resisting glass outer and plate glass inner, ten inches apart. Facing materials include terracotta, marble, granite and mosaic tiles. This building is designed in the Post-War International style.
Statement of significance	The first high rise office block in North Sydney and the largest for a number of years after its construction. Seminal building on subsequent high-rise design in Sydney and utilised construction and structural techniques not previously used in Australia. First use of curtain wall design; first use of modular units in Australia. Major landmark in North Sydney. The interior, exterior and landscape setting are of significance.
Impact type	Indirect impact: Views and vistas Potential direct impact: Vibration
Heritage impact assessment	The Victoria Cross southern site station entrance would be constructed immediately north of this heritage item. The demolition of the existing buildings and construction of the proposed station entrance would result in a minor visual impact to this heritage item. **Indirect impact: Minor** Although modelling indicates that the closest façade of this item would not experience vibration levels above the screening level for cosmetic damage, demolition of existing adjacent and adjoining structures to the north of this item may result in vibration impacts. **Potential direct impact: Minor** (demolition of adjacent and adjoining structure potentially resulting in impacts to fabric of heritage item)

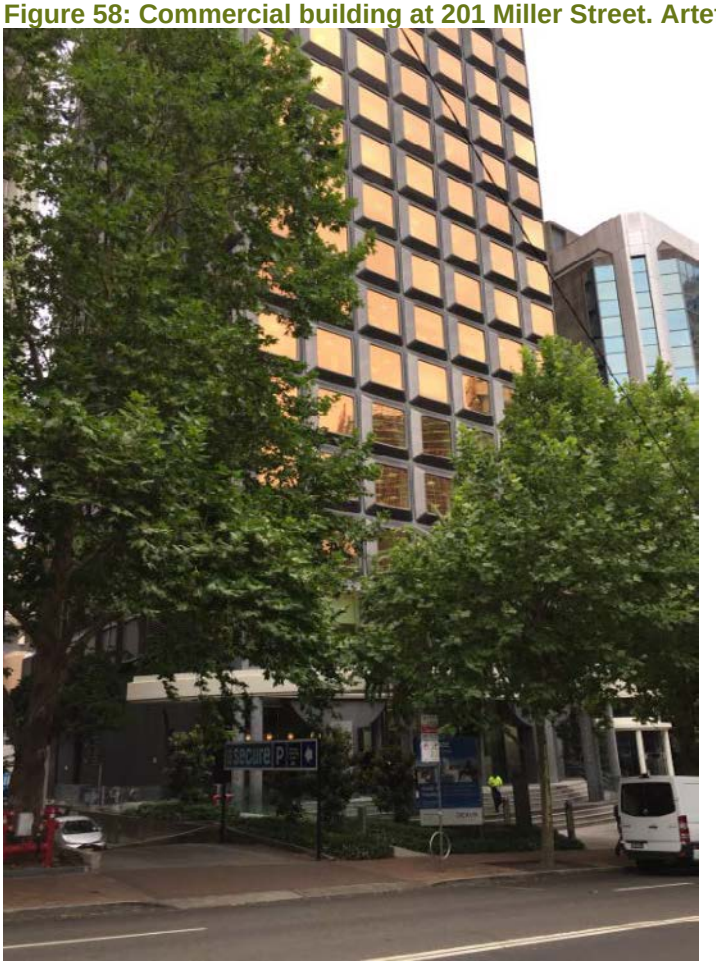
[69] Description and Statement of significance extracted from State Heritage inventory sheet “MLC Building” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2180854 on 22/10/2015.

Table 31: Rag and Famish Hotel heritage impact assessment

Rag and Famish Hotel[70]	
Image	**Figure 57: Rag and Famish Hotel. Artefact Heritage 2015.** 
Significance	Local
Description	Originally constructed in the 1860's as the 'Sailors Return,' it was acquired in 1866 by Charles Bullivant and renamed the 'Rag and Famish'. The hotel was rebuilt in 1892 as the 'North Shore Hotel'. In 1982 it was restored and renamed the 'Rag and Famish.'
Statement of significance	A very good example of a two storey Hotel in the Federation Free Classical style set on a prominent corner location. Important local hotel with antecedents to the mid-nineteenth century. Associated by tradition with prominent local pioneer and founder of the hotel, Charles Bullivant. Interesting example of its style. The last surviving traditional hotel in the commercial centre. Important and prominent streetscape item.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The station entrance would be constructed to the south of this heritage item on the other side of Berry Road. The demolition of the existing buildings opposite this item and construction of the proposed station entrance would result in a minor visual impact to this heritage item. **Indirect impact: Minor** The heritage item is located to the north of the station site. The use of roadheaders and rock hammers would be used in the construction of underground adits and pedestrian connections between platforms located directly below the heritage item, would esult in vibration levels below the screening level for cosmetic damage. **Potential direct impact: Neutral**

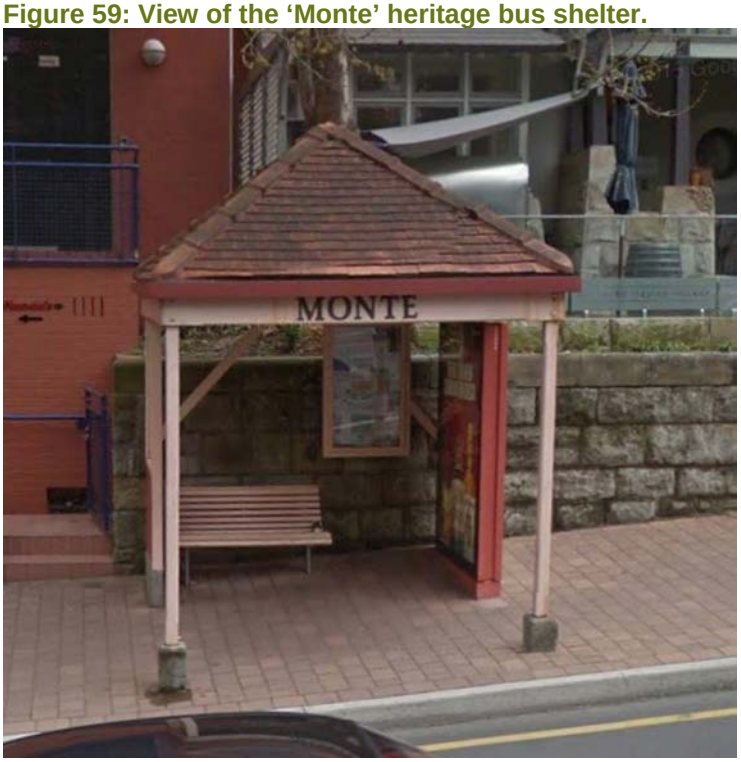
[70] Description and Statement of significance extracted from State Heritage inventory sheet "The Rag & Famish Hotel" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2180852 on 08/12/2015.

Table 32: Commercial building (201 Miller Street) heritage impact assessment

Commercial Building (201 Miller Street)[71]	
Image	**Figure 58: Commercial building at 201 Miller Street. Artefact Heritage 2015.** 
Significance	Local
Statement of significance	An example of a highly integrated office tower in the Twentieth Century International style of considerable quality and distinctive detailing, contributing much to the urban streetscape of this high-rise area. It was controversial when first opened for opened for its unusual and prominent colour and finish.
Impact type	No impact
Heritage impact assessment	The heritage item is located to the north of the Victoria Cross southern site. The construction of a pedestrian connection to platform level would also be located beneath this building. The use of roadheaders and rock hammers to be used in the construction of the pedestrian connections directly below the heritage item have been assessed as being below the vibration screening level for cosmetic damage. **Potential direct impact: Neutral**

[71] Description and Statement of significance extracted from State Heritage inventory sheet "Commercial Building" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2181331 on 08/12/2015.

Table 33: North Sydney bus shelters heritage impact assessment

North Sydney bus shelters[72]	
Image	**Figure 59: View of the 'Monte' heritage bus shelter.** 
Significance	Local
Description	The bus shelter is listed on the North Sydney LEP, in a group listing for the North Sydney bus shelters. The shelter within the study area is referred to as the Monte shelter, and located on the western side of Miller Street. The installation of the bus shelters was supervised by architect Hugh Slatyer. The construction was undertaken by Stephen Edwards Construction for $9220 per shelter in 1984.
Statement of significance	This heritage item consists of a series of small and effective functional buildings of handsome design and good workmanship. They are traditional and conservative in form and detail and designed to their varied locations. The structures have historic interest as elements of a particular and controversial attempt at Municipal civic design.
Impact type	Direct physical impact: removal and relocation
Heritage impact assessment	The bus shelter is located immediately east of the Victoria Cross northern site. This bus stop would be removed, stored, and relocated on completion of the project. **Direct physical impact: Moderate**

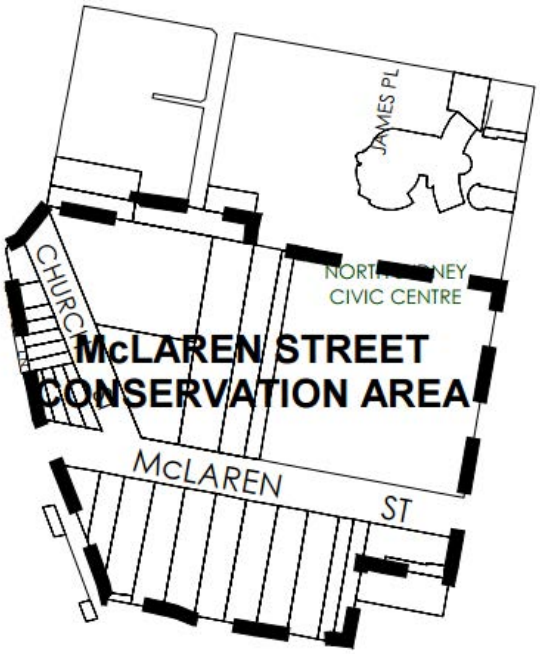
[72] Description and Statement of significance extracted from State Heritage inventory sheet "North Sydney Bus Shelters" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2181325 on 22/10/2015.

Conservation Areas

Table 34: McLaren Conservation Area heritage impact assessment

McLaren Conservation Area[73]

Figure 60: McLaren Street Conservation Area. North Sydney Council DCP 2002.

Image	
Significance	Local
Description	The McLaren Street Conservation Area straddles two separate estates. The 1890's Water Board plan shows a Victorian subdivision surrounding St Thomas' Church. James Street, no longer visible in the urban fabric, ran north from McLaren Street. There is no evident historic rationale for the northern boundary of the current Conservation Area as the subdivision included the land to the north.
Statement of significance	The statement of significance for the McLaren Street Conservation Area identifies its key significant characteristics as: • An area close to the centre of North Sydney that retains representative details from its development in the late 19th and early 20th centuries • The landmark qualities and associations with St Thomas' Church and the Council buildings • The intact character of the buildings on the southern side of McLaren Street that provide a strong edge to the church and civic precinct.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The southern boundary of the McLaren Street Conservation Area is located immediately north of the northern station site. Demolition of existing modern buildings within this site, and the construction of service and emergency egress would have a minor impact on the conservation area, as views and vistas to the south are currently compromised by a modern building that does not contribute to the setting of the heritage item. **Indirect impact: Minor**

[73] Character statement and Statement of significance extracted from PART B North Sydney Council DCP 2002 Area Character Statements July 2013: 298.

6.5.5 Archaeological assessment

The following archaeological assessment will focus on the proposed locations of the northern and southern station buildings, the construction of which would require the demolition of existing buildings, and construction of new station buildings, incorporating lift shafts and tunnelled access to the proposed platforms.

6.5.5.1 Site inspection results

The Victoria Cross Station site is located across a built environment. The station site is situated across a moderate to gentle slope down to the south. Below ground car park entrances were observed associated with 189 Miller Street and 194 Berry Street.

Discussion and analysis of site inspection results

Below ground car parks at 189 Miller Street and 194 Berry Street indicate removal of natural deposits and consequently archaeological potential at those locations. The heavily built environment and multiple underground services across the remainder of the area indicate the possible removal of archaeological deposits in some locations.

Figure 61: View southeast across Miller Street towards the proposed southern section of Victoria Cross Station

Figure 62: View north across Berry Street towards the Rag and Famish Hotel

Figure 63: View south across Berry Street towards the northwestern corner of the southern section of Victoria Cross Station

Figure 64: View northwest towards the proposed northern section of Victoria Cross Station at 194 Mill Street

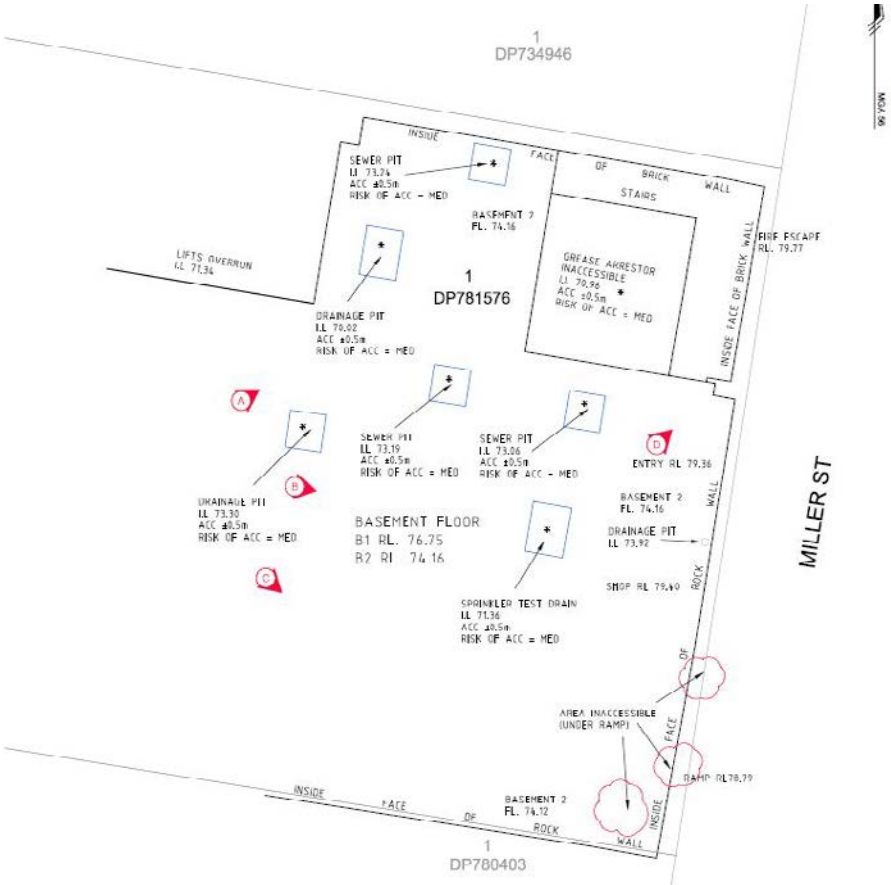
6.5.5.2 Known impacts

Subsurface impacts associated with former or current land uses have the potential to remove or damage potential archaeological remains. Previous impacts within the site need to be further understood and identified before more than a preliminary assessment of archaeological impact can

be made. Based on the initial literature review and site inspection undertaken as part of this assessment, the following preliminary assumptions regarding archaeology at the site can be made:

- The construction of successive phases of buildings on the site would have impacted on archaeological remains. Typically, the earlier the building was constructed, the less impact it would have had on the potential archaeological resource.
- A basement covers the majority of the lot located at 194 Miller Street (Lot 1 DP1183173; Figure 65), in the northernmost study area. The property has two basement levels, with basement 2 (the lowest) ranging between 4.94 metres below ground level fronting Miller Street and 8.94 metres below ground level towards the rear of the property (74.16 metres AHD). It can be assumed that any archaeological resource in this location has been removed.
- During the site inspection an entrance to underground car parking was observed at 189 Miller Street, suggesting excavation has occurred in this location.

Figure 65: Basement plan of Lot 1 DP1183173.



6.5.5.3 Discussion of archaeological potential

The study area was likely unoccupied until the mid-1800s. Although the study area was located within early land grants, it is unlikely that the area was occupied, and it is more likely that the majority of the land in the North Sydney area was utilised for timber felling, grazing of livestock and other agricultural uses.

Following Mitchell's gazetting of the township of St Leonards in the early 19th century, the town developed, and by the mid-19th century the study area may have contained commercial premises, likely associated with residences and gardens.

Overall, dependant on existing impacts, there is some potential that archaeological remains dating from the mid-19th to early 20th century may be located within the study area. Table 35 includes a summary of the archaeological potential of the study area.

6.5.5.4 Preliminary assessment of significance

The following is a preliminary assessment of significance, informed by the NSW Heritage Criteria for *Assessing Significance related to Archaeological Sites and 'Relics'* (2009).

Archaeological research potential (NSW Heritage Criterion E):

- Archaeological remains associated with early residential and agricultural development of the study area may have some research potential dependant on the nature and extent of any remains.

Association with individuals, events, or groups of historical importance (NSW Heritage Criteria A, B & D):

- It is possible that evidence of early residential development of the study area may have associations with former residents and known local historical figures. Specific associations have not been identified at this stage.

Aesthetic or technical significance (NSW Heritage Criterion C):

- It is not possible at this stage to identify whether archaeological remains within the study area have potential to demonstrate aesthetic or technical values.

Ability to demonstrate the past through archaeological remains (NSW Heritage Criterion A, C, F & G):

- There is low to moderate potential, due to low intensity building that has occurred throughout the site, that the study area has the potential to demonstrate the past through archaeological remains.

Overall, the site may contain archaeological remans with potential to reach the local significance threshold.

6.5.5.5 Overview archaeological potential

The study area has low to moderate potential to contain an archaeological resource with the potential to reach the local significance threshold, as summarised in Table 35.

Table 35: Summary of archaeological potential within study area

Potential archaeological resource	Potential	Significance	Heritage impact assessment
Evidence of early occupation of the study area– for example, evidence of land clearance and cultivation, outbuildings, postholes associated with fencing.	Nil-low	Local	Excavation works within the study area have nil-low potential to impact on archaeological remains.
Mid 19th century residential and commercial development	Low-moderate	Local	Excavation works within the study area have low-moderate potential to impact on archaeological remains
Late 19th and early 20th residential and commercial development	Moderate	Intact and substantial artefact bearing deposits, with the ability to answer research questions, may reach the local significance threshold.	Excavation works within the study area have moderate potential to impact on archaeological remains.

6.5.5.6 Archaeological impact assessment

Proposed works within the Victoria Cross Station site with the potential to impact on archaeological remains include:

- Excavation during demolition works
- Excavation of two open shafts during construction
- Foundation/ground slab excavations for establishment of staff amenities, site offices, water treatment plant and dangerous goods storage buildings during construction phase

The extent of excavation within the Victoria Cross Station site varies from discrete areas of minor excavation through to two open shaft excavations. Therefore, works in this location are likely to have a minor to major impact on potential archaeological resources, dependent on the location and extent of excavation.

6.5.6 Overview of constraints

The following table outlines the potential heritage constraints within the study area:

Table 36: Overview of potential heritage constraints for Victoria Cross study area.

Heritage item	Potential heritage impacts		
	Direct impact	**Archaeological impact**	**Indirect impact**
Restaurant	Potential direct impact: Minor (vibration)	Neutral	Neutral
“Fairhaven”	Potential direct impact: Minor (vibration)	Neutral	Neutral
House (31 McLaren Street)	Potential direct impact: Minor (vibration)	Neutral	Neutral
“O’Regan”	Potential direct impact: Minor (vibration)	Neutral	Minor – views and vistas
Monte Sant’ Angelo Group	Neutral	Neutral	Negligible – views and vistas
Shop at 187 Miller Street	Direct impact: Major (complete demolition)	N/A	N/A
MLC Building	Potential direct impact: Minor (vibration – demolition of adjacent and adjoining structure)	Neutral	Minor – views and vistas
Rag and Famish Hotel (199 Miller Street)	Potential direct impact: Neutral (vibration)	Neutral	Minor – views and vistas
Commercial building (201 Miller Street)	Potential direct impact: Neutral (vibration)	Neutral	Neutral
McLaren Street Conservation Area	Neutral	Neutral	Minor – views and vistas
Bus stop	Moderate	Neutral	Neutral
Potential archaeological resource within the study area	N/A	Minor to major – low to moderate potential for locally significant archaeological remains	N/A

6.6 Blues Point temporary site

The temporary construction site at Blues Point is proposed for the retrieval of the cutter head and shield of TBMs launched from Chatswood and Barangaroo. The location of the site is illustrated in Figure 66.

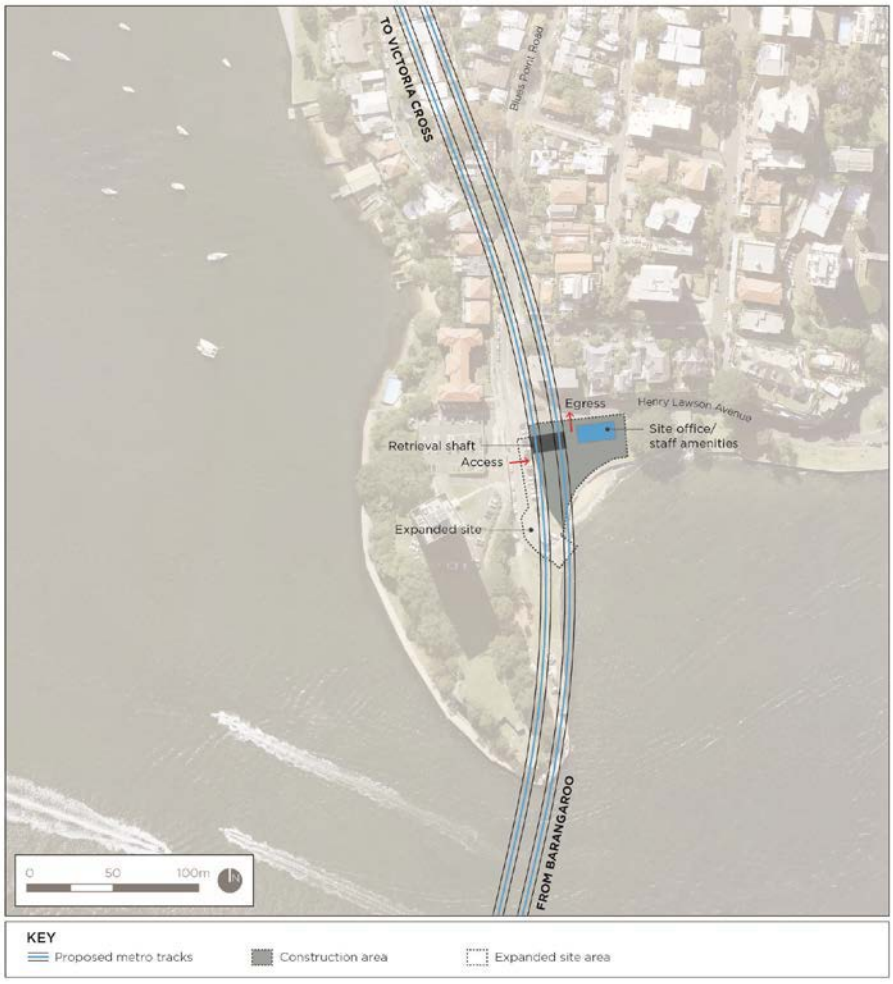
6.6.1 Construction

The Blues Point temporary construction site would be about 2,100 square metres and would be located within Blues Point Reserve at the end of Blues Point Road. The site currently contains public open space and a public road.

Construction works at this site would involve the excavation of a shaft to the tunnels below resulting in around 8,000 cubic metres of spoil being removed through the site. The cutter heads and shield of the tunnel boring machines from the northern portal and from Barangaroo would be retrieved through this shaft. During retrieval of the tunnel boring machine components, this site would expand to encompass the current car parking on Blue Point Road adjacent to the reserve and the end of Blues Point Road to gain access to the existing wharf.

Access and egress to and from the site would be left in from Blues Point Road and left out to Henry Lawson Drive.

Figure 66: Blues Point Temporary Tunnel Support Site.



6.6.2 History of the study area

The study area was originally located within land granted to William (Billy) Blue in 1817. Blue was appointed ferryman to the North Shore and began a rowing boat service between Dawes Point in the Rocks and Blues Point, as the site of his northern ferry terminus became known. In 1823 Edward Wollstonecraft and William Gore, both landholders on the north shore with vested interests in harbour trade, attempted to oust Blue from his land and ferrying service, alleging that he was a law-breaker who regularly smuggled goods and harboured escaped prisoners. In response Blue petitioned Sir Thomas Brisbane that, in view of his long and trusted service for the government, he should be granted 'in his old age the peaceable enjoyment of his premises and ferry'. The governor found in his favour, authorizing him to 'have the Use and Occupation of his ferry, which he formerly occupied between his farm in Northampton and Sydney'.[74]On Blue's death in 1834 the estate was divided amongst his children, and stayed in his family until the mid-nineteenth century.

From the 1850s Blue's estate was subdivided, with the earliest developments occurring around its northern end. Blues Point Road was gazetted from 1839 as a thoroughfare from the ferry wharf to the St Leonards township (today known as North Sydney).

By the 1870s, most of the middle and southern portions of the peninsula had been subdivided. The foreshore was known for its boatbuilding and repair industry from the late 1800s, and a vehicular ferry was established in 1900. A tramway was extended to McMahons Point in 1909, stimulating further development and growth of the area. By the early twentieth century ferry wharves ringed the peninsula, with many berths used by the Sydney Ferry Company Limited (Figure 67)

The tram and ferry service was replaced with a bus service following the opening of the Sydney Harbour Bridge in 1932.

Some of the original housing in the vicinity was demolished in the 1950s, and replaced by Blues Point Tower in 1962.

Figure 67: The vehicular ferry P.S. "Warrane" at Blues Point, undated. MLNSW Government Printing Office 1 – 19851.

[74] Park, M. 'William (Billy) Blue' in *Australian Dictionary of Biography*.

6.6.3 Heritage listed items

The following table outlines the heritage listed items within the study area which are shown in Figure 68).

Table 37: Overview of heritage items within the Blues Point temporary tunnel support site.

Heritage item	Register listings	Significance	Relationship to the study area
Sydney Opera House Buffer Zone	World Heritage List	Outstanding universal value	Construction area within heritage item
Blues Point Waterfront Group	North Sydney LEP 2013 I0423 Includes the following individually listed items • Blues Point vehicular ferry dock (I0451) • World War II Observation Post and stone stairs (I0424) • Blues Point Foreshore Shelf (I0425) • Stone retaining wall (I0426) • Bollard (I0427) • Bollard with chain (I0428) • Excavation (archaeological site) (I0429) • Steps with bollards (I0450)	Local	Construction area within Blues Point Waterfront Group (not all individually listed items within study area)
Blues Point Tower	North Sydney LEP 2013 I0408	Local	Partially within buffer zone
North Sydney bus shelters	North Sydney LEP 2013 I0407	Local	Partially within study area
House (3 Warung Street)	North Sydney LEP 2013 I0515	Local	Partially within buffer zone
House (5 Warung Street)	North Sydney LEP 2013 I0516	Local	Partially within buffer zone
McMahons Point South heritage conservation area	North Sydney LEP 2013 CA14	Local	Construction area within heritage item

Figure 68: Heritage items within the Blue Point temporary tunnel support site.

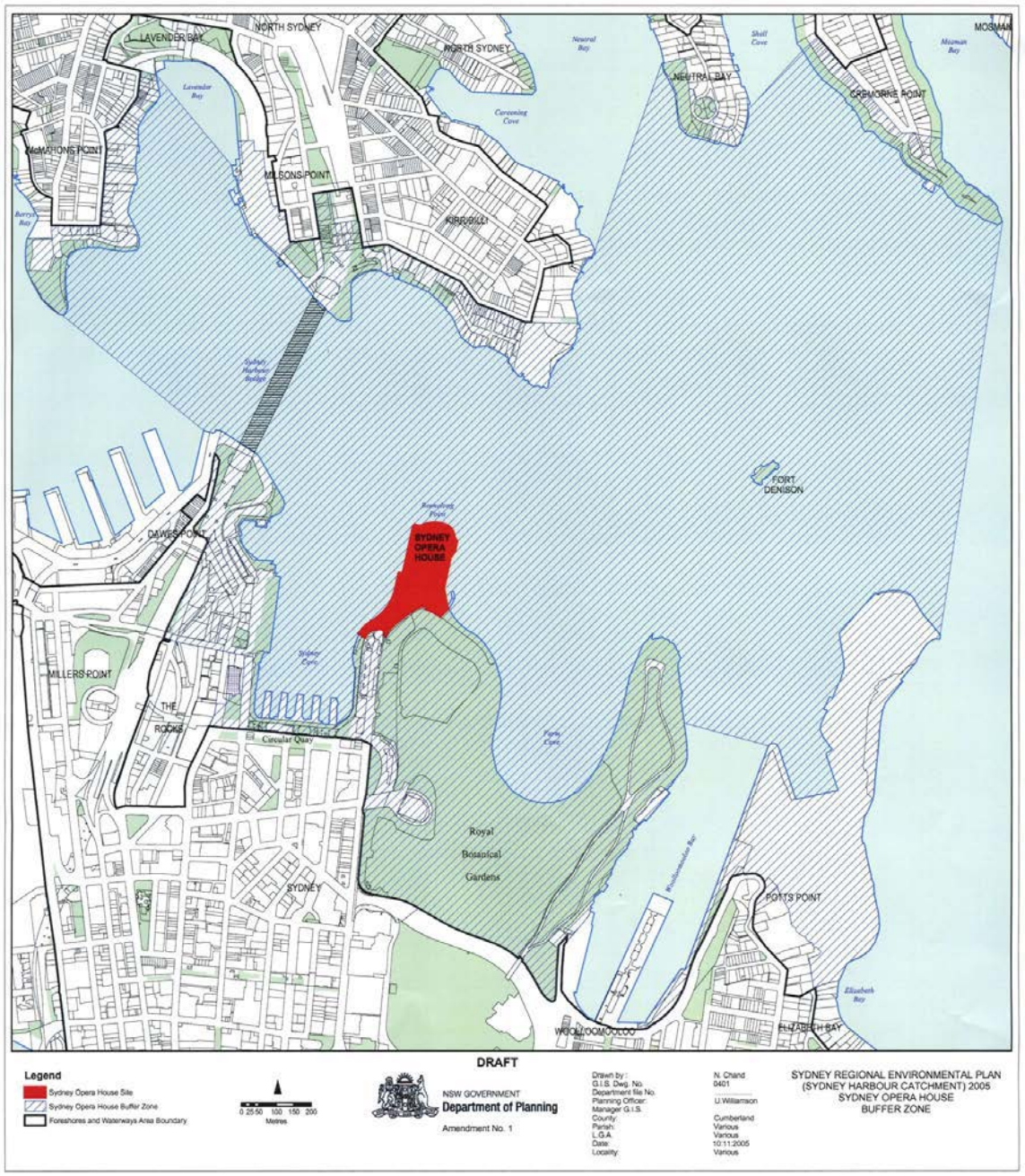
6.6.4 Detailed heritage impact assessments

Heritage items

Table 38: Sydney Opera House Buffer zone heritage impact assessment

Sydney Opera House Buffer zone heritage impact assessment[75]

Figure 69: Sydney Harbour Bridge buffer zone heritage impact assessment



[75] Description and Statement of significance extracted from State Heritage inventory sheet "Blues Point Waterfront Group" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2180677 on 22/10/2015.

Sydney Opera House Buffer zone heritage impact assessment[75]	
Image	**Figure 70: Views from Blues Point towards the Sydney Opera House. Artefact Heritage 2015.** 
Value	Outstanding universal value
Description	The Sydney Opera House is a building recognised worldwide as an iconic landmark overlooking the waters of Sydney Harbour. In acknowledgement of its cultural significance, the *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005* has inserted buffer zone controls for the Sydney Opera House. The buffer is intended to give additional protection to the world heritage values of the Sydney Opera House. The buffer intends to protect views of the site from public places on the foreshores that contribute to its world heritage significance balanced against the need for orderly and economic development of the land.
Statement of significance	The Sydney Opera House constitutes a masterpiece of 20th century architecture. Its significance is based on its unparalleled design and construction; its exceptional engineering achievements and technological innovation and its position as a world-famous icon of architecture. It is a daring and visionary experiment that has had an enduring influence on the emergent architecture of the late 20th century. Utzon's original design concept and his unique approach to building gave impetus to a collective creativity of architects, engineers and builders. Ove Arup's engineering achievements helped make Utzon's vision a reality. The design represents an extraordinary interpretation and response to the setting in Sydney Harbour. The Sydney Opera House is also of outstanding universal value for its achievements in structural engineering and building technology. The building is a great artistic monument and an icon, accessible to society at large. Criterion (i): The Sydney Opera House is a great architectural work of the 20th century. It represents multiple strands of creativity, both in architectural form and structural design, a great urban sculpture carefully set in a remarkable waterscape and a world famous iconic building. All elements necessary to express the values of the Sydney Opera House are included within the boundaries of the nominated area and buffer zone. This ensures the complete representation of its significance as an architectural object of great beauty in its waterscape setting. The Sydney Opera House continues to perform its function as a world-class performing arts centre. The Conservation Plan specifies the need to balance the roles of the building as an architectural monument and as a state of the art

Sydney Opera House Buffer zone heritage impact assessment[75]	
	performing centre, thus retaining its authenticity of use and function. Attention given to retaining the building's authenticity culminated with the Conservation Plan and the Utzon Design Principles. The Sydney Opera House was included in the National Heritage List in 2005 under the *Environment Protection and Biodiversity Conservation Act 1999* and on the State Heritage Register of New South Wales in 2003 under the Heritage Act 1977. Listing in the National Heritage List implies that any proposed action to be taken inside or outside the boundaries of a National Heritage place or a World Heritage property that may have a significant impact on the heritage values is prohibited without the approval of the Minister for the Environment and Heritage. A buffer zone has been established. The present state of conservation is very good. The property is maintained and preserved through regular and rigorous repair and conservation programmes. The management system of the Sydney Opera House takes into account a wide range of measures provided under planning and heritage legislation and policies of both the Australian Government and the New South Wales Government. The Management Plan for the Sydney Opera House, the Conservation Plan and the Utzon Design Principles together provide the policy framework for the conservation and management of the Sydney Opera House.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The temporary construction site at Blues Point is located within the north-western portion of the Sydney Opera House buffer zone, and within direct visual catchment of the Sydney Opera House. The construction site may be temporarily visible from the Sydney Opera House. On finalisation of the works, the area would be reinstated to its pre-construction condition. There would be no permanent project infrastructure located at this site. **Indirect impact: Temporary (negligible)**

Table 39: Blues Point Waterfront Group heritage impact assessment

Blues Point Waterfront Group[76]	
Image	**Figure 71: Blues Point Waterfront Group. Artefact Heritage 2015.** 
Significance	Local
Description	Originally land granted to William Blue in 1817, the area encompassed in this listing covers all lands south of the cliff face that form the northern boundary of Henry Lawson Drive, from the McMahons Point Ferry Wharf to the northernmost end of the public reserve on the western side of Blues Point, but additionally includes the public steps from the corner of East Crescent Street and Warung Street down to the McMahons Point Ferry Wharf. This area is largely a flat shelf retained by seawalls around the foreshore, with a ridge along Blues Point on which sits the Blues Point Tower. Most of the land, excepting the Blues Point Tower, is publicly owned. Numerous features, plus the landform itself, are evidence of the progressive usage of the area from the early nineteenth century. The Blues Point Waterfront Group incorporates a number of elements that are also listed individually on the North Sydney LEP, including the following: • Blues Point vehicular ferry dock (I0451) • World War II Observation Post and stone stairs (I0424) • Blues Point Foreshore Shelf (I0425) • Stone retaining wall (I0426) • Bollard (I0427) • Bollard with chain (I0428) • Excavation (archaeological site) (I0429) • Steps with bollards (I0450) The majority of these elements are located outside the study area.
Statement of significance	One of the earliest areas of settlement on the North Shore and with Milson's Point, the major gateway from the city to the North Shore until the opening of the Bridge. Important relics of transportation by ferry and tram, plus associated modified landforms, all now contained in a Public Reserve. Highly regarded public reserve with important views to and from the harbour, made colourful and interesting by relics of its development.
Impact type	Direct impact: Physical Indirect impact: Views and vistas
Heritage impact assessment	The excavation of the shaft would result in minor to moderate temporary physical and visual impacts to the heritage item through the excavation of existing public park, removal of spoil and establishment of the compound and worksite. **Direct impact: Minor to moderate** The temporary use of the site would result in minor to moderate temporary visual impacts. **Temporary indirect impact: Minor to moderate**

[76] Description and Statement of significance extracted from State Heritage inventory sheet "Blues Point Waterfront Group" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2180677 on 22/10/2015.

Table 40: Blues Point Tower heritage impact assessment

Blues Point Tower[77]	
Image	**Figure 72: Blues Point Tower. Artefact Heritage 2015.** 
Significance	Local
Description	Built between1958-1962 to the design of Harry Siedler, the structure consists of a twenty-five storey apartment building, square in plan, constructed of steel and reinforced concrete. The design was initially part of a larger concept plan for high-rise residential development for McMahon's Point, but by the time it was completed was falling in popular acceptance, as was the general perception of high-rise, high-density residential development. In recent years, whilst generally respected, it is often cited as an example of a structure inappropriate to its context.
Statement of significance	Conspicuous, though unpopular, example of Internationalist style. This landmark building was innovative in its day and intended as a forerunner of a whole movement in architecture and high-density housing. The tower in its landscaped setting is illustrative of the modernist architectural philosophies propounded by Le Corbusier and others. Its construction was a factor in a popular revolt against such types of development, particularly in this area. It was voted, in a popular poll, the building most Sydneysiders would like to see removed. Interior Ground Level foyer of significance including its relationship with the exterior landscape.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The use of the site would result in minor to moderate temporary visual impacts to this heritage item. **Temporary indirect impact: Minor to moderate**

[77] Description and Statement of significance extracted from State Heritage inventory sheet “Blues Point Waterfront Group” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2180677 on 22/10/2015.

Table 41: North Sydney bus shelters heritage impact assessment

North Sydney bus shelters[78]	
Image	**Figure 73: View to the north, towards North Sydney bus shelters. Artefact Heritage 2015.** 
Significance	Local
Description	The bus shelter is listed on the North Sydney LEP, in a group listing for the North Sydney bus shelters. The shelter within the study area is referred to as the Henry Lawson shelter, and located on Henry Lawson Avenue. The installation of the bus shelters was supervised by architect Hugh Slatyer. The construction was undertaken by Stephen Edwards Construction for $9220 per shelter in 1984.
Statement of significance	This heritage item consists of a series of small and effective functional buildings of handsome design and good workmanship. They are traditional and conservative in form and detail and designed to their varied locations. The structures have historic interest as elements of a particular and controversial attempt at Municipal civic design.
Impact type	Direct physical impact: removal and relocation
Heritage impact assessment	The establishment of the temporary site would require the removal, storage and relocation of the bus shelter on finalisation of the works. **Direct physical impact: Moderate**

[78] Description and Statement of significance extracted from State Heritage inventory sheet "North Sydney Bus Shelters" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2181325 on 22/10/2015.

Table 42: House (3 Warung Street) heritage impact assessment

House (3 Warung Street)[79]	
Image	**Figure 74: House at 3 Warung Street. Artefact Heritage 2015.** 
Significance	Local
Description	The heritage item consists of a single storey rendered brick house with basement storey towards the waterfront. Hipped gable roof is clad in slate and a three-facet projecting bay to the waterfront has a faceted hipped roof. Verandah bay is modified by projecting balcony over lower storey with cast-iron lace balustrade. This building is designed in the Victorian Italianate style.
Statement of significance	See under Warung Street Group NSHS0673. A group of fine quality late nineteenth century waterfront villas prominently sited and with important views across the Harbour. Each house is a good example of its type, the three being stylistically similar, and as a group would be exceptional on any site. Their survival here is remarkable and is a tribute to their standard.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The establishment of the Blues Point temporary site may have a minor visual impact on the heritage item that is elevated to the north of the study area. On finalisation of the works, the project would not impact on the heritage item. **Temporary indirect impact: Minor**

[79] Description and Statement of significance extracted from State Heritage inventory sheet "House" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2180674 on 22/10/2015.

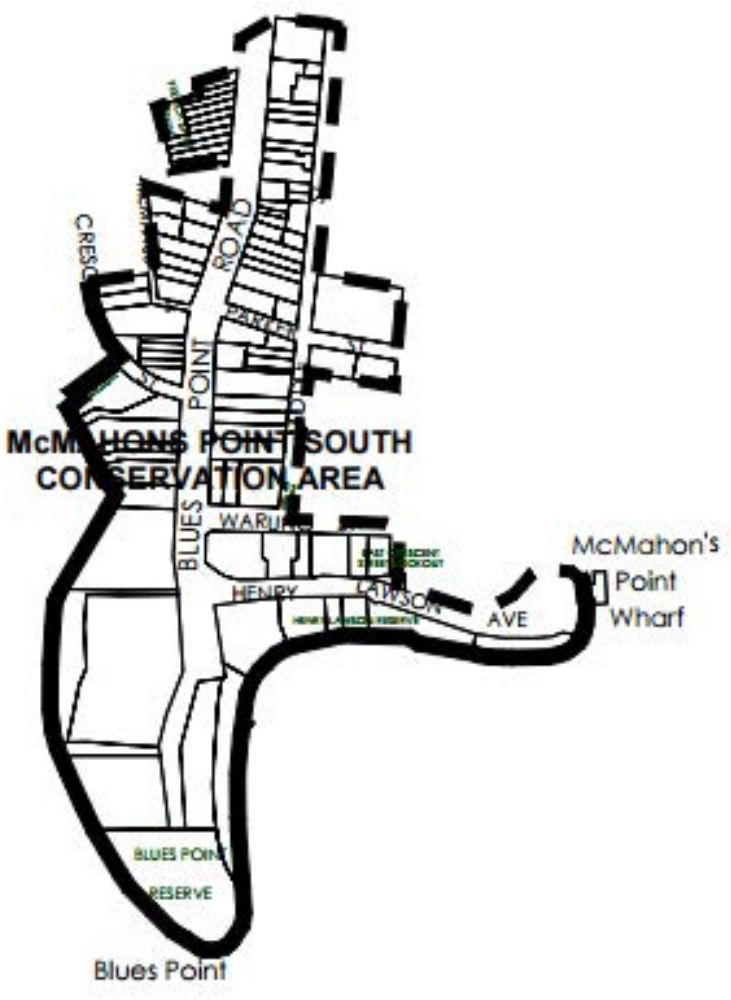
Table 43: House (5 Warung Street) heritage impact assessment

House (5 Warung Street)[80]	
Image	**Figure 75: House at 5 Warung Street. Artefact Heritage 2015.** 
Significance	Local
Description	The heritage item consists of a single storey rendered brick house with hipped gable roof of slate and a verandah returning on two sides towards the waterfront, which has a corrugated-iron skillion roof. There are two three-faceted projecting bays, each with faceted hipped roof, one central to the western facade, the other forming the south-east corner. This building is designed in the Victorian Italianate style.
Statement of significance	See under Warung Street Group NSHS0673. A group of fine quality late nineteenth century waterfront villas prominently sited and with important views across the Harbour. Each house is a good example of its type, the three being stylistically similar, and as a group would be exceptional on any site. Their survival here is remarkable and is a tribute to their standard.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The establishment of the temporary tunnel support site may have a minor visual impact on the heritage item that is elevated to the north of the study area. On finalisation of the works, the project would not impact on the heritage item. **Temporary indirect impact: Minor**

[80] Description and Statement of significance extracted from State Heritage inventory sheet “House” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2180675 on 22/10/2015.

Heritage conservation area

Table 44: McMahons Point South conservation area heritage impact assessment

McMahons Point South conservation area[81]	
Image	
Significance	Local
Character statement	Blues Point Road runs along the ridge line to the waterfront where there are expansive views to the harbour, Sydney City and Berry's Bay. Lot sizes within the area are large. Buildings are mainly residential ranging from 1840s stone cottages through to Interwar buildings. The majority of the buildings are small to modest dwellings, with much group development (eg terraces) and most have rear access. The architectural periods and styles of buildings are quite mixed. Street trees (Jacarandas, mixed Australian species and occasionally palms) are mature and substantial on the major streets with front garden plantings that help supplement street plantings and give a reasonable sense of continuity with Blues Point Road. Other urban elements such as stone retaining walls, rocky outcrops and a maturing avenue of jacaranda trees also help to create a sense of place. Public open space is provided at the water's edge in Public Reserves (Blues Point Reserve and a small pocket park at Warung Street) that provide outstanding views of Sydney Harbour.

[81] Character statement and Statement of significance extracted from PART B North Sydney Council DCP 2002 Area Character Statements July 2013: 370.

McMahons Point South conservation area[81]	
Statement of significance	McMahons Point South Conservation Area is of significance: 1. as a mid 19th century to mid 20th century residential area with a mix of Victorian, Federation and 1920s and 30s housing mixed with a small amount of Interwar residential flat buildings. 2. for the extensive and important open space precinct around the foreshore of Blues Point which is a major civic facility with extensive views of the Harbour Bridge, North Sydney, Milsons Point and the city. It also marks an early crossing point of the harbour with its remaining ferry access point and remnants of waterfront industry.
Impact type	Direct impact: Physical Temporary indirect impact: Views and vistas
Heritage impact assessment	The project would result in minor to moderate temporary physical and visual impacts arising from the establishment of the Blues Point support site and the temporary removal of previously open land from public use. Minor works to facilitate the movement of trucks up Blues Point Road may be required. These works are likely to result in minor physical impacts. On finalisation of the works, the project would not impact on the heritage item. **Temporary indirect impact: Minor to moderate** **Direct impact: Minor to moderate**

6.6.5 Archaeological assessment

6.6.5.1 Site inspection results

The proposed site consists of a gently sloping grassed land bordering the northern foreshore of Sydney Harbour. The foreshore is delineated by a sandstone block retaining wall. A sandstone retaining wall demarcates Warung Street.

Figure 76: View of sandstone retaining wall.

Figure 77: View to the west.

6.6.5.2 Overview of previous structures

The configuration of the study area in the early 19th century is unknown, although it can be assumed that it may have contained simple wharfage associated Billy Blue's ferry service. Small structures may also be associated with this phase of development.

Following subdivision of the estate the valuable foreshore areas of Blues Point became popular with shipbuilders and ferry wharfage. It is possible that reclamation or quarrying also occurred at this time, in order to make the rocky and steep Blue's Point foreshore more conducive to industry. In the late 1850s a substantial network of stone sea walls and a series of small timber wharves were located to the south of the study area (Figure 78). A c.1864 plan partially incorporating the study area also indicates that a number of structures were located in the west of the study area at this time (Figure 79). The plan also illustrates the location of the original rocky shoreline, with sketches indicating the possible location of earlier wharfage, potentially associated with the Blue Estate. These are to the south of the study area

An undated subdivision plan of Blue's Point illustrated a line of reclaimed land on the eastern side of the peninsula (in the vicinity of the earlier stone sea walls; Figure 78).

Historical evidence shows that a structure, probably a dwelling was located within the study area, at the location of the proposed shaft from around 1870. Additions to the structure can been seen in historical photographs up until the 1940s, when it is presumed it was demolished (Figure 80, Figure 81 and Figure 82). There is no clear evidence that further ground disturbance at this location occurred and it is possible that remains of the structure may be present beneath the fill and turf.

By the early 20th century the vehicular ferry had been established, presumably in conjunction with wharfage and possible shelters.

Figure 78: Photograph of Blues Point taken by Robert Hunt c.1858. MLNSW SPF/799

Figure 79: Detail from plan of the Blues Point Estate, Parish of Willoughby c.1864. MLNSW Z/M3 811.1411/1864/1. Study area shown in red.

Figure 80: View southwest across Blues Point showing small dwelling in the study area. Date of image ca. early 1870s (State Library of NSW SPF 933)

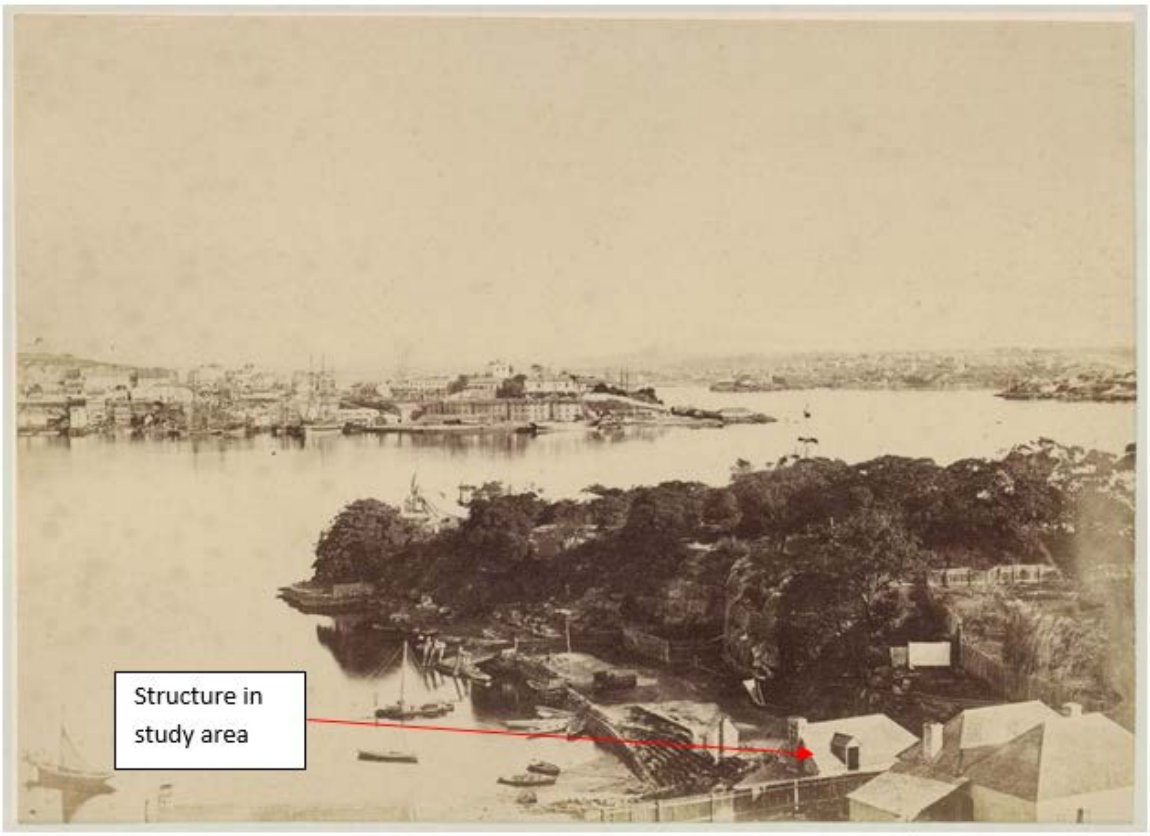


Figure 81: View of Blues Point c.1910. MLNSW PXE 711/59

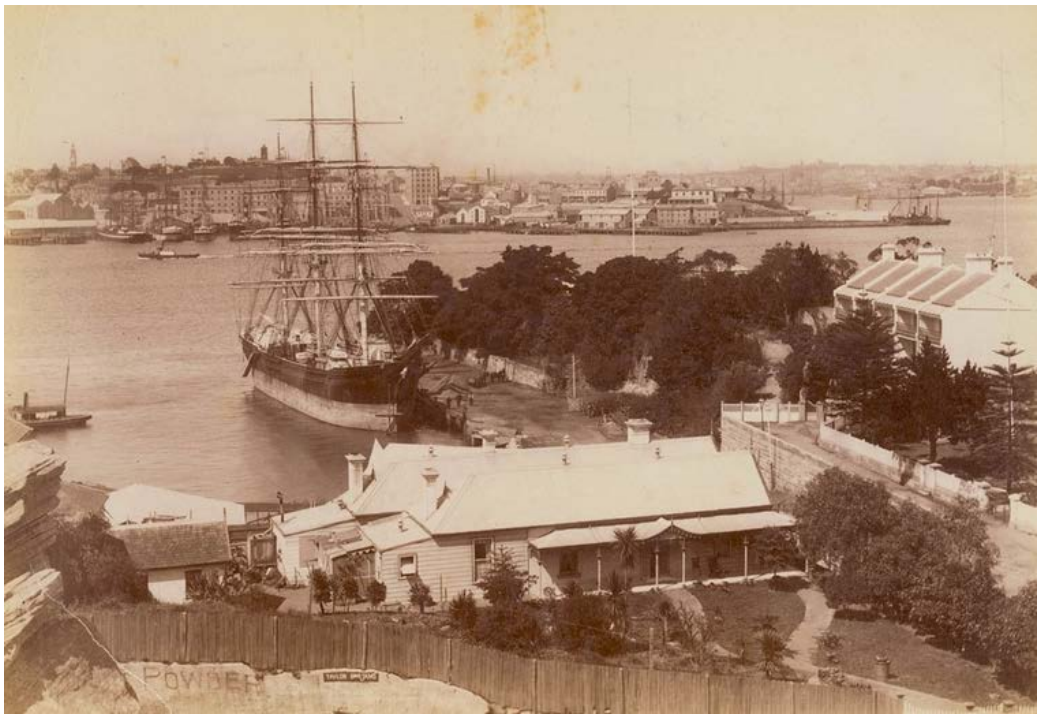


Figure 82: Image assumed to have been taken early Second World War of the SS Stratheden passing Blues Point. Structures within the Blues Point Temporary site visible in the background (Australian War Memorial ID P00172.001)

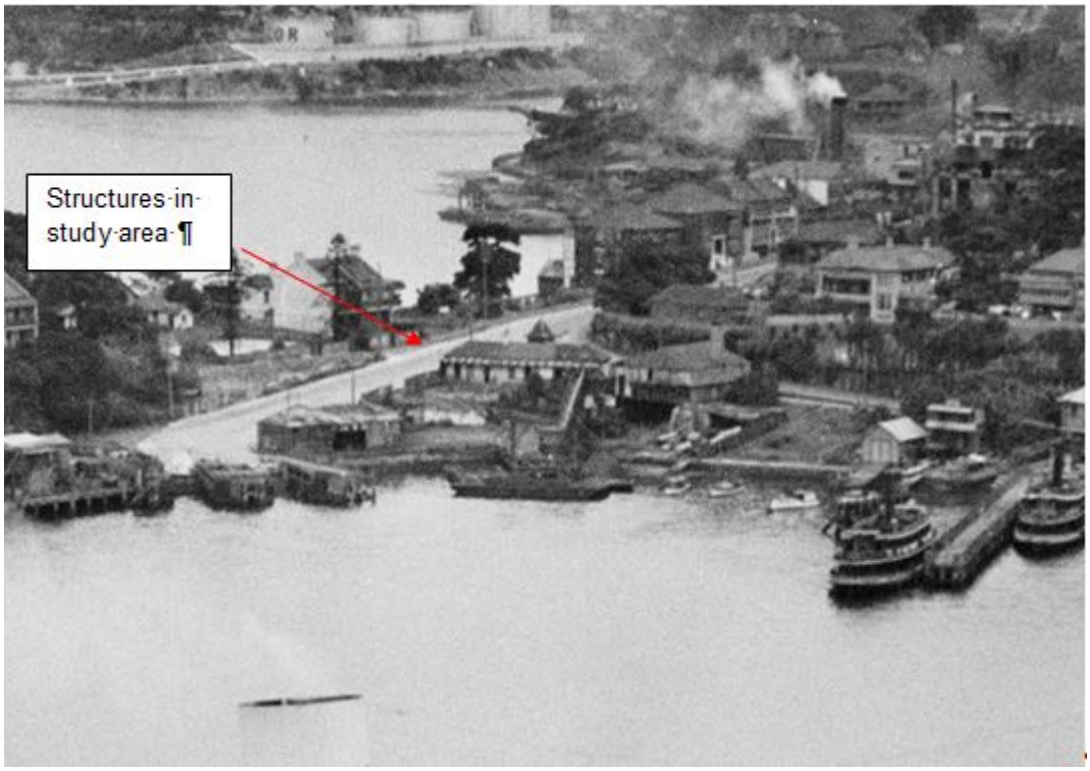
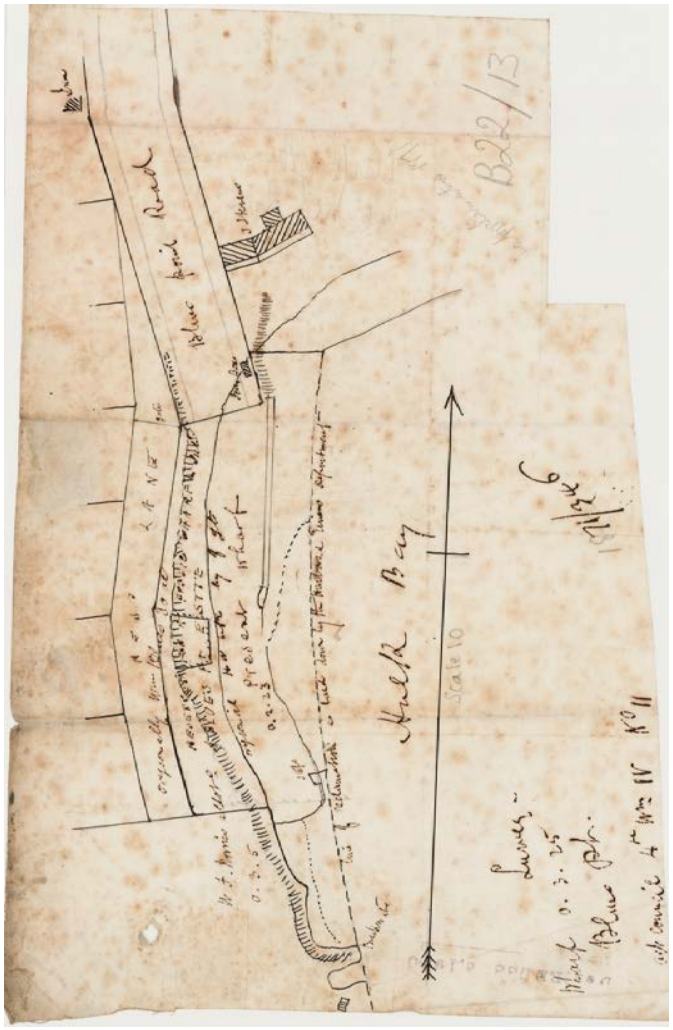


Figure 83: Detail from an undated Blue's Point subdivision plan. MLNSW Z/SP/B22.



6.6.5.3 Known impacts

Subsurface impacts associated with former or current land uses have the potential to remove or damage potential archaeological remains. Previous impacts within the site need to be further understood and identified before more than a preliminary assessment of archaeological impact can be made. Based on the initial literature review and site inspection undertaken as part of this assessment, the following preliminary assumptions regarding archaeology at the site can be made:

- Foreshore environments such as the landscape within the study area, and particularly those utilised for shipbuilding works, tend to be heavily modified. In some locations this modification can protect earlier archaeological remains, for example, within reclamation fills.
- Examination of mid twentieth century aerial photography indicates that the study area may have been subject to in-cutting in a number of locations. It is possible that this has partially removed areas of archaeological potential.
- Reclamation of shallow foreshores area, and successive periods of expansion, rebuilding and subdivision throughout the early to mid 1800s may have buried or removed earlier evidence within the study area, and obscured the original shore line.

- Industrial activity throughout the late 1800s, and into the 20th century, included the demolition of earlier wharves and jetties, reclamation and reconstruction of wharves to better accommodate larger ships and new technologies. This may have disturbed or removed evidence of earlier activities. It is likely, however, that in most instances, structures were demolished to ground level before being backfilled, as was the common practise in 19th century demolition.
- It is likely that some quarrying occurred to the north of the study area, potentially in the mid to late nineteenth century, and currently represented by the sandstone retaining wall on the northern side of Henry Lawson Avenue. This may have impacted on archaeological remains in the north of the study area.

6.6.5.4 Preliminary assessment of significance

The following is a preliminary assessment of significance, informed by the NSW Heritage Criteria for *Assessing Significance related to Archaeological Sites and 'Relics'* (2009).

Archaeological research potential (NSW Heritage Criterion E):

- Archaeological remains associated with early and late nineteenth century foreshore development, wharfage and sea walls (if associated with an intact archaeological site), would have significant research potential, dependant on the nature and extent of any remains.

Association with individuals, events, or groups of historical importance (NSW Heritage Criteria A, B & D):

- Archaeological remains associated with Billy Blue may have significance at a State level.
- It is possible that evidence of early residential development of the study area may have associations with former residents and known local historical figures. Specific associations have not been identified at this stage.

Aesthetic or technical significance (NSW Heritage Criterion C):

- If intact remains associated with early foreshore development, such as wharfage and seawalls, were identified within the study area, they would have technical significance.

Ability to demonstrate the past through archaeological remains (NSW Heritage Criterion A, C, F & G):

- The study area has low to moderate potential to demonstrate the past through archaeological remains.

Overall, the site may contain archaeological remans with potential to reach the local and State significance threshold.

- Archaeological remains associated with Billy Blue's ferry service or the pre-1850 Blue Estate, if found to be substantially intact and legible, may have significance at a State level.
- Evidence associated with mid and later nineteenth century reclamation and associated infrastructure, wharfage and warehousing, on the eastern side of Blues Point may have significance at a local level.
- Evidence of former late 19th century structure identified in the location of the proposed shaft excavation is likely to have significance at a local level.
- Early and later 20th century reclamation and wharfage is unlikely to meet the local significance threshold.

6.6.5.5 Overview archaeological potential

An overview of the archaeological potential within the study area has been included in Table 45.

Table 45: Summary of archaeological potential within study area

Potential archaeological resource	Potential	Significance	Heritage impact assessment
Pre-1850's development of the foreshore (Blue ownership) – wharfage and sea walls associated with early ferry service operated by Blue.	Low	Local - State	Excavation works within the study area have low potential to impact on archaeological remains.
Mid to late 19th century evidence of shipbuilding industry – sea walls, wharfage, reclamation, warehousing and other structures such as the potential dwelling identified within the study area.	Moderate	Local	Excavation works within the study area have moderate potential to impact on archaeological remains
Early 20th century development – vehicular ferry, wharfage, reclamation.	Moderate	Unlikely to reach local significance threshold.	Excavation works within the study area have moderate potential to impact on archaeological remains.

6.6.5.6 Archaeological impact assessment

Proposed works within the Blues Point temporary site with the potential to impact on archaeological remains include:

- Excavation of open shaft to tunnel
- Foundation/ground slab excavations for establishment of staff amenities and site offices during the construction phase

Works with the potential to impact archaeological resources within the Blues Point temporary site, with the exception of the open shaft excavation, are likely to be limited to discrete locations. Therefore, works in this location are likely to have a minor to major impact on potential archaeological resources, dependant on the location and extent of the proposed excavation works.

6.6.6 Overview of constraints

The following table outlines the potential heritage constraints within the study area:

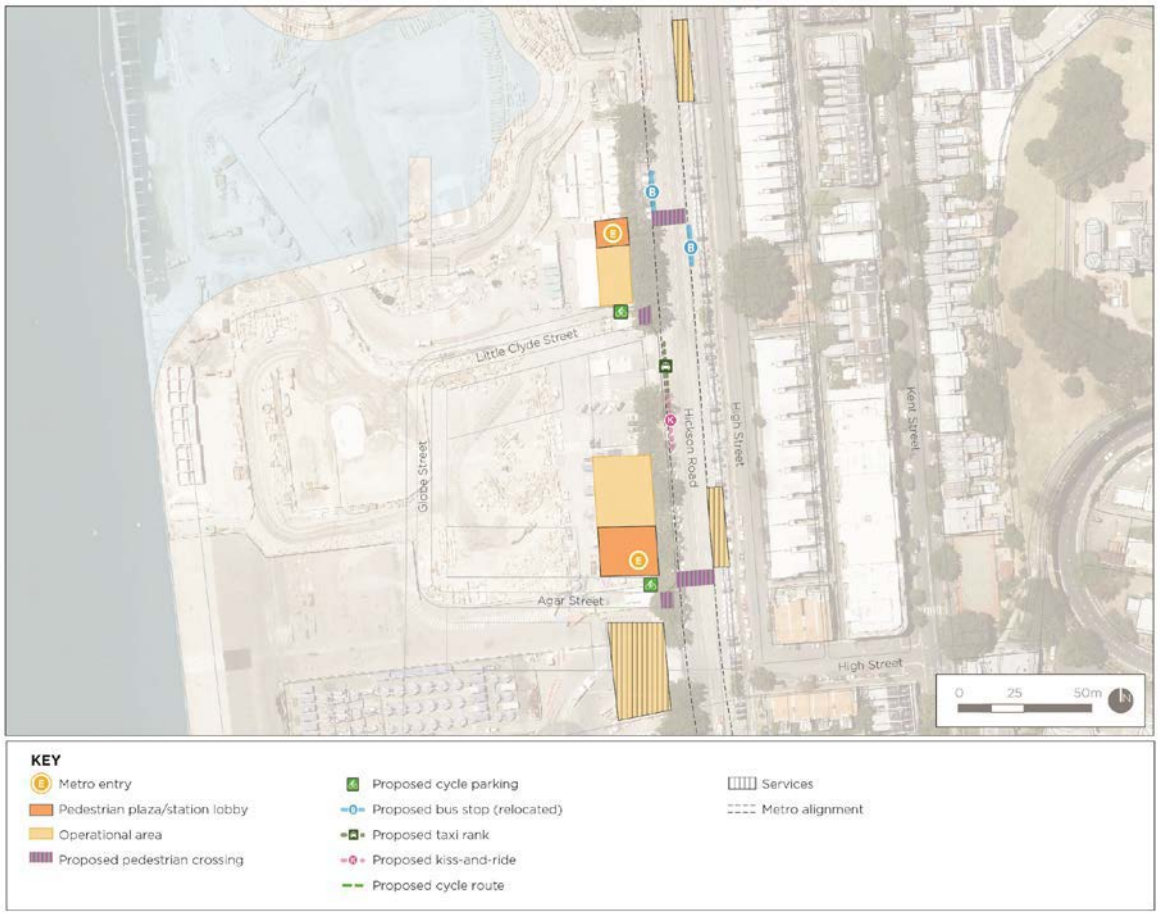
Table 46: Overview of constraints on heritage items and areas of archaeological potential

Heritage item	Potential heritage impacts		
	Direct impact	**Archaeological impact**	**Indirect impact**
Sydney Opera House World Buffer Zone	N/A	N/A	Temporarily negligible – views and vistas
Blues Point Waterfront Group	Temporarily minor to moderate – shaft excavation	Minor to major – low to moderate potential for local and state significant archaeological remains	Temporarily minor to moderate– views and vistas
Blues Point Tower	Neutral	Neutral	Temporarily minor to moderate – views and vistas
North Sydney bus shelters	Direct impact: Moderate (relocation)	Neutral	Neutral
House (3 Warung Street)	Neutral	Neutral	Temporarily minor – views and vistas
House (5 Warung Street)	Neutral	Neutral	Temporarily minor – views and vistas
McMahons Point South heritage conservation area	Temporarily minor to moderate – shaft excavation	Minor to major – low to moderate potential for local and state significant archaeological remains	Temporarily minor to moderate – views and vistas
Potential archaeological resource within the study area	N/A	Minor to major – low to moderate potential for local and state significant archaeological remains	N/A

6.7 Barangaroo Station

The proposed Barangaroo Metro station is located on Hickson Road within the Barangaroo precinct on the west side of the Sydney CBD. The Barangaroo development is Sydney and Australia's largest commercial and residential development.

Figure 84: Location and indicative layout of Barangaroo Station.



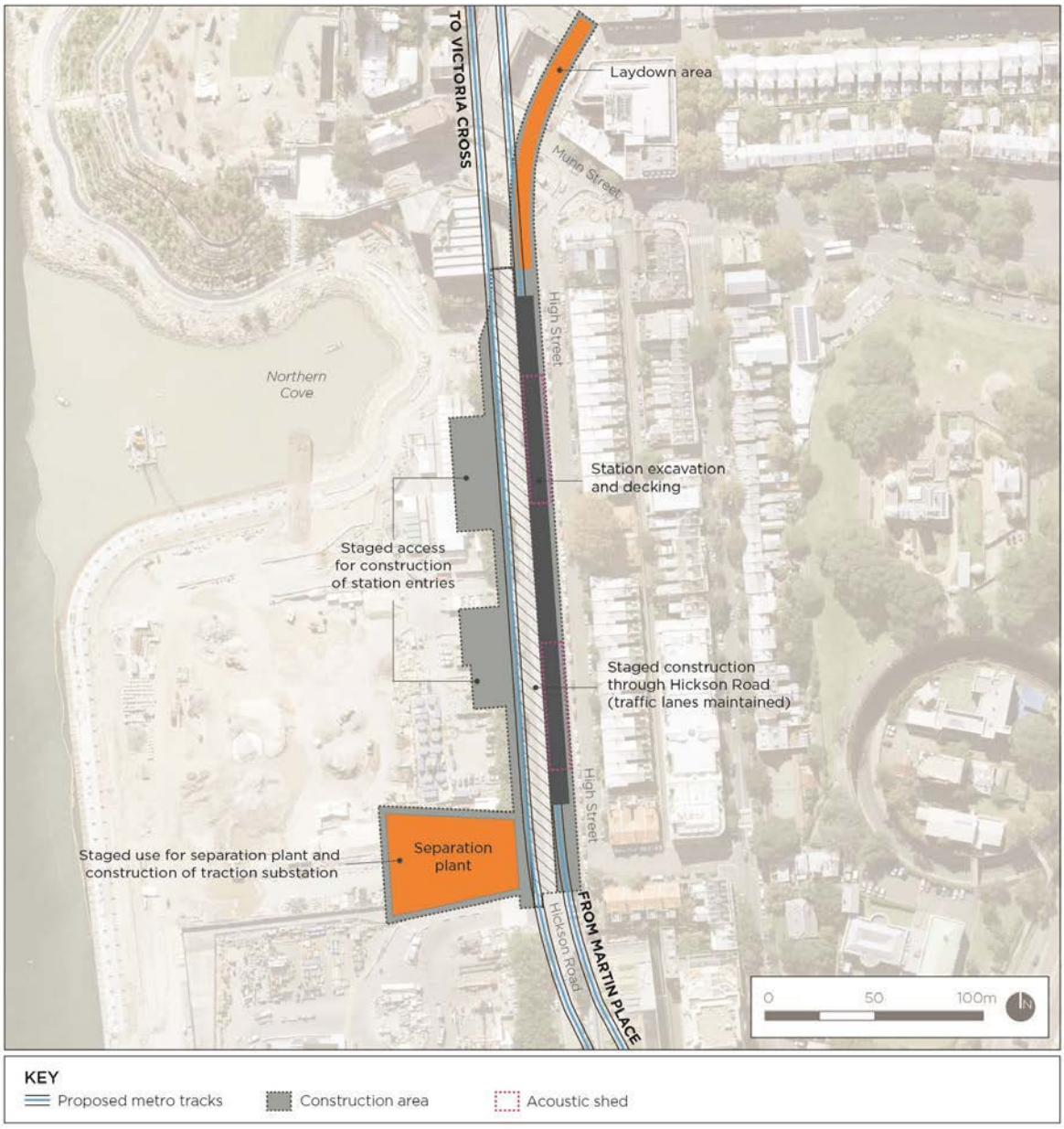
6.7.1 Construction

The Barangaroo Station construction site would cover about 13,800 square metres within the road reserve of Hickson Road and the adjacent Barangaroo development area (Figure 84 and Figure 85). The site would be used to:

- Launch and support the tunnel boring machine for the Sydney Harbour crossing drive to Blues Point
- Retrieve the cutter heads and shields of the two tunnel boring machines driven from the Marrickville dive site
- Carry out the excavation and construction of the future Barangaroo Station.

Access to and egress from the Barangaroo site would be via Hickson Road.

Figure 85: Barangaroo Station construction site layout.



6.7.2 History of the study area

Historic plans indicate that in the early years of the colony the landscape in the vicinity of the study area was underutilised by the British settlers, with settlement concentrated around Sydney Cove and the Tank Stream to the north, and the Brickfields to the east. By Lesueur's plan of 1802, however, the colony appears to have moved west, towards the rocky western ridge overlooking what is now Darling Harbour (Figure 86).[82] Lesueur's plan indicates that the eastern shore of Darling Harbour was originally rocky and steep. The early plans illustrate how modified the current shoreline is in comparison to the original landform.

[82] RPS *Barangaroo Ferry Hub Statement of Heritage Impact*, November 2014: 22.

Figure 86: Detail from Charles Alexandre Lesueur's 1802 Plan de la ville de Sydney. Source: NLA MAP F 307.

Figure 87: Part of the harbour of Port Jackson and the country between Sydney and the Blue Mountains, New South Wales. Drawn by Major Taylor, 48 Regiment, engraved by R Havell & Son c. 1820 Millers Point headland can be seen in the background with two mills. NLA S1974.

For the first decades of European occupation in Sydney, there is very little documentary evidence to suggest extended occupation and use of the lands within the study area, including in and around the Cockle Bay shores (Figure 86). Occupation of the eastern side of what was to be named Cockle Bay (and later Darling Harbour) was confined to several key grants— largely to those associated with the military, including the military hospital, military bathing house and the military barracks—all on the ridge to separate the main settlement from the cove. In terms of desirable land much of the foreshores were marshy or rocky— therefore, initially considered less suitable for occupation and difficult to develop (Figure 87).

From 1810 onwards, Governor Lachlan Macquarie expanded and developed the town of Sydney, including implementation of an organised street layout as part of the Governor's General Orders (Figure 88). The General Orders included the construction of a wharf at the base of Market Street to allow for the easy transport of produce from the farms on the Hawkesbury River, and as a link to the Sydney markets. This was an acknowledgement of the potential of Cockle Bay to play an important role in trade.

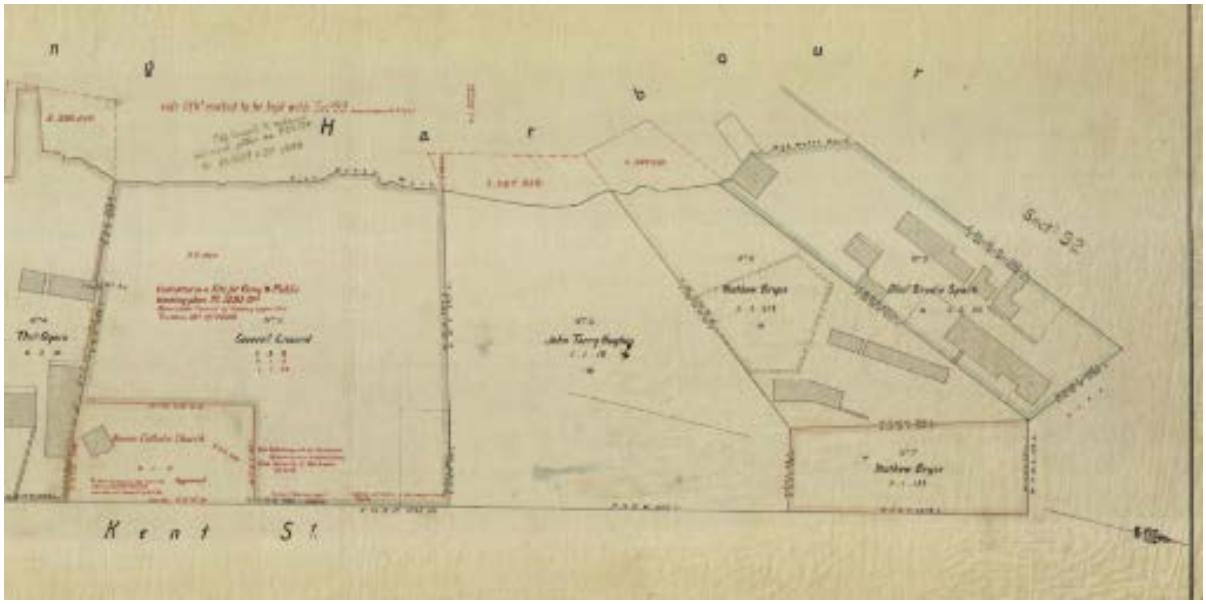
Over the following decades, numerous shipbuilding and transport wharves were constructed along the eastern shore of Darling Harbour (Figure 89).[83]

The spread of Bubonic Plague in 1900 sparked a large-scale redevelopment of the Darling Harbour waterfront. This resulted in a program of land reclamation, amongst other works (Figure 90). Reclamation altered the natural shore line and buried many of the timber wharves constructed prior to 1900.

From 1908, the Sydney Harbour Trust carried out a number of improvements in north Darling Harbour, including the construction of Hickson Road in the mid-1920s. The construction of the road required the pouring of a six-inch thick concrete foundation over a four-inch thick foundation of blue metal, in areas without solid bedrock foundations.[84]

This was part of Hickson Road, the broad thoroughfare that would link the new wharves at Walsh Bay with new and existing wharves at Darling Harbour. Because the Council would be responsible for this road and its maintenance, its officers wished to ensure that the road construction was of high quality. The City Surveyor settled on a concrete roadway at least 6 inches thick where it went over solid rock, and 8 inches thick 'over all portions where solid rock did not exist'. Reinforced with No 9 B. R. C. fabric, the concrete was to be laid on 4 inches of blue metal and topped by a bituminous pavement.[85]

Figure 88: Detail from the 1833 City Section Survey plan. Source: Historical Atlas of Sydney.



[83] RPS 2014: 22.
[84] Broomham, R. Land at Millers Point Ownership and Usage, June 2007: 3.
[85] Broomham 2007: 39.

Figure 89: View of Darling Harbour, looking south from Millers Point c. 1871. SLNSW.

Figure 90: Detail from the Rocks and Foreshore Resumption Plan, c. 1900. Source: Historical Atlas of Sydney.

6.7.3 Heritage listed items

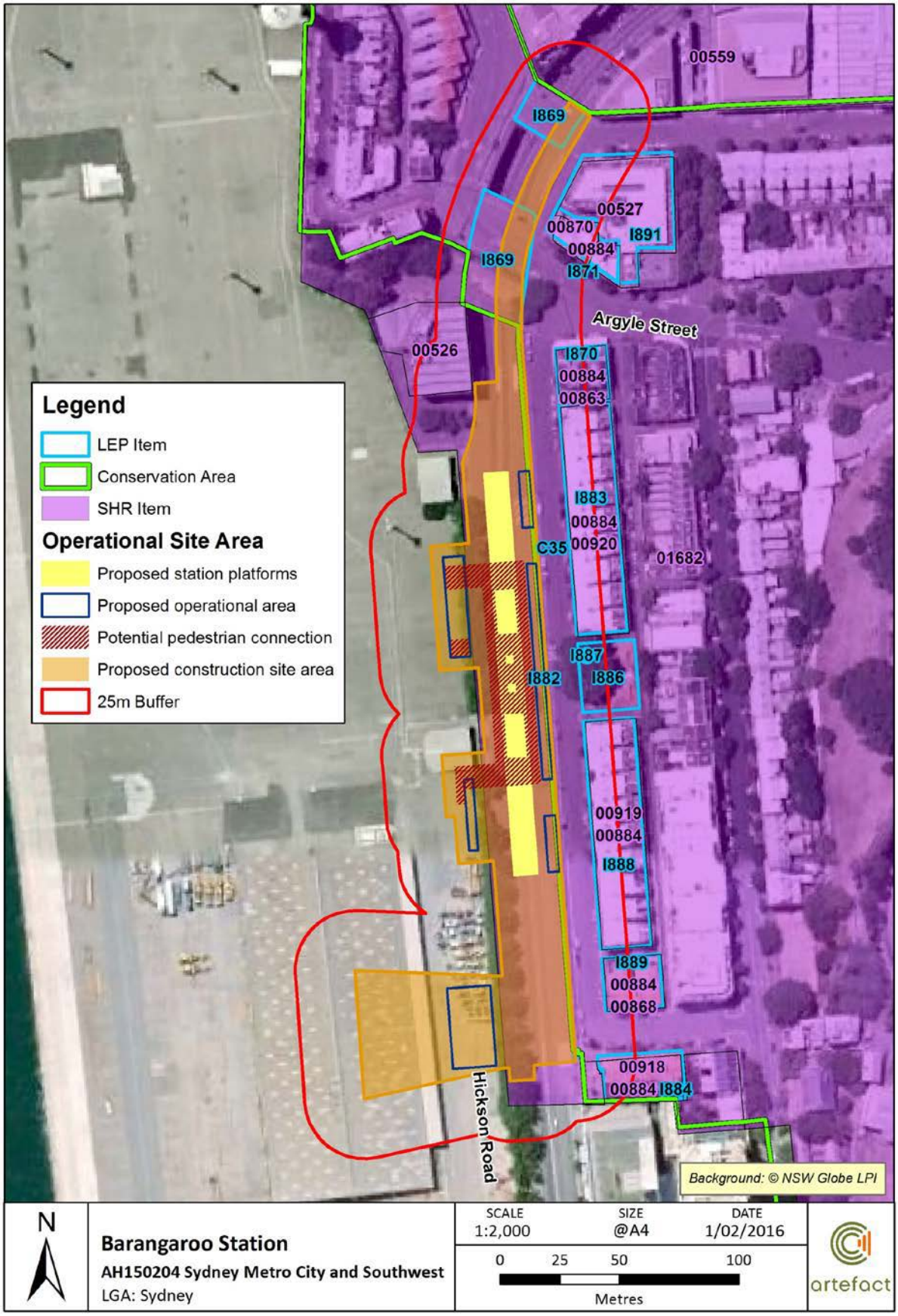
The following table outlines the heritage listed items within the study area which are shown in Figure 91.

Table 47: Overview of heritage items within the Barangaroo study area

Heritage item	Register listings	Significance	Relationship to the study area
Millers Point & Dawes Point Village Precinct	State Heritage Register 01682	State	Partially within construction area and buffer zone
Bridges over Hickson Road	Sydney LEP 2012 I869	Local	Partially within construction area and buffer zone
Palisade Fence and High Steps	Sydney LEP 2012 I882	Local	Within construction area
Warehouses/Dalgety's Bond Store Group	State Heritage Register 00526 State Environmental Planning Policy (Major Development) 2005 Barangaroo heritage Roads and Maritime S170	State	Partially within buffer zone
Shops and residences including interiors	State Heritage Register 00863 Department of Housing S170 register Sydney LEP 2012 I870	State	Partially within buffer zone
Shops 6, 8 Argyle Place	State Heritage Register 00870 Department of Housing S170 register Sydney LEP 2012 I871	State	Partially within buffer zone
Millers Point Conservation Area	State Heritage Register 00884 Department of Housing S170 register Sydney LEP 2012 C35 Register of the National Estate	State	Adjacent to construction area and partially within buffer zone
Terrace Duplexes 2-36 High Street Millers Point	State Heritage Register 00920 Department of Housing S170 register Sydney LEP 2012 I883	State	Partially within buffer zone
Terrace Duplexes 3, 5, 7, 9 High Street Millers Point	State Heritage Register 00918 Department of Housing S170 register Sydney LEP 2012 I884	State	Partially within buffer zone
MSB Bond Store No. 3 Terrace Walsh Bay Wharves Precinct	SHR 00559	State	Partially within buffer zone
Lance Kindergarten including buildings and interiors, early remnant fencing and ground	Sydney LEP 2012 I886	Local	Partially within buffer zone
Trees at Lance Kindergarten	Sydney LEP 2012 I887	Local	Partially within buffer zone

Heritage item	Register listings	Significance	Relationship to the study area
Terrace Duplexes 38-72 High Street Millers Point	State Heritage Register 00919 Department of Housing S170 register Sydney LEP 2012 I888	State	Partially within buffer zone
Terrace Duplexes 74-80 High Street Millers Point	State Heritage Register 00868 Department of Housing S170 register Sydney LEP 2012 I889	State	Partially within buffer zone
Oswald Bond Store	State Heritage Register 00527 Sydney LEP 2012 I891 National Trust Register 9186	State	Partially within buffer zone

Figure 91: Heritage items within the Barangaroo Station study area.



6.7.4 Detailed heritage impact assessments

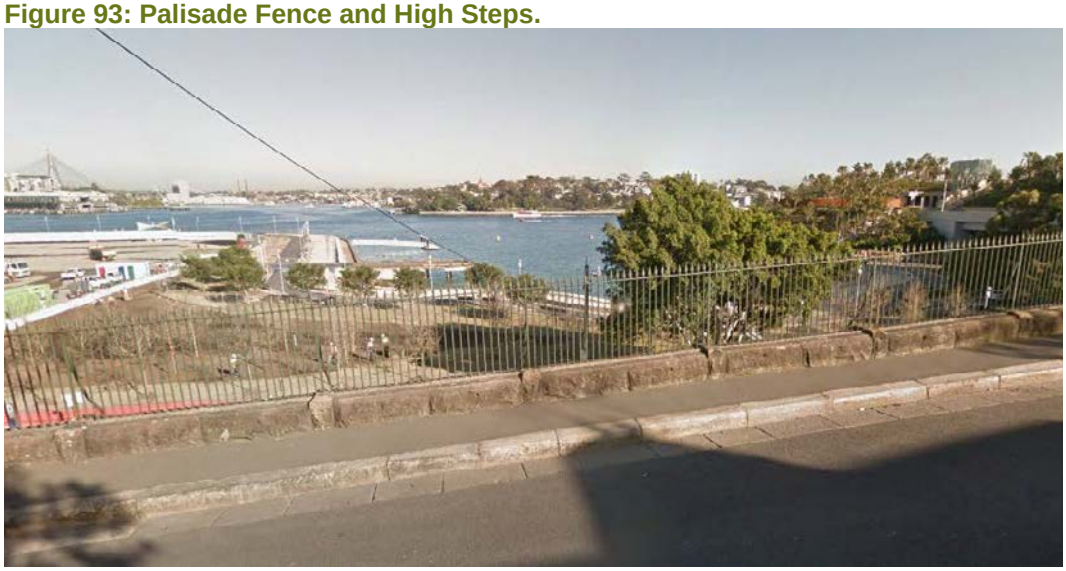
Heritage items

Table 48: Bridges over Hickson Road heritage impact assessment

Bridges over Hickson Road[86]	
Image	**Figure 92: View north onto Hickson Road from Argyle Place, showing the deep cutting and Windmill Street bridge. Artefact Heritage 2015.** 
Significance	Local
Description	Constructed in 1908 this heritage group includes landmark bridge structures which form a "tunnel", and gateway between the Darling Harbour and the Walsh Bay wharf and shipping terminus. Rock excavations and concrete walling form dramatic high walls, and the generous width of Hickson Road emphasises the scale. Demonstrates an early use of reinforced concrete in Sydney. The bridges are located on Munn Street, Argyle Place and Windmill Street.
Statement of significance	Of historical significance as physical evidence of the major state government redevelopment of the district, in the years following the 1901 bubonic plague. Of historical significance as physical evidence of the growth of maritime activities to the west of Circular Quay.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The area immediately below the bridges would be utilised as a temporary laydown area during construction. This would result in minor (temporary) visual impacts. There would be no impacts to the historical significance of the item. **Indirect impact: Minor**

[86] Description and Statement of significance extracted from State Heritage Register inventory sheet “Bridges over HIckson Road” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2423650 on 8/01/2016.

Table 49: Palisade Fence and High Steps heritage impact assessment

Palisade Fence and High Steps[87]	
Image	**Figure 93: Palisade Fence and High Steps.** 
Significance	Local
Description	Constructed in 1920, the Palisade fence and High Steps start 300m from Argyle Place and run along the western edge of High Street. Listing Includes palisade fence, decorative cast iron posts and sandstone posts that flanked the bridges over Hickson Road (most of these bridges have been demolished).
Statement of significance	The High Street sandstone wall and palisade fence are of historical significance for their association with the Sydney Harbour Trust's redevelopment early in the 20th century. They are aesthetically significant as a dramatic landmark feature that defines the edge of the village of Millers Point. The open steps at the southern end of High Street between High Street and Hickson Road are of heritage significance as an integral part of the pedestrian network of Millers Point that connected the wharfs to the suburb above. The remnant elements of the closed steps at the northern end of High Street between High Street and Hickson Road are of heritage significance as an integral part of the pedestrian network of Millers Point that connected the wharfs to the suburb above. They are of historical significance for their association with the Sydney Harbour Trust's redevelopment early in the 20th century, they form part of the well designed and extensive network of stairs and access routes designed to move large numbers of workers to and from the wharves, and display a fine level of detailing for their period of construction.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	High Street is located on a high ridge overlooking the harbour. There are few direct view corridors between the heritage item and Hickson Road / the study area and the proposed works would have a negligible visual impact on the setting of the heritage item. There would be no impact on the historical significance of the item. **Indirect impact: Negligible**

[87] Description and Statement of significance extracted from State Heritage Register inventory sheet “Palisade Fence and High Steps” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2424625 on 8/01/2016.

Table 50: Warehouses/Dalgety's Bond Store group heritage impact assessment

Warehouses/Dalgety's Bond Store Group[88]	
Image	**Figure 94: Warehouses/Dalgety's Bond Store. Artefact Heritage 2015.** 
Significance	State
Description	The group consists of two complimentary warehouse buildings fronting onto what is now the Munn Reserve. The former Dalgety's Bond Stores were originally a complex of three warehouse components, known as Dalgety's Bond A, B and C. Only blocks A and C survive.
Statement of significance	The Munn Street former warehouse complex is important as a townscape feature in this area of dramatic topography. Its different building forms and shapes display a progression of functional architectural style, reflecting the difficulties of building on this contorted terrain. It also demonstrates the redevelopment and change of the area associated with civil works that followed the bubonic plague of 1901. It perpetuates the memory of Dalgety & Co, one of Australia's largest mercantile companies, and maintains a historic link with the maritime activities of Millers Point. The internal structure and mechanical features provide additional scientific significance.
Impact type	Potential direct impact: Vibration Indirect impact: Views and vistas
Heritage impact assessment	Based on its age and likelihood to exhibit timber reinforcing structures rather than concrete or steel reinforcing structures, this item is assumed to be more sensitive to vibration impacts. Based on excavation for the cut-and-cover station being relatively close to this item, modelling indicates that at the closest façade of this item would experience vibration levels above the screening level for cosmetic damage. **Potential direct impact: Minor** At-surface or above-surface station infrastructure, including both station entry points, would be located to the south of the heritage item. The introduction of new station infrastructure in this location would result in a minor impact to the setting of the heritage item. The scientific significance of the item would not be impacted. **Indirect impact: Minor**

[88] Description and Statement of significance extracted from State Heritage Register inventory sheet "Warehouses" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5051348 on 22/10/2015.

Table 51: Shops 6, 8 Argyle Place heritage impact assessment

Shops 6, 8 Argyle Place[89]	
Image	**Figure 95: Shops 6, 8 Argyle Place.** 
Significance	State
Description	Constructed c.1906, this item is one of a row of terraces, consisting of commercial on the ground floor and residential space above. .
Statement of significance	This building is one of a group of five post-plague Edwardian commercial and residential properties, which are very important to the streetscape of Millers Point. It is part of the Millers Point Conservation Area, an intact residential and maritime precinct. It contains residential buildings and civic spaces dating from the 1830's and is an important example of C19th adaptation of the landscape.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	High Street is located on a high ridge overlooking the harbour. There are few direct view corridors between the heritage item and Hickson Road / the study area and the proposed works would have a negligible visual impact on the setting of the heritage item. **Indirect impact: Negligible**

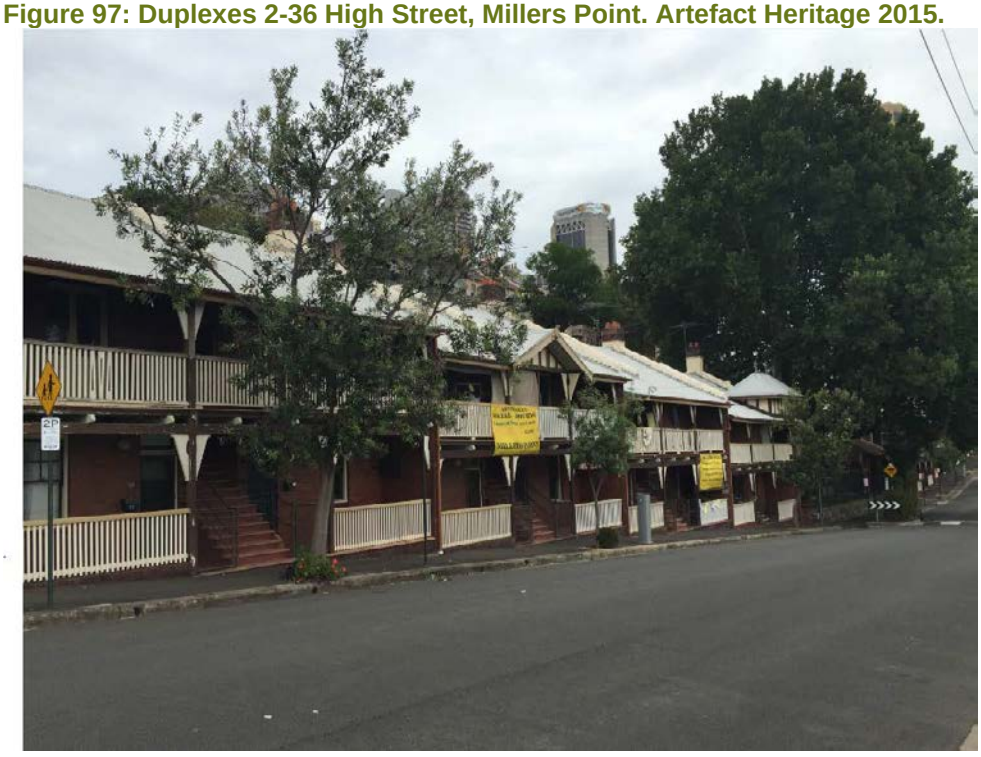
[89] Description and Statement of significance extracted from State Heritage Register inventory sheet “Shops” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5045110 on 8/01/2016.

Table 52: Shops and residences including interiors heritage impact assessment

Shops and residences including interiors[90]	
Image	**Figure 96: Shops and residences.** 
Significance	State
Description	Constructed c.1910 in the Federation style, the two storey shops, with residences over, form part of a group located in a conservation area and are important to the streetscape.
Statement of significance	An interesting example of early 20th Century commercial and residential development being part of the-post plague redevelopment, very important to the streetscape of Millers Point. It is part of the Millers Point Conservation Area, an intact residential and maritime precinct. It contains residential buildings and civic spaces dating from the 1830's and is an important example of 19th century adaptation of the landscape.
Impact type	Indirect impact: views and vistas
Heritage impact assessment	High Street is located on a high ridge overlooking the harbour. There are few direct view corridors between the heritage item and Hickson Road / the study area and the proposed works would have a negligible visual impact on the setting of the heritage item. **Indirect impact: Negligible**

[90] Description and Statement of significance extracted from State Heritage Register inventory sheet "Shops and residences including interiors" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2424652 on 22/10/2015.

Table 53: Terrace duplexes 2-36 High Street Millers Point heritage impact assessment

Terrace Duplexes 2-36 High Street Millers Point[91]	
Image	**Figure 97: Duplexes 2-36 High Street, Millers Point. Artefact Heritage 2015.** 
Significance	State
Description	Constructed c.1911, the large terraces feature elaborate timber verandahs with ornamental brackets in the Federation style. Usually, accommodation consists of either two or three bedroom units on both the ground and first floors. Access to the first floor is shared by two units via stairs off the street. To either side of the stairwell are the entrances to the lower units.
Statement of significance	This terrace is one of a group of early twentieth century workmen's terraces built as part of the post plague redevelopment by the Sydney Harbour Trust. It is part of the Millers Point Conservation Area, an intact residential and maritime precinct. It contains residential buildings and civic spaces dating from the 1830's and is an important example of 19th century adaptation of the landscape.
Impact type	Indirect impact: views and vistas
Heritage impact assessment	High Street is located on a high ridge overlooking the harbour. There are few direct view corridors between the heritage item and Hickson Road / the study area and the proposed works would have a negligible visual impact on the setting of the heritage item. **Indirect impact: negligible**

[91] Description and Statement of significance extracted from State Heritage Register inventory sheet "Terrace Duplexes" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5000859 on 22/10/2015.

Table 54: Terrace duplexes 3, 5, 7, 9 High Street Millers Point heritage impact assessment

Terrace Duplexes 3, 5, 7, 9 High Street Millers Point[92]	
Image	**Figure 98: Duplexes 3, 5, 7, 9 High Street, Millers Point.** 
Significance	State
Description	Constructed c.1911, the large terraces feature elaborate timber verandahs with ornamental brackets in the Federation style. Usually, accommodation consists of either two or three bedroom units on both the ground and first floors. Access to the first floor is shared by two units via stairs off the street. To either side of the stairwell are the entrances to the lower units.
Statement of significance	This terrace is one of a group of early twentieth century workmen's terraces built as part of the post plague redevelopment by the Sydney Harbour Trust. It is part of the Millers Point Conservation Area, an intact residential and maritime precinct. It contains residential buildings and civic spaces dating from the 1830's and is an important example of 19th century adaptation of the landscape.
Impact type	Indirect impact: views and vistas
Heritage impact assessment	High Street is located on a high ridge overlooking the harbour. There are few direct view corridors between the heritage item and Hickson Road / the study area and the proposed works would have a negligible visual impact on the setting of the heritage item. **Indirect impact: negligible**

[92] Description and Statement of significance extracted from State Heritage Register inventory sheet “Terrace Duplexes” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5000858 on 11/01/2016.

Table 55: Terrace duplexes 38-72 High Street Millers Point heritage impact assessment

Terrace Duplexes 38-72 High Street Millers Point[93]	
Image	**Figure 99: Example of terrace, High Street, Millers Point. Artefact Heritage 2015.** 
Significance	State
Description	Constructed c.1911, the large terraces feature elaborate timber verandahs with ornamental brackets in the Federation style. Usually, accommodation consists of either two or three bedroom units on both the ground and first floors. Access to the first floor is shared by two units via stairs off the street. To either side of the stairwell are the entrances to the lower units.
Statement of significance	This terrace is one of a group of early twentieth century workmen's terraces built as part of the post plague redevelopment by the Sydney Harbour Trust. It is part of the Millers Point Conservation Area, an intact residential and maritime precinct. It contains residential buildings and civic spaces dating from the 1830's and is an important example of 19th century adaptation of the landscape.
Impact type	Indirect impact: views and vistas
Heritage impact assessment	High Street is located on a high ridge overlooking the harbour. There are few direct view corridors between the heritage item and Hickson Road / the study area and the proposed works would have a negligible visual impact on the setting of the heritage item. **Indirect impact: negligible**

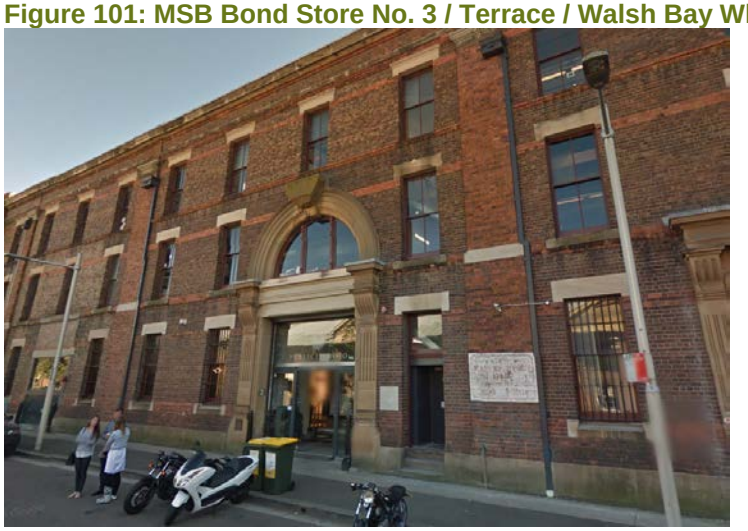
[93] Description and Statement of significance extracted from State Heritage Register inventory sheet “Terrace Duplexes” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5045221 on 22/10/2015.

Table 56: Terrace duplexes 74-80 High Street Millers Point heritage impact assessment

Terrace Duplexes 74-80 High Street Millers Point[94]	
Image	**Figure 100: View south along High Street, terraces to the left. Artefact Heritage 2015.** 
Significance	State
Description	Constructed c.1911, the large terraces feature elaborate timber verandahs with ornamental brackets in the Federation style. Usually, accommodation consists of either two or three bedroom units on both the ground and first floors. Access to the first floor is shared by two units via stairs off the street. To either side of the stairwell are the entrances to the lower units.
Statement of significance	This terrace is one of a group of early twentieth century workmen's terraces built as part of the post plague redevelopment by the Sydney Harbour Trust. It is part of the Millers Point Conservation Area, an intact residential and maritime precinct. It contains residential buildings and civic spaces dating from the 1830's and is an important example of 19th century adaptation of the landscape.
Impact type	Indirect impact: views and vistas
Heritage impact assessment	High Street is located on a high ridge overlooking the harbour. There are few direct view corridors between the heritage item and Hickson Road / the study area and the proposed works would have a negligible visual impact on the setting of the heritage item. **Indirect impact: negligible**

[94] Description and Statement of significance extracted from State Heritage Register inventory sheet "Terrace Duplexes" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5001051 on 22/10/2015.

Table 57: MSB Bond Store No. 3 / Terrace / Walsh Bay Wharves Precinct heritage impact assessment

MSB Bond Store No. 3 / Terrace / Walsh Bay Wharves Precinct heritage impact assessment [95]	
Image	**Figure 101: MSB Bond Store No. 3 / Terrace / Walsh Bay Wharves Precinct.**   

[95] Description and Statement of significance extracted from State Heritage Register inventory sheets “MSB Bond Store No.3”, “Terrace” and “Walsh Bay Wharves Precinct” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5014135 ; http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5045067 on 28/01/2016.

MSB Bond Store No. 3 / Terrace / Walsh Bay Wharves Precinct heritage impact assessment [95]	
Significance	State
Description	This heritage item consists of three individual items that have been listed under the Same SHR number. MSB Bond Store No.3 Bond Store No. 3 is a six-storey, brick-faced building in Queen Anne Revival style, with three-storey fronting Windmill Street. Terrace Sandstone stairway with low landings. It features a cast iron palisade fence and railings. Walsh Bay Wharves Precinct Integrated port precinct comprising wharves, shore sheds, bond stores, bridges and roads. A standard modular timber design was developed for the wharves, wharf sheds and shore sheds so that they could easily be adapted to the requirements of individual sites.
Statement of significance	MSB Bond Store No.3 Bond Store No. 3 is of significance for its historical association with the development of the waterfront trade in the Miller's Point and Walsh Bay area. In its architectural merits, Bond Store No. 3 ranks with three other 19th century bond stores - Grafton Bond (1881) and Parbury's No. 1 Bond (1880s) both in Hickson Road, and Oswald Bond (c1890) in Argyle Place. The building also contributes to the unique streetscape quality of Walsh Bay. The site has potential archaeological research value. Terrace The Hickson Steps are of environmental heritage significance as an integral part of the old pedestrian network of Dawes Point. They are of historical association with the Sydney Harbour Trust's ownership and development of Millers Point residential area early this century. Walsh Bay Wharves Precinct The Walsh Bay area is of State cultural significance due to its unique combination of steep rocky terrain, early, mid, late-Victorian and Edwardian housing, surviving relatively intact Victorian bond stores, and the results of an early twentieth century urban redevelopment scheme of unique scale: the magnificent timber wharf and shore structures and associated rock cuttings, roads and bridges. The Walsh Bay Wharves and associated buildings and works are a virtually intact port and stevedoring facility created by the Sydney Harbour Trust in response to the requirements of maritime trade at the time (1900s-1910s). The precinct documents the workings of a technologically advanced early twentieth century shipping port, developed specifically to accommodate new mechanised transportation technology. The wharves have a strong distinctive character created by the logical use of heavy timber construction and the regular grid layout of piles, columns, beams and infill cladding. The precinct is unified in materials, form and scale and contains structures demonstrating maritime uses. It demonstrates the life of inner Sydney in the early twentieth century. The precinct demonstrates technical and creative excellence of the period 1820-1930.
Impact type	No impact
Heritage impact assessment	The MSB Bond Store No. 3 itself is outside the study area, and would not be impacted by the project. The terrace steps would not be impacted by the project. All significant components of the Walsh Bay Wharves precinct are located to the north of the study area, and the heritage item would not be impacted by the project. **Indirect impact: Neutral**

Table 58: Lance Kindergarten heritage impact assessment

Lance Kindergarten[96]	
Image	**Figure 102: Lance Kindergarten.** 
Significance	Local
Description	Lance Kindergarten is set within a row of early Federation housing along High Street. To the rear of the site is a very high vertical stone cutting, which is the most imposing element of the site. A narrow lane runs along the back side of the properties in front of the wall.
Statement of significance	Lance Kindergarten is significant for the ongoing use of the site, first as a children's playground and then as a kindergarten from 1913 and 1925 respectively. Considered to be the first public playground in the City of Sydney, the place is of high social significance as a community playground for the use of Millers Point residents developed as compensation for the absence of garden and yard space for the occupants of the Trust's housing developments. It is also significant as physical evidence of the major state government redevelopment of the district in the years following the 1901 bubonic plague. The kindergarten was a product of the movement to provide free preschool education and playground facilities for the children of the inner city. The facility has historical associations with a former President of the Sydney Harbour Trust after whom the kindergarten is named. The complex is also a testimony to the efforts of the Kindergarten Union of NSW to develop facilities for the use of children in crowded suburbs of the late nineteenth century. The kindergarten is an important element in the townscape, providing a landscaped relief to the townhouse development on the eastern side of High Street. The site also features a number of significant trees that provide amenity, aesthetic value and have historic associations with the development of the centre.
Impact type	Indirect impact: views and vistas
Heritage impact assessment	High Street is located on a high ridge overlooking the harbour. There are few direct view corridors between the heritage item and Hickson Road / the study area and the proposed works would have a negligible visual impact on the setting of the heritage item. **Indirect impact: negligible**

[96] Description and Statement of significance extracted from State Heritage inventory sheet "Lance Kindergarten" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2423589 on 28/01/2016.

Table 59: Trees at Lance Kindergarten heritage impact assessment

Trees at Lance Kindergarten[97]	
Image	**Figure 103: Trees at Lance Kindergarten.** 
Significance	Local
Description	Lance Kindergarten is set within a row of early Federation housing along High Street. The existing four London Plane trees (Platanus x hydridas) within the site were assessed in 2014 as ranging in height from 20m - 25m. n 2014 an assessment of the four trees indicated that they all appeared to be stable with branching structures and good vigour. The remaining safe usable expectancy was assessed as being long, more than 40years for three of the trees whilst the northern most tree along Argyle Lane was assessed as having a medium expectancy of 15-40 years.
Statement of significance	The playground of the Lance Kindergarten has four large plane trees which are located near the High Street frontage of the site. The trees are of considerable aesthetic value to Millers Point, improve the amenity of the area and provide welcome shade to the outdoor play area of the kindergarten during the summer months. The trees have historical associations with the early development of the site, first as a children's playground and then as being part of Lance Kindergarten from 1913 and 1925 respectively.
Impact type	Indirect impact: views and vistas
Heritage impact assessment	High Street is located on a high ridge overlooking the harbour. There are few direct view corridors between the heritage item and Hickson Road / the study area and the proposed works would have a negligible visual impact on the setting of the heritage item. **Indirect impact: negligible**

[97] Description and Statement of significance extracted from State Heritage inventory sheet “Trees at Lance Kindergarten” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2424616 on 28/01/2016.

Table 60: Oswald Bond Store heritage impact assessment.

Oswald Bond Store[98]	
Image	**Figure 104: Oswald Bond Store.** 
Significance	State
Description	The Bond Store is an example of late Victorian (1892-3 facades)/ Federation (1904) and Free Classical style warehouse structure [Tropman 5.3]. The existing building is essentially in sound condition, there is some cracking and water damage identified on Level 3. Only part of the original 1892-3 brickwork facades survived the 1903 fire. The existing building dates from 1904 when it was rebuilt to original detail after the fire, with the omission of the two upper levels and with other fire prevention measures. The internal timber structure was rebuilt using the original storey post system.
Statement of significance	The Oswald Bond Store is of State significance as an outstanding example of a turn of the century bond store in the Free Classical style. The Store has a strong architectural presence, its scale and facade contributing to the streetscape. The timber driveway doors are part of a rare avenue of industrial openings along Windmill Street, which are a reminder of the commercial use of the area. The storey post system supporting the internal floors is typical of the construction of the Sydney Harbour Trust during this period.
Impact type	Indirect impact: views and vistas
Heritage impact assessment	Windmill and Kent Streets are elevated a ridge overlooking the harbour. There are few direct view corridors between the heritage item and Hickson Road / the study area and the proposed works would have a negligible visual impact on the setting of the heritage item. **Indirect impact: negligible**

[98] Description and Statement of significance extracted from State Heritage Register inventory sheet "Oswald Bond Store" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5045357 on 09/01/2016.

Heritage Conservation Areas

Table 61: Millers Point Conservation Area heritage impact assessment

Millers Point Conservation Area[99]	
Image	
Significance	State

[99] Description and Statement of significance extracted from State Heritage Register inventory sheet "Millers Point Conservation Area" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5001049 on 22/10/2015.

Millers Point Conservation Area[99]	
Description	An integrated port town developed between the 1810s and the 1930s and little changed since then; considered remarkable for its completeness and intactness. Its components include deep-sea wharves and associated infrastructure, bond and free stores, roadways and accessways, public housing built for port workers, former private merchant housing, hotels and shops, schools, churches, post office and community facilities. This is the Department of Housing's Conservation Area only and only applies to Department of Housing property. Because of this, the Department's Conservation Area is not contiguous.
Statement of significance	Millers Point Conservation Area is an intact residential and maritime precinct of outstanding State and national significance. It contains buildings and civic spaces dating from the 1830s and is an important example of nineteenth and early twentieth century adaptation of the landscape. The precinct has changed little since the 1930s.
Impact type	Indirect impact: views and vistas
Heritage impact assessment	The conservation area terminates at High Street. High Street is located on a ridge overlooking the harbour. There are few direct view corridors between the conservation area and Hickson Road / the study area and the proposed works would have a negligible visual impact on the setting of the heritage item. There would be no impacts to the historical, associative or social significance of the item, or to its rarity or representativeness values or research potential. **Indirect impact: negligible**

Heritage precincts

Table 62: Millers Point & Dawes Point Village Precinct heritage impact assessment

Millers Point & Dawes Point Village Precinct[100]	
Image	**Figure 105: View of Millers Point and Dawes Point Village Precinct. Artefact Heritage 2015.** 
Significance	State
Description	The precinct is bounded on the north by the existing Walsh Bay State Heritage Register listed precinct, on the far-north by the waters of Sydney Harbour in the vicinity of Ives Steps on Dawes Point/Tar-ra, on the north-west by the existing Sydney Harbour Bridge State Heritage Register listed item, on the north-east by the Bradfield Highway (bridge approaches) forming a distinctive physical boundary, on the south by the existing high-rise apartment buildings forming a distinctive boundary, on the west by the edge of the concrete-surfaced Darling Harbour wharf aprons forming a distinctive change in the landscape, and on the north-west by the cliff-edges of Old Millers Point, again forming a distinctive boundary.
Statement of significance	Millers Point & Dawes Point Village Precinct is of State significance for its ability to demonstrate, in its physical forms, historical layering, documentary and archaeological records and social composition, the development of colonial and post-colonial settlement in Sydney and New South Wales. The natural rocky terrain, despite much alteration, remains the dominant physical element in this significant urban cultural landscape in which land and water, nature and culture are intimately connected historically, socially, visually and functionally. The close connections between the local Cadigal people and the place remain evident in the extensive archaeological resources, the historical records and the geographical place names of the area, as well as the continuing esteem of Sydney's Aboriginal communities for the place. Much (but not all) of the colonial-era development was removed in the mass resumptions and demolitions following the bubonic plague outbreak of 1900, but remains substantially represented in the diverse archaeology of the place, its

[100] Description and Statement of significance extracted from State Heritage Register inventory sheet "Millers Point & Dawes Point Village Precinct" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5054725 on 22/10/2015.

Millers Point & Dawes Point Village Precinct[100]	
	associated historical records, the local place name patterns, some of the remaining merchants villas and terraces, and the walking-scale, low-rise, village-like character of the place with its central 'green' in Argyle Place, and its vistas and glimpses of the harbour along its streets and over rooftops, the sounds of boats, ships and wharf work, and the smells of the sea and harbour waters. The post-colonial phase is well represented by the early 20th century public housing built for waterside workers and their families, the technologically innovative warehousing, the landmark Harbour Bridge approaches on the heights, the parklands marking the edges of the precinct, and the connections to working on the wharves and docklands still evident in the street patterns, the mixing of houses, shops and pubs, and social and family histories of the local residents. Millers Point & Dawes Point Village Precinct has evolved in response to both the physical characteristics of its peninsular location, and to the broader historical patterns and processes that have shaped the development of New South Wales since the 1780s, including the British invasion of the continent; cross-cultural relations; convictism; the defence of Sydney; the spread of maritime industries such as fishing and boat building; transporting and storing goods for export and import; immigration and emigration; astronomical and scientific achievements; small scale manufacturing; wind and gas generated energy production; the growth of controlled and market economies; contested waterfront work practises; the growth of trade unionism; the development of the state's oldest local government authority the City of Sydney; the development of public health, town planning and heritage conservation as roles for colonial and state government; the provision of religious and spiritual guidance; as inspiration for creative and artistic endeavour; and the evolution and regeneration of locally-distinctive and self-sustaining communities. The whole place remains a living cultural landscape greatly valued by both its local residents and the people of New South Wales.
Impact type	Direct impact: physical Indirect impact: views and vistas
Heritage impact assessment	Cut and cover excavation to facilitate the construction of the station box would result in the potential removal of fabric, archaeological and other evidence associated with the heritage listed Village Precinct. The impact is considered minor in the context of the precinct's extent, although any archaeological remains may be relevant to the historical layering of the precinct in that they may include early European and Aboriginal components. Impacts to the fabric of Hickson Road itself are considered minor in the context of the road and precinct as a whole. Archaeological remains associated with the construction of Hickson Road may include former road surfaces and infrastructure such as drains. Construction and use of the works site, separation plant and staging areas would result in negligible physical and visual impacts. Any impacts would be temporary in nature and would not impact the heritage significance of the item. Operational impacts would primarily be associated with impacts to views and setting as a result of the station entrances and skylights. The station entrances and services building would be to the west of Hickson Road, outside the precinct. The station entrance would be below High Street cutting and obscured from view from the majority of the precinct. There would be some additional operational impacts such as installation of signage, pedestrians crossing, bus stop and kiss and ride along Hickson Road. This would result in negligible visual impacts and negligible impacts to fabric. Ventilation risers and skylights fronting the Hickson Road wall would be within the precinct and would constitute a visual impact to views from the Barangaroo Development Area towards the precinct. Ventilation shafts would be designed to minimise visual impacts and minimise impacts to the fabric of the Hickson Road cutting. The introduction of new station buildings and services infrastructure would constitute a minor to moderate visual impact to the precinct as a whole.

Millers Point & Dawes Point Village Precinct[100]

A number of bus stops and pedestrian crossings are proposed along Hickson Road, these would have a negligible impact on the heritage significance of the precinct and would have negligible visual impacts in the context of the roads current use as a transport and pedestrian corridor.
Direct impact: minor
Indirect impact: minor to moderate

6.7.5 Archaeological assessment

The following archaeological assessment will focus on the proposed locations of station buildings and platforms. The construction of these elements would require the demolition of existing road surfaces, and construction of new station buildings, incorporating lift shafts and tunnelled access to the proposed platforms.

6.7.5.1 Site inspection results

The Barangaroo Station site is located across a hardstand area associated with Hickson Road and includes portions of the Barangaroo redevelopment area. The eastern boundary of the proposed station site is delineated by a steep sandstone cutting and upper concrete retaining wall. To the west of Hickson Road is the large flat hardstand area associated with reclaimed land for a former shipping terminal.

The northern section of the proposed station site is located beneath the deep sandstone cutting associated with the Argyle Place and Windmill Street overpasses. There is no evidence in this portion of the proposed station site of any remaining natural ground surface at the Hickson Street level.

Discussion and analysis of site inspection results

There is no visible evidence of the location of former ground surfaces across the Barangaroo Station site. Hickson Road and adjacent Barangaroo redevelopment area are covered by either concrete or bitumen, whilst the eastern and northwestern boundaries of the road are bordered by steep sandstone cuttings.

Figure 106: View south along Hickson Road from the Argyle Place overpass

Figure 107: View southwest across Hickson Road, the New Bond Stores, and the Barangaroo redevelopment area in the background

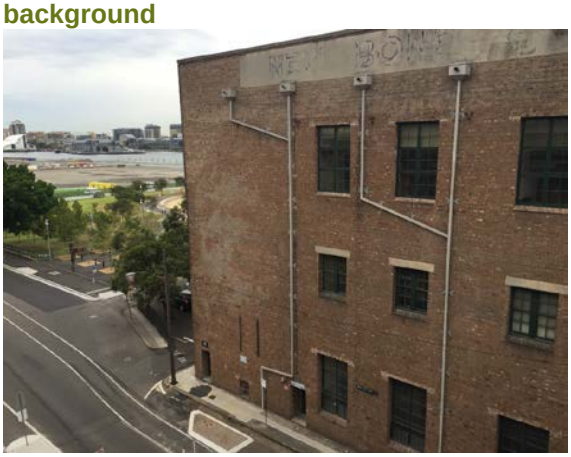


Figure 108: View north along Hickson Road from HighStreet

Figure 109: View north onto Hickson Road from Argyle Place, showing the deep cutting and Windmill Street bridge

6.7.5.2 Previous archaeological investigations in the vicinity

An analysis of the archaeological resource of Millers Point was undertaken in 1991 in 'The Rocks and Millers Point Archaeological Management Plan' prepared by Dr E Higginbotham (with T Kass and M Walker) for the Sydney Cove Authority and NSW Department of Planning. The study area was identified in this plan as being mostly disturbed. The Archaeological Management Plan states that deep features, such as wells and cess pits, may be present under Hickson Road.

In 2010, Austral Archaeology identified the Barangaroo Development Site (located immediately south and west of the study area), as having a moderate to high degree of sensitivity for archaeological resources that are likely to possess a high level of research potential. Austral assessed the Barangaroo site as having potential to contain archaeological evidence of structures and deposits that are likely to include 19th and 20th century remains of wharves and associated buildings, and shoreline modifications such as sea walls and evidence of trade and industry.[101]

In 1980 Lampert and Truscott excavated the site of the Bond Store at Moore's Wharf.[102] The original sandstone warehouse in this location had been constructed in the 1830s. The building was found to have been constructed on harbour infill, and a remnant shell midden was identified below the floorboards of the building, mixed with European artefacts. The intact survival of the archaeological remains in this location suggest that the northern portion of Barangaroo has potential to contain remnants of early wharfage.

In 2000 a large sandstone seawall was encountered during roadworks within Hickson Road, The Rocks.[103] As has also been demonstrated by subsequent archaeological investigations, reclamation had buried, rather than demolished, this earlier evidence of land modification.

Archaeological excavation of the Barangaroo South site was undertaken by Casey & Lowe between 2011 and 2012.[104] This excavation identified archaeological remains within 40 metres of the eastern boundary of Hickson Road. The remains included informal boat ramps buried by 1840s reclamation. Land reclamation undertaken throughout the 1830s and 1850s was evidenced by a series of informal sandstone sea walls in-filled with layers of crushed sandstone, sand and clay. Timber wharfage was then constructed, along with warehouses and stores. A cottage from the 1840s was identified, built partially on reclaimed land and seawall. Evidence of the original sandstone shoreline was

[101] Austral Archaeology Barangaroo Archaeological Assessment and Management Plan June 2010: 5.
[102] Lampert, R. J. and Truscott, M. C. *The Archaeological Investigation of the Bond Store, Moore's Wharf*. Prepared for the Department of Environment and Planning NSW and the Maritime Services Board. 1980.
[103] McLeod, K. *Sea Wall Excavation in Hickson Road, The Rocks*. Prepared for the Sydney Harbour Foreshore Authority. 2000.
[104] Casey & Lowe *Archaeological Excavation Barangaroo South Preliminary Results* Report to Lend Lease (Millers Point) October 2012.

encountered adjacent to Hickson Road. This consisted of a sandstone outcropping that was quite steep and contained several natural flat platforms. There were no natural soil or sand deposits. The sandstone displayed signs of natural water erosion below the high water mark and weathering above it. There was no evidence that this part of the shoreline had been quarried in the early 19th century.[105]

In 2013 Austral Archaeology commenced excavations and Barangaroo North.[106] The work has revealed part of Munn's 1830s stone slipway, as well as Cuthbert's mid-1800s sandstone wharf.

It is also noted the site of Australia's first gas works, Miller's Point Gas Works, is just to the south of the study area.

6.7.5.3 Known impacts

Subsurface impacts associated with former or current land uses have the potential to remove or damage potential archaeological remains. Previous impacts within the site need to be further understood and identified before more than a preliminary assessment of archaeological impact can be made. Based on the initial literature review and site inspection undertaken as part of this assessment, the following preliminary assumptions regarding archaeology at the site can be made:

- Sites within Darling Harbour tend to have been occupied intensively, and therefore have the potential to contain a range of archaeological evidence dating to different periods of use. This is particularly true of area utilised for industrial activity, where rapidly changing technologies impacted on the types of structures and infrastructure required. Often, the rate of change was so rapid that plans were out-of-date as they were published.
- The construction of successive phases of buildings on the site would have impacted on archaeological remains. Typically, the earlier the building was constructed, the less impact it would have had on the potential archaeological resource.
- Reclamation of shallow area, and successive periods of expansion, rebuilding and subdivision throughout the early to mid 1800s may have buried or removed earlier evidence within the study area, and obscured the original shore line.
- Industrial activity throughout the late 1800s, and into the 20th century, included the demolition of earlier wharves and jetties, reclamation and reconstruction of wharves to better accommodate larger ships and new technologies. This may have disturbed or removed evidence of earlier activities. It is likely, however, that in most instances, structures were demolished to ground level before being backfilled, as was the common practise in 19th century demolition.
- A program of government resumption in the early 20th century is likely to have had the most severe impact on any potential archaeological resource. The cutting back of the headland – to the north of the study area – and the construction of Hickson Road – that required some areas of cutting and some areas of infilling – is likely to have impacted on the archaeological potential of the study area.
- It is likely that some quarrying occurred in the vicinity of the study area in the mid 19th century. Most of this activity, however, appears to have been concentrated to the south-west of the study area.

6.7.5.4 Discussion of archaeological potential

Despite the difficulties of the physical environment, European occupants began to recognise the potential of the area for industry, with industries such as the government brickyards located in Haymarket nearby.

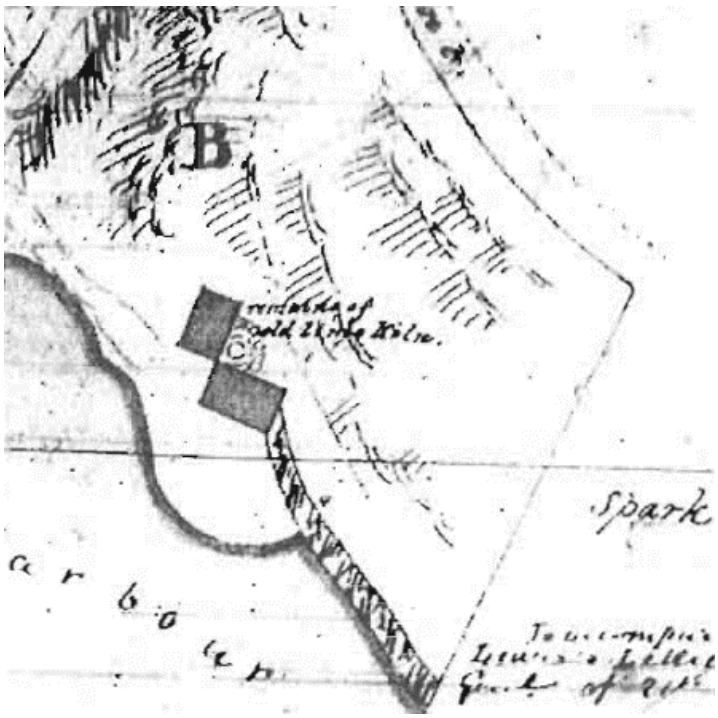
Hickson Road marks the approximate location of the original high water mark. Various phases of resumption occurred throughout the early and later 19th century, to provide for additional wharfage

[105] Casey & Lowe 2012: 44.
[106] Headland Park Archaeological Site Fact Sheet June 2013.

and create useable land for industry. The eastern portion of the study area is located on the original shoreline, and the western portion within early reclaimed land.

Despite the lack of evidence in the historical documentation, it is likely that the foreshore in the vicinity of the study area was utilised for small-scale non-industrial farming activities before documented use of the site in the 1820s. This may have consisted of early shipbuilding activities, fishing, foraging, brick making or lime burning. Abundant shell deposits in the Cockle Bay area would have meant that informal lime burning activities would have been a common activity along the rocky foreshore. Lime kilns were located immediately north of the study area, within Munn's property, as illustrated on Figure 110 (not dated, but likely to be c.1830).

Figure 110: Detail from plan showing the 'old lime kiln' on Munn's property. State Records maps and plans Parish of St Philip Vo;1 folios 1-15 reel 2746.



Numerous structures were originally located in the study area prior to the construction of Hickson Road in the early 20th century. These were associated with Munn and Cuthbert's shipyards (Figure 111). These structures would have included workshops and sheds, offices and other structures that constitute a large commercial enterprise of this type. The northern portion of the study area was later subdivided to provide workers housing (Figure 112 and Figure 113).

In 2010 Austral Archaeology stated the following:

> *"Given the depth of fill (between 2 metres to 7 metres), it is not unreasonable to assume that below ground archaeological features will be present especially along the Hickson Road boundary where the fill deposits are shallow… there is low to moderate potential for evidence of wharf piles, slip ways, building foundations, sea walls, wells, cess pits, landscaping, artefact deposits and infilling representation a range of domestic, commercial and industrial activities form the 1830s, despite later development impacts, on the western boundary of Hickson Road to the south of the headland"*

Overall, the Hickson Road study area has potential to contain a range of archaeological resources spanning the 19th century. These have been summarised in Table 63.

Figure 111: The location of the study area on the 1833 City Section plan (Section 93). City of Sydney Archives. Approximate location of station box shown in blue.

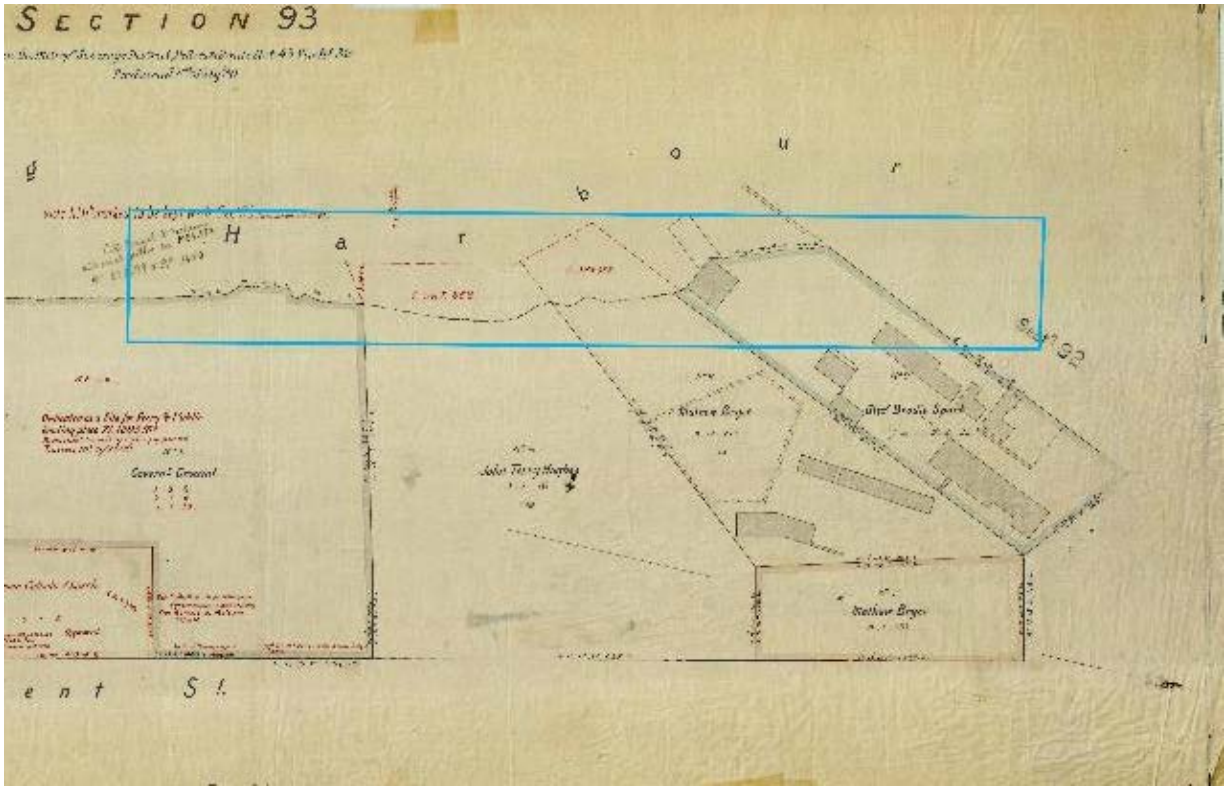
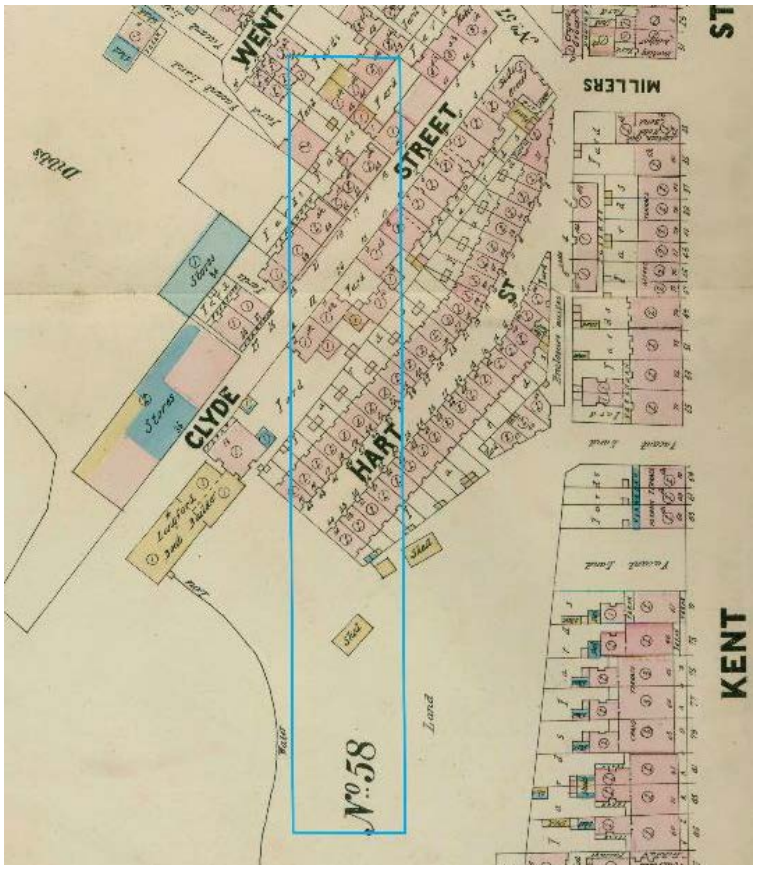


Figure 112: Detail from c.1858 plan of part of Miller's Point. MLNSW M1 811.1718/1858/1.

Figure 113: The location of the study area on the 1880 Doves plan (Block 54, 55A, 56A, 57 and 58). City of Sydney Archives. Approximate station box location shown in blue.



6.7.5.5 Preliminary assessment of significance

The following is a preliminary assessment of significance, informed by the NSW Heritage Criteria for *Assessing Significance related to Archaeological Sites and 'Relics'* (2009).

Archaeological research potential (NSW Heritage Criterion E):

- As the study area is partially within the former shoreline, archaeological remains associated with early foreshore and industrial development (such as limeburing), or sea walls (if associated with an intact archaeological site) would have significant research potential, dependant on the nature and extent of any remains. Previous archaeological investigations have shown that reclamation has often buried and protected evidence of former structures. These type of remains are rare and although some information has been obtained from recent archaeological excavation in the vicinity, additional archaeological data would contribute to understating of the early development of the Sydney foreshore. Evidence of reclamation (including reclamation fill) and subsequent development in the 1840s may also have significant research potential depending on its extent and intactness.

Association with individuals, events, or groups of historical importance (NSW Heritage Criteria A, B & D):

- It is likely that evidence of early development of the study area may have associations with former landowners, entrepreneurs and known local historical figures. For example remains of Munn and Cuthbert's shipyards may be present within the study area. As workers cottages were constructed in early 20th century the northern portion of the study area, archaeological remains may also be associated with working class families who were being increasingly confronted by the challenges of high density urban living.

Aesthetic or technical significance (NSW Heritage Criterion C):

- If intact remains associated with early foreshore development, such as wharfage and seawalls, were identified within the study area, they would demonstrate technical significance. Early seawalls were generally constructed of quarried sandstone, some within high levels of craftsmanship, some showing adaptive technologies using available materials. Evidence of the reclamation process, both filling and shoring, may also demonstrate technical significance.

Ability to demonstrate the past through archaeological remains (NSW Heritage Criterion A, C, F & G):

- The study area has moderate to high potential to demonstrate the past through archaeological remains.

Overall, the site may contain archaeological remains with potential to reach the local and State significance thresholds.

6.7.5.6 Overview archaeological potential

The study area has moderate to high potential to contain an archaeological resource with the potential to reach the local and State significance threshold.

Table 63: Summary of archaeological potential within study area

Potential archaeological resource	Potential	Significance	Heritage impact assessment
Pre-1830's use of the foreshore – evidence of lime burning and boat building.	Low-moderate	State	Excavation works within the study area have low potential to impact on archaeological remains
Pre-1850s resumption and development of the foreshore	Moderate	Local-State	Excavation works within the study area have moderate potential to impact on archaeological remains
Pre-1850s wharfage and industrial development	Moderate	Local-State	Excavation works within the study area have moderate potential to impact on archaeological remains
Pre-1900 wharfage and industrial development	Moderate to high	Local	Excavation works within the study area have moderate to high potential to impact on archaeological remains
Evidence of early 20th century resumption and construction of Hickson Road	High	Local	Excavation works within the study area have moderate to high potential to impact on archaeological remains

6.7.5.7 Archaeological impact assessment

Proposed works within the Barangaroo Station site with the potential to impact on archaeological remains include:

- Excavation of open shafts during construction phase
- Foundation/ground slab excavations for establishment of staff amenities, water supply, ventilation, work train, grout batching plant, drainage and water treatment, workforce facilities, spoil storage and removal during construction phase
- Cut and cover excavation for station box

Whilst excavation works during the construction phase of the project are likely to be limited to discrete locations, the excavation of the cut-and-cover station would result in the complete removal of archaeological remains within the station box footprint. Therefore, works in this location would have a major impact on the potential archaeological resources.

6.7.6 Overview of constraints

The following table outlines the potential heritage constraints within the study area:

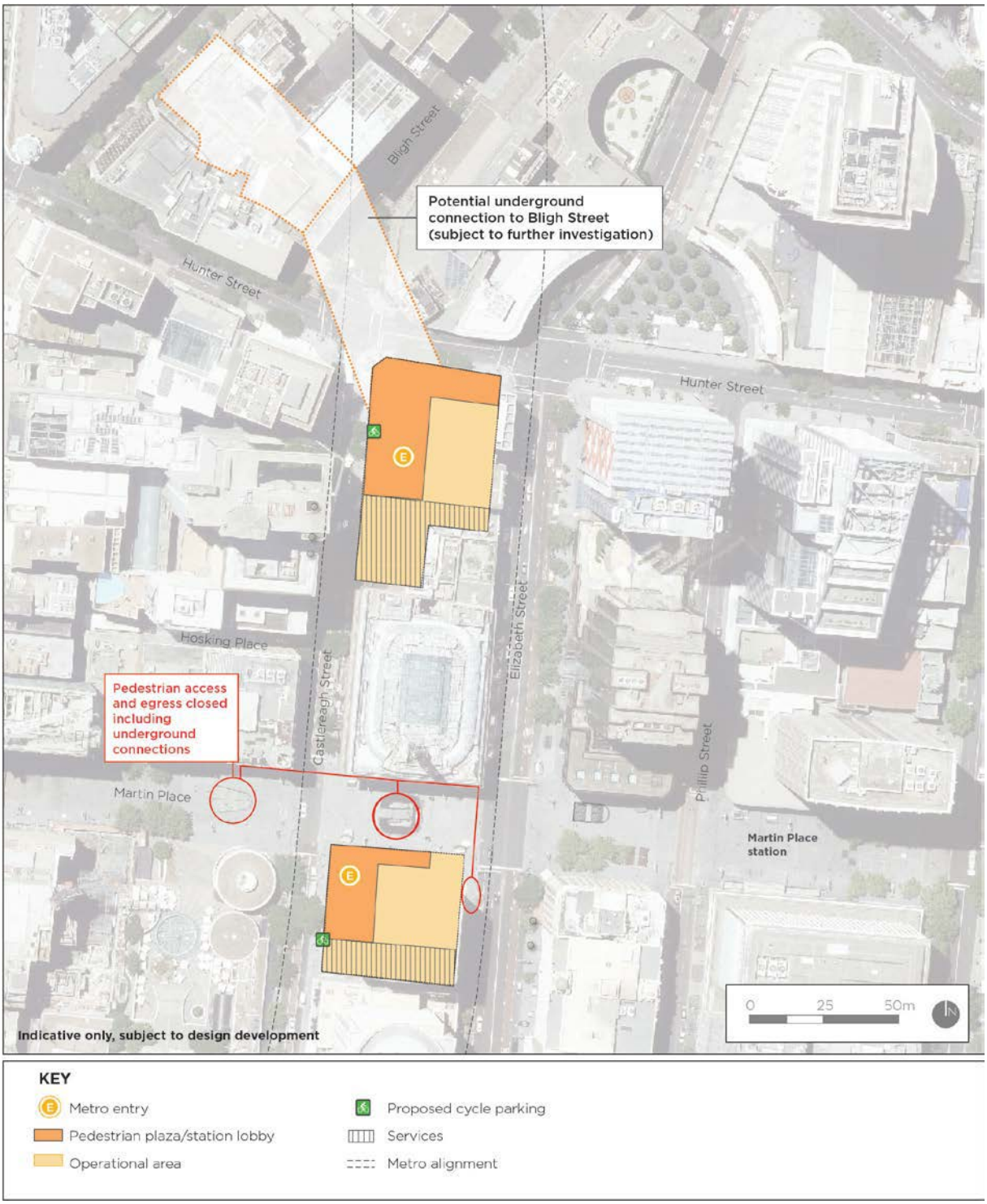
Table 64: Overview of potential heritage constraints for Barangaroo study area.

Heritage item	Potential heritage impacts		
	Direct impact	**Archaeological impact**	**Indirect impact**
Bridges over Hickson Road	Neutral	Neutral	Minor – views and vistas
Palisade Fence and High Steps	Neutral	Neutral	Negligible – views and vistas
Warehouses/Dalgety's Bond Store Group	Potential direct impact: Minor – vibration	Neutral	Minor – views and vistas
Shops 6, 8 Argyle Place	Neutral	Neutral	Negligible – views and vistas
Shops and residences including interiors	Neutral	Neutral	Negligible – views and vistas
Terrace Duplexes 2-36 High Street Millers Point	Neutral	Neutral	Negligible – views and vistas
Terrace Duplexes 3, 5, 7, 9 High Street Millers Point	Neutral	Neutral	Negligible – views and vistas
Terrace Duplexes 38-72 High Street Millers Point	Neutral	Neutral	Negligible – views and vistas
Terrace Duplexes 74-80 High Street Millers Point	Neutral	Neutral	Negligible – views and vistas
MSB Bond Store No. 3 / Terrace / Walsh Bay Wharves precinct	Neutral	Neutral	Neutral
Lance Kindergarten	Neutral	Neutral	Negligible – views and vistas
Trees at Lance Kindergarten	Neutral	Neutral	Negligible – views and vistas
Oswald Bond Store	Neutral	Neutral	Negligible – views and vistas
Millers Point Conservation Area	Neutral	Neutral	Negligible – views and vistas
Millers Point & Dawes Point Village Precinct	Direct impact: Minor	Major – low to high potential for local and state significant archaeological remains	Minor to moderate – views and vistas
Potential archaeological resource within the study area	N/A	Major – low to high potential for local and state significant archaeological remains	N/A

6.8 Martin Place station

Martin Place is a major urban public open space within the heart of the Sydney Central Business District, and it provides an important pedestrian connection between George Street and Macquarie Street (see Figure 114). Martin Place has an existing station that serves the primary business district of the city.

Figure 114: Location of southern and northern entry locations.



6.8.1 Construction

The cut and cover construction of the proposed southern entrance/service building shaft link across the top of the existing ESR tunnels would necessitate temporary closure of the existing open plaza and diversion of pedestrian traffic to the south (Figure 115). The proposed construction of the southern shaft / cavern / adits entails the following:

- Demolition of Prudential Building to Ground Floor.
- Establish a re-routed pedestrian traffic route from Martin Place Plaza over the demolished Prudential Building.
- Close Martin Place Plaza.
- Demolish Existing Plaza and subway structures.
- Construct metro concourse structure and new pedestrian subway structure.
- Install new pedestrian subway building services and systems.
- Reopen Plaza and pedestrian subway to traffic, decommission alternative route.
- Demolish remaining basement structure in Prudential Building (if necessary).
- Form working platforms for piling rigs (backfilling pits if necessary) over Prudential Building footprint.
- Piling works – short and long piles.
- Initial excavations to allow for the construction of working platform.
- Construction of working platform.
- Construction of acoustic shed where necessary and site infrastructure i.e. site office, staff amenities, workshop.
- Shaft excavation to required depth.
- Establish road headers in base of shaft.
- Excavate top headings, followed by removal of benches.

Figure 115: Martin Place Station construction site layout.

6.8.2 History of the study area

Soon after the arrival of Europeans at Sydney Cove in 1788 the Tank Stream was recognised as being a vital source of fresh water in the colony. The stream, today located below present-day Pitt Street, is reflected in the layout of the streets in the vicinity of the study area. George Street (originally High Street), Pitt and Castlereagh Streets (originally Camden Street) were all laid out parallel to the stream. By the early 1800s the study area began to be subdivided and developed. The 1802 plan of Sydney, whilst it has been demonstrated to contain a number of inaccuracies, indicates that the study area at this time was dominated by large blocks containing buildings, and likely utilised for agricultural purposes (Figure 116).

By the early 1830s many of the early landholdings and leases had been formerly granted, and plans indicate that numerous buildings were located within the study area at this time (Figure 117 and Figure 118). It is not known what the buildings on these early land grants were used for, but it is likely that they were associated with commercial, residential and small-scale industrial uses.

Figure 116: Detail from Charles Alexandre Lesueur's 1802 Plan de la ville de Sydney. Source: NLA MAP F 307.

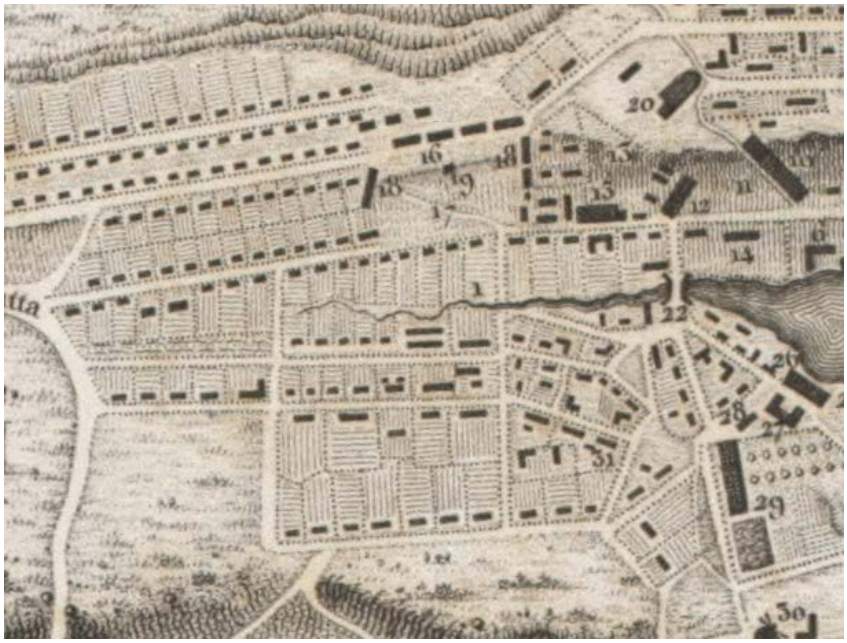


Figure 117: Detail from the 1822 Plan of the town and suburbs of Sydney. NLA MAP F 107. Study area boundary shown in red.

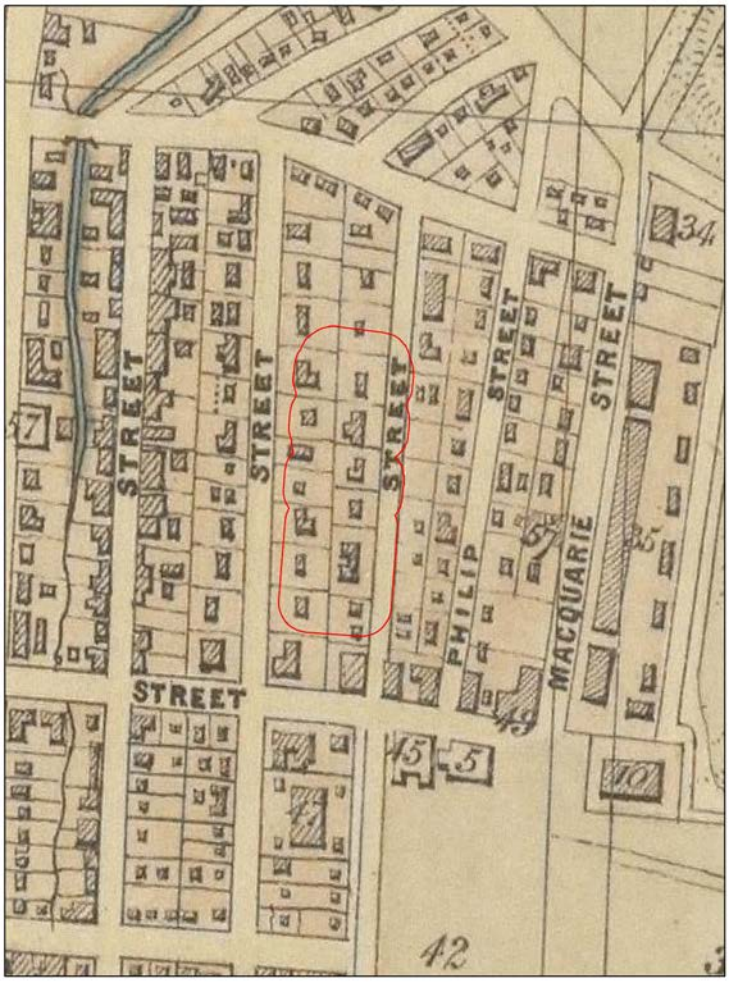
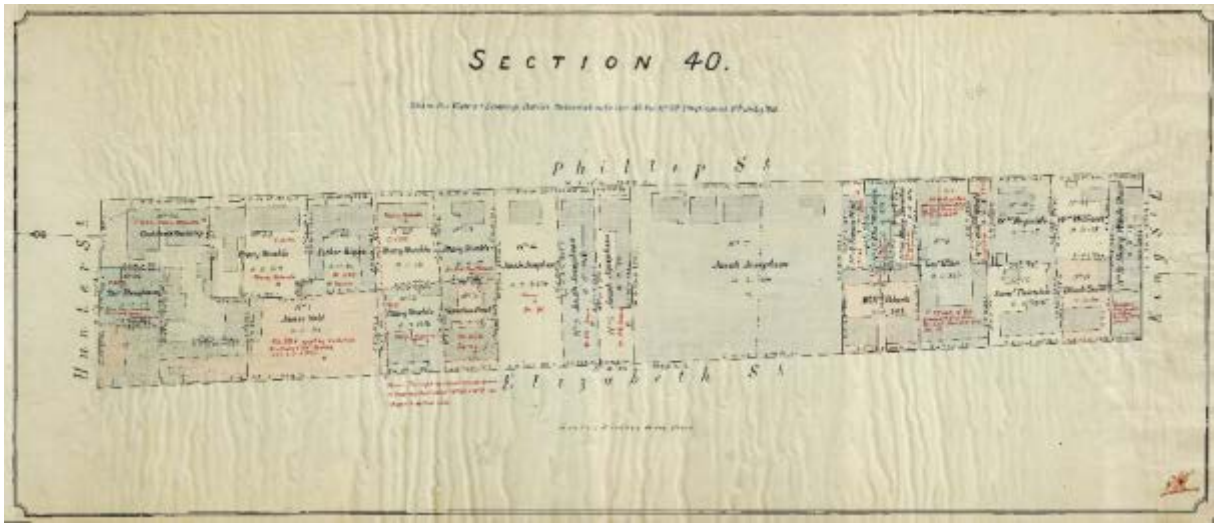


Figure 118: City Survey Section Plan of 1833 showing the number of buildings that were constructed within the study area by this time. Source: The Historical Atlas of Sydney.



By the 1850s, as Sydney became increasingly urbanised, many of the large land grants within the study area were gradually subdivided. By 1880 the study area contained numerous structures, including workshops, offices and commercial interests. According to Dove's plan of 1880, the study area contained hotels, timber yards, a billiard saloon, solicitor's offices, auditing offices and the office of a "Bushell sign writer", amongst many others (Figure 119).

Figure 119: Detail from Dove's plan of 1880, showing the increasing urbanisation of the area.

The construction of the General Post Office on the corner of George and Pitt Streets between 1870 and 1880 saw the first phase of urban planning for what would become Martin Place.[107] The building was designed to be viewed from the north from a grand open space, although, at this time, only a narrow road existed between the GPO and the buildings to the north. By the mid-1860s a narrow roadway, originally known as Foxlow Place, had also been established between Castlereagh and Pitt Streets, connecting with the public area to the front of the GPO.[108] This was renamed 'Moore Street' in the 1870s.

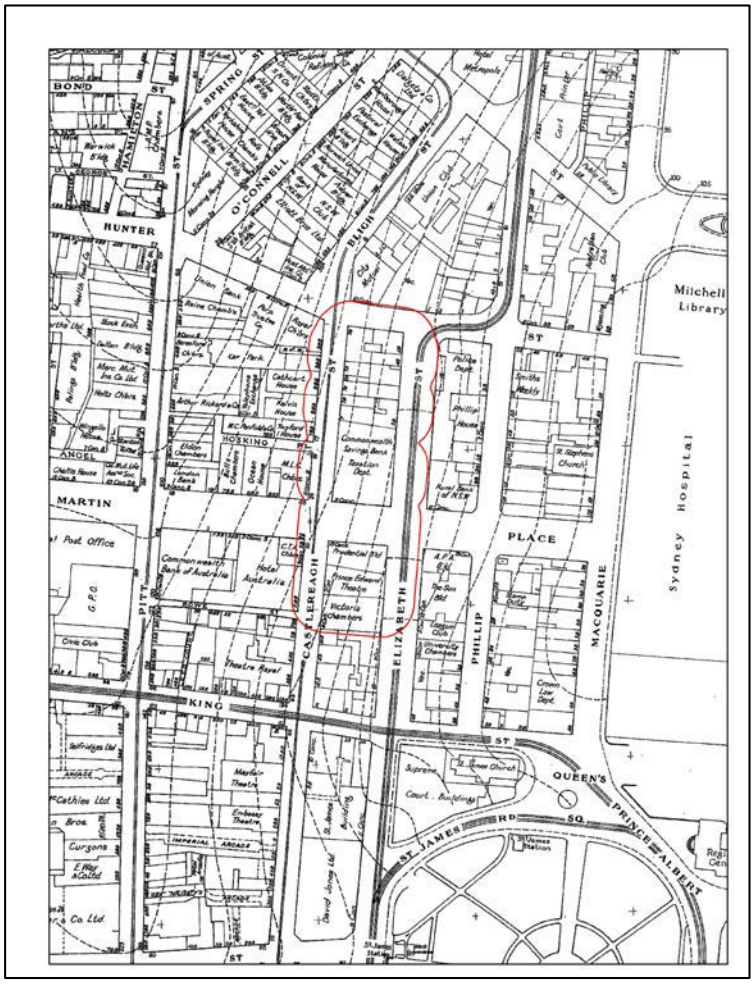
[107] GML Heritage, *20 Martin Place Interpretation Strategy*, Report to Charter Hall, May 2014: 5.
[108] GML Heritage May 2014; 5.

In October of 1890 a fire broke out, destroying many of the properties between Pitt and Castlereagh Streets, immediately west of the study area. This provided the opportunity for council to demolish buildings on George Street, and widen the frontage of Moore Street further north. Between the 1890s and early 1900s a number of new buildings were constructed on Moore Street, and the street was renamed Martin Place in 1921.[109]

Sydney Municipal Council resolved to proceed with a further extension in 1923 but this section required extensive demolition of properties in the way of the line of the street, and it faced concerted opposition from land owners, with legal action taken to prevent the resumption of their land.[110]The extension of Martin Place from Castlereagh Street to Macquarie Street was not completed until 1935, and later suggestions to carry it even further, involving partial demolition of Sydney Hospital, were never carried out.[111]

Sydney City Council began to promote Martin Place as the major financial and insurance centre of Sydney, resulting in many prominent banking, financial and insurance companies establishing themselves in the area from the 1900s (Figure 120). [112]Martin Place also became the focal point for civic and ceremonial activity in the city. In 1979 the entirety of Martin Place became a pedestrian precinct, and the Martin Place Railway Station was opened.

Figure 120: Detail from the 1938-1950 Civic Survey, showing the main buildings within the study area. Source: Historical Atlas of Sydney. Study area boundary shown in red.



[109] "Martin Place" Dictionary of Sydney
[110] ibid
[111] ibid
[112] ibid

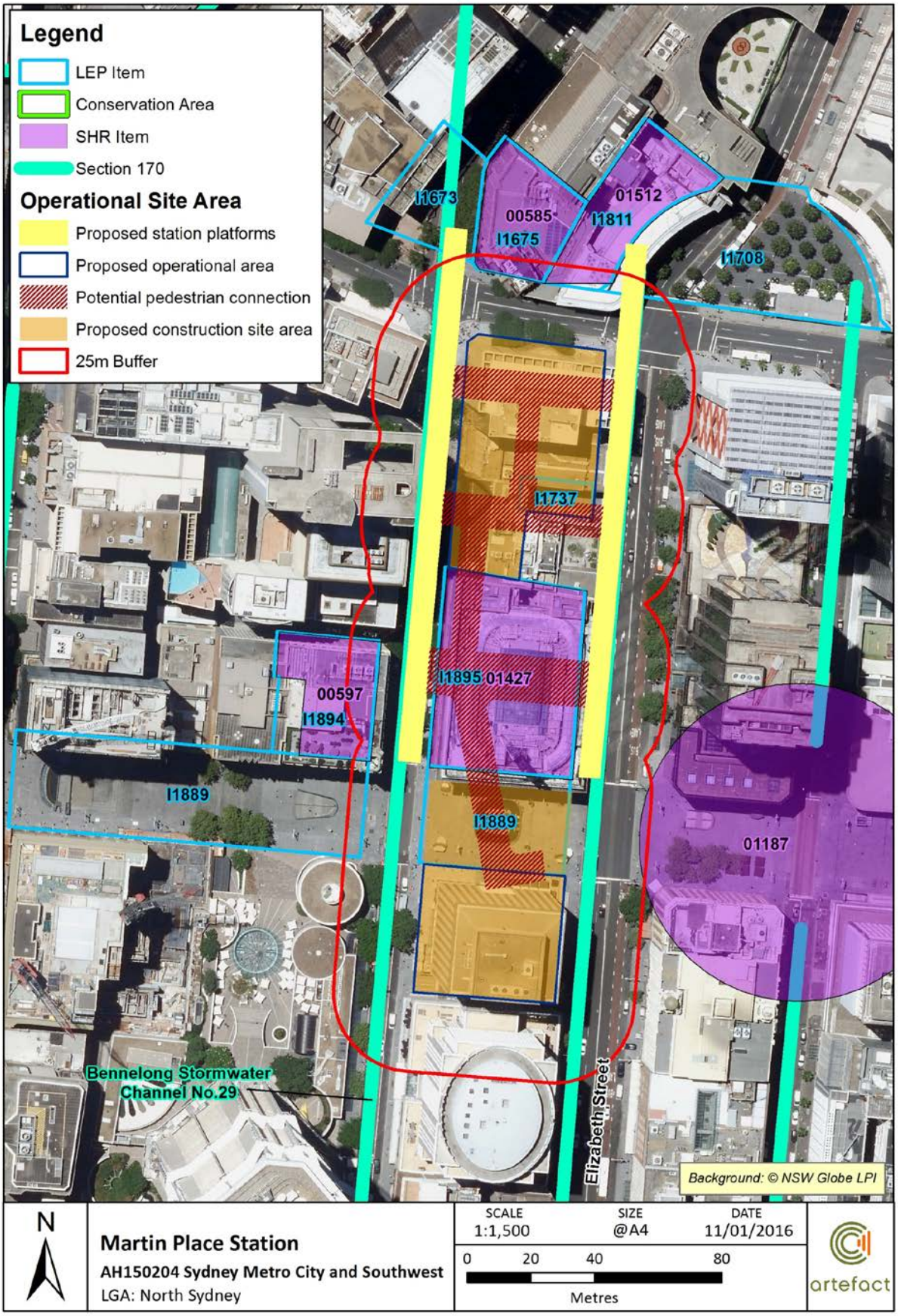
6.8.3 Heritage listed items

The following table outlines the heritage listed items within the study area which are shown in Figure 121.

Table 65: Overview of heritage items within the Martin Place study area

Heritage item	Register listings	Significance	Relationship to study area
Richard Johnson Square including monument and plinth	Sydney LEP 2012 I1673	Local	Partially within buffer zone
Former “MLC” building including interior	State Heritage Register 00597 Sydney LEP 2012 i1894	State	Partially within buffer zone
Former “City Mutual Life Assurance” building including interiors	State Heritage Register 00585 Sydney LEP 2012 I1675	State	Partially within buffer zone
Former “Qantas House” including interiors	State Heritage Register 01512 Sydney LEP 2012 I1811	State	Partially within buffer zone
Chifley Square	Sydney LEP 2012 I1708	Local	Partially within buffer zone
Commonwealth Bank of Australia including interior	State Heritage Register 01427 Sydney LEP 2012 I1895	State	Adjacent to construction area, within buffer zone
Flat building including interior	Sydney LEP 2012 I1737	Local	Within construction area
Martin Place	Sydney LEP 2012 I1889	Local	Partially within construction area and buffer zone
Martin Place Railway Station	State Heritage Register 01187 Sydney LEP 2012 I1891 Sydney Trains S170	State	Partially within construction area
Bennelong Stormwater Channel No.29	Sydney Water S170	Local	Partially within buffer zone

Figure 121: Heritage items within Martin Place study area.



6.8.4 Detailed heritage impact assessments

Heritage items

Table 66: Richard Johnson Square including monument and plinth heritage impact assessment

Richard Johnson Square including monument and plinth[113]	
Image	**Figure 122: Richard Johnson Square and monument.** 
Significance	Local
Description	Small paved square on the north-west corner of Hunter and Blight Streets, containing an obelisk monument on tiered plinth.
Statement of significance	Richard Johnson Square is historically and culturally significant as an important example of 20th century civic planning.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The demolition of 55 Hunter Street within the Martin Place northern site would result in a neutral visual impact to the heritage item. As there is a direct visual connection between the square and the building to be demolished, the works would be altering the streetscape and setting of the heritage item. However, as the building to be removed is a substantial 20th century multi-storey structure that does not contribute to the setting of the heritage item, its removal would not negatively impact on the square. The heritage item has a direct visual connection with the proposed northern-western station entrance. The station entrances would be designed to minimise the street frontage within important urban areas, such as this one. They would consist of awnings, landscaping and street furniture designed to maintain a high quality urban design outcome. The station north-western entrance would have a minor visual impact on the heritage item. There would be no impact to the historical significance if the item. **Indirect impact: Minor**

[113] Description and Statement of significance extracted from State Heritage Inventory sheet "Richard Johnson Square including monument and plinth" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2424648 on 22/10/2015.

Table 67: Former "MLC Building" including interiors heritage impact assessment

Former "MLC Building" including interiors[114]	
Image	**Figure 123: MLC Building. Artefact Heritage 2015.** 
Significance	State
Description	Constructed between 1936 and 1938, the former MLC Building occupies a prominent position on the corner of Martin Place and Castlereagh Streets, Sydney. The building has been maintained in good condition since the substantial renovations of the late 1980s. The main assurance chamber on the ground floor of rare scale and high quality finishes survives in substantially intact condition.
Statement of significance	The former MLC Building is aesthetically significant as one of the best inter-war commercial office buildings in Sydney, and the best example in Australia of the exterior use of Egyptian derived motifs in such buildings. Its quality of design and use of materials make it one of the principal contributors to the architectural character of Martin Place which is recognised as one of Sydney's finest urban spaces. The building contains a substantially intact insurance chamber and relocated boardroom, ante-room and lift lobby and relocated remnants of other architectural features. The former MLC Building is historically significant as one of a small group (about a dozen) of major commercial office buildings constructed in Sydney during the second half of the 1930s. It is associated with the well known Melbourne architects Bates, Smart & McCutcheon, and as the winner of a design competition, reflects the architectural taste of the period.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	As there is a direct visual connection between the southernmost frontage of the heritage item (facing Martin Place), and the Martin Place southern site, the proposed entrance would have a minor impact on the setting of the heritage item. The structures to be demolished within the southern site do not contribute to the heritage significance or setting of the MLC Building. **Indirect impact: Minor**

[114] Description and Statement of significance extracted from State Heritage Register inventory sheet "Former "MLC Building" including interiors" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5045268 on 22/10/2015.

Table 68: Former "City Manual Life Assurance" heritage impact assessment

Former "City Mutual Life Assurance" building including interiors[115]	
Image	**Figure 124: "City Mutual Life Assurance" building. Artefact Heritage 2015.** 
Significance	State
Description	Constructed in 1936, the former "City Mutual Life Assurance" building is one of the best intact example of Art Deco style applied to a commercial office building in the Sydney CBD.
Statement of significance	The City Mutual Life Assurance Building is one of the foremost examples of high quality and well-designed commercial Art Deco architecture in Sydney's CBD and represents the culmination of the work of one of Australia's foremost proponents of this style, Emil Sodersteen. As a largely intact and well maintained late 1930's structure, the building demonstrates through its powerful exterior elevations and dramatic interior spaces the aesthetic and commercial aspects of Art Deco architecture in Australia. The building occupies a dominant position in the surrounding urban context, serving as a backdrop to Richard Johnson Square and as a landmark in the Bligh and Hunter Streetscapes. Since its completion in 1936, the building has been a symbol of the Mutual Life Assurance Society and the building stands as a monument to the Society's participation in the evolution of Sydney's business and commerce. Significance of the building's individual components is discussed below. <u>Exterior</u> Exterior elevations to Bligh and Hunter Streets represent intact and well-maintained examples of late Art Deco commercial detailing and massing. The materials used to differentiate parts of the building and its proportions demonstrate the Art Deco preoccupation with the precision of modern technology and materials. The tower at the corner of Bligh and Hunter Streets is the focal point of the building and serves as a major landmark to the Richard Johnson Square and the Bligh and Hunter Streetscapes. Materials and detailing at

[115] Description and Statement of significance extracted from State Heritage Inventory sheet "Former "City Mutual Life Assurance" building including interiors" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5045589 on 22/10/2015.

Former "City Mutual Life Assurance" building including interiors[115]	
	lower elevations are oriented to the scale and perceptions of pedestrians. Such detailing includes the glossy granite building base at street level, bronze window sashes and sculptures (by Rayner Hoff) over the main entrances. Interior The ground floor main business chamber is the largest and most intact Art Deco commercial chamber in Sydney. It demonstrates Emil Sodersteen's considerable design abilities in accommodating a formally proportioned interior space within an irregular external building envelope. The streamlined space is a controlled image of commercial prestige highlighted by sophisticated detailing and craftsmanship. Scagliola wall and column surfacing, bronze window frames and detailed plasterwork emphasise the overall ambiance of the space. Other major interior spaces that reinforce the total building design include the secondary lift foyers on the ground, first and second floors, and the second floor Board Room.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	As there is a direct visual connection between the southernmost frontage of the heritage item (facing Hunter Street), and the proposed Martin Place northern site station building entrance, the station entrance would have a minor impact on the setting of the heritage item. The structures to be demolished do not contribute to the heritage significance or setting of the heritage building. **Indirect impact: Minor**

Table 69: Qantas House including interiors heritage impact assessment

Qantas House including interiors[116]	
Image	**Figure 125: Qantas House. Artefact Heritage 2015.** 
Significance	State
Description	Constructed between 1955 and 1957, Qantas House is distinguished by its graceful, segmented, curved facade which consists of a 46m high, double glazed curtain wall of green glass with enamelled blue-green steel spandrel panels. It is located on the western side of Chifley Square which itself is located at the intersection of Elizabeth, Hunter and Phillip Streets in Sydney.
Statement of significance	Qantas House, No. 1 Chifley Square, Sydney, designed in 1950 by Felix Tavener of Rudder Littlemore & Rudder, Architects and completed in 1957 represents the highest standard of architectural response to its urban setting and client needs through its form, composition and construction. A variant of the Post-War International style of architecture, Qantas House represents transitional aspects of 'moderate' 1930s European modernism, combined with the latest in post-war curtain wall technologies and materials and is the best design response to its setting in Australia from this period. Although altered internally, its external facade remains largely intact. The graceful double-curved facade is coherently ordered and its shape reflects and visually reinforces the implementation of a long-planned extension to Elizabeth Street. It became the inspiration for the eventual completion of the ironically named, but no less significant, Chifley Square, modelled on a town planned scheme of some eighty years before. Qantas House is a key defining element in this important, planned, urban space; it provides an appropriate visual termination to important vistas and it visually links to adjoining important buildings and streets. Historically significant as the first planned world headquarters for Qantas Empire Airways, at the time Australia's only, and Government-owned, international airline, the building, and in particular the aerofoil-shaped aluminium mullions of its curtain wall, gives form to Qantas' forward looking and expansive image at a time when air travel was taking off. Qantas Airways remained as its sole occupant for twenty-five years and remains associated with the building through its lease of the ground floor. The building is highly regarded by the people of Sydney

[116] Description and Statement of significance extracted from State Heritage Register inventory sheet “Qantas House” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5049926 on 22/10/2015.

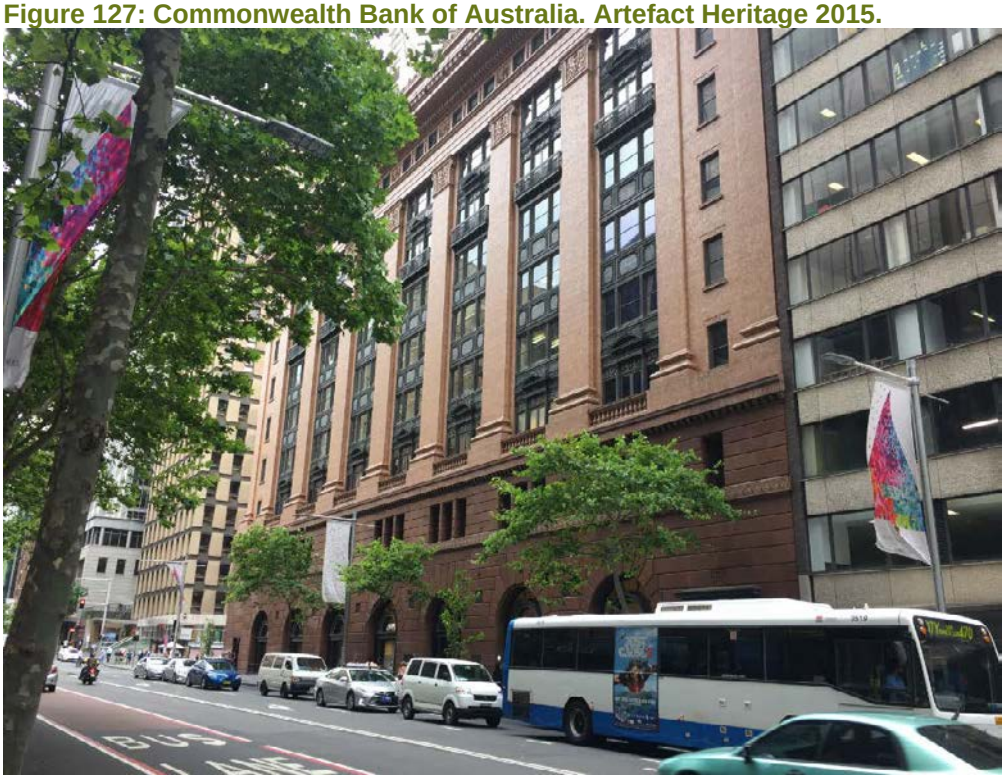
Qantas House including interiors[116]	
	for its inherent aesthetic qualities and its association with Qantas, an Australian corporate icon. Qantas House is a fine example in the Australian context of intact, post-war, multi-storeyed office buildings from the first phase in the 1950s, and is from the small group in Sydney of this group designed prior to the amendments to the Heights of Buildings Act in 1957 that heralded the subsequent 'high-rise' phase. It has particular rarity within Australia for its unique shape, the outstanding quality of its curtain wall facade and its contribution to its urban setting. As such, it is considered to have heritage significance at a national level. A well known and much loved city landmark, Qantas House is an icon of its time; a quintessential Sydney building that represents a brave future and a strong sense of history and of place.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	As there is a direct visual connection between the southernmost frontage of the heritage item (facing Hunter Street), and the proposed Martin Place northern site station building entrance, the proposed entrance would have a minor impact on the setting of the heritage item. The structures to be demolished do not contribute to the heritage significance or setting of the heritage building. **Indirect impact: Minor**

Table 70: Chifley Square heritage impact assessment

Chifley Square[117]	
Image	**Figure 126: Chifley Square. Artefact Heritage 2015.** 
Significance	Local
Description	Constructed between 1957 and 1993 the square is characterised by large-scale high-rise tower buildings interspersed with lower scale development. The majority of towers at the edges of the Square are seen as individual elements within the cityscape, however they follow the street alignment at lower levels, with a curved alignment to the north creating a distinct sense of enclosure for the Square. The curved form of the Square and the recent Aurora Place to the east, visible within this setting, create a unique urban landscape within the Sydney CBD and provide a visual relief and break in the intensely built up area of the financial centre.
Statement of significance	Chifley Square is of historical and aesthetic significance as an early 20th exercise in city planning to create a new public open space, and for its naming to honour J.B. Chifley, Australia's prominent and well loved wartime Prime Minister 1945-1949. The construction of the heritage-listed 1957 Qantas House (designed by Rudder Littlemore and Rudder) at 68-96 Hunter Street was integral to the creation of Chifley Square, and adds to the historical and aesthetic significance of the Square.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	As there is a direct visual connection between the southernmost frontage of the square (facing Hunter Street), and the proposed Martin Place northern site station building entrance, the proposed entrance would have a minor impact on the setting of the heritage item. The structures to be demolished do not contribute to the heritage significance or setting of the heritage building. The historical significance of the item would not be impacted. **Indirect impact: Minor**

[117] Description and Statement of significance extracted from State Heritage Inventory sheet “Chifley Square” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2431190 on 22/10/2015.

Table 71: Commonwealth Bank Australia including interior heritage impact assessment

Commonwealth Bank of Australia including interior[118]	
Image	**Figure 127: Commonwealth Bank of Australia. Artefact Heritage 2015.** 
Significance	State
Description	Constructed between 1925 and 1928, the Commonwealth Bank building fronts Martin Place on the south, Elizabeth Street on the east and Castlereagh Street on the west. The building is an extensive eleven-storey structure plus mezzanine above ground, with three basement levels. Externally the building displays monumental civic scale and precise, symmetrical detailing utilising classical motifs.
Statement of significance	The Commonwealth Bank at 48 Martin Place is culturally significant at a National level as a rare example of Inter-War Beaux-Arts architecture demonstrating outstanding technical accomplishment. It is also of exceptional local and State significance. Located at a prominent address on Martin Place, the building played an important role in the development of the economy in New South Wales during the 1920s. The building was constructed between 1925 and 1928 and is one of the most important examples of its style and type within New South Wales and Australia. 48 Martin Place is one of the finest banking institutions in Australia and the finest in New South Wales. The cultural significance of 48 Martin Place and its setting will be maintained through its association with the Commonwealth Bank of Australia. The item has been assessed as historically, aesthetically and socially significant with rarity values at a state level.
Impact type	Indirect impact: Views and vistas Potential direct impact: Vibration

[118] Description and Statement of significance extracted from State Heritage Register inventory sheet "Commonwealth Bank" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5045790 on 22/10/2015.

Commonwealth Bank of Australia including interior[118]

Heritage impact assessment	The following assessment of heritage impacts is based on the SHR criteria mentioned above. The historical significance of the item would not be impacted as it will retain its use and character. The fabric of the item would be subject to negligible impacts. The closest façade of this item would not experience vibration above the 7.5mm/s screening level for cosmetic damage, however demolition of existing adjacent and adjoining structures to the north and south of this item may result in vibration impacts above the screening level for cosmetic damage. The use of roadheaders and rock hammers to be used in the construction of adits and pedestrian connections between platforms and directly below the heritage item have been designed to provide adequate clearance for the foundations and basement of the heritage building. Vibration modelling indicates that this item would not sustain damage due to vibration impacts provided that small equipment is adopted whenever works are occurring in close proximity to the building. The risk of settlement of the building resulting from the construction of Martin Place Station has been identified as being negligible. Vibration modelling indicates that vibration levels resulting from shaft excavation would not exceed the vibration screening level for cosmetic damage. The aesthetic significance of the item is primarily in relation to its design and materials. These elements of aesthetic value would not be impacted by the project. The structures to be demolished to the north and south do not contribute to the heritage significance or setting of the heritage building, however, their removal would alter the existing streetscape considerably. The position of the item in the streetscape does contribute to its significance. The removal of these buildings, and the introduction of the proposed Martin Place southern site station entrance, would have a moderate impact on setting of the heritage item. The social significance of the item would not be impacted as it would retain its use as a banking institution and public association with that industry. The rarity of the item would not be impacted by the project as the fabric of the item would be subject to negligible impacts. **Potential direct impact: Minor** **Indirect impact: Moderate**

Table 72: Flat building including interiors heritage impact assessment

Flat building including interiors[119]	
Image	**Figure 128: Flat building. Artefact Heritage 2015.** 
Significance	Local
Description	Constructed between 1939 and 1940, the heritage item consists of a 10-storey apartment building, designed to contain 54 flats with two shops at ground floor level and a basement restaurant.
Statement of significance	The building is historically significant because it is the only block of flats constructed in the City of Sydney during the 1930s to have survived and still fulfil its function as a residential building. The building is aesthetically significant because of its associations with two prominent and influential designers, architect Emil Sodersten and interior designer Marion Hall Best. Emil Sodersten was one of the most important architects to have practised in New South Wales during the 1920s and 1930s. Famous for the residential flat buildings that were designed in his office, this is the only one known to have been constructed in the CBD and shows the influence of the modernist European architecture on his work. As such it has state significance [however, the item is listed as having local significance]. Its interiors were an early and well publicised example of the work of Marion Hall Best, who went on to exercise a great influence on interior design in this state during the three decades after World War II. The building has been assessed for its historical, associative and aesthetic and social significance at a local level. The building is a representative example of an inter war apartment block and rare in the context of the Sydney CBD.
Impact type	Direct impact: Physical; demolition
Heritage impact assessment	The project would require the complete demolition of this building to facilitate the Martin Place northern site. This would result in a total loss of heritage fabric, and de-listing of the heritage item. The historical, associative and aesthetic and social significance of the item would be completely lost. **Direct impact: Major – complete demolition**

[119] Description and Statement of significance extracted from State Heritage inventory sheet "Flat Building including interiors" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2428684 on 22/10/2015.

Table 73: Martin Place heritage impact assessment

Martin Place[120]	
Image	**Figure 129: Martin Place, view to the east. Artefact Heritage 2015.** 
Significance	Local
Description	Constructed in 1891, Martin Place consists of a streetscape bounded by Macquarie Street and terminated by George Street, characterised by commercial buildings.
Statement of significance	Martin Place has Historic and Aesthetic Significance for ability to evidence the development of Victorian and Interwar Sydney as a prestige address for institutional buildings. Ability to reflect the status of Sydney because of its relationship with Institutional Buildings. It is significant for its ability to contribute to understanding the nineteenth and twentieth century town planning intention. It has ability to evidence key period of building activity during the Victorian period and later the interwar period and post war period in direct response to the Height of Building controls. Martin Place has Historic Association Significance for its association with Sir James Martin, premier and Chief Justice of NSW.
Recommended management[121]	RECOGNISE THE HISTORICAL LAYERS Victorian Development These form the character of the city Interwar Development Buildings of the early twentieth century usually have an appropriate scale and are therefore neutral elements although some buildings may contribute to the significance of the area and are therefore contributing elements Interwar development provides a greater range of finishes, greater extent of solid façade and recessed balconies which provide more wall façade than post-60's development. Interwar development provides hierarchical composition to centre, base, middle and top and a stepped skyline Associated planting lessens visual impact of Interwar development Buildings of the Post-War Development were seen to indicate Sydney's progressive status PROTECTION OF SIGNIFICANCE Protect Subdivision Pattern Retain Victorian, subdivision Do not allow amalgamation of sites within these important subdivisions Retain the block width characteristics of an area Protect Key Period Significant (Contributory) Development and Settings Retain Victorian Public Buildings Retain Victorian Commercial Buildings Retain Interwar Buildings where they contribute to the streetscape Retain significant corner buildings Retain Scale Maintain building alignments Retain pattern of forms Retain finishes and details

[120] Description and Statement of significance extracted from State Heritage Register inventory sheet "Martin Place" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2424652 on 22/10/2015.
[121] Recommended management extracted from SHI listing 'Martin Place.'

Martin Place[120]	
	Protect Significant Building Type – Warehouse Retain scale and finishes. Remove detracting additions to (Contributory) Development Awnings Airconditioning Dominating signage Large infill shopfront (reconstruction may be required) Reinforce the street character dominant scale Maintain scale of development abutting lanes so that it is complementary to adjacent buildings and encourages pedestrian use by providing for retail or other activity in the lane. Reinforce the dominant street character and scale Retain scale of institutional development Maintain characteristic building alignment Retain characteristic building form and façade composition Retain characteristic building finishes and details Change of Use Retain commercial usage Retain institutional usage Retain an understanding of a former use by not allowing the new use to compromise the significant façade. ENHANCEMENT OF STREETSCAPE SETTING Landscaping Encourage trees at the end of streets to reinforce landscape vistas and frame views. Encourage trees to screen detracting development Views Protect the close and distant views which are important to the character of the city Reinforce street end vistas with street trees Pedestrianisation Retain role of the space as public open space, by maintaining and enhancing pedestrian access and activity. Street Parking Incorporate street trees. Do not alter street alignment. Car Parking/ Access (CBD) Do allow new car access from the street Generally allow parking access from rear lanes Reduce the impact of below ground garages by narrowing garage door, garage lighting screening, providing appropriate gates and doors and providing landscape screening ENHANCE SIGNIFICANCE ON REDEVELOPED SITE Redevelopment of Detracting Sites Respect the Established Area Character Encourage appropriate replacement development on detracting sites. Recognise the collective precedent and impact of the proposal. Recognise the verticality of significant City streetscapes Avoid raised podiums Respect the character of precinct Respect the scale and form of significant development Prepare policy for development of former industrial sites (Glebe) or large sites Respect the Established Facade Encourage reinterpretation of Victorian Subdivision in the vicinity Respect building line, scale, form and roof pitch of significant development in the vicinity Encourage façade qualities being multiple finishes, greater extent of solid façade and recessed balconies. Reduce the impact of uncharacteristic scale and large extent of glass Reduce the impact of minimal setbacks for increased building height Encourage streetwalls Encourage reinterpretation of adjacent significant façade composition Encourage rendered and painted finishes Encourage an appropriate level of contemporary decorative detail Avoid Visual Clutter Reduce the impact of A/C, signs etc. Awnings should not occur in street Disallow bridges and projections over the street lane which overshadows the Lane, obstructs a view or vista or diminishes pedestrian activity at ground level Landscape screening Encourage screening (landscape and architectural) to detracting development by appropriate policy Enhance Significance of Area Establish/maintain and enhance street planting to unify streetscapes Encourage render/paint/stone finishes to detracting developments Remove / discourage reproduction of period detail in contemporary development Provide landscape screening to detracting sites Promote public buildings Promote retail strip Promote articles on improvements within the area RECOMMENDATIONS FOR LEP PROTECTION BOUNDARY ADJUSTMENT Adjust boundary to include areas which do contribute to an understanding of the significance of the Streetscape. Consider extension of the boundary of the Streetscape to Angel Place. STATUTORY PROTECTION Confirm listing in the LEP Interpretation Interpret Victorian street lane pattern and subdivision Encourage historical interpretation of the laneway.
Impact type	Direct impact: Excavation Indirect impact: Views and vistas
Heritage impact assessment	Cut and cover excavation of a portion of Martin Place plaza during construction to facilitate the Martin Place southern site would constitute a moderate impact to fabric of the heritage item. This would not affect the associative or historical significance of the item as it would retain its purpose and relationship with significant historic buildings. **Direct impact: Moderate** The construction of the Martin Place southern station site building may result in a minor to moderate impact on the setting of the heritage item. This would impact its aesthetic significance. Demolition of the existing exit and entry stairs to the station would not have a negative impact on the setting of the item, but would open up public space and improve views across the plaza. There would be a temporary visual impact during construction while the plaza is closed off, but once operational the cviual impacts resulting from works within the plaza itself would be negligible. **Indirect impact: Minor to moderate**

Table 74: Martin Place Railway Station heritage impact assessment

Martin Place Railway Station[122]	
Image	**Figure 130: Station entrance in Martin Place [left] and public concourse [right].** 
Significance	State
Description	Constructed between 1973 and 1979 Martin Place Railway Station consists of an underground complex, accessed via stairs from Martin Place and then banks of three escalators to the concourse level. Pedestrian access is via arcades constructed at the same time as the station and leading to adjacent office and retail plazas.
Statement of significance	Martin Place Railway Station is significant as a representative example of the most recent major railway construction undertaken in Sydney city, as part of the Eastern Suburbs Railway (ESR). The design of the Martin Place Station as displayed in its colour scheme particularly, reflects the design ideas of the 1920s city underground stations such as St James and Museum, and the individual colour schemes used for each of the stations on the ESR. Martin Place is a good example of a late Twentieth-Century International style structure which is highly intact with many of its original materials and finishes still in place. Martin Place Station is listed on the SHR for its rarity values. The section 170 and LEP listings for the item also recognise its representativeness, aesthetic, social and historical significance
Impact type	Direct impact: Project connects directly to station
Heritage impact assessment	The historical significance of the item would not be impacted as it would retain its use and character. There are other examples of red ceramic tiling throughout the item, which would not be impacted by the project. Interchange of the project to Martin Place Railway Station would be provided through the excavation of a mined tunnel that would tie into the western extent of the existing Eastern Suburbs Line platform cavern. This connection would break through from the station cross passage beneath Martin Place and Elizabeth Street into the western end of the existing Martin Place station platform. The entrance point to the platform would include the removal of red ceramic tiling from the western end of Martin Place Station as well as altering the configuration and movement of passengers through the station. The red ceramic tiling is a key component of the aesthetic significance of the item. Red tiling is used sparingly within the platform cavern, with the eastern and western ends of the platform a key visible use of the material. These works would result in moderate impact to the heritage item's aesthetic significance through removal of original fabric. The social significance of the item would not be impacted as it would retain its use as a railway station and public association with that use. The representativeness of the item would not be impacted by the project as impacts to fabric would be limited to one discrete area, with examples of similar fabric remaining at other locations within the station. The rarity of the item would not be adversely impacted as only a portion of fabric would be impacted. **Direct impact: Moderate**

[122] Description and Statement of significance extracted from State Heritage Register inventory sheet "Martin Place Railway Station" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5012097 on 22/10/2015.

Table 75: Bennelong Stormwater Channel No. 29 heritage impact assessment

Bennelong Stormwater Channel No. 29[123]	
Image	**Figure 131: Curtilage plan for Bennelong Stormwater Channel No. 29.** 
Significance	Local
Description	Constructed between 1856 and 1856, the Bennelong sewer consists of a combined sewer/stormwater drain. It is oviform in shape with dimensions of 1.5 metres by 1.2 metres. The system is constructed of brick with some sections tunnelled in sandstone along Tarpian Way (Circular Quay East). This Stormwater channel drains an area of 65 hectares in total, with its uppermost point being the Obelisk vent shaft at Hyde Park. From here it works its way down along Pitt, Castlereagh, Elizabeth, Phillip and Macquarie Streets to the outlet at Bennelong Point.
Statement of significance	The Bennelong Stormwater Channel is of high historical and technical significance as it was one of the five original combined sewers built in Sydney around 1857. The other four sewers were; Blackwattle Bay, Hay Street, Tank Stream and Woolloomooloo. These five sewers were responsible for greatly improving public health, hygiene and living standards for the city's residents. This was done by diverting stormwater and sewerage from the streets and discharging it out into the Harbour currents. The introduction of the Bondi Ocean Outfall Sewer in 1889 diverted sewer flow to the ocean and eventually led to the drain being used predominantly for stormwater, hence further improving public health. Of the five combined sewers Bennelong is probably the most significant, as it is the most intact and was originally known as the "main sewer" because it serviced the CBD area. It was also the first oviform sewer to be built in Australia. Furthermore, the Margaret Street Sewer, which was once attached to the Bennelong system, contains the first sewer aqueduct to be built in Australia. This aqueduct runs along Hunter Street, which is part of the Bennelong catchment.
Impact type	Potential direct impact: Vibration
Heritage impact assessment	The demolition of existing buildings, and construction of the proposed Martin Place northern and southern sites, may have a minor impact to fabric as a result of vibration associated with construction. Minor vibration impacts may occur due to the use of roadheaders and rock hammers in the construction of the station and underground adits and pedestrian connections between platforms. This item would experience vibration above the 7.5mm/s screening level for cosmetic damage. **Potential direct impact: Minor**

[123] Description and Statement of significance extracted from State Heritage Inventory sheet “Bennelong Stormwater Channel No. 29” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4570854 on 22/10/2015.

6.8.5 Archaeological assessment

The following archaeological assessment focuses on the proposed northern and southern station sites, the construction of which would require the demolition of existing buildings and construction of new infrastructure, incorporating lift shafts and tunnelled access to the proposed platforms.

6.8.5.1 Previous archaeological investigations in the vicinity

During October and November 2007 Godden Mackay Pty Ltd undertook archaeological investigations in Angel Place, located between Pitt and George Streets.[124]

During a program of archaeological monitoring and testing in areas that were found to have been undisturbed by later development, the archaeologists uncovered remains of early European settlement in the area surrounding the former banks of the Tank Stream. This included palynological evidence of European clearance of the trees and vegetation in the valley of the Tank Stream and evidence of early landscape modification.

A number of drains were also identified, including a substantial sandstock brick barrel drain, interpreted as dating to the period c.1810-15, which drained from the early property into the Tank Stream. The cut for a former well was also identified, although the brick lining had been removed. The fill of the well was found to contain an extensive assemblage of locally-made earthenware vessels, glass and faunal remains. The site was also found to contain archaeological remains dating to the mid and later 19th centuries, including an early sandstone retaining wall and evidence of later buildings.

Martin Place, listed on the Sydney LEP 2012, is also listed as being an archaeological item.

6.8.5.2 Site inspection results

The Martin Place Station site is located across a built environment on a gentle slope down to the west. No areas of surface visibility or intact ground surface were observed. The southern portion of the proposed station site includes the existing access to Martin Place Station.

Figure 132: View east across Martin Place and existing entrance to Martin Place station

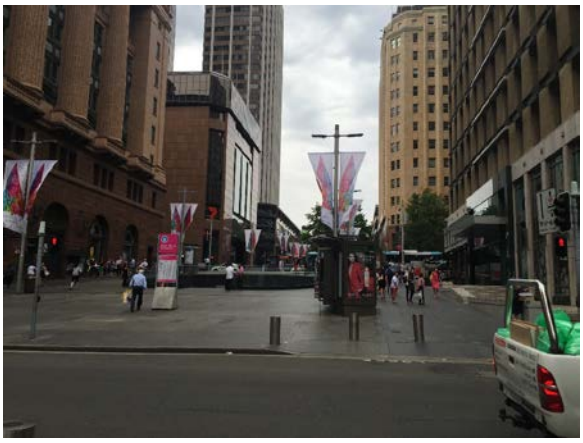
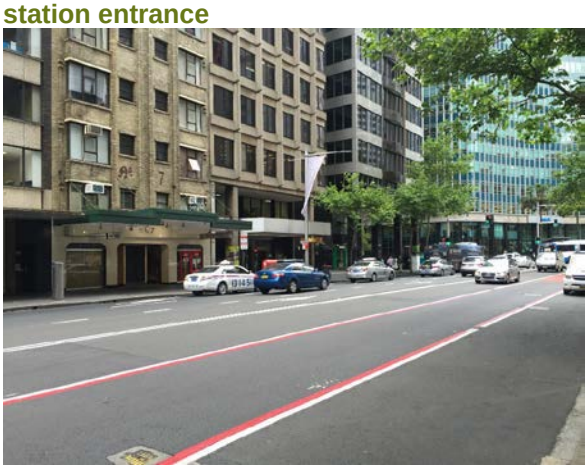


Figure 133: View northwest across Castlereagh Street to proposed northern station entrance



6.8.5.3 Known impacts

Subsurface impacts associated with former or current land uses have the potential to remove or damage potential archaeological remains. Previous impacts within the site need to be further understood and identified before more than a preliminary assessment of archaeological impact can be made.

[124] Godden Mackay Heritage Consultants *Angel Place Project Volume 1 - Final Report*, prepared for AMP Asset Management Australia Ltd. 1997

Based on the initial literature review and site inspection undertaken as part of this assessment, the following preliminary assumptions regarding archaeology at the site can be made:

- Sites within Sydney CBD tend to have been occupied intensively, and therefore have the potential to contain a range of archaeological evidence dating to different periods of use.
- Many large buildings constructed within the vicinity of Martin Place utilised advancing technologies that allowed for the construction of deep and substantial basements. Depth and extent of basement information available indicate that basement excavation has occurred in many locations within the station site excavation areas.

6.8.5.4 Discussion of archaeological potential

Preliminary analysis suggests that the archaeological resource, if it survives within the study area, would be associated with early to late 19th century residences, shopfronts and small scale industrial workshops.

Archaeological remains within the Sydney CBD can be substantially intact, and date from early phases of the development of the colony. Therefore, an intact and early archaeological resource in the study area has the potential to have significance at a State level. This would therefore require further archaeological investigation or assessment in order to mitigate any impacts to the resource that may arise from the proposed demolition, construction and tunnelling works.

6.8.5.5 Preliminary assessment of significance

The following is a preliminary assessment of significance, informed by the NSW Heritage Criteria for *Assessing Significance related to Archaeological Sites and 'Relics'* (2009).

Archaeological research potential (NSW Heritage Criterion E):

- Archaeological remains associated with early development and establishment of the colony would have significant research potential, dependant on the nature and extent of any remains. Although there is a nil-low potential for evidence of early settlement and cultivation such as drains and postholes to remain, any such archaeological remains would be rare and of high significance. There is a moderate potential for remains of pre-1850s occupation and development to be present within the study area. There is limited information available on the use of the structures evident in the study area before 1850, therefore any remains, particularly archaeological deposits associated with yard scatters, cess pits, wells or rubbish pits are likely to have a high research potential.

Association with individuals, events, or groups of historical importance (NSW Heritage Criteria A, B & D):

- It is possible that evidence of early residential development of the study area may have associations with former residents and known local historical figures. Specific associations have not been identified at this stage.

Aesthetic or technical significance (NSW Heritage Criterion C):

- Remains of early buildings may have some technical significance depending on their construction methodology.

Ability to demonstrate the past through archaeological remains (NSW Heritage Criterion A, C, F & G):

- The study area has the potential to demonstrate the past through archaeological remains. It is likely, however that any archaeological remains may be truncated, removed or damaged by later construction on the site.

Overall, the site may contain archaeological remans with potential to reach the local and State significance thresholds.

6.8.5.6 Overview archaeological potential

The study area has low to high potential to contain a substantial archaeological resource with the potential to reach the local and State significance thresholds.

Table 76: Summary of archaeological potential within study area

Potential archaeological resource	Potential	Significance	Heritage impact assessment
Evidence of early establishment of the colony – for example, evidence of land clearance and cultivation, early structures, drains.	Nil-low	Local-State	Excavation works within the study area have nil-low potential to impact on archaeological remains.
Pre-1850s residential and commercial development – stone or brick footings, remnant flooring, drains, rubbish pits, wells, cesspits, occupation deposits and yard scatters.	Moderate	Local - State	Excavation works within the study area have moderate potential to impact on archaeological remains
Late 19th century residential and commercial development – stone or brick footings, basements, rubbish pits, wells, cesspits, occupation deposits and yard scatters.	Moderate	Local	Excavation works within the study area have moderate potential to impact on archaeological remains
Early to mid-20th century commercial development – brick or stone foundations.	Moderate - high	May reach local significance threshold.	Excavation works within the study area have moderate - high potential to impact on archaeological remains.

6.8.5.7 Archaeological impact assessment

Proposed works within the Martin Place Station site with the potential to impact on archaeological remains include:

- Excavation during demolition works
- Excavation of open shafts during construction phase to allow access to the mined tunnels.

The excavation of the open shafts allowing access to the mined tunnels would result in the complete removal archaeological remains within the station box footprint. Therefore, works in these locations would have a major impact on potential archaeological resources.

6.8.6 Overview of constraints

The following table outlines the potential heritage constraints within the study area:

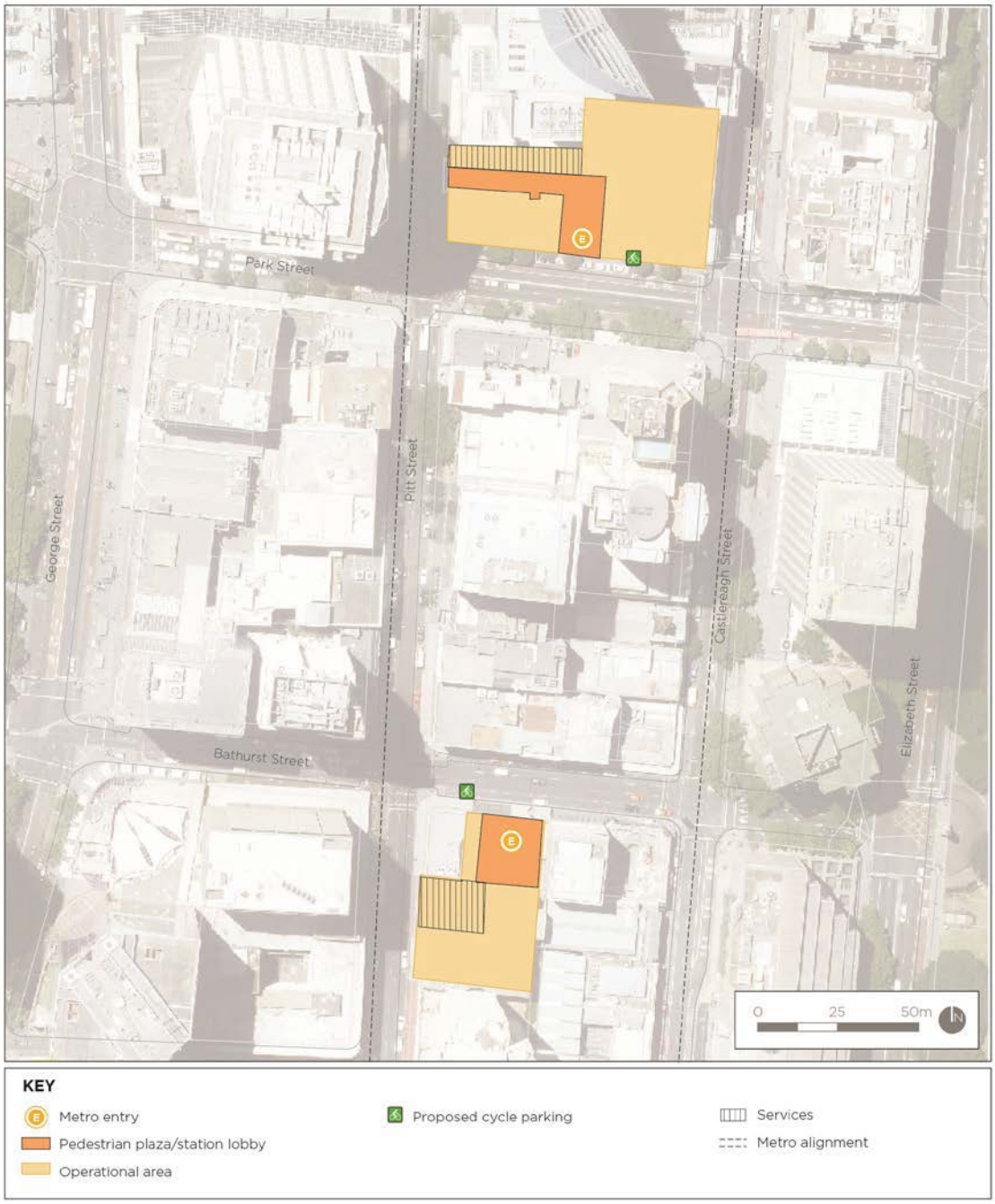
Table 77: Overview of potential heritage constraints for Martin Place study area.

Heritage item	Potential heritage impacts		
	Direct impact	**Archaeological impact**	**Indirect impact**
Richard Johnson Square including monument and plinth	Neutral	Neutral	Minor – views and vistas
Former "MLC" building including interior	Neutral	Neutral	Minor – views and vistas
Former "City Mutual Life Assurance" building including interiors	Neutral	Neutral	Minor – views and vistas
Former "Qantas House" including interiors	Neutral	Neutral	Minor – views and vistas
Chifley Square	Neutral	Neutral	Minor – views and vistas
Commonwealth Bank of Australia including interior	Direct impact: Minor (vibration)	Neutral	Moderate – views and vistas
Flat building including interior	Major – complete demolition	N/A	N/A
Martin Place	Direct impact: moderate (excavation)	See 'potential archaeological resource' below	Minor to moderate – views and vistas
Martin Place Railway Station	Direct impact: moderate (interchange)	Neutral	Neutral
Bennelong Stormwater Channel No.29	Potential direct impact: Minor (vibration)	Neutral	Neutral
Potential archaeological resource within the study area	N/A	Major impact – low to moderate potential for local and state significant archaeological remains	N/A

6.9 Pitt Street station

Pitt Street Station is located within the midtown precinct of the Sydney Central Business District, with a strong retail focus, as well as a mix of commercial, residential and civic buildings. The local area includes a number of listed heritage items, including Sydney Town Hall, the Queen Victoria Building and St Andrews Cathedral. It is also near open spaces such as Hyde Park and Pitt Street Mall.

Figure 134: Location and indicative layout of Pitt Street Station



6.9.1 Construction

The design involves a binocular station cavern arrangement with both platforms at the same level under Pitt and Castlereagh Streets. It has two separated entrances with the southern entry on Bathurst Street and the northern entry on the corner of Pitt and Park Street with the entry off Park Street (Figure 134 and Figure 135).

Following the shaft excavation works, roadheaders are proposed to be launched from the northern shaft to excavate the station caverns and adits.

Site specific features of the proposed works for Pitt Street include;

- Contiguous piles encompassing cut and cover boxes extending into competent rock
- Northern open shaft minimum of 15.0 x 20.0m and southern mucking opening minimum of 8.0 x 8.0 metre for the removal of spoil and mobilization of machinery.
- Road headers launched from northern shaft to maximise site area at the southern site.
- Shafts excavated to required depth and backfilled for the launch/recovery of roadheaders to enable top heading, followed by bench excavation (when necessary for sequencing).

Figure 135: Pitt Street Station construction site layout.

6.9.2 History of the study area

The study area slopes to the west, towards Darling Harbour, although historical modification of this landscape to better facilitate construction of roads and houses, has lessened this incline. [125]The study area falls just short of the marshy delta containing the Tank Stream.

During the earliest years of settlement, it is likely that the study area was considered to be too far from Sydney Cove to attract substantial occupation. A sketch of Sydney Cove and Port Jackson produced by Captain Hunter in 1788 indicates that the study area was "intended for buildings hereafter" (labelled with a "6" and illustrated in Figure 136 below). By the 1790s the northern portion of Pitt Row, that would later become Pitt Street, had been laid out.

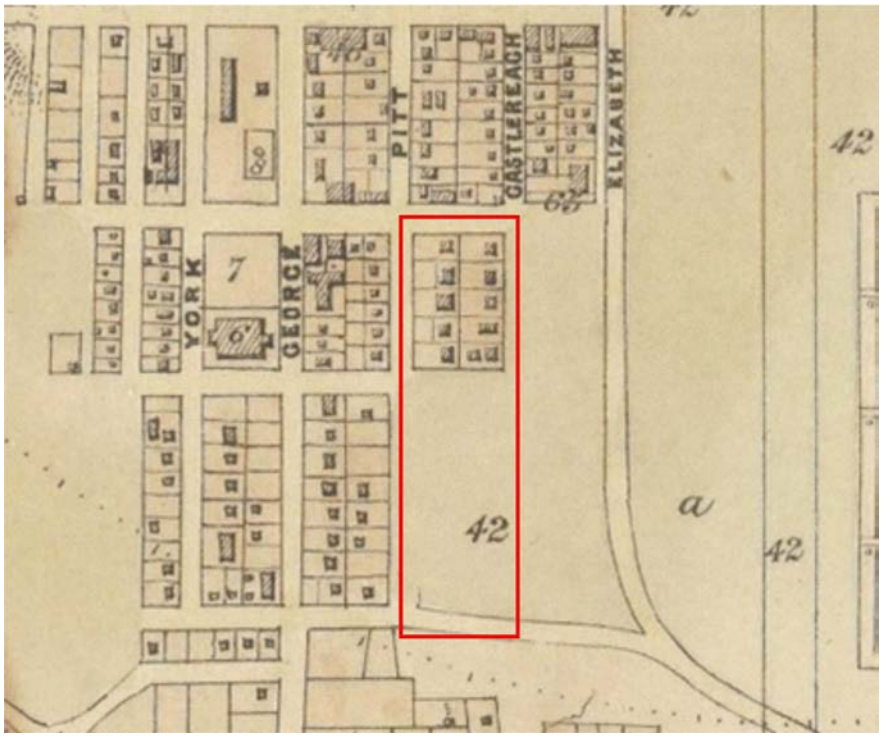
Early plans do not indicate that the study area was occupied in the 1790s (Figure 136), although there is the possibility that occupation had commenced in this area. The presence of the burial ground, in the vicinity of present-day Sydney Town Hall and to the west of the study area, suggests that this area was considered the outer limit of the Town of Sydney.

Figure 136: A Sketch of Sydney Cove and Port Jackson by Captain Hunter, 1788, the approximate location of Pitt Street has been arrowed. Source: NLA MAP NK 2456/124.

By 1822 (Figure 137) the northern portion of the study area, north of Bathurst Street, was occupied by small allotments containing one or two timber huts, set back from the street and with yards behind. The southernmost portion of the study area, south of Park Street, was set aside for a 'race ground' at this time.

[125] Thorp, W. for Abigroup *Archaeological Assessment. Former YMCA Buildings, 323-327 Pitt Street, 90-100 Bathurst Street Sydney*. October 1997: 12.

Figure 137: Plan of the Town and Suburbs of Sydney, August, 1822. NLA MAP F 107. Approximate location of the study area shown in red.



A description of the study area in approximately 1810 was provided by Obed West. He described the land up to Park Street as being unfenced, unoccupied, covered in low scrub and scattered with grass trees. There were a few cottages near the south-western corner of Park Street and its intersection with George Street but between there and Bathurst Street only one cottage was present.[126]

By the 1830s this area of Sydney was characterised as a residential precinct. It was described in 1839;

> *"From the crossing of Park Street to its southern termination, Pitt Street, although less occupied by expensive buildings, is remarkable for the neatness and cheerful appearance displayed by most of the cottages with which it is lined either side; the small garden plots before them, their shaded verandahs, and the regularity of design which many of them display, taken altogether, not only pleases the eye and gratify the taste, but also have a direct tendency to recall the rustic beauties of Old England to the memory of every one which can think of the land he has left, and rejoice in the land now his Home"*[127]

Sydney had greatly expanded by the 1840s particularly due to a massive building boom in the 1830s. Land that once had been on the outer limits of the town was then incorporated into the spreading commercial district.[128] Pitt Street was included in this expansive period of urban development. By the mid 1840s either the earlier houses had been demolished and replaced by new buildings or they had come to serve new purposes principally for a variety of trades and businesses.[129]

[126] Obed West in Thorp, W. October 1997: 12.
[127] The Picture of Sydney and Strangers Guide in New South Wales for 1838; 72.
[128] Thorp, W. October 1997: 15.
[129] Thorp, W. October 1997: 15.

By the mid 1850s the area was densely occupied by a number of residences and retail frontages. The majority of the buildings are likely to have been constructed of brick, and consisted of one or two storeys.

By the 1880s, the study area was occupied by coach factories and workshops, an auction room, numerous hotels, ironmongers, fruit sellers, florist, dentist, churches, a bakery, private school chemist, sadlier, photographer and undertaker, among others (Figure 138).

Figure 138: Detail from the 1888 panorama – The City of Sydney a bird's-eye view. MLNSW M3 811.17s/1888.1A

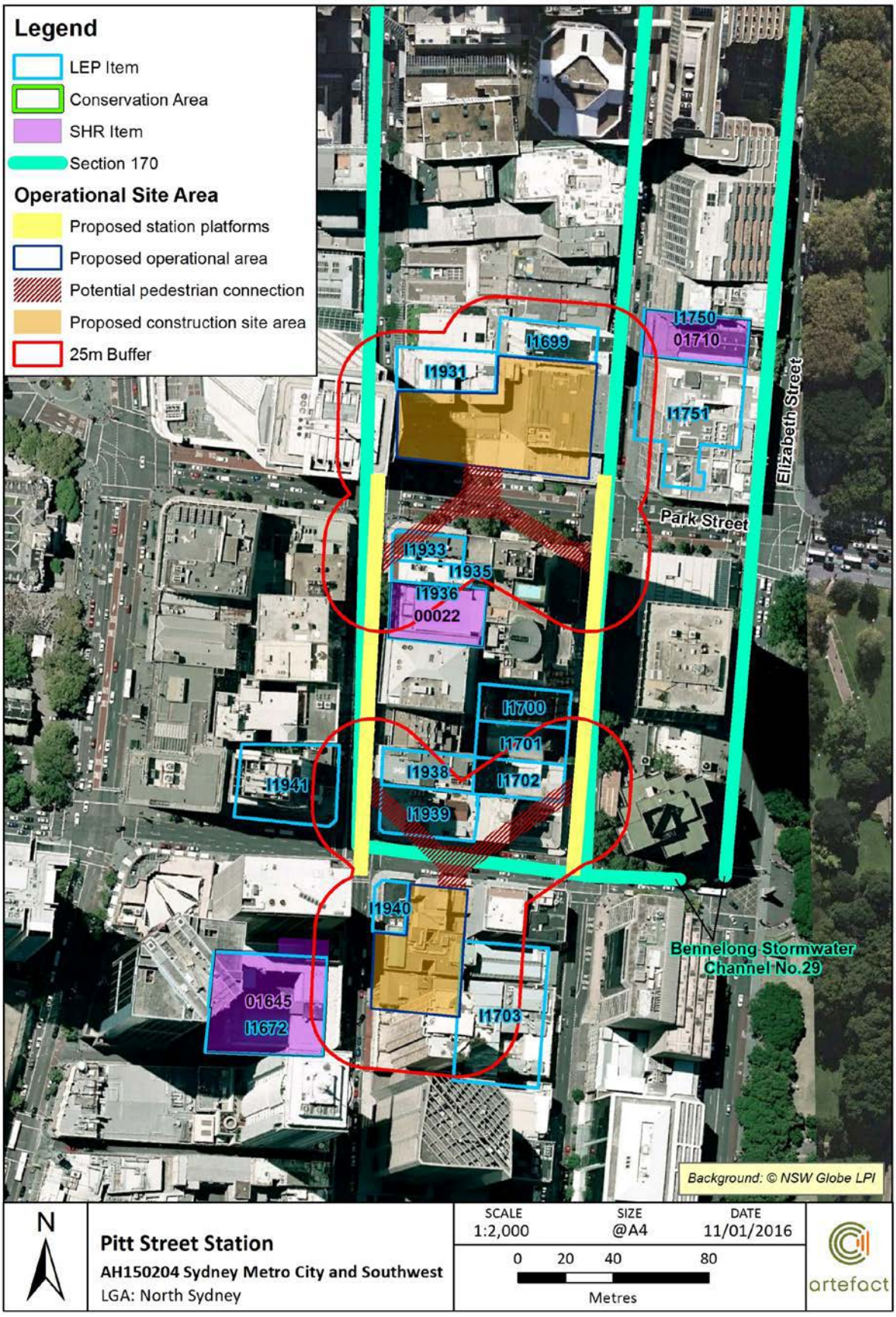
6.9.3 Heritage listed items

Table 78 outlines the heritage items that lie partly, or wholly, within the study area and buffer zone. These items are illustrated in Figure 139.

Table 78: Heritage items within the Pitt Street study area.

Heritage item	Register listings	Significance	Relationship to the study area
"National Building" including interior	Sydney LEP 2012 item no. I1931	Local	Adjacent to the construction area, within buffer zone
Masonic Club (this site has an archaeological component)	Sydney LEP 2012 item no. I1699	Local	Partially within buffer zone
Great Synagogue including interior	SHR no. 01710 Sydney LEP 2012 item no.I1750	State	Partially within buffer zone
Criterion Hotel including interior	Sydney LEP 2012 item no. I1933	Local	Partially within construction area and buffer zone
"Pilgrim House" including interior	Sydney LEP 2012 item no. I1935	Local	Partially within construction area and buffer zone
Former "CENEF House" including interiors	Sydney LEP 2012 item no.I1700	Local	Partially within buffer zone
St George's Church including interior and forecourt	Sydney LEP 2012 item no.I1701	Local	Partially within buffer zone
"Porter House" including interior	Sydney LEP 2012 item no.I1702	Local	Partially within construction area
"Lincoln Building" including interior	Sydney LEP 2012 item no.I1938	Local	Partially within buffer zone
Former "YMCA": building including interiors	Sydney LEP 2012 item no.I941	Local	Partially within buffer zone
Former "Speedwell House" including interiors	Sydney LEP 2012 item no. I1939	Local	Partially within construction area
Edinburgh Castle Hotel	Sydney LEP 2012 item no. I1940	Local	Adjacent to the construction area, within buffer zone
Metropolitan Fire Brigade building including interior	Sydney LEP 2012 item no. I1703	Local	Adjacent to the construction area, within buffer zone
Pitt Street Uniting Church	SHR no. 00022 Sydney LEP 2012 item no.I1936	State	Within construction area
Former "Australian Consolidated Press" façade	Sydney LEP 2012 item no. I1751	Local	Partially within buffer zone
Former Sydney Water Building	State Heritage Register 01645 Sydney LEP 2012 item no. I1672	State	Partially within buffer zone
Bennelong Stormwater Channel No. 29	Sydney Water S170	Local	Partially within buffer zone

Figure 139: Heritage items within the Pitt Street station study area and buffer zone.



6.9.4 Detailed heritage impact assessments

Heritage items

Table 79: "National Building" including interior heritage impact assessment

"National Building" including interior[130]	
Image	**Figure 140: "National Building." Artefact Heritage 2015.** 
Significance	Local
Description	Constructed between 1923 and 1926, the National Building is a prominent high rise building within its Pitt Street block. The twelve storey facade comprises a three storey rusticated base incorporating shopfront below the awning and two storey arched steel windows with rondels and a central cartouche.
Statement of significance	National Building is a twelve storey reinforced concrete commercial building constructed in the Interwar Commercial Palazzo style and having a prominent position due to its height relative to the streetscape. The building has historic significance as a reflection of the history of building societies and other investment institutions in the commercial life of Sydney. It is an important building in the professional work of the architectural firm of Joseland & Gilling. The building has a high aesthetic significance as a fine and largely intact example of the style and includes many of the identifying elements such as the arched windows, antique cornice and terrazzo plasterwork.
Impact type	Potential direct impact: Vibration and demolition of adjoining structures Indirect impact: Views and vistas
Heritage impact assessment	Demolition of adjoining buildings to facilitate construction of the Pitt Street northern site station entrance may result in minor physical impacts to the heritage item through vibration. The closest façade of this item would experience vibration above the screening level for cosmetic damage. The façade of the heritage building would not be affected by the proposed demolition. **Potential direct impact: Minor** The removal of the adjacent buildings that are low in form and date from the early to mid-twentieth century, and introduction of the proposed Pitt Street northern site, would have a minor to moderate impact on the setting of the heritage building. The visual impact of the heritage item being located adjacent to an operational station entrance would be minor, as the heritage item is oriented to the west (Pitt Street) and the proposed entrances to the south (Park Street). **Indirect impact: Minor**

[130] Description and Statement of significance extracted from State Heritage Register inventory sheet "National Buiulding including interior" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2424046 on 22/10/2015.

Table 80: "Masonic Club" including interior heritage impact assessment

"Masonic Club" including interior[131]	
Image	**Figure 141: "Masonic Club" Artefact Heritage 2015.** 
Significance	Local
Description	Constructed in 1925, the Masonic Club is a twelve storey sandstone building constructed in the Inter-war Commercial Palazzo style.
Statement of significance	The Masonic Club is significant as a fine example of the Inter-war Commercial Palazzo style. It is a twelve storey sandstone building, symmetrical in its massing with three distinct sections that are fundamentally classical in composition. Designed and built by the Masonic Lodge in 1925, it is socially and historically significant for its continued associations with this nationally influential social organisation. Its skilfully designed sandstone façade is an important contributor to the streetscape and reflects an important period of urban growth during the 1920s. Its interiors are both aesthetically and historically significant. The double volume main Dining Room is a fine example of a classically derived interior pertaining to the Gentleman's Club and features large recessed arched windows and a plaster ceiling with a deep, elaborate cornice incorporating classical dentils. The conversion of the upper levels to hotel type rooms reflects a growing need in the city during the later decades of the 20th century.
Impact type	Potential direct impact: Vibration and demolition of adjoining structures Indirect impact: views and vistas
Heritage impact assessment	Demolition of adjoining buildings within the Pitt Street northern site may result in minor physical impacts to the heritage item through vibration. The façade of the heritage building would not be affected by the proposed demolition. **Potential direct impact: Minor** The demolition of nearby buildings to facilitate the construction of the Pitt Street northern site station entrance may have minor impacts on the setting of the heritage item through the alteration of the existing streetscape. The building to be demolished to the south of the heritage item does not contribute to the significance of the Masonic Club. The construction of station mechanical and electrical services immediately south of the heritage item would have a minor to moderate impact on the heritage item. **Indirect impact: Minor to moderate**

[131] Description and Statement of significance extracted from State Heritage Inventory sheet "Masonic Club including interior" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2423976 on 22/10/2015.

Table 81: The Great Synagogue including interior heritage impact assessment

The Great Synagogue including interior[132]	
Image	**Figure 142: The Great Synagogue. Artefact Heritage 2015.** 
Significance	State
Description	Constructed between 1874 and 1878 from Pyrmont stone, the Great Synagogue consists of two main sections with a ladies' gallery at the Elizabeth Street end, and a five storey modern section at the Castlereagh Street end behind an earlier façade.
Statement of significance	The Great Synagogue is of state and potentially national significance as the earliest surviving synagogue in NSW still in use, which has represented the centre of Jewish worship and culture in central Sydney since the 1870s. The Great Synagogue is associated with the Mother Congregation of Australian Jewry, together with many subsequent leading members and families of the Jewish faith. By its prominent situation and presence in Central Sydney, its magnificent architectural grandeur, its rich symbolism, and its important collection of Hebrew documents and other religious artefacts, the Great Synagogue also embodies and demonstrates the early development and importance of the Jewish faith and culture in New South Wales during the 19th Century. The Great Synagogue is a major landmark of Sydney. It is the only high Victorian style Synagogue in Australia and represents one of the most elaborately decorated Victorian buildings in Sydney, internally and externally. The building also represents one of the finest works of the leading NSW architect, Thomas Rowe. It contains excellent examples of the best quality decorative work in moulded plaster, carved sandstone and timber, metalwork, tiling and stained glass that is remarkable for its richness, originality and the degree of craftsmanship by leading decorative firms of the High Victorian period from Australia, Great Britain and the United States. Apart from its architectural excellence, the Great Synagogue provides a rich townscape aspect to Hyde Park and is an iconic building of Elizabeth and Castlereagh Streets.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The Pitt Street northern site would contain a mechanical and electrical services building. There is limited visual connectivity between the heritage item and the proposed services building. The services building would have a negligible impact on views to the south-west from the Castlereagh Street entrance of the heritage item. The setting of the heritage item, including its relationship to Hyde Park would not be affected. The station entrances are oriented to the south, towards Park Street, and would not be visible from the Great Synagogue. The project would not impact the significance of the item as architecturally and historically rare. **Indirect impact: Negligible**

[132] Description and Statement of significance extracted from State Heritage Register inventory sheet "Great Synagogue" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5051584 on 09/12/2015.

Table 82: Criterion Hotel including interior heritage impact assessment

Criterion Hotel including interior[133]	
Image	**Figure 143: Criterion Hotel.** 
Significance	Local
Description	Constructed in 1936, the Criterion Hotel is a three storey brick building constructed in the Inter-War Deco style.
Statement of significance	The Criterion Hotel constructed in the Inter-War Art Deco style is situated in a prominent location on the corner of Pitt and Park Streets in the inner city Town Hall precinct, and has aesthetic significance for the quality of its exterior detailing. The Criterion has significance as the finest of the five remaining hotel buildings constructed in this style in the CBD; the others which all remain operational are the Criterion (Sussex Street), the Great Southern, the Tudor Inn, and the Wynyard. It also has aesthetic significance as an important corner element and for its contribution to the streetscape of the immediate area. The hotel has historic significance for carrying on the name of the Criterion Theatre which formerly occupied the site. The hotel has social significance as a fine, largely intact, and fully operational example of a small inner city corner hotel. The building has social significance as part of the network of purpose built hotels which provided social / recreational venues and budget accommodation for the local community.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The demolition of nearby buildings on the northern side of Park Street to facilitate the construction of the Pitt Street northern site station entrance may have minor to moderate impacts on the setting of the heritage item through the alteration of the existing streetscape. The buildings to be demolished do not contribute to the significance of the heritage item. The station entrances of the northern station building would be oriented to the south towards Park Street, and would be clearly visible from the heritage item. The construction of the station entrances would have a minor to moderate impact on the heritage item. **Indirect impact: Minor to moderate** Construction of pedestrian connections and adits underneath this item (at platform level) would not result in vibration levels exceeding the vibration screening level. **Potential direct impact: Neutral**

[133] Description and Statement of significance extracted from State Heritage Inventory sheet “Criterion Hotel including interior” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2424127 on 09/12/2015.

Table 83: 'Pilgrim House' including interior heritage impact assessment

'Pilgrim House' including interior[134]	
Image	**Figure 144: 'Pilgrim House'.** 
Significance	Local
Description	Constructed in 1928, Pilgrim House is a Commercial Palazzo style building located within the mixed streetscape of Pitt Street.
Statement of significance	Pilgrim House is a seven storey commercial building in the Commercial Palazzo style, which forms part of a varied streetscape within Pitt Street. The building has high historic significance in the history of the Australian Broadcasting Commission as the first Federal head office of the ABC and as a venue for the ABC's live studio broadcasts until 1970. The building has high social significance for its ability to reflect the social justice concerns of the Uniting Church. The building has high aesthetic significance as a rare Commercial Palazzo building with a triumphal arch motif. The building has a high level of exterior and interior fabric with outstanding potential to be restored.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The demolition of buildings to the north of Park Street, and introduction of the Pitt Street northern site station entrances, would have a negligible visual impact on the heritage item. There are few direct views corridors between the heritage item and the Pitt Street northern site. **Indirect impact: Negligible.** Construction of pedestrian connections and adits underneath this item (at platform level) would not result in vibration levels exceeding the vibration screening level. **Potential direct impact: Neutral**

[134] Description and Statement of significance extracted from State Heritage Inventory sheet "Pilgrim House including interior" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2424128 on 09/12/2015.

Table 84: Former 'CENEF House' including interior heritage impact assessment

Former 'CENEF House' including interior[135]	
Image	**Figure 145: 'CENEF House'. Artefact Heritage 2016.** 
Significance	Local
Description	Constructed in 1908, the former CENEF House is a five storey building built in the Federation Free Classical Style, modified in the 1940s.
Statement of significance	The former C.E.N.E.F. House, is a five storey building of Federation Free Classical Style modified in the 1940s. The building, together with Porter House at 203 Castlereagh Street, is historically significant for its contribution to understanding the late nineteenth-early twentieth century character of this part of the city as an industrial and warehouse precinct. The building has aesthetic significance as a typical original commercial exterior. The building with the adjacent church and Porter House is an important component of the streetscape. The building is socially significant for the important role it played as a centre for volunteer workers and church organisations in assisting returned servicemen to adjust to civilian life following the Second World War.
Impact type	No impact
Heritage impact assessment	Construction of pedestrian connections and adits underneath this item (at platform level) would not result in vibration levels exceeding the vibration screening level. As works in the vicinity of this heritage item would occur below ground, the work would not result in visual impacts to this heritage item. **Potential direct impact: Neutral** **Indirect impact: Neutral**

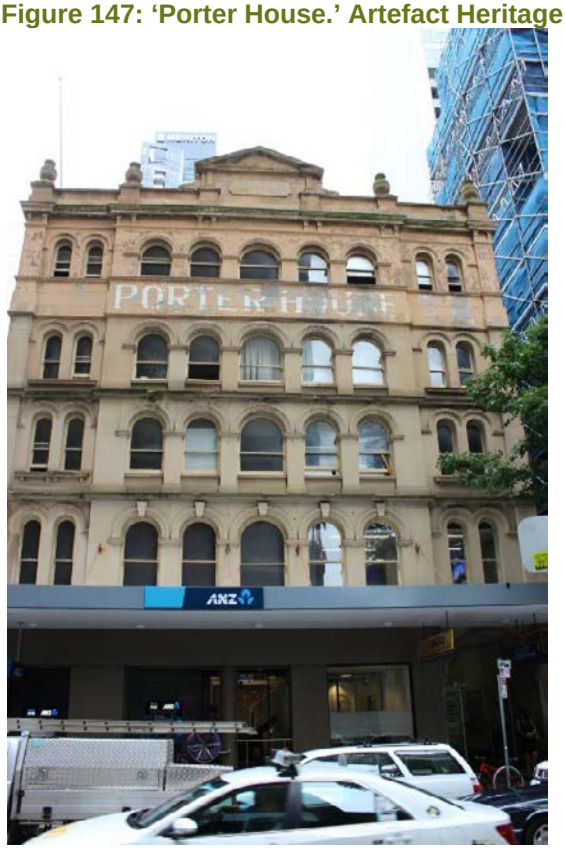
[135] Description and Statement of significance extracted from State Heritage Inventory sheet "Former 'CENEF House' including interior" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2424181 on 09/12/2015.

Table 85: St George's Church including interior and forecourt heritage impact assessment

St George's Church including interior and forecourt[136]	
Image	**Figure 146: St George's Church. Prior to scaffolding (left), and current condition (right).** 
Significance	Local
Description	Constructed in from sparrow picked sandstone in 1858, St George's Church is designed in the Victorian Academic Gothic style. The façade is currently being restored.
Statement of significance	St George's Church is historically and socially significant as the only Free Presbyterian church remaining within metropolitan Sydney. It was the site a meeting of the Synod of Eastern Australia on 15 November 1864 which passed a motion that eventually led to the dissolution of the ecclesiastical connections with the Presbyterian Churches in Scotland, and allowed for the formation of the Presbyterian Church of New South Wales. St George's Church is aesthetically significant as a fine example of the ecclesiastical work of the architectural firm of Field & Rowe.
Impact type	No impact
Heritage impact assessment	Construction of pedestrian connections and adits underneath this item (at platform level) would not result in vibration levels exceeding the vibration screening level. As works in the vicinity of this heritage item would occur below ground, the work would not result in visual impacts to this heritage item. **Potential direct impact: Neutral** **Indirect impact: Neutral**

[136] Description and Statement of significance extracted from State Heritage Inventory sheet "St George's Church including interiors and forecourt" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2424089 on 09/12/2015.

Table 86: 'Porter House' including interior heritage impact assessment

'Porter House' including interior[137]	
Image	**Figure 147: 'Porter House.' Artefact Heritage 2016.** 
Significance	Local
Description	Constructed in 1876, the five storey building has a façade consisting of a repetition of moulded round headed window openings. An additional floor was added to the building in 1909.
Statement of significance	Porter House, formerly Dixson & Sons is five storeys high and has a facade clad with sandstone veneer of Victorian Classical Style. It is historically significant as a rare surviving example of a Victorian factory and warehouse in this part of the city and for its association with the Dixson family, prominent in Sydney business and philanthropic life over a number of generations. The building is aesthetically significant as an interesting example of an 1870s Free Classical inner city commercial building, with exterior painted signs an interesting reminder of late nineteenth century and early twentieth century advertising. The building has streetscape significance due to its relatively sympathetic scale in relation to the adjacent St George's Free Presbyterian Church and Scientology House.
Impact type	No impact
Heritage impact assessment	Construction of pedestrian connections and adits underneath this item (at platform level) would not result in vibration levels exceeding the vibration screening level. As works in the vicinity of this heritage item would occur below ground, the work would not result in visual impacts to this heritage item. **Potential direct impact: Neutral** **Indirect impact: Neutral**

[137] Description and Statement of significance extracted from State Heritage Inventory sheet "Porter House including interior" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2424180 on 09/12/2015.

Table 87: 'Lincoln Building' interior heritage impact assessment

'Lincoln Building' including interior[138]	
Image	**Figure 148: 'Lincoln Building.' Artefact Heritage 2016.** 
Significance	Local
Description	Constructed in 1924, the Lincoln Building is an L shaped building with identical facades of four and five bays facing Pitt and Bathurst Streets. The three upper levels and cornice are an addition of a similar design by the same architects.
Statement of significance	The Lincoln Building is an L shaped ten storey building of Inter War Commercial Palazzo Style with facades facing Pitt Street and Bathurst Street. The Lincoln Building, together with the 1908 corner building 'Speedwell House', has historic significance for its former long association with the firm of Bennett & Wood. It is an important building in the professional work of the noted architectural partnership of Spain and Cosh. The building is aesthetically significant as an excellent example of a highly intact original commercial exterior with outstanding potential, due to its degree of integrity, to continue in its original state. The building is well resolved in its detailing in its exterior and is particularly noted for its use of classical imagery. The L shaped building plan, is with Culwulla, unusual and one of only two in the city with facades fronting two streets.
Impact type	No impact
Heritage impact assessment	Construction of pedestrian connections and adits underneath this item (at platform level) would not result in vibration levels exceeding the vibration screening level. As works in the vicinity of this heritage item would occur below ground, the work would not result in visual impacts to this heritage item. **Potential direct impact: Neutral** **Indirect impact: Neutral**

[138] Description and Statement of significance extracted from State Heritage Inventory sheet "Lincoln Building including interior" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2424130 on 09/12/2015.

Table 88: Former 'YMCA' building Including Interiors heritage impact assessment

Former 'YMCA Building' including interiors[139]	
Image	**Figure 149: Former 'YMCA' building including interiors. Artefact Heritage 2016.** 
Significance	Local
Description	The building at 323-327 Pitt Street was constructed in 1907 as the second phase of the existing L-shaped building. The 1907 building has a face brick facade with stone trims and windows of both steel and timber frames. The retained former YMCA includes the front section of the original building, it is at least two rooms deep and includes the original stair and open lift shaft. The hall beyond was fire damaged and was demolished.
Statement of significance	The original front section of the former YMCA building facing Pitt Street, has historic significance as the home of the YMCA movement in Sydney for nearly 100 years, and for associations with a number of prominent people, including founder Sir James Fairfax and architect Charles Slatyer. It is aesthetically significant as a fine and elaborately ornamented example of the Federation Free Style, and retains many fine decorative elements of this period including moulded plaster, carved stonework and coloured leadlight glass. The building has social significance as a physical reminder of the activities and important influence of the Young Men's Christian Association in Sydney, and an exemplar of the typical development pattern of the time with retail uses at street level.
Impact type	No impact
Heritage impact assessment	Construction of pedestrian connections and adits underneath this item (at platform level) would not result in vibration levels exceeding the vibration screening level. As works in the vicinity of this heritage item would occur below ground, the work would not result in visual impacts to this heritage item. **Potential direct impact: Neutral** **Indirect impact: Neutral**

[139] Description and Statement of significance extracted from State Heritage Inventory sheet "Lincoln Building including interior" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2424130 on 09/12/2015.

Table 89: Former "Speedwell House" including interior heritage impact assessment

Former "Speedwell House" including interior[140]	
Image	**Figure 150: Former "Speedwell House." Artefact Heritage 2015.** 
Significance	Local
Description	Constructed in 1907, the former "Speedwell House" comprises a 7 storey loadbearing brick former warehouse linked to a later steel framed brick commercial building.
Statement of significance	Former 'Speedwell House' has historical significance as the home for over 50 years of Bennett and Wood, a well-known Sydney supplier of motor cycles and parts which is still in business today. It has aesthetic significance as a good and restrained example of the Federation warehouse style, largely intact externally, which achieves prominence because of its corner location, and exhibits the typical curved corner with timber windows curved in plan. Although the curved corner element including its timber windows is intact (unlike other city buildings such as the former Danchen House, Inventory No 2424121), International House is overall less significant than other similar examples such as the Farmers and Graziers Woolstores (Inventory No 6518).
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The demolition of existing nearby buildings to the south of the heritage item, to facilitate the construction of the Pitt Street southern site station entrance may have a minor impact on the setting of the building. The proposed demolition works would alter the existing streetscape through the removal of the existing buildings on the southern side of Bathurst Street. The proposed southern station entrance would be located on the southern side of Bathurst Street, opposite the heritage item. The station entrance may result in a minor to moderate visual impact. The historical significance of the item would not be impacted. **Indirect impact: Minor to moderate**

[140] Description and Statement of significance extracted from State Heritage Inventory sheet "Former Speedwell House including interior" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2424185 on 22/10/2015.

Table 90: Edinburgh Castle Hotel heritage impact assessment

Edinburgh Castle Hotel[141]	
Image	**Figure 151: Edinburgh Castle Hotel. Artefact Heritage 2015.** 
Significance	Local
Description	Constructed between 1930 and 1931, the three storey hotel has been constructed in the Inter-War Georgian Revival style.
Statement of significance	The Edinburgh Castle Hotel, a three storey hotel of Inter War Georgian Style, is located on a prominent corner site. The building has historic significance for its embodiment of a lengthy tradition of hotel trading on this site and for the continuity of the hotel name from the 1860s. It is an important building in the professional work of the noted architectural partnership of Rudder and Grout. The building has aesthetic significance as rare and outstanding example of a highly intact original hotel exterior and interior of high quality design with outstanding potential, due to its degree of integrity, to continue in its original state. The building is significant for its contribution as a landmark building to the corner of Pitt and Bathurst Streets. The building is socially significant as it has remained a hotel of the same name on the same site since the 1885's and prior to that on the diagonally opposite corner.
Impact type	Potential direct impact: Vibration and demolition of adjoining structure Indirect impact: Views and vistas
Heritage impact assessment	The proposed Pitt Street southern site would be constructed adjacent to the eastern and southern boundaries of this heritage item. The demolition of existing adjacent buildings in this location, and shaft excavation works, may result in minor physical impacts to the heritage building through vibration and impacts to fabric. Vibration modelling indicates that the closest façade of this item would experience vibration levels above the screening level for cosmetic damage **Potential direct impact: Minor** The entrance to the southern station building would be located adjacent to the heritage item on Bathurst Street. The existing 20th century buildings in this location do not contribute to the heritage significance of the hotel, and their demolition, whilst impacting on the setting of the heritage item, would not negatively impact on its significance. The introduction of the southern station entrance adjacent to the heritage item would have a minor to moderate visual impact on the heritage item. **Indirect impact: Minor to moderate**

[141] Description and Statement of significance extracted from State Heritage Inventory sheet "Edinburgh Castle Hotel including interior" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2424132 on 22/10/2015.

Table 91: Metropolitan Fire Brigade building heritage impact assessment

Metropolitan Fire Brigade building[142]	
Image	**Figure 152: Metropolitan Fire Brigade building. Artefact Heritage 2015.** 
Significance	Local
Description	Constructed in 1887, the Fire Brigade Headquarters constructed in the Victorian Free Classical style with Italianate features includes the original 1887 building and 1912 extension. The building is located on a site extending from Castlereagh Street to Bathurst street. A former control building also occupies the site, a garage and former electrical workshops have since been demolished.
Statement of significance	The Fire Brigade Headquarters is a four storey brick and stucco building constructed in the Victorian Free Classical style featuring Italianate motifs. The building demonstrates the growth of the Fire Brigade from a Metropolitan force to a Statewide body and provides evidence of the progressive development of the Brigade in both operations and responsibilities. It has a prominent Castlereagh Street address and is significant as a well known item of continuing public interest, having been in use for more than a century as the Central Sydney Fire Station, and for much of this time as the Brigades administrative headquarters. The building features state-of-the-art fire fighting technology of the late nineteenth and early twentieth centuries. It is architecturally significant as the only Fire Station constructed in Victorian Free Classical style in the city, and as example of the work of colonial architect James Barnet. It is one of only six comparable buildings designed by Barnet. The building has been heavily modified internally however it remains largely intact externally, and compares to Trades Hall although its facade is less significant. It is also significant for its association with architects Spain, Cosh and Minett.
Impact type	Potential direct impact: Vibration and demolition of adjoining structure
Heritage impact assessment	The proposed Pitt Street southern site would be constructed adjacent to the westernmost boundary of the heritage item. This may result in minor physical impacts to the heritage building through vibration and other impacts associated with construction activities. Vibration modelling indicates that the closest façade of this item would experience vibration levels above the screening level for cosmetic damage **Potential direct impact: Minor** As there is no visual connection between the heritage item and the southern site, demolition of the existing buildings in this location, and construction of the proposed station entrance, would not impact on the setting of the heritage item, which is oriented to Castlereagh Street. There would be no impact to the historical and aesthetic significance of the item. **Indirect impact: Neutral**

[142] Description and Statement of significance extracted from State Heritage Inventory sheet “Metropolitan Fire Brigade Building” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2424090 on 22/10/2015.

Table 92: Pitt Street Uniting Church heritage impact assessment

Pitt Street Uniting Church[143]	
Image	**Figure 153: Pitt Street Uniting Church. Artefact Heritage 2015.** 
Significance	State
Description	Constructed between 1841 and 1846, the exterior of the church is a fine example of the late Georgian Classical design. Standing two storeys high, the sandstone facade to Pitt Street is symmetrical, with monumental ionic columns supporting a balustraded parapet.
Statement of significance	The Pitt Street Uniting Church has had a significant role in the development of the social and religious life of Australia. It has always represented a pioneering and socially aware face to the community. It's architectural design is significant as arguably the finest example of Neo Classicism in Australia. It is a fine example of notable architect John Bibb's work. It was the first Independent Church in Australia. It has associations with notable local figures, including David Jones and James Fairfax.
Impact type	No impact
Heritage impact assessment	Construction of pedestrian connections and adits underneath this item (at platform level) would not result in vibration levels exceeding the vibration screening level. As works in the vicinity of this heritage item would occur below ground, the work would not result in visual impacts to this heritage item. **Potential direct impact: Neutral** **Indirect impact: Neutral**

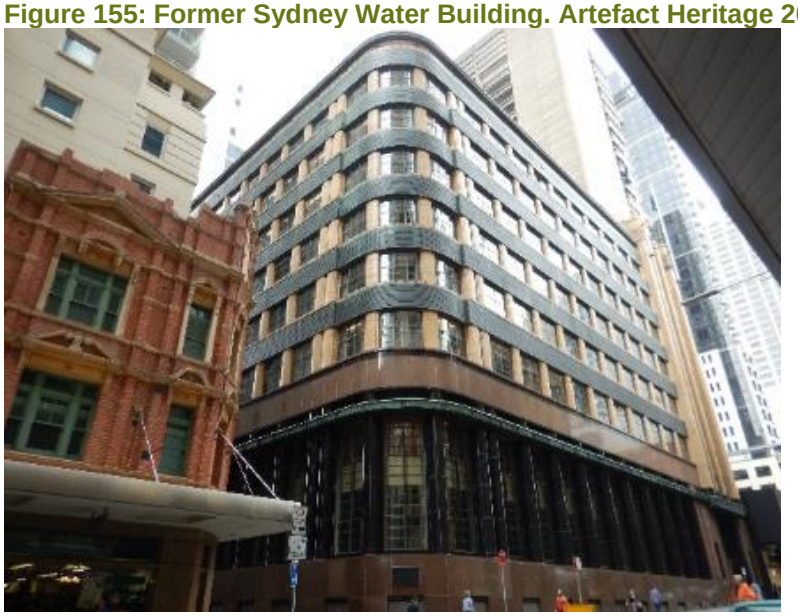
[143] Description and Statement of significance extracted from State Heritage Register inventory sheet "Pitt Street Uniting Church" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5045476 on 09/12/2015.

Table 93: Former "Australian Consolidated Press" façade heritage impact assessment

Former "Australian Consolidated Press" façade [144]	
Image	**Figure 154: Former "Australian Consolidated Press" façade. Artefact Heritage 2015** 
Significance	Local
Description	Constructed between 1924 and 1925, the Australian Consolidated Press building is composed of two distinct sections, the lower six levels form the Inter-War Free Classical/Commercial Palazzo portion and the upper six storeys were added during the 1960s.
Statement of significance	The Australian Consolidated Press Offices was designed by the influential firm of Spain & Cosh, and Bruce Dellit (whilst in their employ). The sandstone facade has aesthetic significance as a confident expression of the inter-war Free Classical style. It was designed to express the most modern standards of publishing and staff amenity. The building has been continuously associated with newspaper publishing since its construction in 1925. Its construction at that time is representative of an important period of redevelopment in the city.
Impact type	No impact
Heritage impact assessment	Construction of pedestrian connections and adits underneath this item (at platform level) would not result in vibration levels exceeding the vibration screening level. **Potential direct impact: Neutral** As there is limited visual connection between the heritage item and the Pitt Street northern site, demolition of the existing buildings in this location would not negatively impact on the setting of the heritage item. Similarly, the construction of the proposed northern station entrances (oriented to the south and Park Street) would not visually impact on the heritage item. **Indirect impact: Neutral**

[144] Description and Statement of significance extracted from State Heritage Inventory sheet "Former Australian consolidated press façade" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2424004 on 22/10/2015.

Table 94: Sydney Water Building heritage impact assessment

Sydney Water Building[145]	
Image	**Figure 155: Former Sydney Water Building. Artefact Heritage 2015** 
Significance	State
Description	Constructed between 1938 and 1939, the building exhibits elaborate use of various coloured granite and marble finishes. Architectural terracotta tiles and bands of bronze and copper elements plus the associated bronze windows and curved fenestration to the corner make this building one of the most exquisite examples of the Art Deco style and detail in Sydney, if not Australia.
Statement of significance	The 1939 Sydney Water head office building is of State significance, reflecting the function and growth of Sydney Water and the importance the organisation has had and continues to have in the lives of many people in NSW. The building in its aesthetic, historic and scientific (technical/research) qualities is an outstanding example of architectural growth and development for its values which are reflected in its original design, materials, construction techniques, evidence of use, movable relics and siting within the City of Sydney. The building is held in high esteem by recognised community groups and authorities throughout Australia and New South Wales.
Impact type	Indirect impact: views and vistas
Heritage impact assessment	The historical significance of the item would not be impacted as it would retain its use and character. The heritage item is located on the western side of Pitt Street and has a direct visual connection to the Pitt Street southern site. The demolition of the existing early to mid-20th century high rise buildings in this location would considerably alter the existing setting of the heritage item. The station entry and entry for future above station development (subject of a separate application) would also be located directly opposite the heritage item, and would have a visual impact on the heritage item. The proposed demolition would therefore have a moderate to major visual impact on the setting of the heritage item. The aesthetic significance of the structure itself would not be impacted, apart from in relation to the setting of the item. The social significance of the item would not be impacted as it would retain its use as an office building and public association with that use. The representativeness of the item would not be impacted by the project. The building is representative in its design qualities which would not be compromised. The rarity of the item would not be adversely impacted as its unique design elements would not be affected by the project. **Indirect impact: Moderate to major**

[145] Description and Statement of significance extracted from State Heritage Register inventory sheet "Former Sydney Water Head Office" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5053884 on 22/10/2015.

Table 95: Bennelong Stormwater Channel No. 29 heritage impact assessment

Bennelong Stormwater Channel No. 29[146]	
Image	**Figure 156: Curtilage of the Bennelong Stormwater Channel No. 29.** 
Significance	Local
Description	Constructed between 1856 and 1857, the Bennelong sewer consists of a combined sewer/stormwater drain. It is oviform in shape with dimensions of 1.5 metres by 1.2 metres. The system is constructed of brick with some sections tunnelled in sandstone along Tarpian Way (Circular Quay East). This Stormwater channel drains an area of 65 hectares in total, with its uppermost point being the Obelisk vent shaft at Hyde Park. From here it works its way down along Pitt, Castlereagh, Elizabeth, Phillip and Macquarie Streets to the outlet at Bennelong Point.
Statement of significance	The Bennelong Stormwater Channel is of high historical and technical significance as it was one of the five original combined sewers built in Sydney around 1857. The other four sewers were; Blackwattle Bay, Hay Street, Tank Stream and Woolloomooloo. These five sewers were responsible for greatly improving public health, hygiene and living standards for the city's residents. This was done by diverting stormwater and sewerage from the streets and discharging it out into the Harbour currents. The introduction of BOOS in 1889 diverted sewer flow to the ocean and eventually led to the drain being used predominantly for stormwater, hence further improving public health. Of the five combined sewers Bennelong is probably the most significant, as it is the most intact and was originally known as the "main sewer" because it serviced the CBD area. It was also the first oviform sewer to be built in Australia. Furthermore, the Margaret Street Sewer, which was once attached to the Bennelong system, contains the first sewer aqueduct to be built in Australia. This aqueduct runs along Hunter Street, which is part of the Bennelong catchment.
Impact type	Potential direct impact: Vibration
Heritage impact assessment	The demolition of existing buildings, and establishment of the proposed Pitt Street northern and southern sites, may have a minor impact to fabric as a result of vibration associated with construction. Construction of the station and underground pedestrian connections and adits underneath this item (at platform level) would result in vibration levels above the vibration screening level for cosmetic damage. **Potential direct impact: Minor**

[146] Description and Statement of significance extracted from State Heritage Inventory sheet “Bennelong Stormwater Channel No. 29” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4570854 on 22/10/2015.

6.9.5 Archaeological assessment

This archaeological assessment focuses on the Pitt Street Station physical impact areas, being the southern and northern station footprints, the construction of which would require the demolition of existing buildings, excavation of station boxes and platforms (including vertical transport and tunnelled access to the proposed platforms) and station fit out, including new station entries.

6.9.5.1 Site inspection results

The Pitt Street Station site is located across a built environment on a flat to gentle slope.

The heavily built environment and multiple underground services suggest it is possible that archaeological potential has been impacted in numerous locations throughout the study area.

Figure 157: View southwest across proposed southern station entrance on Bathurst Street

Figure 158: View northeast across proposed northern station entrance on Park Street

6.9.5.2 Previous archaeological investigations in the vicinity

The Archaeological Zoning Plan (AZP) of Sydney identifies a number of properties in Park Street (numbers 30-40) and Bathurst Street (numbers 107-109, 131-135 and 137-139) as Areas of Archaeological Potential. These properties are within the study area for this station site. According to the AZP, this designation refers to an allotment of land or feature that has been identified as being an area of high archaeological potential due to limited physical disturbance (usually limited to disturbance resulting from the most recent building development).

Two items within the study area are listed on the Sydney LEP 2012, the Metropolitan Fire Brigade and “Masonic Club” buildings, as having an archaeological component to their heritage significance.

6.9.5.3 Known impacts

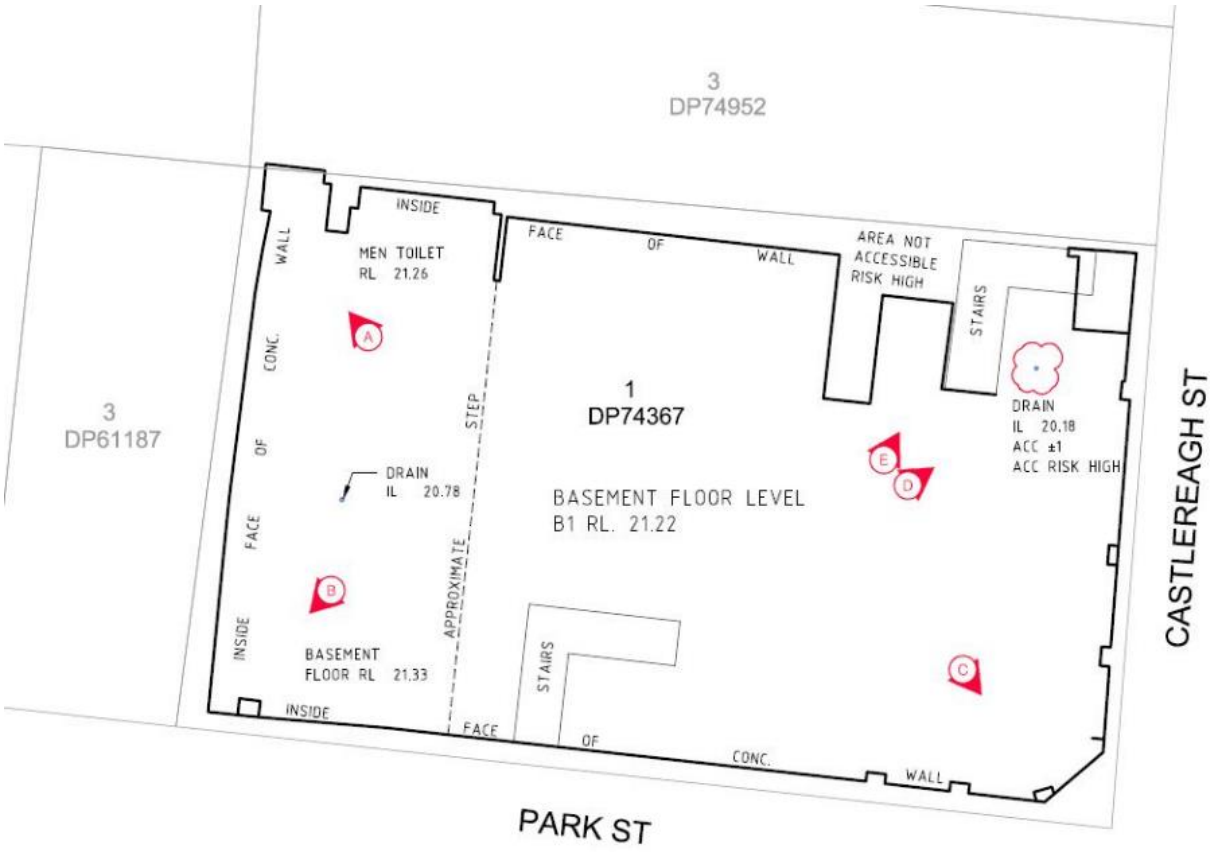
Subsurface impacts associated with former or current land uses have the potential to remove or damage potential archaeological remains. Previous impacts within the site need to be further understood and identified before more than a preliminary assessment of archaeological impact can be made. Based on the initial literature review and site inspection undertaken as part of this assessment, the following preliminary assumptions regarding archaeology at the site can be made:

- Sites within the Sydney CBD tend to have been occupied intensively, and therefore have the potential to contain a range of archaeological evidence dating to different periods of use.
- The area towards Hyde Park was likely levelled at some stage in the early 19th century to lessen the steep slope to the west and facilitate the construction of level roads. It is possible that some historical levelling activity may have impacted on early archaeological remains within the study area.
- The construction of successive phases of buildings on the site would have impacted on archaeological remains. Typically, the earlier the building was constructed, the less impact it would have had on the potential archaeological resource. The existing structures at the

proposed location of the southern and northern cut and cover boxes date from different periods. Potential survivability of archaeological deposit in that area will largely depend on whether that structure has a basement or below ground car park area.

A basement covers the majority of the lot located at 48-49a Park Street (Lot 1 DP74367; Figure 159), the easternmost portion of the northern study area. The basement floor ranges between 1.74 to 2.78 metres below current ground level (21.22-21.26 metres AHD). It can be assumed that any archaeological resource in this location has been removed.

Figure 159: Basement plan of Lot 1 DP74367



6.9.5.4 Discussion of archaeological potential

The proposed northern station building study area was ‘occupied’ by historic structures from an earlier period than the southern station building, which was reserved for a race track between 1822 and the mid 19th century.

Analysis suggests that the archaeological resource, if it survives within the study area, would be associated with early to late 19th century residences, shopfronts and small scale industrial workshops.

Archaeological remains within the Sydney CBD can be substantially intact, and date from early phases of the development of the colony. Therefore, an intact and early archaeological resource in the study area has the potential to have significance at a State level. This would therefore require further archaeological investigation or assessment in order to mitigate any impacts to the resource that may arise from the proposed demolition, construction and tunnelling works.

An overview of the archaeological potential of the study area has been included in Table 96.

6.9.5.5 Preliminary assessment of significance

The following is a preliminary assessment of significance, informed by the NSW Heritage Criteria for *Assessing Significance related to Archaeological Sites and 'Relics'* (2009).

Archaeological research potential (NSW Heritage Criterion E):

- Archaeological remains associated with early development and establishment of the colony would have significant research potential, dependant on the nature and extent of any remains. The study area is representative of the phase of development that occurred in the now CBD of Sydney from the early 1800s. Prior to the building boom of the 1830s and 1840s in which the study area became commercial in nature, residential occupation and small lot farming was predominant. Any evidence of the pre-commercial phase of development would have significant research potential.

Association with individuals, events, or groups of historical importance (NSW Heritage Criteria A, B & D):

- It is possible that evidence of early residential development of the study area may have associations with former residents and known local historical figures. There is documentary evidence that the southern part of the study area was designated a racetrack by 1822. Any evidence of use of the track may have association with racegoers and early colonial racing figures.

Aesthetic or technical significance (NSW Heritage Criterion C):

- Remains of early buildings may have some technical significance depending on their construction methodology.

Ability to demonstrate the past through archaeological remains (NSW Heritage Criterion A, C, F & G):

- The study area has the potential to demonstrate the past through archaeological remains. It is likely, however, that any archaeological remains may be truncated, removed or damaged by later construction on the site.

Overall, the site may contain archaeological remans with potential to reach the local and State significance thresholds.

6.9.5.6 Overview archaeological potential

The study area has low to high potential to contain an archaeological resource with the potential to reach the local significance threshold.

Table 96: Summary of archaeological potential within study area

Potential archaeological resource	Potential	Significance	Heritage impact assessment
Evidence of early establishment of the colony – for example, evidence of land clearance and cultivation, early structures, drains.	Nil-low	Local-State	Excavation works within the study area have nil-low potential to impact on archaeological remains.
Pre-1850s residential and commercial development – stone or brick footings, rubbish pits, wells, cesspits, occupation deposits and yard scatters.	Moderate	Local - State	Excavation works within the study area have moderate potential to impact on archaeological remains

Potential archaeological resource	Potential	Significance	Heritage impact assessment
Late 19th century residential and commercial development – stone or brick footings, basements, rubbish pits, wells, cesspits, occupation deposits and yard scatters.	Moderate	Local	Excavation works within the study area have moderate potential to impact on archaeological remains
Early to mid-20th century commercial development – brick or stone foundations.	Moderate - high	May reach local significance threshold.	Excavation works within the study area have moderate - high potential to impact on archaeological remains.

6.9.5.7 Archaeological impact assessment

Proposed works within the Pitt Street Station site with the potential to impact on archaeological remains include:

- Excavation during demolition works
- Excavation of open shafts during construction phase to allow access to the mined tunnels.

The excavation of the open shafts allowing access to the mined tunnels would result in the complete removal archaeological remains within the station box footprint. Therefore, works in these locations would have a major impact on potential archaeological resources.

6.9.6 Overview of constraints

Table 97 outlines the potential heritage constraints within the study area:

Table 97: Overview of heritage constraints at the Pitt Street Station site.

Heritage item	Potential heritage impacts		
	Direct impact	**Archaeological impact**	**Indirect impact**
"National Building" including interior	Potential direct impact: Minor (vibration and adjacent demolition)	Neutral	Minor – views and vistas
Masonic Club	Potential direct impact: Minor (vibration and adjacent demolition)	Neutral	Minor to moderate – views and vistas
Great Synagogue including interior	Neutral	Neutral	Negligible – views and vistas
Criterion Hotel including interior	Neutral	Neutral	Minor to moderate – views and vistas
"Pilgrim House" including interior	Neutral	Neutral	Negligible – views and vistas
Former "CENEF House" including interiors	Neutral	Neutral	Neutral
St George's Church including interior and forecourt	Neutral	Neutral	Neutral
"Porter House" including interior	Neutral	Neutral	Neutral

Heritage item	Potential heritage impacts		
"Lincoln Building" including interior	Neutral	Neutral	Neutral
Former "YMCA": building including interiors	Neutral	Neutral	Neutral
Former "Speedwell House" including interiors	Neutral	Neutral	Minor to moderate – views and vistas
Edinburgh Castle Hotel	Potential direct impact: Minor (vibration and adjacent demolition)	Neutral	Minor to moderate– views and vistas
Metropolitan Fire Brigade building including interior	Potential direct impact: Minor (vibration and adjacent demolition)	Neutral	Neutral
Pitt Street Uniting Church	Neutral	Neutral	Neutral
Former "Australian Consolidated Press" façade	Neutral	Neutral	Neutral
Former Sydney Water Building	Neutral	Neutral	Moderate to major – views and vistas
Bennelong Stormwater Channel No. 29	Potential direct impact: Minor (vibration)	Neutral	Neutral
Potential archaeological resource within the study area	N/A	Major impact – low to moderate potential for local and state significant archaeological remains	N/A

6.10 Central Station

Construction of the new metro platforms at Central Station would require the use of multiple construction sites, primarily to provide feasible solutions for construction access and egress (materials delivery and spoil removal) (Figure 160 and Figure 161).

The primary works at Central Station would include a new station constructed using the cut-and-cover technique beneath Platforms 13 and 14 and an associated access way off Regent Street (Regent Street Access Bridge) to the southwest (Figure 162, Figure 163 and Figure 164)

A temporary overbridge concourse would be provided at Central Station from Platform 4 to Platform 23 to maintain interchange connectivity between the Central Station platforms (Figure 165). Construction of the temporary pedestrian bridge would involve:

- Removal and modification of platform canopy roof sections
- Piling works through the existing platforms
- Construction of piers and trusses
- Construction of stairs from the overbridge to each platform
- Fit-out works including floor panels and installation of services.

Following commencement of operation of the project, the temporary pedestrian overbridge would be dismantled and removed.

Figure 160: Location and indicative layout of Central Station.

Figure 161: Central Station construction sites indicative layout.

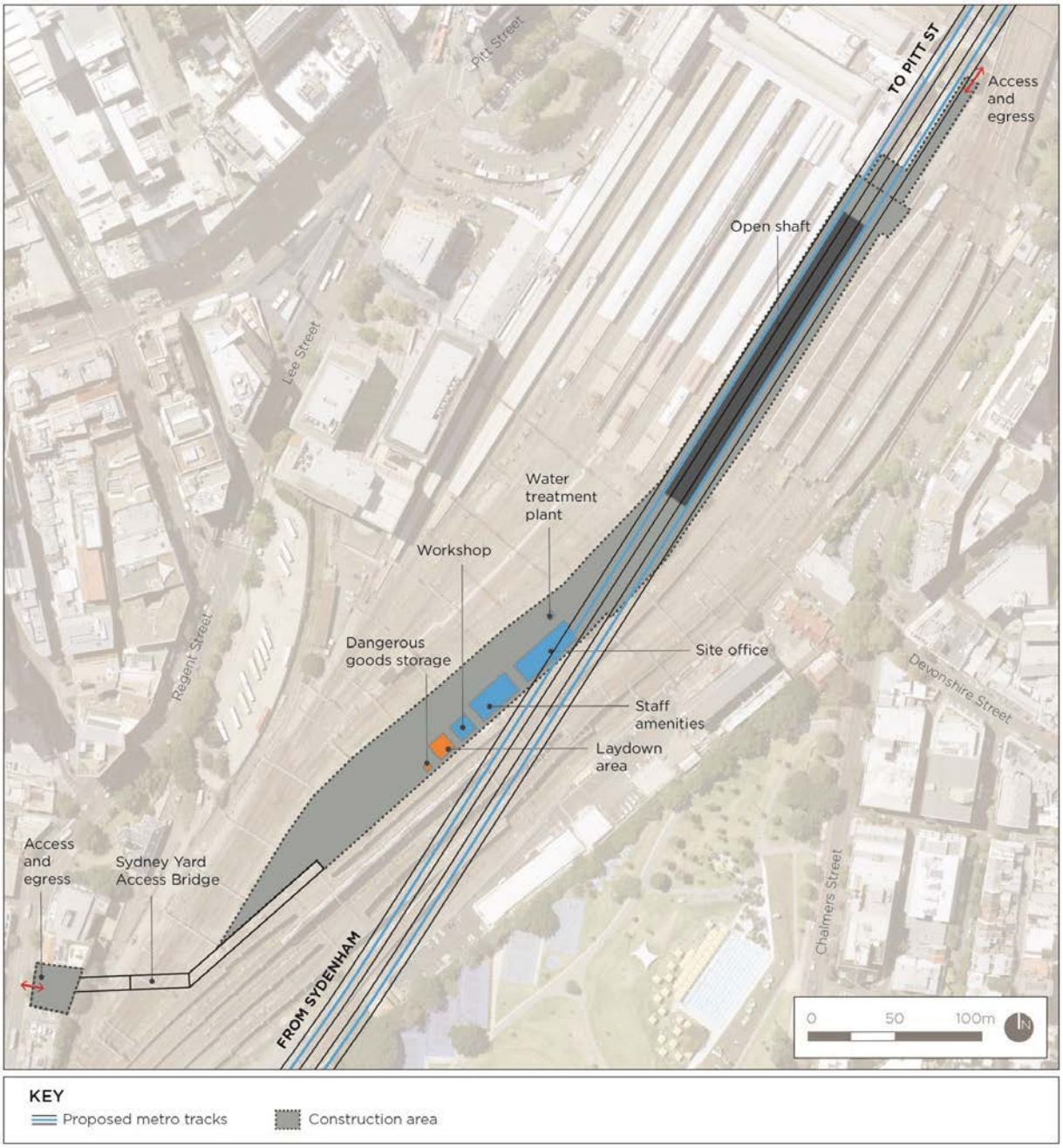


Figure 162: Sydney Yard Access Bridge plan

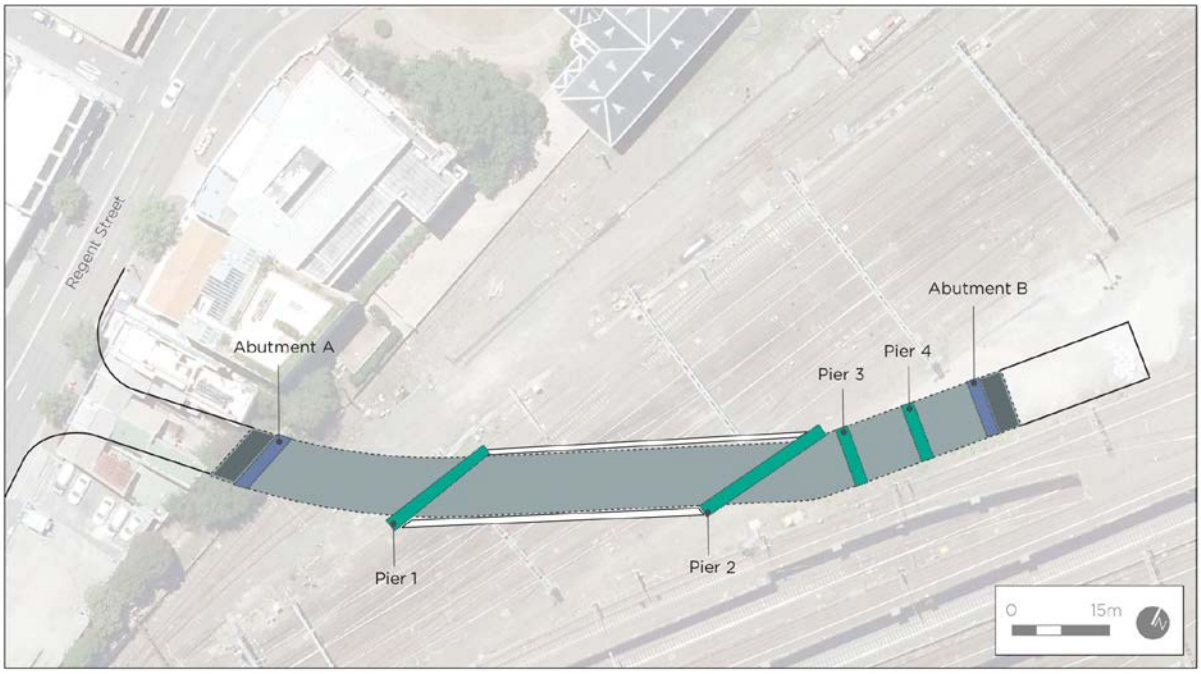


Figure 163: Sydney Yards Access Bridge long section

Figure 164: Indicative illustration of Sydney Yard Access Bridge from Regent Street

Figure 165: Indicative illustration of temporary pedestrian bridge and stairs

6.10.1 History of the study area

In 1849 the Sydney Railway Company was formed as the need for a rail links to the farming communities in western NSW became apparent. In 1854 the Sydney Railway Company and newly founded Hunter River Railway Company were purchased by the New South Wales government. Once formed, The Sydney Railway Company constructed the first Sydney station in 1855, creating the first government owned railway in the British Empire.[147].The station was named 'Redfern' after surgeon William Redfern. Redfern Station sat within Devonshire Street, across from the Devonshire Street cemetery (Figure 166) and south of the Cleveland Street subway in the Government Paddocks.

Figure 166: 1895 Map of the City of Sydney, showing 1874 to the south and Devonshire St cemetery to the north. MAP RM 3443 NSW Dept Lands Source. NLA

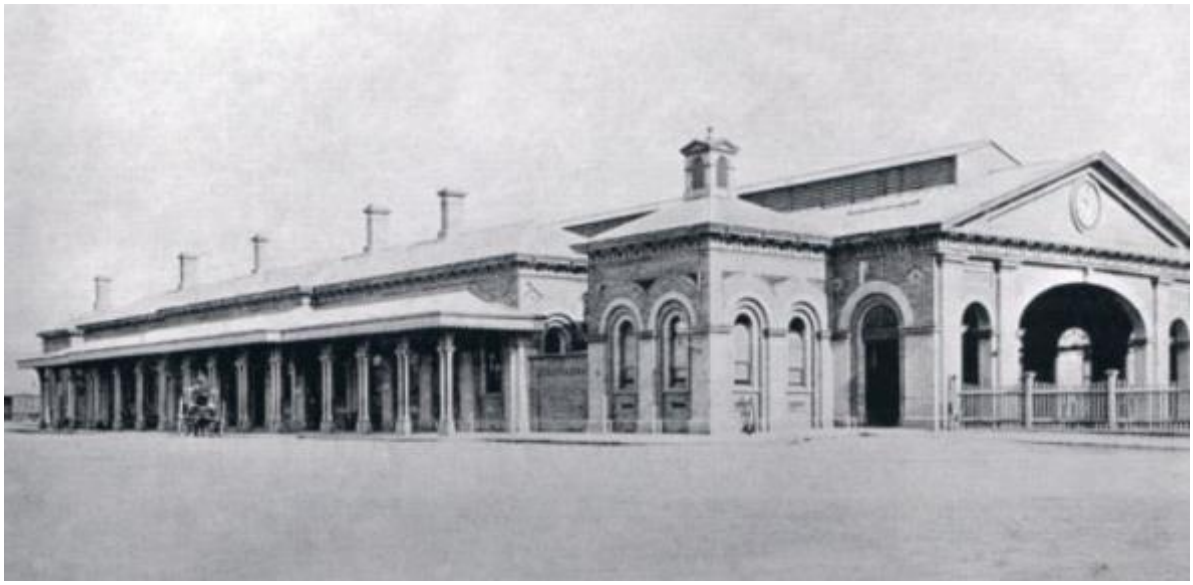
6.10.1.1 Second Sydney Station (c1874)

In the early 1870s a lack of facilities identified at the original Redfern Station led to the construction of a new, larger station which was completed 1874. Called the 'Second Sydney (or Redfern) Station' it was designed by prominent rail and tramways engineer John Whitton in the Neo-Classical style using polychromatic brick (Figure 167). Positioned in the same location as the first Sydney Station, its northern frontages faced onto Devonshire St.

At its capacity, the station contained 13 platforms, including the Mortuary platform and the two original 1855 platforms (platforms 5 and 6). Although the station eased congestion for a short period of time, an increase in inland railway construction put further pressure on the station and the size of the structure meant platforms became increasingly congested with passengers and trains, with trains often blocking each other's access to their assigned platforms.[148]

[147] Central Station CMP, 2013, p 32.
[148] Central Station CMP, 2013, p. 39.

Figure 167: The Second Sydney or Redfern Station, from the west, with train shed covering two platforms. Source. McKillop.149



6.10.1.2 Third Station

In June 1888 Edward Miller Gard Eddy was appointed Chief Railway Engineer. In 1892 he submitted proposals to the Railway Commission to build a large terminus for country trains on the site of the Benevolent Asylum and Devonshire Street Cemetery, both located opposite the new or 'Second' Redfern Station (subsequently know as Central Station). This proposal was adopted by the Parliamentary Standing Committee on Public Works on 7 June 1900 and, soon afterwards, resumptions began on land for the station. Resumptions took over plots occupied by a number of structures which can be seen in Figure 168. These were:

- The Devonshire Street Cemetery (1820-1867)
- The Benevolent Asylum
- The Steam Tram Depot-established in 1879
- The Christ Church Parsonage-established in 1855
- The Police Superintendent's residence, previously known as the government cottage and built at some time in the 1820s
- The Police Barracks in Garden Street built in 1819-1820
- Carters Barracks (1819) which later housed the Sydney Female Refuge and later the Convent of the Good Samaritan.[150]

6.10.1.3 Devonshire Street Cemetery

Devonshire Street cemetery was consecrated in 1820 and closed in 1867 after reaching its capacity. For the next 34 years the cemetery became increasingly decrepit and there was a call for the site to be cleaned up.

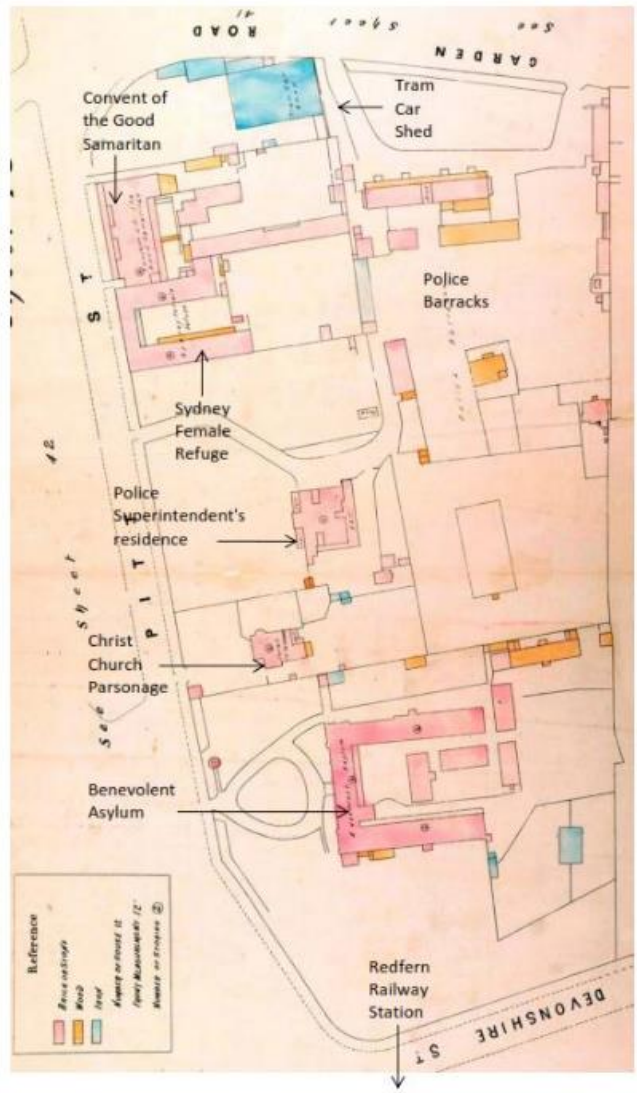
In early 1901, notices were served calling for relatives of individuals buried in the cemetery to nominate their reinterment cemetery of choice. By September exhumation of Devonshire Street cemetery had begun with re-internment fees covered by the New South Wales Government. Many unclaimed plots (an estimated 30,000) were moved to Rookwood Cemetery where they remain today.

[149] McKillop, Century of Central, p 10
[150] CBD Metro Archaeological Assessment (Non-Indigenous Archaeology): Technical Paper 4, Appendix 1, nd in Central Sydney CMP, 2013, p. 44.

6.10.1.4 Sydney Station

The construction of the station was built and modified in a series of phases (four altogether) due to financial constraints associated with the First World War.[151] The Terminus, including the main concourse level, was one of the first structures to be completed in August 1906. The piers, ramps and walls were all built using sandstone quarried from nearby Pyrmont.[152] The second group of buildings to be constructed were the clock tower and upper levels which were built between 1916 and 1921. The Eddy Avenue colonnade which surrounded the tram port-cochere and the Eddy Avenue shops and arcade on the northern façade of the station were also finished during this first phase of construction. Later, but during this initial construction phase, the main terminus, concourse, booking hall, waiting rooms, dining and refreshment rooms, cloak room and barbers saloon also went up. During the second phase of construction, 1914 to 1918, the Parcels Post Office and its associated wings were built.

Figure 168: 1888 Plan of the City of Sydney showing the location of resumed buildings bounded by Pitt Street, Garden Road and Devonshire Street. Source. City of Sydney Historical map Collection.153



[151] Oakes, Central. P. 24.
[152] Sydney Trains, 2014. Central Station-In Depth History. Site accessed on 36/6/2014 at: http://www.sydneytrains.info/about/history/central_station_in-depth
[153] Central Station CMP, 2013, p 45.

Soon after phase one and two had been finalized, increased congestion in the city led to a series of public infrastructure changes in Sydney. These infrastructure upgrades would become some of today's most prominent transport landmarks, including the underground eastern suburbs railway, and initial planning for the Sydney Harbour Bridge. During this period, the idea for an electric railway service was introduced by Chief Engineer for Metropolitan Railway Construction John Rob Crew Bradfield who had recently returned from an overseas trip where he had become familiar with modern transport systems being used in the United States.

In 1915 the *City and Suburban Electric Railways Act 1915* was passed and phase 3 included the construction of a new electric train platform in 1917. The new platform was located on the eastern side of the existing terminal building and involved the demolition of the East carriage shed, several storage sheds and an old sewer. The smaller East storage shed was built as a replacement.[154] In addition, this particular portion of the station was to be situated above-ground rather than at ground level. Although work was quickly commenced, pressures associated with World War One stalled construction work in 1917, and it didn't resume until 1922. From here, four new double platforms designed to accommodate new electric trains were completed to the east of the original 1906 platforms. These new platforms led to further demolitions within the station including platform 16-19, a horse loading platform, a series of sidings and a goods shed.[155] On the first of March, 1926, the first electric train ran from Central Station to Oatley making it the first suburban railway station to be electrified in NSW.

6.10.2 Heritage listed items

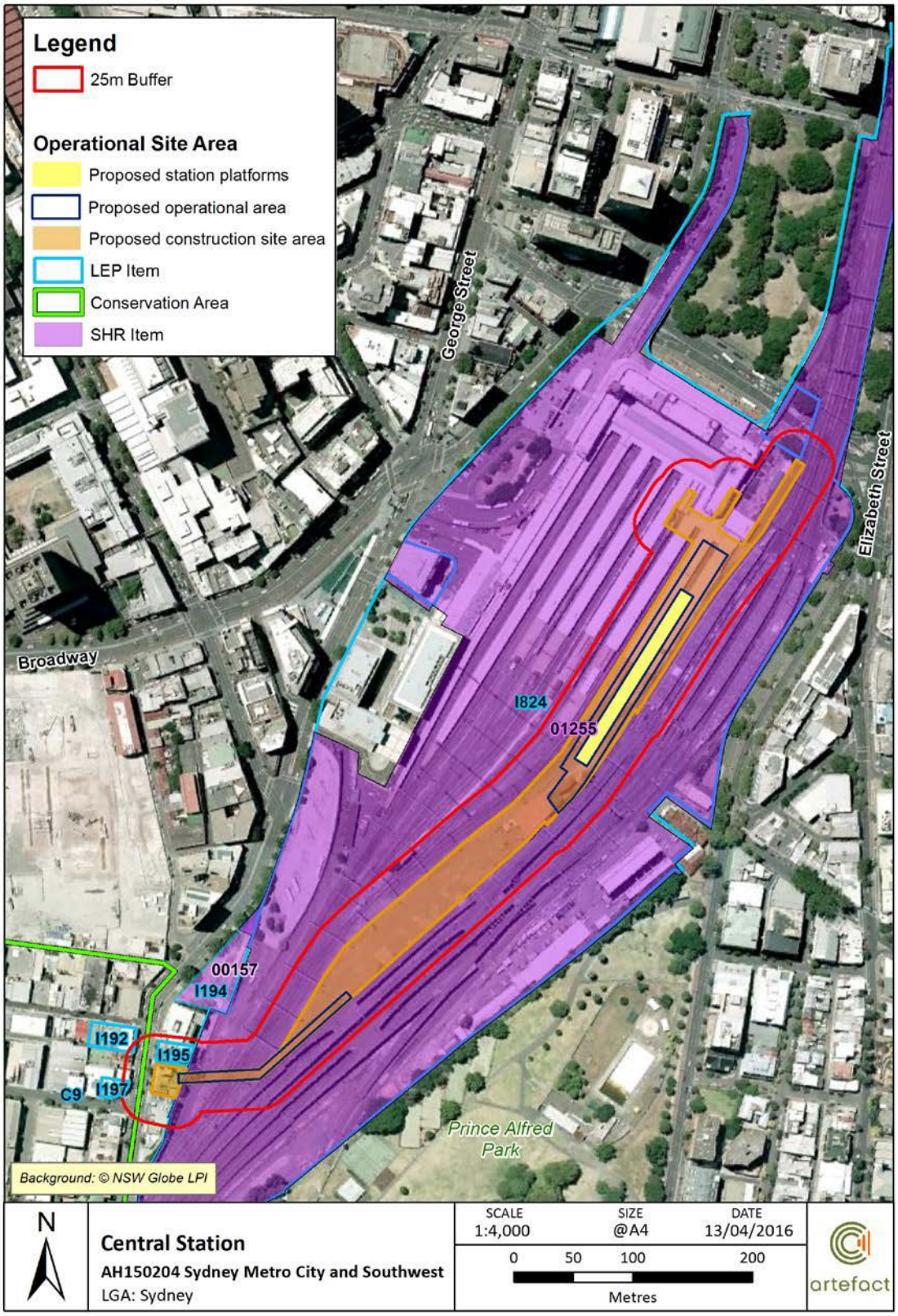
The Central Station study area is within the State Heritage Register listed curtilage of the 'Sydney Terminal and Central Railway Stations Group' (State Heritage Register no. 01255). The 'Central Railway Station and Sydney Terminal Group' is also listed on the Sydney Trains (formerly Railcorp) Section 170 register.[156] The 'Central Railway Station Group including buildings, station yard, viaducts and building interiors is listed on the Sydney LEP 2012 (item no. I824). The study area is within the 'Railway Square/Central Station Special Character Area' listed on the Sydney DCP 2012 (Figure 169). The following heritage items lie partly, or wholly, within the study area and buffer zone:

[154] McKillop, Century of Central., p. 55.
[155] Central Station CMP, 2013, p 54.
[156] Version 2.0, 27 October 2011

Table 98: Overview of listed heritage items within the Central Station study area and buffer zone.

Heritage item	Register listings	Significance	Relationship to the study area
Sydney Terminal and Central Railway Stations Group	State Heritage Register 01255 Sydney Trains S170 Sydney LEP 2012 I824 Sydney DCP 2012 (Railway Square/Central Station Special Character Area)	State	Construction area and buffer zone within heritage item
Terrace group including interior (99-105 Regent Street)	Sydney LEP 2012 I192	Local	Partially within buffer zone
Former Crown Hotel including interior	Sydney LEP 2012 I197	Local	Partially within buffer zone
Former Mortuary Railway Station including interior, ground, fence and railway platforms	State Heritage Register 00157 Included in the 'Sydney Terminal and Central Railway Station Group' SHR item no. 01255 Sydney Trains S170 Sydney LEP 2012 I194	State	Partially within buffer zone
Co-Masonic Temple including interior	Sydney LEP 2012 I195	Local	Within buffer zone
Chippendale Conservation Area	Sydney LEP 2012 C9	Local	Partially within buffer zone

Figure 169: Heritage items within the Central Station study area.



6.10.3 Detailed heritage impact assessments

Heritage items

Table 99: Sydney Terminal and Central Railway Station Group heritage impact assessment

Sydney Terminal and Central Railway Stations Group[157]	
Image	**Figure 170: Sydney Terminal and Central Railway Station Group. Artefact Heritage 2015.** 
Significance	State
Description and statement of significance	Central Station is the largest railway station and transport interchange in NSW and is of State significance for its historical, aesthetic, technical values and for its research potential. With its grand sandstone edifices and approaches it is a well-known landmark in Sydney. The site contains the original Sydney Railway Company grant on which the first Sydney Station and yards were opened, in 1855, and so represents over 150 years of railway operations in the same place, making it the oldest and the longest continuously operated yard in Australia. The Sydney Terminal precinct has a high level of historic significance associated with its early government and institutional uses, as well as being the site of Sydney's second major burial ground, the Devonshire Street cemetery. Archaeological evidence of the government and institutional uses is rare and has high research potential. Central Station site contains evidence of the first phase of railway construction in NSW and has been the major hub of rail transportation in NSW since the mid-19th century and has the ability to demonstrate the evolution of changes in the NSW railways and in railway technology over the past 150 years, from steam to electric, reflected in the changes in yard layout and in signalling work practices. The Darling Harbour branch line and associated sandstone Ultimo Railway Overbridge is the only remaining example of railway infrastructure built for the Sydney Railway Company and is the oldest piece of railway infrastructure in NSW. The Prince Alfred Sidings contains some of the oldest remaining workshops in the NSW railway system. The Prince Alfred Substation is part of the Bradfield 1926 electrification works and was designed by Bradfield himself. The site has technical heritage value in such elements as: the Darling Harbour Dive; Central Electrics flyovers; the elliptical arch construction of the Elizabeth Street Viaduct; the western approach ramp underbridge the three pin truss roof of

[157] Description and Statement of significance extracted from State Heritage Register inventory sheet "Sydney Terminal and Central Railway Station Group" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5012230 on 22/10/2015.

Sydney Terminal and Central Railway Stations Group[157]	
	the porte-cochère; the Devonshire Street subway (probably the first of its type in Australia); the underground men's toilets; and the early mail, parcels and luggage subway system. The main terminus building, accentuated by its clock tower and approach ramps, exemplifies the predominant use of sandstone at the site and it has been sited to dominate its surroundings and to mark the importance of the railway to both the city and the State. The construction of the Sydney Terminus was the largest planned intervention into the urban fabric of Sydney at the time and it was the only major complex of the period where the urban setting was consciously designed to enhance and provide views to and from the main structure. With its multi layered access modes and above ground level platforms, not only was the development extraordinarily innovative but also the largest incursion into the southern part of Sydney prior to World War I. Some of Sydney's most notable 19th and 20th century architects and engineers have worked on the Central Station site, including: James Wallace and William Randle who together designed and built the first railway from Sydney to Parramatta and the associated Darling Harbour Branch Line; the last serving Colonial Architect, James Barnet (Mortuary Station); the first NSW Government Architect, Walter Liberty Vernon (the main Terminus building and the Parcels Post Office); and the Chief Engineer for the City Underground and Sydney Harbour Bridge, Dr John Jacob Crew Bradfield (Central Electric). Mortuary Station, the main terminus building and the Parcels Post Office were the only designs undertaken for the NSW Railways by the Colonial Architect and the Government Architect within the Department of Public Works. The main terminus building, constructed primarily in the early 20th century, is enhanced by its Neo-classical architectural features together with the high quality workmanship and materials it contains, from carved sandstone, marble and terrazzo to cedar joinery, acid etched glazing and metalwork balustrades. The same fine quality in design, materials and workmanship is seen in Mortuary Station, the Railway Institute and also in the Neo-classical Chalmers Street Entrance, the Central Electric Station main façade and the Parcels Post Office, all of which tends to unify these buildings with the main terminus. The Mortuary Station is a fine and rare example by James Barnet of the Gothic Revival architectural style and is the only remaining example of a mortuary station in NSW. The exemplary Federation Anglo-Dutch architectural style of the Railway Institute is significant and it was as the first institute of its type in Australia, demonstrating 19th century initiatives in railway workers educational and recreational facilities. The Parcels Post Office contains fine brickwork and sandstone detailed facades and documents the association of the site with railway postal services. The significance of Central Station is widely appreciated by the broad community for its sense of place and theatre; as an extraordinary place of work for employees past and present and their families; and by many specialist transport and heritage community groups. The Bradfield designed former Lost Property Office was constructed between 1922 and 1926 as part of the electrical upgrades to Central Station. Extending the full width of the concourse, the building was constructed with a reinforced concrete roof, brick sidewalls and sandstone outer wall.
Impact type	Direct impacts: Physical impacts to the station would occur as a result of the excavation of the station box, impacts to underground pedestrian tunnels including Devonshire Street Tunnel, impacts associated with access and egress from Eddy Avenue, installation of the temporary pedestrian bridge, installation of the Sydney Yards Access bridge and use of a temporary worksite in the Sydney Yards. Potential direct impacts: Vibration due to construction of the station box. Indirect impacts: Views and vistas through the installation of the Sydney Yards Access bridge, temporary pedestrian footbridge, alteration of platforms 13 and 14 and construction of a service building at the southern end of the new platform.
Heritage impact assessment	*Excavation of the station box* Physical impacts associated with excavation of the station box would include the removal of platforms 13 to 15 and excavation below platforms 13, 14 and 15. The platforms are elements of moderate significance which were constructed in 1906 and extended to the south in the 1990s. Excavation is proposed for the area below the Bradfield designed former Lost Property Office (constructed over the Eddy Avenue entrance to the station between 1922 and 1926).

Sydney Terminal and Central Railway Stations Group[157]

Modelling indicates that the closest façade of the Bradfield building would not experience vibration levels above the screening level for cosmetic damage.

Excavation works for the cut and cover box would result in minor vibration impacts to the closest intercity and suburban platforms, and to the main station buildings, as follows:

- Vibration levels for the main central station building and the Bradfield Building (Former Lost Property Office) would be below the screening level for cosmetic damage
- Vibration at the closest adjacent, but not directly affected, intercity platform (to the west of the station box) would be above the vibration screening level for cosmetic damage
- Vibration at the closest adjacent, but not directly affected, suburban platform (to the east of the station box) would be above the vibration screening level for cosmetic damage

The construction of the station box would cut three branches of the existing underground pedestrian routes which are elements of moderate/high significance. Note that the Devonshire Street Tunnel, which is an element of high significance would also be directly affected. A 45m section of tunnel would be demolished and reinstated. It is not structurally able to act as a bridge structure during construction and therefore would need to be removed during this process. The impacts would result in loss of original fabric and a change to the historical alignment and pedestrian flow of the tunnels, except for the Devonshire Street Tunnel, which would be reinstated in its current alignment and position.
A new platform would be constructed above the station box, which would include vertical transport such as lifts, providing pedestrian access to the underground metro platforms. The removal of the platforms would create an opportunity for the new structure to express the evolution of the station. The architectural language should refer to, and bind, other elements of the Metro project providing a uniform layer expressing the contemporary use of the station.
A services building would be constructed at the southern end of the new platform. The building would be around seven metres in height and would obscure views from the platform to the Sydney Yards. This impact could be partially mitigated through design.
There are likely to be impacts to elements of station infrastructure as a result of the demolition of Platforms 13-15, such as Over Head Wiring structures, signalling, steel and timber furniture, awning and trusswork, goods lifts (at the southern end of platforms 14/15), signage, and hardwood buffers at the termination of the platform. Impacts to these items could be partially mitigated through removal and reinstatement where practicable, or through archival recording.
The southern end of the station box excavation would extend into the Sydney Yards, impacting the former timetable office/Rolling Stock Officers Building, an element of moderate significance, the Cleaners Amenities Building, and element of moderate significance and the garden, an element of high significance. It should be noted that as the garden is potentially of lower significance due to its condition and significance of its elements which have been assessed in the Central Station Conservation Management Plan as moderate at the highest. Impacts to these items are a result of the application of a design option that, on balance, seeks to minimise the overall impacts of the services building by extending the station box, which would reduce the height of the services building on the southern end of the new platform by about 50 per cent, thus reducing visual impacts to the station. Potential direct impacts to the Bradfield lost property building would be minimised as a result of the lengthening of the station box. Impacts to the former timetable office/Rolling Stock Officers Building, Cleaners Amenities Building and the garden would be direct and would result in a total loss of significance of these elements.

Temporary footbridge

The temporary footbridge would span Platforms 4 to 23. Construction of the footbridge would involve removal and modification of canopy sections from Platforms 4 to 23, construction of piers and trusses and construction of stairs from the bridge to each platform.
Impacts to fabric as a result of the construction of the temporary footbridge would include removal of a portion of canopy, around 15 metres wide at the location of each set of stairs. Platform canopies 4-7 were constructed in 1906 are an element of high significance due to their historical and aesthetic significance. The canopies have a high level of intactness. Platform canopies 8-15 were also constructed in 1906 but modified in the 1990s and are an element of moderate significance. Platform canopies 16-23 are an element of high significance. They were constructed in 1922 and are rare in the local context. Impacts to the

Sydney Terminal and Central Railway Stations Group[157]

canopies as a result of the construction of the temporary footbridge would be moderate and should be minimised where possible.

The construction of the piers and stairs would also involve excavation into the platform surfaces which would impact original fabric. Overall impacts to the platforms themselves would be minor.
The construction of the temporary footbridge would also result in temporary visual impacts. The bridge would stand above the current line of the canopies and would be visually intrusive. Views along the platforms would also be compromised by the stairs and trusses. Visual impacts would be temporary in nature with the pedestrian footbridge removed at completion of construction and could be further (partially) mitigated through a lightweight, high quality and sympathetic design.

Sydney Yards Access Bridge

The construction of the Sydney Yards Access Bridge and access way within the Sydney Yard would result in minor visual impacts to the Sydney Terminal and Central Railway Stations Group as a whole. The bridge would be around 250 m to the south of the station itself so views from the platforms or station buildings would not be subject to major changes. Although there would be some visual impacts to views from passing trains, they would be in the context of the Sydney Yards as a functioning railway corridor with many visual elements. Visual impact to Mortuary Station is discussed separately in the Heritage Impact Assessment for that item (see Table 102 below).

Worksite within the Sydney Yards

The adaption of a portion of the Sydney Yards for a worksite is likely to result in a moderate impact. Currently this land is mostly vacant. The yards undergo continual modification and reconfiguration, reflecting ongoing upgrades to rail technology and the requirements of a working rail station, and the temporary use of this area for the project would represent the ongoing adaptation of an industrial railway landscape.

Services ring

Existing services would need to be relocated prior to excavation of the station box. A services ring would be excavated, generally by under boring. There is some potential to impact archaeological remains however any excavation would be under bored or within previous utility corridors.

Access and egress

There would be no substantial impacts to significant fabric as a result of emergency access and egress arrangements from the station's northern entry arrangements and access to Eddy Avenue. The access ramp on the eastern side of the forecourt would remain. The retail stores to the west of the ramp would be demolished. These freestanding kiosks are intrusive elements, therefore demolition of these structures would provide a positive heritage impact. Impacts to the façade and interior of the Central Electric building entry from the Eddy Avenue forecourt would be avoided. A services facility would be constructed in the eastern portion of Eddy Avenue forecourt adjacent to the ramp. This structure should be designed in sympathy with the forecourt and the entry to the Central Electric building.

Impacts in relation to heritage significance criteria

Although the project would result in major impacts to certain elements of the Sydney Terminal and Central Railway Stations Group, it would retain its State heritage significance as assessed against all relevant criteria.

Historical significance of the group would be impacted through demolition of significant fabric such as Platforms 13-15 and portions of canopies. The station would retain historical significance as a working transport hub which has continued its primary use for over 150 years. The Metro project would be the next phase in this evolution.

Aesthetic significance would be impacted by construction of the temporary walkway and construction of the Sydney Yard Access Bridge. The aesthetic significance of many of the

Sydney Terminal and Central Railway Stations Group[157]

major structures within the group such as the Main Terminus would not be impacted. Aesthetic impacts to the item overall during the operational phase of the project would be negligible to minor.

Technical significance of the item would be impacted through removal of some original fabric which relates to construction and development of the station, such as platforms and underground tunnels. Examples of technical achievement would remain in many structural elements of the station that would not be impacted.

Research significance of the item would be impacted through the removal of any archaeological deposits, especially related to earlier phases of station development or the Devonshire Street cemetery.

Summary of impacts

Physical impacts to the station would occur as a result of the excavation of the station, impacts to underground pedestrian tunnels including Devonshire Street Tunnel, impacts associated with access and egress from Eddy Avenue, installation of the temporary pedestrian bridge, installation of the Sydney Yard Access bridge and use of a temporary worksite in the Sydney Yards.
Direct impacts: Moderate to major

The works are likely to result in moderate to major temporary and permanent visual impacts through the establishment of the staging area, excavation of the station box, and construction of the Regent Street Access Bridge. The pedestrian overbridge would also have a temporary (up to 10 years) moderate to major impact on the heritage item, and would affect commuter views from platform level, as well as views towards the heritage item from outside Central Station (particularly views towards the station from the south, east and west).
On completion of the works, the introduction of new station infrastructure may have a minor, or negligible, visual impact.
Indirect impact: Moderate to major

Application of CMP policies

The Central Station Conservation Management Plan outlines heritage management policies for the item. Adherence to relevant policies has been discussed below.

Policy 1 – Overall heritage management of Central Station.

The government agency/ies responsible for the Central Station CMP area should continue to implement a heritage management structure for the CMP area:

Heritage management has been accounted for during design development for proposed works at Central Station. Detailed design would be informed by the CMP.

Policy 2 – Ongoing use as a Major Transport Complex:

The government agency/ies responsible for the Central Station CMP area should:

i. Recognise that the continuing and sustainable use of Central Station as a major transport hub in NSW is an essential part of its outstanding heritage value.

ii. Recognise that the outstanding heritage values can be successfully balanced within the need for Central Station to continue as a major transport interchange in NSW including both major change and the management of ongoing minor technical adaptation, maintenance and repair; and

The project would be part of the continuing evolution of Central Station as a transport hub. Detailed design will facilitate the creation of a uniform layer to represent this new phase and to in turn recognise and highlight the heritage values of the station. Heritage interpretation incorporated into the design would draw the public's attention to the heritage values of the station and encourage engagement with its dynamic past.

Sydney Terminal and Central Railway Stations Group[157]

Policy 5 – Setting, Views & Landscape

Ensure that the urban setting of Central Station is treated in an appropriate manner which recognises its outstanding heritage values and its listing as a major part of a Special Area in the Sydney LEP 2012.

While visual impacts would result from construction of the Sydney Yard Access Bridge and the temporary pedestrian crossing, the character of the station as a major urban transport hub would be maintained. The majority of the project infrastructure would be constructed underground and would not impact on setting and views from the majority of the surrounding areas. An exception would be impacts to views from Mortuary Station into the rail corridor.

Policy 7 – Heritage Conservation and Major Works

Ensure the following are undertaken for major works within the CMP area:

iii. Involvement of appropriate heritage professionals at an early stage including consideration of heritage opportunities and constraints surrounding the works prior to design work commencing;

Heritage consultants and architects have been involved in design development for works at Central Station. Detailed design would be undertaken in consultation with a heritage architect and would be informed by the CMP. Recommendations for consideration in the detailed design process have been included in this HIA.

Table 100: Terrace group including interiors (99-105 Regent Street) heritage impact assessment

Terrace group including interiors[158]	
Image	**Figure 171: Terrace group including interiors (99-105 Regent Street).** 
Significance	Local
Description	The heritage item consists of a two storey Federation building with four bays of ground floor shops with residences above on the first floor. Each bay steps down in line with the topography. The outer two bays have centrally located pediments within the parapet. Original shop fronts have been replaced with aluminium framed windows. The first floor is characterised by a pair of double hung sash windows with decorative mouldings.
Statement of significance	A good example of a late Victorian/Federation shop and residence development which is a prominent element within the streetscape of Regent Street. The building is evidence of the major commercial expansion that took place along Regent Street in the 1880s and 1890s, particularly on corner sites.
Impact type	Indirect impacts: Views and vistas
Heritage impact assessment	The heritage item is located to west of the Regent Street bridge, which would provide access during and following construction of the project. The bridge would be elevated to the east of the heritage item, connecting Regent Street to the construction worksite within the Sydney Yard. The construction of a worksite to facilitate access to the station from Regent Street, and the introduction of the Regent Street bridge, may have moderate visual impact on the conservation area. **Indirect impact: Moderate**

[158] Description and Statement of significance extracted from State Heritage Register inventory sheet "Terrace Group Including Interiors (99-105 Regent Street)" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2420309 on 03/01/2016.

Table 101: Former Crown Hotel including interior heritage impact assessment

Former Crown Hotel including interior[159]	
Image	**Figure 172: Former Crown Hotel.** 
Significance	Local
Description	The former Crown Hotel is a two storey corner building built in the Federation Free Style of architecture. The design incorporates a curved symmetrical facade with a high parapet that represents the shape of a crown, in keeping with the original name of the building.
Statement of significance	The former Crown Hotel is a good example of an inner suburban hotel built in the Federation Free Style of architecture. It is an important local landmark in Regent Street which because of its corner location and high distinctive parapet has high townscape value. A hotel has existed on this site since at least 1858, trading originally under the name, 'The Crown Inn'
Impact type	Indirect impacts: Views and vistas
Heritage impact assessment	The heritage item is located to west of the Regent Street bridge, which would provide access during and following construction of the project. The bridge would be elevated to the east of the heritage item, connecting Regent Street to the construction worksite within the Sydney Yard. The construction of a worksite to facilitate access to the station from Regent Street, and the introduction of the Regent Street bridge, may have moderate visual impact on the conservation area. **Indirect impact: Moderate**

[159] Description and Statement of significance extracted from State Heritage Register inventory sheet “Former Crown Hotel including interior” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2420310 on 04/02/2016.

Table 102: Mortuary Railway Station heritage impact assessment

Mortuary Railway Station[160]	
Image	**Figure 173: Mortuary Station from Regent Street. Artefact Heritage 2015.** 
Significance	State
Description	Constructed in 1869, the Mortuary Station is a single storey sandstone building designed in the Victorian Academic style, and attributed to James Barnet. The building consists of a platform with the railway line enclosed by nine arched bays, platform offices and waiting room. The building is approached from Regent Street.
Statement of significance	The former Mortuary Station is historically and socially significant as a physical reminder of former funeral customs in nineteenth century Australia, and of the central role in funeral services played by the railway. It would have been a place with memorably sad associations for many Sydney people over a long period. The building is aesthetically significant as a fine example of Gothic inspired design attributed to James Barnet, a style adopted for its religious associations in the construction of a funeral station. It is a rare surviving example of this building type in Australia.
Impact type	Indirect impacts: Views and vistas
Heritage impact assessment	The construction of the Sydney Yard Access Bridge to provide access during and following construction of the project, would be elevated to the east of Mortuary Station, connecting Regent Street to the construction worksite within the Sydney Yard. This bridge would impact on views and vistas towards Mortuary Station from Regent Street and views from within the station group to Mortuary Station, including views from passing trains. Views from Mortuary Station into Sydney Yard would be significantly impacted. The bridge would significantly detract from the setting of the heritage item. Although the Sydney Yard is visually cluttered with overheard wiring, signage, signalling and other infrastructure, the construction of the bridge would constitute a major intrusive element which, due to its bulk and length would impact a number of key sightlines and the setting of Mortuary Station in general. The impacts could only be partially mitigated through sensitive design. The historic and social significance of the item at State level would not be impacted. Impacts would primarily be in relation to views and setting, although there would be some visual connection lost with the working Sydney Yard which would have a minor impact on historical significance. **Indirect impact: Moderate to major**

[160] Description and Statement of significance extracted from State Heritage Register inventory sheet "Former Mortuary Railway Station including interior, grounds, fence and Railway" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2424246 on 09/12/2015.

Table 103: Co-Masonic Temple including interior heritage impact assessment

Co-Masonic Temple including interior[161]	
Image	**Figure 174: Co-Masonic temple. Artefact Heritage 2015.** 
Significance	Local
Description	Constructed c.1898, replacing the previous 1847 Wesleyan Church on the site, the heritage item is a detailed institutional building of 2 stories at the front sitting on a raised plinth and a single storey addition at the rear. The site has archaeological potential related to the earlier Church building located on the site, the re-use of materials from that building in the present building and the relatively large area of site remaining undeveloped that may contain material dating from first use of the site.
Statement of significance	Of historic significance due to its strong physical link to the Wesleyan Church and the Co-masons. The Co-masonic temple is a rare and intact example of a Co-masonic Hall. Of aesthetic significance as a rare example of this building type in the city, for its strong streetscape contribution to Regent Street, for its continuity of the precinct centred around the Mortuary Station and the adjacent commercial terraces and as a well-designed modest institutional building. The site has archaeological potential in relation to the earlier Wesleyan Church that occupied the site.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	The construction of the Regent Street bridge to provide access during and following construction of the project, would be elevated to the east of the heritage item, connecting Regent Street to the construction worksite within the Sydney Yard. This is likely to impact on views and vistas towards the Co-Masonic Temple from Regent Street and has the potential to significantly detract from the setting of the heritage item. **Indirect impact: Moderate to major**

[161] Description and Statement of significance extracted from State Heritage Inventory sheet "Co-Masonic Temple including interior" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2424289 on 22/10/2015.

Heritage Conservation Areas

Table 104: Chippendale Conservation Area heritage impact assessment

Chippendale Conservation Area[162]	
Image	**Figure 175: Chippendale Conservation Area (view from Regent Street). Artefact Heritage 2015** 
Significance	Local
Description	Primarily constructed between 1838 and 1950, the Chippendale Conservation Area consists of the area bounded by City Road, Broadway, Abercrombie, O'Connor, Balfour, Wellington, Regent and Cleveland Streets. The area includes the Cleveland Street, City Road and Broadway Streetscapes. It is characterised by residential and industrial developments with commercial development concentrated along the main thoroughfares. Regent Street - west side only - Wellington Street to Cleveland Street Wide, heavily trafficked street with scattered deciduous street tree planting. A mixture of Victorian era terrace shops, early 20th century multi-storey warehouse/commercial development with one modern multi-storey commercial building (87-97 Regent St)
Statement of significance	Chippendale is of historical significance for three key themes: 19th century industry, industrial working class residential and quality residential housing. Industry was the key historical role of Chippendale due to its location relative to the City. Housing for industrial workers is integral to the industrial history of Chippendale, evidenced by early housing in Elim and Chandler's Avenues. Chippendale is also of historical significance for the extent of land resumption which occurred in the early 20th century which increased the dominance of industry in the area. Strickland House, the first public housing by the City Architect, is significant as evidence of the need to provide quality low income housing. Chippendale's association with high quality 19th century residential housing predominantly predates the intrusion of the railway around Regent Street. Chippendale demonstrates several key period of layers for the development of inner city Sydney: the first layer as a direct result of the subdivision of the Cooper Estate and Shepherd's Nursery, subsequent layers from Railway

[162] Description and Statement of significance extracted from State Heritage Inventory sheet “Chippendale Heritage Conservation Area” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2421466 on 22/10/2015.

Chippendale Conservation Area[162]	
	construction and from the resumption era and the construction of industry and related housing for industrial workers Chippendale is an exceptional area with multiple key period layers, an early residential suburb profoundly affected by land resumptions and the construction of industrial buildings and associated Victorian working class housing. The area contains many intact buildings which are contributory to the area's significance.
Impact type	Indirect impacts: Views and vistas
Heritage Impact Statement	The construction of a worksite to facilitate access to the station from Regent Street, and the introduction of the Regent Street bridge, may have moderate visual impact on the conservation area. **Indirect impact: Moderate**

6.10.4 Archaeological assessment

The Archaeological Zoning Plan of Sydney[163] designated the Central Station precinct as containing areas of archaeological potential that are partly disturbed. The archaeological potential of the Central Station precinct was also assessed in the 2013 Conservation Management Plan.[164]

6.10.4.1 Site inspection results

The rail corridor portion of the Central Station site was not accessed for the survey. The portion of the Central Station site bordering Regent Street consists of built structures.

6.10.4.2 Assessment of archaeological potential – Central Station

The Central Railway Station Group has been built on the site of the two earlier Sydney railway terminals, the former Devonshire Street cemetery and a number of colonial era buildings including the Benevolent Society Asylum. The group also includes a number of earlier railway buildings, such as the Eastern and Western carriage sheds demolished in various phases of expansion. As such it is possible that archaeology may be encountered across the site relating to these various phases of development.

The archaeological potential of the Central Station precinct was assessed in the 2013 Conservation Management Plan and is shown in Figure 176. The proposed station box is located in an area that has been identified as being previously occupied by the Devonshire Street Cemetery (Figure 176).

It is likely that the installation of service and electrical lines, phases of demolition and construction and works associated with the ongoing modernisation of the railway precinct have, at least, partially impacted on archaeological remains.

Two boreholes for the project were placed within the rail corridor above the proposed station box beneath Platforms 14 and 15. The borehole logs indicate a layer of historic fill between 1 to 1.5 metres deep overlying a layer of sand up to 2 metres thick. The presence of historic fill indicates the possibility that deeper subsurface features, including grave cuts and burials (whole or fragmentary) associated with the former cemetery, may survive in intact areas.

6.10.4.3 Management of the potential archaeological resource at Central Station

There is likely to be archaeological potential across the site relating to various phases of development of Central Station. Archaeological remains can include evidence of platform construction or platform fill which may be located within those platforms to be impacted[165]. Strategies for the management of the potential archaeological resource of the Central Station precinct are outlined in the Central Station

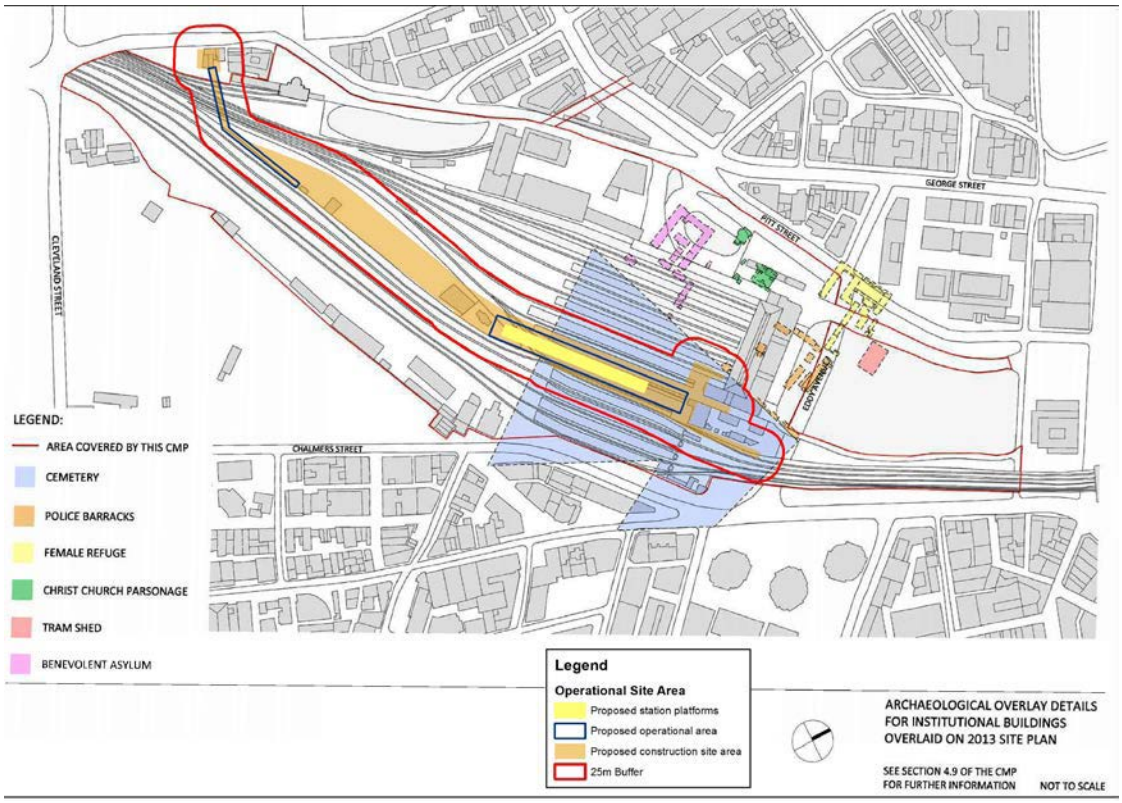
[163] Archaeological Zoning Plan of Sydney, City of Sydney 1997, 18.
[164] Rappaport & GAO 2013
[165] AMBS, Heritage Platforms Conservation Management Strategy, 2015, 100,

CMP.[166] The potential archaeological resources in the study area may provide opportunities to further understand the history and significance of the Central Station site and to interpret its history to the public. The CMP recognises that while only parts of the site are likely to contain archaeological resources associated with the earlier uses of the area, the evidence that does remain is protected by s57(1) of the *NSW Heritage Act, 1977* and as such any subsurface disturbance may be subject to approval from the NSW Heritage Council. It is noted that this project is subject to EP&A Act Critical State Significant Infrastructure approval and therefore approval under the *Heritage Act 1977* would not be required.

The study area is located within sections of the station identified in the 2013 CMP as requiring the following archaeological management.

> ***Notify archaeologist if remains found*** *– These areas are known to have been occupied prior to the redevelopment of the station site in the early 1900s. The levels of disturbance in these areas are expected to be such that they are likely to have wholly or largely removed archaeological evidence of this earlier occupation. However, the remote possibility of evidence being found in these areas exists and contractors need to be advised of the need to be aware of the need to stop work and notify an archaeologist if archaeological remains are found during any excavation work.*

Figure 176: Overlay of early buildings on the current site plan. Source: 2013 CMP.



6.10.4.4 Assessment of significance

The study area has the potential to contain archaeological remains associated with earlier phases of Central Railway Station. The CMP includes the following statement of significance relevant to the project:

[166] Rappaport & GAO 2013

Evidence of the second Redfern Station is likely to be disturbed but may contribute some information not available from other sources about the configuration and use of these early railway uses. This information is likely to be fairly limited however, as there are numerous historic plans, photographs and written records that describe the various changes made to the site and its operation over time. Archaeological remains of the early railway uses will have higher historic than research values.

Archaeological evidence of the Devonshire Street cemetery, including whole or fragmentary burials are likely to have significance at a State level.

6.10.4.5 Overview of archaeological potential

The archaeological potential of the study area has been summarised in Table 105:

Table 105: Summary of archaeological potential within study area

Potential archaeological resource	Potential	Significance	Heritage impact assessment
Earlier phases of Central Station.	Moderate	Local-State	Excavation works throughout the study area, and excavation of existing platforms have moderate potential to encounter archaeological remains associated with earlier configurations of Central Station.
Whole or fragmentary burials related to the former cemetery	Low	Local-State	It is possible that some remains were not reinterred during removal of the cemetery. If human remains survive they would be managed appropriately in line with an Exhumation Policy developed for the project.

6.10.4.6 Archaeological impact assessment

Proposed works within the Central Station site with the potential to impact on archaeological remains include:

- Excavation of open shafts during construction phase
- Foundation/ground slab excavations for establishment of staff amenities, site offices, water treatment plant, wheel washing bays, workshops, dangerous goods and material storage buildings during construction phase
- Cut and cover excavation for station box below platforms 13 -15, including demolition of existing platforms.
- Excavation works for construction of footbridge and Regent Street bridge

Whilst much of the excavation works required during the construction phase of the project are likely to be limited to discrete locations, the excavation of platforms 13 to 15 would result in the complete removal archaeological remains within the station box footprint. Therefore, works in this location would have a major impact on the potential archaeological resources.

6.10.5 Overview of constraints

The following table outlines potential heritage constraints within the study area.

Table 106: Overview of constraints on heritage items and areas of archaeological potential

Heritage item	Potential heritage impacts		
	Direct impact	**Archaeological impact**	**Indirect impact**
Sydney Terminal and Central Railway Stations Group	Direct physical impacts: Moderate to major	Major impact – low to moderate potential to encounter remains of Devonshire Cemetery and earlier phases of Central Railway Station.	Moderate to major: Views and vistas
Terrace group including interior (99-105 Regent Street)	Neutral	Neutral	Moderate: Views and vistas
Former Crown Hotel including interior	Neutral	Neutral	Moderate: Views and vistas
Former Mortuary Railway Station including interior, ground, fence and railway platforms	Neutral	Neutral	Moderate to major: Views and vistas
Co-Masonic Temple including interior	Neutral	Neutral	Moderate to major: Views and vistas
Chippendale Heritage Conservation Area	Neutral	Neutral	Moderate: Views and vistas

6.11 Waterloo Station

The Waterloo Station construction site would be located within the block bounded by Raglan Street, Cope Street, Wellington Street and Botany Road. The site currently contains commercial and residential buildings. This station would be constructed using a cut-and-cover methodology.

Access and egress to and from the site would be via Raglan Street, Cope Street, Wellington Street and Botany Road.

The location and indicative layout of the Waterloo Station construction site is shown in Figure 177 and Figure 178.

Figure 177: Proposed location of Waterloo Station between Botany Road and Cope Street

Figure 178: Waterloo Station construction site layout

6.11.1 History of the study area

The suburb of Waterloo is associated with a 1,400 acre grant given to William Hutchinson in 1823 who named his grant Waterloo Farm after Wellington's victory over Napoleon in 1815.

Large sand hills once covered the area, some of which still remain in the Moore Park area to the east of the Waterloo Station site. By the mid-nineteenth century the Moore Park area had become barren of vegetation due to timber-getting and subsequent erosion.[167]

Prior to development, the area of proposed works was associated with extensive swamps, the most prominent of which were Shea's Creek Swamp and Waterloo Swamp. These sat to the east and west of what is today known as Botany Rd and Bourke St. Although agricultural activity took place within Hutchinson's grant in the early 19th century, the risk of flooding and marshy conditions did little to encourage settlement in the area.[168]

[167] Central Parklands Trust 2014
[168] Weir Phillips Architects and Heritage Consultants, 2013. Heritage Impact Statement 18-20 O'Dea Street Waterloo. P. 4.

During the late 1880s, a series of improvements were made to the landscape. These included the construction of dams built to confine the Waterloo Swamp, the introduction of drainage systems along areas of increased occupation and levelling of various land formations in the area. Once this work was complete the land in the estate became more suitable for building as well as industrial activity thanks to newly diverted water courses which enabled the growth of industry. In addition to changes within the natural landscape the built landscape within the Waterloo Estate also changed dramatically during this period. This included the laying of a tramline along Botany Road in 1882 which played a vital role in these transformations by improving access to the area and enabling further residential settlement.

By the early 1900s increased industrial development in Waterloo meant warehouses and factories became prominent fixtures within the landscape and newspaper articles published in 1899 make specific mention of the extension of sewerage mains from Bourke St, Waterloo to Botany Road.[169]

In the 1920s market gardens and smaller scale factories which had been in the area since its initial establishment were slowly pushed out by large scale industry. As the years progressed the Waterloo/Alexandria area became associated with slums which led to intensive urban renewal in the 1940, 50s and 60s.[170]

6.11.2 Heritage listed items

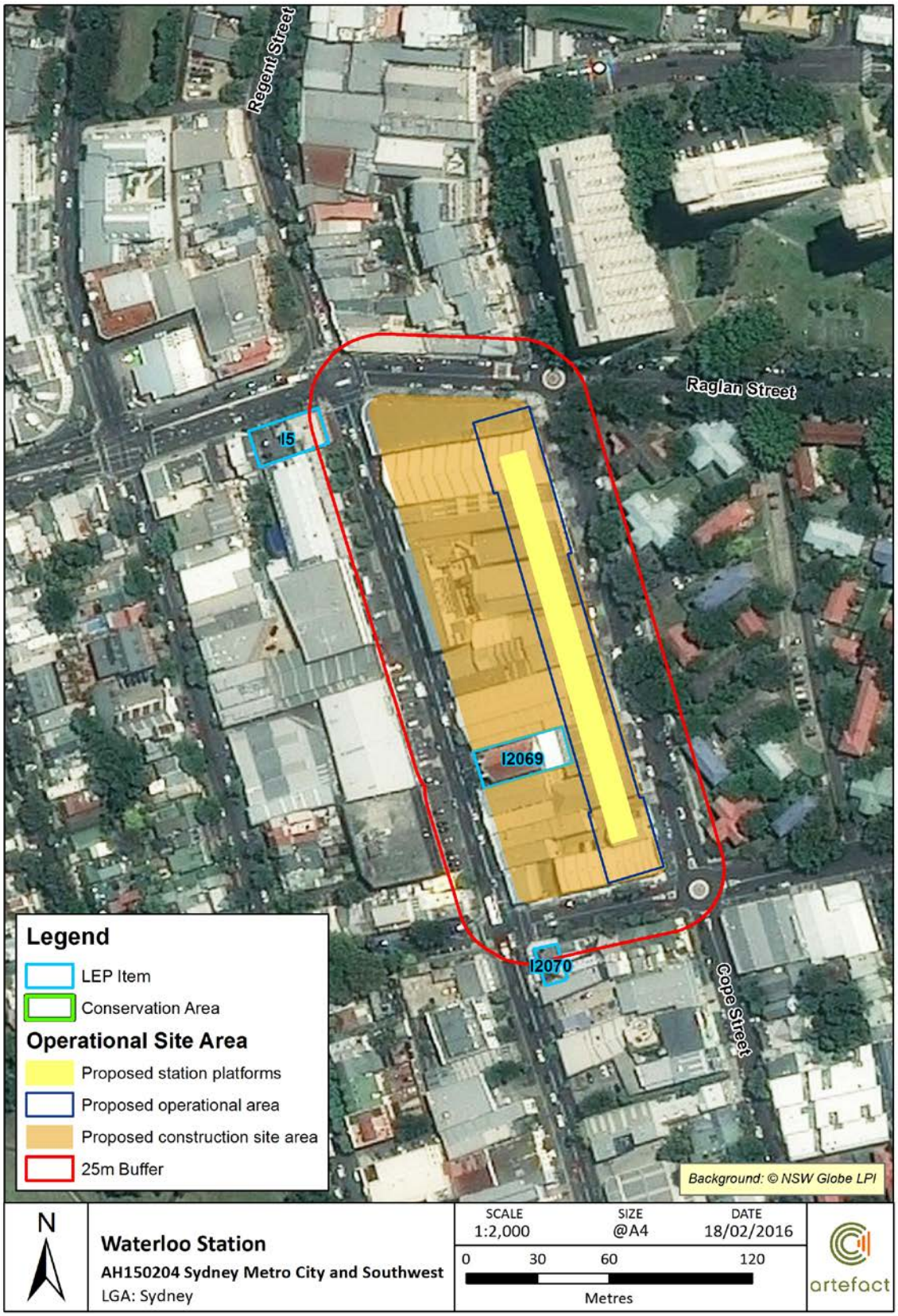
A number of heritage items are located within the Waterloo station study area, as summarised in Table 107 and shown in Figure 179.

Table 107: Overview of heritage item within Waterloo station study area

Heritage item	Register listings	Significance	Relationship to study area
Congregational church including interior	Sydney LEP 2012	Local	Within construction area
Former CBC Bank including interior	Sydney LEP 2012	Local	Partially within buffer zone
Cauliflower Hotel including interior	Sydney LEP 2012	Local	Partially within buffer zone
Alignment Pin, Waterloo (SE corner Wellington Street and Botany Road)	RMS s170	Local	Within buffer zone

[169] Evening News, Sydney. Thursday 27 July, 1899.
[170] Fairman. J. 2004. Waterloo: Whose fault were the slums? The power of ideas that shaped the suburb in Histories of Green Square, p. 61.

Figure 179: Heritage listed items within the Waterloo station study area



6.11.3 Detailed heritage impact assessments

Heritage items

Table 108: Congregational church including interiors heritage impact assessment

Congregational church including interior[171]	
Image	**Figure 180: Congregational Church and street context. Artefact Heritage 2015.** 
Significance	Local
Description	Constructed in 1883, the heritage item consists of a two storey Victorian Gothic style church with cedar pulpit, gallery and staircase. The building is symmetrical in plan and elevation. The building sets back from Botany Road and presents a garden, fence, entrance steps to the front. The foundation stone inscribed year 1865, however, this is from the previous Congregation Chapel on the site.
Statement of significance	The Gothic church of rendered brick construction was constructed in 1883 to replace the congregation chapel built in 1865. The symmetrical design of the façade demonstrates high quality architectural traits of the building. It is one of the earliest worship venues in Waterloo.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	With regard to the proposed excavation for the cut and cover station modelling indicates that the closest façade of this item would not experience vibration levels above the vibration screening level for cosmetic damage. **Potential direct impact: Neutral** As the bulk of the new station would be located to the rear of the heritage item, and the heritage item is oriented to the west and away from the station site, demolition of existing buildings and construction of new station entrances would have a minor impact on the setting of the heritage item. **Indirect impact: Minor**

[171] Statement of significance extracted from State Heritage Inventory sheet "Congregational Church including interior" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2420461 on 22/10/2015.

Table 109: Former CBC Bank including interior heritage impact assessment

Former CBC Bank including interior[172]	
Image	**Figure 181: Former CBC Bank. Artefact Heritage 2015.** 
Significance	Local
Statement of significance	The building represents a good example of the Victorian Italianate style by prominent government architect Mansfield. It is a landmark building on a prominent corner site.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	Proposed station buildings to the east of the heritage item would result in minor visual impacts through the demolition of existing buildings and the introduction of new station entrances. **Indirect impact: Minor**

[172] Statement of significance extracted from State Heritage Inventory sheet "Former CBC Bank including interior" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2420460 on 22/10/2015.

Table 110: Cauliflower Hotel including interior heritage impact assessment

Cauliflower Hotel including interior[173]	
Image	**Figure 182: Cauliflower Hotel. Artefact Heritage 2015.** 
Significance	Local
Description	Constructed in 1862, the hotel consists of a double storey Georgian style public house at a corner site. The original building comprises a front building facing Botany Road and a northern wing facing Wellington Street, which originally connect with each other by verandahs and balconies.
Statement of significance	The Cauliflower Hotel is a good example of a mid- Victorian hotel in the Georgian style and was built in c1862 by George Rolfe who was a leaseholder and a market gardener. The hotel was under the ownership and operation by the Rolfe family until 1920s, and later by Tooheys and Tooth & Co. The name "Cauliflower Hotel" is associated with former market gardens on the site which were said to be used for cauliflower growing. The hotel has been continually licensed since its establishment. This Georgian style building and the unique cauliflower sign is the landmark on Botany Road.
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	Demolition of existing structures to the north-east of the heritage item would result in minor visual impacts through alteration of the existing streetscape. The existing buildings do not contribute to the heritage significance of the hotel. **Indirect impact: Minor**

[173] Statement of significance extracted from State Heritage Inventory sheet “Cauliflower Hotel including interior” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2420462 on 22/10/2015.

Table 111: Alignment pin, Waterloo heritage impact assessment

Alignment pin, Waterloo[174]	
Image	
Significance	Local
Description	The alignment pin was installed in 1882, and consists of a cast iron alignment pin embossed with a broad arrow pointing to a survey mark, used by surveyors to show where the alignment of a road changed. Measures approximately 10cm x 10cm across top, visible on gutter.
Statement of significance	This alignment pin, installed after 1882, is of Local significance. Alignment pins took the form of wooden posts, wrought stones, cement blocks or more commonly iron castings, and these were identifiable through the presence of a broad arrow marked on the upper surface. Those in use on Botany Road consisted of iron castings placed in the kerb or footpath by Lands Department surveyors for the purpose of marking the road alignment. This alignment pin remains an active survey mark for the purpose of confirming cadastral boundaries.
Impact type	No impacts

[174] Statement of significance extracted from State Heritage Inventory sheet “Alignment pin, Waterloo” last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4309672 on 22/10/2015.

6.11.4 Archaeological assessment

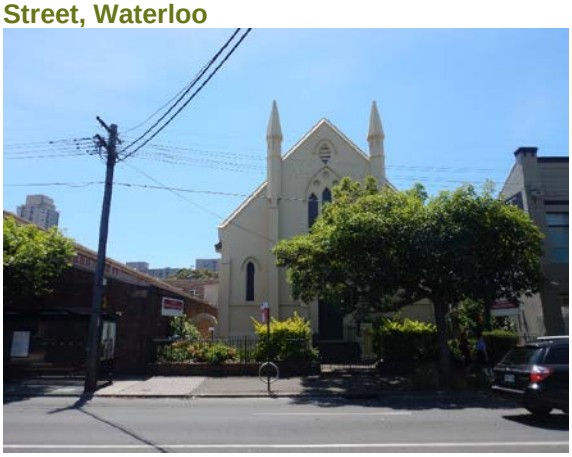
6.11.4.1 Site inspection results

The Waterloo Station site is located across a generally flat area. The area is generally covered by residential and commercial properties interspersed by sealed bitumen roads.

The heavily built environment and associated underground services suggest that there is likely to have been some areas of disturbance throughout the area.

Figure 183: View southeast across the corner of Raglan Street and Botany Street

Figure 184: View east across 103-105 Botany Street, Waterloo



6.11.4.2 Overview of previous structures

The suburb of Waterloo is associated with a 1,400 acre grant given to William Hutchinson in 1823. It is unlikely that substantial development within the study area occurred during this early phase of land-use.

By the late nineteenth century the study area was developed, and plans show that it contained the congregational church and a bank, amongst other structures (Figure 185). By the mid-twentieth century the study area was heavily developed. The 1943 aerial photograph of the study area indicates that this consisted of a combination of low-scale warehousing, and possibly commercial development (Figure 186).

Figure 185: The study area c 1885 – 1890. Source: Atlas of the Suburbs of Sydney, Waterloo, Parish of Alexandria.

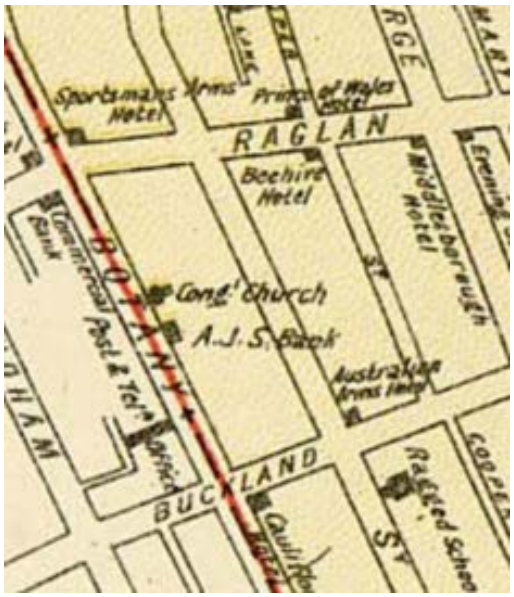


Figure 186: 1943 aerial of the Waterloo construction site showing intensely developed site.

6.11.4.3 Assessment of significance

Archaeological evidence associated with the early occupation of Waterloo, and the development of the study area, are likely to have significance at a local level.

The following is a preliminary assessment of significance, informed by the NSW Heritage Criteria for *Assessing Significance related to Archaeological Sites and 'Relics'* (2009).

Archaeological research potential (NSW Heritage Criterion E):

- Archaeological remains associated with early residential and agricultural development of the study area may have some research potential dependant on the nature and extent of any remains.

Association with individuals, events, or groups of historical importance (NSW Heritage Criteria A, B & D):

- It is possible that evidence of early residential development of the study area may have associations with former residents and known local historical figures. Specific associations have not been identified at this stage.

Aesthetic or technical significance (NSW Heritage Criterion C):

- It is not possible at this stage to identify whether archaeological remains within the study area have potential to demonstrate aesthetic or technical values.

Ability to demonstrate the past through archaeological remains (NSW Heritage Criterion A, C, F & G):

- There is low to moderate potential, due to low intensity building that has occurred throughout the site, that the study area has the potential to demonstrate the past through archaeological remains.

Overall, the site may contain archaeological remains with potential to reach the local significance threshold.

6.11.4.4 Overview archaeological potential

The study area may contain a substantial archaeological resource associated with the mid-nineteenth to early twentieth century development of the suburb of Waterloo. Archaeological remains are likely to consist of evidence of residential and commercial development, including archaeological remains associated with the churches and commercial buildings that were located within the study area.

Table 112: Summary of archaeological potential within study area

Potential archaeological resource	Potential	Significance	Heritage impact assessment
Evidence of Hutchinson's development of the study area– for example, evidence of land clearance and cultivation, outbuildings, postholes associated with fencing.	Nil-low	Local	Excavation works within the study area have nil-low potential to impact on archaeological remains.
Pre-1850s residential and commercial development	Low-moderate	Local	Excavation works within the study area have low-moderate potential to impact on archaeological remains
Late 19th and early 20th century residential and commercial development	Moderate	Intact and substantial artefact bearing deposits, with the ability to answer research questions, may reach the local significance threshold.	Excavation works within the study area have moderate potential to impact on archaeological remains.

6.11.4.5 Archaeological impact assessment

Proposed works within the Waterloo Station site with the potential to impact on archaeological remains include:

- Excavation during demolition works
- Excavation of open shafts during construction phase
- Foundation/ground slab excavations for establishment of staff amenities, site offices, water treatment plant, wheel washing bays, workshops, dangerous goods and material storage buildings during construction phase
- Cut and cover excavation for station box

Whilst excavation works during the construction phase of the project are likely to be limited to discrete locations, the excavation of the cut-and-cover station would result in the complete removal archaeological remains within the station box footprint. Therefore, works in this location would have a major impact on the potential archaeological resources.

6.11.5 Overview of constraints

Excavation for the cut and cover station may result in vibration or other physical impacts to surrounding heritage items, particularly the Congregational Church. The introduction of new station buildings is also likely to result in minor impacts to the setting of surrounding heritage items.

It can be assumed that excavation for a cut and cover station is likely to result in major impacts to any potential archaeological remains or heritage listed items within the study area. An overview of heritage constraints has been included in Table 113.

Table 113: Overview of constraints on heritage items and areas of archaeological potential

Heritage item	Potential heritage impacts		
	Direct impact	**Archaeological impact**	**Indirect impact**
Congregational church including interior	Neutral	Neutral	Minor: Views and vistas
Former CBC Bank including interior	Neutral	Neutral	Minor: Views and vistas
Cauliflower Hotel including interior	Neutral	Neutral	Minor: Views and vistas
Alignment Pin, Waterloo (SE corner Wellington Street and Botany Road)	Neutral	Neutral	Neutral
Potential archaeological resource within the study area	N/A	Major impact - low to moderate potential for locally significant archaeological remains	N/A

6.12 Marrickville dive site (southern)

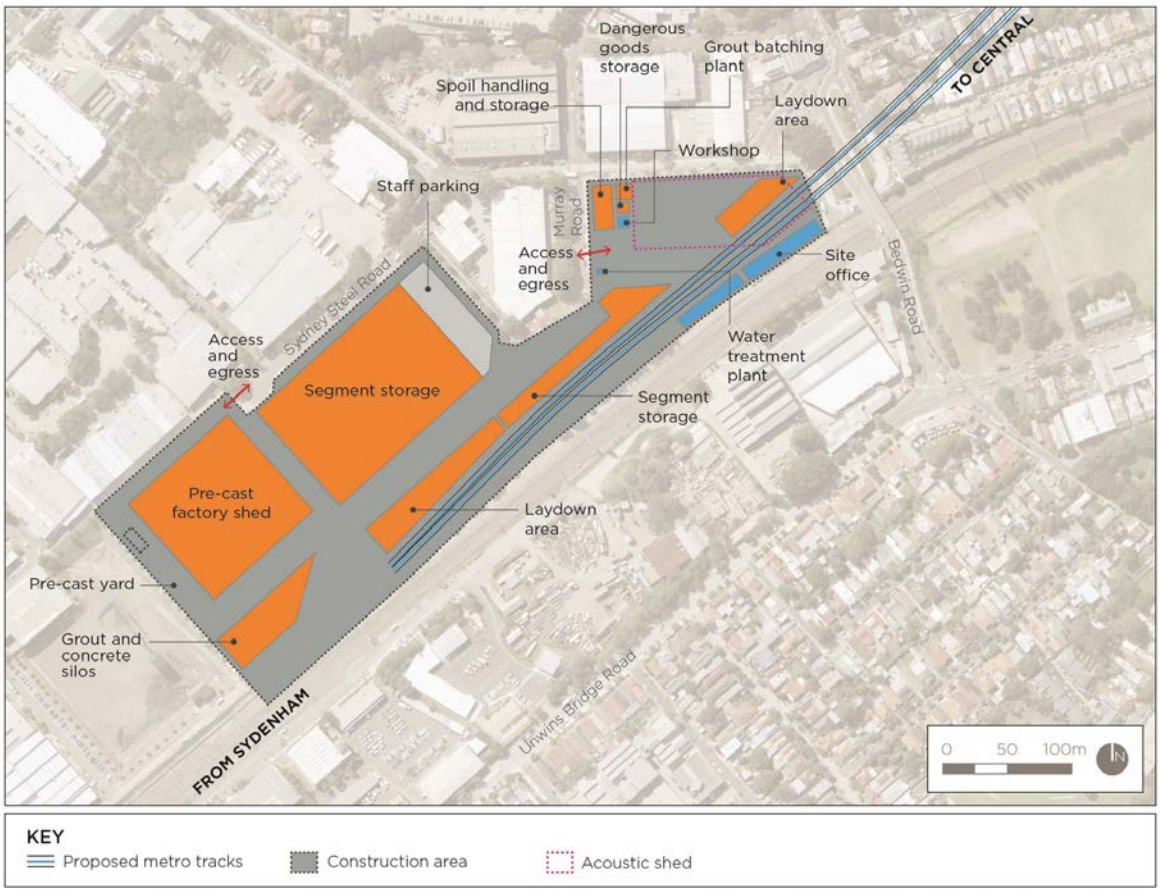
The Marrickville dive site (southern) would be used to:

- Excavate and construct the dive structure and tunnel portal
- Launch and support two tunnel boring machines for the major tunnelling works
- Casting yard and tunnel segment storage
- Support tunnel rail systems fit out works
- Support the construction of the southern services facility.

This would require the use of multiple areas within the one large construction site, primarily to provide sufficient materials storage and feasible solutions for construction access and egress (materials delivery and spoil removal).

The location of the Marrickville dive site (southern) is shown in Figure 187.

Figure 187: Marrickville dive site (southern) indicative construction site layout.



6.12.1 History of the study area

Most of the western half of Sydenham, including the area now occupied by Sydenham Railway Station, was previously a swamp. The swamp provided an effective boundary for early European land grants. The majority of Sydenham stands within Thomas Moore's Douglas Farm, granted in 1799, which includes the study area.

Thomas Moore received a grant of 470 acres in 1799, and a grant of 700 acres in 1803. He also purchased adjoining land and by 1807 held 1920 acres, making him one of the largest landowners in Marrickville. His holdings incorporated much of present day Marrickville, Petersham and Dulwich Hill.[175] Douglas Farm, as Moore's Farm was named, was utilised for the growing of maize and wheat and for its valuable stands of timber. Moore was appointed Master Boat Builder in the dockyard at Port Jackson and it is likely that some of the timber from the property went to his shipbuilding yard. Moore sold his land holdings to Dr Robert Wardell on the 21st of July, 1830.[176] At this time the estate extended from Parramatta Road to Cooks River.

In September 1834 Wardell stumbled across the camp of three escaped convicts whilst riding along the Cooks River and was murdered. The estate was divided amongst his sisters, Anne Fisher, Margaret Fraser and Jane Isabella Priddle.[177] Wardell's death opened the way for the first era of subdivision in the area[178] and parts of his land began to be sold off soon after his death.[179]

By the 1840s a track led away to the west, known as Swamp Road. This is now Sydenham Road, located to the west of the study area. Unwin's Bridge Road, located to the south and east of the study area, was originally constructed using convict labour in 1836 for Frederick Wright Unwin, a landowner in the area.[180] During this phase the area was occupied primarily by brickmakers, and stockmen utilised the swamp to water livestock.

In 1881 the tramway was constructed along what is now Victoria Road. This was designed to stimulate residential development within the area. The Tramvale subdivision was offered for sale soon after, targeting working class families and offering close proximity to factories and employment opportunities.[181] The estate was affected by regular flooding and poor drainage, and lacked basic sewerage facilities. Mosquitos were rampant in summer and its inhabitants suffered badly from a range of diseases.[182] In May 1889, after several days of heavy rain, the Cooks River flooded. Consequently, the areas surrounding Gumbramorra Creek and swamp were soon inundated with water, including the Tramvale estate. Residents were rescued as their homes were severely flooded (Figure 188).

The Tramvale estate was abandoned, and the area continued to be used for industrial purposes. The Gumbramorra Swamp was then drained, commencing in the 1890s, and continuing into the early 20th century. During the Great Depression in the 1930s, a large brick-lined drainage pit designed to take the overflow from stormwater drains to the Cooks River was constructed in Garden Street as a relief work scheme (Figure 189).[183] This pit is heritage listed (details in the following section) and is located over 100 metres to the west of the study area. The canal associated with the heritage items demarcates the north-western boundary of the study area.

The Sydenham Railway Station, located to the south-west of the study area, was built on the duplicated line from Illawarra Junction to Hurstville and opened in 1884.[184] The opening of the station preceded the development of small shopping centre in the vicinity. Today, Sydenham Station is an important junction station on the T4 Illawarra line, T2 Airport, Inner West and South Line and the T3 Bankstown Line.

[175] Cashman and Meader 1990, 40
[176] Cashman and Meader 1990, 40
[177] Cashman and Meader 1990, 88
[178] Cashman and Meader 1990, 88
[179] Cashman and Meader 1990, 42
[180] Meader ibid
[181] Meader ibid
[182] Meader ibid
[183] Meader 2008.
[184] Railcorp S170 register listing for the *Sydenham Railway Station group*, accessed via the State Heritage Inventory; http://www.environment.nsw.gov.au/heritageapp/ 4 June 2015.

Figure 188: 'The Inundations at Marrickville: Rescuing the Homeless'. Source: The Illustrated Sydney News, 6 June 1889: 14

Figure 189: Construction of the Garden Street stormwater pit, taken on the 26 July 1935. SLNSW S. Hood Home and Away series.

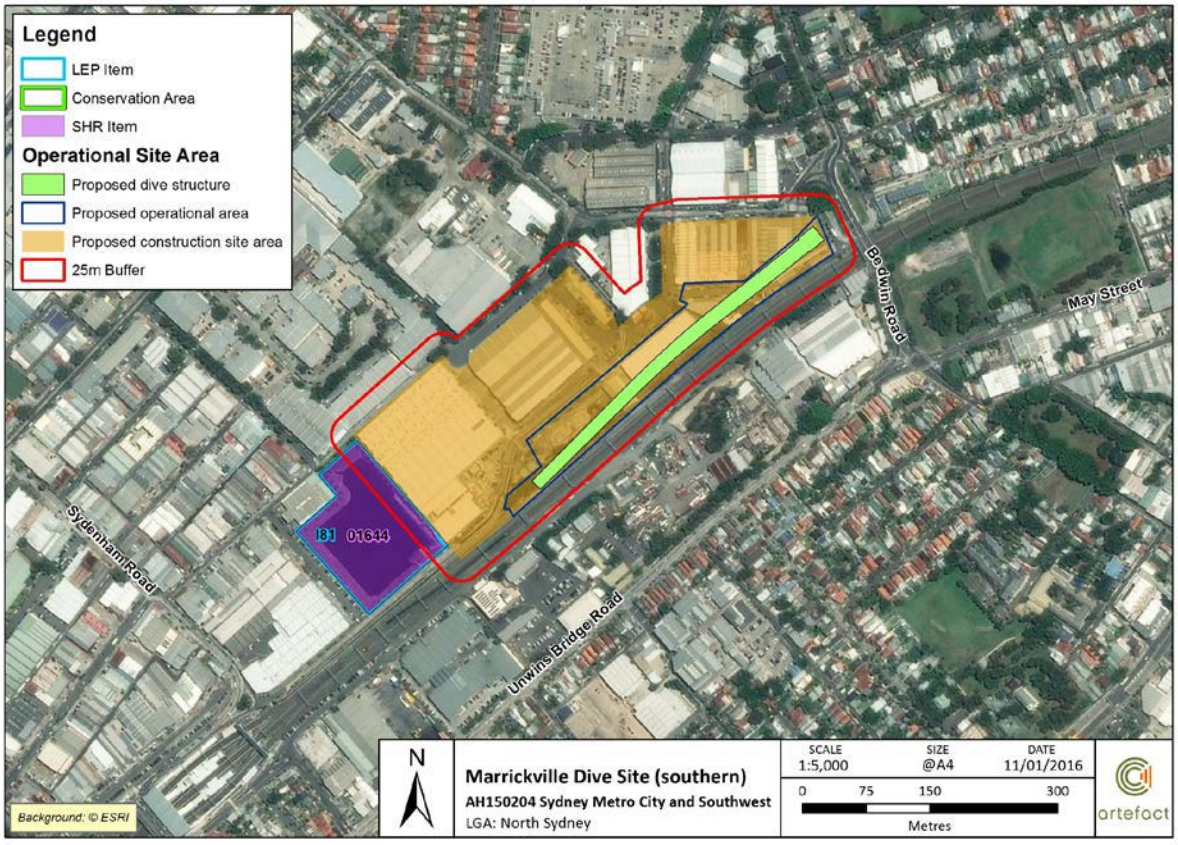
6.12.2 Heritage listed items

The heritage items listed in Table 114 and illustrated in Figure 190 are located within the study area and buffer zone.

Table 114: Overview of heritage items in the study area for the Marrickville dive site (southern)

Heritage item	Register listings	Significance	Relationship to study area
Sydenham Pit and Drainage Pumping Station 1	State Heritage Register no. 1644 Sydney Water S170 Marrickville LEP 2011	State	Within buffer zone

Figure 190: Heritage listed items within the study area for the Marrickville dive site (southern)



6.12.3 Detailed heritage impact assessments

Heritage impact assessments for heritage items potentially affected by the Marrickville dive site (southern) are provided below.

Table 115: Sydenham Pit and Drainage Pumping Station 1 heritage impact assessment

Sydenham Pit and Drainage Pumping Station 1[185]	
Image	**Figure 191: Sydenham Pit and Drainage Pumping Station. Artefact Heritage 2015.** 
Significance	State
Description	Constructed between 1935 and 1941, the Sydenham Storage Pit and Pumping Station consists of two distinct parts: the pit and pumping station. The pit consists of a nine metre deep basin with the sides formed into batters. The pumping station is constructed of reinforced concrete and consists of a series of fins that rise 12 metres from the base of the pit to support the pump house that has its floor level about 1.8 metres above Railway Parade. Sections of the southern and western pit walls collapsed following heavy rains and were rebuilt in the 1950's. In 1968 a concrete floor and a silt pit were installed to the base of the pit.
Statement of significance	The Sydenham Pit and Pumping Station are of historic, aesthetic and technical significance. Historically, it is the first such infrastructure built in the SWC system and is an intact and major component of the Marrickville low level stormwater drainage infrastructure that was built in response to increasing urban expansion since the 1870s in an area prone to flooding. Its large scale and labour intensive construction method of excavating the pit reflects the abundance of labour during the Great Depression and the type of public works undertaken to provide relief work for the unemployed. Aesthetically, the use of pitched dry packed ashlar sandstone walls to line the sides of the pit provides a pleasantly textured and coloured finish to the pit. It is a major landmark and dramatic component of the industrial landscape of Sydenham particularly as viewed from the railway. The pumping station is a very good example of a utilitarian building displaying Inter-War Mediterranean style architectural details. Technically, the pumping plant contains good working examples of 1930s pumps, particularly three Metropolitan Vickers pumps, and its original electrical mains equipment has been preserved in situ during upgrading in c1992
Impact type	Indirect impact: Views and vistas
Heritage impact assessment	Impacts to views and vistas would be minor, resulting from the establishment of the construction site in the adjacent property and excavation of the tunnel portal about 75 metres to the north-east of the heritage item. These visual impacts are likely to be temporary, as on completion of construction the operational project elements would be located mostly below ground level. **Indirect impact: Minor**

[185] Statement of significance extracted from State Heritage Register inventory sheet "Sydenham Pit and Drainage Pumping Station" last accessed via http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5053883 on 22/10/2015.

6.12.4 Archaeological assessment

6.12.4.1 Site inspection results

The Marrickville dive site is located across a built environment on a generally flat landform. One artificial drainage canal was observed from Sydney Steel Road, as well as the large Sydenham Drainage Pit and Pumping Station off the southeastern end of Saywell Street.

Figure 192: View southwest of Murray Street showing canal

Figure 193: View south across Sydenham Drainage Pit and Pumping Station

6.12.4.2 Known impacts

Subsurface impacts associated with former or current land uses have the potential to remove or damage potential archaeological remains. Previous impacts within the site need to be further understood and identified before more than a preliminary assessment of archaeological impact can be made. Based on the initial literature review and site inspection undertaken as part of this assessment, the following preliminary assumptions regarding archaeology at the site can be made:

- Construction of the existing warehouse buildings is likely to have resulted in some impact, although structures of this type are typically 'light-weight,' and impacts tend to be limited to ground levelling and isolated excavation for the introduction of strip foundations and piles.
- The surrounding area was utilised intensively in the production of bricks throughout the late 19th and early 20th centuries. It is therefore possible that the study area may have been subject to excavation for the extraction of clay.
- Railway Parade originally passed through the study area. The construction of this road may have required localised levelling or surfacing, that may have resulted in impact to earlier remains.

6.12.4.3 Discussion of archaeological potential

Analysis of early plans does not provide evidence of earlier structures within the study area. Thomas Moore owned large amounts of land in the vicinity, and it is unlikely that he had a residence in this location or used the land for more than the grazing of stock during the early 19th century (Figure 194).

It is apparent, however, that the area did contain large residential estates from an early date. During the 1830s and 1840s the outer lying suburbs of Newtown, St Peters, Tempe and Petersham became desirable locations for the construction of rural retreats, due to increasing land prices in the city.[186] The possibility that the site contains archaeology dating to the mid-19th century or later, therefore, cannot be entirely discounted.

Traditionally industrial areas within Sydney and the inner suburbs tended to develop quickly, and be subject to rapid modification as the development of technologies required different infrastructure. The location of the study area immediately north-east of an earlier water source suggests that it may have been an attractive location for early brick makers. Analysis of the 1943 aerial of Sydney indicates that

[186] Cashman and Meader 1990: 108.

numerous potential clay pits are located in the area, including one to the south-east of the study area (most likely associated with the Sydney Brickworks). It is possible that the construction of the Sydenham Pit and Pumping Station may have utilised one of these earlier brickmaking pits (Figure 196). It can be assumed, due to the substantial ground disturbance, that if a late 19th, or early 20th century brickmaking pit was located within the study area, that any archaeological remains associated with earlier phases of development are likely to have been impacted or removed.

An undated Parish Plan (post-dating 1935) indicates that Railway Parade originally passed through the study area, adjacent to the railway line (Figure 195). By the 1943 aerial the street terminates at the western extent of the study area.

Figure 194: Undated plan of the Parish of Petersham, showing Thomas Moore's grant of 470 acres. The study area was located within this grant. NSW Lands & Property Information.

Figure 195: Undated plan of the Parish of Petersham, showing the continuation of Railway Parade through the eastern portion of the study area.

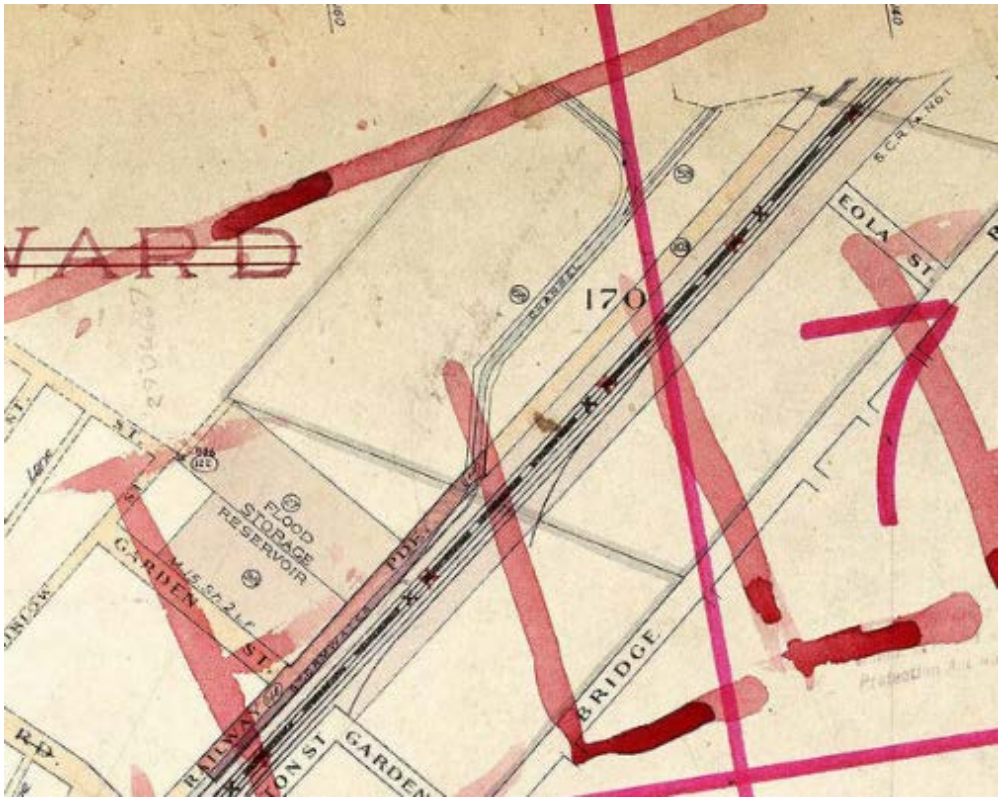


Figure 196: Clay extraction pit for brick making on the south-eastern side of the railway line, opposite the study area, that is vacant in this 1943 aerial. NSW Lands and Property Information, SIX Maps.

6.12.4.4 Assessment of significance

The following is a preliminary assessment of significance, against the NSW Heritage Criteria for Assessing Significance related to Archaeological Sites and 'Relics' (2009).

Archaeological research potential (NSW Heritage Criterion E):

- Archaeological remains associated with early residential and agricultural development of the study area may have some research potential dependant on the nature and extent of any remains.

Association with individuals, events, or groups of historical importance (NSW Heritage Criteria A, B & D):

- It is possible that evidence of early residential development of the study area may have associations with former residents and known local historical figures. Specific associations have not been identified at this stage.

Aesthetic or technical significance (NSW Heritage Criterion C):

- It is not possible at this stage to identify whether archaeological remains within the study area have potential to demonstrate aesthetic or technical values.

Ability to demonstrate the past through archaeological remains (NSW Heritage Criterion A, C, F & G):

- There is low to moderate potential, due to low intensity building that has occurred throughout the site, that the study area has the potential to demonstrate the past through archaeological remains.

Overall, archaeological remains associated with pre-1850 development of the Marrickville / Sydenham area, if found to be intact, are likely to have significance at a local level, and may require mitigation. Archaeological remains of late 19th and early 20th century brickworks are unlikely to reach the local significance threshold.

6.12.4.5 Overview archaeological potential

The study area has low to moderate potential to contain an archaeological resource with the potential to reach the local significance threshold, as outlined in Table 116.

Table 116: Summary of archaeological potential within study area

Potential archaeological resource	Potential	Significance	Heritage impact assessment
Evidence of early development of study area (Moore's grant) – evidence of land clearance and cultivation, water management, postholes associated with farm buildings and fencing.	Nil-low	Local	Excavation works within the study area have nil-low potential to impact on archaeological remains.
Evidence of 20th century brickmaking – clay extraction pits, postholes associated with buildings.	Low-moderate	Unlikely to reach local significance threshold	Excavation works within the study area have low-moderate potential to encounter evidence of brickmaking.

6.12.4.6 Archaeological impact assessment

Proposed works within the Marrickville dive site (southern) with the potential to impact on archaeological remains include:

- Excavation of the dive structure
- Any excavation works associated with the construction or establishment of the pre-cast factory shed, segment storage areas, staff amenities, site office, water treatment plants, workshops, dangerous good storage, grout batching plant, grout and concrete silos, staff parking and laydown areas.

Works with the potential to impact archaeological resources within the Marrickville dive site (southern), with the exception of the excavation for the construction of the dive structure, are likely to be limited to discrete locations. Therefore, works in this location are likely to have a minor impact on potential archaeological resources, dependant on the location and extent of the proposed excavation works.

6.12.5 Overview of constraints

Table 116 provides an overview of heritage constraints for the southern construction site. Generally, impacts to heritage items within the Marrickville dive site would arise from alterations to existing views and vistas, and the settings of these heritage items. Visual impacts are likely to be minor, as the majority of works would occur below the ground surface.

Any potential archaeological resources within the study area would be impacted by substantial excavation works associated with the dive structure and tunnel portal. Although any impacts to potential archaeological resources within the study area would be substantial, the archaeological assessment did not identify any significant archaeological resources within the study area.

Table 117: Overview of heritage constraints.

Heritage item	Potential heritage impacts		
	Direct impact	**Archaeological impact**	**Indirect impact**
Sydenham Pit and Drainage Pumping Station	Neutral	Neutral	Minor: Views and vistas
Potential archaeological resource within the study area	N/A	Minor impact - Nil – low potential to impact on archaeological remains of local significance.	N/A

6.13 Sydney Harbour crossing – ground improvement

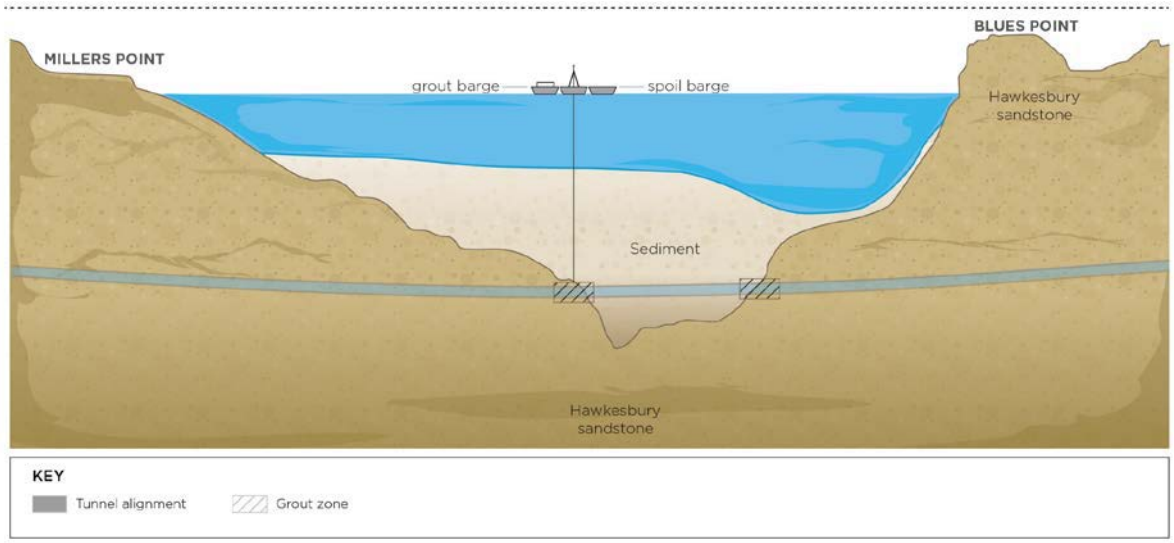
6.13.1 Scope of works

Due to the expected ground conditions, ground improvement works may be required at specific locations underneath Sydney Harbour. Ground improvement works may be required at the rock-sediment transition zones (Figure 197) to reduce construction risks associated with tunnel boring machine work.

For the purposes of assessment, ground improvement works involve jet grouting which comprises the injection of a cement grout into the harbour bed from barges on the harbour. The grout would be delivered to the barges from an on-shore grout facility and would be injected from the barge via a crane and drilling lead.

Indicatively, ground improvement work could require the establishment of two cement grout blocks (each about 35 metres wide by 20 metres long by 16 metres deep) at the two points where the tunnel alignment passes through a rock-sediment transition zone.

Figure 197: Potential ground improvement scope



6.13.2 Discussion of Sydney Harbour archaeological context

The Heritage Division (OEH) is the agency responsible for the management of maritime archaeology and underwater cultural heritage in NSW. The Division administers both the Commonwealth's *Historic Shipwrecks Act 1976*, and the NSW *Heritage Act 1977*. The two acts, together with the Annexe to the UNESCO Convention on the Protection of the Underwater Cultural Heritage 2001 (endorsed by the Heritage Council of NSW as best practice in 2005), provide protection to maritime archaeology and underwater cultural heritage sites in NSW and adjacent waters.

No wrecks listed on the Australian National Shipwreck Database are located within the study area.

One propeller is listed on the OEH Maritime Heritage register. The following information is taken from the register listing:[187]

'The propeller was found during multi-beam survey by Port Authority of Sydney in October 2015. The propeller was covered in nets when found and lies to the NE of the 45 metre deep hole just off the edge of the shipping channel. More than half the propeller (including the boss) is buried beneath thick mud in 13.5 m of water. The relic has two blades exposed, suggesting it is a 4 bladed propeller. The blades are exposed for approximately 1.8-2 m out of the mud, suggesting the propeller is approximately 4-5 m in diameter.

It is possible, given the proximity of the propeller to the deep water hole, the propeller may have been dumped with the intention of it landing in deeper water.'

The propeller is located at GDA 94 MGA 56 334196E 6252919N, which is approximately 300 m east of the proposed Harbour Crossing location.

6.13.3 Documented shipwrecks in the local area

A number of vessels, are known to have been shipwrecked in the waters surrounding Dawes Point and Blues Point throughout the late 19th and early 20th centuries. These include:

- The *Three Bees* - 1814
- The *Sea Nymph* – 1882 (probably raised soon after)
- The *Birkenhead* – 1913 (possibly raised)
- A pinnace/launch from the HMAS Penguin – 1914
- A launch sunk of Dawes Point – 1915

Sydney Ports Corporation conducts Hydrographic survey of Sydney Harbour, providing detailed scans of the Harbour floor capable of detecting shipwrecks and smaller objects, such as the propeller discussed in Section 6.13.2. No items or evidence of the above listed shipwrecks has been identified within the Harbour Crossing easement.

6.14 Power supply routes

The majority of the power supply routes would be constructed by trenching within the road reserve. Where major roads are crossed by the route (such as Mowbray Road for the Chatswood dive site power supply), alternative construction methods would be used such as under boring in order to avoid impacts to the road network. Alternative construction methods such as under boring may also be used to avoid other constraints such as services or areas of environmental sensitivity.

Trenches are expected to be around one metre wide and 1.5 to two metres deep. It is therefore likely any subsurface archaeological remains existing to this depth below the road treatment and pavement would be impacted. Where previous disturbance, such as utilities installation, has occurred the archaeological potential would be low.

The following review includes only those listed items that may be impacted by the power supply route work. It is assumed that the power supply routes would be located within the road corridor.

Assessments of archaeological significance provided in Table 118 are preliminary and are based on assessments of station sites prepared for this project and the results of other investigations. More detailed consideration of impacts would be included in the relevant archaeological research designs for the project.

[187] Accessed 18 March 2016
http://www.environment.nsw.gov.au/maritimeheritageapp/ViewSiteDetail.aspx?siteid=2257

Table 118: Power supply routes – potential impacts on heritage items and archaeological remains

Description	Listing	Heritage significance	Heritage impact and magnitude
Chatswood			
Chatswood zone substation No.80 (Ausgrid)	Willoughby LEP Ausgrid s170	Local	• Impacts to fabric and visual impacts are expected to be minor.
Archaeological resources	N/A	Potentially Local	• Potential for locally significant archaeology in undisturbed sections of the road corridor.
Crows Nest and North Sydney			
Archaeological resources	N/A	Potentially Local. Evidence of early occupation and development of the locality.	• Potential for locally significant archaeology in undisturbed sections of the road corridor.
Millers Point to Darling Harbour			
Millers Point and Dawes Point Village Precinct	SHR	State	• Within conservation area. Impacts to fabric and visual impacts are likely to be temporary and minor.
Millers Point Conservation Area	SHR; Dept of Housing s.170; Sydney LEP LEP; RNE	State	• Within conservation area. Impacts to fabric and visual impacts are likely to be temporary and minor.

Description	Listing	Heritage significance	Heritage impact and magnitude
Archaeological resources	N/A	Potentially Local to State. Potential for evidence of former gas works, reclamation, Girard's flour Mill, former wharfs and industry and 1860s residential.	• Potential for locally significant and State significant archaeology in undisturbed sections of the road corridor.
King Street Wharf to Martin Place			
Tank Stream including tanks and tunnels	SHR Sydney Water s170	State	• The power supply route would cross the Tank Stream on Margaret Street near its intersection with George Street. The Tank Stream has a curtilage of three meters from the structure. Trenching may be up to two meters deep and therefore may encroach into the curtilage of the item. The Tank Stream Conservation Management Plan states that in this area the Tank Stream is generally around three to five meters below the current ground surface. Impacts within the curtilage of the Tank Stream would be avoided.
Richard Johnson Square including monument and plinth	Sydney LEP	Local	• Impacts to fabric and visual impacts are likely to be temporary and minor.
Bennelong Stormwater Channel	Sydney Water s170	Local	• The feeder line would cross the alignment of the Bennelong Stormwater Channel at Hunter, Bligh, Elizabeth, Philip and Macquarie Streets. Impacts within the curtilage of this item would be avoided.

Description	Listing	Heritage significance	Heritage impact and magnitude
Archaeological resources	N/A	Potentially Local to State. Potential evidence of early occupation and development of Sydney including drains, early road surfaces.	• Potential for locally significant and State significant archaeology in undisturbed sections of the road corridor.
Pitt Street to Surry Hills			
Archaeological resources	N/A	Potentially Local to State. Potential evidence of early occupation and development of Sydney including drains, early road surfaces.	• Potential for locally significant and State significant archaeology in undisturbed sections of the road corridor.
Pyrmont to Pitt Street			
Former Pyrmont Power Station Administrative building (42 Pyrmont Street) including interiors	City of Sydney LEP	Local	• Impacts to fabric and visual impacts are expected to be minor.
Archaeological resources	N/A	Potentially Local to State. Potential evidence of early occupation and development of Sydney including drains, early road surfaces.	• Potential for locally significant and State significant archaeology in undisturbed sections of the road corridor. • Sections of the feeder route around Pyrmont are reclaimed land and would have low archaeological potential. • Market Street alignment has not changed since the 1810s so there is some potential for intact early remains.

7.0 MITIGATION AND MANAGEMENT MEASURES

7.1 Site specific mitigation measures

Mitigation measures identified in other technical papers and other chapters of the Environmental Impact Statement that are relevant to the management of potential heritage impacts include:

- Chapter 10 (Construction noise and vibration) with respect to management of potential vibration impacts (Technical paper 2 – Noise and vibration)
- Chapter 16 (Landscape character and visual amenity) with respect to management of potential visual impacts during construction and operation (Technical paper 6 – Landscape character and visual amenity).

The mitigation measures that would be implemented to address potential impacts on non-Aboriginal heritage sites and areas of archaeological potential are listed in Table 119.

The location(s) applicable to each mitigation measure are identified by using a unique identifier as follows:

- STW – Surface track works
- CDS – Chatswood dive site
- AS – Artarmon substation
- CN – Crows Nest Station
- VC – Victoria Cross Station
- BP – Blues Point temporary site
- GI – Ground improvement works
- BN – Barangaroo Station
- MP – Martin Place Station
- PS – Pitt Street Station
- CS – Central Station
- WS – Waterloo Station
- MDS – Marrickville dive site
- Metro rail tunnels – Metro rail tunnels not related to other sites (eg TBM works)
- PSR – Power supply routes.

Table 119: Overview of non-Aboriginal heritage mitigation measures.

ID	Mitigation measure	Applicable location (s)[1]
NAH1	Archival recording and reporting of the following heritage items would be carried out in accordance with the NSW Heritage Office's *How to Prepare Archival Records of Heritage Items* (1998), and *Photographic Recording of Heritage Items Using Film or Digital Capture* (2006): • The internal heritage fabric and any non-original elements removed from within the curtilage of Mowbray House, Chatswood • The interior, exterior and setting of the shop at 187 Miller Street, North Sydney • The fabric and setting of the North Sydney bus shelters requiring removal and temporary relocation at Victoria Cross Station and Blues Point temporary site • Any component of the Blues Point Waterfront Group and the McMahons Point South heritage conservation area to be directly affected or altered, including vegetation and significant landscape features • Hickson Road wall in the vicinity of proposed ventilation risers and skylights for Barangaroo Station • The interior, exterior and setting of the 'Flat Building' at 7 Elizabeth Street, Sydney • Martin Place, between Elizabeth and Castlereagh streets, Sydney • The heritage fabric of areas of the existing Martin Place Station affected by the project • The Rolling Stock Officers Garden, Rolling Stock Officers Building and Cleaners Amenities Building in Sydney Yard and any other component of the Sydney Terminal and Central Railway Stations group to be removed or altered.	CDS, VC, BP, MP, CS
NAH2	An archaeological research designs would be prepared and implemented to identify the need for archaeological testing or monitoring. Archaeological mitigation measures recommended in the archaeological research design would be carried out in accordance with Heritage Council guidelines, and where identified in the archaeological research design, would be supervised by a suitably qualified Excavation Director with experience in managing State significant archaeology.	CDS, CN, VC, BP, BN, MP, PS, CS, WS, PSR
NAH3	An *Exhumation Policy and Guideline* would be prepared and implemented. It would be developed in accordance with the *Guidelines for Management of Human Skeletal Remains* (NSW Heritage Office, 1998b).	All except metro rail tunnels
NAH4	The method for the demolition of existing buildings and / or structures at Chatswood dive site, Victoria Cross Station, Martin Place Station, Pitt Street Station, Central Station and Waterloo Station would be developed to minimise direct and indirect impacts to adjacent and / or adjoining heritage items.	CDS, VC, MP, PS, CS, WS

ID	Mitigation measure	Applicable location (s)[1]
NAH5	Prior to total or partial demolition of heritage items at Victoria Cross and Martin Place stations, heritage fabric for salvage would be identified and reuse opportunities for salvaged fabric considered. This would include salvage and reuse of heritage tiles to be impacted at Martin Place Station.	VC, MP
NAH6	An appropriately qualified and experienced heritage architect would form part of the Sydney Metro Design Review Panel and would provide independent review periodically throughout detailed design.	All
NAH7	The project design would be sympathetic to heritage items and, where reasonable and feasible, minimise impacts to the setting of heritage items. The detailed design for Martin Place Station and Central Station would be developed with input from a heritage architect.	STW, CDS, CN, VC, BN, MP, PS, CS, WS, MDS
NAH8	Appropriate heritage interpretation would be incorporated into the design for the project in accordance with the *NSW Heritage Manual*, the NSW Heritage Office's *Interpreting Heritage Places and Items: Guidelines* (August 2005), and the NSW Heritage Council's *Heritage Interpretation Policy*.	CDS, CN, VC, BP, BN, MP, PS, WS
NAH9	A Central Station heritage interpretation plan would be developed and implemented , consistent with the *Central Station Conservation Management Plan* (Rappoport and Government Architects Office, 2013) and in accordance with the guidelines identified in NAH8.	CS
NAH10	The design of the Sydney Yard Access Bridge would be sympathetic to surrounding heritage items and minimise impacts to sight lines, views and setting of surrounding heritage items, including to Mortuary Station and the Sydney Terminal and Central Railway Stations group. As a minimum the design would: • Incorporate materials and finishes sympathetic to the heritage context of the railway station • Minimise height and bulk of the structure.	CS
NAH11	Except for heritage significant elements affected by the project, direct impact on other heritage significant elements forming part of the following items would be avoided: • The Blues Point Waterfront Group (including the former tram turning circle, stone retaining wall, bollards and steps) • The Millers Point and Dawes Point Village Precinct • The existing Martin Place Station • Sydney Terminal and Central Railway Stations group • Sydney Yard (including the Shunters Hut and Prince Alfred Sewer).	BP, BN, MP, CS
NAH12	Power supply works would be designed and constructed to avoid impacts to the Tank Stream and Bennelong Stormwater Channel.	PSR

ID	Mitigation measure	Applicable location (s)[1]
NAH13	The design and detailed construction planning of work at Central Station would consider the requirements of the *Central Station Conservation Management Plan* (Rappoport and Government Architects Office, 2013) and include consideration of opportunities for the retention, conservation and / or reuse of original and significant heritage fabric. Consultation would be carried out with Sydney Trains and the Heritage Council of NSW during design development.	CS

1 STW: Surface track works; CDS: Chatswood dive site; AS: Artarmon substation; CN: Crows Nest Station; VC: Victoria Cross Station; BP: Blues Point temporary site; GI: Ground improvement works; BN: Barangaroo Station; MP: Martin Place Station; PS: Pitt Street Station; CS: Central Station; WS: Waterloo Station; MDS: Marrickville dive site; Metro rail tunnels: Metro rail tunnels not related to other sites (eg TBM works); PSR: Power supply routes.

7.2 Non-Aboriginal heritage archaeological research design

7.2.1 Archaeological research design

Where an archaeological research design is required, it would be prepared based on research information included in Technical Paper 4 (Non-Aboriginal heritage) and would be supplemented by additional detailed historical research of each site, with reference to the project design and proposed construction methods at each site. Based on the detailed literature review, the archaeological research designs would identify the need for, and provide a detailed methodology for undertaking:

- Archaeological test excavation or test and salvage excavation
- Archaeological monitoring.

7.2.2 Test excavation

Test excavation would not be undertaken prior to the preparation of an archaeological research design. For this project, it is likely that the archaeological research designs would recommend test excavation:

- In areas where access for excavation activities is not restricted by buildings or other structures, and
- Where additional information regarding the nature of subsurface deposits generated through test excavation could inform the assessment of archaeological potential and / or significance at that site.

Archaeological excavation can be undertaken prior to project approval as per the requirements of the Secretary's Environmental Assessment Requirements on the condition that archaeological relics are not removed.

7.2.3 Test and salvage excavation

Test and salvage excavation would not be undertaken prior to the preparation of an archaeological research design. For this project, it is likely that the archaeological research designs would recommend test and salvage:

- Where detailed archival research and understanding of modern disturbance (such as basement information) needs to be supplemented with more site-specific (on-ground) information to better define the archaeological potential and / or significance of the site
- In areas where access for excavation activities is not restricted by buildings or other structures.

Test and salvage excavation would generally be recommended in areas where there is a moderate to high potential for relics of local or state significance to be present. It would involve locating and recording any relics found prior to their removal by construction. Test and salvage excavation could only be undertaken after project approval.

7.2.4 Archaeological monitoring

Archaeological monitoring involves the monitoring of construction phase excavation activities by a qualified archaeologist who would record any significant remains uncovered by excavation. Based on additional detailed historical research, the archaeological research design (see above) may identify areas where archaeological monitoring would be required. Examples of where archaeological monitoring may be required include:

- Low impact construction activities (such as narrow trenching) in areas of moderate to high potential for local or state significant relics
- Areas with low potential to contain remains of state significance.

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