

Appendix B

Landscape character and visual impact assessment



Raglan Highway Duplication, Raglan

Transport for NSW

Urban design and Landscape Character and Visual Impact Assessment

| Final Draft

17 February 2020

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Raglan Highway Duplication, Raglan

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Contents

Executive Summary	iv
1. Introduction	1
1.1 Purpose of this report.....	2
2. Contextual analysis	6
2.1 Study area	6
2.2 Land zoning.....	9
2.3 Local landscape planning guidance.....	10
2.4 Landscape character analysis and sensitivity	12
3. Urban design vision, objectives and principles	19
4. Urban design concept	22
4.1 Proposed road	22
4.2 Residential property access treatment.....	23
4.3 Intersection treatments	23
5. Landscape character impact assessment	32
6. Visibility of proposal	34
6.1 Visual context	34
6.2 Viewpoint locations	34
7. Visual impact assessment	36
8. Summary of landscape and visual impacts	52
9. Landscape character and visual impact mitigation strategy	53
10. Conclusion	55

Appendix A. Methodology

Appendix B. Urban Design and Landscape Plans (Sheets 1-16)

List of Figures

Figure 1-1 Overview of the proposal (Sheet 1 of 3)	3
Figure 2-1 Study area.....	7
Figure 2-2 LEP land zoning	8
Figure 2-3 Map 6: Conservation Values, Priority Site and Rehabilitation Sites. Source: Roadside Vegetation Management Plan 2007, Bathurst City Council.....	10
Figure 2-4 Significant vegetation and natural landscapes Source: Vegetation Management Plan, Bathurst City Council	12
Figure 2-5 Landscape character zones	15
Figure 4-1 Recently completed highway upgrade at Kelso	22
Figure 4-2 Proposed typical section from Ashworth Drive to Napoleon Street (extract from Urban Design and Landscape Plans in Appendix B).....	22
Figure 4-3 Proposed typical section between Locke Street and Nile Street (extract from Urban Design and Landscape Plans in Appendix B).....	23
Figure 4-4 Proposed typical section east of Ceramic Avenue (extract from Urban Design and Landscape Plans in Appendix B)	23
Figure 4-5 Proposed intersection at Napoleon Street (extract from Urban Design and Landscape Plans in Appendix B)	24
Figure 4-6 Proposed intersection at Locke Street (extract from Urban Design and Landscape Plans in Appendix B).....	25
Figure 4-7 Proposed intersection at Nile Street (extract from Urban Design and Landscape Plans in Appendix B).....	26
Figure 4-8 Existing intersection at Eugenie Street / PJ Moodie Memorial Drive and Great Western Highway	26
Figure 4-9 Proposed intersection at Eugenie Street and PJ Moodie Memorial Drive (extract from Urban Design and Landscape Plans in Appendix B)	27
Figure 4-10 Proposed intersection at Ceramic Avenue (extract from Urban Design and Landscape Plans in Appendix B)	28
Figure 4-11 Existing entry to BP service station	28
Figure 4-12 Typical overhead lighting at Kelso.....	29
Figure 4-13 Existing safety barrier	30
Figure 6-1 Viewpoint locations	35
Figure 7-1 Existing view from Viewpoint M1 – Great Western Highway looking west	36
Figure 7-2 Existing view from Viewpoint M2 Ceramic Avenue / Great Western Highway looking east to south	37
Figure 7-3 Existing view from Viewpoint M2 Ceramic Avenue / Great Western Highway looking south to west.....	37
Figure 7-4 Existing view from Viewpoint M3 Great Western Highway at Raglan eastern edge, looking south to west	38
Figure 7-5 Existing view from Viewpoint M4 PJ Moodie Memorial Drive, looking south to west towards the highway	40
Figure 7-6 Existing view from Viewpoint M5 – Great Western Highway: creek crossing, looking east to south	41
Figure 7-7 Existing view from Viewpoint M6 Great Western Highway: Kelso, looking east	43
Figure 7-8 Existing view from Viewpoint L1 Eugenie Street: North, looking north towards the highway	44
Figure 7-9 Existing view from Viewpoint L2 Eugenie Street: South, looking north towards the highway	45
Figure 7-10 Existing view from Viewpoint L3 BP Service Station, looking west along the highway	46
Figure 7-11 Existing view from Viewpoint L3 BP Service Station, looking northeast across the highway	46
Figure 7-12 Existing view from Viewpoint L4 Adrienne Street, looking north towards the highway.....	48
Figure 7-13 Existing view from Viewpoint P1 Elmo Lavis Park, looking north towards the highway ...	49

Figure 7-14 Existing view from Viewpoint P2 Ralph Cameron Park, looking north towards the highway 50

List of Tables

Table 2-1 Relevant zone objectives 9

Table 2-2 Landscape sensitivity 16

Table 5-1 Landscape character impacts..... 32

Table 7-1 Visual assessment of Viewpoint M1 Great Western Highway: East..... 36

Table 7-2 Visual assessment of Viewpoint M2 Ceramic Avenue/ Great Western Highway 37

Table 7-3 Visual assessment of Viewpoint M3 Great Western Highway at Raglan east edge 38

Table 7-4 Visual assessment of Viewpoint M4 PJ Moodie Memorial Drive..... 40

Table 7-5 Visual assessment of Viewpoint M5 – Great Western Highway: creek crossing 41

Table 7-6 Visual assessment of Great Western Highway: Kelso..... 43

Table 7-7 Visual Assessment of Viewpoint L1 Eugenie Street: North, looking north..... 44

Table 7-8 Visual assessment of Viewpoint L2 Eugenie Street: South 45

Table 7-9 Visual assessment of Viewpoint L3 BP Service Station 46

Table 7-10 Visual assessment of Viewpoint L4 Adrienne Street 48

Table 7-11 Visual assessment for Viewpoint P1 Elmo Lavis Park..... 49

Table 7-12 Visual assessment of Viewpoint P2 Ralph Cameron Park looking north west to east 50

Table 8-1 Landscape character impact ratings..... 52

Table 8-2 Visual impact ratings..... 52

Executive Summary

Transport for NSW (TfNSW) seeks to continue duplication of the Great Western Highway east of Bathurst and the recently completed works at Kelso to Raglan (the proposal). Jacobs has been engaged to undertake the Review of Environmental Factors (REF), including this combined Urban Design Report and Landscape Character and Visual Impact Assessment (LCVIA).

Jacobs has undertaken a quantitative and qualitative assessment for the potential for visual and landscape amenity impacts that may be brought about by the proposal, informed by the final strategic design drawings. The methodology adopted for this report is described in Appendix A and is guided by policy and guidelines outlined in *Beyond the Pavement (Roads and Maritime, 2014)* and is in accordance with *Environmental impact assessment practice note: Guideline for landscape character and visual impact assessment (Roads and Maritime, 2018)*.

Landscape and visual impacts arising from the proposal would include the removal of existing vegetation within the road reserve, most notably the mature poplar trees. The Bathurst Vegetation Management Plan recognises the existing tree avenues as being of a low conservation value. The poplars may have previously lined both sides of the highway in a continuous avenue but now appear fragmented in disconnected groups either on one side of the road or on both sides along the route to/from Bathurst. The existing trees assist in defining the gateway to the Bathurst region and contribute to the character of the area, as a historic, memorable landmark on the journey between Bathurst and Lithgow. However, the longevity of the poplars is in decline and a Tree Risk Assessment commissioned by Bathurst City Council and dated September 2018 identifies four trees for urgent removal and a further 28 trees required to be tested and most likely removed. Due to their advancing age the further depletion in numbers is anticipated and the planting of new trees as part of the proposal would be a benefit. The vegetation loss resulting from the removal of the remaining poplars would be mitigated by the planting proposals within the road reserve, however it is recognised that the new trees would reach maturity in the medium-long term (15-20 years). On reaching maturity the proposed intermittent tree avenues would enhance the highway corridor by providing a gateway character to key sections of upgraded highway on approach to Bathurst and the airport.

The greatest visual impact would be for those residential dwellings located at the northern edge of Raglan and that share a boundary with the highway corridor. While the proposal would directly affect properties fronting the highway, the realignment may improve the safety of residential access through the realignment of the carriageway and creation of a wider southern road reserve which would increase sight distance in each direction. The resulting increase in separation between properties and the highway would provide some mitigation to the increased width and vertical alignment of the carriageway, through the creation of a landscaped visual buffer and the shared pedestrian/ cycle path.

The proposal would assist in creating a landscape and visual consistency with the recently upgraded sections of highway to the west at Kelso and provides opportunities for an improved gateway experience for travellers entering Bathurst from the east.

While areas within the study area would experience varying landscape and visual impacts as a result of the proposal, it is considered that as the upgrade comprises widening of an existing highway this would reduce and limit the overall impact of the change upon receptors. Furthermore, the change is considered to be similar in scale and character with the existing highway and following the establishment of the associated landscape improvement works the upgrade works will reinforce and enhance this section of highway as the gateway to Bathurst.

1. Introduction

Transport for NSW (TfNSW) proposes to widen the existing two-lane section of Great Western Highway at Raglan, east of Bathurst, NSW (the proposal). About 3.7 kilometres of the Great Western Highway is proposed to be upgraded between Ashworth Drive, Kelso and about 385 metres east of Ceramic Avenue, Raglan.

Key features of the proposal include:

- Realigning the highway up to 16 metres to the north of the existing highway
- Road widening up to 13 metres to provide
 - Two eastbound lanes for the length of the proposal
 - Two westbound lanes west of Napoleon Street
 - One westbound lane east of Napoleon Street
 - Shoulders on both sides of the highway
 - A central variable width median for the length of the proposal with occasional traffic barriers
- A 2.5 metre wide shared path along the southern side of the highway between Eugenie Street and just west of Napoleon Street, where it crosses to the northern side of the highway and continues to Ashworth Drive
- Provision of a 5.5 metre wide verge between the shared path and the southern edge of the highway to allow for a second westbound lane east of Napoleon Street
- Re-using existing pavement material where the new highway overlies the existing highway
- Removing redundant highway pavement
- Raising the highway by up to one metre, with batters generally sloping at 4:1
- Upgrading four junctions by providing or extending dedicated turn lanes at Napoleon, Locke, Nile Street and Ceramic Avenue
- Upgrading the Eugenie Street and PJ Moodie Memorial Drive intersection with traffic signals and a light vehicle U-turn facility along Eugenie Street
- A widened median is provided at the Napoleon Street junction to allow for future traffic signals
- Street lighting provided at:
 - PJ Moodie Memorial Drive and Napoleon, Eugenie, Locke and Nile Streets intersections
 - Pedestrian crossings
 - Bus stops
 - Bathurst Sheds access
- Realignment of an unnamed tributary of Boyd Creek
- Tie-in works with existing pavements and highway levels at the eastern and western extents
- Driveway adjustment and upgrade where required for properties with direct access to the Great Western Highway
- Upgrading the at-grade access to Bathurst Sheds with an improved right-turn lane
- Relocation and/or adjustments of public utilities and street lighting
- Property acquisitions and adjustments
- Minor relocation and provision of widened shoulders at three bus stops
- Drainage infrastructure including:
 - Replacement and augmentation of existing pipe drainage systems
 - Extension of the existing five cell box culvert

- Installation of new drainage (including kerb and guttering and table drains) in various locations
- A flood detention basin on the northern side of the Great Western Highway opposite Nelson Street
- Ancillary works including safety barriers, signage, line marking and environmental protection work
- Landscaping and rehabilitation work
- Temporary ancillary facilities including site compounds and stockpile sites.

The Raglan Duplication Project falls under the \$95 million program of works “Delivering better connections for Central West”. The proposal has a \$30 million committed budget and is an essential component of this program of works.

During peak travel periods, such as weekends and holidays, this stretch of highway is often congested. This is especially significant during pulse events like the Bathurst 1000.

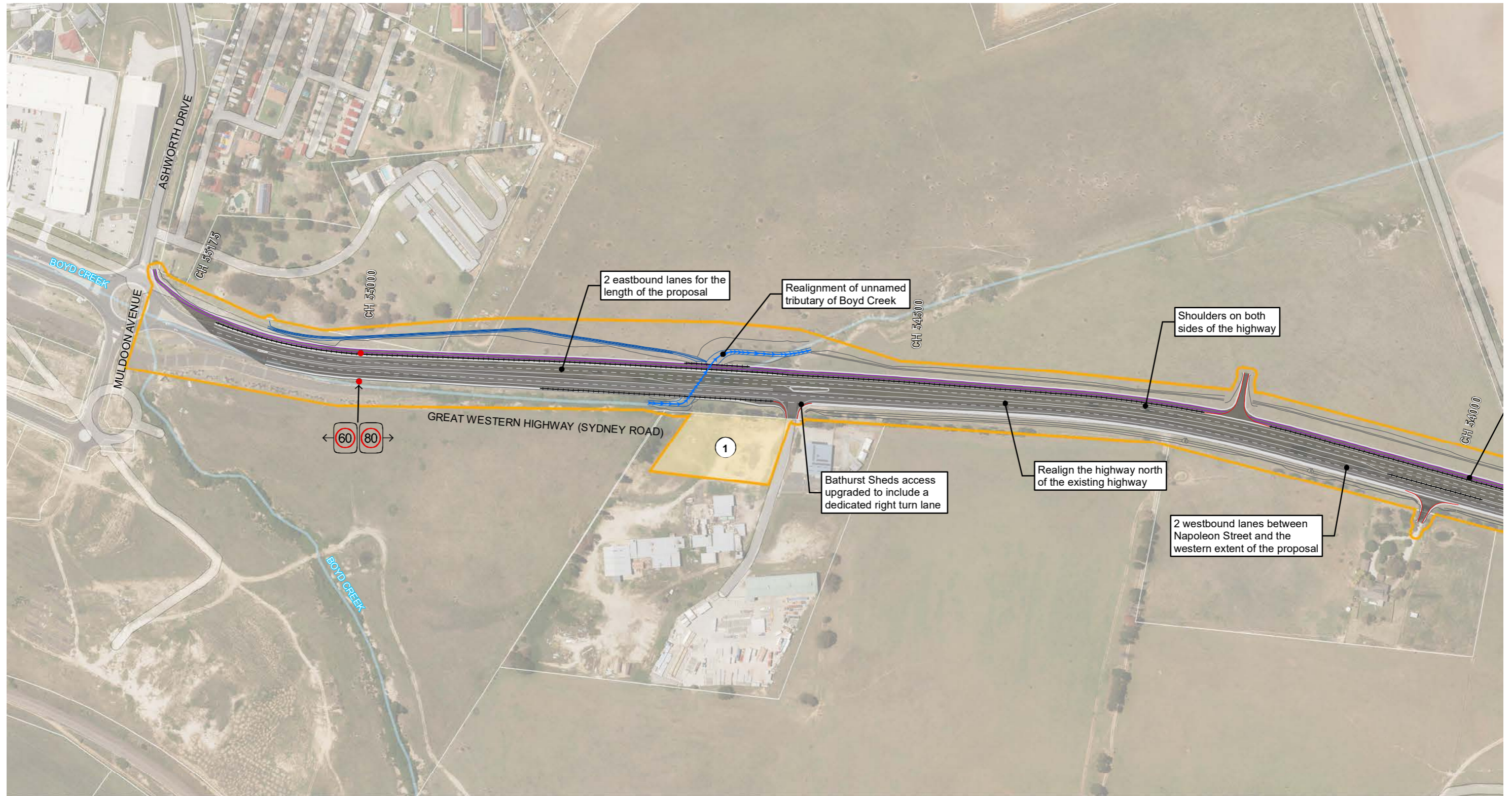
A pavement rehabilitation project for this section of highway was scheduled to commence in 2018/ 2019, with construction commencing in 2019/ 2020. However, given the expected growth in this area and the improved traffic flow from the adjacent Kelso upgrade, widening the highway to provide additional road capacity will be a value-add to the planned pavement upgrade.

The proposal would be delivered by the Western Regional Maintenance Delivery (RMD) team, which is a section within the Regional and Freight Division of Roads and Maritime.

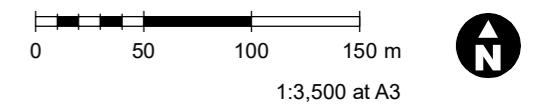
1.1 Purpose of this report

Jacobs has been engaged by TfNSW to undertake this combined urban design report and landscape and visual impact assessment of the proposal as part of a Review of environmental factors (REF) for the proposal. This assessment will set out the urban design vision, objectives and principles, establish a study area for the assessment, determine landscape and visual impacts and propose potential mitigation measures (refer to Appendix A). The urban design strategy for the proposal will be linked to the findings of the assessment and the mitigation strategy.

The description of proposed works is based on the current completed final strategic design drawings (see Appendix B) dated 22 November 2019.



- | | | |
|--|-------------------|-----------------|
| Proposal area | Design | Kerb and gutter |
| Existing Roads and Maritime stockpile site | Batter slope | Safety barrier |
| Potential ancillary site/site number | Table drain | Driveway |
| Proposed flood storage | Creek realignment | Shared path |
| Waterway | | |
| Alignment pavement | | |



Data sources
 Roads and Maritime Services 2019
 Jacobs 2019
 Aerometrex Dec 2018
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 GDA94 MGA56

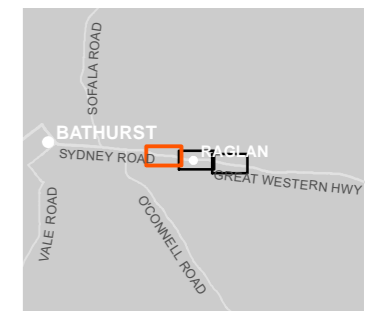
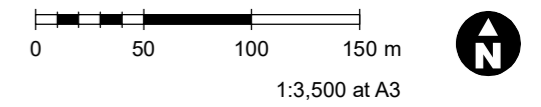
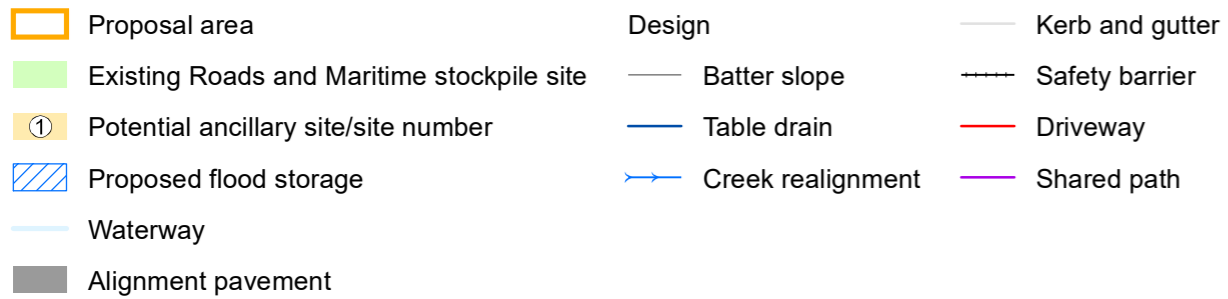
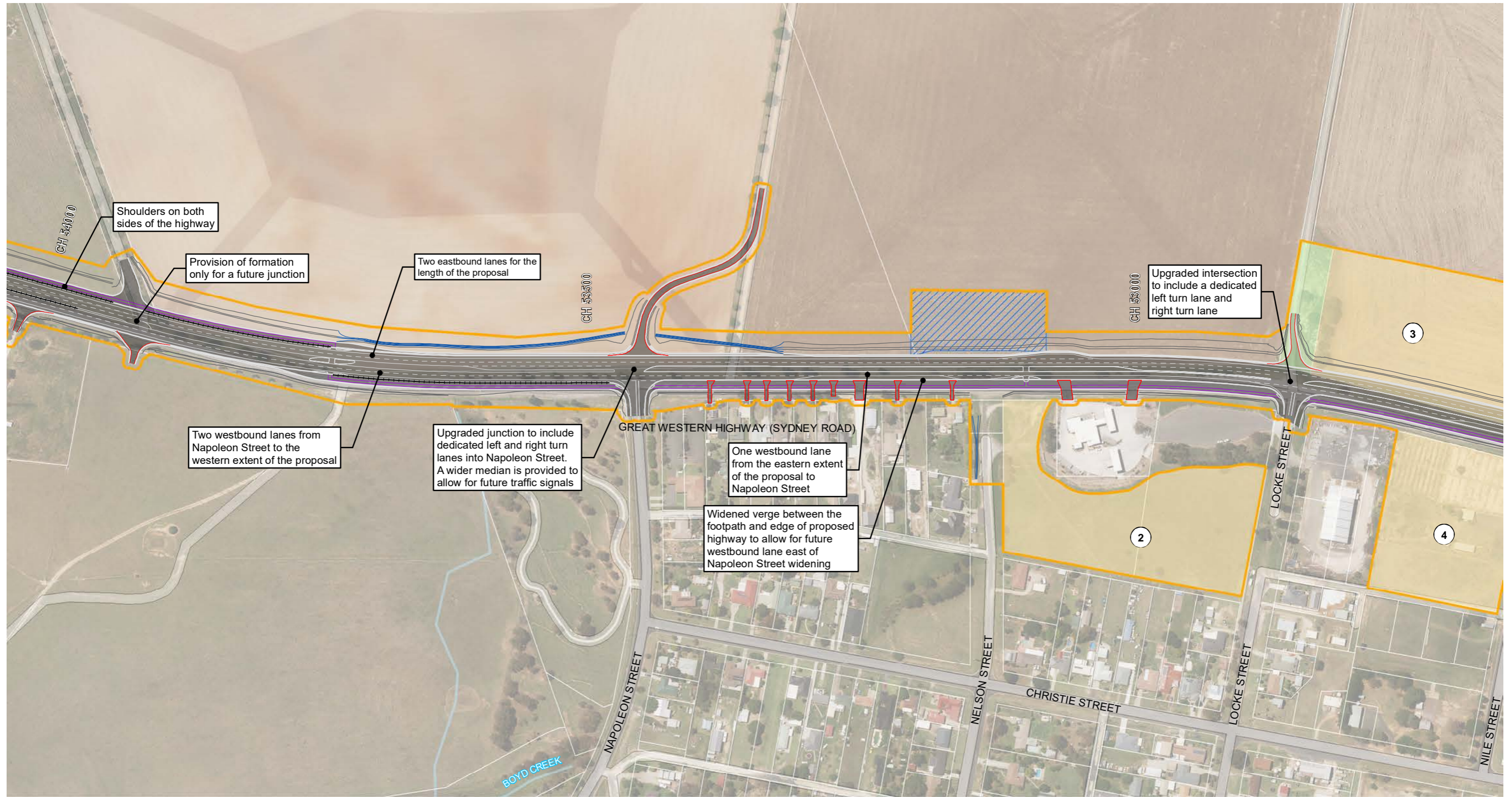


Figure 1-1 (1) Overview of the proposal



Data sources
 Roads and Maritime Services 2019
 Jacobs 2019
 Aerometrex Dec 2018
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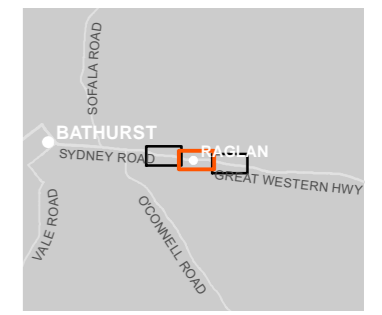
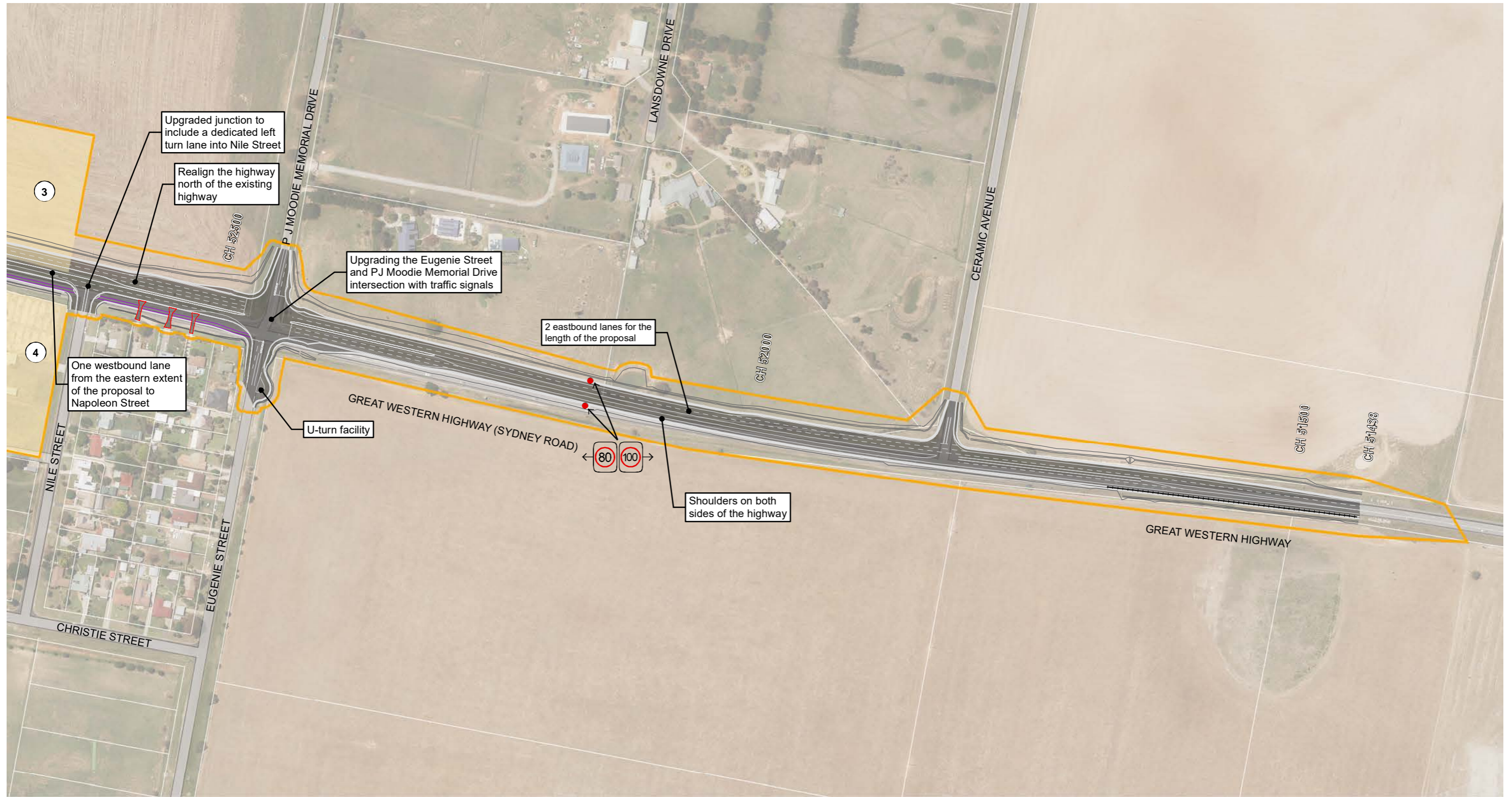
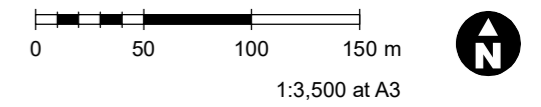


Figure 1-1 (2) Overview of the proposal



- | | | |
|--|-------------------|-----------------|
| Proposal area | Design | Kerb and gutter |
| Existing Roads and Maritime stockpile site | Batter slope | Safety barrier |
| Potential ancillary site/site number | Table drain | Driveway |
| Proposed flood storage | Creek realignment | Shared path |
| Waterway | | |
| Alignment pavement | | |



Data sources
 Roads and Maritime Services 2019
 Jacobs 2019
 Aerometrex Dec 2018
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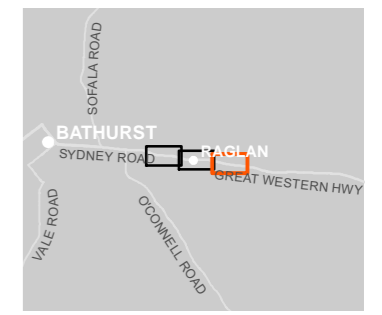


Figure 1-1 (3) Overview of the proposal

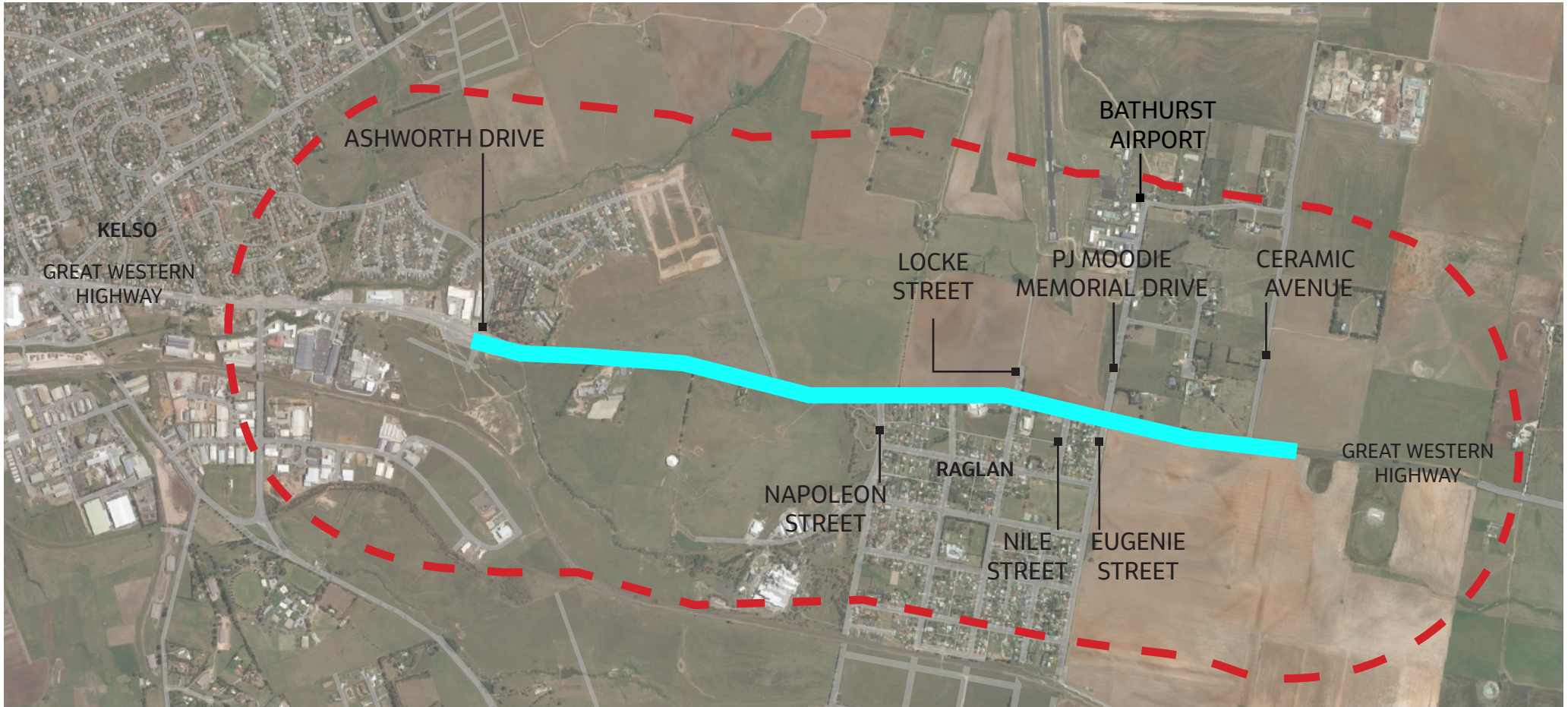
2. Contextual analysis

2.1 Study area

The proposal relates to a 3.7 kilometre section of the Great Western Highway at Raglan, located on the urban periphery of Bathurst in Central West NSW. The landscape adjoining the highway comprises gently rolling hills, generally increasing in elevation in an eastbound direction. The existing vertical alignment of the highway varies from sitting within cutting in some sections, and is therefore screened by landform, whilst other sections overlook the cleared, rural plains when situated on top of a batter.

A viewshed is typically used to determine the study area of a project and is defined by the distance at which the proposed works are either a miniscule element or indiscernible within a viewer's field of view. A viewshed is not defined by the limit of visibility, but rather a distance from which the proposed alteration forms such a small component of the view that the visual impact would be indiscernible.

The proposal would widen the existing highway corridor and whilst some change would be discernible within views, the overall area from which the highway would be visible would likely be unchanged. The study area/ viewshed for this assessment (refer to Figure 2-1) has been nominally defined as extending to one kilometre either side of the road corridor.



- - - Extent of the Proposal
 Extent of the Proposal

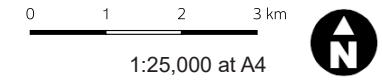
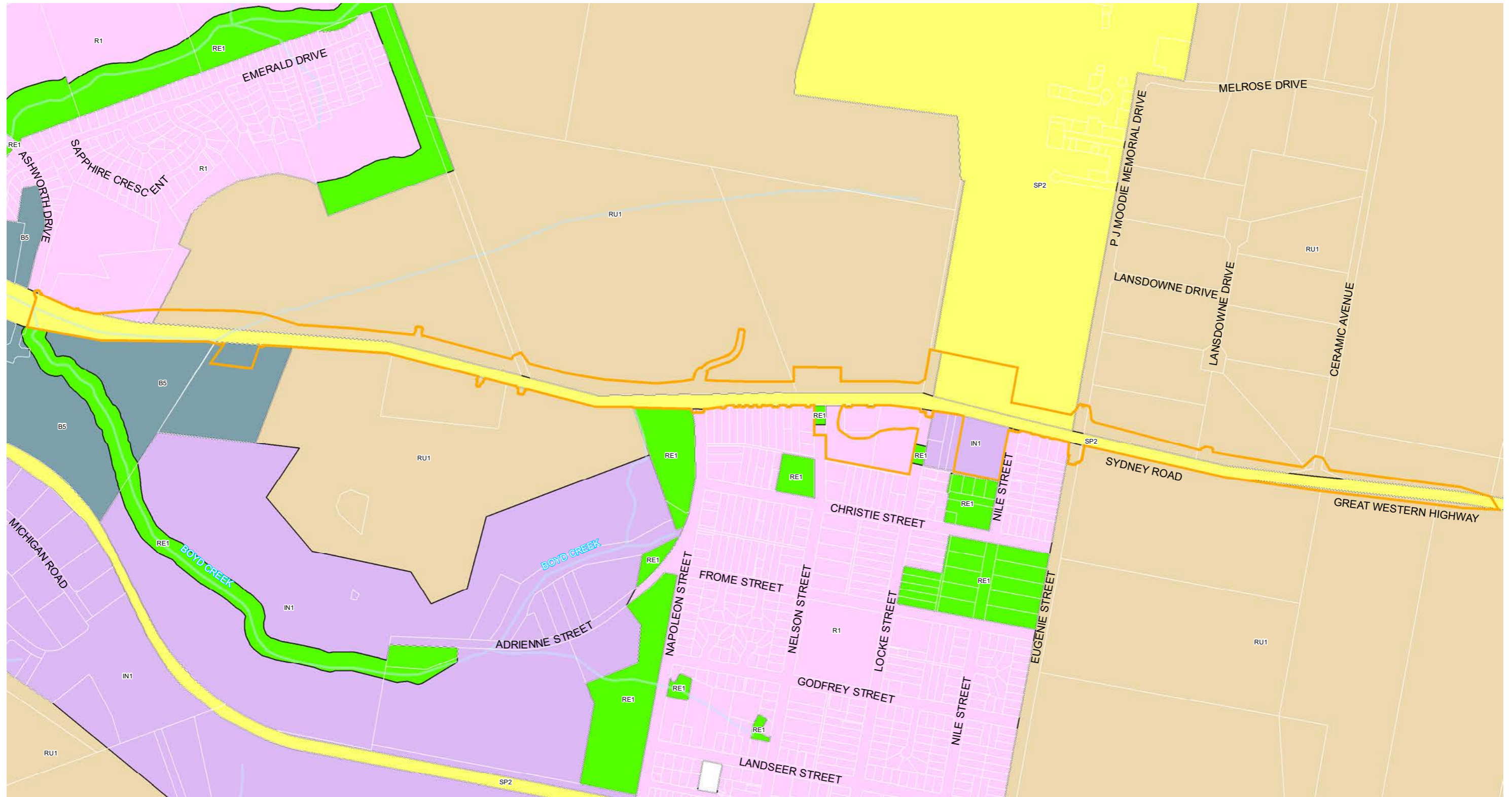


Figure 2-1

Study Area



- Proposal area
- Waterway
- LEP zone**
- B5 Business Development
- IN1 General Industrial
- R1 General Residential
- RE1 Public Recreation
- RU1 Primary Production
- SP2 Infrastructure

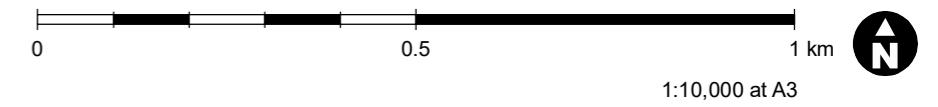
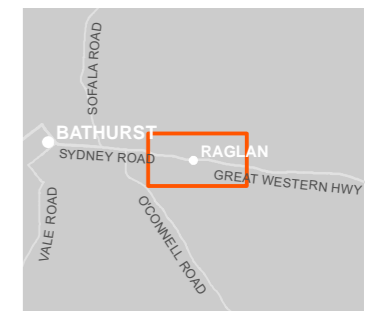


Figure 2-2 LEP land zoning

Data sources
 Roads and Maritime Services 2019
 Jacobs 2019
 NSW Department of Planning and Environment Apr 2019
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 GDA94 MGA56



2.2 Land zoning

This section considers local planning context, including existing land uses, sensitive landscapes or views that are identified within the Bathurst Regional Local Environmental Plan 2014 (Bathurst LEP). The proposal is located within the Bathurst Regional Local Government Area (Bathurst Regional LGA), on land which is subject to the Bathurst LEP. The land zoning around the proposal is shown in Figure 2-2 and described in Table 2-1.

Table 2-1 Relevant zone objectives

Zone	Objectives
R1 – General Residential	<ul style="list-style-type: none"> • To provide for the housing needs of the community • To provide for a variety of housing types and densities • To enable other land uses that provide facilities or services to meet the day to day needs of residents • To provide housing choice and affordability by enabling opportunities for medium density forms of housing in locations and at densities that complement the surrounding residential environment • To protect and conserve the historic significance and scenic quality of the urban villages of Eglinton, Raglan and Perthville • To enable commercial development that is compatible with the amenity of the area and does not prejudice the status and viability of the Bathurst central business district as the retail, commercial and administrative centre of Bathurst.
B5 – Business Development	<ul style="list-style-type: none"> • To enable a mix of business and warehouse uses, and specialised retail premises that require a large floor area, in locations that are close to, and that support the viability of centres • To enable development that serves the needs of the workforce • To promote development that would protect the scenic qualities and enhance the visual character of the entrances to the city of Bathurst • To promote development of a scale and type that is compatible with the role of the Bathurst central business district as the primary retail and business centre in the region.
RE1 – Public Recreation	<ul style="list-style-type: none"> • To enable land to be used for public open space or recreational purposes • To provide a range of recreational settings and activities and compatible land uses • To protect and enhance the natural environment for recreational purposes • To protect and conserve the historical and scenic quality of Bathurst’s open space areas • To provide a network of open space that encourages walking and cycling.
RU1 – Primary Production	<ul style="list-style-type: none"> • To encourage sustainable primary industry production by maintaining and enhancing the natural resource base • To encourage diversity in primary industry enterprises and systems appropriate for the area • To minimise the fragmentation and alienation of resource lands • To minimise conflict between land uses within this zone and land uses within adjoining zones • To maintain the rural and scenic character of the land

Zone	Objectives
	<ul style="list-style-type: none"> To provide for a range of compatible land uses that are in keeping with the rural character of the locality, do not unnecessarily convert rural land resources to non-agricultural land uses, minimise impacts on the environmental qualities of the land and avoid land use conflicts.
SP2 – Infrastructure (Classified Road)	<ul style="list-style-type: none"> To provide for infrastructure and related uses To prevent development that is not compatible with or that may detract from the provision of infrastructure.
IN1 – General Industrial	<ul style="list-style-type: none"> To provide a wide range of industrial and warehouse land uses To encourage employment opportunities To minimise any adverse effect of industry on other land uses To support and protect industrial land for industrial uses To enable development that serves the needs of the workforce To promote development that would protect the scenic qualities and enhance the visual character of the entrances to the city of Bathurst.

2.3 Local landscape planning guidance

2.3.1 Bathurst roadside vegetation management plan

Roadside vegetation within the Bathurst Regional LGA was assessed in 2007 and classified into High, Medium and Low Conservation value categories according to the NSW Roadside Environment Committee Managing Roadsides guidelines. These vegetation classifications were used to guide construction and maintenance works on rural road reserves within the Bathurst Regional LGA via the Bathurst Regional Council Roadside Vegetation Management Guidelines (2007).

The Bathurst Roadside Vegetation Management Plan (Bathurst RVMP) identifies the vegetation along the existing road alignment as being of low conservation value. This is outlined in Figure 2-3, which shows an excerpt of Map 6: Conservation Values, Priority Site and Rehabilitation Sites from the Bathurst RVMP.

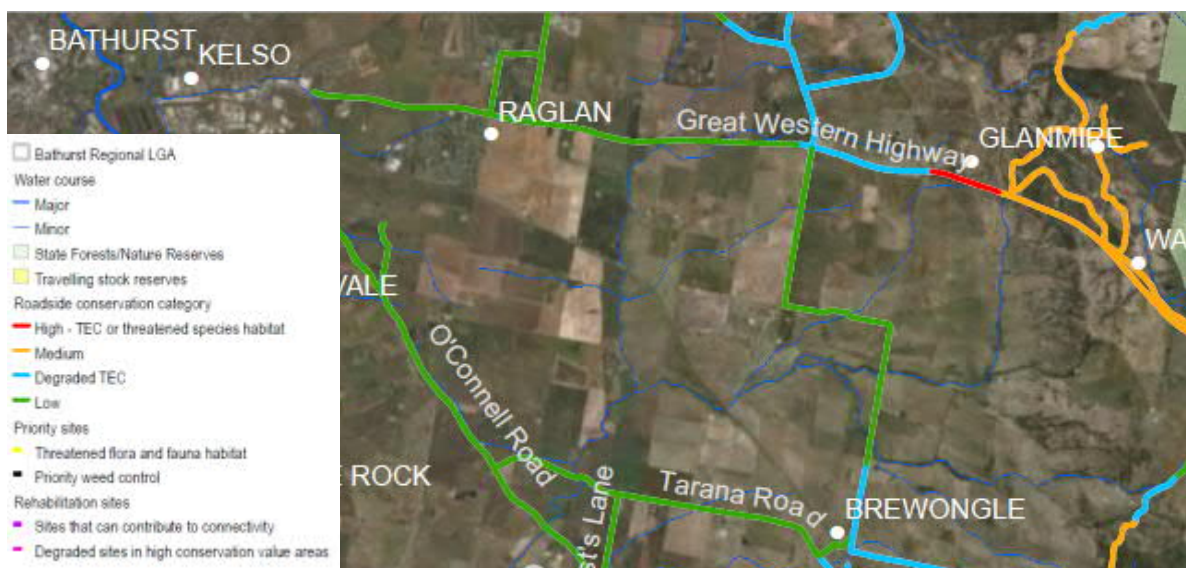


Figure 2-3 Map 6: Conservation Values, Priority Site and Rehabilitation Sites. Source: Roadside Vegetation Management Plan 2007, Bathurst City Council.

2.3.2 Bathurst Region Vegetation Management Plan

Bathurst Regional Council published the Bathurst Region Vegetation Management Plan (VMP) in 2019 which outlines significant landscapes, vegetation and heritage features within the region and provides strategies and recommendations for vegetation management across the region.

Landscape and visual amenity objectives of the Bathurst VMP are listed below:

2.3.3 Significant landscapes

Several landscape types have been identified by the Bathurst VMP as significant landscapes providing visual amenity and landscape character. Significant landscapes relevant to the proposal include:

- **The Great Dividing Range:** The Bathurst VMP recognises views across the rural landscape toward the Great Dividing Range to the east of the proposal. This landscape is characterised by plateaus, and rugged hilly-mountainous terrain. The Bathurst VMP highlights these as a source of visual amenity to be enhanced and protected
- **Rural Landscape and Plateaux** This landscape surrounds much of the land surrounding the Bathurst Regional LGA. These landscapes primarily include agricultural and horticultural land, hobby farms as well as remnant woodland areas on public and private land. They are depicted as open eucalypt woodlands or plains and are characterised by the 'Australian' landscape. These landscapes extend through the tablelands of the region that frame the area and provide a backdrop to vistas viewed from Bathurst city and from throughout the region
- **Bathurst Plains:** The Bathurst Plains are typified by a treeless landscape which provides a contrast to the built-up area of the urban environment. They are viewed from the eastern approach to Bathurst City and are particularly significant as a natural gateway feature. The Bathurst VMP identifies an area immediately south of the proposal alignment, to the east of the Raglan township as a significant portion of the Bathurst Plains. The Bathurst VMP also notes that the extents shown on the map are indicative only. Figure 2-4 provides an excerpt of Map B1: Significant Vegetation and Natural Landscapes from the Bathurst VMP, that focuses on the proposal site and surrounds. It outlines the extensive rural landscape areas surrounding the proposal, roads noted as gateways to Bathurst and a section noted as a visually significant portion of the Bathurst Plains.

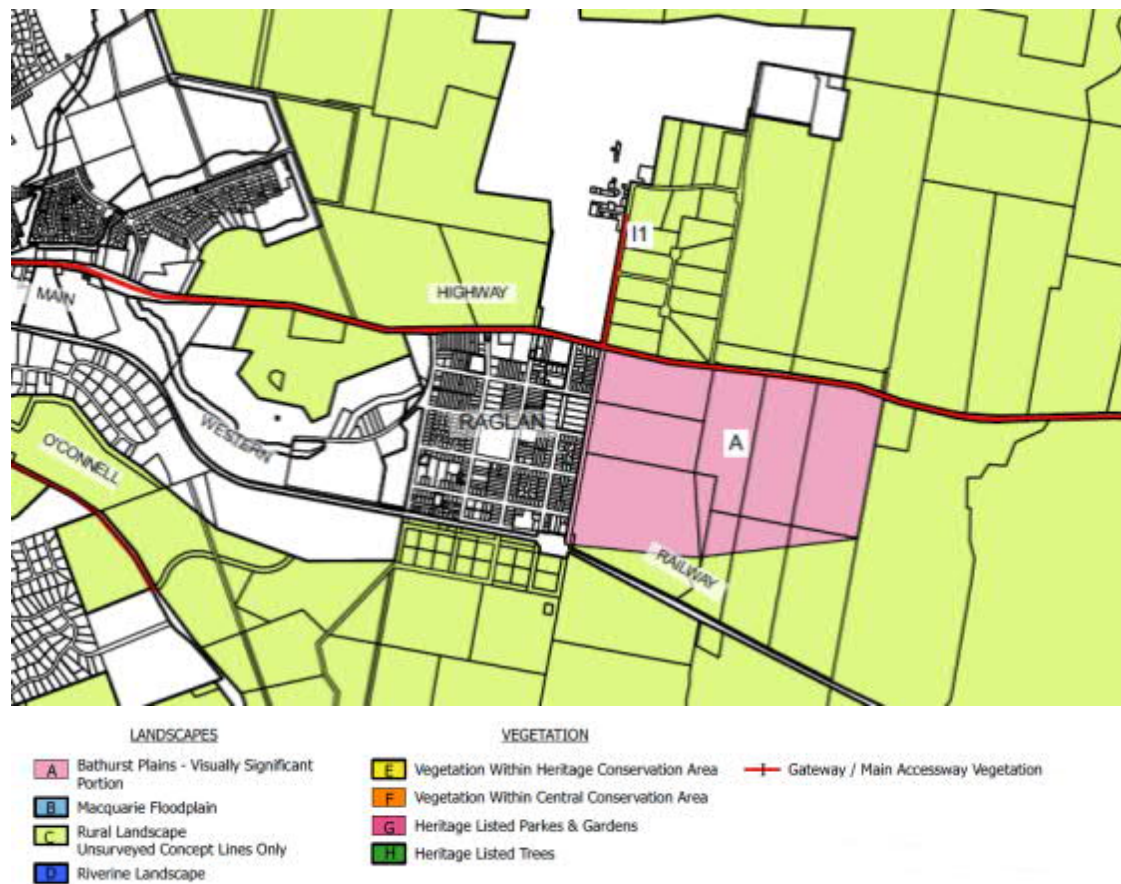


Figure 2-4 Significant vegetation and natural landscapes Source: Vegetation Management Plan, Bathurst City Council

2.3.4 Streetscape

The Bathurst VMP highlights that streetscapes play a strong role in contributing to the visual amenity of the City and villages and help define the individual character of each urban area.

2.3.5 Gateways

The Great Western Highway and PJ Moodie Memorial Drive have been identified as a gateway into Bathurst. The Bathurst VMP highlights a gateway theme of native trees transitioning to exotic trees upon entering the city, with the CBD being wholly vegetated with exotic species.

The Bathurst VMP provides guidance on the selection and placement of vegetation to be re-instated by the proposal. The VMP proposes the use of native species to the area east of Raglan and along the creeks and waterways, transitioning to more formal plantings within Raglan and the approach to Bathurst. The placement of this vegetation should be done with consideration to views toward points of interest such as the Great Dividing Ranges, Mount Panorama as well as the farmland and rolling plains on approach to Raglan.

It should be noted that the VMP is a guide only and the final landscape design and species selection requires consensus between Bathurst Council and TfNSW. Of critical long-term consideration for suitable species selection is climate change adaptation.

2.4 Landscape character analysis and sensitivity

The existing landscape of the study area has been analysed and Landscape Character Zones (LCZ) identified by grouping areas that exhibit similar visual characteristics and features such as

topography, creeks, drainage lines, soil types, vegetation and land use. The following section describes the underlying patterns of these elements within the local context of the proposal.

Topography

The proposal and study area are located east of Bathurst and comprise the existing Great Western Highway leading toward the Great Dividing Range and Sydney. The topography within the study area is generally undulating hills, and ranges in elevation from about 690 metres (above sea level) at the western project extent, to about 755 metres (above sea level) toward the eastern proposal extent.

Vegetation

Vegetation within the study area is typically found in road reserves, public open space, associated with waterways and within private allotments.

Native shrubs characterise the roadside vegetation in the eastern proposal extents. Non-native tree species (poplars) characterise the approach to Bathurst from Raglan and their landscape value as a historic gateway feature is recognised within strategic landscape documents. The longevity of the highway trees is in decline however and a Tree Risk Assessment commissioned by Bathurst City Council and dated September 2018 identifies four trees for urgent removal and a further 28 trees required to be tested and most likely removed.

Land use

The predominant land uses within the study area for the proposal are as identified in Figure 2-2 and include:

- Townships
- Farming and agriculture
- Open space reserves
- Commercial/ industrial uses
- Transport infrastructure (including the highway).

2.4.1 Landscape character zones

The Bathurst Regional Council zoning plan (Figure 2-2) has been used as the basis to identify three LCZs (see Figure 2-5) within the study area. Each zone has been identified through consideration of features such as land use, topography, geology and vegetation and are described below.

LCZ 1 – Townships

LCZ 1 encompasses built form associated with Raglan and Kelso and also includes land designated by Bathurst Regional Council for future development.

Raglan comprises mainly single storey residential properties laid out in a grid pattern. Further land uses include a school and several commercial properties including a BP service station that fronts onto the highway and is accessed via Locke Street. Various warehouses and industrial units are located on Adrienne Street and an area of parkland is located directly south of the Great Western Highway, running parallel to Napoleon Street. Views into Raglan from the highway are limited by built form, vegetation and the relatively level landform. Views across open, undulating grazing land are characteristic within Raglan. A number of mature trees are located in residential property gardens and the highway corridor features incomplete avenues of mature poplars on either or both sides of the carriageway.

The proposal extends into the eastern outskirts of Kelso and connects the previously completed highway widening scheme at a roundabout. The roundabout accesses development land to the south, residential area to the north and the Gold Panner Motor Inn and Panorama Holiday Park to the

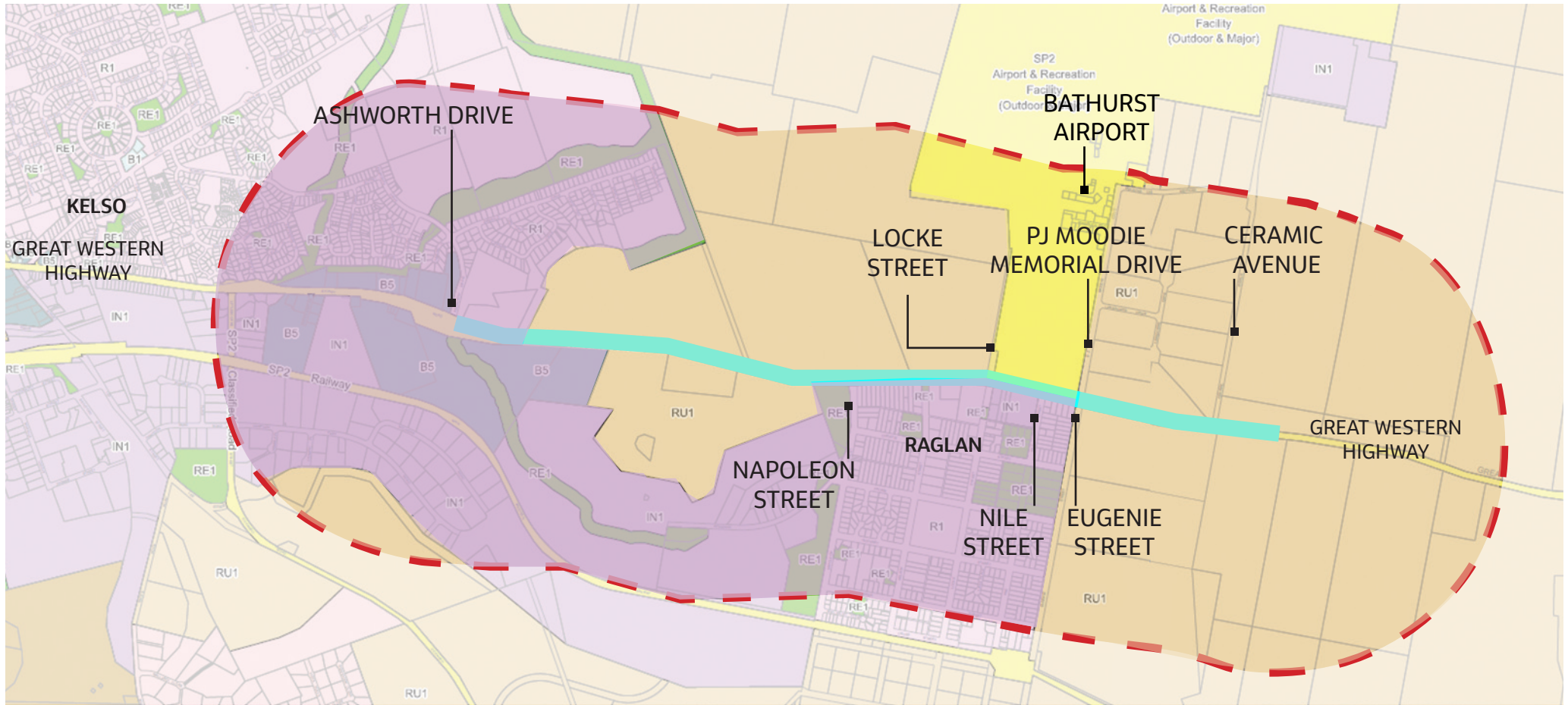
northeast. The residential area appears recently completed, extends eastwards into farmland and comprises several interconnected streets and cul-de-sacs. Housing density is similar at Kelso to Raglan with mainly single storey residential properties arranged within a less angular street pattern. To the west of the roundabout, commercial and industrial premises are aligned either side of the highway. The Great Western Highway generally divides land uses in Kelso with residential development typically located to the north and industrial/ commercial premises to the south.

LCZ 2 – Cleared farmland

LCZ 2 comprises land primarily used for agricultural purposes. Landform is open and gently undulating with a field pattern typically delineated by post and wire fencing. LCZ 2 is a highly modified landscape where native vegetation has been removed and the soils cultivated for primary production purposes. While the land could be considered degraded by clearing and grazing, this rural landscape has been identified in local planning strategies as being important in terms of visual amenity, particularly in framing views toward the Great Dividing Range to the east.

LCZ 3 – Bathurst Airport

Bathurst Regional Airport is located north of Raglan. This LCZ is characterised by airport infrastructure including terminals, sheds, cleared land and the airport runway. This area is recognised as a gateway for travellers into Bathurst, in particular, PJ Moodie Drive which includes an avenue of mature trees lining the route from the airport to the Great Western Highway.



- LCZ1 - Townships
- LCZ2 - Cleared Farmland
- LCZ3 - Bathurst Airport

- 1km Offset
- Extent of the Proposal

0 1 2 3 km

1:25,000 at A4



Figure 2-5

Landscape Character Zones

2.4.2 Landscape sensitivity

Landscape sensitivity is in part a measure of the ability of the existing landscape to absorb change of the order of the proposed development. The sensitivity of the previously described LCZs of the study area is described in Table 2-2 and considers their individual attributes such as location, rarity and scenic quality. It should be noted that residential areas are typically determined as being of High sensitivity.

Table 2-2 Landscape sensitivity

Landscape Character Zone		Overall sensitivity rating	Description
LCZ 1	Townships	High	<ul style="list-style-type: none"> • The suburb of Kelso and adjacent locality of Raglan exhibit a semi-rural character, being typically surrounded by agricultural land • Residential areas within the study area generally comprise medium density development of one storey properties. Properties on the fringes of each township are afforded views across the surrounding landscape • Several areas of existing agricultural land between Kelso and Raglan are identified for future development • Residential properties adjacent to the Great Western Highway generally front onto and have direct access to the highway corridor • Housing development layouts typically are designed for reliance upon vehicular use, with limited provision for pedestrians • Each residential area connects directly into the Great Western Highway via either intersections or roundabouts and the presence of the highway is generally notable within the LCZ due to it being the main arterial connection between townships in the locality, connecting Bathurst, Kelso and Raglan • The road corridor is generally at grade with the surrounding landscape and not visually concealed by embankments or within cutting. Whilst built form and associated mature vegetation within each township may filter visibility, views of the road, traffic and associated mature poplar trees are characteristic within the LCZ • Residential properties within the viewshed are typically clustered within townships with occasional isolated farmsteads along the road corridor • In each township a number of warehouse-scale commercial/ industrial properties and associated parking lots positioned adjacent to

Landscape Character Zone		Overall sensitivity rating	Description
			<p>the highway act as buffers between the road and some residential properties</p> <ul style="list-style-type: none"> Each township features areas of public open space, most notably Elmo Lavis Park located west of Raglan which adjoins the highway corridor. The park comprises formalised paths, close mown grass and mature trees and falls north to south, away from the road corridor.
LCZ 2	Cleared farmland	Moderate	<ul style="list-style-type: none"> Open, gently undulating landscape typically used for grazing This LCZ exhibits a character typical of agricultural land within the region and whose visual quality has been detrimentally affected by clearance of vegetation and overgrazing Limited tree cover and open, undulating landform permits intervisibility with the existing highway and also expansive, long views across the surrounding landscape Several farmsteads are scattered across the landscape and access the Great Western Highway via unbound tracks. Agricultural land parcels are typically angular in form and defined by wire fencing Creeks and ponds of varying sizes are frequent within the viewshed Views of townships, the Great Western Highway corridor and associated poplar trees would likely be frequent within this LCZ. Views would be filtered by undulating landform and vegetation. It should be noted that there are no footpaths or publicly accessible viewpoints within the LCZ which is considered to reduce the sensitivity of this landscape receptor East of the airport is a smaller scale cluster of residential properties/ farmsteads in relatively close proximity to each other in a grid formation and whose location, surrounding topography, built form and associated vegetation result in a self-contained community The Bathurst VMP identifies this area as Rural Landscape and Plateaux comprising agricultural and horticultural land, hobby farms, and remnant woodland. They are depicted as open eucalypt woodlands or plains characteristic of the 'Australian' landscape and providing a backdrop to vistas viewed from Bathurst city and from throughout the region East of Raglan, within the study area, lies an area of farmland identified in Figure 2-4 as a

Landscape Character Zone		Overall sensitivity rating	Description
			visually significant portion of the Bathurst Plains, viewed from the eastern approach to Bathurst City and functioning as a natural gateway feature.
LCZ 3	Bathurst Airport	Low	<ul style="list-style-type: none"> • Large-scale land use defined by the extensive runway, warehouse-scale buildings and associated infrastructure surrounded by open grassland • The airport is typically designed as a functional facility and has grown incrementally as a cluster of buildings with limited consideration for aesthetics or the wider landscape context • The access road (PJ Moodie Memorial Drive) to the airport connects directly to the Great Western Highway and features a distinctive avenue of mature trees along its length • The publicly-accessible areas of the airport are located at some distance from the highway and the formal nature of the airport approach along the tree-lined PJ Moodie Memorial Drive serves as a gateway feature for visitors

3. Urban design vision, objectives and principles

The urban and landscape design has taken into consideration a number of influencing factors in order to develop an appreciation for the proposal, including the proposal objectives, opportunities and limitations. This includes its role as an important gateway boulevard leading into one of Bathurst's major entrances, through Kelso. The Bathurst VMP has been considered in the development of the urban and landscaping design for the proposal.

The urban design vision is to upgrade this section of the Great Western Highway to improve the efficiency and safety of the highway corridor as an appropriate gateway to the Bathurst Region.

The following urban design and landscape objectives are derived from the nine principles set out in Beyond the Pavement (Roads and Maritime, 2014). The planting strategies of the Bathurst VMP have also been referenced where appropriate. The principles guide engineering and urban design considerations for the proposal to achieve integrated outcomes through identification of bespoke elements relating to the study area and the proposal and are described below.

Principle 1: Identify and enhance the defining characteristics of the road corridor

- Contribute to the urban structure and the overall public domain quality for the community and other users
- Locate and identify existing vegetation worthy of retention that has both value to the proposal and surrounding community, taking into consideration the impact of the road works on the existing vegetation, quality and potential lifespan of existing vegetation
- Reference the themes of the avenue planting implemented in the Kelso landscape works on the Great Western Highway Upgrade from Ashworth Drive to Lee Street
- Due to the senescence of the existing poplar avenues and the impact of the roadworks, the former avenue of poplars will no longer have any significant presence on the highway. The design approach should evoke this landscape feature while maintaining a connection to the township of Kelso and the design parameters of the proposal
- Plant new tree avenues to restore elements of the existing character of the route on approach to Bathurst
- Maximise the opportunities for views across the landscape, particularly to the eastern extent of the proposal looking across the Bathurst Plains
- Rehabilitate riparian vegetation impacted by the realignment of Boyd Creek in a complimentary fashion to the Kelso upgrade in order to maintain a sense of continuity.

Principle 2: Integrate the proposal within the landscape context

- Integrate the design and landscape character of the corridor with the adjoining urban village areas, rural settings, open spaces and natural settings
- Widen the road within the existing highway corridor to minimise vegetation removal and ground disturbance
- Select various resilient tree species that complement the previous work undertaken in Kelso on the Great Western Highway Upgrade from Ashworth Drive to Lee Street, as well as the existing landscape character of the region and immediate precinct
- Provide additional roadside planting where appropriate that is sympathetic with the existing landscape and township character of Raglan
- Provide screening or enhanced planting between the Raglan township and the Great Western Highway. While landscape planting would not provide any noise mitigation, planting of both trees

and other vegetation would reduce the impact of headlight spill and enhance the amenity for local residents adjacent to the corridor

- Improve the biodiversity of Boyd Creek by enhanced indigenous, riparian plantings that would reinforce the diversity of visual experiences from wooded creek lines to open woodlands and views to the plains and ranges in the distance
- Create a distinctive and unique boulevard entrance to Bathurst through Raglan and Kelso all the way into the city, capitalising on the theme of strong ornamental boulevards of deciduous trees.

Principle 3: Create a safe and efficient highway

- Provide landscaping to improve the amenity of the shared path, including provision of shade. Where possible, locate trees on the northern side of the shared path to provide shade, to both improve amenity for the user and reduce the impact of the heat island effect on hard surfaces in the vicinity of pedestrians and cyclists
- Minimise potential conflicts between pedestrians, cyclists and motorists
- Align the shared path away from the back of the kerb where possible to reduce risk and enhance safety for cyclist and pedestrians by increasing the distance of users from the roadway
- Gateway plantings to accommodate the constraints set out by the Civil Aviation Safety Authority (CASA). For the purpose of species selection, the maximum allowable height of trees at maturity is not to exceed eight metres in proximity to the airport
- Appreciate the proposal's broader context including identifying, capturing and framing views to the Bathurst Plains and the Great Dividing Range where possible. A number of peaks and hilltops have been identified along with potential long-range views, filtered views and snapshots to enhance the driver experience, maintain alertness and connect the driver experience to this region and its broader landscape character
- Improve the legibility of the road and help alert drivers to different speed environments by differentiating their appearance.

Principle 4: Create an appropriate gateway to Bathurst

The Bathurst VMP lists the following gateway planting strategies:

- Provide distinctive gateway vegetation themes on the approaches to the city and key villages
- Maintain the rural landscape vistas visible from many parts of the city/ villages and surrounds through current strategic planning and appropriate streetscaping
- Where rural vistas are significant, trees need to be widely spaced, grouped together or of upright habit so views are not obstructed
- Adopt drought and climate change management strategies to counteract the adverse effects of extended dry periods and increased temperatures on street trees
- Avoid the development of garden settings along the gateways as they are inappropriate for the scale of the surrounds and would be isolated, unconnected features. Gardens are to be within more 'intimate' settings such as central parks
- The planting of small trees, shrubs and ground covers may be required due to narrow spaces following infrastructure upgrades, however their design is to reflect the gateway theme as opposed to a garden planting
- For approaches to the city, the gateway vegetation, rural vistas, historical built environment, Carillon, Mount Panorama, floodplains and surrounding vegetation are to provide the key focal points

- For approaches to the villages, the gateway vegetation, rural vistas, historical built environment, and surrounding vegetation are to provide the key focal points
- Liaise with Roads and Maritime during future highway upgrades to ensure their landscape design includes an avenue of trees along the airport side of Raglan Village to mirror the plantings on the other side of the highway
- Gateway plantings to accommodate the constraints set out by the Civil Aviation Safety Authority (CASA). For the purpose of species selection, the maximum allowable height of the tree at maturity is not to exceed eight metres in proximity to the airport
- Single row of exotic trees in an avenue is recommended
- Due to the small scale of the tree in relation to the open expanse of the rural landscape surrounding the aerodrome, the spacings between the trees is to be relatively narrow. With overly wide spacings the tree avenue will lose its impact and continuity.

Principle 5: Achieve integrated and minimal maintenance design

- Use robust and durable materials to minimise ongoing maintenance requirements whilst meeting safety needs of maintenance personnel and users
- Consider the impacts of increased temperatures and heatwaves, alternate rainfall cycles, increased winds and cloudburst in response to the impacts global warming
- Design-out opportunities for vandalism
- Minimise street clutter to create a simple, user-friendly palette of road elements along the corridor.

4. Urban design concept

The following section includes a description and illustrations of the proposal and, where appropriate, the existing environment.

4.1 Proposed road

The proposal would widen the highway to tie-in with the recently completed Great Western Highway upgrade at Kelso as shown in Figure 4-1. Highway cross sections would vary along the route and would include turning lanes, a variable median, verges and a 2.5 metre width shared pedestrian/ cycle path.



Figure 4-1 Recently completed highway upgrade at Kelso

Figure 4-2 shows a typical highway cross section from the western extent of the proposal to Napoleon Street (Raglan Township).

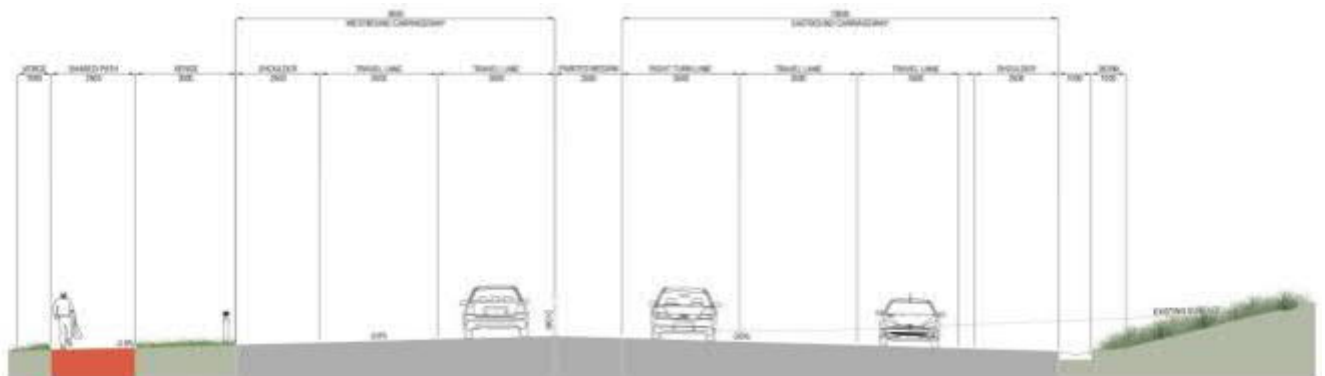


Figure 4-2 Proposed typical section from Ashworth Drive to Napoleon Street (extract from Urban Design and Landscape Plans in Appendix B)

Within the township of Raglan, typical street sections vary at intersections. Figure 4.3 illustrates a typical section between Locke Street and Nile Street.

The road alignment adjacent to Raglan would consist of:

- Two eastbound travelling lanes
- A SF (raised) median
- A shared pedestrian/ cycle path

- One westbound travelling lane
- Deceleration turning lanes to allow left-turns for westbound traffic.

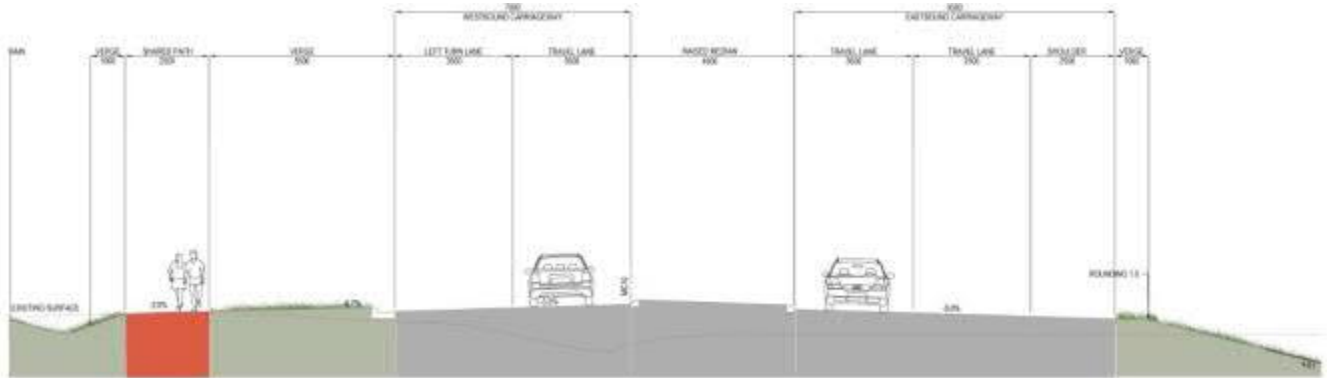


Figure 4-3 Proposed typical section between Locke Street and Nile Street (extract from Urban Design and Landscape Plans in Appendix B)

East of the Raglan township, to the eastern proposal extents past Ceramic Avenue, the proposal would typically comprise two eastbound lanes and one westbound lane. Figure 4-4 shows a typical section between Eugenie Street (east boundary of Raglan township) and Ceramic Avenue. An eastbound overtaking lane is also proposed near Ceramic Avenue.

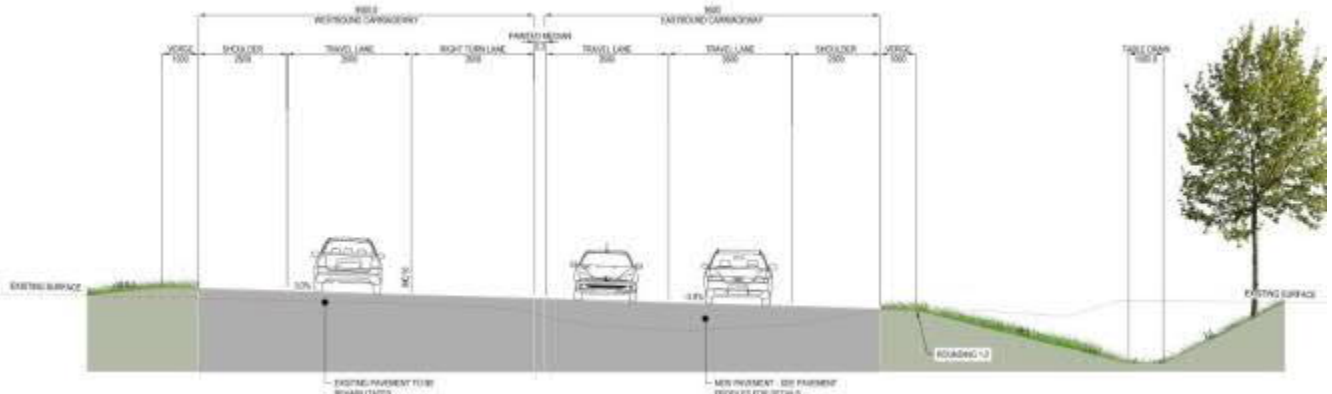


Figure 4-4 Proposed typical section east of Ceramic Avenue (extract from Urban Design and Landscape Plans in Appendix B)

4.2 Residential property access treatment

There are about 14 residential dwellings along the northern edge of the highway that are accessed directly from the existing carriageway. These residents currently have access to their properties from both the east and west bound traffic lanes. The section between Napoleon Street and Eugenie Street would include a raised median to allow left turns into residential driveways from the westbound traffic lane. Entry to these residential driveways would be restricted for eastbound traffic due to the raised median.

As shown above (see Figure 4-3), the southern edge of the road reserve would contain a verge and the shared user path between the highway and the residential property boundaries.

4.3 Intersection treatments

The proposal would upgrade five intersections including Napoleon Street, Locke Street, Nile Street, Eugenie Street/ PJ Moodie Memorial Drive and Ceramic Avenue. The existing highway layouts and the proposed changes are described in the following sections.

4.3.1 Napoleon Street intersection

Existing environment

The existing intersection at Napoleon Street and the Great Western Highway is a T-intersection, with traffic on Napoleon Street giving way.

Proposed intersection

The proposed intersection is shown in Figure 4-5.



Figure 4-5 Proposed intersection at Napoleon Street (extract from Urban Design and Landscape Plans in Appendix B)

The highway would be realigned northwards in the vicinity of this intersection. Turning south into Napoleon Street from the highway would generally be in keeping with the existing arrangement, with deceleration and turning lanes proposed for each direction of travel. A painted chevron median would form the centreline to the west and a raised median would be a new addition to the corridor at this point, extending eastwards along the centreline from the junction. The highway would be on embankment to the south and in cutting to the north. The intersection would also include a new connection northward to connect to a realigned single lane road that provides access to a number of agricultural buildings. Existing mature trees aligned along the northern side of the carriageway would require removal. Avenue tree planting is proposed as a gateway feature on approach to Raglan and on reaching maturity would replace, extend and enhance the existing gateway boulevard as a feature along the highway. Furthermore, a new shared path is proposed to cross Napoleon Street and would follow an alignment adjacent to the highway alongside Telford Park. New tree planting is also proposed within the parkland to act as a visual buffer in views towards the widened highway. The location and selection of species for planting is subject to further stakeholder consultation.

4.3.2 Locke Street intersection

Existing environment

Locke Street intersection is currently utilised to access industrial land to the east, and the truck rest area to the west, next to the BP Service station.

Proposed intersection

Figure 4-6 shows the proposed intersection at Locke Street.

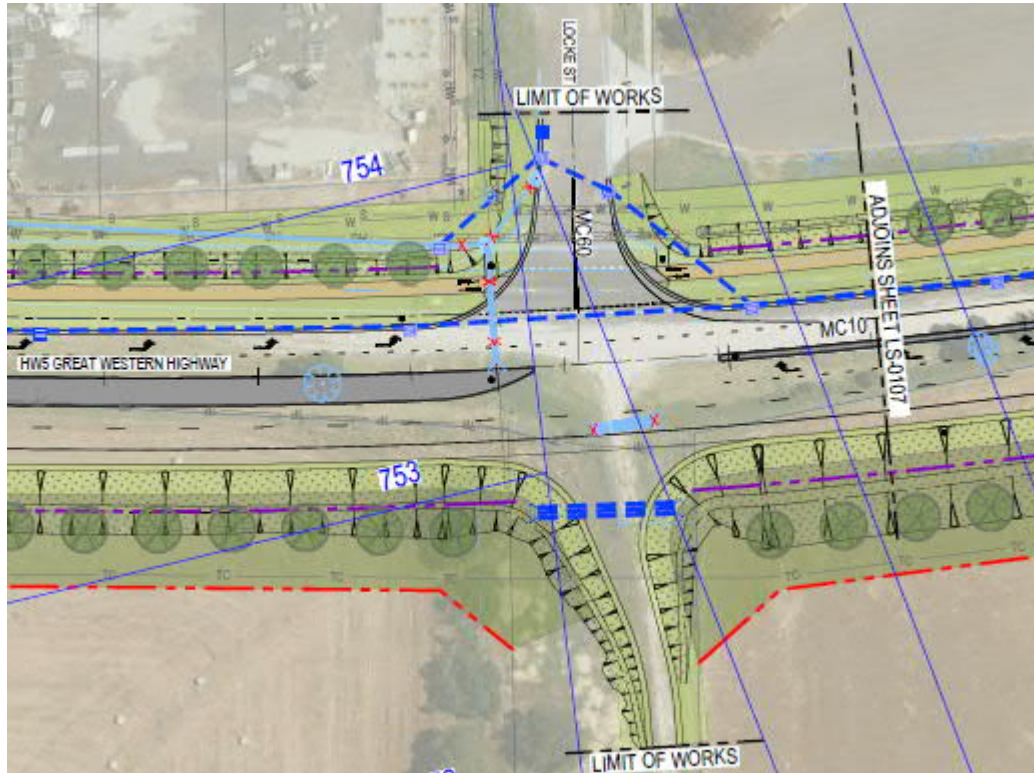


Figure 4-6 Proposed intersection at Locke Street (extract from Urban Design and Landscape Plans in Appendix B)

The highway alignment would be shifted northwards in the vicinity of this intersection. Turning south into Locke Street from the highway would generally be in keeping with the existing arrangement, with deceleration and turning lanes proposed for each direction of travel. Raised central medians would extend both east and west from the intersection along the highway centreline and would be a new addition to the corridor at this point. The highway would be on embankment to the south and approximately at-grade to the north. The intersection would also retain a connection northward to a single lane road to the airport runway. Several existing mature trees aligned along the northern side of the carriageway would require removal. The location and selection of species to be planted is subject to further stakeholder consultation and on reaching maturity would replace the existing boulevard as a feature along the highway. Furthermore, a new shared path is proposed to cross Locke Street and would follow an alignment adjacent to the highway.

4.3.3 Nile Street intersection

Existing environment

The existing intersection at Nile Street and Sydney Road is a T-intersection, with traffic on Nile Street giving way.

Proposed intersection

The proposed intersection is shown in Figure 4-7.

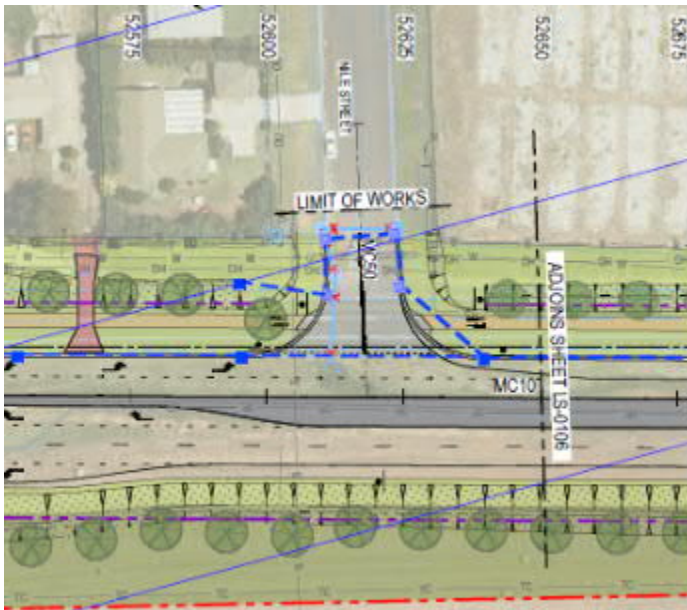


Figure 4-7 Proposed intersection at Nile Street (extract from Urban Design and Landscape Plans in Appendix B)

The highway alignment would be shifted northwards in the vicinity of this intersection. Turning south into Nile Street from the eastbound highway would generally be in keeping with the existing arrangement, with a deceleration lane on approach to the intersection. A proposed raised central median would be a new addition to the corridor at this point and would prevent turning from the westbound carriageway. The highway would be on embankment to both the north and south in proximity to the intersection. The intersection would also retain a connection northward to a single lane road to the airport runway. The location and selection of species to be planted is subject to further stakeholder consultation and on reaching maturity would create a feature along the highway. Furthermore, a new shared path is proposed to cross Nile Street and would follow an alignment adjacent to the highway.

4.3.4 Eugenie Street/ PJ Moodie Memorial Drive Intersection

Existing environment

At the existing intersection at Eugenie Street, PJ Moodie Memorial Drive and the Great Western Highway, traffic crossing the highway gives way (refer to Figure 4-8).



Figure 4-8 Existing intersection at Eugenie Street / PJ Moodie Memorial Drive and Great Western Highway

Proposed intersection

Figure 4-9 shows the proposed intersection at Eugenie Street and PJ Moodie Memorial Drive.



Figure 4-9 Proposed intersection at Eugenie Street and PJ Moodie Memorial Drive (extract from Urban Design and Landscape Plans in Appendix B)

The highway alignment would be shifted northwards by the proposal in the vicinity of this intersection. Turning south into Eugenie Street or north into PJ Moodie Memorial Drive from the highway would generally be in keeping with the existing arrangement, with deceleration and turning lanes proposed for each direction of travel. Raised central medians would extend both east and west from the intersection along the highway centreline and would be a new addition to the corridor at this point. Furthermore, traffic signals and a U-turn area in Eugenie Street would also be new additions to the streetscape. The highway would be on embankment to both the north and south. A number of existing juvenile trees aligned within private land along the northern side of the carriageway would require removal. The location and selection of species to be planted is subject to further stakeholder consultation and on reaching maturity would create a gateway boulevard to Raglan as a feature along the highway. Furthermore, a new shared path is to be created, extending west from Eugenie Street and aligned parallel to the southern side of the highway.

4.3.5 Ceramic Avenue

Existing environment

The existing intersection at Ceramic Avenue is a T-junction, with traffic on Ceramic Avenue giving way.

Proposed intersection

The proposed intersection is shown in Figure 4-10.



Figure 4-10 Proposed intersection at Ceramic Avenue (extract from Urban Design and Landscape Plans in Appendix B)

The highway alignment would be relocated northwards in the vicinity of this intersection. Turning south into Ceramic Avenue from the highway would generally be in keeping with the existing arrangement, with deceleration and turning lanes proposed for each direction of travel and a painted chevron median extending to the west from the junction along the highway centreline. The highway would be vertically aligned on embankment to both the north and south. An area of existing scrub vegetation within private land along the northern side of the carriageway would require removal. The location and selection of species to be planted is subject to further stakeholder consultation and on reaching maturity would create a gateway to Raglan as a feature along the highway.

4.3.6 BP service station intersection

Existing environment

The BP service station currently accepts traffic from both travelling directions, either directly from the highway, or via the Locke Street intersection and truck stop rest area (refer Figure 4-11). No deceleration lane is currently provided for either lane of traffic to enter the service station.



Figure 4-11 Existing entry to BP service station

Proposed arrangement

The proposal at this location would include a raised median to restrict traffic from turning into the service station from the eastbound lane. Traffic exiting the service station would be restricted to exiting to the westbound lane or exiting via the Locke Street intersection to turn west.

Entry to the service station from the westbound lane would generally be in keeping with existing conditions. Traffic would cross the proposed shared user path at this point.

4.3.7 Boyd Creek realignment

A section of the Boyd Creek network travels beneath the existing highway alignment. The proposed works would include a realignment of a section of the creek via a five cell bridge size culvert, 11.4 metres in length, about 50 metres west of the existing culvert.

A section of channel would be realigned to allow for the shared user path south of the proposal alignment.

4.3.8 Overhead lighting

Overhead street lighting is utilised along the completed Kelso highway upgrade (refer to Figure 4-12).

The proposal would include lighting between Eugenie Street and Napoleon Street, within the Raglan township. The final lighting type is to be confirmed by Council. The height of street lighting would be limited due to restrictions relating to the nearby Bathurst Regional Airport.



Figure 4-12 Typical overhead lighting at Kelso

4.3.9 Safety barriers and fencing

The roadway is separated from Boyd Creek near Kelso by safety barriers (refer to Figure 4-13). This style of safety barrier would be implemented along the proposed upgrade, particularly adjacent to sections of the creek, at some intersections, and along the alignment east of Raglan.



Figure 4-13 Existing safety barrier

Wire rope barriers would be installed between Napoleon Street and the Bathurst Sheds to the south of the alignment.

4.3.10 Shared pedestrian/ cycle path

A 2.5 metre width shared path is proposed along the south of the highway to connect Raglan with Bathurst and the surrounding suburbs. The shared path allows for a continuous connection through Raglan that is both safe and provides a sustainable alternative transport solution. Shade trees are proposed in proximity to the shared path where possible in order to enhance the user experience and also mitigate the heat-sink of hard paved surface in proximity to pedestrians and cyclists. Generally, the approach adopted is to plant trees on the northern side of the path to cast effective shade. Where this is not possible, broader canopy trees would be considered in the next design phase in order to cast effective shade in the long term. The location and selection of species to be planted is subject to further stakeholder consultation to identify an appropriate strategy including the consideration of notable views from the road corridor.

4.3.11 Removal of trees

The proposal would widen the carriageway, generally to the north of the existing roadway into the road reserve which contains mature, non-native trees (poplars) which would require removal. The roadside vegetation along the extents of the proposal has been assessed under the Bathurst VMP as being of a low conservation value and the Tree Risk Assessment commissioned by Bathurst City Council dated September 2018 identified four trees for urgent removal and a further 28 trees required to be tested and most likely removed. The trees form a distinctive landscape feature and appear as the remnants of a former double-sided boulevard feature the length of the highway.

Being non-native and fastigate in form the poplar trees are notably different from other native vegetation in the area and their visual prominence in the landscape highlights the route of the highway within local views. Due to their advancing age the further depletion in numbers of the poplars is anticipated and their removal and replacement as part of the proposal would be of long-term benefit.



Figure 5-14 Avenue of existing poplar trees to be removed, as seen from the Napoleon Street / Great Western Highway intersection

4.3.12 Proposed planting

The implementation of tree planting to replace the trees to be removed is an important element of the scheme. Recently completed highway improvements to the west in Kelso have implemented a continuous tree avenue using both natives and non-natives. The design approach for the proposal is to use tree avenues to create gateway features at appropriate locations along the highway. The location and selection of species to be planted is subject to further stakeholder consultation. The proposed planting would be resilient and consider the importance of long views across the landscape from the road corridor.

The proposed planting would:

- Be intermittent avenues at key locations to create gateway features on the approach to Bathurst
- Offer seasonal change/ interest
- Re-establish riparian vegetation along watercourses, including rock-lined drainage swales or channels
- Be sensitive to existing local cultural landscape patterns and plantings to provide a connection to the Bathurst town centre and its cultural identity
- Enhance the views to the significant landscape elements of the region beyond the immediate proposal location
- Use hardy species chosen to ensure low maintenance and longevity
- Be mindful of ultimate growth height to comply with the OLS height restrictions

Enhance the existing environment, ie at the interface between Elmo Lavis Park in the Raglan township and the Great Western Highway, additional Eucalypt plantings have been proposed to express the presence of the park along the highway.

5. Landscape character impact assessment

The potential impacts of the proposal on each LCZ are assessed below in Table 5-1 as a combination of each zone's sensitivity to change and the magnitude of the proposed changes. Refer to Appendix A for methodology of assessment.

Table 5-1 Landscape character impacts

Landscape Character Zone	Sensitivity	Magnitude	Description	Summary of impact
LCZ1 - Townships	High	Moderate	<p>The highway is pre-existing and serves as a gateway to Bathurst Airport, the city of Bathurst and the wider region. The carriageway would be widened and realigned both vertically and horizontally within views.</p> <p>The proposal is aligned along the existing highway corridor and duplicates the width of the existing carriageway.</p> <p>The proposal would remove the majority of the existing carriageway as it passes Raglan and reposition it further north, away from residential properties. The realignment would facilitate the introduction of a grass verge and tree planting.</p> <p>The semi-rural -urban character of LCZ 1 would remain similar to existing, although the expanded road corridor would reinforce the function and presence of the highway as an urban route into the city.</p> <p>The implementation of the shared path along the length of the proposal would potentially reduce reliance upon the use of vehicles to travel between local townships.</p> <p>Removal of the distinctive poplar trees within the highway corridor would have a medium-term adverse impact upon landscape character. Planting replacement trees would contribute to mitigation of the loss of the existing highway trees in the longer term.</p> <p>On reaching maturity within 15-20 years of completion, the proposed replacement tree planting would provide an enhanced gateway arrival feature on approach to Bathurst.</p>	High-moderate
LCZ2 – Cleared farmland	Moderate	Moderate	<p>The proposal would directly impact upon the LCZ through realignment of the carriageway and associated landform into the adjacent fields.</p> <p>The proposal would reinforce and increase the urban influence of the existing highway on the semi-rural landscape within the study area by increasing the scale and prominence of the highway.</p>	Moderate

Landscape Character Zone	Sensitivity	Magnitude	Description	Summary of impact
			<p>Modified landform, a widened and realigned carriageway and vegetation loss would have a medium-term detrimental impact upon the LCZ and broaden views of moving traffic and highway infrastructure.</p> <p>Detrimental impacts would be mitigated by landscaping proposals including avenue tree planting. The replacement and enhancement of the gateway tree avenue feature would require 10-15 years to reach a size that would be notable. The planting of native tree species along some sections of the proposal away from settlements is considered to be a positive landscape contribution to LCZ 1 in restoring elements of the cleared vegetation that would blend in to the wider landscape and provide a more rural character than use of non-native species.</p> <p>The location and selection of species to be planted is subject to further stakeholder consultation.</p> <p>Reclaimed land resulting from the road realignment would be landscaped to act as a buffer and improve visual amenity for residents fronting the highway.</p>	
LCZ 3 Bathurst Airport	Low	Low	<p>LCZ 3 extends south to the highway and would be directly affected through the realignment of the highway into the field south of the airport runway. It is considered that the removal of vegetation required to widen the highway would have a medium-term effect upon the LCZ. However, it should be noted that the publicly accessible areas of the airport are some distance north of the highway and the change in the view would be unlikely to be discernible due to distance and intervening hangars and other industrial buildings</p>	Low

6. Visibility of proposal

This section describes the area from within which the proposed development may be visible, the people who may experience views and their visual amenity. For the purposes of this assessment the study area has been determined as extending to one kilometre either side of the road corridor (refer to Figure 2-1). A selection of views from publicly accessible locations (refer to Figure 6-1) have been prepared to illustrate the existing visibility of the highway and inform the likely impact of the proposed development.

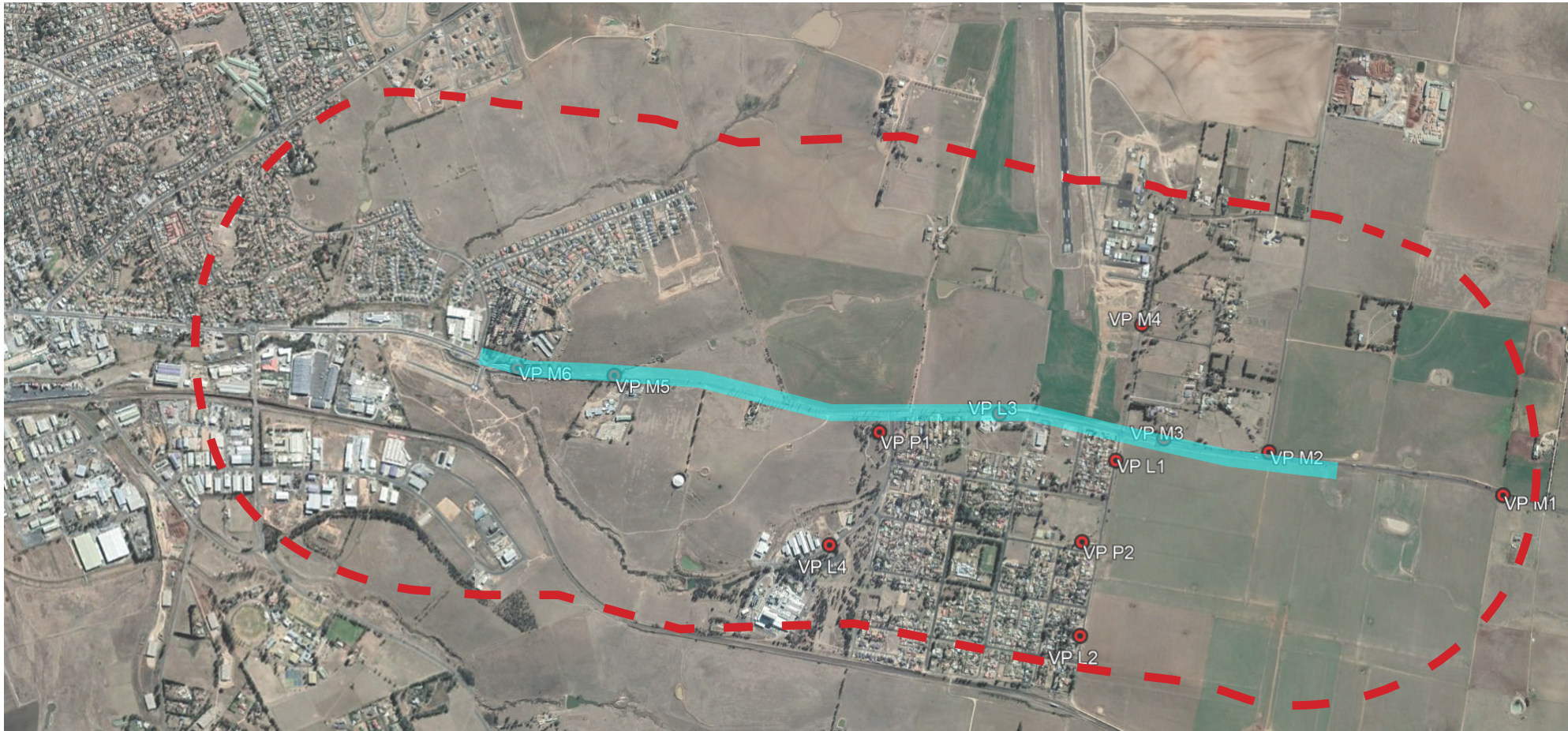
6.1 Visual context

The landscape adjoining the highway comprises gently rolling hills, generally increasing in elevation in an eastbound direction. The existing vertical alignment of the highway varies from sitting within cutting in some sections, and therefore screened by landform, whilst other sections overlook the cleared, rural plains when situated on top of a batter. Provision for pedestrians and cyclists is minimal within residential areas at Kelso and Raglan and there is limited recreational access within the adjacent landscape which largely restricts visual receptors to the road network and public open spaces. A number of single-lane tracks provide access to agricultural buildings to the north and south of the highway. The Great Western Highway and PJ Moodie Memorial Drive are two recognised 'gateways' to Bathurst city and both contain tree avenues. The Great Western Highway receives large volumes of traffic at peak times and affords notable scenic landscape views southwest.

6.2 Viewpoint locations

A number of viewpoints have been identified to illustrate the potential visual impact of the proposal. Figure 6-1 shows the location of selected viewpoints within publicly accessible areas within the study area selected for assessment. Viewpoints with the prefix "M" are representative of views from major roads, those with the prefix "L" are from local roads, and "P" from parkland;

- Viewpoint M1: Great Western Highway – East
- Viewpoint M2: Ceramic Avenue/ Great Western Highway
- Viewpoint M3: Great Western Highway at Raglan eastern edge
- Viewpoint M4: PJ Moodie Memorial Drive
- Viewpoint M5: Great Western Highway – Creek Crossing
- Viewpoint M6: Great Western Highway – Kelso
- Viewpoint L1: Eugenie Street - North
- Viewpoint L2: Eugenie Street - South
- Viewpoint L3: BP Service Station
- Viewpoint L4: Adrienne Street
- Viewpoint P1: Elmo Lavis Park
- Viewpoint P2: Ralph Cameron Park.



- - - 1km Offset
- Extent of the Proposals
- Viewpoints

0 1 2 3 km

1:25,000 at A4



Figure 6-1

Viewpoint Locations


7. Visual impact assessment

This section describes the existing view from each viewpoint, the sensitivity of the view as a visual receptor, the magnitude of the proposed change and makes an assessment of the overall impact of the proposal for visibility. The Visual impact assessment methodology is outlined in Appendix A.

7.1.1 Viewpoint M1 - Great Western Highway: East

The visual impact of Viewpoint M1 - Great Western Highway: East is summarised in Table 7-1.



Table 7-1 Visual assessment of Viewpoint M1 Great Western Highway: East

Assessment category	Rating	Comment
		
<p>Figure 7-1 Existing view from Viewpoint M1 – Great Western Highway looking west</p>		
<p>Viewpoint description: This viewpoint is located approximately 930m east of the proposal’s eastern extent and looks west towards the proposal. Open views are afforded across undulating, cleared farmland and to roadside vegetation in the north road reserve. This view is experienced by road users on the eastern approach to Bathurst City and the existing highway, associated infrastructure and moving traffic are part of the view.</p>		
Sensitivity	High	Bathurst VMP identifies the open landscape directly south of this view as The Bathurst Plains (see Figure 2-4 in this report), typified by a treeless landscape and providing a contrast to the built-up areas of the urban environment. The recognition of the Bathurst Plains’ landscape value as a natural gateway feature to Bathurst and the highway’s role in facilitating views across them places particular importance on the Great Western Highway as being a recreational route for motorists. Therefore, the position of the viewer relative to the views, and the ability to experience the views are of particular importance. While road users would be afforded glimpse views across the landscape from moving vehicles the recognition of the area for its visual amenity increases the sensitivity of this visual receptor to high.
Magnitude	Negligible	The proposal would likely not be visible from this location therefore no change would be discernible. The inclusion of this viewpoint is to illustrate the limited extent of the scheme from the east of the study area.
Overall impact	Negligible	The proposal would likely not be visible from this location.

7.1.2 Viewpoint M2 Ceramic Avenue / Great Western Highway

The visual impact of Viewpoint M2 Ceramic Avenue / Great Western Highway is summarised in Table 7-2.

Table 7-2 Visual assessment of Viewpoint M2 Ceramic Avenue/ Great Western Highway


Assessment category	Rating	Comment
		
<p>Figure 7-2 Existing view from Viewpoint M2 Ceramic Avenue / Great Western Highway looking east to south</p>		
		
<p>Figure 7-3 Existing view from Viewpoint M2 Ceramic Avenue / Great Western Highway looking south to west</p>		
<p>Viewpoint description: This viewpoint is located near the eastern extent of the proposal, at the intersection of Ceramic Avenue and the Great Western Highway. Views to the east take in the elevated hills of the Sunny Corner State Forest and Wambool Nature Reserve. From this location, views are afforded to the Great Dividing Ranges to travellers heading east. Travellers heading toward Bathurst are afforded views of the Bathurst Plains to the south of the highway. Long-distance views are also afforded to Mount Panorama, recognised as a unique attraction to Bathurst.</p>		
Sensitivity	High	<p>Bathurst LEP identifies the open landscape directly southwest of this view as The Bathurst Plains (see Figure 2-4 in this report), typified by a treeless landscape and providing a contrast to the built-up areas of the urban environment. The recognition of the Bathurst Plains' landscape value as a natural gateway feature to Bathurst and the highway's role in facilitating views across them places particular importance on the Great Western Highway as being a recreational route for motorists. Therefore, the position of the viewer relative to the views, and the ability to experience the views are of particular importance. While road users would be afforded glimpse views across the landscape from moving vehicles the recognition of the area for its visual amenity increases the sensitivity of this visual receptor to high</p>

Assessment category	Rating	Comment
Magnitude	Low	<p>The existing highway is proposed to be widened to the east and west of this location and the junction with Ceramic Avenue reconfigured. The proposed highway improvement follows the existing route, widening the road to the north on embankment. The existing road dominates the foreground of the view at the intersection with Ceramic Avenue. The proposal would increase the area of road within the view and raise its vertical alignment, potentially increasing the range of long-distance, panoramic views.</p> <p>An area of existing scrub vegetation within private land along the northern side of the carriageway would require removal which would have a medium-term detrimental impact. Further consultation with stakeholders would be carried out to identify appropriate tree species and a planting strategy along this section of the highway. On reaching maturity in 15-20 years, the trees would provide a gateway feature along the highway.</p> <p>The magnitude of change at this location is assessed as low as whilst the change would be distinguishable, the composition and character, although altered, would be similar in nature to the pre-existing circumstance.</p>
Overall impact	Moderate	<p>This assessment reflects the high sensitivity of a transient viewer experiencing panoramic views on a recreational route combined with the low magnitude of change experienced as a result of the widening of an existing highway within an agricultural landscape. The overall impact is assessed as moderate.</p>

7.1.3 Viewpoint M3 – Great Western Highway at Raglan eastern edge

The visual impact of Viewpoint M3 Great Western Highway at Raglan eastern edge is summarised in Table 7-3.

Table 7-3 Visual assessment of Viewpoint M3 Great Western Highway at Raglan east edge


Assessment category	Rating	Comment
		
<p>Figure 7-4 Existing view from Viewpoint M3 Great Western Highway at Raglan eastern edge, looking south to west</p>		
<p>Viewpoint description: This viewpoint is located about 150m from the eastern edge of Raglan, within the northern road reserve of the Great Western Highway. This location affords open views west towards the township of Raglan and south towards the Bathurst Plains. Road users travelling west would experience their first views of the gateway poplar avenue at this point.</p>		

Assessment category	Rating	Comment
Sensitivity	High	Bathurst LEP identifies the open landscape directly southwest of this view as The Bathurst Plains (see Figure 2-4 in this report), typified by a treeless landscape and providing a contrast to the built-up areas of the urban environment. The recognition of the Bathurst Plains' landscape value as a natural gateway feature to Bathurst and the highway's role in facilitating views across them places particular importance on the Great Western Highway as being a recreational route for motorists. Therefore, the position of the viewer relative to the views, and the ability to experience the views are of particular importance. While road users would be afforded glimpse views across the landscape from moving vehicles the recognition of the area for its visual amenity increases the sensitivity of this visual receptor to high.
Magnitude	Moderate	<p>The highway would be widened and raised on embankment at this location. Changes in this view would include a loss of some minor vegetation in the road reserve and introduction of earthworks associated with drainage features to the north of the highway. The proposed road at this location would include two eastbound traffic lanes, one westbound traffic lane, and two westbound turning lanes (left and right).</p> <p>Land acquisition and earthworks at this location would require removal of existing established vegetation within land north of the road reserve. The visual character of the road would change at this location as the existing semi-rural two-lane road would be replaced by a wider urban highway. Avenue tree planting at this location would be subject to further consultation in order to preserve open views across the Bathurst Plains. Tree planting would require 15-20 years to reach maturity and their location. The identification of spacing between trees and species are important considerations.</p> <p>The magnitude of change at this location is assessed as moderate in recognition of the partial change in visual composition/ character of the road corridor resulting from the increase in width and vertical alignment of the highway and introduction of tree planting. This change whilst prominent would not be either visually discordant or substantially different in scale and character from the existing setting.</p>
Overall impact	High/ Moderate	This assessment reflects the high sensitivity of a transient viewer experiencing panoramic views on a recreational route combined with the moderate magnitude of change experienced as a result of the widening of an existing carriageway and enhanced urban character of the road within an agricultural landscape. The overall impact is assessed as high/ moderate.

7.1.4 Viewpoint M4 – PJ Moodie Memorial Drive

The visual impact of Viewpoint M4 PJ Moodie Memorial Drive is summarised in Table 7-4.

Table 7-4 Visual assessment of Viewpoint M4 PJ Moodie Memorial Drive


Assessment category	Rating	Comment
		
<p>Figure 7-5 Existing view from Viewpoint M4 PJ Moodie Memorial Drive, looking south to west towards the highway</p>		
<p>Viewpoint description: This viewpoint is located about 460m north of the proposal. PJ Moodie Memorial Drive is not a highway but is a recognised gateway into the City of Bathurst, linking Bathurst Airport to the Great Western Highway. The golden-leaved poplars are just visible along the highway against the darker backdrop of trees within Raglan township.</p>		
Sensitivity	High	<p>This viewpoint has been chosen for being representative of the first panoramic views across the landscape for visitors arriving from the airport. As a visual introduction to the region this view has particular importance - most notable is Mount Panorama, visible in the long-distance of the view. In closer proximity to the airport views are filtered or obstructed by infrastructure associated with the airport and air force training facility. While road users would be afforded glimpse views across the landscape from moving vehicles the recognition of the area for its visual amenity increases the sensitivity of this visual receptor to high.</p>
Magnitude	Negligible	<p>The visual changes brought about by the proposal visible from this location would include the removal of trees within the road reserve, most notably the poplar avenue north of the highway at Raglan. The avenue, whilst not being either dominant or the focus of the view does contribute to the visual character of Raglan and defines the highway corridor and the boundary between the rural, open fields and the urban township. The planting of new tree avenues would be subject to further consultation with stakeholders and would replace and reinforce this feature within the view in the medium-term (15-20 years). It should be noted that the changes in the view would be distant and would be afforded as glimpse views to road users of PJ Moodie Memorial Drive. Furthermore, gateway feature planting is also aligned along PJ Moodie Memorial Drive which would filter glimpse view by road users.</p> <p>The magnitude of change recognisable at this location is assessed as negligible in recognition of the distance over which the changes would be viewed. The change would likely be barely</p>

Assessment category	Rating	Comment
		distinguishable and the composition and character of the view would appear substantially unaltered from the pre-existing circumstance.
Overall Impact	Negligible	This assessment reflects the high sensitivity of a transient viewer experiencing panoramic views on a recreational route combined with the low magnitude of change experienced as a result of the distance over which the change would be viewed. The overall impact is assessed as negligible.

7.1.5 Viewpoint M5 – Great Western Highway: creek crossing

The visual impact of Viewpoint M5 Great Western Highway: creek crossing is summarised in Table 7-5.

Table 7-5 Visual assessment of Viewpoint M5 – Great Western Highway: creek crossing


Assessment category	Rating	Comment
		
<p>Figure 7-6 Existing view from Viewpoint M5 – Great Western Highway: creek crossing, looking east to south</p>		
<p>Viewpoint description: This viewpoint is located on the eastern outskirts of Kelso on approach to the Bathurst Sheds industrial estate. Filtered views are available of warehouses with longer views available towards Kelso and the wider landscape to the west. The view looks towards Raglan, which is obscured by landform and vegetation.</p>		
Sensitivity	Moderate	This view is of note due to exhibiting a differing visual quality and character to the rest of the highway within the study area. Long views are available to the east and west along the highway corridor however views are relatively contained to the north and south. Rising landform to the north forms the extent of the view, with the creek providing a modest landscape feature most notable for its associated mature trees directly adjacent to the highway. The vegetation continues to the south of the highway and is of a rougher, more natural form than the adjacent formal poplar avenue planting extending eastwards from the viewpoint (see Figure 7-6). The rough vegetation also serves a purpose in filtering views of industrial buildings to the south of the carriageway. The small-scale, contained character of this area and views of steeply rising landform are remarkable compared with the open panoramic views

Assessment category	Rating	Comment
		elsewhere along the route to/ from Bathurst. The mature poplar trees define the approach to the Bathurst Sheds, a number of warehouses south of the highway. The close alignment and vertical forms of the trees stand out within the natural landscape and provide a distinctive urban feature.
Magnitude	Moderate	<p>The highway corridor would be widened at this location, a shared-user path introduced and notable earthworks required due to the rising landform to the north. The creek culvert would be extended and the creek alignment altered to suit the widened highway. The mature vegetation associated with the creek would be removed and an appropriate riparian planting scheme introduced.</p> <p>The required earthworks would change the visual character by removing the existing vegetation and introducing steep cutting slopes to the north. The replacement of the existing poplars would be subject to further consultation with stakeholders and could serve to visually link with the existing native species visible within the wider landscape.</p> <p>The magnitude of change at this location is assessed as moderate in recognition of the close proximity of vegetation removal and landform modification to accommodate the rerouted creek and widened highway against the hillside. The proposal would result in changes to character and composition of the view and remove existing elements (trees and vegetation). There would be introduction of new features which, although uncharacteristic would not be visually discordant from the existing conditions.</p>
Overall impact	Moderate	This assessment reflects the moderate sensitivity of a transient viewer experiencing panoramic views on a recreational route combined with the moderate magnitude of change experienced as a result of the widening of an existing highway corridor through a small-scale landscape. The overall impact is assessed as moderate.

7.1.6 Viewpoint M6 – Great Western Highway: Kelso

The visual impact of Viewpoint M6 Great Western Highway: Kelso is summarised in Table 7-6.


Table 7-6 Visual assessment of Great Western Highway: Kelso

Assessment category	Rating	Comment
		
<p>Figure 7-7 Existing view from Viewpoint M6 Great Western Highway: Kelso, looking east</p>		
<p>Viewpoint description: This viewpoint is located near the western proposal extents, within the recently upgraded section of highway at Kelso. The view comprises a wide highway corridor, associated infrastructure and moving traffic which filters views of the countryside beyond.</p>		
Sensitivity	Low	<p>This viewpoint has been chosen as representative of the approach to Kelso and the merging of the proposal with the recently completed highway upgrade works at Kelso. This viewpoint exhibits the visual characteristics of a major highway corridor entering an urban area. The upgrade works at Kelso being recently completed are yet to mature and appear stark against the backdrop of the leafy suburb of Kelso on the horizon. Views from this location are urban in nature, comprising a wide highway corridor on approach to Kelso with commercial units, roundabouts, roads, streetlights and other associated highway infrastructure visible. Longer views are available across the agricultural landscape to the south and the formally landscaped grounds associated with the Gold Panner Motor Inn to the north. The rising ground to the north is populated by mature trees and close mown grass and serves as a buffer between the highway corridor and the adjacent Inn and Panorama Holiday Park.</p>
Magnitude	Low	<p>Visual changes arising from the proposal at this location include earthworks to the slope in the north road reserve; replacement of the crash barrier to the south; and construction of a new shared-user (pedestrian and cyclist) path to the north of the highway.</p> <p>Modifications to the road alignment at this location are minimal and are generally in keeping with completed upgrade works at Kelso to the west and would not constitute an overall change in visual character at this location.</p>
Overall impact	Low	<p>This assessment reflects the low sensitivity of a transient viewer entering/exiting an urban area combined with the low magnitude of change experienced as a result of minor changes within an existing highway corridor. The overall impact is assessed as low.</p>

7.1.7 Viewpoint L1 – Eugenie Street: North

The visual impact of Viewpoint L1 Eugenie Street: North is summarised in Table 7-7.

Table 7-7 Visual Assessment of Viewpoint L1 Eugenie Street: North, looking north


Assessment Category	Rating	Comment
		
<p>Figure 7-8 Existing view from Viewpoint L1 Eugenie Street: North, looking north towards the highway</p>		
<p>Viewpoint description: This viewpoint is located on a residential street adjoining farmland on the eastern edge of the township of Raglan about 110m south of the existing highway. The view looks north towards the existing highway.</p>		
Sensitivity	Moderate	<p>Bathurst VMP identifies the open landscape directly east of this view as The Bathurst Plains (see Figure 2-4 in this report), typified by a treeless landscape and providing a contrast to the built-up areas of the urban environment. The viewpoint affords views towards the highway across the Bathurst Plains which is identified as being particularly significant as a natural gateway feature to Bathurst. Its recognition of being of particular landscape value and important in terms of facilitating particular views places particular importance on this area. The view from Eugenie Street is semi-rural in character and comprises views of residential properties, the local road and informal roadside vegetation and views towards the highway filtered by landform, built form and vegetation. Views across the Bathurst Plains are available but limited by rising landform and therefore not characteristic of the panoramic views typically associated with the area. Mature trees associated with properties north of the highway form the backdrop to the view.</p>
Magnitude	Low	<p>The highway is located approximately 110m north of this viewpoint. The visible section of the highway would be widened and raised on embankment within views which would likely increase glimpse views of moving traffic. The highway is proposed to be widened to the north, away from the viewpoint therefore the increase in width would likely not be discernible from this location. Tree planting along the road corridor is subject to stakeholder consultation and would introduce a new feature within the view in the medium-term which is estimated as 15-20 years. Changes to the intersection of Eugenie Street and the highway are relatively minor however a single-lane turning area is proposed which would increase the area of highway, remove an area of the highway verge and intrude into the boundary of the Bathurst Plain designation. Use of the turning</p>

Assessment Category	Rating	Comment
		<p>area would also result in the introduction of new vehicle movements at the northern end of Eugenie Street and a minor change to the linear form of the street.</p> <p>Changes would be distinguishable from their surroundings, however due to the distance over which they would be seen, although altered, the composition and character of the view would remain similar to the existing circumstances.</p>
Overall impact	Moderate-Low	This assessment reflects the moderate sensitivity of a transient viewer within an urban/ semi-rural area combined with the low magnitude of change experienced as a result of the proposed introduction of new features characteristic of a highway corridor to an existing road. The overall impact is assessed as moderate-low.

7.1.8 Viewpoint L2 – Eugenie Street: South

The visual impact of Viewpoint L2 Eugenie Street: South is summarised in Table 7-8.

Table 7-8 Visual assessment of Viewpoint L2 Eugenie Street: South

Assessment Category	Rating	Comment
		
<p>Figure 7-9 Existing view from Viewpoint L2 Eugenie Street: South, looking north towards the highway</p>		
<p>Viewpoint description: This viewpoint is located on a residential street adjoining farmland on the eastern edge of the township of Raglan about 880m south of the highway. The view looks north towards the existing highway which is aligned along the near-horizon.</p>		
Sensitivity	Low	<p>This viewpoint looks toward the highway across the area designated as the Bathurst Plains, visible in the foreground and towards the Great Dividing Ranges in the background. The highway is aligned along the near horizon to the north east, before receding behind landform further east. Glimpse views of moving traffic and highway infrastructure are barely discernible from this distance. Views toward the highway to the west are heavily filtered by built form and vegetation within residential lots and the road reserve to the west along Eugenie Street. The large scale of this open landscape is considered capable of absorbing distant change.</p>

Assessment Category	Rating	Comment
Magnitude	Negligible	Very slight changes resulting from the proposal could be distinguishable from their surroundings from this elevated location. However due to the distance over which they would be seen, although altered, the composition and character of the view would be substantially unaltered from the pre-change circumstances.
Overall impact	Negligible	This assessment reflects the low sensitivity of a transient viewer within an urban/ semi-rural area combined with the low magnitude of change experienced as a result of the proposed introduction of new features characteristic of a highway corridor to an existing road viewed over distance. The overall impact is assessed as negligible.

7.1.9 Viewpoint L3 – BP Service Station

The visual impact of Viewpoint L3 BP Service Station is summarised in Table 7-9.

Table 7-9 Visual assessment of Viewpoint L3 BP Service Station

Assessment category	Rating	Comment
		

Figure 7-10 Existing view from Viewpoint L3 BP Service Station, looking west along the highway




Figure 7-11 Existing view from Viewpoint L3 BP Service Station, looking northeast across the highway

Assessment category	Rating	Comment
Viewpoint description: This viewpoint is located on southern reserve of the Great Western Highway looking north to east. The view comprises the service station, highway corridor, associated infrastructure, the poplar trees in the northern road reserve and moving traffic which combine to partially filter views north towards the countryside.		
Sensitivity	Low	From this viewpoint, long views are afforded across the rural landscape to the north, a recognised area of visual significance. A row of mature poplar trees run parallel to the northern side of the carriageway and reinforces the urban character of the highway corridor. The BP service station occupies a prominent position at the roadside with an adjacent hard surfaced area that functions as a truck stop. Both land uses are surrounded by open grassland. Views include moving highway traffic, service station signage and highway infrastructure. The open character of the view is reasonably tolerant of change with generally substitutable features.
Magnitude	Moderate	<p>The visual changes brought about by the proposal at this location would include the widening (north) of the highway and removal of the mature poplar trees north of the highway. The vertical alignment of the road would remain as existing. The existing trees contribute to the visual character at this location and their removal would be notable within the view. The planting of new trees in this location would be subject to stakeholder consultation and their presence within the view would replace and reinforce this landscape feature in the medium-term which is estimated as 15-20 years.</p> <p>Whilst proposed changes, such as the tree removal would be prominent, the scale and character of the road corridor would not be substantially different from the existing composition. The view would be changed through the introduction of new features such as the central median and new tree planting which are considered not to be visually discordant within the view.</p>
Overall impact	Moderate-Low	This assessment reflects the low sensitivity of a transient viewer on an existing highway within an urban/ semi-rural area combined with the moderate magnitude of change experienced as a result of the proposed introduction of new features characteristic of a highway corridor to an existing road.

7.1.10 Viewpoint L4 - Adrienne Street

The visual impact of Viewpoint L4 Adrienne Street is summarised in Table 7-10.


Table 7-10 Visual assessment of Viewpoint L4 Adrienne Street

Assessment category	Rating	Comment
		
<p>Figure 7-12 Existing view from Viewpoint L4 Adrienne Street, looking north towards the highway</p>		
<p>Viewpoint description: This viewpoint is located in the industrial/ commercial district of Raglan. The view looks across a vacant development plot from the estate access road.</p>		
Sensitivity	Low	<p>This view is afforded through a gap between two warehouses and looks across the rural landscape to the north, a recognised area of visual significance. Across the brow of the hill on the skyline, the mature Poplar tree avenue to the northern side of the highway is partially visible. A short section of the highway carriageway is visible to the right of the view before being screened by vegetation within Lavis Park.</p> <p>The partial and open character of the view is considered tolerant of change at this distance with generally substitutable features. It should be noted that the foreground of this view is a development plot whose development would likely heavily filter/ obscure this view.</p>
Magnitude	Low	<p>The limited existing view of the highway due to intervening landform, built form and vegetation would limit the scale of visible change from this viewpoint. The proposal would remove the poplar trees which are partially visible against the skyline. The loss of the trees would likely be discernible from this location but will not alter the overall nature of the view and the composition and character of the changed surroundings would be similar in nature to the existing character.</p>
Overall impact	Low	<p>This assessment reflects the low sensitivity of a partial view seen over distance within an urban/ semi-rural area combined with the low magnitude of change experienced to an existing road as a result of the loss/ introduction of new features characteristic of a highway corridor. The overall impact is assessed as low.</p>

7.1.11 Viewpoint P1 – Elmo Lavis Park

The visual impact of Viewpoint P1 Elmo Lavis Park is summarised in Table 7-11.

Table 7-11 Visual assessment for Viewpoint P1 Elmo Lavis Park


Assessment category	Rating	Comment
		
<p>Figure 7-13 Existing view from Viewpoint P1 Elmo Lavis Park, looking north towards the highway</p>		
<p>Viewpoint description: This viewpoint is located on a footpath within public open space at Elmo Lavis Park, south of the Great Western Highway. The view looks west to northeast and comprises rising topography, landscaped grass areas and mature trees. The lower elevation of the viewpoint to the road filters views of the road and moving traffic with additional screening provided by intervening trees.</p>		
Sensitivity	High	<p>The park comprises open grassland, formal paths and mature trees. The scale of the open space and the views available from it are appealing and are a contrast to the closely developed properties in Raglan on the opposite side of Napoleon Street. Views north towards the Great Western Highway from this location are filtered by rising landform and mature trees. Moving traffic on the highway is visible from this location and the fastigiate tree forms of the poplar avenue are visible on the horizon.</p> <p>This open, grassy recreational area is afforded filtered views north towards the highway whose presence is notable and forms the backdrop of the view. The park exhibits an urban fringe character, being bordered by two roads with views of adjacent housing. Longer views are available south and west from this elevated position and the park has an attractive quality.</p>
Magnitude	Low	<p>The viewpoint is located on a footpath within the park some distance from the highway and at a lower elevation than the road. The highway is proposed to be shifted northwards and the vertical alignment raised within the view which would likely not be discernible from this location although views of moving traffic may become increasingly filtered by distance and the lower elevation of the viewpoint. The existing mature poplar trees visible along the northern side of the carriageway would be removed. Avenue tree planting in this location would be subject to further consultation with stakeholders and on reaching maturity (estimated at 15-20 years) would replace, extend and enhance the gateway tree planting as a feature along the highway which would be visible along the skyline from the parkland. Additional tree planting is also proposed within the parkland to act as a buffer to the widened highway and on reaching maturity would further filter views towards the highway.</p>

Assessment category	Rating	Comment
		The proposed changes would not alter the overall nature of the view and the composition and character of the changed surroundings would be similar in nature to the existing conditions.
Overall impact	Moderate	This assessment reflects the moderate sensitivity of a view from a recreational area seen over distance within an urban environment combined with the low magnitude of change experienced to an existing road as a result of the loss/ introduction of new features characteristic of a highway corridor. The overall impact is assessed as moderate.

7.1.12 Viewpoint P2 – Ralph Cameron Park

The visual impact of Viewpoint P2 Ralph Cameron Park is summarised in Table 7-12.

Table 7-12 Visual assessment of Viewpoint P2 Ralph Cameron Park looking north west to east

Assessment category	Rating	Comment
		
<p>Figure 7-14 Existing view from Viewpoint P2 Ralph Cameron Park, looking north towards the highway</p>		
<p>Viewpoint description: This viewpoint is located within public open space adjacent to the public rest rooms and sports changerooms. The existing highway is located about 480m north of the viewpoint. Views from this location are available towards the recognised significant landscapes of the Bathurst Plains and the Great Dividing Ranges.</p>		
Sensitivity	High	Views towards the Great Western Highway from this location are largely screened or filtered by topography or existing vegetation. The highway is approximately 480m north of this viewpoint. Glimpse views of traffic and a small section of the existing highway are visible to the east, but these are largely filtered by roadside vegetation within Eugenie Street. This open, grassy recreational area is afforded medium-long views northeast, east and southeast to the recognised significant landscapes of the Bathurst Plains and the Great Dividing Ranges. Panoramic views are considered characteristic from this location and are intrinsic to its appeal as a recreational space.
Magnitude	Negligible	The existing highway is not a prominent feature within the view and views towards it are heavily filtered by intervening landform, built form and vegetation. A small section of the highway is visible to the east, but this is largely filtered by roadside vegetation along Eugenie Street. Avenue tree planting would be subject to further consultation with stakeholders and on reaching maturity (estimated

Assessment category	Rating	Comment
		<p>at 15-20 years) would provide a highway feature which would likely be partially visible along the skyline from the parkland.</p> <p>The proposed changes are anticipated to be barely distinguishable from the surroundings and the character and composition of the view are likely to be substantially unaltered from this location.</p> <p>The proposed changes would not alter the overall nature of the view and the composition and character of the changed surroundings would be similar in nature to the pre-change circumstances.</p>
Overall impact	Negligible	<p>This assessment reflects the high sensitivity of a view from a recreational area seen over distance within an urban environment combined with the low magnitude of change experienced to an existing road as a result of the loss/ introduction of new features characteristic of a highway corridor. The overall impact is assessed as negligible.</p>

8. Summary of landscape and visual impacts

Table 8-1 summarises the potential impacts to landscape character within the study area as a result of the proposal.

Table 8-1 Landscape character impact ratings

Landscape receptor	Sensitivity of receptor	Magnitude of change	Impact
LCZ1: Townships	High	Moderate	Moderate/ High
LCZ2: Cleared Farmland	Moderate	Moderate	Moderate
LCZ3: Bathurst Airport	Low	Low	Low

Table 8-2 summarises the potential impacts to visual amenity within the study area as a result of the proposal.

Table 8-2 Visual impact ratings

Visual receptor	Sensitivity of receptor	Magnitude of change	Impact
VP M1: Great Western Highway – East	High	Negligible	Negligible
VP M2: Ceramic Avenue/ Great Western Highway	High	Low	Moderate
VP M3: Great Western Highway at Raglan eastern edge	High	Moderate	High/ Moderate
VP M4: PJ Moodie Memorial Drive	High	Low	Moderate
VP M5: Great Western Highway – Creek Crossing	Moderate	High	High/ Moderate
VP M6: Great Western Highway – Kelso	Low	Low	Low
VP L1: Eugenie Street - North	Moderate	Low	Moderate/ Low
VP L2: Eugenie Street - South	Low	Negligible	Negligible
VP L3: BP Service Station	Low	Moderate	Moderate/ Low
VP L4: Adrienne Street	Low	Low	Low
VP P1: Elmo Lavis Park	High	Low	Moderate
VP P2: Ralph Cameron Park	High	Negligible	Negligible

9. Landscape character and visual impact mitigation strategy

The design response to the urban design report and landscape character and visual impact assessment has been to integrate the following measures into the design:

- Reference to the gateway vegetation strategy executed in Kelso, throughout Raglan to Kelso
- Use of robust and durable plant species to minimise ongoing maintenance inputs and provide for the successful establishment of landscaped areas
- Creation of robust landscape solutions with consideration for the impacts of temperature change including; alternate rainfall cycles, increased wind speeds and cloudburst storm events in response to the impacts of global warming
- Cost-effective landscape and urban design strategies that are both feasible for implementation and manageable for safe ongoing maintenance
- Seeding of native and lawn grass species by hydromulching or other means that will promote a successful strike, these works should also be implemented with consideration for seasonal rainfall in order to attain successful germination and establishment
- Use of turf for areas that require immediate effect, if required, in specific zones
- Planting can be undertaken as individual specimen plantings such as street tree and broad-scale tree planting or as garden beds consisting of a prepared mulched bed and the mass planting of shrub and grass species
- Rehabilitation and enhancement of ecological values along drainage swales and creek lines
- Compliance with the OLS for maximum growth heights of trees and introduction of built elements such as lighting columns
- Consideration of context, views to the landscape beyond, privacy and amenity of nearby residents and the experience and safety of drivers, cyclists and pedestrians.

The proposed safeguards and management measures are as follows:

- An Urban Design and Landscape Plan (UDLP) will be prepared to support the final detailed design. The Urban Design Plan will present an integrated urban design for the project, providing practical detail on the application of design principles and objectives identified in the environmental assessment. The Plan will include design treatments for:
 - Location and identification of existing vegetation and proposed landscaped areas, including species to be used
 - Pedestrian and cyclist elements including footpath location, paving types and pedestrian crossings
 - Fixtures such as seating, lighting, fencing and signs
 - Details of the staging of landscape works taking account of related environmental controls such as erosion and sediment controls and drainage
 - Procedures for monitoring and maintaining landscaped or rehabilitated areas.
- The Urban Design Plan will be prepared in accordance with relevant guidelines, including:
 - Beyond the Pavement urban design policy, process and principles (Roads and Maritime, 2014)
 - Landscape Guideline (Roads and Maritime, 2018)

- Bathurst VMP, Bathurst RVMP and Bathurst Regional Council Roadside Vegetation Management Guidelines (2007).
- The UDLP will be prepared in consultation with Bathurst Regional Council and Bathurst Regional Airport
- Before finalising the UDLP, the landscape design principles and streetscape (planting) will be reviewed to ensure that they are consistent with the outcomes of the biodiversity assessment and the requirement of the Bathurst VMP and RVMP. This will be done in consultation with Bathurst Regional Council
- Where feasible and reasonable:
 - Street trees will be retained
 - New street trees will be planted in accordance with the Bathurst RVMP and VMP
 - To avoid breaching the OLS, news plantings around end of airport exclusion will have a maximum growth height to maintain OLS clearances
 - Poplar trees would be replaced once there are no longer any construction impacts, dependent on season and the availability of water.
- Temporary lighting will be located and designed to avoid light spill into residential properties and identified sensitive receptors.
- Any trees that are not directly impacted (cleared) during construction and which are proposed to be retained will be assessed by an arborist to determine if the proposal may cause potential indirect impacts on tree health and longevity
- Project work sites, including construction areas and supporting facilities (such as storage compounds and offices) will be managed to minimise visual impacts, including appropriate storage of equipment, parking, stockpile screening and arrangements for the storage and removal of rubbish and waste materials
- Compound and ancillary facilities will be decommissioned and the sites rehabilitated to their existing condition or as otherwise agreed with the landowner on completion of works.

10. Conclusion

The majority of the Great Western Highway through the study area is aligned through a local valley defined by low ridges to the north and south. The valley landform assists in containing views within a narrow corridor of landform, self-contained from the broader region. Furthermore, sections of the route are afforded long range views from which road users are able to interpret the broader landscape character of the region. The main landscape and visual impacts arising from the proposal would be:

- Reinforcement of the character of an urban highway within the area. Currently the road corridor exhibits a semi-rural character defined by the lack of kerbs, painted median, open views across agricultural fields and frequent direct access from residential properties fronting onto the carriageway. The proposal would raise the vertical alignment of the road, introduce sections of raised central median, additional signage, traffic signals, upgrades to residential property access and a pedestrian/ cyclist share path the length of the highway
- The removal of the existing mature trees within the road reserve which form an important gateway feature to the region. The poplar trees are visually distinctive, being non-native and different in form to native species visible along the highway. The existing avenues are incomplete, aligned along either side of the carriageway and are occasionally on both sides, where they most notably contribute to and visually enhance the highway corridor. The Bathurst VMP recognises the existing tree avenues as being of a low conservation value area however their longevity is in decline and a Tree Risk Assessment commissioned by Bathurst City Council and dated September 2018 identifies four trees for urgent removal and a further 28 trees required to be tested and most likely removed. Due to their advancing age the further depletion in numbers of the poplars is anticipated and their replacement as part of the proposal would be of benefit.
- The introduction of intermittent avenues of formal tree planting at key locations along the highway would be subject to stakeholder consultation and would reinforce and enhance the character of the highway on the approach to Bathurst. The planting of new trees would mitigate the removal of the existing trees along the highway and create a cohesive character with adjacent sections of recently completed road upgrades at Kelso. It should be noted that the proposed tree planting would require 15-20 years to establish and positively contribute to the aesthetics of the highway corridor. Species selection and tree location that considers important views across the wider landscape are important considerations.

While the proposal does include direct frontage to dwellings and public open space within the township of Raglan, the addition of a shared pedestrian/ cyclist path between this frontage and the upgraded highway would provide a greater separation distance between these sensitive land uses and the highway traffic. Further opportunities arise from the acquisition of land to the north of the highway to act as a landscape buffer and location for planting between the highway and property boundaries.

In the context of a journey, the proposal would create a landscape and visual consistency with the scale and character of recently completed western sections of the highway upgrade works at Kelso.

While the study area would experience varying landscape and visual impacts as a result of the proposal it is considered that the presence of the existing highway both reduces and limits the overall impact of the change upon receptors. The initial detrimental effects of the proposal are considered, although prominent and featuring both the removal of existing elements (trees) and introduction of new physical elements (wider carriageway, lighting, signage, traffic signals) to not be visually discordant with the pre-change circumstances. The change resulting from the proposal would be similar in scale and character to the existing highway and following the establishment of the associated landscape improvement works the proposed upgrade would reinforce and enhance this section of highway as the gateway to Bathurst.

Appendix A. Methodology

The methodology adopted for this report is guided by policy and guidelines outlined in Beyond the Pavement (Roads and Maritime, 2014) and is in accordance with Environmental impact assessment practice note: Guideline for landscape character and visual impact assessment (LCVIA Guideline) (Roads and Maritime, 2018).

The methodology for the LCVIA component of the report includes the following steps:

- Describe the proposed works
- Describe the subject site and surrounding area
- Describe the planning instruments that are relevant to both visual and character impact and that apply to the subject site and the surrounding area
- Describe the landscape character of the study area
- Assess the character impact of the proposed development
- Describe the visual context of the study area
- Assess the visual impact of the proposed development from publicly accessible locations
- Describe proposed mitigation measures
- Conclusion.

To quantify the likely impacts it is important to assess both sensitivity of the receiving landscape and view and the magnitude of the proposal upon it. The Roads and Maritime LCVIA Guideline provides the following definitions:

- **Sensitivity:** Sensitivity refers to the qualities of an area, the number and type of receivers and how sensitive the existing character of the setting is to the proposed nature of change. For example, a pristine natural environment is likely to be more sensitive to a change of the nature of a four-lane motorway than a built-up industrial area
- **Magnitude:** Magnitude refers to the physical scale of the proposal, how distant it is and the contrast it presents to the existing condition. For example, a large interchange would have a very different impact on landscape character than a localised road widening in the same area.

Table A-1 summarises the assessment of sensitivity and magnitude and combines them to provide an overall impact assessment.

Table A-1 Landscape character and visual impact rating matrix (Roads and Maritime, 2018)

Sensitivity	Magnitude				
		High	Moderate	Low	Negligible
High	High	Moderate / High	Moderate	Negligible	
Moderate	Moderate / High	Moderate	Moderate / Low	Negligible	
Low	Moderate	Moderate / Low	Low	Negligible	
Negligible	Negligible	Negligible	Negligible	Negligible	

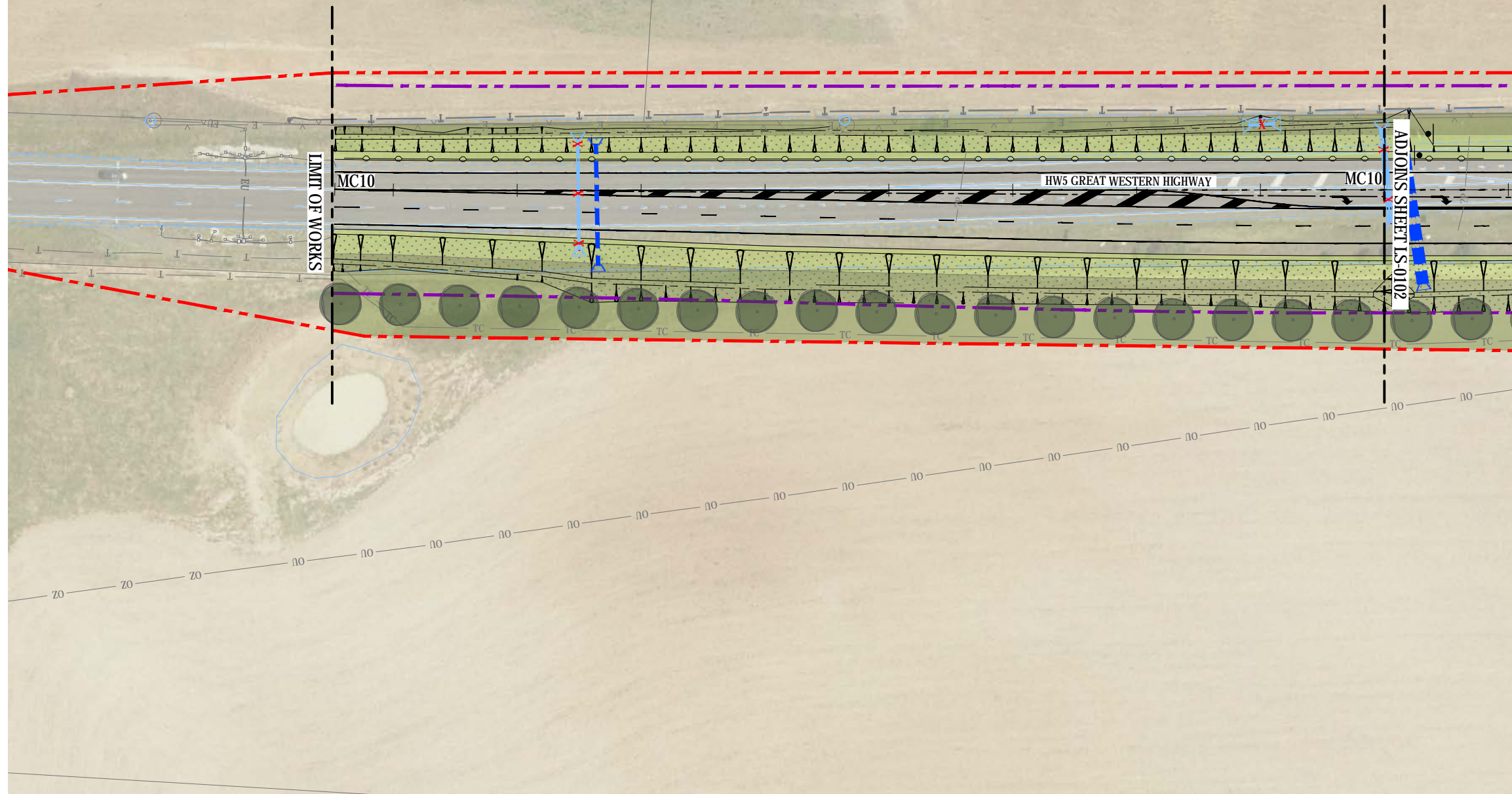
Appendix B. Urban Design and Landscape Plans (Sheets 1-16)



FROM LITHGOW

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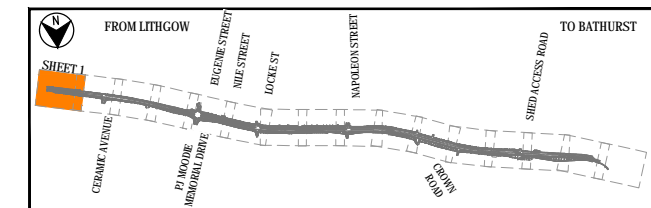


LEGEND

- GENERAL: SURVEY, DIGITAL CADASTRE, PROPOSED BOUNDARY, CLEAR ZONE BOUNDARY, PROPOSED STEEL RAIL SAFETY BARRIER, PROPOSED CYCLIST SAFETY FENCE, PROPOSED WIRE ROPE 4 ROPE (WRSB), OBSTACLE LIMITATION SURFACE (750)
ROAD FURNITURE: SHARED PATH, DRIVEWAY, RAISED MEDIAN, EXISTING STREET LIGHT / POLES, EXISTING/PROPOSED SIGN POST
LANDSCAPE TREATMENTS: GRASS TYPE 1 - 'LAWN' SPECIES MIX, GRASS TYPE 2 - NATIVE GRASSLAND MIX, CREEK RESTORATION & REVEGETATION, EXTENT OF SWALE, ROCK LINED CHANNEL, CONCRETE CHANNEL
PLANTING: GATEWAY BOULEVARD TREE > 5m HEIGHT (EXOTIC), GATEWAY TREE PLANTING < 5m HEIGHT (EXOTIC), TREE PLANTING (SPECIMEN) NATIVE SPECIES, TREE PLANTING (CLUSTERS) NATIVE SPECIES, EXISTING VEGETATION TO BE REMOVED
DRAINAGE DESIGN (REFERENCE ONLY): NEW DRAINAGE PIPE / PIT / HEADWALL, EXISTING DRAINAGE PIPE / PIT / HEADWALL, EXISTING TO BE REMOVED/ABANDONED
ULTIMATE UTILITY LOCATION (REFERENCE ONLY): OVERHEAD ELECTRICAL, ELECTRICAL - UNDERGROUND, COMMUNICATIONS (TELEPHONE LINE), COMMUNICATIONS (TELEPHONE LINE), COMMUNICATIONS (TELEPHONE DIGITISED), COMMUNICATIONS (OPTIC FIBRE), WATER MAIN, WATER MAIN - DIGITISED, WATER HOUSE CONNECTION, GAS - HIGH PRESSURE, STREET LIGHTING

NOTES

- 1. ALL EXISTING TREES WITHIN THE PROPOSED ROAD BOUNDARY ARE TO BE REMOVED.
2. FOR GENERAL NOTES REFER SHEET GE-0032.



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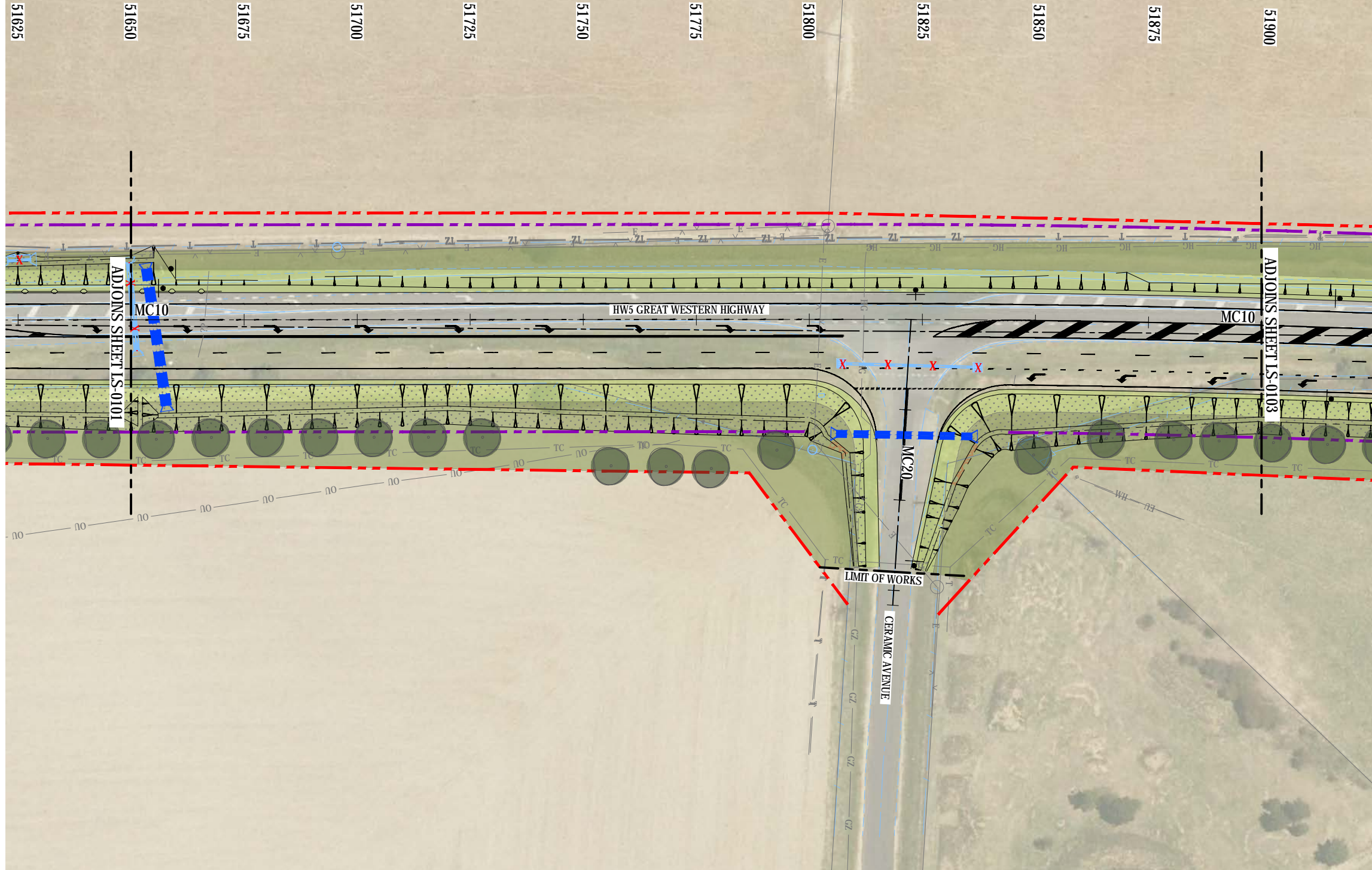
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FROM LITHGOW

TO BATHURST

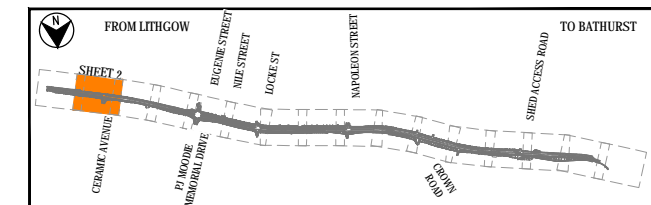


LEGEND

- GENERAL**
- SURVEY
 - DIGITAL CADASTRE
 - PROPOSED BOUNDARY
 - CLEAR ZONE BOUNDARY
 - PROPOSED STEEL RAIL SAFETY BARRIER
 - PROPOSED CYCLIST SAFETY FENCE
 - PROPOSED WIRE ROPE 4 ROPE (WRSB)
 - 750 OBSTACLE LIMITATION SURFACE
- ROAD FURNITURE**
- SHARED PATH
 - DRIVEWAY
 - RAISED MEDIAN
 - EXISTING STREET LIGHT / POLES
 - EXISTING/PROPOSED SIGN POST
- LANDSCAPE TREATMENTS**
- GRASS TYPE 1 - 'LAWN' SPECIES MIX
 - GRASS TYPE 2 - NATIVE GRASSLAND MIX
 - CREEK RESTORATION & REVEGETATION
 - EXTENT OF SWALE
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 - CONCRETE CHANNEL
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 - TREE PLANTING (SPECIMEN) NATIVE SPECIES
 - TREE PLANTING (CLUSTERS) NATIVE SPECIES
 - EXISTING VEGETATION TO BE REMOVED
- DRAINAGE DESIGN (REFERENCE ONLY)**
- NEW DRAINAGE PIPE / PIT / HEADWALL
 - EXISTING DRAINAGE PIPE / PIT / HEADWALL
 - EXISTING TO BE REMOVED/ABANDONED
- ULTIMATE UTILITY LOCATION (REFERENCE ONLY)**
- OVERHEAD ELECTRICAL
 - ELECTRICAL - UNDERGROUND
 - COMMUNICATIONS (TELEPHONE LINE)
 - COMMUNICATIONS (TELEPHONE LINE)
 - COMMUNICATIONS (TELEPHONE DIGITISED)
 - COMMUNICATIONS (OPTIC FIBRE)
 - WATER MAIN
 - WATER MAIN - DIGITISED
 - WATER HOUSE CONNECTION
 - GAS - HIGH PRESSURE
 - STREET LIGHTING

NOTES

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- FOR GENERAL NOTES REFER SHEET GE-0032.



KEY PLAN NTS

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FROM LITHGOW

TO BATHURST



LEGEND

GENERAL

- SURVEY
- DIGITAL CADASTRE
- PROPOSED BOUNDARY
- CLEAR ZONE BOUNDARY
- PROPOSED STEEL RAIL SAFETY BARRIER
- PROPOSED CYCLIST SAFETY FENCE
- PROPOSED WIRE ROPE 4 ROPE (WRSB)
- 750 OBSTACLE LIMITATION SURFACE

ROAD FURNITURE

- SHARED PATH
- DRIVEWAY
- RAISED MEDIAN
- EXISTING STREET LIGHT / POLES
- EXISTING/PROPOSED SIGN POST

LANDSCAPE TREATMENTS

- GRASS TYPE 1 - 'LAWN' SPECIES MIX
- GRASS TYPE 2 - NATIVE GRASSLAND MIX
- CREEK RESTORATION & REVEGETATION
- EXTENT OF SWALE
- ROCK LINED CHANNEL
- CONCRETE CHANNEL

PLANTING

- GATEWAY BOULEVARD TREE > 5m HEIGHT (EXOTIC)
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- TREE PLANTING (SPECIMEN) NATIVE SPECIES
- TREE PLANTING (CLUSTERS) NATIVE SPECIES
- EXISTING VEGETATION TO BE REMOVED

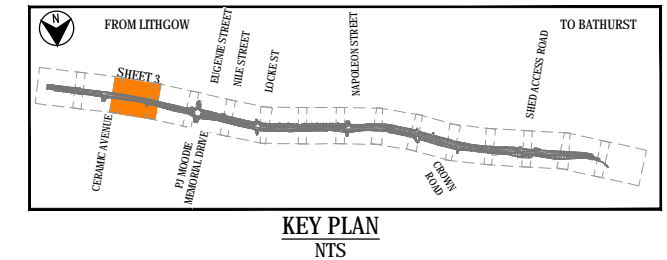
DRAINAGE DESIGN (REFERENCE ONLY)

- NEW DRAINAGE PIPE / PIT / HEADWALL
- EXISTING DRAINAGE PIPE / PIT / HEADWALL
- EXISTING TO BE REMOVED/ABANDONED

ULTIMATE UTILITY LOCATION (REFERENCE ONLY)

- OVERHEAD ELECTRICAL
- ELECTRICAL - UNDERGROUND
- COMMUNICATIONS (TELEPHONE LINE)
- COMMUNICATIONS (TELEPHONE LINE)
- COMMUNICATIONS (TELEPHONE DIGITISED)
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- WATER MAIN - DIGITISED
- WATER HOUSE CONNECTION
- GAS - HIGH PRESSURE
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- NOTES**
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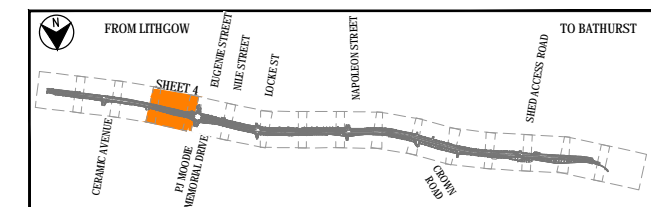


LEGEND

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- SURVEY
 - DIGITAL CADASTRE
 - PROPOSED BOUNDARY
 - CLEAR ZONE BOUNDARY
 - PROPOSED STEEL RAIL SAFETY BARRIER
 - PROPOSED CYCLIST SAFETY FENCE
 - PROPOSED WIRE ROPE 4 ROPE (WRSB)
 - 750 OBSTACLE LIMITATION SURFACE
- ROAD FURNITURE**
- SHARED PATH
 - DRIVEWAY
 - RAISED MEDIAN
 - EXISTING STREET LIGHT / POLES
 - EXISTING/PROPOSED SIGN POST
- LANDSCAPE TREATMENTS**
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- OVERHEAD ELECTRICAL
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NOTES

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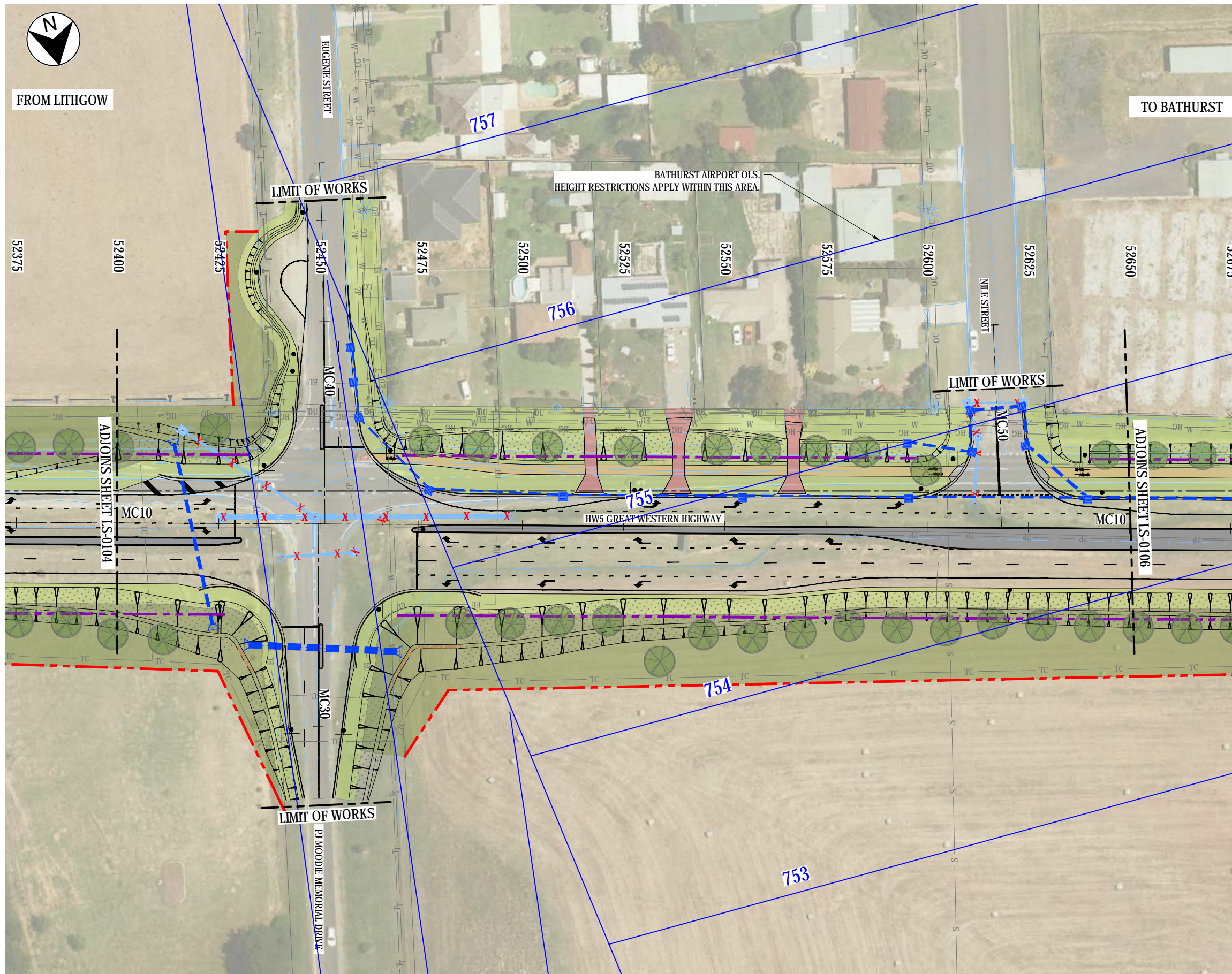
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		1	06.09.19	ISSUED FOR 85% CONCEPT DESIGN	J.CONSTANTINOS			177 Pacific Highway NORTH SYDNEY, NSW 2060 AUSTRALIA Tel: (02) 9928 2100 Fax: (02) 9928 2500 Web: www.jacobs.com		DRG CHECK	S.GALLOWAY	22.11.19	EDMS No.		
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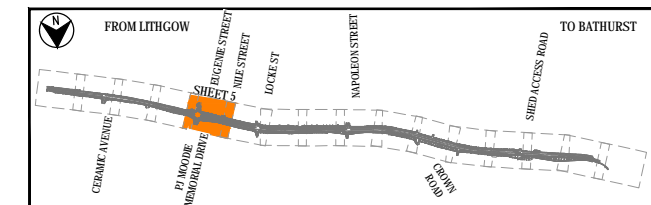


LEGEND

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 - COMMUNICATIONS (TELEPHONE LINE)
 - COMMUNICATIONS (TELEPHONE DIGITISED)
 - COMMUNICATIONS (OPTIC FIBRE)
 - WATER MAIN
 - WATER MAIN - DIGITISED
 - WATER HOUSE CONNECTION
 - GAS - HIGH PRESSURE
 - STREET LIGHTING

NOTES

- ALL EXISTING TREES WITHIN THE PROPOSED ROAD BOUNDARY ARE TO BE REMOVED.
- FOR GENERAL NOTES REFER SHEET GE-0032.



KEY PLAN NTS

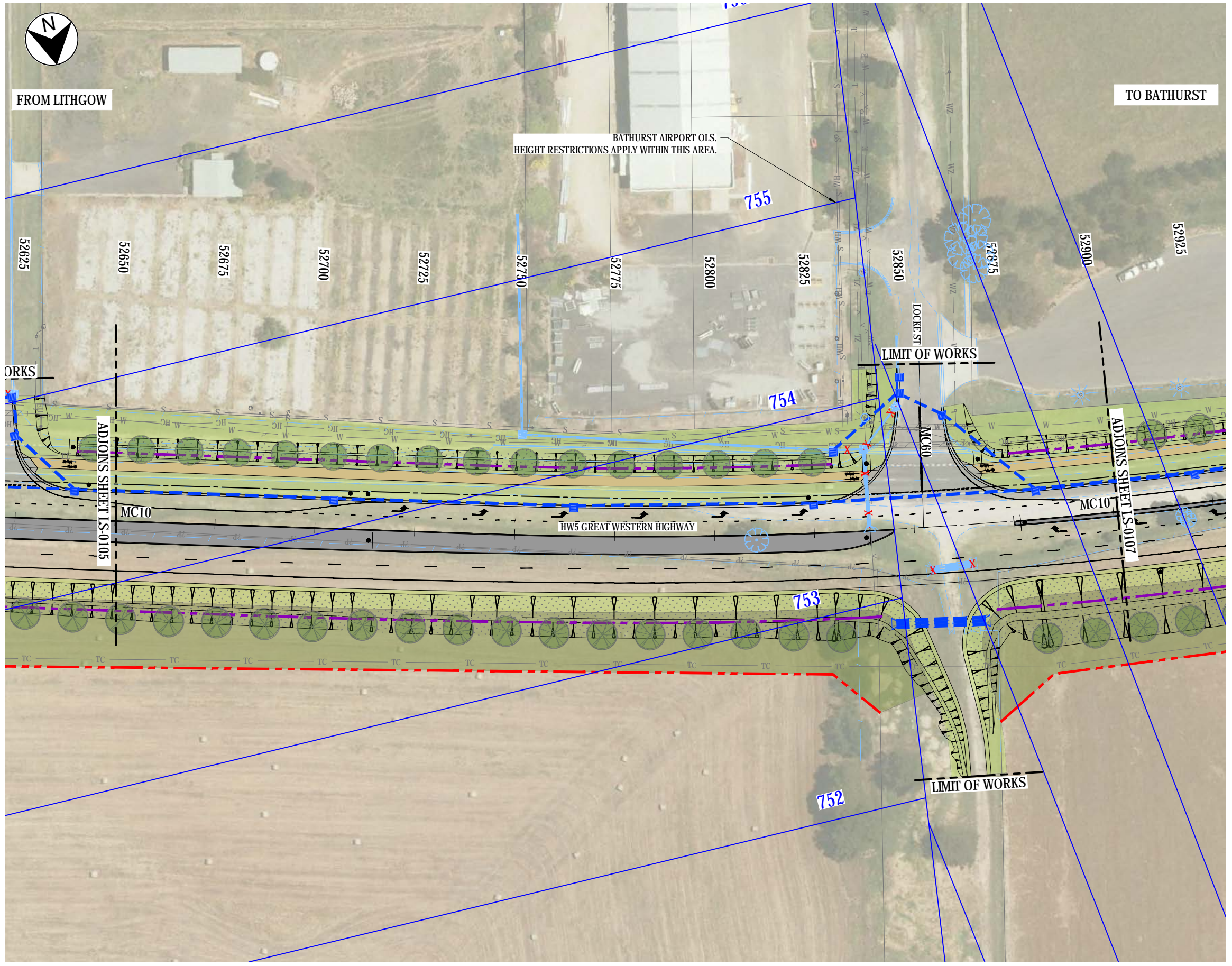
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		1	06.09.19	ISSUED FOR 85% CONCEPT DESIGN		J.CONSTANTINOS		177 Pacific Highway NORTH SYDNEY, NSW 2060 AUSTRALIA Tel: (02) 9928 2100 Fax: (02) 9928 2500 Web: www.jacobs.com		DRG CHECK		S.GALLOWAY		22.11.19	
		2	22.11.19	ISSUED FOR 80% DETAILED DESIGN		T.BARRAND		SCALE 1:1000		DESIGN CHECK		M.THORNTON		22.11.19	
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								HEIGHT DATUM AHD		PREPARED FOR		REGIONAL MAINTENANCE DISTRICT WORKS CENTRAL WEST		RMS REGISTRATION No. DS2019/000516	
										ISSUE STATUS 80% DETAILED DESIGN		EDMS No.		SHEET No. LS-0105	
														PART LS	
														REV 2	

A3

SHEET 5 OF 16



LEGEND

GENERAL

- SURVEY
- DIGITAL CADASTRE
- PROPOSED BOUNDARY
- CLEAR ZONE BOUNDARY
- PROPOSED STEEL RAIL SAFETY BARRIER
- PROPOSED CYCLIST SAFETY FENCE
- PROPOSED WIRE ROPE 4 ROPE (WRSB)
- 750 OBSTACLE LIMITATION SURFACE

ROAD FURNITURE

- SHARED PATH
- DRIVEWAY
- RAISED MEDIAN
- EXISTING STREET LIGHT / POLES
- EXISTING/PROPOSED SIGN POST

LANDSCAPE TREATMENTS

- GRASS TYPE 1 - 'LAWN' SPECIES MIX
- GRASS TYPE 2 - NATIVE GRASSLAND MIX
- CREEK RESTORATION & REVEGETATION
- EXTENT OF SWALE
- ROCK LINED CHANNEL
- CONCRETE CHANNEL

PLANTING

- GATEWAY BOULEVARD TREE > 5m HEIGHT (EXOTIC)
- GATEWAY TREE PLANTING < 5m HEIGHT (EXOTIC)
- TREE PLANTING (SPECIMEN) NATIVE SPECIES
- TREE PLANTING (CLUSTERS) NATIVE SPECIES
- EXISTING VEGETATION TO BE REMOVED

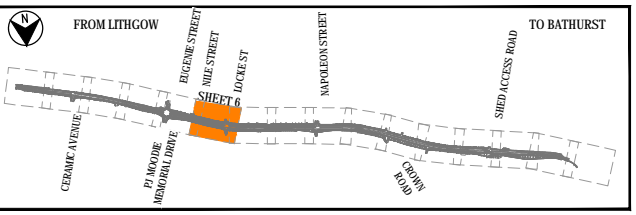
DRAINAGE DESIGN (REFERENCE ONLY)

- NEW DRAINAGE PIPE / PIT / HEADWALL
- EXISTING DRAINAGE PIPE / PIT / HEADWALL
- EXISTING TO BE REMOVED/ABANDONED

ULTIMATE UTILITY LOCATION (REFERENCE ONLY)

- OVERHEAD ELECTRICAL
- ELECTRICAL - UNDERGROUND
- COMMUNICATIONS (TELEPHONE LINE)
- COMMUNICATIONS (TELEPHONE LINE)
- COMMUNICATIONS (TELEPHONE DIGITISED)
- COMMUNICATIONS (OPTIC FIBRE)
- WATER MAIN
- WATER MAIN - DIGITISED
- WATER HOUSE CONNECTION
- GAS - HIGH PRESSURE
- STREET LIGHTING

- NOTES**
- ALL EXISTING TREES WITHIN THE PROPOSED ROAD BOUNDARY ARE TO BE REMOVED.
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NOT FOR CONSTRUCTION

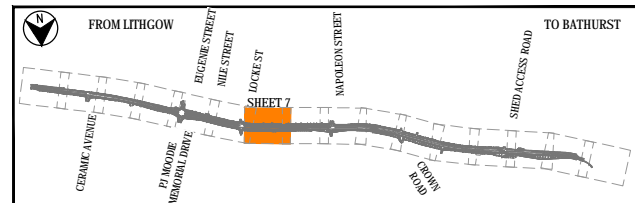
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REV 0 12.06.19 ISSUED FOR 80% CONCEPT DESIGN			J.CONSTANTINOS			 177 Pacific Highway NORTH SYDNEY, NSW 2060 AUSTRALIA Tel: (02) 9928 2100 Fax: (02) 9928 2500 Web: www.jacobs.com			DRAWN			E.HUANG			22.11.19			ISSUE STATUS			EDMS No.			REV		
REV 1 06.09.19 ISSUED FOR 85% CONCEPT DESIGN			J.CONSTANTINOS						DRG CHECK			S.GALLOWAY			22.11.19			80% DETAILED DESIGN			2					
REV 2 22.11.19 ISSUED FOR 80% DETAILED DESIGN			T.BARRAND						DESIGN CHECK			M.THORNTON			22.11.19											
						SCALE 1:1000			CO-ORDINATE SYSTEM			HEIGHT DATUM														
						MGA ZONE 55						AHD														



- ### LEGEND
- GENERAL**
- SURVEY
 - DIGITAL CADASTRE
 - PROPOSED BOUNDARY
 - CLEAR ZONE BOUNDARY
 - PROPOSED STEEL RAIL SAFETY BARRIER
 - PROPOSED CYCLIST SAFETY FENCE
 - PROPOSED WIRE ROPE 4 ROPE (WRSB)
 - 750
 - OBSTACLE LIMITATION SURFACE
- ROAD FURNITURE**
- SHARED PATH
 - DRIVEWAY
 - RAISED MEDIAN
 - EXISTING STREET LIGHT / POLES
 - EXISTING/PROPOSED SIGN POST
- LANDSCAPE TREATMENTS**
- GRASS TYPE 1 - 'LAWN' SPECIES MIX
 - GRASS TYPE 2 - NATIVE GRASSLAND MIX
 - CREEK RESTORATION & REVEGETATION
 - EXTENT OF SWALE
 - ROCK LINED CHANNEL
 - CONCRETE CHANNEL
- PLANTING**
- GATEWAY BOULEVARD TREE > 5m HEIGHT (EXOTIC)
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 - TREE PLANTING (SPECIMEN) NATIVE SPECIES
 - TREE PLANTING (CLUSTERS) NATIVE SPECIES
 - EXISTING VEGETATION TO BE REMOVED
- DRAINAGE DESIGN (REFERENCE ONLY)**
- NEW DRAINAGE PIPE / PIT / HEADWALL
 - EXISTING DRAINAGE PIPE / PIT / HEADWALL
 - EXISTING TO BE REMOVED/ABANDONED
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 - ELECTRICAL - UNDERGROUND
 - COMMUNICATIONS (TELEPHONE LINE)
 - COMMUNICATIONS (TELEPHONE LINE)
 - COMMUNICATIONS (TELEPHONE DIGITISED)
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 - GAS - HIGH PRESSURE
 - STREET LIGHTING

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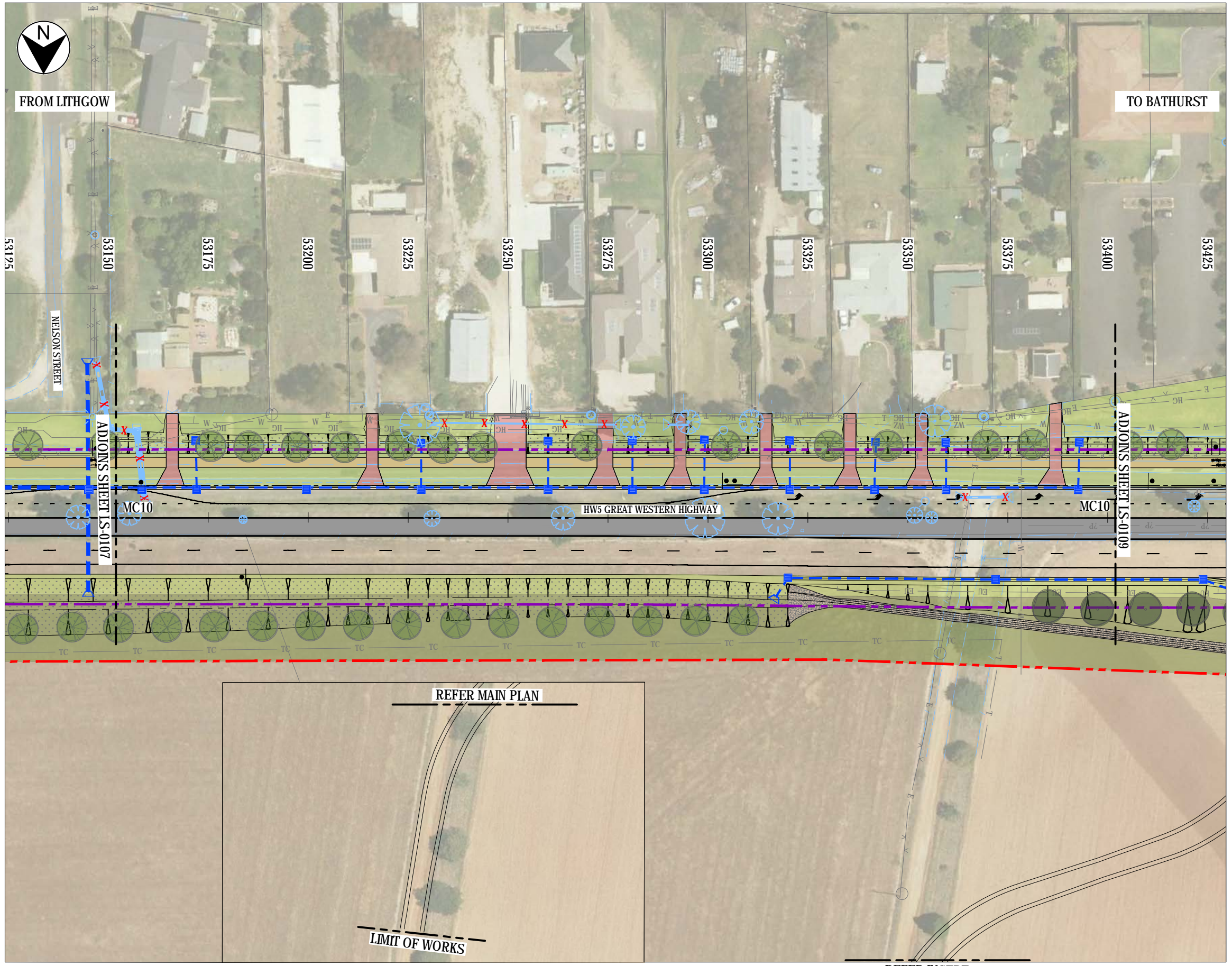
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		1	06.09.19	ISSUED FOR 85% CONCEPT DESIGN		J.CONSTANTINOS		177 Pacific Highway NORTH SYDNEY, NSW 2060 AUSTRALIA Tel: (02) 9928 2100 Fax: (02) 9928 2500 Web: www.jacobs.com		DRG CHECK	S.GALLOWAY	22.11.19	RMS REGISTRATION No. DS2019/000516		
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								HEIGHT DATUM AHD		PROJECT MNGR	T.BARRAND	22.11.19	REV 2		

A3

SHEET 7 OF 16

PART
LS

REV
2



LEGEND

GENERAL

- SURVEY
- DIGITAL CADASTRE
- PROPOSED BOUNDARY
- CLEAR ZONE BOUNDARY
- PROPOSED STEEL RAIL SAFETY BARRIER
- PROPOSED CYCLIST SAFETY FENCE
- PROPOSED WIRE ROPE 4 ROPE (WRSB)
- 750 OBSTACLE LIMITATION SURFACE

ROAD FURNITURE

- SHARED PATH
- DRIVEWAY
- RAISED MEDIAN
- EXISTING STREET LIGHT / POLES
- EXISTING/PROPOSED SIGN POST

LANDSCAPE TREATMENTS

- GRASS TYPE 1 - 'LAWN' SPECIES MIX
- GRASS TYPE 2 - NATIVE GRASSLAND MIX
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- EXTENT OF SWALE
- ROCK LINED CHANNEL
- CONCRETE CHANNEL

PLANTING

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- TREE PLANTING (SPECIMEN) NATIVE SPECIES
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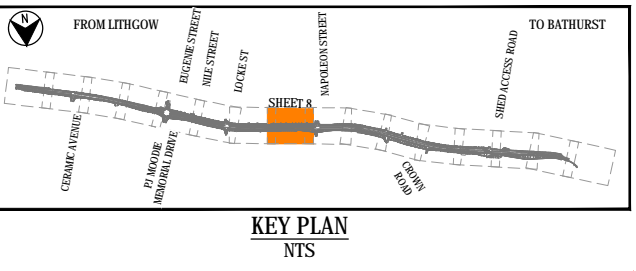
DRAINAGE DESIGN (REFERENCE ONLY)

- NEW DRAINAGE PIPE / PIT / HEADWALL
- EXISTING DRAINAGE PIPE / PIT / HEADWALL
- EXISTING TO BE REMOVED/ABANDONED

ULTIMATE UTILITY LOCATION (REFERENCE ONLY)

- OVERHEAD ELECTRICAL
- ELECTRICAL - UNDERGROUND
- COMMUNICATIONS (TELEPHONE LINE)
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- WATER MAIN
- WATER MAIN - DIGITISED
- WATER HOUSE CONNECTION
- GAS - HIGH PRESSURE
- STREET LIGHTING

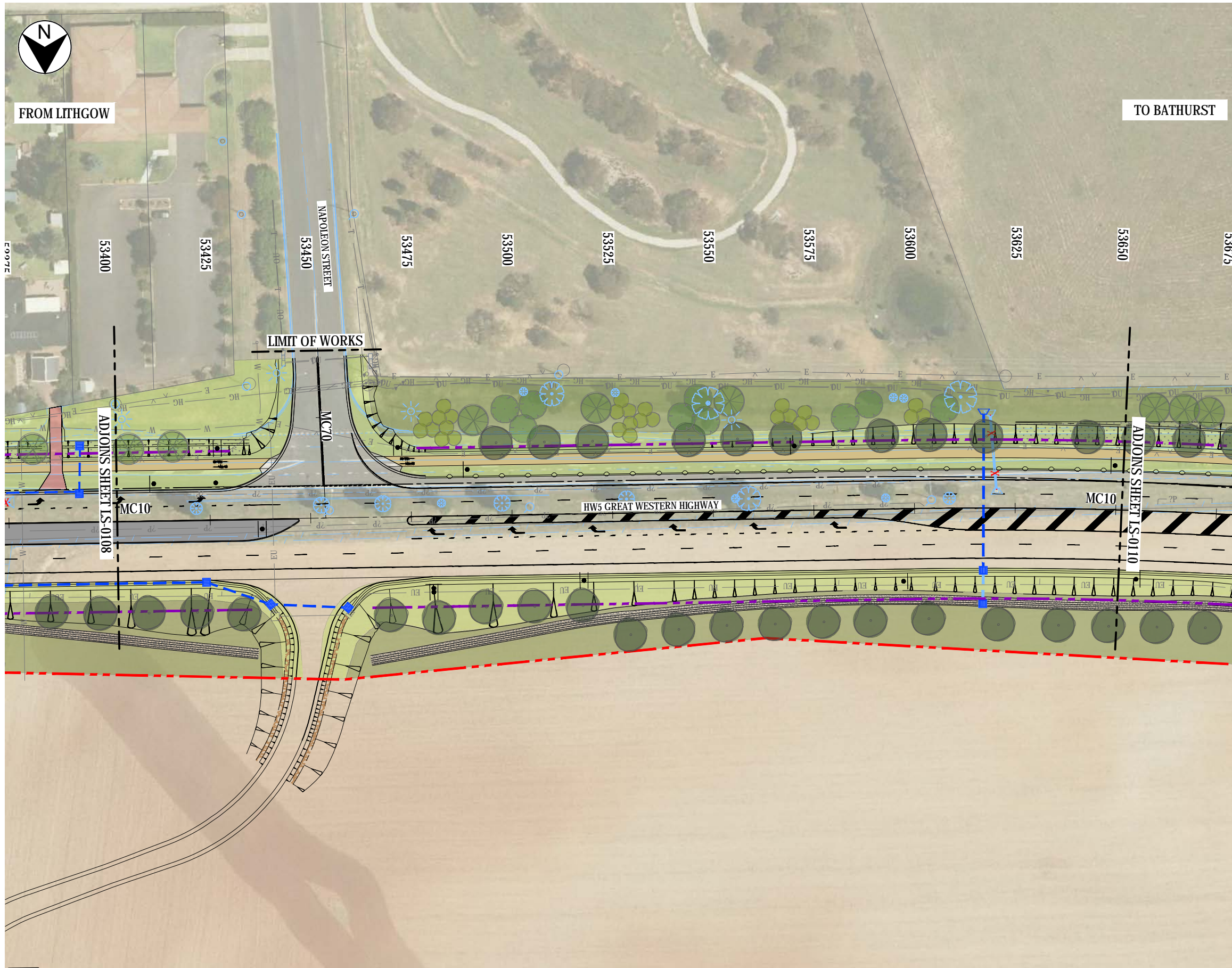
- NOTES**
- ALL EXISTING TREES WITHIN THE PROPOSED ROAD BOUNDARY ARE TO BE REMOVED.
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		1	06.09.19	ISSUED FOR 85% CONCEPT DESIGN	J.CONSTANTINOS	HEIGHT DATUM AHD		M.THORNTON		DRG CHECK	S.GALLOWAY	22.11.19	ISSUE STATUS 80% DETAILED DESIGN		
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								177 Pacific Highway NORTH SYDNEY, NSW 2060 AUSTRALIA Tel: (02) 9928 2100 Fax: (02) 9928 2500 Web: www.jacobs.com		PROJECT MNGR	T.BARRAND	22.11.19	REV 2		
										REGIONAL MAINTENANCE DISTRICT WORKS CENTRAL WEST				© Roads and Maritime Services	



LEGEND

GENERAL

- SURVEY
- DIGITAL CADASTRE
- PROPOSED BOUNDARY
- CLEAR ZONE BOUNDARY
- PROPOSED STEEL RAIL SAFETY BARRIER
- PROPOSED CYCLIST SAFETY FENCE
- PROPOSED WIRE ROPE 4 ROPE (WRSB)
- 750 OBSTACLE LIMITATION SURFACE

ROAD FURNITURE

- SHARED PATH
- DRIVEWAY
- RAISED MEDIAN
- EXISTING STREET LIGHT / POLES
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- GRASS TYPE 2 - NATIVE GRASSLAND MIX
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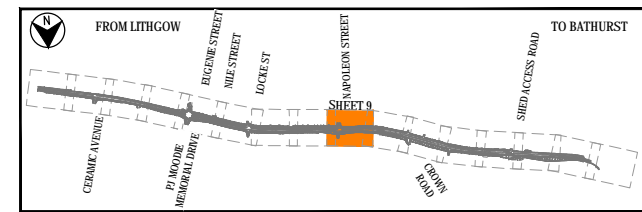
DRAINAGE DESIGN (REFERENCE ONLY)

- NEW DRAINAGE PIPE / PIT / HEADWALL
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ULTIMATE UTILITY LOCATION (REFERENCE ONLY)

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- COMMUNICATIONS (TELEPHONE LINE)
- COMMUNICATIONS (TELEPHONE DIGITISED)
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- WATER MAIN - DIGITISED
- WATER HOUSE CONNECTION
- GAS - HIGH PRESSURE
- STREET LIGHTING

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KEY PLAN
NTS

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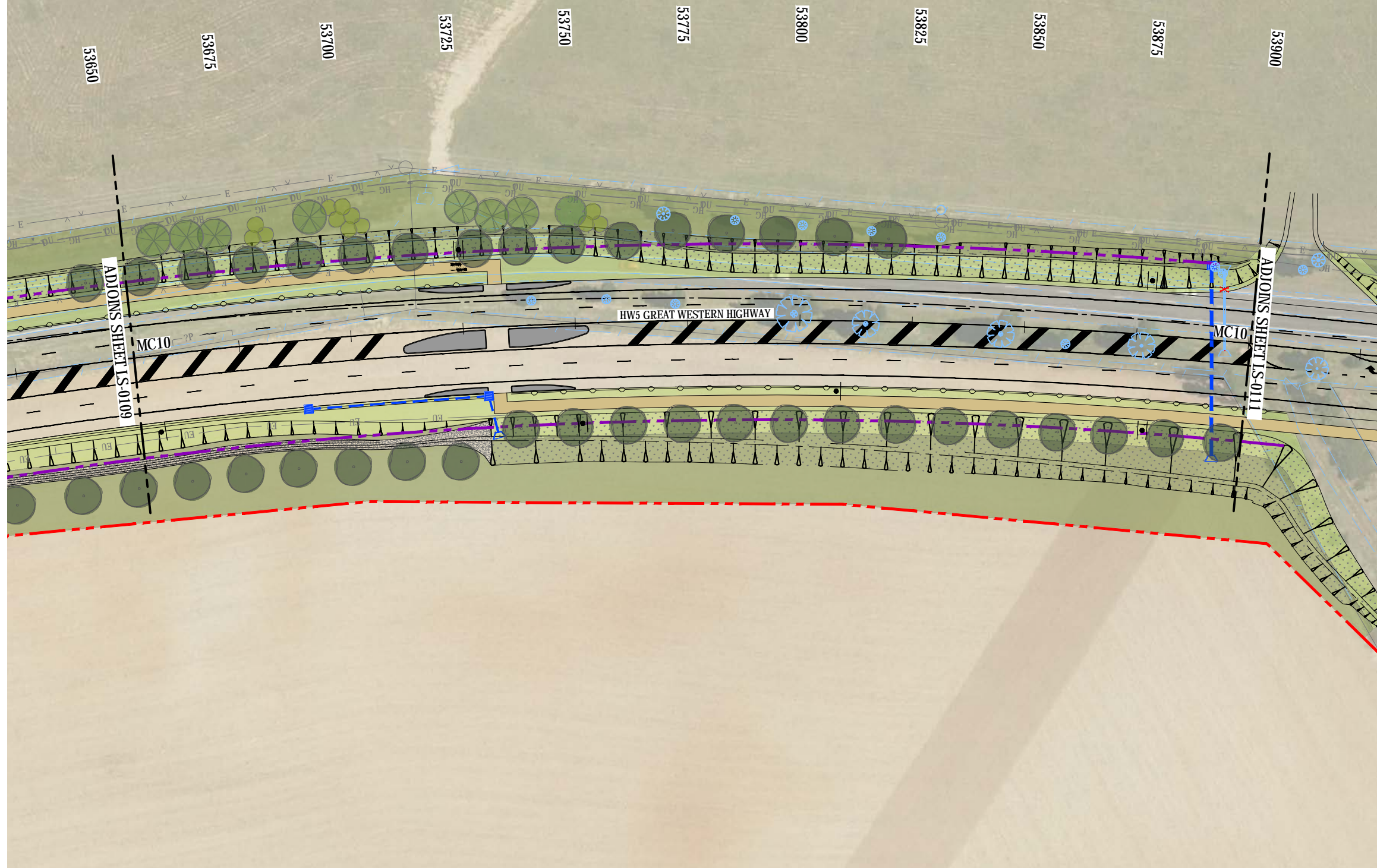
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DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING		REV	DATE	AMENDMENT / REVISION DESCRIPTION	APPROVAL	SCALES ON A3 SIZE DRAWING		DRAWINGS / DESIGN PREPARED BY		TITLE	NAME	DATE	URBAN DESIGN AND LANDSCAPING PLAN SHEET 9 OF 16		
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										DESIGN MNGR	T.BARRAND	22.11.19	REV 2		
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FROM LITHGOW

TO BATHURST

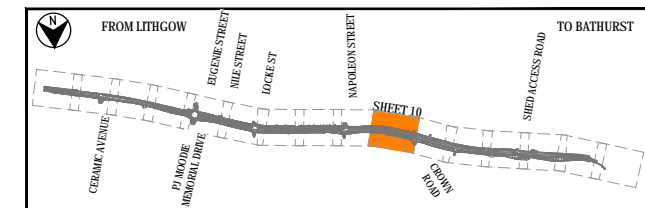


LEGEND

- GENERAL**
- SURVEY
 - DIGITAL CADASTRE
 - PROPOSED BOUNDARY
 - CLEAR ZONE BOUNDARY
 - PROPOSED STEEL RAIL SAFETY BARRIER
 - PROPOSED CYCLIST SAFETY FENCE
 - PROPOSED WIRE ROPE 4 ROPE (WRSB)
 - 750 OBSTACLE LIMITATION SURFACE
- ROAD FURNITURE**
- SHARED PATH
 - DRIVEWAY
 - RAISED MEDIAN
 - EXISTING STREET LIGHT / POLES
 - EXISTING/PROPOSED SIGN POST
- LANDSCAPE TREATMENTS**
- GRASS TYPE 1 - 'LAWN' SPECIES MIX
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- ULTIMATE UTILITY LOCATION (REFERENCE ONLY)**
- OVERHEAD ELECTRICAL
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 - COMMUNICATIONS (TELEPHONE LINE)
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NOTES

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KEY PLAN
NTS

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150mm ON A3 SIZE ORIGINAL

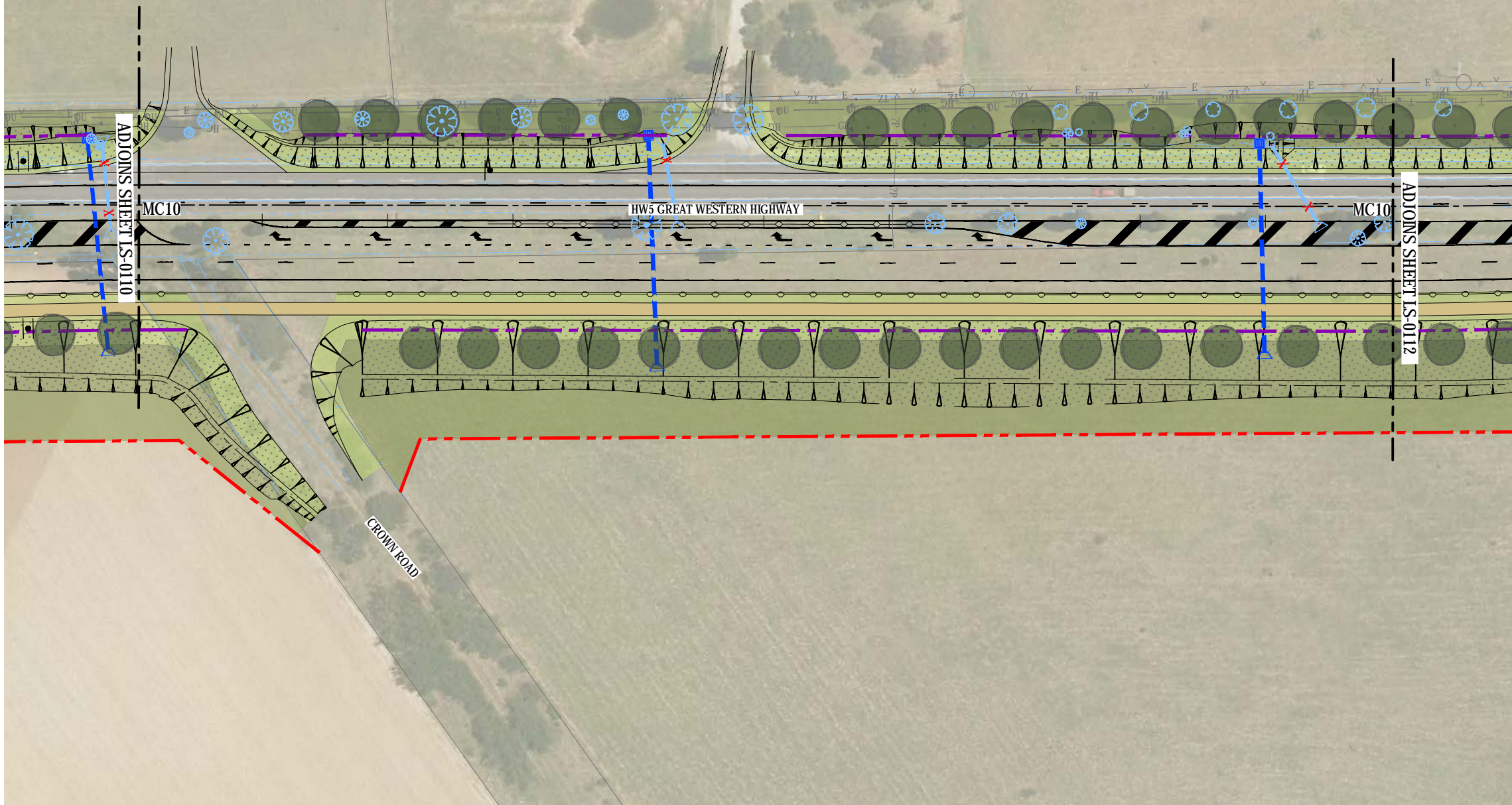
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		1	06.09.19	ISSUED FOR 85% CONCEPT DESIGN	J.CONSTANTINOS	SCALE 1:1000		177 Pacific Highway NORTH SYDNEY, NSW 2060 AUSTRALIA		DRG CHECK	S.GALLOWAY	22.11.19	ISSUE STATUS 80% DETAILED DESIGN		REV 2
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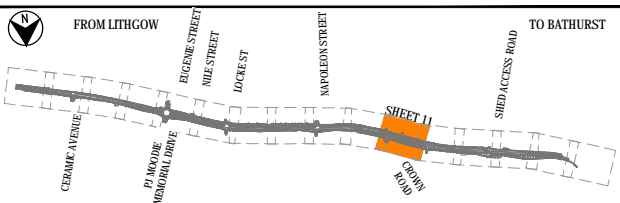
TO BATHURST

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- LEGEND**
- GENERAL**
- SURVEY
 - DIGITAL CADASTRE
 - PROPOSED BOUNDARY
 - CLEAR ZONE BOUNDARY
 - PROPOSED STEEL RAIL SAFETY BARRIER
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 - 750 OBSTACLE LIMITATION SURFACE
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- SHARED PATH
 - DRIVEWAY
 - RAISED MEDIAN
 - EXISTING STREET LIGHT / POLES
 - EXISTING/PROPOSED SIGN POST
- LANDSCAPE TREATMENTS**
- GRASS TYPE 1 - 'LAWN' SPECIES MIX
 - GRASS TYPE 2 - NATIVE GRASSLAND MIX
 - CREEK RESTORATION & REVEGETATION
 - EXTENT OF SWALE
 - ROCK LINED CHANNEL
 - CONCRETE CHANNEL
- PLANTING**
- GATEWAY BOULEVARD TREE > 5m HEIGHT (EXOTIC)
 - GATEWAY TREE PLANTING < 5m HEIGHT (EXOTIC)
 - TREE PLANTING (SPECIMEN) NATIVE SPECIES
 - TREE PLANTING (CLUSTERS) NATIVE SPECIES
 - EXISTING VEGETATION TO BE REMOVED
- DRAINAGE DESIGN (REFERENCE ONLY)**
- NEW DRAINAGE PIPE / PIT / HEADWALL
 - EXISTING DRAINAGE PIPE / PIT / HEADWALL
 - EXISTING TO BE REMOVED/ABANDONED
- ULTIMATE UTILITY LOCATION (REFERENCE ONLY)**
- OVERHEAD ELECTRICAL
 - ELECTRICAL - UNDERGROUND
 - COMMUNICATIONS (TELEPHONE LINE)
 - COMMUNICATIONS (TELEPHONE LINE)
 - COMMUNICATIONS (TELEPHONE DIGITISED)
 - COMMUNICATIONS (OPTIC FIBRE)
 - WATER MAIN
 - WATER MAIN - DIGITISED
 - WATER HOUSE CONNECTION
 - GAS - HIGH PRESSURE
 - STREET LIGHTING

- NOTES**
- ALL EXISTING TREES WITHIN THE PROPOSED ROAD BOUNDARY ARE TO BE REMOVED.
 - FOR GENERAL NOTES REFER SHEET GE-0032.



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		1	06.09.19	ISSUED FOR 85% CONCEPT DESIGN	J.CONSTANTINOS	SCALE 1:1000		177 Pacific Highway NORTH SYDNEY, NSW 2060 AUSTRALIA Tel: (02) 9928 2100 Fax: (02) 9928 2500 Web: www.jacobs.com		DRG CHECK	S.GALLOWAY	22.11.19	ISSUE STATUS 80% DETAILED DESIGN		REV 2
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										DESIGN MNGR	T.BARRAND	22.11.19	REGIONAL MAINTENANCE DISTRICT WORKS CENTRAL WEST		
										PROJECT MNGR	T.BARRAND	22.11.19			



FROM LITHGOW

TO BATHURST

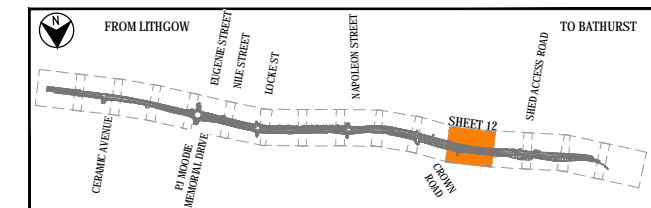


LEGEND

- GENERAL**
- SURVEY
 - DIGITAL CADASTRE
 - PROPOSED BOUNDARY
 - CLEAR ZONE BOUNDARY
 - PROPOSED STEEL RAIL SAFETY BARRIER
 - PROPOSED CYCLIST SAFETY FENCE
 - PROPOSED WIRE ROPE 4 ROPE (WRSB)
 - 750 OBSTACLE LIMITATION SURFACE
- ROAD FURNITURE**
- SHARED PATH
 - DRIVEWAY
 - RAISED MEDIAN
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 - EXISTING/PROPOSED SIGN POST
- LANDSCAPE TREATMENTS**
- GRASS TYPE 1 - 'LAWN' SPECIES MIX
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- OVERHEAD ELECTRICAL
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 - COMMUNICATIONS (TELEPHONE LINE)
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NOTES

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KEY PLAN
NTS

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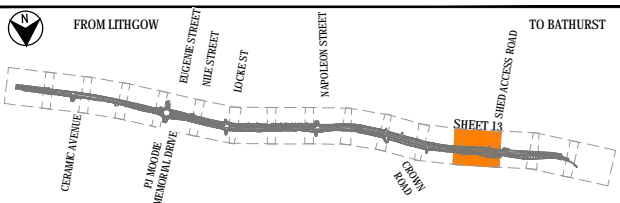
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		1	06.09.19	ISSUED FOR 85% CONCEPT DESIGN		J.CONSTANTINOS		AT A3		S.GALLOWAY		DRG CHECK		S.GALLOWAY		22.11.19		LS	
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										T.BARRAND		PROJECT MNGR		T.BARRAND		22.11.19			
										177 Pacific Highway NORTH SYDNEY, NSW 2060 AUSTRALIA Tel: (02) 9928 2100 Fax: (02) 9928 2500 Web: www.jacobs.com									
																		© Roads and Maritime Services	



- ### LEGEND
- GENERAL**
- SURVEY
 - DIGITAL CADASTRE
 - PROPOSED BOUNDARY
 - CLEAR ZONE BOUNDARY
 - PROPOSED STEEL RAIL SAFETY BARRIER
 - PROPOSED CYCLIST SAFETY FENCE
 - PROPOSED WIRE ROPE 4 ROPE (WRSB)
 - 750 OBSTACLE LIMITATION SURFACE
- ROAD FURNITURE**
- SHARED PATH
 - DRIVEWAY
 - RAISED MEDIAN
 - EXISTING STREET LIGHT / POLES
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- GRASS TYPE 1 - 'LAWN' SPECIES MIX
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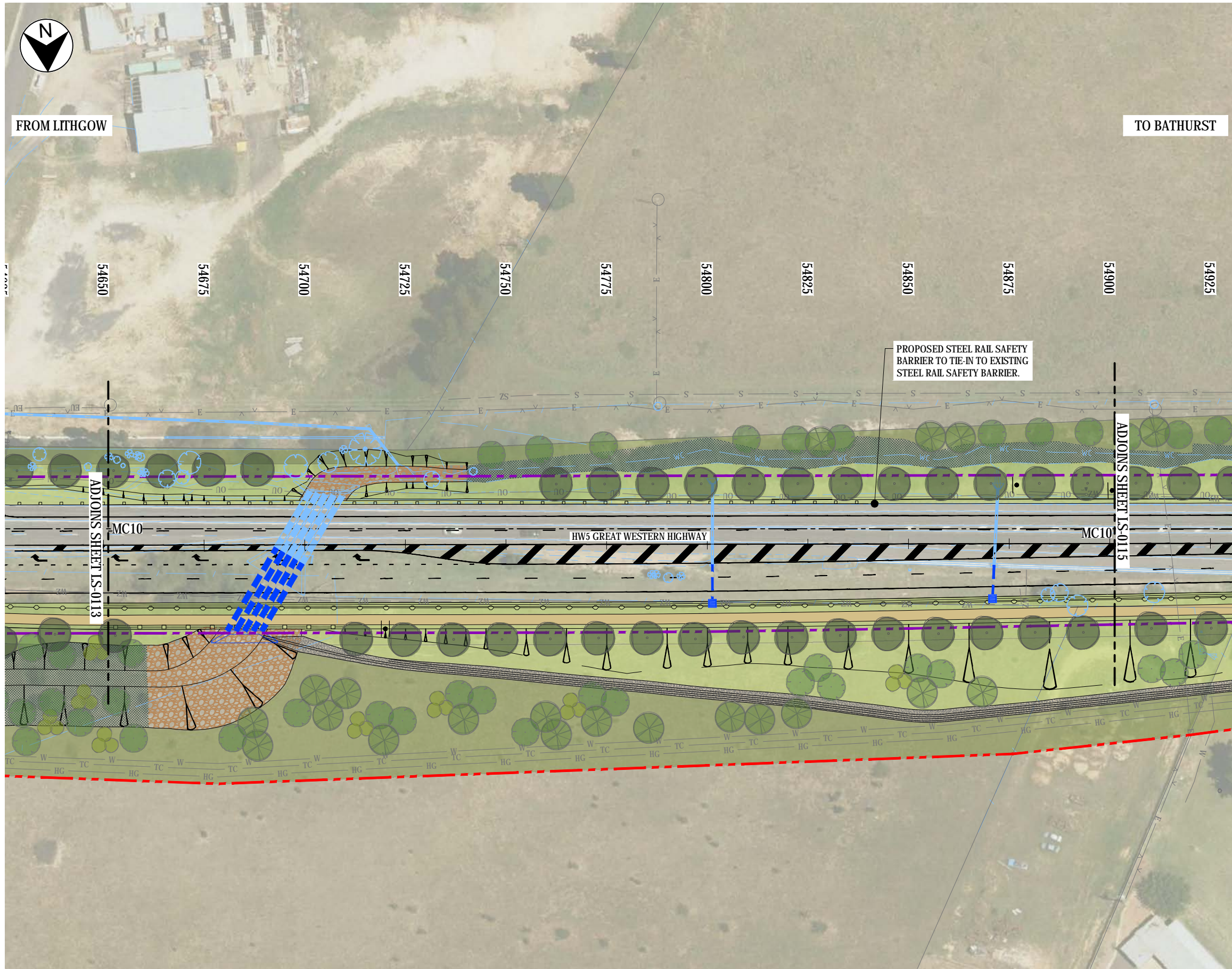


KEY PLAN
NTS

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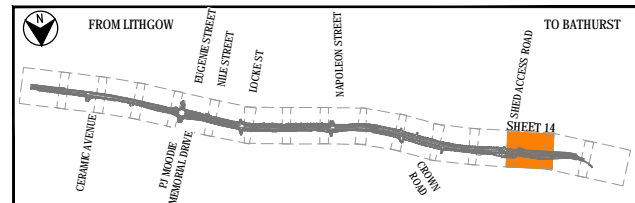
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DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING		REV	DATE	AMENDMENT / REVISION DESCRIPTION	APPROVAL	SCALES ON A3 SIZE DRAWING		DRAWINGS / DESIGN PREPARED BY		TITLE	NAME	DATE	URBAN DESIGN AND LANDSCAPING PLAN		
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		1	06.09.19	ISSUED FOR 85% CONCEPT DESIGN	J.CONSTANTINOS			177 Pacific Highway NORTH SYDNEY, NSW 2060 AUSTRALIA Tel: (02) 9928 2100 Fax: (02) 9928 2500 Web: www.jacobs.com		DRG CHECK	S.GALLOWAY	22.11.19	ISSUE STATUS 80% DETAILED DESIGN		
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										DESIGN MNGR	T.BARRAND	22.11.19	REV 2		
										PROJECT MNGR	T.BARRAND	22.11.19	© Roads and Maritime Services		



- LEGEND**
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 - PROPOSED BOUNDARY
 - CLEAR ZONE BOUNDARY
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 - PROPOSED WIRE ROPE 4 ROPE (WRSB)
 - 750 OBSTACLE LIMITATION SURFACE
- ROAD FURNITURE**
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KEY PLAN
NTS

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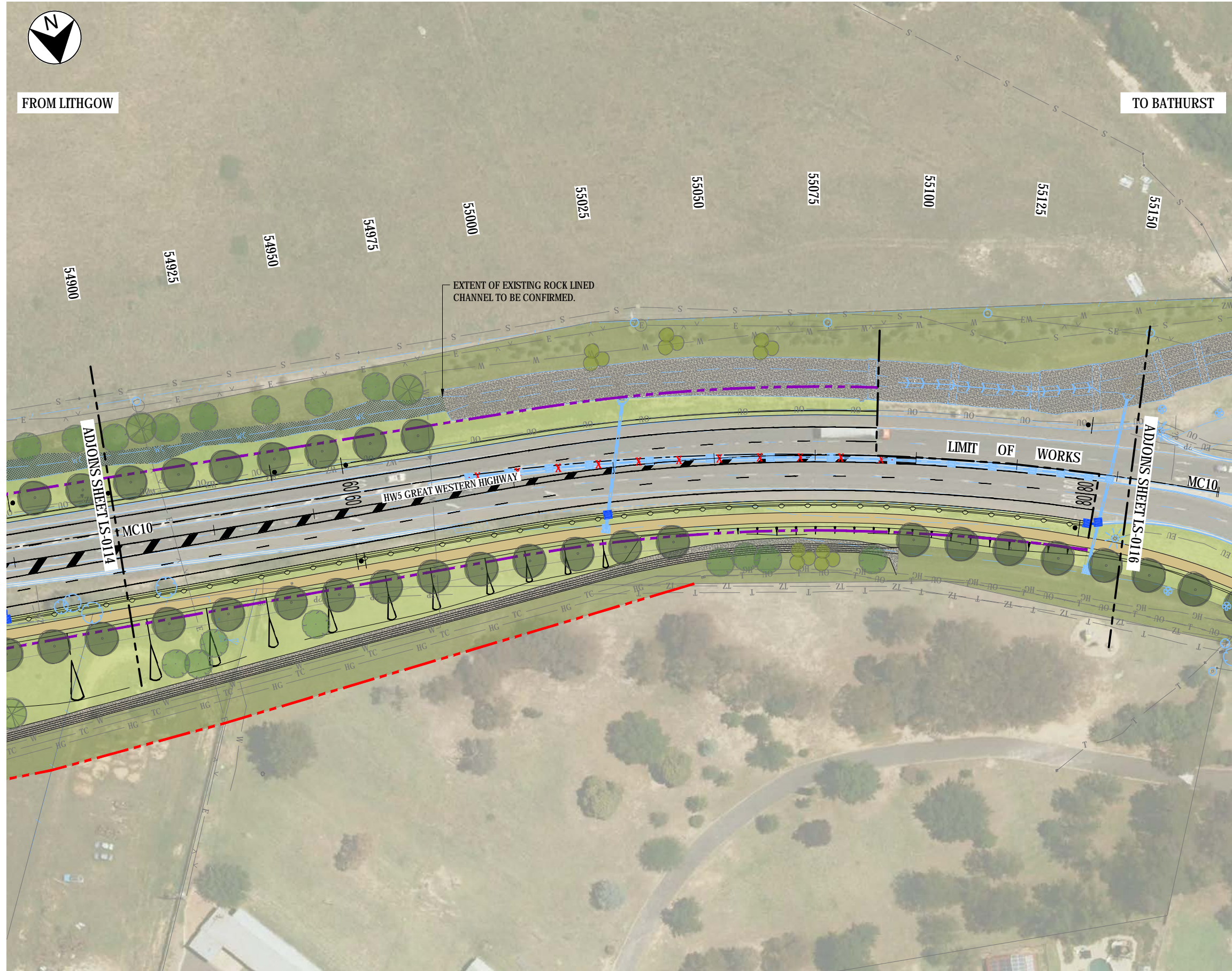
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										PROJECT MNGR	T.BARRAND	22.11.19	REV 2		
										PREPARED FOR REGIONAL MAINTENANCE DISTRICT WORKS CENTRAL WEST		© Roads and Maritime Services			



FROM LITHGOW

TO BATHURST



LEGEND

GENERAL

- SURVEY
- DIGITAL CADASTRE
- PROPOSED BOUNDARY
- CLEAR ZONE BOUNDARY
- PROPOSED STEEL RAIL SAFETY BARRIER
- PROPOSED CYCLIST SAFETY FENCE
- PROPOSED WIRE ROPE 4 ROPE (WRSB)
- 750 OBSTACLE LIMITATION SURFACE

ROAD FURNITURE

- SHARED PATH
- DRIVEWAY
- RAISED MEDIAN
- ☀ / ○ EXISTING STREET LIGHT / POLES
- EXISTING/PROPOSED SIGN POST

LANDSCAPE TREATMENTS

- GRASS TYPE 1 - 'LAWN' SPECIES MIX
- GRASS TYPE 2 - NATIVE GRASSLAND MIX
- CREEK RESTORATION & REVEGETATION
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DRAINAGE DESIGN (REFERENCE ONLY)

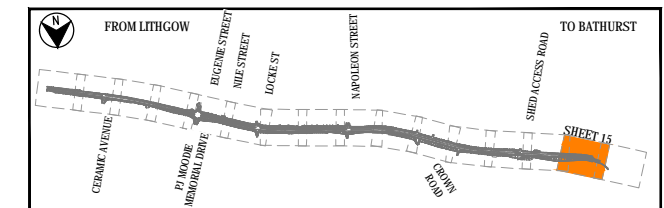
- NEW DRAINAGE PIPE / PIT / HEADWALL
- EXISTING DRAINAGE PIPE / PIT / HEADWALL
- x x x x x EXISTING TO BE REMOVED/ABANDONED

ULTIMATE UTILITY LOCATION (REFERENCE ONLY)

- E — OVERHEAD ELECTRICAL
- EU — ELECTRICAL - UNDERGROUND
- T — COMMUNICATIONS (TELEPHONE LINE)
- TC — COMMUNICATIONS (TELEPHONE LINE)
- TZ — COMMUNICATIONS (TELEPHONE DIGITISED)
- OU — COMMUNICATIONS (OPTIC FIBRE)
- W — WATER MAIN
- WZ — WATER MAIN - DIGITISED
- WH — WATER HOUSE CONNECTION
- HG — GAS - HIGH PRESSURE
- ☀ STREET LIGHTING

NOTES

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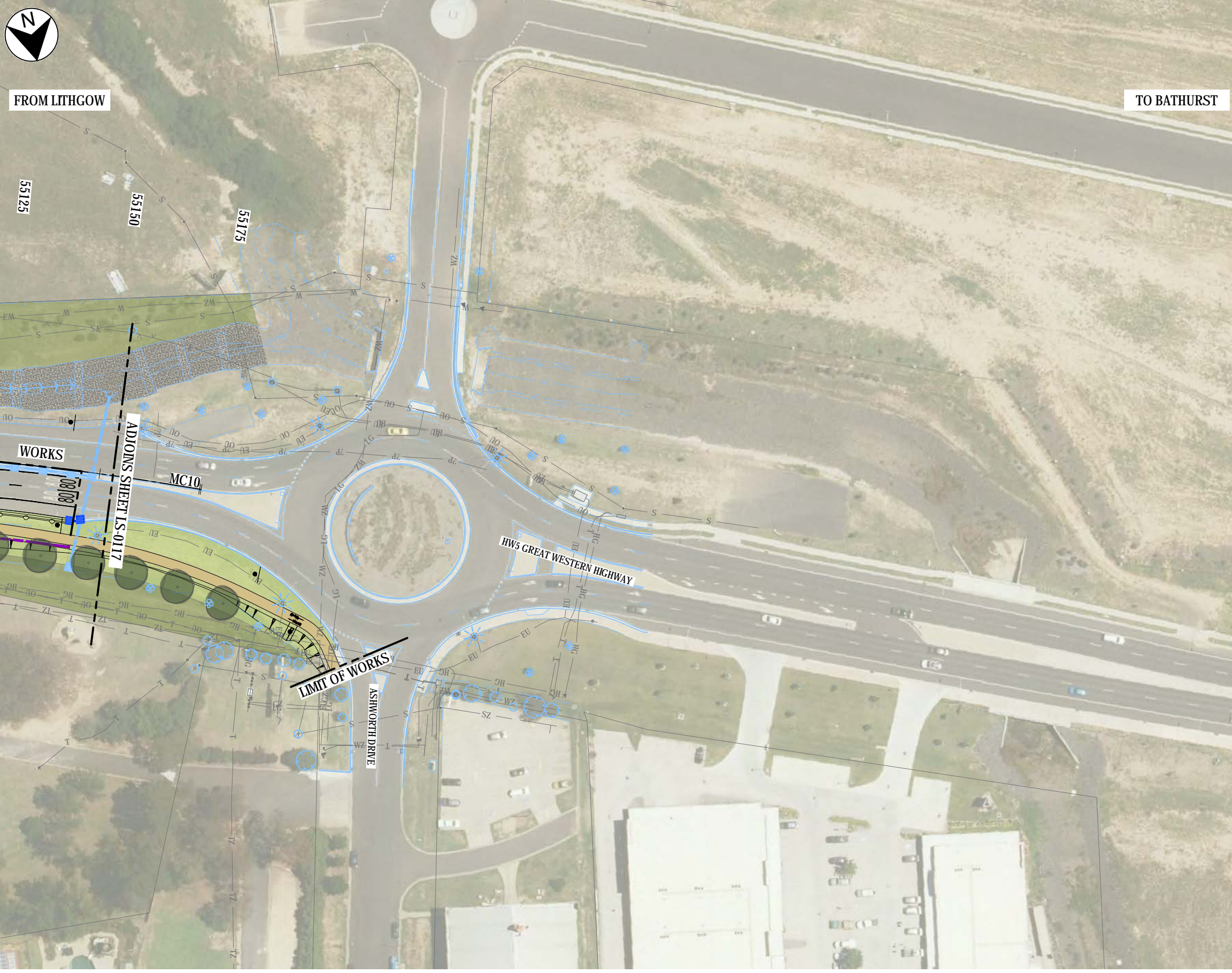
KEY PLAN
NTS

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										PROJECT MNGR	T.BARRAND	22.11.19							



LEGEND

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- SURVEY
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- CLEAR ZONE BOUNDARY
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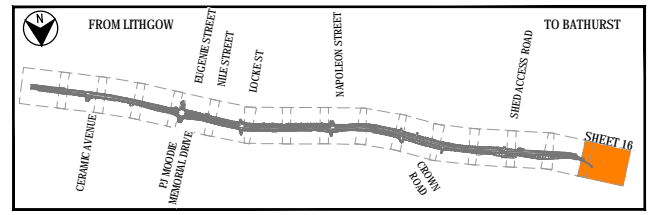
DRAINAGE DESIGN (REFERENCE ONLY)

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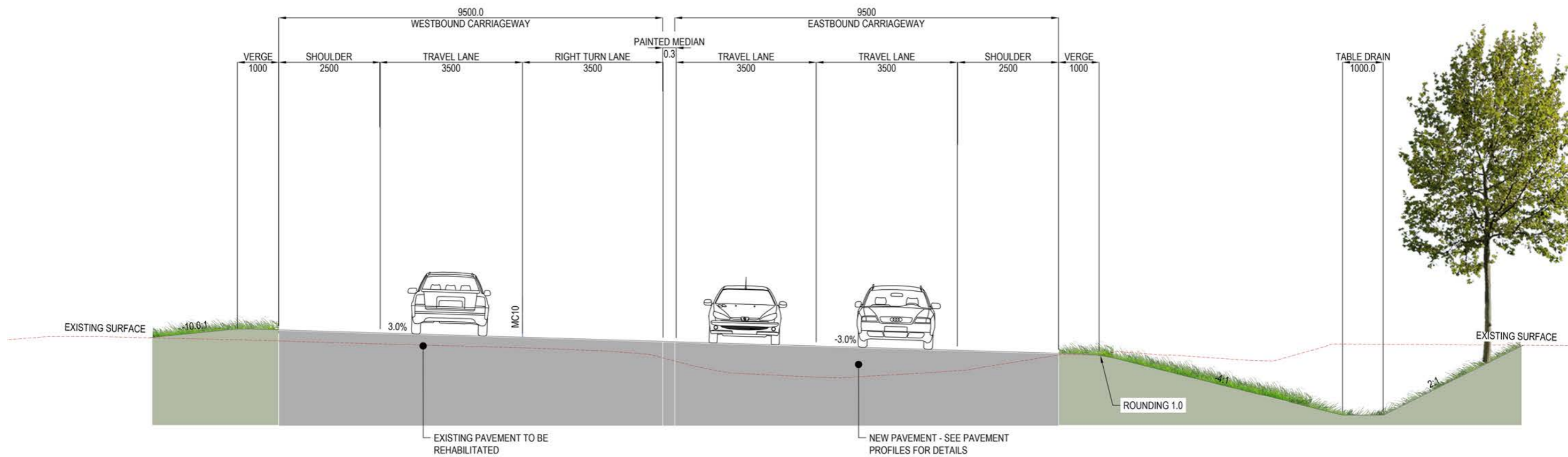
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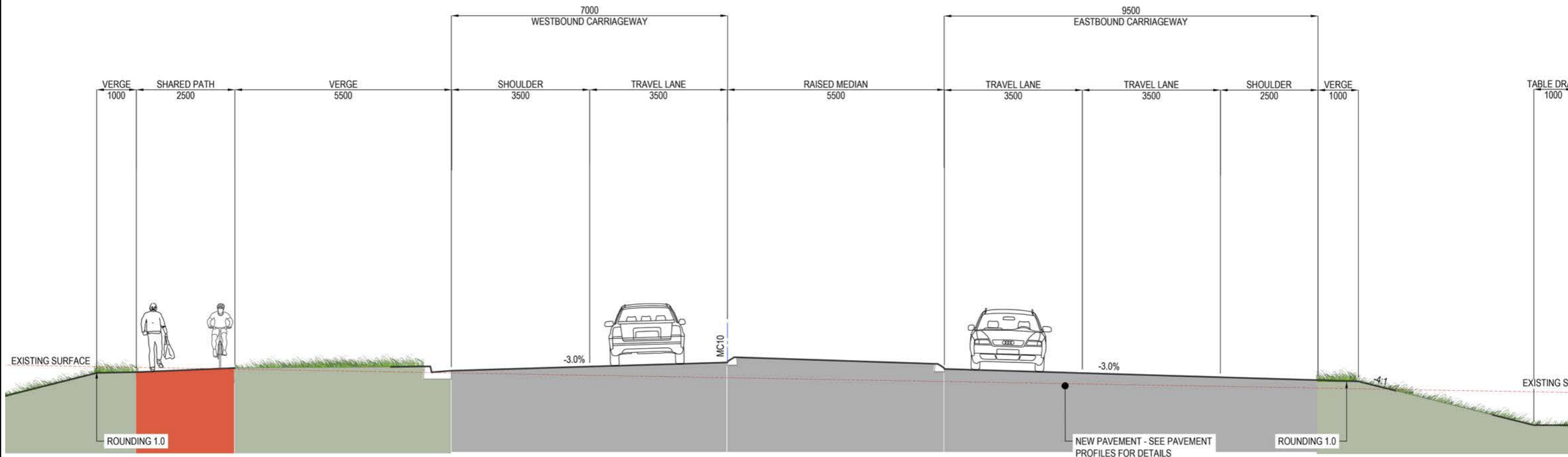
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		2	22.11.19	ISSUED FOR 80% DETAILED DESIGN		T.BARRAND		Tel: (02) 9928 2100 Fax: (02) 9928 2500 Web: www.jacobs.com		DESIGN		M.THORNTON		22.11.19		80% DETAILED DESIGN		2	
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TYPICAL LANDSCAPE SECTION 01 - MAIN ALIGNMENT EAST OF CERAMIC AVENUE INTERSECTION MC10 CH51750

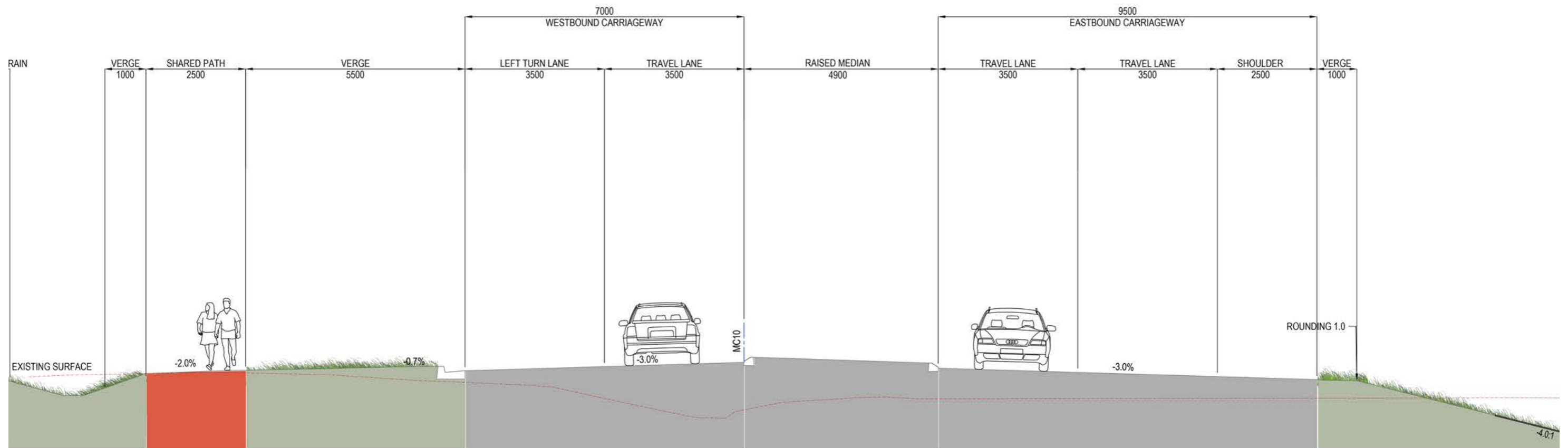


TYPICAL LANDSCAPE SECTION 02 - MAIN ALIGNMENT MC10 WEST OF NILE STREET LEFT IN/ LEFT OUT MC10 CH 52675

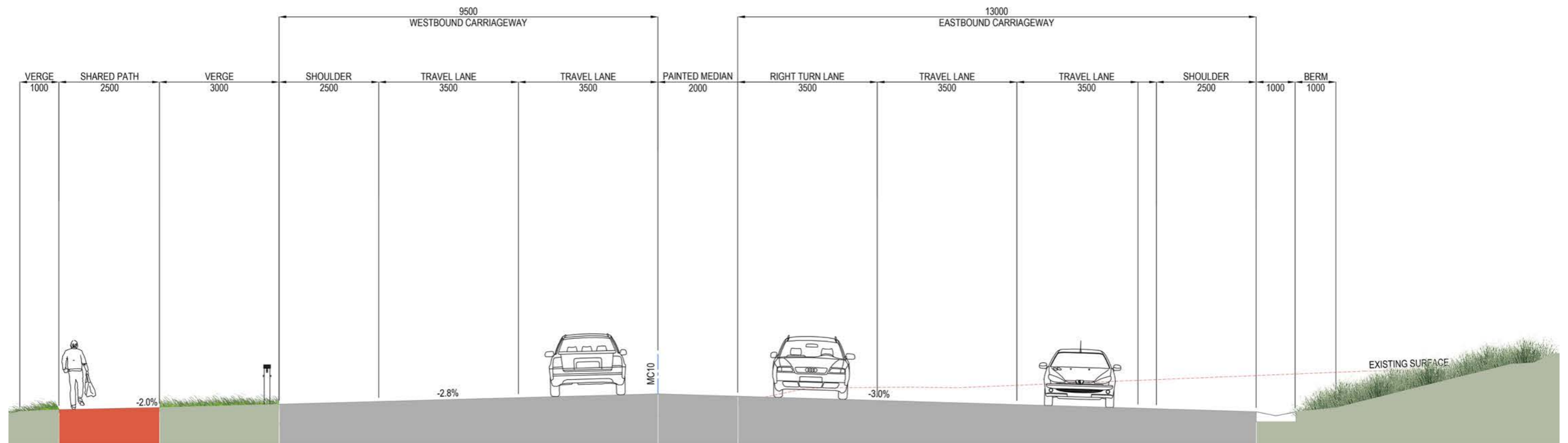
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								177 Pacific Highway NORTH SYDNEY, NSW 2060 AUSTRALIA Tel: (02) 9928 2100 Fax: (02) 9928 2500 Web: www.jacobs.com		DESIGN M.THORNTON		22.11.19		PREPARED FOR REGIONAL MAINTENANCE DISTRICT WORKS CENTRAL WEST							
										DESIGN CHECK C.MISSIO		22.11.19									
										DESIGN MNGR T.BARRAND		22.11.19									
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TYPICAL LANDSCAPE SECTION 03 - MAIN ALIGNMENT EAST OF LOCKE STREET LEFT IN/ LEFT OUT MC10 CH52750

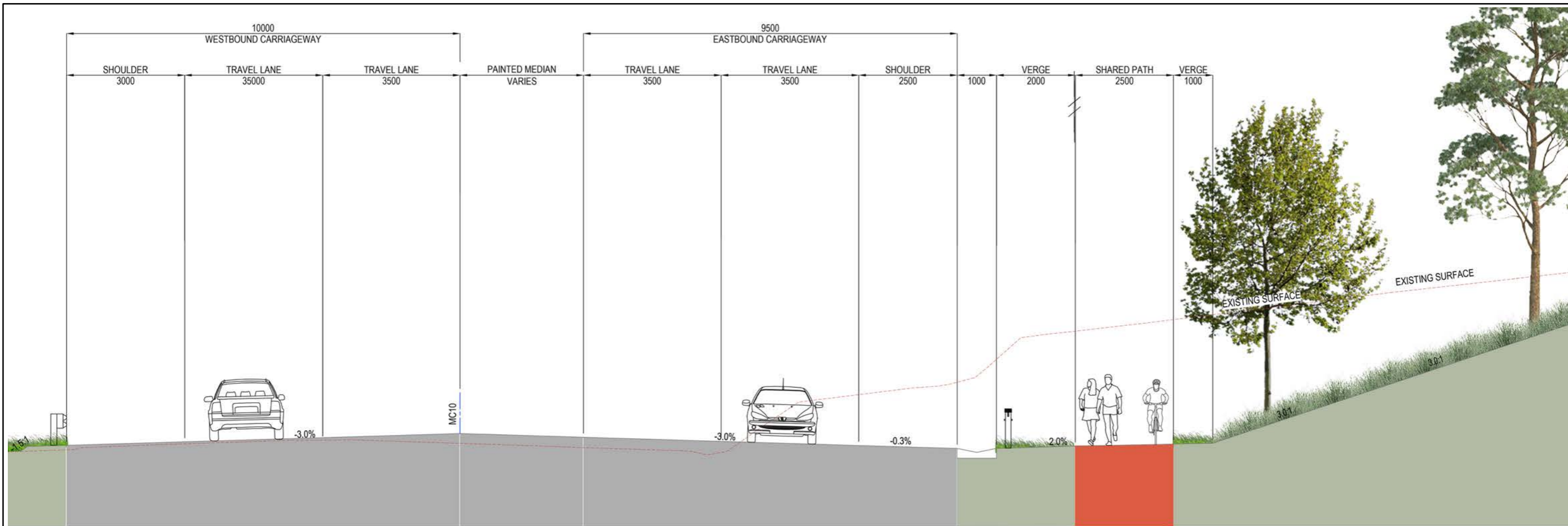


TYPICAL LANDSCAPE SECTION 04 - MAIN ALIGNMENT WEST OF NAPOLEON STREET INTERSECTION MC10 CH 53550

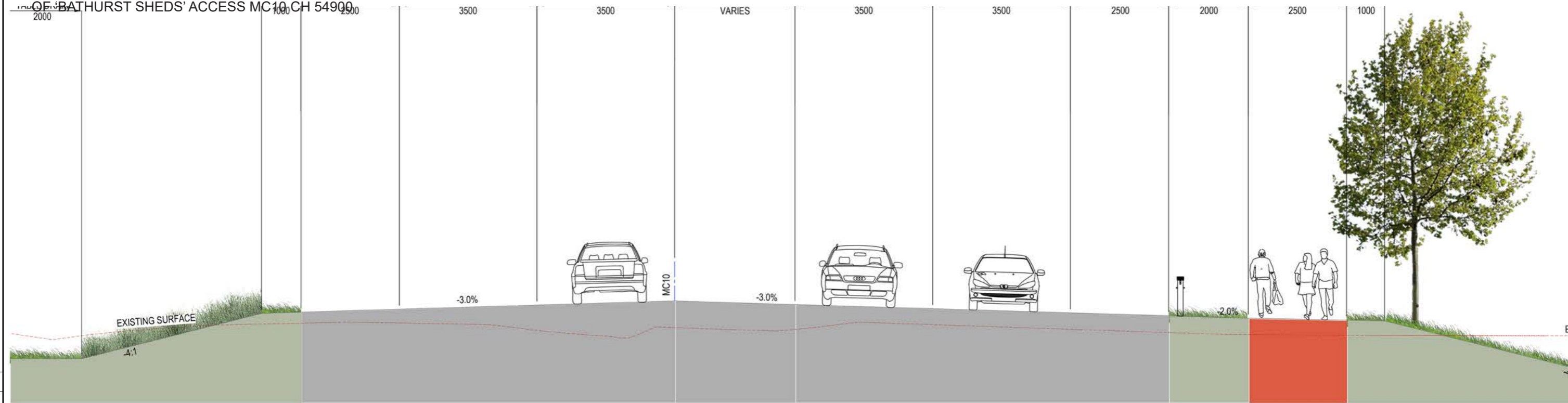
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\\Jacobs.com\ANZ\IE\Projects\04_Eastem\IA214400\01_Design\08 Drawings\IA214400-DG-LS-0201-0203.dwg		20/11/2019 3:46:09 PM		huange		SCALES ON A3 SIZE DRAWING		IA214400-DG-LS-0202		20/11/2019		huange		NSW GOVERNMENT Transport Roads & Maritime Services		URBAN DESIGN AND LANDSCAPING TYPICAL SECTIONS		SHEET 2 OF 3		
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								CO-ORDINATE SYSTEM MGA_ZONE 55									© Roads and Maritime Services			
								HEIGHT DATUM AHD												





TYPICAL LANDSCAPE SECTION 05 - MAIN ALIGNMENT WEST OF 'BATHURST SHEDS' ACCESS MC10 CH 54900

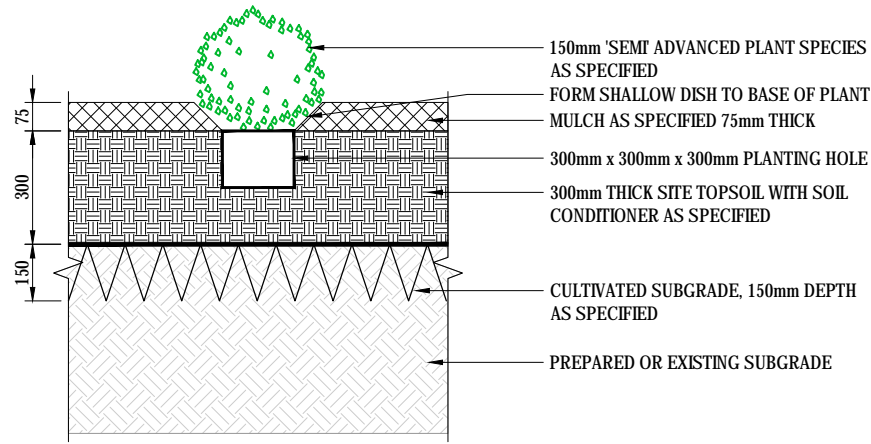


TYPICAL LANDSCAPE SECTION 06 - MAIN ALIGNMENT EAST OF 'BATHURST SHEDS' ACCESS MC10 CH 54450

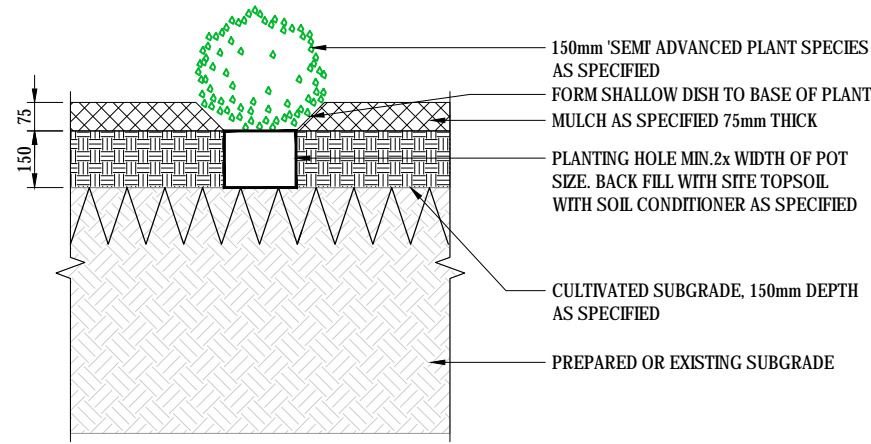
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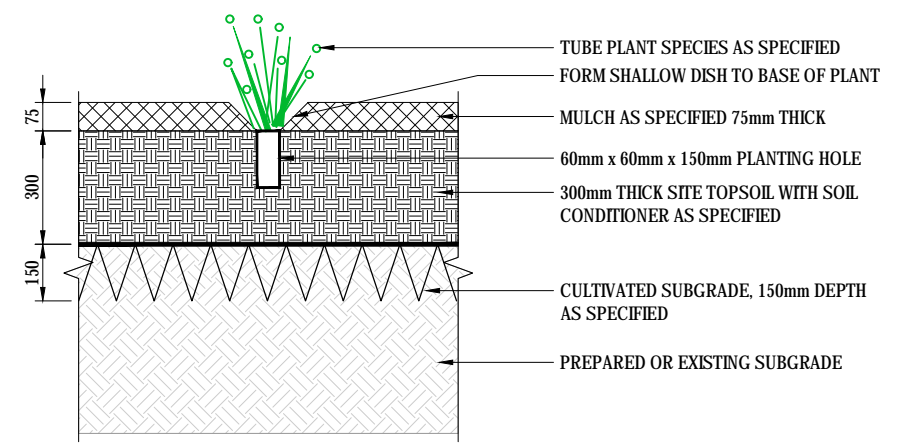
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\\Jacobs.com\ANZ\IE\Projects\04_Eastern\IA214400\01_Design\08 Drawings\IA214400-DG-LS-0201-0203.dwg		20/11/2019 3:46:09 PM		huange		SCALES ON A3 SIZE DRAWING		IA214400-DG-LS-0203		20/11/2019		huange		NSW GOVERNMENT Transport Roads & Maritime Services		URBAN DESIGN AND LANDSCAPING TYPICAL SECTIONS		SHEET 3 OF 3		
DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING		REV	DATE	AMENDMENT / REVISION DESCRIPTION		APPROVAL		DRAWINGS / DESIGN PREPARED BY		TITLE	NAME	DATE	PREPARED FOR		RMS REGISTRATION No. DS2019/000516		PART LS			
		0	22.11.19	ISSUED FOR 80% CONCEPT DESIGN		T.BARRAND		 177 Pacific Highway NORTH SYDNEY, NSW 2060 AUSTRALIA Tel: (02) 9928 2100 Fax: (02) 9928 2500 Web: www.jacobs.com		DRAWN	E.HUANG	22.11.19	REGIONAL MAINTENANCE DISTRICT WORKS CENTRAL WEST		EDMS No.		SHEET No. LS-0203		REV 0	
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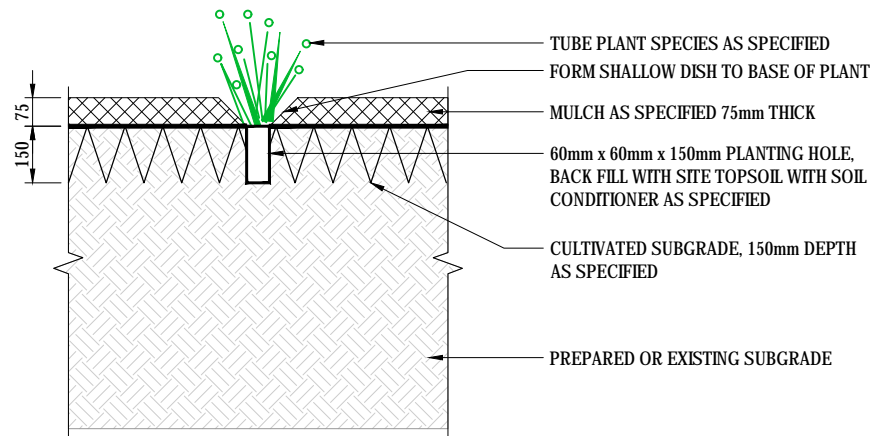
TYPICAL 150mm PLANTING IN IMPROVED SITE SOIL



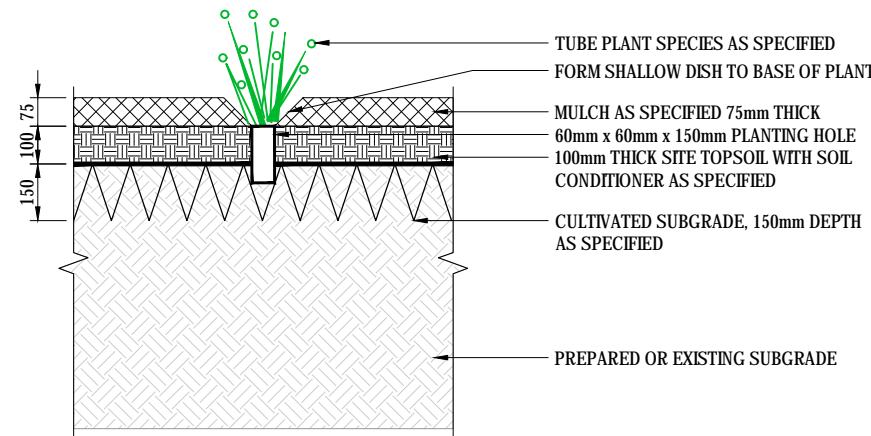
TYPICAL 150mm PLANTING IN EXISTING SITE SOIL



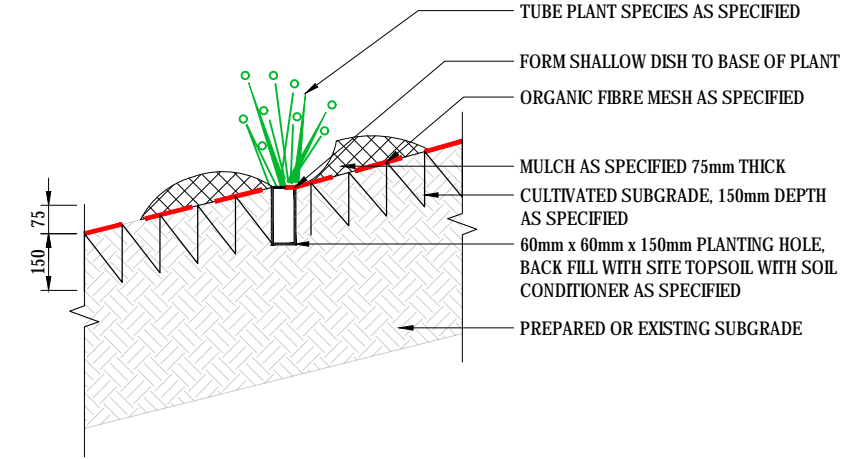
TYPICAL TUBE PLANTING IN IMPROVED SITE SOIL



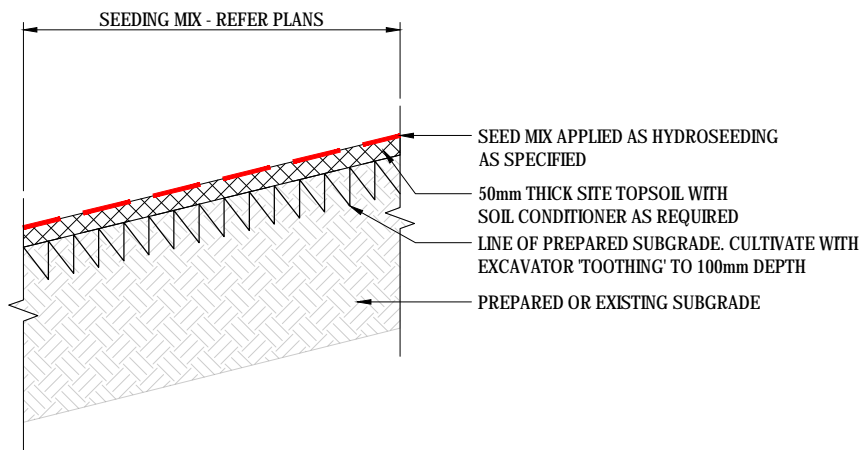
TYPICAL TUBE PLANTING IN EXISTING SITE SOIL



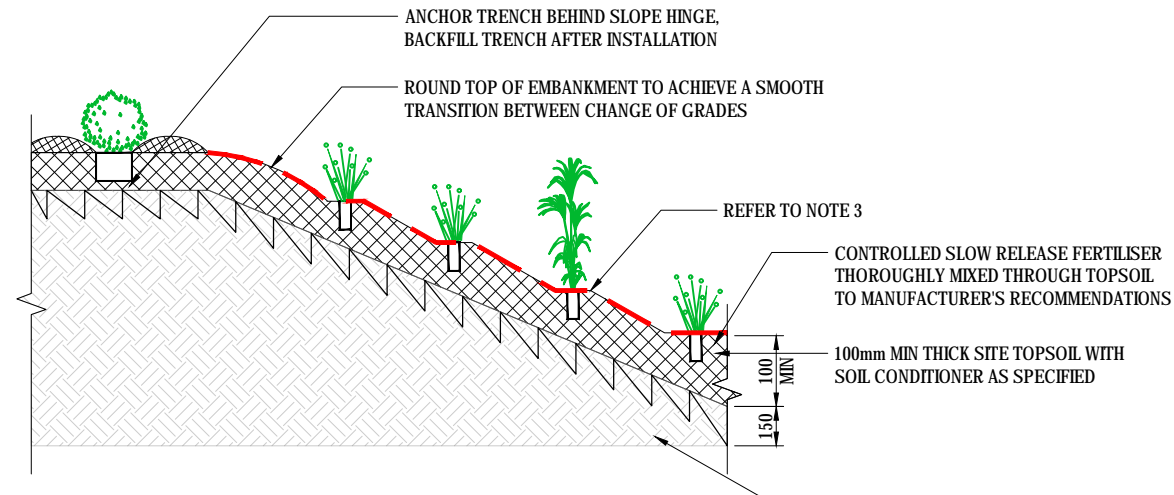
TYPICAL RIPARIAN PLANTING - WITH MULCH



TYPICAL TUBE PLANTING IN EXISTING SITE SOIL ON EMBANKMENT



TYPICAL HYDROSEEDING



TYPICAL RIPARIAN PLANTING - WITH EROSION CONTROL BLANKET
SCALE 1:40



NOTES

- REFER LANDSCAPE PLANS FOR PLANTING AREAS.
- PLANT SPACING AND POT SIZES OUTLINED IN SCHEDULES. REFER IA214400-DG-LS-0401.
- EROSION CONTROL BLANKET (REFER R178): TO BE A THICK JUTE MAT SUITABLE TO ACT AS A MULCH TO PROVIDE BOTH WEED SUPPRESSION AND MOISTURE RETENTION. INSTALLATION TO MANUFACTURERS RECOMMENDATIONS.

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50mm ON A3 SIZE ORIGINAL

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DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING		REV	DATE	AMENDMENT / REVISION DESCRIPTION	APPROVAL	DRAWINGS / DESIGN PREPARED BY		TITLE	NAME	DATE	 Transport Roads & Maritime Services PREPARED FOR REGIONAL MAINTENANCE DISTRICT WORKS CENTRAL WEST RMS REGISTRATION No. DS2019/000516 ISSUE STATUS 80% DETAILED DESIGN EDMS No. SHEET No. LS-0301 REV 0	
		0	22.11.19	ISSUED FOR 80% CONCEPT DESIGN	T.BARRAND	 177 Pacific Highway NORTH SYDNEY, NSW 2060 AUSTRALIA Tel: (02) 9928 2100 Fax: (02) 9928 2500 Web: www.jacobs.com		DRAWN	E.HUANG	22.11.19		
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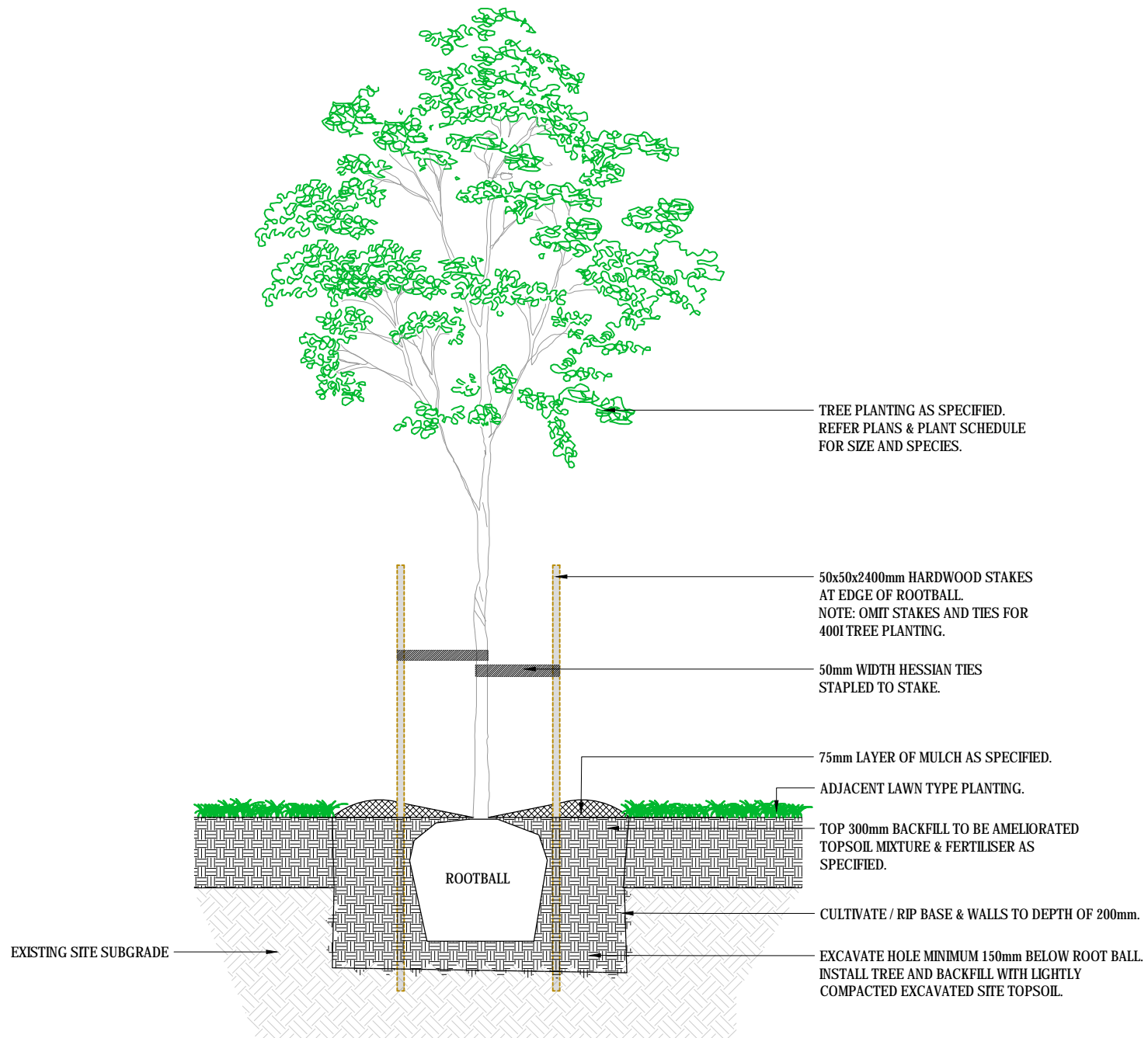
A3

SHEET 1 OF 2

PART
LS

REV
0

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TYPICAL TREE PLANTING DETAIL
NOT TO SCALE

TREE PLANTING AS SPECIFIED.
REFER PLANS & PLANT SCHEDULE
FOR SIZE AND SPECIES.

50x50x2400mm HARDWOOD STAKES
AT EDGE OF ROOTBALL.
NOTE: OMIT STAKES AND TIES FOR
400I TREE PLANTING.

50mm WIDTH HESSIAN TIES
STAPLED TO STAKE.

75mm LAYER OF MULCH AS SPECIFIED.

ADJACENT LAWN TYPE PLANTING.

TOP 300mm BACKFILL TO BE AMELIORATED
TOPSOIL MIXTURE & FERTILISER AS
SPECIFIED.

CULTIVATE / RIP BASE & WALLS TO DEPTH OF 200mm.

EXCAVATE HOLE MINIMUM 150mm BELOW ROOT BALL.
INSTALL TREE AND BACKFILL WITH LIGHTLY
COMPACTED EXCAVATED SITE TOPSOIL.

NOTES

- REFER LANDSCAPE PLANS FOR PLANTING AREAS.
- PLANT SPACING AND POT SIZES OUTLINED IN SCHEDULES.
REFER IA214400-DG-LS-0401.
- EROSION CONTROL BLANKET (REFER R178): TO BE A THICK
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INSTALLATION TO MANUFACTURERS RECOMMENDATIONS.

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			0	22.11.19	ISSUED FOR 80% CONCEPT DESIGN	T.BARRAND	CO-ORDINATE SYSTEM MGA_ZONE 55		177 Pacific Highway NORTH SYDNEY, NSW 2060 AUSTRALIA Tel: (02) 9928 2100 Fax: (02) 9928 2500 Web: www.jacobs.com		REGIONAL MAINTENANCE DISTRICT WORKS CENTRAL WEST		URBAN DESIGN AND LANDSCAPING TYPICAL DETAILS SHEET 2 OF 2		REV 0																					
							HEIGHT DATUM AHD				ISSUE STATUS 80% DETAILED DESIGN		EDMS No.	SHEET No. LS-0302																						

PLANTING SCHEDULE

BOTANICAL NAME	COMMON NAME	HEIGHT	SPREAD	POT SIZE	SPACING	QUANTITY
GATEWAY BOULEVARD TREE >5M HEIGHT (EXOTIC)						
FRAXINUS AMERICANA	WHITE ASH	11m	8m	200L	AS SHOWN	TBC
GATEWAY TREE PLANTING <5M HEIGHT (EXOTIC)						
ACER X FREEMANII 'SCARLET SENTINEL'	SCARLET SENTINEL MAPLE	12m	6m	200L	AS SHOWN	TBC
NATIVE SPECIMEN TREE PLANTING						
EUCALYPTUS BLAKELYI	BLAKELY'S RED-GUM	20m	8m	200L		TBC
NATIVE CLUSTER TREE PLANTING						
EUCALYPTUS ROSSII	SCRIBBLY GUM	15m	8m	200L		TBC
GRASS TYPE 1 'LAWN SPECIES'						
ECLIPSE CRUSADER						
JAPANESE MILLET	ECHINOCHLOA ESCULENTA			SEED		TBC
RED CLOVER GRASS	TRIFOLIUM PRATENSE			SEED		TBC
WHITE CLOVER GRASS	TRIFOLIUM REPENS			SEED		TBC
GRASS TYPE 2 'NATIVE GRASSLAND MIX'						
AUSTROSTIPA BIGENICULATA	KNEED SPEAR GRASS	1.2m	0.5m	SEED		TBC
AUSTROSTIPA SCABRA	ROUGH SPEAR GRASS	0.6m	1.3m	SEED		TBC
DANTHONIA RICHARDSONII	WALLABY GRASS	0.5m	1.3m	SEED		TBC
MICROLAENA STIPOIDES	WEEPING GRASS	0.7m	0.3m	SEED		TBC
THEMEDA TRIANDRA	KANGAROO GRASS	1m	0.5m	SEED		TBC
CREEK RESTORATION AND REVEGETATION						
ACACIA DEALBATA	SILVER WATTLE	12m	8m	150mm		TBC
ACACIA PARADOXA	KANGAROO ACACIA	3m	3m	150mm		TBC
ACACIA VESTITA	WEEPING BOREE	3m	3m	150mm		TBC
CALYTRIX TETRAGONA	FRINGE MYRTLE	2m	2m	150mm		TBC
HELICHRYSUM APICULATUM	YELLOW BUTTONS	0.6m	0.4m	150mm		TBC
LOMANDRA LONGIFOLIA	SPINY HEAD MAT-RUSH	1m	0.8m	TUBESTOCK		TBC
SWALE PLANTING						
BAUMEA JUNCEA	BARE TWIG RUSH	1m	0.9m	TUBESTOCK		TBC
LOMANDRA LONGIFOLIA	SPINY HEAD MAT-RUSH	1m	0.8m	TUBESTOCK		TBC
ISOLEPIS NODOSA	KNOBBY CLUB RUSH	0.8m	0.8m	TUBESTOCK		TBC
POA POIFORMIS	TUSOCK GRASS	1m	0.8m	TUBESTOCK		TBC

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0 5 10 15 20 25 30 35 40 45 50mm

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