REVIEW OF ENVIRONMENTAL FACTORS
Heathcote Road/Bardia Parade and Walder Road, Holsworthy Upgrade
13 July 2020
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Appendix A – Concept Design Drawings
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Appendix D - PACHCI Clearance Letter
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*These studies were previously undertaken by the RMS (now TfNSW) in 2016. These studies are considered by the LCC as adequate for the current study and no further updated study was undertaken.

1 Appendix B, C and D were prepared in 2016 for RMS, and LCC have confirmed they are applicable for this proposal.
### Revision History

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<th>Prepared By</th>
<th>Description</th>
<th>Date</th>
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<td>Prepared by</td>
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<td>13 July 2020</td>
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<td>on behalf of</td>
<td>Beca Pty Limited</td>
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Abbreviations

Terms and acronyms commonly used in this report are outlined in the glossary table below.

<table>
<thead>
<tr>
<th>Abbreviation/Term</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td>AHIMS</td>
<td>Aboriginal Heritage Information Management System</td>
</tr>
<tr>
<td>BC Act</td>
<td>NSW Biodiversity Conservation Act 2016</td>
</tr>
<tr>
<td>CBD</td>
<td>Central Business District</td>
</tr>
<tr>
<td>CEMP</td>
<td>Construction Environmental Management Plan</td>
</tr>
<tr>
<td>DBYD</td>
<td>Dial Before You Dig</td>
</tr>
<tr>
<td>DoE</td>
<td>Federal Department of the Environment</td>
</tr>
<tr>
<td>DPIE</td>
<td>Department of Planning, Industry and Environment</td>
</tr>
<tr>
<td>EP&amp;A Act</td>
<td>Environmental Planning and Assessment Act 1979</td>
</tr>
<tr>
<td>EPA</td>
<td>NSW Environment Protection Authority</td>
</tr>
<tr>
<td>EPA Regs</td>
<td>NSW Environmental Planning and Assessment Regulation 2000</td>
</tr>
<tr>
<td>ESCP</td>
<td>Erosion and Sediment Control Plan</td>
</tr>
<tr>
<td>FM Act</td>
<td>NSW Fisheries Management Act 1994</td>
</tr>
<tr>
<td>ISEPP</td>
<td>NSW State Environmental Planning Policy (Infrastructure) 2007</td>
</tr>
<tr>
<td>LCC</td>
<td>Liverpool City Council</td>
</tr>
<tr>
<td>LGA</td>
<td>Liverpool City Council Local Government Area</td>
</tr>
<tr>
<td>Liverpool LEP 2008</td>
<td>Liverpool Local Environmental Plan 2008</td>
</tr>
<tr>
<td>NES</td>
<td>National Environmental Significance</td>
</tr>
<tr>
<td>NPW Act</td>
<td>National Parks and Wildlife Act 1974</td>
</tr>
<tr>
<td>NSW</td>
<td>New South Wales</td>
</tr>
<tr>
<td>PACHCI</td>
<td>Roads and Maritime Procedure for Aboriginal Cultural Heritage Consultation and Investigation</td>
</tr>
<tr>
<td>POEO ACT</td>
<td>Protection of the Environment Operations Act 1997</td>
</tr>
<tr>
<td>REF</td>
<td>Review of Environmental Factors</td>
</tr>
<tr>
<td>RMS2</td>
<td>Roads and Maritime Services</td>
</tr>
<tr>
<td>ROL</td>
<td>Road Occupying License</td>
</tr>
<tr>
<td>SEPPs</td>
<td>State Environmental Planning Policies</td>
</tr>
<tr>
<td>SPRAT</td>
<td>Department of the Environment Species Profile and Threats</td>
</tr>
<tr>
<td>TCS</td>
<td>Traffic Control Signal</td>
</tr>
<tr>
<td>TNSW</td>
<td>Transport for New South Wales</td>
</tr>
<tr>
<td>TMC</td>
<td>Transport Management Centre</td>
</tr>
</tbody>
</table>

2 Where reference in this document and consultation has been made to Roads and Maritime Services (RMS) it should be noted that from 1 December 2019 RMS has become an integral part of Transport for New South Wales (TNSW) and is no longer a separate service entity of TNSW. References made to RMS is construed as a reference to TNSW (Network Integration team) where appropriate.
1 Introduction

In 2019, Liverpool City Council (LCC) secured Federal funding under the Western Sydney Infrastructure Program (WSIP), round 3, to upgrade the Heathcote Road/Bardia Parade/Walder Road intersection, Holsworthy.

In 2016, the then RMS carried out traffic studies under its pinch point program and identified that improvement to the Heathcote Road, Bardia Parade and Walder Road intersection, is required to improve road safety and traffic efficiency at the intersection. The identified improvements include the construction of a high angle left turn slip lane from Bardia Parade into Heathcote Road, Traffic Control Signal (TCS) changes, and a new signalised pedestrian crossing across Heathcote Road on the southbound approach, as well as civil works including realignment of kerbs and underground services, adjusting footpaths, new medians, signposting and line markings.

The then RMS engaged Downer Mouchel to carry out the identified intersection improvement works. RMS prepared detailed design and approved the required amended TCS plan. In addition, a strategic concept design of a required water-main relocation in Walder Road and draft Review of Environmental Factors (REF) were prepared but not finalised.

Detailed design of the intersection improvement was carried out; however, funding allocation did not include the required civil works and associated relocation of the water main in Walder Road. Liverpool City Council (LCC) has now received funding to undertake the works (the proposal).

Purpose of the Report

Implementation of the civil works requires a Works Authorisation Deed (WAD) which in turn requires the project REF to be updated. The REF has been updated by Beca Pty Ltd on behalf of LCC.

For the purposes of this work, LCC is the proponent and the determining authority under Part 5 of the EP&A Act. The purpose of this REF is to describe the proposal, to document the likely impacts of the proposal, and to detail the mitigation measures that would be implemented.

The description of proposal and associated environmental impact have been undertaken in the context of Clause 228 of the NSW Environmental Planning and Assessment Regulation 2000 (EPA Regs), the NSW Biodiversity Conservation Act 2016 (BC Act), the NSW Fisheries Management Act 1994 (FM Act) and the Australian Government’s Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

In doing so, this REF helps to fulfil the requirements of Section 111 of the EP&A Act, which requires LCC to examine and consider to the fullest extent possible, all matters affecting or likely to affect the environment by carrying out the work.

The findings of the REF would be considered when assessing:

- Whether the proposal is likely to have a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning and Infrastructure under Part 5.1 of the EP&A Act.
- The significance of any impact on threatened species as defined by the BC Act and/or FM Act, in section 5A of the EP&A Act and therefore the requirement for a Species Impact Statement.
- The potential for the proposal to significantly impact a matter of national environmental significance or Commonwealth land and the need to make a referral to the Australian Government Department of Environment for a decision by the Commonwealth Minister for the Environment on whether assessment and approval is required under the EPBC Act.
● The significance of any impact on nationally listed biodiversity matters under the EPBC Act, including whether there is a real possibility that the activity may threaten long term survival, and whether offsets are required and able to be secured
2 The Proposal

2.1 Proposal Identification

Title: Heathcote Road/Bardia Parade and Walder Road Intersection Upgrade, Holsworthy.

Road name and number: Heathcote Road, Bardia Avenue and Walder Road, Holsworthy (GPS Coordinates: -33.949238°S, 150.950128°E).

Closest crossroad(s): The site includes the Heathcote Road, Bardia Avenue and Walder Road intersection and approaches along Heathcote Road, Bardia Parade and Walder Road.

Local Government Area: Liverpool City Council.

Transport for NSW region: Metro.

Description of works: LCC has decided in consultation with the Transport for NSW (TfNSW) to complete the Heathcote Road/Bardia Parade and Walder Road intersection upgrade.

Previous identified improvements include the construction of a high angle left turn slip lane from Bardia Parade into Heathcote Road, Traffic Control Signal (TCS) changes, and a new signalised pedestrian crossing across Heathcote Road on the southbound approach, as well as civil works including realignment of kerbs and underground services, adjusting footpaths, new medians, signposting and line marking.

As indicated above, due to inadequate funding allocations, the proposed upgrade works were not undertaken in 2016.

The purpose of this project is to improve road safety and improve traffic efficiency. The proposal includes:

- Construction of a high angle left slip lane from Bardia Parade into Heathcote Road, including installation of a signalised shared bicycle/pedestrian crossing.
- Implementation of double diamond phasing and associated TCS amendments at the intersection.
- Implementation of one new signalised pedestrian crossing across Heathcote Road, north of the intersection and realignment of two other pedestrian crossings.
- Civil works to adjust existing footpath to match new kerb alignment and kerb ramp locations.
- Localised road widening of Walder Road to accommodate required design vehicle turning paths.
- Modification of the existing signposting and line marking to suit the new signalised intersection arrangement.
- Intersection realignment, line marking and installation of a 40m long, 0.5m wide central median lane in Walder Road.
- Relocation of an affected water main in Walder Road to permit the localised road widening.
- Upgrade of street lighting in Bardia Parade section approximately 100m from the intersection with Heathcote Road and also along the proposed slip lane in Bardia Parade.

Overall, the proposed works aimed to improve road safety and amenity for pedestrians, whilst improving traffic efficiency at the intersection. In addition to the existing traffic control arrangement, signalised pedestrian crossings will be maintained, and new pedestrian signalised crossings incorporated to provide signalised pedestrian crossings across all the intersection approaches.

Design drawings of the proposed intersection upgrade works are included as Appendix A.
2.2 Proposal background

The intersection of Heathcote Road with Bardia Parade and Walder Road at Holsworthy is currently a signalised intersection with pedestrian provisions on three of the four legs. Investigations by RMS in 2016 indicated the safety and efficiency of the right turn movements from Walder Road could be improved with the implementation of a diamond phase for the right turn movements into and out of Heathcote Road. It also identified the need to improve bus movements from Heathcote Road southbound towards Walder Road.

The purpose of this project is to improve safety and manage congestion. In 2016, RMS investigated the intersection under its pinch point program to improve safety and efficiency of traffic movements through the intersection.

Heathcote Road is a four-lane divided roadway from north of its intersection with M5 Motorway northbound off and on ramps, Moorebank, to south of Infantry Parade, Holsworthy, Short right turning lanes exists at all existing signalised intersection between M5 Motorway and Infantry Parade.

Walder Road and Bardia Parade are both dual lane local roads under LCC jurisdiction. The intersection is fully signalised, with filter right turns from Walder Road and Bardia Parade and a ‘diamond phase’ from Heathcote Road into Walder Road and Bardia Parade.

Heathcote Road is a state road and managed by TfNSW. Walder Road, Bardia Parade and other local roads in the area which are managed by LCC.

Heathcote Road is a critical arterial road for the developing outer areas of Sydney’s western suburbs. Heathcote Road provides an interchange to the South Western Motorway, which links the west of Sydney to the airport and CBD with Princess Highway at Heathcote. Heathcote Road also provides link to Military establishment in Holsworthy and the Holsworthy Railway Station which is used to commute to and from work and home.

2.3 Project Location and Context

Heathcote Road is a divided State Road with two (2) lanes in each direction and has a sign posted speed limit of 60km/h. Bardia Parade and Walder Road are local roads with one lane in each direction with a sign posted speed limit of 50km/h.

Heathcote Road provides an interchange to the South Western Motorway (M5), a major arterial road distributing traffic to and from the south west of Sydney. Bardia Parade and Walder Road service the surrounding predominantly residential suburbs of Wattle Grove and Hammondville respectively. Traffic through the intersection is controlled by traffic lights, while shared path along Heathcote Road exists on the west side. Heathcote Road, Walder Road and Bardia Parade is part of local bus routes connecting surrounding area with Liverpool railway interchange. The project location is as indicated in the locality maps figure 2.1 and 2.2 and the layout of the intersection upgrade is shown in figure 2.3 below.
Figure 2-1: Locality map (source: Google Maps, July 2020)

Figure 2-2: Location of the proposed works (source: Google Maps, July 2020)
Three bus routes are currently operational through the intersection connecting Holsworthy to Sandy Point and Liverpool railway interchange respectively, via outlying suburbs including Wattle Grove and Moorebank.

The proposed work site is predominantly surrounded by low density residential areas including Hammond Care aged care facilities, high and primary schools, Holsworthy railway station, open space connectivity routes for pedestrians and community facilities including a medical centre, shopping centre, clubs and pubs, and car parking areas. Holsworthy Barracks military facility is located approximately 1.5 kilometres south of the intersection, while the closest sensitive environmental receptors include Lieutenant Cantello Reserve and Williams Creek (1.5 kilometres east), Georges River (2 kilometres east) and Harris Creek Reserve (1.2 kilometres south).
2.4 Environmental and Community Impact

The proposed intersection upgrade works may cause varying impacts to the environment and community, of which this REF considers in detail.

As shown in Figure 2-4, the proposed introduction of a high entry left turn lane exiting Bardia Parade into Heathcote Road, including the installation of a pedestrian crossing, and the implementation of double diamond phasing and associated TCS amendments at the Heathcote Road / Bardia Parade intersection will require the removal of a minor amount of roadside vegetation.

This vegetation has been investigated as part of a preliminary vegetation assessment to identify potentially significant species and habitat which may require State or Commonwealth referral. The assessment conducted by Ecology and Heritage Partners in July 2016, during the initial project phase, concluded the following:

- The survey area includes a small patch of roadside vegetation covering approximately 170 square metres.
- The vegetation proposed to be removed consists of a small cluster of trees, including one large and well-established Grey Ironbark (Eucalyptus paniculata), four Flax-leaved Paperbarks (Melaleuca linarifolia) and one small Parramatta Red Gum (Eucalyptus parametensis).
- The understory is dominated by introduced grasses typical roadsides and lawns, with scattered weeds also present.
- All of the above species are indigenous to the area.
- It is likely that these trees and shrubs are planted.
- No Threatened flora species were observed during field investigations.
- Vegetation is likely to provide limited habitat opportunities for vertebrate fauna.
- The proposed tree removal will not have any impact on any matters of National Environmental Significance (EPBC Act 1999).
- The flora species identified are not listed as threatened under the BC Act.

It is understood that this vegetation has been planted for amenity purposes along the southern side of the pedestrian footpath along Heathcote Road. This vegetation includes a mixture of native and exotic species and does not hold any significant ecological value or habitat. The full impacts of these works will be fully assessed as per the requirements of the Environmental Planning and Assessment Act 1979. Any unavoidable impacts to existing vegetation will be in accordance with relevant biodiversity guidelines and legislation. The vegetation assessment was conducted in 2016 by the RMS (now TfNSW). The vegetation study is considered by the LCC as adequate for the current study and no further updated study was undertaken.

A copy of the Ecology and Heritage Partners vegetation assessment has been included as Appendix B.

With consideration to the proposed works, it is understood that there is the potential for some minor construction related amenity impacts to the local environment and surrounding community. This REF will seek to accurately define the relative risk associated with the proposed works upon the community and the environment and identify the importance of upgrading this infrastructure and its associated safety profile.

The community, inclusive of road users and pedestrians, will be exposed to limited periods altered traffic conditions during staged construction works. Pedestrian pathways traversing the works area may also be realigned temporarily during construction, or controlled via traffic management, to reduce the interface between the public and the construction area.
Figure 2-1: Aerial view of vegetation impacted by the proposed works (source: Google Maps, July 2020)

Figure 2-2: Street view of roadside vegetation within the proposed project boundary (source: NearMap)
2.5 Underground services

The proposal has been designed with the objective of avoiding disruptions to existing services and utilities. This will be monitored closely throughout the design and construction phases of the works.

A Dial Before You Dig search (DBYD) was undertaken on 30 March 2020. Utilities authorities with assets within the vicinity of the project are listed in Table 2-1. Further DBYD searches will be undertaken prior to works commencing.

The proposed works and design have been planned in a manner which will avoid impacts to, and relocation of, existing services and utilities within the area of works. This will be monitored closely throughout the design and construction phases of the works.

Table 2-1: Utility services

<table>
<thead>
<tr>
<th>Asset Owner</th>
<th>Existing Asset</th>
<th>Existing Utility Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Endeavour Energy</td>
<td>No asset affected</td>
<td>N/A</td>
</tr>
<tr>
<td>2  Jemena Gas West</td>
<td>3500kPa 500mm primary main</td>
<td>A primary gas main crosses Bardia Parade west of the intersection running parallel to Heathcote Road.</td>
</tr>
<tr>
<td>3  Jemena Gas West</td>
<td>210kPa 200mm steel main</td>
<td>A gas main runs along the eastern verge of Heathcote Road crossing Walder Road.</td>
</tr>
<tr>
<td>4  Jemena Gas West</td>
<td>210kPa 50mm steel main</td>
<td>A gas main runs along the northern verge of Walder Road branching off the 200mm steel main in Heathcote Road.</td>
</tr>
<tr>
<td>5  Optus Uecomm</td>
<td>Optus fibre in Other Utility conduit</td>
<td>An asset runs along the west side of Bardia Parade, parallel to Heathcote Road.</td>
</tr>
<tr>
<td>6  Sydney Water</td>
<td>DN500 cast iron cement lined (CICL) water main</td>
<td>A water main runs along the western verge of Heathcote Road crossing Bardia Parade.</td>
</tr>
<tr>
<td>7  Sydney Water</td>
<td>DN300 CICL water main</td>
<td>A water main branches off the DN500 CICL and continues north along the west side of Heathcote Road.</td>
</tr>
<tr>
<td>8  Sydney Water</td>
<td>DN300 CICL water main</td>
<td>A water main runs along the eastern verge of Heathcote Road crossing Walder Road.</td>
</tr>
<tr>
<td>9  Sydney Water</td>
<td>DN300 steel cement lined (SCL) water main</td>
<td>A water main branches off the DN500 CICL and crosses Heathcote Road.</td>
</tr>
<tr>
<td>10 Sydney Water</td>
<td>DN200 CICL water main</td>
<td>A water main runs along the southern verge of Walder Road branching off the 300 CICL water main running along the eastern verge of Heathcote Road.</td>
</tr>
<tr>
<td>11 Sydney Water</td>
<td>DN200 ductile iron cement lined (DICL) water main</td>
<td>A water main runs along the southern verge of Walder Road branching off the 300 CICL water main running along the eastern verge of Heathcote Road.</td>
</tr>
<tr>
<td>12 Sydney Water</td>
<td>DN100 CICL water main</td>
<td>A water main runs along the northern verge of Walder Road branching off the 300 CICL water main running along the eastern verge of Heathcote Road.</td>
</tr>
<tr>
<td>13 Sydney Water</td>
<td>DN500 SCL sewer rising main (concrete encased)</td>
<td>A sewer rising main runs along the western verge of Heathcote Road crossing Bardia Parade.</td>
</tr>
</tbody>
</table>
### Asset Owner | Existing Asset | Existing Utility Description
---|---|---
14 | Sydney Water | DN400/300 vitrified clay (VC) sewer main | A sewer main runs along the eastern boundary of Heathcote Road crossing Walder Road and changes size at the manhole within the intersection.
15 | Sydney Water | DN150 VC sewer main | A sewer main runs along the southern edge of Walder Road carriageway and connects into the manhole within the intersection.
16 | Sydney Water | Disused water main | A disused water main runs along the eastern verge of Heathcote Road crossing Walder Road and branches to cross Heathcote Road at the northern leg of the intersection.
17 | Sydney Water | Disused sewer main | A disused sewer main crosses Heathcote Road and Bardia Parade at the southern leg of the intersection.
18 | Telstra | 35mm PVC conduit | A 35mm conduit runs along the eastern verge of Heathcote Road and continues along the northern verge of Walder Road. There is a cable jointing pit at the north corner of the intersection.
19 | Telstra | 32mm PVC conduit | A 32mm conduit runs south along the eastern verge of Heathcote Road from a pit on the eastern corner of the intersection.
20 | Telstra | 100mm PVC conduit | There is a 100mm conduit connecting the pit on the eastern corner to a pit 4.6m along Walder Road, where the conduit continues along Walder road in the southern verge.
21 | NBN | Service cables | NBN service cables running north south along Walder Road and Bardia Parade.
22 | Optus | Fiber Optic cables | Fiber optic cables running east west to the south of Bardia Parade.
23 | AARnet | Fiber Optic cables | Fiber optic cables running east west along Heathcote Road.

### 2.6 Objectives of works
The objectives of the works are to:
- Improve road safety and traffic efficiency at the Heathcote Road, Bardia Parade and Walder Road intersection, Holsworthy.
- Improve bus movements from Heathcote Road southbound towards Walder Road, Hammondville.
- Improve pedestrian safety.
- To include consent conditions of the proposed development at 192-194 Heathcote Road, Hammondville.

### 2.7 Construction hours and duration

#### 2.7.1 Proposed date of commencement
The indicative timeframe of works commencing on site is proposed as from October 2020, dependent upon acquisition of approvals.

#### 2.7.2 Estimated length of construction period
The project is scheduled to be completed by April 2021. The works are likely to be scheduled over staged intervals.
2.7.3 Property acquisition

The proposed works will be within the existing road reserve and adjacent public land reserves, no property acquisition will be required to facilitate the works.

2.7.4 Other construction details

It is anticipated that some activities outside of standard working hours will be required to facilitate the works, including night works, the purpose of this being to minimise impacts to traffic movement by conducting works during off-peak times, temporary lane closures have been notified to the Minister’s office. All Traffic Control will be in accordance with appropriate TfNSW guidelines and in accordance with conditions prescribed in the ROL issued by the TMC.

2.8 Ancillary Facilities

<table>
<thead>
<tr>
<th>Will the proposed work require the use or installation of a compound site?</th>
</tr>
</thead>
<tbody>
<tr>
<td>A dedicated site shed with amenities will likely be provided for the workers. A laydown area will be required with temporary fencing that would be locked outside construction hours.</td>
</tr>
<tr>
<td>☑ Yes ☐ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Will the proposed work require the use or installation of a stockpile site?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excavated materials will be stockpiled briefly directly adjacent the works site. No satellite sites for bulk storage or stockpiled will be required.</td>
</tr>
<tr>
<td>☑ Yes ☐ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Are any other ancillary facilities required (e.g. temporary plants, parking areas, access tracks)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>All plant and equipment would be transported to and from site at the beginning and end of each shift. A site compound will be established in an appropriate place on site.</td>
</tr>
<tr>
<td>☑ Yes ☐ No</td>
</tr>
</tbody>
</table>

2.9 Project Justification and Consideration of Alternatives

The need for the proposal arises from the need to improve the safety and efficiency for pedestrian and traffic movements and improve bus movements through a busy intersection.

LCC has adopted the RMS approved detailed design and is updated to meet the proposal objectives, refer item 2.6.
3 Statutory and Planning Context

This chapter provides the statutory and planning framework for the proposal and considers provisions of relevant Federal, State environmental planning policies, local environmental plans and other legislation.

3.1 Commonwealth Legislation

3.1.1 Environment Protection & Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act protects matters of National Environmental Significance (NES), such as threatened species and ecological communities, migratory species (protected under international agreements), and National Heritage places.

Any actions that will or are likely to have ‘significant impacts’ on matters of NES require referral and approval from the Australian Government Environment Minister. Significant impacts are defined by the Commonwealth (reference http://www.environment.gov.au/epbc/guidelines-policies.html) for matters of NES.

No matters of NES have been identified at or near the site nor are any significant impacts anticipated. Referral to the Commonwealth under the EPBC Act is therefore not required for the proposal.

3.2 State Environmental Planning Policies

State Environmental Planning Policies (SEPPs) can specify planning controls for certain areas and/or types of development. SEPPs can also identify:

- The development assessment system that applies to developments (e.g. whether a development is State significant)
- The type of environmental assessment that is required (e.g. whether an environmental impact statement is required)

Key SEPPs relating to this proposal have been included as follows:

3.3 NSW State Environmental Planning Policy (Infrastructure) 2007

The NSW State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across the state, including for roads and road infrastructure facilities. Clause 94 of the ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposal is appropriately characterized as development for the purposes of a road or road infrastructure facilities and is to be carried out by or on behalf of LCC, it can be assessed under Part 5 of the EP&A Act. Development consent is not required.

The proposal is not located on land reserved under the National Parks and Wildlife Act 1974 and does not affect land or development regulated by State Environmental Planning Policy No. 14 – Coastal Wetlands, State Environmental Planning Policy No. 26 – Littoral Rainforests or State Environmental Planning Policy (Major Projects) 2005.

3.4 Environmental Planning and Assessment Act 1979 (EP&A Act)

The EP&A Act is the principal planning legislation for NSW. It provides a framework for environmental planning and assessment of proposals.
As LCC is the proponent for this proposal, the works are assessed as 'development permissible without consent' under Part 5 of the EP&A Act. Accordingly, LCC must satisfy Sections 5.5, 5.6 and 5.7 of the EP&A Act by examining, and considering to the fullest extent possible, all matters which are likely to affect the environment. This REF is intended to assist, and ensure that LCC complies with, the EP&A Act including Sections 5.5, 5.6 and 5.7 and the requirements of Clause 228 of the EP&A Regulation 2000. Environmental Planning Instruments made under the EP&A Act may also be relevant and are addressed below.

### 3.5 Biodiversity Conservation Act 2016 (BC Act)

Part 7 of the BC Act provides the environmental assessment requirements for activities being considered under Part 5 of the EP&A Act 1979. If a significant impact is likely, the environmental impact statement is to be accompanied by a Species Impact Statement, or if the proponent so elects – a biodiversity development assessment report. Sections 7.2(1)(a) and 7.3 describe the assessment requirements and thresholds for what is considered a significant impact.

Under the BC Act and the Biodiversity Offsets Scheme, after biodiversity certification is conferred on an area of land, development may proceed without the usual requirement under the Environmental Planning and Assessment Act 1979 for site-by-site threatened species assessment. As the Study Area does not possess a Biodiversity Certification, it must be assessed for impacts from the project activities to threatened species under the BC Act. Threatened species and communities listed under the BC Act were identified as potentially being impacted by the works. Assessments of Significance were undertaken for these matters and concluded that a significant impact is not likely to result due to the limited spatial extents of the project activities and therefore a Species Impact Statement or Biodiversity Development Assessment Report is not required.

### 3.6 Protection of the Environment Operations Act 1997 (POEO ACT)

The Protection of Environment Operations Act 1997 regulates noise, air, water and soil pollution in NSW. As the works would result in minor temporary risks of air, water and noise pollution, the works would need to comply with the requirements of the Act. Relevant sections of the POEO Act are listed below:

- Part 5.4 Air Pollution
- Part 5.5 Noise Pollution
- Part 5.6 Land Pollution and Waste

Any work potentially resulting in pollution must comply with the POEO Act and relevant licences must be obtained if required.

No licences have been identified as being required by the proposal.

### 3.7 National Parks and Wildlife Act 1974 (NPW ACT)

The National Parks and Wildlife Act 1974 is administered by the Office of Environment and Heritage. It provides statutory protection for all Aboriginal ‘objects’ (Section 90) and ‘places’ (Section 84).

The proposal would not impact any known Aboriginal sites, the proponent would not need to obtain an Aboriginal Heritage Impact Permit (AHIP) for this project.

### 3.8 Environment Protection and Biodiversity Conservation Act 1999

Under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), a referral is required to the Australian Government for proposed actions that have the potential to significantly impact on matters of national environmental significance or a direct or indirect impact on Commonwealth land. These matters are considered in Section 8 of this REF.
The assessment has found that the proposal is not likely to significantly affect any matters of national environmental significance or Commonwealth land. Accordingly, the proposal has not been referred to the Federal Department of the Environment (DoE).

3.9 Heritage Act 1977

The Heritage Act 1977 protects items of environmental heritage (natural and cultural) in NSW. State significant items listed on the NSW State Heritage Register are protected under the Heritage Act 1977 against any activities that may damage an item or affect its heritage significance.

It is understood that the proposed works will not impact upon any recognised areas of natural or cultural heritage.

3.10 Local Environmental Plans

The site of the proposed works is located within the Liverpool City Council Local Government Area (LGA). Consequently, the principal relevant local environmental planning instrument under the EP&A Act is the Liverpool Local Environmental Plan 2008 (Liverpool LEP 2008).

The site of the proposed works affecting the roadway directly is located within the Special Activity (SP2 - Infrastructure) Zone under the Liverpool LEP 2008. The road reserve adjacent and Bardia Parade affected by the works is currently zoned Public Recreation (RE1).

It should be noted that the objectives of these zones include the following:

- To provide for infrastructure and related uses.
- To prevent development that is not compatible with or that may detract from the provision of infrastructure.
- To reserve land for the provision of infrastructure.

The existing land use as infrastructure supporting and complementary to the road corridor is compliant with the objectives of the SP2 zone.

Development consent from LCC is not required under Part 5 of the EP&A Act.

The proposal would be within the existing road corridor and adjacent areas, with no impacts expected on other land zones within the proposal area. Intersection upgrade works in order to improve safety is in general accordance with the objectives of this zone and is permissible with development consent under the above zone. Notwithstanding this, since the ISEPP applies to this proposal, the works do not require consent under the Liverpool LEP 2008. However, LCC would endeavour to incorporate measures that are in keeping with the Liverpool LEP 2008 requirements.
4 Community and Agency Consultation

4.1 ISEPP Consultation

Part 2 of the ISEPP (Clauses 13-16) provides provisions for local councils to consult with other public authorities prior to undertaking some development activities.

The site of the proposed works is not located within a designated Flood Planning Area, area of High or Moderate Biodiversity Sensitivity, or an area containing a heritage item as identified in the Liverpool LEP 2008 maps. Therefore, consultation is not required under ISEPP.

4.2 Community Consultation

LCC will undertake community consultation with potentially affected residents within approximately 100m of the works area. Community consultation will be undertaken in accordance with LCC policies including requesting responses from those contacted within 21 days. Responses received will be considered and design changes or work practices amended where considered appropriate.

LCC will prepare traffic control plans and seek ROL approval from the TMC prior to undertaking the works.
5 Proposal Assessment Process and Determination

ISEPP 2007 is an “Environmental Planning Instrument” made in accordance under “Part 3, division 3.2, section 3.13 “Making of environmental planning instruments” under the Environmental Planning and Assessment Act 1979.

Part 5, division 5.1, subdivision 2 “Duty to Consider Environmental Impact” under The Environmental Planning and Assessment Act 1979 requires a “Determining Authority” examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity.

Section 6 details environmental assessments relating to:

- EPA Regs - Regulation 228 “What factors must be taken into account concerning the impact of an activity on the environment”

LCC is the determining authority for the proposed works. This REF fulfils LCC’s obligation as the proponent under Part 5 of the Environment Planning and Assessment Act 1979. The works are permissible without consent by adopting the ISEPP the proposed works would be undertaken under Part 5 of the Environment Planning and Assessment Act 1979.
6 Environmental Assessment

6.1 Summary

This section provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposal. All aspects of the environmental potentially impacted upon by the proposal are considered. The factors specified in clause 228(2) of the Environmental Planning and Assessment Regulation 2000 and the matters of national environmental significance under the Environment Protection and Biodiversity Conservation Act 1995. Site-specific safeguards are provided to ameliorate the identified potential impacts.

All aspects of the environment potentially impacted upon by the proposal are considered including:

- Soil
- Waterways and water quality
- Noise and Vibration
- Air quality
- Non-Aboriginal Heritage
- Aboriginal Heritage
- Biodiversity
- Trees
- Traffic and transport
- Socio-economic
- Landscape character and visual amenity
- Waste
- Cumulative Effects

6.2 Soil

Description of existing environment and potential impacts:

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are there any known occurrences of salinity or acid sulphate soils in the area?</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>A review of the Australian Soil Resource Information System (ASRIS) maps indicate that the project area and surrounds is categorised as Level 4 - Low Probability of Occurrence of Acid Sulfate Soils.</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Does the project involve the disturbance of large areas (e.g. &gt;2ha) for earthworks?</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Does the site have constraints for erosion and sedimentation controls such as steep gradients or narrow corridors?</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Are there any sensitive receiving environments that are located in or nearby the likely project footprint or that would likely receive storm-water discharge from the project?</td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

The closest sensitive environmental receptors include Lieutenant Cantello Reserve and Williams Creek (1.5 kilometres east), Georges River (2 kilometres east) and Harris Creek Reserve (1.2 kilometres south).
The nature and location of the proposed works are not expected to impact on the closest sensitive receiving environments.

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there any evidence within or nearby the likely footprint of potential contamination?</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td>Is the likely project footprint in or nearby highly sloping landform?</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td>Are the works likely to result in more than 2.5ha (area) of exposed soil?</td>
<td>☐</td>
<td>☑</td>
</tr>
</tbody>
</table>

6.2.1 Soil - Safeguards

Safeguards to be implemented are:

1. Erosion and sediment control measures are to be implemented and maintained to:
   - Divert clean water around the site
   - Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets (in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book)).
   - Reduce water velocity and capture sediment on-site.
   - Minimise the amount of material transported from site to surrounding pavement surfaces.

2. Erosion and sedimentation controls are to be checked and maintained on a regular basis (including clearing of sediment from behind barriers) and records kept and provided on request.

3. Erosion and sediment control measures are not to be removed until the works are completed and areas are stabilised.

4. Work areas are to be stabilised progressively at the end of the works.

5. An erosion and sediment control plan (ESCP) should be prepared for the works.

6. If any unexpected contaminants are encountered during the works, work in the area would cease immediately and the LCC Officer would be contacted to seek and advise on the appropriate action.

7. Any waste sent off-site would be classified according to the relevant NSW Environment Protection Authority (EPA) Waste Classification Guidelines.

8. Any storage of materials on site would be managed in accordance with the LCC guidelines.
6.3 Waterways and water quality

Description of existing environment and potential impacts:

<table>
<thead>
<tr>
<th>Are the works located within, adjacent to or near a waterway?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>The closest waterways include Williams Creek (1.5 kilometres east), Georges River (2 kilometres east) and Harris Creek (1.2 kilometres south).</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Run-off within the proposal area is currently managed by a localised kerb and gutter stormwater system. Sediment controls would be used during construction to protect drainage points from uncontrolled run-off.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>An ESCP plan is expected to be prepared to minimise potential discharge of sediment or contaminants to drainage lines or waterways during construction</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Is the location known to flood or be prone to water logging?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>The site of the proposed works is not identified as a designated Flood Planning Area by the Liverpool City Council LEP 2008.</em></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Are the proposed works located within or immediately adjacent to the area managed by Sydney Catchment Authority covered by State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011? (Maps of the Sydney Water Drinking Water Catchment are available from:*</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Will the proposed works be undertaken on a bridge or ferry?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Are the works likely to require the extraction of water from a local water course (not mains)?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

6.3.1 Water and water quality - Safeguards

Safeguards to be implemented are:

1. There is to be no release of dirty water into drainage lines and/or waterways.

2. Water quality control measures are to be used to prevent any materials (e.g. concrete, grout, sediment, etc.) entering drain inlets or waterways.

3. Potable water is to be used for wash down of vehicles and equipment.

4. No concrete wash out is to be carried out on-site.

5. Containment material is to be used to capture / filter water used in wash down.

6. An emergency spill kit is to be kept on-site at all times. All staff are to be made aware of the location of the spill kit and trained in its use.

7. Water required for the proposal would be obtained from an approved source (e.g. potentially including hydrants or tankers).
8. All fuels, chemicals and liquids are to be stored in an impervious bunded area a minimum of 50 metres away from:

- Rivers, creeks or any areas of concentrated water flow.
- Flooded or poorly drained areas.
- Slopes above 10%.

9. Refuelling of plant and equipment is to occur in impervious bunded areas located a minimum of 50 metres from drainage lines or waterways.

### 6.4 Noise and Vibration

**Description of existing environment and potential impacts:**

Are there any residential properties or other noise sensitive areas near the location of the proposed works that may be affected by the works (i.e. church, school, hospital):

<table>
<thead>
<tr>
<th>During construction?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The site of the proposed works is set within an intersection which controls the flow of traffic through an established residential area. A community medical centre is also located directly adjacent the intersection to the south-east along Heathcote Road approximately 70 metres from the centre of the intersection. Residential receivers directly abutting Walder Road, while the distance from Bardia Parade to the nearest residential receiver is approximately 50 metres.</strong></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Works may be conducted during and out of standard working hours, with the intention of staging works so as to avoid peak hour traffic, and reduce chronic noise and vibration impacts to adjacent residents. Duration of works is scheduled to be approximately 22 weeks.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>The proposed works are located directly adjacent residences within the suburb of Holsworthy. Noise impacts to surrounding sensitive receivers (properties abutting Heathcote Road, Walder Road and Bardia Parade) would be managed through the implementation of standard mitigation measures, such as surrounding residential receivers with adequate notification of the proposed works. Additional measures would be implemented for out of hour works (see below).</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>The contractor will select the most appropriate machinery to deliver this work to minimise noise and vibration and will closely monitor impacts during work.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>A quantitative noise assessment using the RMS Construction Noise Calculator and RMS Construction Noise and Vibration Guideline (April 2016) for the works has been conducted. Refer to Appendix C.</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>During operation?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>The proposed works would not move the road corridor closer to sensitive receivers to the extent whereby elevated traffic noise would be experienced and is not expected to increase traffic volumes as a result of the proposal.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Question</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>-----</td>
<td>----</td>
</tr>
<tr>
<td>Are the proposed works going to be undertaken only during standard working hours?</td>
<td></td>
<td><img src="true" alt="Yes" /></td>
</tr>
<tr>
<td><em>In order to minimise impacts on the congested road network, some road closures and works would need to be undertaken outside of standard working hours of:</em></td>
<td></td>
<td><img src="true" alt="Yes" /></td>
</tr>
<tr>
<td>Monday-Friday: 7:00am to 6.00pm</td>
<td></td>
<td><img src="true" alt="Yes" /></td>
</tr>
<tr>
<td>Saturday: 8.00am to 1.00pm</td>
<td></td>
<td><img src="true" alt="Yes" /></td>
</tr>
<tr>
<td>Sunday and Public Holidays: no work.</td>
<td></td>
<td><img src="true" alt="Yes" /></td>
</tr>
<tr>
<td>Noise mitigation measures for out of hours work have been proposed.</td>
<td></td>
<td><img src="true" alt="Yes" /></td>
</tr>
<tr>
<td>Night works are likely to include asphalting and line marking.</td>
<td></td>
<td><img src="true" alt="Yes" /></td>
</tr>
<tr>
<td>Is any explosive blasting required for the proposed works?</td>
<td></td>
<td><img src="true" alt="Yes" /></td>
</tr>
<tr>
<td>Will operation of the works alter the noise environment for sensitive receivers? This might include, but not be limited to, altering the line or level of an existing carriageway, changing traffic flow, increasing traffic speeds by more than 10km/hr. or installing audio-tactile line markings.</td>
<td></td>
<td><img src="true" alt="Yes" /></td>
</tr>
<tr>
<td>Will the works result in vibration being experienced by any surrounding properties or infrastructure (during either construction or operation). Due to the minor nature of the works and distance to the nearest receivers, any vibration impacts are expected to be negligible or very minor.</td>
<td></td>
<td><img src="true" alt="Yes" /></td>
</tr>
</tbody>
</table>

### 6.4.1 Noise and Vibration - Safeguards

Safeguards to be implemented are:

1. Construction personnel will select the most appropriate machinery to deliver this work to minimise noise and vibration and will closely monitor impacts during work.

2. All receivers within the noise impact boundary will be notified of the proposed works prior to the commencement of construction in accordance with the LCC consultation procedure. This notification would include 24-hour contact details for the on-site project manager to report any noise issues as a result of the works.

3. Works are to be carried out during standard construction hours (i.e. 7.00am to 6.00pm Monday – Friday; 8.00am to 1.00pm on Saturdays; no work to be undertaken on Sundays or Public Holidays) where it is feasible to undertake those works without major impacts on the local road network. Any work that is performed outside normal work hours or on Sundays and public holidays is to minimise noise impacts in accordance with Roads and Maritime’s Construction Noise and Vibration Guideline (April 2016).

4. Additional measures to minimise noise would be considered, including:
   - Undertaking the noisiest activities during standard construction hours.
   - Allowing adequate respite periods during noise intensive works.
   - Using alternatives to reversing alarms, such as ambient noise sensitive or ‘quacker’ type reversing alarms.
- Turning off plant and equipment when not in use.
- Ensuring plant/equipment is regularly maintained and repair/replace equipment that becomes noisy.
- Throughout each construction activity, locating stationary plant items as far from receivers as possible.
- Choosing mobile plant and equipment that includes exhaust silencers or residential class mufflers.
- Communicating with construction workers via toolbox talks about minimising noise, including the use of equipment, avoidance of shouting, loud talking and door slamming.

5. Implement community consultation measures - Periodic notification (monthly letterbox drops or equivalent) detailing proposed dates, alternative dates for wet weather and hourly activity plan for night works.

6. Site inductions for all site personnel outlining noise management procedures.

7. No swearing or unnecessary shouting or loud stereos/radios on site.

8. No dropping of materials from height, throwing of metal items and slamming of doors.

9. The CEMP must be regularly updated to account for changes in noise and vibration management issues and strategies.

10. Where feasible and reasonable, construction should be carried out during the standard daytime working hours. Work generating high noise and/or vibration levels should be scheduled during less sensitive time periods.

11. As a guide high noise and vibration generating activities near receivers should be carried out in continuous blocks that do not exceed 3 hours each, with a minimum respite period of one hour between each block. The duration of each block of work and respite should be flexible to accommodate the usage and amenity at nearby receivers.

12. Unless negotiated with the community with consultation documented and approved by LCC project manager, the following shifts should not be exceeded:

   - 2 consecutive evenings or nights per week; and
   - 3 evenings or nights per week; and
   - 6 evenings or nights per month.

13. For night work these periods of work should be separated by not less than one week.

14. Use quieter and less vibration emitting construction methods where feasible and reasonable.

15. Ensure plant including the silencer is well maintained.

16. The offset distance between noisy plant and adjacent sensitive receivers is to be maximised.

17. Plant used intermittently to be throttled down or shut down.

18. Noise-emitting plant to be directed away from sensitive receivers.

19. Only have necessary equipment on site.
20. Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site.

21. Increased noise producing activities should be scheduled for normal working hours. If the work cannot be undertaken during the day, it should be completed before 11:00pm.

22. Loading and unloading of materials/deliveries is to occur as far as possible from sensitive receivers.

23. Select site access points and roads as far as possible away from sensitive receivers.

24. Dedicated loading/unloading areas to be shielded if close to sensitive receivers.

25. Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible.

26. Avoid or minimise these out of hours movements where possible.

27. Use structures to shield residential receivers from noise such as site shed placement; earth bunds; fencing; erection of operational stage noise barriers (where practicable) and consideration of site topography when siting plant.

6.5 Air quality

Description of existing environment and potential impacts:

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are the proposed works likely to result in large areas (&gt;2ha) of exposed soils?</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Will there be any dust sensitive receivers located within the vicinity of the proposed works during the construction period?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

*The works will be in close proximity to sensitive receivers (residential properties). The safeguards below will be implemented to mitigate where possible and manage these potential impacts.*

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there likely to be an emission to air during construction?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

*Minor exhaust emissions from plant may be expected during construction.*

6.5.1 Air Quality - Safeguards

Safeguards to be implemented are:

1. Measures (including watering or covering exposed areas) are to be used to minimise or prevent air pollution and dust.

2. Works (including the spraying of paint and other materials) are not to be carried out during strong winds or in weather conditions where high levels of dust or airborne particulates are likely.

3. Vehicles and plant used on site are to be kept in efficient working order. The Protection of the Environment Operations Act 1997 must be complied with.

4. Work vehicles / machinery would not be left running or idling when not in use.
5. Stand down machinery producing excess emissions.

6. Appropriate action would be taken when levels of dust become unacceptable. This would include suspending works during high wind events.

### 6.6 Non-Aboriginal Heritage

**Description of existing environment and potential impacts:**

Have online heritage database searches been completed?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

The following searches have been undertaken on July 2020 with no non-Aboriginal heritage items found proximate to the proposed area of works:

- NSW Heritage database
- Commonwealth EPBC heritage list
- Australian Heritage Places Inventory
- Local Environmental Plan(s) heritage schedule

Are there any items of non-Aboriginal heritage or heritage conservation areas located within the vicinity of the proposed works?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

Are there any items of potential non-Aboriginal heritage significance within the vicinity of the works?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

Are works likely to occur in or near features that indicate potential archaeological remains?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

#### 6.6.1 Non-Aboriginal Heritage - Safeguards

Safeguards to be implemented are:

1. Should unknown finds be exposed, which are identified as having non-Aboriginal heritage significance, works on the site shall immediately cease in the affected area and the Department of Planning, Industry and Environment (DPIE) and LCC will be informed to determine the appropriate management strategy. The duration of the cessation of works will depend on the integrity and significance of any relic.

2. As part of the site induction, all workers will be advised of their obligations in relation to heritage before construction begins and the guidelines to follow if unanticipated heritage items or deposits are located during construction.

### 6.7 Aboriginal Heritage

**Description of existing environment and potential impacts:**

Would the works involve disturbance in any area that has not been subject to previous ground disturbances?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

Have online AHIMS search been completed?

Yes, the AHIMS Basic Search has been completed using the online portal returning results showing no (zero) Aboriginal sites or places within a 50-metre search buffer.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

Is there potential for the proposed works to impact on any items of Aboriginal heritage?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>
The proposed works area is within the road corridor, road shoulder and road reserve, all subject to previous ground disturbance. Therefore, there is negligible potential for the works to affect Aboriginal heritage.

Would the works involve the removal of mature native trees?
Yes, the proposed works will impact upon a patch of roadside vegetation planted within the road reserve at the corner of Heathcote Road and Bardia Parade, at the site of the proposed high entry left turn lane exiting Bardia Parade into Heathcote Road. This patch of vegetation has undergone assessment by a qualified ecologist and has been identified to be planted.

Would the works impact on any features that may indicate any potential archaeological remains?
Yes

Are the works consistent with the requirements of the Roads and Maritime Procedure for Aboriginal Cultural Heritage Consultation and Investigation?
The PACHICI was previously undertaken in 2016 by RMS. It is understood that the proposed works are still consistent with the requirements of Roads and Maritime Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI). The PACHCI clearance letter from 2016 is included as Appendix D.

6.7.1 Aboriginal Heritage - Safeguards

Safeguards to be implemented are:

1. An unknown finds procedure will be incorporated into the CEMP to provide guidance on the process to be followed if suspected Aboriginal heritage items are found during project works. At a minimum, that process will:
   - Provide that if unforeseen Aboriginal heritage items are uncovered, works will immediately cease and LCC, DPIE and the Local Aboriginal Land Council will be informed
   - Provide that if human remains are uncovered, the site will be secured and the NSW Police, LCC and DPIE shall be notified
   - Record that it is an offence under the NPW Act (Section 86) to disturb or destroy an Aboriginal object

2. As part of the site induction, all workers will be advised of their obligations in relation to heritage under the National Parks and Wildlife Act 1974 before construction begins and the guidelines to follow if unanticipated heritage items or deposits are located during construction

6.8 Biodiversity

Description of existing environment and potential impacts:

Have relevant database searches been carried out?
Commonwealth and State Department Environment and Biodiversity database searches (NSW Department of Environment & Heritage BioNet database, Department of the Environment Species Profile and Threats (SPRAT) Database, EPBC Act Protected Matters Search Tool) were conducted on 19th July 2016. No areas of national or state
significance, or species/habitats deemed to be threatened or endangered were identified. BioNet Atlas search results did not identify any threats or endangered populations within direct proximity to the proposed works area, namely due to the nature of the area being highly modified and built up. An extract from the Office of Environment and Heritage BioNet Atlas map is included as Appendix E.

| Did the database searches identify any endangered ecological communities, threatened flora and/or threatened or protected fauna within the vicinity of the proposed works? | ☐ Yes | ☑ No |

<table>
<thead>
<tr>
<th>Will the proposed works require the removal of any other vegetation? Yes, the proposed works will impact upon a patch of roadside vegetation planted within the road reserve at the corner of Heathcote Road and Bardia Parade, at the site of the proposed high entry left turn lane exiting Bardia Parade into Heathcote Road. This patch of vegetation has undergone assessment by a qualified ecologist and identified the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ One large and well-established Grey Ironbark Eucalyptus paniculata</td>
</tr>
<tr>
<td>▪ Four Flax-leaved Paperbarks Melaleuca linariifolia.</td>
</tr>
<tr>
<td>▪ One small Parramatta Red Gum Eucalyptus parramattensis.</td>
</tr>
<tr>
<td>▪ Two large shrubs Coast Myall Acacia binervia are also present and are located several metres from the trees near the culvert.</td>
</tr>
<tr>
<td>▪ The understorey was dominated by introduced grasses typical of roadsides and lawns, with scattered weeds.</td>
</tr>
<tr>
<td>▪ These species do not constitute threatened species under the EPBC Act or BC Act. The trees are not representative of a threatened ecological community.</td>
</tr>
<tr>
<td>▪ There were no nests or hollows present within the study area and the vegetation is likely to provide limited habitat opportunities for fauna.</td>
</tr>
</tbody>
</table>

The vegetation assessment of this patch of roadside vegetation proposed for removal is included as Appendix B. Safeguard number 8 below specifies how the removal of trees will be mitigated. The mitigation specified will replace canopy cover lost in the works area. In addition, the proposed works will include the connection of new overhead conductors to an existing utility pole 259285. Tree trimming on the tree circled yellow in Figure 2-4 may be required in order to maintain clearance between conductors and vegetation.

| Will the proposed works affect any tree hollows or hollow logs? | ☑ Yes | ☐ No |

| Are there any known areas of critical habitat, SEPP 14 wetland area or SEPP 26 littoral rainforest area within the vicinity of the proposed works? | ☑ Yes | ☐ No |

<p>| Will the proposed works provide any additional barriers to the movement of wildlife? | ☐ Yes | ☑ No |</p>
<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will the proposed works disturb any natural waterways or aquatic habitat?</td>
<td>☑</td>
<td>☐</td>
</tr>
<tr>
<td>Will the proposed works disturb any crevices or other locations (such as on bridges and culverts) for potential bat habitat?</td>
<td>☑</td>
<td>☐</td>
</tr>
<tr>
<td>Will there be impact on any vegetation or land that is part of an offset or is protected under a condition of approval from a previous project?</td>
<td>☑</td>
<td>☐</td>
</tr>
</tbody>
</table>

### 6.8.1 Biodiversity - Safeguards

Safeguards to be implemented are:

1. The works would be limited to the excavation of the grassed verge adjacent to the road and removal/pruning of nominated vegetation.

2. All works areas, including the fenced storage area, would be fully reinstated at the completion of works.

3. If unexpected threatened fauna or flora species are discovered, stop works immediately and follow the LCC guidelines. Any excavation left overnight to be covered and checked at the start of works for trapped fauna.

4. Contact 1300 WIRES (1300 094 737) in the event of injured fauna being discovered.

5. The CEMP prepared for the works will include details of the pre-clearing process for the vegetation.

6. The pre-clearing process will include a requirement to check the trees and shrubs for vertebrate fauna prior to clearing, and to apply a fauna rescue and release procedure should vertebrate fauna be present.

7. Native vegetation to be removed should be recycled (mulched) and re-used within landscaped areas.

8. For the removal of the six existing trees, each tree will need to be replaced at a ratio of three to each one removed. Therefore, a total of 18 trees should be specified in the immediate vicinity of the intersection in order to replace canopy cover lost. These trees should be planted as 100L stock with correct planting detail, staking, mulch ring and spade cut edge and surrounded by turf. The trees should be planted in groups of three with connected mulching and ensure the mulch area and spacing accommodates the mowing requirements of LCC’s maintenance team. The replacement species to include *Eucalyptus Paniculata*, *Melaleuca Linariifolia* and *Eucalyptus Parramattensis*.

### 6.9 Trees

**Description of existing environment and potential impacts:**

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do the proposed works involve pruning, trimming or removal of any tree/s?</td>
<td>☑</td>
<td>☐</td>
</tr>
</tbody>
</table>

*Tree removal will be limited to the nominated roadside vegetation which has been planted within the road reserve at the corner of Heathcote Road and Bardia Parade.*
<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do the trees form part of a streetscape, an avenue or roadside planting?</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Have the trees been planted by a community group, Landcare group or by council or is the tree a memorial or part of a memorial group e.g. has a plaque?</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Do the trees form part of a heritage listing or have other heritage value?</td>
<td></td>
<td>✔</td>
</tr>
</tbody>
</table>

### 6.9.1 Trees - Safeguards

Safeguards to be implemented are:

1. Consultation with relevant authorities and the community will be conducted prior to the commencement of works so that an appropriate course of action can be identified.

2. No excavation works would be undertaken within the root zone of mature trees outside of those nominated for removal.

### 6.10 Traffic and transport

**Description of existing environment and potential impacts:**

Are the proposed works likely to result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during construction?

*Construction related detours/diversions may be required to enable the proposed works during critical construction tasks. This will likely include localised lane closures and traffic management to be implemented to avoid peak hour timing. All access movements to the works area would be maintained at all times. Some works are proposed to be undertaken at night to minimise impacts on the local road network during construction.*

Vehicular traffic travelling along Heathcote Road, Bardia Parade and Walder Road may need to be held for brief periods of time for the purpose of floating large items of plant and vehicles to and from the proposed works area.

Are the proposed works likely to result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during operation?

Are the proposed works likely to affect any other transport nodes or transport infrastructure (e.g. bus stops, bus routes) in the surrounding area?

*Heathcote road is the site of a passenger bus service, yet the site of the proposed works will not impact on nearby bus stops or operations.*

### 6.10.1 Traffic and transport - Safeguards

Safeguards to be implemented are:

1. Where possible, current traffic movements and property accesses are to be maintained during the workday. Any disturbance is to be minimised to prevent unnecessary traffic delays.
2. Where works would affect the free flow of traffic, a ROL would be obtained from TMC and a Traffic Control Plan would be prepared in accordance with the requirements of the Roads and Maritime’s Traffic Control at Worksites Manual (2018) and Australian Standard (AS1743.3 Traffic Control Devices for Projects on Roads).

3. Appropriate signage (such as variable message signs) and supervision would be provided at all times to ensure that all work areas are controlled and that unauthorised personnel (e.g. pedestrians) are excluded from work areas.

4. Vehicle movement arrangements would be developed to limit impacts on other road users (including pedestrians, vehicles and cyclists) and the environment, with specific regard to other road works in the area, local traffic movement requirements and peak traffic volumes.

5. A Traffic Management Plan would be prepared as part of the CEMP or equivalent Site Environmental Plan and approved by LCC prior to implementation.

6. Where changes to access arrangements are necessary, LCC will advise owners and tenants and consult with them in advance regarding alternate access arrangements.

7. Appropriate pedestrian traffic controls must be set up to allow safe passage of pedestrians around the work site.

### 6.11 Socio-economic

**Description of existing environment and potential impacts:**

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are the proposed works likely to impact on local business, including public services?</td>
<td>☑ Yes</td>
<td>☐ No</td>
</tr>
<tr>
<td>Are the proposed works likely to require any property acquisition?</td>
<td>☑ Yes</td>
<td>☐ No</td>
</tr>
<tr>
<td>Are the proposed works likely to alter any access for properties (either temporarily or permanently)?</td>
<td>☑ Yes</td>
<td>☐ No</td>
</tr>
<tr>
<td>Are the proposed works likely to alter any on-street parking arrangements (either temporarily or permanently)?</td>
<td>☐ Yes</td>
<td>☑ No</td>
</tr>
<tr>
<td>Are the proposed works likely to change pedestrian movements or pedestrian access (either temporarily or permanently)?</td>
<td>☑ Yes</td>
<td>☐ No</td>
</tr>
</tbody>
</table>

*The intersection currently contains signalised pedestrian crossings in all four directions. The pedestrian link along Heathcote Road west of Bardia Parade may need to be re-routed during works to facilitate the removal of vegetation and the introduction of the dedicated left turn slip lane with pedestrian crossing. The proposed works will improve pedestrian safety, road safety and traffic efficiency at the Heathcote Road, Bardia Parade and Walder Road intersection, Holsworthy.*

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are the proposed works likely to impact on any items or places of social value to the community (either temporarily or permanently)?</td>
<td>☑ Yes</td>
<td>☐ No</td>
</tr>
<tr>
<td>Are the proposed works likely to reduce or change visibility of any businesses, farms, tourist attractions or the like (either temporarily or permanently)?</td>
<td>☑ Yes</td>
<td>☐ No</td>
</tr>
</tbody>
</table>
6.11.1 Socio-economic - Safeguards

Safeguards to be implemented are:

1. LCC will consult with potentially affected landholders before and during construction to minimise the potential for impacts on land use.

2. LCC will consult with relevant service providers during detailed design to identify possible interactions and develop procedures to be implemented to minimise the potential for service interruptions which have the potential to impact on existing land use.

3. A community notice would be delivered to all near-by properties prior to works and would include contact details for a site supervisor, for residents to raise any construction issues.

6.12 Landscape character and visual amenity

Description of existing environment and potential impacts:

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are the proposed works over or near an important physical or cultural</td>
<td></td>
<td></td>
</tr>
<tr>
<td>element or landscape?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Would the proposed works obstruct or intrude upon the character or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>views of a valued landscape or urban area. For example, locally</td>
<td></td>
<td></td>
</tr>
<tr>
<td>significant topography, a rural landscape or a park, a river, lake or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the ocean or a historic or distinctive townscape or landmark?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Would the proposal require the removal of mature trees or stands of</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vegetation, either native or introduced?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Existing vegetation at the corner of Bardia Parade and Heathcote Road</td>
<td></td>
<td></td>
</tr>
<tr>
<td>will be removed to facilitate the proposed works.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Would the proposal result in large areas of shotcrete visible from the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>road or adjacent properties?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Would the proposal involve new noise walls or visible changes to the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>existing noise walls?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Would the proposal involve the removal or reuse of large areas of road</td>
<td></td>
<td></td>
</tr>
<tr>
<td>corridor, landscape, either verges or medians?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Would the proposal involve substantial changes to the appearance of a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bridge (including piers, girders, abutments and parapets) that are</td>
<td></td>
<td></td>
</tr>
<tr>
<td>visible from the road or residential areas?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>If involving lighting, would the proposal create unwanted light spillage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>on residential properties at night (in construction or operation)?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>The street lightings have been designed by a Level 3 street lighting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>consultant to the Endeavour Energy requirements. In addition, temporary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>construction lighting may be required during construction. Street</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lighting and construction lighting will have selected lamps that ensure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>that unwanted lights do not spill in the adjoining development affecting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>resident amenities during both construction and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Would any new structures or features being constructed result in over</td>
<td></td>
<td></td>
</tr>
<tr>
<td>shadowing to adjoining properties or areas?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>


6.12.1 Landscape character and visual amenity - Safeguards

Safeguards to be implemented are:

1. The site will be kept rubbish free at all times.
2. Temporary erosion and sediment controls would be removed from the site once landforms have been assessed as stable.
3. All disturbed areas would be rehabilitated and progressively stabilised following the completion of the works.
4. Landscaping is to be managed in accordance with LCC guidelines.
5. Replacement tree planting as outlined in section 6.8.1 to be undertaken.

6.13 Waste

Description of existing environment and potential impacts:

| Are the proposed works likely to generate >200 tonnes of waste material (contaminated and/or non-contaminated material)? | ☑ No |
| Are the proposed works likely to require a licence from DPIE? | ☑ No |

6.13.1 Waste - Safeguards

Safeguards to be implemented are:

1. A concrete washout would be established in accordance with Best Practice Guidelines (Department of Environment and Conservation’s Environmental Best Practice Management Guideline for Concreting Contractors). Concrete washout should be clearly marked with signage, located away from drainage lines and be contained using appropriate sediment control measures to prevent any runoff.

   a) Only chutes of concrete trucks and tools can be washout out in the corridor, into a concrete washout pit.

   b) Washout pit should be located at least 30m away from a water course and no more than 100m from the pour site.

   c) The main truck is not to be washed onsite and must be taken back to the concrete plant.

   d) Concrete washout pits are to be lined with suitable plastic lining or similar to prevent soak away of pH affected water. Any pH affected water is expected to be bunded and captured on site, before being disposed of offsite.

2. Spoil and waste for disposal must be classified and transported by appropriately licensed contractors to licensed or approved facilities.

3. Any excavated soil would be reused on site as fill.

4. Resource management hierarchy principles are to be followed, including:
   - avoid unnecessary resource consumption as a priority;
   - use resource recovery measures (including re-use of materials, reprocessing, recycling and energy recovery) where waste generation cannot be avoided; and

5. There is to be no disposal or reuse of construction waste onto other land.
6. No waste is to be burnt on-site.
7. All waste material would be removed from the site once the activity is complete.
8. Waste must be disposed of in accordance with DPIE guidelines.
9. Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.
10. No fuels or hazardous materials are to be held in bulk containers on-site. Only small volumes (<20 litres) are to be stored for refuelling of small handheld equipment. All refuelling of this equipment will be done in a bunded area, and refuelling of vehicles would be conducted off-site.
11. All fuels, chemicals and liquids to be stored in impervious bunded area a minimum of 50m away from rivers, creeks or any concentrated water flow.

6.14 Cumulative impacts

The proposal has the potential to have temporary cumulative environmental effects with other existing or likely future activities (other construction projects in the area), however the effects would be minimal due to the limited scope of works for the activities covered in this REF, and the potential impacts on the environment would be minimised with the implementation of the safeguards set out in Section 6.

6.14.1 Cumulative Impacts - Safeguards

Safeguards to be implemented are:

1. Ongoing coordination and consultation will be carried out with any other proponents to ensure potential cumulative impacts are appropriately assessed and managed

2. The CEMP will be revised to consider potential cumulative impacts from surrounding development activities as they become known

6.15 Matters of National Environmental Significance (MNES)

The EPBC Act protects matters of National Environmental Significance (NES), such as threatened species and ecological communities, migratory species (protected under international agreements), and National Heritage places.

Any actions that will or are likely to have ‘significant impacts’ on matters of NES require referral and approval from the Australian Government Environment Minister. Significant impacts are defined by the Commonwealth (reference http://www.environment.gov.au/epbc/guidelines-policies.html) for matters of NES.

No matters of NES have been identified at or near the site nor are any significant impacts anticipated. Referral to the Commonwealth under the EPBC Act is therefore not required for the proposal.
7 Consideration of State and Commonwealth Environmental Factors

7.1 Environmental Planning and Assessment Regulation 2000 checklist

In addition to the requirements of the REF, the following factors listed in clause 228(2) of the *Environmental Planning and Assessment Regulation, 2000* have also been considered to assess the likely impacts of the proposal on the natural and built environment. This consideration is required to comply with sections 111 and 112 of the EP&A Act.

<table>
<thead>
<tr>
<th>Environmental Factor / Relevant Clause</th>
<th>Impacts</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Any environmental impact on a community?</td>
<td>Minor/Temporary</td>
<td>The proposal may cause minor short-term environmental impacts to the road users (construction disruption) and the local community, such as visual amenity, dust and noise during construction. However, the potential impacts would be minimised with the implementation of the safeguards as detailed in this REF. In the longer term, the community would benefit through improved safety conditions and traffic flow at an integral intersection.</td>
</tr>
<tr>
<td>(b) Any transformation of a locality?</td>
<td>Negligible</td>
<td>The proposed works will transform the arrangement of the existing road corridor. The locality is expected to remain the same.</td>
</tr>
<tr>
<td>(c) Any environmental impact on the ecosystems of a locality?</td>
<td>Minor/Temporary</td>
<td>The proposal will not impact on the ecosystem of the locality.</td>
</tr>
<tr>
<td>(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?</td>
<td>Negligible</td>
<td>The proposal would not reduce the aesthetic, recreational, scientific or other environmental quality or value of the locality, impacts from the removal of roadside vegetation will likely be offset through plantings.</td>
</tr>
<tr>
<td>(e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present generations?</td>
<td>Nil</td>
<td>The proposal would not have any adverse impacts on a locality, place or building with aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations. There are no known items of heritage or social significance at the locality. Environmental safeguards in Section 6 would be adopted to ensure that unexpected finds are managed appropriately.</td>
</tr>
<tr>
<td>Environmental Factor / Relevant Clause</td>
<td>Impacts</td>
<td>Comment</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>(f) Any impact on habitat of any protected fauna (within the meaning of the <em>National Parks and Wildlife Act 1974</em>)?</td>
<td>Nil</td>
<td>The proposal would not impact on the habitat of any protected or endangered fauna.</td>
</tr>
<tr>
<td>(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?</td>
<td>Nil</td>
<td>The proposal would not endanger any species of animal, plant or other form of life, whether living on land, in water or in the air. Proposed tree removal would not impact critical habitat.</td>
</tr>
<tr>
<td>(h) Any long-term effects on the environment?</td>
<td>Positive, long term</td>
<td>The proposal would have positive long-term effects on the environment due to the intersection upgrade increasing the safety profile of the road network and in turn the local road network. No long-term adverse effects are expected.</td>
</tr>
<tr>
<td>(i) Any degradation of the quality of the environment?</td>
<td>Potential short-term negative</td>
<td>There is potential for typical minor short-term noise, visual, dust, noise, vegetation, water quality and traffic impacts during construction. These would be managed and mitigated with the implementation of appropriate environmental safeguards listed in Section 6 of this REF, such that no long-term degradation of the quality of the environment is expected.</td>
</tr>
<tr>
<td>(j) Any risk to the safety of the environment?</td>
<td>Potential short-term negative</td>
<td>The proposed works would have minimal risk to the safety of the environment due to the limited scope of works, and because the potential impacts would be minimised with the implementation of the safeguards given in Section 6 in this REF.</td>
</tr>
<tr>
<td>(k) Any reduction in the range of beneficial uses of the environment?</td>
<td>Short term minor negative</td>
<td>The proposal would cause a minor adjustment in the existing arrangement of the road at the site of the proposed works, as result of temporary disruption during construction, which would potentially increase travelling time for the road users in the short-term. Alterations to the existing road arrangement would seek to be implemented during off-peak times and would typically see the closure of the road shoulder. Lane closures deemed necessary during critical works would be conducted under traffic management and ROL. There would be no long-term reduction in the range of beneficial uses of the environment as a result of the proposal.</td>
</tr>
<tr>
<td>(l) Any pollution of the environment?</td>
<td>Potential short-term negative</td>
<td>It is unlikely that the proposed work will cause pollution of the environment. There is the potential for acute air quality impacts and noise that may temporarily affect adjacent sensitive receivers in a minor way during construction activities. Potential adverse impacts associated with the proposal would be manageable through the application of the environmental...</td>
</tr>
<tr>
<td>Environmental Factor / Relevant Clause</td>
<td>Impacts</td>
<td>Comment</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>(m) Any environmental problems associated with the disposal of waste?</td>
<td>None</td>
<td>The waste generated during the proposal would be contained and removed for disposal to approved facilities accordance with the proposed safeguards in Section 6 of this REF. No environmental problems are anticipated for the disposal of waste. Excavated materials are likely to be used for backfilling following construction, excess materials will be removed.</td>
</tr>
<tr>
<td>(n) Any increased demands on resources, natural or otherwise which are, or are likely to become, in short supply?</td>
<td>Nil</td>
<td>The proposed work would not significantly increase demands on resources, which are, or are likely to become, in short supply. Relatively small amounts of materials would be required for the proposed work. The safeguards provided in this REF would be implemented to minimise any impacts.</td>
</tr>
<tr>
<td>(o) Any cumulative environmental effect with other existing or likely future activities?</td>
<td>Potential short-term negative</td>
<td>The proposal has the potential to have temporary cumulative environmental effects with other existing or likely future activities (other construction projects in the area); however the effects would be minimal due to the limited scope of works for the activities covered in this REF, and the potential impacts on the environment would be minimised with the implementation of the safeguards in Section 6 of this REF.</td>
</tr>
<tr>
<td>(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?</td>
<td>None</td>
<td>The proposed activities would not have any impacts on coastal processes and coastal hazards, taking into account projected climate change conditions.</td>
</tr>
</tbody>
</table>
### 7.2 Matters of national environmental significance checklist

Under the environmental assessment provisions of the EPBC Act, the following matters of national environmental significance are required to be considered to assist in determining whether the proposal should be referred to the Australian Government Department of Environment.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Any impact on a World Heritage property?</td>
<td>Nil</td>
</tr>
<tr>
<td>The proposal would not have any impact on a World Heritage property.</td>
<td></td>
</tr>
<tr>
<td>b. Any impact on a National Heritage place</td>
<td>Nil</td>
</tr>
<tr>
<td>The proposal would not have any impact on a National Heritage place</td>
<td></td>
</tr>
<tr>
<td>c. Any impact on a wetland of international importance?</td>
<td>Nil</td>
</tr>
<tr>
<td>The proposal would not have any impact on a wetland of international</td>
<td></td>
</tr>
<tr>
<td>importance.</td>
<td></td>
</tr>
<tr>
<td>d. Any impact on a listed threatened species or communities?</td>
<td>Nil</td>
</tr>
<tr>
<td>The proposal would not impact on Commonwealth listed threatened species</td>
<td></td>
</tr>
<tr>
<td>or communities listed migratory species.</td>
<td></td>
</tr>
<tr>
<td>e. Any impacts on listed migratory species?</td>
<td>Nil</td>
</tr>
<tr>
<td>The proposal would not impact on Commonwealth listed migratory species.</td>
<td></td>
</tr>
<tr>
<td>f. Any impact on a Commonwealth marine area?</td>
<td>Nil</td>
</tr>
<tr>
<td>There would be no impact on a Commonwealth marine area as a result of</td>
<td></td>
</tr>
<tr>
<td>the proposal.</td>
<td></td>
</tr>
<tr>
<td>g. Does the proposal involve a nuclear action (including uranium mining)?</td>
<td>Nil</td>
</tr>
<tr>
<td>The proposal does not involve a nuclear action.</td>
<td></td>
</tr>
<tr>
<td>Additionally, any impact (direct or indirect) on Commonwealth land?</td>
<td>Nil</td>
</tr>
<tr>
<td>The proposal would not directly or indirectly impact on Commonwealth</td>
<td></td>
</tr>
<tr>
<td>land.</td>
<td></td>
</tr>
</tbody>
</table>
## 8 Summary of safeguards and environmental management measures

This section provides a summary of the site-specific environmental safeguards and management measures identified in described in Section 6 of this REF (refer Table 8-1). These safeguards will be implemented to reduce potential environmental impacts throughout construction and operation. A framework for managing the potential impacts is provided with reference to environmental management plans and relevant Roads and Maritime Services QA specifications. Any potential licence and/or approval requirements required prior to construction are also listed.

Table 8-1: Summary of site-specific safeguards for proposed works

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Safeguards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Soil</strong></td>
<td>1. Erosion and sediment control measures are to be implemented and maintained to:</td>
</tr>
<tr>
<td></td>
<td>▪ Divert clean water around the site</td>
</tr>
<tr>
<td></td>
<td>▪ Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets (in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book)).</td>
</tr>
<tr>
<td></td>
<td>▪ Reduce water velocity and capture sediment on-site.</td>
</tr>
<tr>
<td></td>
<td>▪ Minimise the amount of material transported from site to surrounding pavement surfaces.</td>
</tr>
<tr>
<td></td>
<td>2. Erosion and sedimentation controls are to be checked and maintained on a regular basis (including clearing of sediment from behind barriers) and records kept and provided on request.</td>
</tr>
<tr>
<td></td>
<td>3. Erosion and sediment control measures are not to be removed until the works are completed, and areas are stabilised.</td>
</tr>
<tr>
<td></td>
<td>4. Work areas are to be stabilised progressively at the end of the works.</td>
</tr>
<tr>
<td></td>
<td>5. An erosion and sediment control plan (ESCP) should be prepared for the works.</td>
</tr>
<tr>
<td></td>
<td>6. If any unexpected contaminants are encountered during the works, work in the area would cease immediately and the LCC Officer would be contacted to seek and advise on the appropriate action.</td>
</tr>
<tr>
<td></td>
<td>7. Any waste sent off-site would be classified according to the relevant NSW Environment Protection Authority (EPA) Waste Classification Guidelines.</td>
</tr>
<tr>
<td></td>
<td>8. Any storage of materials on site would be managed in accordance with the LCC guidelines.</td>
</tr>
<tr>
<td><strong>Waterways and water quality</strong></td>
<td>1. There is to be no release of dirty water into drainage lines and/or waterways.</td>
</tr>
<tr>
<td></td>
<td>2. Water quality control measures are to be used to prevent any materials (e.g. concrete, grout, sediment, etc.) entering drain inlets or waterways.</td>
</tr>
<tr>
<td></td>
<td>3. Potable water is to be used for wash down of vehicles and equipment.</td>
</tr>
<tr>
<td></td>
<td>4. No concrete wash out is to be carried out on-site.</td>
</tr>
<tr>
<td></td>
<td>5. Containment material is to be used to capture / filter water used in wash down.</td>
</tr>
<tr>
<td></td>
<td>6. An emergency spill kit is to be kept on-site at all times. All staff are to be made aware of the location of the spill kit and trained in its use.</td>
</tr>
<tr>
<td></td>
<td>7. Water required for the proposal would be obtained from an approved source (e.g. potentially including hydrants or tankers).</td>
</tr>
<tr>
<td></td>
<td>8. All fuels, chemicals and liquids are to be stored in an impervious bunded area.</td>
</tr>
</tbody>
</table>
a minimum of 50 metres away from:

- Rivers, creeks or any areas of concentrated water flow.
- Flooded or poorly drained areas.
- Slopes above 10%.

9. Refuelling of plant and equipment is to occur in impervious bunded areas located a minimum of 50 metres from drainage lines or waterways.

### Noise and Vibration

1. Construction personnel will select the most appropriate machinery to deliver this work to minimise noise and vibration and will closely monitor impacts during work.

2. All receivers within the noise impact boundary will be notified of the proposed works prior to the commencement of construction in accordance with the LCC consultation procedure. This notification would include 24-hour contact details for the on-site project manager to report any noise issues as a result of the works.

3. Works are to be carried out during standard construction hours (i.e. 7.00am to 6.00pm Monday – Friday; 8.00am to 1.00pm on Saturdays; no work to be undertaken on Sundays or Public Holidays) where it is feasible to undertake those works without major impacts on the local road network. Any work that is performed outside normal work hours or on Sundays and public holidays is to minimise noise impacts in accordance with Roads and Maritime’s Construction Noise and Vibration Guideline (April 2016).

4. Additional measures to minimise noise would be considered, including:

- Undertaking the noisiest activities during standard construction hours.
- Allowing adequate respite periods during noise intensive works.
- Using alternatives to reversing alarms, such as ambient noise sensitive or ‘quacker’ type reversing alarms.
- Turning off plant and equipment when not in use.
- Ensuring plant/equipment is regularly maintained and repair/replace equipment that becomes noisy.
- Throughout each construction activity, locating stationary plant items as far from receivers as possible.
- Choosing mobile plant and equipment that includes exhaust silencers or residential class mufflers.
- Communicating with construction workers via toolbox talks about minimising noise, including the use of equipment, avoidance of shouting, loud talking and door slamming.

5. Implement community consultation measures - Periodic notification (monthly letterbox drops or equivalent) detailing proposed dates, alternative dates for wet weather and hourly activity plan for night works.

6. Site inductions for all site personnel outlining noise management procedures.

7. No swearing or unnecessary shouting or loud stereos/radios on site.

8. No dropping of materials from height, throwing of metal items and slamming of doors.
9. The CEMP must be regularly updated to account for changes in noise and vibration management issues and strategies.

10. Where feasible and reasonable, construction should be carried out during the standard daytime working hours. Work generating high noise and/or vibration levels should be scheduled during less sensitive time periods.

11. As a guide high noise and vibration generating activities near receivers should be carried out in continuous blocks that do not exceed 3 hours each, with a minimum respite period of one hour between each block. The duration of each block of work and respite should be flexible to accommodate the usage and amenity at nearby receivers.

12. Unless negotiated with the community with consultation documented and approved by LCC project manager, the following shifts should not be exceeded:
   - 2 consecutive evenings or nights per week; and
   - 3 evenings or nights per week; and
   - 6 evenings or nights per month.

13. For night work these periods of work should be separated by not less than one week.

14. Use quieter and less vibration emitting construction methods where feasible and reasonable.

15. Ensure plant including the silencer is well maintained.

16. The offset distance between noisy plant and adjacent sensitive receivers is to be maximised.

17. Plant used intermittently to be throttled down or shut down.

18. Noise-emitting plant to be directed away from sensitive receivers.

19. Only have necessary equipment on site.

20. Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site.

21. Increased noise producing activities should be scheduled for normal working hours. If the work cannot be undertaken during the day, it should be completed before 11:00pm.

22. Loading and unloading of materials/deliveries is to occur as far as possible from sensitive receivers.

23. Select site access points and roads as far as possible away from sensitive receivers.

24. Dedicated loading/unloading areas to be shielded if close to sensitive receivers.
25. Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible.

26. Avoid or minimise these out of hours movements where possible.

27. Use structures to shield residential receivers from noise such as site shed placement; earth bunds; fencing; erection of operational stage noise barriers (where practicable) and consideration of site topography when situating plant.

### Air Quality

1. Measures (including watering or covering exposed areas) are to be used to minimise or prevent air pollution and dust.

2. Works (including the spraying of paint and other materials) are not to be carried out during strong winds or in weather conditions where high levels of dust or airborne particulates are likely.

3. Vehicles and plant used on site are to be kept in efficient working order. The Protection of the Environment Operations Act 1997 must be complied with.

4. Work vehicles / machinery would not be left running or idling when not in use.

5. Stand down machinery producing excess emissions.

6. Appropriate action would be taken when levels of dust become unacceptable. This would include suspending works during high wind events.

### Non-Aboriginal Heritage

1. Should unknown finds be exposed, which are identified as having non-Aboriginal heritage significance, works on the site shall immediately cease in the affected area and the DPIE and LCC will be informed to determine the appropriate management strategy. The duration of the cessation of works will depend on the integrity and significance of any relic.

2. As part of the site induction, all workers will be advised of their obligations in relation to heritage before construction begins and the guidelines to follow if unanticipated heritage items or deposits are located during construction.

### Aboriginal Heritage

1. An unknown finds procedure will be incorporated into the CEMP to provide guidance on the process to be followed if suspected Aboriginal heritage items are found during project works. At a minimum, that process will:
   - Provide that if unforeseen Aboriginal heritage items are uncovered, works will immediately cease and LCC, DPIE and the Local Aboriginal Land Council will be informed
   - Provide that if human remains are uncovered, works will immediately cease, the site will be secured and the NSW Police, LCC and DPIE shall be notified
   - Record that it is an offence under the NPW Act (Section 86) to disturb or destroy an Aboriginal object

2. As part of the site induction, all workers will be advised of their obligations in relation to heritage under the National Parks and Wildlife Act 1974 before construction begins and the guidelines to follow if unanticipated heritage items or deposits are located during construction.
### Biodiversity

1. The works would be limited to the excavation of the grassed verge adjacent to the road and removal/pruning of nominated vegetation.

2. All works areas, including the fenced storage area, would be fully reinstated at the completion of works.

3. If unexpected threatened fauna or flora species are discovered, stop works immediately and follow the LCC guidelines. Any excavation left overnight to be covered and checked at the start of works for trapped fauna.

4. Contact 1300 WIRES (1300 094 737) in the event of injured fauna being discovered.

5. The Construction Environmental Management Plan prepared for the works will include details of the pre-clearing process for the vegetation.

6. The pre-clearing process will include a requirement to check the trees and shrubs for vertebrate fauna prior to clearing, and to apply a fauna rescue and release procedure should vertebrate fauna be present.

7. Native vegetation to be removed should be recycled (mulched) and re-used within landscaped areas.

8. For the removal of the six existing trees, each tree will need to be replaced at a ratio of three to each one removed. Therefore, a total of 18 trees should be specified in the immediate vicinity of the intersection in order to replace canopy cover lost. These trees should be planted as 100L stock with correct planting detail, staking, mulch ring and spade cut edge and surrounded by turf. The trees should be planted in groups of three with connected mulching and ensure the mulch area and spacing accommodates the mowing requirements of LCC’s maintenance team. The replacement species to include *Eucalyptus Paniculata*, *Melaleuca Linariifolia* and *Eucalyptus Parramattensis*.

### Trees

1. Consultation with relevant authorities and the community will be conducted prior to the commencement of works so that an appropriate course of action can be identified.

2. No excavation works would be undertaken within the root zone of mature trees outside of those nominated for removal.

### Traffic and transport

1. Where possible, current traffic movements and property accesses are to be maintained during the workday. Any disturbance is to be minimised to prevent unnecessary traffic delays.

2. Where works would affect the free flow of traffic, a ROL would be obtained from TMC and a Traffic Control Plan would be prepared in accordance with the requirements of the Roads and Maritime’s Traffic Control at Worksites Manual (2018) and Australian Standard (AS1743.3 Traffic Control Devices for Projects on Roads).
3. Appropriate signage (such as variable message signs) and supervision would be provided at all times to ensure that all work areas are controlled and that unauthorised personnel (e.g. pedestrians) are excluded from work areas.

4. Vehicle movement arrangements would be developed to limit impacts on other road users (including pedestrians, vehicles and cyclists) and the environment, with specific regard to other road works in the area, local traffic movement requirements and peak traffic volumes.

5. A Traffic Management Plan would be prepared as part of the Construction Environmental Management Plan (CEMP) or equivalent Site Environmental Plan and approved by LCC prior to implementation.

6. Where changes to access arrangements are necessary, LCC will advise owners and tenants and consult with them in advance regarding alternate access arrangements.

7. Appropriate pedestrian traffic controls must be set up to allow safe passage of pedestrians around the work site.

### Socio-economic

1. LCC will consult with potentially affected landholders before and during construction to minimise the potential for impacts on land use.

2. LCC will consult with relevant service providers during detailed design to identify possible interactions and develop procedures to be implemented to minimise the potential for service interruptions which have the potential to impact on existing land use.

3. A community notice would be delivered to all near-by properties prior to works and would include contact details for a site supervisor, for residents to raise any construction issues.

### Landscape character and visual amenity

1. The site will be kept rubbish free at all times.

2. Temporary erosion and sediment controls would be removed from the site once landforms have been assessed as stable.

3. All disturbed areas would be rehabilitated and progressively stabilised following the completion of the works.

4. Landscaping is to be managed in accordance with LCC guidelines.

5. Works to be carried out in accordance with EIA-N04 Guidelines for visual impact assessment and landscape character assessment.

### Waste

1. A concrete washout would be established in accordance with Best Practice Guidelines (Department of Environment and Conservation’s Environmental Best Practice Management Guideline for Concreting Contractors). Concrete washout should be clearly marked with signage, located away from drainage lines and be contained using appropriate sediment control measures to prevent any runoff.
- Only chutes of concrete trucks and tools can be washout out in the corridor, into a concrete washout pit.
- Washout pit should be located at least 30m away from a water course and no more than 100m from the pour site.
- The main truck is not to be washed onsite and must be taken back to the concrete plant.
- Concrete washout pits are to be lined with suitable plastic lining or similar to prevent soak away of pH affected water. Any pH affected water is expected to be bunded and captured on site, before being disposed of offsite.

2. Spoil and waste for disposal must be classified and transported by appropriately licensed contractors to licensed or approved facilities.

3. Any excavated soil would be reused on site as fill.

4. Resource management hierarchy principles are to be followed, including:
   - avoid unnecessary resource consumption as a priority;
   - use resource recovery measures (including re-use of materials, reprocessing, recycling and energy recovery) where waste generation cannot be avoided; and
   - Dispose of wastes as a last resort in accordance with the Waste Avoidance & Resource Recovery Act 2001).

5. There is to be no disposal or reuse of construction waste onto other land.

6. No waste is to be burnt on-site.

7. All waste material would be removed from the site once the activity is complete.

8. Waste must be disposed of in accordance with DPIE guidelines.

9. Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.

10. No fuels or hazardous materials are to be held in bulk containers on-site. Only small volumes (<20 litres) are to be stored for refuelling of small handheld equipment. All refuelling of this equipment will be done in a bunded area and refuelling of vehicles would be conducted off-site.

11. All fuels, chemicals and liquids to be stored in impervious bunded area a minimum of 50m away from rivers, creeks or any concentrated water flow.

### Cumulative Effects

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ongoing coordination and consultation will be carried out with any other proponents to ensure potential cumulative impacts are appropriately assessed and managed</td>
</tr>
<tr>
<td>2.</td>
<td>The CEMP will be revised to consider potential cumulative impacts from surrounding development activities as they become known</td>
</tr>
</tbody>
</table>
8.1 Licensing and approvals

A list of licences and / or approvals required for the proposed works is given in Table 8-2.

Table 8-2: Summary of licensing and approvals required

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCC approval of REF</td>
<td>Prior to commencement of works</td>
</tr>
<tr>
<td>Any necessary road permits such as Road Occupancy Licence(s) from Roads and Maritime (under the Roads Act 1993)</td>
<td>Prior to commencement of works</td>
</tr>
</tbody>
</table>
9 Conclusion

Implementation of the remaining intersection improvement works involving the construction of a slip lane from Bardia Parade into Heathcote Road, installation of additional signalised cycle/pedestrian crossings and associated civil and utility works required a Works Authorisation Deed (WAD), which in turn requires a REF. The proposal as described in this REF best meets the project objectives but would still result in some minor impacts to the surrounding environment, yet due to the beneficial nature of the works, the environment being highly modified and the scale and timeline of construction being of minimal risk, such impacts are expected to be limited with respect to the environment and community.

Safeguards proposed in this REF would ameliorate or minimise these expected impacts. The proposal would also have a range of benefits including improved safety conditions for road users and pedestrians within the immediate vicinity and wider road network. On balance the proposal is considered justified.

This REF concludes that the proposal is unlikely to have a significant impact on any threatened species, populations or ecological communities or their habitats, listed under the Biodiversity Conservation Act 2016 or Fisheries Management Act 1994 and therefore a species impact statement is not required. This REF finds that the proposal is unlikely to have a significant environmental impact and therefore an Environmental Impact Statement is not required.

Approval from the Minister for Planning and Infrastructure under Part 5.1 of the Environmental Planning and Assessment Act 1979 is not required. The proposal is unlikely to affect Commonwealth land or have a significant impact on any matters of national environmental significance and therefore a referral under the Environment Protection and Biodiversity Conservation Act 1999 to the Australian Government Department of the Environment and Energy is not required.
9.1 Assessor declaration

This REF provides a true and fair review of the activity in relation to its likely effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the project, and provides sufficient information to determine whether there is likely to be a significant impact on the environment as a result of the Project.

I have considered all environmental impacts and safeguards to the best of my knowledge and have sought advice where required.

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Heathcote Road/Bardia Parade, Walder Road, Holsworthy Upgrade</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name:</strong> Ying Liu</td>
<td><strong>Signature:</strong></td>
</tr>
<tr>
<td><strong>Location:</strong> Sydney</td>
<td><strong>Date:</strong> 07/07/2020</td>
</tr>
<tr>
<td><strong>Phone:</strong> +61 4 264 40276</td>
<td></td>
</tr>
</tbody>
</table>

| **Work Package Manager:** Mike Simons | **Signature:**                   |
| **Location:** Melbourne | **Date:** 07/07/2020              |

9.2 Determiner declaration and approval

I have reviewed the document and consider that the project will not have a significant impact and can proceed subject to the controls outlined in this REF.

<table>
<thead>
<tr>
<th>Name:</th>
<th>Signature:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location:</td>
<td>Date:</td>
</tr>
</tbody>
</table>
LIVERPOOL CITY COUNCIL AREA
(MR512) HEATHCOTE ROAD
INTERSECTION UPGRADE
AT BARDIA PDE / WALDER RD, HAMMONDVILLE
ROAD DESIGN
100% DETAILED DESIGN

SITE OF WORKS

SUPPLEMENTARY DRAWINGS

DRAWING NUMBER | DRAWING TITLE
-----------------|-----------------!
R0220-01        | GULLY PIT TYPE SA PIPE DIAMETER UP TO 450mm
R0300-01        | STANDARD KERB AND GUTTER SHAPES
R0300-04        | STANDARD VEHICULAR CROSSING FOR USE WITH TYPE SA KERB AND CHANNEL
MD.R33.A08.B.2  | COMBINED STORMWATER AND SUBSURFACE DRAINAGE LAYOUT
R055-11         | KERB RAMPS
MD.R33.A08.B.2  | STANDARD PAVEMENT SUBSURFACE DRAINAGE DETAILS
TOOLED JOINT DETAIL

SELECT MATERIAL ZONE (SMZ)

ROAD

WEARING COURSE

BASE COURSE

VARIES

PAVED CONCRETE INFILL

(BROOM FINISH)

150mm THICK CONCRETE (32MPa)

WITH SL82 TOP REINFORCEMENT

40 COVER

FULL DEPTH

EXPANSION JOINT

SM KERB (TYP.)

RMS TYPE

X

SMZ

50mm (MIN) AC14 (A15E)

MILL/RESHEET

EXISTING PAVEMENT

7mm PRIME SEAL

7mm PRIME SEAL

100mm N25 CONCRETE

WITH SL72 MESH

(central) - UNO

EXISITNG CONCRETE

FOOTPATH PAVEMENT

100mm DGB20

COMPACTED SUBGRADE

PROPOSED CONCRETE FOOTPATH PAVEMENT

POINTS:

1. FOR GENERAL NOTES REFER TO DRG RD-0101.

2. PROPOSED RAISED MEDIAN ON FLEXIBLE PAVEMENT

3. MILL AND RESHEET

4. PROPOSED PAVEMENT TYPE 3

5. PROPOSED PAVEMENT TYPE 1

6. PROPOSED PAVEMENT TYPE 2

7. PROPOSED TRAFFIC ISLAND PROFILE

8. TRANSVERSE CONSTRUCTION JOINT DETAIL

9. TOOLED JOINT SEE NOTE 1

10. NEW AC WEARING COURSE

11. EXISTING BASE

12. EXISTING PATH

13. PROPOSED RAISED MEDIAN ON FLEXIBLE PAVEMENT

14. SPECIAL JOINT CUT 25mm DEEP WITHIN 1 DAY OF POURING TO BE SEALED OFF WITH JOINT SEALANT (PARBURY EMI ROADSEAL OR APPROVED EQUIVALENT)

15. MAKE 20mm WIDE 10mm DEEP GROOVE. FILL WITH JOINT SEALANT (PARBURY EMI ROADSEAL OR APPROVED EQUIVALENT)

16. MAKE 30mm WIDE 10mm DEEP GROOVE. FILL WITH JOINT SEALANT (PARBURY EMI ROADSEAL OR APPROVED EQUIVALENT)

17. CLOSED CELL POLYURETHANE FILLER (FULL DEPTH) OR APPROVED EQUIVALENT

18. CLOSED CELL POLYURETHANE FILLER (FULL DEPTH) OR APPROVED EQUIVALENT

19. EXISTING PATH

20. FULL DEPTH

21. EXPANSION JOINT

22. EXPANSION JOINT

23. TRANSVERSE CONSTRUCTION JOINT DETAIL

24. TOOLED JOINT

25. TOOL JOINT

26. EXPANSION JOINT

27. ISOLATION JOINT

28. TRANSVERSE CONSTRUCTION JOINT DETAIL
MAKE SMOOTH MATCH WITH EXISTING ROAD PAVEMENT.

EXISTING SA KERB TO BE DEMOLISHED

PROPOSED SA TYPE KERB

PROPOSED SURFACE

EXISTING SURFACE

PROPOSED SURFACE

PROPOSED PAVEMENT TYPE 1

PROPOSED PAVEMENT TYPE 2

MAKE SMOOTH MATCH WITH EXISTING ROAD PAVEMENT.

EXISTING SURFACE

EXISTING SURFACE

MAKE SMOOTH MATCH WITH EXISTING ROAD PAVEMENT.

EXISTING SURFACE

EXISTING SURFACE

EXISTING SURFACE

EXISTING Ø300 WATER MAIN

EXISTING Ø500 WATER MAIN

EXISTING Ø558 HIGH PRESSURE GAS PIPE

EXISTING 250 HIGH PRESSURE GAS PIPE

NOTES

1. FOR GENERAL NOTES REFER TO DRG RD-0101.
NOTES

1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT RMS STANDARDS UNLESS NOTED OTHERWISE.
3. PROVISION FOR TRAFFIC DURING CONSTRUCTION TO BE IN ACCORDANCE WITH THE CURRENT RMS SPECIFICATION G11. RMS PUBLICATION 'TRAFFIC CONTROL AT WORK SITE' AND AS1742.3.
4. ALL NEW Kerb AND CHANNEL PROFILES ARE TO BE IN ACCORDANCE WITH RMS MODEL DRAWING RD R15.A2.1.
5. ALL NEW DEDICATED CROSSINGS ARE TO BE IN ACCORDANCE WITH RMS MODEL DRAWING RD R15.A2.3.
6. ALL NEW CONCRETE PATHWAYS TO BE IN ACCORDANCE WITH LIVERPOOL CITY COUNCIL PAVEMENT AND KERB & GUTTER DETAIL STANDARD DRAWING No. 23.

1. SAWCUT EXISTING KERB AND PAVEMENT AND MAKE SMOOTH CONNECTION WITH PROPOSED WORKS - TYP
2. NEW Kerb TO BE COORDINATED WITH PROPOSED MEDICAL CENTRE ACCESS DESIGN
3. DRIVESWAYS TO BE REMOVED BY OTHERS
4. PROPOSED SA TYPE KERB
5. BE CONSTRUCTED BY OTHERS
6. DEMOLISH AND REMOVE FROM SITE EXISTING GULLY PIT AND RE-CONSTRUCT 6.2M LENGTH OF SITE DRAINAGE PIPE TO CONNECT WITH PROPOSED GAS GULLY PIT. PIT LIMITS TO BE CONSTRUCTED OVER EXISTING TELETRA SYSTEM. PROTECT CONDUIT DURING CONSTRUCTION IN ACCORDANCE WITH TELETRA REQUIREMENTS.
7. RECONSTRUCT PIT LIMITS, GRATE AND FRAME TO SUIT PROPOSED KERB ALIGNMENT.
8. REMOVE EXISTING DRIVEWAY AND RECONSTRUCT KERB AND GUTTER BY OTHERS
9. PROPOSED KERB TO MAKE SMOOTH MATCH WITH EXISTING KERB RAMP
10. A 3m CLEARANCE ZONE FROM EDGE 050MM HIGH PRESSURE GAS PIPE
11. PROVIDE SCOUR PROTECTION
12. PROPOSED GAS TYPE GULLY PIT
13. ADJUST EXISTING DRAINAGE PIT TO SUIT PROPOSED SURFACE LEVEL. MARK OUT CONNECTIONS PRIOR TO BREAKING GROUND AND EXCAVATE WITH CARE ALONG ALIGNMENT.
14. EXISTING BOUNDARY TO SUIT 1250 x 300 BOX CULVERT
15. REINSTATE GAS MARKER AT COMPLETION OF WORKS IN ACCORDANCE WITH REQUIREMENTS OF JEMENA GAS.
16. PROJECT PROTECT STORMWATER DURING CONSTRUCTION. MARK-OUT ALIGNMENT PRIOR TO BREAKING GROUND AND EXCAVATE WITH CARE ALONG LENGTH.
17. FINAL KERB ALIGNMENT CONSTRUCTION SUBJECT TO JEMENA GAS APPROVAL.
18. DEMOLISH AND REMOVE FROM SITE EXISTING GULLY PIT AND ASSOCIATED DRAIN 1200 x 300 BOX CULVERT AND HEADWALL. EXTEND BOX CULVERT TO NEW HEADWALL LOCATION.

LEGEND

- PROPOSED DESIGN
- PROPOSED SAWCUT
- PROPOSED KERB RAMP
- PROPOSED PAVEMENT
- PROPOSED DRAINAGE PIT
- RELOCATED GAS MARKER POST
- PROPOSED LOW VOLTAGE TRENCHING

DETAILED DESIGN

LIVERPOOL CITY COUNCIL
MR512 HEATHCOTE RD
INTERSECTION UPGRADE AT
BARDIA PDE / WALDER RD, HAMMONDVILLE
GENERAL ARRANGEMENT PLAN

RM512 HEATHCOTE RD
PREPARED FOR
BARDIA PDE / WALDER RD, HAMMONDVILLE
DRAWN
CRL2
DESIGN CHECK
13.07.20

CURRENT RMS STANDARDS UNLESS NOTED OTHERWISE.
NOTES:
1. SURVEY MARKS ARE NOT TO BE DISTURBED BEFORE ASSESSMENT BY SURVEYOR.
2. THE CONTRACTOR SHALL ARRANGE FOR THE WORKS TO BE SETOUT BY A REGISTERED SURVEYOR.
3. THE CONTRACTOR SHALL CHECK THE STABILITY OF THE STATED COORDINATES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
4. ALL SURVEY MARKS MUST BE PRESERVED UNLESS NOTED OTHERWISE.
5. FOR SETOUT TABLES, REFER TO DRG RD-6201.
6. FOR KERB RAMP SETOUT TABLE, REFER TO DRG RD-6201.

GENERAL NOTES:
1. LEVEL DATUM AHD, ORIGIN OF LEVELS PM 310350, RL 25 630 VDE SCS.
2. THE BOUNDARIES HAVE NOT BEEN SURVEYED. BOUNDARY INFORMATION SHOWN HAS BEEN COMPILED FROM THE RELEVANT DEPOSITED SURVEY PLANS.
3. IMPROVEMENTS AND FEATURES SHOWN ON OR NEAR THE BOUNDARIES ARE INDICATIVE ONLY.
### MK01 Horizontal Points

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KERB RAMP SETOUT COORDINATES

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NOTES
1. FOR SETOUT NOTES REFER TO ORG RD-0201.
2. REFER TO RMS STANDARD DRAWINGS R0300-11 FOR KERB RAMP.
NOTES
1. FOR PAVEMENT TYPES AND DETAILS REFER TO DRG RD-0001.
2. SUBSURFACE DRAINAGE SHALL BE INSTALLED IN ACCORDANCE WITH RMS QA SPECIFICATION R33.
3. MINIMUM GRADE OF SUBSURFACE DRAIN IS TO BE 0.5%.
4. SUBSURFACE DRAINAGE TO BREAK INTO STORMWATER STRUCTURES IN ACCORDANCE WITH RMS MODEL DRAWING RD R33.D.2.
5. APPROPRIATE PROTECTION MEASURES SHALL BE PUT IN PLACE WHEN CONSTRUCTING PAVEMENT AND KERBING IN CLOSE PROXIMITY TO UTILITY SERVICES.
6. FOR KIRS RAMP PAVEMENT DETAILS REFER TO

LEGEND

PROPOSED CONCRETE FOOTPATH PAVEMENT
PROPOSED PAVEMENT TYPE 1 - WALDER ROAD
PROPOSED PAVEMENT TYPE 2 - BARDIA PARADE
PROPOSED PAVEMENT TYPE 3 - MILL RESHEET

BOREHOLE LOCATION
SUBSURFACE DRAIN
CADASTRAL BOUNDARY

REFER TO RAISED MEDIAN DETAIL ON DRG RD-0001.
REFER TO PROPOSED TRAFFIC ISLAND PROFILE ON DRAWING RD-0001 FOR CONCRETE INFILL DETAILS.

LEGEND

PROPOSED PAVEMENT TYPE 3 - MILL RESHEET
PROPOSED PAVEMENT TYPE 2 - BARDIA PARADE
PROPOSED PAVEMENT TYPE 1 - WALDER ROAD
PROPOSED CONCRETE FOOTPATH PAVEMENT

BOREHOLE LOCATION
SUBSURFACE DRAIN
CADASTRAL BOUNDARY

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BOREHOLE LOCATION
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BOREHOLE LOCATION
SUBSURFACE DRAIN
CADASTRAL BOUNDARY

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REFER TO PROPOSED TRAFFIC ISLAND PROFILE ON DRAWING RD-0001 FOR CONCRETE INFILL DETAILS.

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PROPOSED CONCRETE FOOTPATH PAVEMENT

BOREHOLE LOCATION
SUBSURFACE DRAIN
CADASTRAL BOUNDARY

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BOREHOLE LOCATION
SUBSURFACE DRAIN
CADASTRAL BOUNDARY

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PROPOSED CONCRETE FOOTPATH PAVEMENT

BOREHOLE LOCATION
SUBSURFACE DRAIN
CADASTRAL BOUNDARY

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PROPOSED PAVEMENT TYPE 1 - WALDER ROAD
PROPOSED CONCRETE FOOTPATH PAVEMENT

BOREHOLE LOCATION
SUBSURFACE DRAIN
CADASTRAL BOUNDARY

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BOREHOLE LOCATION
SUBSURFACE DRAIN
CADASTRAL BOUNDARY

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BOREHOLE LOCATION
SUBSURFACE DRAIN
CADASTRAL BOUNDARY

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PROPOSED PAVEMENT TYPE 1 - WALDER ROAD
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BOREHOLE LOCATION
SUBSURFACE DRAIN
CADASTRAL BOUNDARY

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LEGEND

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PROPOSED PAVEMENT TYPE 2 - BARDIA PARADE
PROPOSED PAVEMENT TYPE 1 - WALDER ROAD
PROPOSED CONCRETE FOOTPATH PAVEMENT

BOREHOLE LOCATION
SUBSURFACE DRAIN
CADASTRAL BOUNDARY

REFER TO RAISED MEDIAN DETAIL ON DRG RD-0001.
REFER TO PROPOSED TRAFFIC ISLAND PROFILE ON DRAWING RD-0001 FOR CONCRETE INFILL DETAILS.
1. All pavement marking and signposting to be in accordance with RMS delineation guidelines.

2. All pavement marking and signposting to be in accordance with RMS specifications R141, R143, and AS 1742.

3. Only officers with a minimum delegation level 5.5 of the RMS Delegations Manual are authorised to approve regulatory signposting and linemarking illustrated on this plan. Regulatory signposting and linemarking shown on this plan are not approved for installation without the written authorisation from RMS Network and Safety Services.

4. All redundant linemarking to be removed by approved methods.

5. For intersection details refer to RMS traffic signal control plan registration number D2014/003903.

6. For street lighting refer Arconatech design.

NOTES:

LEGEND:

- Existing pavement boundary
- Existing pavement marking
- Proposed traffic sign
- Proposed pavement marking
- Line marking to be removed
- Existing TCS pole
- New TCS pole
- Proposed electrical pole with street light
- Existing electrical pole with street light

PROPOSED MEDICAL CENTRE

TO BE CONSTRUCTED BY OTHERS

ROAD

BARDIA PARADE

HEATHCOTE (MR512)

EXISTING HAZARD MARKERS TO BE REMOVED

EXISTING LANE MARKING AND ASSOCIATED PAINTED ARROWS TO BE REMOVED

EXISTING PEDESTRIAN CROSSING LINEMARKING AND ASSOCIATED STOP LINE TO BE REMOVED TYP.

EXISTING NO STOPPING SIGN TO BE RELOCATED

EXISTING NO STOPPING SIGN TO BE REMOVED FOR EXTENT OF NEW MARKING

NOSE OF ISLAND TO BE PAINTED YELLOW

EXISITING PEDESTRIAN CROSSING LINEMARKING AND ASSOCIATED STOP LINE TO BE REMOVED TYP.
NOTES
1. UTILITY INFORMATION SHOWN ON THE PLANS DOES NOT DEPICT ANYMORE THAN THE
PRESENCE OF A SERVICE BASED ON AVAILABLE DOCUMENTARY EVIDENCE. THE PRESENCE OF
A UTILITY SERVICE, ITS SIZE AND LOCATION SHOULD BE CONFIRMED BY FIELD INSPECTION
PRIOR TO THE COMMENCEMENT OF ROAD WORKS AND THE RELEVANT UTILITY PLANS
OBTAINED BY DALLING. PH 1106 OR FAX 1300 82 377 (CALL BEFORE YOU DIG). CAUTION
SHOULD BE EXERCISED WHEN WORKING IN THE VICINITY OF ALL UTILITY SERVICES.
2. THE CONTRACTOR SHALL LOCATE ALL EXISTING SERVICES AND CONSULT WITH RELEVANT
AUTHORITY AS REQUIRED PRIOR TO COMMENCING CONSTRUCTION. PROVIDE SERVICES AND
MAKE NECESSARY ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE AND/OR
ADJUST IF NECESSARY. EXISTING SERVICES LOCATIONS GIVEN ON THE DRAWINGS ARE
PROVIDED FOR INFORMATION ONLY AND THE ACCURACY IS NOT GUARANTEED.
3. THE POSITION OF SERVICES SHOWN IS APPROXIMATE ONLY AND HAS BEEN PLOTTED FROM
FEATURES FOUND AT THE TIME OF SURVEY AND FROM PLANS RECEIVED FROM THE
RELEVANT SERVICE AUTHORITIES. THE POSITION OF SERVICES MUST BE CONFIRMED PRIOR TO
THE COMMENCEMENT OF WORKS.
4. FOR POTABLE WATER MAIN ADJUSTMENT DESIGN REFER SYDNEY WATER CASE No. 152657PW
PREPARED BY RAW.

LEGEND
- PROPOSED WATER PIPE
- PROPOSED LOW-VOLTAGE TRENCHING
- PROPOSED ELECTRICAL POLE WITH STREET LIGHT
- EXISTING ELECTRICAL LINE OH TO BE REMOVED

EXISTING UTILITIES
- EXISTING STORMWATER PIPE
- EXISTING STORMWATER PIT
- EXISTING TELECOMM. LINE UG
- EXISTING TELECOM. LINE OH
- EXISTING ELECTRICAL POLE WITH STREET LIGHT
- EXISTING GAS MAIN (HIGH PRESSURE)
- EXISTING GAS MAIN MARKER
- EXISTING SEWER MAIN
- EXISTING SEWER MANHOLE
- EXISTING WATER MAIN
- EXISTING WATER MAIN
- EXISTING TCS CABLES
- EXISTING TCS POLE
- RELOCATED GAS MARKER POST

ADJUST HYDRANT COVER TO SUIT PROPOSED FINISHED SURFACE LEVEL
FOR PROPOSED STREET LIGHTING POLE AND WIRE DETAILS Refer STREET
LIGHTING DESIGN BY OTHERS - TYP

ADJUST VALVE ACCESS COVER TO SUIT PROPOSED FINISHED SURFACE LEVEL
EMBANKMENT AND BACKFILL MATERIAL TO BE IN
ACCORDANCE WITH SYDNEY WATER
REQUIREMENTS AS PER CASE No. 152657PW
POTABLE WATER MAIN ADJUSTMENT PLAN
TYP.

SECTION OF DRAIN CROSS MAIN TO BE ADJUSTED IN
ACCORDANCE WITH SYDNEY WATER REQUIREMENTS
AS PER CASE No. 152657PW POTABLE WATER MAIN
ADJUSTMENT PLAN TYP.

RELOCATED GAS MARKER IN ACCORDANCE
WITH benchmark GAS STANDARDS.

ADJUST VALVE ACCESS COVER TO SUIT PROPOSED FINISHED SURFACE LEVEL
AND TO CARRY TRAFFICABLE LOADS.
NOTES
1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. EXISTING TREES THAT ARE TO BE RETAINED ARE TO BE PROTECTED DURING CONSTRUCTION IN ACCORDANCE WITH THE LIVERPOOL DEVELOPMENT CONTROL PLAN, PART 1, SECTION 3.4.
3. ALL TREES TO BE INSTALLED IN ACCORDANCE WITH THE LIVERPOOL DEVELOPMENT CONTROL PLAN, DETAILS AND SPECIFICATION, PART 1, SECTION 3.4.
4. ALL TREES TO ALIGN WITH SETBACK REQUIREMENTS FROM IDENTIFIED SERVICES AS OUTLINED IN THE LIVERPOOL DEVELOPMENT CONTROL PLAN, LANDSCAPE SPECIFICATION, PART 1, SECTION 3.4.7.
5. ALL TREES SHALL HAVE A MINIMUM CONTAINER SIZE OF 10L AT THE TIME OF PLANTING.
6. ALL TREES TO HAVE MULCHING INSTALLED WITH A CLEAN SPACE AT THE EDGE AND WELL STAKED TO SUPPORT ESTABLISHMENT. FOR DETAILS, REFER TO THE LANDSCAPE SPECIFICATION, SECTIONS 3.4 IN THE LIVERPOOL DEVELOPMENT CONTROL.
7. ALL TREES SHOULD BE PLANTED IN GROUPS OF THREE WITH CONNECTED MULCHING - ENSURE THE MULCH AREA AND SPACING ACCOMMODATES THE MOWING REQUIREMENTS OF LCCS MAINTENANCE TEAM.
8. THE CONTRACTOR SHALL MAKE GOOD AREAS OF EXISTING TURF THAT HAVE BEEN DISTURBED DURING CONSTRUCTION.
Appendix B – Vegetation Assessment
Vegetation Assessment: Intersection of Heathcote Road and Bardia Parade, Holsworthy, NSW

Date: 14th July 2016
Author: Brigette Hodson
Ref: 8372

1 Introduction

Ecology and Heritage Partners Pty Ltd was commissioned by Beca to provide a letter of advice regarding an assessment of a small patch of native vegetation located at the corner of Heathcote Road and Bardia Parade, Holsworthy in New South Wales (NSW).

It is understood that the vegetation is required to be removed prior to the proposed upgrade of the intersection between Heathcote Road, Bardia Avenue and Walder Road in Holsworthy (the survey area) by Roads and Maritime Services (RMS). The purpose of this report is to identify the ecological values of the vegetation proposed for removal and determine the potential regulatory and legislative implications associated with the proposed action. This report is to inform the Review of Environmental Factors (REF) prepared by Beca along with the design of the intersection upgrade.

2 Survey Area

The survey area is located in the suburb of Holsworthy, approximately 25 kilometres south-west of Sydney’s central business district and the site is within the Liverpool City Council local government area. The survey area includes a small patch of roadside vegetation covering approximately 170 square metres and is bound by Heathcote Road and Bardia Parade (Figure 1).

3 Field Investigation

An assessment of the survey area was undertaken by a qualified ecologist on 5 July 2016. The assessment sought primarily to identify the extent and type of native vegetation present within the survey area and to identify potential habitat for species and ecological communities listed under the NSW State Threatened Species Conservation Act 1995 (TSC Act) and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).
4 Results

4.1 Vegetation

The vegetation proposed to be removed consists of a small cluster of trees, including one large and well-established Grey Ironbark *Eucalyptus paniculata*, four Flax-leaved Paperbarks *Melaleuca linariifolia* and one small Parramatta Red Gum *Eucalyptus paramatensis* (Plate 1). The understorey is dominated by introduced grasses typical of roadsides and lawns, with scattered weeds also present. Two large shrubs Coast Myall *Acacia binervia* are also present and are located several metres west from the trees near the culvert (Plate 2).

All of the above species are indigenous to the area, however given the location and size of the trees; it is likely that these trees and shrubs are planted. No threatened flora species were observed during field investigations.

Plate 1: Vegetation patch including Grey Ironbark, Flax-leaved Paperbarks and Parramatta Red Gum.

Plate 2: Coast Myall (two large shrubs) located behind the patch of vegetation.

4.2 Fauna habitat

There are no nests or tree-hollows present hence vegetation is likely to provide limited habitat opportunities for vertebrate fauna.

The vegetation is likely to be used as a foraging resource by common bird species which are tolerant of modified open areas such as Australian Magpie *Gymnorhina tibicen*, honey-eaters and lorikeets *Trichoglossus* species.

5 Discussion

Although the trees identified in the survey area are native to the area, retaining the trees is not a feasible option given the layout of the proposed road intersection upgrade works and the risk they would cause to public safety if left in situ. Overall, the threat to loss of biodiversity from the removal of these trees is minimal, given their isolated nature and lack of habitat features for vertebrate fauna.

The loss of vegetation may be compensated by incorporating these species or other similar native tree species into the landscaping design for the proposed road intersection upgrade works.
5.1 Legislative, Planning and Policy Framework

5.1.1 Commonwealth Legislation

Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act establishes a Commonwealth process for the assessment of proposed actions (i.e. project, development, undertaking, activity, or series of activities) that are likely to have a significant impact on matters of national environmental significance (NES), or on Commonwealth land. An action, unless otherwise exempt, requires approval from the Commonwealth Environment Minister if it is considered likely to have an impact on any matters of NES.

These species do not constitute threatened species under the EPBC Act, nor is the vegetation representative of a threatened ecological community. Therefore the proposed tree removal will not have an impact on any matters of NES.

5.1.2 NSW Legislation

Environmental Planning and Assessment Act 1979

Where Part 5 of the EP&A Act applies to a proposed construction activity, RMS examines and takes into account the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity. This includes consideration of the effect on critical habitat, impacts on threatened species, populations and ecological communities and their habitats and other protected flora or native species under the TSC Act (RMS 2014).

The removal of trees does not conflict with the regulations outlined in the EP&A Act, as no impacts to threatened species or communities are anticipated. However, notification to Council is required pursuant to Clause 13-15 of the State Environmental Planning Policy (SEPP) (Infrastructure) 2007 for the proposed removal of vegetation within a Council managed road reserve.

Threatened Species Conservation Act 1995

The TSC Act is the primary legislation in dealing with biodiversity conservation of native flora and fauna in NSW.

The flora species identified during field investigations are not listed as threatened under the TSC Act. The vegetation is not considered to contain important habitat for any threatened fauna species listed under the TSC Act. Furthermore, the species identified within the survey area are not considered to be regionally significant, as identified in the Western Sydney Urban Bushland Biodiversity Survey (NSW NPWS 1997).

5.1.3 Local Government Plans and Policy

Liverpool Local Environmental Plan

The environmentally significant land map (sheet ESL-105) which forms part of the Liverpool Local Environment Plan (LEP) 2008 indicates that the site of the proposed road intersection upgrade is not environmentally significant, although the edge of the Holsworthy Road adjacent to Bardia Parade is zoned RE1 which is for public recreation. According to the LEP, one of the objectives of this zone is to protect and
enhance the natural environment for recreational purposes’ which suggests any native vegetation in the vicinity is important.

**Liverpool Biodiversity Management Plan**

The Liverpool Biodiversity Management Plan includes as part of its core objectives a requirement to partner with the community (which would include state government agencies) to maintain, enhance and restore native flora and fauna and their habitat. This means that Council is committed to cooperating and negotiating with agencies such as RMS to ensure that when vegetation needs to be removed or modified, it is done so in a manner that does not adversely impact on the area’s biodiversity.

Due to the ecological value and scale of the vegetation proposed for removal, adverse impacts to the biodiversity of the area will be negligible.

**Liverpool City Council Tree Management Policy**

This policy, which was adopted by Council on 30 March 2016, highlights that Council seeks to maximise the preservation of all existing trees that provide a pleasant visual amenity within the City of Liverpool. Although the policy applies to all land within the Liverpool Local Government Area, in the case of the proposed road intersection upgrade, the policy is overridden by the *Roads Act* 1993. Nonetheless, it is desirable that given Council’s commitment to tree management that RMS consult with Council to obtain their acceptance and agree to a compensation arrangement.

### 5.2 Conclusion

In conclusion, it is noted that the removal of the trees is necessary for the proposed road intersection upgrade works and it is considered that the removal does not represent a significant impact. However, prior to removal of the trees, consultation with the Liverpool City Council is required under Clause 13-15 of the SEPP (Infrastructure) 2007. Consultation should also take into account Council’s biodiversity or visual amenity objectives.

In addition to the above, it is suggested that the following mitigation measures will be undertaken as part of the road intersection upgrade:

- The Construction Environmental Management Plan be required to include details of the pre-clearing process for the vegetation;

- The pre-clearing process include a requirement to check the trees and shrubs for vertebrate fauna prior to the clearing of vegetation and to apply a fauna rescue and release procedure should vertebrate fauna be present; and,

- The native vegetation to be removed be recycled (mulched) and re-used on site.
References

Liverpool Local Environmental Plan 2008, accessed on 7/07/2016


Liverpool City Council 2016. Tree Management Policy. Liverpool City Council, Liverpool NSW.

Proposed Intersection Upgrade
Heathcote Road / Bardia Parade and Walder Street, Holsworthy

Community Consultation Report

July 2016
Executive summary

This report provides a summary of the community consultation carried out by Roads and Maritime Services in March 2016 on the proposed intersection upgrade of Heathcote Road, Walder Road and Bardia Parade in Holsworthy.

The NSW Government is funding this $1.4 million improvement project to improve safety and manage congestion. The proposal includes:

- Installing two new pedestrian crossings and modifying another crossing
- Building a new left turn bay to improve capacity and traffic flow from Bardia Parade onto Heathcote Road
- Realigning the intersection for left and right turning lanes from Walder Road onto Heathcote Road to improve traffic flow
- Removing five trees
- Installing a CCTV camera on an existing traffic light post for monitoring of traffic
- Installing new signs and line marking.

Roads and Maritime Services distributed 750 letters to local residents, businesses and key stakeholders in early March 2016, inviting feedback by Friday 18 March (see Appendix A and B). We received comments from eight people who raised six different matters. Five people were supportive of the proposal and three were neutral, raised questions or made suggestions.

The key points raised were regarding the time taken to turn right from Meehan Avenue onto Walder Road because of queueing traffic and the need for a right turn arrow to turn right from Walder Road onto Heathcote Road. The comments raised will be taken into account in finalising the next step of the project.

We thank everyone who provided comments and the community and stakeholders for considering the proposal.

Some other matters raised were outside the scope of the proposal and will be passed on to Liverpool City Council.

After reviewing the feedback, Roads and Maritime has decided to proceed with the proposal, without change.

We will continue to keep the community and stakeholders informed as the project progresses.
1. Introduction

1.1. Background

Heathcote Road is a four lane roadway with a central median and right turn bays into Walder Road and Bardia Parade. Walder Road and Bardia Parade are both two lane local roads. The intersection is fully signalised, with filter right turns from Walder Road and Bardia Parade and a ‘diamond phase’ from Heathcote Road into Walder Road and Bardia Parade.

Heathcote Road is managed by Roads and Maritime Services (Roads and Maritime). Walder Road, Bardia Parade and other local roads in the area are managed by Liverpool City Council.

Roads and Maritime received feedback from the community regarding the right turn movements from Walder Road into Heathcote Road, Holsworthy. Roads and Maritime conducted an investigation and found that the safety and efficiency of the movement could be improved with changes to the traffic signals to allow right turns from Walder Road and Bardia Parade into Heathcote Road.

1.2. The proposal

Roads and Maritime is proposing to upgrade the intersection of Heathcote Road with Bardia Parade in Holsworthy.

The NSW Government is funding this $1.4 million improvement project to improve safety and manage congestion.

The proposed upgrade includes:

- Installing two new pedestrian crossings and modifying another crossing
- Building a new left turn bay to improve capacity and traffic flow from Bardia Parade onto Heathcote Road
- Realigning the intersection for left and right turning lanes from Walder Road onto Heathcote Road to improve traffic flow
- Removing five trees
- Installing a CCTV camera on an existing traffic light post for monitoring of traffic
- Installing new signs and line marking.
Proposal to upgrade the intersection on Heathcote Road at Bardia Parade and Waider Road, Holsworthy

- New pedestrian crossings
- Removal of trees to allow for new left turn bay
- New left turn bay to improve capacity
- Installing new CCTV camera, signs and line marking
- Intersection realignment and new traffic light phasing from Waider Road and Bardia Parade to improve traffic flow.
2. Consultation approach

2.1. Consultation objectives

Consultation was carried out with the community between Friday 4 March and Friday 18 March 2016 to:

- Seek comment, feedback, ideas, and suggestions for us to consider when making a decision and
- Build a database of interested and concerned community members with whom we can continue to engage during the proposal’s development.

2.2. How consultation was done

We distributed 750 letters to the community in the local area and key stakeholders in March inviting community members and stakeholders to provide feedback on the proposal via mail, email or phone by Friday 18 March.

Table 1 – Consultation tools

| Have Your Say Letter (Appendix A) | • Delivered to 750 residents and businesses in Holsworthy (Appendix B) |
|                                  | • Emailed to emergency services, key stakeholders and community groups in the local area. |

3. Consultation summary

3.1. Overview

We received comments from eight people who raised six different matters. Five were supportive of the proposal, and three were either neutral, raised questions or made suggestions. Matters raised included the time taken to turn right from Meehan Avenue onto Walder Road because of queueing traffic, the need for a right turn arrow to turn right from Walder Road onto Heathcote Road, the provision of a left turn from Heathcote Road into Walder Road, parking on Walder Road near the intersection and other matters which are outside of the scope of the proposal.

3.2 Feedback summary and Roads and Maritime’s responses

Roads and Maritime has provided responses to all feedback received on this proposal. The responses are provided directly to the person who commented as well as in this report, which will be made available to the public.

All comments have been considered to help Roads and Maritime make decisions on this proposal. Matters raised during consultation that are not within Roads and Maritime’s area of responsibility have been forwarded to the relevant authority.
### Table 2 – Comments and responses

<table>
<thead>
<tr>
<th>Issue category</th>
<th>Matter raised</th>
<th>Roads and Maritime response</th>
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| **Right Turn arrow from Walder Road to Heathcote Road** (3 comments) | Will the traffic signals have a right turn arrow from Walder Road into Heathcote Road? This will help traffic flow, especially in peak periods. | The new traffic signal phasing will have a right turn arrow from Walder Road into Heathcote Road.  
The traffic signal phasing has been modelled and optimised to allow the best traffic flow for the volume of traffic and movements on different arms of the intersection. The new traffic signal phasing will provide improved flexibility over the current phasing at the intersection and will be adaptive to changes in traffic conditions. |
|                                                     | The signals should have a right turn arrow to turn onto Heathcote Road in the morning. There should not be a red arrow when nobody is coming from Bardia Parade – it is really frustrating. |                                                                                              |

| **Left turn from Heathcote Road to Walder Road** (1 comment) | The proposal should include a left hand turn from Heathcote Road into Walder Road on the red light. | The proposal includes a left hand turn from Heathcote Road into Walder Road. The new phasing will provide more opportunities for vehicles turning left at the intersection including the ability for vehicles turning left from Heathcote Road towards Walder Road to be operating concurrently with the right turn movement out of Walder Road. |

### Table 3 - Out of scope comments and responses

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<tr>
<th>Issue category</th>
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<th>Roads and Maritime response</th>
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| **Exiting from Meehan Road onto Walder Road** (6 comments) | There are difficulties getting out of Meehan Avenue onto Walder Road, especially during school pick up and drop off times. Queuing traffic does not leave a gap across Meehan Road. | The new intersection layout and traffic signal phasing will improve traffic flow along Walder Road and make it easier to exit from Meehan Avenue, improving safety and traffic flow in the surrounding area.  
Improvements at the intersection of Walder Road and Meehan Avenue are not within the scope of this proposal, however Roads and Maritime Services will pass this suggestion on to Liverpool City Council for their consideration. |
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<tr>
<th>Issue category</th>
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<th>Roads and Maritime response</th>
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<tbody>
<tr>
<td></td>
<td>Please include and enforce ‘do not queue across intersection’ markings across Meehan Avenue at the intersection with Walder Road as part of the proposal, or a roundabout. This will give residents some right of way in the difficult traffic.</td>
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<td></td>
<td>Will the proposed improvements enable better traffic flow from Meehan Avenue onto Walder Road?</td>
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<td></td>
<td>There have been near misses with people turning from Meehan Avenue into oncoming traffic and drivers running red lights.</td>
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<tr>
<td>Walder Avenue</td>
<td>In the morning peak, when driving from Walder Avenue, across Heathcote Road into Bardia Parade, it is difficult to get into the left lane because of cars queuing in the right turn lane and parked vehicles.</td>
<td>Roads and Maritime will take the comment about parking along Walder Avenue near the intersection with Heathcote Road into consideration in the final design of the proposed intersection improvement. A clearway to prevent cars queueing in the right hand lane will be considered in the detailed design and discussed further with Liverpool Council.</td>
</tr>
<tr>
<td>parking</td>
<td>Suggest a clearway on Walder Road between Bradey Avenue and Heathcote Road.</td>
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<tr>
<td>(1 comment)</td>
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<td>U turning in Meehan Road (1 comment)</td>
<td>Many vehicles make U turns at the entrance to Meehan Avenue at the intersection with Walder Road, which has caused several accidents. The respondent suggested a ‘No U Turn’ sign is erected.</td>
<td>Improvements at the intersection of Walder Road and Meehan Avenue are not within the scope of this proposal. Roads and Maritime will pass this suggestion on to Liverpool City Council for their consideration.</td>
</tr>
<tr>
<td>Bus Stop Location (1 comment)</td>
<td>When a bus is stopped at the bus stop on Walder Road, south of Meehan Avenue it becomes dangerous as you cannot see oncoming traffic when turning out of Meehan Avenue.</td>
<td>Changes to the bus stop on Walder Road, northbound, south of Meehan Avenue are not within the scope of this proposal. Roads and Maritime will pass this comment on to Liverpool City Council for their consideration.</td>
</tr>
</tbody>
</table>
3.2. Decision

Following a review of the comments received, Roads and Maritime has decided to proceed with the proposal without change.

3.3. Next steps

We will keep the community informed as the project progresses.

Issues raised concerning turning from Meehan Avenue onto Walder Road, U turning in Meehan Avenue and bus stop location will be passed onto Liverpool City Council for their consideration.
Appendix A – Have your say Letter, March 2016

March 2016

Have your say – Proposal to improve safety on Heathcote Road, Holsworthy

The NSW Government is funding this $1.4 million proposal at the intersection of Bardia Parade and Walder Road to improve safety and manage congestion.

Roads and Maritime Services is seeking your feedback by Friday 18 March on a proposal, which involves:

- Installing two new pedestrian crossings and modifying another crossing
- Building a new left turn bay to improve capacity and traffic flow from Bardia Parade onto Heathcote Road
- Realigning the intersection for left and right turning lanes from Walder Road onto Heathcote Road to improve traffic flow
- Removing five trees
- Installing a CCTV camera on an existing traffic light post for monitoring of traffic
- Installing new signs and line marking.

We have included a map to help explain the project’s location.

Investigation work is required to help us finalise a design for the proposal. This work will include locating utilities and drilling holes then reinstating the pavement.

This work will take three shifts to complete between Thursday 10 March and Thursday 17 March, excluding weekends, weather permitting. Our working hours will be from 8am to 5pm.

How will the work affect you?

There will be noise associated with this work, but we will make every effort to minimise its impact.

Traffic changes

There will be some temporary traffic changes to ensure the work zone is safe.

Lane closures will be in place and may affect travel times. Please keep to speed limits and follow the direction of traffic controllers and signs. For the latest traffic updates, you can call 132 701, visit livetraffic.com or download the Live Traffic NSW App.
How can you give feedback?

We encourage you to send us your comments by Friday 18 March to:

DownerMouchel
PO Box 6465
North Ryde NSW 2113
Or enquiries_nsw@dowmouche.com

Contact

If you have any questions, please contact our delivery partner DownerMouchel on 1800 332 660 or email Enquiries_nsw@dowmouche.com. For more information on our projects, visit rms.nsw.gov.au
Appendix B – Distribution Area
Appendix D - PACHCI Clearance Letter
27/07/2016

Hannah D'eau
Environment Officer

Dear Hannah

Re: Preliminary assessment results for the Heathcote Rd and Bardia Pde Project proposal based on Stage 1 of the Procedure for Aboriginal cultural heritage consultation and investigation (the procedure).

The project, as described in the Stage 1 assessment checklist, was assessed as being unlikely to have an impact on Aboriginal cultural heritage. The assessment is based on the following due diligence considerations:

- The project is unlikely to harm known Aboriginal objects or places.
- The AHIMS search did not indicate any known Aboriginal objects or places in the immediate study area.
- The study area does contain landscape features that indicate the presence of Aboriginal objects, based on the Office of Environment and Heritage's Due diligence Code of Practice for the Protection of Aboriginal objects in NSW and the Roads and Maritime Services' procedure.

Your project may proceed in accordance with the environmental impact assessment process, as relevant, and all other relevant approvals.

If the scope of your project changes, you must contact me to reassess any potential impacts on Aboriginal cultural heritage.

If any potential Aboriginal objects (including skeletal remains) are discovered during the course of the project, all works in the vicinity of the find must cease. Follow the steps outlined in the Roads and Maritime Services' Unexpected Archaeological Finds Procedure.

For further assistance in this matter do not hesitate to contact me.

Yours sincerely

Jeff Nelson
Aboriginal Cultural Heritage Officer (ACHO) – Sydney Region
Data from the BioNet Atlas of NSW Wildlife website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°; ^^ rounded to 0.01°). Copyright the State of NSW through the Office of Environment and Heritage. Search criteria : Public Report of all Valid Records of Endangered Populations in LIVERPOOL LGA returned a total of 70 records of 9 species.
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Sensitivity: General