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Document Status

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<th>Author</th>
<th>Reviewer</th>
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Executive summary

NSW Roads and Maritime Services (Roads and Maritime) is proposing to construct a new grade separated interchange at The Northern Road and Bringelly Road, Bringelly (‘the proposal’).

The proposal, which would involve The Northern Road passing under Bringelly Road, would be located about 300 metres east of the existing intersection of The Northern Road, Bringelly Road and Greendale Road. The proposal also involves modifications to the existing intersection.

A review of environmental factors (REF) was prepared for the proposal and placed on public display from 24 November 2015 until 18 December 2015 at three locations (Liverpool City Library, Camden Council and Narellan Library). The REF was also available on the project website at www.rms.nsw.gov.au/projects/sydney-west/bringelly-the-northern-road-upgrade/bringelly-road-interchange.

A total of four submissions were received in response to the public display of the REF. These comprised submissions from one individual, a developer on behalf of four landowners, and two local councils. None of the submissions objected to the proposal.

The main comments raised by the respondents included:
- Need for an eastbound slip lane
- Potential future significance and need for upgrading Greendale Road
- Council requirements in relation to detailed design and construction management
- Council requirements in relation to noise, water quality, flooding, access and local businesses.

The issues raised in respondents’ submissions have been considered by Roads and Maritime. A response to the issues raised in submissions is provided in Chapter 2. Where required, new or revised management measures have been provided (as outlined in Chapter 3).

In summary, the proposal as described in the REF, meets the proposal objectives while minimising environmental impacts and appropriately considering community and other stakeholder issues.
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Appendix A Community update newsletter
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1 Introduction and background

1.1 Purpose
This submissions report relates to the review of environmental factors (REF) prepared for the proposed new grade separated interchange at The Northern Road and Bringelly Road, Bringelly (referred to as ‘the proposal’), and should be read in conjunction with that document.

The REF was placed on public display and submissions relating to the proposal and the REF were received by Roads and Maritime Services (Roads and Maritime). This submissions report summarises the issues raised and provides responses to each issue (Chapter 2), details investigations carried out since finalisation of the REF (Chapter 3), and identifies new or revised environmental management measures (Chapter 4).

1.2 The proposal
The proposal involves constructing a new grade separated interchange, with The Northern Road passing under Bringelly Road, about 300 metres east of the existing intersection of The Northern Road, Bringelly Road and Greendale Road.

The key features of the proposal include:

- Widening and upgrading about 400 metres of Bringelly Road, between Kelvin Park Drive and Greendale Road, to provide:
  - Two 3.5 metre-wide traffic lanes in each direction between Kelvin Park Drive and The Northern Road/Bringelly Road interchange, with wide central medians for a future six lanes
  - Two 3.5 metre-wide traffic lanes in each direction on the western side of the interchange, transitioning to one lane in each direction to tie in to the existing intersection and Greendale Road
  - Two metre-wide shoulders in each direction
- Building a new section of The Northern Road east of the existing alignment, between about 200 metres south of Robinson Road and the southern abutment of the bridge over Thompsons Creek. The new section, to pass under Bringelly Road, would be about one kilometre long and around 50 metres wide (including embankments), and would include:
  - Two 3.5 metre-wide traffic lanes in each direction
  - Four metre-wide shoulders connecting to the on and off ramps of the interchange, allowing for future bus lanes
  - An underpass about 60 metres long under the upgraded section of Bringelly Road
  - 2.5 metre wide shoulders along The Northern Road under the interchange for about one kilometre
  - A wide central median to allow for a future six lanes
- Providing a new intersection with traffic lights on Bringelly Road over The Northern Road, with turning movements in all directions
- Dual right turn movements in all directions to and from The Northern Road and Bringelly Road, and dedicated left turn lanes in all directions
- Providing bus service facilities by:
  - Retaining bus stops on the existing The Northern Road and relocating bus stops on Bringelly Road to suit the interchange
  - Providing two new bus stops on The Northern Road northbound and southbound interchange on ramps
  - Providing a bus only lane north and south along The Northern Road at the traffic lights on Bringelly Road
- Three metre-wide shared paths for pedestrians and cyclists
• A new road connection between Robinson Road and The Northern Road by extending the realigned Belmore Road intersection, and building a cul-de-sac at the western end of Robinson Road
• Converting the existing The Northern Road (to the west of the new section) to a ‘no through road’, by providing cul-de-sacs at both the northern (at Thames Road) and southern ends (near Robinson Road).

The proposal would tie into The Northern Road Upgrade Stage 2A (Peter Brock Drive to Belmore Road) to the south, The Northern Road Upgrade Stage 2C (Thames Road to Mersey Road) to the north, and the Bringelly Road Upgrade Stage 2 (King Street to The Northern Road) to the east.

1.3 REF display

Roads and Maritime prepared a REF to assess the environmental impacts of the proposal. The REF was publicly displayed between 24 November 2015 and 18 December 2015 at three locations, as detailed in Table 1.1. The REF was also placed on the Roads and Maritime project website and made available for download. The display locations were advertised in the community update newsletter and on the project website.

Table 1-1 Display locations

<table>
<thead>
<tr>
<th>Location</th>
<th>Address</th>
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<tbody>
<tr>
<td>Liverpool City Library</td>
<td>170 George Street, Liverpool</td>
</tr>
<tr>
<td>Camden Council</td>
<td>19 Queen Street, Narellan</td>
</tr>
<tr>
<td>Narellan Library</td>
<td>Corner of Queen Street and Elyard Street, Narellan</td>
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</tbody>
</table>

The community update newsletter (Appendix A) was prepared and uploaded on the Roads and Maritime Services website on 23 November 2015. It was also distributed to 900 properties across Bringelly on 24 November 2015.

Advertisements were placed in the Macarthur Chronicle on 24 November 2015 and the South West Advertiser on 25 November 2015.

The Roads and Maritime website was updated on 23 November 2015, with the REF and community update newsletter published on the site. An animated video about the proposal was uploaded to the Western Sydney Infrastructure Project web portal. The video features a 3D animation of how the proposal would look, drive through videos to help road users understand the design, and features that show changes to property access.

An email was issued on 23 November 2015 to 88 stakeholders on a distribution list for people interested in or affected by this project.

Two community information sessions were held at the Bringelly Community Centre (5 Greendale Road, Bringelly) on Wednesday 2 December 2015 (3.30 to 7.30pm) and Saturday 5 December 2015 (12 to 2.30pm). A total of 46 people attended the information sessions.

The REF display and associated consultation activities represented a continuation of community and stakeholder consultation that has occurred since the announcement of the project in early 2014. Further information on consultation for the proposal is provided in section 5 of the REF.
2 Response to issues

Roads and Maritime received four submissions, accepted up until March 2016. Table 2.1 lists the respondents and each respondent’s allocated submission number. The table also indicates where the issues from each submission have been addressed in Chapter 2 of this report.

Table 2-1 Respondents

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Submission No.</th>
<th>Section number where issues are addressed</th>
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</thead>
<tbody>
<tr>
<td>Individual</td>
<td>1</td>
<td>2.2.2, 2.2.3, 2.2.5, 2.4.1</td>
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<tr>
<td>Individual (on behalf of four landowners)</td>
<td>2</td>
<td>2.2.1, 2.2.3, 2.2.4</td>
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<tr>
<td>Liverpool City Council</td>
<td>3</td>
<td>2.2.1, 2.2.6, 2.3, 2.4.2, 2.4.4, 2.8.1, 2.9.1, 2.10.1, 2.12.1</td>
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<td>Camden Council</td>
<td>4</td>
<td>2.2.6, 2.4.3, 2.4.5, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.6.1, 2.6.2, 2.7.1, 2.7.2, 2.11.1</td>
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</table>

2.1 Overview of issues raised

A total of four submissions were received in response to the display of the REF comprising two submissions from government agencies (Liverpool City and Camden councils), and two submissions from the community. No form letters were received.

Each submission has been examined individually to understand the issues raised. The issues raised in each submission have been extracted and collated, and corresponding responses to the issues provided. Where similar issues have been raised in different submissions, only one response has been provided. The issues raised, and Roads and Maritime’s responses to these issues, form the basis of this chapter.

Issued raised by Liverpool City Council included:

- Council’s requirements in relation to:
  - Existing section of The Northern Road
  - Construction environmental management plan (CEMP)
  - Landscaping strategy
  - Bus stops
  - Construction haul routes
  - Impacts on Council land
  - Drainage
  - Local heritage
  - Consultation with Council.

Issued raised by Camden Council included:

- Council’s requirements in relation to:
  - Configuration of the portions of The Northern Road that will be transferred to the two councils
  - Improving access to Bringelly Public School
  - Impacts on roads used by the temporary construction local traffic diversion
  - Stormwater runoff and flooding
Issues raised by the community included:

- Need for an eastbound slip lane
- Greendale Road traffic and design implications
- Impact of the Western Sydney Airport and the need for a future rail link
- Pedestrian access
- Significance of Greendale Road.

Responses to issues raised are provided in the following sections.

2.2 Proposal scope and design details

2.2.1 Support for the proposal

Submission numbers
2, 3

Issue description
In summary, the respondents raised the following issues:

- General support for the proposal

Response
Roads and Maritime acknowledges the respondents’ support for the proposal.

2.2.2 Eastbound slip-lane

Submission number
1

Issue description
In summary, the respondent raised the following issues:

- Concerned that the effectiveness of the interchange and the Bringelly Road upgrade would be limited by only providing a single traffic signal controlled lane for southbound traffic on The Northern Road travelling east onto Bringelly Road. It is noted that two lanes are provided for traffic flowing from the opposite direction.
- The lack of a slip lane means that traffic will need to stop at the proposed intersection, which is inconsistent with the future importance of this route
- A slip lane should be provided as part of the current design.

Response
As noted in section 2.3 of the REF, the design of the proposal has been developed to respond to the agreed objectives, which are as follows:

- Improve transport connections to the proposed western Sydney airport and surrounding developments, including the Western Sydney Priority Growth Area and South West Priority Land Release Area and the Western Sydney Employment Area
- Improve the flow of traffic to provide more reliable journeys
- Support public and active transport to promote sustainable and efficient journeys
- Improve road safety for pedestrians, cyclists and motorists.
The design has been developed to provide sufficient capacity for predicted traffic to 2036, based on the latest traffic forecast information from Transport for NSW. This information takes into account future development in western Sydney, including the development of urban release areas and the proposed western Sydney airport at Badgerys Creek.

The left turn from The Northern Road (southbound) onto Bringelly Road (eastbound) comprises dual left turn lanes. To provide a safe crossing for pedestrians, the left turn would be controlled by traffic signals.

The provision of a free flowing slip lane does not form part of the concept design, as it would not allow safe pedestrian access across the interchange.

2.2.3 Greendale Road traffic and future upgrading

Submission numbers
1, 2

Issue description
In summary, the respondents raised the following issues:

- The design of the proposal appears to give priority to the traffic flows along Greendale Road, particularly those generated by the Brickworks
- There are plans to rezone and develop four properties to the south of Greendale Road. The properties have a total area of 714 hectares, and a potential future population of about 22,500 people. The developer is proposing to construct the majority of a new north–south sub-arterial road link through the development area, to intersect with Greendale Road about 365 metres to the west of the existing intersection with The Northern Road
- The significance of Greendale Road in providing an important east–west link between the Outer Sydney Orbital and The Northern Road and Bringelly Road should be recognised in the planning for the project. This should include access to the proposed road link through the proposed development site to the south of Greendale Road
- Roads and Maritime should work with NSW Planning and Environment to implement mechanisms for the funding of the upgrade of Greendale Road via the Special Infrastructure Contribution - Western Sydney Growth Areas Levy (the ‘SIC Levy’).

Response

Design considerations

As noted in section 2.2.2, the design of the proposal has been developed to provide sufficient capacity for predicted traffic to 2036, based on the latest traffic forecast information for the study area from Transport for NSW. This information takes into account future development in western Sydney, and includes the expected traffic growth from developments along Greendale Road.

Future upgrading of Greendale Road

As noted in section 6.1.3 of the REF and 7.2.3 of the Traffic and Transport Impact Assessment (Appendix D of the REF), the results of modelling indicate that Greendale Road would operate above capacity in 2029 due to the predicted development to the west of Bringelly. The REF notes that upgrade works would be required along Greendale Road to improve the capacity. These works are outside the scope of the current proposal, but will be considered by Roads and Maritime as part of its program of works for western Sydney.
2.2.4 Land acquisition

Submission number
2

Issue description
In summary, the respondent raised the following issues:

- The land to be reserved and acquired for the intersection should be extended west to allow for widening of Greendale Road to Lot 101.

Response
The extent and amount of land acquisition for road development projects is determined by the design for each individual project. The proposed land acquisition for this proposal is sufficient to undertake the works that form part of the proposal. The proposed acquisition area extends as far as the eastern side of the intersection with Greendale Road.

Any acquisition required to undertake a future upgrade of Greendale Road would form part of the scope of that project.

2.2.5 Pedestrian access

Submission number
1

Issue description
In summary, the respondent raised the following issues:

- The design should include a second pedestrian bridge to remove the multiple pedestrian crossings.

Response
The proposed pedestrian facilities are described in section 3.2.4 and shown in figure 3.8 of the REF. The provision of a pedestrian bridge is outside the scope of the current proposal and the volume of pedestrians does not warrant a pedestrian bridge.

Changes to the shared user path along the existing The Northern Road and upgraded The Northern Road are discussed in section 3.3.

2.2.6 Existing sections of The Northern Road to be transferred to Liverpool and Camden councils

Submission numbers
3, 4

Issue description
In summary, the respondents raised the following issues:

- The existing section of The Northern Road should be rehabilitated in accordance with Council's requirements prior to handover to Council
- Sections to be transferred need to be in a reasonable state of repair
- Clarification is requested on the configuration of the portions of The Northern Road that will be transferred.
Response
Roads and Maritime acknowledges the councils’ requests and notes the rehabilitation requirements provided in Liverpool Council’s submission, and the request for clarification on the configuration provided in Camden Council’s submission. Ongoing negotiation with both councils in relation to the rehabilitation and configuration of the existing The Northern Road is underway. Subject to an agreement between all parties, Roads and Maritime will rehabilitate the area prior to handover. Refer additional management measure in Table 4-1 (measure number 12.5).

2.3 Drainage

Submission number
3

Issue description
In summary, the respondent raised the following issues:

- The design of stormwater drainage and run-off management structures and arrangements should take into account Council’s requirements as listed in the submission.

Response
The proposed drainage arrangements are described in section 3.2.7 of the REF. Roads and Maritime acknowledges Council’s request and notes the drainage requirements provided in Council’s submission. An additional measure is provided in Table 4-1 to respond to this request (measure 5.3).

2.4 Traffic and access

2.4.1 Impacts of the proposed western Sydney airport

Submission number
1

Issue description
In summary, the respondent raised the following issues:

- The design ignores the impact of the airport, which would result in significant traffic volumes (to/from the city and the existing airport) along the M5 corridor and Bringelly Road
- With all the developments in western Sydney (including the airport), there will be road capacity issues unless a rail link is provided.

Response
As part of the Western Sydney Infrastructure Plan, the Commonwealth and NSW governments have committed $3.6 billion over 10 years to major road infrastructure upgrades in western Sydney (including the proposal). These upgrades will relieve pressure on existing infrastructure and provide connectivity to the proposed western Sydney airport and surrounding areas. As noted in the section 1.1 of the REF, the proposal was announced in April 2014 by the (then) Prime Minister as part of the Western Sydney Infrastructure Plan’s program of works to support the proposed western Sydney airport at Badgerys Creek.

The proposal has been designed to take account predicted traffic on the regional road network, including that resulting from the proposed western Sydney airport. The modelling undertaken as part of the Traffic and Transport Impact Assessment (Appendix D of the REF) to assess the potential impacts and operational performance of the proposal included future year strategic modelling undertaken by Transport for NSW, which includes the potential future traffic that would be generated by the proposed western Sydney airport.

The provision of a rail link to the airport does not form part of the scope of this proposal.
2.4.2 Construction traffic management

Submission number
3

Issue description
In summary, the respondent raised the following issues:

- Council requests that it be consulted in relation to appropriate construction traffic management through local streets as part of the development of the CEMP
- Council controlled roads must not be used for the purposes of haulage of fill materials without Council consent and will be subject to Council requirements.

Response
Roads and Maritime acknowledges Council’s request to be consulted in relation to construction traffic management through local streets. Management measure 1 provided in Table 7.1 of the REF (measure 2.1 in Table 4-1 of this report) provides for the preparation of a detailed construction traffic management plan. Additional measures are provided in Table 4-1 detailing council consultation requirements (measures 2.8 and 12.5).

Construction traffic routes (‘haul roads’) would be specified in the construction traffic management plan to be developed by the construction contractor in accordance with the management measures. As provided by measures 2.1 and 2.2 in Table 4-1, the traffic management plan would be:

- Prepared in accordance with Traffic Control at Work Sites (RTA, 2010) and Specification G10 - Control of Traffic
- Approved by Roads and Maritime before implementation
- Provide a comprehensive and objective approach to minimise any potential impacts on road and pedestrian operations during construction
- Minimise impacts on existing roads and local traffic.

Under clause 5 of schedule 2 of the Roads Act 1993, a public authority does not require the consent of the relevant roads authority to exercise the public authority’s functions in, on or over an unclassified road, other than a Crown road. It is not proposed to use local roads for the movement of construction materials. The use of local roads may be used to divert local traffic during construction. Local roads would not be used for construction haulage or the movement of heavy vehicles.

2.4.3 Temporary construction local traffic diversion

Submission number
4

Issue description
In summary, the respondent raised the following issues:

- Prior to construction, Robinson Road, Carrington Street and Jersey Road should be resurfaced in anticipation of the impact of the additional traffic, including heavy vehicles.

Response
As noted in section 2.4.2, it is not proposed to use local roads for the movement of construction materials. The use of local roads would only be used to divert local traffic, if required during construction. Local roads would not be used for construction haulage or the movement of heavy vehicles.

If local roads are not used to divert local traffic during construction, a temporary side track may be required within the proposal footprint to divert Bringelly Road traffic. This would be subject to
construction staging by the construction contractor. It is not expected that a side track would result in any additional amenity impacts than that assessed within the REF.

As per new management measure 2.8 in Table 4-1, the councils would be consulted in relation to the management of construction traffic on local roads, including these roads. The results of consultation would be taken into account during preparation of the construction traffic management plan. An additional measure is included in Table 4-1 to allow for an assessment of the road pavement condition prior to construction and to provide for the repair of the road surface following construction if required (measure 2.9).

2.4.4 Bus stops

Submission number 3

Issue description
In summary, the respondent raised the following issues:

- The school and bus company should be consulted in relation to the bus stop near the school
- The school bus stop should be designed/replaced in accordance with Disability Standards for Accessible Public Transport and Council requirements.

Response
As noted in section 3.2.5 of the REF, the existing bus stop near Bringelly School (bus stop number 2171178) would be retained to service the school. Roads and Maritime acknowledges Council’s requests in relation to this bus stop. However, Roads and Maritime are not proposing any alterations to the existing bus stop in this location.

2.4.5 School access

Submission number 4

Issue description
In summary, the respondent raised the following issues:

- Consideration should be given to improving access to Bringelly Public School from The Northern Road, including on-street parking provision and bus access.

Response
Roads and Maritime acknowledges Council’s requests in relation to the access to Bringelly Public School. It is noted that the main vehicular access to the school is via Greendale Road.

As noted in section 6.11.3 of the REF, the proposal, together with the upgrades of The Northern Road and Bringelly Road as a whole, would improve local access by reducing traffic congestion and improving safety. The removal of through traffic from the remaining section of The Northern Road past Bringelly Village and the school would improve local amenity, safety, and access along this section of road. In particular, heavy vehicles associated with the operation of the expanded Bringelly Brickworks would no longer turn north or south onto The Northern Road from Greendale Road, and would not pass The Northern Road frontage of the Bringelly School.

The proposal would also result in an upgrade to pedestrian and cycle facilities through the study area, which would improve safety and access for pedestrians and cyclists.

As noted in section 3.2.5 of the REF, the existing bus stop near Bringelly School (bus stop number 2171178) would be retained to service the school.
As noted in section 6.1.3 of the REF, existing on-street parking restrictions would be unaffected by the proposal. Parking restriction signage and line marking would be adjusted to suit the new pavement and kerb and gutter. Once the existing sections of The Northern Road are handed over to the councils, they would have the opportunity to review and alter the existing parking restrictions as required.

2.5 Noise

2.5.1 Monitoring

Submission number
4

Issue description
In summary, the respondent raised the following issues:

- Noise monitoring is required at Bringelly Public School to determine appropriate façade mitigation treatment and ensure internal class room noise levels are achieved
- Post development monitoring of the interchange and the surrounding road system should be undertaken.

Response
The potential for noise and vibration impacts as a result of the construction and operation of the proposal was assessed as part of the REF. The impact assessment identified the need for additional investigation of the potential impacts on Bringelly Public School (management measure 13 in Table 7.1 of the REF).

An additional noise assessment has been undertaken at Bringelly Public School. Noise monitoring was conducted inside classrooms outside of school hours between 3.00 pm and 5.00 pm on two days. Future internal classroom noise levels were predicted based on existing and predicted noise levels from Bringelly and Greendale roads. The assessment indicated that noise mitigation is required for two classrooms within one building, and that existing noise levels in this building already exceed the internal noise criteria.

Consultation with Bringelly Public School would be undertaken to determine the future use of the classrooms and this building. Architectural treatment of the building may not reduce the internal noise to a satisfactory level, given the age and construction of the building. An additional management measure (3.1) has been included in Table 4-1 detailing the need for consultation with Bringelly Public School.

Measure 3.22 provides for post construction noise monitoring of the proposal.

2.5.2 Impacts on amenity

Submission number
4

Issue description
In summary, the respondent raised the following issues:

- External amenity (private open space) for residential receivers has not been identified or addressed in the noise assessment report
- The consideration of external amenity for residents forms part of Camden Council’s Environmental Noise Policy (which adopts the ECRTN criteria) and is also a consideration under the Road Noise Policy (RNP).
Response

The assessment was undertaken in accordance with the guidelines listed in section 6.2.1 of the REF. This included Roads and Maritime’s *Noise Criteria Guideline* (2014). This guideline provides an approach to applying the *Road Noise Policy* to specific situations on Roads and Maritime projects. The *Noise Criteria Guideline* includes residential noise criteria and also criteria for non-residential active and passive open space. There is no specific requirement in these guidelines to address the potential for impacts on private open space. Specifically, the *Road Noise Policy* states (section 2.5.4):

> For residential dwellings, the assessment point is one metre from the façade. This position has been adopted to provide a relatively accessible measurement location, and will protect the acoustic amenity of both the internal spaces in the dwelling and external spaces near the respective façade. Meeting the assessment criteria at one metre from the façade does not mean that noise levels over the entire property will also meet the assessment criteria.

> The provision of a good acoustic environment for external spaces around a building (e.g. a courtyard or backyard of a residence) should be considered, although there are no specific criteria relating to these spaces. Guidance on how to improve such environments may be found in Development near rail corridors and busy roads – interim guideline (Department of Planning NSW 2008).

**2.5.3 Noise mitigation**

**Submission number**

4

**Issue description**

In summary, the respondent raised the following issues:

- Noise mitigation should be provided at locations that will be affected by excessive noise from traffic detours where such detours are planned to occur for periods greater than one year
- Where noise levels at receiver locations are excessively higher than existing levels, mitigation is required even if the impact occurs for less than one year.

**Response**

As noted in section 6.2.5 of the REF, the increase in traffic volumes along Jersey Road and Robinson Road as a result of the local traffic construction diversion triggers the new road noise criteria due to the changes in the functional class under the *Noise Criteria Guideline*. As a result, there are 22 receivers that would qualify for consideration of noise mitigation under the *Noise Mitigation Guideline*, as they are predicted to experience an increase of 2 dBA. Figure 6.16 of the noise and vibration assessment report outlines the process used to determine which receivers would be eligible for consideration of additional noise mitigation.

Should the local traffic construction diversion not be used to divert local traffic during construction, a temporary side track may be required within the proposal footprint to divert Bringelly Road traffic. This would be subject to construction staging by the construction contractor. It is not expected that a side track would result in any additional amenity impacts than that assessed within the REF.

Mitigation measure 3.2 in *Table 4-1* provides for further investigation of mitigation options as part of the detailed design process.
2.5.4 Construction working hours

Submission number
4

Issue description
In summary, the respondent raised the following issues:

- Council does not support the carrying out of construction work out of standard hours or during night-time or on any Sundays or public holidays.

Response
Roads and Maritime acknowledges Council’s concerns in relation to working hours. Section 3.4.3 of the REF notes the standard construction working hours. As noted in the REF, some work would need to be carried out outside standard construction hours to minimise disruption to daily traffic on the two major road corridors, and disturbance to surrounding businesses. It is expected that the majority of outside standard hours work times would be between Monday to Friday 8 pm to 5 am.

Some weekend work is also likely to be required, subject to permitted road occupancy licences and construction staging. This would be necessary to minimise traffic disruptions. The works would be undertaken in accordance with the Interim Construction Noise Guideline and the Environmental Noise Management Manual (RTA, 2001): Practice Note vii – Road works outside normal working hours. Prior advice would be given to the community regarding work hours. Management measures 3.5, 3.7 and 3.19 in Table 4-1 provide the requirements for the out of hours procedure in relation to noise and vibration.

2.6 Soils

2.6.1 Salinity

Submission number
4

Issue description
In summary, the respondent raised the following issues:

- A salinity assessment of land should be undertaken in accordance with the EPA’s Site Investigation for Urban Salinity, including soil aggressiveness with respect to concrete and steel infrastructure, and soil permeability/dispersivity
- Imported fill should be assessed for salinity to identify potential use constraints.

Response
As assessment of salinity has formed part of the geotechnical investigations undertaken to inform the detailed design of the proposal. As noted in section 6.3.2 of the REF, the potential for salinity to damage infrastructure and the suitability of excavated material for reuse as fill would be considered during detailed design. Management measure 4.1 has been added to Table 4-1 to reinforce this. Measure 13.4 has been amended to include reference to the fill specification.
2.6.2 Contamination

Submission number

4

Issue description
In summary, the respondent raised the following issues:

- Remediation of any contaminated land should be undertaken in accordance with Camden Council’s Management of Contaminated Lands Policy
- All remediation works require development consent prior to the commencement of remediation.

Response
As noted in section 6.3.2 of the REF there is considered to be minimal potential for widespread contamination to occur in the proposal site. An approach to managing any unexpected contaminated material that may be uncovered would be specified in the construction environmental management plan. This is provided for by mitigation measure 4.17 in Table 4-1. As per mitigation measure 4.17, any contamination would be managed in accordance with Roads and Maritime’s procedures, as specified in the Guideline for the Management of Contamination (Roads and Maritime, 2013). It is noted that not all remediation work requires development consent. The requirements for consent are defined by State Environmental Planning Policy 55 – Remediation of Land. The need for development consent would be determined on a case by case basis.

2.7 Hydrology, water quality, flooding and drainage

2.7.1 Flooding and drainage

Submission number

4

Issue description
In summary, the respondent raised the following issues:

- Impacts to the 1 in 100 year flood afflux level upstream of The Northern Road along the South Creek tributary should be minimised to match the existing flood/flow conditions
- Methods to control the increase in impervious area/volume of stormwater runoff may be necessary to reduce flows and flood levels to existing conditions (in accordance with Camden Council’s Flood Risk Management Policy and Engineering Design Specifications). Otherwise, an appropriate consultation/compensation strategy for affected landholders would need to be considered
- A copy of the final flood/design levels and flood study model completed for the design should be provided to Council.

Response
As detailed in section 6.4 of the REF, a hydrological assessment of the South Creek tributary was completed.

The assessment identified that the South Creek tributary catchment size would increase by about four hectares as a result of the road cutting intercepting the catchments. The proposed cutting would potentially increase flows to the tributary, with the potential to alter peak discharges. The proposal would result in small increases in the 1 in 100 year flood afflux levels. The majority of the increases would be confined to rural land adjacent to these watercourses and would only impact land that is currently flood prone.
A new reinforced box culvert (five cells, 2400 mm wide by 2100 mm high) is proposed to be installed at the South Creek tributary. An assessment of impacts undertaken during detailed design identified similar modelling results. Impacts have been minimised where possible and the associated cross drainage culvert has been designed to minimise any afflux.

As per new mitigation measure 12.5 in Table 4-1, a copy of the drainage report would be provided to Camden Council on completion.

2.7.2 Water quality

Submission number
4

Issue description
In summary, the respondent raised the following issues:

• Stormwater needs to be treated to an appropriate quality before discharging
• The proposed stormwater capture and water quality treatment devices do not appear to comply with nominated pollution retention criteria
• Water quality targets consistent with the Growth Centres Release Areas of Oran Park should be adopted for the treatment of stormwater generated from the interchange.

Response
The impact of construction activities on the quality of runoff discharging to the receiving drainage lines/waterways would be minimised by implementing the soil and water management plan as part of the CEMP. This is provided for by measure 4.2 in Table 4-1. The plan would include measures to monitor the quality of water discharged from the construction site.

Requirements in relation to water quality would be specified in the environmental protection licence (EPL) that would be sought for the construction of the proposal (together with adjoining projects) in accordance with the Protection of the Environment Operations Act 1997. This is further discussed in section 4.3.

The water quality strategy adopted for the proposal is in accordance with The Northern Road upgrade, Narellan to Bringelly Review of Environmental Factors (Roads and Maritime, 2012). In accordance with that REF, the water quality objective of the proposal is consistent with the water quality objective of the upgrade of The Northern Road as a whole, which is to “…minimise the potential impacts on downstream receiving waters so that the system changes the existing water regime by the smallest amount practicable. This objective is consistent with the Roads and Maritime’s Water Policy 1997 (RTA, 1997) and the Code of Practice for Water Management 1999 (RTA, 1999)” (Roads and Maritime, 2012).

The design includes operational spill containment basins at Thompsons Creek and the South Creek Tributary, and where possible, the use of vegetated swales to improve water quality. It is noted that much of The Northern Road is in a cutting at the proposal site, and opportunities to include grassed swales are limited. Given the implementation of these features, the operation of the proposal would not be expected to substantially impact on downstream water quality.
2.8 Heritage

2.8.1 Local heritage

Submission number
3

Issue description
In summary, the respondent raised the following issues:

- A photographic archival recording should be undertaken of the existing landscape/road alignment
- The cultural landscape should be protected through the conservation of mature vegetation
- Opportunities for interpretation of the old alignment, including the use of a derivative name (for example, The Old Northern Road) and other interpretive devices should be considered.

Response
As noted in section 6.7.2 of the REF, the proposal would not directly impact on any listed heritage items. Section 6.7.2 notes that there is the potential for a moderate direct impact to a potential heritage item (the Bringelly Road/Greendale Road corridor) as the proposal would pass through areas that represent the rural landscape context of the study area.

The proposal would impact about 4.26 hectares of native vegetation in biodiversity certified land of the South West Growth Centre. The design has been developed to minimise clearing impacts on existing vegetation, and there would be no direct impacts to non-certified native vegetation.

Management measure 9.2 in Table 4-1 describes the need for a landscaping plan to be developed detailing options for planting designs and landscape treatments. This plan has been developed, and consultation with Council has been undertaken and comments addressed where relevant.

Management measures 76 to 82 in Table 7.1 of the REF (8.1 to 8.7 in Table 4-1) provide for the management of local heritage. Roads and Maritime acknowledges Council’s request in relation to interpretation and photographic archival recording of the existing landscape/road alignment. An additional measure is provided in Table 4-1 (measure 8.3).

It is noted that management measure 78 in Table 7.1 of the REF required a survey and assessment of properties not accessible at the time of writing the REF. This was undertaken concurrently with the Aboriginal heritage investigations (refer to section 3.2). No further impacts to non-Aboriginal heritage items or places were identified.

2.9 Landscape character and visual impacts

2.9.1 Landscaping plan

Submission number
3

Issue description
In summary, the respondent raised the following issues:

- The landscaping strategy prepared as part of the detailed design should be consistent with that prepared for the other sections of The Northern Road and Bringelly Road
- Council requests that the areas between the shared paths and the kerbs should be planted with ground cover and shrubs rather than turf.
Response

Roads and Maritime acknowledges Council’s request and notes the requirements provided in Council’s submission. Management measure 84 provided in Table 7.1 of the REF specified that ‘A landscaping plan would be developed detailing options for planting design and landscape treatments’. This plan has been developed and consultation with Council has been undertaken and comments addressed where relevant. This measure has been amended to take into account Council requirements. The amended measure is provided in Table 4-1 (measure 9.2).

2.10 Land use, property and socio-economic impacts

2.10.1 Council land

Submission number

3

Issue description

In summary, the respondent raised the following issues:

- Any Council land proposed for use/entry during construction should be identified and Council consent obtained.

Response

The only use of Council land proposed during construction is the temporary construction diversion for local traffic along Jersey Road/Carrington Road and Robinson Road (local roads managed by Camden Council) as described in section 3.4.7 of the REF. New management measure 2.8 in Table 4-1 provides for consultation with the two local councils in relation to the management of construction traffic on local roads.

2.11 Socio-economic impacts

2.11.1 Impacts to the Bringelly Village shops

Submission number

4

Issue description

In summary, the respondent raised the following issues:

- The Bringelly Village shops include a number of local businesses which service the local area and passing trade. Consideration should be given to the potential negative impacts on the village (including reduction in passing trade and construction impacts)
- The mitigation measures listed in Council’s submission should be considered, including directional signage, compensation, a ‘buy local’ strategy, business surveys and employment of a business liaison officer.

Response

The socio-economic impact assessment of the proposal (provided in Appendix J of the REF and summarised in section 6.11) recognises the potential for impacts on local businesses, particularly those at Bringelly Village. The potential for construction impacts and a reduction in passing trade during operation is noted in section 6.11.3 of the REF. Management and mitigation measures were provided in Table 7.1 of the REF. As part of the submissions report, an additional assessment of the potential for impacts was undertaken in the form of a survey of local businesses (the need for this survey was identified as a mitigation measure within the REF). The results of the survey, including the additional management and mitigation measures proposed, are summarised in section 3.1. The business survey report is provided in Appendix B.
The applicable additional/amended management measures, which are provided in Table 4-1 (measures 2.13, 12.2, 12.8), include:

- Access to the Bringelly Shops and businesses would be maintained via Bringelly Road and the existing alignment of The Northern Road
- Business owners would be provided with information about the design as soon as practicable to allow each business owner to make an informed decision about the future of their businesses
- Signage would be investigated in consultation with local councils to direct motorists to Bringelly Village.

2.12 Consultation

2.12.1 Consultation with councils

Submission number

3

Issue description

In summary, the respondent(s) raised the following issues:

- Liverpool Council would like to be further consulted during detailed design regarding:
  - Construction traffic management through local streets
  - Any impacts on Council land
  - Design of the school bus stop.

Response

As outlined in section 5 of the REF, consultation with Liverpool and Camden councils has been undertaken throughout the development of the proposal. Consultation would continue during further design development and construction. In response to the matters raised by council, additional consultation measures have been added to the measures originally summarised in Table 7.1 of the REF. The additional management measures are provided in Table 4-1 (measures 2.8 and 12.5).
3 Additional assessment

3.1 Business survey

3.1.1 Summary
A detailed socio-economic assessment was undertaken as part of the REF to consider the potential socio-economic impacts of the construction and operation of the proposal. The full report was provided in Appendix J to the REF. The assessment concluded that the proposal would have the potential to impact on some local businesses, including those located at Bringelly Village at the corner of The Northern Road and Greendale Road. The assessment identified that the proposal would have the potential to create both benefits and impacts for the businesses at Bringelly Village. To provide more information about the potential impacts of the proposal, the REF recommended, as per measure 106 in Table 7.1, that ‘A business survey would be undertaken prior to works commencing’. To fulfil the requirements of this mitigation measure, a survey of local businesses was undertaken in conjunction with the public display to:

- Provide an addendum to the socio-economic assessment undertake for the REF and to support the Submissions Report for the proposal
- Obtain additional information about local businesses and operational requirements, particularly in relation to access, parking, deliveries, transport and customer needs
- Review the existing business impact assessment provided in the socio-economic assessment report, and identify any additional impacts and benefits of the proposal, as an input to the detailed design and construction planning process
- Review the existing environmental safeguards (provided in the REF) and identify any additional measures or changes required.

The survey was undertaken by GHD’s socio-economic specialists, who prepared the socio-economic impact assessment for the REF.

A total of nine businesses were surveyed by GHD (one respondent represented two separate businesses) out of the 18 businesses identified within the catchment area. GHD attempted to contact all 18 businesses by telephone to ask them to complete the survey either face to face, or over the telephone. Three businesses completed the survey face-to-face, and six via telephone. Of the remaining businesses, owners or managers either were not concerned about the proposal and/or did not want to complete the survey, or repeated attempts by GHD to make contact were unsuccessful. This represents a response rate of 50 per cent of the businesses located within the catchment area there were identified by GHD.

There are 18 businesses within a one kilometre radius around the existing intersection of The Northern Road, Bringelly Road and Greendale Road, and including the businesses in Bringelly Village and in the surrounding area. A minimum of three attempts were made to contact all businesses at various times of the day to maximise the response rate. A total of nine businesses responded and were surveyed out of the 18 businesses identified within the catchment area. This represented a response rate of 50 per cent of the businesses. Of the nine businesses surveyed, all were aware of the proposal. A copy of the survey is provided in Appendix A of the business survey report provided in Appendix B.

The key concerns broadly relate to two key themes including:
- Concerns regarding a loss of trade from passing motorists
- The perception that the proposal would result in improved infrastructure for the area and community.
The detailed outcomes of the survey are provided in the report in Appendix B. No additional impacts were identified as a result of the business survey. Key concerns identified by the respondents are generally consistent with the impacts identified during the preparation of the REF.

### 3.1.2 Additional management and mitigation measures

In response to the results of the business survey, additional/amended socio-economic management measures have been added to the measures originally summarised in Table 7.1 of the REF. The additional/amended management measures, which are provided in **Table 4-1** (measures 2.13, 2.14, 2.15, 12.2 and 12.8), include:

- Access to the Bringelly Shops and businesses would be maintained via Bringelly Road and the existing alignment of The Northern Road
- Property access, including access to businesses and Bringelly Public School, would be maintained throughout the construction period with suitable alternative access arrangements provided
- Where changes to access arrangements are necessary, Roads and Maritime would advise owners, tenants and business owners, and consult with them in advance regarding alternate access arrangements
- Business owners would be provided with information about the design as soon as practicable to allow each business owner to make an informed decision about the future of their businesses
- Signage would be investigated in consultation with local councils to direct motorists to Bringelly Village.

### 3.2 Aboriginal heritage

#### 3.2.1 Summary

An archaeological survey report (ASR) was prepared by Artefact Heritage (Artefact) as part of the REF. The ASR was prepared in accordance with Stage 2 of the Roads and Maritime Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI). The assessment identified that five registered Aboriginal Heritage Information Management System (AHIMS) sites are located within the proposal boundary. Two areas of potential archaeological deposit (PAD) were also recorded within the proposal boundary. Two areas of potential archaeological deposit (PAD) were also recorded within the proposal boundary (TNRB PAD01 and TNRB PAD02).

At the time of preparing the original PACHCI Stage 2 ASR, 10 properties within the proposal boundary could not be accessed. These properties were later assessed by an addendum PACHCI Stage 2 ASR. The addendum assessment included a survey to fulfil one of the Aboriginal heritage management measures provided in the REF (measure 69 in Table 7.1 of the REF), which required that properties not accessible at the time of writing the REF be surveyed and assessed prior to works commencing.

The purpose of the PACHCI Stage 2 assessment and addendum report was to identify and document the location of Aboriginal objects and areas of archaeological potential within the previously unassessed properties. The addendum PACHCI Stage 2 ASR extended the original area of TNRB PAD02 to the south. Both assessments recommended test excavations under the PACHCI Stage 3 and OEH Code of Practice be conducted within the portions of the PADs to be impacted by the proposal.

Following the preparation of the addendum PACHCI Stage 2 ASR, test excavations were undertaken and a PACHCI Stage 3 cultural heritage assessment report was prepared (refer to Appendix C).

The test excavation found that no Aboriginal objects were located at TNRB PAD01 and a dispersed artefact scatter was identified at TNRB AS01 (previously TNRB PAD02). A total of 61 artefacts were excavated from this site. Due to the concentration of artefacts identified within a portion of this site, targeted salvage excavation under PACHCI Stage 4 is recommended.
Four of the five registered AHIMS sites identified during the preparation of the REF are subject to existing Aboriginal Heritage Impact Permits (AHIP). This includes AHIP C0000436 (Bringelly Road Upgrade Stage 2) and AHIP C0001407 (The Northern Road Stage 2). The remaining site (TNRU7) will be subject to an AHIP in addition to TNRB AS01.

Refer to Appendix C for the cultural heritage assessment report.

3.2.2 Additional management and mitigation measures

As a result of the additional investigations as described above, management and mitigation measures 69, 70 and 71 in Table 7.1 of the REF have been completed. Additional/amended management and mitigation measures have been added to the original measures and are provided below and in Table 4-1 (measures 7.1 to 7.3):

- In accordance with the Roads and Maritime PACHCI, targeted salvage excavation under PACHCI Stage 4 is required for TNRB AS01 as a condition of the AHIP
- A program of archaeological salvage or surface collection would be undertaken in accordance with the requirements of the existing AHIPs relating to sites BRP-IF-16 / TNRU14, BRP-S-07 and TNRU6, as part of the Bringelly Road Stage 2 mitigation works and The Northern Road Stage 2 mitigation works respectively
- No impacts to identified Aboriginal sites (TNRU7 and TNRB AS01) would occur without an AHIP.

3.3 Pedestrian access

3.3.1 Summary

Section 3.2.4 of the REF outlines the proposed pedestrian and cyclist facilities as part of the proposal. The three metre wide shared paths are shown in figure 3.8 of the REF and are as follows:

- The eastern side of the existing section of The Northern Road, linking to the Bringelly Village shops and Bringelly Public School
- The western side of The Northern Road, from the Belmore Road intersection to the southern cul-de-sac on the existing alignment of The Northern Road
- The western side of The Northern Road, from the northern cul-de-sac on the existing alignment of The Northern Road to the shared path to be provided as part of The Northern Road Upgrade Stage 2C
- Both sides of Bringelly Road, linking to the proposed shared path on the existing section of The Northern Road and the shared path to be provided as part of the Bringelly Road upgrade
- Allowing for the future construction of a shared path on the eastern side of the upgraded The Northern Road corridor, to connect the Stage 2C upgrade with Bringelly Road and the Stage 2A upgrade to the south at Belmore Road.

During the development of detailed design, some refinements were made to the locations of the shared paths due to constructability and access issues. The refined locations are summarised below and are shown in Figure 1:

- The western side of The Northern Road from the northern cul-de-sac on the existing alignment of The Northern Road to the shared path to be provided as part of The Northern Road Upgrade Stage 2C
- The eastern side of the existing section of The Northern Road, between Bringelly Road and the northern cul-de-sac on the existing alignment of The Northern Road
- Both sides of Bringelly Road, linking to the proposed shared path on the existing section of The Northern Road and the shared path to be provided as part of the Bringelly Road upgrade
- Connections on the eastern side of the existing section of The Northern Road to allow for access between the southern cul-de-sac on the existing alignment and Bringelly Road
- The western side of the upgraded The Northern Road corridor, connecting the Stage 2A upgrade with Bringelly Road
• The eastern side of the upgraded The Northern Road corridor, connecting the Stage 2A upgrade with Robinson Road.

There would be no additional impacts as a result of the design refinements. The configuration of the shared path arrangement has been refined, however access is still provided along the existing The Northern Road and the proposed upgrade (to the south of Bringelly Road).

3.3.2 Additional management and mitigation measures
There are no additional management and mitigation measures proposed for the changes in pedestrian access, other than those provided in Table 4-1.
Figure 1 Proposed pedestrian, cyclist and bus facilities
4 Environmental management

The REF for the proposal identified the framework for environmental management, including management and mitigation measures that would be adopted to avoid or reduce environmental impacts (section 7 of the REF).

After consideration of the issues raised in the submissions, the management and mitigation measures have been revised and some additions have been made to reduce the potential environmental impacts of the proposal.

Should the proposal proceed, environmental management will be guided by the framework and measures outlined below.

4.1 Environmental management plans (or system)

A number of safeguards and management measures have been identified to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposal. Should the proposal proceed, these management measures would be incorporated into the detailed design and applied during the construction and operation of the proposal.

A Project Environmental Management Plan (PEMP) and a CEMP will be prepared to describe safeguards and management measures identified. These plans will provide a framework for establishing how these measures will be implemented and who would be responsible for their implementation.

The plans will be prepared prior to construction of the proposal and must be reviewed and certified by the Roads and Maritime Environment Officer, Western Sydney Region, prior to the commencement of any on-site works. The CEMP will be a working document, subject to ongoing change and updated as necessary to respond to specific requirements. The CEMP and PEMP would be developed in accordance with the specifications set out in the QA Specification G36 – Environmental Protection (Management System), QA Specification G38 – Soil and Water Management (Soil and Water Plan) and the QA Specification G40 – Clearing and Grubbing.

4.2 Summary of safeguards and management measures

Environmental safeguards outlined in this document would be incorporated into the detailed design phase of the proposal and during construction and operation of the proposal, should it proceed. These safeguards would minimise any potential adverse impacts arising from the proposed works on the surrounding environment. The safeguards and management measures are summarised in Table 4-1.

Changes and additions made to those previously outlined in the REF are recorded in blue and bold.
## Table 4-1 Summary of site specific environmental safeguards

<table>
<thead>
<tr>
<th>No.</th>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General</td>
<td><strong>All environmental safeguards must be incorporated within the following:</strong></td>
<td>Project manager</td>
<td>Pre-construction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Project Environmental Management Plan</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• Detailed design</td>
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<td></td>
<td></td>
<td>• Contract specifications for the proposal</td>
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<tr>
<td></td>
<td></td>
<td>• Contractor’s Environmental Management Plan.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>General</td>
<td><strong>A risk assessment must be carried out on the proposal in accordance with Project Pack and PMS risk assessment procedures to determine an audit and inspection program for the works. The recommendations of the risk assessment are to be implemented.</strong>&lt;br&gt;A review of the risk assessment must be undertaken after the initial audit or inspection to evaluate is the level of risk chosen for the project is appropriate.&lt;br&gt;Any works resulting from the proposal and as covered by the REF may be subject to environmental audit(s) and/or inspection(s) at any time during their duration.</td>
<td>Project manager and regional environmental staff</td>
<td>Pre-construction&lt;br&gt;After first audit</td>
</tr>
<tr>
<td>1.2</td>
<td>General</td>
<td><strong>The environmental contract specification must be forwarded to the Roads and Maritime Environment Manager for review at least 10 working days prior to the tender stage.</strong>&lt;br&gt;A contractual hold point must be maintained until the CEMP is reviewed by the Roads and Maritime Environment Manager.</td>
<td>Project manager</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>1.3</td>
<td>General</td>
<td>The Project Manager must notify the Roads and Maritime Environment Officer at least five working days prior to work commencing.</td>
<td>Project manager</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>1.4</td>
<td>General</td>
<td><strong>All businesses and residences likely to be affected by the proposed works must be notified at least five working days prior to the commencement of the proposed activities.</strong></td>
<td>Project manager</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>1.5</td>
<td>General</td>
<td><strong>Environmental awareness training must be provided, by the contractor, to all field personnel and subcontractors.</strong></td>
<td>Contractor</td>
<td>Pre-construction and during construction as required</td>
</tr>
<tr>
<td>No.</td>
<td>Impact</td>
<td>Environmental safeguards</td>
<td>Responsibility</td>
<td>Timing</td>
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<tr>
<td>2</td>
<td>Traffic and access</td>
<td>A detailed traffic management plan would be prepared in accordance with <em>Traffic Control at Work Sites</em> (RTA, 2010) and Specification G10 - <em>Control of Traffic</em>. The plan would be approved by Roads and Maritime before implementation to provide a comprehensive and objective approach to minimise any potential impacts on road and pedestrian operations during construction.</td>
<td>Construction contractor</td>
<td>Pre-construction</td>
</tr>
</tbody>
</table>
| 2.1 | Construction traffic management | The plan would be submitted in stages to reflect the progress of work and would:  
- Identify the traffic management requirements during construction, particularly for the traffic diversion  
- Describe the general approach and procedures to be adopted when producing specific traffic control plans  
- Ensure the continuous, safe and efficient movement of traffic for both the public and construction workers  
- Maintain the capacity of local roads  
- Determine temporary speed restrictions to ensure safe driving environments around work zones  
- Undertake a speed limit review of local roads associated with the traffic diversion  
- Minimise impacts on existing roads and local traffic  
- Provide access to local roads, properties and businesses, including the use of temporary turnaround bays  
- Provide temporary works and traffic signals  
- Determine the number and width of traffic lanes in operation  
- Identify traffic barrier requirements and placement  
- Include the need to consult with emergency services on access changes.  
- Include methods for implementing the traffic management plan  
- Include methods for minimising road user delays  
- Provide appropriate warning and advisory signposting  
- Consider other developments that may also be under construction, to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic. | Construction contractor | Pre-construction |
<p>| 2.2 | | | | |</p>
<table>
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<tr>
<th>No.</th>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2 cont.</td>
<td></td>
<td>• Maintain designated pedestrian and cyclist access for safe movements in the study area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td></td>
<td>Consultation would be undertaken with Interline Bus Services before and during construction to confirm bus diversions and bus stop closures.</td>
<td>Roads and Maritime</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>2.4</td>
<td></td>
<td>A speed limit review of the traffic diversion through Robinson Road and Jersey Road would be undertaken to determine if a temporary speed reduction is required during the diversion.</td>
<td>Roads and Maritime</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>2.5</td>
<td></td>
<td>Consultation with the Transport Management Centre would be undertaken to manage cumulative construction traffic impacts.</td>
<td>Roads and Maritime</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>2.6</td>
<td></td>
<td>Consultation would be undertaken with Bringelly Public School to ensure safe walking to School can be maintained during construction.</td>
<td>Roads and Maritime</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>2.7</td>
<td></td>
<td>The community would be kept informed about construction through advertisements in the local media and by prominently placed advisory notices or variable message signs.</td>
<td>Roads and Maritime</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>2.8</td>
<td></td>
<td>Liverpool and Camden councils would be consulted in relation to the management of local traffic during construction on local roads. The results of consultation would be taken into account during preparation of the construction traffic management plan.</td>
<td>Roads and Maritime</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>2.9</td>
<td>Temporary local traffic diversion road condition</td>
<td>The road pavement condition of the route used for the temporary traffic diversion of local traffic through Jersey Road / Carrington Road and Robinson Road would be assessed prior to construction. Any impacts as a result of construction vehicle movements and additional traffic using the traffic diversion would be repaired such that the final condition of the pavement is no worse than the existing condition.</td>
<td>Construction contractor</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>2.10</td>
<td>Congestion and safety</td>
<td>Traffic control would be provided to manage and regulate traffic movements during construction. For example, construction and delivery vehicles entering or leaving the site compound would use arterial roads. These movements would be restricted to non-peak traffic periods wherever possible.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>2.11</td>
<td></td>
<td>Disruption to all road users during the construction period would be kept to a minimum.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>2.12</td>
<td></td>
<td>Clear signage would be provided if traffic or footpath diversions are required.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>No.</td>
<td>Impact</td>
<td>Environmental safeguards</td>
<td>Responsibility</td>
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<tr>
<td>2.13</td>
<td>Access to properties and businesses</td>
<td>Access to the Bringelly Shops and businesses would be maintained via Bringelly Road and the existing alignment of The Northern Road.</td>
<td>Roads and Maritime</td>
<td>Detailed design</td>
</tr>
<tr>
<td>2.14</td>
<td>Property access, including access to businesses and Bringelly Public School, would be maintained throughout the construction period with suitable alternative access arrangements provided.</td>
<td>Construction contractor and Roads and Maritime</td>
<td>Construction</td>
<td></td>
</tr>
<tr>
<td>2.15</td>
<td>Where changes to access arrangements are necessary, Roads and Maritime would advise owners, tenants and business owners, and consult with them in advance regarding alternate access arrangements.</td>
<td>Construction contractor and Roads and Maritime</td>
<td>Construction</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3 Noise and vibration</th>
<th>Noise assessment</th>
<th>Additional detailed noise assessment would be undertaken at Bringelly Public School to identify which buildings are classrooms and to determine the transmission loss through the building facades.</th>
<th>Roads and Maritime</th>
<th>Completed as part of the Submissions Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Consultation</td>
<td>Undertake consultation with Bringelly Public School to determine the future use of the classrooms and buildings</td>
<td>Roads and Maritime</td>
<td>Detailed design</td>
</tr>
<tr>
<td>3.2</td>
<td>Operational noise mitigation</td>
<td>Further investigation of mitigation options would be undertaken to determine suitability of low noise pavement, noise barriers and required at-property treatments.</td>
<td>Roads and Maritime</td>
<td>Detailed design</td>
</tr>
<tr>
<td>3.3</td>
<td>Vibration</td>
<td>Undertake a dilapidation survey at 11 Robinson Road prior to construction commencing.</td>
<td>Roads and Maritime</td>
<td>Detailed design</td>
</tr>
</tbody>
</table>
| 3.4                   | Construction noise and vibration | A construction noise and vibration management plan would be prepared as part of the construction environmental management plan (CEMP). This plan would include, but not be limited to:  
  - A map indicating the locations of sensitive receivers including residential properties  
  - Management measures to minimise the potential noise impacts from the quantitative noise assessment and for potential works outside of standard working hours (including implementation of Interim Construction Noise Guidelines (DECC, 2009)) | Construction contractor | Pre-construction |
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</table>
| 3.4 cont. | • A risk assessment to determine potential risk for activities likely to affect receivers (for activities undertaken during and outside of standard working hours)  
• Mitigation measures to avoid noise and vibration impacts during construction activities including those associated with truck movements  
• A process for assessing the performance of the implemented mitigation measures  
• A process for documenting and resolving issues and complaints  
• A process for updating the plan when activities affecting construction noise and vibration change  
• A process for consideration of cumulative impacts from adjacent projects  
• Identify in toolbox talks where noise and vibration management is required  
• An out of hours works procedure in accordance with the requirements of the Interim Construction Noise Guideline (DECC, 2009) and the Environmental Noise Management Manual Practice (RTA, 2001a)  
• Restrictions on construction delivery times to minimise noise impacts to receivers near the compound site  
• Scheduling works to complete noisiest activities during the day wherever possible (i.e. concrete saw cutting). | Construction contractor | Pre-construction and construction |
| 3.5 | The out of hours procedure would as a minimum include:  
• Background levels for noise criteria in accordance with the Noise Criteria Guideline (RMS, 2014)  
• Locations of the works  
• Locations of sensitive receivers  
• Predicted noise levels  
• Communications plan  
• Triggers for the provision of respite and a respite schedule.  
• Management measures where works are unable to comply with the criteria. | Construction contractor | Pre-construction and construction |
<p>| 3.6 | Noise impacts would be minimised in accordance with Practice Note 7 in Roads and Maritime Services’ <em>Environmental Noise Management Manual</em> and <em>Environmental fact sheet No. 2- Noise management and Night Works</em>. | Construction contractor | Pre-construction and construction |</p>
<table>
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<tr>
<td>3.7</td>
<td>Communication</td>
<td>The local community would be contacted and informed of the proposed work, location, duration of work, and hours involved. The contact would be made a minimum five days before work starts as per RMS ENMM Practice Note 7 requirements.</td>
<td>Construction contractor and Roads and Maritime</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>3.8</td>
<td>Construction noise from machinery and equipment</td>
<td>Construction compounds will be laid-out in such a way that the primary noise sources are at a maximum distance from residences, with solid structures (sheds, containers etc) placed between residences and noise sources (and as close to the noise sources as is practical).</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>3.9</td>
<td>Construction noise from machinery and equipment</td>
<td>All equipment will be selected to minimise noise emissions. Equipment should be fitted with appropriate silencers and be in good working order. Machines found to produce excessive noise compared to normal industry expectations should be removed from the site or stood down until repairs or modifications can be made.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>3.10</td>
<td></td>
<td>Noise-emitting plant would be directed away from sensitive receivers where possible.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>3.11</td>
<td></td>
<td>Reversing alarms that have a tonal noise character are to be avoided during out of hours activities. Quacker style or ‘smart’ reversing alarms are to be used during night time activities (pending safety approvals).</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>3.12</td>
<td></td>
<td>To minimise the potential for sleep disturbance impacts, construction activities likely to generate the highest levels of noise would be scheduled to occur at the beginning of the shift (before 11 pm).</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
</tbody>
</table>
| 3.13 | Construction noise from inappropriate practices | Site inductions would be provided to train staff on ways to minimise construction noise impacts on-site. Responsible working practices include:  
  - Avoid the use of outdoor radios during the night-time period  
  - Avoid shouting and slamming of doors  
  - Where practical, operate machines at low speed or power and switched off when not being used rather than left idling for prolonged periods  
  - Minimise reversing  
  - Avoid dropping materials from height and avoid metal to metal contact on material  
  - All engine covers should be kept closed while equipment is operating | Construction contractor | Construction |
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<tr>
<td>3.13</td>
<td>Site inductions must include:</td>
<td>- All relevant project specific and standard noise and vibration mitigation measures</td>
<td>Construction contractor</td>
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<td></td>
<td>cont.</td>
<td>- Relevant licence and approval conditions</td>
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<td>- Permissible hours of work</td>
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<td></td>
<td>- Any limitations on high noise generating activities</td>
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<td></td>
<td></td>
<td>- Location of nearest sensitive receivers</td>
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<td></td>
<td></td>
<td>- Construction employee parking areas</td>
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<td></td>
<td>- Designated loading/unloading areas and procedures</td>
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<td>- Construction traffic routes</td>
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<td></td>
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<td>- Site opening/closing times (including deliveries)</td>
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<td></td>
<td>- Environmental incident procedures.</td>
<td></td>
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</tr>
<tr>
<td>3.14</td>
<td>Construction traffic noise</td>
<td>Keep truck drivers informed of designated vehicle routes, parking locations and delivery hours.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>3.15</td>
<td>Construction vibration</td>
<td>Confining vibration-generating operations to the least vibration-sensitive part of the shift – which could be when the background disturbance is highest.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>3.16</td>
<td>Quieter and less noise/vibration emitting construction methods would be used where feasible and reasonable.</td>
<td>Construction contractor</td>
<td>Construction</td>
<td></td>
</tr>
<tr>
<td>3.17</td>
<td>Compliance vibration monitoring would be undertaken in response to complaints or when vibration generating activities occur within the structural damage buffer distances. The results of the vibration monitoring would be compared to the structural damage criteria presented in Table 6.15 considering frequency content.</td>
<td>Construction contractor</td>
<td>Construction</td>
<td></td>
</tr>
<tr>
<td>3.18</td>
<td>Building condition surveys</td>
<td>Would be undertaken when vibration generating activities occur within the structural damage buffer distances.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>3.19</td>
<td>Communication</td>
<td>A suitable advertisement will be placed in local papers including a reference to night-time noise impacts.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>3.20</td>
<td>Communications material such as the project website and community notification would include a contact person and phone number to enable complaints to be received and responded to.</td>
<td></td>
<td>Construction contractor</td>
<td>Construction</td>
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<tr>
<td>3.21</td>
<td>Monitoring</td>
<td>Attended compliance noise or vibration monitoring should be undertaken to confirm the predicted noise or vibration levels upon receipt of a complaint. The ICNG state that complaint monitoring measurements should be taken at the complainant’s location and the monitoring should cover the time of day when the impacts were reported to occur. In the case that exceedances of the relevant annoyance criteria levels listed in this report are detected in relation to the complaint, the situation should be reviewed in order to identify means to minimise the impacts to residences.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>3.22</td>
<td></td>
<td>A post construction noise monitoring program will be undertaken to confirm the noise levels predicted as part of the Noise and Vibration assessment. Monitoring locations will be selected along the route at locations monitored as part of the assessment and also at any locations where noise complaints have been made. Where exceedances are identified, further consideration of feasible and reasonable measures would occur.</td>
<td>Construction contractor</td>
<td>Operation (within 12 months of commencement of operation)</td>
</tr>
<tr>
<td>3.23</td>
<td>Road noise</td>
<td>At locations where residual impacts remain after all feasible and reasonable approaches have been exhausted, noise mitigation in the form of acoustic treatment of existing individual dwellings will be considered.</td>
<td>Roads and Maritime</td>
<td>Operation</td>
</tr>
</tbody>
</table>

### 4 Soils, topography and geology

#### 4.1 Salinity
Where high saline soils are identified, salinity management options would be considered and incorporated into the detailed design for structure protection.

- Roads and Maritime Code of Practice for Water Management, the Roads and Maritime Services' Erosion and Sedimentation Procedure

#### 4.2 Soil and water management
A soil and water management plan (SWMP) would be prepared as part of the CEMP in accordance with the requirements of Roads and Maritime contract specification G38. The SWMP would address the following:

- Roads and Maritime Code of Practice for Water Management, the Roads and Maritime Services’ Erosion and Sedimentation Procedure

- Construction contractor: Pre-construction
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</table>
| 4.2 cont |        | The SWMP would detail the following as a minimum:  
• Identification of catchment and sub-catchment areas, high risk areas and sensitive areas  
• Sizing of each of the above areas and catchment  
• The likely volume of run-off from each road sub-catchment  
• Direction of flow of on-site and off-site water  
• Separation of on-site and off-site water  
• The direction of run-off and drainage points during each stage of construction  
• The locations and sizing of sediment traps such as sump or basin as well as associated drainage  
• A dewatering plan which includes process for monitoring, flocculating and dewatering water from site (ie sediment basin and sumps)  
• A mapped plan identifying the above  
• Include progressive site specific Erosion and Sedimentation Control Plans (ESCPs). The ESCP is to be updated at least fortnightly  
• Identify high risk activities and the details required for work method statements to be developed and signed by Roads and Maritime prior to construction  
• A process to routinely monitor the BOM weather forecast  
• Preparation of a wet weather (rain event) plan which includes a process for monitoring potential wet weather and identification of controls to be implemented in the event of wet weather. These controls are to be shown on the ESCPs  
• Provision of an inspection and maintenance schedule for ongoing maintenance of temporary and permanent erosion and sedimentation controls. |          |             |
| 4.3 | Contamination | An incident emergency spill plan would be developed and incorporated into the CEMP. The plan would include measures to avoid and manage spillages of fuels, chemicals, and fluids onto any surfaces or into stormwater inlets and an emergency response procedure. | Construction contractor | Pre-construction |
## Site stabilisation plan

A site stabilisation plan would be prepared as part of the CEMP. The plan would include but not be limited to the following:
- Identification and mapping of areas along the length of the proposal requiring stabilisation
- A risk assessment for disturbed areas and stockpiles
- Detailed methods for stabilisation
- A monitoring program for the stabilised areas
- A process for determining the success of stabilised areas or methods
- A process for identifying additional stabilisation methods:
  - All high risk areas would be stabilised within two weeks
  - All medium risk areas would be stabilised within one month
  - In anticipation of rain events.

### Responsibility
Construction contractor

### Timing
Pre-construction

## Erosion and sedimentation

Erosion and sediment control measures would be implemented and maintained to:
- Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets
- Reduce water velocity and capture sediment on site
- Minimise the amount of material transported from site to surrounding pavement surfaces
- Divert clean water around the site.

### Responsibility
Construction contractor

### Timing
Construction

## Site stabilisation of disturbed areas

Site stabilisation of disturbed areas would be undertaken progressively as stages are completed.

### Responsibility
Construction contractor

### Timing
Construction

## Stockpile Management

All stockpiles would be designed, established, operated and decommissioned in accordance with Roads and Maritime *Stockpile Management Guidelines* (RMS, 2015).

### Responsibility
Construction contractor

### Timing
Construction

## Controls at exit points

Controls would be implemented at exit points to minimise the tracking of soil and particulates onto pavement surfaces.

### Responsibility
Construction contractor

### Timing
Construction
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<tbody>
<tr>
<td>4.10</td>
<td>Erosion and sedimentation</td>
<td>Any material transported onto pavement surfaces would be swept and removed at the end of each working shift.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>4.11</td>
<td>Excess spoil</td>
<td>Excess spoil not required or able to be used for backfilling would be stockpiled in a suitable location before being reused on adjacent Roads and Maritime projects or removed from the site, and disposed of at an appropriately licensed facility.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>4.12</td>
<td>Contamination of soil</td>
<td>A fully equipped emergency spill kit would be kept on-site at all times.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>4.13</td>
<td></td>
<td>If an incident (e.g. spill) occurs, the RMS’s Environmental Incident Classification and Management Procedure is to be followed and the Roads and Maritime Contract Manager notified as soon as practicable.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>4.14</td>
<td></td>
<td>All staff would be inducted about incident and emergency procedures and made aware of the location of emergency spill kits.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>4.15</td>
<td></td>
<td>Machinery would be checked daily to ensure there is no oil, fuel or other liquid leaking from the machinery.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>4.16</td>
<td></td>
<td>Final waste classification is required once the volumes of waste requiring offsite disposal during construction are confirmed. Waste soils should be classified in accordance with the NSW EPA (2014) Waste Classification Guidelines.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>4.17</td>
<td></td>
<td>In the event that indication of contamination is encountered (such as odorous or visually contaminated materials), work in the area would cease until an environmental consultant can advise on the need for remediation or other action, as deemed appropriate. <strong>This requirement would be specified in the CEMP. The management of any contamination would be undertaken in accordance with the Guideline for the Management of Contamination (RMS, 2013).</strong></td>
<td>Construction contractor</td>
<td>Construction</td>
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5 Hydrology, water quality, flooding and drainage

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<tbody>
<tr>
<td>5.1</td>
<td>Flooding impacts</td>
<td>Further flood modelling would be undertaken during detailed design to minimise impacts where possible.</td>
<td>Roads and Maritime</td>
<td>Detailed design</td>
</tr>
<tr>
<td>5.2</td>
<td></td>
<td>Surveys of identified properties would be undertaken to confirm floor levels.</td>
<td>Roads and Maritime</td>
<td>Detailed design</td>
</tr>
<tr>
<td>5.3</td>
<td>Drainage</td>
<td>The relevant council would be consulted in relation to the design of the proposed drainage infrastructure.</td>
<td>Roads and Maritime</td>
<td>Detailed design</td>
</tr>
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<tr>
<td>5.4</td>
<td>General construction impacts</td>
<td>Construct temporary drainage structures in accordance with the <em>Technical Guideline – Temporary Stormwater Drainage for Road Construction</em> (Roads and Maritime, 2011).</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>5.5</td>
<td>Contamination of surface water</td>
<td>All fuels, chemicals, and liquids would be stored at least 50 m away from the existing stormwater drainage system and would be stored in an impervious bunded area within the compound site.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>5.6</td>
<td></td>
<td>The refuelling of plant and maintenance of machinery would be undertaken in impervious bunded areas in the compound site.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>5.7</td>
<td></td>
<td>Vehicle wash downs and/or concrete truck washouts would be undertaken within a designated bunded area of an impervious surface or undertaken off-site.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>5.8</td>
<td>Dewatering</td>
<td>Low lying areas of construction formations and excavations that collect stormwater would be dewatered in accordance with the <em>Technical Guideline - Environmental Management of Construction Site Dewatering EMS-TG-011</em> (RTA, 2011).</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
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</table>

### 6 Biodiversity

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</thead>
<tbody>
<tr>
<td>6.1</td>
<td>Direct impacts to native vegetation</td>
<td>The detailed design would minimise the removal of vegetation in certified land and avoid the removal of vegetation in non-certified land.</td>
<td>Roads and Maritime</td>
<td>Detailed design</td>
</tr>
</tbody>
</table>
| 6.2 | Biodiversity impacts                  | A biodiversity management plan would be prepared and included within the CEMP in accordance with Roads and Maritime’s *Biodiversity Guidelines* (RTA, 2011). It would include:  
  - A site walk with qualified site personnel including Roads and Maritime representatives prior to commencement of works to confirm clearing boundaries and sensitive location  
  - A map which clearly shows vegetation clearing boundaries and sensitive areas/no go zones  
  - On site identification (marking) of the clearing boundary and habitat features (including hollow-bearing trees) to be protected  
  - Pre-clearing survey plan and management measures describing the survey methodology and targeted species, including the Cumberland Plain Land Snail | Construction contractor | Pre-construction |
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</table>
| 6.2   | cont.  | • Incorporation of management measures identified as a result of the pre-clearing survey report and nomination of actions to respond to the recommendations made. This would include details of measures to be implemented to protect clearing limits and no go areas  
• A detailed clearing process in accordance with Roads and Maritime’s *Biodiversity Guidelines 2011*, including the requirements of Guide 1, 2, 4 & 9  
• Identify in toolbox talks where biodiversity would be included such as vegetation clearing or works in or adjacent to sensitive locations  
• Identify control/mitigations measures to prevent impacts on sensitive locations or no go zones  
• A stop works procedure in the event of identification of unidentified species, habitats or populations  
• A procedure for clearing hollow bearing trees in line with Guide 4 of the RMS Biodiversity Guidelines 2011  
• Hygiene protocols to prevent the introduction and spread of pathogens  
• A protocol for the management of dewatering of farm dams to prevent introduction of Mosquito Fish into surrounding waterways should be implemented. | Construction contractor | Pre-construction |
<p>| 6.3   | A suitably qualified ecologist would be engaged to clearly demarcate vegetation protection areas (including habitat trees) and complete the pre-clearing survey report. | Construction contractor | Pre-construction |
| 6.4   | Construction would be undertaken in accordance with the biodiversity management plan. | Construction contractor | Construction |
| 6.5   | An ecologist would be present during the clearing of habitat trees to handle and relocate any injured fauna. WIRES would be consulted if any injured fauna are encountered. | Construction contractor | Construction |
| 6.6   | Declared noxious weeds would be managed in accordance with the requirements of the <em>Noxious Weeds Act 1993</em> and Guide 6 (Weed Management) of the <em>Roads and Maritime Biodiversity Guidelines 2011</em>. | Construction contractor | Construction |
| 6.7   | Dams would be progressively emptied over a number of days to allow native fauna to relocate. An experienced, licenced wildlife carer or ecologist would be required to assist with relocation of fauna such as turtles, or with humane disposal of noxious fish. | Construction contractor | Construction |
| 6.8   | Any large woody debris would be relocated rather than removed. | Construction contractor | Construction |</p>
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<tbody>
<tr>
<td>6.9</td>
<td>Weed management</td>
<td>Ongoing weed management and control would be undertaken in accordance with the <em>Biodiversity Guidelines 2011.</em></td>
<td>Roads and Maritime</td>
<td>Operation</td>
</tr>
<tr>
<td>7</td>
<td>Aboriginal cultural heritage</td>
<td>Properties not accessible at the time of writing this REF are to be surveyed and assessed prior to works commencing.</td>
<td>Roads and Maritime</td>
<td>Completed as part of the Submissions Report</td>
</tr>
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<td></td>
<td>In accordance with the Roads and Maritime Procedure for Aboriginal Cultural Heritage Consultation and Investigation, Stage 3 is to be implemented, including the preparation of a Cultural Heritage Assessment Report (CHAR) and comprehensive consultation with stakeholders.</td>
<td>Roads and Maritime</td>
<td>Completed as part of the Submissions Report</td>
</tr>
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<td></td>
<td></td>
<td>Test excavation would be undertaken for TNRB PAD01 and TNRB PAD02 to inform an assessment of archaeological significance.</td>
<td>Roads and Maritime</td>
<td>Completed as part of the Submissions Report</td>
</tr>
<tr>
<td>7.1</td>
<td>Avoiding impacts on Aboriginal heritage items</td>
<td><strong>In accordance with the Roads and Maritime PACHCI, targeted salvage excavation under PACHCI Stage 4 is required for TNRB AS01 as a condition of the AHIP.</strong></td>
<td>Roads and Maritime</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>7.2</td>
<td></td>
<td>A program of archaeological salvage or surface collection would be undertaken in accordance with the requirements of the existing AHIPs relating to sites BRP-IF-16 / TNRU14, BRP-S-07 and TNRU6, as part of the Bringelly Road Stage 2 mitigation works and The Northern Road Stage 2 mitigation works respectively.</td>
<td>Roads and Maritime</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>7.3</td>
<td>No impacts to identified Aboriginal sites (TNRU7 and TNRB AS01) would occur without an AHIP.</td>
<td></td>
<td>Roads and Maritime</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>7.4</td>
<td></td>
<td>An Aboriginal heritage management plan would be prepared and incorporated into the CEMP. The plan would include (but not be limited to) the following:</td>
<td>Construction contractor</td>
<td>Pre-construction</td>
</tr>
</tbody>
</table>
|     |                                                                        | • A sensitive areas map which clearly identifies the exclusion zones  
• Fencing to control access during construction to the exclusion zones  
• An environmental risk assessment to determine potential risks for discrete work elements or activities likely to affect significant heritage elements | Construction contractor  | Pre-construction            |
<table>
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</table>
| 7.4 cont. | | • Specific mitigation measures to avoid risk of harm  
• A process to communicate risk and responsibilities through environmental awareness training  
• A stop works procedure in the event of actual or suspected potential harm to a heritage feature/place  
• All measures recommended in the CHAR and AHIP, including notification requirements  
• Site training and induction. | | |
| 7.5 | Consultation | Stakeholders would continue to be consulted in accordance with Roads and Maritime’s PACHCI procedure. | Construction contractor | Construction |
| 7.6 | Aboriginal cultural heritage item encountered during work | In the event of an unexpected find of Aboriginal cultural heritage, work would cease in the affected area and the *Standard Management Procedure - Unexpected heritage items* (Roads and Maritime 2015) will be implemented. This would include stopping all work in the vicinity of the find and contacting Roads and Maritime’s Aboriginal cultural heritage advisor or the relevant Roads and Maritime Environment Officer immediately to identify the appropriate course of action. Work would not recommence until receipt of written approval from Roads and Maritime. | Construction contractor | Construction |

### 8 Non-Aboriginal heritage

| 8.1 | Avoiding impacts on heritage items | During design development, impacts on heritage items are to be avoided where practicable. | Roads and Maritime | Detailed design |
| 8.2 | | If the final design of the proposal changes considerably from that currently proposed, additional assessment may be required. | Roads and Maritime | Detailed design |
| | | **Properties not accessible at the time of writing this REF are to be surveyed and assessed prior to works commencing.** | Roads and Maritime | Detailed design  
Completed as part of the Submissions Report |
<p>| 8.3 | Interpretation of local heritage | A heritage interpretation plan would be developed, consistent with <em>Interpreting Heritage Places and Items Guidelines</em> (NSW Heritage Office, 2005) to provide the strategies for the interpretation of the existing road alignment of The Northern Road and the Bringelly Road / Greendale Road corridor. | Roads and Maritime | Pre-construction |</p>
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</thead>
</table>
| 8.4 | Avoiding impacts on heritage items | A non-Aboriginal Heritage Management plan would be prepared and included in the CEMP. This plan would include:  
- A map identifying locations of items/sites in the vicinity of the proposal site  
- Identification of potential environmental risks/impacts due to the work/activities  
- Mitigation measures for the identified risks  
- A procedure to report any damage to heritage items compliant with the Roads and Maritime Incident Classification and Reporting Procedure  
- Identify in toolbox talks where management of non-Aboriginal heritage is required such as identification of no go zones and responsibilities under the *Heritage Act 1977*  
| 8.5 | | Retain the vegetation buffer between the proposal and the cottage (*1186 The Northern Road*), where possible. | Construction contractor | Pre-construction and construction |
| 8.6 | Inadvertent impacts on heritage items | Environmental awareness training would include responsibilities under heritage legislation. Workers would be informed regarding the location of known heritage items, the *requirements of the non-Aboriginal Heritage Management plan*, and the unanticipated finds procedure. | Construction contractor | Construction |
| 8.7 | Unanticipated archaeological finds | If unexpected archaeological remains are uncovered during the work, all work must cease in the vicinity of the material/find and the steps in the Roads and Maritime *Standard Management Procedure: Unexpected Heritage items* (2015) procedure must be followed. Relevant Roads and Maritime Senior Environment Officer must be contacted immediately. | Construction contractor | Construction |

### 9 Landscape character and visual

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<tbody>
<tr>
<td>9.1</td>
<td>Landscape character and visual impacts</td>
<td>Detailed design would be undertaken according to the urban design vision, objectives and principles which underpin the concept design.</td>
<td>Roads and Maritime</td>
<td>Detailed design</td>
</tr>
<tr>
<td>9.2</td>
<td></td>
<td>A landscaping plan would be developed detailing options for planting designs and landscape treatments. <em>The landscaping plan would be consistent with those prepared for the upgrading of the other sections of The Northern Road and Bringelly Road, and would take into account Council requirements where practicable.</em></td>
<td>Roads and Maritime</td>
<td>Detailed design</td>
</tr>
<tr>
<td>9.3</td>
<td></td>
<td>The quality of finishes and treatments that can be viably maintained over time would be considered during detailed design.</td>
<td>Roads and Maritime</td>
<td>Detailed design</td>
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<tr>
<td>9.4</td>
<td>Materials and finishes for new road elements such as retaining walls are to be site appropriate.</td>
<td>Roads and Maritime</td>
<td>Detailed design</td>
<td></td>
</tr>
<tr>
<td>9.5</td>
<td>Light spill</td>
<td>Lighting would be designed to minimise light spill into residential properties and sensitive receptors.</td>
<td>Roads and Maritime</td>
<td>Detailed design</td>
</tr>
<tr>
<td>9.6</td>
<td>Cyclist safety</td>
<td>Where shared paths cross driveways, consideration would be given to use treatment (materials or colours) to provide a visual cue to remind cyclists to look out for cars.</td>
<td>Roads and Maritime</td>
<td>Detailed design</td>
</tr>
<tr>
<td>9.7</td>
<td>Landscape character and visual impacts</td>
<td>Construction equipment, stockpiles, and other visible elements would be located away from key views to and from the identified visual receptors where feasible. Where this is not feasible, screening measures and practices to keep sites tidy would be implemented.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>9.8</td>
<td>Landscape character and visual impacts</td>
<td>Existing trees would be retained where feasible by identifying ‘no go areas’ to restrict access around the drip line of trees not affected by the proposal.</td>
<td>Construction contractor</td>
<td>Construction</td>
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<tr>
<td>9.9</td>
<td>Compound</td>
<td>Revegetate compound sites and stockpile locations with grasses, ground covers and shrubs consistent with the pre-construction state of the location.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>9.10</td>
<td>Light spill</td>
<td>Temporary lighting would be sited and designed to avoid light spill into residential properties and identified sensitive receptors.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>9.11</td>
<td>Visual impacts</td>
<td>New plantings would incorporate locally occurring species which reflect the landscape character zone.</td>
<td>Construction contractor</td>
<td>Operation</td>
</tr>
<tr>
<td>9.12</td>
<td>Safety</td>
<td>New plantings along the shared path/footpath would be selected and positioned such that they do not present safety hazards.</td>
<td>Construction contractor</td>
<td>Operation</td>
</tr>
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<tr>
<td>10</td>
<td>Air quality</td>
<td>An air quality management plan would be prepared as part of the CEMP. The plan would include but not be limited to:</td>
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<tr>
<td></td>
<td></td>
<td>• A map identifying locations of sensitive receivers</td>
<td>Construction contractor</td>
<td>Pre-construction</td>
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<td></td>
<td></td>
<td>• Identification of potential risks/impacts due to the work/activities as dust generation activities</td>
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<td></td>
<td></td>
<td>• Management measures to minimise risk including a progressive stabilisation plan</td>
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<td></td>
<td></td>
<td>• A process for monitoring dust on-site and weather conditions</td>
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<td></td>
<td></td>
<td>• A process for altering management measures as required.</td>
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<tr>
<td>10.1</td>
<td>General air quality impacts</td>
<td>Dust suppression measures would be implemented as per the air quality management plan.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>10.2</td>
<td>Dust emissions</td>
<td>Stockpiled materials would be covered, stabilised or stored in areas not subject to high wind.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>10.3</td>
<td></td>
<td>All trucks would be covered when transporting material to and from the site.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>10.5</td>
<td></td>
<td>Work activities would be reprogrammed if the mitigation measures are not adequately restricting dust generation.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>10.6</td>
<td>Exhaust emissions</td>
<td>Construction plant and equipment would be maintained in a good working condition in order to limit impacts on air quality.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>10.7</td>
<td></td>
<td>Plant and machinery would be turned off when not in use.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>10.8</td>
<td>Impacts on sensitive receivers</td>
<td>Local residents would be advised of hours of operation and duration of work and supplied with a contact name and number for queries regarding air quality.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
</tbody>
</table>
| 11  | Land use and property                       | All land acquisitions would be conducted in accordance with the Roads and Maritime Land Acquisition Policy and the requirements of the *Land Acquisition (Just Terms) Compensation Act 1991*.
<p>| 11.1| Property acquisition                       | Consultation would be undertaken with the owners of properties containing dams that would be impacted by the proposal regarding options to mitigate the impacts. | Roads and Maritime    | Pre-construction |
| 11.2| Impacts on dams                            |                                                                                          | Roads and Maritime    | Pre-construction |</p>
<table>
<thead>
<tr>
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<tr>
<td>12</td>
<td>Socio-economic</td>
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<tr>
<td>12.1</td>
<td>Road signage</td>
<td>Signage at key locations along The Northern Road and Bringelly Road would be investigated during detailed design to promote the town of Bringelly.</td>
<td>Roads and Maritime</td>
<td>Detailed design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A business survey would be undertaken prior to works commencing</td>
<td>Roads and Maritime</td>
<td>Completed as part of the Submissions Report</td>
</tr>
<tr>
<td>12.2</td>
<td>Provision of information</td>
<td>Business owners would be provided with information about the design as soon as practicable to allow them to make informed decisions about the future of their businesses.</td>
<td>Roads and Maritime</td>
<td>Detailed design</td>
</tr>
</tbody>
</table>
| 12.3  | Acquisition                         | Acquisition arrangements and associated consultation would consider:  
- The ability of property owners/occupants to relocate, within the timeframe required, to comparable accommodation that meets the owners/occupants needs  
- The need to liaise and consult on an ongoing basis with affected owners/occupants  
- Providing assistance to households as a required, with a focus on any vulnerable groups identified (older people, people with a disability, people from culturally and linguistically diverse backgrounds). | Roads and Maritime  | Detailed design                  |
| 12.4  | Bus stops                           | Crime prevention through environmental design principles would be considered as part of the design of the bus stops.                                                                                                      | Roads and Maritime  | Detailed design                  |
| 12.5  | Consultation with councils          | Consultation with Liverpool and Camden councils would continue during detailed design and construction, and would include:   
- The rehabilitation and configuration of the existing The Northern Road - subject to an agreement between all parties, Roads and Maritime will rehabilitate the area  
- Construction traffic management  
- Any impacts on Council land  
- The design of the school bus stop  
- Provision of a copy of the final drainage report. | Roads and Maritime  | Detailed design, construction    |
<table>
<thead>
<tr>
<th>No.</th>
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<tbody>
<tr>
<td>12.6</td>
<td>Construction impacts on the community</td>
<td>A communication plan would be prepared and included in the CEMP. The communication plan would include (as a minimum): • Requirements to provide details and timing of proposed activities to affected residents, the local community and businesses, and local bus operators • Consultation actions in relation to access arrangements and servicing requirements, including for local businesses, the bus operator and Bringelly Public School • Complaints handling procedure</td>
<td>Construction contractor</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>12.6 cont.</td>
<td></td>
<td>• Contact name and number for complaints • Procedure to notify adjacent land users for changed conditions during the construction period such as traffic, pedestrian or driveway access. The communication plan would be prepared in accordance with G36 requirements and Roads and Maritime Community Engagement and Communications Manual 2012c.</td>
<td></td>
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</tr>
<tr>
<td>12.7</td>
<td></td>
<td>Local residents, businesses and other stakeholders would be notified before work starts in accordance with the communications plan.</td>
<td>Construction contractor</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>12.8</td>
<td>Construction impacts on the community</td>
<td>Signage would be investigated in consultation with local councils to direct motorists to Bringelly Village.</td>
<td>Roads and Maritime</td>
<td>Construction and operation</td>
</tr>
<tr>
<td>12.9</td>
<td></td>
<td>Local residents, businesses and other stakeholders would be kept regularly informed of construction activities during the construction process through the implementation of the communication plan. The complaints handling procedure would be maintained for the duration of construction.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>12.10</td>
<td>Access and connectivity</td>
<td>During construction, road users, pedestrians and cyclists would be informed of any changed conditions.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>12.11</td>
<td></td>
<td>Signage would be provided during construction to communicate changes, and ensure safety for pedestrians near to construction work.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>12.12</td>
<td></td>
<td>Access to bus stops would be maintained.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>12.13</td>
<td></td>
<td>The traffic management plan would include measures to minimise heavy vehicle usage and parking on local roads.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
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<td>No.</td>
<td>Impact</td>
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<tr>
<td>12.14</td>
<td>Property access would be maintained wherever practicable. Prior to any unavoidable disruption to access, consultation would be undertaken with the affected property owner.</td>
<td>Construction contractor</td>
<td>Construction</td>
<td>Construction</td>
</tr>
<tr>
<td>12.15</td>
<td>Access would be maintained for emergency vehicles in the vicinity of construction works. Ongoing consultation would be undertaken with emergency services during construction to ensure that potential impacts are identified and appropriately managed.</td>
<td>Construction contractor</td>
<td>Construction</td>
<td>Construction</td>
</tr>
<tr>
<td>12.16</td>
<td>Construction impacts on utilities and services</td>
<td>Residents and businesses would be informed before any interruptions to utility services that may be experienced as a result of utilities relocation.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
</tbody>
</table>

### 13 Resource use and waste management

#### 13.1 Demand on resources
Procurement would endeavour to use materials and products with a recycled content where that material or product is cost and performance effective.

#### 13.2 Waste management
A resource and waste management plan would be prepared and included in the CEMP. The plan would include the following (as a minimum):
- The type, classification and volume of all materials to be generated and used on-site including identification of recyclable and non-recyclable waste in accordance with NSW EPA Waste Classification Guidelines (2014)
- Quantity and classification of excavated material generated as a result of the proposal (refer Roads and Maritime Service's Waste Management Fact sheets 1-6, 2012)
- Interface strategies for cut and fill on-site to ensure re-use where possible
- Strategies to 'avoid', 'reduce', 'reuse' and 'recycle' materials
- Classification and disposal strategies for each type of material
- Destinations for each resource/waste type either for on-site reuse or recycling, offsite reuse or recycling, or disposal at a licensed waste facility
- Details of how material would be stored and treated on-site
- Identification of available recycling facilities on and off-site
- Identification of suitable methods and routes to transport waste
- Procedures and disposal arrangements for unsuitable excavated material or contaminated material including asbestos waste

Construction contractor  Pre-construction

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<tr>
<td>13.2</td>
<td>cont.</td>
<td>• The types of waste collected, amounts, date/time and details of disposal are to be</td>
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<td>recorded in a waste register</td>
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<td></td>
<td></td>
<td>• Site clean-up for each construction stage.</td>
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<tr>
<td>13.3</td>
<td>Demand on resources</td>
<td>Excavated material would be reused on-site for fill where feasible to reduce demand on</td>
<td>Construction contractor</td>
<td>Construction</td>
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<td></td>
<td></td>
<td>resources.</td>
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<tr>
<td>13.4</td>
<td></td>
<td>Any additional fill material required would be sourced from appropriately licensed facilities and/or other Roads and Maritime projects wherever possible. The fill specifications, including quality and quantity, would be confirmed during detailed design.</td>
<td>Construction contractor and Roads and Maritime</td>
<td>Construction</td>
</tr>
<tr>
<td>13.5</td>
<td>Waste minimisation</td>
<td>The following resource management hierarchy principles would be followed:</td>
<td>Construction contractor</td>
<td>Construction</td>
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<tr>
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<td></td>
<td>• Avoid unnecessary resource consumption as a priority</td>
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<td></td>
<td>• Avoidance would be followed by resource recovery (including reuse of materials, reprocessing, and recycling and energy recovery)</td>
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<tr>
<td></td>
<td></td>
<td>• Disposal would be undertaken as a last resort (in accordance with the Waste Avoidance and Resource Recovery Act 2001).</td>
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</tr>
<tr>
<td>13.6</td>
<td>Management of green waste</td>
<td>Clearing and grubbing, including mulching, will be undertaken in accordance with RMS QA specification G40 Clearing and Grubbing Rev1. Where possible, mulch will be used on-site.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>13.7</td>
<td>Spoil management</td>
<td>Excavated material would be reused on adjoining projects where feasible to reduce waste.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>13.8</td>
<td></td>
<td>Excess excavated material would be disposed of at an appropriate facility or reused</td>
<td>Construction contractor</td>
<td>Construction</td>
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<tr>
<td></td>
<td></td>
<td>appropriately for fill on the proposal site.</td>
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</tr>
<tr>
<td>13.9</td>
<td></td>
<td>Excess soil requiring waste disposal would first be assessed against the Waste Classification Guidelines- Part 1: Classifying Waste (EPA 2014). Soil samples would be taken from stockpiled material and analysed. Transportation would be undertaken by a licensed contractor capable of transporting the waste and waste would be disposed of to an appropriately licensed waste facility with supporting waste classification documentation.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>13.10</td>
<td>Waste management</td>
<td>Garbage receptacles would be provided and recycling of materials encouraged. Rubbish</td>
<td>Construction contractor</td>
<td>Construction</td>
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<tr>
<td></td>
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<td>would be transported to an appropriate waste disposal facility.</td>
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<tr>
<td>13.11</td>
<td></td>
<td>All wastes would be managed in accordance with the POEO Act.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>13.12</td>
<td></td>
<td>Portable toilets would be provided for construction workers and would be managed by the service provider to ensure the appropriate disposal of sewage.</td>
<td>Construction contractor</td>
<td>Construction</td>
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<tr>
<td>13.13</td>
<td>Noxious weeds removed during work would be managed in accordance with the Department of Primary Industries’ requirements that relate to its classification status.</td>
<td>Noxious weeds removed during work would be managed in accordance with the Department of Primary Industries’ requirements that relate to its classification status.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>13.14</td>
<td>Site inductions would occur and be recorded by a Site Supervisor to ensure staff are aware of waste disposal protocols.</td>
<td>Site inductions would occur and be recorded by a Site Supervisor to ensure staff are aware of waste disposal protocols.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>13.15</td>
<td>Wastewater contamination of soils and water</td>
<td>A dedicated concrete washout facility would be provided during construction so that run-off from the washing of concrete machinery and equipment can be collected and disposed of at an appropriate waste facility.</td>
<td>Construction contractor</td>
<td>Construction</td>
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14 Hazards and risks

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<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.1</td>
<td>Risk management</td>
<td>Emergency response plans would be incorporated into the CEMP including a flood evacuation plan.</td>
<td>Construction contractor</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>14.2</td>
<td>Risk management</td>
<td>A pollution incident response management plan would be developed and implemented in accordance with the POEO Act requirements. The plan would form a sub-plan within the CEMP.</td>
<td>Construction contractor</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>14.3</td>
<td>Hazards and risks associated with construction activities would be identified prior to construction. Management measures for each identified hazard/risk would also be developed. A process for regularly reviewing work practices/procedures would be implemented throughout construction to identify, report and respond to any new environmental hazards/risks.</td>
<td>Hazards and risks associated with construction activities would be identified prior to construction. Management measures for each identified hazard/risk would also be developed. A process for regularly reviewing work practices/procedures would be implemented throughout construction to identify, report and respond to any new environmental hazards/risks.</td>
<td>Construction contractor</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>14.4</td>
<td>Risk management</td>
<td>Site-specific safety management plans and safe work method statements would be developed and implemented in accordance with work health and safety requirements.</td>
<td>Construction contractor</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>14.5</td>
<td>Flood management</td>
<td>A flood evacuation plan would be prepared prior to works commencing on site and incorporated into the CEMP.</td>
<td>Construction contractor</td>
<td>Pre-construction</td>
</tr>
</tbody>
</table>

15 Climate change and greenhouse gases

<table>
<thead>
<tr>
<th>No.</th>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.1</td>
<td>Greenhouse gas emissions</td>
<td>The use of alternative fuels and power sources for construction plant and equipment would be investigated and implemented, where appropriate.</td>
<td>Construction contractor</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>15.2</td>
<td></td>
<td>The energy efficiency and related carbon emissions would be considered in the selection of vehicle and plant equipment.</td>
<td>Construction contractor</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>15.3</td>
<td></td>
<td>Materials would be delivered as full loads and local suppliers would be used where possible.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>No.</td>
<td>Impact</td>
<td>Environmental safeguards</td>
<td>Responsibility</td>
<td>Timing</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------</td>
<td>-----------------------------------------------------------------------------------------</td>
<td>----------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>15.4</td>
<td></td>
<td>Construction equipment, plant and vehicles would be appropriately sized for the task.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>15.5</td>
<td></td>
<td>Equipment would be serviced frequently to ensure they are operating efficiently.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>15.6</td>
<td></td>
<td>Vehicles and machinery would not be left idling when not in use.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>15.7</td>
<td></td>
<td>Clearing of vegetation would be minimised where possible.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
</tbody>
</table>

### 16 Cumulative impacts

<table>
<thead>
<tr>
<th>16.1</th>
<th>Cumulative impacts</th>
<th>Ongoing coordination and consultation would be undertaken with Boral Pty Ltd to ensure cumulative noise and traffic impacts are appropriately assessed and managed.</th>
<th>Roads and Maritime and construction contractor</th>
<th>Detailed design and construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.2</td>
<td></td>
<td>The CEMP would be revised to consider potential cumulative impacts from surrounding development activities as they become known.</td>
<td>Construction contractor</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>16.3</td>
<td>Cumulative traffic and access impacts</td>
<td>The traffic management plan would be prepared in consultation with the Transport Management Centre, Liverpool Council and Camden Council.</td>
<td>Roads and Maritime and construction contractor</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>16.4</td>
<td>Night work</td>
<td>An ‘out of hours work procedure’ would be prepared as part of the construction noise and vibration management plan for the proposal in accordance with the requirements of the <em>Interim Construction Noise Guideline</em> (DECC, 2009) and the <em>Environmental Noise Management Manual Practice</em> (RTA, 2001a) and would consider the cumulative impact from other construction activities occurring in the vicinity of the proposal.</td>
<td>Construction contractor</td>
<td>Construction</td>
</tr>
</tbody>
</table>
### 4.3 Licensing and approvals

A summary of the approvals required to undertake the proposal is provided in Table 5.2.

#### Table 4-2: Summary of licensing and approvals required

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>An environment protection licence</strong> (EPL) is required in accordance with the requirements of the <em>Protection of the Environment Operations Act 1997</em> (POEO Act).</td>
<td>Prior to commencing construction.</td>
</tr>
<tr>
<td>The proposal is not a scheduled road construction activity under schedule 1(35) of the POEO Act as it is less than five kilometres long. However, the proposal is considered to be a scheduled land-based extractive activity under schedule 1(19) of the POEO Act, due to the extraction of about 200,000 tonnes of material over two years. As such, an EPL will be required.</td>
<td></td>
</tr>
<tr>
<td><strong>An Aboriginal heritage impact permit</strong> (AHIP) is required under section 90 of the <em>National Parks and Wildlife Act 1977</em> to harm an Aboriginal heritage object.</td>
<td>Prior to commencing construction.</td>
</tr>
<tr>
<td>An area based AHIP would be required for the entire subject area, with the exception of those areas subject to existing AHIPs for The Northern Road Stage 2 and Bringelly Road Stage 2.</td>
<td></td>
</tr>
<tr>
<td>Requirements for submitting an AHIP include completion of test excavation, Cultural Heritage Assessment Report (CHAR) preparation and REF determination.</td>
<td></td>
</tr>
</tbody>
</table>
5 References

Roads and Maritime, 2012, *The Northern Road upgrade, Narellan to Bringelly Review of Environmental Factors*, prepared by SKM

Roads and Maritime, 2015, *The Northern Road / Bringelly Road Grade Separated Interchange Review of Environmental Factors*, prepared by GHD
Appendix A

Community update newsletter November 2015
Key features

The key features of the upgrade include:

• An interchange to improve connectivity and congestion

• Improving road safety for all road users by:

  • Turning lanes and traffic lights with pedestrian crossings on Bringelly Road and The Northern Road
  • Installing new on and off ramps between Bringelly Road and The Northern Road
  • A new connection from Hazelwood Road in The Northern Road to a point on Bringelly Road
  • An创新发展 parking lot for ped and cycs and 
  • The Northern Road and Bringelly Road

What are the benefits?

The benefits include:

• Improved access to key developments in the area

• Opportunities for improved public transport

• Improved safety for pedestrians and cyclists

• Improved road safety for all road users

• Improved travel times for drivers

The Northern Road Upgrade and Bringelly Road Upgrade

The $3.6 billion Western Sydney Infrastructure Plan includes the $1.6 billion The Northern Road Upgrade and the $509 million Bringelly Road Upgrade. Together the upgrades will provide an improved solution to manage the demands of increased traffic, while also connecting communities and supporting economic growth.

The proposed grade separated interchange (underpass) at The Northern Road and Bringelly Road represents a key component of the overall new interchange solution at The Northern Road and Bringelly Road, Bringelly as part of the $3.6 billion The Northern Road Upgrade and Bringelly Road Upgrade. The interchange would be needed at Bringelly to help manage traffic on the approximately 10 km of The Northern Road and Bringelly Road near the western Sydney airport site.

Background

This site is within the Release Area and Western Sydney Priority Growth Area, and this upgrade has been included as part of the $3.6 billion Western Sydney Infrastructure Plan to reduce future congestion and supporting economic growth. The Australian and NSW governments are planning a new interchange at The Northern Road and Bringelly Road, Bringelly as part of the $3.6 billion Western Sydney Infrastructure Plan to reduce future congestion and supporting economic growth. The Australian and NSW governments are planning a new interchange at The Northern Road and Bringelly Road, Bringelly as part of the $3.6 billion Western Sydney Infrastructure Plan to reduce future congestion and supporting economic growth.


The proposed new interchange will connect to the Australian and NSW governments are planning a new interchange at The Northern Road and Bringelly Road, Bringelly as part of the $3.6 billion Western Sydney Infrastructure Plan to reduce future congestion and supporting economic growth. The Australian and NSW governments are planning a new interchange at The Northern Road and Bringelly Road, Bringelly as part of the $3.6 billion Western Sydney Infrastructure Plan to reduce future congestion and supporting economic growth.

From mid-2015, the construction of the new interchange was phase-by-phase. This ensures it is in place to cater for the growing population and traffic.

The new grade separated interchange connects to the Western Sydney Airport, which is being built. Together these upgrades are being delivered ahead of schedule to support economic growth and connecting communities.

In July and August 2015 we consulted with the community on the preferred concept design for the interchange. The community consultation included an open day at the Bringelly RSL, a presentation at the Rouse Hill Community Centre and an invitation to participate in an online consultation. The consultation received a very positive response: 1,023 individuals and 34 organisations prepared written feedback. The community consultation was then followed by a project team-led walking tour of the proposed interchange location and a formal presentation for local residents and stakeholders.

We have announced the preferred route option for the Northern Road Upgrade Stage 4 from the western CBD precincts, Panthers Leagues Club, to the M5 in Dulwich Hill. The Northern Road Upgrade Stage 4 involves the construction of a new road, from the M5 to the Great Western Highway, Werrington Arterial Road and M4 Interchange.

The $3.6 billion Western Sydney Infrastructure Plan includes the $1.6 billion The Northern Road Upgrade and the $509 million Bringelly Road Upgrade. Together the upgrades will provide an improved solution to manage the demands of increased traffic, while also connecting communities and supporting economic growth.

Western Sydney Infrastructure Plan

The plan includes towers to improve connectivity and congestion

The plan includes towers to improve connectivity and congestion

The plan includes towers to improve connectivity and congestion

• Planning and consultation with the community is ongoing

• Road fund for local Road Package is in collaboration with the local government councils

What are the next steps?

All community concerns are recorded and will be considered during the planning process.

There will be some land acquisition and changes to property access to complete the interchange. We will continue to keep affected property owners directly informed.

Details of the preferred route option:

The 10km Bringelly Road Upgrade is being delivered in four stages from Narellan to Penrith and will cater for future traffic from planned residential and commercial development. All stages are expected to be completed by the end of 2019.

The Australian and NSW governments are planning a new interchange at The Northern Road and Bringelly Road, Bringelly as part of the $3.6 billion Western Sydney Infrastructure Plan to reduce future congestion and supporting economic growth.

The new grade separated interchange connects to the Western Sydney Airport, which is being built. Together these upgrades are being delivered ahead of schedule to support economic growth and connecting communities.

The Review of Environmental Factors is complete and the proposed interchange has been approved subject to the conditions of approval.

We expect to begin building by early 2017, with the new interchange expected to be open by the end of 2019.

Subject to approval of the proposed interchange design and Review of Environmental Factors after construction, the new interchange will be open by the end of 2019.
After carefully assessing eight options, the preferred route for the new interchange was chosen. The route diverts The Northern Road about 300 metres to the east of its current alignment. This route was chosen because it maintains access to Bringelly Village shops, Bringelly Public School and protects heritage items including a heritage-listed house. It also has less noise and visual impact than the other options identified because it takes advantage of the natural terrain of the area. The Northern Road is diverted under Bringelly Road to create an underpass, taking advantage of Bringelly Road’s position on a hill.

This route proposal was displayed for community comment in July 2015 and an options report was published. Since then, we have been working on design options for the interchange layout.

Five options were identified for the layout of the interchange. The preferred interchange was chosen after our studies and a technical workshop assessed a range of criteria including property and land use, environment, constructability and cost. This layout has the smallest footprint and land acquisition of all five options and includes all traffic movements in one intersection. More detail on the selection process is available in the Review of Environmental Factors, available at www.rms.nsw.gov.au/wsip.

How do I get home?
If you live along this route there may be changes to how you access your property. To see these changes, please visit our website at www.rms.nsw.gov.au/wsip and follow the link to the interactive portal, then visit The Northern Road and Bringelly Road Interchange area within the portal.

Robinson Road access
During consultation in July and August 2015, community members told us they were concerned about accessing the new The Northern Road from Robinson Road near their properties. To address these concerns and prioritise safety we are proposing a new access road by extending Belmore Road. The extension will connect with Robinson Road on the eastern side of The Northern Road. This will allow motorists from Robinson Road to turn onto The Northern Road in a safer way from the extended Belmore Road. Robinson Road will become a cul-de-sac at its current intersection with The Northern Road.

The Northern Road to run under Bringelly Road at the new grade separated interchange (underpass)
Bringelly Road travelling over The Northern Road at the new grade separated interchange (underpass)

New cul-de-sac with access to Thames Road
Connects to Bringelly Road Upgrade Stage 2
Left turn slip lane to be removed
New traffic lights on Bringelly Road, with turning movements provided in all directions

Underpass about 60 metres long beneath Bringelly Road
On and off ramps to The Northern Road

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The new interchange
The new interchange will provide two traffic lanes in each direction, with capacity for a third lane in the future. Two traffic lanes in each direction, with a wide central median to allow for a future third traffic lane in each direction.

New section of Belmore Road
Connects to Bringelly Road Upgrade Stage 2
New cul-de-sac
Realigned Belmore Road
Underpass about 60 metres long beneath Bringelly Road
On and off ramps to The Northern Road

Key
- Existing Bus Stop
- New Bus Stop
- Shared pedestrian and cycle path
- Landscaped median
- Road

Designing the Interchange
After carefully assessing eight options, the preferred route for the new interchange was chosen. The route diverts The Northern Road about 300 metres to the east of its current alignment. This route was chosen because it maintains access to Bringelly Village shops, Bringelly Public School and protects heritage items including a heritage-listed house. It also has less noise and visual impact than the other options identified because it takes advantage of the natural terrain of the area. The Northern Road is diverted under Bringelly Road to create an underpass, taking advantage of Bringelly Road’s position on a hill.

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New cul-de-sac
Realigned Belmore Road
Underpass about 60 metres long beneath Bringelly Road
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New section of Belmore Road
Connects to Bringelly Road Upgrade Stage 2
New cul-de-sac
Realigned Belmore Road
Underpass about 60 metres long beneath Bringelly Road
On and off ramps to The Northern Road

Key
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- New Bus Stop
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- Landscaped median
- Road

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Appendix B

Business Survey Outcomes Report
Roads and Maritime Services
The Northern Road / Bringelly Road Grade Separated Interchange
Business survey outcomes report

May 2016
This report has been prepared by GHD for Roads and Maritime Services and may only be used and relied on by Roads and Maritime Services for the purpose agreed between GHD and the Roads and Maritime Services as set out in section 1 of this report.

GHD otherwise disclaims responsibility to any person other than Roads and Maritime Services arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

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Figure 1-1 Proposal location and key features

Figure 3-1 Business days of operation

Figure 3-2 Tenure of businesses

Figure 3-3 Frequency of inventory deliveries

Figure 3-4 Time of inventory deliveries

Figure 3-5 Origin of customers – All businesses surveyed

Figure 3-6 Origin of customers – Bringelly Village Shopping Centre

Figure 3-7 Origin of customers – Other businesses in local area

Figure 3-8 Location of loading access

Figure 3-9 Staff travel route to work

Figure 3-10 Business operational use of The Northern and Bringelly Roads

Figure 3-11 Business plans for the near future

Appendices

Appendix A – Copy of business survey
1. Introduction

1.1 Purpose

Roads and Maritime Services (Roads and Maritime) is proposing a new grade separated interchange at The Northern Road and Bringelly Road, Bringelly (referred to as ‘the proposal’ for the purposes of this report).

Roads and Maritime is the proponent of the proposal, and an environmental assessment in the form of a review of environmental factors (REF) has been prepared in accordance with the requirements of Part 5 of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act). The REF (GHD, 2015a) was placed on public display and submissions invited between 24 November and 18 December 2016.

The REF was supported by a range of specialist assessments, including a socio-economic assessment (GHD, 2015b). A detailed socio-economic assessment was undertaken to consider the potential socio-economic impacts of the construction and operation of the proposal. The full report was provided in Appendix J to the REF. The assessment concluded that the proposal would have the potential to impact on some local businesses, including those located at Bringelly Village at the corner of The Northern Road and Greendale Road. The assessment identified that the proposal would have the potential to create both benefits and impacts for the businesses at Bringelly Village.

To provide more information about the potential impacts of the proposal, the REF recommended, as per measure 106 in Table 7.1, that ‘A business survey would be undertaken prior to works commencing’. To fulfil the requirements of this mitigation measure, a survey of local businesses was undertaken in conjunction with the public display to:

- Provide an addendum to the socio-economic assessment and support the Submissions Report for the proposal
- Obtain additional information about local businesses and operational requirements, particularly in relation to access, parking, deliveries, transport and customer needs
- Review the existing business impact assessment provided in the socio-economic assessment report, and identify any additional impacts and benefits of the proposal as an input to the detailed design and construction planning process for the proposal
- Review the existing environmental safeguards (provided in the REF) and identify any additional measures or changes required.

1.2 The proposal

The proposal involves constructing a new grade separated interchange, with The Northern Road passing under Bringelly Road, about 300 metres east of the existing intersection of The Northern Road, Bringelly Road and Greendale Road.

The key features of the proposal include:

- Widening and upgrading about 400 m of Bringelly Road, between Kelvin Park Drive and Greendale Road, to provide:
  - Two 3.5 m wide traffic lanes in each direction between Kelvin Park Drive and The Northern Road/Bringelly Road interchange, with wide central medians to allow for a future third traffic lane in each direction
- Two 3.5 m wide traffic lanes in each direction on the western side of the interchange, transitioning to one lane in each direction to tie in to the existing intersection and Greendale Road
- Two metre wide shoulders in each direction

- Constructing a new section of The Northern Road, to the east of the existing alignment, between about 200 m south of Robinson Road and the southern abutment of the bridge over Thompsons Creek. The new section, which would pass beneath Bringelly Road, would be about one kilometre long and about 50 m wide (including embankments), and would include:
  - Two 3.5 m wide traffic lanes in each direction
  - Four metre wide shoulders connecting to the on and off ramps of the interchange, allowing for the future provision of bus lanes
  - An underpass about 60 m long beneath the upgraded section of Bringelly Road
  - 2.5 m wide shoulders along The Northern Road under the interchange for a length of about one kilometre
  - A wide central median to allow construction of a future third traffic lane in each direction

- Providing a new signalised intersection on Bringelly Road over The Northern Road, with turning movements provided in all directions
- Providing dual right turn movements in all directions to and from The Northern Road and Bringelly Road, and dedicated left turn lanes in all directions
- Providing bus service facilities by:
  - Retaining the bus stops on the existing The Northern Road
  - Relocating bus stops on Bringelly Road to suit the interchange
  - Providing two new bus stops on The Northern Road northbound and southbound interchange on ramps
  - Providing a bus only lane for buses travelling north and south along The Northern Road at the traffic lights on Bringelly Road
- Providing three metre wide shared paths for pedestrians and cyclists
- Providing a new road connection between Robinson Road and The Northern Road via an extension of the realigned Belmore Road intersection, and building a cul-de-sac at the western end of Robinson Road
- Converting the existing section of The Northern Road (to the west of the new section) to a ‘no through road’, by providing cul-de-sacs at both the northern (at Thames Road) and southern ends (near Robinson Road).

The proposal would tie into The Northern Road Upgrade Stage 2A (Peter Brock Drive to Belmore Road) to the south, The Northern Road Upgrade Stage 2C (Thames Road to Mersey Road) to the north, and the Bringelly Road Upgrade Stage 2 (King Street to The Northern Road) to the east.

Further information on the proposal is available in the REF.
1.3 **Scope and structure of this report**

This report, which provides an addendum to the existing socio-economic assessment for the proposal, has been prepared by GHD. It provides information on the survey methodology and a summary of the results of the survey.

The survey was undertaken by GHD’s socio-economic specialists, who prepared the socio-economic impact assessment (SEIA) for the REF. The survey was undertaken to fulfil the following socio-economic safeguard provided in the REF:

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Detailed design</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business impacts</td>
<td>A business survey would be undertaken prior to works commencing</td>
<td>Roads and Maritime</td>
<td>Detailed design</td>
</tr>
</tbody>
</table>

Further information regarding the potential socio-economic assessment impacts of the proposal are provided in *The Northern Road / Bringelly Road Grade Separated Interchange. Socio-economic assessment* (GHD 2015b). The report is structured as follows:

- **Section 2 – Survey methodology**: describes the scope and methodology for the survey
- **Section 3 – Survey results and analysis**: summarises the findings of the business survey and the analysis of these findings
- **Section 4 – Recommendations**: provides recommendations based on the survey findings analysis, and changes or additions to the socio-economic safeguards previously identified in the REF
- **Section 5 – Conclusion**: presents a summary of the report findings.
2. Survey methodology

2.1 Existing conditions

Information on the existing social and business environment of the local study area is provided in the socio-economic assessment (SEIA) (GHD, 2015b). A summary of the existing business environment is provided below.

Local businesses are concentrated at the Bringelly Village shops, which are located on the south-western side of the existing intersection (to the south of Greendale Road and west of The Northern Road). Driveway access to the Bringelly Village shops is located off The Northern Road, about 70 m south of the intersection, and off Greendale Road, about 40 m west of the intersection. Off-street parking is provided in a sealed parking area, which adjoins The Northern Road.

Businesses in the local study area, located within about one kilometre of the proposal site, were identified from web-based research and a site visit. These are listed in Table 2-1.

Table 2-1 Businesses in the study area

<table>
<thead>
<tr>
<th>Business</th>
<th>Street address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bringelly Village businesses, including:</td>
<td>1197 Bringelly Road</td>
</tr>
<tr>
<td>• Australia Post</td>
<td></td>
</tr>
<tr>
<td>• SPAR supermarket</td>
<td></td>
</tr>
<tr>
<td>• Ray White Real Estate</td>
<td></td>
</tr>
<tr>
<td>• Bringelly Cellars</td>
<td></td>
</tr>
<tr>
<td>• Bringelly Take Away</td>
<td></td>
</tr>
<tr>
<td>• Bringelly Pharmacy</td>
<td></td>
</tr>
<tr>
<td>• Redback Pet and Stockfeeds</td>
<td></td>
</tr>
<tr>
<td>• Mechanics/petrol station</td>
<td></td>
</tr>
<tr>
<td>United Realty</td>
<td>1193 Bringelly Road</td>
</tr>
<tr>
<td>Boral Bricks and Pavers/Bringelly Brickworks</td>
<td>2 Greendale Road</td>
</tr>
<tr>
<td>Bringelly Nursery and Watergardens</td>
<td>900 Bringelly Road</td>
</tr>
<tr>
<td>Event Linen</td>
<td>131 Jersey Road</td>
</tr>
<tr>
<td>Kelvin Homestead</td>
<td>30 The Retreat</td>
</tr>
<tr>
<td>Bringelly Concrete</td>
<td>50 Kelvin Park Drive</td>
</tr>
<tr>
<td>Australian Koi Farm</td>
<td>83 Jersey Road</td>
</tr>
</tbody>
</table>

2.2 Survey area

The area for the survey (the catchment area) involved a one kilometre radius around the existing intersection of The Northern Road, Bringelly Road and Greendale Road, and included businesses in Bringelly Village and the surrounding area. Businesses identified included those previously identified for the SEIA via a web-based search and site visit. The process followed to identify businesses for the survey is described further in section 2.4.1.
2.3 Approach

GHD staff surveyed businesses between Wednesday 25 November 2015 and Monday 14 December 2015 either face to face or over the telephone. The survey included both quantitative and qualitative questions. A copy of survey is provided in Appendix A.

A total of nine businesses were surveyed by GHD (one respondent represented two separate businesses) out of the 18 businesses identified within the catchment area. GHD attempted to contact all 18 businesses by telephone to ask them to complete the survey either face to face, or over the telephone. Three businesses completed the survey face-to-face, and six via telephone. Of the remaining businesses, owners or managers either were not concerned about the proposal and / or did not want to complete the survey, or repeated attempts by GHD to make contact were unsuccessful. This represents a response rate of 50 per cent of the businesses located within the catchment area identified by GHD.

A minimum of three attempts were made to contact each of these businesses at various times of the day to maximise the survey response rate. Where possible, detailed messages were left outlining the reason for the call and requesting a return call to complete the survey.

Reasons for businesses not completing surveys included:

- The manager/owner was not available to complete the survey
- The manager/owner was busy or not interested in participating
- A business was no longer operating from the property
- The business telephone was not answered, the survey team was unable to leave message, or the call was not returned
- The business appeared to be unattended during the visit to complete face to face surveys.

Representatives of two businesses that did not complete the survey provided comments on the proposal, indicating that they had no concerns with the proposed concept for the interchange. This information has been included in section 3.1.6 of this report.

As a result of stakeholder discussions, it is understood that two of the businesses previously identified by GHD for the SEIA do not currently operate as trading businesses. Therefore, surveys with these businesses were not pursued.

Of the nine businesses surveyed, all were aware of the proposal.

2.4 Tasks undertaken

The following tasks were undertaken to prepare and administer the survey.

2.4.1 Task One – Identification of businesses

Businesses within approximately one kilometre of the proposal site were identified during the preparation of the SEIA prepared for the REF. A web-based search and a site visit identified seven businesses within the Bringelly Village shopping centre, and seven others in the local area.

Other local businesses were then identified through a search of the Consultation Manager database for the proposal, to determine whether any property owners recorded on the database mentioned that they operated a business on their property. Based on these records, an additional four properties were identified to be surveyed.

Other businesses identified during discussions with property owners and tenants were added to the business survey.
2.4.2 Task Two – Survey development
GHD developed the business survey including questions to establish the scope and nature of the business and factors that could affect trading conditions. The survey is consistent with Roads and Maritime’s policy and procedures for SEIA and contemporary practice. The core focus of the survey was to engage with business owners/managers and capture the following information:

- Type of business e.g. food store, retail, speciality store
- Nature of operations e.g. opening times, deliveries
- Nature of customers e.g. how they access the business, where they travel from
- Understanding of the proposal and potential impacts for each business.

The survey is included at Appendix A.

2.4.3 Task Three – Survey implementation
GHD telephoned businesses one day prior to the face to face survey on the 25 November 2015 to notify businesses the survey team would be in the field the following day. The option to complete the survey over the telephone was also offered to business owners/managers to accommodate their availability.

Two GHD team members travelled to the catchment area on 26 November 2015 between 1:00 pm to 2:30 pm to meet with business owners/managers and complete the survey in person. GHD telephoned business owners that were not surveyed during this time with offers to complete the survey via phone between 26 November and 14 December 2015.

2.4.4 Task Four – Analysis and reporting
Survey responses were entered into a database to enable analysis of the responses. The analysis is presented in section 3.2, with recommendations developed as an outcome of the analysis presented in section 4.

2.5 Assumptions and data limitations
While a total of nine businesses were surveyed, two of the target businesses were accounted for by one respondent as they own/manager both businesses. Therefore, a total of eight respondents completed the survey, representing nine businesses.

In order to maintain the integrity of the data analysis the following approach was adopted:

- Responses for nine businesses contributed to the quantitative data analysis
- Responses for eight respondents, and two additional businesses that did not complete the survey but provided general feedback about the proposal, contributed to the qualitative data analysis.

GHD took this approach to ensure accurate representation of individual businesses in the quantitative analysis. This approach avoided over-representation of the key themes provided by one respondent in the qualitative analysis.
3. Survey results and analysis

This section presents the results of the survey and provides an analysis of the results.

3.1 Survey results

3.1.1 Business operations

Table 3-1 provides a summary of the businesses that were surveyed.

<table>
<thead>
<tr>
<th>Location</th>
<th>Business name</th>
<th>Description of business</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bringelly Village</td>
<td>SPAR Supermarket/ Super Cellar Liquor</td>
<td>Supermarket and liquor store</td>
</tr>
<tr>
<td></td>
<td>Australia Post</td>
<td>Post office</td>
</tr>
<tr>
<td></td>
<td>Bringelly Take Away</td>
<td>Take away</td>
</tr>
<tr>
<td></td>
<td>Bringelly Pharmacy</td>
<td>Pharmacy</td>
</tr>
<tr>
<td></td>
<td>Ray White Real Estate</td>
<td>Real estate</td>
</tr>
<tr>
<td></td>
<td>Redback Pet and Stockfeeds</td>
<td>Pet and stockfeed supplies</td>
</tr>
<tr>
<td>Local area – within 1 km of the proposed interchange</td>
<td>Australian Koi Farm</td>
<td>Breeding and trading Koi fish and accessories</td>
</tr>
<tr>
<td></td>
<td>Tony's Mobile Repairs</td>
<td>Heavy machinery mobile repairs</td>
</tr>
<tr>
<td></td>
<td>Boral Bringelly Bricks</td>
<td>Brick manufacturing and on-site quarry</td>
</tr>
</tbody>
</table>

Overall, a total of 97 full time and four part time staff are employed across the nine businesses surveyed. A significant proportion of full time staff (74 per cent) are employed by Boral Bringelly Bricks (72 full time employees) with the remaining proportion (26 per cent - 25 full time employees) employed across the remaining eight businesses.

As illustrated in Figure 3-1, the majority of businesses (six) that were surveyed are open seven days per week, while two are open from Monday to Saturday, and one is open Monday to Friday. The hours of operation appear to reflect either the nature of the businesses operations (24 hour on-call services or production), or customer requirements (targeting weekday as well as weekend trade). Boral Bringelly Bricks operates 24 hours, seven days a week, although the transport of product and receipt of materials occurs during limited hours related to the planning approval for the operation.

Of the businesses in Bringelly Village, three operate seven days per week, with opening times starting from 7.00 am and the latest closing time at 8.00 pm.

Figure 3-1 Business days of operation

Figure 3-2 displays the tenure of the businesses surveyed. Seven of the businesses rent their properties while two respondents own the business.
As displayed in Figure 3-3 and Figure 3-4, three businesses receive daily inventory deliveries (seven days per week), and six businesses receive their deliveries at all times of the day during business operation hours.
3.1.2 Customer base

Survey respondents were asked to estimate the percentage of customers that were local residents of Bringelly and its surrounds; passing motorists; or from other areas. Figure 3-5 provides an average of the responses across the eight businesses. The graph shows that the greatest proportion of the business customers (41 per cent) are local residents of Bringelly and surrounding areas. 35 per cent of customers were estimated to be passing motorists.

Two of the business operators surveyed indicated that many of their new customers are passing motorists, which are thought to be attracted to the business by the signage that is readily visible from The Northern Road. The remaining 24 per cent of customers are from other areas, including the broader Sydney and regional areas, ACT and interstate. This is related to the either the niche or wholesale/commercial nature of the business.

One business, the Koi Farm has directional tourist signage on the side road (Jersey Road) but not on Bringelly Road.

Figure 3-5 Origin of customers – All businesses surveyed
Figure 3-6 and Figure 3-7 provide a further breakdown of customer base for the businesses located at the Bringelly Village shops, compared to the other businesses surveyed in the local area. Figure 3-6 indicates that business owners estimate that the majority (58 per cent) of the customer base for Bringelly Village (six businesses) are local residents. Most other customers (38 per cent) were attributed to trade from passing motorists. The estimate of passing motorist customers ranged across the businesses within Bringelly Village, from 5 per cent to 50 per cent.

The majority of the businesses in the Bringelly Village shops offer convenience, food and lifestyle products and services. It operates both as a centre for local residents, while also offering fast food or convenience shopping for passing motorists. Businesses reported that they also receive trade from customers coming to the centre for another business. This includes the pharmacy, which benefits from the presence of a General Practitioner, and the food outlets, which benefit from customers visiting other businesses in the centre.

**Figure 3-6 Origin of customers – Bringelly Village Shopping Centre**

![Graph showing customer base distribution](image)

Figure 3-7 highlights that for the remaining three businesses located in the local area (not part of Bringelly Village shopping centre) a significant majority of customers were neither local residents nor passing motorists. This can be attributed to the niche or wholesale/commercial nature of two of the three businesses (Australian Koi Farm and Boral Bringelly Brinks) in this segment. The 30 per cent of customers identified as passing motorists are attributed to the remaining one business within this segment (Tony’s mobile repairs). The business indicated that the current signage exposure they have is key to attracting the majority of their customer base.
Respondents were also asked to estimate how their customers travel to their business, with an average across the eight businesses displayed in Table 3-2 below.

**Table 3-2 Average mode of travel for customers**

<table>
<thead>
<tr>
<th>Mode of travel</th>
<th>Average percentage of customers (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private vehicle</td>
<td>98</td>
</tr>
<tr>
<td>Walk</td>
<td>1.3</td>
</tr>
<tr>
<td>Bus</td>
<td>0.4</td>
</tr>
<tr>
<td>Bicycle</td>
<td>0</td>
</tr>
<tr>
<td>Other public transport</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
</tr>
</tbody>
</table>

### 3.1.3 Access

Respondents were asked to identify where their staff and customer parking and loading access were located. Of the nine businesses surveyed, eight businesses indicated that they had off street parking for both staff and customers. One respondent, representing two of the businesses in the Bringelly Village shopping centre, indicated that they had access to about 40 parking spaces. Of the remaining four businesses in Bringelly Village:

- one specified that they had four parking spaces allocated for their business and that there was a deficiency in parking in the area
- two indicated that parking was available but did not specify how many
- one did not make any comment regarding parking.

Of the remaining three businesses in the local area (not part of the Bringelly Village shops), all indicated that they offer a proportion of their property for vehicle access and parking for staff, customers, trucks and trailers. One of these businesses indicated that this allocated space could accommodate up to 50 to 60 vehicles.

Figure 3-8 displays the location of businesses’ loading access. Of the nine businesses surveyed, seven have dedicated off street loading access, three of which have specified access.
via Greendale Road. Of the remaining two businesses, one indicated that deliveries were received via the front entrance to the business, and the other indicated this did not apply to their business.

**Figure 3-8 Location of loading access**

<table>
<thead>
<tr>
<th>Access Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loading area specified access (Greendale Rd)</td>
<td>47%</td>
</tr>
<tr>
<td>Loading area non-specified access</td>
<td>33%</td>
</tr>
<tr>
<td>Front door/pedestrian access</td>
<td>20%</td>
</tr>
<tr>
<td>Not applicable</td>
<td></td>
</tr>
</tbody>
</table>

### 3.1.4 Use of The Northern Road and Bringelly Road

Respondents were asked to outline how staff use The Northern Road and Bringelly Road to travel to and from work and for day-to-day business operations.

Figure 3-9 provides an average of the responses across the nine businesses surveyed. The graph shows a relatively even distribution between staff that travel along The Northern Road (47 per cent) and staff that travel along Bringelly Road (53 per cent).

**Figure 3-9 Staff travel route to work**

When asked how The Northern Road and Bringelly Road are used during business operations, Figure 3-10 highlights that 89 per cent of businesses (eight of the nine businesses surveyed) indicated that they use both roads for daily business operations. No response was provided by the remaining business.
Figure 3-10 Business operational use of The Northern and Bringelly Roads

Table 3-3 provides a summary of the key themes categorised from the eight respondents, and respective number of comments for day-to-day use of The Northern Road and Bringelly Road for business operation.

Table 3-3 The Northern and Bringelly Roads key themes for business operations use

<table>
<thead>
<tr>
<th>Key themes</th>
<th>Number of comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incoming and outgoing deliveries</td>
<td>5</td>
</tr>
<tr>
<td>Inventory/equipment collection</td>
<td>2</td>
</tr>
<tr>
<td>Staff business travel</td>
<td>2</td>
</tr>
<tr>
<td>Travel to work</td>
<td>1</td>
</tr>
<tr>
<td>Customer access</td>
<td>2</td>
</tr>
<tr>
<td>Meetings with sales representatives</td>
<td>1</td>
</tr>
<tr>
<td>Waste collection</td>
<td>1</td>
</tr>
</tbody>
</table>

3.1.5 Future business plans

Figure 3-11 displays the future business plans in place or intended for the nine businesses (eight respondents) surveyed. Four of the respondents indicated plans for expansion. Two of these indicated that their plans would be subject to respective state and local government approvals. One indicated uncertainty as to whether to invest as a result of the proposal and the potential impacts of property acquisitions related to the proposal and other infrastructure development in the area. The future plans of at least one business are subject to negotiations with the landlord. One respondent indicated plans to relocate closer to the proposed Bringelly railway station, as they believed the current location would become ‘dead space’ in the future. One respondent indicated that they had planned to employ more staff, but that this is currently on hold. Another respondent indicated that at this stage, future business plans are uncertain because of acquisition discussions with Roads and Maritime relating to their property. One respondent indicated that they intended to maintain the business in its current form.
3.1.6 Potential impacts and issues

The eight respondents were asked to identify the potential impacts of the proposal on their businesses, or any other potential impacts or benefits. Responses were categorised into themes, with Table 3-4 displaying the themes in order of the number of comments. GHD has incorporated feedback from the two businesses that did not complete the survey but provided comments on the proposal into this section of the report.

The highest number of comments (with four comments per theme) relate to two themes, one negative and one positive:

- Concerns regarding a loss of trade from passing motorists
- The perception that the proposal would result in improved infrastructure for the area and community.

Overall, loss of trade was a consistent theme among respondents, which was attributed to various factors, including:

- The impact on signage visibility/exposure (two comments)
- Residential property acquisition (one comment)
- Road diversion during construction (one comment)
- Other reasons not specified (one comment).

In line with this theme, the potential for the proposal to result in business closure/relocation was noted in three instances. One respondent felt that the area would become ‘dead’ which would force them to relocate their business, one respondent expressed concern for the future security of their business due to the potential loss of passing trade, and one faced likely business closure due to property acquisition.

Two businesses felt that the proposal would have no impact on their business. One indicated that it would improve road and pedestrian safety in the vicinity of their business, particularly considering truck movements during school hours.
Table 3-4  Key themes of how the proposal may impact on businesses

<table>
<thead>
<tr>
<th>Key themes</th>
<th>Number of comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of trade (passing motorists)</td>
<td>4</td>
</tr>
<tr>
<td>Improved infrastructure for the area/community</td>
<td>4</td>
</tr>
<tr>
<td>Business closure/relocation</td>
<td>3</td>
</tr>
<tr>
<td>Concerned for future security of the business</td>
<td>2</td>
</tr>
<tr>
<td>Loss of trade (impact on signage visibility/exposure)</td>
<td>2</td>
</tr>
<tr>
<td>No concerns as does not impact their business</td>
<td>2</td>
</tr>
<tr>
<td>Heavy vehicle/ truck access</td>
<td>2</td>
</tr>
<tr>
<td>Restricted truck turning capacity</td>
<td>1</td>
</tr>
<tr>
<td>Increase in freight costs</td>
<td>1</td>
</tr>
<tr>
<td>Loss of trade (residential property acquisition/relocation)</td>
<td>1</td>
</tr>
<tr>
<td>Loss of parking due to property acquisition</td>
<td>1</td>
</tr>
<tr>
<td>Loss of trade (road diversion during construction)</td>
<td>1</td>
</tr>
<tr>
<td>Loss of trade (general)</td>
<td>1</td>
</tr>
<tr>
<td>Amenity impacts during construction (dust, visual)</td>
<td>1</td>
</tr>
<tr>
<td>Positive preparation for growth</td>
<td>1</td>
</tr>
<tr>
<td>Local economic impact</td>
<td>1</td>
</tr>
<tr>
<td>Accessibility (less parking congestion may attract elderly demographic)</td>
<td>1</td>
</tr>
<tr>
<td>Improved road/ pedestrian safety</td>
<td>1</td>
</tr>
<tr>
<td>General proposal opposition</td>
<td>1</td>
</tr>
</tbody>
</table>

Respondents were asked to identify the key issues that Roads and Maritime should consider regarding the proposal. Table 3-5 displays the key themes that were raised in the comments.

The highest number of comments (four comments) highlighted the need for effective management of road access to businesses for staff, customers and heavy vehicles during the construction period. This was followed by businesses seeking Roads and Maritime’s consideration of the impacts on businesses, individuals and the community (three comments) as a result of the construction works and the broader proposal. The need for transparency and clarity in communication (two comments) was also highlighted, which is closely aligned with timely delivery of proposal information.

Single comments related to:

- The consideration of relevant drainage and engineering measures
- The addition of signage to ensure ongoing visibility of the businesses
- Ensuring the proposal takes into consideration future infrastructure developments for the area such as the future railway corridor
- Consideration of local businesses that could offer materials or other services that could be procured during construction.
Table 3-5 Key issues to be considered by Roads and Maritime

<table>
<thead>
<tr>
<th>Key themes</th>
<th>Number of comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective access management during construction</td>
<td>4</td>
</tr>
<tr>
<td>Consider impacts on businesses, individuals and community</td>
<td>3</td>
</tr>
<tr>
<td>Transparency and clarity in communication</td>
<td>2</td>
</tr>
<tr>
<td>Consider drainage in engineering designs</td>
<td>1</td>
</tr>
<tr>
<td>Signage to direct traffic to businesses</td>
<td>1</td>
</tr>
<tr>
<td>Timely delivery of proposal information</td>
<td>1</td>
</tr>
<tr>
<td>Consider integration with future railway corridor</td>
<td>1</td>
</tr>
<tr>
<td>Consider local business support/ services during construction</td>
<td>1</td>
</tr>
</tbody>
</table>

3.2 Analysis of results

The following section discusses the findings of the business survey in relation to the potential socio-economic impacts associated with the proposal, as originally identified by the SEIA. Overall, the findings of the survey are consistent with the findings of the qualitative assessment of impacts identified by the SEIA.

3.2.1 Potential impacts and benefits of the proposal

Construction

The survey results indicate that most businesses operate seven days per week, which would indicate that both The Northern Road and Bringelly Road are used frequently for business operations and customer access at any given time of the day. In addition, the results confirmed that the majority of customers (98 per cent) for the businesses surveyed travel by private vehicle via both The Northern Road and Bringelly Road. Section 3.4 of the REF states that standard construction working hours would be:

- Monday to Friday: 7am to 6pm
- Saturday: 8am to 1pm

Some work would also be carried out outside standard construction hours to minimise traffic disruption and disturbance to surrounding businesses. However, given the survey findings which indicate that business operation hours vary across the week, it is likely that several businesses in the local study area would be impacted by traffic diversions and delays during construction. This would impact business customers, staff and suppliers.

One respondent from a business located in Bringelly Village raised a concern regarding the potential loss of trade from passing motorists as a result of traffic diversions during construction. This would be a minor impact only, during the use of the temporary local traffic construction diversion for southbound traffic on Bringelly Road to The Northern Road via Jersey Road and Robinson Road, and Carrington Road. This is described in Section 3.4 of the REF.

The survey confirmed that several of the shops in Bringelly Village are takeaway food and convenience retail businesses. As identified in Section 6.2.1 of the SEIA, it is likely that these businesses would benefit from increased trade from the construction workforce.
**Operation**

The SEIA report (Section 3.2.1) identified that the proposal may result in a reduction in passing trade for some businesses in the local study area, particularly those located within Bringelly Village, as The Northern Road would be diverted away from the shopping village.

The survey confirmed that most of the shops in the Bringelly Village were likely to have some reliance on passing trade. This ranged across the businesses surveyed, from five per cent to 50 per cent of customers estimated to be passing motorists, with an average of 38 per cent of customers comprising passing trade. Of the Bringelly Village businesses surveyed, three raised the potential for loss of passing trade as a result of the diversion of The Northern Road, with these businesses indicating between five per cent to 40 per cent of customers are passing motorists.

Of the businesses surveyed outside of Bringelly Village (three businesses), two did not have any customers who are passing motorists, while one estimated that up to 90 per cent of customers were passing motorists. However, this business did not raise concerns about loss of passing trade as a result of the proposal, and they indicated that the business would relocate as a result of property acquisition.

As discussed in Section 6.3.3 of the SEIA, the literature on the economic impacts of highway bypasses indicates that in the long term, highway bypasses do not have adverse economic impacts on towns, which is dependent on a number of factors including the size and economic base of the town and distance to larger economic centres. Luddenham is around eight kilometres away, which may result in passing motorists continuing past Bringelly Village. However, the local community is larger (1,800 people in 2011) than those smaller towns which are generally more at risk (less than 1,000 people).

It is likely that some businesses in the local study area would experience a reduction in customers once the proposal is operating, however they would continue to operate based on business from local/regional or other customers. One business in Bringelly Village indicated that they may relocate as a result of the proposal.

The SEIA (Section 6.3.3) discussed the potential access changes for businesses in the local area. For those located in Bringelly Village, customers would continue to have access from The Northern Road and Greendale Road. Customers travelling along the proposal who wish to access Bringelly Village would do so via the interchange, turning onto Greendale Road.

One respondent raised the need for additional parking in the local area. Currently there are existing parking restrictions near the Bringelly Village shops, which would be maintained during operation of the proposal, and parking along the new sections of The Northern Road and Bringelly Road would not be permitted (Section 3.2.7 of the REF).

The SEIA discusses the potential benefits of the proposal for businesses in the local study area, resulting from improved local amenity and the potential for increased urbanisation of the area (Section 6.3.3). The removal of traffic from the bypassed section of The Northern Road may improve amenity and access for local residents through creating a more pedestrianised environment. This was recognised by one business respondent who stated that older residents may be more inclined to visit the Bringelly Village if there is less traffic and parking congestion. Some business respondents also indicated that the proposal would enable improved infrastructure in the area, and facilitate development of the region.

The survey findings also confirmed other potential benefits identified in the SEIA, including improved access for heavy vehicles travelling to and from the Boral Bringelly Brickworks, which is being expanded.
3.2.2  Key considerations for the detailed design

The results of the survey has confirmed that businesses in the catchment area, particularly those in Bringelly Village, may be impacted to some degree by any loss of passing trade as a result of the diversion of The Northern Road.

Key considerations for the detailed design to reduce this impact on businesses could include:

- Investigate signage in consultation with local councils to direct motorists to Bringelly Village
- Provide business owners with information about the design as soon as practicable, to allow each business owner to make informed decisions about the future of their businesses.

3.2.3  Key considerations for construction management

The results of the survey indicate the key considerations for the construction phase to reduce the potential impacts on businesses include:

- Investigate signage in consultation with local councils to direct motorists to Bringelly Village
- Communicate regularly with businesses about the timing and duration of construction activities and changes in access.
4. Recommendations

The recommendations developed as an outcome of the analysis of the survey results are provided below. Suggested changes to the environmental safeguards provided in the REF are summarised below.

4.1 Safeguards

A number of safeguards and management measures have been identified in the Submissions Report to minimise adverse environmental impacts, including socio-economic impacts, which could potentially arise as a result of the proposal. Should the proposal proceed, these management measures would be incorporated into the detailed design and applied during the construction and operation of the proposal.

Suggested changes and additions made to the socio-economic safeguards previously outlined in the REF are recorded in blue and bold.

Table 4-1 Environmental safeguards

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic and access</td>
<td>The plan would be submitted in stages to reflect the progress of work and would:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Identify the traffic management requirements during construction, particularly for the traffic diversion</td>
<td>Construction contractor</td>
<td>Pre- construction</td>
</tr>
<tr>
<td></td>
<td>• Describe the general approach and procedures to be adopted when producing specific traffic control plans</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ensure the continuous, safe and efficient movement of traffic for both the public and construction workers</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Maintain the capacity of local roads</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Determine temporary speed restrictions to ensure safe driving environments around work zones</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Undertake a speed limit review of local roads associated with the traffic diversion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Minimise impacts on existing roads and local traffic</td>
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<td>• Provide access to local roads, properties and businesses, including the use of temporary turnaround bays</td>
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<td>• Provide temporary works and traffic signals</td>
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<td>• Determine the number and width of traffic lanes in operation</td>
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<td>• Identify traffic barrier requirements and placement</td>
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<td>• Include the need to consult with emergency services on access changes</td>
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<td>• Include methods for implementing the traffic management plan</td>
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<td>• Include methods for minimising road user delays</td>
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<td>• Provide appropriate warning and advisory signposting</td>
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<td>• Consider other developments that may also be under construction, to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic. Maintain designated pedestrian and cyclist access for safe movements in the study area.</td>
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<tr>
<td>Access to properties and businesses</td>
<td>Access to the Bringelly Shops and businesses would be maintained via Bringelly Road and the existing alignment of The Northern Road. Property access, including access to businesses and Bringelly Public School, would be maintained throughout the construction period with suitable alternative access arrangements provided. Where changes to access arrangements are necessary, Roads and Maritime would advise owners, tenants and business owners, and consult with them in advance regarding alternate access arrangements.</td>
<td>Roads and Maritime</td>
<td>Construction, detailed design and construction</td>
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<td>Socio-economic</td>
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<td>Road signage</td>
<td>Signage at key locations along The Northern Road and Bringelly Road would be investigated during detailed design to promote the town of Bringelly.</td>
<td>Roads and Maritime</td>
<td>Detailed design</td>
</tr>
<tr>
<td>Business impacts</td>
<td>A business survey would be undertaken prior to works commencing. Business owners would be provided with information about the design as soon as practicable to allow them to make informed decisions about the future of their businesses. Signage would be investigated in consultation with local councils provided to direct motorists to Bringelly Village.</td>
<td>Roads and Maritime</td>
<td>Detailed design, construction and operation</td>
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<td>Construction impacts on the community</td>
<td>A communication plan would be prepared and included in the construction environmental management plan. The communication plan would include (as a minimum): • Requirements to provide details and timing of proposed activities to affected residents, the local community and businesses, and local bus operators • Consultation actions in relation to access arrangements and servicing requirements, including for local businesses, the bus operator and Bringelly Public School • Complaints handling procedure • Contact name and number for complaints • Procedure to notify adjacent land users for changed conditions during the construction period such as traffic, pedestrian or driveway access. The communications plan would be prepared in accordance with G36 requirements and Roads and Maritime Community Engagement and Communications Manual 2012c. Local residents, businesses and other stakeholders would be notified before work starts in accordance with the communications plan.</td>
<td>Construction contractor</td>
<td>Pre-construction</td>
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20 | GHD | Roads and Maritime Services - The Northern Road / Bringelly Road Grade Separated Interchange | Business Survey Outcomes Report
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<td>Local residents, businesses and other stakeholders would be kept regularly informed of construction activities during the construction process through the implementation of the communication plan. The complaints handling procedure would be maintained for the duration of construction.</td>
<td>Construction contractor</td>
<td>Construction</td>
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| Acquisition                                 | Acquisition arrangements and associated consultation would consider:  
- The ability of property owners/occupants to relocate, within the timeframe required, to comparable accommodation that meets the owners/occupants needs  
- The need to liaise and consult on an ongoing basis with affected owners/occupants  
- Providing assistance to households as a required, with a focus on any vulnerable groups identified (older people, people with a disability, people from culturally and linguistically diverse backgrounds), | Roads and Maritime        | Detailed design  |
| Bus stops                                   | Crime prevention through environmental design principles would be considered as part of the design of the bus stops.                                                                                                    | Roads and Maritime        | Design           |
| Construction impacts on the community       | Local residents, businesses and other stakeholders would be kept regularly informed of construction activities during the construction process through the implementation of the communication plan. The complaints handling procedure would be maintained for the duration of construction. | Construction contractor  | Construction     |
| Access and connectivity                     | During construction, road users, pedestrians and cyclists would be informed of any changed conditions.  
Signage would be provided during construction to communicate changes, and ensure safety for pedestrians near to construction work.  
Access to bus stops would be maintained.  
The traffic management plan would include measures to minimise heavy vehicle usage and parking on local roads.  
Property access would be maintained wherever practicable. Prior to any unavoidable disruption to access, consultation would be undertaken with the affected property owner.  
Access would be maintained for emergency vehicles in the vicinity of construction works. Ongoing consultation would be undertaken with emergency services during construction to ensure that potential impacts are identified and appropriately managed. | Construction contractor  | Construction       |
| Construction impacts on utilities and services | Residents and businesses would be informed before any interruptions to utility services that may be experienced as a result of utilities relocation.                                                                | Construction contractor  | Construction     |
5. **Conclusion**

The survey of businesses in Bringelly has provided detailed information about the operations of businesses to inform the assessment of potential socio-economic impacts as a result of the proposal.

Overall, while some respondents recognise that the proposal may lead to benefits, such as improved infrastructure and amenity for the area long term, over half of respondents raised concerns about the impact that the construction and operation of the proposal may have on their businesses. The main concern related to the potential for a loss of passing trade as a result of the diversion of The Northern Road away from the Bringelly Village.

Based on the outcomes of the survey, a number of considerations for the detailed design and construction management of the proposal have been identified. These relate to:

- Investigating signage in consultation with local councils to direct motorists to Bringelly Village
- Provide business owners with information about the design as soon as practicable, to allow each business owner to make informed decisions about the future of their businesses
- Communicate regularly with businesses about the timing and duration of construction activities and changes in access.

No additional impacts were identified as a result of the business survey. Key concerns identified by the respondents are generally consistent with the impacts identified during the preparation of the REF. However, additional safeguards to those identified in the REF have been identified to minimise the potential impacts to businesses as a result of the proposal.

The findings of the business survey will be provided to Roads and Maritime to inform further consultation with businesses as the proposal progresses to detailed design, construction and operation.
6. References

GHD 2015a, The Northern Road / Bringelly Road Grade Separated Interchange. Review of Environmental Factors

GHD 2015b, The Northern Road / Bringelly Road Grade Separated Interchange. Socio-economic assessment
Appendices
Appendix A – Copy of business survey
The Northern Road and Bringelly Road Interchange Business Survey

Good afternoon, my name is ___________ and I'm from GHD. I'm calling in on behalf of the Roads and Maritime Services. The RMS are currently planning to upgrade the intersection of The Northern Road and Bringelly Road to a grade separated interchange (or overpass). GHD is undertaking the investigation of issues which influence the businesses located in Bringelly.

Could I please have 10 minutes of your time to discuss your business and your views of the proposed intersection upgrade?
[If they have no time arrange a telephone interview at a later day and time]
[If they have any further questions they can contact the Western Sydney Infrastructure Plan team on 1800 703 457]

Business name: _____________________________________________________________________
Date of visit: _______________________
Address: _______________________________________________________________________
Contact name and position in business: ________________________________________________
Contact details of business owner (if different): _________________________________________
Business type/ description: __________________________________________________________

1. What are the hours of operation: Monday Tuesday Wednesday Thursday Friday Saturday Sunday
2. Does the business own or rent this property? (circle) OWN RENT
3. Does the business have off-street parking?
   □ On street only
   □ Off street ___ number of spaces
   □ Off street for staff only
4. What is the loading access of the business?
   ______________________________________________________________________________
   ______________________________________________________________________________
   ______________________________________________________________________________
5. Is there anything in particular you plan to do or change with this business in the near future? (Do NOT prompt)
   □ Expansion (detail) __________________________________________________________________________
   □ Relocation (detail) __________________________________________________________________________
   □ Retirement (detail) __________________________________________________________________________
   □ Sale of business (detail) ______________________________________________________________________
   □ Other (detail) ______________________________________________________________________________
6. How many staff does the business employ - Full time? ________ - Part time? ________
7. Please nominate the estimated percentage of customers who are:
   a) Local residents of Bringelly and surrounds _____%
   b) Passing motorists _____%
   c) Other (provide detail) _____% (________________________)

[Check total equals 100%]

8. How do staff travel to work:
   a) Along The Northern Road ______%
   b) Along Bringelly Road ______%

9. Please nominate the estimated percentage of customers to your business who travel by:
   a) Walk ______%
   b) Bicycle ______%
   c) Bus ______%
   d) Private car ______%
   e) Other public transport ______%
   f) Other (provide detail) _____% (________________________)

[Check total equals 100%]

10. Does the business use The Northern Road and/or Bringelly Road during its day-to-day operation?
    If so how?
    PROMPTS: What for? Number of times per day typically?
    SPECIFIC BUSINESS PROMPTS:
    How/when are deliveries received?

________________________________________________________________________________
________________________________________________________________________________

11. How often does the business receive inventory deliveries?
[PROMPTS]
     Day(s) of week
     Time(s) of day

________________________________________________________________________________
________________________________________________________________________________

12. Were you previously aware that RMS are planning to upgrade the intersection to help manage increased traffic volumes? (circle) YES    NO
[Follow-up Prompt for both positive and negative opinions. “Do you see any positive/ negative benefits from the intersection upgrade?”]
13. What are your concerns about the project?
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________

14. What do you think are the most important issues which RMS needs to consider in planning for the intersection upgrade?
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
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_______________________________________________________________________________

15. Is there anything else you would like to add?
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________

[Interviewer Note: Draw rough sketch of (1) property layout (2) use (3) access]

THANK YOU
GHD
133 Castlereagh St Sydney NSW 2000

T: +61 2 9239 7100   F: +61 2 9239 7199   E: sydmail@ghd.com.au

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Appendix C

Cultural Heritage Assessment Report