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West

Major civil construction between The Bays and Sydney CBD

Environmental Impact Statement 2021

Technical Paper 4

Aboriginal cultural heritage assessment report

Sydney Metro West - Major civil construction work between The Bays and Sydney CBD

Technical Paper 4: Aboriginal Cultural Heritage Assessment Report

Inner West and Sydney Local Government Areas

Report to Sydney Metro

October 2021

artefact

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EXECUTIVE SUMMARY

Sydney Metro West

Sydney Metro West will double rail capacity between Greater Parramatta and the Sydney CBD, transforming Sydney for generations to come. The delivery of Sydney Metro West is critical to keeping Sydney moving and is identified in a number of key strategic planning documents including the *Greater Sydney Region Plan: A Metropolis of Three Cities – connecting people* (Greater Sydney Commission, 2018a).

The once-in-a-century infrastructure investment will have a target travel time of about 20 minutes between Parramatta and the Sydney CBD, link new communities to rail services and support employment growth and housing supply.

Stations have been confirmed at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont and Hunter Street (Sydney CBD).

The planning process for Sydney Metro West is being assessed as a staged infrastructure application under section 5.20 of the *Environment Planning and Assessment Act 1979* .

The Sydney Metro West Concept and major civil construction work for Sydney Metro West between Westmead and The Bays (Stage 1 of the planning approval process for Sydney Metro West), application number SSI-10038, were approved on 11 March 2021.

The Concept is described in Chapter 6 of the *Sydney Metro West Environmental Impact Statement – Westmead to The Bays and Sydney CBD* (Sydney Metro, 2020a) and includes:

- Construction and operation of new passenger rail infrastructure between Westmead and the central business district of Sydney, including:
    - Tunnels, stations (including surrounding areas) and associated rail facilities
    - Stabling and maintenance facilities (including associated underground and overground connections to tunnels)
- Modification of existing rail infrastructure (including stations and surrounding areas)
- Ancillary development.

Major civil construction work for Sydney Metro West between Westmead and The Bays (Stage 1 of the planning approval process) is described in Chapter 9 of the *Sydney Metro West Environmental Impact Statement – Westmead to The Bays and Sydney CBD* (Sydney Metro, 2020a) and includes:

- Tunnel excavation including tunnel support activities between Westmead and The Bays
- Station excavation for new metro stations at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock and The Bays
- Shaft excavation for services facilities
- Civil work for the stabling and maintenance facility at Clyde.

Stage 2 of the planning approval process (this proposal) includes all major civil construction work including station excavation and tunnelling between The Bays and Sydney CBD.

Future planning applications for Sydney Metro West will include tunnel fit-out, construction of stations, ancillary facilities and station precincts, and operation and maintenance of the Sydney Metro West line, between Westmead and Sydney CBD.

Overview of the proposal

The proposed major civil construction work between The Bays and Sydney CBD would include:

- Enabling work such as demolition, utility supply to construction sites, utility adjustments, and modifications to the existing transport network
- Tunnel excavation including tunnel support activities
- Station excavation for new metro stations at Pyrmont and at Hunter Street, in the Sydney CBD.

Components of this proposal are subject to further design, and changes may be made during the ongoing design which take into account the outcomes of community and stakeholder engagement and environmental field investigations.

The surface construction work at station and shaft excavation sites are intended to occur across a period of about three years.

The proposal is further described in Chapter 5 (Project description) of the Environmental Impact Statement.

The *Sydney Metro West Environmental Impact Statement – Westmead to The Bays and Sydney CBD* (Sydney Metro, 2020a) assessed the impacts of The Bays Station construction site to:

- Carry out the excavation of The Bays Station
- Launch and support two tunnel boring machines for the drive west to the Sydney Olympic Park metro station construction site.

The Bays Station construction site is being established under the Sydney Metro West Concept and Stage 1 planning approval.

The Bays tunnel launch and support site in this proposal would be located within a part of The Bays Station construction site. This Technical Paper assesses the proposed use of the eastern and southern part of The Bays Station construction site to launch and support two tunnel boring machines for the drive east to the Hunter Street Station (Sydney CBD) construction sites. There would be minimal surface ground disturbance associated with this work.

As impacts to Aboriginal heritage sites associated with The Bays Station construction site are assessed in *Sydney Metro West Environmental Impact Statement – Westmead to The Bays and Sydney CBD* (Sydney Metro, 2020a), no further Aboriginal heritage or archaeological assessment of this construction site is required as part of this Technical Paper. Further assessment required for these Aboriginal heritage sites would be carried out under the Stage 1 of the planning approval process.

Purpose and scope of this Technical Paper

This report, Technical Paper 4: Aboriginal Cultural Heritage Assessment, is one of a number of Technical Papers that form part of the Environmental Impact Statement for major civil construction work between The Bays and Sydney CBD. The purpose of this Technical Paper is to identify and assess the potential impacts of the proposal in relation to Aboriginal cultural heritage. It responds directly to the Secretary's Environmental Assessment Requirements outlined in Section 1.3.1.

The objectives of this Technical Paper include:

- To provide the statutory framework for this heritage assessment
- To assess the Aboriginal archaeological potential of the construction sites through desktop research and archaeological survey
- To consult with registered Aboriginal parties (RAPs) in accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010[1]
- To assess the Aboriginal cultural heritage significance of the proposal and identify any specific areas of cultural significance
- To assess the impact of the proposal on Aboriginal archaeological sites and cultural heritage significance
- To assess the vibration and settlement impacts to known Aboriginal sites in the vicinity of the tunnel alignment, including the portion of the tunnel alignment which would be located at The Bays
- To provide archaeological and heritage management and mitigation measures where required.

This Technical Paper has been carried out in accordance with the following guidelines:

- Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010[2]
- Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW[3]
- Aboriginal cultural heritage consultation requirements for proponents 2010[4]
- The Burra Charter 2013[5]
- NSW Skeletal Remains: Guidelines for Management of Human Remains[6].

[1]Department of Environment, Climate Change, and Water 2010b
[2] Department of Environment Climate Change & Water [DECCW] 2010a
[3] Office of Environment & Heritage 2011
[4] DECCW 2010b
[5] Australia ICOMOS 2013.
[6] Heritage Office 1998

Mitigation measures

The measures detailed in the mitigation measures table are proposed to address potential impacts on Aboriginal heritage sites and areas of archaeological potential during construction. They were developed following consideration of:

- Processes for Aboriginal heritage assessment consistent with the *National Parks and Wildlife Act 1974* as amended, including compliance with Part 8A of the National Parks and Wildlife Regulation 2009
- The results of the desktop assessment, archaeological survey and assessment of archaeological potential, significance (both archaeological and cultural), and impact.

The proposed Aboriginal heritage mitigation measures for the proposal are provided in Table A.

Table A: Aboriginal heritage mitigation measures

Ref	Mitigation measure	Applicable site
AH1	Aboriginal stakeholder consultation for this proposal should continue, following on from major construction work between Westmead and The Bays (Stage 1 of the planning approval process for Sydney Metro West) in accordance with the NSW Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*.	All
AH2	If suspected human skeletal remains are uncovered at any time during the proposed work, procedures outlined in the Sydney Metro Exhumation Management Plan and the Sydney Metro Unexpected Heritage Finds Procedure Heritage Management Plan unexpected finds procedure would be implemented.	All
AH3	If unexpected Aboriginal objects are identified during construction work, the Sydney Metro Unexpected Finds Procedure w would be implemented.	All
AH4	In recognition of potential impacts to the Aboriginal cultural values of the project area, the line-wide Heritage Interpretation Strategy for Sydney Metro West would address Aboriginal cultural values and be prepared in consultation with the local Aboriginal community, knowledge holders and with reference to the Connecting with Country framework.	All
AH5	As the Hunter Street Station (Sydney CBD) western construction site has been assessed as having the potential for intact deposits, a stage specific Archaeological Method Statement would be prepared prior to works commencing. The Archaeological Method Statement would adhere to the archaeological management measures for Method Area 2 as outlined in Technical Paper 4 (Aboriginal Cultural Heritage Assessment Report).	Hunter Street Station (Sydney CBD) western construction site

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TABLES

1.0 INTRODUCTION

1.1 Sydney Metro West

Sydney Metro will double rail capacity between Greater Parramatta and the Sydney CBD, transforming Sydney for generations to come. The delivery of Sydney Metro West is critical to keeping Sydney moving and is identified in a number of key strategic planning documents including the *Greater Sydney Region Plan: A Metropolis of Three Cities – connecting people* (Greater Sydney Commission, 2018a).

The once-in-a-century infrastructure investment will have a target travel time of about 20 minutes between Parramatta and the Sydney CBD, link new communities to rail services and support employment growth and housing supply.

Stations have been confirmed at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont and Hunter Street (Sydney CBD). The main elements of Sydney Metro West are shown in Figure 1.

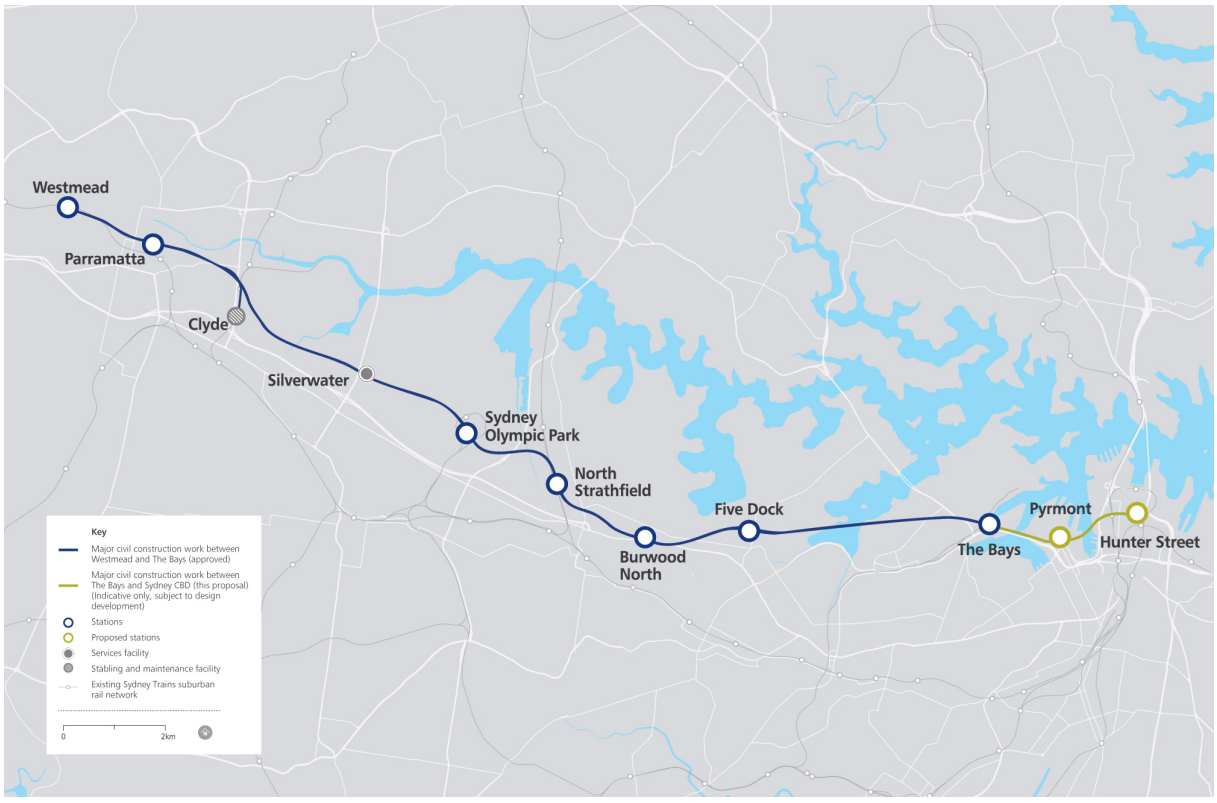


Figure 1: Sydney Metro West

The planning process for Sydney Metro West is being assessed as a staged infrastructure application under section 5.20 of the *Environment Planning and Assessment Act 1979*.

The Sydney Metro West Concept and major civil construction work for Sydney Metro West between Westmead and The Bays (Stage 1 of the planning approval process for Sydney Metro West), application number SSI-10038, were approved on 11 March 2021.

The Concept is described in Chapter 6 of the *Sydney Metro West Environmental Impact Statement – Westmead to The Bays and Sydney CBD* (Sydney Metro, 2020a) and includes:

- Construction and operation of new passenger rail infrastructure between Westmead and Sydney CBD, including:
  - Tunnels, stations (including surrounding areas) and associated rail facilities
  - Stabling and maintenance facilities (including associated underground and overground connections to tunnels)
- Modification of existing rail infrastructure (including stations and surrounding areas)
- Ancillary development.

Major civil construction work for Sydney Metro West between Westmead and The Bays (Stage 1 of the planning approval process) is described in Chapter 9 of the *Sydney Metro West Environmental Impact Statement – Westmead to The Bays and Sydney CBD* (Sydney Metro, 2020a) and includes:

- Tunnel excavation including tunnel support activities between Westmead and The Bays
- Station excavation for new metro stations at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock and The Bays
- Shaft excavation for services facilities
- Civil work for the stabling and maintenance facility at Clyde.

Stage 2 of the planning approval process (this proposal) includes all major civil construction work including station excavation and tunnelling between The Bays and Sydney CBD.

Future planning applications for Sydney Metro West will include tunnel fit-out, construction of stations, ancillary facilities and station precincts, and operation and maintenance of the Sydney Metro West line, between Westmead and Sydney CBD. The associated potential impacts are being assessed and will be presented within the Environmental Impact Statement currently being prepared for 'Sydney Metro West - Rail infrastructure, stations, precincts and operations' (Stage 3 of the planning approval process for Sydney Metro West). Sydney Metro West - Rail infrastructure, stations, precincts and operations have been assessed in this assessment only in relation to potential cumulative impacts with this proposal, where relevant.

1.2 Overview of the proposal

This proposal would be located largely underground in twin tunnels. Indicative locations of the proposed alignment and stations are shown in Figure 2.

Figure 2: Overview of Sydney Metro West between The Bays and Sydney CBD

The proposed major civil construction work between The Bays and Sydney CBD would include:

- Enabling work such as demolition, utility supply to construction sites, utility adjustments, and modifications to the existing transport network
- Tunnel excavation including tunnel support activities
- Station excavation for new metro stations at Pyrmont and at Hunter Street, in the Sydney CBD.

Components of this proposal are subject to further design, and changes may be made during the ongoing design which take into account the outcomes of community and stakeholder engagement and environmental field investigations.

The surface construction work at station and shaft excavation sites are intended to occur across a period of about three years.

The proposal is further described in Chapter 5 (Project description) of the Environmental Impact Statement.

The *Sydney Metro West Environmental Impact Statement – Westmead to The Bays and Sydney CBD* (Sydney Metro, 2020a) assessed the impacts of The Bays Station construction site to:

- Carry out the excavation of The Bays Station
- Launch and support two tunnel boring machines for the drive west to the Sydney Olympic Park metro station construction site.

The Bays Station construction site is being established under the existing Sydney Metro West Concept and Stage 1 planning approval.

The Bays tunnel launch and support site in this proposal would be located within a part of The Bays Station construction site. This Technical Paper assesses the proposed use of the eastern and southern part of The Bays Station construction site to launch and support two tunnel boring machines for the drive east to the Hunter Street Station (Sydney CBD) construction sites. There would be minimal surface ground disturbance associated with this work.

1.3 Purpose and scope of this Technical Paper

This report, Technical Paper 4: Aboriginal Cultural Heritage Assessment, is one of a number of Technical Papers that form part of the Environmental Impact Statement for major civil construction work between The Bays and Sydney CBD. The purpose of this Technical Paper is to identify and assess the potential impacts of the proposal in relation to Aboriginal cultural heritage. It responds directly to the Secretary's Environmental Assessment Requirements outlined in Section 1.3.1.

The objectives of this Technical Paper include:

- To provide the statutory framework for this heritage assessment
- To assess the Aboriginal archaeological potential of the construction sites through desktop research and archaeological survey
- To consult with RAPs in accordance with the relevant guidelines (refer to Section 2.2.1)
- To assess the Aboriginal cultural heritage significance of the study area and identify any specific areas of cultural significance
- To assess the impact of the proposed work on Aboriginal archaeological sites and Aboriginal cultural heritage significance
- To assess the vibration and settlement impacts to known Aboriginal sites in the vicinity of the tunnel alignment, including the portion of the tunnel alignment which would be located at The Bays
- To provide for archaeological and heritage management and mitigation measures where required.

The study area that forms the geographic scope of this assessment is comprised of the proposed construction sites and tunnel alignment, as described in Section 3.2.

1.3.1 Secretary's Environmental Assessment Requirements

The Secretary's Environmental Assessment Requirements were issued for the proposal on 7 July 2021. The requirements specific to Aboriginal heritage, and where these requirements are addressed in this Technical Paper, are outlined in Table 1.

In support of seeking the Secretary's Environmental Assessment Requirements, the *Sydney Metro West Scoping Report – Major civil construction work between The Bays and Sydney CBD* (Sydney Metro, 2021) identified a number of investigations and further assessments relevant to this Technical Paper. How the Technical Paper addresses these matters is provided in Table 2.

Table 1: Secretary's Environmental Assessment Requirements – Aboriginal heritage

Secretary's Environmental Assessment Requirements	Where addressed
4. Aboriginal heritage	
1 Direct and/or indirect impacts to the **heritage significance** of:	
a) Aboriginal places, objects and cultural heritage values, as defined under the *National Parks and Wildlife Act 1974* and in accordance with the principles and methods of assessment identified in the current guidelines;	Section 10.0
b) Aboriginal places of heritage significance, as defined in the Standard Instrument – Principal Local Environmental Plan	Section 2.3.1
4. Where archaeological investigations are proposed these must be conducted by a suitably qualified archaeologist, in accordance with section 1.6 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010).	Section 12.3
5. Where impacts to Aboriginal objects and/or places are proposed, consultation must be undertaken with Aboriginal people in accordance with the current guidelines.	Section 5.0

Table 2: Investigations and further assessments identified in the Scoping Report – Aboriginal heritage

Scoping report requirements	Where addressed
Aboriginal heritage assessment	
Identify the potential for this proposal to cause direct or indirect impacts to Aboriginal heritage (sites, objects, remains, values, features, intangible values or places), including the potential for cumulative impacts, and, where this is the case, to:	
a) Determine, in consultation with relevant stakeholders, including the Registered Aboriginal Parties, the significance of the heritage resources to the Aboriginal community	Section 9.0
b) Determine the extent and significance of impact to those values	Section 10.0
Identify any requirements for in-situ conservation of items and/or areas (as appropriate), and the need for further archaeological testing and/or detailed archaeological excavations	Section 12.0

Scoping report requirements	Where addressed
Aboriginal heritage assessment	
Identify appropriate measures to avoid, minimise and/or mitigate potential impacts. Such measures would be developed as appropriate to the assessment of significance and potential impact, and may include:	
c) Consultation with the relevant Aboriginal stakeholders, including the Metropolitan Local Aboriginal Land Council, in accordance with *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (Department of Environment, Climate Change and Water, 2010)	Section 12.0
d) Archaeological test excavation	
e) Preparation and implementation of an Aboriginal heritage management plan as part of the construction environmental management plan.	

1.4 Structure of this Technical Paper

The structure of this Technical Paper is outlined below:

- Chapter 1 introduces the proposal
- Chapter 2 presents relevant legislative and policy context to this proposal
- Chapter 3 documents the assessment methodology for this assessment
- Chapter 4 provides a description of this proposal
- Chapter 5 details the Aboriginal community consultation that has been conducted as part of this assessment
- Chapter 6 details the environmental context of the study area as relevant to Aboriginal heritage
- Chapter 7 outlines the Aboriginal heritage archaeological context of the study area
- Chapter 8 provides an overview of the specific environmental and archaeological context for each construction site and details the results of site inspections
- Chapter 9 presents a significance assessment for the archaeological potential of each construction site
- Chapter 10 summarises how the proposal would avoid or minimise harm to identified Aboriginal cultural heritage values
- Chapter 11 provides a cumulative impact assessment
- Chapter 12 identifies mitigation and management measures
- Chapter 13 provides a conclusion for this assessment.

1.5 Authors

This report was prepared by Alyce Haast (Senior Heritage Consultant) and Isabel Wheeler (Heritage Consultant). Management input and review was provided by Duncan Jones (Principal) and Dr Sandra Wallace (Director).

The qualifications of the heritage consultants involved in the production of the report is included in Table 3.

Table 3: Qualifications of document authors

Name	Qualification	Years' Experience
Alyce Haast	Master of Professional Archaeology BSc Archaeology	6 years
Isabel Wheeler	B Archaeology (Hons)	2 years
Duncan Jones	BA Prehistoric and Historic Archaeology (Hons)	13 years
Sandra Wallace	PhD Archaeology BA Prehistoric and Historic Archaeology (Hons)	17 years

2.0 LEGISLATIVE CONTEXT

The legislative and policy context in the *Sydney Metro West Environmental Impact Statement – Westmead to The Bays and Sydney CBD*[7] would broadly apply to the Aboriginal heritage assessment for the major civil construction work between The Bays and Sydney CBD. The legislation, policy and guidelines that are relevant to this proposal are summarised below.

2.1 Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

The *Environment and Heritage Legislation Amendment Act (No.1) 2003* amends the *Environment Protection and Biodiversity Conservation Act 1999* to include 'national heritage' as a matter of National Environmental Significance and protects listed places to the fullest extent under the Constitution. It also establishes the National Heritage List and the Commonwealth Heritage List.

The *Australian Heritage Council Act 2003* establishes a new heritage advisory body – the Australian Heritage Council, to the Minister for the Environment and Energy and retains the Register of the National Estate.

The *Australian Heritage Council (Consequential and Transitional Provisions) Act 2003* repeals the *Australian Heritage Commission Act 1975*, amends various Acts as a consequence of this repeal, and allows the transition to the current heritage system.

The *Commonwealth Aboriginal and Torres Strait Islander Heritage Protection Act 1984* can protect areas and objects that are of particular significance to Aboriginal people by allowing the Environment Minister, on the application of an Aboriginal person or group of persons, to make a declaration to protect an area, object or class of objects from a threat of injury or desecration.

Together the above three Acts provide protection for Australia's natural, Indigenous and non-Indigenous heritage. The new framework includes:

- A new National Heritage List of places of national heritage significance
- A new Commonwealth Heritage List of heritage places owned or managed by the Commonwealth
- The creation of the Australian Heritage Council, an independent expert body to advise the Minster on the listing and protection of heritage places
- Continued management of the non-statutory Register of the National Estate.

2.1.1 National Heritage List

The National Heritage List is a list of places with outstanding heritage value to our nation, including places overseas. So important are the heritage values of these places that they are protected under the *Environment Protection and Biodiversity Conservation Act 1999*. This means that a person cannot take an action that has, will have, or is likely to have, a significant impact on the national heritage values of a national heritage place without the approval of the Australian Government Minister for the Environment.

[7] Sydney Metro 2020

There is one item listed on the National Heritage List located within the tunnel alignment portion of the study area, which is defined in Section 3.1 - The Governors Domain and Civic Precinct (Place ID 106103).

The listing for The Governors Domain and Civic Precinct includes Aboriginal cultural heritage values which are further discussed in Section 9.2.

2.1.2 Commonwealth Heritage List

The Commonwealth Heritage List is a list of places managed or owned by the Australian Government. The Commonwealth Heritage List includes natural, Indigenous and historic heritage places which the Minister is satisfied have one or more Commonwealth Heritage values.

There are no items listed on the Commonwealth Heritage List located within the study area, which is defined in Section 3.1.

2.2 *National Parks and Wildlife Act 1974* (NSW)

The *National Parks and Wildlife Act 1974* provides statutory protection to all Aboriginal places and objects. An Aboriginal Place is declared by the Minister, under Section 84 of the *National Parks and Wildlife Act 1974* in recognition of its special significance with respect to Aboriginal culture. Under Section 86 of the *National Parks and Wildlife Act 1974* Aboriginal objects and Aboriginal places are protected. An Aboriginal object is defined as:

> *any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction and includes Aboriginal remains.*

The protection provided to Aboriginal objects applies irrespective of the level of their significance or issues of land tenure. However, areas are only gazetted as Aboriginal places if the Minister is satisfied that sufficient evidence exists to demonstrate that the location was and/or is of special significance to Aboriginal culture.

There are no gazetted Aboriginal places in the study area, which is defined in Section 3.1. All Aboriginal objects, whether recorded or not are protected under the *National Parks and Wildlife Act 1974*.

The proposal is subject to assessment under Part 5, Division 5.2 of the *Environmental Planning and Assessment Act 1979* and therefore Aboriginal Heritage Impact Permit (AHIP) under section 90 of the *National Parks and Wildlife Act 1974* are not required.

2.2.1 National Parks and Wildlife Regulation 2019

Under the authority of the *National Parks and Wildlife Act 1974*, the National Parks and Wildlife Regulation 2019 provides regulations for Aboriginal heritage assessment and consultation with registered Aboriginal parties.

Part 5 (Division 2) of the National Parks and Wildlife Regulation 2019 sets out the requirements of the due diligence assessment process and provides requirements for more detailed assessment and consultation with registered Aboriginal parties for activities that may result in harm to Aboriginal objects. This includes:

- Clause 60 – Consultation process to be undertaken before application for Aboriginal heritage impact permit
- Clause 61 – Application for Aboriginal heritage impact permit to be accompanied by cultural heritage assessment report.

In order to comply with Clause 60 and 61 of the National Parks and Wildlife Regulation 2019, preparation of the Aboriginal Cultural Heritage Assessment Report (ACHAR) and consultation with registered Aboriginal parties must be in accordance with the following guidelines:

- Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010[8]
- Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW[9]
- Aboriginal cultural heritage consultation requirements for proponents 2010[10].

The current assessment has been undertaken in accordance with the above guidelines in accordance with the Secretary's Environmental Assessment Requirements.

2.3 *Environmental Planning and Assessment Act 1979* (NSW)

The *Environmental Planning and Assessment Act 1979* provides planning controls and requirements for environmental assessment in the development approval process. The *Environmental Planning and Assessment Act 1979* consists of three main parts of direct relevance to Aboriginal cultural heritage; Part 3 which governs the preparation of planning instruments, Part 4 which relates to development assessment processes for development which requires consent, and Part 5 which relates to activity approvals and State significant infrastructure.

The proposal is subject to assessment and approval by the NSW Minister for Planning and Public Spaces under Part 5, Division 5.2 of the *Environmental Planning and Assessment Act 1979*, which establishes an assessment and approval regime for State Significant Infrastructure.

The Environmental Impact Statement that is supported by the current assessment has been prepared to assess the impacts of the proposal, in accordance with Secretary's Environmental Assessment Requirements.

2.3.1 Local Environment Plans

Local Environmental Plans (LEPs) are generally prepared by councils in accordance with the *Environmental Planning and Assessment Act 1979* to guide planning decisions for Local Government Areas (LGA). The aim of LEPs, in relation to heritage, is to conserve the heritage significance of

[8] Department of Environment Climate Change & Water [DECCW] 2010a, *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*
[9] Office of Environment & Heritage 2011, *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW*
[10] DECCW 2010b, *Aboriginal cultural heritage consultation requirements for proponents 2010*

heritage items and heritage conservation areas, including associated fabric, settings, views and archaeological sites.

Schedule 5 of each LEP lists items of heritage significance within each LGA. If agreement is reached with the Aboriginal community, items or Aboriginal places of heritage significance are also listed within this schedule. While State Significant Infrastructure projects are not subject to environmental planning instruments (such as LEPs), the assessment of heritage items listed on the LEPs is required under the SEARs for the proposal (see Section 1.3.1).

The proposal would fall within the boundaries of two LGAs including the Inner West and Sydney LGAs. The proposal would fall within the areas covered by the following environmental planning instruments:

- Leichhardt Local Environment Plan 2013, which applies to the Inner West LGA
- Sydney Local Environment Plan 2012, which applies to the Sydney LGA.

No Aboriginal places of heritage significance were identified on LEPs within the vicinity of the proposal.

2.4 *Aboriginal Land Rights Act 1983* (NSW)

The *Aboriginal Land Rights Act 1983* (NSW) is administered by the NSW Department of Planning, Industry and Environment. This Act established Aboriginal Land Councils (at State and local levels). These bodies have a statutory obligation under the Act to:

- Take action to protect the culture and heritage of Aboriginal persons in the council's area, subject to any other law
- Promote awareness in the community of the culture and heritage of Aboriginal persons in the council's area.

The proposal is located within the Metropolitan Local Aboriginal Land Council land boundaries.

2.5 *Native Title (NSW) Act 1994* and Commonwealth *Native Title Act 1993.*

The *Native Title (NSW) Act 1994* was introduced to work in conjunction with the Commonwealth *Native Title Act 1993*. Native Title claims, registers and Indigenous Land Use Agreements are administered under the *Native Title Act 1993.*

The main objects of the *Native Title Act 1993 are:*

- To provide for the recognition and protection of native title; and,
- To establish ways in which future dealings affecting native title may proceed, and to set standards for those dealings; and
- To establish a mechanism for determining claim to native title; and,
- To provide for, or permit, the validation of past acts, and intermediate period acts, invalidated because of the existence of native title.

No Native Title Claims within the study area (defined in Section 3.1) were identified on the National Native Title Tribunal *Native Title Vision* mapping service.[11]

[11] Accessed on 31 March 2021 via: https://nntt.maps.arcgis.com/apps/webappviewer/index.html?id=b221c006ae5d4cabaa1e18099bc11bb9

3.0 ASSESSMENT METHODOLOGY

3.1 Overview

The potential Aboriginal cultural heritage impacts of the major civil construction work between The Bays and Sydney CBD have been assessed using the following methodology:

- Desktop analysis of the landscape context, local and regional character of Aboriginal land-use, and the development of a predictive model for Aboriginal site distribution
- Desktop assessment of Aboriginal Heritage Information Management System (AHIMS) registered sites, Local Environmental Plans, and examination of Aboriginal cultural heritage and excavation reporting
- Archaeological survey of the construction sites which would be impacted by the proposal
- Consultation with Registered Aboriginal Parties and a site representative from the Metropolitan Local Aboriginal Land Council
- Assessment of cultural heritage and archaeological significance of Aboriginal sites in and near the study areas as defined in Section 3.2
- An assessment of impacts to the Aboriginal cultural heritage and archaeological significance of any Aboriginal sites
- Identification of mitigation measures to avoid or minimise adverse impacts to the heritage significance of Aboriginal sites, including archaeological investigation.

These were carried out within the study areas as defined in Section 3.2.

This Technical Paper has been undertaken in accordance with the following guidelines:

- Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010[12]
- Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW[13]
- Aboriginal cultural heritage consultation requirements for proponents 2010[14]
- The Burra Charter 2013[15].

3.2 Study areas

The proposal would extend from The Bays in the west to the Sydney CBD in the east. The study area for the Aboriginal cultural heritage assessment consists of the proposed construction sites and the tunnel alignment. For the purposes of this assessment, these study areas are separated into construction sites study areas, power supply routes and tunnel alignment study areas.

As the Aboriginal archaeological significance for The Bays Station construction site was assessed in *Sydney Metro West Environmental Impact Statement – Westmead to The Bays and Sydney CBD* (Sydney Metro, 2020a), no further Aboriginal heritage or archaeological assessment of the site is

[12] Department of Environment Climate Change & Water [DECCW] 2010a
[13] Office of Environment & Heritage 2011
[14] DECCW 2010b
[15] Australia ICOMOS 2013.

required as part of this Technical Paper. However, vibration and settlement impacts to registered Aboriginal archaeological sites within the alignment of the proposed tunnelling work at The Bays are included within this assessment.

3.2.1 Construction sites study areas

The locations of the construction sites that form part of the study area for this assessment are outlined in Table 4 and shown in Figure 3 and Figure 4.

Table 4: Construction sites

Construction site	Site location
Pyrmont Station western construction site	The block bound by Pyrmont Bridge Road, Pyrmont Street and Paternoster Row
Pyrmont Station eastern construction site	Within the block bound by Pyrmont Bridge Road, Edward Street and Union Street
Hunter Street Station (Sydney CBD) western construction site	Within the block bound by George Street and Hunter Street
Hunter Street Station (Sydney CBD) eastern construction site	Within the block bound by Hunter Street, O'Connell Street and Bligh Street

This assessment identifies any Aboriginal sites which are located in these areas. Direct, indirect, vibration, and settlement impacts to any such sites resulting from the proposal are assessed.

3.2.1.1 Pyrmont Power supply route

A power supply route would be installed to the west of the Pyrmont Station construction sites. This Pyrmont power supply route would be installed through trench excavation, which would be about one metre wide and up to two metres deep. The Pyrmont power supply route would be located within the road corridors of Pyrmont Bridge Road and Harris Street, to connect to the Pyrmont substation.

Desktop assessment was conducted to identify any Aboriginal sites which are located or may be located in this area. These sites or potential sites are assessed for direct, indirect, vibration, and settlement impacts resulting from the proposal.

3.2.2 Tunnel alignment study area

The tunnel sections between construction sites are generally too deep to affect archaeological deposits. These sections have not been assessed for impacts.

Previously AHIMS listed Aboriginal sites which are located above the proposed tunnel alignment would be located within existing soils and ground-level sandstone outcroppings, and the horizontal tunnel excavation through sandstone bedrock would not directly impact any Aboriginal sites.

Desktop assessment of potential settlement and vibration impacts have been conducted for any previously AHIMS registered Aboriginal sites which are located above the proposed tunnel alignment. Visual site inspection was only conducted for areas subject to direct impacts, therefore no site inspection was conducted for the tunnel alignment study area.

3.3 Desktop assessment

Desktop research has been conducted to inform the landscape context of the construction sites, including the physical and environmental setting, the history of the peoples living on that land, any documented cultural and intangible values and the material evidence of Aboriginal land use. This includes a review of previous archaeological work conducted in the area, and a review of the registered AHIMS sites in the vicinity of the construction sites. The purpose of this desktop review is to further understand the nature of the cultural landscape, Aboriginal land-use patterns within a local context, and to construct a predictive model for Aboriginal site distribution.

Further archaeological assessment was undertaken of registered AHIMS sites across the tunnel alignment as part of a desktop assessment of potential indirect impacts. This assessment was limited to previously registered Aboriginal sites across the tunnel alignment.

Desktop assessment included the examination of AHIMS site cards and reports to determine the nature and extent of sites within the alignment. The Heritage NSW Aboriginal Heritage Impact Permit (AHIP) public register was also consulted to determine if active AHIPs were present in or near the project construction sites.

The results of the AHIMS search are provided in Section 7.2.2.

3.4 Archaeological survey

3.4.1 Aboriginal site definition

An Aboriginal site is generally defined as an Aboriginal object or place. An Aboriginal object is the material evidence of Aboriginal land use, such as stone tools, scarred trees or rock art. Some sites, or Aboriginal places can also be intangible and although they might not be visible, these places have cultural significance to Aboriginal people.

The Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales[16] states in regard to site definition that one or more of the following criteria must be used when recording material traces of Aboriginal land use:

- The spatial extent of the visible objects, or direct evidence of their location
- Obvious physical boundaries where present e.g. mound site and middens (if visibility is good), a ceremonial ground
- Identification by the Aboriginal community on the basis of cultural information.

For the purposes of this assessment an Aboriginal site, or potential Aboriginal site, was defined by recording the spatial extent of visible traces or the direct evidence of their location within the study area.

3.4.2 Archaeological survey methodology

Site surveys were undertaken on 14 May 2021 by Isabel Wheeler (Heritage Consultant, Artefact Heritage), Olivia Turner (Heritage Consultant, Artefact Heritage), and Duncan Jones (Principal, Artefact Heritage). The aim of the site survey was to assist in the assessment of archaeological potential for each construction site.

[16] OEH 2011

Site surveys were conducted across the entirety of the Pyrmont Station and Hunter Street Station (Sydney CBD) construction sites (Figure 3 and Figure 4). Each construction site was defined as a survey unit. All survey units were covered on foot. Areas of surface visibility within the study area were generally non-existent, with the majority of each survey unit covered by buildings, roads and concrete footpaths. Site surveys were not conducted across areas without potential direct impact, including the tunnel alignment.

The site survey only included survey of publicly accessible areas. Private property was not accessed during the survey. All areas of accessible ground were examined during the site survey.

A photographic record was kept of all accessible portions of each survey unit. A map showing the survey units covered by archaeological survey is shown in Section 8.0. Photographs were taken to document the existing environment and landform context of each construction site. Landform, land surface, and vegetation conditions were noted during the survey. No areas of ground visibility were noted, and so soil information was not recorded.

A discussion of the survey results for the accessible portions of each construction site, including mapping of the survey units, is included in Section 8.0.

3.4.3 Recorded Aboriginal sites and areas of archaeological potential

Information on any recorded Aboriginal sites, including type and location, as well as an assessment of archaeological potential, is included in the discussion of each construction site.

The assessment of archaeological potential incorporates available information on existing and past structures, including the location of basements and underground car parks that are likely to have impacted archaeological deposits.

3.5 Assessment of cultural heritage values

A consultation process with Registered Aboriginal Parties (RAPs) and a site representative from the Metropolitan Local Aboriginal Land Council is being carried out to identify non-archaeological Aboriginal cultural heritage values. The aim of this methodology is to ensure that information about cultural significance is provided by Aboriginal people who hold cultural knowledge relevant to the study areas.

3.5.1 Cultural heritage survey

An additional site survey was carried out with Rowena Welsh (Metropolitan Local Aboriginal Land Council) and Isabel Wheeler on 16 July 2021. The aim of the survey was to identify any non-archaeological Aboriginal values associated with the study areas.

The site survey was a pedestrian survey conducted across the Pyrmont Station and Hunter Street Station (Sydney CBD) construction sites. Survey was not conducted across the study areas with no potential for direct impact, such as the tunnel alignment.

Following the survey, a report will be prepared by the Metropolitan Aboriginal Local Land Council summarising the cultural heritage values identified. This report will be summarised and included in Section 9.0 for future versions of this Technical Paper.

3.5.2 Consultation process

Aboriginal community consultation is being conducted in accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010.[17] RAPs have been provided the opportunity to identify intangible or non-archaeological values relating to the study areas during preparation of this report and were provided with a copy of the draft report for comment. More detail regarding the consultation process can be found in Section 5.0.

3.6 Impact assessment

The impact assessment for the proposal is guided by the definition of harm under the *National Parks and Wildlife Act 1974,* which is limited to impact which '…destroys, defaces, damages an object or place or in relation to an object – moves the object from land on which is has been situated' (Section 5 of *National Parks and Wildlife Act*).

Direct harm may occur as a result of activities which disturb the ground surface or identified cultural values including site preparation activities, and the installation of services and infrastructure. The direct impact associated with the proposal is assessed in Section 10.0.

Indirect harm for Aboriginal heritage refers to impacts that may affect sites or features located immediately beyond or within the area of the proposed work. Indirect harm may include impacts from vibration, increased visitation, increased erosion, or changing access to wild resources.

The impact assessment evaluates the potential archaeological impacts for the proposal. It assessed the type of harm, the degree of harm, and the consequence of harm for any known Aboriginal sites or areas of potential.

The proposal construction sites would be located within heavily built environments. Registered Aboriginal sites which are within the study area are comprised of artefact sites or areas of potential archaeological deposit which are located below existing development. Some sites across the proposed tunnel alignment include rock shelter sites which may be subject to the effects of vibration. Consequently, an assessment of potential indirect impact has also been included for registered Aboriginal sites across the tunnel alignment study area.

3.6.1 Geotechnical information

A short description of relevant geotechnical information is provided in the discussion of each construction site in Section 8.0. This information is to inform the assessment of archaeological potential and the methodology for test excavation.

[17] DECCW 2010b, Aboriginal cultural heritage consultation requirements for proponents 2010

4.0 PROJECT DESCRIPTION

4.1 General construction and design elements

The proposal would involve major civil construction work between The Bays and Sydney CBD including:

- Enabling work such as demolition, utility supply to construction sites, utility adjustments, and modifications to the existing transport network
- Tunnel excavation including tunnel support activities.

Station excavation for new metro stations at Pyrmont and at Hunter Street in the Sydney CBD.

The proposal would be located largely underground in twin tunnels. Indicative locations of the proposed alignment and stations are shown in Figure 2.

4.1.1 Pyrmont Station construction sites

The approved Sydney Metro West Concept noted that there would be potential for a strategic station location at Pyrmont.

Pyrmont Station would be located in the block bound by Pyrmont Bridge Road, Union Street and Edward Street with an additional station entrance in the block bound by Pyrmont Bridge Road, Paternoster Row and Pyrmont Street (refer to Figure 3).

Figure 3 Pyrmont Station construction sites

This proposal covers the station excavation and structural work only. Features of Pyrmont Station will be provided and assessed in the Environmental Impact Statement for Sydney Metro West - Rail infrastructure, stations, precincts and operations (Stage 3 of the planning approval process).

4.1.2 Hunter Street Station (Sydney CBD) construction sites

The approved Sydney Metro West Concept noted that at the time of the Proposals preparation, that investigations were still being undertaken to determine the location of the Sydney CBD location.

The Hunter Street Station (Sydney CBD) construction sites would be located at the block bound by Hunter Street, George Street and includes De Mestre Place, with an additional station entrance located on the site bound by Hunter Street, Bligh Street and O'Connell Street (refer to Figure 4).

This proposal covers the station excavation and structural work only. The features of Hunter Street Station (Sydney CBD) and its assessment will be provided in the Rail infrastructure, stations, precincts and operations Environmental Impact Statement (Stage 3 of the planning approval process).

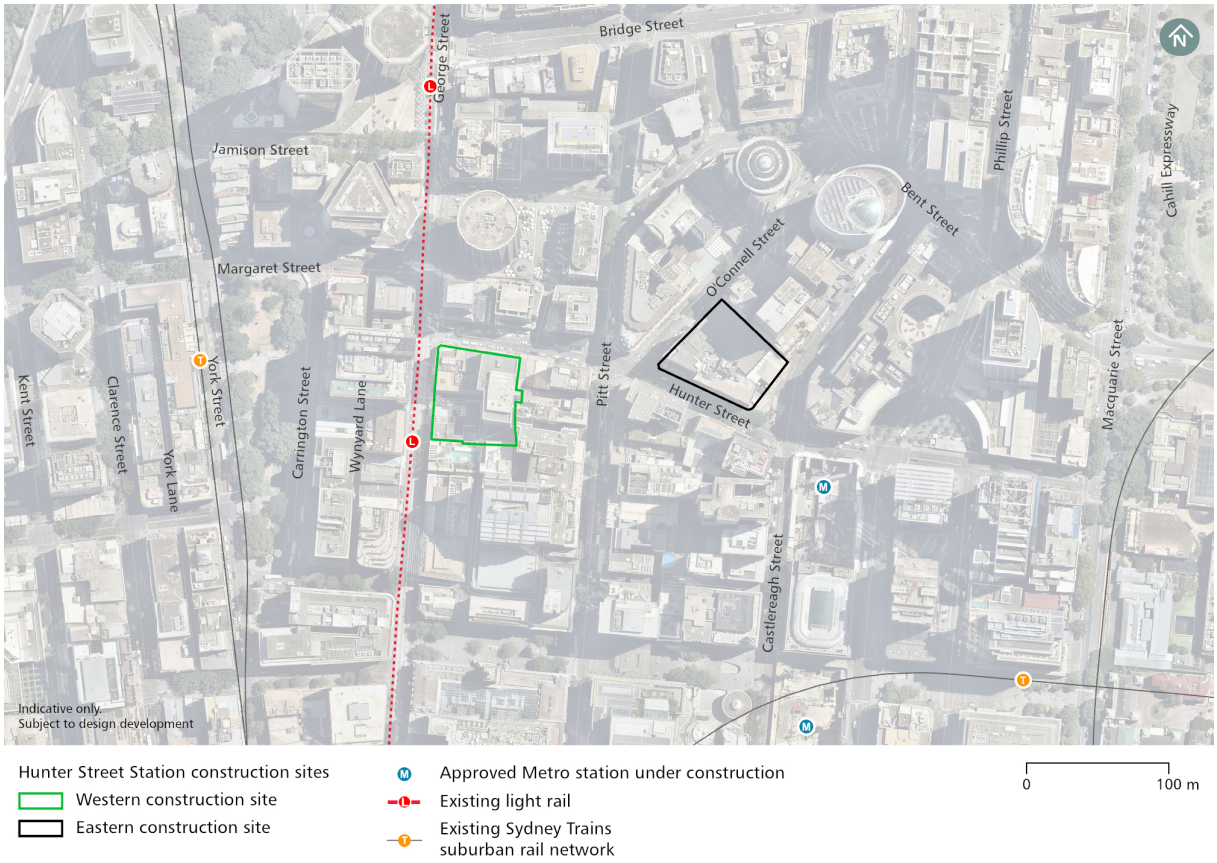


Figure 4 Hunter Street Station construction sites

4.1.3 Tunnelling excavation

Tunnel excavation is likely to be carried out using tunnel boring machines with roadheaders used for caverns and stub tunnels. The tunnel boring machines would be launched from The Bays tunnel launch and support site and would head east to Hunter Street Station (Sydney CBD). An indicative long section is shown in Figure 5 and Figure 6.

Figure 5 Indicative alignment plan and long section of tunnel (Page 1)

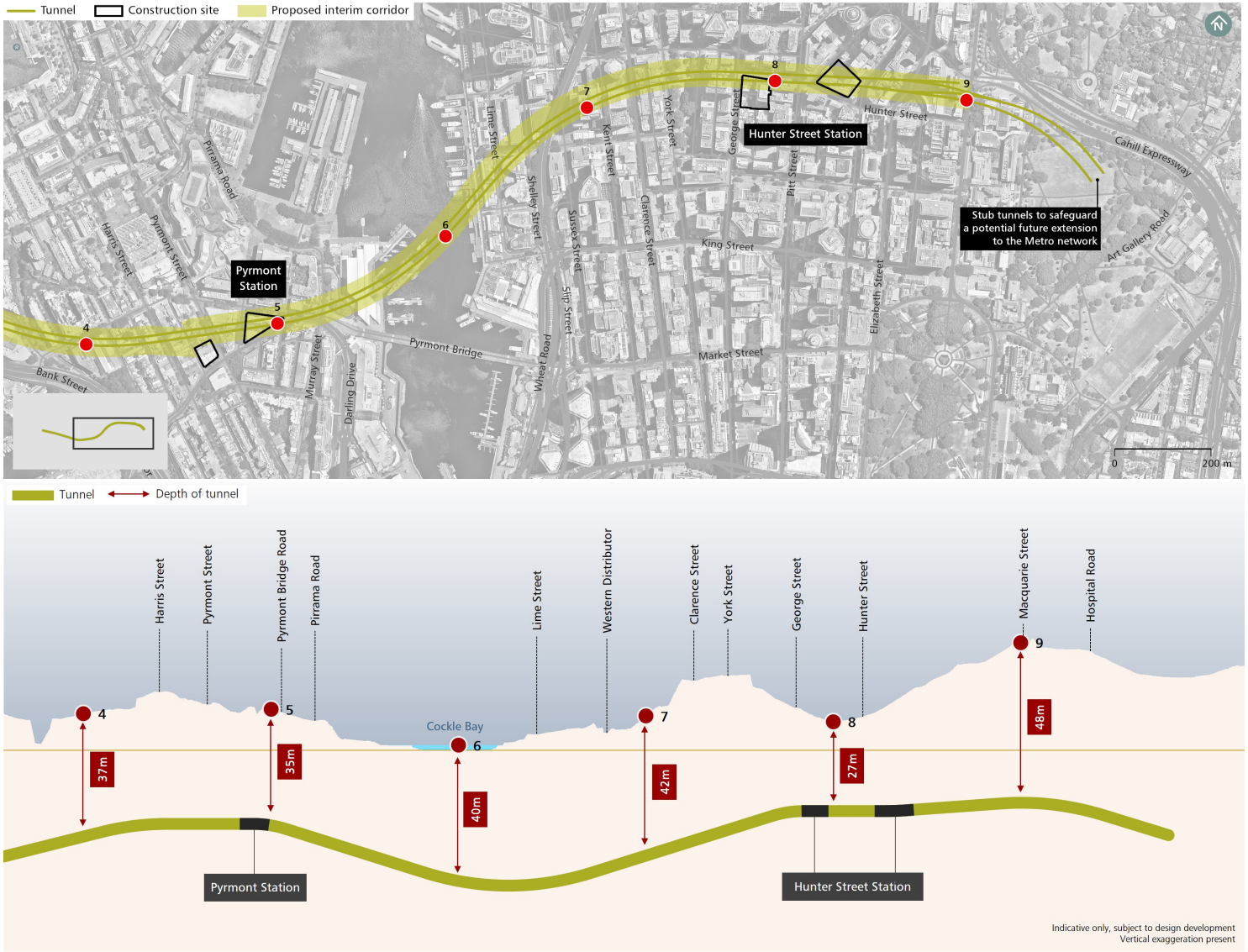


Figure 6: Indicative alignment plan and long section of tunnel (Page 2)

4.1.4 Pyrmont power supply route

A new trenched power supply route is proposed for the Pyrmont Station construction sites. The Pyrmont power supply route would extend from the eastern Pyrmont Station construction site west along Pyrmont Bridge Road and then north along Harris Street. The location of the Pyrmont power supply route is shown in Figure 7.

Installation of the Pyrmont power supply route would involve trench excavation about one metre wide and up to two metres deep. Excavation would be entirely located within the road corridor of these streets. Following the completion of the conduit installation, the road surface would be restored to its original condition.

Figure 7: Location of the Pyrmont power supply route

4.2 Construction site methodologies

This section describes the construction methods for the major civil construction work between The Bays and Sydney CBD. The construction methodology would be consistent with that for major civil construction work between Westmead and The Bays, as described and assessed within Sydney Metro West in *Sydney Metro West Environmental Impact Statement – Westmead to The Bays and Sydney CBD* (Sydney Metro, 2020a).

4.2.1 Enabling work

Enabling work are those activities that would typically be carried out before the start of substantial construction in order to make ready the key construction sites and to provide protection to the public. Enabling work may include activities such as:

- Construction site establishment
- Demolition of buildings and structures within the proposed construction footprint
- Utility adjustments and protection
- Utility supply to the construction sites including power and water
- Transport network modifications to roads, public transport, and pedestrian and cyclist facilities
- Heritage investigations, protection, and archival recordings (this document and the *Statement of Heritage Impact*[18])
- Additional geotechnical and contamination investigations, and remediation where required.

4.2.2 Excavation method

Excavation to support the proposed stations would generally be carried out in the following sequence:

- Enabling work including protection or diversion of utilities and establishment of site access points
- Demolition of structures on the site and removal of identified landscape vegetation
- Excavation and temporary structural work for station boxes and underground pedestrian passages.

It is anticipated that both stations would be constructed as mined cavern stations using roadheaders. The shafts for future station entry and vertical transport (escalators and lifts) would be typically offset from the location of future station platforms. Shafts would be progressively excavated from the surface within the footprint of the future vertical transport to an intermediate floor level. Roadheaders and other excavation equipment would then be lowered through the shaft to excavate the underground station cavern and pedestrian connections. Spoil would be moved to the shafts, transferred to the surface and then removed from site. Excavation of Pyrmont Station would be timed such that it would require breaking through the concrete lined tunnels from within the mined station cavern. Excavation of the station cavern at Hunter Street Station (Sydney CBD) would be completed in advance of the arrival of the tunnel boring machine.

Acoustic sheds are proposed at both of the Pyrmont Station construction sites. The existing acoustic shed at the Hunter Street Station (Sydney CBD) eastern construction site would be used during excavation of the station cavern. Alternative means of achieving the same noise outcome, such as acoustic panels over the shaft excavations, may be adopted. The specific noise mitigation measures would be determined during detailed construction planning taking into account the construction program, construction working hours and construction traffic management.

[18] Artefact 2021

5.0 CONSULTATION

Aboriginal community consultation has been conducted in accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010.[19] A consultation log has been maintained which details all correspondence with the registered Aboriginal parties for Sydney Metro West (refer to Appendix 1).

5.1 Identification of stakeholders and registrations of interest

The consultation process undertaken to support the ACHAR for the major civil construction work for Sydney Metro West between Westmead and The Bays (Stage 1 of the planning approval process) has been continued for this proposal.

A total of 62 stakeholders registered their interest in the Sydney Metro West between Westmead and The Bays and have continued their registrations and involvement with the project (redacted for public display):

[redacted]

[19] DECCW 2010b, Aboriginal cultural heritage consultation requirements for proponents 2010

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

5.2 Review of ACHAR assessment methodology

A copy of the proposed ACHAR methodology for the project was distributed to Aboriginal stakeholders on 17 June 2021, with a 28-day period for review and comment. The document included details of the proposal and a summary of the proposed ACHAR assessment methodology.

A summary of comments received from stakeholder groups are provided in Table 5. Seven Aboriginal stakeholder groups provided comments to the proposed investigation methodology.

Table 5: Summary of Aboriginal stakeholder methodology review comments (redacted)

Person / RAP group	Comment
[redacted]	Acknowledged receipt of information
[redacted]	Supported the methodology
[redacted]	• Noted that the “project area” is significant to Darug people “due to the evidence of continued occupation”, and that there are several significant sites in the area • Commented that consultation occurs with RAPs who “do not contribute to the Aboriginal community of Western Sydney”, and that the involvement of such parties “means that genuine local Aboriginal organisations are unable to properly care for our cultural heritage”
[redacted]	• Noted that the whole study area is important to Aboriginal people • Noted in particular the skies and waterways as guiders and markers • Agreed with the methodology and supports the ACHAR
[redacted]	Supported the methodology
[redacted]	Expressed interest in the project
[redacted]	Supported the methodology

5.3 Site inspection

A site inspection was conducted on 16 July 2021 with Rowena Welsh (Metropolitan Local Aboriginal Land Council). The aim of the survey was to identify any Aboriginal cultural values associated with the study areas. Metropolitan Local Aboriginal Land Council was invited to conduct survey on behalf of the Registered Aboriginal stakeholders as a continuation of

The site survey was a pedestrian survey conducted across the Pyrmont Station and Hunter Street Station (Sydney CBD) construction sites. Survey was not conducted across areas with no direct impact, such as the tunnel alignment.

The areas surrounding the construction sites, including areas of both land and water, were identified as containing high cultural significance to the Gadigal people and surrounding clan groups. Sites of high cultural significance within close proximity to the surveyed area include initiation ceremonial sites within Sydney Harbour, and cockle shell deposits at Cockle Bay. Elizabeth Street, to the east of the Hunter Street Station (Sydney CBD) construction sites, was noted as past walking tracks for Aboriginal people moving across the landscape for ceremonial and cultural practices, as well as to make use of the freshwater resources offered across the landscape (including the Tank Stream).

It was noted that the original sandstone of the area has been disturbed or removed, dramatically reducing the presence of lore sites and engravings depicting lore stories.

5.4 Stakeholder review of draft ACHAR

A copy of the draft ACHAR was provided to Aboriginal stakeholders on 30 July 2021, with feedback requested by 27 August 2021.

At the close of the consultation period, there have been three responses. Table 6 summarises the responses received at this stage of the process (redacted for public display).

Table 6: Summary of Aboriginal stakeholder responses to the draft ACHAR

Person / RAP group	Comment
[redacted]	Has reviewed the ACHAR and supports the recommendations
[redacted]	• Supports the report • Notes that [redacted] holds a cultural connection to the land, sky, and waterways • States that the study area has a high potential and significance to Aboriginal people, and that the water ways which run near the study area tell stories and are meant to be cared for • Also highlights the significance of burials. • Requests an interpretation plan for the project to educate the wider community and the younger generation

Person / RAP group	Comment
	• Suggests design, native gardens, water features, digital display, app, art, and playgrounds as example methods of interpretation
[redacted]	Supports the draft report

6.0 ENVIRONMENTAL CONTEXT

6.1 Landform, geology and soils

The proposal would be located within the Sydney Harbour foreshores area of the wider Sydney Basin. The Sydney Basin is a large depositional geological feature that spans from Batemans Bay to the south, Newcastle to the north and Lithgow to the west.

The underlying geology of The Bays tunnelling launch and support site and the proposal construction sites consists of Triassic aged Hawkesbury Sandstone. Within the construction sites, Hawkesbury Sandstone is overlaid by the Gymea soil landscape which consists of shallow to moderately deep sandy soils with frequent rock outcrops. The Gymea soil landscape is generally associated with undulating to rolling rises and low hills. Soils within the Gymea soil landscape vary with underlying landform with crests and side slopes generally associated within a quartz sandy loam directly overlying bedrock. Shale lenses are documented to occur within this landscape which are generally associated with a clay deposit underlying the A horizon sand deposit[20].

Both the Sydney CBD and Pyrmont Peninsula have been subject to substantial landform modification which make interpretation of the former landscape challenging. Reconstructions of the original topography of the Sydney CBD was originally comprised of two north-south running ridgelines located at the Rocks and within Hyde Park (refer to Figure 10). These landforms were connected by a valley which formed the Tank Stream water catchment area. Early maps of Pyrmont identify that the peninsula was dominated by an undulating ridge surrounded by steep slopes.[21]

[20] Espade 2021, Gymea soil landscape available at: https://www.environment.nsw.gov.au/Salisapp/resources/spade/reports/9130gy.pdf accessed 1 April 2021
[21] KNC 2020, Pyrmont Peninsula Place Strategy: Indigenous Cultural Heritage Report, report to DPIE,

Figure 8: Soil landscapes across the construction sites

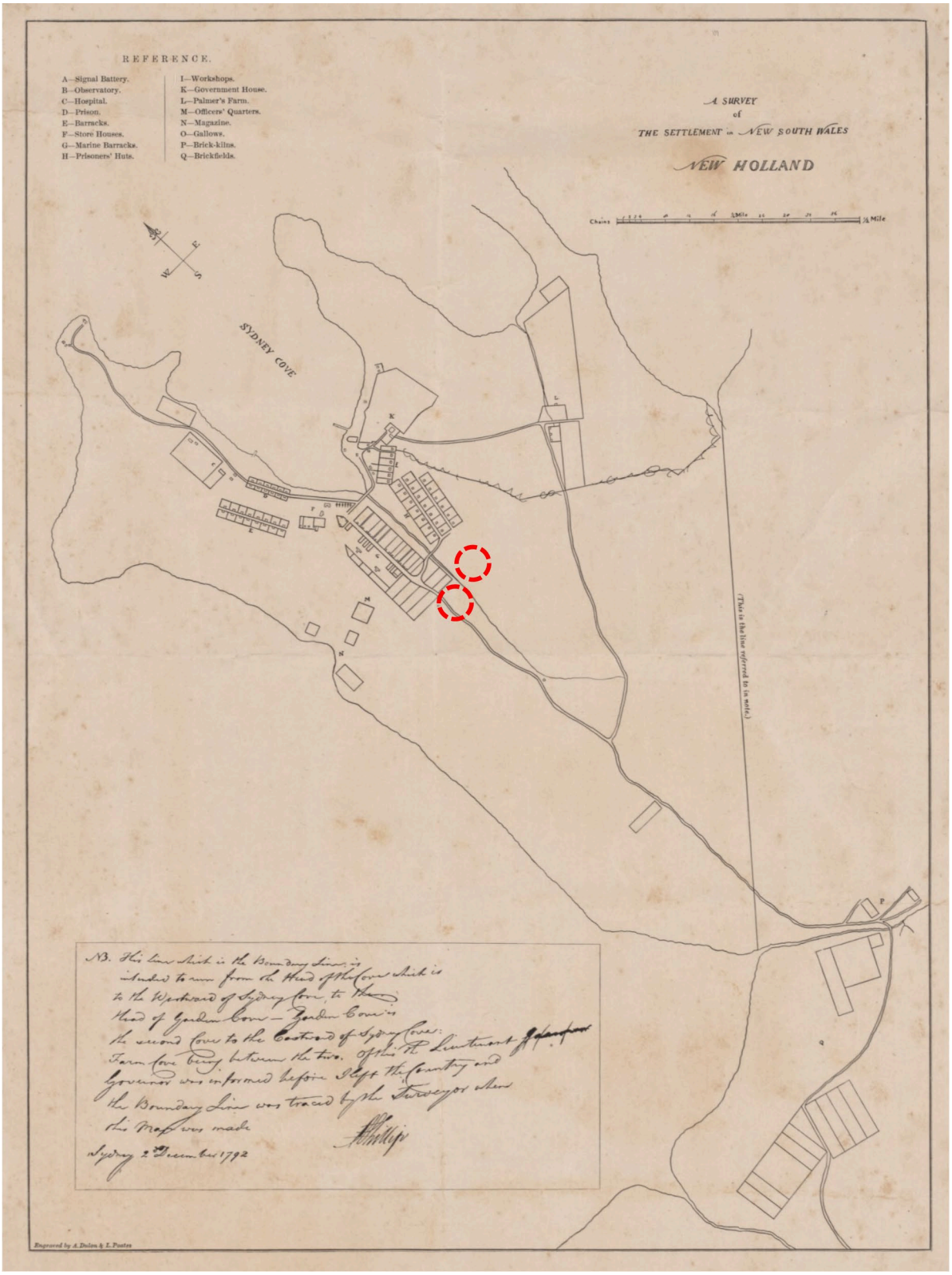


Figure 9: A survey of the settlement of New South Wales, New Holland. Engraved by A. Dulon & L. Poates (1792), approximate locations of Hunter Street Station construction sites outlined in red. (Source: NLA, ID 1796129)

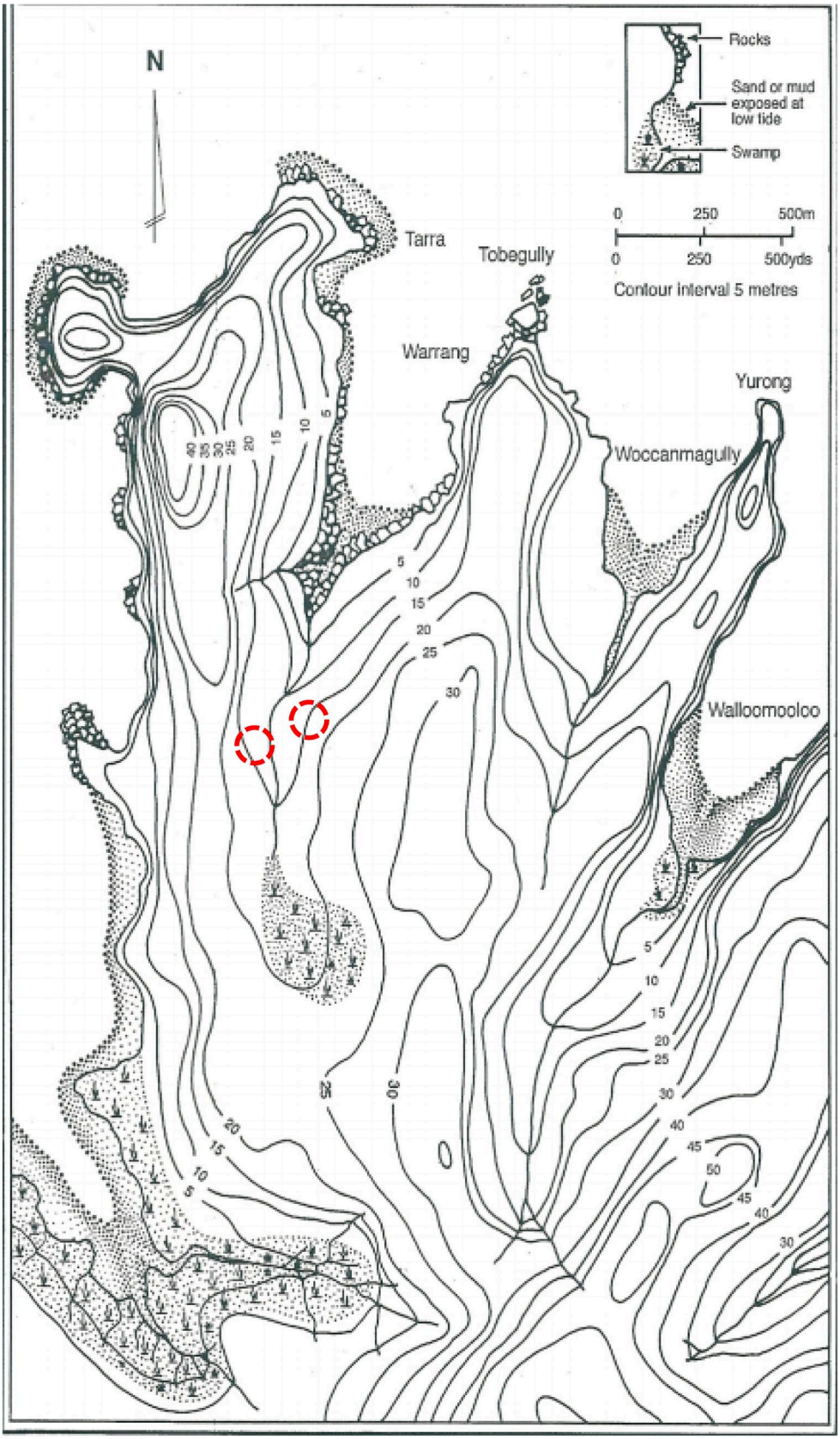


Figure 10: Reconstruction of the original topography of the current Sydney CBD with approximate location of Hunter Street Station construction sites in red[22]

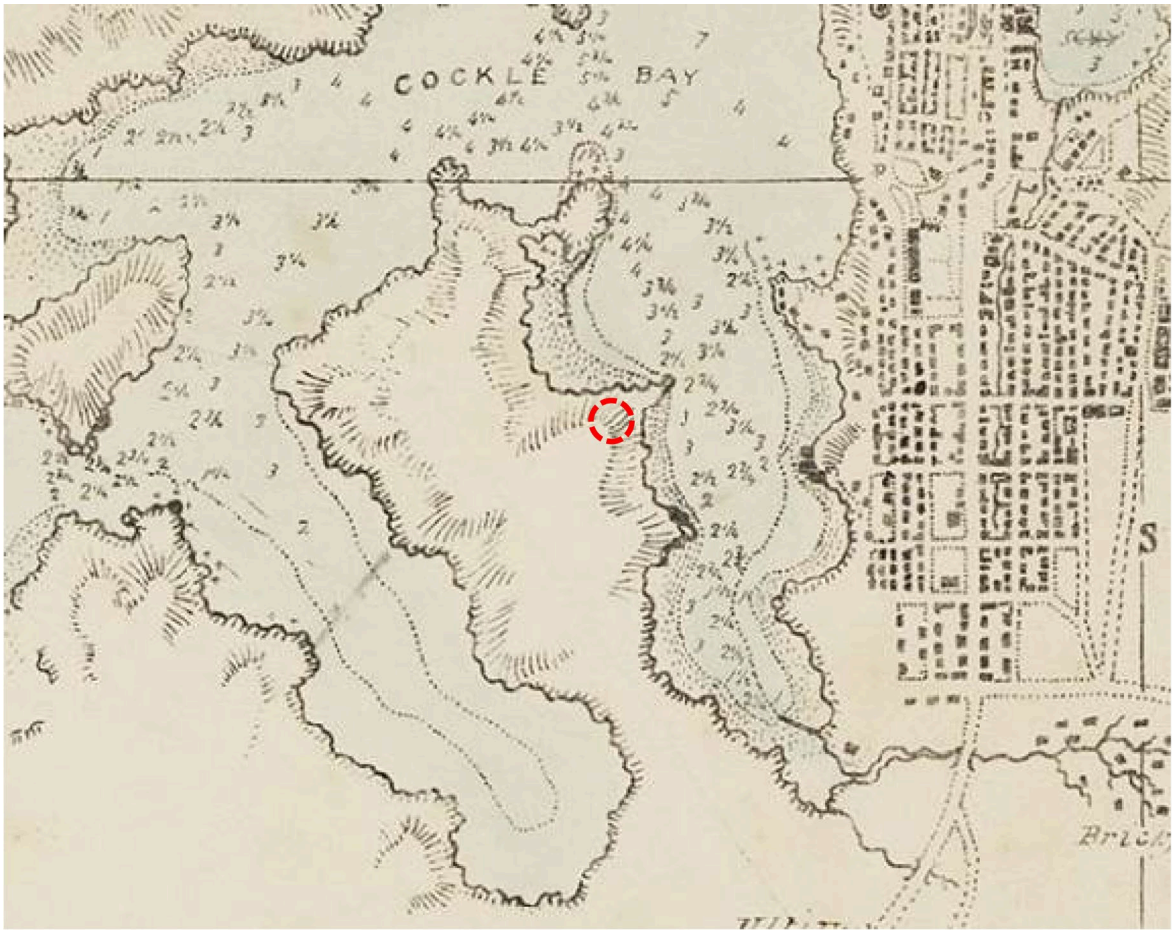


Figure 11: Excerpt from 1822 map of Port Jackson foreshore showing the Pyrmont Peninsula with approximate location of Pyrmont Station construction sites in red[23]

[22] Aplin G 2013, A Strange Natural Environment: Colonists in Eighteenth- Century Sydney, *Sydney Journal*, Vol 4, No 1: 23

[23] Roe, John Septimus. Port Jackson, New South Wales [Cartographic Material] / by John Septimus Roe, Lieut. R.N. in 1822. Lithographed by R. Clint, 1820.

Figure 12: Excerpt from Wells map of Sydney c 1843 showing Pyrmont Station construction sites in red[24]

[24] Reproduced from Casey and Lowe 2000, Archaeological investigation CSR Site, Pyrmont (Jacksons Landing), Vol 1: Description, Analysis and Interpretation, for Lend Lease, available at: http://www.caseyandlowe.com.au/wp-content/uploads/1999/10/Chapter1-2-w-Vol-Cover.pdf

6.2 Water sources

The main watercourse within the Sydney CBD is currently known as the Tank Stream. The Tank Stream formed from a combination of seepage springs in the vicinity of what is now Hyde Park, as well as surface runoff from the surrounding catchment which was localised within the current Sydney CBD. The Tank Stream consisted of an open watercourse flowing generally north along the current alignments of Pitt Street and George Street before flowing into Sydney Cove near the intersection of Pitt and Alfred Street.[25]

The southern portion of the Pyrmont Peninsula includes the former reaches of Cockle Creek which formerly ran from Central Station to Daring Harbour. To the west of the Pyrmont Peninsula an additional creek line discharged into Blackwattle Bay. Blackwattle Creek was mapped in early historic plans to run east-west across the Cleveland Paddocks, before joining other first and second order tributaries in the Chippendale area.

Both Cockle Creek and Blackwattle Creek would have been subject to tidal influence within the immediate proximity of the Pyrmont Peninsula. Blackwattle Creek itself was associated with an area of swampland adjacent to Blackwattle Bay.[26]

No direct freshwater creeks were located across Pyrmont, however, freshwater springs were known to exist across the Peninsula. One such spring, known to the Europeans as Tinker's Well was located at the corner of Bowman Street and Bank Street within a large sandstone overhang [27].

These former watercourses have been canalised since the mid-nineteenth century and in many cases have been re-routed or moved as part of modern sewerage and stormwater control[28].

6.3 Natural resources

The vegetation of the study area originally would have consisted of a combination of Coastal Dry Sclerophyll Forest and Coastal Heaths. The Dry Sclerophyll Forest grows on sandstone landscapes in areas below 700 metres elevation, where rainfall average varies from 1,000 to 1,300 millimetres per annum. This vegetation type encompasses a wide range of related forest and woodland communities. The eucalypt canopy includes Sydney red gum, red bloodwood and Sydney peppermint, brown stringybark, broadleaved scribbly gum and old man banksia. The prominent and diverse sclerophyll shrub understory is shorter and more open on ridges than in gullies, while the open ground layer is dominated by sclerophyll sedges.[29]

Analysis of plant fossils identified at 200 George Street found that casuarina swamp forest dominated in the estuary of the Tank Stream or was present as stands growing along the lower reaches of the stream, with ground ferns dominating damp sites. The study concluded that the vegetation within and surrounding the Tank Stream Valley in 1788 was part of a cultural landscape shaped and managed by Aboriginal people through millennia of burning.[30]

[25] Wong, A. 1999. Colonial Sanitation, Urban Planning and Social Reform in Sydney, New South Wales 1788-1857. Australian Historical Archaeology, no. 17.
[26] Barani Sydney's Aboriginal History, Blackwattle Creek, available at: https://www.sydneybarani.com.au/sites/blackwattle-creek/
[27] Tinker's Well. An Everflowing Spring, Evening News 12 December 1912: 11
[28] M R Matthews, 1982, Pyrmont and Ultimo History
[29] Keith, 2004. Ocean shores to desert dunes: the native vegetation of New South Wales and the ACT. (Dept. of Environment and Conservation, Hurstville, NSW).
[30] Macphail, M.K. and T. Owens, 2018. What was growing along the Tank Stream Valley, Sydney Cove, in 1788? *Australian Historical Archaeology*, issue 36.

The region surrounding the precinct would have provided an abundance of native animals for food and a number of other materials. Mammals such as kangaroos and wallabies and arboreal mammals such as possums can be used as a food source and also for tool making. For example, tail sinews are known to have been used as a fastening cord, whilst 'bone points' which would have functioned as awls or piercers are an abundant part of the archaeological record.[31] Ethnographic observations of early European settlers noted that Aboriginal people used a variety of animal parts including claws, talons, bone, skin, teeth, shell, fur and feathers for a variety of tools and non-utilitarian functions. The region would have provided a variety of resource and suitable climatic conditions for year-round occupation by Aboriginal people inhabiting the area.

[31] Attenbrow 2002. *Sydney's Aboriginal Past: Investigating the archaeological and historical records*. 118.

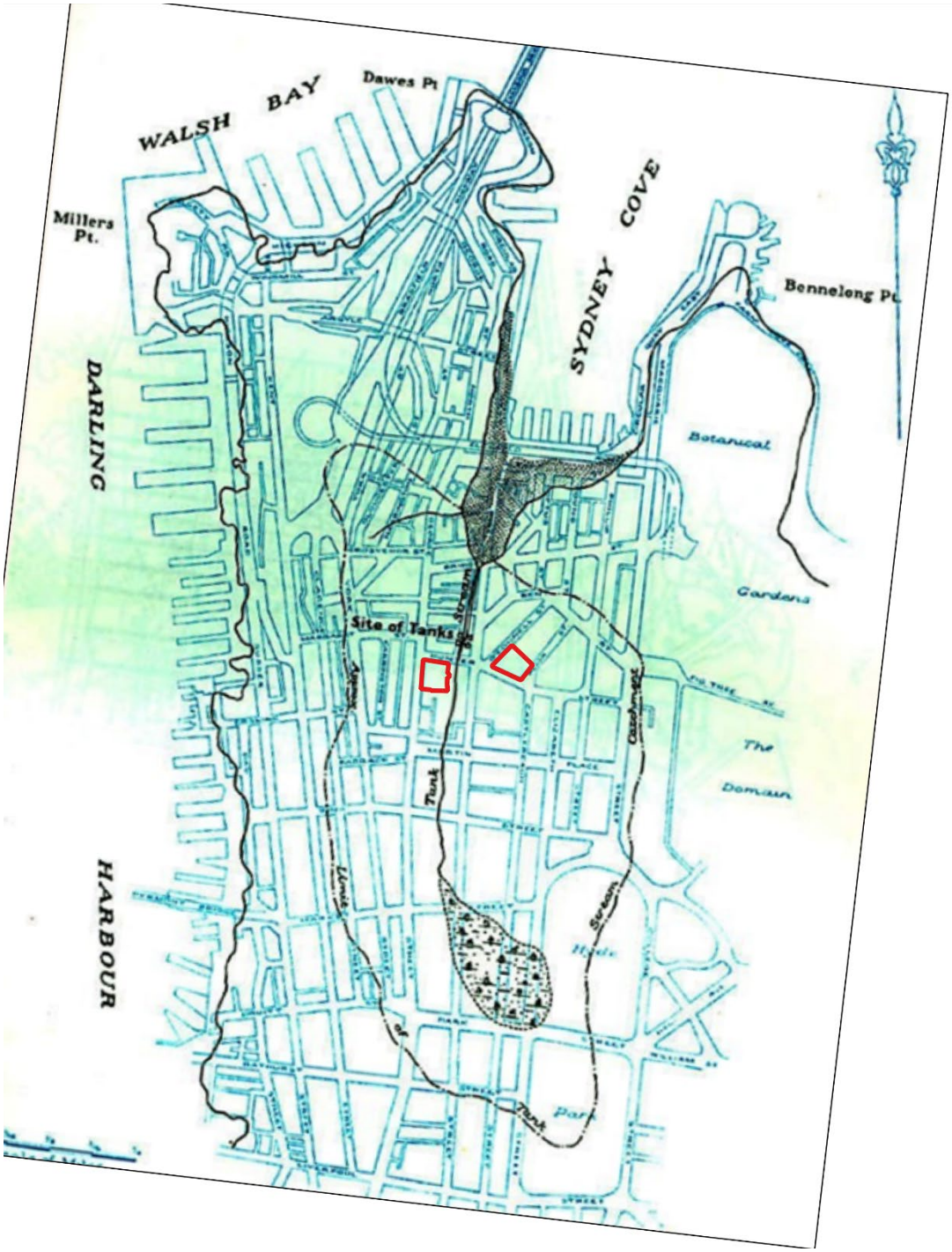


Figure 13: Location of Tank Stream and other historical water courses with respect to Hunter Street Station construction sites shown in red [32]

[32] Aird, W.V 1961. The Water Supply, Sewerage and Drainage of Sydney, 1788-1960, Halstead Press Pty Ltd, Sydney, Australia

7.0 ARCHAEOLOGICAL CONTEXT

7.1 Aboriginal histories of the locality

The Aboriginal people who lived in the Sydney region were part of the Eora Nation. The word Eora, meaning 'here' or 'of this place', is not a term traditionally used by Aboriginal communities pre-contact but arose during the first encounters with non-Aboriginal settlers.[33] It is now accepted as an appropriate term for the coastal Aboriginal peoples in the broader Sydney area.

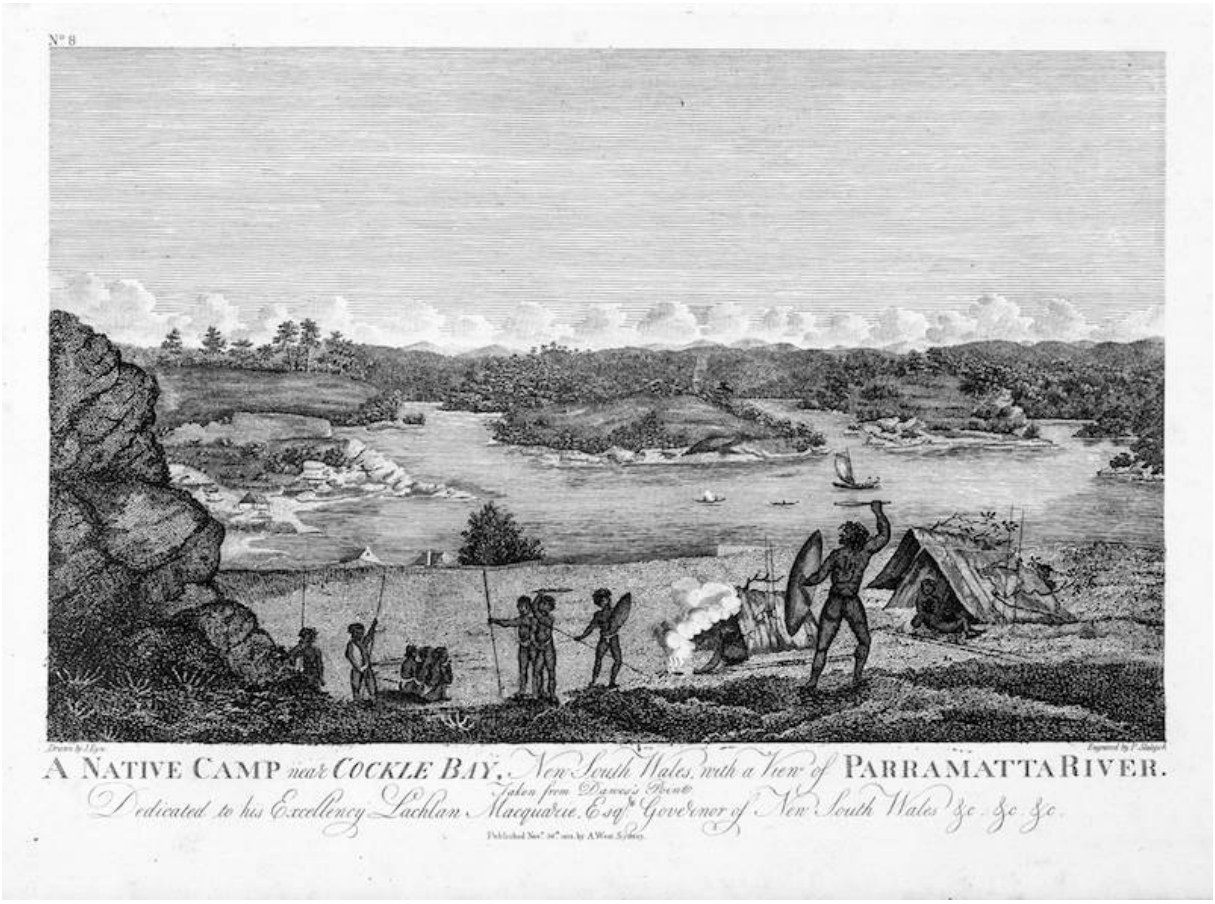


Figure 14: A Native Camp near Cockle Bay, New South Wales with a view of Paramatta River, taken from Dawes's Point; drawn by J. Eyre; engraved by P. Slaeger. Image source: State Library of NSW (file no. FL1790486)

The proposal would be located in Gadigal (alternatively Cadigal) Country. Phillip Gidley King recorded in 1793 that[34]:

> *The tribe of Cadi inhabit the south side, extending from the south head to Long-Cove; at which place the district of Wanne, and the tribe of Wangal, commences, extending as far as Par-ra-mata, or Rose-Hill.*

[33] City of Sydney, Sydney Barani 2013 'Aboriginal People and Place'. *Barani Sydney's Aboriginal History.* Accessed https://www.sydneybarani.com.au/sites/aboriginal-people-and-place/ 27 April 2021
[34] quoted in Dominic Steele Consulting 2005:35

Modern streets of Sydney, including George Street, are thought to have originated as Aboriginal tracks connecting areas of plentiful food or fishing opportunities.[35] These tracks were worn into the landscape through years of use and managed with cultural burning.[36]

The Pyrmont Peninsula appears to form part of the boundary between the Gadigal and the Wangal tribes. Early recordings by Governor Phillip[37] describe the Wangal lands as:

> *The south of the harbour, from the above-mentioned cove (present day Darling Harbour) to Rose Hill, which the natives call Paramatta*

Phillip continues to describe the district as Wann, and the clan as Wangal. The Darug (alternatively Darruk) language would have been spoken by both Gadigal and Wangal clans, as it was spoken across the Sydney region, from the Hawkesbury River in the north to Appin in the south, west of the George's River to the Blue Mountains, as well as along the coast between Port Jackson and Botany Bay.[38] It is likely that dialects would have differed between the coast and inland areas, although documentary evidence of this is thin.

Ethnohistorical sources suggest that, despite differences in dialect and customs, the Wangal, Gadigal, and other Darug clans of the Eora Nation would have interacted for ceremonies, intermarriage, dispute resolution, trade, and access to resources. Early accounts report large gatherings of clans for social or religious events, or to share access to abundant resources. For example, Tench[39] records that in September 1790 at least 200 Aboriginal people came together to harvest a whale beached in Manly Cove. He notes that the gathering included members from the Wangal, Gadigal, and Broken Bay clans.

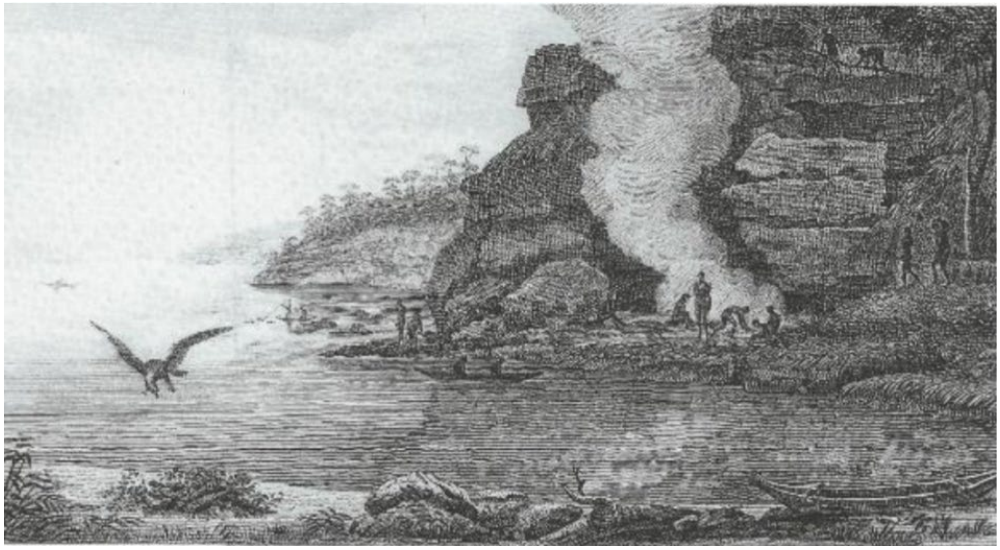


Figure 15: Aboriginal activities on the shore of Port Jackson in 1824. Image source: Peron and Freycinet 1824[40]

[35] *Ibid*
[36] Redfern Oral History 2020'Timeline' Accessed http://redfernoralhistory.org/Timeline/Gadigalpeople/tabid/240/Default.aspx/ 27 April 2021
[37] Phillip 1790 1892:309
[38] Attenbrow, V 2002 *Pre-colonial Aboriginal land and resource use in Centennial, Moore and Queens Parks – assessment of historical and archaeological evidence for Centennial Parklands Conservation Management Plan*. Report for incorporation into overall Conservation Management Plan prepared by Beyond Consulting for Conybeare Morrison and Partners. P:34
39 Tench, W 1973 *Complete Account of the Settlement at Port Jackson*. G. Nicol and J. Sewell, London.
[40] McBryde 1989: 26

The Pyrmont Station and the Hunter Street Station (Sydney CBD) construction sites would be located across a landscape of varied subsistence. Adjacent to the Hunter Street Station (Sydney CBD) construction sites were the tidally influenced mud flats associated with the mouth of the Tank Stream, located to the north of Martin Place and to the east of Barangaroo, while fresh water was available from the stream itself to the southwest in the vicinity of Pitt Street.

Archaeological and historical records indicate that marine and estuarine resources formed an important part of the Port Jackson area. Aboriginal communities consumed large amounts of marine animals, evidenced by the large number of shell middens in the Sydney area, where the shellfish were processed onsite for the meat to be consumed or used as fishing bait.[41] Watkin Tench noted that "fishing, indeed, seems to engross nearly the whole of their time, probably forming the chief part of their subsistence[42]". Tench recorded observing fish, including "bass, mullets...and sharks of an enormous size", populating the waters of Port Jackson, indicating the wide variety of marine animals available for consumption.[43] Shellfish not only formed an important subsistence resource, but also were utilised as tools. Shell tools included fishhooks, shell hafted onto spears in various forms, as a tool to repair spears, and as a cutting edge.[44] 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.[45]

Figure 16: "Aboriginies fishing, cooking, and eating in canoes". Watercolour by an unknown artist, often attributed to Phillip Gidley King (the elder); undated, circa 1788-92. Image Source: Mitchell Library, State Library of NSW

[41] Attenbrow, V 2012 Archaeological evidence of Aboriginal life in Sydney. *Dictionary of Sydney* Accessed https://dictionaryofsydney.org/entry/archaeological_evidence_of_aboriginal_life_in_sydney 27 April 2021
[42] Cited in KNC 2020 Pyrmont Place Strategy: Indigenous Cultural Heritage Report. Report to: DPIE
[43] Tench, W 2009 *1788* Text Publishing: Melbourne.
[44] Attenbrow, V. 2012
[45] Baker, N. 2004 *Archaeological Salvage of an Aboriginal Site at Williams Street, East Sydney*. Report to Zonie Construction and Design Pty Ltd. P:31

The Aboriginal people of Cockle Bay utilised the wide range of animals native to the region for food and tool making. Mammals such as kangaroo and wallabies, as well as arboreal mammals such as possums were in plentiful supply, with cultural burning used to facilitate hunting. Ethnographic observations by early non-Aboriginal colonists noted that Aboriginal people used a variety of tools and non-utilitarian functions. Plant products like gums and sap were used for binding and hafting stone hatchets and plant fibres were woven into baskets, nets, ropes, and hammocks. Locally sourced plants were also used in the manufacture of shelters, shields, and coolamons used to carry food and water.

7.2 Archaeological context

7.2.1 Aboriginal material culture

The existing archaeological record is limited to certain materials and objects that were able to withstand degradation and decay. As a result, the most common type of Aboriginal objects remaining in the archaeological record are stone artefacts, followed by bone and shell. There is potential for Aboriginal objects to occur across the landscape. The nature of the underlying geology and proximity of water sources to portions of the study area indicates the potential for the occurrence of artefact sites and/or midden sites.

Stone artefacts are one of the most common types of Aboriginal objects remaining in the archaeological record. Archaeological analyses of these artefacts and their contexts have provided the basis for the interpretation of change in material culture over time. Technologies used for making tools changed, along with preference of raw material. Different types of tools appeared at certain times. It is argued that changes in material culture were an indication of changes in social organisation and behaviour.

7.2.2 Registered Aboriginal sites

An extensive search of the AHIMS database was completed on 26 April 2021. The aim of the AHIMS site register search was to identify Aboriginal sites registered within, or in the vicinity of, the study areas. Searches were undertaken using the following parameters:

GDA 1994 MGA 56	330343mE – 335934mE 6249852mN – 6252506mN
Number of sites	107
AHIMS Search ID	470218

The distribution of recorded sites within the AHIMS extensive search areas is shown in Figure 17.

IMAGE REDACTED FOR PUBLIC DISPLAY

Figure 17: Results of extensive AHIMS search conducted for the project

7.3 Previous archaeological investigations

There have been many archaeological investigations in the vicinity of the proposal. Table 7 below summarises those most pertinent based on proximity to the construction sites or similar landform contexts, and the locations of these previous archaeological studies are shown in Figure 19.

Table 7: Previous archaeological studies close to the proposal

Author, title of study	Summary	Distance from closest construction site
GML Heritage – Angel Place Project Volume 3 – prehistory report Salvage Excavation of Site (1997)	The Angel Place site is situated between George and Pitt Streets opposite Wynyard Station, immediately southeast of the Hunter Street Station (Sydney CBD) western construction site. The Angel place investigation area was identified as containing Aboriginal archaeological potential due to its position immediately adjacent to the former alignment of the Tank Stream. Aboriginal archaeological deposit was identified when Aboriginal stone artefacts were retrieved during the course of historical excavation at the site. The site, AHIMS ID 45-6-2581, was located across a four-by-four metre area of intact topography bordering the Tank Stream. The stratigraphy of the investigation area was comprised of three distinct deposits: two charcoal-rich sands overlying an alluvial sandsheet deposit. The upper layer was assessed as being re-deposited during the early nineteenth century for the purposes of European watercourse management associated with the Tank Stream, and the transitory middle layer an *in situ* fluvial soil context from post-1788. The underlying sandsheet deposit was demonstrated to be comprised of a pre-1788 sand-clay C-horizon derivative of sandstone bedrock material and contained the vast majority of the Angel Place stone artefacts. Excavation revealed that only small portions of the investigation area were relatively free of disturbance. Noted disturbances within the excavation area included a late eighteenth or early nineteenth century well, two 1840s sandstone footings, and 1820s-30s sandstock brick battel drain, and a twentieth century machine-pressed brick pad. Technological analysis of the 54 flaked stone artefacts recovered during salvage excavation identified on-site manufacturing through the presence of flakes, cores, and debris. A variety of raw materials including silicified-tuff, indurated mudstone, silcrete, and quartz were identified. The total size of the original site was unable to be determined due to the truncation and modification of the subsurface profiles. However, it was concluded that, based on the distribution of artefacts recovered, an adjoining distribution of lithics would have been present alongside the banks of the original creek, deposited from repetitive or continuous Aboriginal occupation.	About 100 metres to the south of the Hunter Street Station (Sydney CBD) western construction site

Author, title of study	Summary	Distance from closest construction site
Dominic Steele Consulting Archaeology – The KENS Site, Sydney Aboriginal Heritage Assessment (2002)	The KENS site block is defined by Kent, Erskine, Napoleon, and Sussex Streets (KENS), 250 metres due west from the Hunter Street Station (Sydney CBD) western construction site. The site included the original rocky shoreline of Cockle Bay which ran through the western portion of the site. Wendy Thorpe CRM (2002: 24-25) assessed the site to have high potential for Aboriginal archaeological deposits, based on its inclusion of the former shoreline of Darling Harbour. It was also noted that little recorded European activity along the shoreline until the area was sealed by fill used to reclaim it in 1839/40. The assessment concluded that it was likely that some land at the edge of the inlet on the mudflats and sand were buried beneath fill materials deposited to reclaim the bay, and that potential Aboriginal archaeological deposits may survive intact. The site was assessed to have potential for high cultural, educative, and scientific significance. Test excavation was recommended and is summarised below.	250 metres west of the Hunter Street Station (Sydney CBD) construction sites
Dominic Steele Consulting Archaeology – The KENS Site, Sydney Aboriginal Archaeological Excavation Report (2006)	An Aboriginal test and salvage program was conducted at the KENS site in 2006 by Dominic Steele Consulting Archaeology. This was triggered by the historical archaeological investigation, which identified a buried soil profile in the north-east portion of the site underneath a basement floor level. The stratigraphic record from the Aboriginal excavations revealed that natural soil profiles were truncated and rapidly buried, evidenced by a distinction between contexts containing Aboriginal and historical artefacts. The excavations also revealed that sheet erosion in the eighteenth century and additional mixing of the natural soil profiles through human activities occurred. Some natural soil profiles were buried by colluvial deposits, and later sealed by construction and demolition phases. Overall, it was assessed that post-depositional processes had severely affected the condition and distribution of artefacts. The investigations identified that impact on the site through changing land practices (hunting and gathering to clearing to urbanisation) was relatively early in the post contact period. Aboriginal artefacts were recovered from three areas of salvage. Some artefacts which were recovered from truncated silty soils were fragmented, with chipped edges, and artefacts damaged by heat. This was interpreted to be the result of extensive trampling, suggesting that despite the quick burial, traffic was substantial enough to damage artefacts. Post-contact artefacts were identified through the presence of two glass tools displaying retouch and use-	250 metres west of the Hunter Street Station (Sydney CBD) construction sites

Author, title of study	Summary	Distance from closest construction site
	wear characteristics. It was suggested that the artefact characteristics were consistent with the Middle to Late Bondaian assemblage (2800 BP to 1788). Whilst the recovered assemblage and related contexts were not particularly significant in terms of the nature of the technology identified, the KENS site demonstrated that this area on the outskirts of the early European Sydney colony was intensively used by Aboriginal populations both prior to and also, at least for a short period, following 1788. It also contributes an understanding of how the Aboriginal archaeological record can survive through multiple phases of historical development and disturbance in the CBD.	
Dominic Steele Consulting Archaeology – Application for an S87 Permit, Aboriginal Archaeological Assessment, Research Design, and Excavation Methodology. 320-328 George Street PAD, George Street, Sydney (2005)	An Aboriginal Archaeological Assessment & Application for a S87 Preliminary Research Permit was undertaken by Dominic Steele Consulting Archaeology in 2005. The location, 320-328 George Street, is located opposite Wynyard Station occupying a city block between Angel Place and Paling Lane, with De Mestre Place to the north. The AHIMS site is registered as being within Lots 1, 2, and 3 for DP 185597. These lots have since been consolidated as part of the development of the Ivy (current Lot 2 DP 1250819). The extent of the AHIMS site is assumed to be confined to the extent of the Ivy Complex, therefore not overlapping with the Hunter Street Station (Sydney CBD) western construction site. The assessment identified a PAD based upon the prior ground disturbance of the site, in conjunction with the proximity to the Tank Stream and previous assessment in the immediate local area, suggesting that intact soil profiles containing archaeological deposits associated with the Tank Stream would survive. The area of potential was confined to the eastern portion of the study area, with the remaining area determined to be truncated by historic development and all potential for *in situ* archaeological deposits removed. It is noted that existing buildings on the site which were removed did not feature deep basements, allowing historical soil deposits to be preserved in some portions (eastern) of the site. The Aboriginal archaeological investigation was not conducted as the excavation of test trenches conducted during historical archaeological investigations ceased at a level of occupation laid down after c.1850. During the historical archaeological investigations[46], one Aboriginal lithic object was recovered. It was located in the eastern portion of the assessment area (Area A). The	Directly adjacent to the Hunter Street Station (Sydney CBD) western construction site

[46] AMAC Archaeological 2015 Final Archaeological Report – 320-328 George Street, Sydney, NSW, Including portions of the *Tank Stream* curtilage (SHR 636)

Author, title of study	Summary	Distance from closest construction site
	artefact was recovered from a heavily disturbed deposit comprising of twentieth century utility and construction fills. The historical archaeological excavations demonstrated that the site as a whole has been subject to extensive development over time, resulting in severe truncation of the majority of the original soil profiles. This included the eastern portion of the site associated with the former alignment of the Tank Stream (Area E), where evidence of historic disturbances and modern fill layers were identified including the walling of some of the curtilage of the Tank Stream and the presence of subsurface modern sewers and drains.	
GML Heritage – 200 George Street, Sydney Post Excavation Report, Volume 1: Main Report (2014)	GML Heritage conducted an archaeological excavation at 200 George Street, Sydney, about 345 metres north/ northwest from the Hunter Street Station (Sydney CBD) construction sites. The excavations were investigating a PAD (AHIMS ID 45-6-3081), registered in 2012 by GML, within the 200 George Street project area. Excavation was conducted under an AHIP in 2013. Intact natural soil was identified during historical archaeological investigations in Areas 4 and 8. The two areas (northeast and southwest of site) were located beneath the basement level of the 1970s tower building, demolished concurrently with the archaeological excavation program. These areas were investigated for potential Aboriginal objects. Geomorphological assessment within Area 4 revealed an estuarine soil deposit 600-700 mm below the floor slab. The deposit was determined to be a marsh environment and assessed to be not conducive to any human activity that could have resulted in an archaeological signature. No further investigations in this area were conducted. Investigations within Area 8 identified a natural deposit below historic sandstone foundations. Hand excavation was conducted to irregular sandstone bedrock. No artefacts were recovered. It was determined that archaeological deposits were unlikely to accumulate *in situ* due to the irregularity of the sandstone bedrock. It was determined that all portions of the study area hold very low to no archaeological potential for further *in situ* Aboriginal archaeological deposits.	About 345 metres north of the Hunter Street Station (Sydney CBD) construction sites

Author, title of study	Summary	Distance from closest construction site
Jillian Comber – Darling Quarter (formerly Darling Walk), Darling Harbour (2012)	An assessment of the Darling Walk project area (Cockle Bay) was undertaken by Jillian Comber in 2009. The investigations included an archaeological survey, cultural heritage assessment, as well as archaeological test and salvage excavation work. Comber found that Aboriginal objects including stone artefacts and shell midden were present along the former shoreline. Lithic types included chert (n=8, 80%), as well as singular instances of silcrete and quartz. Shell material recovered was predominantly *Andara trapezia (*Sydney Cockle / Mud Ark), accounting for 90.57% of the minimum number of individuals retrieved during excavation. A total of 342 whole shells, 5122 values, 6754 hinges, and 8224 shell fragments were recovered. The western section of the study area contained no evidence of Aboriginal occupation and was within reclaimed land. The site was interpreted as a midden redeposited by wave action, and possibly disturbed by later land reclamation activities. It was suggested that Aboriginal people would have been cooking and eating their food on the sandstone outcrops overlooking the harbour, and that raw materials utilised for stone tool production had been traded with people from west of the harbour on the Cumberland Plain, where sources of chert are known to occur.	About 400 metres southeast of Pyrmont Station eastern construction site
Urbis – The Star Sydney, Section 75W Modification Application, Aboriginal and Historical Cultural Heritage Archaeological Assessment (2018)	Urbis completed a combined historical and Aboriginal heritage assessment of the site of the Star Casino, Lot 500 DP 1161507; about 190 metres northwest of the Pyrmont Station eastern construction site and 210 metres north of the Pyrmont Station western construction site. The assessment determined that there was very low to nil potential for any intact Aboriginal archaeological sites having remained *in situ*. This was due to identification of historic construction, including that of The Star and the previous phase as the former Pyrmont Power Station, resulting in severe disturbances across the site. Basement levels extending across the entire site were established to extend to a depth of between 7 and 14 metres below the established ground level, eradicating the potential for intact soil profiles or *in situ* Aboriginal archaeological deposits.	190 metres northwest of the Pyrmont Station western construction site
KNC – Pyrmont Peninsula Place Strategy – Aboriginal Cultural	KNC completed an Aboriginal Heritage assessment of the Pyrmont Peninsula in 2020, for an area including the Pyrmont Station construction sites. Assessment was conducted through desktop research and visual survey; no excavation was completed. The assessment identified six Aboriginal sites, including five potential archaeological deposits.	Includes the Pyrmont Station construction sites

Author, title of study	Summary	Distance from closest construction site
Heritage Report (2020)	The assessment noted that, despite the extensive disturbance and built nature of the Pyrmont environment, Aboriginal archaeological sites can survive in built environments as subsurface archaeological deposit if the disturbance of remnant natural soils is relatively low. Despite noting extensive landform and land-use disturbance across the investigation area, KNC identified areas within the Pyrmont Peninsula as containing the potential for remnant natural soils. The approximate extent of the original peninsula landform prior to reclamation work, including the Pyrmont Station construction sites, was identified as an area of archaeological sensitivity.	
Artefact Heritage – Sydney Metro West Concept and Stage 1 ACHAR (2020)	An ACHAR was prepared for the Sydney Metro West Concept and major civil construction work for Sydney Metro West between Westmead and The Bays (Stage 1 of the planning approval process for Sydney Metro West) in 2020 by Artefact Heritage. The assessment included an area for The Bays Station. Assessment was conducted through visual survey and desktop research. The assessment identified that the location of The Bays Station construction site was above the tidal limit in a resource-rich wetland area, and therefore an important part of subsistence land-use strategies. The assessment also noted that infilling phases in the early twentieth century are likely to have preserved any intact archaeological deposits or Aboriginal artefacts and could preserve both pre-contact and contact era remains. The south-western portion of The Bays Station construction site was considered to have low-moderate potential for Aboriginal archaeological remains, whilst the remainder of the site was considered at contain low potential. Test excavation was recommended for the proposal to be triggered by any subsurface impacts within the area assessed as demonstrating archaeological sensitivity at The Bays Station construction site. Test excavation was also recommended if historical excavations in other portions of the construction site identified any intact remnant soil profiles.	Included in The Bays Station construction site

IMAGE REDACTED FOR PUBLIC DISPLAY

Figure 18: Identified areas of Aboriginal archaeological sensitivity according to Pyrmont Peninsula Place Strategy, study area outlined in red

IMAGE REDACTED FOR PUBLIC DISPLAY

Figure 19: Locations of previous Aboriginal archaeological studies in the vicinity of the study area

7.4 Predictive model

Archaeological and ethnographic data have demonstrated substantial use of Pyrmont Peninsula and the Sydney CBD by Aboriginal people. The study areas for the proposal, particularly the Hunter Street Station (Sydney CBD) construction sites, are in close proximity to marine and estuarine resources, fresh water and varying terrestrial subsistence resources.

Previous archaeological investigation of Pyrmont Peninsula and the Sydney CBD reflect the use of the area by Aboriginal people however evidence is largely limited to areas which have been subject to archaeological investigation, and which have not been impacted by historical development. Due to the scale of urban development in Pyrmont Peninsula and the Sydney CBD, particularly from deep excavation work for basements, much of the former ground surface has been removed which strongly limits the extent to which evidence of Aboriginal use of the landscape is preserved. However, previous archaeological investigations in the Sydney CBD have demonstrated that Aboriginal objects can be present below older extant properties, which typically do not feature basements or have limited deep excavation. Previous archaeological investigations have also demonstrated that isolated Aboriginal stone tools may be redeposited in historically modified soils, however this redeposition would have removed the spatial and stratigraphic integrity of the site and artefacts recovered from these historically modified layers are often out of context and of limited diagnostic value.

Sites within the Pyrmont Peninsula are largely limited to the coastal foreshore and include a sandstone rock shelter site. Sites within the Sydney CBD are largely focused around the Sydney Harbour foreshore and near early watercourses such as the Tank Stream and Cockle Creek. The majority of the registered sites across the study area are comprised of areas of PAD with the built-up nature of the study area limiting the survivability of surface-based site types.

Based on the physical inspections, comparative analysis and desk top studies it can be predicted that:

- Archaeologically sensitive landforms, including the former foreshore of the Tank Stream, are present within the immediate vicinity of the Hunter Street Station (Sydney CBD) construction sites
- Sandstone shelters suitable for archaeological deposits and outcrops suitable for engraving may be preserved across sandstone outlooks associated with areas of preserved headland within the Pyrmont Peninsula
- Sandstone outcrops overlooking the harbour within the Pyrmont Peninsula are likely places to find evidence of Aboriginal occupation
- Middens may occur in remnant natural soils, particularly along the original shoreline on the Pyrmont Peninsula
- Sub-surface artefact sites within floodplain areas tend to consist of lower density isolated occurrences, including freshwater, marine and estuarine areas
- The survivability of Aboriginal objects would be largely dependent on the extent and nature of subsequent phases of historical construction activities as well as the depth of the underlying deposit. In many cases, historical construction activities have involved excavation below the lower elevation of the natural soil horizon, removing most evidence of past Aboriginal use of the landscape

- However, residual areas where intact natural soils remain may be present within the study areas. These areas of potential would be likely limited to:
  - Locations beneath extant buildings constructed in the nineteenth or early twentieth century, where deep excavation for construction was less commonly conducted
  - Chance areas on outer margins of a development where soil profiles may have been preserved below footpaths, access roads or ground-level carparks, where modern utility services in these areas are minor or absent
  - Locations beneath buildings without basement levels where construction was limited to shallow-ground disturbance
- Aboriginal objects may also be identified in redeposited soil which was excavated and infilled during historical construction events. However, Aboriginal objects identified in redeposited soil would likely be isolated, out of stratigraphic context and of low research value
- Areas of non-Aboriginal archaeological potential from the late eighteenth and early nineteenth centuries, may contain Aboriginal archaeological and cultural significance and the presence of contact-period Aboriginal objects and deposits within these contexts cannot be excluded.

8.0 SITE LOCATION CONTEXT AND ARCHAEOLOGICAL SURVEY

8.1 Introduction

This section presents an overview of the environmental and archaeological context for each station location, including the results of the archaeological survey. The purpose of this section is to present the results of the archaeological survey, and to assess and demonstrate the archaeological potential for each location.

A summary of the desktop assessment of the tunnel alignment beyond the construction site boundaries is included in Section 10.1.1. A summary of the survey results including the coverage of survey units and landforms as per the Code of Practice is provided in Section 8.4.

The construction sites were surveyed on foot and a photographic recording of the landscape and built environment made.

8.2 Pyrmont Station construction sites

Each of the Pyrmont Station construction sites was assigned its own separate survey unit. The locations of these survey units are shown in Figure 20. The location of AHIMS sites located in the Pyrmont area is shown in Figure 21.

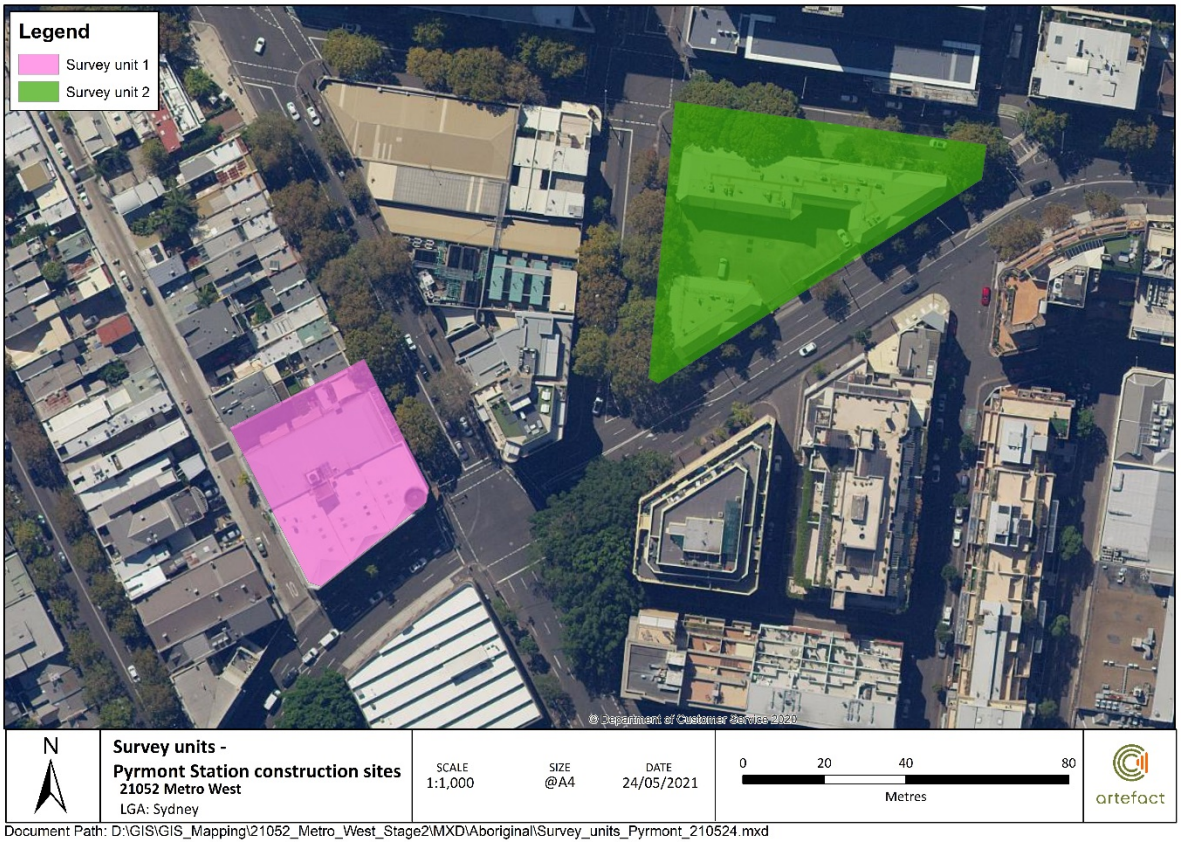


Figure 20: Survey units - Pyrmont Station construction sites

Figure 21: AHIMS sites in proximity to Pyrmont Station construction sites

8.2.1 Pyrmont Station western construction site – survey unit 1

8.2.1.1 Environmental context

The underlying geology of the Pyrmont Station construction sites is Hawkesbury sandstone, which comprises medium to coarse-grained sandstone with minor shale and laminate lens. Soils across the construction site are identified as the Gymea soil landscape which are generally comprised of sandy soils with a high erosion hazard.

The closest known freshwater sources to the Pyrmont Station construction sites would have been the upper reaches of Cockle Creek and Blackwattle Creek beyond the tidal influence of Cockle Bay and Blackwattle Creek respectively or freshwater springs such as Tinkers well.

Based on historical maps and the current topography across Pyrmont, the Pyrmont Station western construction site appears to be located within the broad ridgeline which runs south east to north west along the Pyrmont Peninsula. At its closest point the Pyrmont Station western construction site would be located about 250 metres east of the former foreshore of Blackwattle Bay. Historic maps however identify that, unlike the eastern side of the Pyrmont Peninsula, the western portion of the foreshore was comprised of a steeply sloped transition between the ridgeline and foreshore features. The Gymea soil landscape is generally comprised of shallow soils of up to 50 centimetres on crest landforms.

The closest known freshwater source (Tinker's Well, a former freshwater spring) to the Pyrmont Station western construction site would have been about 680 metres northwest of the Pyrmont Station western construction site.

There are no AHIMS registered sites within 200 metres of the Pyrmont Station western construction site. AHIMS registered sites located within Pyrmont are shown in Figure 21.

8.2.1.2 Archaeological context

No recorded Aboriginal sites are located within 200 metres of the Pyrmont Station western construction site (see Figure 21). The closest registered AHIMS site to the construction site would be located 270 metres to the west within the former foreshore. The site, The Bays Precinct PAD01 (AHIMS ID 45-6-3339) was recorded as an area of archaeological potential associated with potential for intact foreshore deposits to exist beneath existing disturbance associated with the construction of a surface carpark area. All registered Aboriginal sites within the Pyrmont Peninsula are associated with foreshore landforms.

Several phases of development across the site are noted in an archaeological research design completed for the site by GML[47]. The assessment, completed in advance of the most recent building in the northern portion of the construction site, notes former phases of development and disturbance within the site including a series of Terrace houses across the site between 1883 and 1915. The southern building currently extant across the site was identified as beginning in the later 1940s resulting in the complete demolition of the earlier terrace structures.

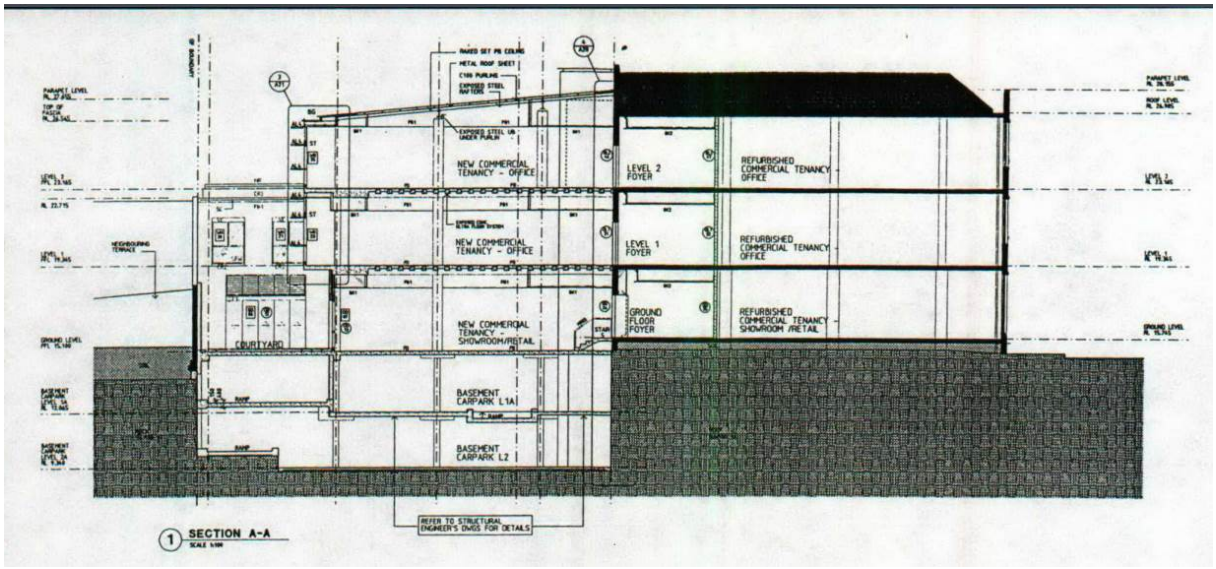


Figure 22: View of site development plans across 26-32 Pyrmont Bridge Road as illustrated in archaeological research design completed prior to construction[48]

The KNC[49] assessment of the Pyrmont Peninsula identified that the area including the Pyrmont Station construction sites is situated on the crest of a broad ridgeline which runs from north to south, sloping back towards Blackwattle and Cockle Bay. All non-reclaimed land across the peninsula as a whole was assessed as part an area of Aboriginal archaeological sensitivity due to the potential for buried remnant natural soils which may conserve Aboriginal objects; however, only in those locations where ground disturbance has been very light.

8.2.1.3 Archaeological survey

The Pyrmont Station western construction site would be located across a built environment comprised of the office block of 26-32 Pyrmont Bridge Road. The construction site would be located across a gently sloped landform located along the central ridgeline of the Pyrmont Peninsula. No areas of surface visibility were observed.

Existing buildings across the construction site include two commercial office structures. The northern building includes entry to a basement carpark structure on Paternoster Row in the northern portion of construction site (refer to Figure 25). The southern building, fronting Pyrmont Bridge Road, showed no evidence of associated basement excavation. Vents located near street level suggest underfloor ventilation, indicating an absence of basement structure (refer to Figure 24).

[47] GML 2000, 26-32 Pyrmont Bridge Road, Pyrmont
[48] GML 2000, 26-32 Pyrmont Bridge Road, Pyrmont
[49] KNC 2020 Pyrmont Peninsula Place Strategy, Indigenous Cultural Heritage Report

Figure 23: View south-west towards Pyrmont Station western construction site

Figure 24: Pyrmont Bridge Road showing potential under-floor ventilation within Pyrmont Station western construction site

Figure 25: Evidence of sub-surface ground modification on Paternoster Row

Figure 26: View north along Paternoster Row

8.2.1.4 Assessment of archaeological potential

Due to basement excavation for car parking within current structures, the northern portion of this construction site has no remnant natural soils conserved and no Aboriginal archaeological potential is predicted in this location.

The southern portion of the site has been developed several times since European settlement, with late nineteenth century terrace houses constructed in the 1880s, followed by the construction of Gilbey's Distillery in the 1940s. Non-Aboriginal archaeological remains related to nineteenth century terrace houses has been predicted to be located in the subfloor space of Gilbey's Distillery. However, the construction of earlier terrace houses on the former sandy soils of the lower slope of a local ridgeline in Pyrmont would likely have removed much of the former soil surface, with deeper soils likely disturbed from construction and use of the historical properties.

In addition, the Pyrmont Station western construction site would not be located near other landscape features (such as former watercourses, sandstone shelters or caves) which sub-surface Aboriginal sites are often proximate to. With natural and intact original soil deposits likely to have been truncated or removed, the Pyrmont Station western construction site is not considered to have the potential for sub-surface Aboriginal objects.

8.2.2 Pyrmont Station eastern construction site – survey unit 2

8.2.2.1 Environmental context

Based on historical maps and the current topography across Pyrmont, the Pyrmont Station eastern construction site would be located within a slope landform which transitioned the foreshore towards the broad ridgeline which runs south east to north west along the Pyrmont Peninsula. At its closest point the Pyrmont Station eastern construction site would be located about 150 metres west of the former foreshore of Cockle Bay. Historic maps identify a transition to sandy bays and mudflats along the eastern shore of the peninsula about 100 metres east of the eastern construction site.

Geotechnical investigations to the immediate west of the construction site within Edward Street identified the soil profile of the construction site as being comprised of an underlying silty sandy gravel and silty sand fill deposit overlying weathered sandstone which was identified from one metre below the ground surface. This profile is consistent with the Gymea soil landscape.

The closest freshwater sources are about 770 metres northwest of the Pyrmont Station eastern construction site.

8.2.2.2 Archaeological context

The KNC[50] assessment of the Pyrmont Peninsula identified the Pyrmont Station eastern construction site as part of a larger area of Aboriginal archaeological sensitivity but identified that areas with potential Aboriginal archaeological deposit would only occur within areas of limited ground modification with the possibility of remnant natural soils. Jillian Comber[51] suggested that Aboriginal sites would be likely found on sandstone outcrops overlooking the Harbour, associated with the major resources of Blackwattle Bay and Pyrmont Point.

There are no AHIMS registered sites within 200 metres of the Pyrmont Station eastern construction site. AHIMS registered sites located within Pyrmont are shown in Figure 21.

8.2.2.3 Archaeological survey

The Pyrmont Station eastern construction site would be located across a built environment bound by Union Street, Edward Street and Pyrmont Bridge Road. The construction site would be located across a sloped landform which rises to the south west (refer to Figure 27). Portions of the development within the construction site include basement and subsurface office levels which are largely evident across the western portion of the construction site (refer to Figure 30). The north-eastern portion of the construction site along Union Street has been excavated into the slope landform (refer to Figure 29). No areas of surface visibility or intact ground profiles were observed.

[50] KNC 2020 Pyrmont Peninsula Place Strategy, Indigenous Cultural Heritage Report
[51] Comber 2009

Figure 27: View of sloped landform south-west towards Pyrmont Station eastern construction site

Figure 28: Observed landform modification associated with commercial construction along Union Street

Figure 29: View east along Union Street, subsurface impacts evident

Figure 30: Example of below-ground disturbance along Edward Street

8.2.2.4 Assessment of archaeological potential

The whole of the survey unit consists of a series of connected office buildings and carparks, located on a moderate slope that descends to the north and west. This office complex is two storey (upper and lower ground), with the lower ground at the elevation of Union Street and the upper ground at the elevation of Pyrmont Bridge Road. As such, the lower ground level (predominantly carparking) is excavated into the rising slope towards the south, with all former soil deposits removed for the construction of this lower ground level.

The north-western portion of the survey unit is located on an area of ground which is not likely to have been removed from basement excavation in the past. Terrace housing was present on the site from the 1870s until the 1940s. The construction of this terrace housing would have involved some landscape modification due to the moderately graded slope that faced Pyrmont Bay to the north. The construction of these terrace houses would have disturbed the residual soil profile, with remaining sandy soils in this location likely to be truncated or removed from this historic construction.

In addition, prior to construction of Union Street in the 1840s, the survey unit was more steeply graded than at present. The presence of intact sub-surface Aboriginal archaeological sites is not be predicted on a moderately sloped landform where expected stationary occupation activities are not anticipated and colluvial erosion is predicted.

There are no Aboriginal sites or predicted areas of Aboriginal archaeological sensitivity within the Pyrmont Station eastern construction site.

8.3 Hunter Street Station (Sydney CBD) construction sites

Each of the Hunter Street Station (Sydney CBD) construction sites were assigned their own separate survey units. The locations of these survey units are shown in Figure 31. The location of AHIMS sites located near the Hunter Street Station (Sydney CBD) construction sites is shown in Figure 32.

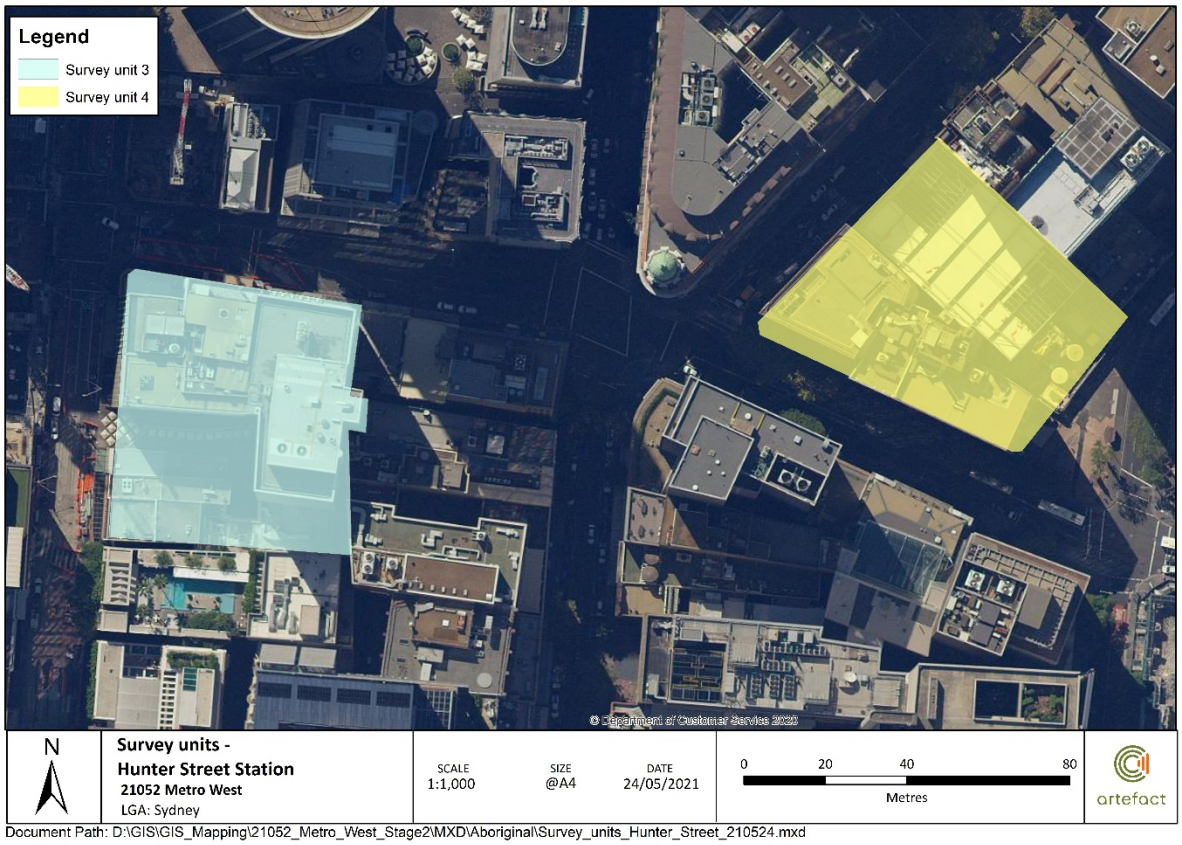


Figure 31: Survey units - Hunter Street Station construction sites

IMAGE REDACTED FOR PUBLIC DISPLAY

Figure 32: AHIMS sites within the vicinity of the Hunter Street Station construction sites. Location of AHIMS ID 45-6-2796 is considered to be inaccurately mapped and is considered to be outside of Hunter Street Station) western construction site (see Section 8.3.1.2)

8.3.1 Hunter Street Station (Sydney CBD) western construction site – survey unit 3

8.3.1.1 Environmental context

The underlying geology of the Hunter Street Station (Sydney CBD) western construction site is Hawkesbury sandstone, which comprises medium to coarse-grained sandstone with minor shale and laminate lens. Soils across the construction site are identified as the Gymea soil landscape which are generally comprised of sandy soils with a high erosion hazard.

The western construction site encompasses the original alignment of the Tank Stream, which served as the CBD's main water course both pre-European contact and the fledgling Sydney colony. The Tank Stream Valley had surface drainage in the vicinity of Market Street, flowing north to be augmented by springs in the walls and side gullies, before cutting a definite channel in the vicinity of present-day King Street. The steam descended rapidly from this point to deposit in an area of the bay reclaimed by Circular Quay West.[52] The foreshore around Sydney was comprised of clean white sand which graduated to mud banks at the entrance of the stream.

8.3.1.2 Archaeological context

AHIMS site 45-6-2796 is registered as partially within the study area (Figure 32), specifically at the Hunter Street Station (Sydney CBD) western construction site. The site, located at 320 George Street, consists of an area containing archaeological potential associated with the proximity of the Tank Stream, and the potential for intact soil deposits beneath layers of existing disturbance. Historical excavation of this site revealed extensive disturbances, including infrastructure associated with the walling of the Tank Stream as well as modern drains and sewers. The assessment identified that only areas in the central and eastern portions of that site had residual archaeological potential, due to the truncation of the former hillslope on the western side near George Street.

The AHIMS site is registered as being within Lots 1, 2, and 3 for DP 185597. These lots have since been consolidated as part of the development of the Ivy Complex (now Lot 2 DP 1250819). AHIMS site card information indicates that the location data displayed on the AHIMS register has been inaccurately recorded, resulting in the AHIMS site erroneously appearing within the Hunter Street Station (Sydney CBD) western construction site.

It is understood that no specific Aboriginal archaeological test excavation was conducted for work at the 320 George Street site. However, one Aboriginal stone artefact was identified during historical archaeological excavation conducted on the site. This stone artefact was recovered from a redeposited soil layer within the historical archaeological contexts of that site. It is noted that historical archaeological remains were preserved at the 320 George Street site in part because the extant building, which was removed did not possess basement levels, with historic deposits conserved below shallow building footings.

Again, evidence for the potential for the survivability of Aboriginal objects in sub-surface contexts includes the results of excavation at Angel Place to the south of the Hunter Street Station (Sydney CBD) western construction site[53]. The Aboriginal and non-Aboriginal archaeological deposit at Angel Place had been preserved to some extent by large deposits of fill placed over those sites prior to subsequent phases building construction. The Angel Place site did not include any former development which included basement structures which meant that fill deposit layers underlying the structures partially protected truncated natural soil deposits.

[52] GML 1998: 11
[53] GML 1997

Historical archaeological assessment of an area immediately adjacent south at 320 George Street notes that the site had been subject to extreme disturbance. Whilst prior assessments had considered the site to have potential for intact buried natural soil profiles, excavation demonstrated that natural soils had been repeatedly truncated and disturbed. One Aboriginal artefact was identified during historical excavation from a heavily disturbed context.

8.3.1.3 Archaeological survey

The Hunter Street Station (Sydney CBD) western construction site would be located across a built environment comprised of several retail and commercial venues including food houses, medical centres, and a St George Bank branch. An underground walkway providing pedestrian access between Wynyard Station, George Street and Pitt Street is located in a basement structure beneath the construction site (refer to Figure 37). Extensive subsurface excavation was evident, with an underground connection to Wynyard Station. Further subsurface excavation was apparent with basement level carparks associated with buildings along George Street, Hunter Street, and Pitt Street (refer to Figure 38).

The location of the Tank Stream in its current form of a stormwater drain was identified at Hunter Street where it crosses Hamilton Street (refer to Figure 36). However, information derived from the Tank Stream Conservation Management Plan[54] indicates that the portion of the Tank Stream which traverses along and partly through the eastern edge of the survey unit was replaced with a modern concrete and steel drain in the second half of the twentieth century (refer to Figure 33).

The construction site would be located across a very gentle slope rising west up Hunter Street and sloping down along George Street. The entire construction site has had extensive ground surface modification, and no areas of surface visibility were observed.

[54] Sydney Water 2005. *Tank Stream Conservation Management Plan*. Report prepared for Asset Management and Sydney Water Corporation.

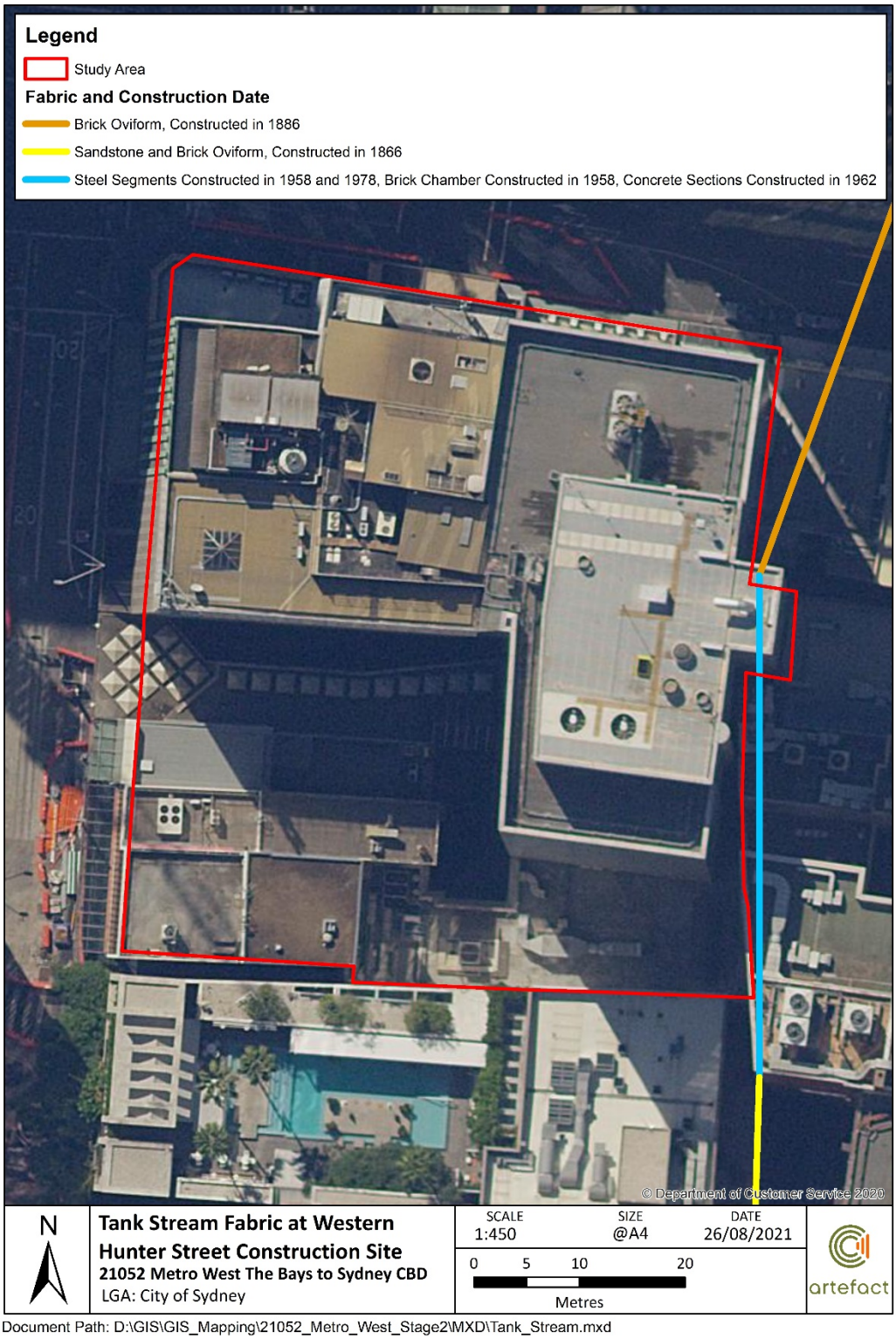


Figure 33: Location of physical fabric of Tank Stream (reproduced from CMP)

Figure 34: View south towards the construction site, corner of George Street and Hunter Street

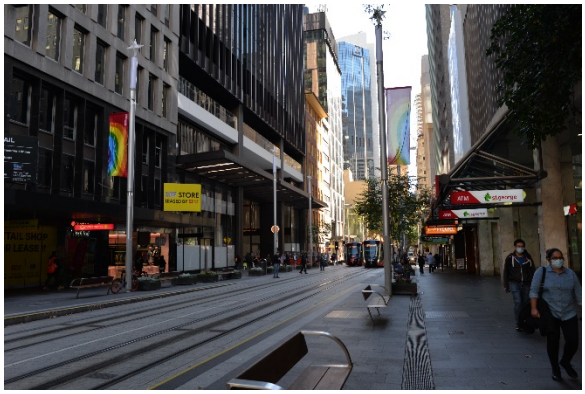


Figure 35: View north along George Street

Figure 36: Former alignment of the Tank Stream, 30 m north of the construction site facing north

Figure 37: Street level entrance to the underground pedestrian walkway between Wynyard Station, George Street and Pitt Street showing substantial subsurface excavation

8.3.1.4 Assessment of archaeological potential

Archaeological excavations conducted in the vicinity of the Hunter Street Station (Sydney CBD) western construction site (the 320 George Street excavation and the Angel Place excavations) have identified historical archaeological resources, historic soils, residual soils and small numbers of Aboriginal objects within historic fill layers below extant structures. However, these excavations were conducted below former buildings which did not feature basements and where the extant buildings at the time were resting on relatively shallow footings excavated into the ground.

The majority of the Hunter Street Station (Sydney CBD) western construction site has been subject to significant disturbance, namely through previous construction involving deep excavation to create a publicly accessible food court and retail area, as well as below-ground carparks, commercial properties, and an underground pedestrian walkway between Wynyard Station and Pitt Street. These basement levels extend more than five metres below the level of George Street in most cases. However, there are two portions which are considered to have the potential for truncated natural soil profiles: the eastern portion of the construction site along the former alignment of the Tank Stream, and the area beneath the Skinners Hotel at the north-eastern corner of the construction site.

The construction of the underground pedestrian walkway between Wynyard Station, George Street and Pitt Street has involved excavation into the lower ground around the alignment of the Tank Stream. The course of the Tank Stream which traverses along and partly within the eastern edge of

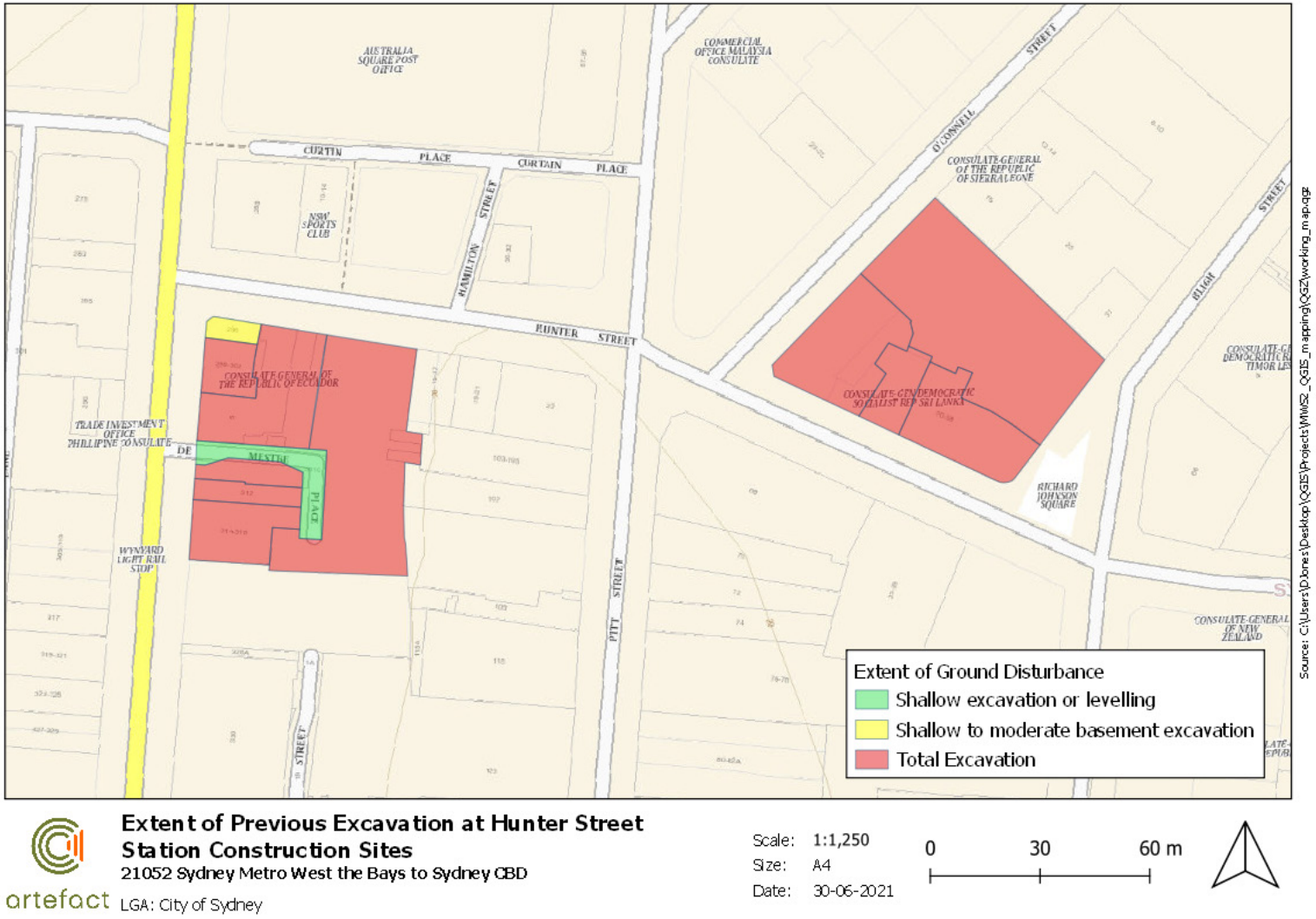
the survey unit was replaced with a modern concrete drain in the second half of the twentieth century. This modification to the Tank Stream likely removed a substantial portion of the natural sedimentary deposits associated with the former riparian foreshore. However, due to the potential depth of alluvial deposits, there is a possibility that a portion of the alluvial subsoils associated with the original Tank Stream exist beneath the disturbances resulting from the installation of the modern Tank Stream. Sedimentary alluvial deposits are considered unlikely to be artefact bearing, as the location within the former riparian zone is not considered to be a desirable location for permanent camping activities, and because of the swampy nature of the deposit. However, due to the sloped nature of the area there is a possibility for colluvial soils to be washed in and caught in the Tank Stream catchment. It would be anticipated that artefacts deposited by colluvial action would not be associated with specific occupation activities or would be located within secure stratigraphic contexts. The eastern portion of the Hunter Street Station (Sydney CBD) western construction site has a low potential for intact remnant alluvial soils at depth; if these intact natural soil deposits are there, they are considered to have a low potential to contain Aboriginal artefacts.

The Skinners Hotel, constructed in 1845, exists on the slope above the original eastern bank of the Tank Stream. This raised position above a major water source is considered to have been a desirable position for Aboriginal occupation, and therefore is more likely to retain an archaeological signature. The Skinners Hotel has a subfloor cellar level which was been incised into the side of the slope, which is one storey in depth. The construction activities would have disturbed the upper profile of the natural soil body, likely removing the A1 profile. However, as the excavation is of only a moderate depth, the potential for buried intact residual soils exists. The footprint of the Skinners Hotel, therefore, is considered to demonstrate low potential for a truncated natural soil profile (A2) within the Gymea soil body. Intact but truncated soil profiles have a low potential to contain Aboriginal objects.

De Mestre Place was formalised in the 1860s as De Mestre's former land grant was subdivided. Prior to this the land within De Mestre's grant had been cleared of all vegetation, and the area containing de Mestre place served as the rear yard for the main residential building.[55] The historical activities in this area, including land clearing and use, would likely have removed the former topsoils of the formerly sandy soils. Due to the extent of development for De Mestre's property, it is not considered likely for any residual soils to remain *in-situ* at this location, although truncated soil horizons may exist at depth. Overall, truncated and intact soils have a low potential for containing Aboriginal objects.

The remainder of the Hunter Street Station (Sydney CBD) western construction site is considered to have no Aboriginal archaeological potential due to total excavation of all residual soils (refer to Figure 39).

[55] Artefact Heritage 2021 Technical Paper 3: Non-Aboriginal Heritage Report



artefact

Extent of Previous Excavation at Hunter Street Station Construction Sites

21052 Sydney Metro West the Bays to Sydney CBD

LGA: City of Sydney

Scale: 1:1,250
Size: A4
Date: 30-06-2021

0 30 60 m

Figure 38: Basement excavation within Hunter Street Station construction sites

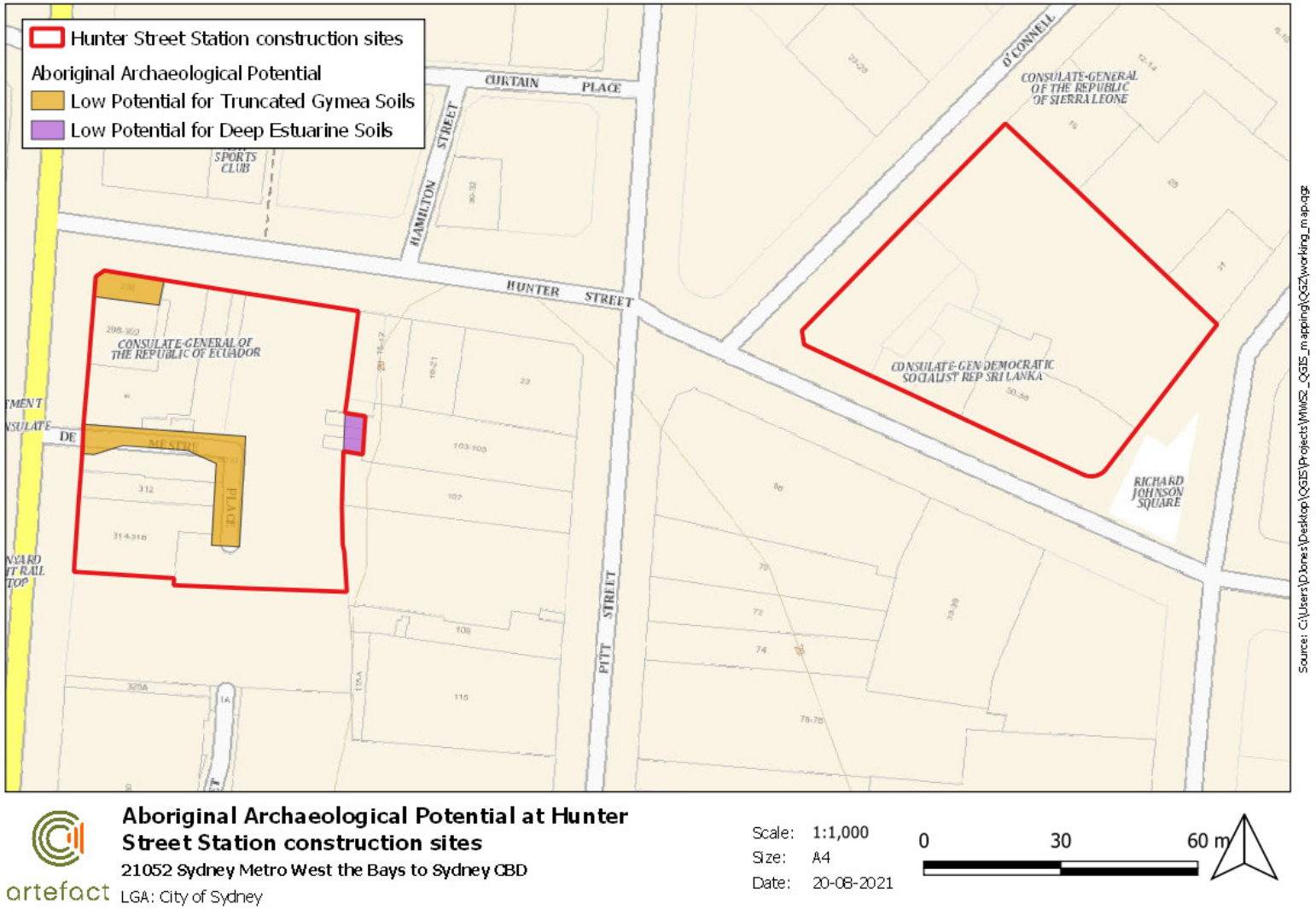


Figure 39: Areas of archaeological potential at Hunter Street Station construction sites

8.3.2 Hunter Street Station (Sydney CBD) eastern construction site – survey unit 4

8.3.2.1 Environmental context

The underlying geology of the Hunter Street Station (Sydney CBD) western construction site is Hawkesbury sandstone, which comprises medium to coarse-grained sandstone with minor shale and laminate lens. Soils across the construction site are identified as the Gymea soil landscape which are generally comprised of sandy soils with a high erosion hazard. The eastern construction site would be within a slope landform rising to the east.

The eastern construction site would be within the catchment area of the Tank Stream which served as the CBD's main water course. The original alignment of the tank stream was located about 80 metres west of the Hunter Street Station (Sydney CBD) eastern construction site.

8.3.2.2 Archaeological context

Archaeological assessment of the northern portion of the construction site completed within the footprint of the former Kindersley House (now demolished) notes that the basement of the building in this section formerly extended to a depth of about three metres below the O'Connell Street front and up to nine metres below the Bligh Street frontage[56]. The assessment noted that this area was zoned within the City of Sydney's Archaeological Zoning Plan (for non-Aboriginal archaeological remains) as having no archaeological potential.

Utility augmentation work conducted for Sydney Metro as part of the Martin Place metro station work identified that no Aboriginal archaeological sites were predicted at the 33 Bligh Street site. No archaeological investigation was conducted, nor Aboriginal objects identified during the excavation work for that project.

8.3.2.3 Archaeological survey

The Hunter Street Station (Sydney CBD) eastern construction site would be located across a gentle – moderate slope rising to the east. It would be located across a built environment comprised of three office blocks located along Hunter Street as well as a temporary acoustic shed within the northern portion of the construction site. The acoustic shed is associated with the Bligh Street tunnelling support site for Sydney Metro Chatswood to Sydenham to the north of the construction site. No areas of surface visibility or intact ground surface were observed.

[56] Casey and Lowe 2012, Sydney CityGrid Project – City Zone Substation Stage 2a – Non-Indigenous Archaeology

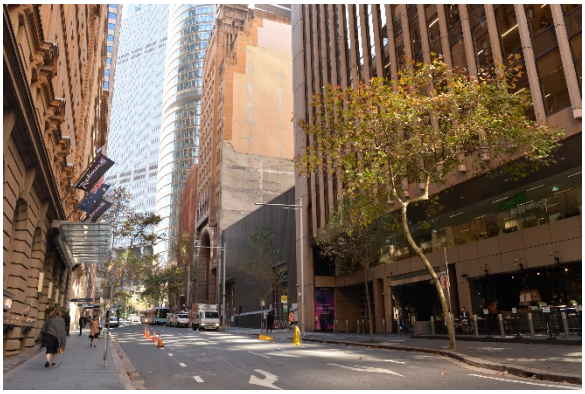


Figure 40: View north-east along O'Connell Street, construction site on right

Figure 41: View south-east along Hunter Street

Figure 42: View north from corner of Hunter Street and Bligh Street

Figure 43: View south-west along Bligh Street

8.3.2.4 Assessment of archaeological potential

All existing buildings within the Hunter Street Station (Sydney CBD) eastern construction site are known to possess deep basements (two storeys or lower) which encompass the entirety of their building footprints. All former soil deposits are expected to have been removed (refer to Figure 38). The construction of the current Sydney Metro City & Southwest site on Bligh Street involved deep excavation work through bedrock, further removing any residual archaeological remains that may have been located in this area prior to excavation. In the absence of any residual soil deposits there are no predicted areas of Aboriginal archaeological potential within the Hunter Street Station (Sydney CBD) eastern construction site.

8.4 Pyrmont power supply route

A desktop assessment was completed for the alignment of the Pyrmont power supply route. No AHIMS sites were identified along the alignment. Pedestrian survey was not conducted.

The power supply route would be constructed by trenching works located along a local ridgeline in Pyrmont. The initial land clearing and associated removal of vegetation in this area would have encouraged erosion of the shallow, sandy Gymea soils. Harris Street was originally formed and ballasted in the mid-nineteenth century, with kerb and guttering constructed around 1862. This disturbance would likely have removed much of the remaining soil surface. In addition, the Pyrmont power supply route would not be located near water courses or shelters in the rock face of the local sandstone, which are often indicators of sub-surface Aboriginal archaeological remains.

The trenching works would be within the road corridors of Pyrmont Bridge Road and Harris Street. Trenches are expected to be between one and two metres deep. Therefore, it is likely that if any intact archaeological deposits remained below the road surface would be impacted by the trenching works.

Overall, the Pyrmont power supply route is not considered to have potential to impact an Aboriginal archaeological site.

8.5 Summary of survey results

8.5.1 Survey coverage

A summary of survey coverage, in accordance with the Code of Practice, is outlined in Table 8 and Table 9. Note that as ground surface visibility was zero per cent, effective survey unit coverage is also zero per cent.

Table 8: Survey coverage summary - survey units

Survey unit	Survey unit area (square metres)	Landform	Visibility (per cent)	Exposure (per cent)	Effective coverage (square metres)	Effective coverage (per cent)
1	1524.89	Crest	0	0	0	0
2	3090.87	Slope	0	0	0	0
3	3748.99	Slope	0	0	0	0
4	3666.97	Slope	0	0	0	0

Table 9: Survey coverage summary - landforms

Landform	Landform area (square metres)	Area effectively surveyed (square metres)	Percentage of landform effectively surveyed (per cent)	Number of sites	Number of PADs
Slope	10506.83	0	0	0	0
Crest	1524.89	0	0	0	0

8.5.2 Survey results

Due to the urban environment, level of development, and the presence of identified basements, the majority of the study area is considered to demonstrate no Aboriginal archaeological potential. No Aboriginal sites or Potential Archaeological Deposits were identified. Portions of the Hunter Street Station (Sydney CBD) western construction site were identified as demonstrating low potential to contain truncated but in-situ deposits associated with the Gymea soil body beneath modern and historic disturbances, and sedimentary deposits of the Tank Stream below the modern Tank Stream drain. These intact but truncated residual soil profiles are considered to have a low potential to contain Aboriginal objects. Therefore, the Hunter Street Station (western construction site) demonstrates a low potential to contain Aboriginal objects. The remainder of the study area demonstrates no potential to contain Aboriginal objects.

9.0 SIGNIFICANCE ASSESSMENT

This section presents a significance assessment for the archaeological potential of each construction site. The significance of any identified area of archaeological potential would not be known with certainty until after archaeological excavation is completed and the significance of archaeological deposits can be assessed.

9.1 Significance assessment criteria

An assessment of the cultural heritage significance of an item or place is required in order to form the basis of its management. The Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW[57] in accordance with the Burra Charter[58] provides guidelines for significance assessment with assessments being required to consider the criteria described in Table 10.

Table 10: Heritage criteria

Criterion	Description
Social values	The spiritual, traditional, historical or contemporary associations and attachments the place or area has for Aboriginal people. Social or cultural value is how people express their connection with a place and the meaning that place has for them. Does the subject area have strong or special association with the Aboriginal community for social, cultural or spiritual reasons?
Historic values	Historic value refers to the associations of a place with a historically important person, event, phase or activity in an Aboriginal community. Is the subject area important to the cultural or natural history of the local area and/or region and/or state?
Scientific values	This refers to the importance of a landscape, area, place or object because of its rarity, representativeness and the extent to which it may contribute to further understanding and information. Information about scientific values will be gathered through any archaeological investigation undertaken. Does the subject area have potential to yield information that will contribute to an understanding of the cultural or natural history of the local area and/or region and/or state?
Aesthetic values	This refers to the sensory, scenic, architectural and creative aspects of the place. It is often linked with the social values. It may consider form, scale, colour, texture and material of the fabric or landscape, and the smell and sounds associated with the place and its use. Is the subject area important in demonstrating aesthetic characteristics in the local area and/or region and/or state?

Scientific values should be considered in light of the following criteria:

- Research potential – Does the evidence suggest any potential to contribute to an understanding of the area and/or region and/or state's natural and cultural history?
- Representativeness – How much variability (outside and/or inside the subject area) exists, what is already conserved, how much connectivity is there?

[57] OEH 2011
[58] Australia ICOMOS 2013

- Rarity – Is the subject area important in demonstrating a distinctive way of life, custom, process, land use, function or design no longer practised? Is it in danger of being lost or of exceptional interest?
- Education potential – Does the subject area contain teaching sites or sites that might have teaching potential?

The heritage significance of a place or object is a dynamic value which can change over time. Places and objects of significance to Aboriginal people and their reason for significance may change as Aboriginal traditions evolve. The current assessment of significance is based on information derived from background research and Aboriginal community consultation carried out to date for Sydney Metro West which may not accurately reflect the future values of these places or objects to Aboriginal people.

9.2 Social significance

9.2.1 Cultural landscape

The World Heritage Convention of United Nations Educational, Scientific and Cultural Organisation (UNESCO) defines a cultural landscape as one which has 'powerful religious, artistic or cultural associations of the natural element rather than material cultural evidence, which may be insignificant or even absent'[59] (UNESCO 1991). The relationship between Aboriginal Australians and the land is conceived in spiritual terms rather than primarily in material terms.[60] Aboriginal cultural knowledge has been defined as:

> *Accumulated knowledge which encompasses spiritual relationships, relationships with the natural environment and the sustainable use of natural resources, and relationships between people, which are reflected in language, narratives, social organisation, values, beliefs and cultural laws and custom (Andrews et al 2006).*

Aboriginal cultural knowledge was traditionally bequeathed through oral traditions from generation to generation. Within all Aboriginal communities there was a time of dislocation and upheaval associated with the arrival of colonial settlers. This widespread disruption resulted in much of the detailed knowledge and understanding of many of the elements of the cultural landscape being lost from the Aboriginal community, nonetheless many Aboriginal people maintain a strong connection to the land of their ancestors and collectively possess a wealth of knowledge passed down through the generations. Consultation has shown that the study areas are part of a wider cultural landscape of high cultural significance to many of the RAPs.

A cultural officer from the Metropolitan Local Aboriginal Land Council discussed the significance of the cultural landscape and Aboriginal heritage cultural values, which has been incorporated into this Technical Paper.

Further Aboriginal heritage values as identified by RAPs will be incorporated into future versions of this Technical Paper if provided.

[59] UNESCO 1991
[60] Andrews G, Daylight C, Hunt J et al 2006, Aboriginal cultural heritage landscape mapping of Coastal NSW, prepared for the Comprehensive Coastal Assessment by the NSW Department of Natural Resources, Sydney NSW

9.2.2 Aboriginal cultural heritage values

Three Aboriginal stakeholders noted a strong cultural connection to the area which includes the construction sites. Particular emphasis was placed on the proximity to Sydney Harbour, as both the location of ceremonial activities and as a resource gathering place. Initiation ceremonial sites and cockle shell deposits were associated with the Sydney Harbour foreshore. Sacred women's sites were noted to often be associated with freshwater resources.

One Aboriginal stakeholder noted that landscapes and landforms hold specific cultural connection to Aboriginal people due to the values of respect and belonging to the land (Country). It was noted that Aboriginal sites are connected through the landscape, and that Aboriginal people would move through areas following signs in the landscape. Another stakeholder noted that the waterways which run near the study area tell stories and are meant to be cared for. The sandstone nature of the study area was noted for its connection to Aboriginal lore and its potential to hold engravings depicting lore stories.

Several Aboriginal stakeholders noted that, with the rapid urbanisation of Sydney, many sites and significant landform features are being lost and, with that, the original sites which were associated with these stories.

9.3 Historic significance

The proposal would be located across areas of substantial historic significance as part of the landscape associated with attested early interactions between Aboriginal people and European explorers, settlers and soldiers.

In addition, on Aboriginal stakeholder noted that Elizabeth Street, east of the study area, was used as a track through the landscape for Aboriginal people both before 1788 and immediately after contact. The freshwater resources along this track (partly within the wider Tank Stream catchment) were highlighted as important resources for Aboriginal people. The area of the early Sydney colony, encompassing the study areas, was noted to have connection with the figures of Bennelong and Barangaroo. Barangaroo in particular was noted due to the presence of the Tank Stream in close proximity to the study area and the connection of freshwater with women's sites.

The Harbour foreshore would have continued to be a gathering place for Aboriginal people until after 1788 due to its importance as a ceremonial site, highlighted by the Aboriginal stakeholders.

9.4 Indicative archaeological (scientific) significance

Archaeological values refer to the archaeological or scientific attributes of a landscape or area. These are characterised using archaeological criteria such as archaeological potential, rarity or the archaeological resource and disturbance.

A summary of the assessed archaeological values is provided in Table 11.

Table 11: Summary of indicative scientific significance of each construction site

Construction site	Research potential	Scientific value	Representative value	Rarity value	Overall indicative significance assessment
Pyrmont Station western construction site	Low	Low	Low	Low	Low

Construction site	Research potential	Scientific value	Representative value	Rarity value	Overall indicative significance assessment
Pyrmont Station eastern construction site	Low	Low	Low	Low	Low
Hunter Street Station (Sydney CBD) western construction site	Low/High if buried remnant landforms were located	Low/High if buried remnant landforms were located	Low/High if buried remnant landforms were located	Low/High if buried remnant landforms were located	Low/High if buried remnant landforms were located
Hunter Street Station (Sydney CBD) eastern construction site	Low	Low	Low	Low	Low

9.5 Aesthetic significance

Aesthetic value refers to the 'sensory' value of a place, and can include aspects such as form, texture and colour, and can also include the smell and sound elements associated with use or experience of a site (Australian ICOMOS 2000). Aesthetic significance can be closely linked to the social value of a site.

Construction sites for the proposal would largely be located within heavily modified residential landscape which has been heavily altered from its former landscape features. While significant landscape elements such as the Darling Harbour and the Tanks Stream are located within close proximity of the study areas these areas are not considered to maintain a direct connection with this feature.

The construction sites for the proposal are considered to contain low aesthetic significance.

9.6 Statement of significance

The study areas represent substantial levels of disturbance and have low scientific significance. If buried remnant landforms associated with the Tank Stream were located in the Hunter Street Station (Sydney CBD) western construction site, they would have a high research potential as Aboriginal objects may be present and would be rare in the context if the urban landscape of the former Tank Stream valley.

The heavily modified urban landscapes bear little resemblance to the former landscape, and as such are also considered to demonstrate low aesthetic significance.

The study areas are located in an area with substantial history of use of the land by Aboriginal people, as well as contact between Europeans and Aboriginal people in the early colony of Sydney. The identified cultural connection with the landscape, including the freshwater resources, marine resource area of Sydney Harbour, and the sandstone nature of the land within the construction sites, is recognised as part of a wider landscape representing strong cultural connection for Aboriginal people and indicates high social significance. The memory of Bennelong and Barangaroo in association with the early contact period and the fledgling Sydney colony on Sydney Harbour contributes to the

historic significance of the area including the study areas. These connections are considered to result in high levels of social and historic significance.

10.0 AVOIDING AND MINIMISING HARM

10.1 Impact assessment

10.1.1 Tunnel alignment

A desktop assessment was completed for all AHIMS sites within the proposal tunnel alignment (refer to Table 12). This assessment was limited to the potential for indirect impact associated with vibration impacts due to the overall depth of direct impact associated with the tunnelling process.

A high-level estimation of ground movement along the proposal alignment and associated settlement impacts due to the proposed construction works and tunnelling is presented in Chapter 14 (Groundwater and ground movement) of the Environmental Impact Statement. This assessment concluded settlement impacts would be 'negligible' with an expected ground movement of one to five millimetres. Proposed works would be unlikely to result in sufficient ground movement to disturb potential sub-surface Aboriginal sites. Proposed works are unlikely to result in superficial damage to sandstone on the surface (AHIMS ID 45-6-2960). Overall, the potential for impact to Aboriginal sites from settlement and ground movement impacts are considered to be low.

Table 12: Summary of registered AHIMS sites along the tunnel alignment

Site / AHIMS ID	Site type	Location	Site status	Potential indirect impact
The Bays Precinct PAD 02 (AHIMS ID 45-6-3338)	PAD	Directly above tunnel alignment	Valid	The tunnel alignment would be located about 45 metres below the AHIMS registered site. It is predicted that this would result in one millimetre vertical settlement and would result in negligible impacts.
Jackson's Landing Shelter (AHIMS ID 45-6-2960)	Rockshelter with PAD	Directly above tunnel alignment	Valid	The tunnel alignment would be located about 45 metres below the AHIMS registered site. It is predicted that this would result in one millimetre predicted vertical settlement and would result in negligible impacts.
Wynyard Walk PAD (AHIMS ID 45-6-3116)	PAD	Directly above tunnel alignment	Destroyed	The tunnel alignment is located about 40 metres below the site. However, the site is registered as destroyed and there would be no impacts to this site.

Site / AHIMS ID	Site type	Location	Site status	Potential indirect impact
RBG PAD 1 (AHIMS ID 45-6-3324)	PAD	Directly above tunnel alignment	Valid	The tunnel alignment is located about 50 metres below the site. It is predicted that five millimetres of vertical settlement would occur at ground level at this location. Due to the site being an area of PAD (an area of ground with the potential to contain subsurface Aboriginal objects), the five millimetre ground displacement would not likely result in damage to, or significant stratigraphic displacement of, any Aboriginal objects. Tunnelling works would result in negligible impacts to the site.

10.1.2 Pyrmont Station construction sites

No known Aboriginal sites would be impacted by the proposed work at the Pyrmont Station construction sites, including as a result of the power supply route to the construction sites.

Due to the landscape context and largely modified nature of the Pyrmont Station construction sites and surrounding area, the likelihood of intact artefact bearing archaeological deposits is considered to be nil. There is no potential for impact to Aboriginal objects.

10.1.3 Hunter Street Station (Sydney CBD) construction sites

Due to the landscape context and largely modified nature of the Hunter Street Station (Sydney CBD) construction sites and surrounding area, the likelihood of intact artefact-bearing archaeological deposits is considered to be nil for Hunter Street Station (Sydney CBD) eastern construction site and low for the Hunter Street Station (Sydney CBD) western construction site. There is low potential for impact to Aboriginal objects at the Hunter Street Station (Sydney CBD) western construction site and no potential for impact to Aboriginal objects at the Hunter Street Station (Sydney CBD) eastern construction site.

10.1.4 Pyrmont power supply route

No known Aboriginal sites would be impacted by the proposed work for the construction of the Pyrmont power supply route.

Due to the modified nature of the landscape and the shallow, erodible soils, the likelihood of intact, artefact-bearing archaeological deposits is considered to be nil. There is no potential for impact to Aboriginal objects.

10.2 Summary of impacts

Portions of the Hunter Street Station (Sydney CBD) western construction site has been identified to demonstrate low Aboriginal archaeological potential. It is unlikely that the proposal will impact Aboriginal objects or sites at this location, although if intact remnant deposit associated with the Tank Stream were located Aboriginal objects may be present and impacted. No other areas of Aboriginal archaeological potential were identified across the other construction sites. There is no potential for impacts to Aboriginal objects or sites from the proposal for the remainder of the construction sites.

10.3 Consideration of alternatives and justification of impacts

The design and development of the proposal has included a focus on avoiding or minimising impact to a number of environmental considerations including Aboriginal heritage. This has been achieved through:

- Avoiding direct impacts to previously recorded Aboriginal sites
- Development of a tunnel alignment that avoids potential impacts to Aboriginal archaeological remains through excavation below potential archaeological resources
- Ecologically Sustainable Development Principles.

In accordance with the 'Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW'[61], Ecologically Sustainable Development (ESD) principles have been considered in the preparation of this ACHAR, including options to avoid impacts to Aboriginal cultural heritage, assessment of unavoidable impacts, identification of mitigation and management measures, and taking into account Aboriginal community views.

The principles of ESD are detailed in Schedule 2, clause 7(4) of the Environmental Planning and Assessment Regulation 2000 and the NSW *Protection of the Environment Administration Act 1991*. Chapter 23 of the latter (Synthesis of the Environmental Statement) of the Environmental Impact Statement discusses the ESD principles in regard to the proposal. The ESD principles relevant to the assessment of the proposal as it relates to Aboriginal cultural heritage are considered below.

10.3.1 The precautionary principle

If there are threats of serious or irreversible environmental damage, lack of full scientific confidence should not be used as a reason for postponing measures to prevent environmental degradation (the 'precautionary principle'). The preparation of this assessment has involved an analysis of whether Aboriginal cultural sites would be impacted by the proposal.

10.3.2 The principle of intergenerational equity

The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations (the 'principle of intergenerational equity). The proposal would not impact any significant Aboriginal heritage sites and any unexpected Aboriginal finds would be managed in accordance with investigative mitigation measures outlined in this ACHAR. Where these impacts are unavoidable this ACHAR identifies mitigation measures so that that full scientific confidence is achieved prior to irreversible impacts occurring. The aim of these measures is to mitigate impacts and provide a written record for future generations.

[61] OEH 2011

10.3.3 Conservation of biodiversity and ecological integrity

Cultural values of biodiversity are intertwined with the lives of Aboriginal people and their use of the landscape. Biodiversity impacts of the proposal are considered as part of Chapter 18 (Biodiversity) of the Environmental Impact Statement.

10.3.4 Improved valuation, pricing, and incentive mechanisms

Sydney Metro is committed to the assessment and protection of cultural heritage as a key component of project development. The costs and time required to ensure this assessment is completed to a high standard is incorporated into wider development of Sydney Metro West both prior to and during the associated with these assessments are built into the Environmental Impact Statement. Sydney Metro aims to comprehensively assess impacts, avoid impacts (where feasible), work with the community, and implement management and mitigation measures which strike a balance between meeting New South Wales infrastructure needs and protecting Aboriginal heritage values.

11.0 CUMULATIVE IMPACT ASSESSMENT

11.1 Introduction

Cumulative impacts have the potential to occur when benefits or impacts from a project interact or overlap with impacts from other projects, and can potentially result in a larger overall effect (positive or negative) on the environment or local communities. Cumulative impacts may occur during construction stages when projects are constructed or operated concurrently or consecutively. Concerning heritage, cumulative impacts can result from the successive, incremental and/or combined effects of a single project or multiple projects affecting the same item.

The extent to which another development or activity could interact with the construction and/or operation of the project would depend on its scale, location, and/or timing of construction. Generally, cumulative impacts would be expected to occur where multiple long-term during construction activities are undertaken close to, and over a similar timescale to, construction activities for the project, or where consecutive construction occurs in the same area. Additionally, operation of the project could cause cumulative benefits or impacts when it interrelates or possibly enhances the construction or operation of other projects.

Registered Aboriginal stakeholders noted that the history of urbanisation of Sydney has and continues to result in the modification of the natural landform. Given the strong Aboriginal cultural connection to landforms, including sites depicting lore stories and representing cultural activities, landscape modification leads to an increasing cumulative loss of Aboriginal cultural heritage. The following sections provide an overview of concurrent and future infrastructure projects near to the project study area and summarises the cumulative impacts from each separate nearby infrastructure development for heritage items that would be impacted by the project.

11.2 Sydney Metro West existing approval

The Sydney Metro West Concept and major civil construction work for Sydney Metro West between Westmead and The Bays (Stage 1 of the planning approval) were approved on 11 March 2021.

Aboriginal heritage assessment completed for the existing approval identified potential impacts to Aboriginal heritage within the Parramatta metro station construction site, Clyde stabling and maintenance facility construction site, and The Bays Station construction site. Archaeological investigation of these resources would be conducted prior to work commencing. As the current assessment has not identified any potential impacts to The Bays tunnel launch and support site, there would be no associated cumulative impacts with the Sydney Metro West existing approval.

11.3 Sydney Metro West - Rail infrastructure, stations, precincts and operations

Stage 3 of the planning approval process for Sydney Metro West includes tunnel fit-out, construction of stations, ancillary facilities and station precincts, and operation and maintenance of the Sydney Metro West line. The Scoping Report for *Sydney Metro West – Rail infrastructure, stations, precincts and operations* (Sydney Metro, 2021) was lodged on 21 June 2021. Station construction at The Bays Station would be carried out between the third quarter 2025 and the first quarter 2028, while station construction at Pyrmont Station and Hunter Street Station (Sydney CBD) would be carried out between the final quarter 2025 and the second quarter 2028. Construction activities associated with tunnel fit-out and rail systems would be carried out between the final quarter 2024 and the first quarter

2028. An Environmental Impact Statement is currently in preparation for this proposal, therefore, there is no data to inform a cumulative impact assessment.

11.4 Sydney Metro City & Southwest

Sydney Metro City & Southwest will deliver 30 kilometres of new metro rail between Chatswood and Bankstown, including new twin tunnels under Sydney Harbour, and the upgrade and conversion of all 11 stations between Sydenham and Bankstown to metro railway standard. The Chatswood to Sydenham component of Sydney Metro City & Southwest was granted planning approval in January 2017, and the Sydenham to Bankstown upgrade was approved in December 2018.

The Sydenham to Bankstown component of this project was not considered in this cumulative impact assessment as this stage of the project did not meet the spatial relevance criterion. Components of the Chatswood to Sydenham alignment relevant to this assessment include the tunnel rail systems fit out and station construction and fit out work which would overlap with shaft excavation work at the Hunter Street Station (Sydney CBD) eastern construction site during the first quarter, 2023.

The existing Sydney Metro City and Southwest tunnelling support site at 33 Bligh Street would be handed over from the City and Southwest contractor to the Sydney Metro West contractor around January 2023 and would become part of the Hunter Street Station (Sydney CBD) eastern construction site. The site would, therefore, be in use for an extended period, from January 2023 to about the end of the fourth quarter, 2025.

Seven proposed work sites within the assessment area (Blues Point temporary site, Barangaroo Station, Martin Place Station, Pitt Street Station, Central Station, Waterloo Station and the Marrickville dive site (southern) were identified as likely to contain natural soil/sand deposits. It was assessed that work along the power supply route for the project would have the potential to impact the ground surface. Assessment recommended archaeological test excavation (and salvage excavation would be undertaken) where intact natural profiles with the potential to contain significant archaeological deposits are encountered. No information regarding Aboriginal test or salvage excavation across this site is publicly available. There is therefore no data from which to form a cumulative impact assessment.

11.5 WestConnex M4-M5 Link

The WestConnex M4-M5 Link will comprise a new multi-lane road link between the M4 East Motorway at Haberfield and the New M5 Motorway at St Peters. The project will also include an interchange at Lilyfield and Rozelle (the Rozelle interchange) and a tunnel connection between Anzac Bridge and Victoria Road, east of Iron Cove Bridge (the Iron Cove Link).

Aboriginal heritage assessment completed as part of the WestConnex project did not identify any direct or indirect impacts to Aboriginal cultural heritage associated with the project. Consequently, there would be no cumulative impacts associated with the WestConnex project.

11.6 Other projects

A review of the Department of Planning, Industry and Environment Major Project Register, Government agency websites, relevant local government websites and state media releases identified a list of 13 projects and proposals that have the potential to generate further cumulative impacts with this proposal. The relevant projects which have heritage impact information known, and which were considered in identifying potential cumulative impacts are provided in Table 13, Table 14, and Table 15.

Table 13: Projects in proximity to The Bays tunnel launch and support site with the potential to result in cumulative impacts

Project	Description	Heritage impacts
Western Harbour Tunnel and Warringah Freeway Upgrade About 200 metres east of The Bays tunnel launch and support site	The Western Harbour Tunnel and Warringah Freeway Upgrade project form part of the Western Harbour Tunnel and Beaches Link Program and comprise a new motorway tunnel connection across Sydney Harbour, and an upgrade of the Warringah Freeway to integrate the new motorway infrastructure with the existing road network, with a connection to the Beaches Link and Gore Hill Freeway Connection project.	• Nine Aboriginal cultural places associated with Aboriginal sites registered on AHIMS were identified. Four of these sites were assessed as demonstrating high significance, one site as moderate significance. The remaining four sites were inaccessible for archaeological survey, and further assessment was recommended • Moderate potential for indirect vibration impacts was identified for one Aboriginal terrestrial site within the tunnel alignment • Mitigation measures for this project included terrestrial Aboriginal site condition surveys, vibration monitoring, and condition assessments in consultation with Metropolitan Local Aboriginal Land Council during works. Any change noted in site condition during works would result in the preparation of updated site cards • As the current assessment has not identified any potential impacts to Aboriginal sites for The Bays tunnel launch and support site, the overlapping work with this proposal between the second quarter of 2023 and the first quarter of 2025 does not have the potential to have cumulative impacts on the Aboriginal cultural heritage sites in this area.
Glebe Island multiuser facility About 370 metres east of The Bays tunnel launch and support site	This proposal includes the construction and operation of a ship off-loading, storage and dispatch facility for bulk construction materials such as sand, aggregates and other dry bulk construction materials. The proposal site is located within land owned by	• No Aboriginal archaeological sites or Aboriginal places were identified within 200 metres of the project site • It was assessed to be unlikely that previously undisturbed Aboriginal sites were present below the ground surface due to extensive

Project	Description	Heritage impacts
	the Port Authority on the eastern side of Glebe Island.	disturbance, including the establishment of reclaimed land • No further Aboriginal heritage assessment is available.
Glebe Island concrete batching plant and aggregate handling facility About 250 metres east of The Bays tunnel launch and support site	This proposal is for the construction and operation of a new aggregate handling and concrete batching facility, with the capacity to produce up to one million cubic metres of concrete per annum.	• No Aboriginal sites or places were identified within 200 metres of the study area for the project • Due to the level of past impacts as a result of prior development to the project site, it was determined unlikely for Aboriginal subsurface sites to be present • No Aboriginal heritage constraints were identified • No Aboriginal stakeholder consultation was conducted.

There are no Aboriginal archaeological sites predicted to be impacted by the proposed work and therefore no cumulative impact from The Bays tunnel launch and support site would occur.

Table 14: Projects in proximity to the Pyrmont Station construction site with the potential to result in cumulative impacts

Project	Description	Heritage impacts
The new Sydney Fish Market About 500 metres south-west of Pyrmont Station western construction site.	The project involves building a new Sydney Fish Market which will be set within an improved public domain including the creation of a waterfront promenade. The site is located at the head of Blackwattle Bay between Pyrmont Peninsula and Glebe Peninsula.	• The assessment noted that the probability of Aboriginal sites occurring in the assessment area is generally low as the area is reclaimed however the potential for buried intact soils may exist • Two areas of PAD (The Bays Precinct PAD01 [AHIMS ID 45-6-3339] and The Bays Precinct PAD02 [AHIMS ID 45-6-3338]) were identified based on the potential for intact soils • Potential to impact these areas would be dependent on development impacts and further detailed assessment.

Project	Description	Heritage impacts
Cockle Bay Wharf mixed use development About 500 metres south-east of Pyrmont Station eastern construction site. About 700 metres south-west of Hunter Street Station (Sydney CBD) western construction site.	A SSDA was approved by the NSW Independent Planning Commission on 13 May 2019 for the Concept Proposal and Stage 1 of the planning approval process work which include demolition work. The current proposal would include: • Construction of a land bridge across part of the Western Distributor • The design, construction and use of a 43 storey mixed-use development • At least 6500 m^2 of publicly accessible open space • Site interface work • Subdivision.	• An area of high Aboriginal archaeological sensitivity was identified in a limited area where the subject site was not located on reclaimed ground • Further Aboriginal archaeological excavation and assessment of this area of sensitivity was recommended.

There are no Aboriginal archaeological sites predicted to be impacted by the proposed work and therefore no cumulative impact from the Pyrmont Station construction sites would occur.

Table 15: Projects in proximity to the Hunter Street Station (Sydney CBD) construction sites with the potential to result in cumulative impacts

Project	Description	Heritage impacts
50-52 Phillip Street New Hotel About 300 metres north-east of the Hunter Street Station (Sydney CBD) construction sites	The proposal involves the delivery of a new landmark hotel building in Sydney's CBD. The proposal will deliver around 331 new rooms throughout the 47 storey hotel development.	• Assessment identified an overall low potential for intact Aboriginal archaeological deposits to be present • Assessment notes that a small portion of the assessment area retains potential for pockets of intact natural soil profiles and subsequently this portion of the assessment area contained some archaeological potential • Assessment recommended post approval archaeological investigation. The results of this investigation are not currently available.
One Sydney Harbour	One Sydney Harbour is a skyscraper complex under construction in Sydney which	• No Aboriginal heritage assessment is publicly available for this project,

Project	Description	Heritage impacts
About 500 metres north-west of Hunter Street Station (Sydney CBD) western construction site	includes 808 apartments in three towers. The project is part of the major urban renewal precinct of Barangaroo.	therefore there is no data to inform a cumulative impact assessment.
Sydney Metro – Martin Place Over Station Development About 50 metres south-west Hunter Street Station (Sydney CBD) western construction site	This project includes two over station development commercial towers above the northern and southern entrances of the yet to be constructed Martin Place Metro Station. The Concept Proposal is intended to be delivered as a single, integrated project along with the delivery of rail, station, concourse infrastructure and public domain work associated with the Martin Place Metro Station. The construction of the different elements is likely to be staged so as not to interrupt the Metro construction program.	• Aboriginal heritage was not assessed as part of the Environmental Impact Statement for this project • This project is not expected to impact any Aboriginal heritage, therefore would not result in any cumulative impacts.
65-77 Market Street About 500 metres south of the Hunter Street Station (Sydney CBD) construction sites	This project involves the retention and alteration of the existing retail/commercial building on the site and the construction of a 22 storey residential tower above. The development accommodates retail and commercial uses within the existing building, 101 residential apartments within the tower and 108 car parking spaces within the basement.	• Aboriginal heritage was not assessed as part of the Statement of Environmental Effects and there is therefore no data to inform a cumulative impact assessment.
317 and 319-321 George Street, Sydney About 20 metres west of the Hunter Street Station (Sydney CBD) western construction site	The proposed development includes: • Excavation for two basement levels • Demolition of all existing improvements and structures on the site except for the heritage listed fabric contained on site • Restoration works to the heritage listed fabric • Construction and use of a 14-storey commercial office building • Vehicular access from Wynyard Lane	• Aboriginal heritage was not assessed as part of the Statement of Environmental Effects and there is no data to inform a cumulative impact assessment.

Project	Description	Heritage impacts
	• Extension and augmentation of services and utilities to the development.	
194-204 Pitt Street, Sydney About 500 metres south of the Hunter Street Station (Sydney CBD) construction sites	The DA seeks approval for: • Demolition of existing structures and construction of a new façade and podium • Excavation and site preparation • Construction and use of a building with a podium (entrance, retail glass floor area, City Tattersalls Club and hotel amenities), tower (101 hotel rooms, 241 residential apartments, landscape garden terrace) and basement • Servicing and plant equipment throughout the building.	• The northern portion of the study area for this project was assessed as having nil potential for Aboriginal archaeology due to the construction of modern basement levels • The southern portion of the study area was assessed as containing low potential for Aboriginal archaeology, due to stripping and land levelling in the early nineteenth century causing removal of the remnant natural soil horizon • Works were approved to proceed under an unexpected finds procedure.
301 and 305 Kent Street Concept Hotel Development About 290 metres south-west of the Hunter Street Station (Sydney CBD) western construction site	The proposal is a Concept SSDA submitted in accordance with Section 4.22 of the *Environmental Planning and Assessment Act 1979*. The Concept SSDA seeks consent for: • The establishment of a building envelope up to a height of RL 96.2 metres • Use of the site as a hotel (with ancillary uses) • Pedestrian and vehicular access arrangements • The provision of on-site bicycle and car parking. A future detailed SSDA (Stage 2 SSDA) will be lodged for the detailed design and construction of the development. The architectural reference scheme for the proposed development	• An Aboriginal Heritage Assessment Report was prepared to support the Environmental Impact Statement • No Aboriginal sites were identified within the project boundaries. The nearest Aboriginal sites were noted to be located within remnant Gymea soils, either redeposited or truncated and rapidly buried by historical deposits. • It was established that the position of the study area across a middle-to-upper slope landform would not have been favoured for Aboriginal occupation activities, and that any deposits representing temporary Aboriginal activities would have relocated downslope and away from the study area • It was also noted that historical development was likely to have modified bedrock surfaces during construction and thereby removed any remnant soils from the study area

Project	Description	Heritage impacts
	prepared by DBI Architects envisages a 29-storey hotel development on the site, comprising: • The site was therefore assessed as having low sensitivity for Aboriginal archaeological objects • A two storey lower podium with entry via Kent Street (Upper Ground) containing a forecourt plaza and hotel lobby, hotel amenities and function rooms, plant, back-of-house, and rear courtyard terrace • 24 storeys of hotel accommodation containing 360 rooms, hotel GFA of up to 10,432 square metres, plant rooms and a rooftop bar and terrace • A Lower Ground entry via Erskine Street with up to five levels of basement car parking accommodating 81 car parking spaces (including loading bays), bicycle and motorcycle spaces • An overall GFA of 11,301 square metres (FSR 11.0:1).	• The site was therefore assessed as having low sensitivity for Aboriginal archaeological objects.
180 George Street, Sydney About 380 metres north of the Hunter Street Station (Sydney CBD) construction sites	180 George Street will encompass the Salesforce Tower with a collection of new urban laneways hosting retail, dining and a major public square on George Street.	• An Aboriginal Heritage Impact Permit (no: C0001822) was issued for the project • Assessment for the Statement of Environmental Effects recommended testing to determine if the site contains Aboriginal objects • No information regarding Aboriginal test or salvage excavation across this site is publicly available and there is no data to inform a cumulative impact assessment of this project.

There is a low potential for encountering subsurface Aboriginal objects within the Hunter Street Station (Sydney CBD) construction sites. No cumulative impacts associated with nearby concurrent projects have been identified for the Hunter Street Station (Sydney CBD) construction sites.

12.0 MITIGATION AND MANAGEMENT MEASURES

12.1 Guiding principles

The overall guiding principle for cultural heritage management is that where possible Aboriginal sites should be conserved and Aboriginal cultural values more generally recognised and protected. If conservation is not practical, measures would be taken to mitigate impacts to Aboriginal sites.

The nature of mitigation measures is primarily based on an assessment of archaeological potential and significance. The mitigation measures are also informed by cultural significance, which would be discussed with the registered Aboriginal parties during their review of this report.

12.2 Test/salvage excavation

The background context provided in this report indicates that the survivability of archaeological contexts at the proposal construction sites is considered very low and no direct Aboriginal testing or salvage excavation is proposed. However, there is a possibility of remnant intact soils in the specific areas (Method Area 2 – defined in Section 12.3.4) may be present. Should ground conditions consistent with definitions outlined in Section 12.3.4 be identified during historical archaeological excavation or historical archaeological monitoring during construction, further archaeological management may be required. Any remnant soils identified during non-Aboriginal archaeological management would be tested for Aboriginal objects but that once cleared, the Sydney Metro Unexpected Heritage Finds Procedure would be followed and the stop work procedure would only apply if an Aboriginal object is identified. A flexible test/salvage excavation methodology has been prepared and included in Section 12.3.

12.3 Archaeological excavation methodology

The urban setting of each construction site presents a series of challenges for both the survivability of archaeology and the timing and nature of archaeological excavation. This methodology seeks to provide a practical approach to excavation in a variety of different environmental and construction site settings.

This section provides a methodology for archaeological excavation within the study area, including test excavation, and more extensive salvage excavation where certain triggers are identified.

12.3.1 Research themes

Key research themes for the excavation program include:

- Intactness – Investigate the intactness of Aboriginal archaeological contexts in urban contexts
- Nature and extent – Establish the nature and extent of investigated Aboriginal archaeological contexts
- Significance – Assess the archaeological and cultural significance of identified Aboriginal sites in consultation with RAPs
- Comparative – Compare the results and significance of identified Aboriginal sites with previous archaeological investigations in the area.

12.3.2 Archaeological Method Statement

The methodology provided in this document is a guiding methodology for the proposal. A detailed and site-specific methodology called an archaeological method statement would be prepared where archaeological excavation is required for each activity or site-specific work stage, in this case work stages at Hunter Street Station (Sydney CBD) western construction site where archaeological potential has been identified. In some cases, it may be practical to update an existing archaeological method statement for additional work stages. The archaeological method statement would adhere to the excavation methodology outlined in this document and provide detailed information on site-specific and/or activity specific archaeological management requirements.

It is anticipated that the Aboriginal archaeological Excavation Director would oversee preparation of the archaeological method statement, with contributions from a geomorphology specialist where required. It is anticipated that site inspections would be conducted where possible during preparation of the archaeological method statement.

12.3.3 Participation in archaeological investigations

RAP representatives would participate in all Aboriginal archaeological excavations. The archaeological method statement prepared for each work stage would be provided to the RAPs for their information prior to archaeological work commencing. RAP sign off on individual archaeological method statement would not be required as the archaeological method statement would be prepared in adherence to the approved ACHAR.

12.3.4 Method Areas

To assist with implementation of the archaeological excavation and unexpected finds, method areas have been considered for the study area based on archaeological potential, consistent with the methodology applied in *Sydney Metro West Environmental Impact Statement – Westmead to The Bays and Sydney CBD* (Sydney Metro, 2020a). The core archaeological methodology and any Method Area specific considerations would be addressed in the archaeological method statement for each work stage. As the tunnel alignment section of the route would be excavated through bedrock and there is no potential for Aboriginal objects, these sections have not been included in this methodology.

Two Method Areas have been identified for the proposal:

- Method Area 1 (MA1) – For the Pyrmont Station construction sites and the Hunter Street Station (Sydney CBD) eastern construction site
- Method Area 2 (MA2) – For the Hunter Street Station (Sydney CBD) western construction site.

The Pyrmont Station construction sites, the Hunter Street Station (Sydney CBD) eastern construction site, and the Pyrmont power supply route have been categorised as Method Area 1 (MA1), as they would be located in developed urban environments that have been significantly disturbed by historical land-use activities.

Hunter Street Station (Sydney CBD) western construction site has been categorised as Method Area 2 (MA2). This is due to an identified low potential for Aboriginal objects to be present in truncated natural soils at depth, including any deep estuarine sediments associated with the former course of the Tank Stream.

The location of the method areas is illustrated in Figure 44.

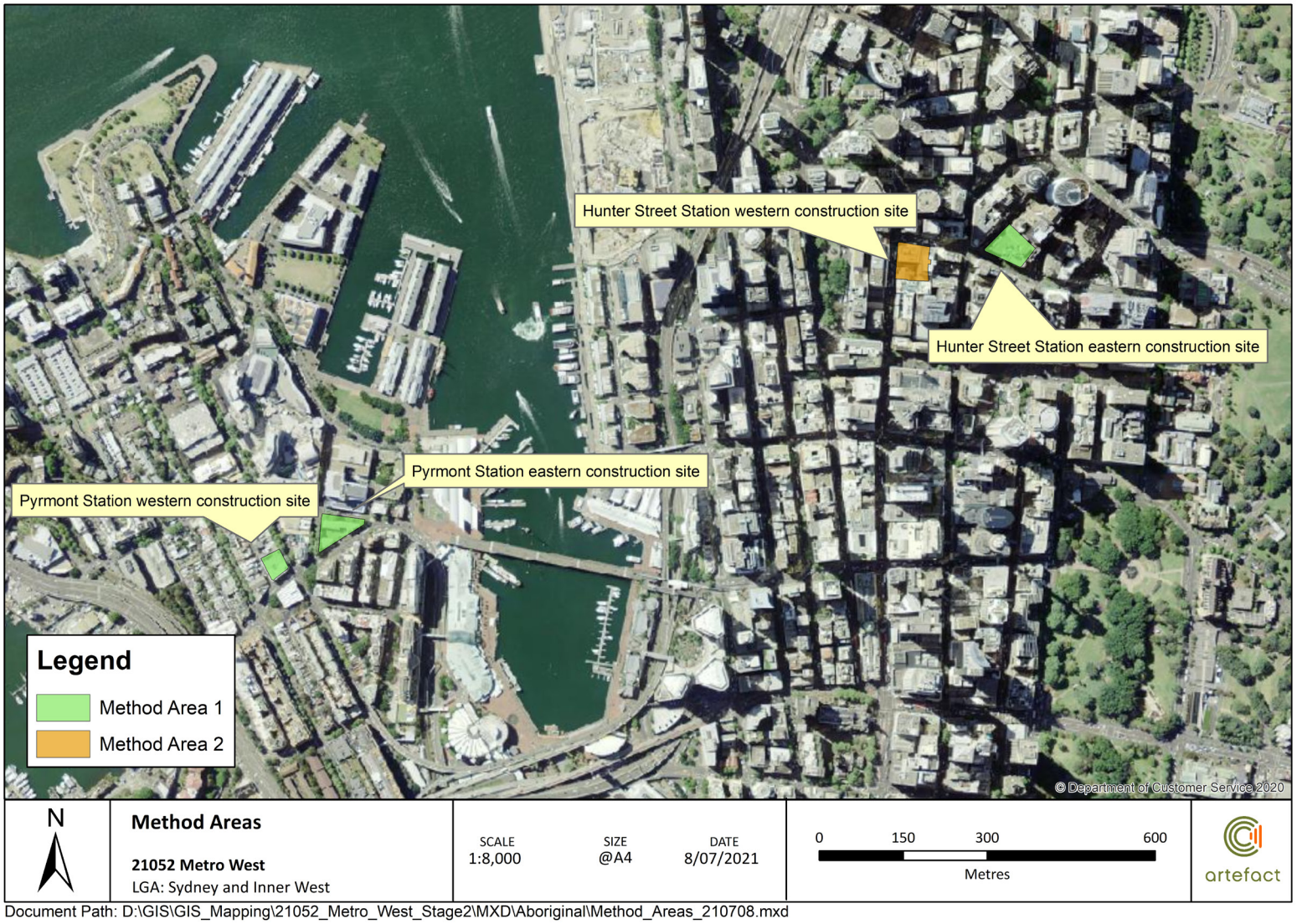


Figure 44: Method areas for the proposal

12.3.5 Test excavation triggers

Triggers for test excavation differ across the method areas.

12.3.5.1 Method Area 1 (MA1)

Triggers for potential test excavation within **MA1** would include Aboriginal object(s) identified as an unexpected find.

12.3.5.2 Method Area 2 (MA2)

Triggers for potential test excavation within **MA2** would include Aboriginal object(s) identified as an unexpected find or intact remnant soil profiles associated with the Gymea soil body or the Tank Stream sedimentary soils.

The Aboriginal archaeological Excavation Director would then assess the need for test excavations given the nature and context of the find and the extent of proposed impacts.

Once the need for test excavation has been confirmed, a work stage based or site based archaeological method statement would be prepared which would adhere to the core methodology and any method areas specific considerations as presented in this ACHAR.

12.3.6 Salvage triggers

The archaeological method statement prepared prior to test excavation would specify triggers for salvage excavation at each construction site / work stage.

Triggers for potential salvage excavation within **MA2** would include:

- Identification of more than 15 artefacts per excavation unit during test excavation
- Identification of rare or significant artefacts, features or site type.

The Aboriginal archaeological Excavation Director would then assess the need for salvage excavations given the nature and context of the find and the extent of proposed impacts, and in consultation with RAPs for the project. Salvage excavation would proceed under the methodology discussed in the archaeological method statement and in adherence to the core methodology and method area consideration presented in the ACHAR.

12.3.7 Core excavation methodology

A core excavation methodology would be the basis for test and salvage excavation for MA2 areas. These are outlined below.

12.3.7.1 Test excavation

The methodology of test excavation would be influenced by:

- The extent of the potential archaeological resource available to test. The extent of test excavation would depend upon constructability, potential depth of the archaeological resource, and the area extent of any remaining potential archaeological resource
- Proposed impacts. Where impacts would be limited to a certain depth or width, such as underground service routes, excavation would not extend outside the proposed impact area unless required for safety reasons.

Test excavation would require hand excavation of test pits in controlled excavation units. Excavation units would comprise of one square metre test pits excavated in either arbitrary 100 millimetre spits or stratigraphic units where applicable. Excavation units can be joined together to form a two square metre test pit or larger, if required for work health and safety reasons in loose or deep contexts. In some instances, where very small portions of intact natural soil profile remain, the Excavation Unit size would be smaller than one square metre.

Excavation units would be excavated until archaeologically sterile deposit has been reached, or enough information has been retrieved to trigger salvage excavation, or a depth of 1.5 metres (or safe working depth) has been reached, whichever is the shallowest. If archaeological deposit extends below a safe depth (1.5 metres) deeper archaeological excavation should be considered such as shoring or stepping.

Where there is sufficient space, a grid of test pits would be established across the area to be tested. The archaeological method statement would include the grid layout and spacing of test pits. Where there are constraints on the grid layout, such as disturbed areas or services, test pits may be offset to an adjacent location within the area of proposed impact.

Machine excavation would be used where required to remove introduced fill layers overlying areas to be hand excavated. The Aboriginal archaeological Excavation Director would determine bucket size and areal extent of machine excavation. Where machine excavation is used for removal of fill, there is no need for constraints on excavation size, with the main consideration being the provision of an area large enough to safely and satisfactorily undertake hand excavation of underlying natural contexts.

Dependent on depth of excavation, contamination, water table considerations, etc., the archaeological method statement may give consideration to using push tubes for test excavation.

12.3.7.2 Salvage excavation

Should a test excavation trigger the need to undertake archaeological salvage excavation, a salvage excavation methodology generally in accordance with that outlined below would be followed. Salvage excavation would involve the continuation of hand excavation in one square metre Excavation Units. Salvage would cease once the excavation has retrieved a sufficient sample to describe the intactness, nature, extent, significance and is a statistically comparable quantity.

Work health and safety considerations would need to be taken into account in the archaeological method statement for ‘stepping’ of excavation in areas of deeper deposit.

Machine excavation would be used to remove introduced fill layers where required, or to excavate below a safe depth where archaeological sterile deposits have not been reached.

12.3.7.3 Non-Aboriginal (Historic) archaeological contexts

It is likely that historical (non-Aboriginal) archaeological excavation would be conducted at some construction sites contemporaneously with the Aboriginal heritage excavation program. Non-Aboriginal archaeological remains may be superposed or otherwise stratigraphically related to Aboriginal archaeological remains.

Although the archaeological research design for historical archaeology has not yet been prepared, it is likely that key processes for historical archaeological excavation would include:

- Single context excavation
- Machine scrapes to remove layers of introduced fill and expose historical features.

Single context excavation

Historical excavation of features would generally involve single context excavation to retrieve material from the feature for recording purposes. The removed material may not be sieved. It is anticipated that where Aboriginal objects are identified during single context excavation, that further material removed from the feature would be sieved to determine if further Aboriginal objects are present. Depending on the size and nature of the feature, sieving may cease at the direction of the historical archaeology Excavation Director where it is clear that no further Aboriginal objects are likely to occur within the feature. RAPs would be involved in excavation of identified Aboriginal objects within historical archaeological contexts.

Where historical features are identified during Aboriginal heritage salvage excavation, such as within a test Excavation Unit, or within open area salvage excavation, the Historical archaeology Excavation Director would be notified. Single context excavation would continue under the direction of the historical archaeology Excavation Director and in accordance with the archaeological research design to the extent of the feature(s) within the excavation area. Whether historical archaeology is contained to within the test excavation or salvage excavation pit, or widened over a broader area, would be at the discretion of the historical archaeology Excavation Director.

Machine scrapes to remove layers of fill and expose historical features

It is likely that non-Aboriginal archaeological excavation would involve the use of machines to remove overburden covering historical features and that this activity would be monitored by a Historical Archaeologist. Where natural contexts are encountered, machine excavation would cease, and the Aboriginal archaeology Excavation Director would be notified and excavation would revert to test and salvage excavation methodology as outlined in Section 12.3.7, unless the construction site has been cleared by the Aboriginal archaeology Excavation Director (see ‘Cease Aboriginal heritage excavation’ below).

Cease Aboriginal heritage excavation

Once test and salvage Aboriginal archaeological excavations have ceased in accordance with this methodology and the conditions of approval, Sydney Metro and the Department of Planning, Industry and Environment would be notified in writing. Any remaining non-Aboriginal excavation that requires impact to natural contexts could then proceed in accordance with the archaeological research design and conditions of approval.

12.3.7.4 Geomorphology

Geomorphology would form an integral part of the archaeological investigative process. This is due to the potentially fragmented, deep, and complex natural contexts that may be encountered. The archaeological potential of an area is closely linked with soil depositional processes and disturbance, which cannot be assessed from surface inspection. Geomorphological investigations can assist in addressing research themes including ‘extent’, as well as ‘nature and intactness’ by providing depositional and stratigraphic detail of the archaeological contexts. It is anticipated that a geomorphologist would be involved, where required, in all aspects of the investigative process, including contribution to preparation of the archaeological method statement, site inspections, excavation and reporting.

It is also possible that geomorphological testing and sampling may occur in separation from the excavation process, such as retrieving deep samples that are beyond the scope of archaeological investigation. The potential scope and outline of geomorphological investigation at each construction site would be outlined in the archaeological method statement.

12.3.7.5 Collection of paleo-environmental data and dating samples

Soil samples would be collected where possible for particle size analysis, pollen analysis and Optically Stimulated Luminescence dating. Particle size samples would be collected from intact sections at up to 50 millimetre intervals by a qualified geomorphologist on site. Soil from buried humic layers would be collected where possible for palynological analysis. The number of samples collected from the site would be contingent on the degree of stratigraphic intactness, local sub-surface sedimentary conditions, and the relationship of stratigraphic units with artefactual deposits. Soil samples may also be retrieved by augur or push tube (or similar) methodologies.

Samples for Optically Stimulated Luminescence dating would be collected by using PVC piping tubes, sealed at one end, inserted horizontally into controlled stratigraphic deposits. The number of samples recovered would be contingent on the degree of stratigraphic intactness and the relationship between stratigraphic units with artefactual deposits. It would be expected that a minimum of two section profiles would be vertically sampled with PVC tubing. Optically Stimulated Luminescence samples may also be retrieved by push tube (or similar) excavation methodology.

Once Optically Stimulated Luminescence samples are collected, they would be submitted to a laboratory with the ability to undertake the analysis. Due to the expense of Optically Stimulated Luminescence dating, it is expected that not all collected Optically Stimulated Luminescence samples would be submitted for analysis. Results from paleo-environmental data would be used to address research themes by linking the site with specific temporal or environmental data, and allowing for comparative analysis with results from other archaeological sites in the local and greater Sydney area.

12.3.7.6 Full extent of the resource

Where the areal extent of the remaining archaeological resource is very limited, or where Aboriginal objects are identified in historical archaeology contexts, it is anticipated that salvage excavation would continue to the full extent of the archaeological resource and would not trigger salvage excavation.

12.3.7.7 Sieving

All retrieved material from hand excavation would be sieved through nested five millimetre and three millimetre sieve mesh. It is likely that all material would be wet sieved, however dry sieving may be more appropriate in certain contexts.

The amount of fill material retrieved by machine that is sieved would depend upon the nature of the fill and the decision of the supervising archaeologist on site at the time.

12.3.7.8 Identification of rare site types

Where the following site types are encountered, a more detailed approach to excavation, sampling and recording would be required:

- Hearths
- Middens.

Sites with detail linked to the provenance of each artefact. Once entered into the database, the data can be readily supplied with associated reporting to RAPs and the proponent in either electronic or hard-copy form. An archaeologist experienced in stone artefact recording would conduct the attribute recording and analysis.

All artefacts would be given a unique number and stored in double re-sealable snap lock bags. A permanent marker would be used to record the provenance and unique number of artefacts in each bag in writing on the outside of the bag and on an archival grade tag such as Dupont ™ Tyvek ® paper.

12.3.8 Temporary and long-term care and management of retrieved Aboriginal objects

The temporary repository of any retrieved artefacts would be a locked cupboard on the premises of the archaeological consultant.

If recovered, further consultation with RAPs would be required to determine the preferred long-term care and management of any retrieved Aboriginal artefacts. Opportunities for reburial, care and control agreements and incorporation of Aboriginal objects for heritage interpretation would be discussed and determined in consultation with RAPs.

12.4 Unexpected finds

The Sydney Metro Unexpected Heritage Finds Procedure would be implemented for any Aboriginal objects or finds which have not been identified in this assessment and for the whole of the MA1 areas.

12.4.1 Discovery of human remains

If suspected human skeletal remains are uncovered at any time during the proposed work, procedures outlined in the Sydney Metro Exhumation Management Plan and the Sydney Metro Unexpected Heritage Finds Procedure would be implemented.

12.5 Summary of recommended management measures

The following summary is an indication of management approach only (refer to Table 16). The archaeological excavation methodology included in this ACHAR is flexible and allows responses to changing construction methodologies and site conditions.

Table 16: Management approach

Construction site	Archaeological management approach[1]
Pyrmont Station western construction site	Unexpected finds procedure
Pyrmont Station eastern construction site	Unexpected finds procedure
Hunter Street Station (Sydney CBD) western construction site	• Site and stage specific Archaeological Method Statements • Unexpected finds procedure • Test/salvage excavation required if intact natural soil profiles are located during work

Construction site	Archaeological management approach[1]
Hunter Street Station (Sydney CBD) eastern construction site	Unexpected finds procedure

13.0 CONCLUSIONS

13.1 Management plans

Key management plans/documentation relating to Aboriginal heritage required prior to construction which relate to the ACHAR would likely include:

- Construction Environmental Management Plan
- Heritage Management subplan
- In the appropriate Method Area, excavation would be triggered by encountering intact undisturbed subsoil deposit, or recovering an Aboriginal heritage item, resulting in Archaeological Method Statements which respond to specific construction methodologies.

Refer to Appendix C (Construction Environmental Management Framework) of the Environmental Impact Statement for further information on these management plans.

13.2 Mitigation measures

This section provides a summary of the mitigation and management measures that would be required to minimise, avoid or mitigate the impacts of the project on Aboriginal Cultural Heritage. Mitigation measures identified for this proposal are provided in Table 17. These are proposed to address potential impacts on Aboriginal heritage sites and areas of archaeological potential during construction. They were developed following consideration of:

- Processes for Aboriginal heritage assessment consistent with the *National Parks and Wildlife Act 1974* as amended, including compliance with Part 8A of the National Parks and Wildlife Regulation 2009
- The results of the desktop assessment, archaeological survey and assessment of archaeological potential, significance (both archaeological and cultural), and impact.

The revised environmental mitigation measures included in the *Sydney Metro West Westmead to The Bays and Sydney CBD – Submissions Report* (Sydney Metro, 2020b) that would be applicable to the proposal are presented below. The reference numbering has not been changed. New mitigation measures or amendments to the revised mitigation measures included in the Submissions Report are shown in bold text, with deletions shown with a strikethrough.

These would be supplemented by mitigation measures detailed in Chapter 23 (Synthesis of the Environmental Impact Statement) of the Environmental Impact Statement with respect to cumulative impacts.

Sydney Metro is piloting the Connect with Country Framework with the Office of Government Architect. Sydney Metro recognises knowledge holders consider the proposal would have an impact on Aboriginal Country. The aim of this pilot is to recognise Aboriginal values into the planning, assessment and development process. Consultation with RAPS, Local Aboriginal Land Council and knowledge holders regarding the proposal will be ongoing.

Table 17: Aboriginal heritage mitigation measures

Ref	Mitigation measure	Applicable site
AH1	Aboriginal stakeholder consultation for this proposal should continue based on initial consultation originally commenced on major construction work between Westmead and The Bays (Stage 1 of the planning approval process for Sydney Metro West) in accordance with the NSW Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.* Additional consultation with knowledge holders about the project would be undertaken where possible.	All
AH2	If suspected human skeletal remains are uncovered at any time during the proposed work, procedures outlined in the Sydney Metro Exhumation Management Plan, the Sydney Metro Unexpected Heritage Finds Procedure and Heritage Management Plan would be implemented	All
AH3	If unexpected Aboriginal objects are identified during construction work, the Sydney Metro Unexpected Finds Procedure would be implemented.	All
AH4	In recognition of potential impacts to the Aboriginal cultural values of the project area, the line-wide Heritage Interpretation Strategy for Sydney Metro West would address Aboriginal cultural values and be prepared in consultation with the local Aboriginal community, knowledge holders and with reference to the Connecting with Country framework.	All
AH5	As the Hunter Street Station (Sydney CBD) western construction site has been assessed as having the potential for intact deposits, a stage specific Archaeological Method Statement would be prepared prior to works commencing. The Archaeological Method Statement would adhere to the archaeological management measures for Method Area 2 as outlined in Technical Paper 4 (Aboriginal Cultural Heritage Assessment Report).	Hunter Street Station (Sydney CBD) western construction site

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