



Appendix J

Non-Aboriginal Heritage Impact Assessment

Non-Aboriginal Heritage Impact Assessment

Technical Report

15-Jul-2022
Westlink M7 Widening

Non-Aboriginal Heritage Impact Assessment

Client: Transport for NSW

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Table of Contents

Glossary and abbreviations	i
Executive Summary	iii
1.0 Introduction	1
1.1 Overview of proposed modification	1
1.2 Purpose of this technical report	3
1.2.1 Secretary's Environmental Assessment Requirements	3
1.3 Structure of this technical report	4
2.0 Proposed modification	5
3.0 Method of assessment	12
3.1 Relevant legislation, guidelines and policy	12
3.1.1 State legislation	12
3.1.2 Local government areas	12
3.2 Method of assessment	13
3.2.1 Study area	13
3.2.2 Cumulative impact assessment	19
3.2.3 Assumptions and limitations	19
4.0 Existing environment	20
4.1 Historical context	20
4.1.1 Early European settlement	20
4.1 Literature review	28
4.2 Recorded heritage items	30
4.3 Site inspection	31
4.3.1 Upper Canal System	33
4.3.2 Rooty Hill Historic Site	33
4.3.3 Former Government Depot	34
4.3.4 Blacktown Native Institute	35
4.4 Significance assessment	36
4.4.1 Introduction	36
4.4.2 Individual significance assessments of listed items	37
4.5 Archaeological items	44
4.5.1 Archaeological site – Native Institution site	44
4.5.2 Archaeological site – ruins (same as Government Depot ruins)	46
5.0 Construction impact assessment	49
5.1 Upper Canal System	49
5.2 Rooty Hill Historic Site and Former Depot site	51
5.3 Blacktown Native Institution Historic Site	51
5.4 Cumulative impact assessment	55
5.4.1 Other relevant projects	55
5.4.2 Summary of cumulative impact assessment	56
6.0 Operational impact assessment	57
7.0 Statement of Heritage Impact	58
7.1 Process questions	60
7.2 Summary of Statement of Heritage Impact	60
8.0 Mitigation and management measures	62
8.1 Mitigation and management measures	62
8.2 Upper Canal System Conservation Management Plan 2016	62
9.0 Conclusion	65
References	66

Figures

Figure 1-1	Extent of the approved project and the proposed modification	2
Figure 2-1	Key features (Sheet 1 of 5)	7
Figure 2-2	Key features (Sheet 2 of 5)	8
Figure 2-3	Key features (Sheet 3 of 5)	9
Figure 2-4	Key features (Sheet 4 of 5)	10
Figure 2-5	Key features (Sheet 5 of 5)	11
Figure 3-1	Non-Aboriginal heritage study area (Sheet 1 of 5)	14
Figure 3-2	Non-Aboriginal heritage study area (Sheet 2 of 5)	15
Figure 3-3	Non-Aboriginal heritage study area (Sheet 3 of 5)	16
Figure 3-4	Non-Aboriginal heritage study area (Sheet 4 of 5)	17
Figure 3-5	Non-Aboriginal heritage study area (Sheet 5 of 5)	18
Figure 4-1	Site of the former Blacktown Native Institution looking east toward Westlink M7 (Heritage NSW)	22
Figure 4-2	Rooty Hill Government Farm residence of the Superintendent of the stock farm, also known as “Thornleigh House” (Source: Blacktown City Council Libraries. Blacktown Memories; Ref. no. 004792)	23
Figure 4-3	Main drive to Horsley homestead, Horsley Park, lined with Bunya Pine (Fairfield City Council Heritage Collection, Item 8151595)	24
Figure 4-4	Bunya pine marking entrance to “Horsley”, corner of The Horsley Drive and Cowpasture Road (Google Maps)	24
Figure 4-5	Map attached to Certificate of Title Volume 1068 Folio 162 showing Elizabeth Drive (then known as Orphan School Road) and the Cecil Hills tunnel portion of the Upper Canal System. Also note John Wylde’s 2,000 acres “Cecil Hills” Grant and Thomas Wylde’s Macquarie Farm (Courtesy: Historical Land Records Viewer, File No. 1068_162_03.jp2)	25
Figure 4-6	Location of Tunnel Shaft 4	29
Figure 4-7	Location of Upper Canal System in relation to the Westlink M7 and the approved M12 Motorway (Jacobs, 2019: 166)	30
Figure 4-8	Location of non-Aboriginal heritage items present within the study area	32
Figure 4-9	View of the modern shaft entrance above the Upper Nepean Canal tunnel located in the median of the Westlink M7 (looking west from the southbound lanes of the Westlink M7) (Source: Google Maps, 2021)	33
Figure 4-10	Portion of the Rooty Hill Historic Site looking towards the Westlink M7 (view to the north west from existing car park, with the hill in the background)	34
Figure 4-11	The Former Government Depot site, looking south from Dunsmore Avenue towards the Rooty Hill Historic Site and Eastern Road, Rooty Hill (Source: Google Maps, November 2019)	35
Figure 4-12	View of the grassed areas and mature trees on the site of the Blacktown Native Institution (view to west, photograph taken from Richmond Road near the intersection with Rooty Hill Road)	36
Figure 4-13	Native Institute site, looking south. The art installation is at left, the site of the institution building is at right and the M7 is located beyond the tree line at left (AECOM, 2021)	45
Figure 4-14	Art installation at Blacktown Native Institute in foreground, fenced Blacktown Native Institution building site with mature exotic plantings in background (AECOM, 2021)	45
Figure 4-15	Plan of features within Native Institute site (Aerial Source: Six Maps)	46
Figure 4-16	Archaeological potential for the Blacktown Native Institute	48
Figure 5-1	Longitudinal section of Cecil Hills Tunnel (SMEC Australia Pty Ltd, 2019)	50
Figure 5-2	View of No. 4 Shaft from Cecil Hills Tunnel, looking up (Source: SMEC Australia Pty Ltd, 2019:9)	50
Figure 5-3	Proposed modification in the vicinity of ‘Upper Canal System (Pheasants Nest Weir to Prospect Reservoir)’ [SHR 1373]	52
Figure 5-4	Proposed modification in the vicinity of ‘The Rooty Hill’ [SHR 01756] and ‘Government Depot Site (Former)’ [SHR 0345]	53
Figure 5-5	Proposed modification in the vicinity of ‘Blacktown Native Institution’ [SHR 1866]	54

Tables

Table 1-1	SEARs – non-Aboriginal heritage	3
Table 4-1	Recorded heritage items within and adjacent to study area	31
Table 4-2	Significance assessment criteria	37
Table 4-3	Significance assessment of Blacktown Native Institution	38
Table 4-4	Significance assessment of Rooty Hill Government Depot (former) (Heritage NSW, 2006b)	40
Table 4-5	Significance assessment of Rooty Hill Historic Site	41
Table 4-6	Significance assessment for Upper Canal System	43
Table 7-1	Recommended minimum working distances for vibration intensive plant (AECOM Australia Pty Ltd, 2022:70)	58
Table 7-2	Summary of the nature of the direct and indirect impacts from construction and operation of the proposed modification	61
Table 8-1	Mitigation and management measures	62
Table 8-2:	Relevant conservation policies	63

Glossary and abbreviations

Key terms	Description
Approved project	The Westlink M7 (previously referred to as Western Sydney Orbital) is an existing 39-kilometre-long toll road connecting the M5 Motorway at Prestons, the Hills M2 Motorway at Baulkham Hills and the M4 Motorway at Eastern Creek
CEMP	Construction Environmental Management Plan - A site specific plan developed for the construction phase to ensure that all contractors and sub-contractors comply with the environmental conditions of approval and that the environmental risks are properly managed
CCHMP	Construction Cultural Heritage Management Plan
CMP	Conservation Management Plan
CoA	Conditions of Approval. These are the current conditions that apply to the approved project: https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-663-MOD-5%2120190718T013836.398%20GMT
Construction footprint	The area required for construction of the proposed modification
DPE	NSW Department of Planning and Environment
EIS	Environmental Impact Statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW). Provides the legislative framework for land use planning and development assessment in NSW
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2021</i> (NSW)
EPA	NSW Environment Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Act 1999</i> (Commonwealth)
EPL	Environment protection licence
HIA	Heritage Impact Assessment
LEP	Local Environmental Plan
LGA	Local Government Area
m	metres
median	The strip of land between the carriageways of a motorway or other major road
NSW	New South Wales
Operational footprint	The area required for operation of the proposed modification
Proposed modification	The addition of a trafficable lane in both directions within the existing median of the Westlink M7, from about 140 metres south of the Kurrajong Road bridge at Prestons (southern end) to the Westlink M7 Bridge at Richmond Road in Oakhurst/Glendenning (northern end), excluding at the M4/Westlink M7 Light Horse Interchange
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SHI	State Heritage Inventory
SHR	State Heritage Register

Key terms	Description
SoHI	Statement of Heritage Impact
Study area	Refer Section 3.2.1 of this report
Transport	Transport for NSW - The proponent seeking approval for the proposed modification
Westlink M7	M7 Motorway or formerly known as Western Sydney Orbital

Executive Summary

The Westlink M7 is an existing 39 kilometre long toll road connecting the M5 Motorway at Prestons, the Hills M2 Motorway at Baukham Hills and the M4 Motorway at Eastern Creek ('the approved project'). Transport for NSW (Transport) is seeking a modification to the approved project to widen part of the Westlink M7 in response to current and future traffic growth, and to address reduced motorway efficiency, travel time performance and safety. The proposed modification would enable the following key components:

- Widening into the existing median of the Westlink M7 from about 140 metres south of the Kurrajong Road bridge at Prestons (southern end) to the Westlink M7 at Richmond Road in Oakhurst/Glendenning (northern end). Widening would not occur through the Light Horse Interchange
- Widening of some existing Westlink M7 bridges into the median
- Relocation or upgrade of existing drainage infrastructure and establishment of new drainage infrastructure
- Upgrades and modifications to noise wall infrastructure
- Use of temporary construction ancillary facilities along and near to the Westlink M7.

The non-Aboriginal Heritage assessment has been prepared to address the relevant Secretary's Environmental Assessment Requirements (SEARs) issued for the proposed modification. Specifically, this report has been prepared to assess the potential impacts of construction and operation of the proposed modification on known heritage features, including the Upper Nepean Canal System, Blacktown Native Institution, and the Rooty Hill historic heritage sites and to identify appropriate mitigation and management measures to address the impacts identified.

The proposed modification is unlikely to have an impact to the Upper Nepean Canal System. The canal, in the form of a tunnel in this section, would not be impacted directly from construction or operational use. There is the potential for indirect, vibrational impacts to be caused during construction works, however the noise and vibration impact assessment prepared for the proposed modification (refer Appendix E of the modification report) found that provided the identified minimum working distances are applied, and that structure specific vibration criteria are developed during detailed design and applied during construction, there is unlikely to be impacts to the Upper Canal System, including No. 4 shaft. The recommended mitigation measures include undertaking attended vibration measurements at the work site when work commences, to determine site specific minimum working distances. These measurements would be made progressively at distances outside the minimum working distances so that no structure damage occurs, and would provide detailed information regarding the transmission of vibration to allow site-specific safe working distances to be determined.

The proposed modification would not have impacts to the Blacktown Native Institution historic site or to the Rooty Hill historic site. Works in the vicinity of both of these heritage items would be contained within the existing median area and would therefore cause no direct or indirect impact to either of these sites.

1.0 Introduction

The Westlink M7 is an existing 39 kilometre long toll road connecting the M5 Motorway at Prestons, the Hills M2 Motorway at Baulkham Hills and the M4 Motorway at Eastern Creek ('the approved project'). Transport for NSW (Transport) is seeking a modification to the approved project to widen part of the Westlink M7 in response to current and future traffic growth, and to improve motorway efficiency, travel time performance and safety ('the proposed modification').

1.1 Overview of proposed modification

Transport, as the proponent for the proposed modification, is requesting that the Minister for Planning and Homes modify the planning approval for the Western Sydney Orbital (now referred to as Westlink M7) under section 5.25 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The original approval (DPE reference number SSI-663) was for the construction and operation of the existing four-traffic lane motorway. The proposed modification would provide an additional trafficable lane in both directions within the existing median of the Westlink M7. The motorway would be widened from about 140 metres south of the Kurrajong Road bridge at Prestons (southern end) to the intersection with Richmond Road in Oakhurst/Glendenning (northern end), excluding at the M4 Motorway/Westlink M7 Motorway (Light Horse) interchange. Refer to Figure 1-1 for an overview of the proposed modification.

This non-Aboriginal heritage assessment has been prepared to support the application for the proposed modification.

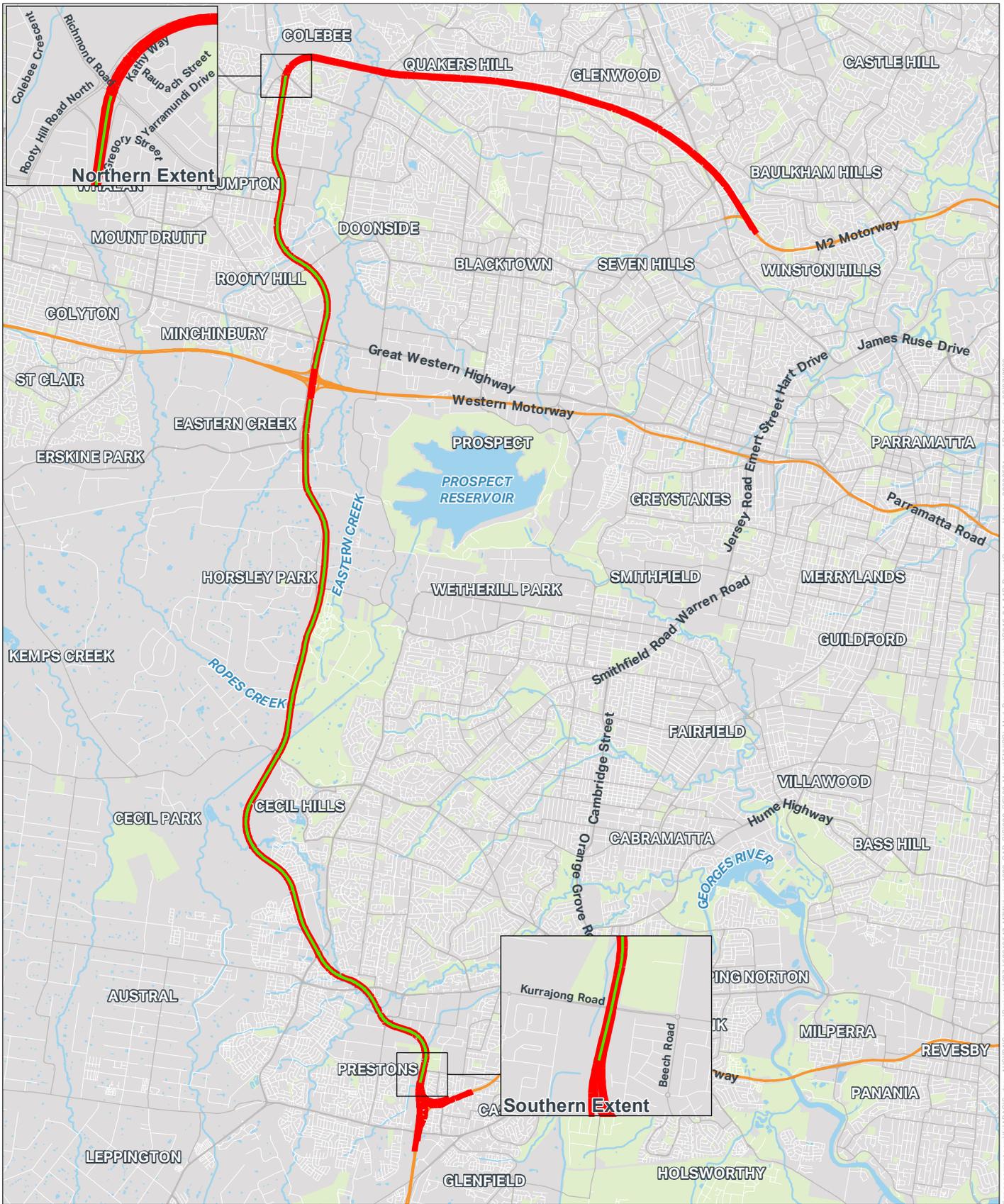


FIGURE 1-1: EXTENT OF THE APPROVED PROJECT AND THE PROPOSED MODIFICATION



- Legend**
- Proposed modification
 - Approved project
 - Motorway
 - Primary road

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1.2 Purpose of this technical report

This technical report provides a non-Aboriginal heritage assessment of the proposed modification and has been prepared to support the modification report. The aim of this report is to address the relevant Secretary's Environmental Assessment Requirements (SEARs) for the modification, provided by the New South Wales (NSW) Department of Planning and Environment (DPE).

1.2.1 Secretary's Environmental Assessment Requirements

The relevant non-Aboriginal heritage SEARs are presented in Table 1-1.

Table 1-1 SEARs – non-Aboriginal heritage

Desired Performance Outcome	SEAR	Where addressed within this report
9. Other issues	<p>1. An assessment of the following issues must be undertaken in accordance with the commitments in Attachment 2 of the M7 Motorway (SSI 663) Project Modification letter submitted 09 May 2022 (via Major Projects Portal):</p> <ul style="list-style-type: none"> • Non-Aboriginal Heritage <p><i>Extract from letter:</i></p> <p>Identify and assess any direct and/or indirect impacts (including cumulative impacts) to the heritage significance of:</p> <ol style="list-style-type: none"> a. Environmental heritage, as defined under the NSW <i>Heritage Act 1977</i> b. Items listed on the National and World Heritage lists. <p>Where impacts to State or locally significant heritage items are identified, the assessment must:</p> <ol style="list-style-type: none"> a. Include a statement of heritage impact for all heritage items including the State heritage listed Upper Canal System (Pheasants Nest Weir to Prospect Reservoir) Site and Blacktown Native Institution (including significance assessment) b. Consider impacts to the item of significance caused by, but not limited to, vibration, demolition, archaeological disturbance, altered historical arrangements and access, visual amenity, landscape and vistas, curtilage, subsidence and architectural noise treatment (as relevant) c. Outline measures to avoid and minimise those impacts in accordance with the current guidelines d. Be undertaken by a suitably qualified heritage consultant(s) (note: where archaeological excavations are proposed the relevant consultant must meet the NSW Heritage Council's Excavation Director criteria). 	<p>Section 5.0 Section 6.0 Section 7.0</p>

1.3 Structure of this technical report

This technical report is structured as follows:

- **Section 1.0 – Introduction:** This section introduces features of the proposed modification
- **Section 2.0 – Proposed modification:** This section provides a description of the proposed modification including construction and operational activities
- **Section 3.0 – Method of assessment:** This section outlines the methods used to assess the proposed modification as it relates to the study area
- **Section 4.0 – Existing environment:** This section describes the existing environment as it relates to the study area
- **Section 5.0 – Construction impact assessment:** This section assesses the impacts of the proposed modification during construction as it relates to the study area
- **Section 6.0 – Operational impact assessment:** This section assesses the impacts of the proposed modification during operation as it relates to the study area
- **Section 7.0 – Statement of heritage impact:** This section provides a statement of heritage impact for the Upper Canal System identified as being potentially impacted by the proposed modification
- **Section 8.0 – Mitigation and management measures:** This section documents environmental management measures that are proposed to mitigate the identified impacts of the proposed modification (taking into account the Conditions of Approval for the approved project)
- **Section 9.0 – Conclusion:** This section summarises the construction and operational impacts of the proposed modification as it relates to the study area and briefly describes the recommended mitigation and management measures.

2.0 Proposed modification

The proposed modification would permit the addition of a trafficable lane in both directions within the existing median of the Westlink M7. A full description of the construction activities and operational features are provided in detail in **Chapter 4** (Proposed modification) of the modification report. Key features of the proposed modification are shown in Figure 2-1 to Figure 2-5, and would include the following key operational components:

- Widening of the motorway into the existing median for a length of about 26 kilometres along the Westlink M7 from about 140 metres south of the Kurrajong Road overhead bridge at Prestons (southern end) to Richmond Road interchange in Oakhurst/Glendenning (northern end), excluding at the M4 Motorway/Westlink M7 (Light Horse) Interchange
- Widening the exit from the Westlink M7 northbound onto the M4 Motorway westbound from one lane to two lanes
- Widening of 43 existing northbound and southbound bridges on the Westlink M7 at 23 locations within the centre median, and widening on the outside of the bridges on the approach to the M4 Motorway from Old Wallgrove Road
- Upgrades, additions and modifications to noise walls
- Utility works and upgrades to drainage
- Intelligent Transport System (ITS) installations, adjustments and relocations to cover the new lane configurations.

Existing operational features impacted by the proposed modification would include:

- Main road alignment, including median and bridge areas
- Interchanges, tie-ins and entry/exit ramps
- Fill embankments and cuttings
- Culverts and drainage structures
- Water quality control measures, including basins
- Landscaping
- Artwork at the M4 (Light Horse) Interchange
- Maintenance access
- Security fencing
- Noise walls
- Shared path
- Other associated elements required during operation (for example, ITS, utilities and variable message signs (VMS)).

The following activities would be required to facilitate construction of the proposed modification:

- Multiple construction ancillary facility sites within and adjacent to the Westlink M7 for stockpiling, construction support at bridge and median widening locations, project offices and compounds.
- Vegetation clearing within the median/widening areas and within construction ancillary facilities, including construction accesses
- Demolition of existing structures and infrastructure within the widening areas
- Provision of temporary water management infrastructure including the maintenance of stormwater drainage and establishment of waterway crossings and diversions
- Utility works within Westlink M7 and adjoining roads, particularly around existing motorway bridge sub-structures

- Earthworks for bridge and road widening within the existing median, and placement and compaction of fill material likely to result in a net amount of spoil material
- Bridge widening including establishment of sub-structures such as piles, abutments, piers and headstocks and superstructures including beams, girders, decks and barriers
- Pavement widening works within the road median
- Finishing works including asphaltting the carriageway surface, line marking, signage, permanent barriers and median infill, adjustments to noise walls, installation of communications infrastructure and landscaping treatments.

Temporary road network changes would be required including a reduction in speed limits along the Westlink M7, temporary traffic diversions and lane closures. Two lanes in each direction on the Westlink M7 would be maintained during peak traffic periods. Temporary lane and full local road closures as well as temporary off-motorway detour routes would be required to support the construction of widened bridges. Construction access and haulage of materials would primarily be from within Westlink M7, however would also include roads adjacent to the Westlink M7. The existing Westlink M7 shared path would also be closed in places, however appropriate detours would be provided to maintain full north-south connectivity.

Construction would likely commence in 2023 and continue through to the end of 2025. The construction program for the M12 Motorway, and how this interfaces with the Westlink M7, has been considered in the development of this program. It is proposed to undertake the proposed modification at this interchange at the same time as the M12 Motorway project works to minimise disruption and achieve efficiencies during construction.

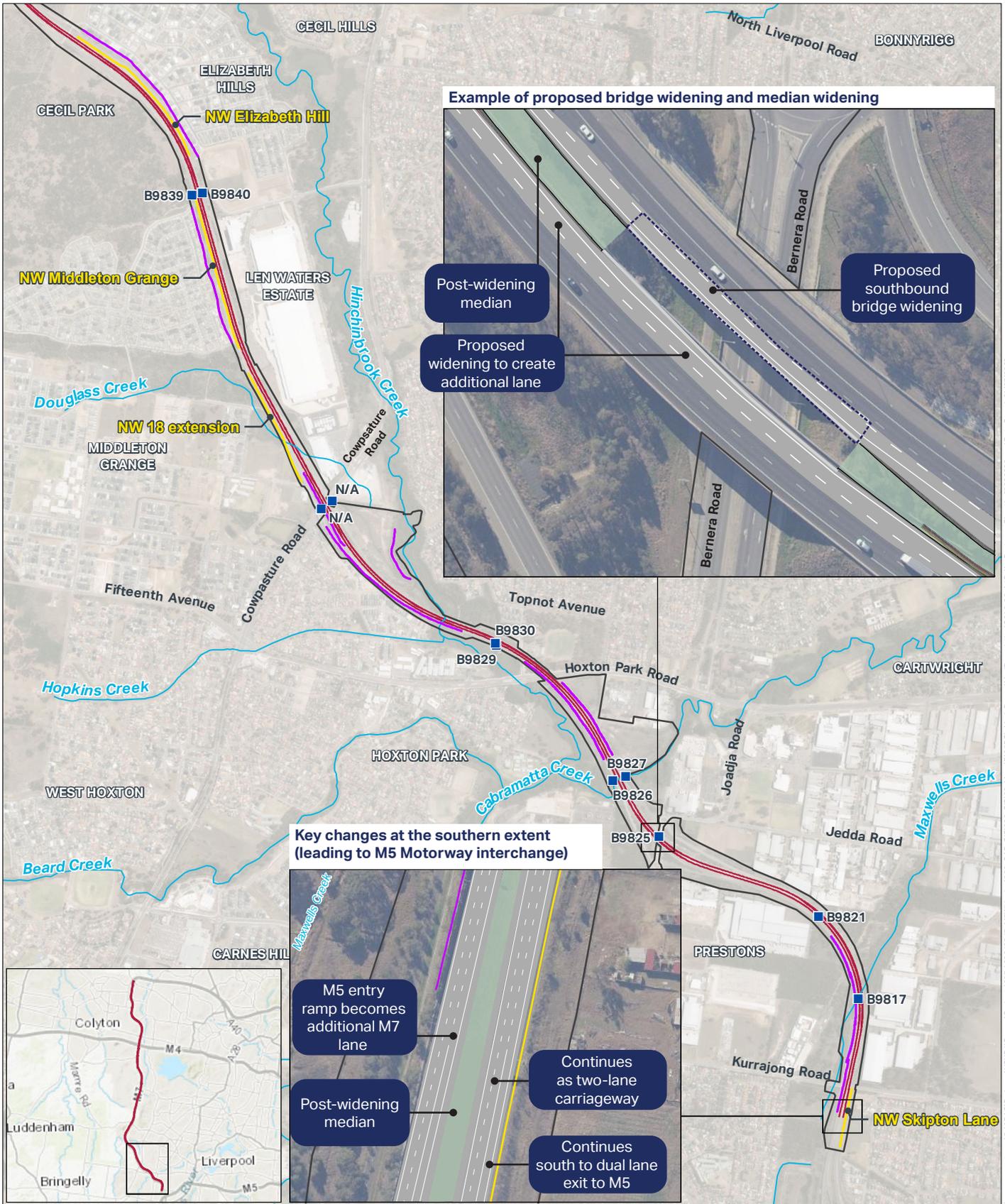


FIGURE 2-1: KEY FEATURES



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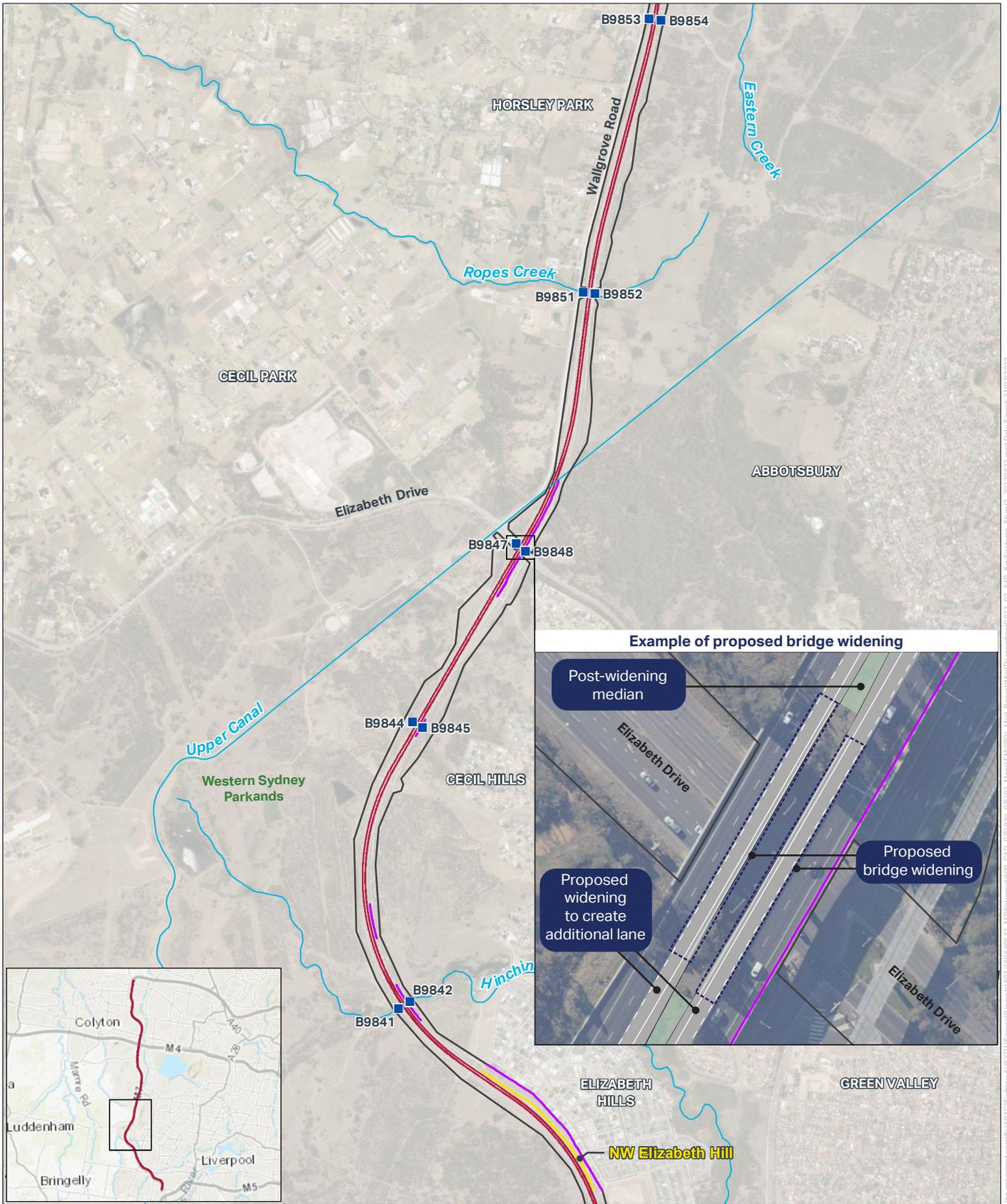


FIGURE 2-2: KEY FEATURES

Legend

- Proposed widening
- Operational footprint
- Watercourse
- Existing noise wall
- New noise wall (NW#####)
- Transport for NSW bridge number B9##### proposed to be widened



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FIGURE 2-3: KEY FEATURES



Legend

- Proposed widening
- Operational footprint
- Watercourse
- Existing noise wall
- Transport for NSW bridge number B9#### proposed to be widened

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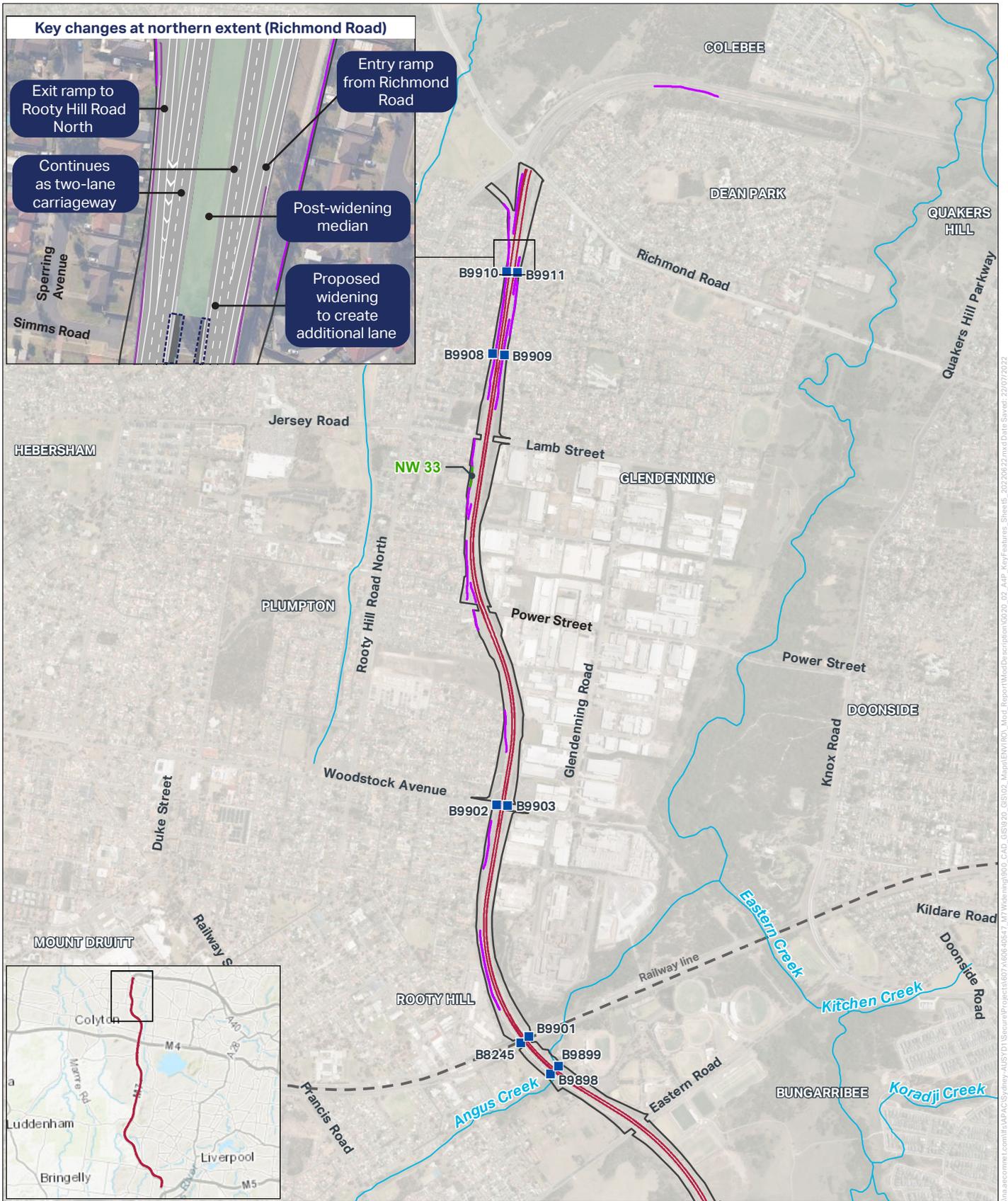


FIGURE 2-5: KEY FEATURES



Legend

- Proposed widening
- Operational footprint
- Watercourse
- Existing noise wall
- Existing noise wall height increase (NW####)
- Transport for NSW bridge number B9#### proposed to be widened

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3.0 Method of assessment

This section describes the method of assessment used to complete the non-Aboriginal heritage assessment, and also outlines the legislation, guidelines and policy that have guided this approach.

3.1 Relevant legislation, guidelines and policy

3.1.1 State legislation

Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act) allows for the preparation of environmental planning instruments to direct development within NSW. This includes local environmental plans (LEPs), which are administered by local government and contain provisions to guide land use and the process for development applications. LEPs usually include clauses requiring that heritage be considered during development applications and a schedule of identified heritage items be provided. The EP&A Act also allows for the gazettal of State Environmental Planning Policies (SEPP).

Heritage Act 1977

The *Heritage Act 1977* (NSW) (as amended) was enacted to conserve the environmental heritage of NSW. Under Section 32, places, buildings, works, relics, movable objects or precincts of heritage significance are protected by means of either Interim Heritage Orders (IHO) or by listing on the NSW State Heritage Register (SHR). Items that are assessed as having State heritage significance can be listed on the SHR by the Minister on the recommendation of the NSW Heritage Council.

Under Section 170 of the *Heritage Act 1977*, NSW Government agencies are required to maintain a register of heritage assets. The register places obligations on the agencies, but not on non-government proponents, beyond their responsibility to assess the impact on surrounding heritage items.

Archaeological features and deposits are afforded statutory protection by the 'relics provision'. Section 4(1) of the *Heritage Act 1977* (as amended 2009) defines 'relic' as follows:

any deposit, artefact, object or material evidence that:

(a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and

(b) is of State or local heritage significance.

The 'relics provision' requires that no archaeological relics be disturbed or destroyed without prior consent from the Heritage Council of NSW. Therefore, no ground disturbance works may proceed in areas identified as having archaeological potential without first obtaining an Excavation Permit pursuant to Section 140 of the *Heritage Act 1977*, or an Archaeological Exemption under Section 139 of the *Heritage Act 1977*.

The Heritage Council must be notified of the discovery of a relic under Section 146 of the *Heritage Act 1977*.

3.1.2 Local government areas

The study area crosses three local government areas (LGAs) and is governed by their respective LEPs. The LGAs are (from north to south):

- Blacktown City Council
- Fairfield City Council
- Liverpool City Council.

Each LEP contains the standard clauses relating to heritage consent and protection, contained in Part 5, Section 5.10 of each LEP. However, under Section 5.22(2) of the EP&A Act these consent provisions do not apply to approved State significant infrastructure (SSI) projects.

3.2 Method of assessment

This heritage assessment has been undertaken in accordance with *Assessing Heritage Significance* (NSW Heritage Office, 2001) and *Statements of Heritage Impact* (NSW Heritage Office & Department of Urban Affairs & Planning, 2002). It includes:

- Desktop searches of relevant heritage registers
- Review of design drawings for the proposed modification
- Review of the following key documents:
 - heritage register listings
 - historic plans
 - previous reports and other relevant documentation
- Background research into the historical development of the road and surrounding areas using the historic plans, historical photographs, newspapers and other primary and secondary historical sources as relevant
- Site inspection on 16 September 2021 by AECOM Senior Heritage Specialist, Luke Wolfe, assessing the existing road and adjoining properties along with the existing character of the study area and surrounding land uses. All photographs within this report were taken during the site inspection unless otherwise stated.

3.2.1 Study area

The study area for this assessment consists of the 26 kilometre long construction footprint, between 140 metres south of the Kurrajong Road overhead bridge at Prestons (southern end) to Richmond Road in Oakhurst/Glendenning (northern end). The construction footprint has a 250 metre radius applied so that the width incorporates the location of the widening, construction ancillary sites, as well as vehicle and machinery movement during construction. Construction ancillary facilities beyond this 250 radius formed part of the study area and were subject to this assessment. The study area passes through the LGAs of Blacktown City Council, Fairfield City Council and Liverpool City Council. The study area as defined for this assessment is shown on Figure 3-1 to Figure 3-5.

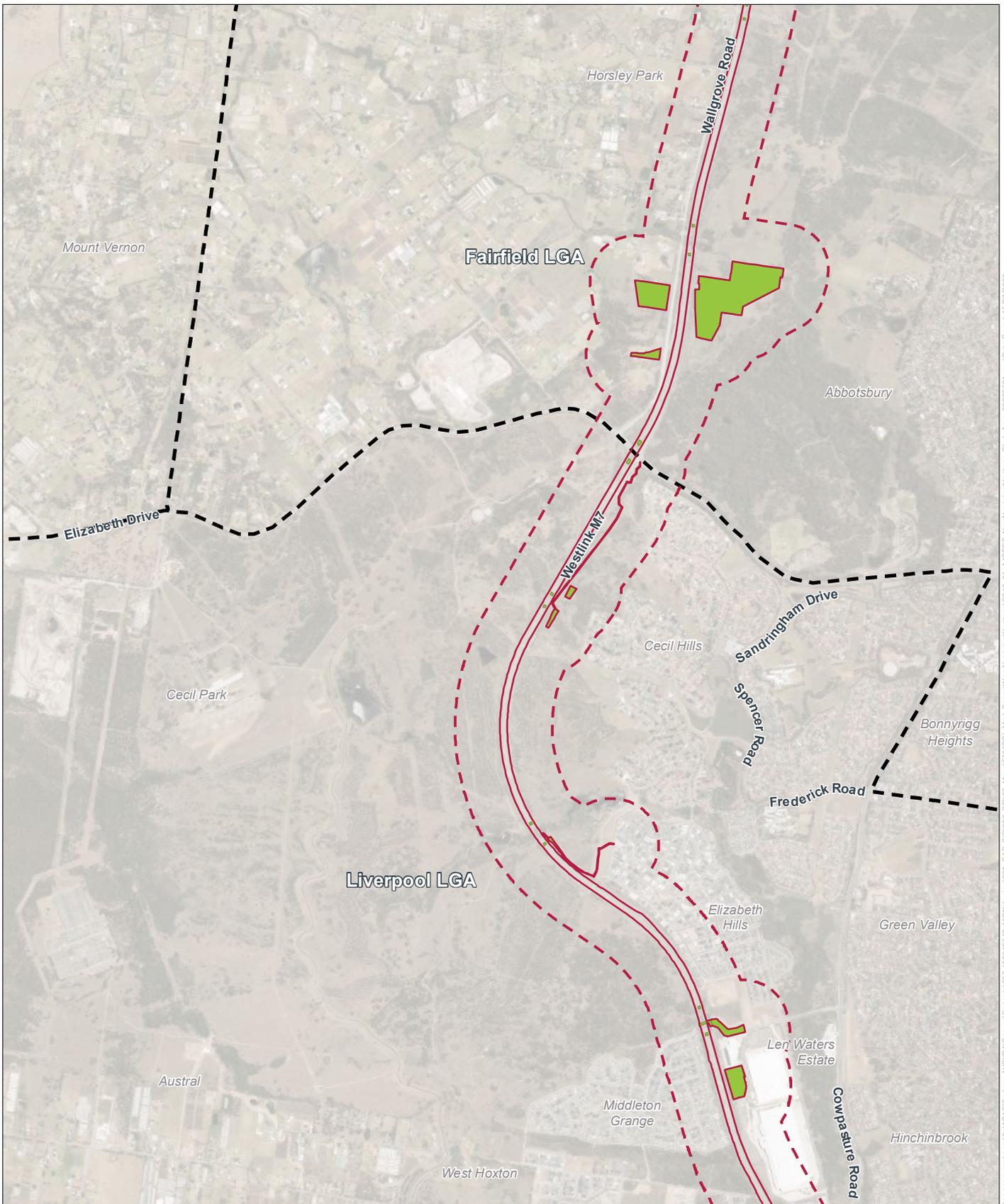


FIGURE 3-2: NON-ABORIGINAL HERITAGE STUDY AREA
(SHEET 2 OF 5)



Legend

- Construction footprint
- Study area
- Construction compound
- LGA boundary

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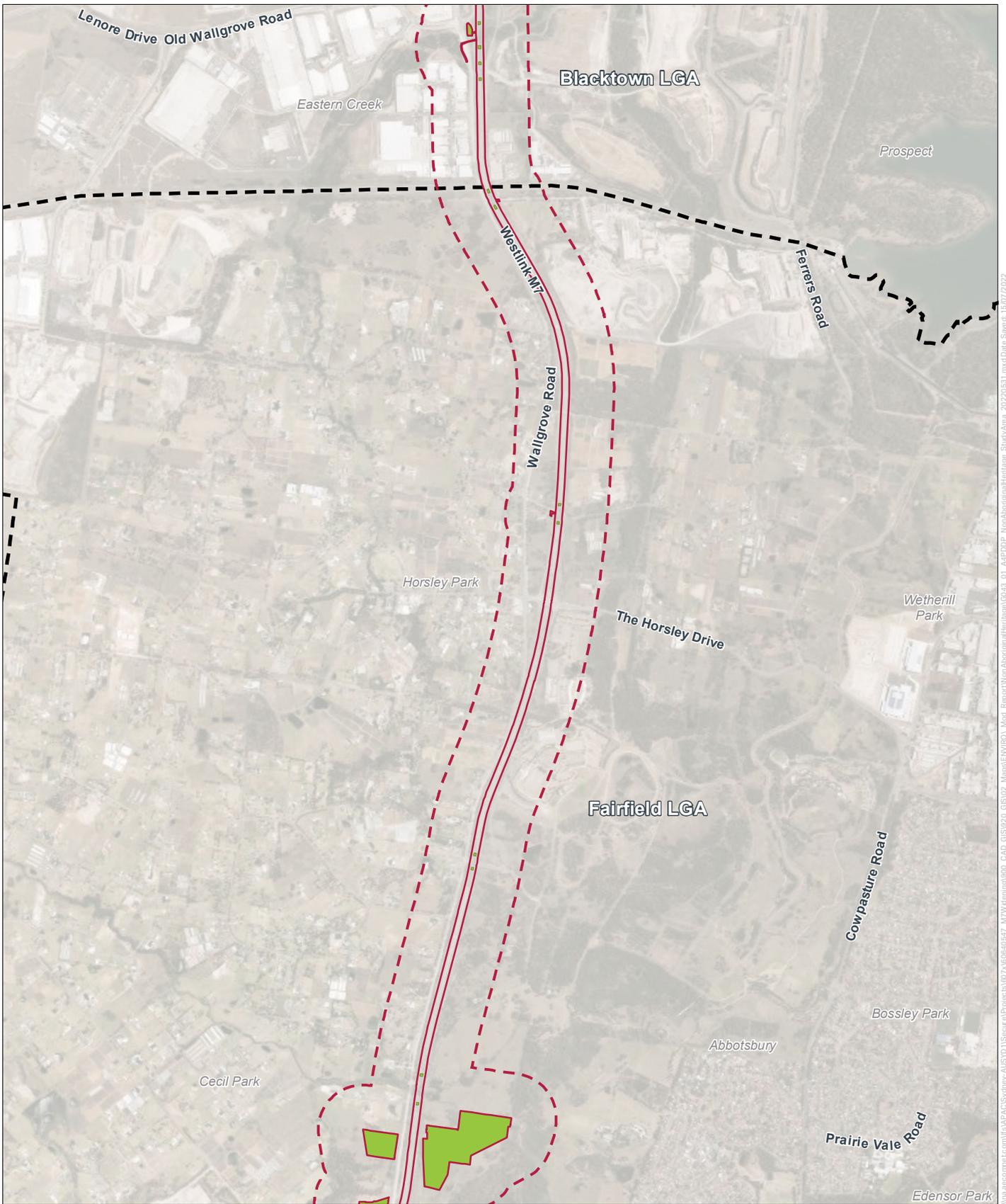
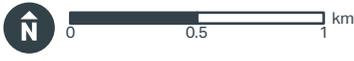


FIGURE 3-3: NON-ABORIGINAL HERITAGE STUDY AREA (SHEET 3 OF 5)



- Legend**
- Construction footprint
 - Study area
 - Construction compound
 - LGA boundary

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FIGURE 3-5: NON-ABORIGINAL HERITAGE STUDY AREA (SHEET 5 OF 5)



- Legend**
- Construction footprint
 - Study area
 - Construction compound

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3.2.2 Cumulative impact assessment

A cumulative impact assessment has been undertaken for both construction and operation, to assess the potential cumulative impacts of the proposed modification with other projects in the area. This was undertaken based on a screening of other nearby projects to determine those that have the potential to cause cumulative impacts. The screening took into account projects that have been approved but where construction has not commenced and projects that have commenced construction. The screening process is described further in **Section 7.18** (Cumulative impacts) of the modification report.

The cumulative impact assessment was based on the residual impacts of the proposed modification (i.e. those that are expected to exist after application of management and mitigation measures).

3.2.3 Assumptions and limitations

The purpose of this report is to identify and assess historic heritage and archaeological potential that might be impacted by the proposed modification. Predictions have been made within this report about the probability of subsurface archaeological materials occurring within the construction and operational footprints of the proposed modification, based on surface indications and environmental contexts. However, it is possible that materials may occur in areas without surface indications and in any environmental context. Should subsurface archaeological materials not anticipated in this assessment be uncovered during construction, these would be addressed in accordance with an Unexpected Finds Procedure developed for the proposed modification for use during construction.

This report is based on the concept design and is subject to detailed design. It is noted that during detailed design, details of the proposed modification may change or be refined. Further heritage assessment would be required to assess the potential additional impacts to heritage during detailed design.

A summary of the statutory requirements regarding historical heritage is provided in **Section 3.1**. The summary is provided based on the experience of the authors with the heritage system in Australia and does not purport to be legal advice. It should be noted that legislation, regulations and guidelines change over time and users of the report should satisfy themselves that the statutory requirements have not changed since the report was written.

4.0 Existing environment

This section provides a description of the existing environment as it relates to non-Aboriginal heritage.

4.1 Historical context

In order to appreciate the heritage significance of an item, it is important to understand the historical context in which it developed and the subsequent factors that have influenced its development.

The following sections discuss the historical background of the items potentially impacted by the proposed modification during construction.

4.1.1 Early European settlement

Blacktown - The Blacks Town

In 1814 William Shelley, a trader and former London Missionary Society Missionary, wrote to Governor Macquarie with a proposal to educate Aboriginal people. Macquarie sent a letter to his superiors in England on 10 December 1814, outlining his intention to create the Native Institute in a 15 point plan:

"...to effect the Civilization of the Aborigines of New South Wales, and to render their Habits more domesticated and industrious... producing such an Improvement in their condition as may eventually contribute to render them not only more happy in themselves, but also in some Degree useful to the Community, has determined to institute a school for the Education of the Native Children of both sexes and to assign a Portion of land for the Occupancy and Cultivation of adult Natives" (Macquarie, 1814).

Originally opened as the Paramatta Native Institution at Parramatta in January 1815 and run by William Shelley, it was relocated the following year to South Creek, on Richmond Road (west of Parramatta), the location of which would later be known as Black Town (Brook & Kohen, 1991).

In 1823, George and Martha Clarke, Church Mission Society (CMS) missionaries originally bound for New Zealand, took up position as managers of the Blacktown Native Institution (Brook & Kohen, 1991). Initially, a few sheds had been constructed to house the Clarkes and the 14 children in their care, with a more substantial building not due for completion for another six months. The students dug gardens, the boys were taught agricultural skills and the girl's taught needlework, along with reading, writing, and Christian studies (Attenbrow, 2010). Sunday services were performed by Clarke as acting chaplain for the settlement, which included a Maori man living at the settlement acting as the Clarke's servant (Brook & Kohen, 1991). In October 1823 the Mission House had been completed with room to house at least 60 children. The Mission House had four bedrooms on the upper floor, whilst the ground floor had two large rooms, four small bedrooms, two outer apartments for servants, and a veranda (Brook & Kohen, 1991). There was also a detached kitchen, coach house, and stable. In 1823, an assistant schoolteacher, John Harper, was also appointed and presumably took care of the children following the Clarke's departure to New Zealand in February 1824 (Godden Mackay Logan Pty Ltd (GML), 2018).

In 1824, Governor Brisbane reorganised the administration of the institution, dismissing the committee and placing the school under control of Reverend William Walker, a Wesleyan Methodist.

"...when the Native Institution was dissolved, the children were divided, and the boys placed under the care of the Rev. R. Cartwright, and the girls under the care of the Rev. W. Walker; that Government allowed £20 a year for the support of each child that belonged to the Institution; and has engaged to advance £5 a year, more for every other child afterward taken under the tuition of either of the Reverend Gentlemen. At present, we believe, Mr. Walker has 8 or 9 under his charge, for which he receives from Government £140 a year: the children also receive a weekly ration from His Majesty's stores" (Sydney Gazette and New South Wales Advertiser, 1825:3).

The end of 1824 saw Brisbane close the institution altogether, amalgamating the Native and Orphan Schools and placing Walker and his wife in charge of the Female Orphan Institution in Parramatta (Brook & Kohen, 1991).

In May 1825, Archdeacon Scott proposed the reopening and repair of the Blacktown schoolhouse. By December, Anglican CMS missionary William Hall and his wife were given control over the re-opened

school after spending the last 10 years teaching Maoris in New Zealand. They moved with their three children and brought with them three Maori children who acted as their servants. By late 1827, there were 17 Aboriginal and five Maori pupils at the school, although this was still below the institute's capacity of 60 children (Brook & Kohen, 1991). During the operation of the school, records show that not only was it difficult in acquiring student enrolments, but the children frequently absconded or were removed by their parents, rebelling against the institute's purpose:

"An institution for instructing the natives was some time in existence, and grants of land were made for them; houses built and rations served to induce them to cultivate, but all of no avail - the children, on leaving the institution taking up their old wandering calling through the forest as usual" (The Australian, 1827:4).

In light of these difficulties, and the rising cost of the institute's operation, Archdeacon Scott recommended its closure in 1829, and the remaining children were removed to Cartwright's school in Liverpool. Following his resignation from the Male Orphan School, Cartwright took charge of 10 remaining children at his premises for £250 per annum, however it was at this time that the school began to deteriorate (Brook & Kohen, 1991). Hill brought Cartwright's 500 acres of land at the 'Black Town' in April 1829, where he constructed a cottage and set up a small boarding school that his family ran until the late 1870s (Godden Mackay Logan Pty Ltd (GML), 2018).

In 1831, Hall wrote to the new Archdeacon Broughton and mentioned that the 'house formerly built for the instruction of the Aboriginal Natives' was in disrepair, the rain had 'brought down the ceiling in many places' and the roofing shingles were 'entirely rotten' (Brooks and Kohen, 1991). In 1833, the Blacktown Native Institution was advertised for sale:

"...will put up to AUCTION...the HOUSE and PREMISES at Blacktown, built for the instruction of the Aboriginal Natives, and lately occupied by Mr. WILLIAM HALL, together with the Allotment of Land on which the same stands measuring 29 acres, 2 roods, and 24 perches" (McLeay, 1833:484).

The land was sold off several more times over the years until 1924, when the house was destroyed by a fire. At the time of the fire, the house was described as 'old but in good repair and well kept' (Nepean Times, 1924:7). From 1955 to 1982, the site was used as a dairy farm and a fibro cottage was built over the ruins of the former institute. The Land Commission NSW purchased the site in 1982 and demolished the fibro cottage in 1985, subdividing the site and adjoining land into acreage allotments for housing development that never eventuated.

By 1986, the preservation of the Blacktown Native Institution became a high priority for the Dharug Aboriginal Land Council, with archaeological investigations identifying within the boundaries of the original site the footings of the institute building, a contact site, and a pre-contact camp (Bickford, 1981). In 2002, the site was listed on the Blacktown City Council LEP and a conservation management plan was commissioned. In 2011 it was listed on the NSW State Heritage Register, and in 2018 the NSW State Government handed the land on which the Blacktown Native Institution was built, back to the Dharug Aboriginal People (Figure 4-1).



Figure 4-1 Site of the former Blacktown Native Institution looking east toward Westlink M7 (Heritage NSW)

Rooty Hill Government Farm

Sometimes referred to as the Government Depot Site, this government run stock farm was located on land originally set out by Governor King on the 'Rooty Hill' Pastoral Run' but constructed by Governor Macquarie. Built and modified between 1810-1822 it consisted of a two-storey brick structure with 38,728 acres attached. The structure is sometimes referred to as the superintendent's cottage or Government House (Knox & Partners Landscape Architects, 2003; 16). It served as a stock farm with a boundary at the present-day City of Blacktown perimeter. The original structure onsite also served as the Superintendent's residence with a suite of rooms reserved for Governor Macquarie's use (Heritage NSW, 2006a).

The farm drew water from nearby Angus Creek and Eastern Creek. The farm was worked by convicts with at least one principal overseer and a superintendent who ran the government stock reserves. The complex held stockyards for grazing cattle and horses, which Macquarie had redeveloped in 1813 from the original Rooty Hill stockyards. By 1815, the residence was constructed (Figure 4-2). The house was located at the foot of the Rooty Hill (ruins still present) and consisted of a hand-made brick structure with a shingle roof and timber and mud/lime plaster. By 1822 there were four paddocks of 50 acres each near the cottage, used for grazing, growing wheat and maize. There were also temporary log huts erected for stock keepers and convict labour (Knox & Partners Landscape Architects, 2003:17).

In the early 1820s the size of the Rooty Hill reserve was reduced through private grants to settlers on its perimeter though the stock farm continued. By 1822, Governor Macquarie notes the Rooty Hill Stock Farm consisted of approximately six thousand acres. Following Macquarie's departure from the colony, it was also maintained under Governor Brisbane, still using convict labour.

However, by 1827 the importance of the farm seems to have decreased, with more land distributed to private grantees and approximately half the number of convicts working the remaining land. In December 1828, the Government Depot was closed by Governor Darling and granted the land to the Trustees of the Church and School Corporation in 1829. However the land reverted to the government in 1832 and was leased out for grazing cattle (Knox & Partners Landscape Architects, 2003:17).



Figure 4-2 Rooty Hill Government Farm residence of the Superintendent of the stock farm, also known as “Thornleigh House” (Source: Blacktown City Council Libraries. Blacktown Memories; Ref. no. 004792)

In 1865 the Rooty Hill Government Stock Farm was offered for sale. The 333 acres were acquired by Charles McKay forming part of his estate and north of the railway was purchased by Walter Lamb. The actual hill at Rooty Hill was used for general farming and grazing by McKay and subsequent owners. Walter Lamb used his portion to breed cattle though drought from 1875-76 caused him to sell horses and cattle, resorting to fruit-growing and canning. This spread across the Rooty Hill area and was one of the principal agricultural products in the 1880s. The cottage became privately owned when the run ceased. By the 1960s it was in a ruinous state and was demolished (Knox & Partners Landscape Architects, 2003:18). Currently the whole site is overgrown and any historic structures in a ruinous state (Heritage NSW, 2006b).

The Horsley Drive

In 1805, Lieutenant Colonel George Johnston of Annandale was granted 2,000 acres of land by Governor King for his part in putting down a convict uprising in the previous year at Vinegar Hill (exact site unknown but considered to be close to present Rouse Hill/Mungerie Park). He named the land 'Kings Gift' (Yarwood, 1967). Johnston died in 1823, leaving behind three sons and four daughters. Johnston left the property to his daughter Blanche, who in 1829 married Captain George Weston of the East India Company Army at St James Church, Sydney (Clive Lucas Pty Ltd, 1982). The family moved onto the Kings Gift property, which Weston renamed 'Horsley' after his birthplace in Surrey, England. The homestead was built in 1832 (Figure 4-3) (The Cumberland Argus and Fruitgrowers Advocate, 1899:12).

Blanche Weston lived at Horsley until her death in 1904 at the age of 98 years, leaving behind two married daughters and her eldest son. In 1905 the Horsley estate was put up for sale. The Sydney Morning Herald listed the property as consisting of 2,045 acres, noting that 'the water canal forms a boundary at one end' after a portion of land was resumed in the 1870s for the development of the Upper Canal (The Sydney Morning Herald, 1905: 21). In 1928, the new owner, George Sydney Vicars, sold the eastern portion of the Horsley estate, including that portion of the main drive, and began subdividing for small rural lots. The drive was part of that subdivision and became The Horsley Drive.



Figure 4-3 Main drive to Horsley homestead, Horsley Park, lined with Bunya Pine (Fairfield City Council Heritage Collection, Item 8151595)

Today, The Horsley Drive is a sealed arterial road running from what remains of the driveway at the edge of the Horsley property across the Westlink M7 to Cowpasture Road, with a modern extension that runs through Western Sydney Parklands to Lansdowne, thereby supplying crucial motor links to and from the Westlink M7. The only reminder of the road's former purpose is a large Bunya pine on the north western corner of The Horsley Drive and Cowpasture Road, marking the former entrance to Horsley homestead (Figure 4-4).



Figure 4-4 Bunya pine marking entrance to "Horsley", corner of The Horsley Drive and Cowpasture Road (Google Maps)

“Judge’s Hill”, Elizabeth Drive

The Westlink M7 crosses Elizabeth Drive at Cecil Park. A grant of 2,000 acres was made to the Deputy Judge-Advocate, John Truro Wylde in 1817. A separate grant of 1,120 acres was made to his father, Thomas Wylde, who was appointed a Solicitor to the Crown in 1819. John Wylde named his grant “Cecil Hills”, while Thomas Wylde named his “Macquarie Farm”. Both parcels are located on elevated land, which drops away to the east (Figure 4-5). Although neither lived on their properties, the hill became known locally as “Judges Hill”.

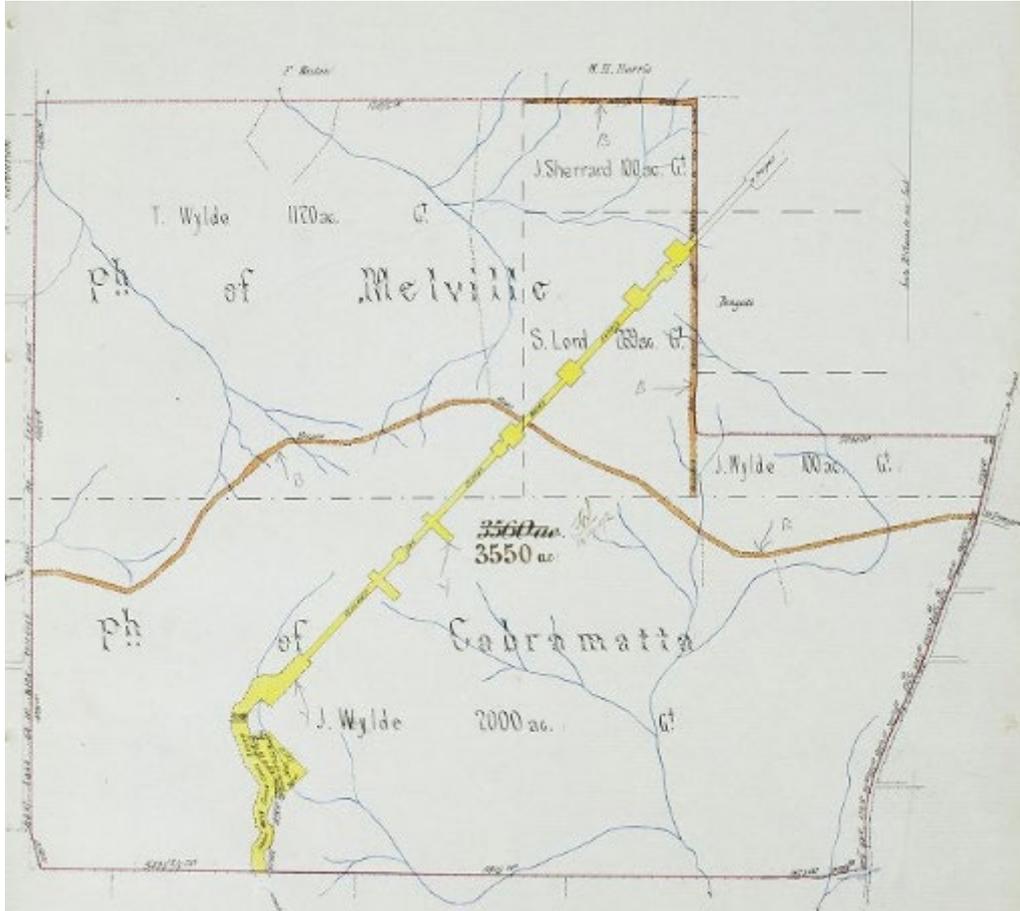


Figure 4-5 Map attached to Certificate of Title Volume 1068 Folio 162 showing Elizabeth Drive (then known as Orphan School Road) and the Cecil Hills tunnel portion of the Upper Canal System. Also note John Wylde’s 2,000 acres “Cecil Hills” Grant and Thomas Wylde’s Macquarie Farm (Courtesy: Historical Land Records Viewer, File No. 1068_162_03.jp2)

Thomas Wylde died in 1821, leaving his property to his son John, and the Macquarie Farms parcel was absorbed by the Cecil Hills property. Further grants to John Sherrard and Simeon Lord were also later added to the Cecil Hills property by Wylde Cecil Hills stayed in the Wylde family until the late 1890s, after which it was subdivided.

In the late 19th/early 20th century the village of Cecil Park, located to the immediate west of the Westlink M7 where it intersects with Elizabeth Drive, had a school, a school master’s residence, a church and post office. The school, Cecil Park Public School, and its residence were constructed circa 1898. To the east of the school, the School Church of St Paul was constructed in 1902, and between the school and the church a post office was erected in 1906. To the north of the school, a public hall was constructed in 1942. On the next block east (on the other side of Wallgrove Road) stood a store owned by George Shipley. The hill, formerly known as Judge’s Hill, became known as ‘Shipley’s Hill’. Collectively, these buildings represented the civic centre of Cecil Park. None of these buildings survive, although archaeological investigations undertaken in 2019 as part of the non-Aboriginal heritage investigations for the M12 Motorway project uncovered remains associated with the school, the residence, and the

post office. Foundations associated with the former public hall are still above ground on site (NSW Roads and Maritime Services, 2019: 121-131, 146-149).

Cecil Hills remained as a semi-rural area, predominantly with small agricultural properties, until the late 20th century/early 21st century, when the new residential development of Cecil Hills was constructed. Cecil Park remains a semi-rural area.

Upper Canal System

Constructed between 1880 and 1888, The Upper Canal System forms a part of the Upper Nepean scheme, supplying water to Sydney since its construction. The Upper Nepean Scheme was Sydney's fourth water supply system, consisting of two diversion weirs in the Upper Nepean River Catchment, located at Pheasant's Nest and Broughton's Pass, with water feeding into a reservoir at Prospect through a series of tunnels, canals, and aqueducts known as the Upper Canal. The 64 kilometre long Upper Canal remains the only way of transferring water from the four major Nepean dams, Cataract, Cordeaux, Nepean and Avon rivers, into the Prospect Reservoir. The Upper Canal uses no energy other than the earth's natural gravity to transport the water.

In 1867, fresh water had become scarce due to Sydney's population growth and recent recurring dry seasons. That year the government established a special commission to address the pressing need for a more reliable and larger water supply than the existing Botany Swamps (Higginbotham, 2002). In 1869 the commission reported in favour of the Upper Nepean Scheme; however, no decision was made for six years, during which time a number of alternative proposals were in circulation (Henry, 1939). In 1877 the government requested the independent opinion of English civil engineer W. Clark; he was brought out to the colony from England and engaged in reviewing the various proposals. After reviewing eight schemes, Clark strongly endorsed the Upper Nepean Scheme as it would provide water at the least expensive rate, with the best capacity for future development (Henry, 1939).

As work commenced in 1880, each section profile was built using a variety of materials depending upon the nature of the landscape in which it was to pass through (Higginbotham, 2002). In areas of soft ground, V-shaped sections were cut and lined with sandstone slabs and sometimes shale. In areas of harder ground, U-shaped sections were dug and lined with sandstone or left unlined if cut into solid rock. Tunnels were excavated where the canal had to go under a hill and were lined with brick or stone unless they were cut through solid rock, in which case they were also unlined. Tunnels in excess of 670 metres required air shafts for ventilation, including one capped with a cylindrical brick sandstock brick structure and an iron/steel cover, located in the median of the M7 at Cecil Hills (No. 4 Shaft, within study area) (Edward Higginbotham & Associates Pty Ltd, 2002:Volume 2, 65). Where creeks or large depressions lay, the canal crossed in wrought iron syphons that rested upon stone piers. In some locations, concrete was used to line the canal walls (Stedinger Associates Pty Ltd, 2013).

Throughout the 19th and early 20th centuries, the Upper Nepean Scheme water supply was managed by a resident engineer first housed at Prospect Reservoir and later Potts Hill and Pipe Head. Care and maintenance were provided by maintenance men and inspectors who were positioned along the canal in cottages owned by the Water Board. This system was later phased out in the 20th century in preference for mobile teams. Valve controllers were responsible for the discharge of water along the system, housed at the weirs and Prospect Reservoir. By 1898 a telephone line had been installed along the length of the Upper Canal and was an essential element in controlling the scheme.

Additional design features were added to assist in controlling water flow within the canal. These included multiple flumes, aqueducts, coping drains, stop logs, sluice gates, and wrought iron inverted syphons (Stedinger Associates Pty Ltd, 2013). Flumes in particular were constructed to prevent storm water runoff, polluted with animal and other wastes, from contaminating Sydney's drinking water. Originally, the flumes were constructed using timber, however they were gradually replaced, first with wrought iron, and later by concrete flumes (Higginbotham, 2002). The sides of the canals were subjected to regular cleaning, with some lengths patched and relined by the 1900s.

Access to the Upper Canal was initially provided by an extensive dirt track that ran alongside the canal as an access road. At bridges, road crossings and maintenance cottages, gates were installed to restrict access to the road. Bridges over the canal carried major roads, and occupation bridges allowed property owners access between their land holdings where it had been cut by the canal. Large creeks were not bridged until 1935-1936 (Higginbotham, 2002). In the 20th century, only minor work was required to bring the Upper Canal to its current 150 million gallon per day capacity, including

replacement of rough areas of the canal and tunnels with concrete to improve water flow. In the 2000s, a range of works were undertaken to prevent or minimise the impacts of coal mining subsidence including propping and repairs to aqueducts and unstable sections of the canals. During this time trash racks at the tunnel and aqueduct portals were also replaced, and safer working conditions led to the installation of new safety railing at various points along the canal system (City Plan Heritage, 2019).

The Upper Canal is listed on the State Heritage Register as the “Upper Canal System” under the *Heritage Act 1977* (NSW), and includes the entire length and area of the Upper Canal corridor and all related water supply components.

The Cross Roads

The Cross Roads is a locality near the interchange of the Westlink M7 and M5 Motorway in Casula. The history of its name is unclear; however historical records show that it was noted on parish maps by 1834, known locally as ‘The Cross Roads’ by 1874, and gazetted as the locality ‘The Cross Roads’ by the Department of Lands, Sydney on 23 May 1975 (Pearce, 1975:8; Miller, 1975). Today it is an elevated entry point where Campbelltown Road originates from Camden Valley Way (previously Cowpasture Road), and an enclosed locality boarded by Campbelltown Road, and the Hume Motorway.

Post-contact land use within the Parish of Minto begun through the distribution of land grants in 1810s, characterising the area with large properties of prominent landowners from the colony and largely agrarian in nature. At this time, Governor Macquarie had founded Liverpool in 1810 and Campbelltown in 1820s with major roads and transport links from Sydney under construction (Tanner Architects, 2010). Historical research suggests the site of the modern ‘Cross Roads’ was located across two major estates, the “Glenfield” estate, granted to Charles Throsby, and “Parkers Farm”, granted to Charles Parker. The land surrounding these estates were granted to James Meehan and Henry Kitching.

Dr Charles Throsby arrived in New South Wales as a surgeon aboard the transport ‘Coromandel’ in 1802 and went on to have a career as Assistant Colonial Surgeon, Magistrate, and explorer (Johnson, 2007). He spent four years as commandant in Newcastle where he established grazing areas before resigning in 1809. He was granted 950 acres of land, which had grown to 1,030 acres by 1834 that straddled both sides of the Main Southern Road (later the Hume Highway). Throsby’s land fell into both the Parish of Minto and St Luke’s, which he named ‘Glenfield’ after his birthplace in England (Mayne-Wilson, 2002). The homestead was located on the eastern portion of his land between 1810-1817, on a ridge that overlooked Holsworthy fields at Casula. Charles Parker had established ‘Parkers Farm’ on his 300 acre land grant by 1817, in the area now known as Edmondson Park and in which the Hume Motorway runs through. Up until 1919 part of his land was occupied by the Rolf family, and 13 acres were occupied by the army during World War II.

In 1833, the Talbot Inn was established at the junction of Campbelltown Road and what was then Cowpasture Road (later Camden Valley Way). Historical records, including gazetted parish roads and ecclesiastical jurisdiction notices, indicate that by the 1880s, it was known as the Crossroads (Cross Roads) Hotel (Abbott, 1884; Naughton, 1890). It is not a registered heritage site.

Despite its long non-Aboriginal history, there are no heritage items in the vicinity of this section of the Westlink M7. The closest heritage item is one of 10 original sandstone milestones, located on the eastern side of Campbelltown Road, south of the intersection with Glenfield Road. It is inscribed with the distances to Sydney (24 miles) and Campbelltown (nine miles) on either side in Roman Numerals, however it is interesting to note that Sydney is misspelt, and the distance to Campbelltown has been erased and re-carved.

The intersection at The Cross Roads with Camden Valley Way has undergone substantial redevelopment and upgrading in the late 20th century. Due to its elevated position, The Cross Roads retains clear views over the surrounding area, highlighting its importance as a junction towards Campbelltown and the Hume Highway, or south west towards Camden and Bringelly, and the South West Growth Centre along Camden Valley Way. Aerial images indicate that the area was open pastoral lands with scattered trees for most of the 20th century, however the intersection has developed from a single carriageway to multiple lanes and signalisation with a gradual accumulation of built form (Taylor Brammer Landscape Architects, 2013). Today, The Cross Roads is largely the site for large retailers including a wholesaler, a hardware store, a super centre, and the Cross Roads Hotel.

4.1 Literature review

Archaeological Survey of the proposed Western Sydney Orbital from West Baulkham Hills to Cecil Park, Part A: Non Indigenous Heritage, Robynne Mills Archaeological and Heritage Services, 1999.

Archaeologists at Robynne Mills Archaeological and Heritage Services were commissioned to carry out a preliminary heritage assessment within the route for the proposed Western Sydney Orbital in 1995. The assessment involved an initial survey to identify areas of heritage sensitivity and make recommendations for further investigations where appropriate. The proposed orbital route ran from the terminus of the M2 Motorway, West Baulkham Hills to Elizabeth Drive, Cecil Park, a distance of 28 kilometres, with a proposed interchange at Richmond Road. At the time of the preliminary heritage assessment the proposed orbital was not a tolled motorway, but a four-lane dual carriageway.

During archival investigations, 34 items of heritage significance were identified within the vicinity of the proposed orbital route across multiple local government areas. Two pedestrian surveys were performed in 1995 and 1996, with additional investigations undertaken at Symonds Road, Dean Park and by Casey and Lowe at Pearce's Farm, Seven Hills. During the preliminary survey, 11 sites were identified as areas of possible heritage significance including one burial site, seven standing structures, and three archaeological sites. Of these, four sites were assessed as having a high heritage significance, including Meurants Cottage (SO-E-10), a section of original pavement of Old Windsor Road (SO-E-8), Pearce's Cemetery (SO-E-5), and an archaeological site with structural remains and exotic trees (SO-E-4). Two sites, a possible burial (SO-E-2) and the foundations of a former Royal Australian Air Force (RAAF) base (SO-E-9) were identified as having moderate heritage significance, and four sites were assessed as having low significance (SO-E-1, SO-E-3, SO-E-6, SO-E-7).

Following the assessment of heritage significance, further investigations were undertaken, particularly at the site of a possible burial (SO-E-2) to establish whether or not the site is indeed a burial and attempt to identify who may be interred there. Minimal field excavations were carried out, which raised questions of the site's integrity as the evidence suggested it was a dumping ground for monumental mason materials. Further sub-surface investigations were recommended to determine the presence or absence of skeletal material.

Reported conclusions included the recommendation for assessment and recording of SO-E-1, SO-E-3, and SO-E-7. SO-E-6 was fully assessed and recorded by Casey and Lowe, with subsequent approval from NSW Heritage Council for its removal from the motorway corridor. Due to the presence of both European and Aboriginal cultural heritage, SO-E-4 was recommended for an historical research program including further survey and excavation. SO-E-10 was outside of the proposed impact zone, but caution was advised so no indirect impacts during construction could occur. SO-E-5 was also outside of the impact zone, but only when assessed under a possible route realignment. SO-E-8 was within the immediate impact zone, however, the Norwest Boulevard option would remove this threat along with further recommendations for future management suggested by that report.

It was concluded, that as a result of the findings in that report, that 'there is no archaeological reason why the proposed development should not proceed', providing their recommendations were adhered to.

Edward Higginbotham & Associates, Conservation Management Plan for the Upper Canal, Pheasant's Nest to Prospect Reservoir, NSW, 2002

This Conservation Management Plan (CMP) was prepared for the then Sydney Catchment Authority (now Water NSW). It is a three-volume report comprising its history, survey results and heritage significance of the canal, conservation management policies, guidelines and recommendations.

Government Architect's Office, Upper Canal Conservation Management Plan, 2016

This report is an update of Higginbotham's 2002 CMP for the Upper Canal System, prepared for Water NSW.

Jacobs Group (Australia) Pty Ltd, M12 Non-Aboriginal Heritage Assessment Report, 2019

This assessment was undertaken by Jacobs as part of the Environmental Impact Assessment for the M12 Motorway (now approved), linking the Westlink M7 with The Northern Road, with access to the Nancy Bird Walton (Western Sydney International) Airport. The assessment covered the entirety of the footprint, assessing listed and potential non-Aboriginal heritage items that may be impacted by the project.

Jacobs identified 13 listed or potential items of heritage significance within the footprint of the M12 Motorway. They include the McGarvie Smith Farm, Luddenham Road alignment and McMaster Field Station (Elizabeth Drive West), as well as the Fleurs Radio Telescope site, the Fleurs Aerodrome, Exeter Farm Archaeological site and South, Kempes and Badgerys Creek Confluence Weirs Scenic Landscape (Elizabeth Drive East).

In addition, the Cecil Hills Tunnel portion of the State-heritage listed Upper Canal System (Pheasants Nest Weir to Prospect Reservoir) and the former Cecil Hills Public School, Post Office and Church site were identified at the intersection of Elizabeth Drive and the Westlink M7. It was noted that the canal is located in a brick-lined tunnel approximately 32 metres below the ground surface. The brick-lined Tunnel Shaft 4 for the Cecil Hills Tunnel is located within the existing Westlink M7 central road median, approximately 300 metres north of Elizabeth Drive (Figure 4-6). The shaft is noted as 33.8 metres deep and one of seven shafts along the Cecil Hills tunnel (Jacobs, 2019:88). As there are no works required to the Westlink M7 central road median for the M12 Motorway, no impacts were expected to this shaft for the construction and operation of the M12 Motorway (Figure 4-7).

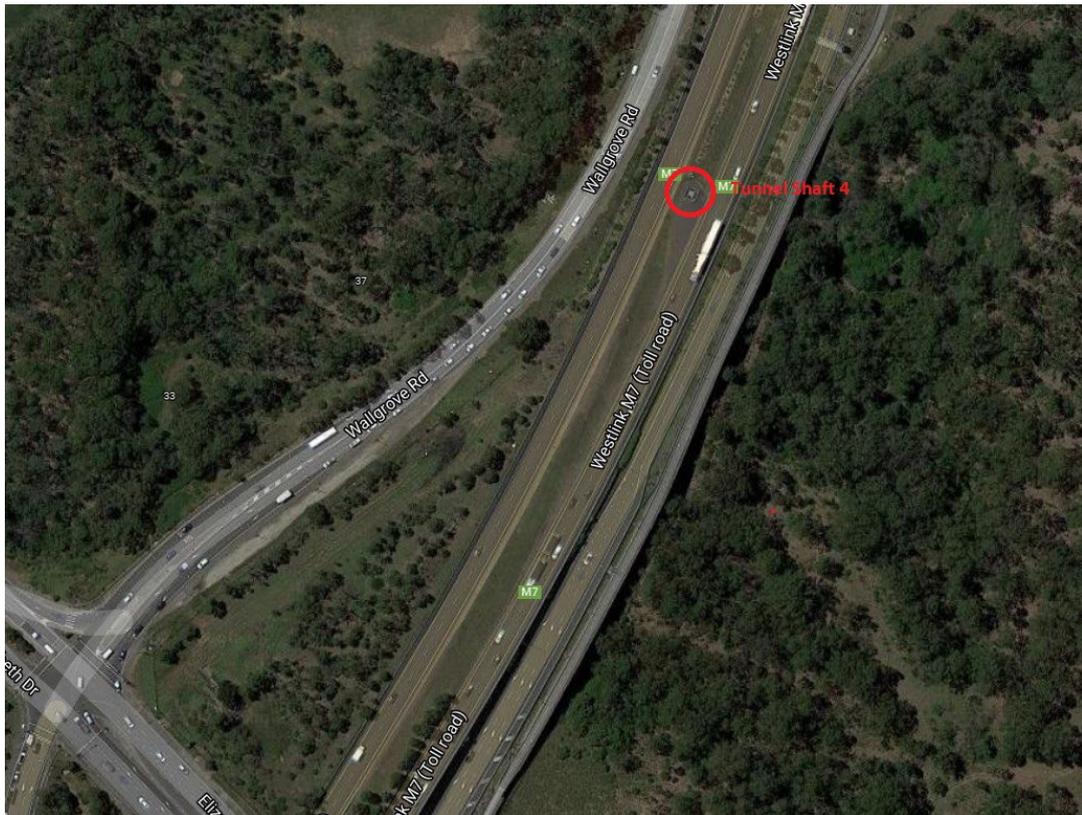


Figure 4-6 Location of Tunnel Shaft 4

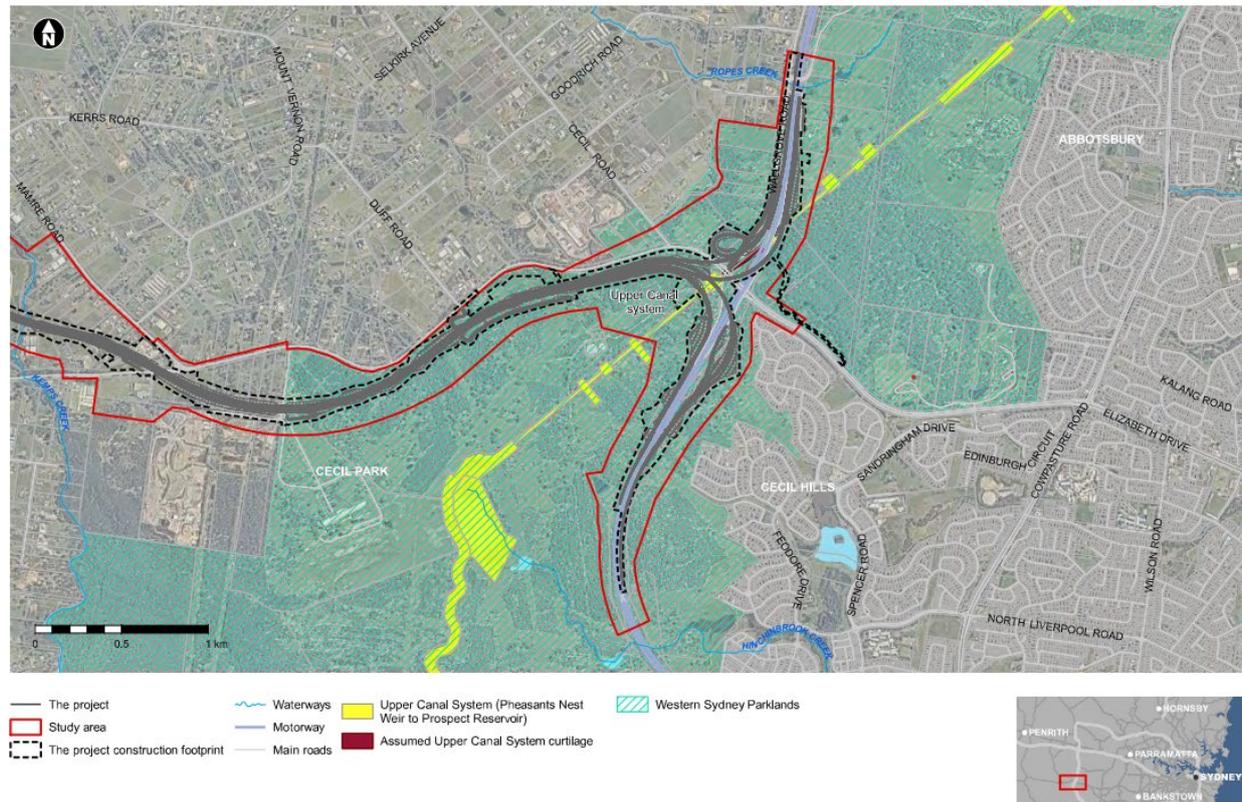


Figure 4-7 Location of Upper Canal System in relation to the Westlink M7 and the approved M12 Motorway (Jacobs, 2019: 166)

However, owing to the high significance of the Upper Canal System, it was recommended that conservation policies in the CMP for the Upper Canal System be incorporated into a Construction Cultural Heritage Management Plan (CCHMP).

The former Cecil Park Public School, Post Office and Church site are located on the northern intersection of Wallgrove Road and Elizabeth Drive, adjacent to the Westlink M7. As noted above, these buildings represented the civic centre of the village of Cecil Park and were assessed as having archaeological potential. The site of the former Cecil Park Public Hall was also identified on Wallgrove Road, approximately 160 metres north-east of the former church site.

In 2019 test excavations were undertaken on the site, which confirmed the site school and other buildings. It was recommended that further archaeological salvage excavation be undertaken to provide insights into the changing layout of the historical complex.

4.2 Recorded heritage items

A search of the study area shows the following recorded heritage items as outlined in Table 4-1. Identified heritage items are shown on Figure 4-8. No items are recorded on the World Heritage List (WHL), National Heritage List (NHL), Commonwealth Heritage List (CHL) or Register of National Estate (RNE) in or within the vicinity of the study area.

Table 4-1 Recorded heritage items within and adjacent to study area

Item	Address	List	Proximity to construction footprint
Upper Canal System (Pheasants Nest Weir to Prospect Reservoir)	Various	State Heritage Register (SHR 1373)	Within
Blacktown Native Institution	Richmond Road, Oakhurst	State Heritage Register (SHR 1866)	Adjacent
Government Depot Ruins	Dunsmore Street, Rooty Hill	State Heritage Register (SHR 0345)	80 metres
The Rooty Hill	Eastern Road, Rooty Hill	State Heritage Register (SHR 01756)	>50 metres
West Fairfield Reservoir (WS 0137)	92 Villiers Road, Cecil Park	Sydney Water s170 heritage & conservation register (4575816)	Over 250 metres (outside of the study area)
Archaeological site – Native Institute Site	Richmond Road, Oakhurst	Blacktown LEP 2015 (Archaeological Item) A121	Adjacent
Archaeological site – Ruins (former Government Depot site)	Dunsmore Street, Rooty Hill	Blacktown LEP 2015 (A123)	80 metres

4.3 Site inspection

A site inspection was conducted by AECOM Principal Heritage Specialist, Luke Wolfe on 16 September 2021. The site inspection was conducted within the study area, including the area outside of the Westlink M7. One heritage item is located within the construction footprint, the Upper Canal System, which passes beneath the M7 near Elizabeth Drive (see Figure 4-8). This section of the Upper Canal System is a tunnel, known as the “Cecil Hills Tunnel” and therefore not visible from the surface. The only visible feature that indicates the location of the tunnel is the concrete portal entrance installed when the Westlink M7 was originally constructed.

Three heritage sites located within the study area were surveyed as part of this assessment, being the Rooty Hill Historic Heritage Site, the former Government Depot and the Blacktown Native Institution Historic Site.

4.3.1 Upper Canal System

As noted above, the one heritage item that crosses the Westlink M7 within the construction footprint is the Upper Canal System. The Cecil Hills Tunnel passes beneath the M7 travelling south west to north east (Figure 4-8). It is owned by Water NSW and was not accessible as part of this heritage survey. The visible air shaft feature, a concrete portal entrance, is located in the median of the Westlink M7 (Figure 4-9).



Figure 4-9 View of the modern shaft entrance above the Upper Nepean Canal tunnel located in the median of the Westlink M7 (looking west from the southbound lanes of the Westlink M7) (Source: Google Maps, 2021)

4.3.2 Rooty Hill Historic Site

The Rooty Hill Historic Heritage Site is a prominent hill that gave the area its name. A sports field is located on its south eastern slope and the remainder comprises of a large, grassed public open space (Figure 4-10).



Figure 4-10 Portion of the Rooty Hill Historic Site looking towards the Westlink M7 (view to the north west from existing car park, with the hill in the background)

4.3.3 Former Government Depot

The former Government Depot is located on the northern slopes of the Rooty Hill, between Dunsmore Avenue and Eastern Road. It is located to the west of the Westlink M7.

The former Government Depot archaeological site is currently vacant, grassed land with a stand of trees and shrubs in its centre, marking the location of the former Government Depot buildings, later known as “Thornleigh House” (refer Figure 4-11). The land is fenced and although is State-owned land, its current tenure is uncertain and therefore was not inspected.



Figure 4-11 The Former Government Depot site, looking south from Dunsmore Avenue towards the Rooty Hill Historic Site and Eastern Road, Rooty Hill (Source: Google Maps, November 2019)

4.3.4 Blacktown Native Institute

The Blacktown Native Institution is located on the western side of the intersection of Rooty Hill Road and Richmond Road. The site is presently an open grassed reserve, with a stand of mature trees near the centre of the site, fenced off from the rest of the area (refer Figure 4-12). There are the remains of a former grain silo to the south west of the heritage listed site, however, this item is not included in the Native Institution listing, and there are no other remains of other former farming items.



Figure 4-12 View of the grassed areas and mature trees on the site of the Blacktown Native Institution (view to west, photograph taken from Richmond Road near the intersection with Rooty Hill Road)

4.4 Significance assessment

4.4.1 Introduction

In order to understand how a development would impact on a heritage item, it is essential to understand why an item is significant. An assessment of significance is undertaken to explain why a particular item is important and to enable the appropriate site management and curtilage to be determined. Cultural significance is defined in *The Australia International Council on Monuments and Sites (ICOMOS) Charter for Places of Cultural Significance 2013* (Australia ICOMOS 2013) as meaning "aesthetic, historic, scientific, social or spiritual value for past, present or future generations" (Article 1.2). Cultural significance may be derived from a place's fabric, association with a person or event, or for its research potential. The significance of a place is not fixed for all time, and what is of significance to us now may change as similar items are located, more historical research is undertaken, and community tastes change.

The process of linking this assessment with an item's historical context has been developed through the NSW Heritage Management System and is outlined in the guideline *Assessing Heritage Significance* (NSW Heritage Office, 2001), part of the *NSW Heritage Manual* (Heritage Branch, Department of Planning, 2001). The *Assessing Heritage Significance* guidelines establish seven evaluation criteria (which reflect four categories of significance and whether a place is rare or representative) under which a place can be evaluated in the context of State or local historical themes. Similarly, a heritage item can be significant at a local level (i.e. to the people living in the vicinity of the site), at a State level (i.e. to all people living within NSW) or be significant to the country as a whole and be of National or Commonwealth significance.

In accordance with the *Assessing Heritage Significance* guidelines, an item would be considered to be of State significance if it meets two or more criteria at a State level, or of local heritage significance if it meets one or more of the criteria outlined in Table 4-2. The Heritage Council requires the summation of the significance assessment into a succinct paragraph, known as a Statement of Significance. The Statement of Significance is the foundation for future management and impact assessment.

Table 4-2 Significance assessment criteria

Criterion	Inclusions/Exclusions
Criterion (a) – <i>an item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area).</i>	The site must show evidence of significant human activity or maintains or shows the continuity of historical process or activity. An item is excluded if it has been so altered that it can no longer provide evidence of association.
Criterion (b) – <i>an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local to area).</i>	The site must show evidence of significant human occupation. An item is excluded if it has been so altered that it can no longer provide evidence of association.
Criterion (c) – <i>an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area).</i>	An item can be excluded on the grounds that it has lost its design or technical integrity or its landmark qualities have been more than temporarily degraded.
Criterion (d) – <i>an item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons.</i>	This criterion does not cover importance for reasons of amenity or retention in preference to proposed alternative.
Criterion (e) – <i>an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area). Significance under this criterion must have the potential to yield new or further substantial information.</i>	Under the guideline, an item can be excluded if the information would be irrelevant or only contains information available in other sources.
Criterion (f) – <i>an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area).</i>	An item is excluded if it is not rare or if it is numerous, but under threat. The item must demonstrate a process, custom or other human activity that is in danger of being lost, is the only example of its type or demonstrates designs or techniques of interest.
Criterion (g) – <i>an item is important in demonstrating the principal characteristics of a class of NSW's (or local area's): cultural or natural places cultural or natural environments.</i>	An item is excluded under this criterion if it is a poor example or has lost the range of characteristics of a type.

4.4.2 Individual significance assessments of listed items

There are four heritage items immediately within or adjacent to the proposed modification in the study area. These include:

- Blacktown Native Institution Historic Site
- Rooty Hill former Government Depot
- Rooty Hill Historic Site
- Upper Canal System.

Where available, the significance assessments have been taken directly from those listed on the State Heritage Inventory (SHI) in Table 4-3, Table 4-4, Table 4-5, and Table 4-6 respectively (minor additions to the SHI entries are in *italics*).

Table 4-3 Significance assessment of Blacktown Native Institution

Significance Criteria	Application of Criteria (Existing Assessment)
Historical significance SHR criterion (a)	<p>For Aboriginal and non-Aboriginal people, the Blacktown Native Institution is an important landmark in the history of black and white relations in Australia. The institution, which operated between 1823 and 1829, reflects the commencement of the historical process of Aboriginal child removal, marking the Colonial Administration's attempts, beginning with Governor Macquarie in 1814, to educate and to assimilate Aboriginal children into white society. More specifically, it reflects a colonial policy featuring a belief that Aboriginal children could be 'civilised' through removal from their culture, and a policy of confining Aboriginal people within settlements remote from European society. For the current Aboriginal community, the site provides a link with an early Aboriginal settlement, known from the 1820s as the 'Black Town'. This is where the first land grants were made to Aboriginal people (Colebee and Nurragingy) and farming allotments were taken up, representing the earliest attempts of Aboriginal people to engage with, and to establish their autonomy within, European society.</p> <p>The Native Institution also represents Indigenous objectives and experiences between 1823-1829, including parents' refusal to accept separation from their children, the children's reluctance to conform with European strictures, their resistance to remaining within the institution and their experience of life within it.</p>
Associative significance SHR criterion (b)	<p>The Blacktown Native Institution is notable for the range of associations it possesses with prominent colonial figures. The Blacktown Native Institution is strongly associated with Governor Lachlan Macquarie. Although the Blacktown Native Institution followed Macquarie's original Parramatta initiative, it reflects the outcomes of his policy towards indigenous people. The site is also associated with Governor Brisbane's attempts to develop colonial policy with respect to the indigenous inhabitants.</p> <p>The site is associated with Reverend Samuel Marsden and missionary William Walker. Reverend Marsden, a prominent figure in the early colony, was appointed chairman of the Native Institution Committee by Governor Brisbane in December 1821. Marsden who had missionary connections with New Zealand was responsible for bringing Maori children to the school. William Walker, protege of Governor Brisbane, and the first missionary to be instructed specifically to minister to the indigenous people of New South Wales, was appointed as manager of the Institution in 1824.</p> <p>The site of the Blacktown Native Institution is associated with the prominent and influential late nineteenth-century figure Sydney Burdekin, who purchased the property in 1877 for use as his country residence. Burdekin was a pastoralist and politician. He served almost continuously in the NSW Legislative Assembly between 1880 and 1894 representing in succession Tamworth, East Sydney and the Hawkesbury. Burdekin was also alderman of Sydney Municipal Council between 1883 and 1898 and Mayor of Sydney Municipal Council between January 1890 and April 1891.</p>
Aesthetic significance SHR criterion (c)	<i>There is no aesthetic significance attached to this item.</i>

Significance Criteria	Application of Criteria (Existing Assessment)
Social significance SHR criterion (d)	<p>The Blacktown Native Institution for the Aboriginal community is a key site symbolising dispossession, child removal and enduring links to the land. For some members of the Aboriginal community it represents a landmark in Aboriginal-European relations, symbolising the continuing need for reconciliation and understanding between blacks and whites.</p> <p>The site is also important to the Sydney Maori community as an early tangible link with colonial history of trans-Tasman cultural relations and with the history of children removed by missionaries. The non-Aboriginal community of Blacktown value the place because of its association with important historical events, processes and individuals, and as the historical heart of Blacktown.</p>
Technical/Research significance SHR criterion (e)	<p>The Blacktown Native Institution site has high archaeological potential to reveal evidence, that may not be available from other sources, about the lives of the children who lived at the school and the customs and management of the earliest Aboriginal school in the colony. The site also has the potential to contain archaeological evidence relating to later phases of land use, including the period the property was owned by Sydney Burdekin. In addition, the site may contain evidence of Aboriginal camps which may provide information about how Aboriginal people, accustomed to a traditional way of life, responded to the changes prompted by colonisation.</p>
Rarity SHR criterion (f)	<p>The Blacktown Native Institution is a rare site reflecting early 19th century missionary activity. The site may contain the earliest evidence of the Colonial Administration's attempts to Christianise and Europeanise Aboriginal children.</p>
Representativeness SHR criterion (g)	<p><i>There are no built elements associated with the Institution. It therefore does not demonstrate the principal characteristics of a class of cultural places or environments.</i></p>
Integrity/Intactness	<p>The Blacktown Native Institution site has suffered considerable disturbance over its history, however the site does have the potential to contain archaeological relics and deposits associated with the Blacktown Native Institution.</p>
Statement of Significance	<p>The Blacktown Native Institution is a site of State significance because of its combination of historical, social and archaeological values. The Blacktown Native Institution played a key role in the history of colonial assimilation policies and race relations. The site is notable for the range of associations it possesses with prominent colonial figures including: Governor Macquarie, Governor Brisbane, Samuel Marsden, William Walker and Sydney Burdekin. The Blacktown Native Institution site is valued by the contemporary Aboriginal community and the wider Australian community as a landmark in the history of cross-cultural engagement in Australia. For Aboriginal people in particular, it represents a key historical site symbolising dispossession and child removal. The site is also important to the Sydney Maori community as an early tangible link with colonial history of trans-Tasman cultural relations and with the history of children removed by missionaries.</p> <p>The Blacktown Native Institution is a rare site reflecting early 19th century missionary activity. The site has the potential to reveal evidence, that may not be available from other sources, about the lives of the children who lived at the school and the customs and management of the earliest Aboriginal school in the colony. The site also has the potential to contain archaeological evidence relating to later phases of land use, including the period the property was owned by Sydney Burdekin. In addition, the site may contain evidence of Aboriginal camps which may provide information about how Aboriginal people, accustomed to a traditional way of life, responded to the changes prompted by colonisation.</p>

Table 4-4 Significance assessment of Rooty Hill Government Depot (former) (Heritage NSW, 2006b)

Significance Criteria	Application of Criteria (Existing Assessment)
Historical significance SHR criterion (a)	The (former) Government Depot site is of historical significance for its association with Governor Macquarie and other travellers and early settlers in the Blacktown/Rooty Hill district. It is also of significance for its former role as a Government Stock Farm (DUAP, 1999). As part of the Government Stock Farm, it was the second most important Government Station in the colony, after Camden (Bertie, 1935, and Read, S., pers. comm., 2006).
Associative significance SHR criterion (b)	The (former) Government Depot site is associated with former governors of the early NSW colony, including Lachlan Macquarie and Thomas Brisbane. It was also generally associated with the convicts who worked the farm.
Aesthetic significance SHR criterion (c)	The (former) Government Depot retains the fabric of a portion of the Government Stock Farm's original 6,000 acres of land, and as open space which could be read as still 'rural', it has some aesthetic value, and some rarity in modern Western Sydney (Bertie, 1935, and Read, S., pers. comm., 2006). The superintendent's house site is considered to have little, if any, remaining built fabric. The site does retain the overall form and remnants of the overseer's garden. This latter site therefore has relatively little aesthetic significance, at present (DUAP, 1999 and Read, S., pers. comm., 2006).
Social significance SHR criterion (d)	The (former) Government Depot is of social significance for its association with early settlers and travellers through the Blacktown/Rooty Hill district. It has further significance for the role it played in the raising of stock for the young colony and for its association with early industry in the district. It would have provided employment for many early settlers (DUAP, 1999).
Technical/Research significance SHR criterion (e)	The (former) Government Depot may be of technical significance should the existence of any early structures be confirmed, and for its association with early farming and stock raising techniques - which may be demonstrated through any remains on the site which are yet to be discovered. These may provide insights into field sizes, shapes, fencing materials and types, animal and crop residues (DUAP, 1999 and Read, S., pers. comm., 2006).
Rarity SHR criterion (f)	The (former) Government Depot retains the fabric of a portion of the Government Stock Farm's original 6,000 acres of land, and as open space which could be read as still 'rural', it has some aesthetic value, and some rarity in modern Western Sydney. As part of the Government Stock Farm it was the second most important Government Station in the colony, after Camden (Bertie, 1935, and Read, S., pers. comm., 2006).
Representativeness SHR criterion (g)	Cannot be assessed at this point in time (DUAP, 1999). The Government Stock Farm was one of the two most important such stations in the colony in the early 1820s, and still retains potential to demonstrate through its archaeological resources, a representative example of a colonial era farm, with typical farm elements of that era (Bertie, 1935, and Read, S., pers. comm., 2006).
Integrity/Intactness	It is considered that there is very little, if any built fabric remaining and the overseer's house site cannot therefore be considered to be intact. However, it does retain the overall form and elements of the house's garden, and open space, remnant of the former Government Stock Farm (DUAP, 1999 and Read, S., 2006).

Significance Criteria	Application of Criteria (Existing Assessment)
Statement of Significance	<p>The Government Depot site has potential State significance for its association with Governor Macquarie and is certainly of regional significance as the former residence of the Superintendent of the stock farm. The site also has local significance through its association with early travellers and settlers in the district (HO).</p> <p>The station at Rooty Hill was the next principal one to that at Camden for the grazing of the Government horned cattle and horses in the early 1800s (Bertie, 1935).</p>

Table 4-5 Significance assessment of Rooty Hill Historic Site

Significance Criteria	Application of Criteria (Existing Assessment)
Historical significance SHR criterion (a)	<p>The Rooty Hill is of heritage significance at a State level as a remnant of the Rooty Hill Government Depot and stock farm. It was established as the second most important of the stock farms which were established by Governor King as a reserve for food in times of shortage. Macquarie further developed the stock farm as a place to strengthen and increase the colonial herds and as a mechanism of government intervention to control the supply and price of meat, grain and livestock and market monopolies by wealthy property owners and military officers in the early years of the colony. It also represents the history of colonial government intervention in the release of land for settlement and private tenure.</p>
Associative significance SHR criterion (b)	<p>The Rooty Hill has historic associations at a State level with Governor King. King named the hill 'Rooty Hill' and declared the colonial reserve which included the hill. The later development and history of the stock farm which included the Rooty Hill is associated with Governor Macquarie.</p> <p>The Rooty Hill has local heritage significance for its association with several early local families including Dr Charles McKay who through a series of shrewd purchases became a large landowner in the area. His holdings included much of the land between the Western Highway, the Great Western Railway, Rooty Hill Road South and Rupertsworth Road. He was responsible for developing the Minchinbury vineyards. Another important association is with James Angus who purchased many of McKay's holdings and including Rooty Hill and the Minchinbury Estate which he continued to successfully develop. He is credited with establishing the Champagne industry in NSW (George Nicholadis, 2000).</p>
Aesthetic significance SHR criterion (c)	<p>The Rooty Hill has aesthetic significance at a State level for its landmark qualities. It is one of the highest points between Parramatta, Penrith and the Blue Mountains. Its role as a distinguishing feature of the landscape is demonstrated by the fact that the government reserve of which the hill was part, was named the Rooty Hill Run. In addition, the hill and associated overseer's cottage provided a stopping point for colonial travellers on their way to the western areas of the State.</p> <p>The landmark qualities of the hill were also utilised by local Aboriginal people in post contact years. Groups of Aboriginal people travelling between Penrith and Paramatta used the Hill as a gathering place and camping site.</p> <p>The appearance of the hill as a bald topped peak has remained and provides a strong visual link to its historical function as part of a colonial pastoral grazing run.</p>
Social significance SHR criterion (d)	<p>The Rooty Hill has high local significance as a place of special social associations for the local community. The hill figures in locals' memories as a place of informal recreation and gathering as well as its historic role as a venue for community events which began in the 1890s at the instigation of its then owner, James Angus.</p>

Significance Criteria	Application of Criteria (Existing Assessment)
Technical/Research significance SHR criterion (e)	The existence of an Open Stone Artefact Scatter site on the south eastern slopes of the Rooty Hill enhances its State heritage significance as a resource for archaeological research and makes it an important resource of technical and archaeological information relating to pre-contact Aboriginal culture. The existence of this site makes it highly likely that further evidence of Aboriginal archaeological resources will be found in investigation. Its close proximity and association with the Government and Stock farm makes it a potential site for European archaeological finds such as artefacts associated with grazing and farming.
Rarity SHR criterion (f)	The Rooty Hill contains regrowth Cumberland Plain Woodland in the Presbyterian church site on the southern perimeter of the hill. This vegetation is important to the maintenance of the gene pool of local species.
Integrity/Intactness	<p>The character of The Rooty Hill as a grassy topped hill is the result of colonial land clearing and grazing activity during the years it was part of the stock farm and later when owned by the Church and Schools Corporation and then in private ownership (i.e., 1802 - 1975). The donation of a parcel of land on the south west perimeter of the hill to the Baptist Church in 1890 and consequent cessation of grazing there, led to regrowth of Cumberland Plain Woodland in that parcel of land. Since the 1960s grazing activity ceased over the whole of the area and there has been some associated regeneration of bushland.</p> <p>While no archaeological investigations have taken place on The Rooty Hill, based on its landscape character, land use history and previous regional research, it has been assessed as having moderate archaeological potential relating to Aboriginal and European artefacts and places.</p>
Statement of Significance	The Rooty Hill is of State heritage significance as a remnant of one of the four Government Depots and stock farms first selected by Governor King in 1802 and further developed by Governor Macquarie after 1810. Under Macquarie, Rooty Hill Depot and stock farm developed as the second most important of the stock farms in colonial NSW. It functioned to provide an important reserve food supply for the colony during its establishment when it frequently faced crop failures, drought and other difficulties. The stock farm also enabled the government to control livestock prices and so prevent exploitation of the market by private graziers and contributed to the establishment of colonial breeding herds. An open stone artefact scatter has been located on the site indicating the site's potential as a research resource for Aboriginal history in the area. The hill also has significance to the Aboriginal community as a post-contact camping and meeting place for those travelling over the Blue Mountains and into Parramatta and Sydney.

Source: (Heritage NSW, 2006b)

Table 4-6 Significance assessment for Upper Canal System

Significance Criteria	Application of Criteria (Existing Assessment)
Historical significance SHR criterion (a)	The Upper Nepean Scheme has functioned as part of the main water supply system for Sydney since 1888. Apart from the augmentation and development in supply and other improvements, the Upper Canal and Prospect Reservoir portions of the Scheme have changed little and, in most cases, operate in essentially the same way as was originally envisaged.
Associative significance SHR criterion (b)	The construction of the Upper Nepean Scheme made the big advance from depending on local water sources to harvesting water in upland catchment areas, storing it in major dams and transporting it to the city by means of major canals and pipelines.
Aesthetic significance SHR criterion (c)	<i>There is no aesthetic significance attached to this item.</i>
Social significance SHR criterion (d)	<i>There is no social significance attached to this item.</i>
Technical/Research significance SHR criterion (e)	The Upper Nepean Scheme provides detailed and varied evidence of engineering construction techniques prior to the revolution inspired by reinforced concrete construction. Although concrete was later used to improve the durability of the system, much of the earlier technology is still evident along the canal. It also provides extensive evidence of the evolution of engineering practice, such as the replacement of timber flumes by wrought iron flumes to be followed by concrete flumes. The early utilisation of concrete for many engineering purposes in the system, also demonstrates the growing emergence of an engineering technology based upon man-made materials. Many of the original control installations such as the 'Stoney gates', stop logs, penstocks, gate valves are still in service and continue to illustrate the technology of the time.
Rarity SHR criterion (f)	The Upper Nepean Scheme is unique in NSW, being the only extensive canal, reservoir and dam network to supply the large city and its population with fresh water from a distant source in the hinterland. This type of water supply system is also rare in Australia and only has major comparative examples in other countries.
Representativeness SHR criterion (g)	<i>There is no representative significance associated with this item.</i>
Integrity/Intactness	The item is in good condition with many original features still <i>in situ</i> .

Significance Criteria	Application of Criteria (Existing Assessment)
Statement of Significance	<p>The Upper Canal System is significant as a major component of the Upper Nepean Scheme. As an element of this Scheme, the Canal has functioned as part of Sydney's main water supply system since 1888. Apart from maintenance and other improvements, the Upper Canal has changed little. As part of this System, the Canal is associated with Edward Moriarty, Head of the Harbours and Rivers Branch of the NSW Public Works Department. The Canal is aesthetically significant, running in a serpentine route through a rural bushland setting as an impressive landscape element with sandstone and concrete-lined edges.</p> <p>The Canal is significant as it demonstrates the techniques of canal building, and evidence of engineering practice. The Canal as a whole is an excellent example of 19th century hydraulic engineering, including the use of gravity to feed water along the canal (BCubed Sustainability, 2/2006).</p> <p>The Upper Nepean Scheme is significant because:</p> <p>In its scope and execution, it is a unique and excellent example of the ingenuity of late 19th century hydraulic engineering in Australia, in particular for its design as a gravity-fed water supply system</p> <p>It has functioned as a unique part of the main water supply system for Sydney for over 100 years and has changed little in its basic principles since the day it was completed</p> <p>It represented the major engineering advance from depending on local water sources to harvesting water in upland catchment areas, storing it in major dams and transporting it to the city by means of major canals and pipelines</p> <p>It provides detailed and varied evidence of the engineering construction techniques prior to the revolution inspired by reinforced concrete construction, of the evolution of these techniques (such as the replacement of timber flumes with wrought iron and then concrete flumes), and of the early use of concrete for many engineering purposes in the system</p> <p>The Scheme possesses many elements of infrastructure which are of national and world renown in technological and engineering terms</p> <p>Many of the structural elements are unique to the Upper Nepean Scheme.</p>

4.5 Archaeological items

The following items were listed as archaeological items on their respective LEPs:

- Archaeological site – Native Institution site, Richmond Road, Hassall Grove (Blacktown LEP 2015) (same as Blacktown Native Institution – above)
- Archaeological site – ruins (Blacktown LEP 2015) (same as Government Depot ruins).

In relation to both sites, these were once much larger complexes than their current heritage curtilages suggest. However, in both cases these larger areas likely contained ephemeral features, such as sheds for livestock shelter, small huts and fencing. Later disturbances, such as urban development and road construction, have likely removed all traces of these features.

The following discussion relates to the archaeological potential existing within the current heritage curtilages of both archaeological sites. In both cases, these heritage curtilages contain the archaeological deposits relating to the principal structures of each former facility.

4.5.1 Archaeological site – Native Institution site

The site of the former Blacktown Native Institute is currently a grassed, fenced field with an art installation depicting three stands of flowers. The site of the former schoolhouse of the Native Institute was located along the Rooty Hill Road south frontage. It is currently fenced and surrounded by stands of mature trees (Figure 4-13, Figure 4-14 and Figure 4-15). Bells Creek runs in a south-west to north-east direction at the west of the former schoolhouse and has been modified.



Figure 4-13 Native Institute site, looking south. The art installation is at left, the site of the institution building is at right and the M7 is located beyond the tree line at left (AECOM, 2021)



Figure 4-14 Art installation at Blacktown Native Institute in foreground, fenced Blacktown Native Institution building site with mature exotic plantings in background (AECOM, 2021)



Figure 4-15 Plan of features within Native Institute site (Aerial Source: Six Maps)

The fenced area containing the site of the Native Institute building was not inspected as part of this assessment and no archaeological surface remains were noted in the remainder of the site. However, an inspection undertaken by GML in 2018 noted that visible surface material was identified in the vicinity of the former institute building site and that the only remnant vegetation across the Native Institute site related to garden remains around the main house site (Godden Mackay Logan Pty Ltd (GML), 2018:24).

The site has been subjected to disturbance chiefly relating to the site's former agricultural use until 1985, and activities relating to clearance, sewerage and drainage works and the modification to Bells Creek following 1985 (Godden Mackay Logan Pty Ltd (GML), 2018:28). Despite these disturbances, there is still potential for archaeological remains of the schoolhouse, the later residence "Lloydhurst", and the dairy farm that succeeded that residence on the site. Most of the buildings from all of these phases are within or adjacent to the fenced area (see Figure 4-16).

4.5.2 Archaeological site – ruins (same as Government Depot ruins)

The archaeological site of the former Government Depot is located on the northern slopes of the Rooty Hill, between Eastern Road and Dunsmore Avenue. It is currently a vacant field with a clump of trees and shrubs in its centre, marking the site of the former buildings. The site is State-owned land but was not inspected as part of this investigation.

Historical sources note the construction of a house and offices for the principal overseer in 1817 (Campbell, 1817:2). In May 1835, a retrospective of Governor Macquarie's building program included the following for Rooty Hill:

1. *A brick-built house, for the residence and accommodation of the superintendent and principal overseer of the government stock at the station, reserving one room for the use of the Governor, when occasionally there, with kitchen, stables, and other necessary out-offices, and a kitchen-garden inclosed (sic).*
2. *Four paddocks, 50 acres each, inclosed (sic) for the grazing of the young cattle, and raising of wheat and maize for the use of the stockmen.*

3. *Temporary Long-huts, or Barracks, for the accommodation of twenty stock-keepers, with a small kitchen-garden attached thereto.*

(The Colonist, 1835:3)

The overseer's house was later known as Thornleigh House and the land was used for agricultural purposes until its demolition in 1960. Agricultural land use, such as grazing and cropping, will have had a low-moderate impact on subsurface remains, depending on the depths of the foundations and depths of later ploughing. Consequently, archaeological deposits may be present on the site for the main house and its associated outbuildings, however, given that the long-huts/barrack were referred to as "temporary", the archaeological potential for these are assessed as low. Aside from post-holes from any fencing, there is little to no potential for archaeological remains to be present for the four paddocks.

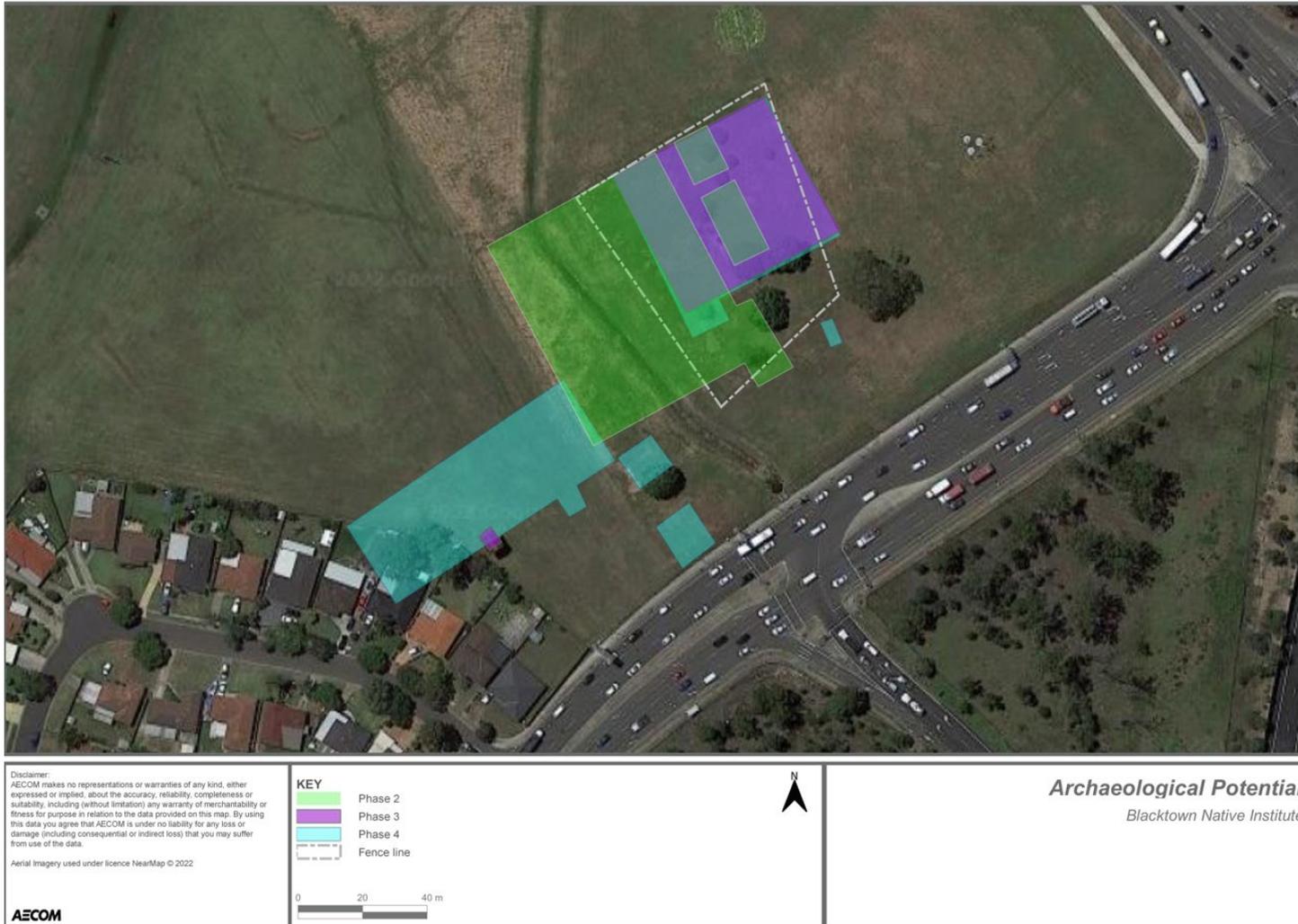


Figure 4-16 Archaeological potential for the Blacktown Native Institute

5.0 Construction impact assessment

This section provides an assessment of construction impacts from the proposed modification.

5.1 Upper Canal System

From a heritage perspective, the proposed modification is not likely to have a direct impact on the Cecil Hills tunnel of the Upper Nepean Canal System. The Cecil Hills tunnel is a part of the Upper Canal System extending from Western Sydney Parklands to an area west of the M7, south of its intersection with Elizabeth Drive at Cecil Hills. The Cecil Hills Tunnel was constructed in 1888 and is brick-lined, approximately 3.2 kilometres-long and gravity fed. Design drawings dated to 1888 for the tunnel show the presence of seven air shafts along the length of the tunnel. The canal is the only heritage item that is located within the construction footprint for the proposed modification. The depth of the tunnel varies, however sections of the Cecil Hills tunnel run approximately 30 metres below the existing motorway (SMEC Australia Pty Ltd, 2019) (Figure 5-1 to Figure 5-3). The original construction of the Westlink M7 in this area was done 'at grade' with the road works built up above the former ground level (PPK Environment & Sinclair Knight Merz, 2000).

The construction of the proposed modification in this location would require excavation to a depth of up to one metre and would be contained within the current median area between lanes of traffic either side. Although the depth of the tunnel has not been confirmed by Water NSW, an earlier assessment of the tunnel indicates it is approximately 30 metres below the ground's surface and that the shaft is 33.8 metres deep. Consequently, impacts are not anticipated on the tunnel structure as a result of the construction of the proposed modification. As the works would be restricted to the current road corridor for the Westlink M7, there are not expected to be any direct impacts to the Cecil Hills tunnel section located below the Westlink M7.

However, an air shaft contemporaneous with the construction of the Cecil Hills tunnel is located within the median of the Westlink M7. The relevant air shaft is known as "No. 4 Shaft" in the Cecil Hills tunnel, with the chainage being 1,921 metres. All air shafts within the Upper Canal System are considered to be within the category of "Ancillary Facilities, Structures and Infrastructure" of the Upper Canal System (E. Higgenbotham, 2000)(NSW Government Architect's Office, 2016:136). The air shafts within tunnels form part of the tunnel fabric, and are therefore considered to be of exceptional heritage significance (NSW Government Architect's Office, 2016:255).

In a recent survey of the Cecil Hills Tunnel, the air shaft is described as having a diameter of 1.4 metres, with 1.5 metres cover to the fill material. The fill is described as comprising ballast, supported by timber beams. Although the timber beams have been present since its 1888 construction, it was the opinion of SMEC in 2019 that weathering of these beams may eventually result in their deterioration (SMEC Australia Pty Ltd, 2019:9).

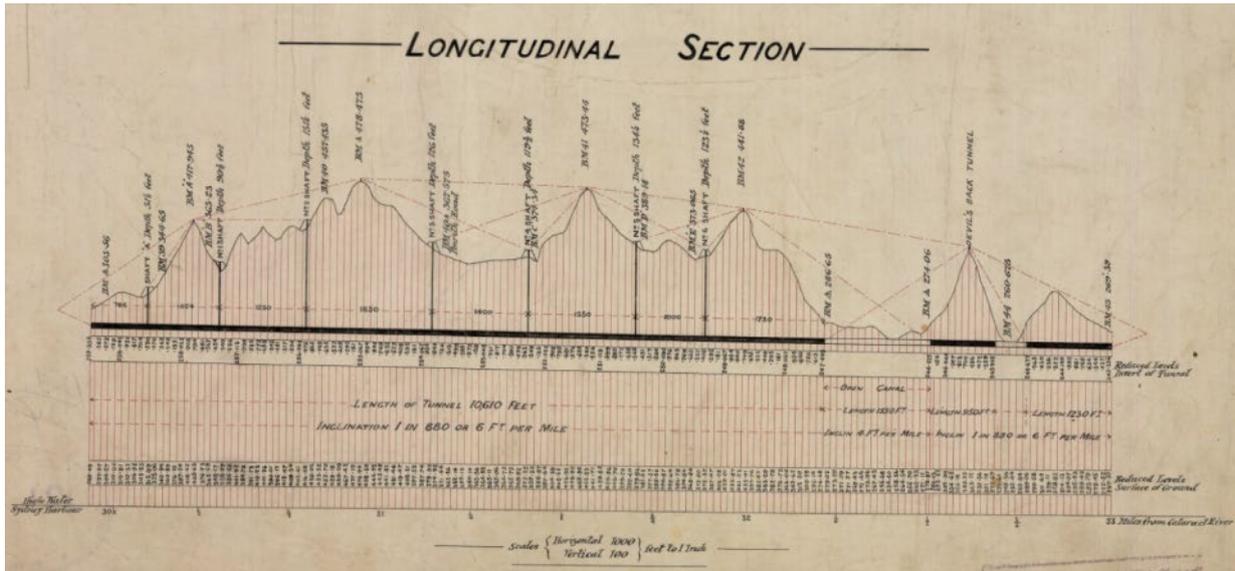


Figure 5-1 Longitudinal section of Cecil Hills Tunnel (SMEC Australia Pty Ltd, 2019)



Figure 5-2 View of No. 4 Shaft from Cecil Hills Tunnel, looking up (Source: SMEC Australia Pty Ltd, 2019:9)

The No. 4 Shaft above-ground access point within the M7 median comprises a modern metal structure which is not considered to be part of the heritage fabric associated with the Upper Nepean Canal System (see Figure 4-6 and Figure 4-9). Beneath this modern access structure is 1.5 metres of fill, followed by the original air shaft constructed of timber and brick (Figure 5-2). The depth of impact within the road corridor is assessed as one metre, which will impact the ballast fill but not the fabric of the No. 4 Shaft. However, while the current design avoids direct impact to the air shaft, vibration during construction may impact the stability of the air shaft. It should be noted that the 2002 CMP contains the following recommendation for the air shaft:

The brick cap to the air shaft on the Cecil Hills Tunnel... should be stabilised, maintained and preserved (Higginbotham, 2002: Volume 2, 66).

Measures would need to be implemented to minimise accidental damage during construction by machinery and ground vibration impacts from construction works in the vicinity of the Upper Nepean Canal System.

5.2 Rooty Hill Historic Site and Former Depot site

The proposed modification in the vicinity of the Rooty Hill Historic Site and Former Depot site would be contained within the existing Westlink M7 lease area. The proposed modification would occur within the central median strip. New noise walls and alterations to existing noise walls would also be constructed. A new noise wall is proposed on the eastern side of the Westlink M7, across from the Rooty Hill Historic Site. This noise wall is on the opposite side to the historic site and would not be visible. As such, there would be no direct impact to this heritage item (Figure 5-4). Furthermore, the works would be contained within the Westlink M7 lease area. The height of the existing road would be retained similar to existing. As such, there is not expected to be indirect, visual, impacts to the Rooty Hill Historic Site or to the former Government Depot site.

5.3 Blacktown Native Institution Historic Site

Although the Blacktown Native Institution Historic Site is adjacent to the M7 Motorway, the proposed works in this area would be contained within the Westlink M7 corridor. It is therefore considered unlikely that there will be any impact to this item (Figure 5-5).

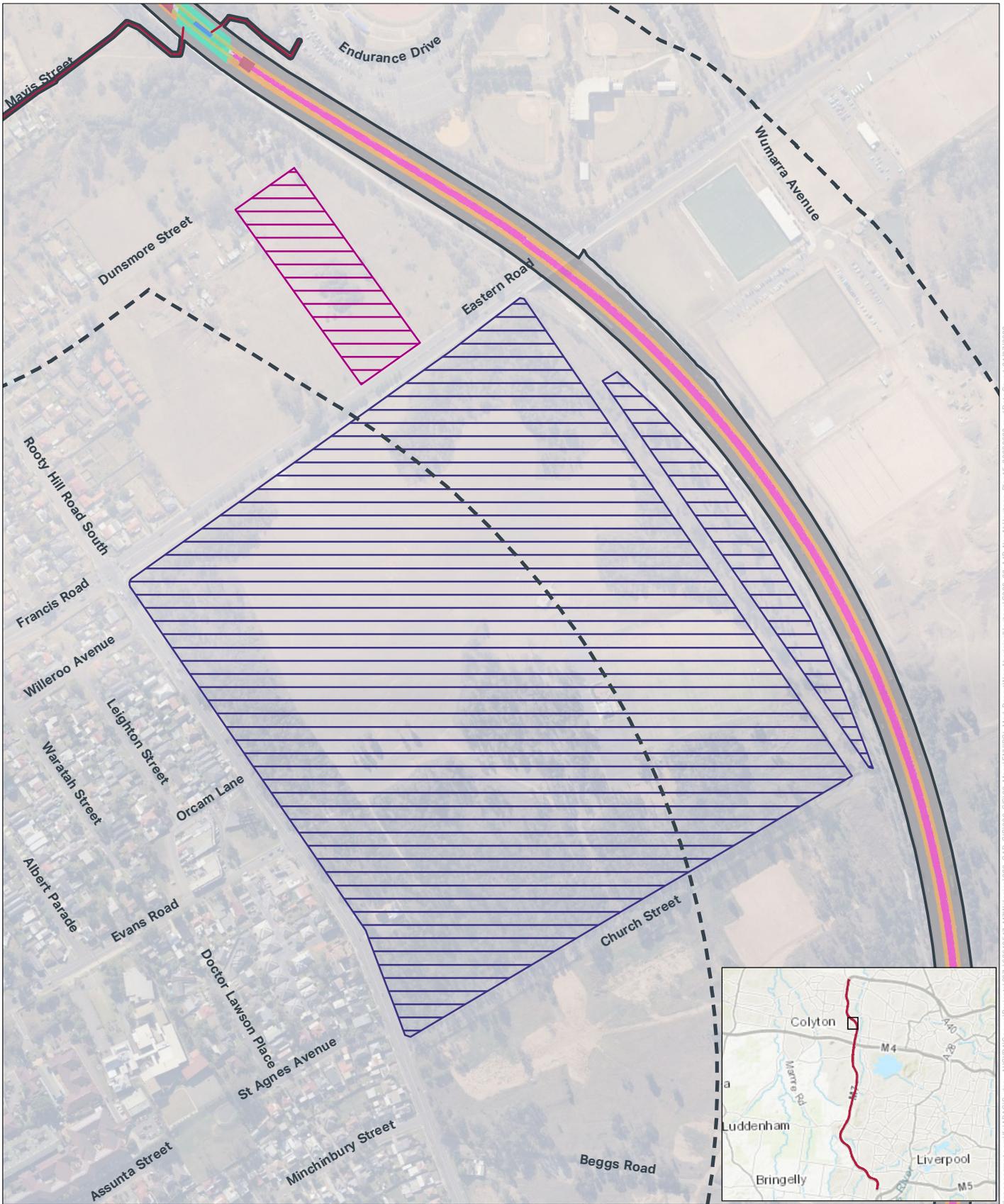


FIGURE 5-4: PROPOSED MODIFICATION IN THE VICINITY OF 'THE ROOTY HILL' [SHR 01756] AND 'GOVERNMENT DEPOT SITE (FORMER)' [SHR 0345]

Legend

- Construction footprint
- Study area
- Construction ancillary facility
- Government Depot Site (former)
- The Rooty Hill
- Access route for construction ancillary facility
- Bridge clear and grub
- Bridge widening area
- Line-marking and resurfacing works
- Median earthworks
- Temporary stream crossing diversion
- Proposed widening into the existing median



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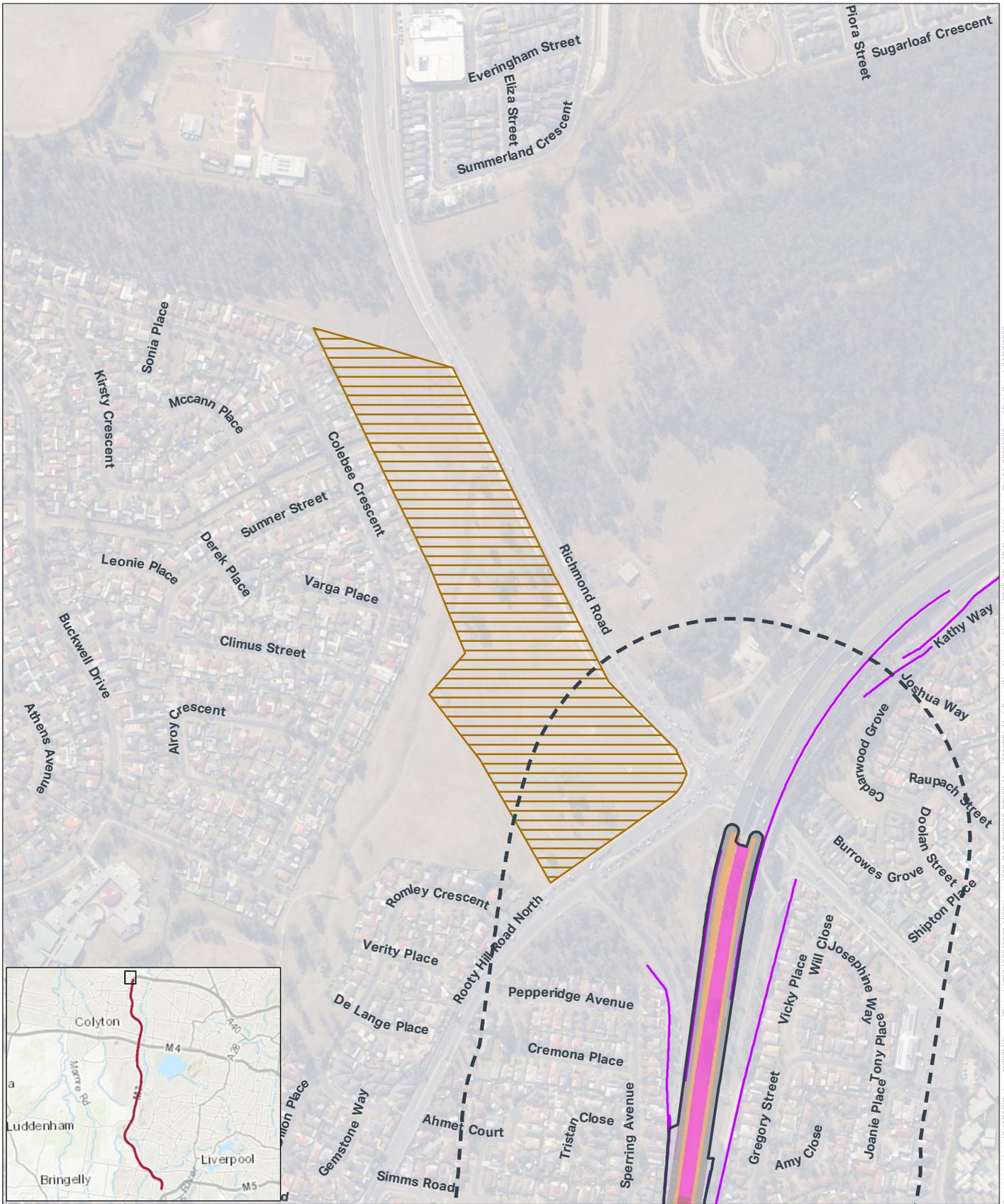


FIGURE 5-5: PROPOSED MODIFICATION IN THE VICINITY OF 'BLACKTOWN NATIVE INSTITUTION' [SHR 1866]



- Legend**
- Construction footprint
 - Study area
 - Construction ancillary facility
 - Blacktown Native Institution
 - Existing noise wall
 - Line-marking and resurfacing works
 - Median earthworks
 - Proposed widening into the existing median

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5.4 Cumulative impact assessment

In addition to the impacts caused by the project, cumulative impacts must be considered together with other projects having been, or to be, undertaken in the area. The following sources were searched to identify relevant projects:

- Department of Planning and Environment's Planning Portal
- Transport for NSW website
- Infrastructure NSW website
- Relevant local councils' websites.

Relevant projects were reviewed and their impact on heritage assessed to arrive at conclusions regarding cumulative impacts on non-Aboriginal heritage as a result of the proposed modification.

The original Westlink M7 construction (then called the "Western Sydney Orbital" noted potential impacts to seven non-Aboriginal heritage items (Banksia Heritage + Archaeology, 2005):

- Horse track and exotic trees, Kings Langley
- Potential well, Eastern Creek
- Former Eastern Creek Public School site, Eastern Creek
- Great Western Highway alignment
- PAD 20 rubbish dump, eastern Creek
- Woodstave pipeline, Cecil Hills
- Concrete pipeline, Cecil Hills.

All seven items were within the area of impact for the Westlink M7 and presumed destroyed. All were assessed as being of low heritage significance.

5.4.1 Other relevant projects

There have been multiple residential and infrastructure projects completed in the vicinity of the Westlink M7 since its construction. These include projects relating to residential developments and associated infrastructure in a number of areas along the alignment such as Prestons, Cecil Hills and Kellyville shaft. Major infrastructure projects completed include the Sydney Metro Northwest, the North-West T-Way and upgrades to the Light Horse Interchange in connection with the Westconnex M4 widening. The overall impact that these projects have had on non-Aboriginal heritage is difficult to assess owing to difficulty in accessing relevant reports.

The following planned projects are in the vicinity of the Westlink M7:

- M12 Motorway
- Light Horse Interchange Business Hub
- The Horsley Drive Upgrade.

M12 Motorway Project

This proposal relates to the construction of a motorway between the junction of Elizabeth Drive and the Westlink M7 in the east, to the Northern Road in the west with a diversion to the Western Sydney International (Nancy-Bird Walton) Airport (currently under construction). An assessment of non-Aboriginal heritage was undertaken in 2019, which found that major impacts were anticipated to four of the nine sites identified, and a minor impact to one site.

One of the sites that would be subject to major impact was the Cecil Park School, Post Office and Church site on the corner of Elizabeth Drive and Wallgrove Road, adjacent to the western boundary of the Westlink M7. At the time of writing the Environmental Impact Statement (EIS), it was assessed that the site would be totally destroyed. Archaeological test excavations of the site, undertaken as part of the EIS, indicated the presence of footings of the former school, with ephemeral evidence of the post office and church sites.

The Cecil Hill tunnel portion of the Upper Canal System also crossed the M12 study area, however given the depth of the tunnel, it was assessed that there would be no impact to the tunnel.

Light Horse Interchange Business Hub, Eastern Creek NSW

The Light Horse Interchange is located at the junction of the M7 and M4 Motorways at Eastern Creek. The proposed Light Horse Interchange Business Hub is located at 165 Wallgrove Road and 475 Ferrers Road, Eastern Creek, east of the M7 and south of the M4.

A non-Aboriginal heritage assessment was undertaken in 2019 to support an EIS. That assessment found that although a small portion of the site formed part of the unlisted former Wallgrove Army Camp, then the Wallgrove Migrant Hostel, some of these potential archaeological deposits were destroyed during construction of the Westlink M7, and the remainder did not meet the local significance threshold. The assessment concluded that any archaeological deposits encountered during construction should be managed by an Unexpected Finds Procedure.

The Horsley Drive Upgrade

The Horsley Drive crosses the Westlink M7 at Horsley Park. It also crosses the Upper Canal System approximately 1.5 kilometres east of the Westlink M7. A detailed design for the upgrade of The Horsley Drive is currently in preparation and is due to be finalised in 2022.

A non-Aboriginal heritage assessment was prepared for the proposed upgrades in 2017. That assessment found two items that would be potentially impacted by the upgrades, being a bunya pine on the corner of Cowpasture Road and the Horsley Drive, and the Weston Tunnel portion of the Upper Canal System. Of the two items, only the Weston Tunnel is assessed as being potentially impacted. Currently, it is proposed that the Weston Tunnel will be bridged and therefore not impacted.

5.4.2 Summary of cumulative impact assessment

Generally, impacts by the proposed modification would chiefly be located within the existing Westlink M7 corridor plus small, discrete areas along its route for compounds and utilities. Additional noise walls and concrete barriers would also be constructed along the outside of the existing motorway. However, none of these discrete areas appear to have non-Aboriginal heritage value. The overall cumulative impact by the proposed modification is therefore considered to be very low.

The only impact by the proposed modification is potentially to an air shaft associated with the Upper Canal System at Cecil Hills, located within the Westlink M7 boundary. Impact in vicinity of the air shaft is expected to be limited to one metre below the current median level. As the top 1.5 metres of the ground surface within the Westlink M7 median contains a ballast fill and is not of heritage significance, there is not expected to be a direct impact to the No. 4 Shaft during construction.

6.0 Operational impact assessment

This section provides an assessment of operational impacts of the proposed modification.

In relation to ongoing impacts during operation, only the Upper Canal System is within the operational footprint of the proposed modification. This item will be avoided and is not expected to be directly or indirectly impacted.

In relation to potential visual impacts caused by the proposed modification during operation, an Urban Design, Landscape Character and Visual Impact Assessment (LCVIA) was prepared (AECOM Australia Pty Ltd, 2022b) (refer Appendix K of the modification report). The LCVIA (AECOM Australia Pty Ltd, 2022b:53) considered four sub-categories to assess changes to views from the Westlink M7 motorway (i.e. "Viewpoint 1") during operation:

1. When the carriageways are roughly at grade with the surrounding landscape
2. When the carriageways travel over the surrounding landscape, typically over watercourses, via a bridge
3. When the carriageways sit below the grade of the surrounding landscape, i.e. the Westlink M7 is enclosed by cuttings
4. When approaching the M4 Motorway (Light Horse) Interchange from either direction.

It was assessed that of these subcategories, 1 and 3 were considered to have a low magnitude of change, subcategory 2 had a high magnitude of change and subcategory 4 had a moderate magnitude of change. Overall, the proposed modification had a moderate magnitude of visual change owing to the widening of the existing carriageway, the new signage, safety fencing and barriers, the reduction of the median and the reinstatement of vegetation. It is assessed that the most visually prominent change would be the absence of tree canopy vegetation between carriageway bridges where the Westlink M7 passes over riparian corridors. Otherwise, however, the resulting visual outcome will be similar to that currently experienced on the length of the Westlink M7. (AECOM Australia Pty Ltd, 2022b:54-56).

As the Cecil Hills tunnel portion of the Upper Canal System is underground, no visual impacts during operation are expected. In relation to the Blacktown Native Institution Historic Site or to the Rooty Hill Historic Site, both items are archaeological in nature and therefore will not be impacted visually.

7.0 Statement of Heritage Impact

The objective of a Statement of Heritage Impact (SoHI) is to evaluate and explain how a proposed development, rehabilitation or land use change would affect the heritage value of the site and/or place. A SoHI should also address how the heritage value of the site/place can be conserved or maintained, or preferably enhanced by the proposed modification.

This report has been prepared in accordance with the NSW Heritage Office & Department of Urban Affairs and Planning NSW *Heritage Manual* (1996) and NSW Heritage Office 'Statements of Heritage Impact' (NSW Heritage Office & Department of Urban Affairs & Planning, 2002). The guidelines pose a series of questions as prompts to aid in the consideration of impacts based on the type of proposal.

Assessing the likely construction and operational impacts of the proposed modification, it has been identified that it is unlikely to have an impact to the tunnel section the proposed modification traverses in the study area. The construction of the Westlink M7 in this area was completed above grade, in that they were built over the ground's surface. The proposed modification would require excavation to about one metre below the current road level. Given that the tunnel is at least 30 metres below the ground's surface, it is not expected that the works would cause any direct or indirect impact to the tunnel.

However, the No. 4 Shaft associated with the Upper Canal System is located within the median of the existing M7 Motorway. It is considered that construction and operation impacts may impact the stability of the air shaft, particularly through vibration. As it is expected that the depth of works will not exceed one metre, and that the top 1.5 metres from the ground's surface comprises a ballast fill, it is not expected that there will be a direct impact during construction to the No. 4 Shaft.

There is the potential for ground vibration impacts on the Upper Canal System from construction works in the vicinity. However, the *Guidelines for development adjacent to the Upper Canal and Warragamba Pipelines* (Sydney Catchment Authority 2012) sets out guidelines when designing, planning or assessing development on land adjacent to this pipeline. The relevant measures from this guideline would be implemented for the proposed modification, which include the following:

- Design, construction, and operation of structures within or alongside the Upper Canal should not impact the heritage significance.

In addition, the Noise and Vibration Assessment prepared for the proposed modification (refer Appendix E of the modification report) indicates the following minimum working distances for heritage and other sensitive structures (Table 7-1):

Table 7-1 Recommended minimum working distances for vibration intensive plant (AECOM Australia Pty Ltd, 2022:70)

Plant item	Rating/Description	Minimum working distance - Cosmetic damage (DIN 4150) Heritage and other sensitive structures
Vibratory Roller	< 50 kilonewton (kN) (Typically 1-2 tonne (t))	14 m
	< 100 kN (Typically 2-4 t)	16 m
	< 200 kN (Typically 4-6 t)	33 m
	< 300 kN (Typically 7-13 t)	41 m
	> 300 kN (Typically 13-18 t)	54 m
	> 300 kN (> 18 t)	68 m
Small Hydraulic Hammer	(300 kg - 5 to 12 t excavator)	5 m
Medium Hydraulic Hammer	(900 kg – 12 to 18 t excavator)	19 m

Plant item	Rating/Description	Minimum working distance - Cosmetic damage (DIN 4150) Heritage and other sensitive structures
Large Hydraulic Hammer	(1600 kg – 18 to 34 t excavator)	60 m
Vibratory Pile Driver	Sheet piles	50 m
Pile Boring	≤ 800 mm	4 m
Jackhammer	Hand held	2 m

The report also notes, however, that these minimum working distances are general:

...due to the uncertain nature of the condition of each of these structures, and given their importance, a detailed investigation into each identified structure's sensitivity to vibration should be undertaken during the detailed design phase of the project. Structure-specific vibration criteria should be applied based on the integrity of the structure.

(AECOM Australia Pty Ltd, 2022a)

The only item of built heritage with the potential to be impacted by the modification is the Upper Canal System. Provided that these minimum working distances and any further structure-specific vibration criteria developed during detailed design are followed, it is concluded that the works will not cause any indirect impact to the Upper Canal System, including the No. 4 shaft.

The *Upper Canal Pheasants Nest to Prospect Reservoir - Conservation Management Plan (CMP)* (NSW Public Works Government Architect's Office, 2016) is the key heritage management document for the Upper Canal and is applicable to this assessment. The document outlines exemptions to works, including excavation for services and maintenance where this does not impact on areas designated as archaeologically significant (NSW Public Works Government Architect's Office, 2016:101). This includes installation of new access roadways adjacent to the Upper Canal System provided these are in accordance with the conservation policies and guidelines of the CMP (NSW Public Works Government Architect's Office 2016:103).

The CMP recommends that a CEMP is prepared to ensure the Upper Canal is protected from impacts during construction. For the proposed modification, this would require construction contractor working in the vicinity of the Tunnel Shaft to undertake the activities in accordance with the policies and procedures in the Construction Heritage Management Plan. This would include a minimum working distance exclusion zone around the tunnel alignment in the Westlink M7 median, in accordance with the process of safe work distances outlined by the Noise and Vibration Assessment prepared for the proposed modification.

The relevant SoHI questions that should be asked in relation to the Upper Nepean Canal System are related to major additions to the site, as detailed and answered below.

The review of the construction and operational impacts has identified that there would be no direct or indirect impact from the proposed modification to the two nearby heritage items, the Blacktown Native Institution and the Rooty Hill Historic Sites. There are no proposed noise walls or other walls proposed in the vicinity of both of these items. There is a proposed noise wall on the eastern side of the Westlink M7 across from the Blacktown Native Institution Historic Site, however, this is on the opposite side, and would not be visible from the historic site. There are no proposed construction compounds/laydown areas to be located on these properties. There is also expected to be no operational impact to either of these historic sites. As such, there are no statement of heritage impact questions to be asked in relation to the construction or operation of the proposed modification for both of these historic sites.

7.1 Process questions

How is the impact of the addition on the heritage significance of the item to be minimised?

There would be no direct impacts to the Upper Nepean Canal System. The proposed modification would be restricted to surface works and be undertaken within the existing Westlink M7 median and carriageway area in this location. Potential for vibration impacts from the construction works would be mitigated by implementing mitigation measures outlined in the Noise and Vibration Assessment (refer Appendix E of the modification report), that include minimum working distances. Structure-specific vibration criteria should also be developed for the Upper Canal System during detailed design and applied during construction.

Can the additional area be located within an existing structure? If not, why not?

The proposed modification works would be undertaken within the existing median of the Westlink M7 and would not require any additional land outside of the current motorway.

Construction access and construction ancillary facilities would be needed during construction works. The sites proposed are located outside of the Westlink M7 and would not be placed on any known heritage or archaeological sites.

Will the additions tend to visually dominate the heritage item?

The proposed modification would be of a similar ground level and design to the existing roadway. The works would have no visual impact to the Upper Nepean Canal System as the item is a tunnel with associated shafts in this section and not visible.

Are the additions sited on any known, or potentially significant archaeological deposits? If so, have alternative positions for the additions been considered?

The area within the current Westlink M7 land, and the median in particular, was highly disturbed during the construction of the motorway, and there is not expected to be any historical archaeological remains present within the area. The two original land parcels comprising the Blacktown Native Institute and the former Government Depot were both much larger than their current curtilages suggest. The alignment of the Westlink M7 cuts through both of the original land parcels, but not the existing heritage curtilages. Both the Blacktown Native Institute and the former Government Depot were largely agricultural features, which would have left fragmentary archaeological evidence such as paddock fencing post holes, temporary stock sheds and other such features. These would have been destroyed by later land uses, including the construction of the Westlink M7. The existing heritage curtilages of the two items, however, encompass significant archaeological deposits, such as the primary buildings and associated features. The proposed modification will therefore not impact potentially significant archaeological deposits relating to the Blacktown Native Institute and former Government Depot.

In relation to the air shaft, the non-Aboriginal heritage assessment for the M12 Motorway assessed that there was a potential for archaeological deposits to be present in the vicinity of the air shaft that related to the construction of the Upper Canal System. However, it was concluded by that report that such deposits were not likely to be of archaeological significance. It is possible that such deposits could include tools, personal items and other such artefacts that were used by workers during construction. It is agreed that such items would not add to the existing knowledge of the construction of the Upper Canal System and would therefore not reach the local significance threshold. This assessment likewise concludes that the proposed modification would not disturb significant archaeological deposits.

7.2 Summary of Statement of Heritage Impact

The potential impacts to Upper Nepean Canal System, Rooty Hill Historic Site, including the former Government Depot Site, and the Blacktown Native Institution Historic Site have been assessed against the criteria outlined in the NSW Heritage Division guidelines (NSW Heritage Office & Department of Urban Affairs & Planning, 2002). The impacts of the proposed modification have been graded against the significance of the site as outlined in Table 7-2.

Table 7-2 Summary of the nature of the direct and indirect impacts from construction and operation of the proposed modification

Impact Type	Impact
Major negative impacts (substantially affects fabric or values of State significance)	N/A
Moderate negative impacts (irreversible loss of fabric or values of local significance; minor impacts on State significance)	N/A
Minor negative impacts (reversible loss of local significance fabric or where mitigation retrieves some value of significance; loss of fabric not of significance but which supports or buffers local significance values)	N/A
Negligible or no impacts (does not affect heritage values either negatively or positively)	<p>There are expected to be negligible impacts to the Blacktown Native Institution, the Government Depot site and the Rooty Hill Historic Site. There would be no change to their operation or indirect visual impacts.</p> <p>There is not expected to be any direct or indirect impact to the Upper Nepean Canal System tunnel section and air shaft which passes beneath the Westlink M7.</p>
Minor positive impacts (enhances access to, understanding or conservation of fabric or values of local significance)	N/A
Major positive impacts (enhances access to, understanding or conservation of fabric or values of State significance)	N/A

8.0 Mitigation and management measures

This section describes performance outcomes related to non-Aboriginal heritage, and mitigation and management measures to manage potential heritage impacts from the proposed modification.

8.1 Mitigation and management measures

The mitigation and management measures described in Table 8-1 have been identified to address the impacts identified as a direct result of the assessment undertaken in this report. These measures would be incorporated into the construction and operational environmental management plans. Proposed amendments to the CoA for the proposed modification are described in **Chapter 8** (Conditions of Approval) of the modification report.

Table 8-1 Mitigation and management measures

Reference	Mitigation and management measure	Responsibility	Timing
Conservation Management Plan (Policy 3)	All works within the vicinity of the No. 4 Shaft should avoid its original fabric.	Construction contractor	Construction
Conservation Management Plan (Policy 40)	An archival recording of No. 4 Shaft will be undertaken prior to construction.	Transport	Prior to construction
Construction Heritage Management Plan	A Construction Heritage Management Plan, to be included in the Construction Environmental Management Plan, will be prepared prior to construction of the proposed modification. The CEMP should include the location of the known heritage items that are within the study area, including the Upper Canal System, details relating to vibration mitigation measures for works in the vicinity of the Upper Nepean Canal, and a stop works procedure for unexpected finds.	Construction contractor	Construction
Upper Canal System	Vibration recommendations contained in the Noise and Vibration Assessment (AECOM, 2022) for the proposed modification) for minimising potential ground vibration impacts to the Upper Nepean Canal System tunnel will be adhered to during construction.	Construction contractor	Construction
Consultation with WaterNSW	Consultation with WaterNSW detailing the proposed works in the vicinity of the Upper Canal System shall be undertaken prior to construction. A copy of this assessment shall be made available to WaterNSW prior to any consultation.	Construction contractor	Construction

8.2 Upper Canal System Conservation Management Plan 2016

As an item of State heritage, the Upper Canal System has a CMP governing appropriate management measures for works within its curtilage. The 2016 CMP is an updated version of a CMP prepared in 2002 by Edward Higginbotham & Associates.

The following policies are relevant to works in the vicinity of the No. 4 Shaft (note that the archival recording mentioned in Policy 40 below has been included in Table 8-1 above):

- Key original components of the Canal including open canal sections, tunnels, aqueducts, weirs and offtakes and the support structures that allow it to function such as flumes, access roads, depots, cottages, telegraph lines and bridges.

Table 8-2: Relevant conservation policies

Policy number	Policy and reference	Comment
Policy 1	<p>The following aspects of the Upper Canal are integral to the significance of the place. Manage them to ensure they are conserved and that their heritage values are retained.</p> <p>These elements are ranked as having Exceptional or High heritage significance.</p> <p>(NSW Government Architect's Office, 2016:27)</p>	<p>As noted in Section 5.1, the No. 4 shaft is considered to be part of the original fabric of the Canal and is therefore of exceptional heritage significance. The heritage significance of the No. 4 Shaft must therefore be conserved.</p>
Policy 3	<p>Retain all elements of Exceptional Significance as a priority.</p> <ul style="list-style-type: none"> - Aim to retain all original fabric of elements of exceptional significance as a first conservation option. - Avoid adding new fabric, where this will result in a negative impact on significance. <p>(NSW Government Architect's Office, 2016:29)</p>	<p>All works within the vicinity of the No. 4 Shaft should avoid its original fabric.</p>
Policy 35	<p>Make decisions requiring change to the Upper Canal with a clear understanding of the implications for the identified heritage values of the Canal and seek to minimise negative heritage impacts.</p> <p>(NSW Government Architect's Office, 2016:42)</p>	<p>This Heritage Impact Assessment (HIA) has demonstrated a clear understanding of the heritage values of the Upper Canal and the No. 4 Shaft. Although works are taking place within the curtilage of the Upper Canal System, the design of the works have ensured that they will not cause negative impacts.</p>
Policy 37	<p>Prepare a Heritage Impact Statement for all works requiring an exemption notification or application for approval under the NSW <i>Heritage Act 1977</i>.</p> <p>(NSW Government Architect's Office, 2016:43-44)</p>	<p>This HIA is sufficient to append to a s60 permit or exemption. However, as the proposed modification is part of a project designated as SSI, no permit under the <i>Heritage Act 1977</i> is required.</p>
Policy 40	<p>Undertake formal archival recording in accordance with NSW Heritage Council guidelines when undertaking major changes to elements of Exceptional and High heritage significance.</p> <p>(NSW Government Architect's Office, 2016:45)</p>	<p>Although the works will not cause major changes to the Cecil Hills Tunnel or the exceptional heritage fabric of the No. 4 Shaft, works will alter its setting. It is therefore recommended that formal archival recording is undertaken of the current setting and elements subject to change as a result of the proposed works in the vicinity of the No. 4 Shaft.</p>

Policy number	Policy and reference	Comment
Policy 41	Keep and archive ongoing, informal records of changes to the Canal. (NSW Government Architect's Office, 2016:45)	A copy of this report should be kept evidencing the change in landscape surrounding the No. 4 Shaft.
Policy 42	Ensure that operational documents for the Upper Canal are archived in the Sydney Water/Water NSW Joint Archive and Research Facility as part of the historical record of the activities of Water NSW and the role and function of the Upper Canal and Upper Nepean Scheme. (NSW Government Architect's Office, 2016:45)	A copy of this report should be forwarded to the Sydney Water/Water NSW Joint Archive and Research Facility.
Policy 43	Obtain any necessary heritage and planning approvals or exemptions prior to undertaking changes to the place. Carry out the works in accordance with any conditions placed on these approvals. (NSW Government Architect's Office, 2016:47)	The proposal is in the vicinity of the No. 4 Shaft and the Cecil Hills Tunnel of the Upper Canal System and has the potential to cause indirect impacts through vibration. However, as the proposed modification is part of a project designated as SSI, a s60 permit will not be required.
Policy 45	Retain and conserve <i>in situ</i> which are presently redundant or may be identified as redundant during the life of this CMP. (NSW Government Architect's Office, 2016:49)	Although the shaft is redundant, it is understood that the original fabric of the No. 4 Shaft will be retained <i>in situ</i> .
Policy 51	Ensure new buildings or structures are unobtrusive and set back from elements of exceptional significance where those structures would have a negative visual or physical impact on those elements. (NSW Government Architect's Office, 2016)	All of the works within the vicinity of the No. 4 Shaft will be "at-grade" and therefore will not cause a visual or physical impact.

9.0 Conclusion

This non-Aboriginal heritage assessment has been prepared to support the modification report and to address the relevant SEARs issued for the assessment of the proposed modification. Specifically, this report has been prepared to assess the potential impacts of construction and operation of the proposed modification on the known non-Aboriginal historic heritage sites and to identify appropriate mitigation and management measures to address the impacts identified.

The proposed modification of the Westlink M7 is unlikely to have an impact on the Upper Nepean Canal System. The canal, in the form of a below ground tunnel and air shaft in this section, would not be impacted directly from construction or operational use. There is the potential for indirect, vibrational, impacts during construction works, however, vibration modelling for the proposed modification has concluded that provided the identified minimum working distances are applied as per Table 7-1 above, and that structure specific vibration criteria are developed during detailed design and applied during construction, there is little risk of harm to the Upper Canal System, including No. 4 shaft.

The widening of the Westlink M7 would not have impacts to the Blacktown Native Institution Historic Site or to the Rooty Hill Historic Site. Works in the vicinity of both of these heritage items would be contained within the existing Westlink M7 lease area. Proposed locations for construction access and construction facilities would not be located on any known historic heritage sites.

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