

# Appendix B7

## Non-Aboriginal Heritage Management Sub-plan

M4-M5 Link Mainline Tunnels

August 2020

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# Contents

<b>Appendix B7</b> .....	<b>1</b>
<b>Contents</b> .....	<b>i</b>
<b>Glossary/ Abbreviations</b> .....	<b>v</b>
<b>1 Introduction</b> .....	<b>1</b>
1.1 Context.....	1
1.2 Project Background .....	1
1.3 Scope of the Sub-plan .....	1
1.4 Environmental management systems overview .....	1
1.5 Consultation for preparation.....	1
<b>2 Purpose and objectives</b> .....	<b>3</b>
2.1 Purpose.....	3
2.2 Objectives.....	3
2.3 Environmental performance outcomes and targets.....	3
<b>3 Environmental Requirements</b> .....	<b>6</b>
3.1 Relevant legislation and guidelines.....	6
3.1.1 Legislation .....	6
3.1.2 Additional approvals, licences, permits and requirements.....	6
3.1.3 Guidelines .....	6
3.2 Minister’s Conditions of Approval.....	6
3.3 Revised Environmental Management Measures.....	10
<b>4 Consultation</b> .....	<b>11</b>
4.1 Consultation undertaken to date .....	11
4.2 Ongoing consultation .....	11
<b>5 Existing environment</b> .....	<b>14</b>
5.1 Key reference documents .....	14
5.2 Regional context.....	15
5.3 Heritage and archaeological assessments.....	15
5.3.1 Heritage impact assessment .....	15
5.3.2 Built heritage and landscape assessment.....	15
5.3.3 Historical Archaeological assessment.....	16
5.3.4 Other items assessed.....	16
5.4 Non-Aboriginal heritage .....	16
<b>6 Environmental aspects and impacts</b> .....	<b>17</b>
6.1 Construction activities.....	17
6.2 Non-Aboriginal Heritage impacts .....	18

6.3	Sydney Water Corporation (Sydney Water) City Tunnel and Pressure Tunnel and Shafts 18	
6.3.1	Description and activities .....	18
6.3.2	Monitoring .....	19
6.3.3	Post Completion .....	19
<b>7</b>	<b>Environmental mitigation and management measures .....</b>	<b>20</b>
7.1	Vibration Management Measures .....	20
7.2	Ground movement .....	21
7.3	Heritage and archaeological reports, procedures and plans .....	22
7.3.1	Pre-dilapidation and post-dilapidation surveys.....	23
7.3.2	Feasibility investigation of the façade of Former Bank of NSW Bank.....	23
7.3.3	Heritage Archival Recording and Salvage Report.....	23
7.3.4	The Historical Archaeological Research Design and Excavation Methodology ....	23
7.3.5	Heritage Interpretation Plan.....	24
7.3.6	Archaeological Excavation Report .....	24
7.3.7	Unexpected Heritage Items Procedure .....	25
7.3.8	Urban Design and Landscape Plan and Urban Design Review Panel .....	25
7.4	Cumulative impacts .....	25
7.5	Non-Aboriginal heritage management and mitigation measures .....	26
<b>8</b>	<b>Compliance Management .....</b>	<b>38</b>
8.1	Roles and responsibilities .....	38
8.2	Training .....	38
8.3	Monitoring and inspections .....	39
8.3.1	Regular monitoring and inspections.....	39
8.4	Auditing .....	39
8.5	Reporting.....	40
<b>9</b>	<b>Review and improvement .....</b>	<b>43</b>
9.1	Continuous improvement .....	43
9.2	NAHMP update and amendment .....	43
<b>Appendix A – Other Conditions of Approval and Revised Environmental Management Measures relevant to this Plan.....</b>		<b>44</b>
<b>Appendix B - Roads and Maritime Standard Management Procedure: Unexpected Heritage Items 58</b>		
<b>Appendix C - Safe working distances for vibration intensive equipment.....</b>		<b>59</b>
<b>Appendix D – Non-Aboriginal Heritage Impacts and Mitigation Measures .....</b>		<b>60</b>

## Tables

<b>Table 2-1 KPIs for non-Aboriginal heritage</b> .....	3
<b>Table 3-1 Conditions of Approval relevant to the NAHMP</b> .....	7
<b>Table 4-1 Non-Aboriginal heritage consultation summary</b> .....	12
<b>Table 6-1 Summary of heritage and archaeological impacts</b> .....	18
<b>Table 7-1 DIN 4150 structural damage – safe limits for short-term building vibration</b> .....	21
<b>Table 7-2 Settlement criteria as per CoA E103 and REMM PL 6</b> .....	22
<b>Table 7-3 Overall heritage impacts of WestConnex projects</b> .....	25
<b>Table 7-4: Non-Aboriginal heritage management and mitigation measures</b> .....	27
<b>Table 8-1 Roles and responsibilities relevant to Non-Aboriginal heritage management</b> .....	38
<b>Table 8-2 Reporting requirements relevant to management of non-Aboriginal heritage</b> .....	40

## Appendices

Appendix A	Other Conditions of Approval and Revised Environmental Management Measures relevant to this Plan
Appendix B	Roads and Maritime Standard Management Procedure: Unexpected Heritage Items
Appendix C	Safe working distances for vibration intensive equipment
Appendix D	Non-Aboriginal Heritage Impacts and Mitigation Measures

## Document control

### Approval and authorisation

<b>Title</b>	M4-M5 Link Mainline Tunnels Non-Aboriginal Heritage Management Sub-plan
<b>Document No/Ref</b>	M4M5-LSBJ-PRW-EN-MP01-PLN-0007-10
<b>Document Path</b>	

### Version control

Revision	Date	Description
01	3 September 2018	Final for DPE approval
02	7 September 2018	Final for DPE approval
03	22 October 2018	Final for DPE approval
04	25 October 2018	For DPE approval following minor comments
05	20 November 2018	Minor updates
06	29 January 2019	Minor updates
07	27 February 2019	Minor updates – For ER Approval
08	4 September 2019	Minor updates – For WestConnex Transurban review
09	25 September 2019	Minor updates – For ER Approval
10	August 2020	Update to include detail on Sydney Water assets management

#### Note:

From Revision 01 Document Number has changed from M4M5-LSBJ-PRW-GEN-EV01-PLN-0008-E (previous revisions) to M4M5-LSBJ-PRW-EN-MP01-PLN-0007-01.

# Glossary/ Abbreviations

Abbreviations	Expanded text
AECOM	AECOM Australia Pty Ltd
ACHMP	Aboriginal Cultural Heritage Management Sub-plan
CCS	Community Communication Strategy
CEMP	Construction Environmental Management Plan
CoA	Minister's Conditions of Approval
CNVG	Construction Noise and Vibration Guideline
CNVIS	Construction Noise and Vibration Impact Statement
DIN	Deutsches Institute fur Normung
DIN 4150	German Standard DIN 4150-3: 1999-02 Vibration in buildings – Part 3: effects on structures
DPE	NSW Department of Planning and Environment
DPIE	NSW Department of Planning, Industry and Environment
EIS	Environmental impact statement
EMM	Environmental management measure
EMS	Environmental Management System
Environmental heritage/ Non-Aboriginal heritage	Places, buildings, works, relics, movable objects and precincts, of State or local heritage significance as outline in Section 4 of the Heritage Act 1997
EPA	NSW Environment Protection Authority
EP&A Act	Environmental Planning and Assessment Act 1979
EPL	Environment Protection Licence
EWMS	Environmental Work Method Statements
G36	Roads and Maritime Services QA Specifications G36 Environmental Protection (August 2014)
HARD	Historical Archaeological Research Design

Abbreviations	Expanded text
HARDEM	Historical Archaeological Research Design and Excavation Methodology
HARSR	Heritage Archival Recording and Salvage Report
HAMU	Historical Archaeological Management Unit
HCA	Heritage Conservation Area
Heritage Act	Heritage Act 1997
Heritage Division of OEH	Heritage Division of the Office of Environment and Heritage
Heritage item	Identified heritage items include heritage-listed buildings, structures, bridges, tunnels, parks, trees and plantings
Heritage study area	A study area, as defined in the EIS, includes the proposed Project footprint (study area) plus an appropriate buffer around the footprint in some cases; to ensure that the assessment includes heritage items, potential heritage items and HCAs adjacent to the Project footprint that may be subject to visual or indirect impacts (visual setting, vibration or settlement). Each one has been determined on a case by case basis when undertaking site inspections of the areas.
HIA	Heritage Impact Assessment
Hz	Hertz
King Georges Road Interchange Upgrade	A component of the WestConnex program of works. Upgrade of the King Georges Road Interchange between the M5 West and the M5 East at Beverly Hills, in preparation for the New M5 Project.
LGA	Local government area
LSBJV	Lendlease Samsung Bouygues Joint Venture
M4 East	A component of the WestConnex program of works.
M4-M5 Link Project	A component of the WestConnex program of works, which includes the construction and operation of Stage 1: M4-M5 Link Mainline Tunnels and Stage 2: Rozelle Interchange.
M4 Widening	A component of the WestConnex program of works, which includes extending the M4 Motorway in tunnels between Homebush and Haberfield via Concord.
NAHMP	Non-Aboriginal Heritage Management Sub-plan
New M5	A component of the WestConnex program of works, located from Kingsgrove to St Peters
NVMP	Noise and Vibration Management Sub-plan



Abbreviations	Expanded text
NPW Act	National Parks and Wildlife Act 1974
Hz	Hertz
LGA	Local government area
LSBJV	Lendlease Samsung Bouygues Joint Venture
M4 East	A component of the WestConnex program of works.
M4-M5 Link Project	A component of the WestConnex program of works, which includes the construction and operation of Stage 1: M4-M5 Link Mainline Tunnels and Stage 2: Rozelle Interchange.
M4 Widening	A component of the WestConnex program of works, which includes extending the M4 Motorway in tunnels between Homebush and Haberfield via Concord.
NAHMP	Non-Aboriginal Heritage Management Sub-plan
New M5	A component of the WestConnex program of works, located from Kingsgrove to St Peters
NVMP	Noise and Vibration Management Sub-plan
NPW Act	National Parks and Wildlife Act 1974
NSW Heritage Council	Heritage Council of NSW
NVIA	Noise and Vibration Impact Assessment
OEH	Office of Environment and Heritage
PAD	Potential Archaeological Deposit
Potential heritage items	Items with heritage value that are not listed and may be directly or indirectly impacted by the Project
Project, the	M4-M5 Link Mainline Tunnels
REMM	Revised environmental management measures
Roads and Maritime	Roads and Maritime Services
SAP(s)	Sensitive Area Plan(s)
S170	State Agency 170 Heritage and Conservation Register
Secretary	Secretary of DPIE (or delegate)
SHR	State Heritage Register
SMC	Sydney Motorway Corporation (formerly WestConnex Delivery Authority)

Abbreviations	Expanded text
SPIR	Submission and Preferred Infrastructure Report

Abbreviations	Expanded text
Study area	The Project footprint and a buffer determined by the character and visual corridors surrounding the Project footprint. The study area is separated into six areas that would be subject to surface disturbance as part of the Project and the area above the mainline tunnel alignment.
Sydney Water	Sydney Water Corporation
UDLP	Urban Design and Landscape Plan
UDRP	Urban Design Review Panel
WestConnex program of works	A program of works that includes the M4 Widening, King Georges Road Interchange Upgrade, M4 East, New M5 and WestConnex M4-M5 Link Projects.

# 1 Introduction

## 1.1 Context

This Non-Aboriginal Heritage Management Sub-plan (NAHMP or Plan) forms part of the Construction Environmental Management Plan (CEMP) for the M4-M5 Link Mainline Tunnels (the Project).

This NAHMP has been prepared to address the requirements of the Minister's Conditions of Approval (CoA), the M4-M5 Link Environmental Impact Statement (EIS), the revised environmental management measures (REMM) listed in the M4-M5 Link Submissions and Preferred Infrastructure Report (SPIR), the WestConnex M4-M5 Link Mainline Tunnel Modification report (September 2018) and applicable guidance and legislation.

## 1.2 Project Background

The M4-M5 Link Project (M4-M5 Link Project) EIS (AECOM, 2017) assessed the impacts of construction and operation of the Project on non-Aboriginal heritage.

The EIS identified potential direct and indirect impacts on the non-Aboriginal heritage items listed in Appendix D of this Plan. Additional heritage items were identified as part of the Tunnelling Construction Noise and Vibration Impact Statement (CNVIS) and are also included in Appendix D.

Further background information on non-Aboriginal heritage aspects of the Project is provided in Section 5 of this Plan.

Please refer to Section 1.3 of the CEMP for the Project Description.

## 1.3 Scope of the Sub-plan

The scope of this Plan is to describe how LSBJV propose to manage and protect non-Aboriginal heritage during construction of the Project. Operational non-Aboriginal heritage and operational measures do not fall within the scope of this Plan and therefore are not included within the process contained within this Plan.

The management and protection of Aboriginal cultural heritage during construction is addressed in the Aboriginal Cultural Heritage Management Sub-plan (ACHMP) (refer to Appendix B8 of the CEMP).

## 1.4 Environmental management systems overview

The environmental management system overview is described in section 1.5 of the CEMP.

## 1.5 Consultation for preparation

This Plan was provided to the Heritage Council of NSW (NSW Heritage Council), Heritage Division of the Office of Environment and Heritage (OEH) (Heritage Division of OEH), City of Sydney and Inner West Council in accordance with CoA C4(g), for review and comment.

Ongoing consultation with relevant councils and other stakeholders, including any unique local receivers, may be undertaken for particular issues pertaining to the Project's impact on non-Aboriginal heritage. Community feedback and complaints relating to non-Aboriginal cultural heritage will be dealt with in accordance with the Community Communications Strategy (CCS) and the Complaints Management System.

Refer to Section 4 for a more detailed outline of consultation and ongoing consultation related to non-Aboriginal heritage management during the construction of the Project.

# 2 Purpose and objectives

## 2.1 Purpose

The purpose of this Plan is to describe how LSBJV proposes to manage and protect non-Aboriginal heritage during construction of the Project.

## 2.2 Objectives

The key objective of the NAHMP is to ensure all CoA, REMM and licence/permit requirements relevant to non-Aboriginal heritage are described, scheduled and assigned responsibility as outlined in:

- The EIS prepared for the M4-M5 Link Project
- The SPIR prepared for the M4-M5 Link Project
- The Modification report for WestConnex M4-M5 Link Mainline Tunnel (September 2018)
- CoA granted to the M4-M5 Link Project on 17 April 2018 and as modified on 25 February 2019
- Roads and Maritime Services (Roads and Maritime) specifications G36, G38 and G40
- The Project's Environment Protection Licence (EPL)
- All relevant legislation and other requirements described in Section 3.1 of this Plan.

## 2.3 Environmental performance outcomes and targets

The desired environmental performance outcome for non-Aboriginal heritage, as outlined and addressed in the EIS, is to design, construct and operate the Project facilities, to the greatest extent possible, to ensure the long-term protection, conservation and management of heritage significance of the items of environmental heritage.

In addition, the outcome is to design, construct and operate the Project to avoid or minimise impacts, to the greatest extent possible, on the heritage significance of environmental heritage.

The targets presented in Table 2-1 have been established to achieve this environmental performance outcome, as related to the management of non-Aboriginal heritage items during construction of the Project. The Project has also established key performance indicators (KPIs) for these targets. These have been derived from the following sources:

- EIS Appendix A
- Conditions of Approval granted to the project on 17 April 2018 and as modified on 25 February 2019
- Internal LLE Environmental Management System (EMS).

**Table 2-1 KPIs for non-Aboriginal heritage**

Target/ KPI number	Target	KPI	Records	Sources
1	Ensure full compliance with the relevant legislative	No non-conformances	LLE703A Environmental	CoA A1

Target/ KPI number	Target	KPI	Records	Sources
	requirements, CoA and REMM.		Inspection Checklist (internal document) / audits	
2	Ensure training is provided in the form of inductions to relevant Project personnel on heritage protection measures and the Roads and Maritime Standard Management Procedure Unexpected Heritage Items (November 2015) (Unexpected Heritage Items Procedure), provided in Appendix B, before they begin work on site.	Site induction records to be completed at the time of induction, and kept on file	Induction records (internal document)	CEMP Section 3.5
3	Weekly documented inspections of heritage areas, no go areas and management measures to be undertaken by the LSBJV environmental team members to identify and action any non-Aboriginal heritage issues.	Environmental inspections to be completed and recorded weekly during construction	LLE703A Environmental Inspection Checklist (internal document)	LLE711 Archaeology and Heritage Section 3.4 (internal document) LLE703 Environmental Monitoring and Inspections Section 5.1 (internal document)
4	Minimise identified impacts to heritage items and heritage conservation areas (HCAs) throughout detailed design and construction.	At all times	LLE703A Environmental Inspection Checklist (internal document) Sensitive Area Plans (SAPs)	CoA E156
5	<ul style="list-style-type: none"> <li>Establish archival recording of items of heritage significance that will be demolished</li> <li>Salvage features and fabric of heritage significance for</li> </ul>	Table 7-4	LLE703A Environmental Inspection Checklist (internal document)	EIS Appendix A

Target/ KPI number	Target	KPI	Records	Sources
	redistribution to the community <ul style="list-style-type: none"> <li>• Minimise impacts on heritage items during site establishment.</li> </ul>			

# 3 Environmental Requirements

## 3.1 Relevant legislation and guidelines

### 3.1.1 Legislation

All legislation relevant to this NAHMP is included in Appendix A1 of the CEMP.

### 3.1.2 Additional approvals, licences, permits and requirements

Refer to Appendix A1 of the NAHMP.

### 3.1.3 Guidelines

The main guidelines, specifications and policy documents relevant to this Plan include:

- Assessing Heritage Significance for Historical Archaeological Sites and 'Relics' (Heritage Branch of NSW Department of Planning 2009)
- Historical Archaeology Code of Practice (NSW Heritage Office 2006)
- Skeletal Remains: Guidelines for Management of Human Remains (NSW Heritage Office 1998)
- Criteria for the assessment of excavation directors (NSW Heritage Council 2011)
- NSW Heritage Manual (Heritage Office and Department of Urban Affairs and Planning 1994)
- How to Prepare Archival Records of Heritage Items (NSW Heritage Office 2003)
- Assessing Heritage Significance (NSW Heritage Council 2002)
- Statement of Heritage Impact (NSW Heritage Council 2002)
- Archaeological Assessments: Archaeological Assessment Guidelines (NSW Heritage Office and NSW Department of Urban Affairs and Planning 1996)
- Historical Archaeological Sites: Investigation and Conservation Guidelines (NSW Heritage Council 1993)
- The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance 2013 (the Burra Charter)
- Roads and Maritime Specification G36 – Environmental Protection (Management System)
- Roads and Maritime Cultural Heritage Guidelines (November 2015)
- Unexpected Heritage Items Procedure (refer to Appendix B).

## 3.2 Minister's Conditions of Approval

The CoA relevant to this Plan are listed in Table 3-1 below. A cross reference is also included to indicate where the condition is addressed in this Plan or other project management documents.

Please refer to Appendix A for all other CoA relevant to the development of this Plan.



**Table 3-1 Conditions of Approval relevant to the NAHMP**

CoA No.	Condition Requirements	Document Reference	How addressed			
C4	The following CEMP Sub-plans must be prepared in consultation with the relevant authorities identified for each CEMP Sub-plan and be consistent with the CEMP referred to in the EIS.	This Plan Table 4-1	This Non-Aboriginal Heritage Management Sub-plan has been prepared in accordance with this condition and describes how LSBJV propose to manage non-Aboriginal heritage aspects during construction of the Project.			
	<table border="1"> <thead> <tr> <th></th> <th>Required CEMP Sub-plan</th> <th>Relevant authority(s) and council(s) to be consulted for each CEMP Sub-plan</th> </tr> </thead> <tbody> <tr> <td>(g)</td> <td>Non-Aboriginal Heritage</td> <td>Heritage Council of NSW Heritage Division of OEH Relevant council(s)</td> </tr> </tbody> </table>				Required CEMP Sub-plan	Relevant authority(s) and council(s) to be consulted for each CEMP Sub-plan
	Required CEMP Sub-plan	Relevant authority(s) and council(s) to be consulted for each CEMP Sub-plan				
(g)	Non-Aboriginal Heritage	Heritage Council of NSW Heritage Division of OEH Relevant council(s)				
C5	The CEMP Sub-plans must state how:					
	(a) the environmental performance outcomes identified in the EIS and SPIR as modified by these conditions will be achieved	Section 2.3 Table 2-1	This Plan was prepared in accordance with the environmental performance outcomes identified in the EIS and SPIR and is evidenced primarily in Section 2.3 and Table 2-1.			
	(b) the mitigation measures identified in the EIS and SPIR as modified by these conditions will be implemented.	Section 6.3 Table 7-4 Appendix D	The implementation of non-Aboriginal heritage mitigation and management measures identified in the EIS and the SPIR are listed in Section 6.3, Table 7-4 and Appendix D.			
	(c) the relevant terms of this approval will be complied with, and	Table 2-1 Table 3-1	Details regarding how LSBJV propose to comply with the relevant terms of approval are listed in this Table and in Appendix B.			

CoA No.	Condition Requirements	Document Reference	How addressed
	(d) issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed.	Section 6 Section 7.1 Section 7.2 Section 7.4 Table 7-4 Appendix D Environmental Risk Assessment Workshop (Section 3.2.1 of the CEMP)	Non-Aboriginal heritage issues requiring management during construction of the Project have been identified through the EIS, SPIR and Environmental Risk Assessment Workshop. These issues have been detailed in Section 6, Section 7.1 and Section 7.2.  Environmental risk analysis will be ongoing and regularly reviewed in accordance with Section 3.9 to Section 3.13 of the CEMP to ensure effective management of non-Aboriginal heritage.  Mitigation and management measures for these issues are listed in Table 7-4 and Appendix D.
C6	The CEMP Sub-plans must be endorsed by the ER and then submitted to the Secretary for approval no later than one (1) month prior to the commencement of the construction activities to which they apply.	Section 2.2 of the CEMP	This NAHMP (Revision 02) was endorsed by the Lead ER, on 7 September 2018 (Letter ref: 17021-LT-ED-008_0).
C7	Any of the CEMP Sub-plans may be submitted to the Secretary along with, or subsequent to, the submission of the CEMP.	Section 2.2 of the CEMP	This Plan has been submitted for approval to DPIE prior to the final submission of the CEMP for DPIE approval.

CoA No.	Condition Requirements	Document Reference	How addressed
C8	Construction must not commence until the CEMP and all CEMP Sub-plans have been approved by the Secretary. The CEMP and CEMP Sub-plans, as approved by the Secretary, including any minor amendments approved by the ER, must be implemented for the duration of construction. Where the CSSI is being staged, construction of that stage is not to commence until the relevant CEMP and CEMP Sub-plans have been endorsed by the ER and approved by the Secretary.	Section 2.2 of the CEMP	Construction will not commence until the CEMP and all CEMP Sub-plans have been approved by DPIE. The CEMP and CEMP Sub-plans will be implemented for the duration of construction.

### **3.3 Revised Environmental Management Measures**

Refer to Appendix A for all REMMs relevant to the development of the Plan.

# 4 Consultation

## 4.1 Consultation undertaken to date

Consultation and collaboration with regulatory agencies and registered stakeholders has been integral to the assessment and management of non-Aboriginal heritage for the Project.

Consultation carried out during the assessment process is outlined in Chapter 7 of the EIS.

Agency, stakeholder and community submissions received during the public exhibition stage contributed to the SPIR and the REMM and the development of this Plan.

As mentioned in Section 1.5, this Plan has been provided to NSW Heritage Council, the Heritage Division of OEH, City of Sydney and Inner West Council in accordance with CoA C4 (g) for review and comment.

## 4.2 Ongoing consultation

Ongoing consultation will be undertaken prior to and throughout the construction of the Project.

Consultation will include, but will not be limited to, the relevant non-Aboriginal heritage items and HCAs listed in Appendix D. The approach to ongoing consultation is outlined in Table 4-1 below.

Community feedback and complaints relating to non-Aboriginal heritage will be dealt with in accordance with the CCS and the Complaints Management System.

**Table 4-1 Non-Aboriginal heritage consultation summary**

Source	Consultation matter	Regulatory agency/ Stakeholder	Details
CoA C4(g)	This Plan	NSW Heritage Council Heritage Division of OEH City of Sydney Inner West Council.	<ul style="list-style-type: none"> <li>This Plan has been prepared in consultation with the listed agencies.</li> </ul>
CoA E163 CoA E164 CoA E165	HARSR	DPIE Heritage Division of OEH City of Sydney Inner West Council Local libraries Local historical societies in the respective LGAs.	<ul style="list-style-type: none"> <li>In accordance with CoA E164, a heritage archival recording will be undertaken of the former Bank of NSW building at the Pyrmont Bridge Road tunnel site</li> <li>Within 12 months of completing the archival recording, the archival recording and the HARSR will be submitted to the mentioned agencies and stakeholders for their information</li> <li>Should salvage support good conservation outcomes, the material will be collected and stored in suitable repository locations established in consultation with Inner West Council. The salvage must be determined in consultation with the Heritage Division of OEH</li> <li>Any residual items and materials will be made available through a process to be developed in consultation with Inner West Council, to landowners within the locality from where the material originated.</li> </ul>
CoA E168 CoA E169	Historical Archaeological Research Design and	NSW Heritage Council (or its delegates)	<ul style="list-style-type: none"> <li>The HARDEMs prepared for the Project will be submitted for review and comment to the NSW</li> </ul>

Source	Consultation matter	Regulatory agency/ Stakeholder	Details
	Excavation Methodology (HARDEM)		<p>Heritage Council prior to finalisation. HARDEMs will be prepared for the following sites:</p> <ul style="list-style-type: none"> <li>◦ Parramatta Road East and West, Ashfield/Haberfield</li> <li>◦ Pyrmont Bridge Road, Camperdown/Annandale.</li> </ul> <ul style="list-style-type: none"> <li>• The HARDEMs will include the procedures for notifying the NSW Heritage Council (or its delegates) and the Secretary of any relic findings, in accordance with CoA E169 (e).</li> </ul>
CoA E172	Archaeological Excavation Report	<p>DPIE NSW Heritage Council Local library Local historical society in the relevant LGAs.</p>	<ul style="list-style-type: none"> <li>• As required by CoA E172, within 12 months of completing all archaeological investigations, the report will be submitted to the mentioned agencies and stakeholders for their information.</li> </ul>
S140 of the <i>Heritage Act 1977</i>	Relic findings	NSW Heritage Council	<ul style="list-style-type: none"> <li>• Under S146 of the Heritage Act there is a requirement that if any unexpected relics are discovered the NSW Heritage Council must be notified.</li> </ul>

# 5 Existing environment

Appendix U (Technical working paper: Non-Aboriginal heritage (GML Heritage Pty Ltd 2017)) of the EIS (Non-Aboriginal heritage technical working paper) for the Project was prepared to assess the non-Aboriginal heritage impacts for the EIS.

The Non-Aboriginal heritage technical working paper and the SPIR identify a number of HCAs, heritage items, potential heritage items and Historical Archaeology Management Units (HAMUs) within the Project footprint (M4-M5 Link Mainline Tunnels), and the type of impact that can be anticipated for each of these (refer to Table 6-1).

Additional heritage items were identified as part of the Tunnelling CNVIS and the Noise and Vibration Management Plan (NVMP) and are included in Appendix D.

Places, buildings, structures, bridges, tunnels, parks and trees registered as having non-Aboriginal heritage significance are all referred to as a heritage items in the following sections. Items with heritage value that are not listed under the State, local or other non-Aboriginal heritage registers are referred to as potential heritage items. Precincts and areas recognised and valued for their historical and aesthetic character are referred to as HCAs. HAMUs are areas identified according to their anticipated significance of historical archaeology.

The following sections summarise what is known about Non-Aboriginal heritage within and adjacent to the Project corridor.

## 5.1 Key reference documents

The key reference documents are:

- Chapter 20 of the EIS
- Non-Aboriginal heritage technical working paper
- SPIR
- Noise and Vibration Impact Assessment (NVIA) (refer to Appendix J of the EIS –Technical working paper: Noise and vibration)
- NVMP
- Tunnelling CNVIS
- GML Pty Ltd, 2015. *Appendix S of the M4 East Environmental Impact Statement – Non-Aboriginal Heritage Impact Assessment*. Prepared for Roads and Maritime
- GML Pty Ltd, 2016. *M4-M5 Link – Rozelle Rail Yards – Site Management Works Review of Environmental Factors, Heritage Impact Assessment*. Prepared for Roads and Maritime
- Heritage Council of NSW, 1993. *Historical Archaeological Sites: Investigation and Conservation Guidelines*
- Heritage Council of NSW, 2002. *'Assessing Heritage Significance'*, a NSW Heritage Manual update, Sydney
- Heritage Council of NSW, 2011, *Criteria for the assessment of excavation directors*
- NSW Department of Planning, 2009. *Assessing Heritage Significance for Historical Archaeological Sites and Relics*
- NSW Heritage Office, 1996. *Archaeological Assessments: Archaeological Assessment Guidelines*



- NSW Heritage Office, 1998, *NSW Skeletal Remains: Guidelines for Management of Human Remains*
- NSW Heritage Office, 2003. *How to Prepare Archival Records of Heritage Items*
- NSW Heritage Office, 2006. *Historical Archaeology Code of Practice*
- NSW Heritage Office & Department of Urban Affairs and Planning, 1994. *NSW Heritage Manual*.

## 5.2 Regional context

The Project is located within the Inner West and City of Sydney LGAs. The Inner West LGA was formed by the amalgamation of former Ashfield, Leichhardt and Marrickville LGAs. The Project traverses the suburbs of Ashfield, Haberfield, Leichhardt, Rozelle, Annandale, Stanmore, Camperdown, Newtown and St Peters.

Existing land use and development within and around the Project footprint contains a mix of residential, commercial and industrial with pockets of open space (refer to Section 12.2.1 of Chapter 12 of the EIS).

The largest waterbodies are located towards the eastern end of the Project, near Sydney Airport (Alexandra Canal at St Peters). Dobroyd Canal (Iron Cove Creek) at Haberfield and Johnstons Creek at Annandale are also located nearby the Project footprint.

Heritage items and HCAs located above the tunnel alignment are included in the Land Use Survey (refer to the Project NVMP).

## 5.3 Heritage and archaeological assessments

The Non-Aboriginal heritage technical working paper assesses potential impacts to heritage items, HCAs and HAMUs for both Stage 1: M4-M5 Link Mainline Tunnels and Stage 2: Rozelle Interchange. The Non-Aboriginal heritage technical working paper includes the assessments identified in the following sections.

### 5.3.1 Heritage impact assessment

The heritage impact assessment (HIA) is structured around six study areas that would be subject to surface impacts along the Project corridor, and the area above the mainline tunnel. Only some of these study areas, or parts of areas, are applicable to Project works including:

- Study area 1 – Haberfield/Ashfield
- Study area 3 – Rozelle and Lilyfield
- Study area 5 – Annandale
- Study area 6 – St Peters.

The HIA also consists of other assessments and study areas, which are outlined in Sections 5.3.2 – 5.3.4.

### 5.3.2 Built heritage and landscape assessment

The built heritage and landscape assessment, surface and sub-surface, is structured on a broader study area applied to each of the above-mentioned six areas. The broader study area comprises a buffer surrounding the Project footprint to ensure indirect impacts are appropriately assessed (ie potential visual setting, vibration and settlement impacts). It is referred to as the heritage study area. Same as in Section 5.3.1, only the heritage study areas 1, 3, 5 and 6 apply to the Project (refer to Appendix D).

### 5.3.3 Historical Archaeological assessment

An archaeological assessment is structured around the six study areas to identify where key archaeological resources may exist and may be impacted by the construction of the Project, including the tunnel entry and exit portals and associated infrastructure. As the driven tunnels would be generally located between 20 metres to greater than 65 metres below the ground, these works would not have an impact on historical archaeological remains and have therefore not been considered further.

The Non-Aboriginal heritage technical working paper assessed historical archaeology across the Project footprint, allocating Historic Archaeology Management Units (HAMU) to each heritage area according to historical phases, archaeological potential, past construction activities, proposed impacts and management requirements. The following HAMUs are relevant to the Project:

- Area 1 Haberfield/Ashfield – HAMU 1 – Haberfield/Ashfield
- Area 5 Annandale – HAMU 10 – Bignell Lane
- Area 5 Annandale – HAMU 11 – Parramatta Road/ Pymont Bridge Road
- Area 6 St Peters – None – N/A.

Archaeological potential and significance of study Area 1 (Haberfield/Ashfield) and Area 6 (St Peters) were previously assessed under the M4 East Project and New M5 Project, respectively, and have therefore not been considered further in the Non-Aboriginal heritage technical working paper.

### 5.3.4 Other items assessed

The Non-Aboriginal heritage technical working paper also assesses the ground movement associated with construction and operation of the Project, cumulative heritage impacts (associated with New M5, King Georges Road Interchange Upgrade, M4 Widening, M4 East and M4-M5 Link) and management of impacts (refer to Section 7.4).

Heritage items and HCAs which fall within the discussed study areas, heritage study areas and HAMUs relevant to the Stage 1: M4-M5 Link Tunnels scope of the M4-M5 Link Project are specified in Appendix D.

Further information about the characteristics and the area covered in each study area, heritage study area and HAMU can be found in the Non-Aboriginal heritage technical working paper and Chapter 20 of the EIS.

## 5.4 Non-Aboriginal heritage

Non-Aboriginal heritage items and HCAs above, below or next to the tunnel alignment are listed in Appendix D, as identified in the EIS.

Appendix D also identifies properties predicted to exceed cosmetic damage as identified in the Project vibration screening criteria drawings (presented in Appendix D of the NVMP) and the Tunnelling CNVIS.

# 6 Environmental aspects and impacts

Environmental aspects and risks associated with construction, as related to non-Aboriginal heritage, were identified and assessed in the Non-Aboriginal heritage technical working paper prepared for the EIS (refer to Section 5.2 of this Plan for a brief overview of assessment approach/methodology). Key construction features and work stages of the Project are outlined in Table 2-1 of the Non-Aboriginal heritage technical working paper.

The Non-Aboriginal heritage technical working paper assessed heritage items and HCAs within each of the study areas, HAMUs and heritage study areas. Key assessment findings are summarised in the following sections of the Non-Aboriginal heritage technical working paper:

- Tables 6-1 provides a summary of potential impacts (type and ranking) to listed heritage items and HCAs within the study areas
- Table 6-2 provides a summary of potential impacts (type and ranking) to potential heritage items and HCAs within the study areas.
- Table 6-48 provides a list of other heritage items and HCAs along the main tunnel route, listed on local, State and S170 Registers
- Section 5 provides an assessment of historical archaeology (ie by assessing each HAMU separately).

**The majority of the Project footprint (and therefore works) would be underground.** However, limited surface works would be required to support tunnelling activities as well as construction compounds and to construct surface infrastructure such as interchanges, tunnel portals, ventilation facilities, ancillary operations buildings and facilities. SAPs are provided in Appendix A5 of the CEMP.

## 6.1 Construction activities

Key aspects of the Project that could result in adverse impacts to Non-Aboriginal heritage include:

- Planned salvage of non-Aboriginal heritage items
- Initial clearing and removal of vegetation
- Topsoil stripping
- Change in heritage conservation area values, such as construction of new elements within HCAs (setting)
- Construction of new road infrastructure and ancillary facilities (setting)
- Tunnelling (vibration, settlement and groundwater drawdown)
- Earthworks (vibration)
- Piling (vibration)
- Acquisition and associated demolition of one property that has heritage value
- At-property acoustic treatment of heritage listed buildings
- Temporary access roads during construction
- Pavement works
- Finishing works.

As a consequence of the identified construction aspects above, the potential direct heritage impacts could include:

- Complete or partial demolition of non-listed buildings assessed as having heritage values (ie potential heritage item – former Bank of NSW)
- Removal of heritage vegetation
- Inadvertent damage to heritage trees/roots.

Potential indirect impacts could include:

- Impacts to heritage curtilage or visual setting of heritage items or HCAs
- Continued use of existing construction compounds at Haberfield and St Peters
- Vibration impacts from earthworks, piling and tunnelling activities
- Settlement and groundwater drawdown from tunnelling activities.

## 6.2 Non-Aboriginal Heritage impacts

A summary of the type of impacts anticipated to occur from the construction of the Project are presented in Table 6-1, and the specific management measures associated with each of the heritage items, HCAs and HAMUs located within the Project footprint are presented in Appendix D. Further details about the planned management and mitigation measures are provided in Section 6.3.

**Table 6-1 Summary of heritage and archaeological impacts**

Type of heritage item	No impact	Potential indirect impact	Direct impact
HCA	6	3	0
Heritage item	19	17	0
Potential heritage item	0	0	1
HAMU	1	2	1

It is detailed in Chapter 20 of the EIS that potential indirect impacts (neutral or minor adverse) may occur to heritage items listed in Appendix D. The only direct impact within the construction footprint includes demolition of the former Bank of NSW.

The general management methodology would be informed by site conditions, proposed strategy and Unexpected Heritage Items Procedure (refer Appendix B). Appendix D provides an overview of the protocols for managing the potential archaeological resources in each area within the Project footprint.

## 6.3 Sydney Water Corporation (Sydney Water) City Tunnel and Pressure Tunnel and Shafts

### 6.3.1 Description and activities

The Pressure Tunnel was constructed in approximately 1920/30's, is 2.48m in diameter and steel-lined. The M110 and M120 project mainline tunnels are located above the Pressure Tunnel in close proximity. Roadheader (including benching and drainage activities) activities are approximately 7m from the Pressure Tunnel.

The Sydney Water City Tunnel is largely a functional duplicate of the Pressure Tunnel. It was built in response to the need for additional pipeline and is used in conjunction with the Pressure Tunnel.

The City Tunnel was constructed in the 1950's, is 2.1m in diameter and steel-lined and is located above the M110 and M120 project mainline tunnels, as well as M180 and M190 On and Off Ramps. Roadheader activity is expected to occur approximately 12 m from City Tunnel and rock-bolting 6.4m.

The EIS assessed the impact of the tunnelling activities on the tunnel/pipe infrastructure with a safe vibration of 25mm/sec. However, in line the Project's Utilities Management Plan consultation has been undertaken with Sydney Water to establish appropriate vibration limits and corresponding management protocol if the limits are exceeded. Condition surveys were carried out on the City Tunnel in July/August 2013 and the Pressure Tunnel in July 2018 by Sydney Water. The Inspection, Condition Assessment and Rehabilitation Report for both tunnels have been received by LSBJV from the utility operator.

Vibration and displacement triggers for the City and Pressure Tunnels are described within Sydney Water City and Pressure Tunnels Interface Protocol (M4M5-LSBJ-PRW-GEN-MP01-PRC-0002). Note the triggers may be subject to change based on outcomes from the real-time monitoring (as per section 6.3.2) or for any other reasons in agreement with Sydney Water.

### **6.3.2 Monitoring**

As per the Interface Protocol, baseline monitoring data collection is required to commence three months prior to excavation within 150m of the Pressure and City tunnels. This will be achieved through automated real-time monitoring.

Extensometers, inclinometers and geophones have been installed along the tunnel alignment and in between the project tunnels and the Sydney Water assets. LSBJV will use the collected data to validate the predictions from the geotechnical modelling. Once this validation has been carried out, it will be provided to Sydney Water prior to the tunnel excavation work approaching the 30m boundary of the asset, to review and provide agreement of the analysis. Only then can the excavation work continue into the 30m zone.

The monitoring equipment will continue to be utilised during construction to provide alerts should the agreed criteria be approached or exceeded.

All trigger levels will be managed in accordance with the Sydney Water City and Pressure Tunnel Interface Protocol (M4M5-LSBJ-PRW-GEN-MP01-PRC-0002).

### **6.3.3 Post Completion**

On completion, a final report detailing the predicted, accepted and actual effects on the ground conditions and Sydney Water Tunnels will be prepared and provided to relevant stakeholders.

# 7 Environmental mitigation and management measures

Specific management measures and requirements to address contract specification, CoA and REMM in relation to Non-Aboriginal heritage are outlined in the following sections including Table 7-4.

## 7.1 Vibration Management Measures

As shown in Appendix D, some heritage items and HCAs along the Project route may be subject to vibration impacts as a result of vibration intensive construction activities and equipment. The potential impacts to heritage items and HCAs due to construction vibration would be confirmed during detailed design (refer to the NVMP for more detail). Where required, mitigation and management measures to minimise potential impacts will be investigated prior to, and implemented during, construction of the Project (refer to management measures in Table 7-4).

### Vibration criteria and impact assessment

In accordance with CoA E84, vibration testing will be conducted before and during vibration generating activities that have the potential to impact on heritage items, to identify minimum working distances to prevent cosmetic damage. In the event that the vibration testing and monitoring shows that the preferred values for vibration are likely to be exceeded, the construction methodology will be reviewed and, if necessary, additional mitigation measures implemented.

The NVIA identified vibration criteria and impact assessment for sensitive receivers. Safe vibration levels are provided in Table 7-1. Subject to inspection, where a heritage structure is deemed to be more sensitive to cosmetic damage from vibration, the more conservative screening criterion of 3 mm/s will be considered. Otherwise the 20 mm/s and 5 mm/s screening criteria will apply, as applicable to the building. Refer to Section 5.7 of the NVMP for more details. These inspections will be conducted by a suitably qualified and experienced built heritage expert.

A summary of heritage listed items and HCAs that are located within safe working distances of the Project and may experience vibration impacts are identified in Appendix D. Properties predicted to exceed cosmetic damage as identified in the Project vibration screening criteria drawings (presented in Appendix D of the NVMP) and Tunnelling CNVIS are also identified in Appendix D.

**Table 7-1 DIN 4150 structural damage – safe limits for short-term building vibration**

Group	Type of structure	Peak particle velocity (mm/s)			
		Line	Type of building	1 Hz to 10 Hz	10 Hz to 50 Hz
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 at 10 Hz increasing to 40 at 50 Hz	40 at 50 Hz increasing to 50 at 100 Hz	40
2	Dwellings and buildings of similar design and/or use	5	5 at 10 Hz increasing to 15 at 50 Hz	15 at 50 Hz increasing to 20 at 100 Hz	15
3	Structures that because of their particular sensitivity to vibration (structurally unsound), do not correspond to those listed in Lines 1 or 2.	3	3 at 10 Hz increasing to 8 at 50 Hz	8 at 50 Hz increasing to 10 at 100 Hz	8

Note: 1. For frequencies above 100 Hertz the upper value in this column should be used  
 Source: Table 4-7, Appendix J of the EIS - Technical working paper: Noise and vibration

**Vibration monitoring and acoustic treatment of heritage items**

The process for identification and monitoring for potential effects of vibration on sensitive heritage items is addressed in the NVMP (refer Appendix B2 of the CEMP) and Section 7 of the Noise and Vibration Monitoring Program.

It is a requirement of CoA E79 that a CNVIS is to be prepared for construction ancillary facilities before any works that result in noise and vibration impacts commence, and include specific mitigation measures identified through consultation with affected sensitive receivers.

Furthermore, in accordance with CoA E162, where acoustic treatment is required at any heritage item identified in the documents listed in CoA A1, the advice of a suitably qualified and experienced built heritage expert will be obtained and implemented to ensure any such work minimises any adverse impacts on the heritage significance of the item or the HCA. For further detail refer to Section 8.1 and Appendix E (Noise Insulation Program) of the NVMP.

General inspection and monitoring requirements are summarised in Section 8.3.

**7.2 Ground movement**

As shown in Appendix D, some heritage items and HCAs along the Project route may be subject to settlement impacts as a result of construction activities and equipment. The potential impacts to heritage items and HCAs due to construction vibration would be confirmed during detailed design (refer to the NVMP for more detail). The Non-Aboriginal heritage technical working paper identified that the areas most likely to be affected by settlement are usually where tunnelling is closest to the

ground surface, around tunnel portals and entry and exit ramps, and where soils are more likely to be compressible. Table 6-48 of the Non-Aboriginal heritage technical working paper includes the anticipated below ground Project depth in relation to some of the heritage items and HCA.

As required by CoA E103, REMM's NAH 07 and PL 6, potential heritage impacts due to settlement and ground movement caused by the Project will be managed in accordance with the following:

- The relevant management measures identified in Table 7-4 (NAH 7, NAH 8, NAH 9)
- Settlement criteria identified in Table 7-2
- Settlement Monitoring Program outlined below and in Table 8-2.

It is a requirement of CoA E103 and REMM PL 6 that ground settlement will be managed to comply with the criteria set out in Table 7-2.

**Table 7-2 Settlement criteria as per CoA E103 and REMM PL 6**

Surface and Sub-Surface Structures	Maximum Settlement	Maximum Angular Distortion	Limited Tensile Strain (percent)*
Buildings – Low or non-sensitive properties (ie ≤ 2 levels and carparks.	30 mm	1 in 350	0.1
Buildings and pools – High or sensitive properties (ie ≥ 3 levels and heritage items)	20 mm	1 in 500	0.1
Roads and parking areas	40 mm	1 in 250	N/A
Parks	50 mm	1 in 250	N/A

A Settlement Monitoring Program for the Project will be prepared prior to, and implemented during, construction (refer to Section 8.3). The Settlement Monitoring Program will provide details on:

- Settlement criteria and predictions
- Location of monitoring points
- Duration of monitoring
- Data collection (type and method)
- Comparison of actual settlement with predictions
- Triggers and corrective actions that will be implemented if, based on monitoring results, actual settlement is likely to exceed predictions or the relevant criteria, with the aim of complying with the criteria.

### **7.3 Heritage and archaeological reports, procedures and plans**

The following surveys, reports, protocols and plans will be developed prior to or during construction activities, as specified in the CoA and REMM. Refer to Table 4-1 and Table 8-2 for consultation and reporting requirements in relation to the below.



### **7.3.1 Pre-dilapidation and post-dilapidation surveys**

As outlined in Appendix D, pre-dilapidation surveys will be offered for heritage items, where required and in accordance with CoA E105. The pre-dilapidation surveys will be carried out for buildings, services and utilities identified as at risk from settlement or vibration.

Should the pre-dilapidation surveys be undertaken, a post-dilapidation assessment will be carried out for the same heritage item(s) once construction works have finished, as required by CoA E106. Inspection reports for both pre- and post- dilapidation surveys will be provided to the owners of the item surveyed.

In accordance with CoA E107, the results of the surveys will be documented in a Condition Survey Report for each surface and sub-surface structure surveyed. Copies of the Condition Survey Reports will be provided to the owner(s) of the structure surveyed within three (3) weeks of completing the surveys and no later than four (4) months following completion of construction.

Section 9.1 of the CCS outlines the engagement/consultation process with each of the heritage item owners, as well as the damage rectification process.

### **7.3.2 Feasibility investigation of the façade of Former Bank of NSW Bank**

As per CoA E160, the feasibility of retaining the façade of the former Bank of NSW building (164 Parramatta Road) has been investigated. The feasibility investigation has been carried out by a suitably qualified heritage expert.

### **7.3.3 Heritage Archival Recording and Salvage Report**

In accordance with CoA E163 and E164, a heritage archival recording has been undertaken of the former Bank of NSW building at the Pyrmont Bridge Road tunnel site and a HARSR prepared outlining how any salvage or recovery of material will be undertaken.

Any CoA pertaining to requirements for the properties at 84 Lilyfield Road (Cadden Le Messurier) or 78 Lilyfield Road (Former Hotel) are not applicable to Stage 1 of the M4-M5 Link project and will be addressed in the Rozelle Interchange stage. Refer to the M4-M5 Link Project Staging Report.

As required by CoA E163, the archival recording will be undertaken in accordance with the NSW Heritage Office's How to Prepare Archival Records of Heritage Items (1998) and Photographic Recording of Heritage Items Using Film or Digital Capture (2006).

The photographic archival recording will occur prior to any works that have the potential to impact upon the items and will include the identification of appropriate stakeholders to receive copies of the documentation.

Within 12 months of completing the archival recording, a HARSR will be submitted to the agencies listed in Table 4-1 and stakeholders for their information.

Following archival recording as required by CoA E163, and prior to demolition, the former Bank of NSW building will need to be assessed for sympathetic reuse (including integrated heritage displays and interpretation) on the Project or other options for conservation, including architectural salvage for re-use in comparable buildings and displays.

Should salvage support good conservation outcomes, the material will be collected and stored in suitable repository locations established in consultation with relevant council(s). The salvage from the former Bank of NSW building must be determined in consultation as per requirements outlined in Table 4-1.

Any residual items and materials will be made available, in consultation as outlined in Table 4-1, to landowners within the locality from where the material originated.

### **7.3.4 The Historical Archaeological Research Design and Excavation Methodology**

In accordance with CoA's E 168 and E169, prior to works that have a direct material impact on a HAMU a suitably qualified archaeologist whose experience complies with the Heritage Council of NSW's Criteria for Assessment of Excavation Directors (July, 2011) (referred to as the Excavation

Director) will be engaged to oversee and advise on matters associated with historic archaeology and to prepare a HARDEM. The HARDEM will:

- Be consistent with the NSW Heritage Council's Archaeological Assessment Guidelines (1996) or as updated
- Provide descriptions of clear significance thresholds for possible archaeological items that may be uncovered during works
- Provide for the detailed analysis of any heritage items discovered during the investigation
- Include a methodology and scope for a program of archaeological excavation, investigation and recording of any historical archaeological remains that will be impacted by the Project
- Include management options for discovered items, whether known or unexpected finds ((including options for avoidance, salvage, relocation and display)
- For unexpected finds that are determined to be relics, set out the assessment process that will determine an appropriate archaeological response to managing their significance
- Include requirement for post-excavation reporting, including artefact analysis and additional historical research, where necessary, and long-term management of records
- Include procedures for notifying the NSW Heritage Council (or its delegate) and Secretary of any relic findings and associated reports
- If the findings of the investigation are significant, provide for the preparation and implementation of a Heritage Interpretation Plan in accordance with E167.

### **7.3.5 Heritage Interpretation Plan**

A Heritage Interpretation Plan will be prepared and implemented in accordance with CoA's E167 and E169(f). The Heritage Interpretation Plan will be prepared to identify and interpret the key heritage values and stories of heritage items and HCAs impacted by the Project. The Heritage Interpretation Plan will include, but will not be limited to:

- A discussion of the key interpretative themes, stories and messages proposed to interpret the history and significance of the affected heritage items and sections of heritage conservation areas
- Themes, stories and initiatives proposed as part of other stages of WestConnex program of works to ensure a consistent approach to heritage interpretation for the Project
- Identify how any salvaged items will be reused
- Identification of interpretive initiatives implemented to mitigate impacts to archaeological relics, heritage items and HCAs affected by the Project.

The Heritage Interpretation Plan will inform the development of the Urban Design and Landscape Plan (UDLP) for the Project, in accordance with Interpreting Heritage Places and Items Guideline (NSW Heritage Office 2005).

### **7.3.6 Archaeological Excavation Report**

The Archaeological Excavation Report will be prepared by a suitably qualified Excavation Director. It will contain the findings of any excavations, including artefact analysis and the identification of a final repository of any finds. The report will be submitted to the Secretary within 12 months of completing the archaeological investigations. The Archaeological Excavation Report will also be submitted to the Heritage Council of NSW, the local library and the local Historical Society. The Archaeological Excavation Report will be retained with the relics at all times.

### 7.3.7 Unexpected Heritage Items Procedure

In accordance with CoA E157, an Unexpected Heritage Items Procedure prepared by Roads and Maritime will be implemented to manage unexpected heritage finds in accordance with relevant guidelines and standards prepared by the NSW Heritage Council and OEH. The Unexpected Heritage Items Procedure has been included in Appendix B of this plan.

Any items of potential heritage conservation significance or human remains discovered during construction will be managed in accordance with the Unexpected Heritage Items Procedure. The procedure details requirements regarding notification of relevant agencies and the NSW Police and will be implemented for the duration of construction.

### 7.3.8 Urban Design and Landscape Plan and Urban Design Review Panel

Retention of any heritage items, if applicable, will be incorporated into the UDLP which will be reviewed by the Urban Design Review Panel (UDRP), as per CoA E134.

## 7.4 Cumulative impacts

The design intent of the M4-M5 Link Project was to place as much infrastructure below ground to avoid and minimise impacts across the M4-M5 Link Project. However, the M4-M5 Link Project will contribute to the overall heritage impacts from other components of the WestConnex program of works, which are listed in Table 7-3. In addition, other major infrastructure projects such as CBD and South East Light Rail and Sydney Metro City and Southwest Metro overlap with the M4-M5 Link Project at St Peters.

**Table 7-3 Overall heritage impacts of WestConnex projects**

WestConnex project	Overall heritage impact ranking
New M5	Moderate adverse
King Georges Road Interchange Upgrade	Nil
M4 Widening	Nil
M4 East	Major adverse
M4-M5 Link Project Stage 1 (the Project and subject of this document): M4-M5 Link Mainline tunnels	Moderate adverse
M4-M5 Link Project Stage 2: Rozelle interchange	

The M4-M5 Link Project has been assessed to have an overall moderate heritage impact, due to the subterranean nature of most of the interventions. The aboveground motorway infrastructure (eg ventilation facilities and outlets, substations, water treatment plants, etc) have been located and designed to reduce heritage impacts.

The detailed design and construction of the M4-M5 Link Project will be managed to ensure, as far as possible, that the identified potential heritage and archaeological impacts are minimised and/or avoided by implementation of a range of general and specific measures. Measures outlined in Table 7-4 and Appendix D will serve to avoid, reduce and manage potential impacts to non-Aboriginal heritage.

## **7.5 Non-Aboriginal heritage management and mitigation measures**

All reasonably practicable environmental control measures will be implemented to minimise impacts to items of non-Aboriginal heritage significance and HCAs during the construction of the Project. Specific measures and requirements to meet the objectives of this NAHMP and to address impacts non-Aboriginal heritage area outlined in Table 7-4.

**Table 7-4: Non-Aboriginal heritage management and mitigation measures**

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
<b>Planning / managing cumulative impacts</b>						
NAH 1	Ensure non-Aboriginal heritage impacts and risks are considered as part of the development of detailed designs.	EIS SPIR This Plan	Pre-construction	Engineers Designers	Best practice	SAPs Detailed designs
NAH 2	All activities will be planned and carried out to avoid where practicable, or minimise, any potential impacts to heritage items and HCAs.  Prior to works commencing, any areas of archaeological (non-Aboriginal heritage) will be reviewed and identified. Typically, these would be assessed and documented during the planning and approval stages of the Project and will be reviewed prior to physical works commencing on site.	This Plan Chapter 20 of the EIS Appendix U of the EIS SAPs	Construction	Engineers Foreman	Best practice LLE 711 3 (internal document)	This Plan SAPs EWMS
<b>Vibration</b>						
NAH 3	A NVMP will be prepared for the Project to assist with the management of potential vibration impacts at surrounding buildings and structures (including heritage-listed items and HCAs).	NVIA Noise and Vibration Impact Statements (NVIS)	Pre-construction Construction	Project manager Environment and Sustainability Manager	REMM NAH06	NVMP

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
	<p>Potential vibration impacts to features of heritage significance will be managed in accordance with the NVMP prepared for the Project.</p> <p>The NVMP will:</p> <ul style="list-style-type: none"> <li>• Identify relevant performance criteria in relation to noise and vibration</li> <li>• Identify noise and vibration sensitive receivers and features in the vicinity of the Project</li> <li>• Include standard and additional mitigation measures from the CNVG and details about when each will be applied</li> <li>• Describe the process(es) that will be adopted to carrying out location and activity specific noise and vibration impact assessment to assist with the selection of appropriate mitigation measures.</li> </ul>	EIS SPIR		Foreman		
NAH 4	Advice will be sought of a suitably qualified and experienced heritage specialist on methods and locations for installing equipment used for vibration, movement and noise monitoring at heritage-listed structures. This is to ensure any such	Noise and vibration monitoring equipment	Construction	Project manager Environment and Sustainability Manager	CoA E85 COA E162	Correspondence with heritage specialist

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
	work minimises any adverse impacts on the heritage significance of the item.					
NAH 5	<p>Vibration monitoring will be conducted before and during vibration generating activities that have the potential to impact on heritage items, and to identify minimum working distances to prevent cosmetic damage.</p> <p>In the event that the vibration testing and monitoring shows that the preferred values for vibration are likely to be exceeded, the construction methodology will be reviewed and, if necessary, additional mitigation measures will be implemented.</p>	<p>Noise and vibration monitoring equipment</p> <p>Appendix C NVMP</p> <p>Noise and Vibration Monitoring Program</p>	Construction	<p>Project manager</p> <p>Environment and Sustainability Manager</p>	CoA E84	<p>Vibration testing records</p> <p>Training, toolbox and internal communication records</p>
NAH 6	Where required, a pre-construction and post-construction dilapidation inspections will be conducted. The inspections will include heritage-listed items identified as at risk from settlement or vibration by the geotechnical model described in CoA E101 of the approval.	<p>SAPs</p> <p>Settlement Monitoring Program</p> <p>NVMP</p> <p>CCS</p>	<p>Pre-construction</p> <p>Post-construction</p>	Engineer	<p>CoA E105</p> <p>CoA E106</p>	Pre-construction and post-construction dilapidation reports

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
<b>Ground movement (settlement and heave)</b>						
NAH 7	<p>Further assessment of potential settlement impacts, including numerical modelling, will be undertaken during detailed design.</p> <p>In areas where ground movement in excess of settlement criteria is predicted (refer to Table 7-2), instrumentation and monitoring program to measure settlement, distortion or strain will be implemented.</p>	Detailed designs	Construction	Environment and Sustainability Manager  Project Engineer	CoA E104 REMM PL 7	Settlement Monitoring Program
NAH 8	<p>Feasible and reasonable measures will be investigated and implemented to ensure where possible that predicted settlement is within the criteria. Measures that will be considered may include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Review of the proposed tunnel design including:               <ul style="list-style-type: none"> <li>◦ The depth and alignment of tunnels</li> <li>◦ The proximity of multiple tunnels to each other</li> <li>◦ The proposed tunnel support system</li> </ul> </li> </ul>	Detailed designs	Construction	Environment and Sustainability Manager  Project Engineer	REMM PL 7	Settlement Monitoring Program



ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
	<ul style="list-style-type: none"> <li>◦ The tunnel lining to manage groundwater inflows</li> <li>• Rationalising the layout of the proposed ventilation tunnels including the number, location and length of tunnels</li> <li>• Review of the proposed construction methodology</li> <li>• Consideration of ground movement options.</li> </ul>					
NAH 9	<p>Building condition surveys (ie pre- and post-dilapidation surveys as per Section 7.3.1) will be offered to property owners within the zone of influence of tunnel settlement (50 metres from the outer edge of the tunnels and within 50 metres of surface works) or as otherwise directed by the Independent Property Impact Assessment Panel.</p> <p>The surveys of properties will be carried out prior to the commencement of any Project works in the vicinity that have the potential to result in damage to the properties. The surveys will be carried out by a structural engineer.</p> <p>Appropriate mitigation measures will be implemented in consultation with</p>	<p>SAPs Settlement Monitoring Program CCS</p>	<p>Pre-construction and post-construction</p>	<p>Project Engineer</p>	<p>CoA E104 CoA E105 CoA E106 PL 10</p>	<p>Pre- and post-dilapidation surveys</p>

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
	the owner(s) of the relevant surface and sub-surface structures prior to excavation and tunnelling works, to ensure no exceedances of the relevant criteria.					
<b>Heritage and archaeological management (including unexpected finds)</b>						
NAH 10	Heritage items, including human remains, outside of the Project boundary will not be destroyed, modified, or otherwise physically affected and no works will be undertaken in or on Alexandra Canal.	Unexpected Heritage Items procedure SAPs Identification of project boundary and no go areas.	Construction	Environment and Sustainability Manager Foreman All site personnel	CoA E154	Site observations
NAH 11	Prior to works that have a direct material impact on a HAMU, a suitably qualified archaeologist will be hired to oversee and advise on matters associated with historic archaeology and to prepare a HARDEM.	EIS SPIR This Plan	Pre-construction	Project manager Environment and Sustainability Manager	CoA E168	Correspondence with the Excavation Director/ HARDEM

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
NAH 12	<p>The nominated Excavation Director for the Project will be consulted where excavation works are required in the vicinity of potential archaeological sites. The Excavation Director will advise on how the works are to be managed and any archaeological impact minimised.</p> <p>They must be given the authority to advise on the duration and extent of oversight required during excavation.</p>	HARDEM	Construction	<p>Project Manager</p> <p>Environment and Sustainability Manager</p> <p>Excavation Director</p>	CoA E170	Correspondence with the Excavation Director
NAH 13	<p>Works within the vicinity of a find (items that may be of cultural or archaeological significance) will not recommence until the relevant requirements of the HARDEM or advice on unexpected finds from the Excavation Director have been met.</p> <p>The site of the discovery will be demarcated and communicated to workers as a no go area.</p>	<p>HARDEM</p> <p>Unexpected Heritage Items Procedure</p>	Construction	<p>Project Manager</p> <p>Excavation Director</p>	<p>CoA E171</p> <p>LLE 711 H3 (internal document)</p> <p>LLE 711 H8 (internal document)</p>	<p>Correspondence with the Excavation Director</p> <p>LLE702B Environmental Incident Investigation report (if required) (internal document)</p>
NAH 14	Any excavations, intrusive works or other operations that have the potential to impact areas of known heritage, cultural or archaeological items must ensure works are performed in accordance with a heritage assessment and regulatory requirements (which may include a	<p>Dilapidation survey, if required</p> <p>Vibration monitoring or any other equipment, if required</p> <p>SAPs</p>	<p>Pre-construction</p> <p>Construction</p>	<p>Environment and Sustainability Manager</p>	LLE 711 H2 (internal document)	Site observations

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
	<p>dilapidation survey and/or supervision of works by a competent person and/or vibration monitoring).</p> <p>Any such areas should be signposted and segregated by the erection of physical barriers to prevent authorised entry.</p>	Signs and flagging tape				
NAH 15	<p>Any item of potential Aboriginal archaeological or cultural heritage conservation significance or human remains discovered during construction will be managed in accordance with the Unexpected Heritage Items Procedure developed for the Project.</p> <p>In the case of human remains finds, works may recommence at an agreed distance further along the Project corridor in agreement with client, the Police and regulatory representatives. The site of the discovery will be demarcated and communicated to workers as a no-go area.</p>	Unexpected Heritage Items Procedure	Construction	Environment and Sustainability Manager Foreman	<p>REMM AH1 Roads and Maritime Specifications G36 4.10</p> <p>LLE 711 H3 (internal document)</p> <p>LLE 711 H8 (internal document)</p>	LLE702B Environmental Incident Investigation report (if required) (internal document)
NAH16	Human remains uncovered during the construction of the Project will not be harmed, modified, or otherwise impacted during the construction of the Project.	Induction training Unexpected Heritage Items Procedure	Construction	Environment and Sustainability Manager	CoA E155	LLE702B Environmental Incident Investigation report (if required) (internal document)

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
				Foreman All site personnel		
<b>Environmentally sensitive areas (including heritage-listed items and HCAs)</b>						
NAH17	All known heritage items within immediate vicinity of the construction work zones will be identified on SAPs including in the CEMP. Preserved heritage items and places will be shown on relevant site plans and communicated to the relevant workforce. SAPs will be available to all personnel working on the site.	CEMP SAPs	Construction	Project Manager Environment and Sustainability Manager Foreman	Roads and Maritime Specifications G36 4.10	Appendix A5 of the CEMP
NAH18	An environmental work method statement (EWMS), for working in or near environmentally sensitive areas, will be prepared and implemented as required.	CEMP EWMS	Construction	Project Manager Environment and Sustainability Manager Foreman	Roads and Maritime Specifications G36 4.10 and 4.12	EWMS
NAH19	Locations and boundaries of all environmentally sensitive areas, including items of heritage, cultural and/or archaeological significance, will be clearly identified on a SAP and delineated and signposted. They	EWMS Signs and flagging tape, if required	Pre-construction Construction	Environment and Sustainability Manager Foreman	Roads and Maritime Specifications G36, 4.13	EWMS SAPs Site observations

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
	should be protected in accordance with regulatory requirements.					
<b>Sydney Water Corporation (Sydney Water) City Tunnel and Pressure Tunnel and Shafts</b>						
NAH20	<ul style="list-style-type: none"> <li>Sydney Water have provided their pre-condition survey reports from July/August 2013 (City Tunnel) and July 2018 (Pressure Tunnel) to LSBJV.</li> <li>Consult with Sydney Water and agree on appropriate vibration criteria for the assets. This will be documented in the Sydney Water City and Pressure Tunnel Interface Protocols</li> <li>Prior to works in the vicinity of the asset commencing, confirm compliance with the agreed vibration criteria, for all vibration intensive tunnelling activities, based on known or measured vibration levels.</li> <li>On approach to the asset, the geotechnical model and its predictions is to be validated against the actual data recorded by the extensometers, inclinometers and geophones attached to and around the asset.</li> </ul>	CNVG Tunnelling CNVIS	Construction	Environment and Sustainability Manager Interface Manager Area Manager	Best Practice	Consultation records Vibration testing records

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
	<ul style="list-style-type: none"> <li>• Automated real-time monitoring of the Sydney Water assets will be undertaken and made fully accessible to all interface parties.</li> <li>• If a trigger level is reached the action response protocol is to be followed as per the Sydney Water City and Pressure Tunnel Interface Protocol.</li> <li>• Post-construction monitoring will be undertaken for a period of 3 months after tunnelling excavation has continued past the interface zone (150m), or when ground conditions have demonstrated stabilisation.</li> </ul> <p>Prior to the date of completion, a final report detailing the predicted, accepted and actual effects on the ground conditions and Sydney Water Tunnels will be provided to TfNSW, WCX.</p>					

# 8 Compliance Management

## 8.1 Roles and responsibilities

The LSBJV Project Team’s organisational structure and overall roles and responsibilities are outlined in Section 3.3 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Table 7-4 of this Plan.

Additional roles, specific to the management of non-Aboriginal heritage aspects of the Project are listed in Table 8-1.

**Table 8-1 Roles and responsibilities relevant to Non-Aboriginal heritage management**

Role	Responsibilities
Environment and Sustainability Manager	<ul style="list-style-type: none"> <li>• Determine the location and nature of known or potential heritage sites/items</li> <li>• Consider the susceptibility of heritage items to construction impacts</li> <li>• Determine and obtain if required any regulatory permits and licenses.</li> </ul>
Excavation Director (qualified archaeologist)	<ul style="list-style-type: none"> <li>• Experience must comply with the NSW Heritage Council’s Criteria for Assessment of Excavation Directors (July 2011)</li> <li>• Oversee and advise on matters associated with historic archaeology</li> <li>• Prepare the following reports:               <ul style="list-style-type: none"> <li>◦ HARDEM</li> <li>◦ HARSR</li> <li>◦ Heritage Interpretation Plan</li> <li>◦ Archaeological excavation report, if required</li> </ul> </li> <li>• Advise on how the works are to be managed.</li> </ul>

## 8.2 Training

All employees, contractors and utility staff working on site will undergo site induction training relating to non-Aboriginal heritage management and issues. The induction training will address elements related to non-Aboriginal heritage management including:

- Requirements of this Plan
- Applicable and relevant legislative requirements, including the NSW *Heritage Act 1997* (Heritage Act)
- Roles and responsibilities for non-Aboriginal heritage management
- Location of identified heritage sites and conservation, protection and no-go areas
- Proposed heritage management and protection measures
- Procedures to follow in the event of an unexpected heritage item find or discovery of human remains during construction works (Unexpected Heritage Items Procedure, Appendix B)



- Incident response procedure.

Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in non-Aboriginal heritage management.

Further details about staff induction and training are outlined in Section 3.5 of the CEMP.

## 8.3 Monitoring and inspections

### 8.3.1 Regular monitoring and inspections

Regular monitoring and inspections will be carried out during construction in accordance with regulatory requirements, CoA, REMM and the LLE703 Environmental Monitoring and Inspection procedure (internal document).

Monitoring and inspection regimes will be conducted in accordance with contractual and/or legislative requirements. Monitoring and inspections will include, but are not limited to:

- Prior to commencement of construction:
  - The environmental team (or delegate) and the nominated Excavation Director should inspect specified areas to determine archival recording and salvage requirements
  - Where required, a pre-dilapidation survey will be carried out for heritage items identified as at risk from settlement or vibration. A post-dilapidation survey for the same items will be carried out at the end of construction
  - Heritage inspections will be carried out prior to any modification to heritage items for acoustic treatments
  - Feasibility study (refer to Section 7.3.2) and archival recording of the former Bank of NSW
  - Site observations to identify and action any non-Aboriginal heritage issues, including:
    - Visual surveillance of no-go zone fencing and signage to make sure it is in place and undamaged
    - Visual surveillance to make sure there is no unauthorised access to no-go zone
- Weekly documented site inspections by the Foreman and environmental team while construction works are occurring. The aim of these inspections is to make sure all heritage management measures are in place and effective, and identify and action any non-Aboriginal heritage issues. These inspections are to record on LLE703A Environmental Inspection Checklist (internal document) (or equivalent).
- Vibration monitoring, as per requirements set out in the NVMP
- Settlement monitoring as per the Settlement Monitoring Program.

Additional requirements and responsibilities in relation to inspections are documented in Section 3.9.1 and Section 3.9.2 of the CEMP.

## 8.4 Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this Plan, CoA and other relevant approvals, licences and guidelines.

Audit requirements are detailed in Section 3.9.3 of the CEMP.

## 8.5 Reporting

Project reporting requirements relevant to the management of non-Aboriginal heritage are identified in Table 8-2.

**Table 8-2 Reporting requirements relevant to management of non-Aboriginal heritage**

Item	Frequency	Standards	External reporting	Responsibility
Incidents	As required	As required by the CoA, Roads and Maritime Environmental Incident Classification and Reporting Procedure (September 2017) and Roads and Maritime Environmental incident report.	Appropriate authority	Environment and Sustainability Manager  Foreman or delegate
LLE703B Environmental Observation Report (weekly documented inspections) (internal document)	Weekly	LLE703 Environmental Monitoring and Inspection (internal document)	As required	Environment and Sustainability Manager  Foreman or delegate
Project monthly reports	Monthly	As per reporting requirements and responsibilities documented in the CEMP	In accordance with the CEMP and the	Environment and Sustainability Manager
Six-monthly construction compliance reports	Six-monthly	As per Compliance Tracking Program	In accordance with Compliance Tracking Program	Environment and Sustainability Manager
Notification and reporting in the event that archaeological relics/heritage items are discovered	In accordance with the timeframe detailed in the HARDEM	S146 of the Heritage Act  Unexpected Heritage Items Procedure (Appendix B)	Notification of NSW Heritage Council and subsequent preparation of an Archaeological Relics Management Plan.  Written notification to	Environment and Sustainability Manager  Foreman

Item	Frequency	Standards	External reporting	Responsibility
			DPIE and the outcome of NSW Heritage Council consultation.	
HARDEM	Prior to works that have a direct material impact on a HAMU	CoA E168 CoA E169	Must be submitted to the NSW Heritage Council (or its delegate) for review and comment prior to finalisation.	Environment and Sustainability Manager
Archival recording (former Bank of NSW)	Within 12 months of completing the archival recording	CoA E163 CoA E164	Must be submitted to the Secretary, relevant council(s), relevant local libraries and local historical societies in the respective LGAs.	Environment and Sustainability Manager
Heritage Interpretation Plan	During Project delivery	CoA E167	Can be supplied to relevant agencies for information upon request.	Environment and Sustainability Manager
Archaeological Excavation Report	Within 12 months of completing all archaeological investigations	CoA E172	Must be submitted to the Secretary within 12 months of completing all archaeological investigations.  It will also be submitted to the NSW Heritage Council, the local library and the local Historical Society in the relevant LGAs.	Environment and Sustainability Manager
Settlement Monitoring Program	Starting prior to commencement of tunnel construction through to until all settlement	REMM NAH07 REMM PL9 The implementation and adequacy of	In accordance with Settlement Monitoring Program	Environment and Sustainability Manager

Item	Frequency	Standards	External reporting	Responsibility
	has stabilised following end of construction	the Settlement Monitoring Program will be monitored by the Independent Property Impact Assessment Panel		

All other legislative reporting requirements are documented in Section 3.9.5 of the CEMP.

For incident management and emergency management process refer to Section 3.8 of the CEMP.

# 9 Review and improvement

## 9.1 Continuous improvement

Continuous improvement of this plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance
- Determine the cause or causes of non-conformances and deficiencies
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies
- Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement
- Make comparisons with objectives and targets.

## 9.2 NAHMP update and amendment

The processes described in Section 3.9 to Section 3.13 of the CEMP may result in the need to update or revise this Plan. This will occur as needed.

Only the Environment and Sustainability Manager, or delegate, has the authority to change any of the environmental management documentation. The ER can approve minor amendments to the Plan.

Any reviews to the NAHMP will be in accordance with the process outlined in Sections 1.5 and 3.13.1 of the CEMP.

A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure – refer to Section 3.11.2 of the CEMP.

## Appendix A – Other Conditions of Approval and Revised Environmental Management Measures relevant to this Plan

Other Conditions of Approval relevant to the development of this Plan

CoA No.	Condition Requirements	Document Reference
E79	<p>Construction Noise and Vibration Impact Statements must be prepared in construction ancillary facility(s) before any works that result in noise and vibration impacts commence, and include specific mitigation measures identified through consultation with affected sensitive receivers. The Statement must supplement the Construction Noise and Vibration Management Sub-plan or Site Establishment Management Plan(s) and are to be implemented for the duration of the works.</p> <p>The Construction Noise and Vibration Impact Statement for the White Bay Civil Site (C11) must be prepared in consultation with the Port Authority of NSW and NSW Heritage Council.)</p>	Section 7.1
E84	<p>The Proponent must conduct vibration testing before and during vibration generating activities that have the potential to impact on heritage items to identify minimum working distances to prevent cosmetic damage. In the event that the vibration testing and monitoring shows that the preferred values for vibration are likely to be exceeded, the Proponent must review the construction methodology and, if necessary, implement additional mitigation measures.</p>	Section 7.1 Table 7-4 NAH5
E85	<p>The Proponent must seek the advice of a heritage specialist on methods and locations for installing equipment used for vibration, movement and noise monitoring at heritage-listed structures.</p>	Table 7-4 NAH 4

CoA No.	Condition Requirements	Document Reference																				
E103	<p>In the case of buildings, roads, parking areas and parks, the appropriate criteria which governs the greatest risk of damage are to be selected from Table 9 (Maximum Settlement, Maximum Angular Distortion or Limited Tensile Strain) unless the Proponent has determined more stringent criteria as a result of Condition E102.</p> <table border="1" data-bbox="304 450 1145 1167"> <thead> <tr> <th data-bbox="304 450 520 573">Surface and Sub-Surface Structures</th> <th data-bbox="520 450 730 573">Maximum Settlement</th> <th data-bbox="730 450 938 573">Maximum Angular Distortion</th> <th data-bbox="938 450 1145 573">Limited Tensile Strain (percent)*</th> </tr> </thead> <tbody> <tr> <td data-bbox="304 573 520 790">Buildings – Low or non-sensitive properties (ie ≤ 2 levels and car parks).</td> <td data-bbox="520 573 730 790">30 mm</td> <td data-bbox="730 573 938 790">1 in 350</td> <td data-bbox="938 573 1145 790">0.1</td> </tr> <tr> <td data-bbox="304 790 520 1008">Buildings and pools – High or sensitive properties (ie ≥ 3 levels and heritage items)</td> <td data-bbox="520 790 730 1008">20 mm</td> <td data-bbox="730 790 938 1008">1 in 500</td> <td data-bbox="938 790 1145 1008">0.1</td> </tr> <tr> <td data-bbox="304 1008 520 1104">Roads and parking areas</td> <td data-bbox="520 1008 730 1104">40 mm</td> <td data-bbox="730 1008 938 1104">1 in 250</td> <td data-bbox="938 1008 1145 1104">N/A</td> </tr> <tr> <td data-bbox="304 1104 520 1167">Parks</td> <td data-bbox="520 1104 730 1167">50 mm</td> <td data-bbox="730 1104 938 1167">1 in 250</td> <td data-bbox="938 1104 1145 1167">N/A</td> </tr> </tbody> </table> <p>* As defined in Burland et al. 'Building response to tunnelling – Case studies from construction of the Jubilee Link Extension', London, Thomas Telford (2001)</p>	Surface and Sub-Surface Structures	Maximum Settlement	Maximum Angular Distortion	Limited Tensile Strain (percent)*	Buildings – Low or non-sensitive properties (ie ≤ 2 levels and car parks).	30 mm	1 in 350	0.1	Buildings and pools – High or sensitive properties (ie ≥ 3 levels and heritage items)	20 mm	1 in 500	0.1	Roads and parking areas	40 mm	1 in 250	N/A	Parks	50 mm	1 in 250	N/A	Section 7.2
Surface and Sub-Surface Structures	Maximum Settlement	Maximum Angular Distortion	Limited Tensile Strain (percent)*																			
Buildings – Low or non-sensitive properties (ie ≤ 2 levels and car parks).	30 mm	1 in 350	0.1																			
Buildings and pools – High or sensitive properties (ie ≥ 3 levels and heritage items)	20 mm	1 in 500	0.1																			
Roads and parking areas	40 mm	1 in 250	N/A																			
Parks	50 mm	1 in 250	N/A																			
E104	Should the geotechnical model in Condition E101 identify exceedances of the relevant criteria established by Conditions E102 and E103, the Proponent must implement an instrumentation and monitoring program to measure settlement, distortion or strain as required. The Proponent must also identify and implement appropriate mitigation measures in consultation with the owner(s) of the relevant surface and sub-surface structures prior to excavation and tunnelling works to ensure where possible that the surface and sub-surface structures will not experience exceedances of the relevant criteria.	Table 7-4 NAH 7 Table 7-4 NAH 9																				
E105	The Proponent must offer pre-dilapidation surveys and must undertake and prepare pre-dilapidation reports where the offer is accepted, on the current condition of surface and sub-surface structures identified as at risk from settlement or vibration by the geotechnical model described in Condition E101. The pre-dilapidation surveys and reports must be prepared by a suitably qualified and experienced person(s) and must be provided to the owners of the surface and sub-surface structures for review prior to the commencement of potentially impacting works.	Section 7.3.1 Appendix D																				

CoA No.	Condition Requirements	Document Reference
E106	Where pre-dilapidation surveys have been undertaken in accordance with Condition E105, subsequent post-dilapidation surveys must be undertaken to assess damage to the surface and sub-surface structures that may have resulted from the construction of the CSSI within three (3) months of the completion of construction.	Section 7.3.1 Appendix D
E107	The results of the surveys must be documented in a Condition Survey Report for each surface and sub-surface structure surveyed. Copies of the Condition Survey Reports must be provided to the owner(s) of the structure surveyed within three (3) weeks of completing the surveys and no later than four (4) months following the completion of construction.	Section 7.3.1 Appendix D
E154	The Proponent must not destroy, modify or otherwise physically affect any heritage items, including human remains, outside of the CSSI boundary, or undertake works in or on Alexandra Canal.	Table 7-4 NAH 10
E155	The Proponent must not harm, modify, or otherwise impact human remains uncovered during the construction of the CSSI.	Table 7-4 NAH 16
E156	Identified impacts to heritage items and heritage conservation areas must be minimised through both detailed design and construction. The measures for ensuring this are to be detailed in the Construction Non-Aboriginal Heritage Management Sub-plan and Aboriginal Cultural Heritage Management Sub-plan required by Conditions C4 (g) and (h), respectively.	Table 2-1 Table 7-4 Appendix D Refer to AHCMP (Appendix B8 of the CEMP) for matters relating to Aboriginal cultural heritage.
E157	An Unexpected Heritage Finds Procedure must be prepared: (a) to manage unexpected heritage finds in accordance with any guidelines and standards prepared by the Heritage Council of NSW or OEH; and (b) by a suitably qualified and experienced heritage specialist.  The Procedure must be included in the Construction Non-Aboriginal Heritage Management Sub-plan and Aboriginal Cultural Heritage Management Sub-plan required by Conditions C4 (g) and (h).  <i>Note: Human remains that are found unexpectedly during works are under the jurisdiction of the NSW State Coroner and must be reported to the NSE Police immediately.</i>	Section 7.3.1 Appendix A
E160	The Proponent must investigate the feasibility of retaining Cadden Le Messurier (84 Lilyfield Road)	N/A – Applicable to Stage 2: Rozelle Interchange scope of work



CoA No.	Condition Requirements	Document Reference
	Former Hotel (78 Lilyfield Road) and	N/A – Applicable to Stage 2: Rozelle Interchange scope of work
	the façade of the former Bank of NSW building (164 Parramatta Road) during detailed design.	Appendix D
E162	Prior to conducting acoustic treatment at any heritage item identified in the documents listed in Condition A1 the advice of a suitably qualified and experienced built heritage expert must be obtained and implemented to ensure any such work minimises any adverse impacts on the heritage significance of the item.	Section 7.1
E163	The Proponent must prepare a Heritage Archival Recording and Salvage Report, including photographic recording of heritage items which have been identified for demolition in the documents referred to in Condition A1 and outline how any salvage or recovery of material will be undertaken from these items.	Table 4-1 Section 7.3.3 Appendix D
	Archival recording must be undertaken by a suitably qualified heritage specialist and prepared in accordance with NSW Heritage Office's How to Prepare Archival Records of Heritage Items (1998) and Photographic Recording of Heritage Items Using Film or Digital Capture (2006).	Table 4-1 Section 7.3.3 Appendix D
	Within 12 months of completing the archival recording, the Proponent must submit the Heritage Archival Recording and Salvage Report to the Secretary, relevant council(s), relevant local libraries and local historical societies in the respective local government area(s).	Table 4-1 Section 7.3.3
E164	Archival recording as required by Condition E163 must also be undertaken for the Cadden Le Messurier	N/A – Applicable to Stage 2: Rozelle Interchange scope of work
	former Hotel and	N/A – Applicable to Stage 2: Rozelle Interchange scope of work
	former Bank of NSW building, should these structures be demolished.	Appendix D

CoA No.	Condition Requirements	Document Reference
E165	<p>Following archival recording as required by Condition E163, and prior to demolition, the Proponent must assess options for sympathetic reuse (including integrated heritage displays and interpretation) on the Project or other options for conservation, including architectural salvage for re-use in comparable buildings and displays.</p> <p>Where salvage supports good conservation outcomes, the material is to be collected and stored in suitable repository locations established in consultation with relevant council(s). The salvage from any State-listed items or elements must be determined in consultation with the Heritage Division of OEH.</p> <p>Any residual items and materials are to be made available, through a process to be developed by the Proponent in consultation with the relevant council(s), to landowners within the locality from where the material originated.</p>	Table 4-1 Section 7.3.3
E167	<p>The Proponent must prepare a Heritage Interpretation Plan, as committed to in the SPIR (NAH02) which identifies and interprets the key heritage values and stories of heritage items and heritage conservation areas impacted by the CSSI. The Heritage Interpretation Plan must include, but not be limited to:</p> <p>a) a discussion of the key interpretive themes, stories and messages proposed to interpret the history and significance of the affected heritage items and sections of heritage conservation areas; and</p> <p>(b) identification of interpretive initiatives implemented to mitigate impacts to archaeological relics, heritage items and conservation areas affected by the CSSI.</p>	Section 7.3.5
E168	<p>Prior to works that have a direct material impact on a Historical Archaeological Management Unit (HAMU), the Proponent must engage a suitably qualified archaeologist whose experience complies with the Heritage Council of NSW's Criteria for Assessment of Excavation Directors (July, 2011) (referred to as the Excavation Director) to oversee and advise on matters associated with historic archaeology and to prepare an Historical Archaeological Research Design and Excavation Methodology.</p>	Section 7.3.4 Section 8.1 Appendix D

CoA No.	Condition Requirements	Document Reference
E169	<p>The Historical Archaeological Research Design and Excavation Methodology must to be submitted to the Heritage Council of NSW (or its delegate) for review and comment prior to finalisation. The Historical Archaeological Research Design and Excavation Methodology must:</p> <p>(a) be consistent with the NSW Heritage Council's Archaeological Assessments Guideline (1996) or as updated;</p> <p>(b) provide for the detailed analysis of any heritage items discovered during the investigations;</p> <p>(c) include management options for discovered heritage items, whether known or unexpected finds (including options for avoidance, salvage, relocation and display);</p> <p>(d) for unexpected finds that are determined to be relics, set out the assessment process that will determine an appropriate archaeological response to managing their significance;</p> <p>(e) include procedures for notifying the Heritage Council of NSW (or its delegate) and Secretary of any relic findings; and</p> <p>(f) if the findings of the investigations are significant, provide for the preparation and implementation of a Heritage Interpretation Plan, as required under Condition E167.</p>	Table 4-1 Section 7.3.4 Appendix D
E170	Where excavation works are required in the vicinity of potential archaeological sites, the Excavation Director must be consulted to advise on how the works are to be managed and any archaeological impact minimised. The Excavation Director must be given the authority to advise on the duration and extent of oversight required during excavation.	Table 7-4 NAH 12 Appendix D
E171	Works within the vicinity of the find must not recommence until the relevant requirements of the Historical Archaeological Research Design and Excavation Methodology or advice on unexpected finds from the Excavation Director have been met.	Table 7-4 NAH13
E172	The Proponent must prepare an Archaeological Excavation Report containing the findings of any excavations, including artefact analysis and the identification of a final repository of any finds. The report must be submitted to the Secretary within 12 months of completing all archaeological investigations. The Archaeological Excavation Report must also be submitted to the Heritage Council of NSW, the local library and the local Historical Society in the relevant local government area(s). A copy of the Archaeological Excavation Report must be retained with the relics at all times.	Section 7.3.6 Appendix D

Revised Environmental Management Measures relevant to the development of this Plan

Outcome	Ref #	Commitment	Timing	NAHMP Reference
Long-term protection, conservation and management of items and HCAs of non-Aboriginal heritage significance, and potential archaeological finds	NAH 01	Construction Heritage Management Plan (CHMP) will be prepared and implemented as part of the Construction Environmental Management Plan. The CHMP will include:	Pre-construction	This Plan
		<ul style="list-style-type: none"> <li>Measures that will be implemented to manage potential impacts to items of heritage significance</li> </ul>	Pre-construction Construction	Table 7-4 Appendix D
		<ul style="list-style-type: none"> <li>Inclusion of heritage awareness and management training for relevant personnel involved in site works</li> </ul>	Pre-construction Construction	Section 8.2
		<ul style="list-style-type: none"> <li>Details regarding the conservation and curation of any historical artefacts recovered during works.</li> </ul>	Pre-construction Construction	Section 7.3.3 Section 7.3.4 Section 7.3.5
	NAH 02	An Interpretation Strategy will be developed and implemented to identify and interpret the key heritage values and stories of the heritage areas affected by the Project and inform the development of the Urban Design and Landscape Plan (UDLP) for the Project, in accordance with Interpreting Heritage Places and Items Guideline (NSW Heritage Office 2005). The Interpretation Strategy will:	Construction	Section 7.3.5
		<ul style="list-style-type: none"> <li>Build on themes, stories and initiatives proposed as part of other stages of WestConnex to ensure a consistent approach to heritage interpretation for the Project</li> </ul>	Construction	Section 7.3.5

Outcome	Ref #	Commitment	Timing	NAHMP Reference
		<ul style="list-style-type: none"> <li>Include themes and stories including the Rozelle railways historic functions, trains and trams transport, industrialisation and The Rozelle-Darling Harbour Goods Line</li> </ul>	N/A	N/A (Refer to Stage 2: Rozelle Interchange scope of work)
		<ul style="list-style-type: none"> <li>Identify how the rail related infrastructure salvaged from the Rozelle Rail Yards will be reused.</li> </ul>	N/A	N/A (Refer to Stage 2: Rozelle Interchange scope of work)
	NAH 03	Photographic archival recording will be undertaken of:		
		<ul style="list-style-type: none"> <li>Former Bank of NSW (164 Parramatta Road)</li> </ul>	Pre-construction	Appendix D
		<p>It will be undertaken in accordance with the NSW Heritage Office guidelines Photographic Recording of Heritage Items Using Film or Digital Capture (2006).</p> <p>The photographic archival recording will occur prior to any works that have the potential to impact upon the items and will include the identification of appropriate stakeholders to receive copies of the documentation.</p>	Pre-construction	Section 7.3.3

Outcome	Ref #	Commitment	Timing	NAHMP Reference
	NAH 04	<p>As part of the CHMP, a Historical Archaeological Research Design (HARD) will be prepared before the start of proposed works within each of the following Historical Archaeological Management Units (HAMUs): HAMU 3, HAMU 6, HAMU 7, HAMU 10, and HAMU 11. The HARD will be prepared by a qualified archaeologist in consultation with the NSW Heritage Council and will include:</p> <ul style="list-style-type: none"> <li>• Descriptions of clear significance thresholds for possible archaeological items that may be uncovered during works</li> <li>• A methodology and scope for a program of archaeological excavation, investigation, and recording of any historical archaeological remains that will be impacted by the Project</li> <li>• Requirement for post-excavation reporting, including artefact analysis and additional historical research, where necessary, and long-term management of records</li> <li>• Details of what will happen with any artefacts uncovered and associated reports</li> </ul>	Pre-construction	Section 7.3.4 Appendix D
	NAH 05	Before excavation of archaeological management sites, a suitably qualified Excavation Director who complies with Criteria for Assessment of Excavation Directors (Heritage Council of NSW 2011) will be engaged to advise on matters associated with historic archaeology. Where archaeological excavation is required, the Excavation Director will oversee excavation and advise on archaeological matters.	Pre-construction Construction	Table 7-4 NAH12 Section 8.1 Appendix D
	NAH 06	Potential vibration impacts to features of heritage significance will be managed in accordance with the CNVMP prepared for the Project.	Pre-construction Construction	Table 7-4 NAH3

Outcome	Ref #	Commitment	Timing	NAHMP Reference
	NAH 07	Potential heritage impacts due to settlement and ground movement caused by the Project will be managed in accordance with the relevant measures identified in the land use and property section of this table (refer to PL 6, PL 7, PL 8 and PL 10) and monitored in accordance with the Settlement Monitoring Program.	Construction	Section 7.2 Appendix D
	NAH 08	Any items of potential heritage conservation significance or human remains discovered during construction will be managed in accordance with an Unexpected Heritage Finds and Human Remains Procedure developed for the Project in accordance with relevant guidance provided by the Heritage Council of NSW, the NSW Heritage Division of OEH and the Standard Management Procedure Unexpected Archaeological Finds (Roads and Maritime 2015a). The procedure will detail requirements regarding notification of relevant agencies and the NSW Police and will be implemented for the duration of construction.	Construction	Table 7-4 NAH 15 Section 7.3 Appendix B
	NAH 09	A Heritage Salvage Strategy will be prepared to identify the salvage potential of the fabric and features from heritage items and potential heritage items that will be demolished to facilitate the Project. This could include timber joinery, fireplaces, stained glass, stairs, decorative tiles, bricks, steel truss structures, windows, etc. The strategy will also identify options and a process for dissemination of salvaged items to owners, community groups and interested parties.	Construction	Table 4-1 Section 7.3.3

Outcome	Ref #	Commitment	Timing	NAHMP Reference
	NAH16	A condition assessment of the northern penstock will also be carried out by a heritage specialist and a structural engineer prior to any vibratory works in the vicinity that have the potential to impact on the item. The condition assessment will inform additional management measures to protect the northern penstock, if required. Any conservation works required to limit potential impacts on deteriorated fabric (loose bricks, corroded steel) will be identified and implemented prior to commencement of the relevant vibratory works in the vicinity.	Pre-construction	Appendix D
	AH 1	Any items of potential Aboriginal archaeological or cultural heritage conservation significance or human remains discovered during construction will be managed in accordance with the Unexpected Heritage Finds and Human Remains Procedure developed for the Project.	Construction	Section 7.3 Appendix B



Outcome	Ref #	Commitment	Timing	NAHMP Reference																				
	PL 6	Ground settlement will be managed to comply with the following criteria where possible:	Construction	Section 7.2																				
		<table border="1"> <thead> <tr> <th>Beneath structure/facility</th> <th>Maximum Settlement</th> <th>Maximum Angular Distortion</th> <th>Limited Tensile Strain (percent)*</th> </tr> </thead> <tbody> <tr> <td>Buildings – Low or non-sensitive properties (ie less than or equal to two levels and car parks)</td> <td>30 mm</td> <td>1 in 350</td> <td>0.1</td> </tr> <tr> <td>Buildings and pools – High or sensitive properties (ie greater than or equal to 3 levels and car parks)</td> <td>20 mm</td> <td>1 in 500</td> <td>0.1</td> </tr> <tr> <td>Roads and parking areas</td> <td>40 mm</td> <td>1 in 250</td> <td>N/A</td> </tr> <tr> <td>Parks</td> <td>50 mm</td> <td>1 in 250</td> <td>N/A</td> </tr> </tbody> </table>	Beneath structure/facility	Maximum Settlement	Maximum Angular Distortion	Limited Tensile Strain (percent)*	Buildings – Low or non-sensitive properties (ie less than or equal to two levels and car parks)	30 mm	1 in 350	0.1	Buildings and pools – High or sensitive properties (ie greater than or equal to 3 levels and car parks)	20 mm	1 in 500	0.1	Roads and parking areas	40 mm	1 in 250	N/A	Parks	50 mm	1 in 250	N/A		
Beneath structure/facility	Maximum Settlement	Maximum Angular Distortion	Limited Tensile Strain (percent)*																					
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Parks	50 mm	1 in 250	N/A																					
		* As defined in Burland et al. 'Building response to tunnelling – Case Studies from construction of the Jubilee Line Extension', London, Thomas Telfor (2001)																						

Outcome	Ref #	Commitment	Timing	NAHMP Reference
	PL 7	<p>Further assessment of potential settlement impacts, including numerical modelling, will be undertaken during detailed design. In areas where ground movement in excess of settlement criteria is predicted, an instrumentation and monitoring program to measure settlement, distortion or strain will be implemented. Feasible and reasonable measures will be investigated and implemented to ensure where possible that the predicted settlement is within the criteria. Measures that will be considered may include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Review of the proposed tunnel design including: <ul style="list-style-type: none"> <li>◦ The depth and alignment of tunnels</li> <li>◦ The proximity of multiple tunnels to each other</li> <li>◦ The proposed tunnel support system</li> <li>◦ The tunnel lining to manage groundwater inflows</li> </ul> </li> <li>• Rationalising the layout of the proposed ventilation tunnels including the number, location and length of tunnels</li> <li>• Review of the proposed construction methodology</li> <li>• Consideration of ground movement options.</li> </ul>	Pre-construction Construction	Table 7-4 NAH 7 Table 7-4 NAH 8

Outcome	Ref #	Commitment	Timing	NAHMP Reference
	PL 8	<p>A Settlement Monitoring Program will be prepared that will provide details on:</p> <ul style="list-style-type: none"> <li>• Settlement criteria and predictions</li> <li>• Location of monitoring points</li> <li>• Duration of monitoring</li> <li>• Data collection (type and method)</li> <li>• Comparison of actual settlement with predictions</li> <li>• Triggers and corrective actions that will be implemented if, based on monitoring results, actual settlement is likely to exceed predictions or the relevant criteria, with the aim of complying with the criteria</li> </ul> <p>The Settlement Monitoring Program will be endorsed by the Independent Property Impact Assessment Panel (see PL 11) prior to the commencement of any construction activities with the potential to result in settlement, as determined by the panel, unless otherwise agreed to by the Secretary.</p>	Pre-construction	Section 7.2 Table 8-2
	PL 10	<p>Building condition surveys will be offered to property owners within the zone of influence of tunnel settlement (50 metres from the outer edge of the tunnels and within 50 metres of surface works) or as otherwise directed by the Independent Property Impact Assessment Panel (see PL11). Building condition surveys of properties will be carried out prior to the commencement of any Project works in the vicinity that have the potential to result in damage to the properties, as identified by the contractor and confirmed by the Independent Property Impact Assessment Panel. Building condition surveys will be carried out by a structural engineer.</p>	Pre-construction Post-construction	Table 7-4 NAH 9

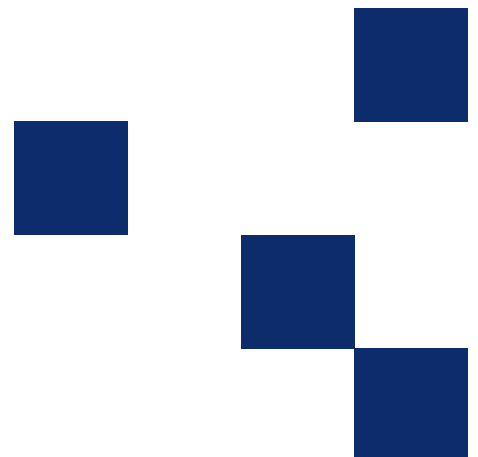
# Appendix B - Roads and Maritime Standard Management Procedure: Unexpected Heritage Items



# STANDARD MANAGEMENT PROCEDURE

## Unexpected Heritage Items

March 2015



# About this release

<b>RMS/ISBN numbers</b>	RMS 12.003   ISBN 9781922040305
<b>Title</b>	Unexpected Heritage Items Procedure

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File location	File name
Objective - SF2013/153770	Unexpected heritage items procedure.doc

Document status	Date
Final	16 March 2015

Version	Date	Revision Description
Final	1 November 2011	First Draft
Revised	23 July 2012	Amended to reflect that (a) unexpected finds do not include items covered by a relevant approval; (b) Aboriginal people must be consulted where an unexpected find is likely to be an Aboriginal object; (c) the Department of Planning and Environment must be notified in accordance with Step 5 of this procedure for Part 3A and Part 5.1 projects.
Revised	09 October 2013	Amended to clarify that the procedure applies to all types of unexpected heritage items, not just archaeological items. The procedure introduces the term 'Historic Items' to cover both 'archaeological relics' and 'other historic items' such as works, structures, buildings and movable objects. The title of the document has been amended to better reflect this clarification.
Revised	16 March 2015	The procedure was streamlined to address all project types including maintenance works. The separate maintenance procedure (formerly Appendix B) was removed. Names and titles updated throughout.

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**Please note**

This procedure applies to all development and activities concerning roads, road infrastructure and road related assets undertaken by Roads and Maritime.

For advice on how to manage unexpected heritage items as a result of activities related to maritime infrastructure projects, please contact the Senior Environmental Specialist (Heritage).

## Contents

About this release .....	2
1. Purpose .....	2
2. Scope.....	2
3. Types of unexpected heritage items and their legal protection .....	3
3.1 Aboriginal objects .....	3
3.2 Historic heritage items .....	4
3.3 Human skeletal remains .....	5
4. Responsibilities .....	7
5. Acronyms.....	8
6. Overview of the procedure .....	9
7. Unexpected heritage items procedure.....	10
8. Seeking advice.....	19
9. Related information .....	19
10. List of appendices.....	20
<b>Appendix A</b> .....	21
Identifying unexpected heritage items .....	21
<b>Appendix B</b> .....	27
Unexpected heritage item recording form 418.....	27
<b>Appendix C</b> .....	30
Photographing unexpected heritage items .....	30
<b>Appendix D</b> .....	32
Key environmental contacts .....	32
<b>Appendix E</b> .....	33
Uncovering bones .....	33
<b>Appendix F</b> .....	37
Archaeological/heritage advice checklist .....	37
<b>Appendix G</b> .....	39
Template notification letter .....	39



# Unexpected heritage items procedure

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## 1. Purpose

This procedure has been developed to provide a consistent method for managing unexpected heritage items (both Aboriginal and non-Aboriginal) that are discovered during Roads and Maritime activities. This procedure includes Roads and Maritime's heritage notification obligations under the *Heritage Act 1977* (NSW), *National Parks and Wildlife Act 1974* (NSW), *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Cth) and the *Coroner's Act 2009* (NSW).

This document provides relevant background information in Section 3, followed by the technical procedure in Sections 6 and 7. Associated guidance referred to in the procedure can be found in Appendices A-H.

## 2. Scope

This procedure assumes that an appropriate level of Aboriginal and non-Aboriginal heritage assessment has been undertaken prior to on site project work commencing. In some case, such as exempt development, detailed heritage assessment may not be required.

Despite appropriate and adequate investigation, unexpected heritage items may still be discovered during maintenance and construction works. When this happens, this procedure must be followed. This procedure provides direction on when to stop work, where to seek technical advice and how to notify the regulator, if required.

**This procedure applies to all Road and Maritime construction and maintenance activities**

This procedure **applies to**:

- The discovery of any unexpected heritage item (usually during construction), where Roads and Maritime does not have approval to disturb the item or where safeguards for managing the disturbance (apart from this procedure) are not contained in the environmental impact assessment.
- All Roads and Maritime projects that are approved or determined under Part 3A (including Transitional Part 3A Projects), Part 4, Part 5 or Part 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), or any development that is exempt under the Act.

This procedure must be followed by Roads and Maritime staff, alliance partners (including local council staff working under Road Maintenance Council Contracts, [RMCC]), developers under works authorisation deeds or any person undertaking Part 5 assessment for Roads and Maritime.

This procedure **does not apply** to:

- The legal discovery and disturbance of heritage items as a result of investigations being undertaken in accordance with OEH's *Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW* (2010); an Aboriginal Heritage Impact Permit (AHIP) issued under the *National Parks and Wildlife Act*

1974; or an approval issued under the *Heritage Act 1977*<sup>1</sup>.

- The legal discovery and disturbance of heritage items as a result of investigations (or other activities) that are required to be carried out for the purpose of complying with any environmental assessment requirements under Part 3A (including Transitional Part 3A Projects) or Part 5.1 of the EP&A Act.
- The legal discovery and disturbance of heritage items as a result of construction related activities, where the disturbance is permissible in accordance with an AHIP<sup>2</sup>; an approval issued under the *Heritage Act 1977*; the Minister for Planning's conditions of project approval; or safeguards (apart from this procedure) that are contained in the relevant environmental impact assessment.

All construction environment management plans (CEMPs) must make reference to and/or include this procedure (often included as a heritage sub-plan). Where approved CEMPs exist they must be followed in the first instance. Where there is a difference between approved CEMPs and this procedure, the approved CEMP must be followed. Where an approved CEMP does not provide sufficient detail on particular issues, this procedure should be used as additional guidance. When in doubt always seek environment and legal advice on varying approved CEMPs.

### 3. Types of unexpected heritage items and their legal protection

The roles of project, field and environmental staff are critical to the early identification and protection of unexpected heritage items. **Appendix A** illustrates the wide range of heritage discoveries found on Roads and Maritime projects and provides a useful photographic guide. Subsequent confirmation of heritage discoveries must then be identified and assessed by technical specialists (usually an archaeologist).

An 'unexpected heritage item' means any unanticipated discovery of an actual or potential heritage item, for which Roads and Maritime does not have approval to disturb<sup>3</sup> or does not have a safeguard in place (apart from this procedure) to manage the disturbance.

These discoveries are categorised as either:

- (a) Aboriginal objects
- (b) Historic (non-Aboriginal) heritage items
- (c) Human skeletal remains.

The relevant legislation that applies to each of these categories is described below.

#### 3.1 Aboriginal objects

The *National Park and Wildlife Act 1974* protects *Aboriginal objects* which are defined as:

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<sup>1</sup> RMS' heritage obligations are incorporated into the conditions of heritage approvals.

<sup>2</sup> RMS *Procedure for Aboriginal cultural heritage consultation and investigation* (2011) recommends that Part 4 and Part 5 projects that are likely to impact Aboriginal objects during construction seek a whole-of-project AHIP. This type of AHIP generally allows a project to impact known and potential Aboriginal objects within the entire project area, without the need to stop works. It should be noted that an AHIP may exclude impact to certain objects and areas, such as burials or ceremonial sites. In such cases, the project must follow this procedure.

<sup>3</sup> Disturbance is considered to be any physical interference with the item that results in it being destroyed, defaced, damaged, harmed, impacted or altered in any way (this includes archaeological investigation activities).

*“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”<sup>4</sup>.*

Examples of Aboriginal objects include stone tool artefacts, shell middens, axe grinding grooves, pigment or engraved rock art, burials and scarred trees.

## **IMPORTANT!**

### **All Aboriginal objects, regardless of significance, are protected under law.**

If any impact is expected to an Aboriginal object, an Aboriginal Heritage Impact Permit (AHIP) is usually required from the Office of Environment and Heritage (OEH)<sup>5</sup>. Also, when a person becomes aware of an Aboriginal object they must notify the Director-General of OEH about its location<sup>6</sup>. Assistance on how to do this is provided in Section 7 (Step 5).

## 3.2 Historic heritage items

Historic (non-Aboriginal) heritage items may include:

- Archaeological ‘relics’
- Other historic items (i.e. works, structures, buildings or movable objects).

### 3.2.1 Archaeological relics

The *Heritage Act 1977* protects *relics* which are defined as:

*“any deposit, artefact, object or material evidence that relates to the settlement of the area that comprises NSW, not being Aboriginal settlement; and is of State or local heritage significance”<sup>7</sup>.*

Relics are archaeological items of local or state significance which may relate to past domestic, industrial or agricultural activities in NSW, and can include bottles, remnants of clothing, pottery, building materials and general refuse.

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<sup>4</sup> Section 5(1) *National Park and Wildlife Act 1974*.

<sup>5</sup> Except when Part 3A, Division 4.1 of Part 4 or Part 5.1 of the *EP&A Act* applies.

<sup>6</sup> This is required under s89(A) of the *National Park and Wildlife Act 1974* and applies to **all projects** assessed under Part 3A, Part 4, Part 5 and Part 5.1 of the *EP&A Act*, including exempt development.

<sup>7</sup> Section 4(1) *Heritage Act 1977*.

## IMPORTANT!

### **All relics are subject to statutory controls and protections.**

If a relic is likely to be disturbed, a heritage approval is usually required from the NSW Heritage Council<sup>8</sup>. Also, when a person discovers a relic they must notify the NSW Heritage Council of its location<sup>9</sup>. Advice on how to do this is provided in Section 7 (Step 5).

### 3.2.2 Other historic items

Some historic heritage items are not considered to be ‘relics’; but are instead referred to as works, buildings, structures or movable objects. Examples of these items that Roads and Maritime may encounter include culverts, historic road formations, historic pavements, buried roads, retaining walls, tramlines, cisterns, fences, sheds, buildings and conduits. Although an approval under the *Heritage Act 1977* may not be required to disturb these items, their discovery must be managed in accordance with this procedure.

As a general rule, an archaeological relic requires discovery or examination through the act of excavation. An archaeological excavation permit under Section 140 of the *Heritage Act 1977* is required to do this. In contrast, ‘other historic items’ either exist above the ground’s surface (e.g. a shed), or they are designed to operate and exist beneath the ground’s surface (e.g. a culvert).

Despite this difference, it should be remembered that relics can often be associated with ‘other heritage items’, such as archaeological deposits within cisterns and underfloor deposits under buildings.

### 3.3 Human skeletal remains

Human skeletal remains can be identified as either an Aboriginal object or non-Aboriginal relic depending on ancestry of the individual (Aboriginal or non-Aboriginal) and burial context (archaeological or non-archaeological). Remains are considered to be archaeological when the time elapsed since death is suspected of being 100 years or more. Depending on ancestry and context, different legislation applies.

As a simple example, a pre-contact archaeological Aboriginal burial would be protected under the *National Park and Wildlife Act 1974*, while a historic (non-Aboriginal) archaeological burial within a cemetery would be protected under the *Heritage Act 1977*. For these cases, the relevant heritage approval and notification requirements described in the above sections 3.1 and 3.2 would apply. In addition to the *National Park and Wildlife Act 1974*, finding Aboriginal human remains also triggers notification requirements to the Commonwealth Minister for the Environment under s20(1) of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Cth).

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<sup>8</sup> Except when Part 3A, Division 4.1 of Part 4 or Part 5.1 of the *EP&A Act* applies.

<sup>9</sup> This is required under s146 of the *Heritage Act 1977* and applies to **all projects** assessed under Part 3A, Part 4, Part 5 and Part 5.1 of the *EP&A Act*, including exempt development.

 **IMPORTANT!**

**All human skeletal remains are subject to statutory controls and protections.**

All bones must be treated as potential human skeletal remains and work around them must stop while they are protected and investigated urgently.

However, where it is suspected that less than 100 years has elapsed since death, the human skeletal remains come under the jurisdiction of the State Coroner and the *Coroners Act 2009* (NSW). Such a case would be considered a 'reportable death' and under legal notification obligations set out in s35(2); a person must report the death to a police officer, a coroner or an assistant coroner as soon as possible. This applies to all human remains less than 100 years old<sup>10</sup> regardless of ancestry (ie both Aboriginal and non-Aboriginal remains). Public health controls may also apply.

Guidance on what to do when suspected human remains are found is provided in **Appendix E**.

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<sup>10</sup> Under s19 of the *Coroners Act 2009*, the coroner has no jurisdiction to conduct an inquest into reportable death unless it appears to the coroner that (or that there is reasonable cause to suspect that) the death or suspected death occurred within the last 100 years.

## 4. Responsibilities

The following roles and responsibilities are relevant to this procedure.

<b>Role</b>	<b>Definition/responsibility</b>
Aboriginal Cultural Heritage Advisor (ACHA)	Provides Aboriginal cultural heritage advice to project teams. Acts as Aboriginal community liaison for projects on cultural heritage matters. Engages and consults with the Aboriginal community as per the Roads and Maritime <i>Procedure for Aboriginal Cultural Heritage Consultation and Investigation</i> .
Aboriginal Sites Officer (ASO)	Is an appropriately trained and skilled Aboriginal person whose role is to identify and assess Aboriginal objects and cultural values. For details on engaging Aboriginal Sites Officers, refer to Roads and Maritime <i>Procedure for Aboriginal Cultural Heritage Consultation and Investigation</i> .
Archaeologist (A)	Professional consultant, contracted on a case-by-case basis to provide heritage and archaeological advice and technical services (such as reports, heritage approval documentation etc). Major projects with complex heritage issues often have an on call Project archaeologist.
Project Manager (PM)	Ensures all aspects of this procedure are implemented. The PM can delegate specific tasks to a construction environment manager, Roads and Maritime site representatives or regional environment staff, where appropriate.
Regional Environment Staff (RES)	Provides advice on this procedure to project teams. Ensuring this procedure is implemented consistently by supporting the PM. Supporting project teams during the uncovering of unexpected finds. Reviewing archaeological management plans and liaising with heritage staff and archaeological consultants as needed.
Registered Aboriginal Parties (RAPs)	RAPs are Aboriginal people who have registered with Roads and Maritime to be consulted about a proposed Roads and Maritime project or activity in accordance with OEH's Aboriginal cultural heritage consultation requirements for proponents (2010).
Senior Environmental Specialist (Heritage) (SES(H))	Provides technical assistance on this procedure and archaeological technical matters, as required. Reviewing the archaeological management plans and facilitating heritage approval applications, where required. Assists with regulator engagement, where required.
Team Leader - Regional Maintenance Delivery (TL-RMD)	Ensures Regional Maintenance Delivery staff stop work in the vicinity of an unexpected heritage item. Completes Unexpected Heritage Item Recording Form 418 and notifies WS-RMD.
Technical Specialist	Professional consultant contracted to provide specific technical advice that relates to the specific type of

	unexpected heritage find (eg a forensic or physical anthropologist who can identify and analyse human skeletal remains).
Works Supervisor - Regional Maintenance Delivery (WS-RMD)	Ensures Regional Maintenance Delivery staff are aware of this procedure. Supports the Team Leader - Regional Maintenance Delivery during the implementation of this procedure and ensures reporting of unexpected heritage items through environment management systems.

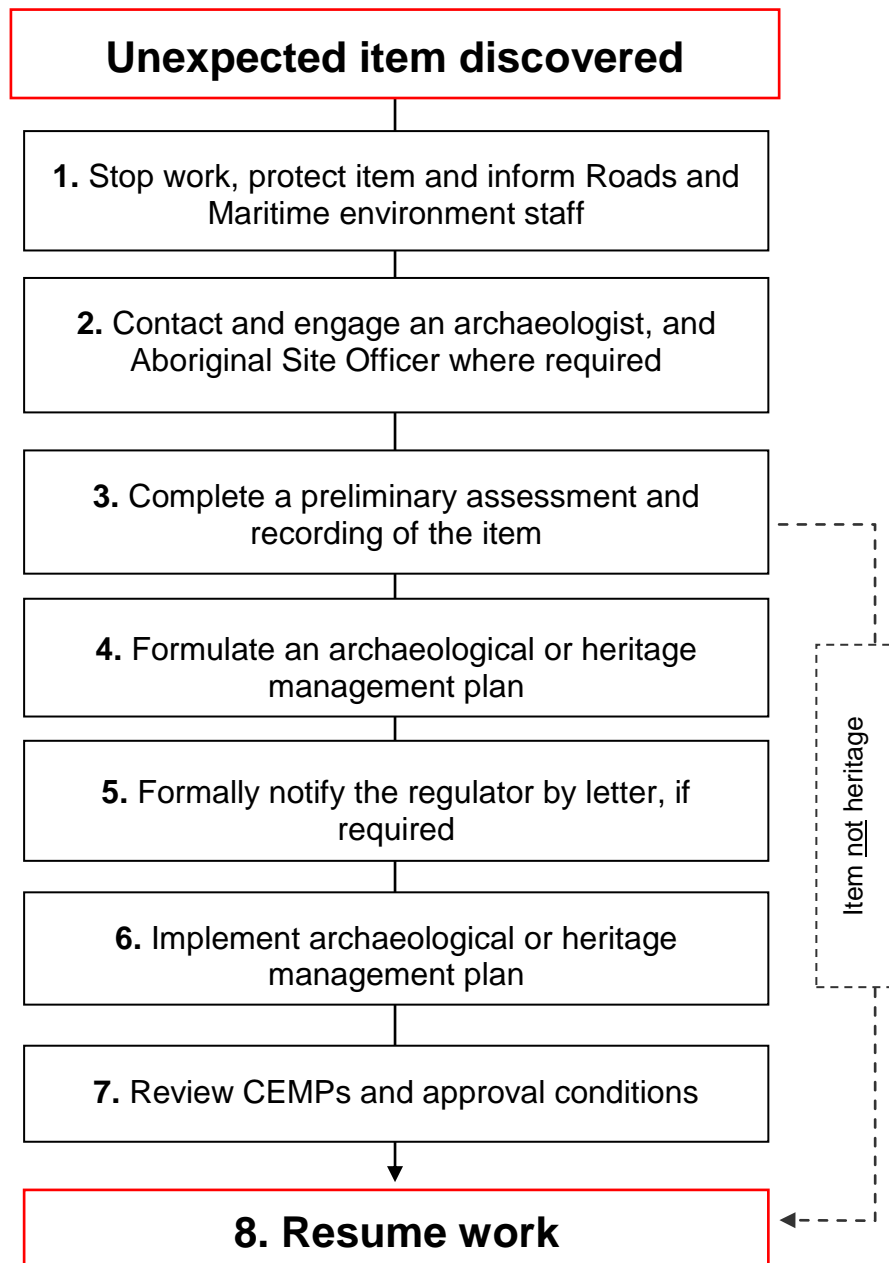
## 5. Acronyms

The following acronyms are relevant to this procedure.

<b>Acronym</b>	<b>Meaning</b>
A	Archaeologist
ACHA	Aboriginal Cultural Heritage Advisor
AHIP	Aboriginal Heritage Impact Permit
ASO	Aboriginal Site Officer
CEMP	Construction Environment Management Plan
OEH	Office of Environment and Heritage.
PACHCI	Procedure for Aboriginal Cultural Heritage Consultation and Investigation
PM	Project Manager
RAP	Registered Aboriginal Parties
RES	Regional Environmental Staff
SES(H)	Senior Environmental Specialist (Heritage)
TL-RMD	Team Leader – Regional Maintenance Division
RMD	Regional Maintenance Delivery
RMS	Roads and Maritime
WS-RMD	Works Supervisor - Regional Maintenance Division

## 6. Overview of the procedure

On discovering something that could be an unexpected heritage item ('the item'), the following procedure must be followed. There are eight steps in the procedure. These steps are summarised in **Figure 1** below and explained in detail in Section 7.



**Figure 1:** Overview of steps to be undertaken on the discovery of an unexpected heritage item.

### **IMPORTANT!**

RMS may have approval or specific safeguards in place (apart from this procedure) to impact on certain heritage items during construction. If you discover a heritage item and you are unsure whether an approval or safeguard is in place, STOP works and follow this procedure.



## 7. Unexpected heritage items procedure

**Table 1:** Specific tasks to be implemented following the discovery of an unexpected heritage item.

*Aboriginal Cultural Heritage Advisor (ACHA); Aboriginal Sites Officer (ASO); Archaeologist (A); Project Manager (PM); Regional Environment Staff (RES); Registered Aboriginal Parties (RAPs); Senior Environmental Specialist (Heritage) (SES(H)); Team leader – Roads and Maintenance Division (TL - RMD); Works supervisor – Roads and Maintenance Division (WS - RMD).*

Step	Task	Responsibility	Guidance & Tools
<b>1</b>	<b>Stop work, protect item and inform Roads and Maritime environment staff</b>		
1.1	Stop all work in the immediate area of the item and notify the Project Manager or Team Leader-RMD. (For maintenance activities, the Team Leader is to also notify the Works Supervisor-RMD)	All	<b>Appendix A</b> (Identifying Unexpected Heritage items)
1.2	Establish a 'no-go zone' around the item. Use high visibility fencing, where practical.	PM or TL-RMD	
1.3	Inform all site personnel about the no-go zone. No further interference, including works, ground disturbance, touching or moving the item must occur within the no-go zone.	PM or TL-RMD	
1.4	Inspect, document and photograph the item using 'Unexpected Heritage Item Recording Form 418'.	PM or TL-RMD	<b>Appendix B</b> (Unexpected Heritage Item Recording Form 418) <b>Appendix C</b> (Photographing Unexpected Heritage items)

Step	Task	Responsibility	Guidance & Tools
1.5	<p>Is the item likely to be bone?</p> <p>If <b>yes</b>, follow the steps in Appendix E – ‘Uncovering bones’. Where it is obvious that the bones are human remains, you must notify the local police by telephone immediately. They may take command of all or part of the site.</p> <p>If <b>no</b>, proceed to next step.</p>	PM or WS-RMD	<b>Appendix E</b> (Uncovering Bones)
1.6	<p>Is the item likely to be:</p> <p>a) A relic? (A relic is evidence of past human activity which has local or state heritage significance. It may include items such as bottles, utensils, remnants of clothing, crockery, personal effects, tools, machinery and domestic or industrial refuse) and/or</p> <p>b) An Aboriginal object? (An Aboriginal object may include a shell midden, stone tools, bones, rock art or a scarred tree).</p> <p>If <b>yes</b>, proceed directly to Step 1.8</p> <p>If <b>no</b>, proceed to next step.</p>	PM or WS-RMD	<b>Appendix A</b> (Identifying heritage items)
1.7	<p>Is the item likely to be a “work”, building or standing structure? (This may include tram tracks, kerbing, historic road pavement, fences, sheds or building foundations).</p> <p>If <b>yes</b>, can works avoid further disturbance to the item? (E.g. if historic road base/tram tracks have been exposed, can they be left in place?) If <b>yes</b>, works may proceed without further disturbance to the item. Complete Step 1.8 within 24 hours.</p> <p>If works cannot avoid further disturbance to the item, works must not recommence at this time. Complete the remaining steps in this procedure.</p>	PM or WS-RMD	<b>Appendix A</b> (Identifying heritage items)

Step	Task	Responsibility	Guidance & Tools
1.8	Inform relevant Roads and Maritime Regional Environmental Staff of item by providing them with the completed 'Form 418'.	PM or WS-RMD (RES)	<b>Appendix D</b> (Key Environmental Contacts)
1.9	<p>Regional Environmental Staff to advise Project Manager or Works Supervisor whether RMS has an approval or safeguard in place (apart from this procedure) to impact on the 'item'. (An approval may include an approval under the <i>Heritage Act</i>, the <i>National Parks and Wildlife Act</i> or the <i>Planning and Assessment Act</i>).</p> <p>Does RMS have an approval, permit or appropriate safeguard in place to impact on the item?</p> <p>If <b>yes</b>, work may recommence in accordance with the approval, permit or safeguard. There is no further requirement to follow this procedure.</p> <p>If <b>no</b>, continue to next step.</p>		
1.10	Liaise with Traffic Management Centre where the delay is likely to affect traffic flow.	PM or WS-RMD	
1.11	Report the item as a 'Reportable Event' in accordance with the Roads and Maritime <i>Environmental Incident Classification and Reporting Procedure</i> . Implement any additional reporting requirements related to the project's approval and CEMP, where relevant.	PM or WS-RMD	RMS Environmental Incident Classification and Reporting Procedure
<b>2</b>	<b>Contact and engage an archaeologist and, where required, an Aboriginal site officer</b>		
2.1	<p>Contact the Project (on-call) Archaeologist to discuss the location and extent of the item and to arrange a site inspection, if required. The project CEMP may contain contact details of the Project Archaeologist.</p> <p>OR</p>	PM or WS-RMD (A; RES; SES(H))	Also see <b>Appendix D</b> (Key Environmental Contacts)

Step	Task	Responsibility	Guidance & Tools
	Where there is no project archaeologist engaged for the works, engage a suitably qualified and experienced archaeological consultant to assess the find. A list of heritage consultants is available on the RMS contractor panels on the Buyways homepage. Regional environment staff and Roads and Maritime heritage staff can also advise on appropriate consultants.		<u>Buyways</u>
2.2	Where the item is likely to be an Aboriginal object, speak with your Aboriginal Cultural Heritage Advisor to arrange for an Aboriginal Sites Officer to assess the find. Generally, an Aboriginal Sites Officer would be from the relevant local Aboriginal land council. If an alternative contact person (ie a RAP) has been nominated as a result of previous consultation, then that person is to be contacted.	PM or WS-RMD (ACHA; ASO)	
2.3	If requested, provide photographs of the item taken at Step 1.4 to the archaeologist, and Aboriginal Sites Officer if relevant.	PM or WS-RMD (RES)	<b>Appendix C</b> (Photographing Unexpected Heritage items)
<b>3</b>	<b>Preliminary assessment and recording of the find</b>		
3.1	In a minority of cases, the archaeologist (and Aboriginal Sites Officer, if relevant) may determine from the photographs that no site inspection is required because no archaeological constraint exists for the project ( <i>eg the item is not a 'relic', a 'heritage item' or an 'Aboriginal object'</i> ). Any such advice should be provided in writing (eg via email) and confirmed by the Project Manager or Works Supervisor - RMD.	A/PM/ASO/ WS-RMD	Proceed to Step 8
3.2	Arrange site access for the archaeologist (and Aboriginal Sites Officer, if relevant) to inspect the item as soon as practicable. In the majority of cases a site inspection is required to conduct a preliminary assessment.	PM or WS-RMD	
3.3	Subject to the archaeologist's assessment (and the Aboriginal Sites Officer's assessment, if relevant), work may recommence at a set distance from the item. This is to protect any other archaeological material that may exist in the vicinity, which has not yet been uncovered. Existing protective fencing established in Step 1.2 may need to be adjusted to	A/PM/ASO/ WS-RMD	

Step	Task	Responsibility	Guidance & Tools
	reflect the extent of the newly assessed protective area. No works are to take place within this area once established.		
3.4	The archaeologist (and Aboriginal Sites Officer, if relevant) may provide advice after the site inspection and preliminary assessment that no archaeological constraint exists for the project ( <i>eg the item is not a 'relic', a 'heritage item' or an 'Aboriginal object'</i> ). Any such advice should be provided in writing (eg via email) and confirmed by the Project Manager or Works Supervisor - RMD.	A/PM/ASO/ WS-RMD	Proceed to Step 8
3.5	Where required, seek additional specialist technical advice (such as a forensic or physical anthropologist to identify skeletal remains). Regional environment staff and/or Roads and Maritime heritage staff can provide contacts for such specialist consultants.	RES/SES(H)	<b>Appendix D</b> (Key Environmental Contacts)
3.6	Where the item has been identified as a 'relic', 'heritage item' or an 'Aboriginal object' the archaeologist should formally record the item.	A	
3.7	The regulator can be notified informally by telephone at this stage by the archaeologist, Project Manager (or delegate) or Works Supervisor - RMD. Any verbal conversations with regulators must be noted on the project file for future reference.	PM/A/WS-RMD	
<b>4</b>	<b>Prepare an archaeological or heritage management plan</b>		
4.1	The archaeologist must prepare an archaeological or heritage management plan (with input from the Aboriginal Sites Officer, where relevant) shortly after the site inspection. This plan is a brief overview of the following: (a) description of the feature, (b) historic context, if data is easily accessible, (c) likely significance, (d) heritage approval and regulatory notification requirements, (e) heritage reporting requirements, (f) stakeholder consultation requirements, (g) relevance to other project approvals and management plans etc.	A/ASO	<b>Appendix F</b> (Archaeological/ Heritage Advice Checklist)
4.2	In preparing the plan, the archaeologist with the assistance of regional environment staff must review the CEMP, any heritage sub-plans, any conditions of heritage approvals, conditions of project approval (and or Minister's Conditions of Approval) and heritage assessment documentation (eg Aboriginal Cultural Heritage Assessment Report). This will outline if the unexpected item is consistent with previous heritage/project approval(s)	A/RES/PM	<b>Appendix F</b> (Archaeological/ Heritage Advice Checklist)

Step	Task	Responsibility	Guidance & Tools
	and/or previously agreed management strategies. The Project Manager and regional environment staff must provide all relevant documents to the archaeologist to assist with this. Discussions should occur with design engineers to consider if re-design options exist and are appropriate.		
4.3	The archaeologist must submit this plan as a letter, brief report or email to the Project Manager outlining all relevant archaeological or heritage issues. This plan should be submitted to the Project Manager as soon as practicable. Given that the archaeological management plan is an overview of all the necessary requirements (and the urgency of the situation), it should take no longer than two working days to submit to the Project Manager.	A	
4.4	The Project Manager or Works Supervisor must review the archaeological or heritage management plan to ensure all requirements can reasonably be implemented. Seek additional advice from regional environment staff and Roads and Maritime heritage staff, if required.	PM/RES/SES(H)/ WS-RMD	
<b>5</b>	<b>Notify the regulator, if required.</b>		
5.1	Review the archaeological or heritage management plan to confirm if regulator notification is required. Is notification required?  If <b>no</b> , proceed directly to Step 6  If <b>yes</b> , proceed to next step.	PM/RES/SES(H)/ WS-RMD	
5.2	If notification is required, complete the template notification letter.	PM or WS-RMD	<b>Appendix G</b> (Template Notification Letter)
5.3	Forward the draft notification letter, archaeological or heritage management plan and the site recording form to regional environment staff and Senior Environmental Specialist (Heritage) for review, and consider any suggested amendments.	PM/RES/SES(H)/ WS-RMD	

Step	Task	Responsibility	Guidance & Tools
5.4	Forward the signed notification letter to the relevant regulator (ie notification of relics must be given to the Heritage Division, Office of Environment and Heritage (OEH), while notification for Aboriginal objects must be given to the relevant Aboriginal section of OEH). Informal notification (via a phone call or email) to the regulator prior to sending the letter is appropriate. The archaeological management plan and the completed site recording form must be submitted with the notification letter. For Part 3A and Part 5.1 projects, the Department of Planning and Environment must also be notified.	PM or WS-RMD	<b>Appendix D</b> (Key Environmental Contacts)
5.5	A copy of the final signed notification letter, archaeological or heritage management plan and the site recording form should be kept on file by the Project Manager or Works Supervisor- RMD and a copy sent to the Senior Environmental Specialist (Heritage).	PM or WS-RMD	
<b>6</b>	<b>Implement archaeological or heritage management plan</b>		
6.1	Modify the archaeological or heritage management plan to take into account any additional advice resulting from notification and discussions with the regulator.	A/PM or WS-RMD (RES)	
6.2	Implement the archaeological or heritage management plan. Where impact is expected, this would include such things as a formal assessment of significance and heritage impact assessment, preparation of excavation or recording methodologies, consultation with registered Aboriginal parties, obtaining heritage approvals etc, if required.	PM or WS-RMD (RAPs and RES)	PACHCI Stage 3
6.3	Where heritage approval is required contact regional environment staff for further advice and support material. Please note time constraints associated with heritage approval preparation and processing. Project scheduling may need to be revised where extensive delays are expected.	PM/RES/WS-RMD	
6.4	For Part 3A/Part 5.1 projects, assess whether heritage impact is consistent with the project approval or if project approval modification is required from the Department of Planning and Environment. Seek advice from regional environment staff and Environment Branch specialist staff if unsure.	PM/RES	

Step	Task	Responsibility	Guidance & Tools
6.5	Where statutory approvals (or project approval modification) are required, impact upon relics and/or Aboriginal objects must not occur until heritage approvals are issued by the appropriate regulator.	PM or WS-RMD	
6.6	Where statutory approval (or Part 3A/Part 5.1 project modification) is not required and where recording is recommended by the archaeologist, sufficient time must be allowed for this to occur.	PM or WS-RMD	
6.7	Ensure short term and permanent storage locations are identified for archaeological material or other heritage material is removed from site, where required. Interested third parties (eg museums or local councils) should be consulted on this issue. Contact regional environment staff and Senior Environmental Specialist (Heritage) for advice on this matter, if required.	PM or WS-RMD	
<b>7</b>	<b>Review CEMPs and approval conditions</b>		
7.1	Check whether written notification is required to be sent to the regulator before re-commencing work. Where this is not explicit in heritage approval conditions, expectations should be clarified directly with the regulator.	PM	
7.2	Update the CEMP, site mapping and project delivery program as appropriate with any project changes resulting from final heritage management (eg retention of heritage item, salvage of item). Updated CEMPs must incorporate additional conditions arising from any heritage approvals, and Aboriginal community consultation if relevant. Include any changes to CEMP in site induction material and update site workers during toolbox talks.	PM	
<b>8</b>	<b>Resume work</b>		
8.1	Seek written clearance to resume project work from regional environment staff and the archaeologist (and regulator, if required). Clearance would only be given once all archaeological excavation and/or heritage recommendations (where required) are complete. Resumption of project work must be in accordance with the all relevant project/heritage approvals/determinations.	RES/A/PM/WS-RMD	
8.2	If required, ensure archaeological excavation/heritage reporting and other heritage	PM/A/WS-RMD	



Step	Task	Responsibility	Guidance & Tools
	approval conditions are completed in the required timeframes. This includes artefact retention repositories, conservation and/or disposal strategies.		
8.3	Forward all heritage/archaeological assessments, heritage location data and its ownership status to the Senior Environmental Specialist (Heritage). They will ensure all heritage items in Roads and Maritime ownership and/or control are considered for the Roads and Maritime S170 Heritage and Conservation Register.	PM/SES(H)/ WS-RMD	
8.4	If additional unexpected items are discovered this procedure must begin again from Step 1.	PM/TL-RMD	

## 8. Seeking advice

Advice on this procedure should be sought from Roads and Maritime regional environment staff in the first instance. Contractors and alliance partners should ensure their own project environment managers are aware of and understand this procedure. Regional environment staff can assist non-Roads and Maritime project environment managers with enquires concerning this procedure.

### IMPORTANT!

**Roads and Maritime Services staff and contractors are not to seek advice on this procedure directly from the Office of Environment and Heritage without first seeking advice from regional environment staff and heritage policy staff.**

Technical archaeological or heritage advice regarding an unexpected heritage item should be sought from the contracted archaeologist. Technical specialist advice can also be sought from heritage policy staff within Environment Branch to assist with the preliminary archaeological identification and technical reviews of heritage/archaeological reports.

## 9. Related information

**Contact details:** Senior Environmental Specialist (Heritage), Environment Branch, 02 8588 5754

**Effective date:** 01 February 2015

**Review date:** 01 February 2016

This procedure should be read in conjunction with:

- Roads and Maritimes' *Heritage Guidelines 2015*.
- Roads and Maritime Services *Environmental Incident Classification and Reporting Procedure*
- Roads and Maritime's *Procedure for Aboriginal Cultural Heritage Consultation and Investigation*
- RTA *Environmental Impact Assessment Guidelines*.

This procedure replaces:

- Procedure 5.5 ("*unexpected discovery of an archaeological relic or Aboriginal object*") outlined in the RTA's *Heritage Guidelines 2004*.

Other relevant reading material:

- NSW Heritage Office (1998), *Skeletal remains: guidelines for the management of human skeletal remains*.
- Department of Environment and Conservation NSW (2006), *Manual for the identification of Aboriginal remains*.
- Department of Health (April 2008), *Policy Directive: Burials - exhumation of human remains*<sup>11</sup>.

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<sup>11</sup> [http://www.health.nsw.gov.au/policies/pd/2008/pdf/PD2008\\_022.pdf](http://www.health.nsw.gov.au/policies/pd/2008/pdf/PD2008_022.pdf)

## 10. List of appendices

The following appendices are included to support this procedure.

Appendix A	Identifying Unexpected Heritage items
Appendix B	Unexpected Heritage Item Recording Form 418
Appendix C	Photographing Unexpected Heritage Items
Appendix D	Key Environment Contacts
Appendix E	Uncovering Bones
Appendix F	Archaeological Advice Checklist
Appendix G	Template Notification Letter

# Appendix A

## Identifying unexpected heritage items

The following images can be used to assist in the preliminary identification of potential unexpected items (both Aboriginal and non-Aboriginal) during construction and maintenance works. Please note this is not a comprehensive typology.



**Top left hand picture continuing clockwise:** Stock camp remnants (Hume Highway Bypass at Tarcutta); Linear archaeological feature with post holes (Hume Highway Duplication), Animal bones (Hume Highway Bypass at Woomargama); Cut wooden stake; Glass jars, bottles, spoon and fork recovered from refuse pit associated with a Newcastle Hotel (Pacific Highway, Adamstown Heights, Newcastle area).



**Wood stave water pipe**



**Tram tracks**



**Retaining wall**



**Cistern**

**Top left hand picture continuing clockwise:** Woodstave water pipe with tar and wire sealing (Horsley Drive); Tram tracks (Sydney); Brick lined cistern (Clyde); Retaining wall (Great Western Highway, Leura).



**Top left hand picture continuing clockwise:** Road pavement (Great Western Highway, Lawson); Sandstone kerbing and guttering (Parramatta Road, Mays Hill); Telford road (sandstone road base, Great Western Highway, Leura); Ceramic conduit and sandstone culvert headwall (Blue Mountains, NSW); Corduroy road (timber road base, Entrance Road, Wamberai).



Alignment pin



Survey tree



Alignment stone



Survey tree



Milestone



**Top left hand corner continuing clockwise:** Alignment Pin (Great Western Highway, Wentworth Falls); Survey tree (MR7, Albury); Survey tree (Kidman Way, Darlington Point, Murrumbidgee); Survey tree (Cobb Highway, Deniliquin); Milestone (Great Western Highway, Kingswood, Penrith); Alignment Stone (near Guntawong Road, Riverstone). Please note survey marks may have additional statutory protection under the *Surveying and Spatial Information Act 2002*.



**Remnant Bridge Piers**



**Mine Shaft**



**Historic fence boundary**



**Dairy shed**

**Top left hand corner continuing clockwise:** Remnant bridge piers (Putty Road, Bulga); Wooden boundary fence (Campbelltown Road, Denham Court); Dairy shed (Ballina); Golden Arrow Mine Shaft.





**Top left hand corner:** Culturally modified stone discovered on Main Road 92, about two kilometres west of Sassafras. The remaining images show a selection of stone artefacts retrieved from test and salvage archaeological excavations during the Hume Highway Duplication and Bypass projects from 2006-2010.

## **Appendix B**

Unexpected heritage item recording form 418



**This form is to be filled in by a project manager (or their delegate) or a team leader – Road and Maintenance Division, on the discovery of an unexpected heritage item during construction or maintenance works.**

<b>Date:</b>		<b>Recorded by:</b> (Include name and position)	
<b>Project name:</b>			
<b>Description of works being undertaken</b> (eg Removal of failed pavement by excavation and pouring concrete slabs in 1m x 1m replacement sections).			
<b>Description of exact location of item</b> (eg Within the road formation on Parramatta Road, east bound lane, at the corner of Johnston Street, Annandale, Sydney).			
<b>Description of item found</b> (What type of item is it likely to be? Tick the relevant boxes).			
<b>A. A relic</b>	<input type="checkbox"/>	A 'relic' is evidence of a past human activity relating to the settlement of NSW with local or state heritage significance. A relic might include bottles, utensils, plates, cups, household items, tools, implements, and similar items.	
<b>B. A 'work, building or structure'</b>	<input type="checkbox"/>	A 'work' can generally be defined as a form infrastructure such as tram tracks, a culvert, road base, a bridge pier, kerbing, and similar items.	
<b>C. An Aboriginal object</b>	<input type="checkbox"/>	An 'Aboriginal object' may include stone tools, stone flakes, shell middens, rock art, scarred trees and human bones.	
<b>D. Bone</b>	<input type="checkbox"/>	Bones can either be human or animal remains. <b>Remember that you must contact the local police immediately by telephone if you are <u>certain</u> that the bone(s) are <u>human remains</u>.</b>	
<b>E. Other</b>	<input type="checkbox"/>		

<p><b>Provide short description of item</b> (eg Metal tram tracks running parallel to road alignment. Good condition. Tracks set in concrete, approximately 10cms (100 mm) below the current ground surface).</p>	
<p><b>Sketch</b> (Provide a sketch of the item's general location in relation to other road features so its approximate location can be mapped without having to re-excavate it. In addition, please include details of the location and direction of any photographs of the item taken).</p>	
<p><b>Action taken</b> (Tick either A or B)</p>	
<p><b>A. Unexpected item <b>would not</b> be further impacted on by works</b> <input type="checkbox"/></p>	
<p><b>Describe how works would avoid impact on the item.</b> (eg The tram tracks will be left <i>in situ</i>, and recovered with road paving).</p>	
<p><b>B. Unexpected item <b>would be</b> further impacted on by works</b> <input type="checkbox"/></p>	
<p><b>Describe how works would impact on the item.</b> (eg Milling is required to be continued to 200 mm depth to ensure road pavement requirements are met. Tram tracks will need to be removed).</p>	
<p><b>Important:</b> It is a statutory offence to disturb Aboriginal objects and historic relics (including human remains) without an approval. All works affecting objects and relics must cease until an approval is sought. Approvals may also be required to impact on certain works. Contact your regional environment staff for guidance.</p>	
<p><b>Project manager / works supervisor signature</b></p>	

## Appendix C

### Photographing unexpected heritage items

✋ Removal of the item from its context (e.g. excavating from the ground) for photographic purposes is not permitted.

Photographs of unexpected items in their current context (*in situ*) may assist heritage staff and archaeologists to better identify the heritage values of the item. Emailing good quality photographs to specialists can allow for better quality and faster heritage advice. The key elements that must be captured in photographs of the item include its position, the item itself and any distinguishing features. All photographs must have a scale (ruler, scale bar, mobile phone, coin) and a note describing the direction of the photograph.

#### Context and detailed photographs

It is important to take a general photograph (Figure 1) to convey the location and setting of the item. This will add much value to the subsequent detailed photographs also required (Figure 2).



**Figure 2:** Close up detail of the sandstone surface showing material type, formation and construction detail. This is essential for establishing date of the feature.

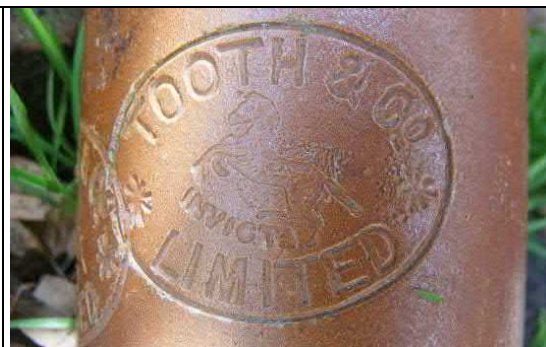
**Figure 1:** Telford road uncovered on the Great Western Highway (Leura) in 2008.

#### Photographing distinguishing features

Where unexpected items have a distinguishing feature, close up detailed photographs must be taken of this, where practicable. In the case of a building or bridge, this may include diagnostic details architectural or technical features. See Figures 3 and 4 for examples.



**Figure 3:** Ceramic bottle artefact with stamp.



**Figure 4:** Detail of the stamp allows 'Tooth & Co Limited' to be made out. This is helpful to a specialist in gauging the artefact's origin, manufacturing date and likely significance.

## Photographing bones

The majority of bones found on site will those of be recently deceased animal bones often requiring no further assessment (unless they are in archaeological context). However, if bones are human, Roads and Maritime must contact the police immediately (see Appendix F for detailed guidance). Taking quality photographs of the bones can often resolve this issue quickly. Heritage staff in Environment Branch can confirm if bones are human or non-human if provided with appropriate photographs. Ensure that photographs of bones are not concealed by foliage (Figure 5) as this makes it difficult to identify. Minor hand removal of foliage can be undertaken as long as disturbance of the bone does not occur. Excavation of the ground to remove bone(s) should not occur, nor should they be pulled out of the ground if partially exposed. Where sediment (adhering to a bone found on the ground surface) conceals portions of a bone (Figure 6) ensure the photograph is taken of the bone (if any) that is not concealed by sediment.



**Figure 5:** Bone concealed by foliage.



**Figure 6:** Bone covered in sediment

Ensure that all close up photographs include the whole bone and then specific details of the bone (especially the ends of long bones, the *epiphysis*, which is critical for species identification). Figures 7 and 8 are examples of good photographs of bones that can easily be identified from the photograph alone. They show sufficient detail of the complete bone and the epiphysis.



**Figure 7:** Photograph showing complete bone.



**Figure 8:** Close up of a long bone's epiphysis.

## Appendix D

### Key environmental contacts

Hunter region	Environmental Manager (Hunter)	4924 0440
	Aboriginal Cultural Heritage Advisor	4924 0383
Northern region	Environment Manager (North)	6640 1072
	Aboriginal Cultural Heritage Advisor	6604 9305
Southern region	Environmental Manager (South)	6492 9515
	Aboriginal Cultural Heritage Advisor	4221 2767
South West region	Environment Manager (South West)	6937 1634
	Aboriginal Cultural Heritage Advisor	6937 1647
Sydney region	Environment Manager (Sydney)	8849 2516
	Aboriginal Cultural Heritage Advisor	8849 2583
Western region	Environment Manager (West)	6861 1628
	Aboriginal Cultural Heritage Advisor	6861 1658
Pacific Highway Office	Environment Manager	6640 1375
Regional Maintenance Delivery	Environment Manager	9598 7721
Environment Branch	Senior Environmental Specialist (Heritage)	8588 5754

### Heritage Regulators

Heritage Division Office of Environment and Heritage Locked Bag 5020 Parramatta NSW 2124 Phone: (02) 9873 8500	Department of the Environment (Clth) GPO Box 787 Canberra ACT 2601 Phone: (02) 6274 1111
Office of Environment and Heritage (Sydney Metropolitan) Planning and Aboriginal Heritage Section PO Box 668 Parramatta NSW 2124 Phone: (02) 9995 5000	Office of Environment and Heritage (North Eastern NSW) Planning and Aboriginal Heritage Section Locked Bag 914 Coffs Harbour NSW 2450 Phone: (02) 6651 5946
Office of Environment and Heritage (North Western NSW) Environment and Conservation Programs PO Box 2111 Dubbo NSW 2830 Phone: (02) 6883 5330	Office of Environment and Heritage (Southern NSW) Landscape and Aboriginal Heritage Protection Section PO Box 733 Queanbeyan NSW 2620 Phone: (02) 6229 7188

### Project-Specific Contacts

Position	Name	Phone Number
Project Manager		
Site/Alliance Environment Manager		
Regional Environmental Officer		
Aboriginal Cultural Heritage Advisor		
Consultant Archaeologist		
Local Police Station		
OEH: Environment Line		131 555

# Appendix E

## Uncovering bones

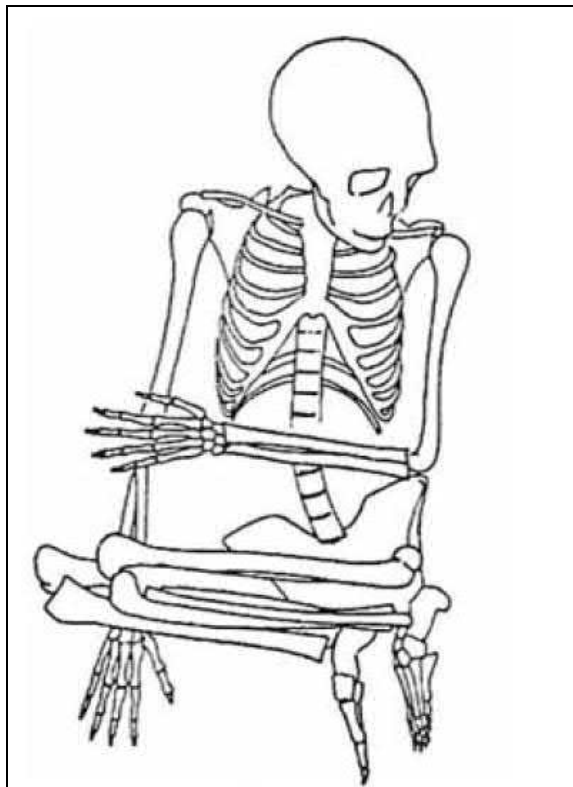
**Hand icon** All matters relating to uncovering bones and RMS' human remains notification obligations should involve RMS regional environment and heritage staff. They will guide Project Managers through occurrences of uncovering bones.

This appendix provides Project Managers with advice (1) on what to do on first uncovering bones (2) the range of human skeletal notification pathways and (3) additional considerations and requirements when managing the discovery of human remains.

### 1. First uncovering bones

Stop all work in the vicinity of the find. All bones uncovered during project works should be **treated with care and urgency** as they have the potential to be human remains. Therefore they must be identified as either human or non-human as soon as possible by a qualified forensic or physical anthropologist. These specialist consultants can be sought by contacting regional environment staff and/or heritage staff at Environment Branch.

On the very rare occasion where it is *instantly obvious* from the remains that they are human, the Project Manager (or a delegate) should **inform the police by telephone** prior to seeking specialist advice. It will be obvious that it is human skeletal remains where there is no doubt, as demonstrated by the example in Figure 1. Often skeletal elements in isolation (such as a skull) can also clearly be identified as human. Note it may also be obvious that human remains have been uncovered when soft tissue and clothing are present.



**Figure 1:** Schematic of a complete skeleton that is 'obviously' human<sup>12</sup>.



**Figure 2:** Disarticulated bones that require assessment to determine species.

<sup>12</sup> After Department of Environment and Conservation NSW (2006), *Manual for the identification of Aboriginal Remains*: 17.



This preliminary phone call is to let the police know that Roads and Maritime is undertaking a specialist skeletal assessment to determine the approximate date of death which will inform legal jurisdiction. The police may wish to take control of the site at this stage. If not, a forensic or physical anthropologist must be requested to make an on-site assessment of the skeletal remains.

Where it is not 'obvious' that the bones are human (in the majority of cases, illustrated by Figure 2), specialist assessment is required to establish the species of the bones. Photographs of the bones can assist this assessment if they are clear and taken in accordance with guidance provided in Appendix C. Good photographs often result in the bones being identified by a specialist without requiring a site visit; noting they are nearly always non-human. In these cases, non-human skeletal remains must be treated like any other unexpected archaeological find.

If the bones are identified as human (either by photographs or an on-site inspection) a technical specialist must determine the likely ancestry (Aboriginal or non-Aboriginal) and burial context (archaeological or forensic). This assessment is required to identify the legal regulator of the human remains so **urgent notification** (as below) can occur. Preliminary telephone or verbal notification by the Project Manager or regional environment staff is considered appropriate. This must be followed up later by Roads and Maritime's formal letter notification as per Appendix G when a management plan has been developed and agreed to by the relevant parties.

## 2. Range of human skeletal notification pathways

The following is a summary of the different notification pathways required for human skeletal remains depending on the preliminary skeletal assessment of ancestry and burial context.

### A. Human bones are from a recently deceased person (*less than 100 years old*).

#### Action

A police officer must be notified immediately as per the obligations to report a death or suspected death under s35 of the *Coroners Act 2009* (NSW). It should be assumed the police will then take command of the site until otherwise directed.

### B. Human bones are archaeological in nature (*more than 100 years old*) and are likely to be **Aboriginal** remains.

#### Action

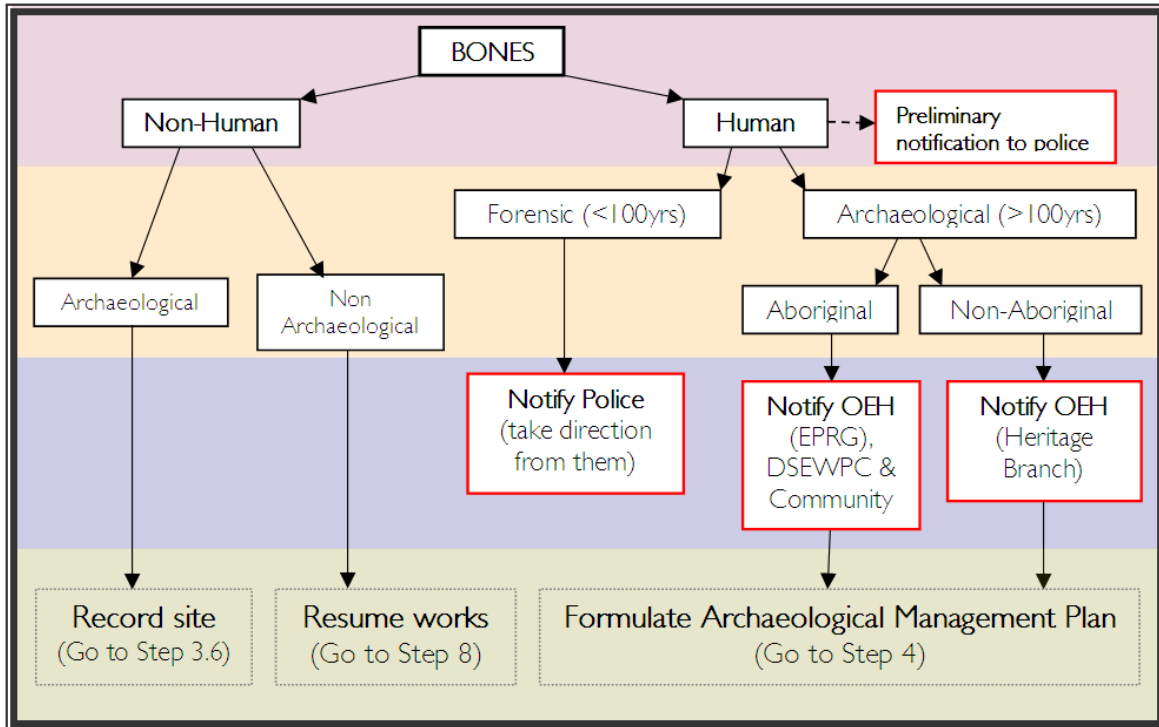
The OEH and the RMS Aboriginal Cultural Heritage Advisor (ACHA) must be notified immediately. The ACHA must contact and inform the relevant Aboriginal community stakeholders who may request to be present on site. Relevant stakeholders are determined by the RTA's *Procedure for Aboriginal Cultural Heritage Consultation and Investigation*.

### C. Human bones are archaeological in nature (*more than 100 years old*) and likely to be **non-Aboriginal** remains.

#### Action

The OEH (Heritage Branch, Conservation Team) must be notified immediately.

The simple diagram below summarises the notification pathways on finding bones.



After the appropriate verbal notifications (as described in B and C), the Project Manager must proceed through the *Unexpected Heritage Items Procedure* to formulate an archaeological management plan (Step 4). Note no archaeological management plan is required for forensic cases (A), as all future management is a police matter. Non-human skeletal remains must be treated like any other unexpected archaeological find and so must proceed to recording the find as per Step 3.6.

### 3. Additional considerations and requirements

Uncovering archaeological human remains must be managed intensively and needs to consider a number of additional specific issues. These issues might include facilitating culturally appropriate processes when dealing with Aboriginal remains (such as repatriation and cultural ceremonies). Roads and Maritime's ACHA can provide advice on this and how to engage with the relevant Aboriginal community. Project Managers, more generally, may also need to consider overnight site security of any exposed remains and may need to manage the onsite attendance of a number of different external stakeholders during assessment and/or investigation of remains. Project Managers may also be advised to liaise with local church/religious groups and the media to manage community issues arising from the find. Additional investigations may be required to identify living descendants, particularly if the remains are to be removed and relocated.

If exhumation of the remains (from a formal burial or a vault) is required, Project Managers should also be aware of additional approval requirements under the *Public Health Act 1991* (NSW). Specifically, Roads and Maritime is required to apply to the Director General of NSW Department of Health for approval to exhume human remains as per Clause 26 of the *Public Health (Disposal of Bodies) Regulation 2002* (NSW)<sup>13</sup>. Further, the exhumation of such remains needs to consider health risks such as infectious disease control, exhumation procedures and reburial approval and registration. Further guidance on this matter can be found at the NSW Department of Health [website](#).

In addition, due to the potential significant statutory and common law controls and prohibitions associated with interfering with a public cemetery, project teams are

<sup>13</sup> This requirement is in addition to heritage approvals under the *Heritage Act 1977*.

advised, when works uncover human remains adjacent to cemeteries, to confirm the cemetery's exact boundaries.

## Appendix F

### Archaeological/heritage advice checklist

The archaeologist must advise the Project Manager of an appropriate archaeological or heritage management plan as soon as possible after site inspection (see Step 4). An archaeological or heritage management plan can include a range of activities and processes, which differ depending on the find and its significance. In discussions with the archaeologist the following checklist can be used by the Project Manager and the archaeologist as a prompt to ensure all relevant archaeological issues are considered when developing this plan. This will allow the project team to receive clear and full advice to move forward quickly and in the right direction. Archaeological and/or heritage advice on how to proceed can be received in a letter or email outlining all relevant archaeological and/or heritage issues.

	Required	Outcome/notes
<b>Assessment and investigation</b>		
• Assessment of significance	Yes/No	
• Assessment of heritage impact	Yes/No	
• Archaeological excavation	Yes/No	
• Archival photographic recording	Yes/No	
<b>Heritage approvals and notifications</b>		
• AHIPs, Section 140, S139 exceptions etc	Yes/No	
• Regulator relics/objects notification	Yes/No	
• Roads and Maritime's S170 Heritage and Conservation Register listing requirements	Yes/No	
• Compliance with CEMP or other project heritage approvals	Yes/No	
<b>Stakeholder consultation</b>		
• Aboriginal stakeholder consultation requirements and how it relates to RTA <i>Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI)</i> .	Yes/No	
• Advice from regional environmental staff, Aboriginal Cultural Heritage Advisor, Roads and Maritime heritage team.	Yes/No	
<b>Artefact/ heritage item management</b>		
• Retention or conservation strategy (eg items may be subject to long conservation and interpretation) • Disposal strategy (eg former road pavement) • Short term and permanent storage locations (interested third parties should be	Yes/No	

#### Roads & Maritime Services

consulted on this issue).		
• Control Agreement for Aboriginal objects.	Yes/No	
<b>Program and budget</b>		
• Time estimate associated with archaeological or heritage conservation work.		
• Total cost of archaeological/heritage work.		

## **Appendix G**

Template notification letter

[Select and type date]

[Select and type reference number]

[Select and type file number]

[Insert recipient's name and address, see **Appendix D**]

[Select and type salutation and name],

**Re: Unexpected heritage item discovered during Roads and Maritime Services project works.**

I write to inform you of an unexpected [select: relic, heritage item or Aboriginal object] found during Roads and Maritime Services construction works at [insert location] on [insert date]. [Where the regulator has been informally notified at an earlier date by telephone, this should be referred to here].

This letter is in accordance with the notification requirement under [select: Section 146 of the *Heritage Act 1977* (NSW) or Section 89(A) of the *National Parks and Wildlife Act 1974* (NSW)] **NB:** There may be not be statutory requirement to notify of the discovery of a 'heritage Item that is not a relic or Aboriginal object].

**NB:** On finding Aboriginal human skeletal remains this letter must also be sent to the Commonwealth Minister for Sustainability, Environment, Water, Populations and Communities (SEWPC) in accordance with notification requirements under Section 20(1) of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Cth).

[Provide a brief overview of the project background and project area. Provide a summary of the description and location of the item, including a map and image where possible. Also include how the project was assessed under the *Environmental Planning and Assessment Act 1979* (NSW) (eg Part 5). Also include any project approval number, if available].

Roads and Maritime Services [or contractor] has sought professional archaeological advice regarding the item. A preliminary assessment indicates [provide a summary description and likely significance of the item]. Please find additional information on the site recording form attached.

Resulting from these preliminary findings, Roads and Maritime Services [or contractor] is proposing [provide a summary of the proposed archaeological/heritage approach (eg develop archaeological research design (where relevant), seek heritage approvals, undertake archaeological investigation or conservation/interpretation strategy). Also include preliminary justification of such heritage impact with regard to project design constraints and delivery program].

The proposed approach will be further developed in consultation with a nominated Office of Environment and Heritage staff member.

Please contact me if you have any input on this approach or if you require any further information.

Yours sincerely

[Sender name and position]

[Attach the archaeological/heritage management plan and site recording form].



# Appendix C - Safe working distances for vibration intensive equipment

# Appendix C

## Safe working distances for vibration intensive equipment

Non-Aboriginal Heritage Management Plan

August 2018

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# 1 Safe working distances

## 1.1 Purpose

The purpose of this document is to summarise the safe working distances for vibration intensive equipment, as provided in Section 5.7, Section 7.4.1 and Section 8.3 of the Noise and Vibration Management Sub-plan (NVMP).

## 1.2 Construction vibration impacts – safe working distances

Table 1-1 provides an indicative conservative safe working distance for heritage items.

This table will be used by the Project when planning work when construction activities are in the vicinity of heritage items. In addition, vibration screening criteria drawings have been developed, and are presented in Appendix D of the NVMP. These drawings also identify safe working distances when working around heritage items. A vibration prediction tool will also be developed to allow the Project to predict potential impacts to heritage items and implement required management measures, including vibration monitoring.

The safe working distances provided are indicative and will vary depending on the particular item of plant and local geotechnical conditions. These distance provide the most conservative safe working distance for heritage items. They apply to cosmetic damage of typical buildings under typical geotechnical conditions. Working inside these distances should only occur after vibration monitoring has been done to identify the actual levels of vibration in accordance with the various vibration guidance.

**Table 1-1 Vibration levels and safe working distance guidance**

Source	Safe working distances for heritage Structures
Large vibratory roller (20t)	20-50m
Medium vibratory roller (10t)	20-31m
Compactor (7t)	20m
Hand operated wacka packer on backfill	5m
Hand operated wacka packer on asphalt	5m
Heavy hydraulic hammer (1500kg hammer on 30t excavator)	10-44m
Light hydraulic hammer (300kg on 5t excavator)	5m
Jack hammer	5m
Air track drill	10m
Small rock drill (estimate)	5m
Down the Hole Hammer	5m
Ripping (measured in Sydney sandstone)	5m
Impact piling	20m
Vibratory piling	30-100m
Rock sawing	5m
Bored piling	10m

Notes: Based on information provided in the NorthConnex Construction Noise and Vibration Management Sub Plan prepared by Lend Lease Bouygues Joint Venture dated 1 May 2017.

## Appendix D – Non-Aboriginal Heritage Impacts and Mitigation Measures

### Existing Non-Aboriginal Heritage Impacts and Mitigation Measures

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
Pressure Tunnel and Shafts	Potts Hill Road to Waterloo Pumping Station Potts Hill to Waterloo	SHR #01630 Sydney Water S170 4570942	N/A	N/A	N/A	35 metres to 65 metres below ground	State	Neutral impact due to the separation distance from the tunnels (refer to Section 6.12 of the Non-Aboriginal heritage technical working paper)	<ul style="list-style-type: none"> <li>Undertake works in close proximity with the Sydney Water tunnels, unless otherwise agreed with Roads and Maritime and Sydney Water, to ensure no adverse impacts on the condition or performance of the City Tunnel and Pressure Tunnel</li> <li>Undertake geotechnical modelling to ensure that the settlement and heave impacts are consistent with those predicted to be acceptable in the EIS</li> <li>Monitor for potential impacts identified in</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									<p>the Tunnelling CNVIS and geotechnical model for the Project</p> <ul style="list-style-type: none"> <li>Mitigation measures identified in the non-Aboriginal heritage assessment in the EIS and subsequent updates in the SPIR (refer to Section 6.3 and Table 7-4)</li> <li>Tunnelling CNVIS will include prediction of vibration impacts on Sydney Water assets and identify additional management measures, if required.</li> </ul>
St Peters Railway Station Group – including interiors	King Street, St Peters	SHR #5012222 Marrickville LEP 2011 #1272	N/A	N/A	N/A	N/A	State	Potential settlement and vibration	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documents:</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									<ul style="list-style-type: none"> <li>• Settlement Monitoring Program</li> <li>• SAPs (refer to Appendix A5 of the CEMP)</li> <li>• Establishment of Safe Working Distances (refer to Appendix C)</li> <li>• Where required, pre-dilapidation surveys will be offered for heritage items. Should the pre-dilapidation surveys be undertaken, a post-dilapidation assessment will be carried out for the same heritage items once construction works have finished (refer to CoA's E105 and E106)</li> <li>• Reasonable and feasible mitigation measures based on</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									the non-Aboriginal heritage assessment in the EIS and subsequent updates in the SPIR (refer to Section 6.3 and Table 7-4).
Haberfield HCA	Haberfield	Ashfield LEP 2013 #C42	1	1	1	All depths	Local	Potential indirect impacts: setting, vibration and settlement	<ul style="list-style-type: none"> <li>• Consideration of the heritage item in the following documents: <ul style="list-style-type: none"> <li>• Settlement Monitoring Program</li> <li>• SAPs (refer to Appendix A5 of the CEMP)</li> </ul> </li> <li>• Establishment of Safe Working Distances (refer to Appendix C)</li> <li>• Where required, pre-dilapidation surveys will be offered for heritage items. Should the pre-dilapidation surveys</li> </ul>



Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									<p>be undertaken, a post-dilapidation assessment will be carried out for the same heritage items once construction works have finished (refer to CoA's E105 and E106)</p> <ul style="list-style-type: none"> <li>Reasonable and feasible mitigation measures based on the non-Aboriginal heritage assessment in the EIS and subsequent updates in the SPIR (refer to Section 6.3 and Table 7-4).</li> </ul>
Houses	146–148 Ramsay Street, Haberfield	Ashfield LEP 2013 #451	1	1	N/A	N/A	Local	Potential indirect impacts: setting, potential vibration	<ul style="list-style-type: none"> <li>These houses were assessed in Appendix S (Technical working paper: Non-Aboriginal heritage impact assessment) as part of the M4 East EIS</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									<ul style="list-style-type: none"> <li>• Consideration of the heritage item in the SAPs (refer to Appendix A5 of the CEMP)</li> <li>• Establishment of Safe Working Distances (refer to Appendix C)</li> <li>• Where required, pre-dilapidation surveys will be offered for heritage items. Should the pre-dilapidation surveys be undertaken, a post-dilapidation assessment will be carried out for the same heritage items once construction works have finished (refer to CoA's E105 and E106)</li> <li>• Reasonable and feasible mitigation measures based on the non-Aboriginal heritage assessment in the EIS and</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									subsequent updates in the SPIR (refer to Section and Table 7-4).
Houses	150–152 Ramsay Street, Haberfield	Ashfield LEP 2013 #452	1	1	N/A	N/A	Local	Potential indirect impacts: setting, potential vibration (cosmetic damage)	<ul style="list-style-type: none"> <li>• These houses were assessed in Appendix S (Technical working paper: Non-Aboriginal heritage impact assessment) as part of the M4 East EIS</li> <li>• Consideration of the heritage item in the SAPs (refer to Appendix A5 of the CEMP)</li> <li>• Establishment of Safe Working Distances (refer to Appendix C)</li> <li>• Where required, pre-dilapidation surveys will be offered for heritage items. Should the pre-dilapidation surveys be undertaken, a</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									<p>post-dilapidation assessment will be carried out for the same heritage items once construction works have finished (refer to CoA's E105 and E106)</p> <ul style="list-style-type: none"> <li>Reasonable and feasible mitigation measures based on the non-Aboriginal heritage assessment in the EIS and subsequent updates in the SPIR (refer to Section and Table 7-4).</li> </ul>
Commercial building	476 Parramatta Road, Ashfield	Ashfield LEP 2013 #273	1	1	N/A	N/A	Local	Potential indirect impacts: setting, vibration and settlement	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documents: <ul style="list-style-type: none"> <li>Settlement Monitoring Program</li> <li>SAPs (refer to Appendix</li> </ul> </li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									<p style="text-align: center;">A5 of the CEMP)</p> <ul style="list-style-type: none"> <li>• Establishment of Safe Working Distances (refer to Appendix C)</li> <li>• Where required, pre-dilapidation surveys will be offered for heritage items. Should the pre-dilapidation surveys be undertaken, a post-dilapidation assessment will be carried out for the same heritage items once construction works have finished (refer to CoA's E105 and E106)</li> <li>• Reasonable and feasible mitigation measures based on the non-Aboriginal heritage assessment in the EIS and subsequent updates in the SPIR (refer to</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									Section 6.3 and Table 7-4).
Pioneers Memorial Park	217-219 Norton Street, Leichhardt	Leichhardt LEP 2013 #1683	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul> </li> </ul>
Leichhardt Street/ Stanley Street HCA	Leichhardt	Leichhardt LEP 2013 C11	N/A	N/A	NA	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul> </li> </ul>
Street trees – row of Port Jackson Figs	Catherine Street, Leichhardt	Leichhardt LEP 2013 #1638	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul> </li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
Scarvell Estate HCA	Leichhardt	Leichhardt LEP 2013 C12	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul> </li> </ul>
Kerb and gutter	Chester Street, Annandale	Leichhardt LEP 2013 #I613	5	5	N/A	N/A	Local	Potential indirect impacts: setting, vibration	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the SAPs (refer to Appendix A5 of the CEMP)</li> <li>Establishment of Safe Working Distances (refer to Appendix C).</li> </ul>
Warehouse, including interiors	52–54 Pymont Bridge Road, Annandale	Leichhardt LEP 2013 #I616	5	5	N/A	N/A	Local	Potential indirect impacts: setting, vibration (cosmetic damage)	<ul style="list-style-type: none"> <li>Where required, pre-dilapidation surveys will be offered for heritage items. Should the pre-dilapidation surveys be undertaken, a post-dilapidation assessment will be carried out for the same heritage items</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									<p>once construction works have finished (refer to CoA's E105 and E106)</p> <ul style="list-style-type: none"> <li>Reasonable and feasible mitigation measures based on the non-Aboriginal heritage assessment in the EIS and subsequent updates in the SPIR (refer to Section 6.3 and Table 7-4).</li> </ul>
Former Grace Bros Repository including interiors	6–10 Mallett Street, Camperdown	Sydney LEP 2012 #12242	5	5	N/A	N/A	Local	Potential indirect impacts: vibration (cosmetic damage)	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the SAPs (refer to Appendix A5 of the CEMP)</li> <li>Establishment of Safe Working Distances (refer to Appendix C)</li> <li>Where required, pre-dilapidation surveys will be offered for heritage items. Should the pre-dilapidation surveys</li> </ul>



Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									<p>be undertaken, a post-dilapidation assessment will be carried out for the same heritage items once construction works have finished (refer to CoA's E105 and E106)</p> <ul style="list-style-type: none"> <li>Reasonable and feasible mitigation measures based on the non-Aboriginal heritage assessment in the EIS and subsequent updates in the SPIR (refer to Section 6.3 and Table 7-4).</li> </ul>
Bridge Road School (former Camperdown Public School), including interiors	127 Parramatta Road, Camperdown	Marrickville LEP 2011 #15	5	5	N/A	N/A	Local	Potential indirect impacts: vibration (cosmetic damage)	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the SAPs (refer to Appendix A5 of the CEMP)</li> <li>Establishment of Safe Working Distances (refer to Appendix C)</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									<ul style="list-style-type: none"> <li>Where required, pre-dilapidation surveys will be offered for heritage items. Should the pre-dilapidation surveys be undertaken, a post-dilapidation assessment will be carried out for the same heritage items once construction works have finished (refer to CoA's E105 and E106)</li> <li>Reasonable and feasible mitigation measures based on the non-Aboriginal heritage assessment in the EIS and subsequent updates in the SPIR (refer to Section 6.3 and Table 7-4).</li> </ul>
Warehouse	9-11 Layton Street, Camperdown	Sydney LEP 2012 #158	N/A	N/A	N/A	N/A	Local	Potential indirect impacts: vibration	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the SAP</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
								(cosmetic damage)	<ul style="list-style-type: none"> <li>Establishment of Safe Working Distances (refer to Appendix C)</li> <li>Where required, pre-dilapidation surveys will be offered for heritage items. Should the pre-dilapidation surveys be undertaken, a post-dilapidation assessment will be carried out for the same heritage items once construction works have finished (refer to CoA's E105 and E106)</li> <li>Reasonable and feasible mitigation measures based on the non-Aboriginal heritage assessment in the EIS and subsequent updates in the SPIR (refer to Section 6.3 and Table 7-4).</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
Group of 2 Victorian semi-detached cottages, including interiors	143 & 145 Salisbury Road, Camperdown	Marrickville LEP 2011 #17	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Potential indirect impacts: vibration (cosmetic damage)	<ul style="list-style-type: none"> <li>• Consideration of the heritage item in the SAPs (refer to Appendix A5 of the CEMP)</li> <li>• Establishment of Safe Working Distances (refer to Appendix C)</li> <li>• Where required, pre-dilapidation surveys will be offered for heritage items. Should the pre-dilapidation surveys be undertaken, a post-dilapidation assessment will be carried out for the same heritage items once construction works have finished (refer to CoA's E105 and E106)</li> <li>• Reasonable and feasible mitigation measures based on the non-Aboriginal heritage assessment in the EIS and</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									subsequent updates in the SPIR (refer to Section and Table 7-4).
Street trees	Annandale Street, Annandale	Leichhardt LEP 2013 #19	N/A	N/A	N/A	N/A	Local	Potential settlement	<ul style="list-style-type: none"> <li>• Consideration of the heritage item in the following documents: <ul style="list-style-type: none"> <li>• Settlement Monitoring Program</li> <li>• SAPs (refer to Appendix A5 of the CEMP)</li> </ul> </li> <li>• Establishment of Safe Working Distances (refer to Appendix C)</li> <li>• Where required, pre-dilapidation surveys will be offered for heritage items. Should the pre-dilapidation surveys be undertaken, a post-dilapidation assessment will be</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									<p>carried out for the same heritage items once construction works have finished (refer to CoA's E105 and E106)</p> <ul style="list-style-type: none"> <li>Reasonable and feasible mitigation measures based on the non-Aboriginal heritage assessment in the EIS and subsequent updates in the SPIR (refer to Section 6.3 and Table 7-4).</li> </ul>
Street trees-Brush Box	Johnston Street, Annandale	Leichhardt LEP 2013 #166	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul> </li> </ul>
Annandale Public School – including interiors	25 Johnston Street, Annandale	Leichhardt LEP 2013 #134	N/A	N/A	N/A	35 metres to 65 metres	Local	Potential indirect impact: vibration	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the SAPs (refer to</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
						below ground		(cosmetic damage)	<p>Appendix A5 of the CEMP)</p> <ul style="list-style-type: none"> <li>• Establishment of Safe Working Distances (refer to Appendix C)</li> <li>• Where required, pre-dilapidation surveys will be offered for heritage items. Should the pre-dilapidation surveys be undertaken, a post-dilapidation assessment will be carried out for the same heritage items once construction works have finished (refer to CoA's E105 and E106)</li> <li>• Reasonable and feasible mitigation measures based on the non-Aboriginal heritage assessment in the EIS and subsequent updates in the SPIR (refer to</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									Section 6.3 and Table 7-4).
'Norton House' – including interiors	33 Johnston Street, Annandale	Leichhardt LEP 2013 #I36	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul> </li> </ul>
House, including interiors	1 The Avenue, Annandale	Leichhardt LEP 2013 #I81	N/A	N/A	N/A	N/A	Local	Potential indirect impact: vibration (cosmetic damage)	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the SAPs (refer to Appendix A5 of the CEMP)</li> <li>Establishment of Safe Working Distances (refer to Appendix C)</li> <li>Where required, pre-dilapidation surveys will be offered for heritage items</li> <li>Should the pre-dilapidation surveys be undertaken, a post-dilapidation</li> </ul>



Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									<p>assessment will be carried out for the same heritage items once construction works have finished (refer to CoA's E105 and E106)</p> <ul style="list-style-type: none"> <li>Reasonable and feasible mitigation measures based on the non-Aboriginal heritage assessment in the EIS and subsequent updates in the SPIR (refer to Section and Table 7-4).</li> </ul>
Annandale HCA	Annandale	Leichhardt LEP 2013 C1	N/A	N/A	N/A	10 metres to 65 metres below ground	Local	Potential settlement and vibration	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documents: <ul style="list-style-type: none"> <li>Settlement Monitoring Program</li> <li>SAPs (refer to Appendix A5 of the CEMP)</li> </ul> </li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									<ul style="list-style-type: none"> <li>• Establishment of Safe Working Distances (refer to Appendix C)</li> <li>• Where required, pre-dilapidation surveys will be offered for heritage items. Should the pre-dilapidation surveys be undertaken, a post-dilapidation assessment will be carried out for the same heritage items once construction works have finished (refer to CoA's E105 and E106)</li> <li>• Reasonable and feasible mitigation measures based on the non-Aboriginal heritage assessment in the EIS and subsequent updates in the SPIR (refer to Section 6.3 and Table 7-4).</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
Cardigan Street HCA	Camperdown	Marrickville LEP 2011 C8	N/A	N/A	N/A	10 metres to 65 metres below ground	Local	Potential settlement and vibration	<ul style="list-style-type: none"> <li>• Consideration of the heritage item in the following documents: <ul style="list-style-type: none"> <li>• Settlement Monitoring Program</li> <li>• SAPs (refer to Appendix A5 of the CEMP)</li> </ul> </li> <li>• Establishment of Safe Working Distances (refer to Appendix C)</li> <li>• Where required, pre-dilapidation surveys will be offered for heritage items. Should the pre-dilapidation surveys be undertaken, a post-dilapidation assessment will be carried out for the same heritage items once construction works have finished</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									(refer to CoA's E105 and E106) <ul style="list-style-type: none"> <li>Reasonable and feasible mitigation measures based on the non-Aboriginal heritage assessment in the EIS and subsequent updates in the SPIR (refer to Section 6.3 and Table 7-4).</li> </ul>
Corner shop – including interiors	88 Chelmsford Street, Newtown	Marrickville LEP 2011 #I141	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul> </li> </ul>
Victorian Georgian house and stables – including interiors	38 and 54 Albermarle Street, Newtown	Marrickville LEP 2011 #I130	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>SAPs (refer to Appendix</li> </ul> </li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									A5 of the CEMP).
Group of Victorian Style Terraces – including interiors	92-98 Chelmsford Street, Newtown	Marrickville LEP 2011 #I142	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul> </li> </ul>
Coronation Hall – Federation Arts and Crafts style hall, including interior	95-103 Lennox Street, Newtown	Marrickville LEP 2011 #I162	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Potential indirect impacts: vibration (cosmetic damage)	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the SAPs (refer to Appendix A5 of the CEMP)</li> <li>Establishment of Safe Working Distances (refer to Appendix C)</li> <li>Where required, pre-dilapidation surveys will be offered for heritage items. Should the pre-dilapidation surveys be undertaken, a post-dilapidation assessment will be</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									<p>carried out for the same heritage items once construction works have finished (refer to CoA's E105 and E106)</p> <ul style="list-style-type: none"> <li>Reasonable and feasible mitigation measures based on the non-Aboriginal heritage assessment in the EIS and subsequent updates in the SPIR (refer to Section and Table 7-4).</li> </ul>
Former electricity substation	134 Lennox Street, Newtown	Marrickville LEP 2011 #1163	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul> </li> </ul>
St Joseph's Boys School –including interiors	93 Chelmsford Street, Newtown	Marrickville LEP 2011 #1309	N/A	N/A	N/A	35 metres to 65 metres	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation:</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
						below ground			<ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul>
Bedford Street Retail Group – including interiors	15, 27 and 37 Bedford Street and 167 Probert Street, Newtown	Marrickville LEP 2011 #I138	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Potential indirect impacts: vibration (cosmetic damage)	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the SAPs (refer to Appendix A5 of the CEMP)</li> <li>Establishment of Safe Working Distances (refer to Appendix C)</li> <li>Where required, pre-dilapidation surveys will be offered for heritage items. Should the pre-dilapidation surveys be undertaken, a post-dilapidation assessment will be carried out for the same heritage items once construction works have finished (refer to CoA's E105 and E106)</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									<ul style="list-style-type: none"> <li>Reasonable and feasible mitigation measures based on the non-Aboriginal heritage assessment in the EIS and subsequent updates in the SPIR (refer to Section and Table 7-4).</li> </ul>
North Kingston Estate HCA	Camperdown, Newtown	Marrickville LEP 2011 C11	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul> </li> </ul>
Community building 'St George's Hall' (352 King Street) including interior	344-358 King Street, Newtown	Sydney LEP #I1014	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul> </li> </ul>



Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
Saints Constantine and Helen Green Orthodox Church including buildings and their interiors, front fence and ground	366-378 King Street, Newtown	Sydney LEP #I1015	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul> </li> </ul>
Service station 'Rising Sun' (426 King Street) including interior and front forecourt	424-430 King Street, Newtown	Sydney LEP #I1016	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul> </li> </ul>
Commercial building including interior	482-496 King Street, Newtown	Sydney LEP #I1017	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul> </li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
Commercial building including interior	522-524A King Street, Newtown	Sydney LEP #I1018	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul> </li> </ul>
City Tunnel	Potts Hill Reservoir to Dowling Street Pumping Station	Sydney Water S170 #4574202	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Neutral impact due to the separation distance from the tunnels (refer to 6.12 of the Non-Aboriginal heritage technical working paper)	<ul style="list-style-type: none"> <li>Undertake works in close proximity with the Sydney Water tunnels, unless otherwise agreed with Roads and Maritime and Sydney Water, to ensure no adverse impacts on the condition or performance of the City Tunnel and Pressure Tunnel</li> <li>Undertake geotechnical modelling to ensure that the settlement and heave impacts are consistent with those predicted to</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									<p>be acceptable in the EIS</p> <ul style="list-style-type: none"> <li>• Monitor for potential impacts identified in the Tunnelling CNVIS and geotechnical model for the Project</li> <li>• Mitigation measures identified in the non-Aboriginal heritage assessment in the EIS and subsequent updates in the SPIR (refer to Section 6.3 and Table 7-4).</li> </ul>
Formerly 'Molloys' shop including interiors	539 King Street, Newtown	Marrickville LEP 2011 #I156	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>• Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>• SAPs (refer to Appendix A5 of the CEMP).</li> </ul> </li> </ul>
Shop counters –	555 King Street, Newtown	Marrickville LEP 2011 #I157	N/A	N/A	N/A	35 metres to 65 metres	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>• Consideration of the heritage item in the</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
including interiors						below ground			<p>following documentation:</p> <ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul>
Holmwood Estate HCA	Newtown	Marrickville LEP 2011 C15	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul> </li> </ul>
Newtown/ Erskineville HCA	Newtown	Sydney LEP 2012 C47	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul> </li> </ul>
King Street and Enmore Road HCA	Newtown	Marrickville LEP 2011 C2	N/A	N/A	N/A	35 metres to 65 metres	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation:</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
						below ground			<ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul>
St Peters Public School – including interiors	93A Church Street, St Peters	Marrickville LEP 2011 #I271	N/A	N/A	N/A	35 metres to 65 metres below ground	Local	Unlikely to be impacted	<ul style="list-style-type: none"> <li>Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>SAPs (refer to Appendix A5 of the CEMP).</li> </ul> </li> </ul>
Terrace group including interiors	2–34 Campbell Road, Alexandria	Marrickville LEP 2011 #I12	6	6	N/A	N/A	Local	Potential indirect impacts: setting	<ul style="list-style-type: none"> <li>These houses were assessed in Appendix R (Technical working paper: Non-Aboriginal) as part of the New M5 EIS</li> <li>Consideration of the heritage items in the SAPs (refer to Appendix A5 of the CEMP)</li> <li>Reasonable and feasible mitigation measures based on the non-Aboriginal</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									heritage assessment in the EIS and subsequent updates in the SPIR (refer to Section 7 and Table 7-3).
Remaining brick road and footpath paving and stone guttering	Victoria Street, Near 2 Bishop Street, St Peters	Marrickville LEP 2011 #I283	6	6	N/A	N/A	Local	Potential indirect impacts: vibration	<ul style="list-style-type: none"> <li>• These heritage items were assessed in Appendix R (Technical working paper: Non-Aboriginal) as part of the New M5 EIS</li> <li>• Consideration of the heritage items in the SAPs (refer to Appendix A5 of the CEMP)</li> <li>• Establishment of Safe Working Distances (refer to Appendix C)</li> <li>• Reasonable and feasible mitigation measures based on the non-Aboriginal heritage assessment in the EIS and</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									subsequent updates in the SPIR (refer to Section 6.3 and Table 7-4).
Former Bank of NSW building	164 Parramatta Road, Annandale	Potential heritage item	5	5	11	N/A	Potential local significance	Direct impact: full demolition	<ul style="list-style-type: none"> <li>• Consideration of the heritage item in the following documentation: <ul style="list-style-type: none"> <li>• SAPs (refer to Appendix A5 of the CEMP)</li> <li>• Pyrmont Bridge Road HARDEM</li> <li>• HARSR.</li> </ul> </li> <li>• The feasibility to retaining the façade of the former Bank of NSW building has been investigated, as required by CoA E160</li> <li>• Photographic archival recording has been carried out</li> </ul>

Name	Location	Registered listing	Study area <sup>1</sup>	Heritage study area <sup>1</sup>	HAMU	Depth	Significance	Project impact	Mitigation Measure
									<p>in accordance with CoA E164</p> <ul style="list-style-type: none"> <li>Implementation of the Unexpected Heritage Items Procedure.</li> </ul>



Non-Aboriginal Heritage Historical Archaeological Management Units (HAMU) - impacts and mitigation

HAMU name and heritage study area	Listed archaeological items	Archaeological potential	Significance level	Management
HAMU 1 Haberfield/Ashfield (Area 1)	No heritage registers listings for potential historical archaeological resources	Moderate to high	Does not meet the threshold for significance.	<ul style="list-style-type: none"> <li>• Preparation of a HARDEM by a suitably qualified archaeologist in accordance with E168 to E172</li> <li>• No further archaeological investigation is anticipated, and thus a Heritage Interpretation Plan is not expected to be required for HAMU 1 under CoA E169(f)</li> <li>• Relevant management measures outlined in Table 7-4</li> <li>• Implementation of the Unexpected Heritage Items Procedure should be implemented in case of archaeological finds.</li> </ul>
HAMU 10 Bignell Lane (Area 5)	No heritage registers listings for potential historical archaeological resources	Moderate to high  Archaeological evidence to be present associated with the following: <ul style="list-style-type: none"> <li>• Western half of the c1860s Didliston House (building footings and deposits)</li> <li>• Footings and deposits associated with C1890s houses</li> <li>• Early twentieth century services beneath Bignell Lane</li> </ul>	Local	<ul style="list-style-type: none"> <li>• Preparation of a HARDEM by a suitably qualified archaeologist in accordance with E168 to E172</li> <li>• If required by E169(f) and E167, a Heritage Interpretation Plan will be prepared in accordance with these conditions</li> <li>• If required by E172, an Archaeological Excavation Report within 12 months of completing all archaeological investigations in accordance with the condition</li> <li>• Management measures outlined in Table 7-4</li> </ul>

HAMU name and heritage study area	Listed archaeological items	Archaeological potential	Significance level	Management
		<ul style="list-style-type: none"> <li>• Early to mid-nineteenth-century property boundaries and garden/agricultural remains</li> <li>• External structures and features associated with the Bignell and Clarke steam joinery works (the main buildings is outside of this HAMU)</li> </ul> <p>Given the size of the twentieth century buildings and the absence of basements within the HAMU there is potential for archaeological remains to survive beneath the existing floor slabs and between building footings.</p>		<ul style="list-style-type: none"> <li>• Carrying out an archaeological excavation program including salvage, where required</li> <li>• Archaeological Excavation Report within 12 months of completing all archaeological investigations</li> <li>• Implementation of the Unexpected Heritage Items Procedure should be implemented in case of archaeological finds.</li> </ul>
HAMU 11 Parramatta Road/Pymont Bridge Road (Area 5)	No heritage registers listings for potential historical archaeological resources	Low	Local	<ul style="list-style-type: none"> <li>• Preparation of a HARDEM by a suitably qualified archaeologist in accordance with E168 to E172</li> <li>• Undertaking an archaeological excavation program including salvage (HARSR as detailed in Table 6-1)</li> <li>• If required by E169(f) and E167, a Heritage Interpretation Plan will be prepared in accordance with these conditions</li> <li>• If required by E172, an Archaeological Excavation Report within 12 months of</li> </ul>

HAMU name and heritage study area	Listed archaeological items	Archaeological potential	Significance level	Management
				<p>completing all archaeological investigations in accordance with the condition</p> <ul style="list-style-type: none"> <li>• Management measures outlined in Table 7-3</li> <li>• Implementation of the Unexpected Heritage Items Procedure should be implemented in case of archaeological finds.</li> </ul>