Townson Road Upgrade between Richmond Road and Jersey Road – Stage 1

Submissions report

Transport for NSW | September 2021

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Prepared by GHD and Transport for NSW

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Approval and authorisation

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Signed:	
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Executive summary

The proposal

Transport for NSW proposes to widen and upgrade about 1.6 kilometres of Townson Road, between Richmond Road and Durham Road/Jersey Road. Key features of the proposal include:

- Widening and upgrading about 1.6 kilometres of Townson Road, between Richmond Road and Durham Road/Jersey Road, to provide:
  - Two 3.5 metre wide traffic lanes in each direction
  - A new section of Townson Road about 250 metres long, to the east of the existing alignment, between Meadow Road and Durham Road/Jersey Road to maintain east-west connectivity
- Providing a wide central median along the length of the upgrade narrowing at intersections to accommodate for turning lanes
- Constructing two bridges, each about 36 metres long, to reduce flooding afflux with one bridge over Bells Creek and another bridge about 50 metres east of Bells Creek
- Providing a new southbound slip lane at Richmond Road intersection from Townson Road
- Providing two new signalised intersections allowing all turning movements to and from Townson Road/Victory Road/'A New Road', and formalised pedestrian crossings at each leg of the signalised intersection
- Constructing stubs for Victory Road north and the new road to the north and south of the Townson Road intersection, with a 3.5 metre wide traffic lane in each direction
- Providing a 3.0 metre wide shared path for pedestrians and cyclists on the southern side of Townson Road along the length of the proposal and a pedestrian crossing across the new southbound slip lane from Townson Road to Richmond Road
- Providing a 1.2 metre wide footpath on the northern side of Townson Road along the length of the proposal.

The proposal is to be delivered in stages – interim and ultimate. The delivery of the proposal would initially provide an interim phase with a single carriageway, one lane in each direction, on the southern side of the road corridor incorporating earthworks to allow future full road construction. The planning and delivery of works would be managed by the Department of Planning Industry and Environment, Blacktown City Council and the Developer. The start of construction is dependent on the re-zoning of West Schofields Precinct and approval and agreement between the three parties.

The location of the proposal is shown in Figure 1.1 and an overview of the proposal as exhibited in the review of environmental factors (REF) report is provided in Figure 1.2 and Figure 1.3.

A more detailed description of the proposal is found in the *Townson Road Upgrade between Richmond Road and Jersey Road - Stage 1 Review of Environmental Factors* (REF).

Display of the Review of Environmental Factors

Transport for NSW prepared an REF for the Townson Road Upgrade between Richmond Road and Jersey Road – Stage 1. As part of the planning process the REF was publicly displayed for 28 days between Friday 19 February 2021 and Friday 19 March 2021 on the Transport for NSW website at ***nswroads.work/townson-burdekinrd***.

Due to COVID-19 the REF was available online and printed versions by request. A number of activities were carried out during the public display period to provide the community with an opportunity to learn more about the proposal, ask questions and 'have their say'. Activities included distribution of community updates, a targeted social media campaign, advertising in the Hawkesbury Courier and Hawkesbury Gazette.

In replacement of a face to face community information a Facebook session was held online on the NSW Roads Facebook page at facebook.com/NSWRoads on Tuesday 2 March 2021 between 4pm to 4.30pm.

Community involvement activities were also carried out during the public display period to give the community a chance to learn more about the project, ask questions and 'have their say'.

Community involvement activities included:

- Media release
- Community update through letterbox drops
- Project webpage
- Emails
- Community information session through Facebook live
- Social media postings
- Interactive portal.

Summary of issues and responses

A total of 22 submissions were received, 18 from the general community and one each from Blacktown City Council, Jemena, Sydney Water, TransGrid.

Two submissions were received in support, nine opposing the proposal or parts of the proposal. An additional 11 submissions requested further information or to be added to the mailing list.

The main issues raised by stakeholders and the community and responses to those issues are summarised below.

Need and options considered

Concern was raised as to why the proposal needed to impact homes.

The corridor and alignment (Townson Road to Burdekin Road) Stage 1 and Stage 2 combined was identified in the North West Priority Growth Area Land Use and Infrastructure Implementation Plan (Department of Planning and Environment, 2017). The alignment was further refined by Transport for NSW in 2019. The design development process assessed a number of factors which influenced the final alignment including: impacts to property, constructability, road safety, utilities and physical constraints such as environmental and geotechnical issues. One key constraint for this proposal was an alignment that connected to a suitable crossing point over the T1 Western rail line. The final option provided the best overall outcome for the proposal. Unfortunately, not all impacts, including impacts to property, could be entirely designed out for any option available.

Description of the proposal – construction

Further detail was requested on property acquisition, construction timing and methodology including water quality treatment and spill control.

- All property acquisition will be carried out in accordance with Blacktown City Council policy and the *Acquisition (Just Terms Compensation) Act 1991*. Transport for NSW will continue discussions with all impacted property owners.

- The proposal is to be delivered in stages – interim and ultimate. The delivery of the proposal would initially provide an interim phase with a single carriageway, one lane in each direction, on the southern side of the road corridor incorporating earthworks to allow future full road construction. The planning and delivery of works would be managed by the Department of Planning Industry and Environment, Blacktown City Council and the Developer. The start of construction is dependent on the re-zoning of West Schofields Precinct and approval and agreement between the three parties.
- Construction sediment and erosion control measures would be developed as part of the detailed design and may include temporary diversion channels, sediment fencing, silt traps and the use of mulch bunds to manage stormwater flows and filter sediment and included within the Construction Environmental Management Plan.

Description of the proposal – operation

Further detail was requested on operational features of the design including drainage and water quality infrastructure and the neighbouring quarry.

- According to traffic modelling, the design is sufficient to cater for the future demand. The interim phase has been developed to continue east/west connectivity within the proposed road corridor, which allows for a connection to Durham Road and provide access to Jersey Road. This alignment and connection has been developed with consideration of the future land use and North West Priority Growth Area Land Use and Infrastructure Implementation Plan (Department of Planning and Environment, 2017), which does not accommodate any connection from Jersey Road onto the future dual carriageway.
- Drainage channels will be provided along the southern road corridor to capture the existing runoff prior to commencement of sub-division land forming works.
- The quarry would be decommissioned and rehabilitated for residential development in the future. The site is proposed to be redeveloped as medium density residential, subject to re-zoning by the Department of Planning Industry and Environment.

Traffic and transport

Issues were raised regarding the methodology and findings presented in the construction and operational traffic and transport impact assessment. Of particular concern was the proposed temporary closure of Townson Road during construction of the bridges.

- Following submissions received on the REF, the construction stage of the proposal has been refined to enable Townson Road to remain open throughout the construction period for local traffic. A single lane, traffic controlled, temporary road would be constructed adjacent to the northern side of Townson Road between Richmond Road and connecting prior to Victory Road. This temporary road will provide access to residents in the area and will be removed through the progression of the construction staging works. These works would be contained within the exhibited construction footprint and would not require additional land.
- The operational design has been determined based upon predicted increases in traffic volumes resulting from development of the North West Growth Area. Traffic forecasting has been developed based upon residential developments and Stage 2 opening. The year that the ultimate design has to be implemented will depend on the progress of these developments and delivery of the ultimate proposal will be developed in response to this.

Noise and vibration

Concern relating to impacts from noise and vibration particularly from operational traffic were raised. Queries were raised about the type of mitigation to be provided to impacted residences.

- A noise and vibration impact assessment report assessed the construction and operation of the proposal and recommended noise mitigation for existing residential properties and developments with approved development applications. Noise mitigation is the responsibility of the developer where the approval for the individual dwelling has been approved subsequent to the approval of the proposal.
- Based on the operational road traffic noise modelling, 37 residential receivers qualify for noise mitigation for the ultimate phase and 13 residential receivers qualify for noise mitigation for the interim phase.
- Noise mitigation would be considered in the following order of preference:
    - Quieter road pavement surfaces
    - Noise mounds
    - Noise barriers
    - At-property treatments.

    Quieter pavement surfaces are the preferred form of noise mitigation as it reduces source noise levels and has a low visual impact. This provides noise benefits to outdoor recreational areas in addition to reducing internal road traffic noise levels. Noise barriers and noise mounds will be considered where there are four or more closely spaced sensitive receivers that would benefit from the noise barrier or noise mound. A noise barrier analysis will be undertaken during the detailed design phase of the project considering where it is reasonable and feasible to construct a noise barrier. At property treatment will be considered where at source controls such as barriers and quieter pavements are not feasible or reasonable or are unable to reduce noise levels to the appropriate criteria.

Hydrology and flooding

Concerns were raised about the risk from flood events on Townson Road.

- Flood modelling has been carried out to confirm the flood immunity of the proposal and to determine any local or regional flood impacts that may arise from the construction and operation of the proposal.
- Measures have been developed to mitigate adverse flood impacts on the Bells Creek watercourse and adjoining properties which could arise as a result of the proposal. These measures include the construction of a bridge over Bells Creek and a second flood relief bridge to the east across the Bells Creek floodplain including associated earthworks.

Landscape character and visual amenity

Request for further detail on replanting of trees after construction.

- The urban design strategy for the road corridor recognises the existing urban and landscape character and seeks to integrate the widened road and new bridge structures sensitively into the natural and suburban setting. The urban design would introduce a more formal arrangement to the landscape where adjacent to residential land uses. A naturalised character would be introduced adjacent to creek crossings and areas adjacent to existing vegetation.

Changes to the proposal

The following design changes were identified after display of the REF:

- Change to the construction compound location
- Change to traffic management during construction
- Minor changes to the construction footprint.

Additional assessment

GHD carried out further assessment to determine potential impacts of the changes to the proposal including biodiversity and noise and vibration.

Next steps

Transport for NSW as the determining authority will consider the information in the REF and this submissions report and make a decision whether or not to proceed with the proposal.

Where a decision is made to proceed, Transport for NSW will continue to inform the community and stakeholders prior to and during the construction phase.

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Appendix A General arrangement drawings of the Townson Road temporary access

1. Introduction and background

1.1 The proposal

Transport for NSW is proposing to construct a four-lane divided road along the Townson Road/Burdekin Road corridor, linking Richmond Road, Marsden Park in the west and Burdekin Road, Schofields in the east.

The overall program of work consists of two stages:

- Stage 1 involves an upgrade of about 1.6 kilometres of road extending from Richmond Road to south of Jersey Road (referred to as 'the proposal' for the purposes of this assessment)
- Stage 2 is about two kilometres in length involving the construction of a new road between the Stage 1 tie-in and Burdekin Road.

Stage 2 is subject to a separate planning approval.

The proposal is located within the Marsden Park Industrial and West Schofields precincts of the North West Growth Area (NWGA), about 37 kilometres north-west of the Sydney central business district and three kilometres west of Schofields.

Key features of the proposal would include:

- Widening and upgrading about 1.6 kilometres of Townson Road, between Richmond Road and Durham Road/Jersey Road, to provide:
  - Two 3.5 metre wide traffic lanes in each direction
  - A new section of Townson Road about 250 metres long, to the east of the existing alignment, between Meadow Road and Durham Road/Jersey Road to maintain west to east connectivity
- Providing a wide central median along the length of the upgrade narrowing at intersections to accommodate for turning lanes
- Constructing two bridges, each about 36 metres long, to reduce flooding afflux with one bridge over Bells Creek and another bridge about 50 metres east of Bells Creek
- Providing a new southbound slip lane at Richmond Road intersection from Townson Road
- Providing two new signalised intersections allowing all turning movements to and from Townson Road/Victory Road/'A New Road', and formalised pedestrian crossings at each leg of the signalised intersection
- Constructing stubs for Victory Road north and the new road to the north and south of the Townson Road intersection, with a 3.5 metre wide traffic lane in each direction
- Providing a three metre wide shared path for pedestrians and cyclists on the southern side of Townson Road along the length of the proposal and a pedestrian crossing across the new southbound sliplane from Townson Road to Richmond Road
- Providing a 1.2 metre wide footpath on the northern side of Townson Road along the length of the proposal.

A more detailed description of the Townson Road Upgrade between Richmond Road and Jersey Road – Stage 1 (the proposal) is found in the Townson Road Upgrade between Richmond Road and Jersey Road – Stage 1 Review of Environmental Factors (REF) prepared by Transport for NSW in February 2021.

The location of the exhibited proposal is shown in Figure 1.1.

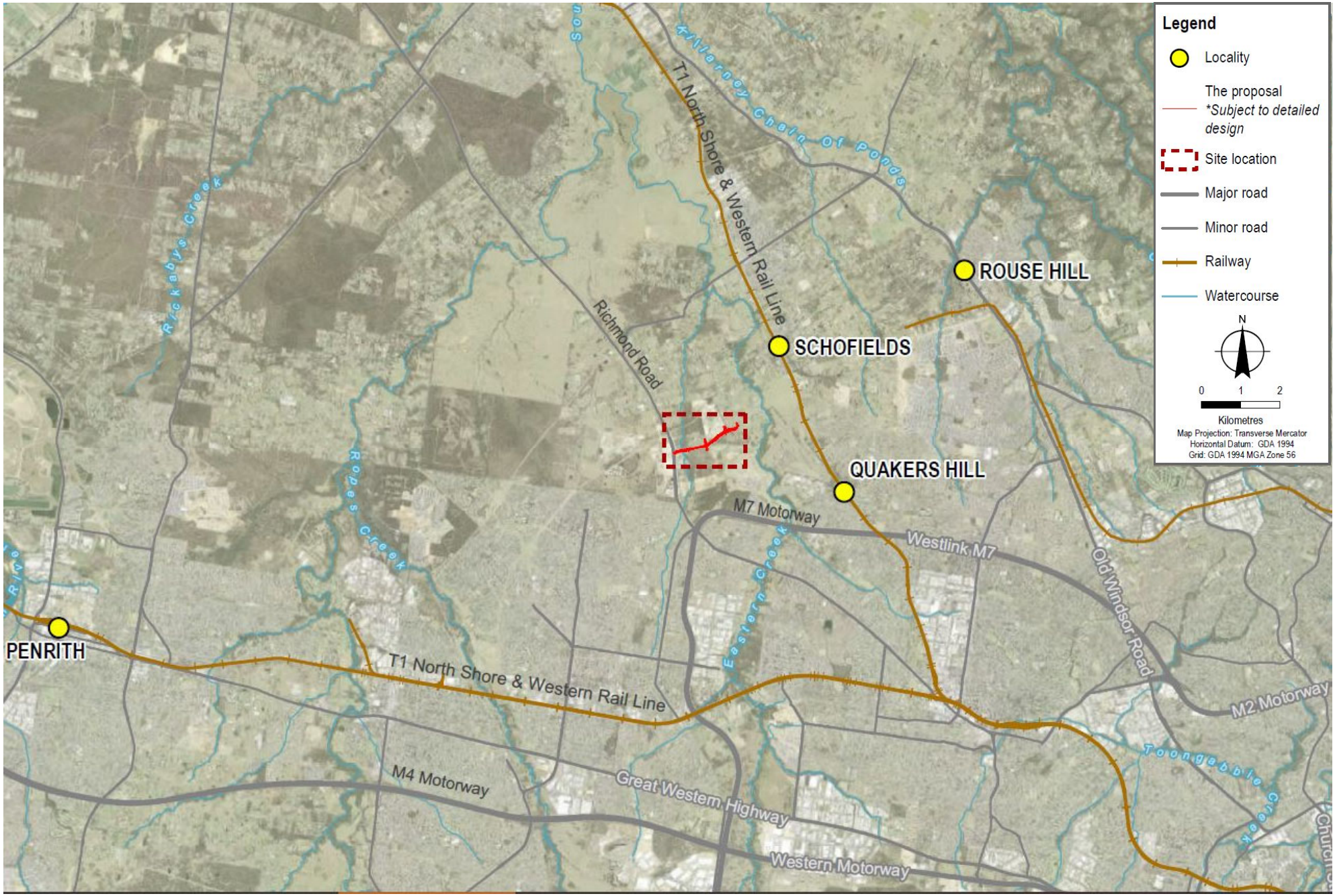

Figure 1.1 Location of the proposal

The proposal is to be delivered in stages – interim and ultimate. The delivery of the proposal would initially provide an interim phase with a single carriageway, one lane in each direction, on the southern side of the road corridor incorporating earthworks to allow future full road construction. The planning and delivery of works would be managed by the Department of Planning Industry and Environment, Blacktown City Council and the Developer. The start of construction is dependent on the re-zoning of West Schofields Precinct and approval and agreement between the three parties.

Figure 1.2 and Figure 1.3 show the proposal as exhibited in the REF.

1.2 REF display

Transport for NSW prepared a REF to assess the potential environmental impacts of the proposed works. The REF was publicly displayed for 28 days between Friday the 19 February 2021 and Friday the 19 March 2021.

The REF was also published on the Transport for NSW project website ***nswroads.work/townson-burdekinrd*** and was made available for download. The details about the public display period were advertised in the local newspaper The Hawkesbury Gazette and Hawkesbury Courier, and in the Community Update distributed to the local community.

In addition to the above public display, an invitation to comment and copy of the review of environmental factors were directly emailed to four stakeholders, including Blacktown City Council (Appendix A).

Due to the COVID-19 pandemic, Transport for NSW replaced the face to face community information session with an online live session on 2 March 2021 between 4:00pm and 4.30pm.

1.3 Purpose of the report

This submissions report relates to the REF prepared for the Townson Road Upgrade between Richmond Road and Jersey Road – Stage 1, 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 Transport for NSW. This submissions report summarises the issues raised and provides responses to each issue (Chapter 2). It details investigations carried out since finalisation of the REF (Chapter 3), describes and assesses the environmental impact of changes to the proposal (Chapter 4) and identifies new or revised environmental management measures (Chapter 5).

Several minor changes are proposed to the construction phase of the proposal and additional minor construction boundary changes. These are outlined in Chapter 3 and general arrangement drawings provided in Appendix A.

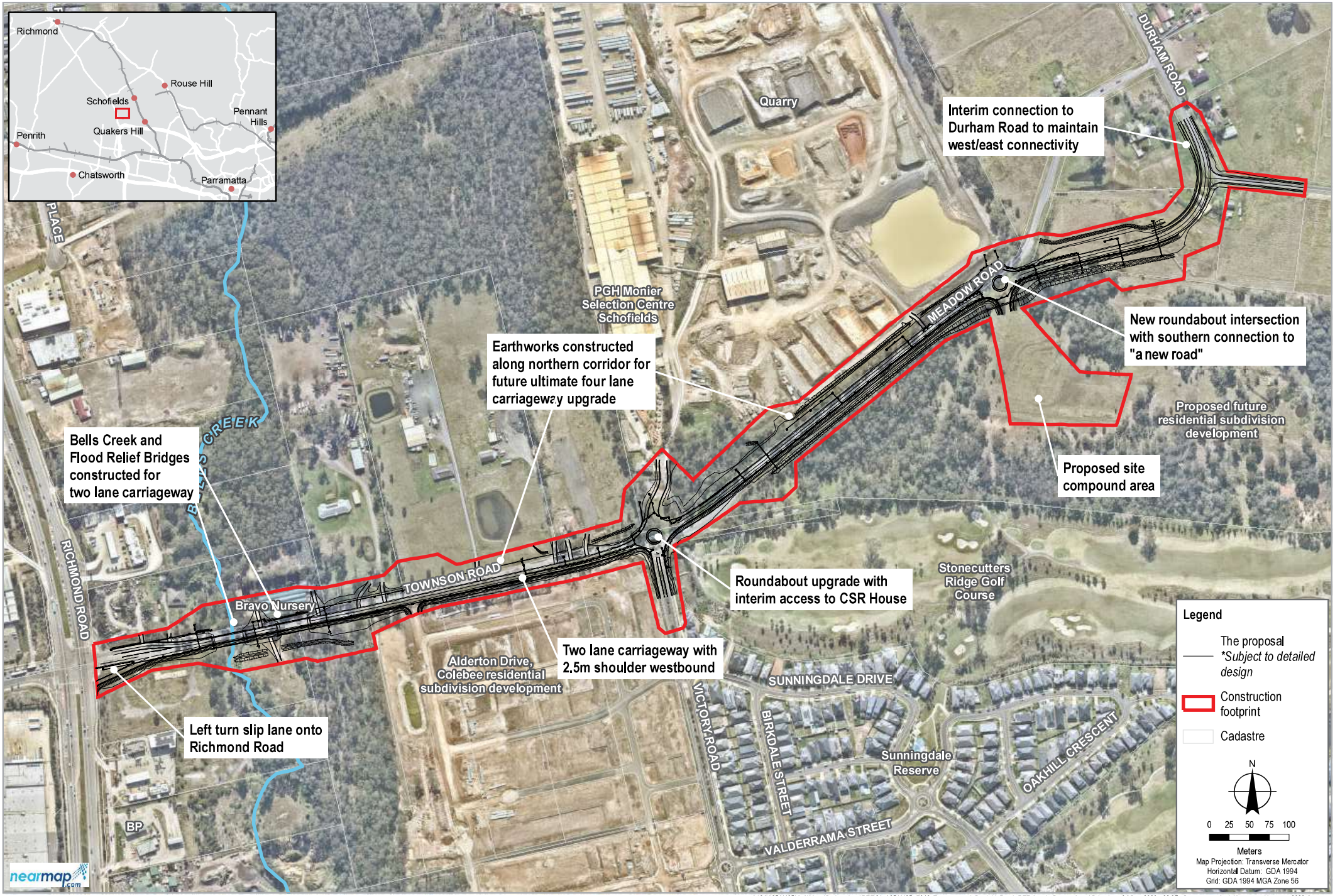

Figure 1.2 Key features of the exhibited proposal - Interim phase

G:\21\12511195\GIS\Maps\Deliverables\REF\21_12511195_Z016_Townson_and_BurdekinRoad_REF_InterimProposal.mxd Print date: 04 Dec 2020 - 09:37 - Data source:Aerial Imagery - Nearmap 2020 (image date 03/08/2020, image extracted 28/09/2020) . Created by: eibbertson

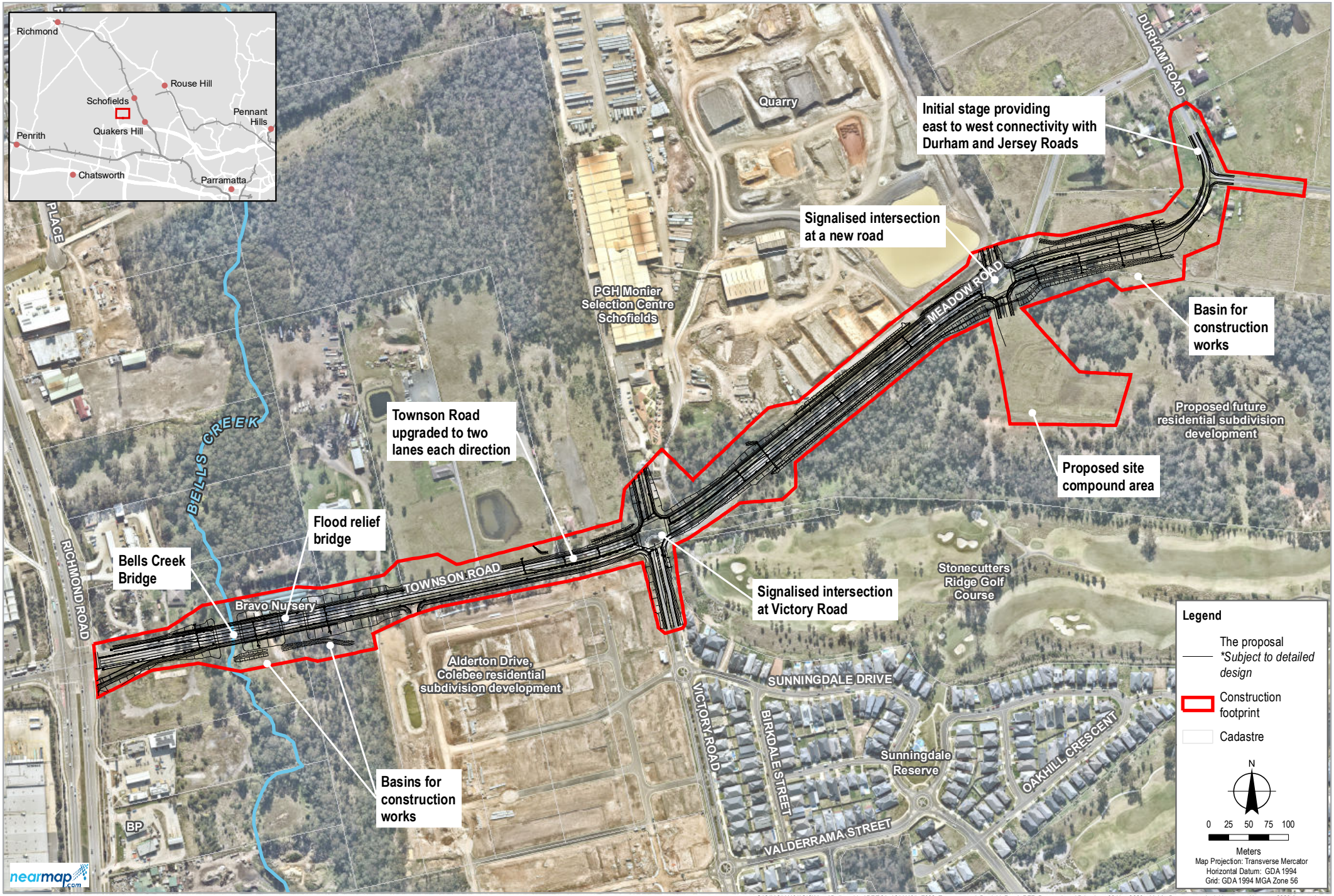

Figure 1.3 Key features of the exhibited proposal - Ultimate phase

G:\21\12511195\GIS\Maps\Deliverables\REF\21_12511195_Z002_Townson_and_BurdekinRoad_REF_Proposal.mxd Print date: 06 Nov 2020 - 11:14 - Data source:Aerial Imagery - Nearmap 2020 (image date 03/08/2020, image extracted 28/09/2020) . Created by: eibbertson

2. Response to issues

Transport for NSW received 22 submissions, accepted up until the 11 May 2021. 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

Respondent	Submission No.	Section number where issues are addressed
Community member: individual	1	2.7.3
Community member: individual	2	2.13.2
Community member: individual	3	2.13.1
Jemena	4	2.3
Community member: individual	5	2.7.1, 2.7.2, 2.8
Community member: individual	6	2.8
Community member: individual	7	2.6, 2.7.3
Community member: individual	8	2.8
Community member: individual	9	2.8
Community member: individual	10	2.8
Community member: individual	11	2.11
Community member: individual	12	2.13.1
Community member: individual	13	2.13.2
Community member: individual	14	2.11
Community member: individual	15	2.6, 2.8, 2.9.1, 2.9.2, 2.13.2, 2.13.3
Sydney Water	16	2.4
TransGrid	17	2.5
Community member: individual	18	2.7.1, 2.7.2, 2.7.4, 2.9.2, 2.10.1, 2.10.2, 2.10.3
Community member: individual	19	2.7.3, 2.9.3, 2.10.2, 2.10.3, 2.12
Community member: individual	20	2.7.3, 2.9.3, 2.13.3

Respondent	Submission No.	Section number where issues are addressed
Community member: individual	21	2.13.1
Blacktown City Council	22	2.2

2.1 Overview of issues raised

A total of 22 submissions were received in response to the display of the REF. This included submissions from one government agency, three utility providers and 18 from the community.

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

Two submissions were received in support, nine opposing the proposal or parts of the proposal. An additional 11 submissions requested further information or to be added to the mailing list.

Sections 2.2 to 2.5 outline the issues raised by Council and utility providers and the response from Transport for NSW. The main issues can be summarised as:

- Traffic and transport issues, particularly relating to the temporary closure of Townson Road during construction
- Landscaping details
- Stormwater and flooding issues
- Requesting liaison in relation to utility relocation and co-ordination with utility projects.

Sections 2.6 to 2.7 outline the issues raised by the community and the response from Transport for NSW. The main issues can be summarised as:

- Needs and options considered
- Description of the proposal
- Consultation
- Traffic and transport
- Noise and vibration
- Hydrology and flooding
- Landscape character and visual amenity.

2.2 Blacktown City Council

The issues raised by Blacktown City Council (submission 22) in response to the exhibition of the REF are summarised below.

Table 2.2: Blacktown City Council Issues

	Issue raised	Response
1	The suggested piecemeal staging of the proposed infrastructure can be expected to create additional traffic congestion and delays, on an already heavily congested Richmond Road.	Transport for NSW is designing a four-lane divided road along the Townson Road/Burdekin Road corridor, linking Richmond Road, Marsden Park in the west and Burdekin Road, Schofields in the east. The overall program of work consists of two stages: • Stage 1 involves an upgrade of about 1.6 kilometres of road extending from Richmond Road to south of Jersey Road (referred to as 'the proposal' for the purposes of this assessment) • Stage 2 is about two kilometres in length involving the construction of a new road between the Stage 1 tie-in and Burdekin Road. Stage 2 is subject to a separate planning approval and assessment. The Stage 1 proposal is to be delivered in stages – interim and ultimate. The primary purpose of the staging of works for Stage 1, is to deliver just two out of four lanes as an interim delivery stage. This is to enable CSR to unlock parcels of land for residential use, subject to re-zoning and the development approval process. The new subdivision is to be released in stages. Based on the release frequency and timing of the new subdivision, the traffic impact assessment has confirmed that the interim stage works would be capable of handling traffic generated by the initial residential developments. It should also be noted that developer contribution and "works in kind" arrangements are to be used under a Voluntary Planning Agreement between DPIE and CSR to deliver the interim stage of the proposal. Without this agreement in place, there isn't likely to be funds in place for the upgrade of Townson Road and Meadow Road, including upgrade to Richmond Road/Townson Road intersection. The broader network issues including upgrades to Richmond Road are outside the scope of this proposal. Details of other projects including the Richmond Road project can be found at the following Transport for NSW website: ***roads-waterways.transport.nsw.gov.au/projects/north-west-growth-centre-strategy***.

	Issue raised	Response
2	The proposal to temporarily close Townson Road traffic access to Richmond Road during bridge construction will cause traffic congestion, noise and loss of amenity for residents.	Following submissions on the REF, received from residents, business owners and Council, Townson Road would remain open throughout the construction period for local traffic. A temporary road would be constructed early on in the construction phase adjacent to the northern boundary of Townson Road between Richmond Road and Victory Road. This temporary road will enable construction of bridgeworks "off line" while maintaining access to road users and designed to take heavy vehicle traffic generated by CSR Brickworks. On completion of bridgeworks over Bells Creek and the two lanes to the south of the road corridor, the traffic would be switched to the new section of the Townson Road before removal of the temporary road. These works would be contained within the assessed construction footprint and would not require additional property acquisition.
3	Review the proposed staging of construction to ensure that Townson Road remains open to traffic and connected to Richmond Road, as Victory Road and Alderton Drive are not appropriate for the traffic, including trucks that will be diverted as a result of the proposed temporary closure of Townson Road.	Further details of the temporary road are provided in section 3.2 of this report. Provision of the through route during construction will negate the need to use Alderton Drive and Victory Road as a detour. The predicted impacts from detoured traffic onto these roads will therefore be avoided. Mitigation measures T4 and NV6, listed in section 5.2, have been revised to take account of this and have removed reference to the detour routes.
4	If there is no alternative to the temporary closure of Townson Road, then traffic modelling be undertaken to identify the impact on Victory Road and Alderton Drive and proposed remedial actions.	
5	Landscaping proposed requires further refinement and details.	Replanting will occur during the interim phase and again after construction of the ultimate phase of the proposal. An urban design report was prepared to inform the concept design and is provided as Appendix D of the REF. The urban design strategy for the road corridor recognises the existing urban and landscape character and seeks to integrate the widened road and new bridge structures sensitively into the natural and suburban setting. The urban design would introduce a more formal arrangement to the landscape where adjacent to residential land uses. A naturalised character would be introduced adjacent to creek crossings and areas adjacent to existing vegetation.

	Issue raised	Response
		Further details will be provided to the urban design report at detailed design and this will include a native plant species schedule and details of street trees. Detailed plans will be provided including landscape general arrangement drawings, landscape cross sections, hard details (pavements and street furniture, where relevant), planting details, material sketch schedules and specification notes. These details are to be finalised in consultation with Blacktown City Council and the Design Review Panel.
6	Stormwater and flooding concerns with the current design plans.	Flood modelling has been carried out to confirm the flood immunity of the proposal and to determine any local or regional flood impacts that may arise from the construction and operation of the proposal. It found that the lowest level of the proposal is close to the Bells Creek floodplain. The design of the proposal provides around 0.9 metres of freeboard from the 0.2 per cent flood level in Bells Creek to the edge of the through carriageway of Townson Road at the low-point to the west of the bridge. Similarly, a minimal 0.5 metre freeboard has been allowed for the underside of the bridge deck crossing Bells Creek and the overland flow bridge. This will enable Townson Road to remain trafficable as a flood evacuation route during rare flood events up to a 0.2 per cent AEP (1:500 year event) magnitude. Downstream of Townson Road, there are localised minor increases of up to 0.05 metres in flood levels adjacent to Townson Road which occur at the proposed bridge opening locations but which is reduced to zero within one hundred metres downstream of the proposal. Measures have been developed to mitigate adverse flood impacts on the Bells Creek watercourse and adjoining properties which could arise as a result of the proposal. These measures include the construction of a bridge over Bells Creek and a second flood relief bridge to the east across the Bells Creek floodplain including associated earthworks. Further information on the expected flood conditions during operation is available as Appendix G to the REF. A summary of the assessment is provided in Section 6.3 of the REF.
7	Roads and bridges require further work to meet Council's requirements.	The concept design was prepared in accordance with the requirements of a design management system certified under *AS/NZS ISO 9001:2008 Quality Management Systems* and with reference to relevant standards, guidelines and specifications. As noted in section 3.2 of the REF, the design would be further refined at the detailed design stage and in consultation with the Council.

	Issue raised	Response
8	Urgently upgrade Richmond Road to at least 3 through-traffic lanes in each direction, between the M7 Motorway and future Bandon Road intersection, including the intersection of Rooty Hill Road North with Richmond Road. The Richmond Road upgrade to be undertaken prior to the upgrade of Townson Road and Burdekin Road, and prior to further redevelopment approvals along Townson Road.	The main objective of the Townson Road to Burdekin Road proposal is to improve capacity along the Townson Road corridor between Richmond Road and Jersey Road. The area of concern falls outside the study area of Stage 1. A number of other projects are currently being completed or planned for Richmond Road. Details of other projects on Richmond Road can be found at the following Transport for NSW website: https://roads-waterways.transport.nsw.gov.au/projects/north-west-growth-centre-strategy/richmond-road-upgrade.html.

2.3 Jemena

The issues raised by Jemena (submission 4) in response to the exhibition of the REF are summarised below in Table 2.3.

Table 2.3: Jemena Issues

	Summary of raised	Response
1	A preliminary review has identified encroachment from the proposal on both the medium and high pressure gas assets. There are concerns for construction timing and Non-Routine works may take between 12 and 18 months to deliver. Continued consultation with Jemena is requested.	Utility providers have been consulted by Transport for NSW to ensure that utility infrastructure is protected and/or relocated and that construction timing does not clash with Jemena's works. Consultation will continue to be carried out with utility providers during design development. .

2.4 Sydney Water

The issues raised by Sydney Water (submission 16) in response to the exhibition of the REF are summarised below in Table 2.4.

Table 2.4: Sydney Water Issues

	Summary of raised	Response
1	The proponent must obtain endorsement and/or approval from Sydney Water to ensure that the proposal does not adversely impact on any existing water, wastewater or stormwater assets, or other Sydney Water asset, including any easement or property.	Utility providers including Sydney Water have been consulted by Transport for NSW to ensure that utility infrastructure is protected and/or relocated and that construction timing does not clash with utility provider's projects. Consultation will continue to be carried out with utility providers during design development.
2	Sydney Water strongly recommends Transport for New South Wales to pursue continued consultations with Sydney Water to discuss designs and constraints.	
3	Appropriate fittings of Sydney Water watermain in Victory Road during operation need to be available, and connectivity to the system needs to be provided. Space allocation of assets needs to be agreed on with SW. Concerns that assets being attached to external facade of bridge will be an issue if bridge ownership changes. If so, alternative locations of mains needs to be confirmed with SW.	Watermain designs are being developed in conjunction with the detailed design of the proposal. It is expected detailed designs will be submitted to Sydney Water (under the allocated case numbers) in June 2021. It is understood the ownership of the road infrastructure including Bells Creek Bridges will lie with Blacktown City Council.

2.5 TransGrid

The issues raised by TransGrid (submission 17) in response to the exhibition of the REF are summarised below in Table 2.5.

Table 2.5: TransGrid Issues

	Summary of issue raised	Response
1	As TransGrid has a 330KV Transmission Line crossing over Richmond Road, TransGrid requests to be consulted with any future stages of these road upgrade works.	The proposal would not impact TransGrid assets on the Richmond Road corridor. Utility providers have been consulted by Transport for NSW to ensure that utility infrastructure is protected and/or relocated and that construction timing does not clash with utility provider's projects.

2.6 Issue 1, Need and options considered

Submission number(s)

7, 15

Issue description

- Question about why the proposal did not avoid impacts to homes.
- Requests for the design to include:
  - Bus bays outside traffic lanes
  - Longer west and east right turn lanes at Richmond and Victory Road
  - U-turn lane on Townson Road to avoid congestion on Victory Road
  - Left decal left turn lane for westbound traffic on Meadow Road into Victory Road and for westbound traffic on Meadow Road into Victory Road
  - No provision of a bus stop at the crest of hill on Meadow Road, as sight lines are compromised
  - No active traffic lights until adjacent lands are developed.

Response

The corridor and alignment (Townson Road to Burdekin Road) Stage 1 and Stage 2 combined was identified in the *North West Priority Growth Area Land Use and Infrastructure Implementation Plan* (Department of Planning and Environment, 2017). The alignment was further refined by Transport for NSW during an optioneering process in 2019.

The optioneering process assessed a number of factors which influenced the final alignment including: impacts to property, constructability, road safety, utilities and physical constraints such as environmental and geotechnical issues. One key constraint for this proposal was an alignment that connected to a suitable crossing point over the rail line. The final alignment provided the best overall outcome for the road alignment. Unfortunately, not all impacts, including impacts to property, could be entirely designed out for any option available.

A range of options were considered to mitigate impacts and maximise benefits of the proposal. Selection of the preferred option considered how each of the options satisfied the need for the proposal as well as its performance against the objectives and development criteria outlined in Section 2.3 of the REF.

Descriptions of the key features of each option are provided in Section 2.4.2 of the REF, and an analysis of each option is provided in Section 2.4.4 of the REF.

In response to the specific design issues raised:

- Provision of a safe refuge for bus bays/stops outside the lanes of traffic is constrained by property boundaries.
- Provision of a longer west bound right turn lane turning from Townson Road north into Richmond Road is constrained by Bells Creek Bridge.
- Provision of a longer east bound right turn lane turning from Townson Road into Victory Road was not identified as necessary. The turn lane is already 140 metres long and this is confirmed by traffic modelling to be adequate.
- An option to provide a U-turn along Townson Road between Richmond Road and Victory Road has been investigated and there are no safe locations for U-turns on the main Townson Road between Richmond Road and Victory Road.

- The current layout at Victory Road, presented in Section 3.2.3 of the REF report is predicted to be sufficient for the predicted increase in traffic, based on the traffic assessment results.
- A bus stop at the crest of the hill on Meadow Road was not considered as part of this proposal. However, as it has been highlighted as a concern, this will be reviewed as part of the ongoing design development and possible locations will be explored.
- All underground work such as provision of ducts required at traffic signal sites would be completed as part of the interim phase. The conversion of the roundabouts to be constructed as part of the interim phase to traffic signals and timing for switching of the signals would be decided by Blacktown City Council. It should be noted the interim phase of the proposal (refer to Section 3.1.1 of the REF) will not have signalised intersections.

2.7 Issue 2, Description of the proposal

2.7.1 Property acquisition

Submission number(s)

5, 18

Issue description

- Question about the property at 25 Jersey Road Schofields and if it will be a partial or full acquisition and if the remaining parts of the Lot would be subdivided.
- Requests that 46 Durham Road be updated to a partial acquisition, aligning with proposed road reserve in Figure E1 of the REF.

Response

The property at 25 Jersey Road, Schofields, is not impacted by Stage 1 of Townson Road Upgrade proposal. During Stage 2 of the Townson Road upgrade between Jersey Road and Burdekin Road, the property in question, on Lot B in DP376106, would be impacted. Currently the Stage 2 concept design and REF are being prepared with the REF display planned for late 2021. During concept design and preparation of the REF, consultation will be undertaken with the property owners to discuss direct impacts. All property acquisition will be carried out in accordance with Blacktown City Council policy and the *Acquisition (Just Terms Compensation) Act 1991*.

It is noted that currently, there is no funding allocated for detailed design of Stage 2 Townson Road Upgrade, and it is unlikely that funding would be available in the short to medium term. Prior to the road construction, there may be changes to the existing land-use with the introduction of the Precinct Plan for West Schofields, following re-zoning and approval from the NSW Department of Planning.

The property at 46 Durham Road, Schofields will be partially acquired for the proposal from the current landowner CSR and will be returned to them upon completion of Stage 2 of the Townson Road Upgrade between Jersey Road and Burdekin Road. This is a reduction in acquisition from the design presented in the REF which identified a potential full acquisition of the property.

2.7.2 Construction

Submission number(s)

5, 18

Issue description

- Request for information on when construction will start.
- Site compound is located on CSR land, within future residential development land. Concerns raised over impacts due to development potential and earthworks of the site. Suggests alternative location for site compound, at 46 Durham Road, Schofields, which is also owned by CSR. CSR is prepared to enter into a license agreement to use this land.
- Requests details on what the interim strategy for water quality treatment and spill control will be for Townson Road prior to construction of the regional basin, and how runoff from the road pavement will achieve the removal properties for nutrients and Total Suspended Solids. Concerns raised about performance of temporary basins if untreated surface water or potential spills enter filters. Requests to identify water quality strategy to reduce impacts on downstream landowners and waterways. Requests detail on potential sediment basin locations to remove impacts on future residential subdivision strategy.

Response

The proposal is to be delivered in stages – interim and ultimate. The delivery of the proposal would initially provide an interim phase with a single carriageway, one lane in each direction, on the southern side of the road corridor incorporating earthworks to allow future full road construction. The planning and delivery of works would be managed by the Department of Planning Industry and Environment, Blacktown City Council and the Developer. The start of construction is dependent on the re-zoning of West Schofields Precinct and approval and agreement between the three parties. Traffic forecasting has been developed based upon residential developments and Stage 2 opening. The year that the ultimate design has to be implemented will depend on the progress of these developments and delivery of the ultimate proposal will be developed in response to this.

Transport for NSW will continue discussions with CSR to lease 46 Durham Road as a construction compound, as an alternative to the currently proposed location, located at 75 Townson Road. This is in order to reduce potential impacts to the CSR owned land at 75 Townson Road and allow for future residential construction. Further detail is provided in section 3.1.

The measures to manage water quality during construction are described in Section 6.4 of the REF. It was identified that construction activities have the potential to impact on water quality within local receiving waters, including Bells Creek. The main potential impacts relate to soil disturbance, which represents a risk to surface water quality due to sediment laden run-off during construction. Pollutants such as sediment, soil nutrients and construction waste have the potential to mobilise and enter drainage lines, particularly during high rainfall events.

Water quality impacts could also potentially occur during construction as a result of contamination by fuel or chemical spills from construction equipment and vehicles.

It is anticipated that temporary construction sediment basins would not be required for the proposal and the management controls in the form of silt trap, fences and barriers will be implemented to meet the construction sequencing. However, if construction sediment basins are deemed to be needed due to the construction sequencing, these basins would be temporary and would only be installed near Bells Creek to detain and treat stormwater prior to release to Bells Creek during the construction period. These basins would be removed after construction of the road pavement and when revegetation is established sufficiently to control erosion without the need for sediment basins.

As noted above, other sediment and erosion control measures would be developed as part of the detailed design and may include temporary diversion channels, sediment fencing, silt traps and the use of mulch bunds to manage stormwater flows and filter sediment. The final location and size of the temporary sediment basins would be confirmed during the development of the Construction Environmental Management Plan (CEMP). The impact of construction activities on the quality of runoff discharging to the receiving drainage lines would be minimised by implementing a construction soil and water management plan as part of the CEMP.

2.7.3 Operation

Submission number(s)

1, 7, 19, 20

Issue description

- The design provided no provision for left slip lanes.
- Question about where Jersey Road is connected in relation to surrounding roads.
- Requests detail on if the quarry will be removed to accommodate the proposal, or if it would entail tree removal and detail on what will take the place of the existing quarry.
- Concerns that the proposal will directly impact on future development at 6 Townson Road and limit access to 6 Townson Road by restricting access to a single point on Richmond Road.
- Appendix E *Traffic and Transport Impact Assessment* of the REF, does not consider Keneco site at 6 Townson Road, like other developments that have been assessed and that the REF has incorrectly described number of development applications at 6 Townson Road. Notes that two take-away food and drink premises are within the development applications and have not been considered. Requests reassessment in Appendix E *Traffic and Transport Impact Assessment* of the REF to include impacts on traffic and access to 6 Townson Road.

Response

As part of the design and REF for the proposal, a traffic and transport assessment and associated traffic modelling was carried out to determine the scope of development required to satisfy the surrounding current and future land use. This assessment concluded that "left turn at any time", otherwise known as slip lanes were not required on the future intersections of the proposal, other than the intersection with Richmond Road. According to traffic modelling, the design displayed with the REF is sufficient to cater for the future demand.

The corridor and alignment (Townson Road to Burdekin Road) Stage 1 and Stage 2 combined was identified in the *North West Priority Growth Area Land Use and Infrastructure Implementation Plan* (Department of Planning and Environment, 2017). The interim phase has been developed to continue east/west connectivity within the proposed road corridor, which allows for a connection to Durham Road and provide access to Jersey Road. This alignment and connection has been developed with consideration of the future land use and infrastructure implementation plan, which does not accommodate any connection from Jersey Road onto the future dual carriageway.

The quarry would be decommissioned and rehabilitated for residential development in the future. The site is proposed to be redeveloped as medium density residential, subject to re-zoning by the Department of Planning Industry and Environment.

Transport for NSW has consulted directly with the Kenco site owners located at 6 Townson Road. This consultation has related to site access, property acquisition and impacts of the interim and ultimate phases of the proposal. It should be noted Kenco has been advised of access restrictions and denial of access to the development site to and from Townson Road. Access to the development lot would be via the extended service road on Richmond Road as advised by Transport for NSW. Direct access to and from Townson Road to the subject site will not be permitted due to the proximity of the development site to the upgraded intersection with Richmond Road, proximity of the site to the proposed Bells Creek Bridge and E3 zoned land.

Appendix E Traffic and Transport Impact Assessment of the REF has not assessed impacts on traffic and access to 6 Townson Road, as access would not be permitted to this site due to the reasons discussed above. Access arrangements for future development of this site would need to be discussed with Blacktown City Council at that time.

Transport for NSW and Blacktown City Council will continue to consult with property owners directly impacted by the proposal.

2.7.4 Operational drainage and water quality

Submission number(s)

18

Issue description

- Requests detail on stormwater management on Townson Road and the catchment to the north at temporary drainage channel (CSR owned).
- Requests assessment of the drainage along Townson Road (Stage 2) to be assessed in Stage 1 to align with CSR works.
- Requests details about stormwater diversions to inform CSR in order to plan for the design of Tranche 1 residential subdivision, located south of Townson / Meadow Road.
- It is requested that drainage easements for the proposed stormwater flows into CSR's land are obtained and included within the REF.
- CSR requests that drainage easements for the proposed stormwater flows into CSR's land are obtained and included within the REF.

Response

All road drainage will be captured and conveyed to a discharge point 100 metres west of Jersey Road (chainage 1500). This will include capturing the existing runoff from the area to the north of the proposal.

Drainage channels will be provided along the southern road corridor to capture the existing runoff prior to commencement of sub-division land forming works. These channels would be progressively maintained / adjusted by CSR during sub-division construction to ultimately being replaced with a sub-division water management strategy.

2.8 Issue 3, Consultation

Submission number(s)

5, 6, 8, 9, 10, 15

Issue description

- Request for further information about stage 1 and stage 2 of the proposal.
- Requests to be added to mailing list.
- Registration of interest for taking part in future Aboriginal Heritage Investigation.

Response

Section 5.6 of the REF outlines the ongoing consultation for the proposal. This will include providing updates to the local community during the construction planning phase and construction period of the proposal and providing information to the public via Blacktown City Council website. Community updates will be emailed to stakeholders where this has been requested.

A Facebook live community information session was carried out on 2 March 2021. A recorded copy of the event can be viewed here ***nswroads.work/townson-burdekinrd***.

Transport for NSW are currently developing the concept design and REF for Stage 2 of the Townson Road to Burdekin Road upgrade proposal, between Jersey Road and Burdekin Road, with an aim to display the REF later this year, for comment.

Aboriginal Heritage Investigations for Stages 1 and 2 of the proposal have been completed, in accordance with the PACHCI. There may be further work required to be carried out during construction. The details provided will be kept on the proposal record for future reference.

2.9 Issue 4, Traffic and transport

2.9.1 Methodology

Submission number(s)

15

Issue description

- Concern is raised that the baseline data for traffic volumes is already outdated. The Luxeland development extent and construction timing is incorrectly relayed.
- Requests resurveying and remodelling of AM and PM movements through the Victory Road/Townson Road/Meadow Road corridors.
- Concerns for road efficiency by 2026, and use of outdated base case modelling. Section 5.1.3 of Appendix E of the REF states that the proposed new Townson Road/Victory Road signalised intersection would perform at Level of Service (LOS) D in 2026 and LOS E predicted by 2036. The LOS less than C is unacceptable.

Response

A traffic and transport impact assessment has been carried out for the proposal. This is provided in Appendix E of the REF and summarised in Section 6.1 of the REF.

The traffic modelling works were commissioned in 2019. It is acknowledged that the existing condition of the study area can be easily outdated in a fast growing precinct and ever changing landscape. To incorporate future changes to the environment into the traffic and transport impact assessment, assumptions have been developed for the future assessment scenarios for 2026 and 2036. These are based upon the available information at the time of assessment to calculate the dwellings currently being developed and to be developed within the study area and the planned precincts.

The predicted LoS D in future years is the targeted agreed criteria for the traffic and transport impact assessment provided in Appendix E of the REF. The ultimate phase of (4-lane dual carriageway) Townson Road and Victory Road intersection is predicted to operate as LoS C/D by 2036 (Table 5-12 in Appendix E of the REF). The results noted in Section 5.1.3 of Appendix E of the REF refers to the interim phase of the proposal where Townson Road would have only two lanes along the southern side of the road corridor.

2.9.2 Construction

Submission number(s)

15, 18

Issue description

- Concern that any closure of Townson Road during construction of Bells Creek Bridge will cause major traffic issues.
- Suggests Bells Creek Bridge to be constructed in phases to maintain continuous traffic flow.

- Concerns raised over the proposed traffic diversion onto residential roads (Victory Road and Alderton Drive) during Townson Road closure for the bridge construction. Notes that Victory Road and Alderton Drive can't accommodate CSR's B-Double trucks, and therefore Townson Road access to Richmond Road is required to remain open.
- Request to maintain truck access along Townson Road to Richmond Road, and for Construction Traffic Management Plan to clearly detail access maintenance from CSR plant.
- Requests detail on approval for road works under S138 of *Roads Act 1993* from Blacktown City Council.

Response

Following receipt of submissions to the REF from stakeholders, the construction stage of the proposal has been refined to enable Townson Road to remain open throughout the construction period for local traffic. A single lane, traffic controlled, temporary road would be constructed adjacent to the northern side of Townson Road between Richmond Road and connecting prior to Victory Road. This temporary road will provide access to residents in the area and will be removed through the progression of the construction staging works. These works would be contained within the exhibited construction footprint and would not require additional land. Further details of the temporary road are provided in section 3.2.

Provision of the through route during construction will negate the need to use Alderton Drive and Victory Road as a detour. The predicted impacts from detoured traffic onto these roads will therefore be avoided. Mitigation measures T4 and NV6, listed in section 5.2, have been revised to take account of this and have removed reference to the detour routes.

Townson Road and Meadow Road are unclassified roads managed by Blacktown City Council. The determining authority for the proposal is Transport for NSW. Transport for NSW is the proponent for the upgrade works at the intersection of Richmond Road and Townson Road. This would be carried out to Transport for NSW requirements under a Works Authorisation Deed. Blacktown City Council will be responsible for the works along the road alignment of Townson Road and Meadow Road including the tie-in works at Jersey Road/Durham Road. This would be carried out under Section 138 of the *Roads Act 1993*.

2.9.3 Operation

Submission number(s)

19, 20.

Issue description

- Concerns for high levels of traffic generation due to Townson Road/Meadow Road upgrade to four lanes.
- Concerns that left turn slip lane length would cause issues for intersection operation. Vehicles exiting 6 Townson Road enter road within left turn slip lane. Requests for reduction in length of left turn auxiliary lane.

Response

The proposal is located within the Marsden Park Industrial and West Scofield precincts of the North West Growth Area. With the predicted population and economic growth within the North West Growth Area, the existing roads will be required to support the additional traffic of around 33,000 homes generated by the proposed residential developments, over the next 10 years. Richmond Road is the key arterial road for access to the North West Growth Area, while Townson Road is the key access point for the proposed development in the Marsden Park Industrial and West Scofield precincts. The corridor and alignment (Townson Road to Burdekin Road) Stage 1 and Stage 2 combined was identified in the *North West Priority Growth Area Land Use and Infrastructure Implementation Plan* (Department of Planning and Environment, 2017). This Plan identified the need to upgrade the existing Townson Road from Richmond Road through to Burdekin Road.

Increased traffic is expected on local roads around Sunningdale Drive as the proposed residential developments planned in the planning precincts of the North West Growth Area are completed. The traffic and transport impact assessment provided in Appendix E of the REF shows that the interim phase of the proposal would maintain capacity on Townson Road until 2026, based upon predicted traffic increases. Beyond 2026, it is likely the interim phase would be oversaturated at the Victory Road intersection and additional lanes and signalised intersections proposed for the ultimate phase would be required to maintain a satisfactory level of service.

The existing layout of the Richmond Road and Townson Road intersection would be predominantly retained. To accommodate the predicted additional westbound left turn volumes, particularly in the future year 2036, an additional left turn slip lane would be provided. This would take traffic from Townson Road onto southbound Richmond Road. The length of this slip lane has been determined based upon predicted increases in traffic volumes resulting from development of the North West Growth Area.

Traffic forecasting has been developed based upon residential developments and Stage 2 opening. The year that the ultimate design has to be implemented will depend on the progress of these developments and delivery of the ultimate proposal will be developed in response to this.

Potential traffic impacts have been assessed and are discussed in Sections 6.1 and Appendix E of the REF.

2.10 Issue 5, Noise and vibration

2.10.1 Methodology

Submission number(s)

18

Issue description

- The noise and vibration impact assessment has not considered future residential development areas in West Schofields Precinct. Lots along Townson/Meadow Row will have additional noise impacts. Requests future residential use impacts are assessed in operational noise assessment and within noise contours.
- Requests the noise assessment includes noise mitigation with consideration to future residences on Meadow and Townson Road, during and post construction.

Response

The Townson Road Stage 1 noise and vibration impact assessment report presented in Appendix F of the REF assessed and recommended noise mitigation for existing residential properties and developments with approved development applications. Noise mitigation is the responsibility of the developer where the approval for the individual dwelling has been approved subsequent to the approval of the proposal, as the *Road Noise Policy* (DECCW, 2011) noise goals apply only to existing receivers. As such, any dwelling that is approved prior to the approval of the proposal would qualify for noise mitigation.

Section 1.1.1 of *Land Use and Development Planning in the Road Noise Policy* (DECCW 2011) provides the following information for the proposed residential developments:

> 'Land use planning offers the greatest potential for minimising conflict between road noise and sensitive land uses, followed closely by the development of appropriately designed and noise insulated buildings. The *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP) (Department of Planning 2007) sets internal noise criteria which must be met by new developments along some of the busiest transport corridors in NSW. This is a major initiative to ensure that sustainable higher density living can occur along major transport routes whilst maintaining an acceptable level of amenity for residents. Developers and councils should consider the recommended approaches outlined in the accompanying *Development near rail corridors and busy roads – interim guideline* (Department of Planning 2008).'

As such, it is the responsibility of Council/relevant authorities to set appropriate consent conditions to meet the requirements of the Infrastructure SEPP and for the developer to be able to achieve the internal noise criteria of the Infrastructure SEPP when building next to a busy road through appropriate building design.

2.10.2 Operation

Submission number(s)

18, 19.

Issue description

- Concerns that high levels of traffic due to Townson Road/Meadow Road upgrade to four lanes will increase noise to residences on Sunningdale Drive.

Response

The proposal is located within the Marsden Park Industrial and West Scofield precincts of the North West Growth Area. With the predicted population and economic growth within the North West Growth Area, the existing roads will be required to support the additional traffic of around 33,000 residents generated by the proposed residential developments, over the next 10 years. Richmond Road is the key arterial road for access to the North West Growth Area, while Townson Road is the key access point for the proposed development in the Marsden Park Industrial and West Scofield precincts. The corridor and alignment (Townson Road to Burdekin Road) Stage 1 and Stage 2 combined was identified in the *North West Priority Growth Area Land Use and Infrastructure Implementation Plan* (Department of Planning and Environment, 2017). This Plan identified the need to upgrade the existing Townson Road from Richmond Road through to Burdekin Road.

Based on the operational road traffic noise modelling, 37 residential receivers qualify for noise mitigation for the ultimate phase and 13 residential receivers qualify for noise mitigation for the interim phase.

Noise barriers would be considered where it would likely benefit four or more closely spaced receivers. Four residences along the northern side of Sunningdale Drive (20 Sunningdale Drive to 68 Sunningdale Drive) are close enough together to be considered in a noise barrier analysis. A noise barrier analysis will be undertaken during the detailed design phase of the proposal considering where it is reasonable and feasible to construct a noise barrier along the southern side of Townson Road (east of Victory Road) and will determine the design height of the noise barrier in accordance with Transport for NSW's *Noise Mitigation Guideline*. The detailed design noise assessment will also consider the possibility and effectiveness of using low-noise pavement surfaces. Once noise has been minimised by feasible and reasonable methods during detailed design, receivers with residual exceedances of Noise Criteria Guideline (Road and Maritime, 2015) criteria can be assessed to determine if they qualify for at-property noise mitigation.

Potential noise and vibration impacts have been assessed and would be minimised with appropriate mitigation measures as discussed in Section 6.2 and Appendix F of the REF.

2.10.3 Mitigation

Submission number(s)

18, 19.

Issue description

- Requests detail on how noise will be mitigated.
- Typical cross section has not made allowance for any noise mounds or noise attenuation barriers along either side of the Townson Road upgrade and are not possible to be accommodated in the road reserve in the current cross-section design.

Response

All proposed mitigation measures have been provided in Section 6.2.5 of the REF. In general, a Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP. The NVMP will generally follow the approach in the *Interim Construction Noise Guideline* (DECC, 2009) and identify:

- All potential significant noise and vibration generating activities associated with the activity.
- Feasible and reasonable mitigation measures to be implemented, taking into account *Beyond the Pavement: urban design policy, process and principles* (Roads and Maritime, 2014).
- A monitoring program to assess performance against relevant noise and vibration criteria.
- Arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures.
- Contingency measures to be implemented in the event of non-compliance with noise and vibration criteria.

All sensitive receivers (eg schools, local residents) likely to be affected will be notified at least 7 days prior to commencement of any work associated with the activity that may have an adverse noise or vibration impact. The notification will provide details of:

- The proposal
- The construction period and construction hours
- Contact information for proposal management staff

- Complaint and incident reporting
- How to obtain further information.

Due to the relocation of the site compound area, additional assessment has been carried out on this change and is provided in section 4.3 of this report.

The operation of the proposal is likely to cause some additional noise disturbance due to road traffic noise. Noise levels are predicted to be exceeded at 37 sensitive receivers for the ultimate phase and 13 receivers for the interim phase of the proposal. Noise mitigation would be in the following order of preference:

- Quieter pavement surfaces
- Noise mounds
- Noise walls
- At-property treatments.

Quieter pavement surfaces are the preferred form of noise mitigation as it reduces source noise levels and has a low visual impact. This provides noise benefits to outdoor recreational areas in addition to reducing internal road traffic noise levels. The detailed design noise assessment will consider the possibility and effectiveness of using low-noise pavement surfaces

Noise barriers are considered where it would likely benefit four or more closely spaced receivers. Four residences along the northern side of Sunningdale Drive are close enough together to be considered in a noise barrier analysis for the ultimate design phase. A noise barrier analysis will be undertaken during the detailed design phase of the proposal considering where it is reasonable and feasible to construct a noise barrier along the southern side of Townson Road (east of Victory Road) and will determine the design height of the noise wall in accordance with Transport for NSW's Noise Mitigation Guideline.

Once noise has been minimised by feasible and reasonable methods during detailed design, receivers with residual exceedances of the Noise Criteria Guideline (Road and Maritime, 2015) can be assessed to determine whether they qualify for noise mitigation, at-property treatments.

2.11 Issue 6, Hydrology and flooding

Submission number(s)

11, 14.

Issue description

- Concern raised about flood levels on Townson Road
- Concerns for risks associated with flood events, including potential impacts to residents and assets in the North West Growth Area. Requests for detail related to mitigation measures for flood impacts.

Response

Flood modelling has been carried out to confirm the flood immunity of the proposal and to determine any local or regional flood impacts that may arise from the construction and operation of the proposal. It found that the lowest level of the proposal is close to the Bells Creek floodplain. The design of the proposal provides around 0.9 metres of freeboard. from the 0.2 per cent flood level in Bells Creek to the edge of the through carriageway of Townson Road at the low-point to the west of the bridge. Similarly, a minimal 0.5 metre freeboard has been allowed for the underside of the bridge deck crossing Bells Creek and the overland flow bridge. This will enable Townson Road to remain trafficable as a flood evacuation route during rare flood events up to a 0.2 per cent AEP (1:500 year event) magnitude. Downstream of Townson Road, there are localised minor increases of up to 0.05 metres in flood levels adjacent to Townson Road which occur at the proposed bridge opening locations but which is reduced to zero within one hundred metres downstream of the proposal.

Measures have been developed to mitigate adverse flood impacts on the Bells Creek watercourse and adjoining properties which could arise as a result of the proposal. These measures include the construction of a bridge over Bells Creek and a second flood relief bridge to the east across the Bells Creek floodplain including associated earthworks.

Further information on the expected flood conditions during operation is available as Appendix G of the REF. A summary of the assessment is provided in Section 6.3 of the REF.

The Stage 2 Townson Road Upgrade proposal design and assessment are still in progress. The main Eastern Creek crossing would be designed for a 1 in 100 year storm event with the structure likely to be a long bridge in the order of 300 metres.

2.12 Issue 7, Landscape character and visual amenity

Submission number(s)

19.

Issue description

- Requests detail on replanting trees after construction.

Response

Replanting will occur during the interim phase and again after construction of the ultimate phase of the proposal. An urban design report was prepared to inform the concept design and is provided as Appendix D of the REF.

The urban design strategy for the road corridor recognises the existing urban and landscape character and seeks to integrate the widened road and new bridge structures sensitively into the natural and suburban setting. The urban design would introduce a more formal arrangement to the landscape where adjacent to residential land uses. A naturalised character would be introduced adjacent to creek crossings and areas adjacent to existing vegetation.

2.13 Issue 8, Out of scope

2.13.1 Stage 2 Townson Road/Burdekin Road Upgrade

Submission number(s)

3, 12, 21

Issue description

- Concern about peak traffic at Burdekin Road and Hambledon Road intersection. Suggestion for traffic signals to be provided at this intersection.
- Concerns that traffic generation from the proposal will impact Burdekin Road which is already heavily congested. Questions if upgrades will occur at the Burdekin Road/Hambledon Road intersection, and Stanhope Parkway.
- Concerns for increased traffic and noise, and questions if noise mitigation measures will cover Burdekin Road to reduce impacts on residents.
- Request for additional noise mitigation for residents between Alex Avenue and Hambledon Road. Suggests vegetation barrier or noise wall.
- Concerns around when the construction would commence for Stage 2.

Response

The area of concern falls outside the Stage 1 Townson Road Upgrade REF study area and falls within Stage 2 of the Townson Road-Burdekin Road Link. The issues relating to Stage 2 of the Townson Road proposal will be considered during the concept design phase and REF for Stage 2.

As part of the REF for Stage 2, a traffic and transport assessment will be carried out and publicly displayed. This assessment will highlight impacts of the proposal on traffic flow and efficiency in the study area, during construction and operation. This assessment will be carried out and publicly displayed as part of the Stage 2 REF. This study will assess impact to the Townson Road to Burdekin Road corridor. This assessment will highlight impacts of the proposal on traffic flow and efficiency in the study area, during construction and operation.

A noise and vibration assessment will be carried out and publicly displayed as part of the Stage 2 REF. The assessment will highlight any affected properties impacted by the noise and vibration of this proposal and identify potential mitigation measures to be considered during the detail design of the proposal.

The concept design and REF for Stage 2 is currently being prepared and is likely to be publicly exhibited in late 2021. Following the display and submissions report, the proposal approval is likely to be granted in late 2021/early 2022.

The proposal is to be delivered in stages – interim and ultimate. The delivery of the proposal would initially provide an interim phase with a single carriageway, one lane in each direction, on the southern side of the road corridor incorporating earthworks to allow future full road construction. The planning and delivery of works would be managed by the Department of Planning Industry and Environment, Blacktown City Council and the Developer. The start of construction is dependent on the re-zoning of West Schofields Precinct and approval and agreement between the three parties.

2.13.2 Other projects

Submission number(s)

2, 13, 15.

Issue description

- Will any of the roads lead to Quakers Hill Parkway as traffic has become congested due to just one connection between Quakers Hill Parkway and Hambledon Road.
- Suggest development of Bandon Road and Richmond Road is likely to improve traffic congestion through Riverstone.
- Suggest provision of new left slip lane westbound of Alderton Drive to reduce traffic and widening of Richmond Road to six lanes.

Response

The main objective of the Townson Road to Burdekin Road proposal is to improve capacity along Townson Road between Richmond Road and Jersey Road. The area of Quakers Hill Parkway falls outside the study area of Stage 1. The Stage 2 of the proposal will provide a new road between Jersey Road and Burdekin Road, including a bridge crossing of the rail line at Schofields.

Transport for NSW will consider these issues raised during the concept design phase and REF for the Stage 2 of the proposal. As part of the REF for Stage 2, a traffic and transport assessment will be carried out and publicly displayed. This assessment will highlight impacts of the proposal on traffic flow and efficiency in the study area, during construction and operation.

Impacts to traffic flow outside the study area will need to be discussed with Blacktown City Council as Alex Avenue and Hambledon Road are owned and maintained by Blacktown City Council.

It is noted that there are a growing number of dwellings in the wider area around the proposal and there are existing concerns in the community about lack of access to Quakers Hill Parkway. This proposal however, does not include a link to Quakers Hill Parkway, as this is outside the scope of this proposal. As part of the Schofields Precinct Indicative Layout Plan, there is a strategy to extend Veron Road south to Quakers Road. The timing for this extension is unknown.

The NSW Government is planning for the future by finalising the new Bandon Road corridor between Richmond Road, Marsden Park and Windsor Road, Vineyard. Bandon Road is part of the North West Growth Centre Road Network Strategy. Consultation on the Bandon Road project has concluded. The final Bandon Road corridor is proposed as medium-term work and is subject to funding availability. Details of the Bandon Road project can be found at the following Transport for NSW website: https://roads-waterways.transport.nsw.gov.au/projects/north-west-growth-centre-strategy/bandon-road.html

The NSW Government is planning the upgrade of Richmond Road from Elara Boulevard to Heritage Road, Marsden Park. Consultation and display of the REF for the project was carried out in 2020. Details of the Richmond Road project can be found at the following Transport for NSW website: https://roads-waterways.transport.nsw.gov.au/projects/north-west-growth-centre-strategy/richmond-road-upgrade.html

The area of Alderton Drive falls outside the operational study area of the proposal. The main objective of the Townson Road to Burdekin Road Link project is to improve capacity along Townson Road between Richmond Road and Jersey Road. Impacts to traffic flow outside the study area, on local roads such as Alderton Drive, will need to be discussed with Blacktown City Council who owns and maintains them.

2.13.3 Other concerns and suggestions

Submission number(s)

15, 20.

Issue description

- Suggests appropriate signage at the intersection of South Street and Carnarvon Road, Schofields to warn west bound vehicles not to traffic through Carnarvon Road and Durham Road towards Townson Road, to alleviate traffic volumes on Townson Road.
- Concerns that bus stop location on Richmond Road impacts access at 6 Towson Road. Suggests change in bus stop design and redesign of intersection to allow for a second crossover point on Townson Road.

Response

The intersection of South Street and Carnarvon Road falls outside the operational study area of the proposal. The main objective of the Townson Road to Burdekin Road Link proposal is to improve capacity along Townson Road between Richmond Road and Jersey Road.

Impacts to traffic flow outside the study area on local roads, will need to be discussed with Blacktown City Council who owns and maintains them.

Potential relocation of a bus stop on Richmond Road to facilitate access to Kenco is outside the scope of the Townson Road Upgrade proposal. Any such proposal would need to be part of future development application by Kenco.

3. Changes to the proposal

3.1 Change 1 – change to the construction compound location

3.1.1 Description

The proposed location for the construction compound site was on the southern side of the proposal site. This site is currently vacant and therefore no demolition of structures was required to use the site. This site and the activities associated with it was discussed in Section 3.4 of the REF.

The new location for the compound is at the north eastern end of the proposal. The new site is also currently vacant and therefore no demolition of structures would be required to use the site. The operational hours and activities within the compound will remain as described in Section 3.4 of the REF.

The location of the former and new compound site is shown in Figure 3.1.

This change is required following further consultation with the property owner, which confirmed the original location would not be available at the time of construction. The new site is owned by the same property owner who proposed this location as an alternative site. This site is also within a property already partially impacted by construction of the proposal.

Part of this site is outside of the exhibited construction footprint and would therefore require additional temporary leasing.

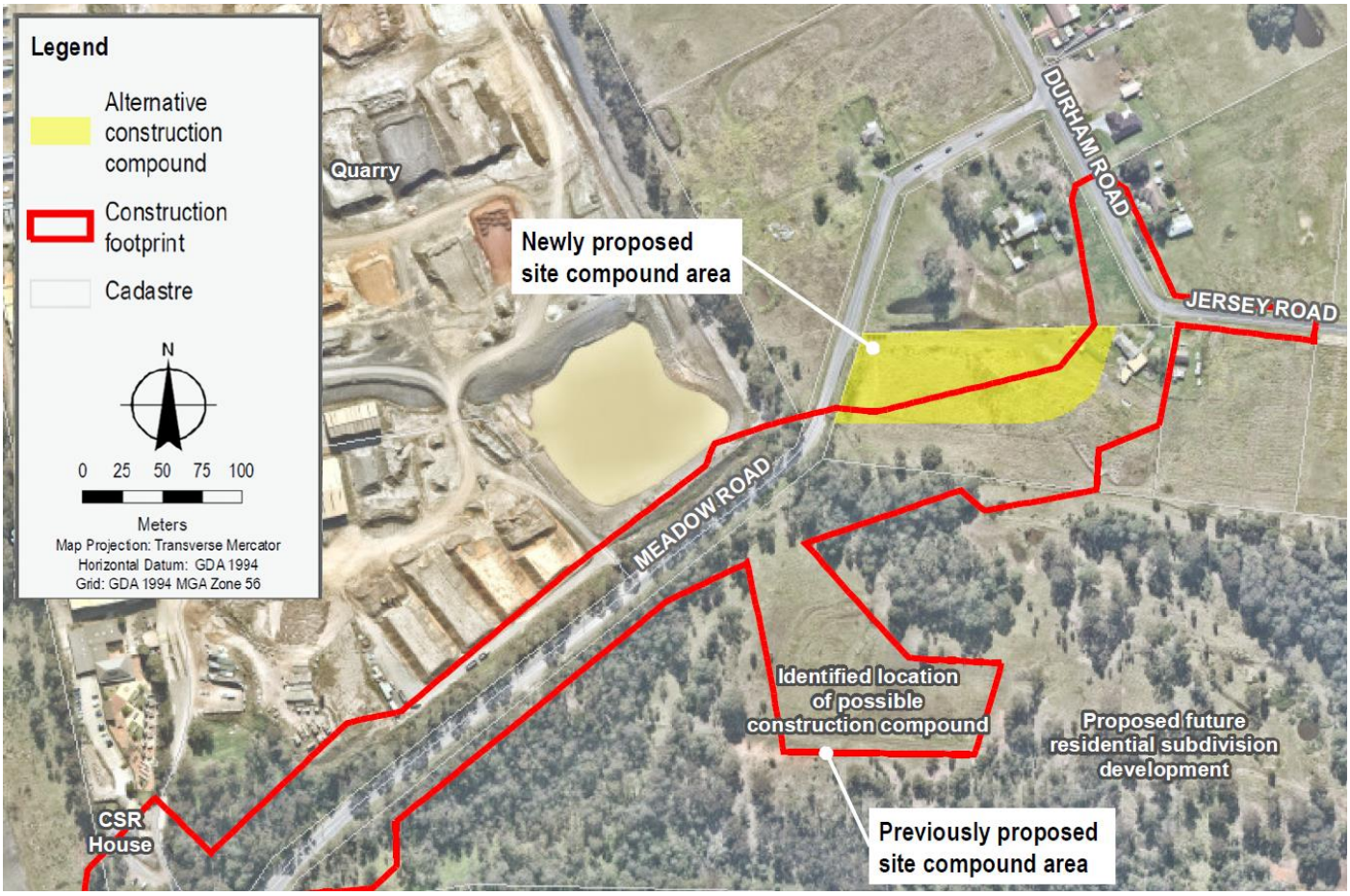

Figure 3.1: Change in compound site location

3.2 Change 2 – temporary access road on Townson Road

3.2.1 Description

During construction, Townson Road through traffic was proposed to be diverted from the proposal area to a temporary diversion through Victory Road and Alderton Drive for a period of six months during the construction of the Bells Creek Bridge and the flood relief bridge.

Following receipt of submissions on the REF, the construction stage of the proposal has been refined to enable Townson Road to remain open throughout the construction period for local traffic. Blacktown City Council also requested an option which would maintain a through route along Townson Road which would avoid the need to use the alternative Victory Road and Alderton Drive detour. An additional access provision was therefore investigated to provide and maintain temporary access along Townson Road during construction of Bells Creek Bridge and the flood relief bridge.

Figure 3.2 shows a temporary access road would be provided along the northern boundary of the construction works to maintain access to the Nursery and the CSR Brickworks site and provide a through route.

This road will comprise a single traffic controlled lane, either signalised or with a traffic controller. This will provide two property access points into the Nursery. It will connect into the existing Townson Road at either end, allowing trucks from CSR and other through traffic access along the Townson Road corridor. This road will be operational for around 6 months during construction of Bells Creek Bridge and the flood relief bridge.

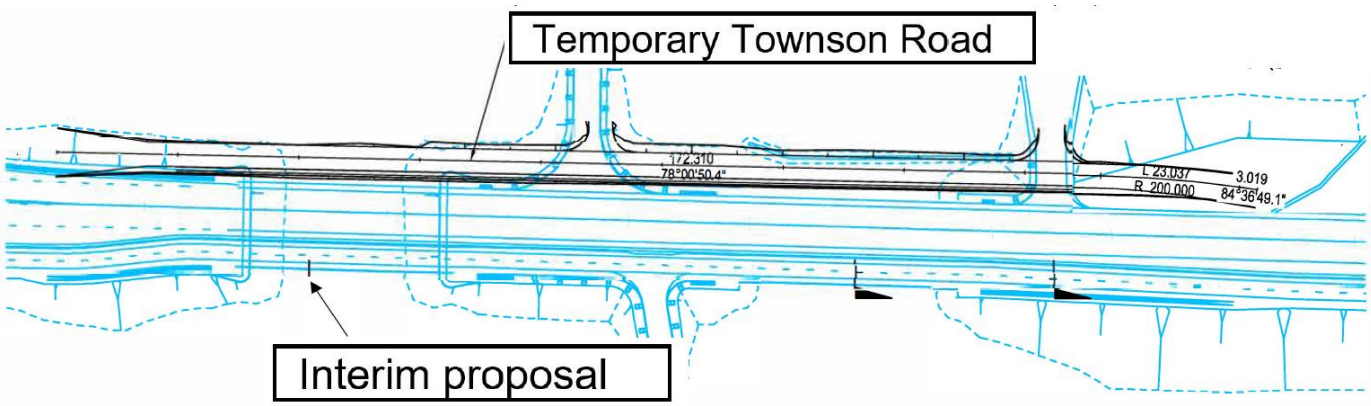

Figure 3.2: Temporary access road on Townson Road

A single lane temporary road has been assessed as adequate based upon the existing traffic volumes as reported in the traffic and transport impact assessment provided in Appendix E of the REF. This data was collected from traffic counts carried out in September 2019.

Table 3.1 shows the existing volumes for the east and westbound traffic on Townson Road between the Richmond Road intersection and the Victory Road intersection. The network AM peak hour was identified as 7.15 am to 8.15 am and the PM peak hour was identified as 4.45 pm to 5.45 pm.

This shows the low volumes of vehicles which would need to utilise the temporary access road.

Table 3.1: Townson Road existing peak hour traffic volumes

	AM Peak eastbound	AM Peak westbound	PM Peak eastbound	PM Peak westbound
Total volume	74	259	146	132
Heavy vehicles	5	8	5	1
Light vehicles	69	251	141	131

The additional access would be achieved within the existing construction footprint and would not result in additional permanent or temporary property acquisition or leasing.

Provision of the through route during construction will negate the need to use Alderton Drive and Victory Road as a detour. The predicted impacts from detoured traffic onto these roads will therefore be avoided. Mitigation measures T4 and NV6, listed in section 5.2, have been revised to take account of this and have removed reference to the detour routes.

General arrangement drawings and cross sections are provided in Appendix A.

3.3 Change 3 – Other minor construction footprint changes

3.3.1 Description

Further design changes, since display of the REF, have identified the need to amend the construction footprint of the proposal.

A minor change to the construction footprint is required at both the eastern Richmond Road end and north-western Durham Road end, of the proposal. This work would comprise minor adjustments to the level of the existing roads in order to tie-in the proposal to the existing road carriageways and associated utility adjustments. This work is within the existing road corridor of Richmond Road to the west and Jersey Road to the east. No additional land acquisition is required.

Another minor change to the construction boundary is required on the south side of the proposal around the planned new road. This is to accommodate construction of a drainage channel.

The changes are shown in Figure 3.3 which shows the footprint from the exhibited REF and the new construction footprint.

Additional design refinements since display of the REF have identified the need fortwo additional accesses for Durham Road 61 and 61B to be provided. These are located within the construction footprint of the REF and do not require any further property acquisition. Adjustments comprise minor changes to the levels of existing access to tie-in with the upgraded carriageway. Property adjustment plans would be developed in consultation with the affected property owners.

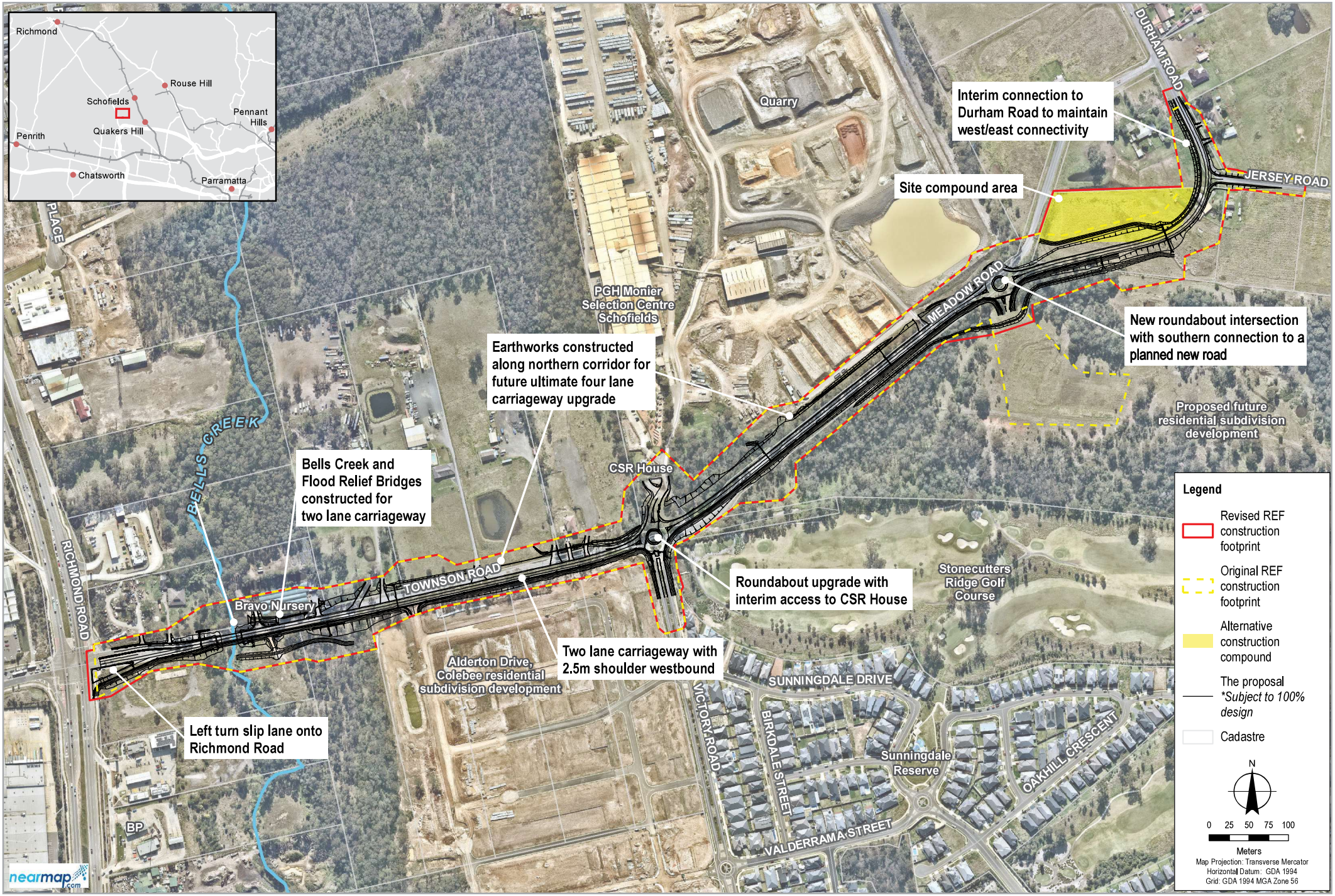

Figure 3.3 Revised interim proposal

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4. Environmental assessment

4.1 Environmental impact screening assessment

An environmental impact screening assessment was carried out for the revised proposal (refer to section 3.1) to determine if these refinements could result in consequential changes to any of the impacts as presented in the amendment report. The revised proposal is shown in Figure 3.3.

Where the initial screening assessment identifies that the refinement is unlikely to result in a change to the potential impacts as presented in the REF, no further assessment was required. Additional environmental impact assessment has been provided where a potential change to impact was identified in the environmental impact screening.

The environmental impact screening assessment is presented in Table 4.1. Table 4.1 identifies the environmental aspects where additional environmental assessment of the proposed refinements is required and the aspects where no further assessment is required. Where further detailed assessment is required, this, along with any amended mitigation measures, are provided in sections 4.2 to 4.3.

Table 4.1: Environmental screening assessment

Environmental aspect	Changes to any of the impacts as presented in the REF	Further assessment required
Traffic and transport	The key construction impact identified in Section 6.1 of the REF related to temporary closure of Townson Road during bridge construction. The proposal would now maintain a through route along Townson Road during construction (see section 3.2). This negates the need to close Townson Road during construction and would therefore avoid this impact. The proposed change to the location of the compound site (see section 3.1) and other minor changes (see section 3.3) will not impact the predicted construction traffic generation. The new location of the site compound remains adjacent to the proposal site so would not generate additional traffic volumes on local roads. Impacts from construction works will continue to be managed by the mitigation measures detailed in Section 7.2 of the REF, and reproduced in section 5.2 of this report. Provision of the through route during construction will negate the need to use Alderton Drive and Victory Road as a detour. Mitigation measure T4, listed in section 5.2, has been revised to take account of this and reference to the detour route has been removed.	No

Environmental aspect	Changes to any of the impacts as presented in the REF	Further assessment required
Noise and vibration	The key impact identified in Section 6.2 of the REF related to the distance of construction work to sensitive receivers. The new location of the compound site (see section 3.1) will locate it near new receivers. As a result, an additional assessment has been undertaken as described in section 4.3. The proposal would now maintain a through route along Townson Road during construction (see section 3.2). This negates the need to close Townson Road during construction. This will result in minimising noise impacts generated along Victory Road and Alderton Drive from diverted traffic during this period. Other minor changes (see section 3.3) would not alter the noise and vibration assessment.	Yes
Hydrology and flooding	Section 6.3 of the REF assesses potential impacts to hydrology and flooding caused by construction of the proposal. No additional impacts are anticipated from the proposed changes to the proposal. Impacts from construction works will continue to be managed by the mitigation measures detailed in Section 7.2 of the REF, and reproduced in section 5.2 of this report.	No
Surface water and groundwater	Section 6.4 of the REF assesses potential impacts to surface and groundwater caused by construction of the proposal. No additional impacts are anticipated from the proposed changes to the proposal. Impacts from construction works will continue to be managed by the mitigation measures detailed in Section 7.2 of the REF, and reproduced in section 5.2 of this report.	No
Soils and contamination	Section 6.5 of the REF assesses potential impacts from soils and contamination caused by construction of the proposal. No additional impacts are anticipated from the proposed changes to the proposal. Impacts from construction works will continue to be managed by the mitigation measures detailed in Section 7.2 of the REF, and reproduced in section 5.2 of this report.	No
Biodiversity	The key impact identified in Section 6.6 of the REF was the potential for removal or temporary disturbance to native vegetation, including listed threatened communities. The new location of the compound site will impact a new location. As a result, an additional assessment has been undertaken as described in section 4.2.	Yes
Aboriginal cultural heritage	Section 6.7 of the REF assesses potential impacts to Aboriginal cultural heritage caused by construction of the proposal. The changes to the proposal outlined in sections 3.1 to 3.3 will not impact any new sites or alter the impacts predicted. Impacts from construction works, including unexpected finds, will continue to be managed by the mitigation measures detailed in Section 7.2 of the REF, and reproduced in section 5.2 of this report.	No

Environmental aspect	Changes to any of the impacts as presented in the REF	Further assessment required
Non-Aboriginal heritage	Section 6.8 of the REF assesses potential impacts to non-Aboriginal heritage caused by construction of the proposal. No additional sites will be impacted from the proposed changes to the proposal. Impacts from construction works, including unexpected finds, will continue to be managed by the mitigation measures detailed in Section 7.2 of the REF, and reproduced in section 5.2 of this report.	No
Landscape character and visual impacts	Section 6.9 of the REF assesses potential impacts to landscape character and visual amenity, caused by construction of the proposal. This identified a temporary visual change to the landscape from provision of a compound site. The new location for the site compound (see section 3.1) is within a lot that is already part of the construction works area and therefore will not create visual impacts to new receivers. The other changes to the proposal outlined in sections 3.2 and 3.3, will not change the predicted impacts of the proposal. Impacts from construction works will continue to be managed by the mitigation measures detailed in Section 7.2 of the REF, and reproduced in section 5.2 of this report.	No
Air quality	Section 6.10 of the REF assesses potential impacts to air quality caused by construction of the proposal. No additional impacts are anticipated from the proposed changes to the proposal. Impacts from construction works will continue to be managed by the mitigation measures detailed in Section 7.2 of the REF, and reproduced in section 5.2 of this report.	No
Property and land use	Section 6.11 of the REF discusses impacts to land use and property resulting from of the proposal. This section notes that '*Leasing requirements are unknown at this stage and would be identified during detailed design of the proposal*.' The new site is owned by the same property owner who proposed this location as an alternative for leasing. This site is also within a property already partially impacted by construction of the proposal. The other changes to the proposal outlined in sections 3.2 and 3.3, will not change the predicted impacts of the proposal. The proposed changes do not result in permanent changes to property and land use.	No
Socio-economic	Section 6.12 of the REF assesses potential impacts to socio-economic issues caused by construction of the proposal. Delays to bus route 742 were identified related to the temporary closure of Townson Road during bridge construction. The proposal would now maintain a through route along Townson Road during construction (see section 3.2). This negates the need to close Townson Road during construction and would therefore avoid this impact.	Yes

Environmental aspect	Changes to any of the impacts as presented in the REF	Further assessment required
	The proposed change to the location of the compound site has the potential to change temporary noise impacts to residential receivers. As a result, additional noise assessment has been undertaken, as described in section 4.3. The other changes to the proposal outlined in section 3.3, will not change the predicted impacts of the proposal. Impacts from construction works will continue to be managed by the mitigation measures detailed in Section 7.2 of the REF, and reproduced in section 5.2 of this report.	
Resource use and waste	Section 6.13 of the REF assesses potential resource use and waste issues arising from the proposal. No additional impacts are anticipated from the proposed changes to the proposal. Impacts from construction works will continue to be managed by the mitigation measures detailed in Section 7.2 of the REF, and reproduced in section 5.2 of this report.	No
Sustainability and climate change	Section 6.13 of the REF sustainability requirements related to the proposal. No amendments to these requirements are anticipated from the proposed changes to the proposal.	No
Cumulative impacts	Section 6.13 of the REF assesses potential cumulative impacts arising from the proposal. Small changes are anticipated relating to biodiversity and noise impacts are anticipated which are reported in sections 4.2 and 4.3. These changes are not considered to alter the cumulative impact assessment previously reported. Impacts from construction works will continue to be managed by the mitigation measures detailed in Section 7.2 of the REF, and reproduced in section 5.2 of this report.	No

4.2 Biodiversity

4.2.1 Methodology

Field surveys of the proposal study area were completed on 13 and 14 November and 4 December 2019. The newly proposed site compound area was inspected as part of these surveys, as it fell within the overall study area considered during that field survey, with two GHD ecologists traversing the area on foot and visually assessing the wider lot for biodiversity values. Targeted threatened flora surveys were completed for threatened flora species predicted to occur by the desktop searches conducted as part of the biodiversity assessment provided in Appendix J of the REF.

Additional field survey of the newly proposed site compound area was completed by three GHD ecologists on 5 May 2021, to confirm the findings of the 2019 field surveys.

The spatial data for the newly proposed site compound area was overlaid on the GHD vegetation mapping completed for the biodiversity assessment provided in Appendix J of the REF, to confirm that there was no overlap with any biodiversity values identified is this assessment.

4.2.2 Description of existing environment

The newly proposed site compound area is 100 metres north east from the initially identified compound area as shown in Figure 3.1. The newly proposed site compound area is located entirely within certified land and supports exotic grassland. The site is a heavily disturbed horse paddock and lacks any intact native vegetation or habitat features of relevance for predicted threatened species.

4.2.3 Potential impacts

Potential impacts from the new compound site location, would be limited to the removal of exotic grassland only, with no impact to native vegetation or habitat features of relevance to predicted threatened species. Exotic grassland contains limited habitat resources of relevance to most native species due to low structural and floristic diversity. Exotic grasses and herbs may provide foraging resources for relatively mobile and opportunistic native fauna species, however no species would depend on the habitat within the newly proposed site compound area for their continued persistence in the local area.

The biodiversity values in the newly proposed site compound footprint are minimal compared to the previously selected site, which would have resulted in direct impacts to the threatened flora species, *Grevillea juniperina* subsp*. juniperina,* which is listed as a vulnerable species under the *Biodiversity Conservation Act 2016*. Locating the compound site in the newly proposed site compound area would result in a reduction in the number of *Grevillea juniperina* subsp*. juniperina* that are impacted by the proposal and would reduce the likelihood of edge effects in stands of adjacent intact native vegetation.

An additional area of Cumberland Plain Woodland would be impacted by the expansion of the construction footprint next to the intersection for the new planned road. This area comprises 0.06 hectares (ha) and is within certified land. There are no additional impact predicted to habitat for threatened flora are identified. The details of additional vegetation impacted are presented in Table 4.2 and shown on Figure 4.1.

Table 4.2: Change to the extent of native vegetation clearing

Plant community type (PCT)	TEC	Status [1]		Vegetation to be cleared (ha) within the REF construction footprint			Vegetation to be cleared (ha) within the revised construction footprint			Total change in area of vegetation to be cleared (ha)		
		BC Act	EPBC Act	Non-certified land	Certified land	Total	Non-certified land	Certified land	Total	Non-certified land	Certified land	Total
Grey Box – Forest Red Gum grassy woodland on flats – poor condition (PCT ID 849)	Cumberland Plain Woodland	CEEC	-	0.13	0.51	0.64	0.13	0.51	0.64	0	0	0
Grey Box – Forest Red Gum grassy woodland on flats - high condition (PCT ID 849)	Cumberland Plain Woodland	CEEC	CEEC	0.47	3.28	3.75	0.47	3.34	3.81	0	0.06	0.06
Forest Red Gum – Rough-barked Apple grassy woodland – poor condition (PCT ID 835)	River-flat Eucalypt Forest	EEC	EEC	0.10	0.00	0.10	0.10	0.00	0.10	0	0	0
Forest Red Gum – Rough-barked Apple grassy woodland – moderate condition (PCT ID 835)	River-flat Eucalypt Forest	EEC	CEEC	0.30	0.00	0.30	0.30	0.00	0.30	0	0	0

Note 1: BC Act: Biodiversity Conservation Act 2016 (NSW); EPBC Act: Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth); CEEC: Critically endangered ecological community; EEC: Endangered ecological community

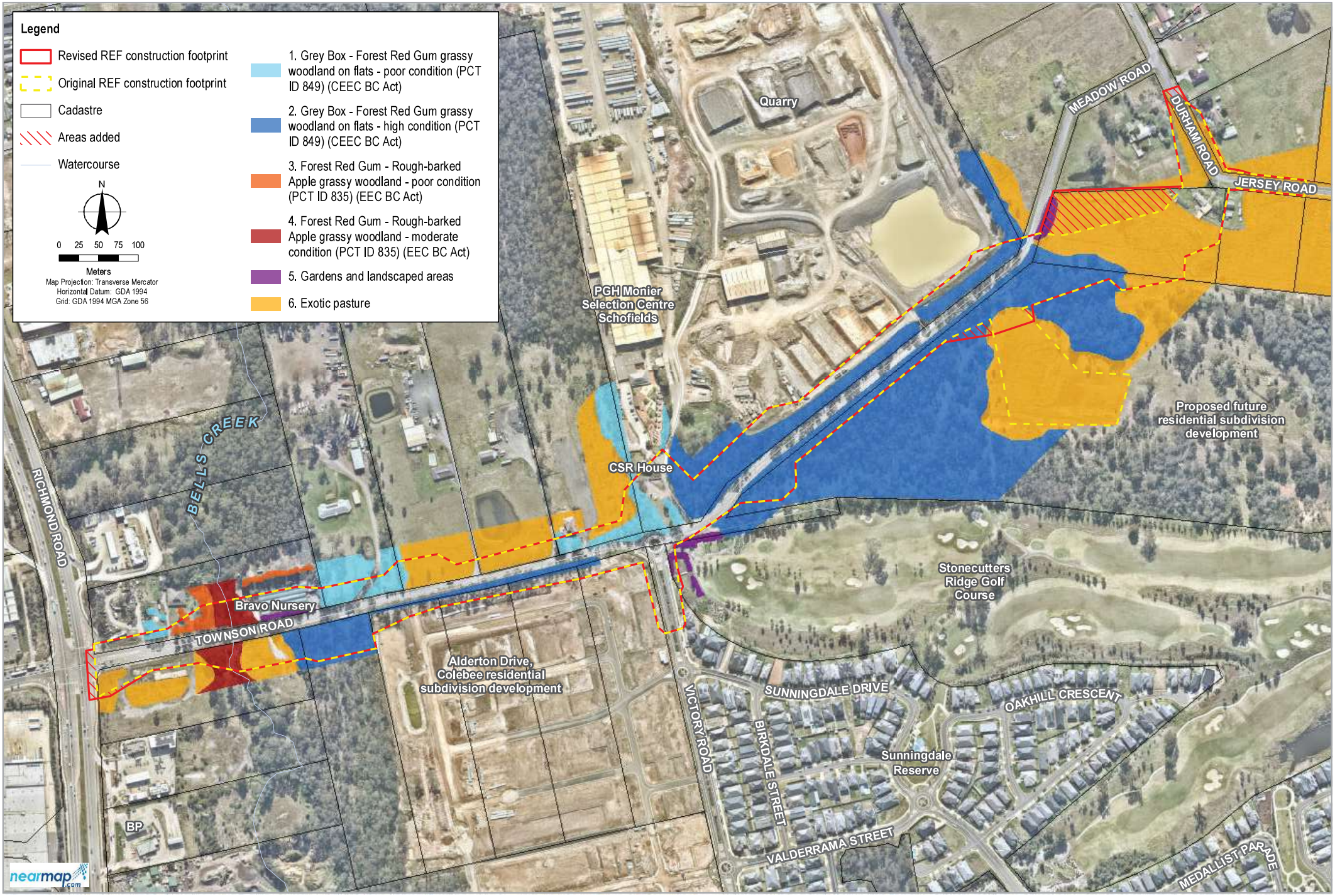


Figure 4.1 Changes to biodiversity impacts

G:\21\12511195\GIS\Maps\Deliverables\SubmissionsReport\21_12511195_Z006_Stage1_SR_DesignStageVariations.mxd Print date: 16 Jul 2021 - 08:39 - KENV, biocertification, threatened flora/fauna - OEH.
Data source:Aerial Imagery - Nearmap 2020 (image date 03/08/2020, image extracted 28/09/2020) . Created by: ebbertson

4.2.4 Revised safeguards and management measures

No additional requirement for statutory or non-statutory offsets, above that identified in Section 6.6.5 of the REF, are required.

Safeguards and management measures should be as detailed in Section 7.2 of the REF, and reproduced in section 5.2 of this report.

4.3 Noise and vibration

4.3.1 Methodology

A noise and vibration assessment has been undertaken in order to identify potential impacts to surrounding receivers from the use of the construction compound in the alternative location shown in Figure 3.1. The assessment receivers, noise management levels and modelling methodology are consistent with those established in the noise and vibration impact assessment provided in Appendix F and Section 6.2 of the REF. A summary of the noise management levels, and noise modelling methodology are provided below.

Noise modelling was undertaken using Sound Plan 8.2 with environmental noise propagation calculated according to *ISO 9613-2 'Acoustics – Attenuation of sound during propagation outdoors'*.

The construction compound noise generating equipment likely to be used in the construction compound are listed below. The sound power levels for the individual equipment are outlined in Section 4.6 of the noise and vibration assessment in Appendix F of the REF:

- Excavator (20-35 tonnes)
- Grader
- Light vehicle (4 wheel drive)
- Trucks
- Vibratory Rollers (12-15 tonnes)
- Water truck.

The activity sound power level for the construction compound is a representative worst-case value assigned to the scenario and is representative of the two loudest items of equipment operating at a single point at the nearest distance between the construction area and the receiver. For the construction compound the activity sound power level used for modelling purposes is 113 dBA.

4.3.2 Description of existing environment

The existing noise environment for the area is outlined in Section 4.4 of the noise and vibration assessment in Appendix F of the REF. Four noise catchment areas (NCA) were established, and the construction noise management levels derived as per the *Interim Construction Noise Guideline* (DECC, 2009) are outlined in Table 4.3.

Table 4.3: Proposal specific construction noise management level, dBA

Receiver area	Construction noise management level, $L_{Aeq\ (15min)}$					
	During standard recommended hours		Outside of standard recommended hours			
	7 am to 6 pm Monday to Friday, 8 am to 1 pm Saturday, no work on Sunday or public holidays		Day 7 am to 8 am and 1 pm to 6 pm Saturday, 8 am to 6 pm Sunday and public holidays	Evening 6 pm to 10 pm Monday to Sunday and public holidays	Night 10 pm to 7 am, Monday to Saturday; 10 pm to 8 am Sunday and public holidays	Sleep dist. criteria[1] L_{Amax}
	Noise affected	Highly noise affected				
Residential (NCA01 and NCA02)	53	75	48	44	42	65
Residential (NCA03)	53	75	48	43	42	65
Residential (NCA04)	53	75	43	41	36	65
Child care centre	55 (External noise level)[1]					
Golf course	60[1]					
Commercial premises	70[1] (External noise level)					
Industrial premises	75[1] (External noise level)					

Note 1: Applies when properties are being used.

4.3.3 Potential impacts

Predicted impacts from the construction compound are summarised in Table 4.4.

These results show that no residential receivers within NCA01, NCA02 or NCA03 are predicted experience noise levels that exceed the noise management levels. Exceedances of the noise management level are predicted at 15 of the residential receivers within NCA04. Of these, one residential receiver, R926 at 46 Durham Road is predicted experience noise levels that exceed the highly noise affected level. However, it should be noted that this property has been identified as being acquired.

No non-residential receivers are predicted to experience noise levels that exceed the relevant noise management levels.

Table 4.4: Summary of predicted noise levels and number of exceedances above Standard Hours noise management level

NCA		Alternate compound site
NCA01	Number of exceedances	0
	Highest noise level	34
	Highest exceedance	-
	Worst affected receivers	R037, R288, R451
NCA02	Number of exceedances	0
	Highest noise level	42
	Highest exceedance	-
	Worst affected receivers	R308, R699, R787
NCA03	Number of exceedances	0
	Highest noise level	47
	Highest exceedance	-
	Worst affected receiver	R832
NCA04	Number of exceedances	15
	Highest noise level	77
	Highest exceedance	29
	Worst affected receiver	R926 (acquired)

The use of a vibratory roller within the construction compound has the potential to cause human comfort impacts or cosmetic damage due to vibration. The determined minimum safe working distance for cosmetic damage due to vibratory rolling works is 20 metres. One building in the study area falls within this distance of the alternative compound location, being R926 at 46 Durham Road. However, this property has been identified as being acquired.

4.3.4 Revised safeguards and management measures

To reduce potential construction noise and vibration impacts, standard mitigation measures are outlined in Section 7.2 of the REF, and reproduced in section 5.2 of this report. Provision of the through route on Townson Road during construction will negate the need to use Alderton Drive and Victory Road as a detour. The predicted impacts from detoured traffic onto these roads will therefore be avoided. Mitigation measure NV6, listed in section 5.2, has been revised to take account of this and reference to the detour route has been removed.

The *Construction Noise and Vibration Guideline* (RMS, 2016) provides information regarding further mitigation measures for certain receivers exceeding various trigger levels above the noise management level. During standard hours, receivers where the predicted noise level is greater than 10 dBA above the noise management level qualify for additional mitigation measures.

Details of receivers at which noise levels exceed the noise management level have been revised and are provided in Table 4.5, with applicable additional mitigation measures. These measures are detailed below.

Table 4.5: Predicted noise level and additional mitigation measures

Receiver ID	Address	Receiver Type	NCA	Predicted noise level, dBA	Additional management measures
R911	61 Durham Road Schofields	Residential	NCA04	66	N, V
R912	43 Durham Road Schofields	Residential	NCA04	51	-
R914	55 Durham Road Schofields	Residential	NCA04	59	N, V
R915	43 Durham Road Schofields	Residential	NCA04	52	-
R922	39 Durham Road Schofields	Residential	NCA04	50	-
R923	61 Durham Road Schofields	Residential	NCA04	65	N, V
R926	46 Durham Road Schofields	Residential	NCA04	77	N, V, PC, RO
R927	25 Jersey Road Schofields	Residential	NCA04	53	-
R928	12 Jersey Road Schofields	Residential	NCA04	49	-
R929	42 Jersey Road Schofields	Residential	NCA04	68	N, V
R930	32 Jersey Road Schofields	Residential	NCA04	56	-
R931	15 Jersey Road Schofields	Residential	NCA04	49	-
R932	9 Jersey Road Schofields	Residential	NCA04	50	-
R954	5 Meadow Road Schofields	Residential	NCA04	67	N, V
R955	10 Meadow Road Schofields	Residential	NCA04	57	-

Notification (letterbox drop or equivalent) (N)

Advanced warning of works and potential disruptions can assist in reducing the impact on the community. The notification may consist of a letterbox drop (or equivalent) detailing work activities, time periods over which these will occur, impacts and mitigation measures. Notification should be a minimum of 5 working days prior to the start of works. The approval conditions for projects may also specify requirements for notification to the community about works that may impact on them.

Phone calls (PC)

Phone calls detailing relevant information made to identified/affected stakeholders within seven calendar days of proposed work. Phone calls provide affected stakeholders with personalised contact and tailored advice, with the opportunity to provide comments on the proposed work and specific needs. Where the resident cannot be telephoned then an alternative form of engagement should be used.

Respite Offers (RO)

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

The purpose of such an offer is to provide residents with respite from an ongoing impact. This measure is evaluated on a project-by-project basis, and may not be applicable to all projects.

Verification (V)

Verification of noise and vibration levels would be undertaken as part of routine checks of noise levels or following reasonable complaints. This verification should include measurement of the background noise level and construction noise. Note this is not required for projects less than three weeks unless to assist in managing complaints.

5. Environmental management

The REF for the Townson Road Upgrade between Richmond Road and Jersey Road – Stage 1 identified the framework for environmental management, including safeguards and management measures that would be adopted to avoid or reduce environmental impacts (Section 7.1 of the REF).

After consideration of the issues raised in the public submissions and changes to the proposal, the safeguard and management measures have been revised. Revisions include minor changes to responsibilities and timing of work and a change to T4 and NV6 in relation to traffic diversion routes.

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

5.1 Environmental management plans (or system)

A number of safeguards and management measures have been identified in order 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 Construction Environmental Management Plan (CEMP) will be prepared to describe safeguards and management measures identified. The PEMP and CEMP will provide a framework for establishing how these measures will be implemented and who would be responsible for their implementation.

The PEMP and CEMP will be prepared prior to construction of the proposal and must be reviewed and certified by environment staff, 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 PEMP and CEMP 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 QA Specification G40 – Clearing and Grubbing and QA Specification.

5.2 Summary of safeguards and management measures

The REF for the Townson Road Upgrade between Richmond Road and Jersey Road – Stage 1 identified a range of environmental outcomes and management measures that would be required to avoid or reduce the environmental impacts.

After consideration of the issues raised in the public submissions, the environmental management measures for the proposal (refer to Chapter 7 of the REF) have been revised. Should the proposal proceed, the environmental management measures in Table 5.1 will guide the subsequent phases of the proposal. Additional and/or modified environmental safeguards and management measures to those presented in the REF have been underlined and deleted measures, or parts of measures, have been struck out.

Table 5.1: Summary of environmental safeguards and management measures

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
General					
GEN1	General - minimise environmental impacts during construction	A CEMP will be prepared and submitted for review and endorsement of the Transport for NSW Environment Manager prior to commencement of the activity. As a minimum, the CEMP will address the following: • Any requirements associated with statutory approvals • Details of how the proposal will implement the identified safeguards outlined in the REF • Issue-specific environmental management plans • Roles and responsibilities • Communication requirements • Induction and training requirements • Procedures for monitoring and evaluating environmental performance, and for corrective action • Reporting requirements and record-keeping • Procedures for emergency and incident management • Procedures for audit and review. The endorsed CEMP will be implemented during the undertaking of the activity.	Contractor/ Blacktown City Council	Pre-construction/detailed design	Core standard safeguard GEN1
GEN2	General - notification	All businesses, residential properties and other key stakeholders (eg schools, local councils) affected by the activity will be notified at least five days prior to commencement of the activity.	Contractor/ Blacktown City Council	Pre-construction	Core standard safeguard GEN2

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
GEN3	General – environmental awareness	All personnel working on site will receive training to ensure awareness of environment protection requirements to be implemented during the project. This will include up-front site induction and regular 'toolbox' style briefings. Site-specific training will be provided to personnel engaged in activities or areas of higher risk. These include: • Areas of Aboriginal heritage sensitivity • Threatened species habitat and areas of ecological sensitivity and requiring protection • Adjoining residential areas requiring particular noise management measures.	Contractor/ Blacktown City Council	Pre-construction/ detailed design	Core standard safeguard GEN3

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
Traffic and transport					
T1	Traffic and transport	A Traffic Management Plan (TMP) will be prepared and implemented as part of the CEMP. The TMP will be prepared in accordance with the Roads and Maritime Traffic Control at Work Sites Manual (RTA, 2010). The TMP will include: • Confirmation of haulage routes • Measures to maintain access to local roads and properties • Site specific traffic control measures (including signage) to manage and regulate traffic movement • Measures to maintain pedestrian and cyclist access • Requirements and methods to consult and inform the local community of impacts on the local road network • Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads. • A response plan for any construction traffic incident • Consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic • Monitoring, review and amendment mechanisms.	Contractor	Detailed design/ Pre-construction	Core standard safeguard TT1 Section 4.8 of QA G36 Environment Protection

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
T2	Emergency services access	Consultation with emergency service authorities will be undertaken during development of the detailed design and maintained throughout construction as the proposal progresses.	Contractor/ Blacktown City Council	Detailed design and Construction	Additional safeguard
T3	Access during construction	Current traffic movements and property accesses are to be maintained during the work. Any disturbance is to be minimised to prevent unnecessary traffic delays and businesses/residences informed.	Contractor	Construction	Core standard safeguard T1
T4	Management of heavy vehicles	An assessment of heavy vehicles from construction and through traffic ~~(on diversion routes)~~ will consider: • Vehicle types/maximum size which can negotiate the road network. ~~In particular Alderton Drive and Victory Road due to restricted manoeuvrability of longer vehicles~~ • Coordination to prevent queuing or double parking.	Contractor	Construction	Additional safeguard
T5	Worker parking	Provision of parking within compound and work sites for workers and construction vehicles.	Contractor	Construction	Additional safeguard
T6	Road closures	• TCPs will be developed in accordance with Roads and Maritime Traffic Control at Work Sites manual (2018) and AS1742.3 – Traffic Control for Works on Roads • Residences and businesses in the local area will be notified on any road closures.	Contractor	Construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
T7	Pedestrian and cyclists	• Safe pedestrian and cyclist access around and past the work site will be provided. Pedestrians will be clearly directed to utilise formed paths where possible or temporary paths will be provided as a short- term measure • Clear visibility at the site egress along the road network and the pedestrian pathway will be maintained.	Contractor	Construction	Additional safeguard
Noise and vibration					
NV1	Noise and vibration	A Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP. The NVMP will generally follow the approach in the *Interim Construction Noise Guideline* (ICNG) (DECC, 2009) and identify: • All potential significant noise and vibration generating activities associated with the activity • Feasible and reasonable mitigation measures to be implemented, taking into account *Beyond the Pavement: urban design policy, process and principles* (Roads and Maritime, 2014) • A monitoring program to assess performance against relevant noise and vibration criteria • Arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures • Contingency measures to be implemented in the event of non-compliance with noise and vibration criteria.	Contractor	Detailed design/ pre-construction	Core standard safeguard NV1 Section 4.6 of *QA G36 Environment Protection*

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
NV2	Noise and vibration	All sensitive receivers (eg schools, local residents) likely to be affected will be notified at least 7 days prior to commencement of any work associated with the activity that may have an adverse noise or vibration impact. The notification will provide details of: • The project • The construction period and construction hours • Contact information for project management staff • Complaint and incident reporting • How to obtain further information.	Contractor	Detailed design/ pre-construction	Core standard safeguard NV2
NV3	Community consultation	All sensitive receivers (eg schools, local residents) likely to be affected will be notified prior to commencement of any work associated with the activity that may have an adverse noise or vibration impact. The ENMM Practice Note (vii) provides community consultation procedures for road work outside normal working hours. The notification will provide details of: • The project • The construction period and construction hours • Contact information for project management staff • Complaint and incident reporting • How to obtain further information.	Contractor	Detailed design/ pre-construction	Additional safeguard
NV4	Building vibration	Undertake building dilapidation surveys on all buildings located within the buffer zone prior to commencement of activities with the potential to cause property damage.	Contractor	Pre-construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
NV5	Construction noise from inappropriate practices	All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: • All relevant project specific and standard noise and vibration mitigation measures • Relevant licence and approval conditions • Permissible hours of work • Any limitations on high noise generating activities • Location of nearest sensitive receivers • Construction employee parking areas • Designated loading/unloading areas and procedures • Construction traffic routes • Site opening/closing times (including deliveries) • Environmental incident procedures.	Contractor	Construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
NV6	Construction traffic noise	Management of construction related traffic or traffic reroutes should as a minimum include the following controls: • Scheduling and routing of vehicle movements • Speed of construction related heavy vehicles should be limited to 40 km/hr ~~along Alderton Drive, Victory Road and Townson Road~~ • Driver behaviour and avoidance of the use of engine compression brakes • Ensuring vehicles are adequately silenced before allowing them to access the site • Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work • Loading and unloading of materials/deliveries is to occur as far as possible away from sensitive receivers • Select site access points and roads as far as possible away from sensitive receivers • Dedicated loading/unloading areas to be shielded if close to sensitive receivers • Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible • Avoid or minimise out of hours movements where possible.	Contractor	Construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
NV7	Construction noise form machinery and equipment	The use and selection of machinery and equipment will: • Use quieter and less vibration emitting construction methods where reasonable and feasible. • The noise levels of plant and equipment must have operating sound power or sound pressure levels compliant with the criteria in Appendix H of the CNVG. Implement a noise monitoring audit program to ensure equipment remains within the more stringent of the manufacturer's specifications or Appendix H of the CNVG. • The noise levels of plant and equipment items are to be considered in rental decisions and in any case cannot be used on site unless compliant with the criteria in Table 2 of the CNVG. • The offset distance between noisy plant and adjacent sensitive receivers is to be maximised. Plant used intermittently to be throttled down or shut down. Noise-emitting plant to be directed away from sensitive receivers. Only have necessary equipment on site.	Contractor	Construction	

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
NV8	Hours of construction activity	Where reasonable and feasible, construction should be carried out during the standard daytime working hours. Work generating high noise and/or vibration levels should be scheduled during less sensitive time periods. Further to this, it is recommended that the use of mulchers, jack hammers, concrete saws, rock breakers, compaction or other equipment used in very close proximity to the receivers should be limited where feasible and reasonable to the standard construction hours.	Contractor	Construction	
NV8	Extended duration of noise and vibration activity	If highly noise affected impacts are predicted high noise and vibration generating activities may only be carried out in continuous blocks, not exceeding three hours each, with a minimum respite period of one hour between each block. If highly noise affected impacts are predicted no more than four consecutive nights of high noise and/or vibration generating work may be undertaken over any seven-day period, unless otherwise approved by the relevant authority.	Contractor	Construction	
NV9	Road noise	The NMG recommends noise mitigation in the following order of preference: • Quieter road pavement surfaces • Noise mounds • Noise barriers (noise walls) • At-property treatments.	Contractor	Construction	

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
NV10	Audio tactile device noise at pedestrian crossings	Noise mitigation measures applicable to the audio tactile devices to reduced potential sleep disturbance impacts should include volume adjustment limiting the devices to a sound pressure level of 68 dBA at 1 metre. These mitigation measures would also need to consider health and safety requirements.	Contractor	Construction	
NV11	Post construction monitoring	To confirm that the noise level targets are achieved, the NMG refers to the ENMM Practice Note 8 which recommends that a post-construction noise monitoring program be undertaken.	Blacktown City Council	Operation	
Hydrology and flooding					
FL1	Drainage design	Consult with Council during detailed design to ensure appropriate integration with Council's stormwater network. Design will include: • The reinstatement of local scour protection work in unlined channels, where present. • Ensuring stormwater network alternatives are in place prior to any disconnection or diversion of stormwater infrastructure.	TfNSW	Detailed design	Additional safeguard
FL2	Stormwater runoff	Detailed design to result in no net increase in stormwater runoff rates in all storm events, unless it can be demonstrated that increased runoff rates as a result of the proposal would not increase downstream flood risk.	TfNSW	Detailed design	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
FL3	Piers in waterway	Where feasible and reasonable, the bridge is to be designed to ensure piers and associated scour protection are not constructed within the waterway.	TfNSW	Detailed design	Additional safeguard
FL4	Flood hazard	As part of the CEMP, a flood risk management plan will be prepared that details the processes for monitoring of flood alerts. The plan will specify the steps to be taken in the event a flood warning is issued including removal or securing of loose material in the floodplain and removal or securing of all fuels and chemicals.	Contractor	Pre-construction and Construction	Additional safeguard
FL5	Flood hazard	Storage of excess materials within the floodplain, including within compound areas will be minimised. As far as is practical materials are to be ordered on, or, as close as possible to, an as needs basis.	Contractor	Construction	Additional safeguard
FL6	Flood hazard	Install drainage work prior to or concurrent with road formation construction to minimise potential adverse impacts upstream and/or downstream of site.	Contractor	Construction	Additional safeguard
FL7	Management of water bodies	Work within or near the creek will be undertaken with consideration given to the NSW Department of Primary Industries (Water) *Guidelines for controlled activities on waterfront land – Riparian corridors* (2018).	Contractor	Construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
Surface water and groundwater					
SW1	Erosion and sedimentation	A Soil and Water Management Plan will be prepared as part of the CEMP in accordance with the requirements of TfNSW contract specification G38. The SWMP would address the following: • TfNSW Code of Practice for Water Management, the Roads and Maritime Services' Erosion and Sedimentation Procedure • The NSW Soils and Construction – Managing Urban Stormwater Volume 1 'the Blue Book' (Landcom, 2004) and Volume 2 (DECC, 2008) • Technical Guideline: Temporary Stormwater Drainage for Road Construction (Roads and Maritime Services, 2011) • Technical Guideline: Environmental Management of Construction Site Dewatering (Roads and Maritime Services, 2011). The SWMP would detail the following as a minimum: • Identification of catchment and sub-catchment areas, high risk areas and sensitive areas including separation of on-site and off-site water • Erosion and sediment control measures • Dewatering plan (including a map) which includes process for monitoring, flocculating and dewatering water from site (ie sediment basin and sumps) • Details of the management of groundwater in-flow during construction	Contractor	Pre-construction	Core standard safeguard SW2 QA *G38 Soil and Water Management*

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
		• Include progressive site specific erosion and sedimentation control plans to be updated fortnightly, as a minimum • Identify high risk activities (such as the bridge construction) and the details required for work method statements to be developed and signed by TfNSW prior to construction • The process for monitoring potential wet weather and identification of controls to be implemented in the event of wet weather with controls shown on the erosion and sedimentation control plans • Provision of an inspection and maintenance schedule for ongoing maintenance of temporary and permanent erosion and sedimentation controls.			
SW2	Water quality monitoring	A surface water and groundwater quality monitoring program will be developed as part of the soil and water management plan. The monitoring program will be prepared in accordance with the requirements of the *Townson Road to Burdekin Road Stage 1 Surface Water And Groundwater Assessment* (GHD, 2020).	Contractor	Pre-construction and construction	Additional safeguard
SW3	Impacts to GDEs	Where excavation activities are likely to occur in close proximity to GDEs and groundwater is likely to be intercepted, groundwater elevations will be monitored. This will be reported as part of the surface water and groundwater quality monitoring program.	Contractor	Construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
Soils and contamination					
SC1	Soil and water	A site specific Erosion and Sediment Control Plan will be prepared and implemented as part of the Soil and Water Management Plan. The Plan will include arrangements for managing wet weather events, including monitoring of potential high risk events (such as storms) and specific controls and follow-up measures to be applied in the event of wet weather.	Contractor	Detailed design/Pre-construction	Core standard safeguard E2 Section 2.2 of QA *G38 Soil and Water Management*
SC2	Contaminated land	If contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the immediate risks of contamination. All other work that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the TfNSW Environment Manager and/or EPA.	Contractor	Detailed design/Pre-construction	Section 4.2 of QA *G36 Environment Protection*
SC3	Accidental spill	A site specific emergency spill plan will be developed, and include spill management measures in accordance with the Roads and Maritime *Code of Practice for Water Management* (RTA, 1999) and relevant EPA guidelines. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including TfNSW and EPA officers).	Contractor	~~Detailed design/~~Pre-construction	Section 4.3 of QA *G36 Environment Protection*

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
SC4	Storage of materials	Hazardous materials such as fuel and chemicals will be stored in suitably located and bunded areas, in accordance with DECC's *Storing and Handling Liquids: Environmental Protection Participants Manual* (DECC, 2007).	Contractor	Construction	Additional safeguard
SC5	Excess spoil	Excess spoil not required or able to be used for backfilling would be stockpiled in a suitable location before being reused on adjacent TfNSW projects or removed from the site, and disposed of at an appropriately licensed facility.	Contractor	Construction	Additional safeguard
SC6	Use of water for construction	Should surface or groundwater be used during construction, further assessment and analysis of potential contamination will be undertaken prior to its adequate use and disposal.	Contractor	Construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
Biodiversity					
BIO1	Construction management	A Flora and Fauna Management Plan will be prepared in accordance with the *Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects* (RTA, 2011) and implemented as part of the CEMP. It will include, but not be limited to: • Plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas • Requirements set out in the Landscape Guideline (RTA, 2008) • Pre-clearing survey requirements • Procedures for unexpected threatened species finds and fauna handling in accordance with the Unexpected Threatened Species Find Procedure in the Biodiversity Guidelines 2011 – Guide 1 (Pre-clearing process) and Biodiversity Guidelines - Guide 9 (Fauna Handling) • Procedures addressing relevant matters specified in the Policy and guidelines for fish habitat conservation and management (DPI Fisheries, 2013) • Protocols to manage weeds and pathogens in accordance with *Biodiversity Guidelines - Guide 6 (Weed Management).*	Contractor	Detailed design/pre-construction	Core standard safeguard B1 Section 4.8 of QA *G36 Environment Protection*
BIO2	Vegetation removal	Measures to further avoid and minimise the construction footprint and native vegetation or habitat removal will be investigated during detailed design and implemented where practicable and feasible.	Contractor	Detailed design/pre-construction	Core standard safeguard B2

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
BIO3	Impact to connectivity	Bridge design will consider the provision of dry passage under the structure, to allow for improved connectivity for terrestrial species, where possible. Bridge design should also include features such as fauna furniture (eg ledges, bolted poles etc) to allow safe passage of fauna species along the bridge structure.	TfNSW ~~Contractor~~	Detailed design	Additional safeguard
BIO4	Removal of threatened species habitat and habitat features	A Bat Management Plan is required to manage impacts on the maternity colony of the Southern Myotis in the Bells Creek culverts. This will be developed with the input of an industry specialist in bat management, and will include the following measures at a minimum: • Appropriate timing of construction to avoid disruption of breeding, with no work to be undertaken during the breeding season • Management of removal of culverts to avoid mortality of roosting bats (eg exclusion of bats at night prior to demolition of the existing culverts) • Provision of alternate roosting habitat (eg bat boxes) in retained vegetation outside of the construction footprint • Construction of the new bridge structure in a timely manner so as to minimise the length of time that the species would have to find alternate roost sites • Inclusion of bat-friendly features into the design of the new bridges (eg dedicated recesses cast into the slabs to provide roost sites etc).	Contractor	Pre-construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
BIO5	Removal of threatened plants	A protocol should be developed for the removal of the threatened *Grevillea juniperina subsp. juniperina* in conjunction with industry experts on threatened flora management, such as collection of seed or fertile material for use in propagating the species off site, to maintain the genetic diversity of the local population. Experts from the Save our Species program and Royal Botanic Gardens should be consulted as part of this process.	Contractor	Pre-construction	Additional safeguard
Aboriginal cultural heritage					
AH1	Construction management	An Aboriginal Heritage Management Plan (AHMP) will be prepared in accordance with the Procedure for Aboriginal cultural heritage consultation and investigation (Roads and Maritime, 2012) and Standard Management Procedure - Unexpected Heritage Items (Roads and Maritime, 2015) and implemented as part of the CEMP. It will provide specific guidance on measures and controls to be implemented for managing impacts on Aboriginal heritage. The AHMP will be prepared in consultation with all relevant Aboriginal groups.	Contractor	Detailed design/pre-construction	Section 4.9 of QA *G36 Environment Protection*

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
AH2	Unexpected finds	• *The Standard Management Procedure - Unexpected Heritage Items* (Roads and Maritime, 2015) will be followed in the event that an unknown or potential Aboriginal object/s, including skeletal remains is found during construction. This applies where TfNSW does not have approval to disturb the object/s or where a specific safeguard for managing the disturbance (apart from the Procedure) is not in place. • Work will only re-commence once the requirements of that Procedure have been satisfied.	Contractor	Detailed design/pre-construction	Section 4.9 of QA *G36 Environment Protection*
AH3	Aboriginal heritage	An application for an AHIP will be made under section 90A of the *National Parks and Wildlife Act 1974* for three Aboriginal archaeological sites. The application will be prepared in accordance with the DPIE *Applying for an Aboriginal Heritage Impact Permit: Guide for Applicants* (OEH, 2011b).	TfNSW/ Blacktown City Council	Pre-Construction	Additional safeguard
AH4	Aboriginal heritage	The portion of Schofields 2, AHIMS number 45-5-0827 (outside of the construction and AHIP boundary) will be marked as an environmentally sensitive “no-go zone” on the CEMP.	Contractor	Pre-Construction	Additional safeguard
AH5	Aboriginal heritage	Temporary fencing will be installed around the edge of the AHIP area prior to construction.	Contractor	Pre-Construction	Additional safeguard
AH6	Aboriginal heritage	Workers will be inducted as to appropriate Aboriginal heritage protection measures.	Contractor	Pre-Construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
Non-Aboriginal heritage					
H1	Non-Aboriginal heritage	The *Standard Management Procedure - Unexpected Heritage Items* (Roads and Maritime, 2015) will be followed in the event that any unexpected heritage items, archaeological remains or potential relics of Non-Aboriginal origin are encountered. Work will only re-commence once the requirements of that Procedure have been satisfied.	Contractor	~~Detailed design/~~ Pre-construction	Section 4.10 of QA *G36 Environment Protection*
Landscape character and visual amenity					
LV1	Landscape character and visual impact	An Urban Design Plan will be prepared to support the detailed design and will be implemented as part of the CEMP. The Urban Design Plan will present an integrated urban design for the proposal, providing practical detail on the application of design principles and objectives identified in the environmental assessment. The Plan will include design treatments for: • Location and identification of existing vegetation and proposed landscaped areas, including species to be used • Built elements including retaining walls, bridges and noise walls • Pedestrian and cyclist elements including footpath location, paving types and pedestrian crossings • Fixtures such as seating, lighting, fencing and signs	Contractor	~~Detailed design/~~ Pre-construction	Standard safeguard V1

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
		• Details of the staging of landscape work taking account of related environmental controls such as erosion and sedimentation controls and drainage • Procedures for monitoring and maintaining landscaped or rehabilitated areas. The Urban Design Plan will be prepared in accordance with relevant guidelines, including: • *Beyond the Pavement urban design policy, process and principles* (Roads and Maritime, 2014) • *Landscape Guideline* (RTA, 2008) • *Bridge Aesthetics* (Roads and Maritime 2012) • *Noise Wall Design Guidelines* (RTA, 2006) • *Shotcrete Design Guideline* (RTA, 2005).			
LV2	Existing views from sensitive receiver locations	Ongoing consultation on visual impacts with relevant stakeholders will continue throughout the proposal.	TfNSW/ Blacktown City Council	Construction and operation	Additional safeguard
LV3	Views from the construction work on sensitive receiver locations	Vegetation buffers will be maintained between site compounds and public roads wherever practicable.	Contractor	Construction	Additional safeguard
LV4	Views from the construction work on sensitive receiver locations	All waste material generated during construction will be reused or recycled where practicable, or collected and transported by licensed contractors for disposal at appropriately licensed facilities and in accordance with local government requirements.	Contractor	Construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
LV5	Views from the construction work on sensitive receiver locations	The hoarding of construction materials will be minimised as far as practicable.	Contractor	Construction	Additional safeguard
LV6	Changes to view from vegetation loss	The approved clearing extent, including environmental features within the construction footprint, will be identified with flagging, marking tape or similar.	Contractor	Construction	Additional safeguard
LV7	Views from the construction work on sensitive receiver locations	All temporary above ground infrastructure will be removed at the completion of construction.	Contractor	Construction	Additional safeguard
LV8	Light spill	Light generated during construction will be managed in general accordance with the requirements in *Australian Standard AS 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting*. Generally, lighting would be designed to minimise off site light spill.	Contractor	Construction	Additional safeguard
LV9	Landscape character	Reinstatement of access roads and construction site compounds will commence progressively post construction and will be undertaken as soon as practicable.	Contractor	Operation	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
Air quality					
AQ1	General air quality impacts	An air quality management plan will be prepared as part of the CEMP. The plan will include but not be limited to: • A map identifying locations of sensitive receivers • Identification of potential risks/impacts due to the work/activities as dust generation activities • Management measures to minimise risk including a progressive stabilisation plan • A process for monitoring dust on-site and weather conditions • A process for altering management measures as required.	Contractor	Pre- Construction	Core standard safeguard AQ1 Section 4.4 of QA G36 Environment Protection
AQ2	Dust emissions	• Dust suppression measures will be implemented as per the air quality management plan. • Stockpiled materials will be covered, stabilised or stored in areas not subject to high wind. • All trucks will be covered when transporting material to and from the site. • Work activities will be reprogrammed if the mitigation measures are not adequately restricting dust generation.	Contractor	Construction	Core standard safeguard A1
AQ3	Exhaust emissions	• Construction plant and equipment will be maintained in a good working condition in order to limit impacts on air quality. • Plant and machinery will be turned off when not in use.	Contractor	Construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
AQ4	Impacts on sensitive receivers	Local residents will be advised of hours of operation and duration of work and supplied with a contact name and number for queries regarding air quality.	Contractor	Pre-Construction	Additional safeguard
Property and land use					
P1	Property acquisition	All property acquisition will be carried out in accordance with Blacktown City Council policy and the *Acquisition (Just Terms Compensation) Act 1991.*	Blacktown City Council	Pre-construction and construction	Core standard safeguard
P2	Property adjustment	Property adjustment plans would be developed in consultation with the affected property owners.	TfNSW	Pre-construction	Additional safeguard
Socio-economics					
S1	Socio-economic	A Communication Plan (CP) will be prepared and implemented as part of the CEMP to help provide timely and accurate information to the community during construction. The CP will include (as a minimum): • Mechanisms to provide details and timing of proposed activities to affected residents, including changed traffic and access conditions • Contact name and number for complaints. The CP will be prepared in accordance with the *Community Involvement and Communications Resource Manual* (RTA, 2008). This will include protocols for managing construction fatigue.	Contractor	~~Detailed design/~~Pre-construction	Core standard safeguard SE1

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
S2	Property and land acquisition	Consultation will be carried out with each landowner and resident throughout the acquisition process, in accordance with Blacktown City Council policy and the Land Acquisition (Just Terms Compensation) Act 1991.	Blacktown City Council	Pre construction	Additional safeguard
Resource use and waste					
RW1	Demand on resources	Procurement will endeavour to use materials and products with a recycled content where that material or product is cost and performance effective.	Contractor	Pre-construction	Additional safeguard
RW2	Waste management	A resource and waste management plan will be prepared and included in the CEMP. The plan will 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	Contractor	Pre-construction	Core standard safeguard W1 Section 4.2 of QA G36 Environment Protection

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
		• 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 will 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 • The types of waste collected, amounts, date/time and details of disposal are to be recorded in a waste register • Site clean-up for each construction stage.			
RW3	Waste management	Garbage receptacles will be provided and recycling of materials encouraged. Rubbish will be transported to an appropriate waste disposal facility.	Contractor	Construction	Additional safeguard
RW4	Waste management	All wastes will be managed in accordance with the POEO Act.	Contractor	Construction	Additional safeguard
RW5	Waste management	Portable toilets will be provided for construction workers and will be managed by the service provider to ensure the appropriate disposal of sewage.	Contractor	Construction	Additional safeguard
RW6	Waste management	Weeds removed during work will be managed in accordance with the *Biosecurity Act 2015* requirements that relate to its classification status.	Contractor	Construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
RW7	Waste management	Site inductions will occur and be recorded by a Site Supervisor to ensure staff are aware of waste disposal protocols.	Contractor	Construction	Additional safeguard
RW8	Waste minimisation	The following resource management hierarchy principles will be followed: • Avoid unnecessary resource consumption as a priority • Avoidance will be followed by resource recovery (including reuse of materials, reprocessing, and recycling and energy recovery) • Disposal will be undertaken as a last resort (in accordance with the *Waste Avoidance and Resource Recovery Act 2001*).	Contractor	Construction	Core standard safeguard M2
RW9	Demand on resources	Excavated material will be reused on-site for fill where feasible to reduce demand on resources.	Contractor	Construction	Additional safeguard
RW10	Demand on resources	Where additional fill material is required this will be sourced from appropriately licensed facilities and/or other projects wherever possible.	Contractor/ Blacktown City Council	Construction	Additional safeguard
RW11	Management of green waste	Clearing and grubbing, including mulching, will be undertaken. Where possible, mulch will be used on-site.	Contractor	Construction	Additional safeguard
RW12	Spoil management	Excavated material will be reused on adjoining projects where feasible to reduce waste.	Contractor	Construction	Additional safeguard
RW13	Spoil management	Excess excavated material will be disposed of at an appropriate facility or reused appropriately for fill on the construction footprint.	Contractor	Construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
RW14	Spoil management	Excess soil requiring waste disposal will first be assessed against the *Waste Classification Guidelines-Part 1: Classifying Waste* (EPA 2014). Soil samples will be taken from stockpiled material and analysed. Transportation will be undertaken by a licensed contractor capable of transporting the waste and waste will be disposed of to an appropriately licensed waste facility with supporting waste classification documentation.	Contractor	Construction	Additional safeguard
RW15	Generation of construction waste	A post-construction land assessment will be undertaken of land that was used for ancillary construction purposes (compounds, storage, parking, etc) to determine the suitability for hand-back to the landowner. The assessment will be prepared in accordance with the *Roads and Maritime Environmental Procedure - Management of Wastes* on TfNSW land. Where the land is privately owned, a copy of the assessment will be provided to the landowner.	Contractor	Construction	Additional safeguard
RW16	Wastewater contamination of soils and water	A dedicated concrete washout facility will 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.	Contractor	Construction	Additional safeguard
Cumulative impacts					
C1	Cumulative construction impacts	The Contractor's Environmental Management Plan will be revised as required to consider potential cumulative impacts from surrounding development activities as they become known. This will include consultation with the proponent and/or lead contractor.	Contractor	Pre-construction and construction	Additional safeguard

5.3 Licensing and approvals

Prior to construction commencing, licences, permits, approvals or statutory consultation is required as detailed in Table 5.2.

Table 5.2: Summary of licensing and approval required

Instrument	Requirement	Timing
Fisheries Management Act 1994 (s199)	Notification to the Minister for Agriculture and Western NSW prior to any dredging or reclamation works. [Note exemption under s263A of the Fisheries Management (General) Regulation 2010]	A minimum of 28 days prior to the start of work.
National Parks and Wildlife Act 1974 (s90)	Aboriginal heritage impact permit from the Coordinator General of EES under DPIE	Prior to start of the activity.

6. References

Department of Environment and Climate Change NSW. 2009*. Interim Construction Noise Guideline and the Construction Noise and Vibration Guideline*

ISO 9613-2 ‘Acoustics – Attenuation of sound during propagation outdoors’

RMS, 2016 *Construction Noise and Vibration Guideline*

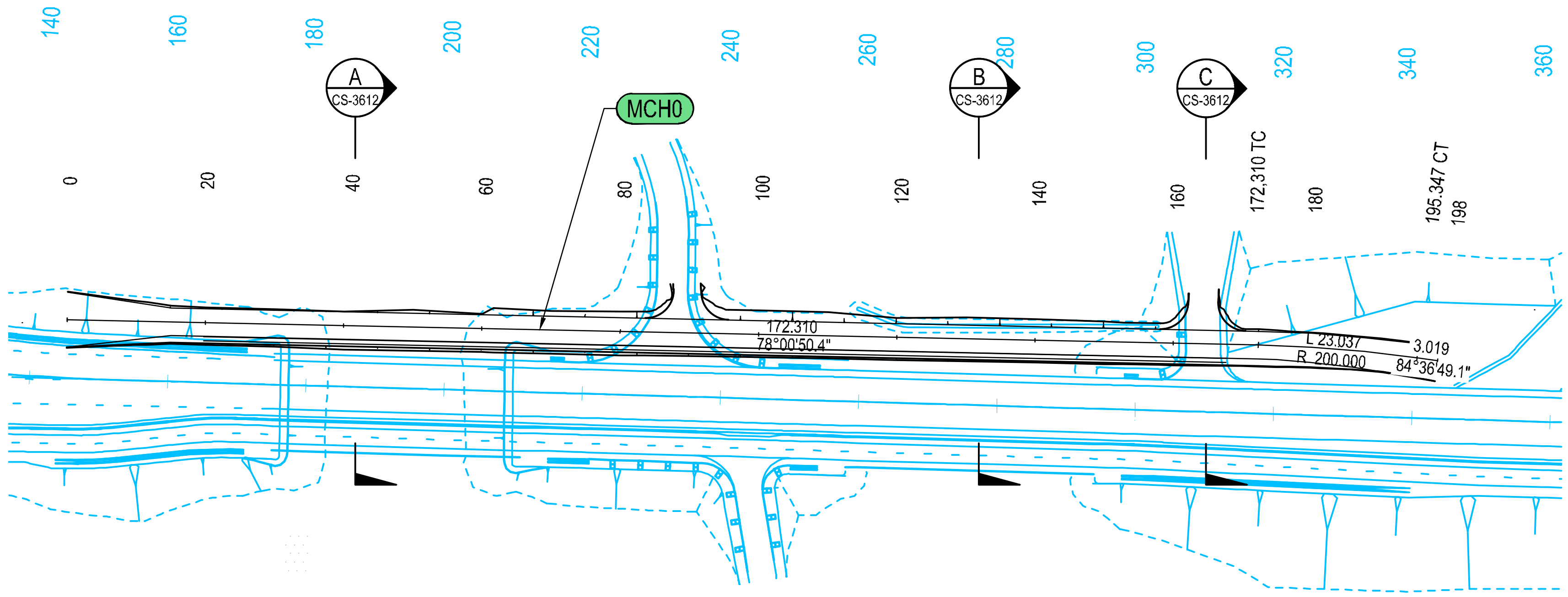
Transport for NSW 2021, February *Townson Road Upgrade between Richmond Road and Jersey Road – Stage 1 Review of Environmental Factors*

7. Glossary of terms and abbreviations

Term	Meaning
AEP	Annual exceedance probability: the chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage.
AHD	Australian height datum
AHIMS	Aboriginal Heritage Information Management System
BC Act	*Biodiversity Conservation Act 2016 (NSW)*
CEEC	Critically endangered ecological community
CEMP	Construction environment management plan
DAWE	Department of Agriculture, Water and the Environment Former Department of Environment and Energy (DoEE)
DECCW	Department of Environment, Climate Change and Water
DoEE	Former Department of the Environment and Energy Now Department of Agriculture, Water and the Environment (DAWE)
DPC (Heritage)	Department of Premier and Cabinet (Heritage) Formerly Office of Environment and Heritage (OEH)
EEC	Endangered ecological community
EESG	Environment, Energy and Science Group of the Department of Planning, Industry and Environment Formerly NSW Office of Environment and Heritage
EIS	Environmental impact statement
EPA	Environmental Protection Agency
EP&A Act	*Environmental Planning and Assessment Act 1979 (NSW)*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth).
POEO Act	*Protection of the Environment Operations Act 1997 (NSW)*
Roads and Maritime	Roads and Maritime Services; now known as Transport for NSW
SEPP	State environmental planning policy
study area	The term study area is used to describe the locations investigated. The study area varies based on the specific areas of interest targeted for each environmental issue (eg ecology, heritage, noise, visual amenity etc). The study area relevant to particular environmental issues is shown on figures where relevant.
TECs	Threatened ecological communities
TfNSW	Transport for New South Wales
TSC Act	*Threatened Species Conservation Act 1995* (NSW) (repealed) but relevant for this assessment due to being saved under the BC Transitional arrangements

Appendix A

Townson Road temporary access road general arrangement drawings



CROSS OVER PLAN - CONTROL MCH0

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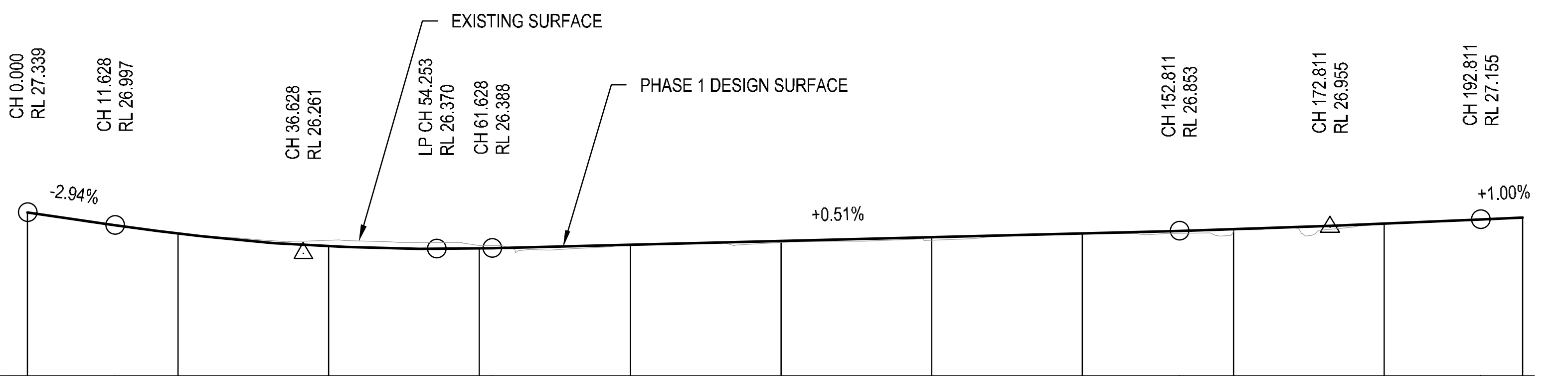

DATUM RL 23

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HORIZONTAL ALIGNMENT	L = 172.310; R = 200.000, L = 23.037; L = 3.019

CHAINAGE	0.000	20	40	60	80	100	120	140	160	180	198.366
CUT / FILL	-0.000	0.010	0.155	0.079	0.010	-0.047	-0.083	-0.006	-0.063	-0.010	0.000
DESIGN SURFACE LEVELS	27.339	26.775	26.440	26.381	26.482	26.584	26.686	26.788	26.893	27.037	27.211
EXISTING SURFACE LEVELS	27.339	26.785	26.594	26.460	26.492	26.537	26.603	26.781	26.830	27.027	27.211

CHAINAGE: 0.000, 11.628, 20, 36.628, 40, 54.253, 60, 61.628, 80, 100, 120, 140, 152.811, 160, 172.811, 180, 192.811, 195.347, 198.366

CROSS OVER LONGITUDINAL SECTION - CONTROL MCH0

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DESIGN	M. FERREIRA	09.06.21
DESIGN CHECK	.A. PENN	09.06.21
DESIGN MNGR	M. FERREIRA	09.06.21
PROJECT MNGR	M. RODRIGO	09.06.21

CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR: WESTERN SYDNEY PROGRAM OFFICE

BLACKTOWN CITY COUNCIL
TOWNSON ROAD TO BURDEKIN ROAD LINK
STAGE 1
RICHMOND ROAD MARSDEN PARK TO JERSEY ROAD
CONSTRUCTION STAGING (CS)
PHASE 1A - CROSSOVER DETAILS

SHEET 1 OF 2

A3

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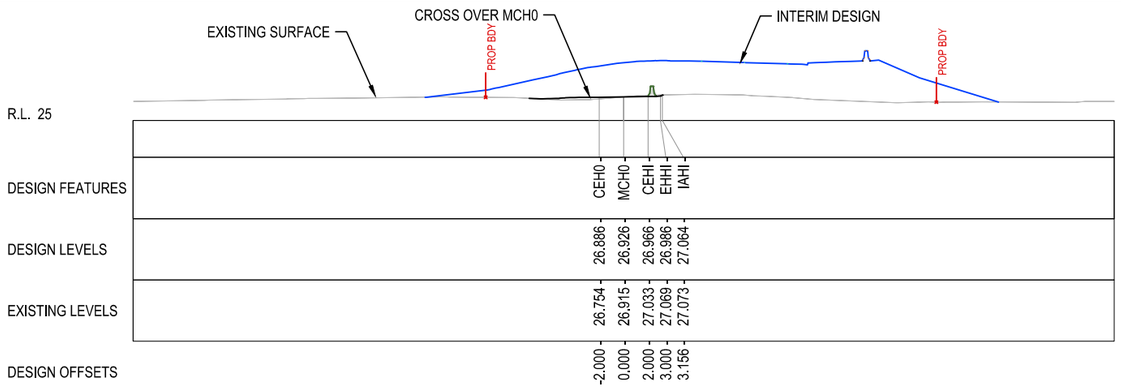

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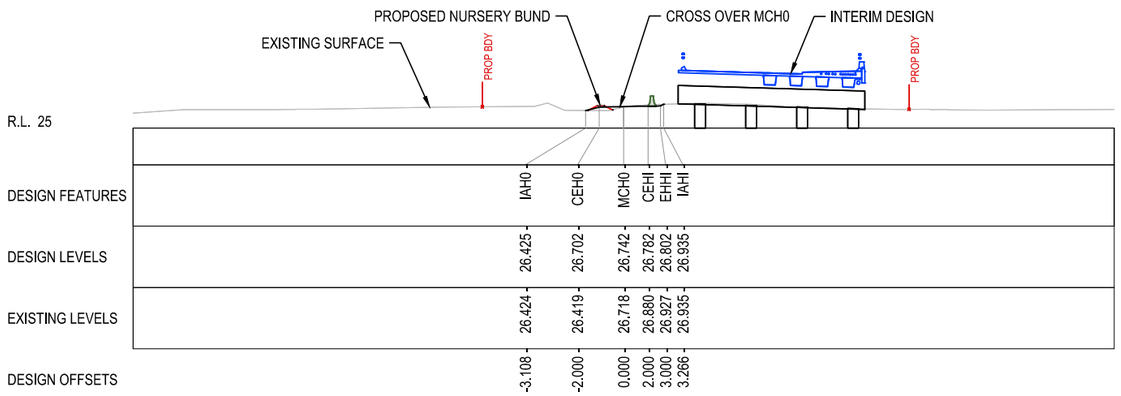

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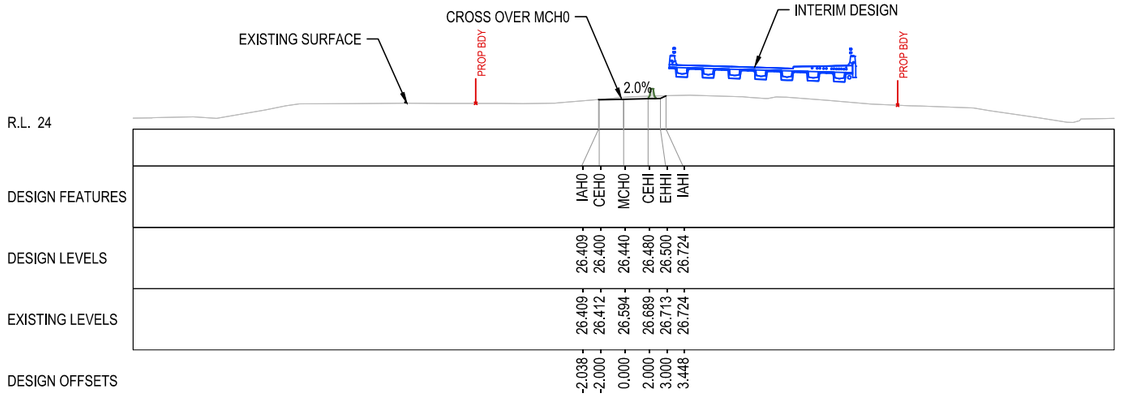

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PREPARED FOR: WESTERN SYDNEY PROGRAM OFFICE

BLACKTOWN CITY COUNCIL
TOWNSON ROAD TO BURDEKIN ROAD LINK

A3

STAGE 1
RICHMOND ROAD MARSDEN PARK TO JERSEY ROAD
CONSTRUCTION STAGING (CS)
PHASE 1A - CROSSOVER DETAILS SHEET 2 OF 2

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