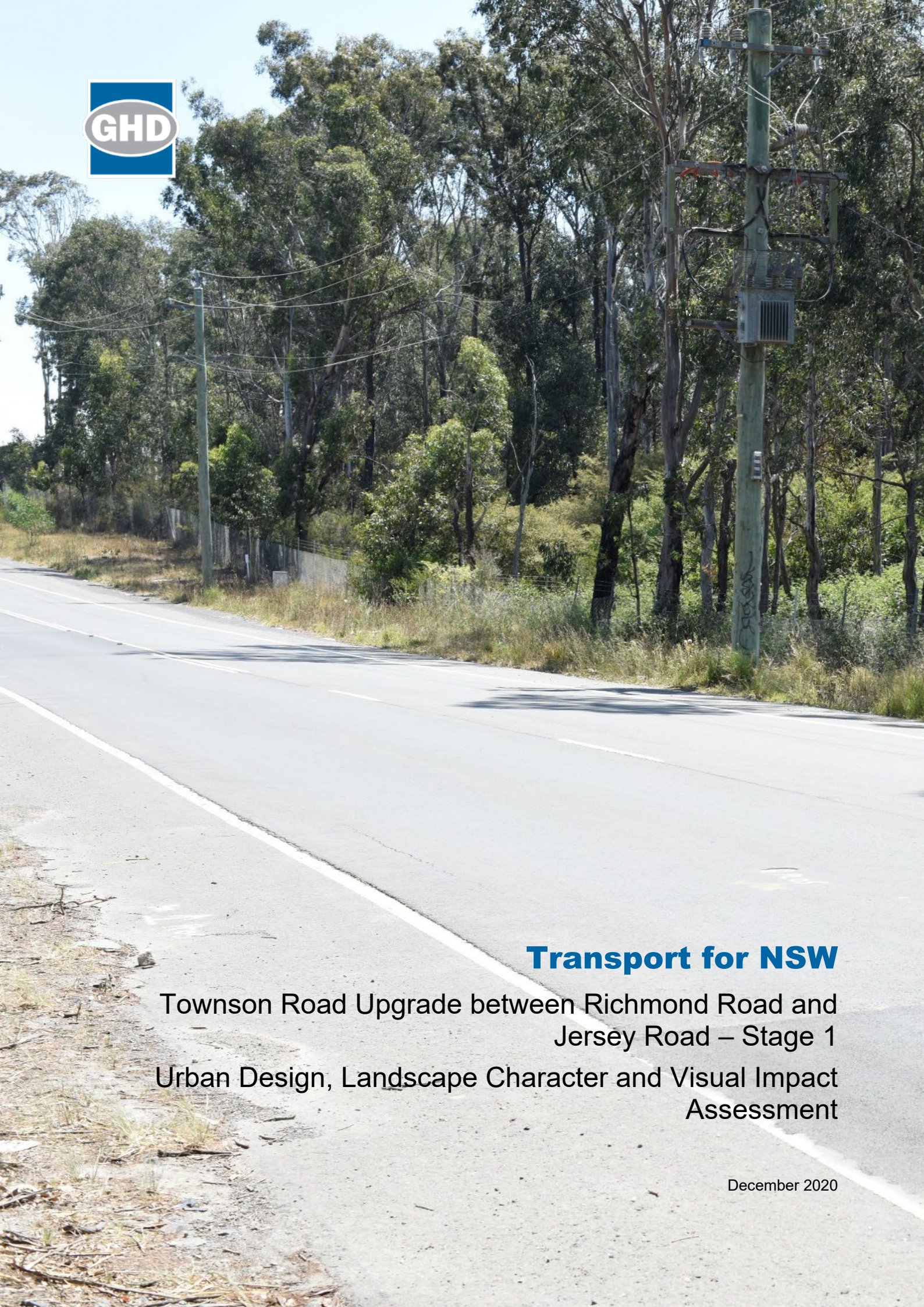
Appendix D

Urban design, landscape character and visual impact assessment



Transport for NSW

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

Urban Design, Landscape Character and Visual Impact Assessment

December 2020

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Terminology

Terminology	Definition
Impact	The effect of a proposal, which can be adverse or beneficial, when measured against an existing condition.
Landscape	All aspects of a tract of land, including landform, vegetation, buildings, villages, towns, cities and infrastructure.
Landscape character	The combined quality of built, natural and cultural aspects which make up an area and provide its unique sense of place.
Landscape character zone	An area of landscape with similar properties or strongly defined spatial qualities, distinct from areas immediately nearby.
Landscape effects	Effects on the landscape as a resource in its own right.
Landscape value	The relative value that is attached to different landscapes by society. A landscape may be valued by different stakeholders for a whole variety of reasons.
Magnitude	The measurement of the scale, form and character of a development proposal when compared to the existing condition. In the case of visual assessment this also relates to how far the proposal is from the viewer. Combines with sensitivity, magnitude provides a measurement of impact.
Sensitivity	The sensitivity of a landscape character zone or view and its capacity to absorb change of the nature of the proposal. In the case of visual impact this also relates to the type of viewer and number of viewers. Combined with magnitude, sensitivity provides a measurement of impact.
Significance	A measure of the importance or gravity of the environmental effect, defined by significance criteria specific to the environmental topic.
Viewshed	A portion of the landscape that can be seen from one or more observer positions. The extent of area that can be viewed is normally limited by landform, built form, vegetation and distance.
Visibility	The state or fact of being visible or seen.
Visual effects	Effects on specific views and on the general visual amenity experienced by people.
Visual amenity	The overall pleasantness of the views people enjoy of their surroundings, which provides an attractive visual setting or backdrop for the enjoyment of activities of the people living, working, recreating, visiting or travelling through an area.
Visual impact	The impact on the views from residences, workplaces and public places.
Visual receivers	Individuals and/or defined groups of people who have the potential to be affected by a proposal.

Abbreviations

Abbreviations	Definition
CEMP	Construction Environmental Management Plan
CHAR	Cultural Heritage Assessment Report
DCP	Development Control Plan
GPS	Global Positioning System
LCVIA	Landscape character and visual impact assessment
LCZ	Landscape character zone
LEP	Local Environmental Plan
LGA	Local Government Authority
PACHCI	Procedure for Aboriginal Cultural Heritage Consultation and Investigation
REF	Review of Environmental Factors
RFI	Request for Information
RMS	Roads and Maritime Service
TfNSW	Transport for NSW
VP	Viewpoint
WSUD	Water Sensitive Urban Design

1. Introduction

1.1 Overview

Transport for NSW (TfNSW) is proposing to construct a four-lane divided road along Townson Road/Burdekin Road corridor linking Richmond Road, Marsden Park in the west and Burdekin Road, Schofields in the east. The length of the overall program of work is about 3.6 kilometres.

The overall program of work consists of two stages:

- Stage 1 (the proposal) involves an upgrade of about 1.6 kilometres of road extending from Richmond Road to south of Jersey Road (see Figure 1-1).
- 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.

Staged delivery of the proposal would involve:

- Interim phase- two lanes plus earthworks (Figure 1-2)
- Ultimate phase- completion of remainder of the works for a four-lane dual carriageway.

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

Transport for NSW is the proponent of the proposal, and an environmental assessment in the form of a review of environmental factors (REF) is being prepared in accordance with the requirements of Division 5.1 of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act).

This report provides an urban design assessment and landscape character and visual impact assessment (LCVIA) of the proposal.

1.2 Proposal outline

The key features of the proposal are shown in Figure 1-1 and include:

- Widening and upgrading about 1.6 kilometres of Townson Road, between Richmond Road and Durham Road/Jersey Road, to provide:
  - Two traffic lanes, about 3.5 metres wide 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
  - A temporary connection road extending from the stub to Durham Road/Jersey Road to maintain access and connectivity until Stage 2 is operational
  - A new southbound slip lane at Richmond Road intersection from Townson Road.
- 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 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 intersections

- Constructing stubs for Victory Road north and the new road to the north and south of the Townson Road intersection, with a traffic lane in each direction about 3.5 metres wide and a footway on either side, about 1.2 metres wide
- Providing a shared path about three metres wide 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 footpath about 1.2 metres wide on the northern side of Townson Road along the length of the proposal and at the intersections.

This interim phase allows the surrounding developments to progress and allows utilities to be relocated to their ultimate location. It is anticipated that construction of the interim phase would commence in early 2022 and would be open to traffic in 2023. Completion of the ultimate phase of the proposal would take place around five years after completion of the interim phase.

1.3 Scope of this report

This report incorporates the urban and landscape concept design for the proposal. The purpose of this report is to provide a consolidated overview for the urban design and LCVIA and will inform the detailed design phase. The proposal area is 1.6 kilometres in length, from Richmond Road to Jersey Road as shown in Figure 1-1. A review of environmental factors and supporting information has been prepared for the proposal, which include:

- Biodiversity Report
- Historic Heritage Report
- PACHCI Stage 3 CHAR/test excavation report
- Surface Water Report
- Groundwater Report
- Noise and Vibration Report
- Socio-economic Report
- Traffic and Transport Report
- Urban Design, Landscape Character and Visual Impact Assessment Report.

The aforementioned specialist studies were also used to inform the urban design for the proposal. The biodiversity assessment report prepared by GHD includes assessments of the existing flora and fauna along the road corridor. This has been used as well as on site investigations to determine the proposed planting typologies for the proposal.

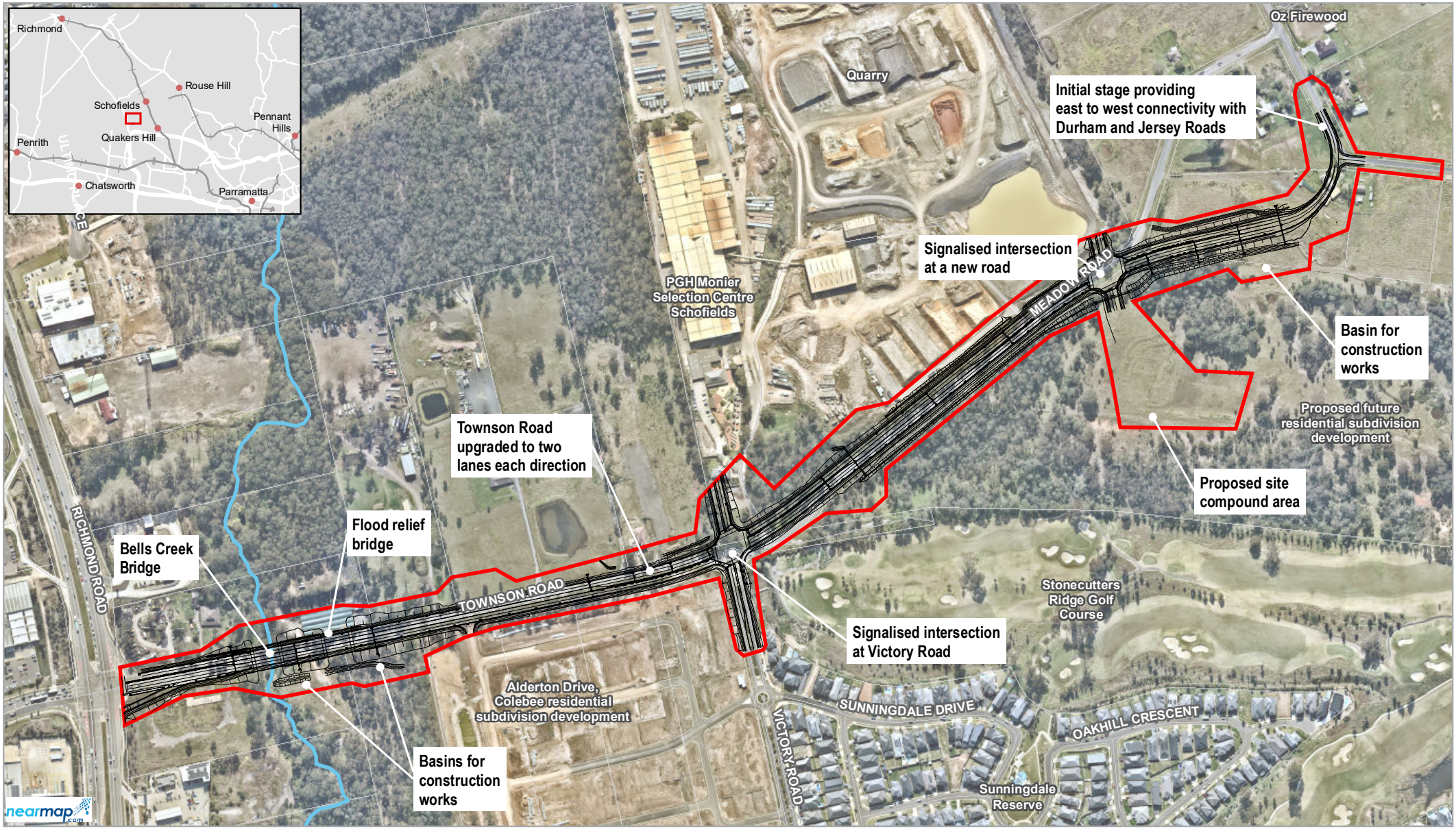
This urban design and LCVIA report has been prepared for the REF and is based on the concept design. This report incorporates the following:

- Urban design objectives and principles
- Mitigation measures developed by the LCVIA
- Planting typologies and methodologies
- Urban design and landscape treatments for the proposal corridor.

1.4 Report structure

This report is comprised of the following sections:

- **Section 2 – Methodology:** describes the methodology used for the purposes of this report.
- **Section 3 – Existing environment:** summarises the existing landscape character and visual environment in terms of landscape character zones and sensitive visual receivers.
- **Section 4 – Urban design vision, objectives and principles**: identifies the general and proposal specific urban design objectives and principles. Includes a summary of relevant legislation and policy, and other relevant projects/strategies.
- **Section 5 – Policy and legislative context:** provides an analysis of the relevant policies in the context of the proposal.
- **Section 6 – Urban and landscape design:** provides the urban design concept design and a description of the proposal components most relevant to this assessment.
- **Section 7 – Landscape character assessment:** landscape character zones are assessed and impacts to landscape character are provided.
- **Section 8 – Visual impact assessment:** Assesses the visual impact of the proposal on the key sensitive visual receivers that have been identified.
- **Section 9 – Landscape character and visual impact mitigation measures:** recommends mitigation measures in response to issues arising in the assessment during construction and operation phases of the proposal. Includes key urban design mitigation strategies.
- **Section 10 – Cumulative impacts:** discusses the impacts of nearby projects which may be under construction or operational during a similar timeframe.
- **Section 11 – Conclusion:** presents a summary of the urban design and LCVIA.



LEGEND

- The proposal **Subject to detailed design*
- Construction
- Cadastre

Paper Size ISO A4

0 25 50 75 100

Metres

N

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

GHD

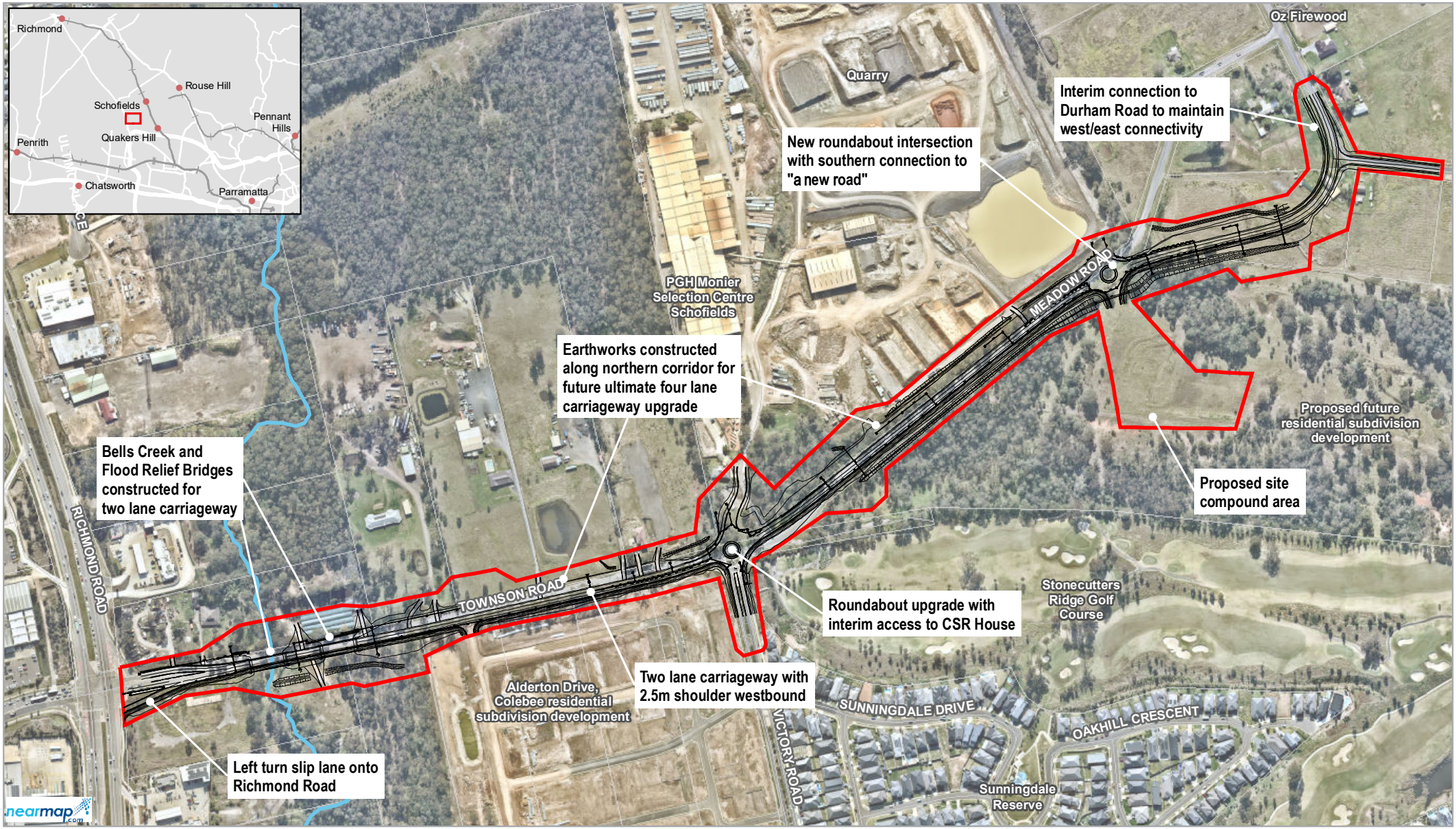
Transport for NSW
Townson Road Upgrade Stage 1
Between Richmond Road and Jersey Road

The Ultimate Phase of the Proposal

Project No. **21-12511195**
Revision No. **-**
Date **6/11/2020**

FIGURE 1-1

Data source: Aerial Imagery - Nearmap 2019 (image date 12/09/2019, image extracted 21/09/2019) and NSW Six Maps, 2019 . Created by: eibbertson



LEGEND

- The proposal **Subject to detailed design*
- Construction footprint
- Cadastre

Paper Size ISO A4

0 25 50 75 100

Metres

N

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

GHD

Transport for NSW
Townson Road Upgrade Stage 1
Between Richmond Road and Jersey Road

Interim phase of the proposal

Project No. **21-12511195**
Revision No. **-**
Date **4/12/2020**

FIGURE 1-2

Data source: Aerial Imagery - Nearmap 2020 (image date 03/08/2020, image extracted 28/09/2020) and NSW Six Maps, 2020 . Created by: eibbertson

2. Methodology

2.1 Standards and guidance

Transport for NSW has produced a comprehensive list of design guideline documents aimed at achieving good urban design outcomes, and for the assessment of landscape character and visual impacts. This report has been undertaken with reference to the following published documents:

- *Environmental impact assessment practice note EIA-N04 - Guideline for landscape character and visual impact assessment, Version 2.1* (Roads and Maritime, 2018)
- *Beyond the Pavement RMS Urban Design Policy, Procedures and Design Principles* (Roads and Maritime Services, 2014)
- *Noise Wall Design Guideline* (The Centre for Urban Design, Roads and Maritime Services, 2016)
- *Bridge Aesthetics* (TfNSW Centre for Urban Design, 2019)
- *Shotcrete Design Guideline* (The Centre for Urban Design, Roads and Maritime Services, 2016)
- *Landscape Design Guideline* (The Centre for Urban Design, Roads and Maritime Services, 2018)
- *Water Sensitive Urban Design Guideline* (The Centre for Urban Design & Environmental Land Management, Roads and Maritime Services, 2017).

The *Guidelines for Landscape and Visual Impact Assessment, 3rd Edition* (Landscape Institute and Institute of Environmental Management & Assessment, 2013) were also referred to.

2.2 Urban design objectives and principles

In accordance with the RMS Guideline *Beyond the Pavement RMS Urban Design Policy, Procedures and Design Principles,* the proposed urban design objectives and principles were defined by the urban design team and identified within this report for the purposes of assessment and integration with any relevant recommendations. This report was produced in collaboration with the urban design team to achieve an integrated outcome between the urban design concept and landscape character and visual impact assessment/recommendations.

2.3 Context analysis

2.3.1 Review of legislation and policy

A review of key planning designations, policies and guidance was undertaken in relation to the landscape and visual environment within the urban design and LCVIA study area. The study area has been defined in section 2.3.3. A review was also undertaken of relevant planned projects within the study area. This information has been utilised in the assessment of cumulative impacts, described in section 9.

2.3.2 Desktop analysis of the proposal, urban, landscape and visual resources

Existing data was gathered and reviewed, including proposal design information, topography, land use, and vegetation data, aerial imagery, and previous site photographs by others. Using this data, a preliminary assessment of the landscape and visual environment was undertaken to inform the site inspection. Further information regarding mobility and land use plans were collated.

2.3.3 Study area

The study area for the urban design and LCVIA is generally confined to the viewshed of the proposal. This has resulted in an indicative study area of about 300 metres from the road corridor, based on a desktop study examining aerial photographs and topographic maps; a site inspection considering the existing visual catchment; and previous studies of a similar nature.

2.3.4 Site inspection

A site inspection was undertaken by a Landscape Architect and Urban Designer in late 2019. The purpose of the inspection was to:

- Inspect the site and appreciate views to/from sensitive visual receivers
- Inspect publicly accessible locations identified in the desktop study as likely to provide views of the proposal, including roads, footpaths and public open spaces
- Identify sensitive visual receiver locations
- Assess the landscape character of the study area and identify landscape sensitivities
- Undertake site photography.

The Global Positioning System (GPS) coordinates of each viewpoint were recorded during the site inspection.

2.4 Landscape character and visual impact assessment

2.4.1 Definition of existing landscape and visual environment

A landscape baseline assessment was undertaken to determine the existing natural and cultural features within the study area. This includes determination of key landscape and spatial elements, features, and values. Aspects considered include land use, built form, landform, topography, hydrology, vegetation, historical features, and mobility and access.

A visual baseline assessment was also undertaken to establish the key views, the proposal viewshed, and other visual features within the study area. This was based on a desktop review and visual appraisal of the study area during the site inspection.

The existing landscape and visual environment has been discussed in section 3.

2.4.2 Identification of landscape character zones

Landscape character refers to a distinct and recognisable pattern of elements that occur consistently in a particular type of landscape. Particular combinations of geology, landform, soils, vegetation, land use and human settlement create character, which makes each part of the landscape distinct and gives each its particular sense of place.

Landscape character zones (LCZ) define common landscape types defined by typical features and characteristics identified during the desktop assessment and site inspection. Defining LCZ's identifies areas sharing the same homogenous environmental or cultural qualities or pattern as described in the preceding paragraph.

This approach has been used to establish the existing landscape character around the proposal site and to provide a framework for measuring the impact of the proposal. This assists in:

- Defining landscape elements that contribute to defining character
- Defining landscape character attributes
- Identifying landscape value.

The assessment of the existing environment also considers factors which have influenced landscape change in the past and those that are likely to do so in the future.

LCZ's are discussed in section 3.1.

2.4.3 Viewpoint selection

The assessment of visual impacts deals with the effects of change and development on the views available to people and their visual amenity. It assesses how the surroundings of individuals or groups of people may be specifically affected by changes in the context and character of views as a result of the change or loss of existing elements of the landscape and/or the introduction of new elements.

Visual receivers have been considered in terms of the views they are likely to obtain from within the study area including consideration of any key vantage points, such as lookouts, where there is particular interest in the view. Visual receivers are identified based on:

- Proximity of the receivers to the proposal, as the most affected visual receivers are anticipated to be located closest to the proposal, unless located at an elevated vantage point
- Type of receiver, as different viewer types would have different perceptions of the change.

Based on the analysis of the existing landscape and visual environment, sensitive visual receivers were identified and viewpoint locations selected as representative locations for assessment.

Viewpoint selection has been described in section 3.2.

2.4.4 Landscape effects

The assessment of landscape effects deals with the effect of change and development on the landscape as a resource. The concern is with how the proposal would affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.

The consideration of potential impacts on landscape character is determined based on the sensitivity of the existing landscape to change and the magnitude of change that is likely to occur. The sensitivity of a landscape is judged on the extent to which it can accept change of a particular type and scale without adverse effects on existing landscape character. The level of sensitivity is determined on the basis of:

- The landscape's inherent values and any specific values that may apply such as landscape planning designations
- The landscape's ability to absorb changes associated with the proposal.

The magnitude of change to landscape character depends on the nature, scale and duration of the change expected to occur. The magnitude of change also depends on the loss, change or addition of any feature to the existing landscape. It is based on that part of the LCZ which is likely to be impacted to the greatest extent by the proposal.

The sensitivity and magnitude of landscape effects address the following specific criteria:

- Sensitivity of landscape to proposed change, based on the susceptibility to change, and the value of landscape
- Magnitude of landscape effect, based on the size or scale of change, the geographical extent of effects, and the duration and reversibility of effects.

A judgement is made on the overall level of significance of the landscape effect in relation to the existing conditions.

Table 2-1 provides the criteria for the sensitivity of the landscape to proposed changes. Table 2-2 provides the criteria for the magnitude of change. Landscape effects have been discussed in section 7.1.

Table 2-1 Sensitivity criteria (landscape)

Rating	Criteria
High	Landscape character elements in good or above average condition and/or that make a strong positive contribution to the landscape character. May include nationally important features. The type of development proposed could have a detrimental effect on the landscape character, condition or value. Mitigation measures are unlikely to reduce the impacts of the change.
Moderate	Landscape character elements in reasonably good condition and/or that make an average contribution to the local character, which may include locally important features. Any change caused by the proposed development would be unlikely to have a significant adverse effect on the landscape character, condition or value that could not be mitigated.
Low	Landscape character elements in average condition and/or that are not particularly distinctive local features. Development of this type is unlikely to have an adverse effect on the landscape character, condition or value. Mitigation measures would be effective in neutralising adverse effects.
Negligible	Elements in below average condition and/or that are not distinctive local features. Development of this type is very unlikely to have an adverse effect on the urban landscape character, condition or value. Mitigation measures would be effective in neutralising adverse effects and/or improve the urban landscape character.

Table 2-2 Magnitude of change criteria (landscape)

Rating	Criteria
High	A substantial/obvious change to the landscape character due to total loss of, or change to, elements, features or characteristics of the landscape. Would cause a landscape to be permanently changed and its quality diminished.
Moderate	Discernible changes in the landscape character due to partial loss of, or change to elements, features or characteristics of the landscape, however has potential to be partly mitigated. The change would be out of scale with the landscape character, and at odds with the local pattern and landform and would leave an adverse impact on the landscape character.
Low	Minor loss or alteration to one or more key landscape character elements, features or characteristics, or the introduction of components that may be new but may not be uncharacteristic within the existing landscape character.
Negligible	Almost imperceptible or no change in the landscape character as there is little or no loss of/or change to the elements, features or characteristics of the landscape.

2.4.5 Visual effects

The evaluation of potential impacts on visual amenity is based on the sensitivity of the viewpoint (and the visual receiver it represents) to change, and the magnitude of change that is likely to occur.

The sensitivity of each viewpoint is considered to be dependent on the:

- Importance of the view, its existing scenic qualities and the presence of other existing man-made elements in the view
- Type of visual receiver and their likely interest in the view.

The magnitude of change to views and visual amenity depends on the nature, scale and duration of the change that is expected to occur. The magnitude of a change also depends on the loss, change or addition of any feature in the field of view of the receiver including an assessment of the level to which the change contrasts with the existing view or expected view of the landscape. This includes the degree of any change to the backdrop to, or outlook from a viewpoint.

The assessment considers the likely impacts of the proposal. The level of effects on a view depends on factors such as the extent of visibility, degree of obstruction of existing features, degree of contrast with the existing view, angle of view, duration of view and distance from the proposal.

Steps undertaken to assess visual effects include an assessment of visual effects, comprising:

- Sensitivity of visual receivers to proposed change, based on: susceptibility of visual receivers to change, and value attached to views
- Magnitude of visual effect, based on: size or scale of change; geographical extent of effects, and duration and reversibility of effects.

An assessment is undertaken of the overall level of significance of the visual effects in relation to the existing view.

Table 2-3 describes the sensitivity criteria for visual effects.

Table 2-4 describes the magnitude of change criteria for visual effects.

Table 2-3 Sensitivity criteria (visual)

Rating	Criteria
High	Occupiers of residential properties, at home or going to or from, with long viewing periods, within close proximity to the proposed development; Communities that place value upon the urban landscape and enjoyment of views of their setting.
Moderate	Outdoor workers who have a key focus on their work who may also have intermittent views of the study area; Viewers at schools, or similar, when outdoor play and recreation areas are located within close proximity but viewing periods are limited; Occupiers of residential properties with long viewing periods, at a distance from or screened from the study area.
Low	Road users in motor vehicles, trains or on transport routes that are passing through or adjacent to the study area and therefore have short term views; Viewers indoor at their place of work, schools or similar.
Negligible	Viewers from locations where there is screening by vegetation or structures where only occasional screened views are available and viewing times are short; Road users in motor vehicles, trains or on transport routes that are passing through/adjacent to the study area and have partially screened views and short viewing times.

Table 2-4 Magnitude of change criteria (visual)

Rating	Criteria
High	A substantial/obvious change to the existing view due to total loss of, or change to, elements, features or characteristics of the view. Would cause a view to be permanently changed and its quality diminished.
Moderate	Discernible changes in the existing view due to partial loss of, or change to elements, features or characteristics of the view, however has potential to be partly mitigated. The change would be out of scale with the existing view, and would leave an adverse impact on the view.
Low	Minor loss or alteration to one or more key view elements, features or characteristics, or the introduction of components that may be visible but may not be uncharacteristic within the existing view.
Negligible	Almost imperceptible or no change in the view as there is little or no loss of/or change to the elements, features or characteristics of the view.

2.4.6 Significance of impacts

The combination of sensitivity and magnitude determines the significance of the impact on the landscape character or representative viewpoint. Refer Table 2-5 for the matrix used to determine the significance of impact. The matrix has been extracted from “Roads and Maritime Services (2018), *Environmental impact assessment practice note EIA-N04 - Guideline for landscape character and visual impact assessment, Version 2.1”*. The assessment of visual effects has been undertaken in section 7.2.

Table 2-5 Significance of impact matrix

Sensitivity	Magnitude of impact				
	High	Moderate	Low	Negligible
High	High Impact	High-Moderate	Moderate	Negligible
Moderate	High-Moderate	Moderate	Moderate-Low	Negligible
Low	Moderate	Moderate-Low	Low	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

2.4.7 Cumulative impacts

The assessment of cumulative landscape character and visual impacts considers impacts that result from additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other development, or actions that occurred in the past, present of are likely to occur in the foreseeable future.

The assessment of cumulative impacts has been undertaken in section 9.

2.4.8 Photos

All photographic images were captured using a 50 millimetre fixed focal length lens on a 35 millimetre full frame format camera at a camera height of 1.6 metres. All photograph locations were recorded and mapped.

A series of eight viewpoint locations were chosen and existing views represented.

2.5 Mitigation measures

Potential mitigation measures have been developed to minimise the landscape character and visual impact of the proposal and may include:

- Adopting alternative designs or revisions to the basic engineering and design to prevent and/or minimise negative impacts
- Remedial measures such as colour and textural treatment of structural features
- Compensatory measures such as landscape design to compensate for unavoidable negative impacts and to attempt to generate long-term positive impacts.

Further details on mitigation measures have been provided in section 8.1.

2.6 Assumptions and limitations

There is no national guidance on the assessment of landscape character and visual impacts specific to Australia, however, the industry typically refers to the guidelines as outlined in section 2.1.

The assessment aims to be objective and describe any changes factually. While potential changes resulting from the proposal are defined, the significance of these changes requires qualitative (subjective) judgements. This assessment's conclusion therefore combines objective measurement and professional interpretation. While this assessment aims to be objective, it is recognised that visual impact assessment can be subjective and individuals are likely to associate different visual experiences to the study area.

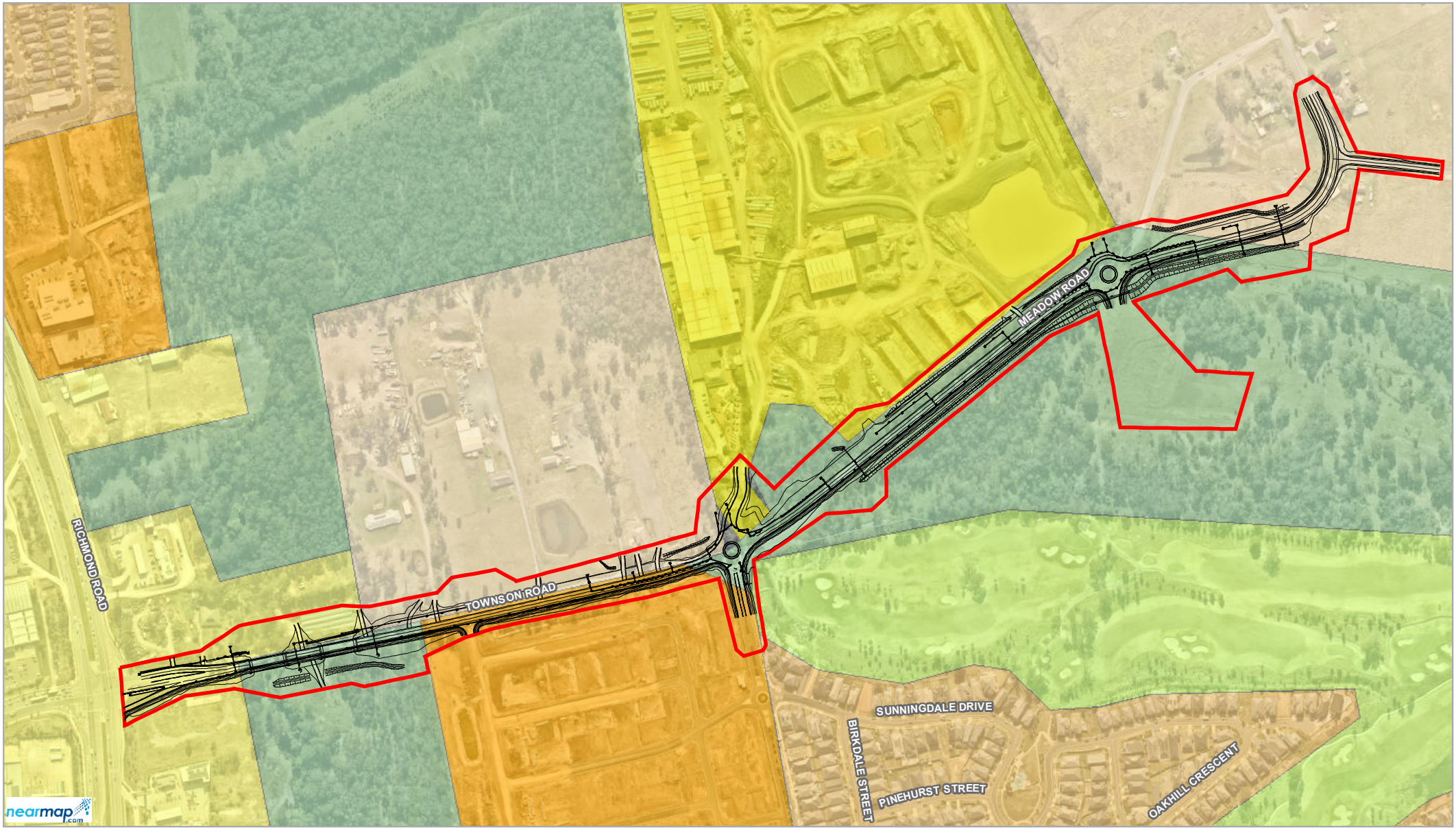
3. Existing environment

A preliminary landscape character assessment for the Townson Road and Burdekin Road extension and upgrade was prepared by Hills Environmental and Transport for NSW in December 2018. This assessment described the landscape character as being strongly influenced by the Bells Creek and Eastern Creek floodplains and associated riparian and rural lands. Taking previous work into consideration and the site observations undertaken as part of this report, the existing environment has been described in the following sections in terms of landscape character zones and the visual baseline.

3.1 Landscape character zones

Landscape character zones were defined based on the existing natural and cultural influences on the urban landscape. These represent broadly homogenous landscape characteristics and urban patterns. LCZ's are described in 3.1.1 to 3.1.7 and shown in Figure 3-1.

Impacts to landscape character zones have been assessed in section 7.1.



LEGEND

The proposal *Subject to detailed design

Construction footprint

Landscape zone

- Semi rural/ Residential
- Residential
- Future residential
- Bushland/ Open space
- Recreation
- Industrial/ Commercial
- Extractive industry

Paper Size ISO A4

0 25 50 75 100

Metres

N

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

GHD

Transport for NSW
Townson Road Upgrade Stage 1
Between Richmond Road and Jersey Road

Landscape character

Project No. **21-12511195**
Revision No. **-**
Date **5/11/2020**

FIGURE 3.1

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Data source: Nearmap 2020 (image date 03/08/2020, image extracted 28/09/2020) and NSW Six Maps, 2019 . Created by: eibbertson

3.1.1 LCZ 1 Industrial and Commercial

LCZ 1, Industrial and Commercial, primarily consists of Sydney Business Park, which occupies the area along Hollingsworth Road on the western side of Richmond Road. The area is typified by large format industrial and commercial buildings with businesses such as IKEA, Bunnings, Aldi, Bing Lee and Costco. It is a vehicle dominated environment with minimal landscaping as compared with the large expanses of car parking and warehouse buildings. Figure 3-2 shows a view north-west towards Sydney Business Park from Richmond Road.

Figure 3-2 View north-west towards LCZ 1 (Sydney Business Park)

3.1.2 LCZ 2 Bushland / Open Space

LCZ 2, Bushland/Open Space, is typified by areas of dense, tall native vegetation or open grassy fields that have not been developed. Visibility in and out of these areas is usually constrained by vegetation. LCZ 2 is sporadically distributed throughout the study area but is important for habitat connectivity along the Western Sydney Parklands corridor. Figure 3-3 shows a view south towards bushland/open space from Meadow Road.

Figure 3-3 View south towards LCZ 2, bushland/open space, from Meadow Road

3.1.3 LCZ 3 Residential

LCZ 3, Residential, comprises areas that have been subdivided and developed into residential allotments with traditional single and double storey detached dwellings. The residential area which is closest to the proposed development is located about 100 metres to the south of the intersection of Townson Road and Victory Road. Residential areas are typically sensitive to changes in the surrounding landscape. Figure 3-4 shows a view south-east toward residential, from Victory Road.

Figure 3-4 View south-east towards LCZ 3, residential, from Victory Road

3.1.4 LCZ 4 Future residential

This part of Western Sydney is undergoing a process of rapid development with areas of bushland and farmland making way for residential development. The main future residential development comprises the 'Townson Road Precinct' development which is located on the south side of Townson Road between Victory Road and Bells Creek. Large tracts of vegetation have been cleared for the development which would abut Townson Road. Another residential area undergoing development is located on the eastern side of Richmond Road, to the south of Harmony Avenue. Figure 3-5 shows a view south-east towards future residential, from Townson Road.

Figure 3-5 View south-east towards LCZ 4, future residential, from Townson Road

3.1.5 LCZ 5 Semi Rural/Residential

LCZ 5 Semi Rural / Residential consists of large grain residential allotments with multiple structures in addition to the main dwelling. Features such as fences, sheds, dams, farming equipment and vehicles, livestock and other elements associated with a rural landscape are also typical elements. Figure 3-6 shows a view of LCZ 5.

Figure 3-6 View north-west towards LCZ 5, semi rural/residential, from Kerry Road

3.1.6 LCZ 6 Extractive industry

The CSR site is located on the northern side of Meadow Road and has been extensively quarried for the production of bricks, pavers, tiles and other masonry products. The site has a display area on the south western corner and storage and handling facilities along the western boundary. The main part of the site comprises dams and earthen mounds interspersed with service roads. Figure 3-7 shows a view north-west towards extractive industry, from Meadow Road.

Figure 3-7 View north-west towards LCZ 6, extractive industry, from Meadow Road

3.1.7 LCZ 7 Recreation

LCZ 7 comprises the Stonecutters Ridge Golf Club that is located between Victory Road and Eastern Creek. This area would not be impacted by the proposal so has not been described further.

3.2 Visual baseline assessment

The following sections 3.2.1 to 3.2.8 describe eight viewpoints that represent different visual receivers that were identified based on:

- Proximity of the receivers to the proposal
- Different type of receiver, as different viewer types would have different perceptions of the change.

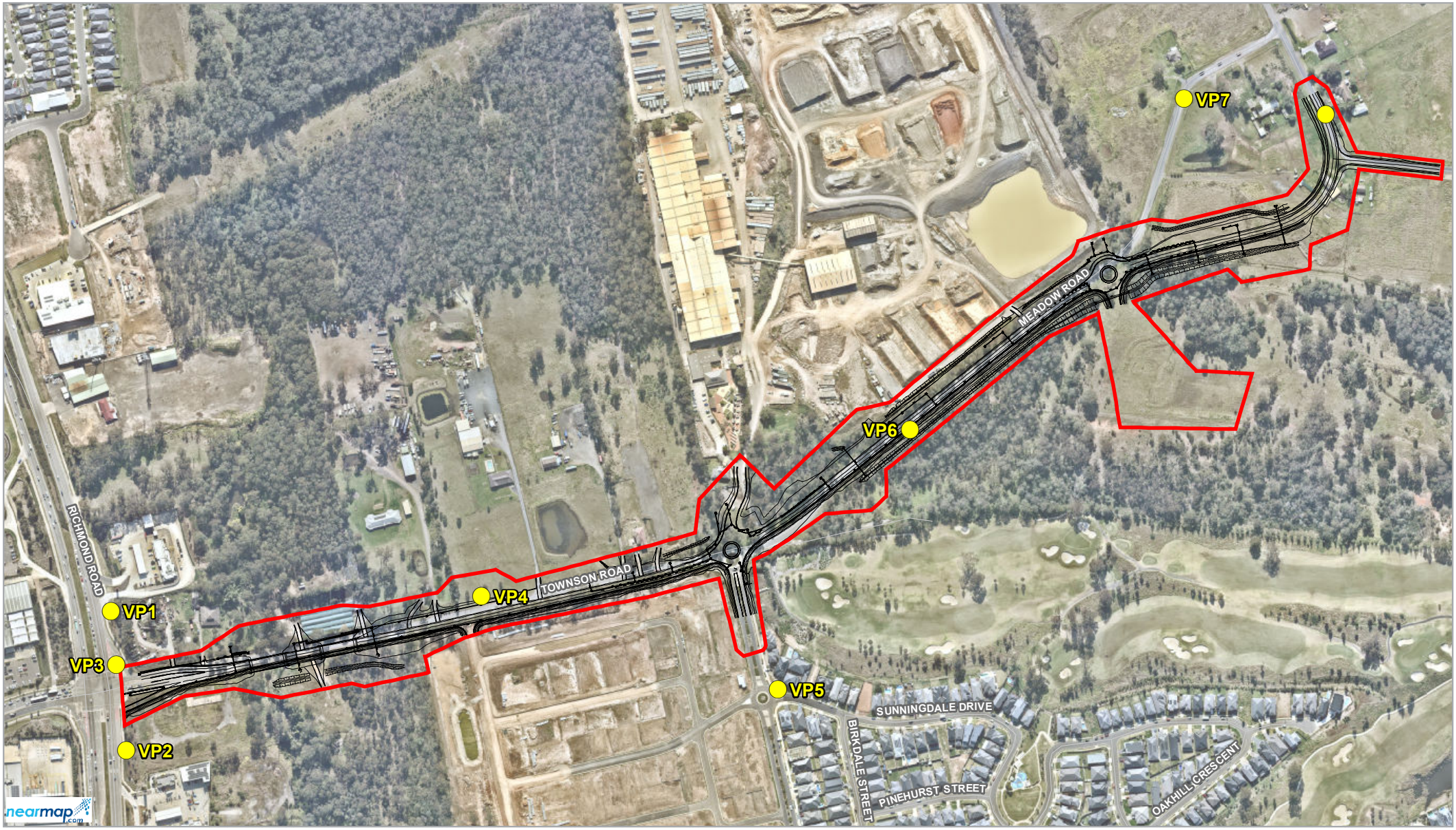
Sensitive visual receivers within the study area comprise residential areas, road users and visitors to public recreation areas.

Based on the context analysis, representative viewpoint locations were selected for assessment with a focus on publicly accessible locations representative of the most sensitive receivers.

Refer to Table 3-1 and Figure 3-8 for locations.

Table 3-1 Viewpoint locations

Viewpoint	Location	Description
VP 01	Richmond Road #1	VP 01 is located on Richmond Road, about 75 m north-west of the intersection of Richmond Road and Townson Road.
VP 02	Richmond Road #2	VP 02 is located on Richmond Road, about 75 m south of the intersection of Richmond Road and Townson Road.
VP 03	Townson Road #1	VP 03 is located on the north eastern corner of the intersection of Richmond Road and Townson Road.
VP 04	Townson Road #2	VP 04 is located on Townson Road, about 425 m east from the intersection of Townson Road and Richmond Road.
VP 05	Victory Road	VP 05 is located on the eastern side of Victory Road, about 160 m south of the intersection of Victory Road and Townson Road.
VP 06	Meadow Road #1	VP 06 is located on Meadow Road, about 250 m north-east from the intersection of Townson Road and Victory Road.
VP 07	Meadow Road #2	VP 07 is located on Meadow Road, about 120 m south-west of the intersection of Meadow Road and Durham Road.
VP 08	Durham Road	VP 08 is located on Meadow Road, about 90 m south-east of the intersection of Meadow Road and Durham Road.



LEGEND

- Viewpoint location
- The proposal *Subject to detailed design
- Construction footprint

Paper Size ISO A4

0 25 50 75 100

Metres

N

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

GHD

Transport for NSW
Townson Road Upgrade Stage 1
Between Richmond Road and Jersey Road

Viewpoint locations

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FIGURE 3.8

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Data source: Aerial Imagery - Nearmap 2020 (image date 03/08/2020, image extracted 28/09/2020 and NSW Six Maps, 2019 . Created by: eibbertson

3.2.1 Viewpoint location 01: Richmond Road #1

Figure 3-9 View south-east toward proposal

Criteria	Comments
Location and View Direction	VP 01 is located on Richmond Road, about 75 m north-west of the intersection of Richmond Road and Townson Road. Figure 3-9 shows a view south-east towards the proposal.
Visual Receivers	VP 01 is representative of Motorists travelling south-east along Richmond Road. It is also representative of cyclists, pedestrians and road users in motor vehicles, travelling south along the eastern side of Richmond Road.
Description of Existing View	VP 01 is a view of a highly modified environment. There are four lanes of traffic on the eastern side of Richmond Road and two lanes of traffic on the western side. Also visible is a slip lane for motorists turning left into Townson Road. In addition to the traffic, there are numerous artificial elements and structures such as traffic lights, signage, light poles, an electrical substation and large industrial buildings.

3.2.2 Viewpoint location 02: Richmond Road #2

Figure 3-10 View north towards the proposal

Criteria	Comments
Location and View Direction	VP 02 is located on Richmond Road, about 75 m south of the intersection of Richmond Road and Townson Road. Figure 3-10 shows a view north towards the proposal.
Visual Receivers	VP 02 is representative of cyclists, pedestrians and road users in motor vehicles, travelling north along the eastern side of Richmond Road.
Description of Existing View	VP 02 is a view of a highly modified environment. There are four lanes of traffic on the eastern side of Richmond Road and two lanes of traffic on the western side. Also visible is a slip lane for motorists turning left into Richmond Road from Townson Road. In addition to the traffic, there are numerous artificial elements and structures such as traffic lights, signage, light poles, an electrical substation and large industrial buildings.

3.2.3 Viewpoint location 03: Townson Road #1

Figure 3-11 View north-east along Townson Road

Criteria	Comments
Location and View Direction	VP 03 is located on the north eastern corner of the intersection of Richmond Road and Townson Road. Figure 3-11 shows a view north-east along Townson Road.
Visual Receivers	VP 03 is representative of views that would be obtained by cyclists, pedestrians and motorists travelling north-east along Townson Road from the intersection of Richmond Road and Townson Road.
Description of Existing View	VP 03 is characterised by the significant stands of native vegetation on both the northern and southern sides of Townson Road. The foreground is however dominated by signage, billboards, traffic signals, chain wire fencing and soil stockpiles associated with an industrial facility.

3.2.4 Viewpoint location 04: Townson Road #2

Figure 3-12 View north-east along Townson Road

Criteria	Comments
Location and View Direction	VP 04 is located on Townson Road, about 425 m north-east from the intersection of Townson Road and Richmond Road. Figure 3-12 shows a view north-east along Townson Road.
Visual Receivers	VP 04 is representative of views that would be obtained by motorists travelling along Townson Road from the intersection of Richmond Road and Townson Road. There are existing semi-rural residential properties to the north of the road. A future residential development is under construction, in the area to the south of the Townson Road.
Description of Existing View	VP 04 is characterised by an established row of native trees along the southern road reserve. Vegetation can also be observed in the far distance. To the right in the view, a new residential development is undergoing construction and much of the bushland that was there previously has been removed. However a row of established trees has been retained adjacent to the corridor.

3.2.5 Viewpoint location 05: Victory Road

Figure 3-13 View north-west along Victory Road

Criteria	Comments
Location and View Direction	VP 05 is located on the eastern side of Victory Road, about 160 m south-east of the intersection of Victory Road and Townson Road. Figure 3-13 shows a view north-west along Victory Road toward the proposal.
Visual Receivers	VP 05 is representative of the views motorists and pedestrians would obtain when travelling toward the intersection of Victory Road and Townson Road, recreational users of Stonecutters Ridge Golf Course and occupants of the adjacent residential properties. A future residential development is under construction in area to the west of the Victory Road.
Description of Existing View	To the left of the view, there is a residential subdivision undergoing construction. To the right of the view is a reserve that abuts a golf course that is located to the east of Victory Road. In the centre of the view, beyond the intersection of Townson Road and Victory Road is the CSR quarry site and associated administrative buildings. It is mostly concealed from view by established native trees, however a small portion of the administrative building can be seen through a gap in the trees.

3.2.6 Viewpoint location 06: Meadow Road #1

Figure 3-14 View north-east along Meadow Road

Criteria	Comments
Location and View Direction	VP 06 is located on Meadow Road, about 250 m north-east from the intersection of Meadow Road and Victory Road. Figure 3-14 shows a view north-east along Meadow Road.
Visual Receivers	VP 06 is representative of views that would be obtained by motorists travelling north-east along Meadow Road from the intersection of Meadow Road and Victory Road.
Description of Existing View	VP 06 is characterised by the significant stands of native vegetation on the southern side of Meadow Road and roadside vegetation on the northern side of Meadow Road. The established row of native trees along the northern side of the road assists to partially screening the CSR quarry site from view.

3.2.7 Viewpoint location 07: Meadow Road #2

Figure 3-15 View south from Meadow Road

Criteria	Comments
Location and View Direction	VP 07 is located on Meadow Road, about 120 m south-west of the intersection of Meadow Road and Durham Road. Figure 3-15 shows a view south from Meadow Road.
Visual Receivers	VP 07 is representative of views that would be obtained by motorists travelling along Meadow Road from the intersection of Meadow Road and Durham Road. There are existing semi-rural residential properties to the north and south of the road.
Description of Existing View	VP 07 is characterised by the significant stands of native vegetation on the southern side of Meadow Road and open grassy paddocks. A paddock with livestock and a residential lot can be seen to the left of the view.

3.2.8 Viewpoint location 08: Durham Road

Figure 3-16 View south-west from Durham Road.

Criteria	Comments
Location and View Direction	VP 08 is located on Durham Road, about 90 m south-east of the intersection of Meadow Road and Durham Road. Figure 3-16 shows a view south-west from Durham Road.
Visual Receivers	VP 08 is representative of views that would be obtained by motorists travelling along Durham Road. There are existing semi-rural residential properties to the east and west of the road.
Description of Existing View	VP 08 is characterised by the significant stands of native vegetation in the mid distance and semi-rural residential lots in the foreground. Signs of human modification to the landscape are visible such as livestock, fences, sheds, overhead power lines and other farming infrastructure.

4. Urban design vision, objectives and principles

The following section outlines specific urban design objectives and principles as devised by TfNSW and the urban design team for the proposal.

4.1 Urban design vision, objectives and principles for the proposal

4.1.1 Vision

The planning and design of Townson Road, active transport corridors and bridges would respond to the urban character of the site. A focus on enhancing the user experience and natural habitat would facilitate the appreciation of the existing landscape adjacent to the road corridor. Areas of the proposal that interface with adjacent residential developments, would consider the surrounding built form and associated risks in relation to landscape finishes and mature tree heights.

The design would enhance urban interfaces for neighbouring communities to the north and south of the corridor. The connections, both visual and physical, to and across the corridor would improve creek corridors, proposed residential developments and nearby commercial areas within the LGA.

Implementing this vision would ensure the proposal would harness the potential to further connect and enhance the existing and future suburban context of the site.

4.1.2 Design strategy

The road corridor alignment offers a variety of experiences designed to respond to the adjacent built and landscape context.

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 woodland.

Our urban design approach can be rationalised into six core objectives. These objectives will inform our urban design strategy and are outlined below:

- Reinforce the existing landscape character along the road alignment to create a distinctive and legible journey
- Protect and enhance existing views
- Improve connectivity along and across the road alignment
- Provide a unified suite of road and roadside elements that respond to the local setting
- Provide a landscape design that strengthens indigenous plant communities and natural landscape systems
- Provide a landscape design that delivers a sustainable solution for the future.

These six urban design objectives and principles can be seen in Table 4-1. Figure 4-1, Figure 4-2, Figure 4-3, Figure 4-4, Figure 4-5 and Figure 4-6 provide examples of each.

Table 4-1 Urban design objectives and principles

Objective 1 Reinforce the existing landscape character along the road alignment to create a distinctive and legible journey	
Principles Retain existing vegetation within the road corridor where practicable and supplement with plant species from the same vegetation communities Provide landscape finishes that complement the adjacent plant communities and developments along the corridor Develop a robust planting palette that responds to changing urban form and altered site conditions	 **Figure 4-1 Stands of existing Eucalyptus spp. trees**
Objective 2 Protect and enhance existing views	
Principles Protect broad open views across open grassland areas by utilising low native gasses and shrubs along adjacent embankments Control the placement of utilities in the corridor and locate underground where possible to preserve character, enhance views and maximise planting opportunities	 **Figure 4-2 Broad open views across rural residential lots**

Objective 3

Improve connectivity along and across the road alignment

Principles

Ensure safe and convenient connections to and across the road corridor

Consider how walking, cycling and public transport modes are integrated into the proposal design

Optimise the shared path route to create an appealing experience for users that connects in with existing active transport infrastructure

Consider shade provision, visual interest through retaining open view corridors, and sight lines in planting design

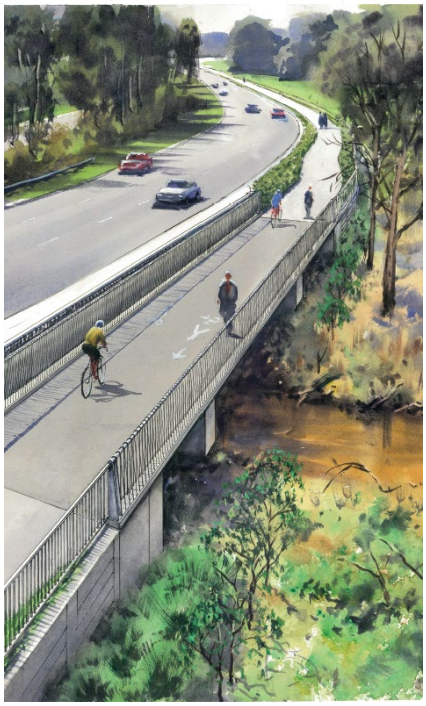


Figure 4-3 Shared user path access across creek

Objective 4

Provide a unified suite of road and roadside elements that respond to the local setting

Principles

Reference relevant technical manuals (such as RMS: *Beyond the Pavement 2014*).

Ensure scale and location of elements are appropriate and consider not only road users but adjacent properties.

Consider how elements can be integrated to reduce clutter and enhance the road user experience.

Consider material selection that addresses the changing context, from rural to residential.

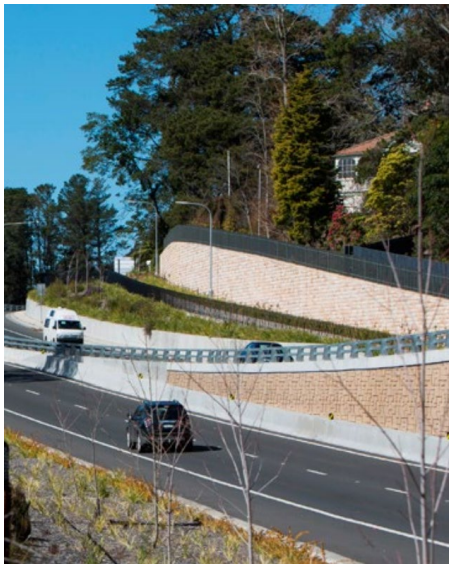


Figure 4-4 Great Western Highway

Objective 5

Provide a landscape design that strengthens indigenous plant communities and natural landscape systems

Principles

Ensure riparian corridors are protected and enhanced through use of appropriate scour protection and revegetation

Reference soil landscapes and associated plant communities to help connect to landscape setting

Consider re-use of site topsoil and stockpile management to protect the existing seed bank

Consider how expanding development adjacent to the road corridor would impact the surrounding plant communities

Figure 4-5 Bells Creek

Objective 6

Provide a landscape design that delivers a sustainable solution for the future

Principles

Maximise Water sensitive urban design (WSUD) opportunities within landscape areas to reduce surface run-off and increase infiltration

Consider material selection and its associated carbon footprint

Maximise the re-use of site topsoils and endemic plant species that are best suited to the local climate and setting

Figure 4-6 WSUD device Blacktown City Council LGA

5. Policy and legislative context

The following section describes the existing policy context of the proposal relevant to urban design, landscape character and visual amenity. This has been used to inform the definition of landscape character zones, as well as provide an understanding of the visual character of the area.

5.1 Regional policy and legislation

5.1.1 North West Growth Area

The proposal is located in the North West Growth Area, an area designated to supply greenfield land for urban development in Sydney. This area is to accommodate 33,000 new homes by 2026, with new schools, parks, community facilities, public transport and services to support the proposed growth.

Precincts are released in stages by the State Government to allow the proper planning and coordination of infrastructure delivery. Each released precinct has a Precinct Plan. The proposal is located within the Marsden Park Industrial, West Schofields and Schofields Precincts.

5.1.2 Sydney Regional Environmental Plan No 20 – Hawkesbury-Nepean River (No 2-1997)

Within this plan, the Eastern Creek riparian corridor has local-level scenic protection.

The aim of this plan is to protect the environment of the Hawkesbury-Nepean River system by ensuring that the impacts of future land uses are considered in a regional context. Relevant strategies within this plan includes those relating to riverine scenic quality. This includes the following:

> *Maintain areas of extensive, prominent or significant vegetation to protect the character of the river;*
>
> *Ensure proposed development is consistent with the landscape character as described in the Scenic Quality Study;*
>
> *Consider the siting, setback, orientation, size, bulk and scale of and the use of unobtrusive, non-reflective material on any proposed building or work, the need to retain existing vegetation, especially along river banks, slopes visible from the river and its banks and along the skyline, and the need to carry out new planting of trees, and shrubs, particularly locally indigenous plants;*
>
> *Consider opportunities to improve riverine scenic quality.*

5.2 Local policy and legislation

5.2.1 Blacktown Local Environmental Plan

The study area is located within the Blacktown local government area and therefore the *Blacktown Local Environmental Plan 2015* (LEP) applies. Relevant aims of the Blacktown LEP include:

- To provide for infrastructure to maintain and meet demands arising from housing and employment growth;
- To conserve and enhance Blacktown's built, natural and cultural heritage;

- To conserve, restore and enhance biological diversity and ecosystem health, particularly threatened species, populations and communities.

Land use zones

Land uses within the context of the proposal are shown in Figure 5-1.

Relevant objectives of each land use zone can be seen in Table 5-1.

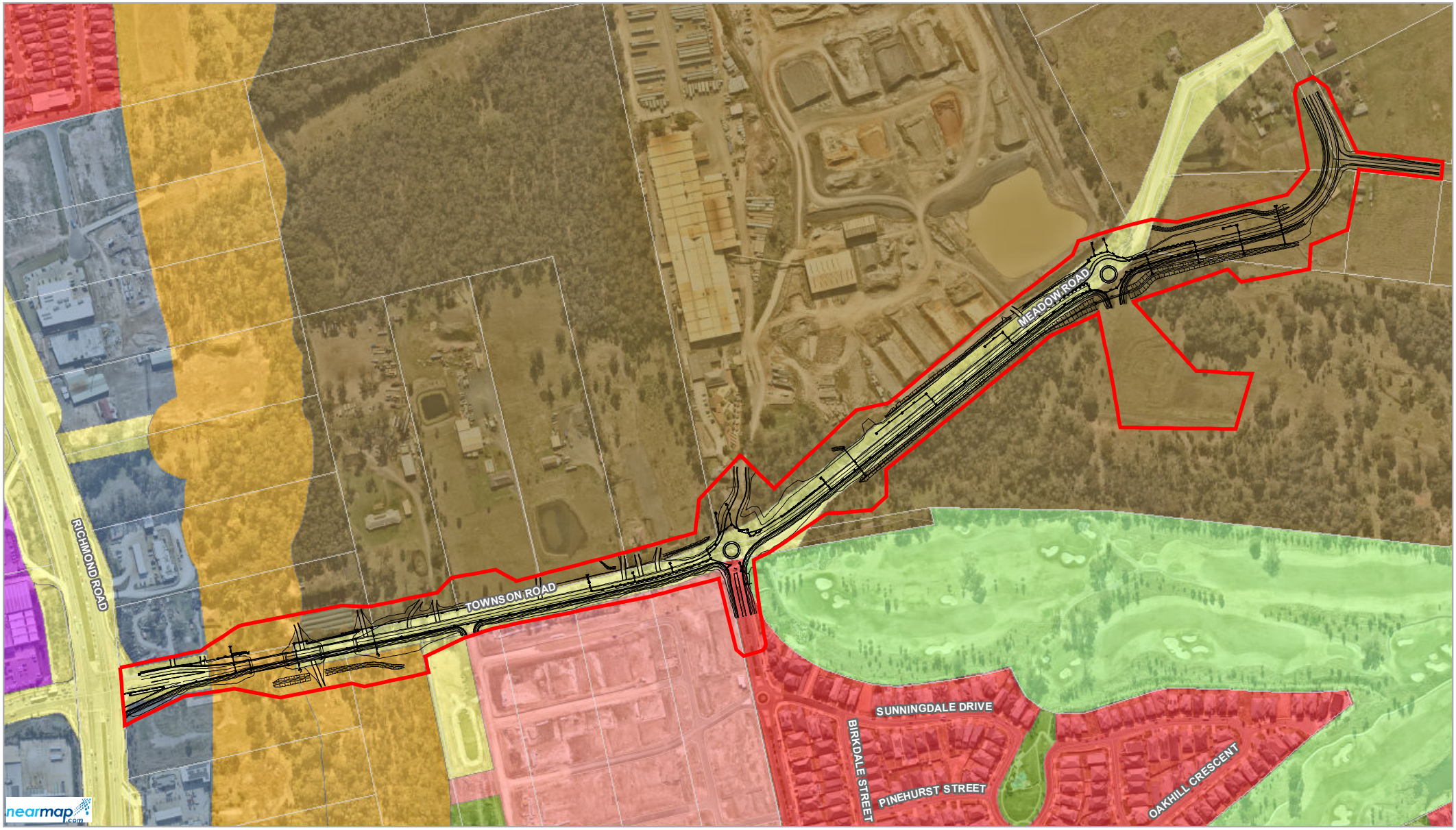
Table 5-1 Land use zones and objectives

Land Use Zone	Objectives
RU4: Primary Production Small Lots	To ensure that development is sympathetic to the ecological attributes of the area.
R2: Low Density Residential	To enable certain activities to be carried out within the zone that do not adversely affect the amenity of the neighbourhood.
R3: Medium Density Residential	To enable certain activities to be carried out within the zone that do not adversely affect the amenity of the neighbourhood.
B2: Local Centre	To maximise public transport patronage and encourage walking and cycling. To encourage the development of an active centre that is commensurate with the nature of the surrounding area.
B5: Business Development	To allow development that is compatible with the scale and form of the surrounding area.
SP2: Infrastructure	To ensure that development does not have an adverse impact on the form and scale of the surrounding neighbourhood.
RE1: Public Recreation	To provide a range of recreational settings and activities and compatible land uses. To protect and enhance the natural environment for recreational purposes.
RE2: Private Recreation	To provide a range of recreational settings and activities and compatible uses. To protect and enhance the natural environment for recreational purposes.
E2: Environmental Conservation	To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values. To prevent development that could destroy, damage or otherwise have an adverse effect on those values. To provide for passive recreational activities that are compatible with the land's environmental constraints.

5.2.2 Blacktown City Council Growth Centre Precincts Development Control Plan

This plan is to communicate the planning, design and environmental objectives and controls for the Growth Centre Precincts, and to promote high quality urban design outcomes within the context of environmental, social and economic sustainability. Objectives and controls are provided, applying to all development in the Growth Centre Precincts. An indicative layout plan is also provided specific to each precinct and is shown in Figure 5-2. Figure 5-3, Figure 5-4, Figure 5-5 and Figure 5-6 provide an overview of the following relevant objective controls of the DCP:

- 2.3.4 Native vegetation and ecology
- 3.4 Movement Network
- 4.2.9 Visual and acoustic privacy.



LEGEND

The proposal *Subject to detailed design

Construction footprint

Land use

B5, Business Development

E2, Environmental Conservation

IN2, Light Industrial

R2, Low Density Residential

R3, Medium Density Residential

RE1, Public Recreation

RE2, Private Recreation

RU4, Primary Production Small Lots

SP2, Infrastructure

Paper Size ISO A4

0 25 50 75 100

Metres

N

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

GHD

Transport for NSW
Townson Road Upgrade Stage 1
Between Richmond Road and Jersey Road

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Land use plan

FIGURE 5-1

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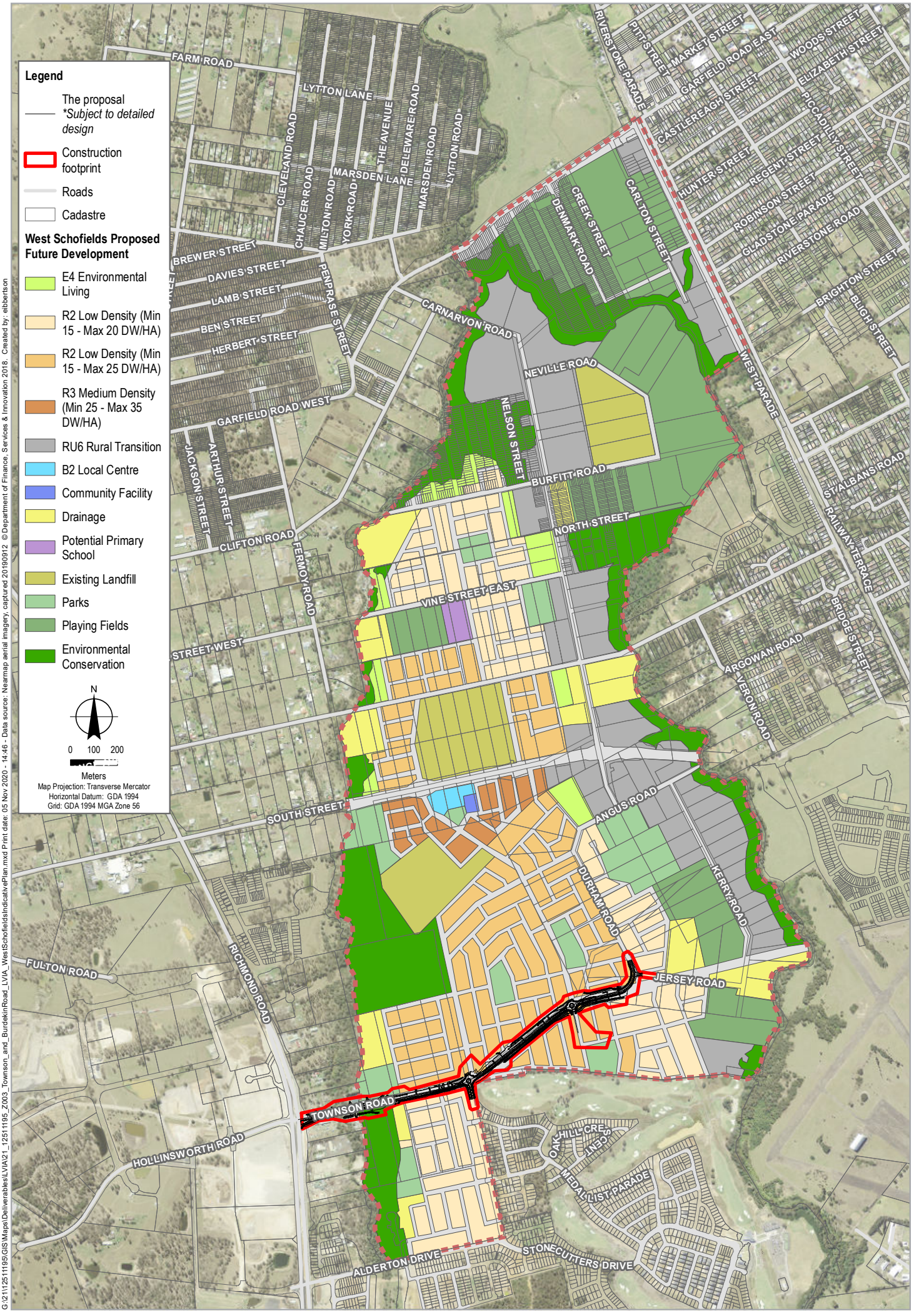

Figure 5-2 Proposal North West Growth Area Precincts

LEGEND

- Train Station
- Rail Corridor
- Bus routes
- Cycleway
- Construction footprint

Paper Size ISO A4

0 75 150 225 300

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

GHD

Transport for NSW
Townson Road Upgrade Stage 1
Between Richmond Road and Jersey Road

Public and Active Transport

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Date **5/11/2020**

FIGURE 5-3

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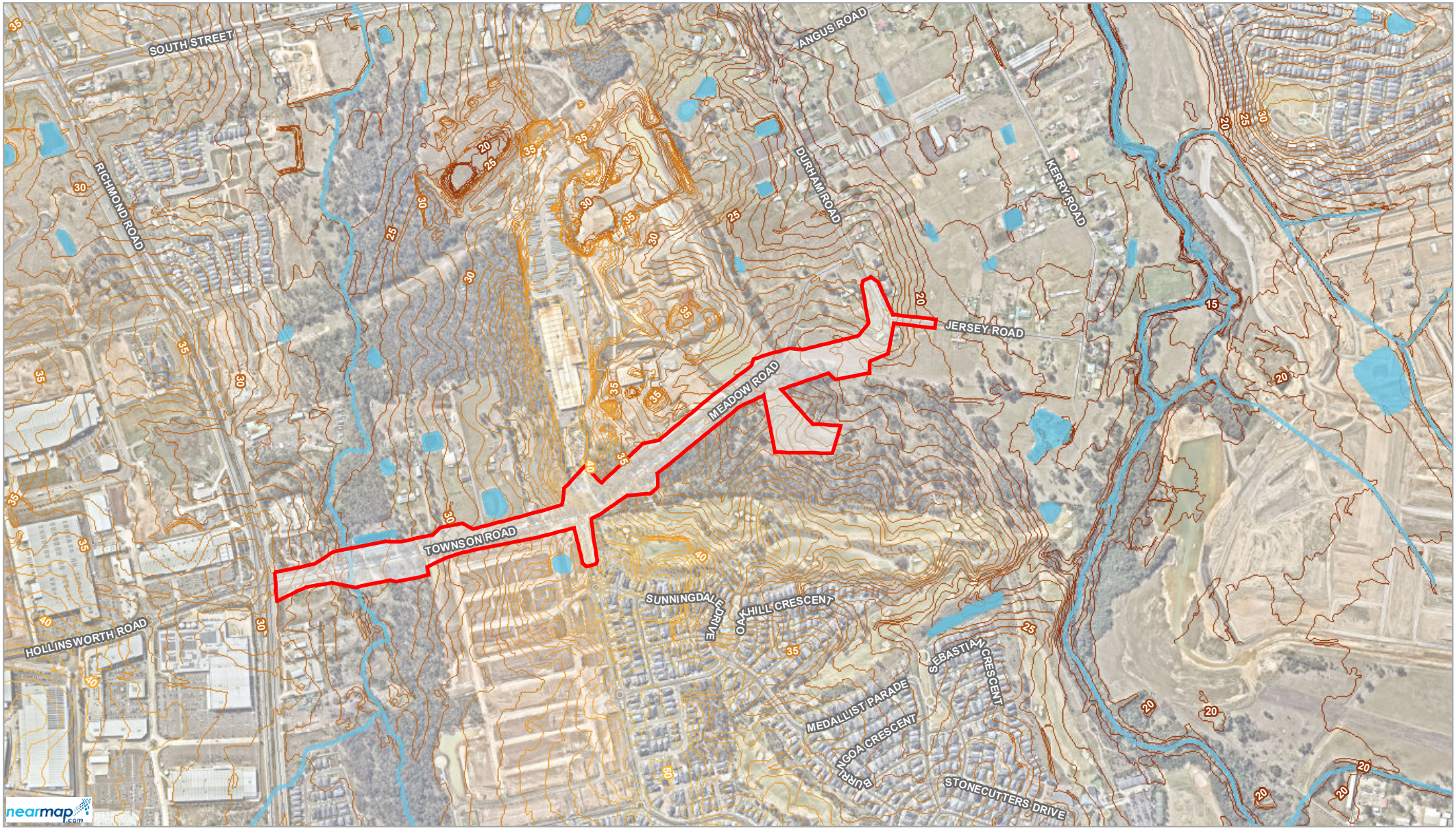

LEGEND

Construction footprint

Contour (1m)

36 - 40 | 21 - 25

46 - 50 | 31 - 35 | 16 - 20

41 - 45 | 26 - 30 | 11 - 15

Water feature

Paper Size ISO A4

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

GHD

Transport for NSW
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Between Richmond Road and Jersey Road

Topography and Hydrology

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Date **5/11/2020**

FIGURE 5-4

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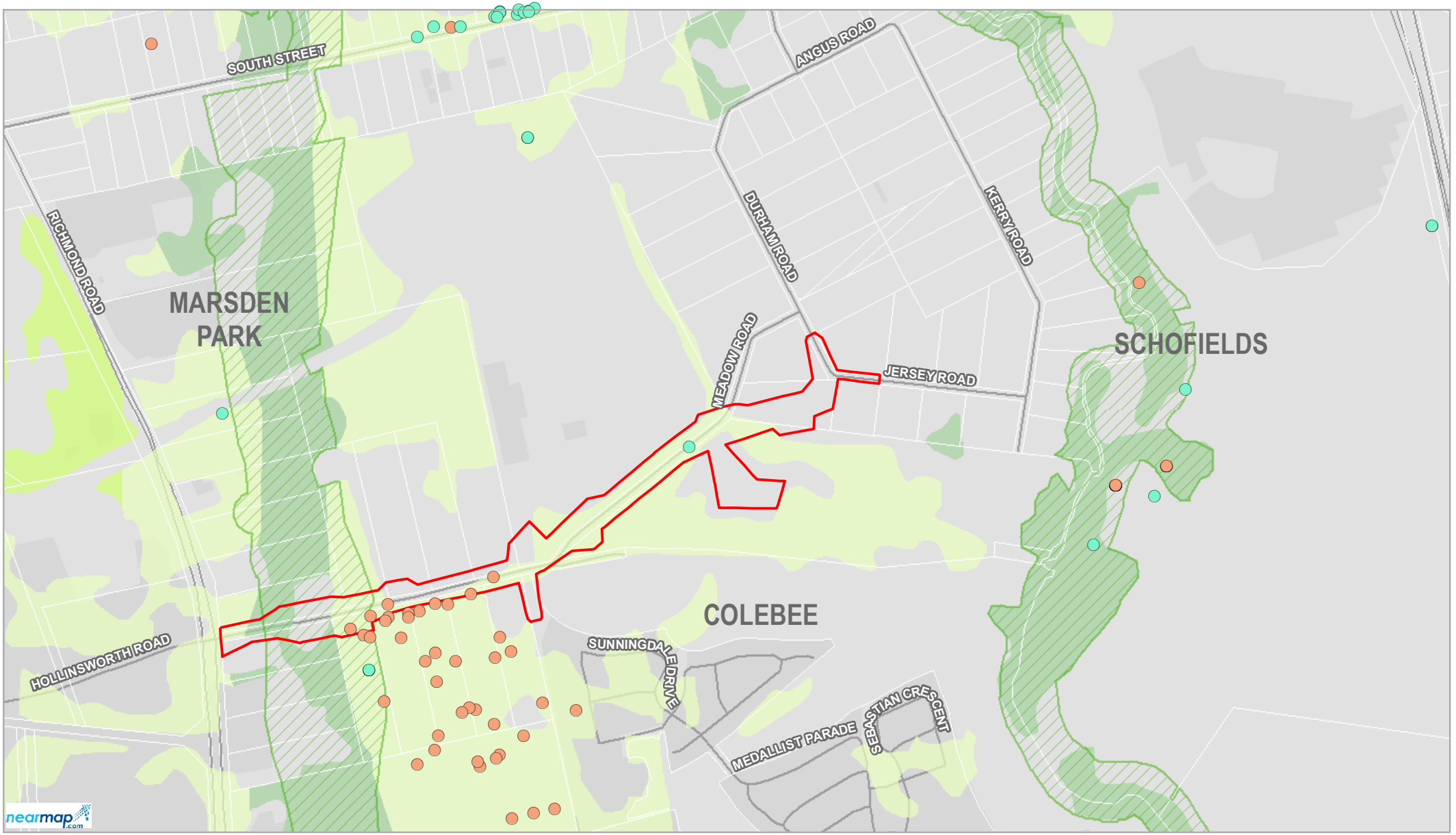

LEGEND

- Construction footprint
- Threatened flora
- Threatened fauna
- Regional biodiveristy corridor

Vegetation

- Shale Plains Woodland
- Shale/Gravel Transition Forest
- Alluvial Woodland

Paper Size ISO A4

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

Transport for NSW
Townson Road Upgrade Stage 1
Between Richmond Road and Jersey Road

Vegetation and Open Space

Project No. **21-12511195**
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Date **5/11/2020**

FIGURE 5-5

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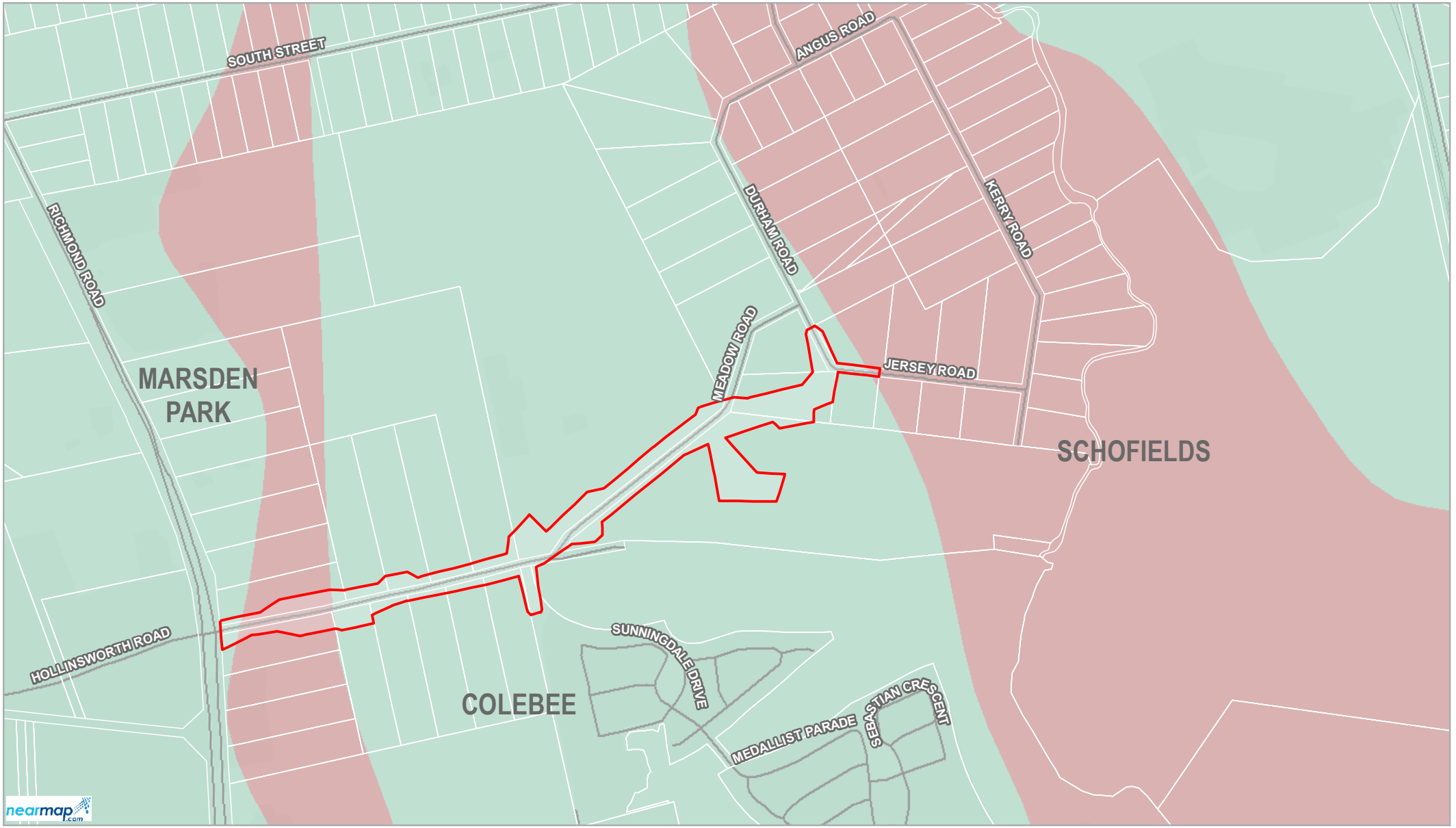

LEGEND

Construction footprint

Soils

Blacktown

South Creek

Paper Size ISO A4

0 50 100 150 200

Metres

N

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Transport for NSW
Townson Road Upgrade Stage 1
Between Richmond Road and Jersey Road

Soils

Project No. **21-12511195**
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Date **5/11/2020**

FIGURE 5-6

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6. Urban and landscape design

6.1 Introduction

The urban and landscape design for the proposal has been based on site investigations, review of background documentation and determination of an appropriate response for a roadway widening project in the Blacktown LGA.

This section includes the following information to inform the urban and landscape design intent for the proposal:

- The proposed vegetation types are described along with the implementation methods
- The engineering concept plans showing the extent of the roadway corridor and incorporating the location, extent of the proposed landscape finishes for the road corridor (Refer Appendix A)
- Cross sections have been developed that provide additional information of the proposal at key locations.

The following key considerations that apply to the overall program of work:

- Extent and location of planting on batters is subject to detailed design
- Extent of landscape treatment is three metres only beyond the edge of batters or new work
- Tree planting and locations subject to appropriate clear zones for the road design speed. To be addressed in the detailed design
- Landscape design is subject to the Flora and fauna management plan being prepared as part of the Construction Environmental Management Plan (CEMP)
- The design is based on the engineering concept design and chainages relate to these drawings
- For the Interim phase the intention is to implement the majority of planting. This would include groundcover planting to maintain slope stabilisation until the ultimate phase is completed.

6.2 Landscape intent and typologies

Site investigations were undertaken in late 2019 to review the existing site conditions with respect to the recommendations of the background documentation including the LCVIA and Biodiversity Assessment and the engineering concept design.

A set of principles were developed in order to guide the landscape design as follows:

- Revegetate new landscape areas from works to stabilise the earthworks, minimise visual impact and integrate with the character of the surrounding landscape
- Reinforce existing habitats and ecological corridors through species selection
- Inclusion of locally occurring native species
- Species selected to have minimal or no maintenance requirements
- Provide visual interest, amenity and legibility of the varied roadside environment.

Vegetation types were developed based on soil landscapes within the corridor and plant communities identified in the Biodiversity assessment reports. Table 6-1 includes the three planting mixes proposed for the design. The overall approach of the design is to revegetate the understorey using tubestock plant material, as has been used in other road projects adjacent to the Townson Road corridor.

Compost blanket or Ecoblanket is proposed for batter steeper than 3:1, which includes native and pasture grasses for general revegetation along the road corridor. Mature trees are proposed along the entire corridor to provide instant canopy cover. The trees are used in combination with grasses and shrubs in order to assist in identifying areas, provide amenity, habitat and maintain consistency and diversity of vegetation.

Table 6-1 Planting schedule

Botanical name	Common name	Application rate/density	Planting mix rationale	Planting methodology	Location
Native trees					
Angophora subvelutina	Broad-Leaved Apple	-	Native tree planting mix derived from soil landscapes and cumberland plain plant communities	A mixture of semi-mature and tubestock planting to provide initial cover	Proposal verge and road reserve areas
Eucalyptus amplifolia	Cabbage Gum	-			
Casuarina glauca	Swamp Oak	-			
Eucalyptus maculata	Spotted Gum	-			
Eucalyptus moluccana	Grey Box	-			
Eucalyptus crebra	Narrow-Leaved Ironbark	-			
Eucalyptus punctata	Grey Gum	-			
Eucalyptus tereticornis	Forest Red Gum	-			
Eucalyptus longifolia	Woollybutt	-			
Melaleuca linariifolia	Narrow-Leaved Paperbark	-			
Melaleuca quinquenervia	Broad-Leaved Paperbark	-			
Mass Planting (Type 1)					
Carex appressa	Tall Sedge	6/m^2	Native planting mix for use in drainage swales, basins and batters	Tubestock planting	Drainage infrastructure
Dianella caerulea	Blue Flax Lily	6/m^2			
Eleocharis sphacelata	Tall Spike Rush	4/m^2			
Ficinia nodosa	Knobby club-sedge	6/m^2			
Imperata cylindrica	Blady Grass	4/m^2			
Lomandra longifolia	Spiny Mat Rush	2/m^2			
Juncus usitatus	Common Rush	6/m^2			
Mass Planting (Type 2)					
Cissus antarctica	Native Grape	4/m^2	Native planting mix for use on roadside batters and verges	Tubestock planting	Roadside batters and verges
Bursaria spinosa	Blackthorn	4/m^2			
Eleocharis sphacelata	Tall Spike Rush	4/m^2			
Leptospermum petersonii	Lemon Scented Teatree	2/m^2			

Botanical name	Common name	Application rate/density	Planting mix rationale	Planting methodology	Location
Lomandra longifolia	Spiny Mat Rush	2/m^2			
Lomandra 'Shara'	Shara	6/m^2			
Themeda australis	Kangaroo Grass	4/m^2			
Hardenbergia violacea	Native Sarsparilla	4/m^2			
Compost Blanket					
Pasture Grasses					
Cynodon dactylon	Hulled Couch	5.0 kg/ha	Cover crop species providing erosion protection and slope stabilisation	Compost blanket or Ecoblanket * Japanese Millet to be used only from September to March * Rye Corn to be used only from April to August	Steep batters ≤ 2h:1v
Echinochloa esculenta	Japanese Millet *	35.0 kg/ha			
Lolium multiflorum	Eclipse Rye	30.0 kg/ha			
Lolium perrene	Perennial Rye	7.0 kg/ha			
Trifolium pratense	Red Clover	5.0 kg/ha			
Secale cereal	Rye Corn *	35.0 kg/ha			
Native Grasses					
Dianella longifolia	Blueberry Lily	2.0 kg/ha	Native understorey planting mix for steep cut batters	Compost blanket or Ecoblanket	Steep batters ≤ 2h:1v
Cymbopogon refractus	Barbed Wire Grass	1.0 kg/ha			
Goodenia hederacea subsp. hederacea	Forest Goodenia	1.5 kg/ha			
Lomandra longifolia	Spiny Mat Rush	2.5 kg/ha			
Lomandra multiflora subsp. Multiflora	Many Flowered Mat-Rush	1.0 kg/ha			
Hardenbergia violacea	Native Sarsparilla	0.5 kg/ha			
Themeda australis	Kangaroo Grass	1.5 kg/ha			
Turf					
Zoysia japonica "SS500"	Empire Zoysia				

6.3 Urban design intent and typologies

The following section has been influenced by local road projects within the Blacktown LGA and incorporates Blacktown City Council's recommendations for urban design treatments.

6.3.1 Retaining walls

Retaining walls have not been included in the concept design at this stage. Should retaining walls be deemed necessary, a pre-cast concrete panel will be detailed as part of the urban design scope. Figure 6-1 provides an illustration of the typical finish for retaining walls if proposed at the bridge crossing. Details to be developed further during detailed design.

Figure 6-1 Typical retaining wall detail

6.3.2 Bridges

The proposal includes provision of two bridges:

- Bridge 1 (BR1) over Bells Creek
- Bridge 2 (BR2) over Bells Creek Overflow.

Bridge barriers for BR1 and BR2 consist of precast concrete traffic barriers on the outer edge of the bridge structure. A single rail is proposed along the top of the concrete barrier, however, this would to be developed further during detailed design.

Figure 6-2 provides an illustration of the typical finish for bridge barriers.

Figure 6-2 Typical bridge barrier detail

The bridge deck structure for BR1 and BR2 will explore fibre reinforced concrete decks as an alternative to plain concrete.

Figure 6-3 provides an illustration of the typical finish for the bridge deck. Details would be developed further during detailed design.

Figure 6-3 Typical bridge deck detail

6.3.3 Noise walls

The acoustic assessment is currently being developed and was not available for this submission. Should noise walls be required, these would be developed during detailed design.

6.4 Landscape sections

Typical sections through Townson Road, new road and Victory Road illustrate the landscape intent to maximise planting to batters, verges and medians. Clear zones have been considered in the placement of trees and would be developed further during detailed design. Plant species selection would be determined by geographical location, soil landscapes and commercial availability.

Figure 6-4 and Figure 6-5 show the interim phase. Figure 6-6, Figure 6-7 and Figure 6-8 show the ultimate phase of the proposal. The intention is to implement the majority of proposed planting during the interim phase. This would include provision of groundcover planting to maintain slope stabilisation until the ultimate phase is completed.

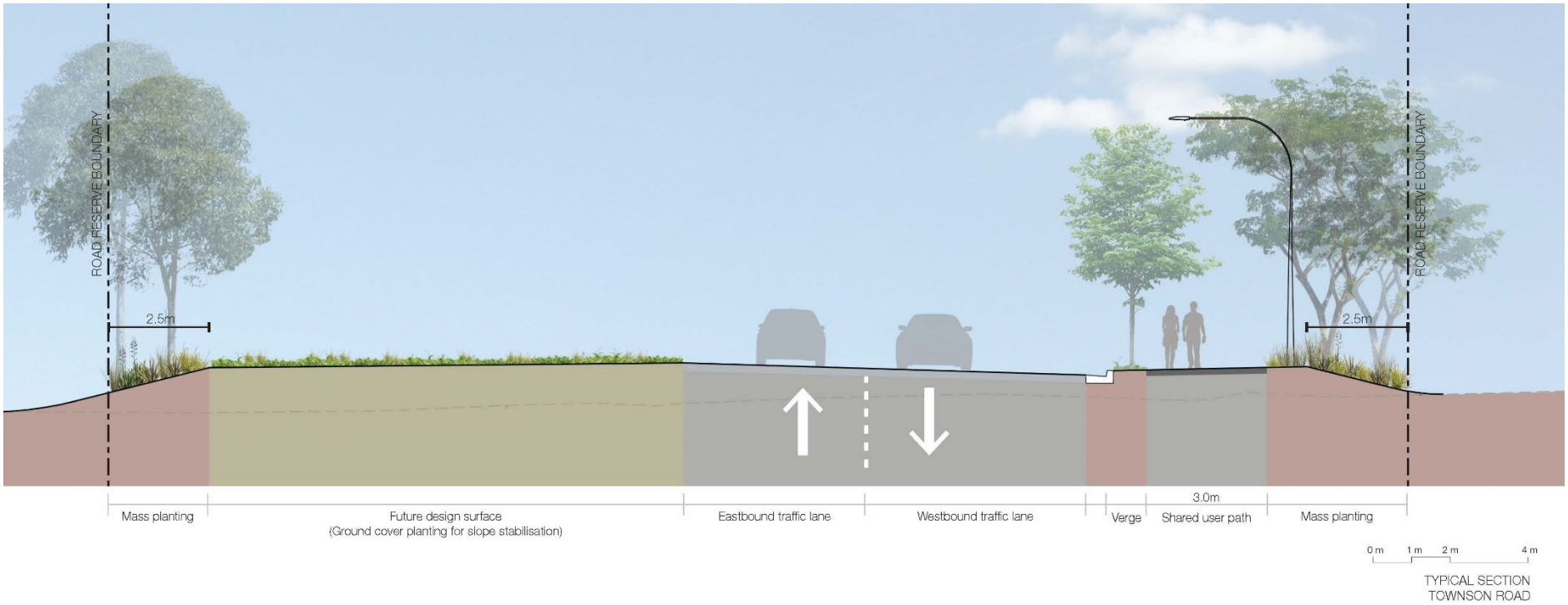

Figure 6-4 Typical section through Townson Road interim phase fill batters

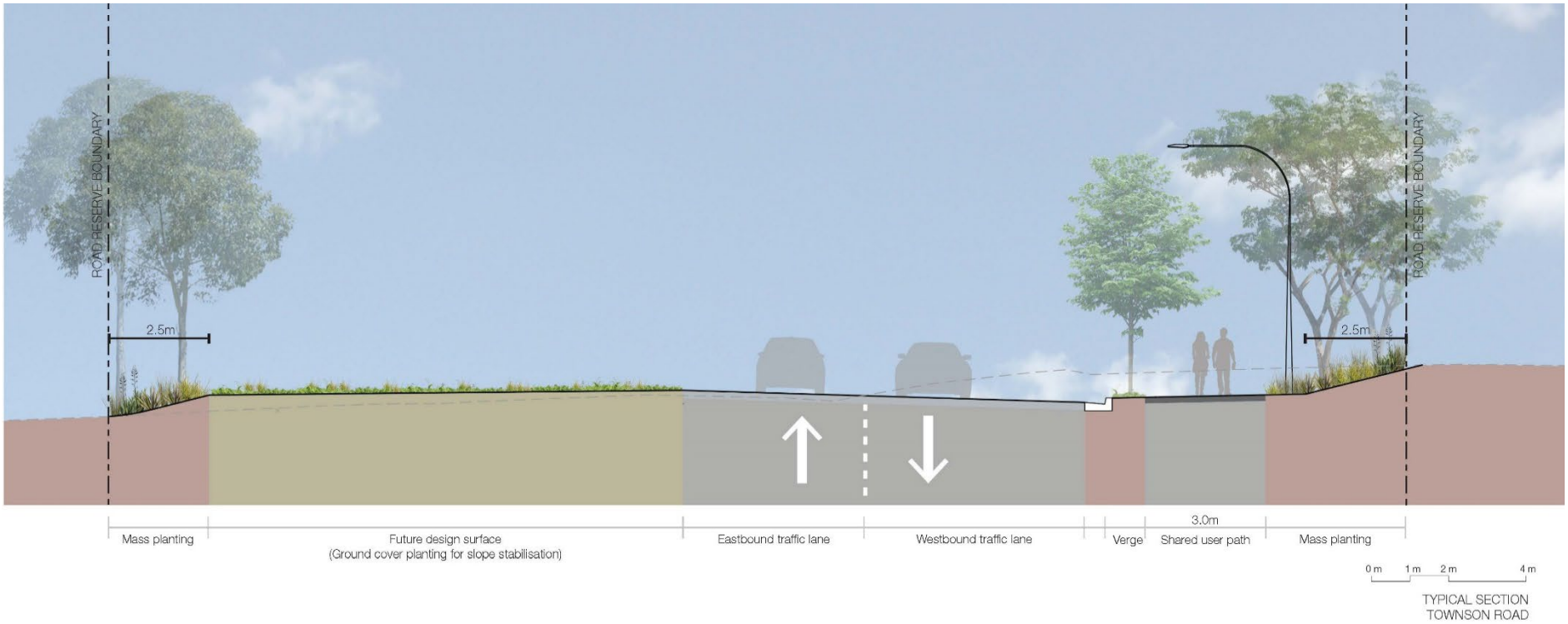

Figure 6-5 Typical section through Townson Road interim phase cut batters

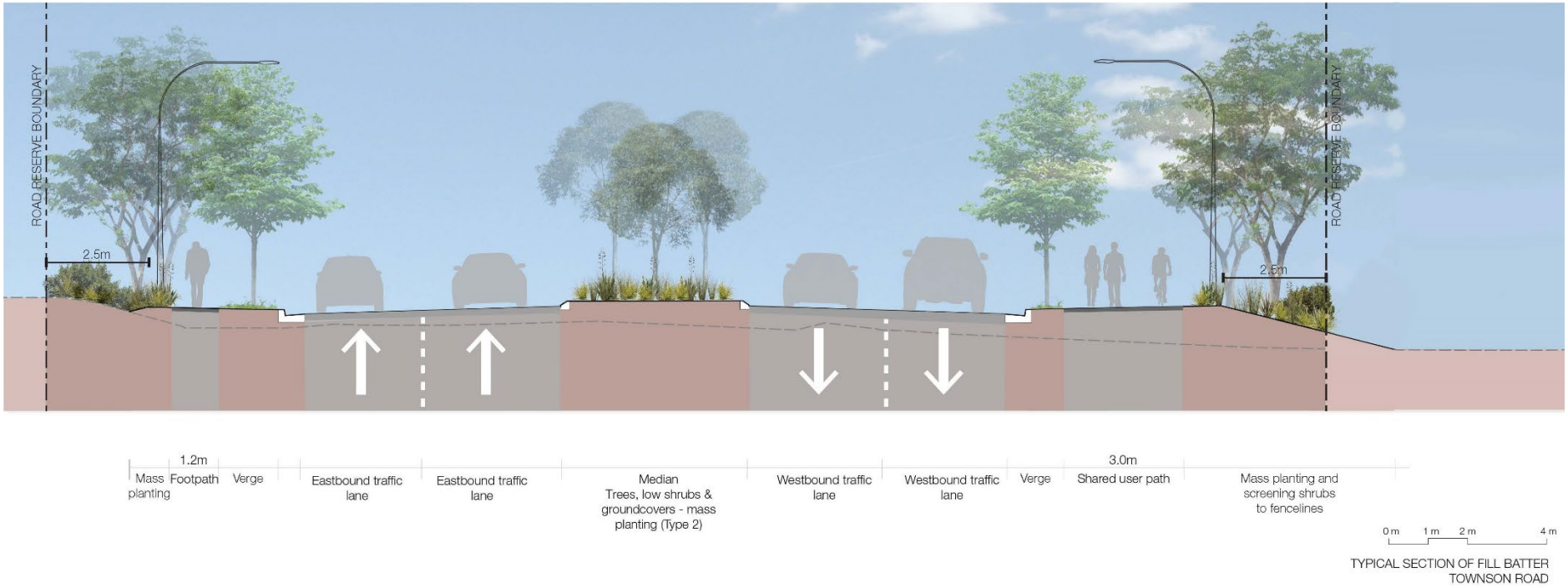

Figure 6-6 Typical section through Townson Road ultimate phase fill batters

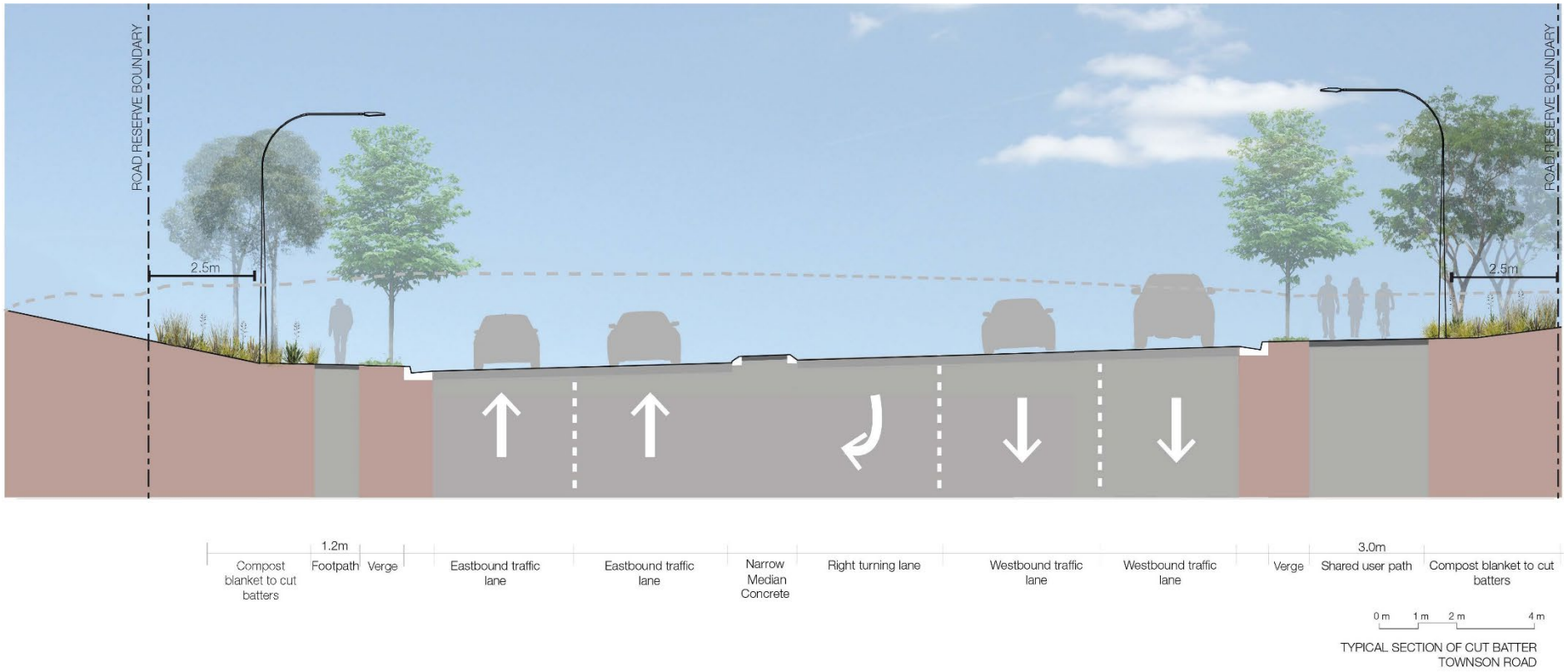

Figure 6-7 Typical section through Townson Road ultimate phase cut batters

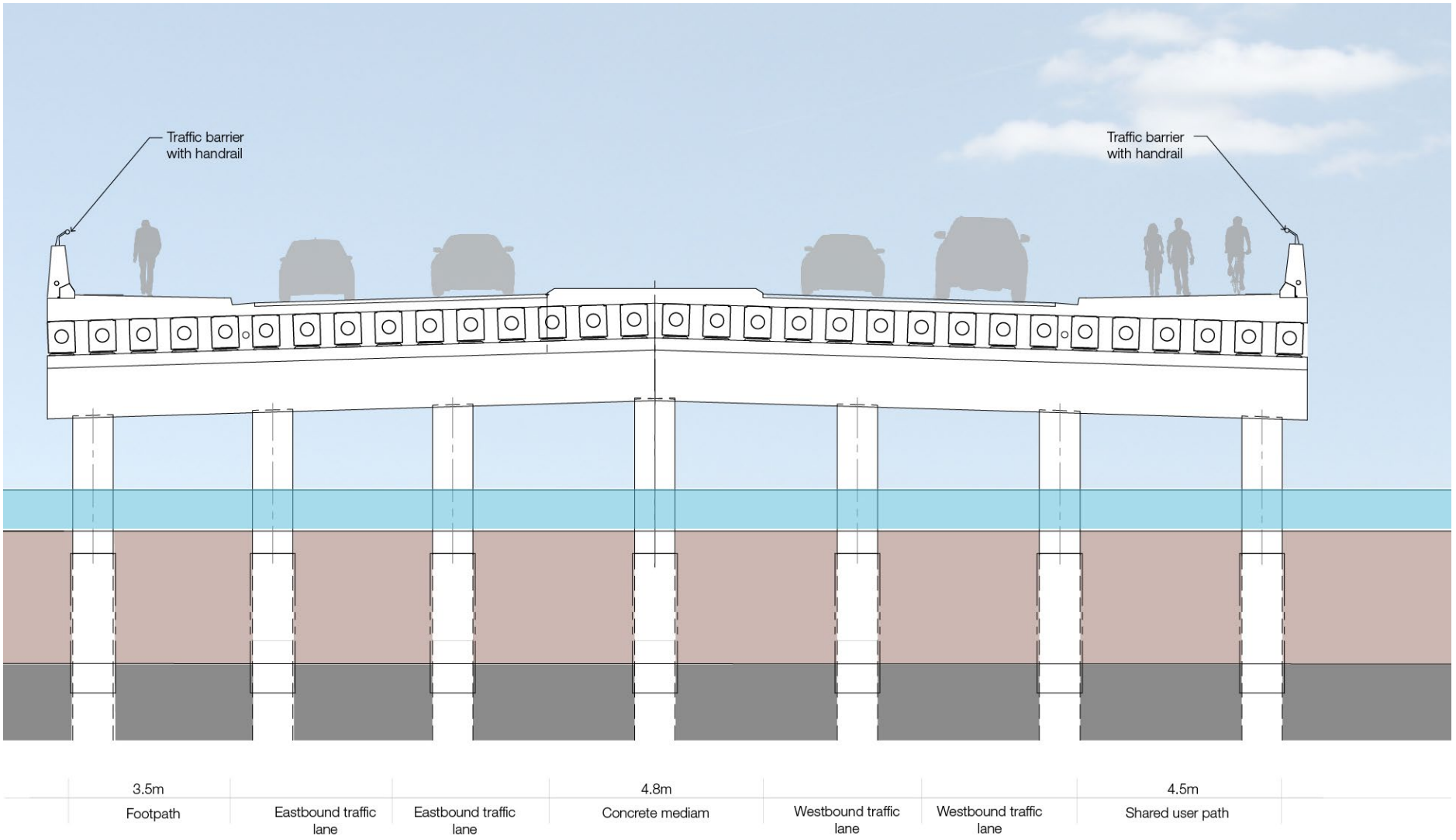

Figure 6-8 Typical section through Bridge over Bells Creek for the ultimate phase

7. Impact assessment

7.1 Landscape character assessment

In section 7.1.1 to 7.1.7 below the impacts of the proposal to the landscape character are assessed. The existing environment for each of the LCZ's has been previously identified and described in section 3.1.1 to 3.1.7.

7.1.1 Landscape character zone 1: Industrial and Commercial

The existing environment of LCZ 1 has been described in 3.1.1. Refer to Table 7-1 for LCZ 1 impact assessment.

Table 7-1 LCZ 1 assessment

Landscape character zone 1	
Description and location of LCZ	Industrial and Commercial, primarily consists of Sydney Business Park, which occupies the area along Hollingsworth Road on the western side of Richmond Road.
Anticipated change	**Interim phase** The anticipated changes as a result of the interim phase include the provision of a new southbound slip lane at Richmond Road intersection from Townson Road. **Ultimate phase** The anticipated changes as a result of the ultimate phase include the provision of dual right turn movements to Richmond Road northbound.
Sensitivity to change	The sensitivity to change of LCZ 1 would be low given it is a highly built up and modified environment.
Magnitude of change	**Interim phase** The magnitude of change as a result of the interim stage would be low. At the intersection of Townson Road and Richmond Road, both roads are comprised of two lanes in each direction. There are slip lanes on south bound lane of Richmond Road, so further modifications of the road intersection would not constitute a significant change to the landscape. **Ultimate phase** The magnitude of change as a result of the ultimate phase would be low. At the intersection of Townson Road and Richmond Road, both Townson Road and Richmond Road are comprised of two lanes in each direction. There are slip lanes on both the north bound and south bound lanes of Richmond Road, so further modifications of the road intersection would not constitute a significant change to the landscape.
Significance of impact	The significance of impact for the interim phase and ultimate phase proposal would be **low.**

7.1.2 Landscape character zone 2: Bushland / Open Space

The existing environment of LCZ 2 has been described in 3.1.2. Refer to Table 7-2 for LCZ 2 impact assessment

Table 7-2 LCZ 2 assessment

Landscape character zone 2	
Description and location of LCZ	LCZ 2, Bushland/Open Space, is typified by areas of dense, tall native vegetation or open grassy fields that have not been developed. Visibility in and out of these areas is usually constrained by vegetation. LCZ 2 is sporadically distributed throughout the study area but is important for habitat connectivity along the Western Sydney Parklands corridor.
Anticipated change	**Interim phase** Some areas of vegetation may need to be removed where it abuts Townson Road and Meadow Road. **Ultimate phase** There would be no change from the interim phase.
Sensitivity to change	This LCZ would have a high sensitivity to change given the relative scarcity of bushland within this part of Western Sydney.
Magnitude of change	**Interim phase** The magnitude of change is relatively **low** given that only a minor portion of the trees would be removed at the interface to Townson Road and Meadow Road. **Ultimate phase** There would be no change from the interim phase.
Significance of impact	The significance of impact for the interim phase and ultimate phase proposal would be **moderate**.

7.1.3 Landscape character zone 3: Residential

The existing environment of LCZ 3 has been described in 3.1.3. Refer to Table 7-3 for LCZ 3 impact assessment.

Table 7-3 LCZ 3 assessment

Landscape character zone 3	
Description and location of LCZ	LCZ 3 Residential, comprises areas that have been subdivided and developed into residential allotments with traditional single and double storey detached dwellings. The residential area which is closest to the proposed development is located about 100 m to the south of the intersection of Townson Road and Victory Road.
Anticipated change	There would be no development within residential areas so the anticipated change to this LCZ would be negligible.
Sensitivity to change	Residential LCZ has a **moderate** sensitivity to change due to the landscape character elements being in reasonably good condition. Any change caused by the proposed development would be unlikely to have a significant adverse effect on the landscape character, condition or value that could not be mitigated.
Magnitude of change	The magnitude of change would be **negligible**.
Significance of impact	The significance of impact would be **negligible**.

7.1.4 Landscape character zone 4: Future Residential

The existing environment of LCZ 4 has been described in 3.1.4. Refer to Table 7-4 for LCZ 4 impact assessment.

Table 7-4 LCZ 4 assessment

Landscape character zone 4	
Description and location of LCZ	The future residential development comprises the 'Townson Road Precinct' development which is located on the south side of Townson Road between Victory Road and Bells Creek. Large tracts of vegetation have been cleared for the development which would abut Townson Road. Another residential area undergoing development is located on the eastern side of Richmond Road, to the south of Harmony Avenue.
Anticipated change	There is not expected to be any change to future residential areas.
Sensitivity to change	**Low** as the landscape character elements are in average condition and are not particularly distinctive local features give that it is currently a construction site. Development of the type proposed is unlikely to have an adverse effect on the landscape character, condition or value. Mitigation measures would be effective in neutralising adverse effects.
Magnitude of change	The magnitude of change would be **negligible**.
Significance of impact	The significance of impact would be **negligible**.

7.1.5 Landscape character zone 5: Semi Rural Residential

The existing environment of LCZ 5 has been described in 3.1.5. Refer to Table 7-5 for LCZ 5 impact assessment.

Table 7-5 LCZ 5 assessment

Landscape character zone 5	
Description and location of LCZ	LCZ 5 Semi Rural Residential consists of large grain residential allotments with multiple structures in addition to the main dwelling. Features such as fences, sheds, dams, farming equipment and vehicles, livestock and other elements associated with a rural landscape are also typical elements.
Anticipated change	**Interim Phase** The anticipate change in this area would include a new road alignment which would include the acquisition of one of the semi-rural residential properties in the vicinity of Meadow Road and Jersey Road and partial acquisition an other. The interim phase would include a two lane carriageway with 2.5 m shoulder to the southern section of the new road alignment. **Ultimate phase** The anticipated change in this area would include the addition of the two east bound lanes to the new road alignment.
Sensitivity to change	Semi-rural residential LCZ has a **moderate** sensitivity to change due to the landscape character elements being in reasonably good condition. Any change caused by the proposed development would be unlikely to have a significant adverse effect on the landscape character, condition or value that could not be mitigated.

Landscape character zone 5	
Magnitude of change	The magnitude of change for the interim phase and ultimate phase would be **low** as the introduction of the road corridor components are new but would not be uncharacteristic within the existing landscape character.
Significance of impact	The significance of impact for the interim phase and ultimate phase would be **moderate-low**.

7.1.6 Landscape character zone 6: Extractive Industry

The existing environment of LCZ 6 has been described in 3.1.6. Refer to Table 7-6 for LCZ 6 impact assessment.

Table 7-6 LCZ 6 assessment

Landscape character zone 6	
Description and location of LCZ	The CSR quarry site is located on the northern side of Meadow Road and has been extensively quarried for the production of bricks, pavers, tiles and other masonry products. The site has a display area on the south western corner and storage and handling facilities along the western boundary. The main part of the site comprises dams and earthen mounds interspersed with service roads.
Anticipated change	There is not anticipated to be any significant change to this LCZ
Sensitivity to change	As it is a highly modified landscape, this LCZ has a **negligible** sensitivity to change.
Magnitude of change	The magnitude of change is anticipated to be **negligible**.
Significance of impact	The significance of impact is anticipated to be **negligible**.

7.1.7 Landscape character zone 7: Recreation

The existing environment of LCZ 7 has been described in 3.1.7. Refer to Table 7-7 for LCZ 7 impact assessment.

Table 7-7 LCZ 7 assessment

Landscape character zone 7	
Description and location of LCZ	LCZ 7 comprises the Stonecutters Ridge Golf Club that is located between Victory Road and Eastern Creek.
Anticipated change	**Negligible**
Sensitivity to change	**Moderate**
Magnitude of change	**Negligible**
Significance of impact	**Negligible**

7.2 Visual impact assessment

The following section assesses the visual impact of the proposal from the following selected representative viewpoint locations. The existing environment for each of the viewpoint locations is described in section 3.

7.2.1 Viewpoint location 01: Richmond Road #1

The existing environment of VP 01 has been described in 3.2.1. Refer to Table 7-8 for VP 01 assessment.

Table 7-8 VP 01 assessment

Criteria	Comments
Location and View Direction	VP 01 is located on Richmond Road, about 75 m north-west of the intersection of Richmond Road and Townson Road.
Anticipated Change to View	**Interim Phase** Changes would include modifications to the intersection such as a new southbound slip lane at Richmond Road intersection with Townson Road. **Ultimate phase** Changes would include modifications to the intersection such as dual right turn movements to Richmond Road northbound.
Sensitivity to change	**Low**, as the receivers within this area are road users in motor vehicles, cyclists and pedestrians on transport routes that are passing through the study area and have short term views.
Magnitude of change	**Interim Phase** **Low**, given that it involves minor changes to the road footprint, in a highly modified and vehicle dominated environment. Some vegetation would need to be removed for the construction of the slip lane, however this would not represent a substantial change to the view. **Ultimate phase** Low, given that it involves minor changes to the road footprint, in a highly modified and vehicle dominated environment.
Significance of impact	The significance of impact for Interim Phase and ultimate phase would be **low.**

7.2.2 Viewpoint location 02: Richmond Road #2

The existing environment of VP 02 has been described in 3.2.2. Refer to Table 7-9 for VP 02 assessment.

Table 7-9 VP 02 assessment

Criteria	Comments
Location and View Direction	VP 02 is located on Richmond Road, about 75 m south of the intersection of Richmond Road and Townson Road.
Anticipated Change to View	**Interim Phase** Changes would include modifications to the intersection such as a new southbound slip lane at Richmond Road intersection with Townson Road. **Ultimate phase** Changes would include modifications to the intersection such as dual right turn movements to Richmond Road northbound.
Sensitivity to change	**Low**, as the receivers within this area are road users in motor vehicles, cyclists and pedestrians on transport routes that are passing through the study area and have short term views
Magnitude of change	**Interim Phase** **Low**, given that it involves minor changes to the road footprint, in a highly modified and vehicle dominated environment. Some vegetation would need to be removed for the construction of the slip lane, however this would not represent a substantial change to the view. **Ultimate phase Low**, given that it involves minor changes to the road footprint, in a highly modified and vehicle dominated environment.
Significance of impact	The significance of impact for Interim Phase and ultimate phase would be **low.**

7.2.3 Viewpoint location 03: Townson Road #1

The existing environment of VP 03 has been described in 3.2.3. Refer to Table 7-10 for VP 03 assessment.

Table 7-10 VP 03 assessment

Criteria	Comments
Location and View Direction	VP 03 is located on the north eastern corner of the intersection of Richmond Road and Townson Road.
Anticipated Change to View	**Interim Phase** Changes to the view would incorporate widening of Townson Road corridor to allow for the ultimate four lane carriageway. A new two lane bridge over Bells Creek would also be visible from this viewpoint. There would be some vegetation removal as part of the proposed works. A portion of the southbound slip lane into Richmond Road may be visible to the far right of this view. **Ultimate phase** Changes to the view would include the addition of the two northern alignment lanes to Townson Road, and providing a central median. There would be a three metre wide shared path on the southern side of Townson Road and a 1.2 metre wide footpath on the northern side of Townson Road. The bridge over Bells Creek would be widened to four lanes and would be visible from this viewpoint.
Sensitivity to change	**Low**, as the receivers within this area are road users in motor vehicles, cyclists and pedestrians on transport routes that are passing through the study area and have short term views
Magnitude of change	**Interim Phase** **Low**, as this is an existing road corridor that would be widened and would not be uncharacteristic within the existing view. There may be some additional removal of vegetation but this has not been confirmed. **Ultimate phase Low**, as this is an existing road corridor that would be widened. There would be a minor alteration to the view with the introduction of median and shared use paths that may be visible but would not be uncharacteristic within the existing view.
Significance of impact	The significance of impact for interim phase and ultimate phase would be **low**.

7.2.4 Viewpoint location 04: Townson Road #2

The existing environment of VP 04 has been described in 3.2.4. Refer to Table 7-11 for VP 04 assessment.

Table 7-11 VP 04 assessment

Criteria	Comments
Location and View Direction	VP 04 is located on Townson Road, about 425 m north-east from the intersection of Townson Road and Richmond Road.
Anticipated Change to View	**Interim phase** Changes to the view would incorporate widening of Townson Road corridor to allow for the ultimate four lane carriageway. There would be distant views to the upgraded roundabout at Victory Road. It is likely that vegetation would need to be removed to accommodate the proposal. **Ultimate phase** Changes to the view would include the addition of the two northern alignment lanes to Townson Road and a central median. There would be distant views of a new intersection at Victory Road. There would also be a three metre wide shared path on the southern side of Townson Road and a 1.2 metre wide footpath on the northern side of Townson Road.
Sensitivity to change	**High**, as the adjacent residential property occupants would view the development within close proximity and when going to or from the property, with long viewing periods.
Magnitude of change	**Interim phase** **Low**, as this is an existing road corridor that would be widened and would not be uncharacteristic within the existing view. There may be some additional removal of vegetation but this has not been confirmed. **Ultimate phase Low**, as this is an existing road corridor that would be widened. There would be a minor alteration to the view with the introduction of median and shared use paths that may be visible but would not be uncharacteristic within the existing view.
Significance of impact	The significance of impact for interim phase and ultimate phase would be **moderate**.

7.2.5 Viewpoint location 05: Victory Road

The existing environment of VP 05 has been described in 3.2.5. Refer to Table 7-12 for VP 05 assessment.

Table 7-12 VP 05 assessment

Criteria	Comments
Location and View Direction	VP 05 is located on the eastern side of Victory Road, about 160 m south-east of the intersection of Victory Road and Townson Road.
Anticipated Change to View	**Interim phase** There would be views towards the widening of Townson Road. It is likely that vegetation would need to be removed to accommodate the proposal along Townson Road. At Townson Road and Victory Road the roundabout would be upgraded. **Ultimate phase** There would be views towards the widening and upgrading of Townson Road. At Townson Road and Victory Road there would be formalised pedestrian crossings with a signalised intersection and removal of the existing roundabout
Sensitivity to change	**Moderate**, as recreation users of the golf course are located within close proximity but viewing periods are limited; occupiers of residential properties along Victory Road would have long viewing periods although are at a distance from the proposal.
Magnitude of change	**Interim phase** **Low**, as there would be views to the existing road corridor that would be widened. There may be some additional removal of vegetation but this has not been confirmed. **Ultimate phase Low**, as there would be views to the existing road corridor that would be upgraded. There would be a minor alteration to the view with the introduction of a signalised intersection that may be visible but would not be uncharacteristic within the existing view.
Significance of impact	The significance of impact for interim phase and ultimate phase would be **moderate-low**.

7.2.6 Viewpoint location 06: Meadow Road #1

The existing environment of VP 06 has been described in 3.2.6. Refer to Table 7-13 for VP 06 assessment.

Table 7-13 VP 06 assessment

Criteria	Comments
Location and View Direction	VP 06 is located on Meadow Road, about 250 m north-east from the intersection of Meadow Road and Victory Road.
Anticipated Change to View	**Interim phase** There would be views towards the widening of Meadow Road. It is possible that vegetation would need to be removed to accommodate the proposal along Meadow Road, however this would need to be confirmed. **Ultimate phase** There would be views towards the upgrading of Meadow Road.
Sensitivity to change	**Low**, as the receivers within this area are road users in motor vehicles, on transport routes that are passing through the study area and have short term views.
Magnitude of change	**Interim phase** **Low**, as this is an existing road corridor that would be widened. There may be some additional removal of vegetation that would open up views to the quarry site but this has not been confirmed. **Ultimate phase Low**, as this is an existing road corridor that would be widened and upgraded. There would be a minor alteration to the view with the introduction of median and shared use paths that may be visible but would not be uncharacteristic within the existing view.
Significance of impact	The significance of impact for interim phase and ultimate phase would be **low**.

7.2.7 Viewpoint location 07: Meadow Road #2

The existing environment of VP 07 has been described in 3.2.7. Refer to Table 7-14 for VP 07 assessment.

Table 7-14 VP 07 assessment

Criteria	Comments
Location and View Direction	VP 07 is located on Meadow Road, about 120 m south-west of the intersection of Meadow Road and Durham Road.
Anticipated Change to View	**Interim phase** Changes to the view would include the construction of a new section of road about 300 m long, to the south of the existing Meadow Road alignment. The new road alignment would connect into the existing road network at the junction of Durham Road and Jersey Road. The new section of road is likely to be constructed adjacent to the native vegetation, it is likely that some trees may need to be removed. **Ultimate phase** Changes to the view would include the upgrading of the new section of road about 300 m long, to the south of the existing Meadow Road alignment. The new road alignment would connect into the existing road network at the junction of Durham Road and Jersey Road. There would be a three metre wide shared path on the southern side and a 1.2 metre wide footpath on the northern side of the new road.
Sensitivity to change	**High**, as the adjacent residential property occupants would view the development within close proximity and when going to or from the property, with long viewing periods.
Magnitude of change	**Interim phase** **Moderate**, as there would be a discernible changes in the existing view due to the addition of the new road alignment. **Ultimate phase Moderate**, as there would be a discernible changes in the existing view due to the addition of the new road alignment however this could be partially mitigated through revegetation.
Significance of impact	The significance of impact for Interim Phase and ultimate phase would be **high-moderate**.

7.2.8 Viewpoint location 08: Durham Road

The existing environment of VP 08 has been described in 3.2.8. Refer to Table 7-15 for VP 08 assessment.

Table 7-15 VP 08 assessment

Criteria	Comments
Location and View Direction	VP 08 is located on Durham Road, about 90 m south-east of the intersection of Meadow Road and Durham Road.
Anticipated Change to View	**Interim phase** Changes to the view would include the construction of a new section of road about 300 m long, to the south of the existing Meadow Road alignment. The new road alignment would connect into the existing road network at the junction of Durham Road and Jersey Road. The new section of road is likely to be constructed adjacent to the native vegetation, it is likely that some trees may need to be removed. The buildings and structures associated with the private dwelling are likely to be removed. **Ultimate phase** Changes to the view would include the upgrading of the new section of road about 300 m long, to the south of the existing Meadow Road alignment. The new road alignment would connect into the existing road network at the junction of Durham Road and Jersey Road. There would be a three metre wide shared path on the southern side and a 1.2 metre wide footpath on the northern side of the new road.
Sensitivity to change	**High**, as the adjacent residential property occupants would view the development within close proximity and when going to or from the property, with long viewing periods.
Magnitude of change	**Interim phase** **Moderate**, as there would be a discernible changes in the existing view due to the addition of the new road alignment and the likely removal of some existing vegetation and buildings. **Ultimate phase Moderate**, as there would be a discernible changes in the existing view due to the addition of the new road alignment, however this could be partially mitigated through revegetation.
Significance of impact	The significance of impact for interim hase and ultimate phase would be **high-moderate**.

7.3 Impacts during construction

There would be two constructions phases, one associated with the interim phase works and one associated with the ultimate phase works. The visual impact associated with construction may include the following:

- During construction, a work crew, vehicles and machinery would be seen moving along the alignment as they construct the new widened section of road
- There may be additional dust generated as a result of construction works
- The presence of vehicles and machinery would be temporary as construction crews work to complete the new road surface
- The presence of site compounds, particularly where they are adjacent to the main road may result in a temporary visual change to the landscape during the construction phase of the proposal
- Clearing of vegetation may also be required for construction laydown areas, temporary access tracks and other construction related activities.

8. Landscape character and visual impact mitigation measures

The following section recommends mitigation measures that respond to issues arising within the assessment that have potential to adversely impact on:

- The character of the landscape within which the proposal is located
- Existing views from sensitive receiver locations.

Mitigation measures address the most visual elements of the proposal as well as referencing any relevant considerations drawn from the legislation and policy review.

8.1 Mitigation measures

An urban design vision, objectives and principles have been developed for the proposal, which translate to project specific design strategies and initiatives as outlined in this report. The following mitigation measures support the ongoing work being undertaken by the urban design team:

- The approved clearing extent, including environmental features within the construction footprint, will be identified with flagging, marking tape or similar.
- Reinstatement of access roads and construction site compounds will commence progressively post construction and will be undertaken as soon as practicable.
- The hoarding of construction materials will be minimized as far as practical.
- All temporary above ground infrastructure will be removed at the completion of construction.
- 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.
- 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.
- Vegetation buffers will be maintained between site compounds and public roads wherever practicable.
- The urban design plans should show proposed vegetation to reinstate areas where vegetation has been removed, such as between Meadow Road and Jersey Road.
- Ongoing consultation with relevant stakeholders will continue throughout the proposal.

9. Cumulative impacts

Immediately south of Townson Road, between Bells Creek and Victory Road a residential area is undergoing development. At the time of the site inspection, most of the vegetation had been cleared, save for a band of roadside vegetation adjacent to Townson Road. Construction machinery was also present as the ground was being levelled to make way for development.

This part of Western Sydney is undergoing a process of continuous development with areas of bushland and farmland making way for residential and other developments. Within this context of continuous change, any subsequent development, such as the proposal, would not have as great an impact as compared to a relatively stable landscape.

10. Conclusion

10.1 Summary of landscape character and visual impact assessment

Refer to Table 10-1 and Table 10-2 for a summary of landscape character and visual impacts for the proposal.

Table 10-1 Summary of landscape character assessment

LCZ	Description	Sensitivity to change	Magnitude of change	Overall Rating
LCZ 1	Industrial and Commercial	Low	Low	**Low**
LCZ 2	Bushland / Open Space	High	Low	**Moderate**
LCZ 3	Residential	Moderate	Negligible	**Negligible**
LCZ 4	Future Residential	Low	Negligible	**Negligible**
LCZ 5	Semi-Rural Residential	Moderate	Low	**Moderate-Low**
LCZ 6	Extractive Industry	Negligible	Negligible	**Negligible**
LCZ 7	Recreation	Moderate	Negligible	**Negligible**

Table 10-2 Summary of visual impacts

Viewpoint	Location	Sensitivity to change	Magnitude of change	Overall Rating
VP 01	Richmond Road #1	Low	Low	**Low**
VP 02	Richmond Road #2	Low	Low	**Low**
VP 03	Townson Road #1	Low	Low	**Low**
VP 04	Townson Road #2	High	Low	**Moderate**
VP 05	Victory Road	Moderate	Low	**Moderate-Low**
VP 06	Meadow Road #1	Low	Low	**Low**
VP 07	Meadow Road #2	High	Moderate	**High-Moderate**
VP 08	Durham Road	High	Moderate	**High-Moderate**

The landscape within the study area is a mix of highly developed areas, such as the industrial precinct and quarry site, as well as areas of natural bushland. The key sensitivities are associated with the bushland and where the proposal would be located within close proximity to residential areas.

Where roadside vegetation would be cleared to accommodate road widening works, this would lead to high visual impact as adjacent land uses, such as the quarry site and new residential areas, would be visible from the road.

The greatest visual impact of the proposal would occur along Townson Road at the interface of the new residential development as well as at the interface of the quarry site. This is because of the likely requirement for the removal of roadside trees which could result in greater exposure of the adjacent land uses.

The proposal is mostly located along the existing roads of Townson Road and Meadow Road. The only entirely new section of road would be located between the bend in Meadow Road and the junction of Durham and Jersey Roads. For this reason, the landscape character and visual impact of the proposal would be less than if it were constructed along an entirely new corridor.

The urban design treatments have been designed to respond to the major landscape character and visual impact by preserving or reinstating roadside vegetation which is consistent with tall tree species and other vegetation that is endemic to the area.

11. References

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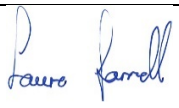
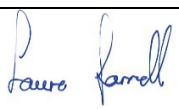
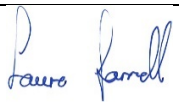
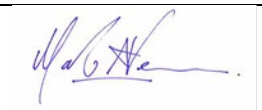
Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
1	Durwin Dharmaraj	Laura Farrell Sarah Viney				30.01.2020
2	Durwin Dharmaraj Emma Davis	Laura Farrell		Mark Elvidge		06.03.2020
3	Durwin Dharmaraj Emma Davis	Laura Farrell		Matthew Ferreira		27.07.2020

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