Gocup Road intersection upgrade

Review of Environmental Factors

Transport for NSW | September 2021

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Prepared by NGH Pty Ltd and Transport for NSW

Document controls

Approval and authorisation

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Signed:	
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Executive summary

The proposal

Transport for NSW (Transport) proposes to upgrade the intersection of Gocup Road and the Snowy Mountains Highway (the proposal). The intersection is located within the Snowy Valleys Council Local Government Area (LGA) and is about three kilometres north west from the township centre of Tumut, NSW (refer Figure 1-1).

The proposal aims to significantly increase the safety of this intersection through the installation of a roundabout and key features including:

- rehabilitating approach span gradient to improve vehicle sight distance
- widening road shoulder and lane widths where needed
- clearing and trimming of vegetation including mature trees
- relocating of a section of overhead powerlines, with a second section to be moved underground as per images
- extending of existing drainage structure
- relocating the Wetlands Walking trail
- enhancing the visibility of signposting and line marking
- upgrading the protection and visible permeability of guardrail on approach spans
- improving pedestrian and cyclist accessibility around the intersection.

To carry out these works, the following construction activities are proposed:

- establishing of compound, stockpiles sites, and fencing, where required
- implementing of traffic control, including partial road closures and closures of side streets, where necessary
- installing of erosion and sediment controls
- relocating of utilities and power poles
- clearing of vegetation including mature trees
- removing of topsoil
- extending an existing drainage structure (cast insitu and/or precast unit)
- widening and building table drains
- widening existing pavement (with removal of pavement layers in some locations) and disposal/reuse of this pavement and subgrade material
- placing sub-base material, base material and bitumen wearing surfaces
- relocating active travel path for pedestrian and cyclist to northeast (to be closed during construction period with detours along alternative pedestrian/cycle paths within the wetland)
- modifying the pavement (in widening areas) with lime
- installing new and upgrading of existing safety barrier
- installing line marking and any roadside furniture including medians and signs
- site cleaning-up of site and removal of stockpiles
- landscaping and restoring disturbed areas
- removing traffic controls and any erosion and sediment controls.

Stockpile sites for the works would include (refer Figure 1-1):

- SWT4 Tumut Transport for NSW Depot Compound Site (500 metres west of project location)
- SWA 013 Stockpile Site (3.2km north of project location – Gocup Road)
- SWA 014 Stockpile Site (7.3km north of project location – Gocup Road)
- SWA 016 Stockpile Site (16.1km north of project location – Gocup Road)
- SWT4/10 Stockpile Site (14km west of project location – Snowy Mountains Highway).

Construction is expected to commence in late 2021 and would take around nine months to complete (weather permitting).

Need for the proposal

The intersection of Gocup Road and Snowy Mountains Highway has a history of road safety and traffic efficiency issues. Based on the Transport for NSW Summary Crash Report there have been 27 casualties from 24 crashes at the intersection since 2013 (Transport for NSW, 2021).

Gocup Road and Snowy Mountains Highway are single carriageways with one lane in either direction. The posted speed limit on Gocup Road is 50km/h (southbound) through the intersection (or 100km/h around 1km north of the intersection). After crossing the Snowy Mountains Highway (headed southbound) the road changes to Capper Street, a residential two way road, with roadside parking. The speed limit on Capper Street is 50km/h, with a school zone located about 300 metres south of the intersection. The Highway carries moderate to high traffic levels (including heavy vehicles such as Visy paper mill log transport) and is a gateway for traffic traveling into Kosciuszko National Park and an important junction point with Gocup Road.

The Gocup Road/Snowy Mountains Highway intersection poses a risk to safety as it is unregulated, that is a road without indication as to right of way, posing particular risk to vehicles travelling south from Gocup Road and north from Capper Street who must give way to traffic on the Snowy Mountains Highway.

Recent works carried out at the proposal location occurred to formalise vehicle moments around the intersection, as existing line marking and delineation was poor. However, since those upgrades, another fatal crash occurred on 16 May 2020 involving a vehicle travelling south on Gocup Road entering the intersection and colliding with a semi-trailer travelling west on the Snowy Highway, resulting in two fatalities. The proposal is in response to these ongoing safety issues and a strong push from the community and the acting Deputy Premier and Minister of Regional Transport and Roads (Paul Toole) to improve safety at the intersection (Transport for NSW, 2020).

Centre for Road Safety (CFRS) has completed an assessment of the intersection and recommended that the best way to improve road safety, and traffic efficiency at the intersection is to construct a roundabout.

Proposal objectives

The primary objective of the proposed works is to upgrade the safety and efficiency of traffic at this intersection by:

- improving safety for all road users by reducing potential for, and severity of, motor vehicle accidents
- improving traffic flow and efficiency, particularly for heavy vehicles
- improving connections to regional communities

Options considered

Transport CFRS developed and investigated six design options. These options were then assessed to identify which best met the objectives of the proposal of improving road safety, traffic flow and regional connections, and performed best with projected increase in traffic volumes. Options 1 - 5 did not improve safety as effectively as option 6 (roundabout); the roundabout was the only option that minimised all conflict points, impact speeds and impact angles.

Statutory and planning framework

Clause 94 of State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

The proposal is for the purposes of a road and is to be carried out by Transport and can therefore be assessed under Division 5.1 of the *Environmental Planning and Assessment Act 1979*. Development consent from council is not required.

A lease or licence will be required prior to the start of the construction period to occupy areas of Crown land under the *Crown Land Management Act 2016* (Division 3.4, 5.5 and 5.6). A road occupancy licence (ROL) under Section 138 of the NSW *Roads Act 1993* would be required prior to the start of the construction period to allow for road closures. No other approvals or licences are required for the proposal.

Community and stakeholder consultation

The primary methods for consultation carried out and proposed include:

- keeping the local community and other key stakeholders regularly informed about project progress
- ensuring community expectations are managed by providing clear and consistent messaging on the type of feedback required at all times
- ensuring community and stakeholder feedback is continuously fed into communication and engagement
- actively listening to feedback, investigate suggestions and report back
- engaging in a collaborative, innovative, adaptive and sustainable manner
- increasing stakeholder understanding of the Tumut intersection project and its objectives
- ensuring community and stakeholder enquiries about the project are managed and resolved effectively
- developing key messages, with particular focus on ensuring expectations are managed
- determining relevant and appropriate communication and engagement channels and timing
- being transparent in all that Transport does.

Due to restrictions around Covid 19, consultation is to be carried out primarily via digital methods.

To date, consultation has included:

- consultation with directly impacted businesses and residents throughout the initial planning phase
- a community update sent to residents in Tumut in December 2020, with a concept design
- project update in May 2021 - the community of Tumut were provided with a project update, detailing additional minor improvements to be delivered alongside the new roundabout infrastructure
- a workshop with Snowy Valleys Council (SVC) in May 2021.

Further consultation details are provided in section 5.

As part of the REF being released on public display, the community, agencies and stakeholders would be invited to provide feedback. Ongoing consultation would occur throughout the construction program with a focus on keeping the community and stakeholders informed of progress and delays across as many platforms as possible.

Environmental impacts

The main environmental impacts of the proposal are biodiversity, traffic and transport, noise and vibration and socio-economic. A summary of each is provided below.

It is noted that the impact assessment and impact area calculations have been based on the extent of the proposal shown in Figure 1-2 and are therefore the maximum impact assessment; the electrical works in

Figure 1-3 show a reduced impact area for the electrical works, which would therefore reduce the impact area further from what has been assessed in this report.

Biodiversity

The proposal would result in the direct loss of up to 1.036ha of planted native vegetation to be removed along the edge of the wetland, where it intersects the proposal area. The proposal is not likely to significantly impact threatened species or ecological communities or their habitats with the minor vegetation clearing.

Traffic and transport

During the construction period there would be altered traffic conditions at the intersection of Gocup Road and Snowy Valleys Highway including traffic control, and reduced speed limits (40km/hour). This may result in temporary delays and increased travel time for road users during the construction period.

Construction of the proposal would result in additional construction vehicle movements. Additional construction vehicles on the road network have the potential to contribute to traffic delays and queues for local traffic.

To reduce traffic impacts, the construction work would generally be carried out when traffic volumes within the road network are typically lower i.e. outside of peak hour traffic.

Once operational the proposal would result in improved safety and access and provision for future increased traffic volumes.

Noise and vibration

During the construction period there would be a temporary increase in noise levels which would result in noise level exceedances at nearby residential receivers. The most affected receivers are located to the west and south of the proposal. These noise impacts would be limited to the construction period and a range of management measures have been identified to manage these impacts.

An operational road traffic noise assessment predicted that noise levels at the ‘worst affected’ sensitive receiver locations would not increase more than 2 dB(A), as a result of the proposed minor works.

Socio-economic

Social impacts predicted during the construction phase include temporary disruption to bus stops and routes, traffic and parking impacts, and noise impacts. All construction related impacts are expected to be manageable with the implementation of standard safeguards. Ongoing impacts as a result of these changes are expected to be minor and ultimately justified as a result of the improved traffic efficiency and road safety benefits of the proposal.

Justification and conclusion

The proposal is a response to the crash history of Gocup Road and Snowy Mountains Highway intersection and predicted future traffic growth in the surrounding area. The construction of a roundabout meets the objectives to improve safety and efficiency for the intersection.

The REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity. Environmental impacts can be effectively mitigated with the application of safeguards outlined within the REF.

The environmental impacts of the proposal are not likely to be significant and therefore the preparation of an environmental impact statement and approval from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act is not required for the proposal.

The proposal is not likely to have a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the *Environment Protection and Biodiversity Conservation Act 1999*. A referral to the Australian Department of Agriculture, Water and Environment is not required.

Overall, the proposal is believed to be justified in meeting its objectives with long-term impacts and is therefore justified and is in the interest of the public.

Display of the Review of Environmental Factors (REF)

This REF is on display for comment between Monday 27 September 2021 and Sunday ~~24~~ October 2021. You can access the documents in the following ways:

Internet

The documents are available as pdf files on the Transport website at nswroads.work/tiu

Printed copies

The documents can be viewed at the following locations:

Snowy Valleys Council office: 76 Capper Street, Tumut. This location will be staffed between 8.30am and 4.30pm, seven days per week.

Copies by request

Printed and electronic copies are available by contacting SouthProjects@transport.nsw.gov.au and (02) 6923 6525, noting that there may be a charge for hard copies, CD or USB.

How can I make a submission?

To make a submission about this proposal, please send your written comments to:

PO Box 484, Wagga Wagga, NSW 2650

SouthProjects@transport.nsw.gov.au

Submissions must be received by midnight on Sunday ~~24~~ October 2021. Submissions will be managed in accordance with Transport's Privacy Statement which can be found at transport.nsw.gov.au/privacy-statement or by contacting SouthProjects@transport.nsw.gov.au for a copy.

What happens next?

Transport will collate and consider the submissions received during public display of the REF.

After this consideration, Transport will determine whether or not the proposal should proceed as proposed and will inform the community and stakeholders of this decision.

If the proposal is determined to proceed, Transport will continue to consult with the community and stakeholders prior to and during construction.

Contents

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Tables

Figures

Appendices

Appendix A	Detailed Design
Appendix B	Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI)
Appendix C	Biodiversity Assessment (BA)
Appendix D	Statutory Consultation Checklists
Appendix E	Consideration of clause 228(2) factors and matters of national environmental significance and Commonwealth land
Appendix F	Background Searches
Appendix G	Site Photos
Appendix H	Noise and Vibration Assessment

1. Introduction

This chapter introduces the proposal and provides the context of the environmental assessment. In introducing the proposal, the objectives and project development history are detailed and the purpose of the report provided.

1.1 Proposal identification

Transport for NSW (Transport) proposes to upgrade the intersection of Gocup Road and the Snowy Mountains Highway in order to address significant road safety issues (the proposal). The proposal aims to significantly increase the safety of this intersection through the installation of a roundabout and key features including:

- rehabilitating approach span gradient to improve vehicle sight distance
- widening road shoulder and lane widths where needed
- clearing and trimming of vegetation including mature trees
- relocating of a section of overhead powerlines, with a second section to be moved underground as per images
- extending of existing drainage structure
- relocating the Wetlands Walking trail
- enhancing the visibility of signposting and line marking
- upgrading the protection and visible permeability of guardrail on approach spans
- improving pedestrian and cyclist accessibility around the intersection.

The intersection is located within the Snowy Valleys Council Local Government Area (LGA) and is about three kilometres north west from the township centre of Tumut, NSW (refer Figure 1-1). Stockpile sites for the works would include (refer Figure 1-1):

- SWT4 Tumut Transport for NSW Depot Compound Site (500 metres west of project location)
- SWA 013 Stockpile Site (3.2km north of project location – Gocup Road)
- SWA 014 Stockpile Site (7.3km north of project location – Gocup Road)
- SWA 016 Stockpile Site (16.1km north of project location – Gocup Road)
- SWT4/10 Stockpile Site (14km west of project location – Snowy Mountains Highway).

To undertake these works, the following construction activities are proposed:

- establishing of compound, stockpiles sites, and fencing, where required
- implementing of traffic control, including partial road closures and closures of side streets, where necessary
- installing of erosion and sediment controls
- relocating of utilities and power poles
- clearing of vegetation including mature trees
- removing of topsoil
- extending an existing drainage structure (cast insitu and/or precast unit)
- widening and building table drains

- widening existing pavement (with removal of pavement layers in some locations) and disposal/reuse of this pavement and subgrade material
- placing sub-base material, base material and bitumen wearing surfaces
- relocating active travel path for pedestrian and cyclist to northeast (to be closed during construction period with detours along alternative pedestrian/cycle paths within the wetland)
- modifying the pavement (in widening areas) with lime
- installing new and upgrading of existing safety barrier
- installing line marking and any roadside furniture including medians and signs
- site cleaning-up of site and removal of stockpiles
- landscaping and restoring disturbed areas
- removing traffic controls and any erosion and sediment controls.

The location of the proposal is shown in Figure 1-1 and an overview of the proposal is provided in Figure 1-2. Transport has refined the electrical construction limits to be that shown in Figure 1-3. This provides further detail on the electrical construction limits, however, all estimates of vegetation clearing and impact assessments are based on the extent provided in Figure 1-2, which is the maximum impact likely from the proposal. Chapter 3 describes the proposal in more detail.

1.2 Terms used in this report

The following terms are used in this report:

- proposal: road upgrades at the intersection of Gocup Road, Snowy Mountains Highway
- proposal area: the road corridor of Gocup Road for 200 metres north of the intersection, Snowy Mountains Highway for 350 metre east of the intersection, Capper Street for 100 metres south of the intersection, and Adelong Road, from 160 metres west of the intersection, as well as the local road corridor and sections of surrounding road shoulder, including the construction and electrical construction limits, and Tumut Wetlands to the north as seen in Figure 1-2.

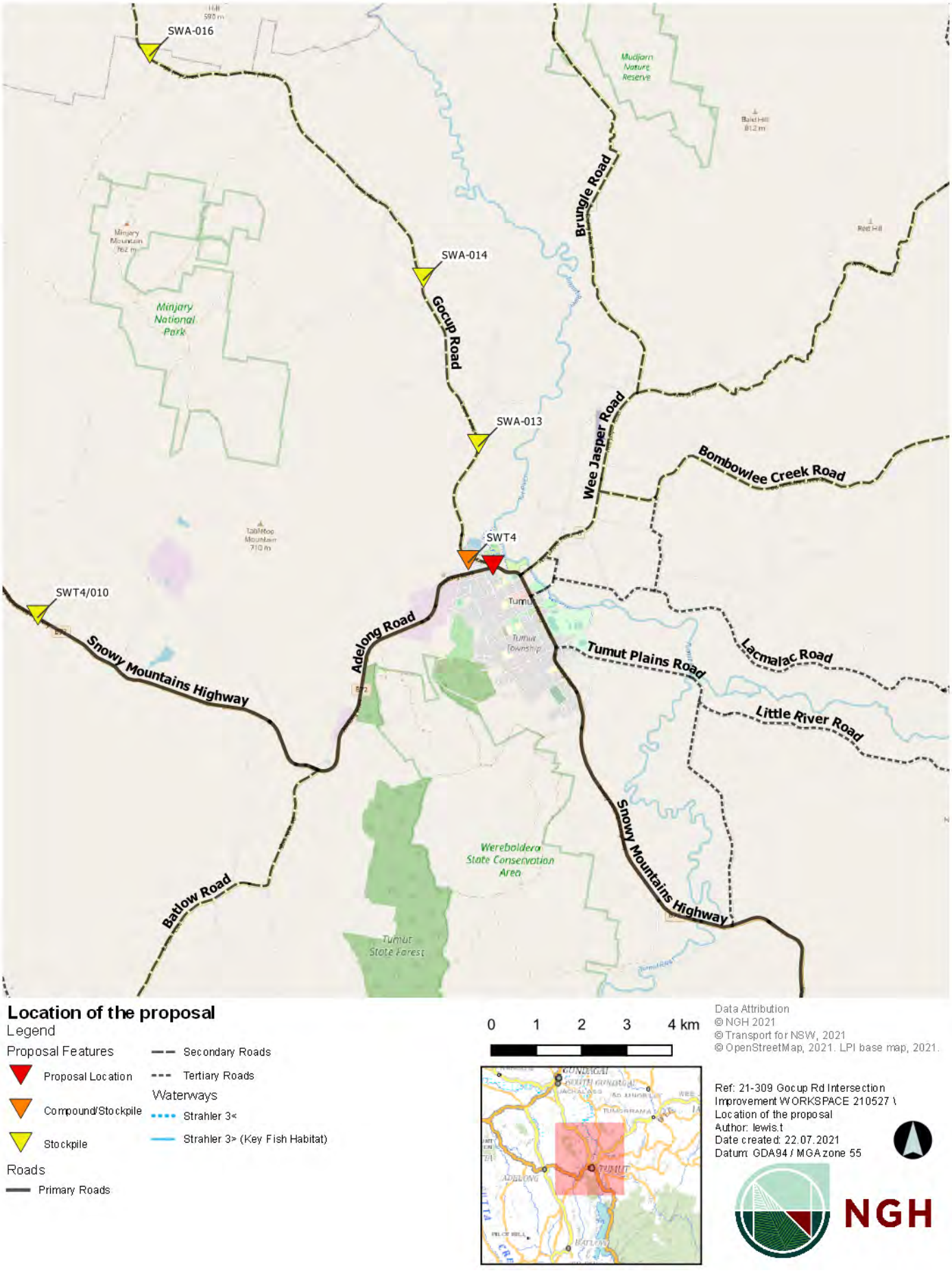


Figure 1-1 Location of the proposal

Figure 1-2 The proposal
(NB: see Figure 1-3 for detailed electrical construction limits)

Figure 1-3 Proposed electrical disturbance corridor – blue shading is the new corridor, pink shading is the old corridor (TfNSW, 2021)

1.3 Purpose of the report

This review of environmental factors (REF) has been prepared by NGH Pty Ltd on behalf of Transport for NSW's Maintenance and Delivery Directorate. For the purposes of these works, Transport is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The purpose of the REF is to describe the proposal, to document the likely impacts of the proposal on the environment, and to detail mitigation and management measures to be implemented.

The description of the proposed work and assessment of associated environmental impacts has been undertaken in the context of clause 228 of the Environmental Planning and Assessment Regulation 2000, the factors in *Is an EIS Required? Best Practice Guidelines for Part 5 of the Environmental Planning and Assessment Act 1979* (Is an EIS required? guidelines) (DUAP, 1995/1996), *Roads and Related Facilities EIS Guideline (DUAP 1996)*, the *Biodiversity Conservation Act 2016 (BC Act), the Fisheries Management Act 1994* (FM Act), and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In doing so, the REF helps to fulfil the requirements of:

- section 5.5 of the EP&A Act including that Transport examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

The findings of the REF would be considered when assessing:

- whether the proposal is likely to have a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act
- the significance of any impact on threatened species as defined by the BC Act and/or FM Act, in section 1.7 of the EP&A Act and therefore the requirement for a Species Impact Statement or a Biodiversity Development Assessment Report
- the significance of any impact on nationally listed biodiversity matters under the EPBC Act, including whether there is a real possibility that the activity may threaten long-term survival of these matters, and whether offsets are required and able to be secured.

The potential for the proposal to significantly impact any other matters of national environmental significance or Commonwealth land and the need, subject to the EPBC Act strategic assessment approval, to make a referral to the Australian Government Department of Agriculture, Water and the Environment for a decision by the Commonwealth Minister for the Environment on whether assessment and approval is required under the EPBC Act.

2. Need and options considered

This chapter describes the need for the proposal in terms of its strategic setting and operational need. It identifies the various options considered and the selection of the preferred option for the proposal.

2.1 Strategic need for the proposal

The intersection of Gocup Road and Snowy Mountains Highway has a history of road safety and traffic efficiency issues. Based on the Transport for NSW Summary Crash Report there have been 27 casualties from 24 crashes at the intersection since 2013 (Transport for NSW, 2021). The intersection is required to be upgraded to address these concerns.

Recent works carried out at the proposal location occurred to formalise vehicle moments around the intersection, as existing line marking and delineation was poor. These works included the installation of a designated right hand turn bay into Capper Street and the installation of an island on Gocup Road to prevent uncontrolled slip lane movements on Snowy Mountains Highway. Vehicle activated signs were also provided to advise motorists of the approaching intersection, and to “Slow Down”. A roundabout upgrade was not considered at this stage of upgrade activities due to cost.

On 16 May 2020 a fatal crash occurred, involving a vehicle travelling south on Gocup Road entering the intersection and colliding with a semi-trailer travelling west on the Snowy Highway, resulting in two fatalities. The proposal is in response to these safety issues and a strong push from the community to improve safety at the intersection (Transport for NSW, 2020). Acting Deputy Premier and Minister of Regional Transport and Roads (Paul Toole) instructed the Centre for Road Safety (CFRS) to complete an assessment of the intersection. The recommended outcome from the CFRS was to construct a roundabout.

With further traffic growth predicted in coming years, the proposal is needed to ensure the intersection can manage increasing traffic volumes.

The proposal is also considered to be consistent with the objectives of the following Australian and State government strategic documents:

- Restart NSW (Infrastructure NSW, 2019)
- Future Transport Strategy 2056 (Transport for NSW, 2018)
- Building Momentum: State Infrastructure Strategy 2018 (Infrastructure NSW, 2018)
- NSW Road Safety Strategy 2012 – 2021 (Transport for NSW, 2012).

Restart NSW

In 2011 the NSW Government started the Restart NSW Fund to improve the economic growth and productivity of the state. The fund provides for local and community infrastructure projects such as road and rail upgrades, projects which support safe and reliable water sources, that boost tourism and those which drive economic growth and productivity.

Part of the funding for the proposal was granted by the Housing Acceleration Fund, which is one of the funding programs of Restart NSW. The Housing Acceleration Fund provides grants to assist in road upgrades and the provision of water supply and sewage infrastructure to accelerate housing development across NSW.

The proposal would be consistent with the goals of Restart NSW and the Housing Acceleration Fund, as it would improve road infrastructure for new housing developments in the surrounding area.

Future Transport 2056

The Future Transport Strategy 2056 (Future Transport Strategy) provides the framework for delivery of a transport system which focuses on customer needs and maximises the benefits of emerging technologies and innovation.

The Future Transport Strategy introduces the safe system approach which incorporates safe roads, safe speeds, safe vehicles and safe people. The safe system is used to assist in reducing road trauma as part of the NSW Road Safety Plan 2021.

The proposal is considered in alignment with the Future Transport Strategy as it would improve road user safety at the intersection through the installation of a roundabout.

Building Momentum: State Infrastructure Strategy 2018

The Building Momentum: State Infrastructure Strategy 2018 – 2038 (Infrastructure NSW, 2018) is used as a strategic guide for the NSW government to plan and fund infrastructure projects over the next 20 years.

The 2018 State Infrastructure Strategy considered a range of sector-based infrastructure areas. The strategic objective of the Transport sector is to, 'ensure the transport system creates opportunities for people and businesses to access the services and support they need'. By carrying out the proposal, surrounding residents and road users would have improved road infrastructure, which is in alignment with the strategic Transport objective of the 2018 State Infrastructure Strategy.

NSW Road Safety Strategy 2012 – 2021

The NSW Road Safety Strategy 2012-2021 (Safety Strategy) establishes the direction of road safety in NSW for the next 10 years. The Safety Strategy aims to improve road safety by identifying and upgrading black spots, promoting safety features in cars, enforcing speed limits and other road rules, and education to encourage road users to take less risks on NSW roads.

The key directions identified within the Safety Strategy are considered consistent with the objectives of the proposal (refer to section 2.3) and the anticipated outcomes of the proposal.

2.2 Limitations of existing infrastructure

Gocup Road/Capper Road

Gocup Road is single carriageway with one lane in either direction. The posted speed limit on Gocup Road (northbound) is 100km/h, and 50km/h (southbound) through the intersection. After crossing the Snowy Mountains Highway (headed southbound) the road changes to Capper Street, a residential two way road, with roadside parking. The speed limit on Capper Street is 50km/h, with a school zone located about 300 metres south of the intersection.

There are a variety of road users on Gocup Road and Capper Street including cyclists and buses (i.e. buses 723 and 724 traveling from Cootamundra to Tumbarumba). There are currently no dedicated cyclist facilities or bus stops along these roads within the proposal area.

There are no other traffic lights or traffic light controlled pedestrian crossings within the proposal area. The intersection is an unregulated give way crossroads intersecting Gocup Road and Capper Street with the Snowy Mountains Highway (Transport for NSW, 2020).

The intersection has streetlights on each corner, an electrical powerline that runs north east into the adjacent wetland (Figure 1-3), as well as a large cluster of underground public utilities to the north west. Disturbance within the old powerline corridor would be limited to removal of the old cable (most likely dragged out from one end), and where the old powerline corridor and new powerline corridor meet there

would be surface disturbance with either a new heavy duty power pole installed, or a cable stay to alleviate stress caused by changing the direction of the cable.

Snowy Mountains Highway/Adelong Road

Snowy Mountains Highway has a single lane in either direction. The road bends left with dense vegetation blocking vision of the intersection for vehicles approaching from the east, views as it approaches the Gocup Road/Capper Street intersection. The posted speed limit on the Snowy Mountains Highway through the intersection is 50km/h (Transport for NSW, 2020).

The road carries moderate to high traffic levels (including heavy vehicles such as Visy paper mill log transport). It is a gateway for traffic traveling into Kosciuszko National Park and an important junction point with Gocup Road.

Gocup Road/Snowy Mountains Highway Intersection

The intersection poses a risk to safety as it is unregulated, that is a road without indication as to right of way, posing particular risk to vehicles travelling south from Gocup Road and north from Capper Street who must give way to traffic on the Snowy Mountains Highway (Transport for NSW, 2020).

Using the Safer Roads Risk Assessment Platform and Safe Systems approach, the intersection has been identified as being in the top 2.1 per cent of intersections in NSW for risk. This evaluation is based on design elements including lane and shoulder width, road curve and safety barriers. Snowy Mountains Highway from the east has been rated a three (out of five)-star road. Snowy Mountains Highway from the west and Gocup Road are four-star roads (Transport for NSW, 2020).

The combination of these infrastructure limitations have contributed to the considerable safety risks for vehicles using this intersection contributing to the need for the proposal.

2.3 Proposal objectives and development criteria

Transport is responsible for developing and implementing strategies that ensure the safety of all road users. Due to the moderate volume of traffic using the Snowy Mountains Highway at the Gocup Road intersection, and crash history of the site, Transport has identified the need to perform safety upgrades to rectify the existing infrastructure. The primary objective of the proposed works is to upgrade the safety and efficiency of traffic at this intersection, as described below:

- high number of vehicles using intersection
- poor approach sight distance
- queuing of vehicles
- high approach speed from Gocup Road
- high number of heavy vehicle turning manoeuvres
- poor delineation, with no designated turning lanes.

2.3.1 Proposal objectives

The objectives of the proposal include:

- improving safety for all road users by reducing potential for, and severity of, motor vehicle accidents
- improving traffic flow and efficiency, particularly for heavy vehicles
- improving connections to regional communities.

2.3.2 Development criteria

The development criteria for the proposal include:

- designing the proposed upgrades to meet the environmental requirements and to limit adverse impacts to the natural environment, while maximising the environmental benefits
- satisfying the technical and procedural requirements of Transport and Snowy Valleys Council with respect to the design of the proposed upgrades and subsequent construction and tender documentation
- optimising the design to ensure that the proposed upgrades can be practically and efficiently constructed and maintained while meeting all other proposal objectives
- applying appropriate urban design, landscape and visual principles in the design of the proposal elements
- planning temporary arrangements that minimise disruption to traffic and maintaining access to adjacent properties during construction
- developing, implementing and maintaining effective management systems for quality, work health and safety, environmental, project reporting, risk management, value management and value engineering, constructability assessment, safety audits and community participation
- minimising impacts to utilities and properties.

2.3.3 Urban design objectives

Urban design objectives for the proposal include:

- ensuring the landscaping is consistent with the existing environment
- reflecting the built, natural and community environment of Snowy Valleys Council
- contributing to the overall quality of the public domain for the community and all road users.

2.4 Alternatives and options considered

The development of the proposal has involved the analysis of multiple strategic design options and the selection of a preferred design option which best meets the project objective and minimises potential environmental and community impacts. The following describes the options selection process.

2.4.1 Methodology for selection of preferred option

Transport engaged the Centre for Road Safety (CFRS) to investigate the best possible safety outcome for the community (Transport for NSW, 2021).

Transport's CFRS developed several strategic design options including do nothing, traffic lights, closing Capper Street, raising the intersection, closing Gocup Road and moving the intersection, and installation of a roundabout (Transport for NSW, 2021). These options were then assessed with traffic modelling to identify which performed best with the projected increase in traffic volumes, as well as which best met the proposal objective.

2.4.2 Identified options

A total of six options were considered for the proposal, including the “do nothing” option. The options are quoted from the CFRS: Safety Assessment Gocup Road, Tumut, Executive Summary (September 2020) as follows:

1. **do nothing** further except ban movements and reduce the speed limit at the intersection. This option does not improve safety at the intersection and would require a safety performance review every 12 months if adopted.
2. **traffic lights** to simplify road user decisions. Traffic lights would not minimise conflict points, impact speeds or impact angles. This option would address the existing crash history. Construction would take an estimated 18 to 30 months to complete from approval.
3. **close Capper Street** to reduce conflict points and simplify road user decisions. This would not minimise impact speeds or impact angles, nor address the crash history associated with turning movements from Gocup Road. Construction would take an estimated 12 months to complete from approval.
4. **raised intersection** to slow the approach speeds to the intersection. This would not simplify road user decisions or minimise conflict points or impact angles. This option would address some of the location’s crash history by reducing severity of crashes due to the slower approach speeds to the intersection. Construction completion would be an estimated 12 to 24 months following project approval.
5. **close Gocup Road and move the intersection** to remove the safety risks at the existing intersection. This option would reduce the conflict point and remove road user decisions associated with Gocup Road but would not minimise impact speeds or impact angles. Crash mitigation would have to be considered at the new intersection at Boundary Street, where an upgrade would be expected with a single lane roundabout based on traffic volumes. This option would require significant development work, including utilities and property boundaries assessments. Construction would be an estimated 36 to 60 months from approval.
6. **roundabout** to reduce conflict points, simplify road user decisions and minimise impact speeds and impact angles. Installing a roundabout would address the site’s crash history, with a non-mountable annulus considered most effective. Construction completion would be an estimated 18 to 30 months following project approval.

2.4.3 Analysis of options

The selection of the preferred option was based on which option best met the proposal objectives (refer to section 2.3). Analysis of the six options was based on vehicle speeds, impact angles, conflict points, direction and percentage likelihood of serious injury.

Studies have shown roundabouts are safer than traffic lights, improve traffic flow and are more efficient for heavy vehicles (Transport for NSW, 2020). In pursuit of a reduction in accidents and fatalities, roundabouts improve intersection safety by:

- reducing vehicle speeds, making it easier to choose a safe gap in traffic
- minimising the impact angles of approach, leading to lower severity crashes
- having significantly fewer conflict points
- directing motorists in one direction
- reducing the risk of being seriously injured by up to 85 per cent.

2.5 Preferred option

Based on the analysis provided in 2.4.3, the preferred option is Option 6. This option was identified to best meet the proposal objective of improving road safety, traffic flow and regional connections.

Although this option would have some environmental and social impacts during both construction and operation (noise, visual, traffic and access), these have been minimised through the design process and would be managed in accordance with standard safeguards and mitigation measures during construction. The perceived traffic efficiency and road safety related benefits during operation are considered to outweigh the minor, negative impacts associated with the proposal. As such, Option six (roundabout) is the preferred option.

2.6 Design refinements

A number of design refinements have occurred since the selection of the preferred option. The design refinements applied to the initial concept design include:

- initial concept designs located the roundabout further towards the southeast. This design was deemed unacceptable due to poor access, wet areas, vegetation density, the amount of earthworks required, and the amount of land acquisition required. Re-alignment to the north east materially reduced these limitations.
- the roundabout centre was kept to the east due to high utilities density to the west (which would involve high relocation costs).
- the approach alignment to the intersection from the east and from the north have been refined to improve sight distance including extending works further east for clear sight distance from the east.
- Gocup Road approach has been narrowed and median extended in an effort to reduce approach speeds on roundabout.
- vegetation was identified for removal on the northwest corner of the works to improve vision of oncoming traffic.
- the approach elevation of Gocup Road has been raised to improve sight distance.
- maintaining existing pedestrian access including relocation of the existing walking path adjacent to the wetlands.
- provision has been made in the design for future pedestrian access in crossing Gocup Road and Snowy Mountains Highway to the west.
- removal of retaining wall to the south eastern corner, as it would not be required.

3. Description of the proposal

This chapter describes the proposal and provides descriptions of existing conditions, the design parameters including major design features, the construction method and associated infrastructure and activities.

3.1 The proposal

Transport proposes to upgrade the intersection of Gocup Road and the Snowy Mountains Highway in order to address road safety issues. The proposal is shown in Figure 1-2.

Key features of the proposal would include:

- providing improved vehicle sight distance along and to intersection approaches
- widening road shoulder and lane widths where needed
- clearing and trimming of vegetation including mature trees
- relocating a section of overhead powerlines, with a second section to be moved underground as per images
- extending existing drainage structure
- relocating the Wetlands Walking trail
- enhancing the visibility of signposting and line marking
- upgrading the protection and visible permeability of guardrail on approach spans
- improving pedestrian and cyclist accessibility around the intersection.

Key features of the proposal are shown in Figure 3-1. The roundabout upgrade detailed design can be seen in Appendix A and in Figure 3-2, Figure 3-3, Figure 3-4, and Figure 3-5.

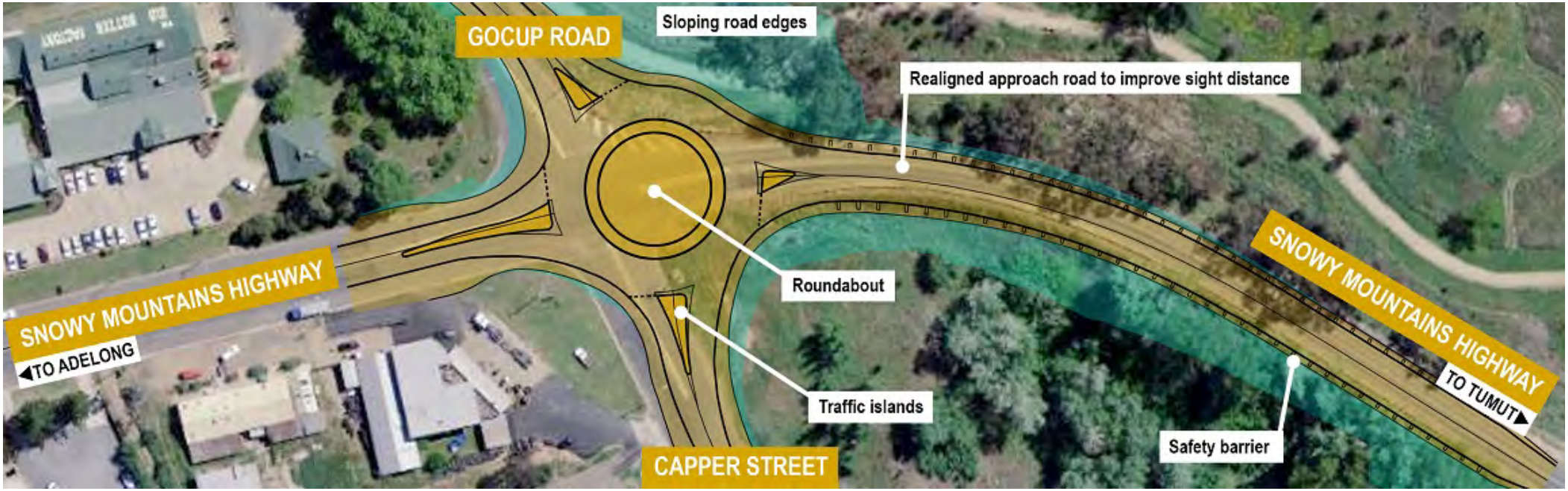


Figure 3-1 Key features of the proposal (Transport for NSW, 2021)

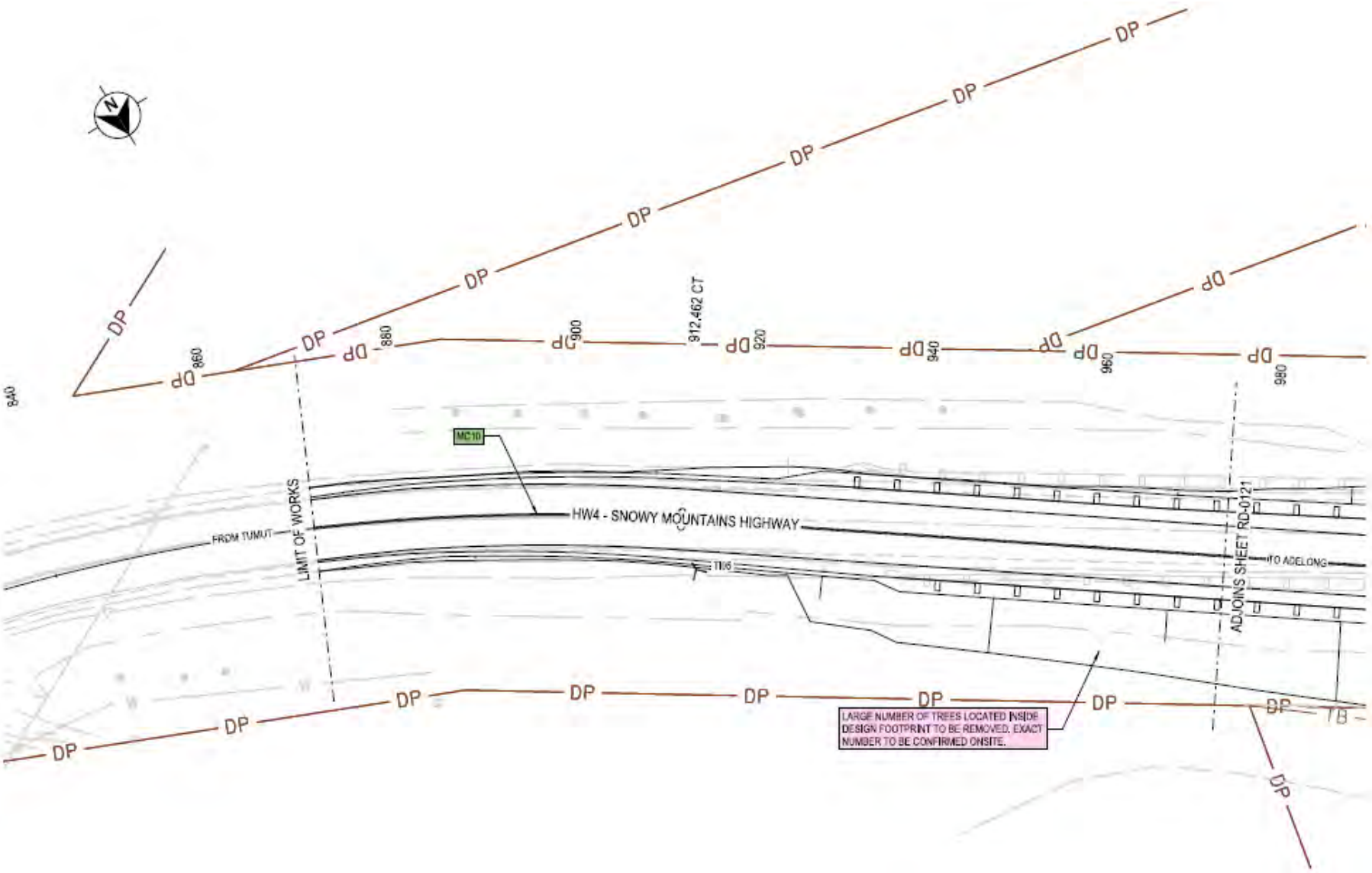


Figure 3-2 Key features of the proposal – Detail plan 1 of 5 (Transport for NSW, 2021)

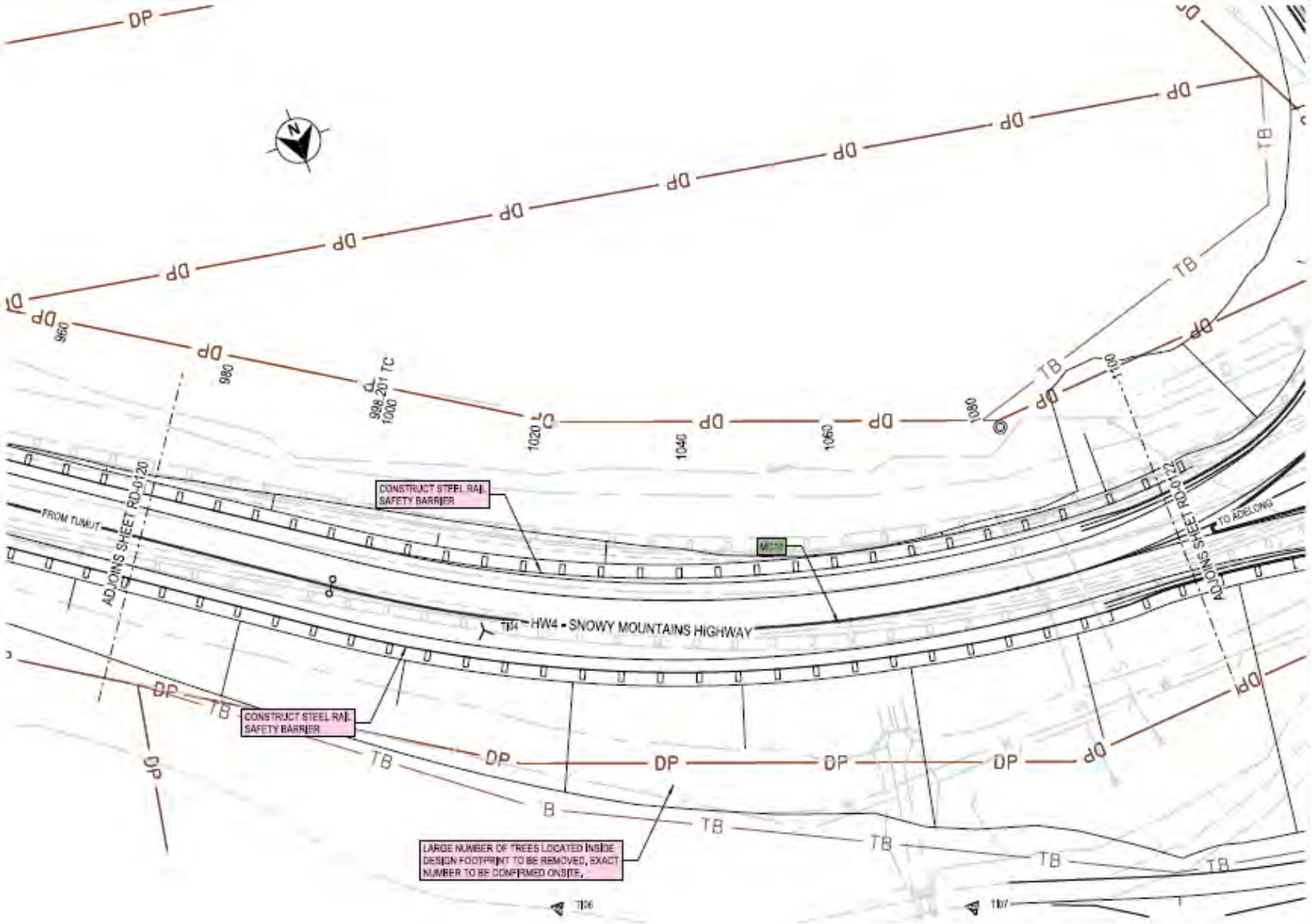


Figure 3-3 Key features of the proposal – Detail plan 2 of 5 (Transport for NSW, 2021)

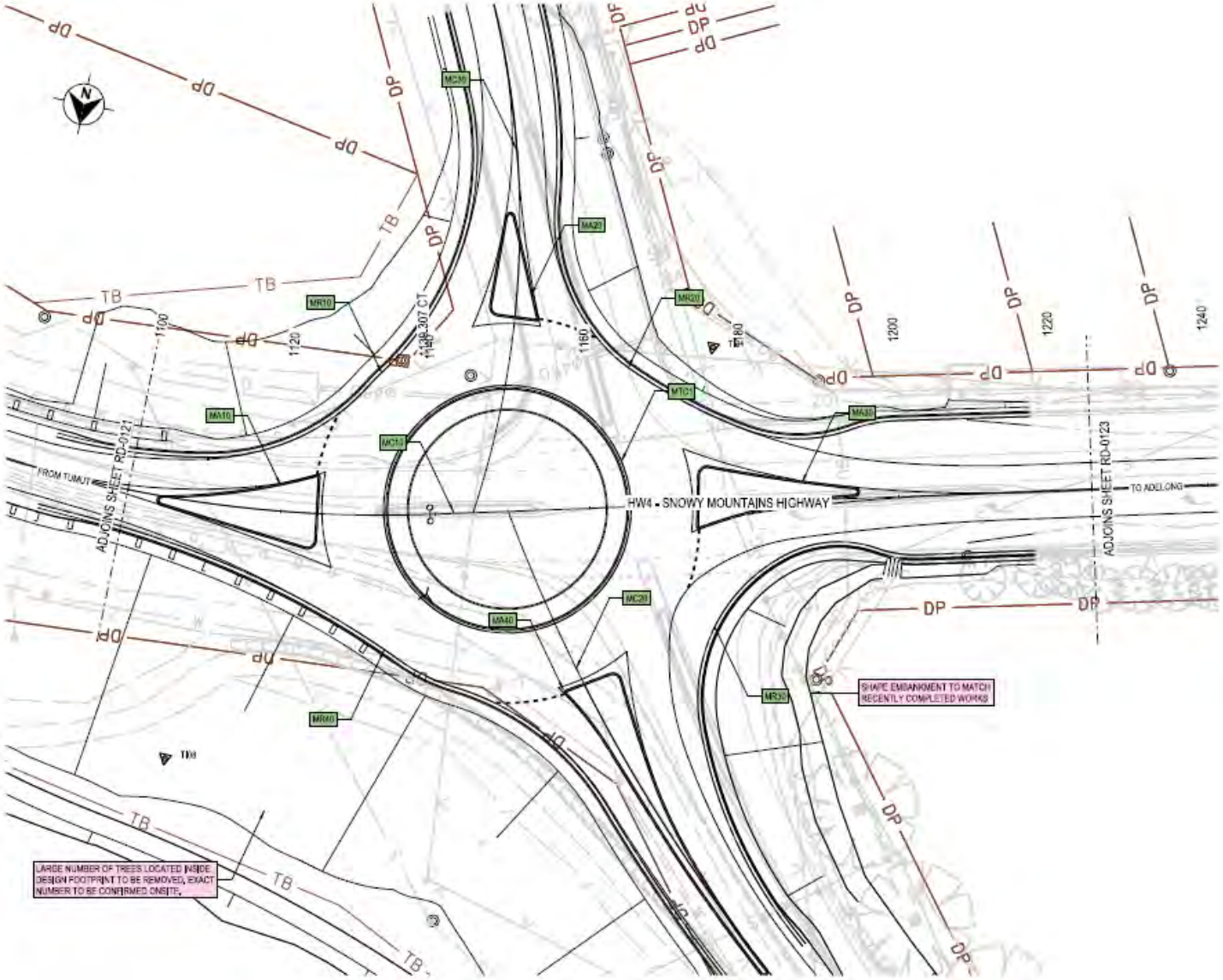


Figure 3-4 Key features of the proposal – Detail plan 3 of 5 (Transport for NSW, 2021)

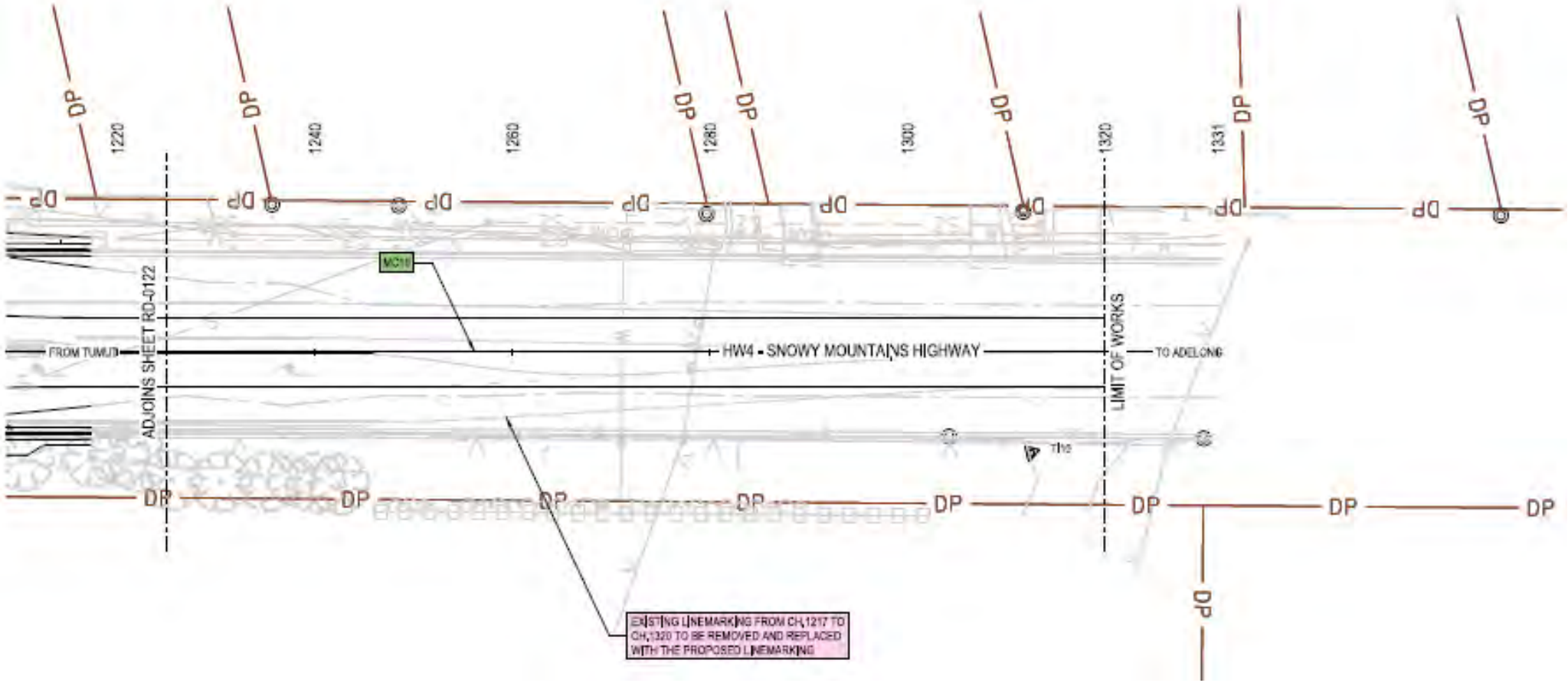


Figure 3-5 Key features of the proposal – Detail plan 4 of 5 (Transport for NSW, 2021)

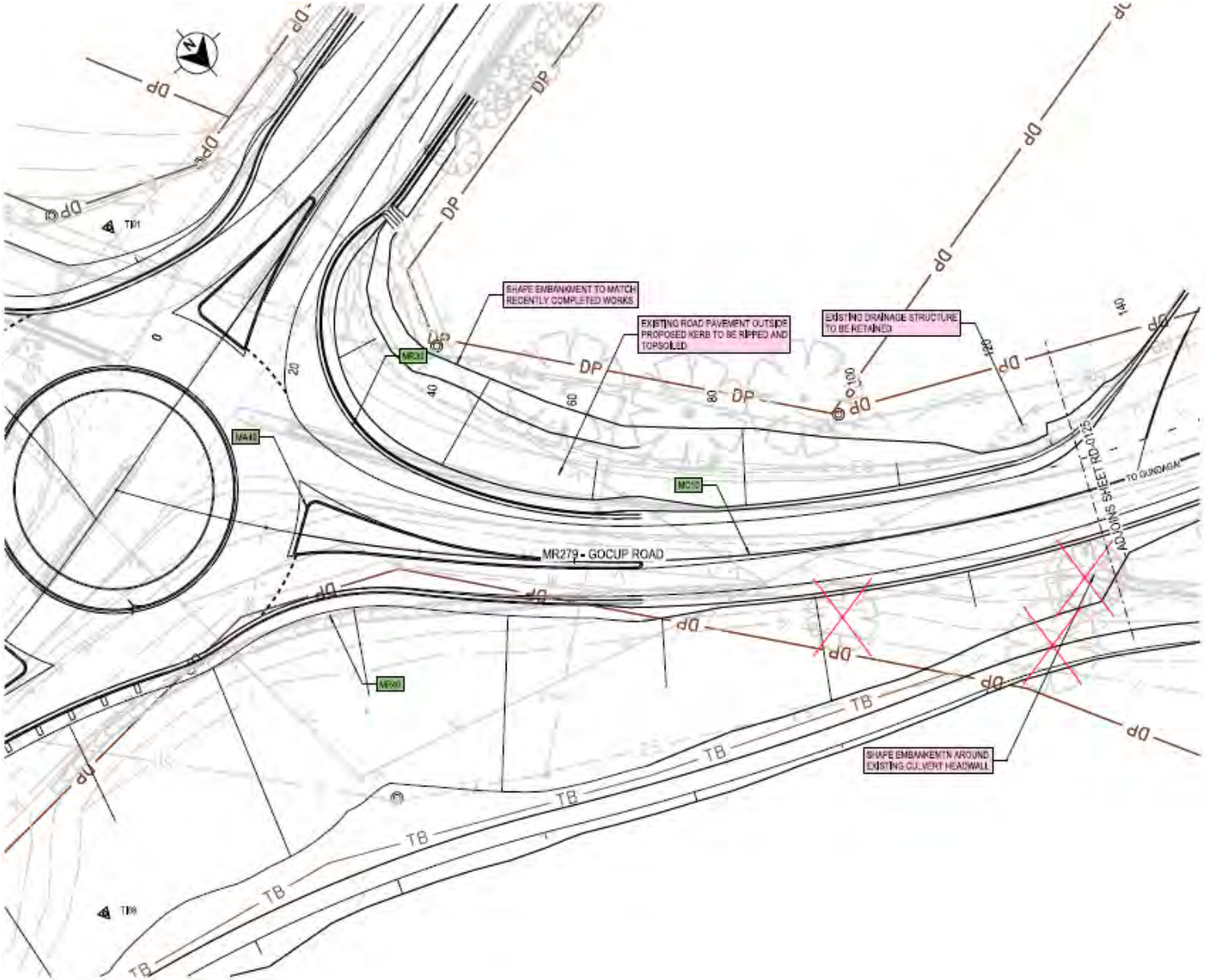


Figure 3-6 Key features of the proposal – Detail plan 5 of 5 (Transport for NSW, 2021)

3.2 Design

3.2.1 Design criteria

The design would include bulk earthworks, pavement construction, safety barrier installation, stormwater drainage measures, minor concrete works, street lighting, service relocation, possible property acquisition and other ancillary works. The design would also provide minor realignment and rehabilitating of the Snowy Mountains Highway eastern approach leg to improve approach sight distance to the roundabout. This would include the removal of up to 1.036 hectares (ha) of planted native vegetation.

More detailed elements of the design (including typical cross section) can be found in the detailed design under Appendix A, however, a few additional noteworthy features include:

- a large number of trees are located inside the design footprint to the north of Snowy Mountains Highway along the wetlands. These would need to be removed for constructability of the proposal.
- a steel rail safety barrier is to be constructed on the road edge of the Snowy Mountains Highway along approach to roundabout.
- existing road pavement outside of the proposed kerb (to the west at Gocup Road and Capper Street) would be removed, and area rehabilitated.
- an existing drainage structure at chainage 120 along Gocup Road) is to be retained, whilst on the opposite side of Gocup Road the embankment would be shaped around the existing culvert headwall as per Figure 3-6. Five new drainage pipes are proposed as per the Stormwater Management Plan in the detailed design in Appendix A.
- the embankment along the north western edge would be shaped to match the recently completely works.
- existing line marking along the Snowy Mountains Highway in the vicinity of the proposal are to be removed and replaced with new line markings.

Design constraints also include:

- minimising or avoiding property impacts
- minimising or avoiding utility impacts
- where pavement widening is required, widen to one side only to improve constructability.

3.2.2 Engineering constraints

Some minor engineering constraints identified include:

- a large number of underground utilities along the north western edge of the proposal (also extending to the southwest corner), which require the roundabout be moved east to avoid gas, optic fibre, electrical, Telstra, sewer and overhead powerlines.
- a large Visy watermain is located directly beneath the roundabout which would require relocation to the toe of the batter in the north east.
- powerlines that are a hazard to construction would be placed underground. These powerlines are located close to the intersection of Gocup Road and Snowy Mountains Highway.
- a powerline that runs north east through the adjacent wetland would need to be diverted to the west (meeting at a different power pole at the end of the project on Gocup Road) to avoid construction. Vegetation clearing would be kept to the minimum extent necessary to undertake the works.

3.2.3 Major design features

Major design features include:

- large roundabout with major fill component to northeast and some to southeast
- powerlines located close to the intersection of Gocup Road and Snowy Mountains Highway would be relocated underground
- sealed and lighted wetlands shared pathway (in project vicinity)
- rehabilitating approach span gradient, and providing better approach lines to improve vehicle sight distance and visibility to roundabout
- enhancing the visibility of signposting and line marking
- safety barriers where required (upgrading the protection and visible permeability of guardrail on approach spans)
- provision for future pedestrian access
- widening road shoulder and lane widths where needed
- clearing and trimming of vegetation including mature trees.

3.3 Construction activities

The likely method, staging, work hours, plant and equipment requirements needed to build the proposal are described in this section. An indicative work plan and method are also provided.

3.3.1 Work methodology

Detailed construction activities and work methodologies would be determined during detailed design and construction planning. Construction activities would follow a Construction Environmental Management Plan (CEMP) to ensure the work is carried out to Transport specifications within the specified work area.

The proposal would involve the work methodology as outlined in Table 3-1.

Table 3-1 Proposed work methodology

Activity	Methodology
General site establishment	• establishment of compound, stockpiles sites, and fencing, where required • implementation of traffic control, including partial road closures and closures of side streets, where necessary • installation of erosion and sediment controls.
Utility relocation/drainage adjustments	• identification and relocation of utilities and power poles.
Vegetation clearing/trimming	• clearing of vegetation including mature trees • removal of topsoil.
Pavement widening	• widening of existing pavement (with removal of pavement layers in some locations) and disposal/reuse of this pavement and subgrade material • construction of access way to become pathway • bulk earthworks including placement of sub-base material, base material and bitumen wearing surfaces

Activity	Methodology
	• drainage works (culverts, subsoils, kerb and gutter) • street lighting • relocation of active travel path for pedestrian and cyclist to northeast (to be closed during construction period with detours along alternative pedestrian/cycle paths within the wetland) • modification of the pavement (in widening areas) with lime.
Safety barrier installation	• installation of new and upgrading of safety barrier.
Line marking	• installation of line marking and any roadside furniture including medians and signs.
Site cleanup and pack down	• site clean-up and removal of stockpiles • landscaping and remediation of disturbed areas • removal of traffic controls and any erosion and sediment controls.

3.3.2 Construction workforce

The proposal is scheduled to require an average of up to 10 construction workers per day.

3.3.3 Construction hours and duration

Construction of the proposal is anticipated to commence in late 2021 and would take about nine months to complete (weather permitting).

Where possible work would be carried out during standard construction hours as follows:

- Monday to Friday: 7:00am to 6:00pm
- Saturday: 8:00am to 1:00pm
- Sunday and public holidays: No work.

However, to minimise disruption to traffic and access to surrounding land owners and businesses, and to ensure the safety of workers, it may be necessary to carry out work outside of standard working hours. Out of hours work would be as follows:

Monday to Friday 6:30pm – 4:30am.

If out of hours work is required for the completion of the works, it would be in accordance with a Road Occupancy Licence (ROL). There would be no out of hours work on public holidays.

3.3.4 Plant and equipment

A range of plant and equipment would be used during construction. The final equipment and plant requirements would be determined by the construction contractor. An indicative list of plant and equipment is provided in Table 3-2.

Table 3-2 Indicative proposed plant and equipment

Activity	Proposed plant and equipment
General site establishment	• crew truck • support vehicle • variable message board • survey vehicle • small generator at compound • portable demountable office and lunch room with air conditioning operating during daytime and night time periods • tilt tray truck.
Pavement widening	• circular saw • road pavement profiling machine (mill) • asphalt paver and Asphalt material transfer vehicle • tipper trucks • water truck (10KL) • rollers (steel drum, multi tyre) • crew trucks • lighting towers. • pavement stabilizer • kerbing machine • trenching machine.
Shoulder/ verge works	• 13 tonne excavator • 20 tonner excavator • backhoe • positrack • tipper truck • smooth drum roller • crew truck • grader • water truck (10KL) • padfoot roller (15T) • hydromulcher • bitumen sprayer truck.
Safety barrier reinstallation	• post driving rigs – trailer mounted • pneumatic tools • crew truck • flatbed rigid truck • semi-trailer truck.
Line marking	• line marking truck • support vehicle.

3.3.5 Earthworks

Earthworks required for the proposal would involve cut and fill quantities as outlined in Table 3-3. Excavated material would be stockpiled and reused where suitable at the proposed compound site (refer to section 3.4), or disposed of at a licensed facility in accordance with the *Waste Classification Guidelines* (EPA, 2014).

Majority of cut and fill is required to the northeast of the current intersection, continuing down to Gocup Road (with a small height increase at the roundabout location). General fill and pavement materials would be sourced as per Transport procurement guidelines.

The proposal includes alterations to culverts, waterways, and drainage infrastructure, including:

- a large watermain that passes under the roundabout
- a dual pipe culvert passing under the Snowy Mountains Highway would be extended (with all other culverts to be replacements or installed new
- extension of existing drainage structure (including excavating current culvert under Snowy Mountains Highway, and culvert under Wetland Walk path) which flows into a dam within the adjacent wetland.

Table 3-3 Anticipated cut and fill quantities

Earthworks	Quantity
Cut	~3940 $m^{3.}$
Fill	~15000 $m^{3.}$

During construction three temporary sediment basins may be required; two would likely be located to the north east near a waterbody (on either side of the nearby culvert outlet), and a smaller sediment basin in the south east corner (to reduce risks of runoff and sediment damage). During construction temporary erosion and sediment controls (such as sediment fences) would be employed to mitigate potential increases in runoff and sedimentation draining into the wetlands (particularly waterbodies closest to the proposal area.

3.3.6 Source and quantity of materials

Materials which would be brought to site for the work include the following:

- pavement materials (aggregates)
- pavement stabilising material
- asphalt
- sprayed seals
- concrete
- concrete reinforcement mesh
- concrete pipes
- perforated pipes
- drainage pits
- safety barrier.

Where possible, the materials would be sourced from local Transport prequalified suppliers. The final quantity of materials would be determined during detailed design i.e. source of materials would be as per procurement Transport guidelines.

Surplus or unsuitable material that cannot be used on-site would be classified in accordance with the *Waste Classification Guidelines* (EPA, 2014) and disposed of or reused as is appropriate

A full estimates schedule of quantities can be found in Table 3-4.

Table 3-4 Schedule of Quantities

Item	Total	Units	Item	Total	Units
Volumes Cut	3940	m³	**SF Kerb**	375	m
Volumes Fill	15230	m³	**SE Kerb**	100	m
Imported Fill	11290	m³	**SM Kerb**	81	m
Selected Material	2145	m³	**No Fines Concrete**	70	m³
Upper Zone Formation	340	m³	**F20 Aggregate**	92	m³
Verge Material	820	m³	**Perforated Pipe**	510	m
AC14 PMB (A15E) (R116)	360	m³	**Geotextile (R63)**	1071	m²
AC14 AR450 (R116)	910	m³	**MASH TL3 Flexible Safety Barrier**	276	m
AC20 (R116)	340	m³	**MASH TL3 Terminals**	4	each
Heavily Bound (R73)	580	m³	**TB Linemarking**	23	m
DGB20 Class 1 (R71)	510	m³	**BB Linemarking**	330	m
DGB20 Class 2	610	m³	**E1 Linemarking**	1000	m
DGS20 (R71)	630	m³	**E4 Linemarking**	250	m
Emulsion Seal	5810	m²	**1/450mm Dia RCPC**	130	m
Primer Seal	3410	m²	**450mm Headwall**	2	each
Final Seal	3410	m²	**SA Pit - 450mm pipe**	3	each
SFRC Annulus	86	m³	**Junction Pit - 450mm pipe**	1	each
PCP-R (Central and Splitter Island Infill)	182	m³	**Table Drain Pit - 450mm Pipe**	1	each
R15			**Gabion Rock**	35	m
SA Kerb	510	m			

3.3.7 Traffic management and access

Traffic management measures to be employed during construction include:

- speed limit to be reduced to 40km/hr when required
- possible 30km/hr under new Transport guidelines
- return to 50km/hr out of standard work hours (unless adjacent to excavation or steep unprotected batters)
- temporary traffic light control where possible
- stop/slow control when required
- delays kept to a minimum
- possible closure (and detour) of each leg if required (short term).

The proposal would generate additional light and heavy vehicle movements during the construction period, including:

- heavy vehicle delivery and removal of construction materials/ equipment/ machinery to both the proposal area and the compound site:
    - trucks planned to enter site at one end, unload and leave via other end
- light vehicles transporting construction personnel between the proposal area and the compound site.

Construction personnel would typically travel via their personal vehicle to the Tumut Transport for NSW depot and then travel in shared light vehicle to the proposal area. Parking for light vehicles would be provided in the site compound.

The typical number of heavy and light vehicle movements per day/period and during the various activities is as follows:

- general site establishment – two heavy vehicles, two light vehicles per shift
- pavement widening, shoulder/ verge works, safety barrier reinstallation and line marking – four heavy vehicles, two light vehicles per shift
- construction vehicle movement at peak during earthworks phase would average around 50 vehicles per day
- site clean- up and commissioning of upgraded facility – two heavy vehicles, two light vehicles per shift.

A Traffic Management Plan (TMP) would be prepared in accordance with the Transport for NSW Traffic Control at Work Sites Technical Manual (Transport for NSW, 2020) and Roads and Maritime Specification G10 – Traffic Management and approved by Transport before use. The TMP would provide details of the traffic management to be implemented during construction to ensure traffic flow on the surrounding network is maintained where possible. The intersection would not be closed during construction, however, some additional traffic management measures may include:

- diversions on specific legs of the road may be required to permit tie-in works
- stop/slow would be in place when required
- traffic flow would be maintained with short delays to permit entry and exit of vehicles and specific work activities
- property access would be maintained
- access to wetland would be maintained.

Construction would involve the relocation of Wetland Walk, moving the active travel path for pedestrian and cyclist to northeast (to be closed during construction period with detours along existing pedestrian/cycle paths within the wetland). This is not anticipated to cause significant disturbance as there are many alternative pedestrian/cycle paths available around the wetland, and signage would be erected to advise of detours.

3.4 Ancillary facilities

The proposal would include the use of stockpile and compound sites including (refer Figure 1-1):

- SWT4 Tumut Transport for NSW Depot Compound Site (500 metres west of project location)
- SWA 013 Stockpile Site (3.2km north of project location – Gocup Road)
- SWA 014 Stockpile Site (7.3km north of project location – Gocup Road)
- SWA 016 Stockpile Site (16.1km north of project location – Gocup Road)
- SWT4/10 Stockpile Site (14km west of project location – Snowy Mountains Highway).

Limitations of these sites include long distance travel between stockpile sites and the proposal area. Similarly, Lot 7314 and SWT4 have been deemed too small, and are no longer being utilised.

The compound site would be used for the following activities:

- temporary stockpiling
- temporary material laydown
- utilisation of existing office building and amenities
- car parking and machinery storage
- temporary waste storage.

No property acquisition is required for the use of the compound site. The site is currently fenced.

During construction temporary erosion and sediment controls (such as sediment fences) would be employed to mitigate potential increases in runoff and sedimentation draining into the wetlands (particularly waterbodies closest to the proposal area).

A number of activities usually specific to the compound site would take place at the site during construction, including:

- the site would include a portable toilet
- refuelling
- parking of rollers and excavators would occur overnight so as to not track debris over council roads to the depot
- delivery of materials depending on materials may occur on the site or be taken to the stockpile sites.

3.5 Public utility adjustment

Public utilities would be impacted by the proposal including:

- relocating essential energy overhead powerlines to below surface level at the intersection of Gocup Road and Golden Highway
- redirecting powerline through the wetland, as per Figure 1-3
- extension of existing Transport drainage structure (including excavating current culvert under Snowy Mountains Highway, and culvert under Wetland Walk path)

- adjusting underground Visy watermain located directly beneath roundabout, to be relocated to toe of batter within Transport acquisition land.

A large cluster of public utilities to the north west would not be impacted by the proposal as the design has been moved to the north east. For further detailed images of utilities refer to Appendix A.

3.6 Property acquisition

Property acquisition of Crown land is required during construction within Lot 7042/ DP1068148 and Lot 7315/ DP1155552. The area of each lot required is presented in Table 3-5, Figure 3-7 and Figure 3-8.

Table 3-5 Proposed property acquisition

Area ID	Description	Total area	Acquisition type	Current owner	Lot and DP	Land use zone (LEP)
1	Acquisition required for construction limits	487m^2	Partial acquisition	Crown land	Lot 7042/ DP1068148	RE1
2	Acquisition required for construction limits	4521m^2	Partial acquisition	Crown land	Lot 7315/ DP1155552	RE1

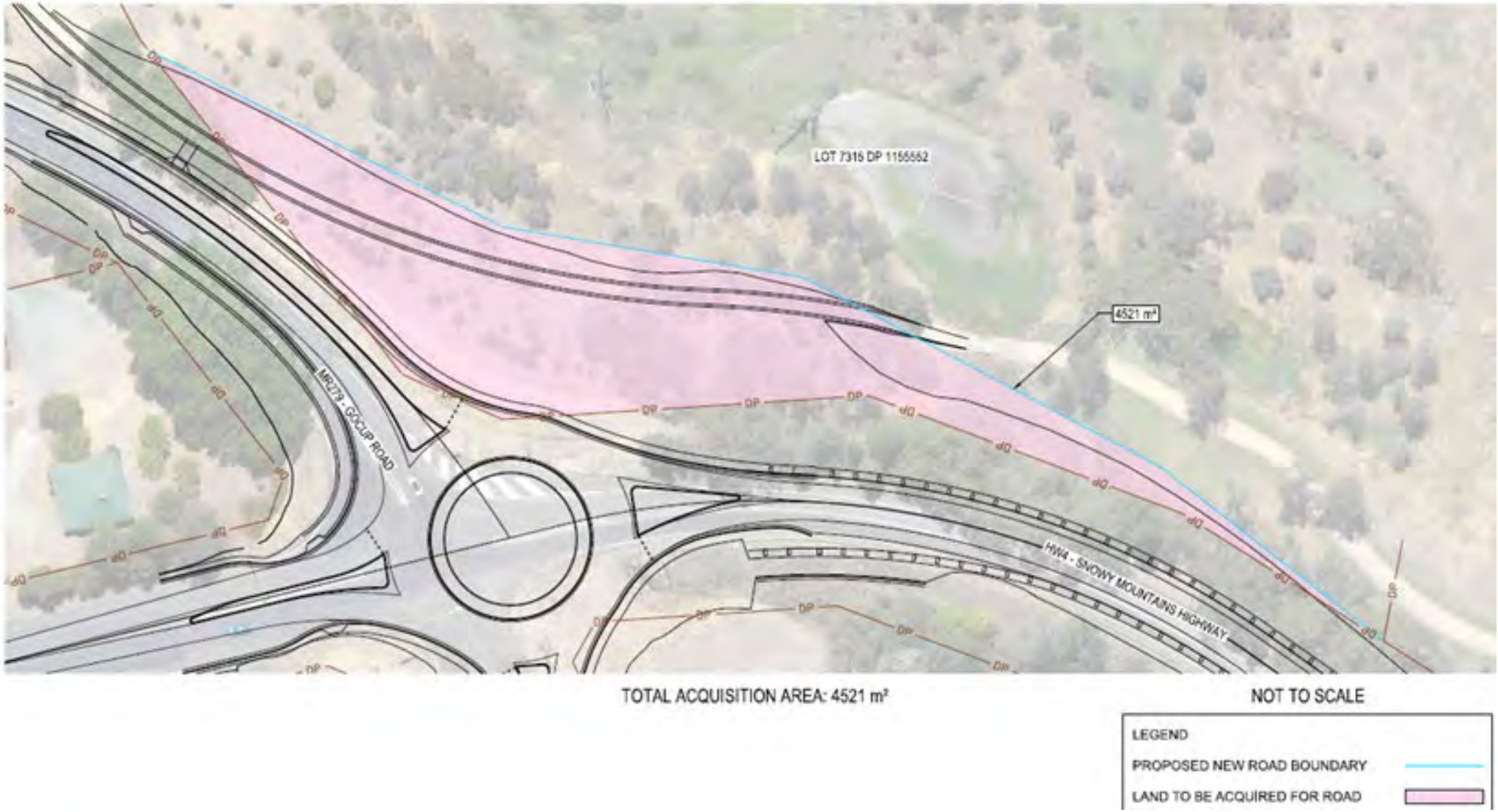


Figure 3-7 Proposed property acquisition 1 of 2 (Transport for NSW, 2021)

Figure 3-8 Proposed property acquisition 2 of 2 (Transport for NSW, 2021)

4. Statutory and planning framework

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

4.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) and its associated regulations provide the framework for assessing environmental impacts and determining planning approvals for developments and activities in NSW.

The proposal does not require development consent under Part 4 of the EP&A Act due to permissibility in State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) (refer to chapter 4.1.1) and is not classified as State significant infrastructure under Division 5.2. Therefore, the proposal may be assessed under Division 5.1 of the EP&A Act. Under Part five of the EP&A Act, Transport is classified as a proponent and a determining authority.

4.1.1 State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across the State.

Clause 94 of ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposal is for a road and is to be carried out by Transport, it can be assessed under Division 5.1 of the *Environmental Planning and Assessment Act 1979*. Development consent from council is not required.

The proposal is not located on land reserved under the *National Parks and Wildlife Act 1974* and does not require development consent or approval under State Environmental Planning Policy (Coastal Management) 2018, State Environmental Planning Policy (State and Regional Development) 2011 or State Environmental Planning Policy (State Significant Precincts) 2005.

Part two of ISEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Consultation, including consultation as required by ISEPP (where applicable), is discussed in chapter 5 of this REF.

4.1.2 Local Environmental Plans

Tumut Local Environmental Plan 2012

The proposal is located within the Snowy Valleys Council LGA (an amalgamation of Tumut and Tumbarumba), previously the Tumut LGA, and as such, the *Tumut Local Environmental Plan 2012* (Tumut LEP) applies. Figure 4-1 shows that the proposal is within land zoned as SP2 Infrastructure, and RE1 Public Recreation. The surrounding land is zoned IN1 General Industrial, and R2 Low Density Residential.

The objectives of land zoned as SP2 Infrastructure is to:

- provide for infrastructure and related uses

- to prevent development that is not compatible with or that may detract from provision of infrastructure.

Roads are permitted with consent in SP2 Infrastructure.

The objectives of land zoned as RE1 Public Recreation is to:

- 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.

Roads are permitted with consent in RE1.

As identified in section 4.1.1, the provisions of ISEPP override development consent requirements of the Tumut LEP and development consent from Snowy Valleys Council is not required. Consultation requirements with Snowy Valleys Council pursuant to the ISEPP are outlined in section 5.4.

Figure 4-1 Land zoning of the proposal under the Tumut LEP

4.2 Other relevant NSW legislation

4.2.1 Biodiversity Conservation Act 2016

Section 7.3 of the *Biodiversity Conservation Act 2016* (BC Act) establishes a test to determine whether a proposed development or activity is 'likely to significantly affect threatened species'. A Species Impact Statement (SIS) or a Biodiversity Development Assessment Report (BDAR) is required to be prepared where an activity under Division 5.1 of the EP&A Act is likely to significantly affect threatened species.

Relevant biodiversity searches were carried out on 21 May 2021 as documented in 6.1. The proposal is not likely to significantly impact threatened species or ecological communities or their habitats, within the meaning of the *Biodiversity Conservation Act 2016* or *Fisheries Management Act 1994* and therefore a Species Impact Statement or Biodiversity Development Assessment Report is not required.

4.2.2 Biosecurity Act

The *Biosecurity Act 2015* (Biosecurity Act) repealed the *Noxious Weeds Act 1993* and provides a framework for the prevention, elimination and minimisation of biosecurity risks. The Biosecurity Act and supporting Biosecurity Regulation 2017 provide for the establishment and functions of Local Control Authorities for weeds (LGA or County Councils) and weed control obligations on public and private land. Any land managers or authorities who deal with any plant has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.

Measures have been included in the REF to ensure adequate weed hygiene during the works (refer to section 6.1).

4.2.3 Heritage Act 1977

The *Heritage Act 1977* (Heritage Act) provides protection for items of 'environmental heritage' in NSW. 'Environmental heritage' includes places, buildings, works, relics, movable objects or precincts considered significant based on historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic values. Under the Heritage Act, a person must not disturb or excavate land if they know or have reasonable cause to suspect that they might discover, expose, move or damage a relic unless they have an excavation permit.

A search of all relevant heritage databases was undertaken for the proposal area. Heritage impacts are considered in section 6.5 of this REF.

4.2.4 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NPW Act) provides for the care, control and management of all national parks, historic sites, nature reserves, reserves, Aboriginal areas and state game reserves. The NPW Act outlines approval requirements for works in the vicinity of indigenous archaeological sites and provides for the protection of flora and fauna.

The NPW Act also provides statutory protection for all Aboriginal 'objects' (consisting of any material evidence of the Aboriginal occupation of NSW) under Section 90 of the act, and for 'Aboriginal Places' (areas of cultural significance to the Aboriginal community) under Section 84. Aboriginal objects are afforded automatic statutory protection in NSW. The proposal is not expected to result in impacts to any Aboriginal sites.

Transport is currently carrying out a Stage two assessment in accordance with the *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI) (Roads and Maritime, 2011). This assessment would conclude whether the proposal would impact on Aboriginal heritage and if further assessment is required (Refer to Appendix B).

4.2.5 Roads Act 1993

Under Section 138 of the *Roads Act 1993* (Roads Act) a person must not: erect a structure or carry out a work in, on or over a public road, or dig up or disturb the surface of a public road, otherwise than with the consent of the appropriate roads authority. Prior to undertaking any works, a Road Occupancy Licence (ROL) under Section 138 of the Roads Act would be sought for works on Gocup Road and Snowy Mountains Highway (HW4), which are classified main roads under the care of Transport.

4.2.6 Crown Lands Management Act 2016

The objective of the *Crown Land Management Act 2016* (CLM Act) is to ensure that Crown land is managed for the benefit of the people of NSW. The majority of the proposal area is mapped as Crown land. Transport would be required to consult with Crown Lands to obtain leases and/permits as required. Property acquisition of Crown Land is required as per section 3.6.

4.2.7 Aboriginal Land Rights Act 1983

The *Aboriginal Land Rights Act 1983* (ALR Act) allows Local Aboriginal Land Councils (LALCs) to claim Crown land. Consultation carried out as part of the *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI) (section 6.5) with the Office of the Registrar, ALR Act, confirmed that there are no Registered Aboriginal Owners in the proposal area.

4.2.8 Fisheries Management Act 1994

The *Fisheries Management Act 1994* (FM Act) regulates activities that pose a threat of damage to aquatic habitats, threatened species, populations or ecological communities. The FM Act aims to conserve, develop and share the fishery resources of the State for the benefit of present and future generations. The FM Act requires an assessment of whether threatened species of fish and marine vegetation, populations or ecological communities are likely to be affected by the activity. Where a significant impact is considered likely, a SIS must be prepared, and concurrence sought from the Director-General of NSW Trade and Investment. The Minister for Primary Industries may also need to be consulted.

The Tumut River (360 metres northeast of the proposal) and parts of the Tumut Wetlands are mapped as key fish habitat (see Figure 1-2). Parts of this key fish habitat is mapped within and adjacent to the proposal area. Minor indirect impacts may occur including erosion and sediment which have the capacity to reduce water quality and harm aquatic vegetation and habitat. These potential impacts would be managed through the implementation of standard safeguards as outlined in section 6.1.4.

4.3 Commonwealth legislation

4.3.1 Environment Protection and Biodiversity Conservation Act 1999

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) a referral is required to the Australian Government for proposed actions that have the potential to significantly impact on matters

of national environmental significance or the environment of Commonwealth land. These are considered in Appendix C and chapter 6 of the REF.

A referral is not required for proposed road activities that may affect nationally listed threatened species, endangered ecological communities and migratory species. This is because requirements for considering impacts to these biodiversity matters are the subject of a strategic assessment approval granted under the EPBC Act by the Australian Government in September 2015.

Potential impacts to these biodiversity matters are also considered as part of chapter 6 of the REF and Appendix C.

Findings – matters of national environmental significance

The assessment of the proposal's impact on matters of national environmental significance and the environment of Commonwealth land found that there is unlikely to be a significant impact on relevant matters of national environmental significance or on Commonwealth land. Accordingly, the proposal has not been referred to the Australian Government Department of Agriculture, Water and the Environment under the EPBC Act.

As per the Biodiversity Assessment in Appendix C, no EPBC threatened species are likely to occur in the proposal area. The nearest wetland of international importance is Hattah-Kulkyne Lakes, between 500-600 kilometres upstream. Therefore, there is no apparent interaction between the waterways within the proposal area and Hattah-Kulkyne Lakes. Finally, no migratory species are considered likely to occur in the proposal area.

4.3.2 Native Title Act 1993

The *Native Title Act 1993* recognises and protects native title. The Act covers actions affecting native title and the processes for determining whether native title exists and compensation for actions affective native title. It establishes the Native Title Registrar, the National Native Title Tribunal, the Register of Native Title Claims and the Register of Indigenous Land Use Agreements, and the National Native Title Register. Under the Act a future act includes proposed public infrastructure on land or waters that affects native title rights or interest.

A search of the Native Title Tribunal Native Title Vision website was undertaken on 8 June 2021, with no Native Title holders/claimants identified (see Appendix F).

4.4 Confirmation of statutory position

The proposal is categorised as development for the purpose of a road and is being carried out by or on behalf of a public authority. Under clause 94 of ISEPP the proposal is permissible without consent. The proposal is not State significant infrastructure or State significant development. The proposal can be assessed under Division 5.1 of the EP&A Act.

Transport is the determining authority for the proposal. This REF fulfils Transport's obligation under section 5.5 of the EP&A Act including to examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the activity.

5. Consultation

This chapter discusses the consultation carried out to date for the proposal as well as consultation proposed for the future.

5.1 Consultation strategy

The primary communications objectives during planning and delivery of the Tumut intersection upgrade includes:

- keeping the local community and other key stakeholders regularly informed about project progress
- ensuring community expectations are managed by providing clear and consistent messaging on the type of feedback required at all times
- ensuring community and stakeholder feedback is continuously fed into communication and engagement
- actively listening to feedback, investigate suggestions and report back
- engaging in a collaborative, innovative, adaptive and sustainable manner
- increasing stakeholder understanding of the Tumut intersection project and its objectives
- ensuring community and stakeholder enquiries about the project are managed and resolved effectively
- developing key messages, with particular focus on ensuring expectations are managed
- determining relevant and appropriate communication and engagement channels and timing
- being transparent in all that Transport does.

Community expectations would be managed by ensuring all collateral provides clear and consistent messaging, emphasising the improvements to safety for all transport customers.

5.1.1 Communications approach

Due to COVID-19 restrictions and uncertainty as to how long these restrictions will be in place, the communications approach would be predominately via digital methods.

The communications approach for the early stages of the project focus on community updates, social media posts and project webpage updates. Any community feedback required during planning stages would primarily be gathered via online methods, with email, phone and written responses also accepted to ensure coverage of all demographics within the community.

During construction, the communications approach would focus on keeping the community and stakeholders informed of progress and delays across as many platforms as possible.

Roy Morgan Helix Persona research showed no dominant communications preference, meaning a coordinated approach would need to be engaged across social media, traditional notification letters, traditional and digital media, community updates and electronic signage on site to regularly inform the community about project progress.

Transport Communications team would work closely with the project manager and the project team to ensure a whole-of-project approach.

The project team aims to establish relationships and maintain regular communication, information and interface with nearby residents and businesses, Members of Parliament, council and the freight industry. Ongoing communications and consultation would occur to ensure all issues would be addressed.

The wider community would be informed via media releases, traffic alerts, notification letters, social media, electronic signage (Variable Message Sign (VMS)), community updates, advertisements, website updates and weekly traffic reports as appropriate to ensure they are aware of possible delays to their journeys.

Information would also be sent for possible inclusion on council websites, school newsletters and distributed through varying communication channels where possible.

5.1.2 Engagement tools and techniques

The following tools and techniques are being used to consult with identified stakeholders and the broader community:

- door-knocking nearby residents and businesses as required
- meetings and briefings for stakeholders, businesses and residents (as required)
- residential mail-outs: postcards, community updates or notification letters to inform residents of project or impacts
- media releases and traffic alerts
- social media campaign to educate the community about the project and any feedback opportunities. Promoted on NSW Roads Facebook page, targeting 100km radius of Tumut and shared with Snowy Valleys Council
- VMS signs in lead-up to and during construction
- weekly traffic report to ensure project inclusion on Live Traffic website
- project updates on the Transport website nswroads.work/tiu
- advertisements in the Tumut and Adelong Times as required to help keep non-digitally connected parts of community informed.

5.2 Community involvement

The project team consulted with directly impacted businesses and residents throughout the initial planning phase. Soon after this initial consultation in December 2020, a community update was sent out to residents in Tumut, showing the concept design. In May 2021, the community of Tumut were provided with a project update, detailing additional minor improvements to be delivered alongside the new roundabout infrastructure. As part of the REF being released on public display, the community would be invited to provide feedback.

Table 5-1 Summary of issues raised by the community

Group	Issue raised	Response / where addressed in REF
Residents	• some expressed a preference for new traffic lights • whether a roundabout was appropriate for a heavy vehicle/freight corridor.	• community updates provided further information on why the roundabout was proven to be the safest option • FAQs on the project webpage were updated to respond to questions about the compatibility of

Group	Issue raised	Response / where addressed in REF
		the new roundabout with A-Double trucks.
Local business	• no issues raised.	N/A

5.3 Aboriginal community involvement

As part of the Stage 2 PACHCI carried out by NGH, representatives from the Wagga Wagga Local Aboriginal Land Council, Darrell Charles Jnr and Nathan Williams, attended the site inspection.

Details regarding Aboriginal Community involvement can be found within the Stage 2 PACHCI.

5.4 ISEPP consultation

A review of statutory consultation requirements has been carried out in Appendix D.

Snowy Valleys Council need to be consulted about the proposal for the purposes of cl.13(1)(a) – stormwater, cl.13(1)(b) – traffic, cl.13(1)(e) – temporary structures and cl.13(1)(f) – road and footpath excavation of the ISEPP, as well as the State Emergency Services (SES) for the purpose of cl.15AA, development on flood liable land. Consultation letters were sent to Snowy Valleys Council and the SES on 13 August 2021. A response was received from the SES on 20 August 2021 and is attached in Appendix D.

Table 5-2 Issues raised through ISEPP consultation

Agency	Issue raised	Response / where addressed in REF
SES	• none.	• N/A.

5.5 Government agency and stakeholder involvement

Transport consulted with Snowy Valleys Council (SVC) through a presentation on 6 May 2021. Council had particular interest in re-vegetation and finishing off the northern batter with general acceptance of the notion that Transport is building a one in four batter which would be vegetated with low-growing native plants aimed at discouraging pedestrians from walking up and down the slope, in conjunction with an enhanced pedestrian walkway (all-weather surfacing), lighting and fencing. Issues raised are summarised in Table 5-3.

Consultation has taken place on a number of occasions with Council between November 2020 and July 2021. This consultation was carried out in the form of meetings, emails and phone calls. The discussions with SVC have mostly been related to council's future mobility plans and how the two organisations can work together to improve pedestrian access in the area.

Issues that have been raised as a result of consultation with these agencies and stakeholders are outlined below in Table 5-3.

Table 5-3 Issues raised through stakeholder consultation

Agency	Issue raised	Response / where addressed in REF
Snowy Valleys Council	• Mayor concerned about removing the trees (Pine Oaks) on Gocup Road • Council has concerns about traffic management during construction • colour and texture of island annulus • access to gravel track on Gocup Road • Council was enquiring about material supply • Council were enquiring about plant supply from local nursery. Advised procurement guidelines will govern.	• the following responses were presented to Council at the presentation: o advised the proposal would provide improved access to the gravel track on Gocup Road o advised procurement guidelines would govern where plants would be sourced for the proposal. o The annulus would be terracotta texture brick pattern, similar to the existing median islands

5.6 Ongoing or future consultation

The community would be invited to provide feedback on the REF documents. It is anticipated Transport would also need to do some targeted consultation with directly impacted residents or businesses as the project progresses. The community would be kept informed of major project milestones as well as future plans to manage potential impacts during the construction phase.

6. Environmental assessment

This section of the REF provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposal. It is noted that the impact assessment and impact area calculations have been based on the extent of the proposal shown in Figure 1-2 and are therefore the maximum impact assessment; the electrical works in Figure 1-3 show a reduced impact area for the electrical works, which would therefore reduce the impact area further from what has been assessed in this report.

All aspects of the environment potentially impacted upon by the proposal are considered. This includes consideration of:

- potential impacts on matters of national environmental significance under the EPBC Act.
- the factors specified in the guidelines Is an Environmental Impact Statement (EIS) required? (DUAP 1995/1996) as required under clause 228(1) *of the* Environmental Planning and Assessment Regulation 2000 and the Roads and Related Facilities EIS Guideline (DUAP 1996). The factors specified in clause 228(2) of the Environmental Planning and Assessment Regulation 2000 are also considered in Appendix E.

Site-specific safeguards and management measures are provided to mitigate the identified potential impacts.

6.1 Biodiversity

6.1.1 Methodology

Database searches were carried out to identify the potential for State (BC Act) listed and Commonwealth (EPBC Act) listed threatened species and ecological communities to occur within the proposal area. A summary of the searches carried out is provided in Table 6-1, with full search results provided in Appendix F.

Table 6-1 Database searches

Database search	Date searched	Search area
EPBC Act Protected Matters Search	27 May 2021	10 kilometre buffer from the proposal area
NSW Office of Environment and Heritage (OEH) Bionet Atlas	27 May 2021	10 kilometre buffer from the proposal area
NSW Department of Primary Industries (DPI) Weed Wise	27 May 2021	Riverina Local Land Services Region
Bureau of Meteorology National Atlas of Groundwater Dependant Ecosystems (GDE)	27 May 2021	proposal area
DPI Fisheries Threatened Species	27 May 2021	proposal area

A daytime survey of the proposal area was undertaken on 4 June 2021 by an NGH Ecologist and an NGH Environmental Consultant. A random meander search (Cropper, 1993) was used to allow inspection of all

available habitat types within the proposal area. Followed by three biodiversity assessment method (BAM) plots.

Criteria recorded during the site survey included:

- native flora species and vegetation communities present
- potential for threatened species presence identified during background searches with targeted transect surveys undertaken where suitable habitat is present
- opportunistic fauna sightings
- weed species present and their abundance.

There are limitations to this approach. As the flora field surveys were undertaken in June, the flora species lists reflect plant species usually detectable during Spring. There is the potential for some flora species that were not in flower at the time of the survey to have gone undetected. However, the lists are considered sufficient to identify vegetation communities present within the proposal area and therefore to evaluate the probability of threatened flora species to occur.

Detailed habitat assessments were made within the proposal area so local occurrence of fauna could be predicted. A precautionary approach has been taken as to the likelihood of the presence of threatened species so fauna species unlikely to be detected during the time of the survey are assessed.

6.1.2 Existing environment

The proposal area is located at the Gocup Road and Snowy Mountains Highway Intersection and is located within the NSW South West Slopes Interim Biogeographic Regionalisation for Australia (IBRA) bioregion. The proposal area occurs in the Inland Slopes subregion, within Tumut Channels and Floodplains and Minjary Hills and Ranges Mitchell Landscapes. The underlying geology is comprised of Quaternary alluvial deposits.

The vegetation is exotic and planted native vegetation. North east of the proposal area comprises the Tumut Wetlands which contain moderate condition planted grassy woodland and forested wetland plant community types (PCTs) including hollow bearing trees. The south east contains exotic planted vegetation. The south west and north west comprise of residential and commercial dwellings, as well as open pasture. A large number of trees are located inside the design footprint to the north of Snowy Mountains Highway along the adjacent wetlands.

Threatened ecological communities

Database searches identified the potential for five BC Act and four EPBC Act threatened ecological communities (TECs) to occur within the proposal area.

The State Vegetation Mapping was reviewed to confirm if Plant Community Types (PCT) have been mapped to occur within the proposal area. PCTs were shown to occur within and adjacent to the proposal area, including:

- PCT 283 - Apple Box - Blakely's Red Gum moist valley and footslopes grass-forb open forest of the NSW South Western Slopes Bioregion
- PCT 277 - Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion.

Based on a field survey undertaken on 4 June 2021, the vegetation identified within the proposal area included:

- PCT 283 - Apple Box -Blakely’s Red Gum moist valley and foot slopes grass-forb open forest of the NSW South Western Slopes Bioregion (0.8ha within proposal area)

- PCT 79 - River Red Gum shrub/grass riparian tall woodland or open forest wetland mainly in the upper slopes of the sub-region of the NSW South Westher Slopes Bioregion and western South Eastern Highlands bioregion (1.3ha within proposal area)
- planted native vegetation (2.3ha within proposal area)
- exotic vegetation (2.8ha within proposal area).

The two PCTs were found to be in poor to good condition. Of the 1.036ha of PCT found, 0.795ha was identified as TEC (BC Act): White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW South Western Slopes.

Threatened species

Database searches identified the potential for three BC Act and seven EPBC Act threatened flora species to occur within 10 kilometres of the proposal area. A review of previous records indicates that no threatened flora species have been recorded within the proposal area and the closest record is 440 metres to the south east, being the Silky Swainson-pea *Swainsona sericea* (listed as Vulnerable under the BC Act).

Database searches identified the potential for 129 BC Act and 24 EPBC Act threatened fauna species to occur within 10 kilometres of the proposal area. From a review of previous records, it is evident that no threatened fauna species have been recorded within the proposal area and the closest record is of a Spotted-tailed Quoll (*Dasyurus maculatus*), about 440 metres to the south east of the proposal area. The Spotted-tailed Quoll is listed as Vulnerable/Protected under the BC Act and Endangered under the EPBC Act. Threatened species records are provided in Appendix F.

No threatened flora species were recorded within the proposal area during surveys.

Aquatic

Tumut River is about 360m north east of the proposed roundabout, and is classified as Strahler order eight, key fish habitat (KFH). Tumut River is mapped as potential and important habitat for the Murray Crayfish. There are also smaller creeks, streams and water bodies within the wetland to the north (some of which are mapped as KFH). One waterway traverses the proposal area; a small nameless creek under the Snowy Mountains Highway flowing through culverts that would be extended during construction. This creek is not KFH, but provides runoff from the south east as it drains into an existing dam.

The threatened Southern Purple Spotted Gudgeon (*Mogurnda adspersa*) (FM Act) is not mapped to occur within the study area.

No threatened fauna species were recorded within the proposal area during surveys. During the survey, an abundance of frogs were recorded, including the Whistling Tree Frog (*Litoria verreauxii*), Clicking Froglet (*Crinia signifera*) and Beeping Froglet (*Crinia parinsignifera*) recorded during surveys. Macrophytes were also noted within the Wetlands.

Weeds

A search of the DPI Weed Wise database identified the priority weeds for the Riverina Region which have the potential to occur within the proposal area. All priority weeds for the Riverina Region can be seen in Appendix F.

6.1.3 Potential impacts

Construction

Threatened ecological communities

The proposal would result in the direct loss of up to 1.036 hectares of native vegetation to be removed along the edge of the wetland, where it intersects the proposal area. Native vegetation in the proposal area is mostly located along the road edge and so is highly disturbed and receives edge effects from the Highway.

Construction would result in the clearing of up to 0.596ha of PCT 283, and loss of threatened fauna foraging and breeding habitat. The biodiversity assessment (Appendix C) concluded that the proposal is unlikely to have a significant impact on any NSW or nationally listed entity. Therefore, the EPBC Act Strategic Assessment is not triggered for the proposal, nor is Transport required to prepare a species impact statement (SIS). This vegetation removal would be carried out in accordance with the safeguards as provided below and in section 6.1.4 of this REF to minimise impacts.

Threatened species

No threatened fauna species have been identified to occur within the proposal area. The small amount of woodland vegetation to be removed by the proposed works would not isolate or fragment habitat within the proposal area or place any threatened species at risk of extinction. The linear nature of vegetation along the roadside has reduced its quality due to edge effect from the roadside environment. The habitat is of low value due to the existing disturbance of the Highway and as such threatened fauna are likely to utilise less disturbed habitats away from the direct impacts of the highway traffic.

Temporary disturbance to wildlife from noise emissions and light spill during construction and night works are likely to be localised to within 50-100 metres of the proposal area and are not likely to have a significant long-term impact on wildlife that may occur within the proposal area or surrounding environment.

Aquatic

The proposal is unlikely to directly impact on aquatic biodiversity, as the works are localised to the road edge. One construction element which would change the existing hydrology is the proposed works in an unnamed creek that intersects the Snowy Mountains Highway via culvert from the adjacent wetland. The culvert would be extended further into the Tumut Wetlands as the batter of the road increases. The new culvert would still provide runoff from the south east and would continue to drain into the existing dam. There is potential for increased sedimentation to drain into the wetlands as runoff during the proposed works.

The proposal is also in proximity of waterways and waterbodies within the wetland, with the closest named waterway being the Tumut River about 360 metres north east (Strahler order eight, key fish habitat). Whilst impacts to Tumut River are unlikely, the smaller waterways and waterbodies within the wetland are at low risk of potential indirect impacts such as sediment laden inflow which may reduce water quality and harm aquatic vegetation and habitat. These potential impacts would be managed through the implementation of suitable erosion and sedimentation controls, as detailed in safeguards, section 6.1.4.

Weeds

Database searches identified priority weeds which may occur within the proposal area (see Appendix F). Five priority weeds were recorded in the proposal area including Large-leaved Privet, Small-leaf Privet, Blackberry, Olive and Bridal Creeper. Ground disturbance during construction may provide suitable

conditions for weeds to propagate. Mitigation measures as provided below and in section 6.1.4 of this REF would be used to guide the handling of weeds throughout construction.

Operation

There would be no operational impacts on biodiversity.

Conclusion on significance of impacts

The proposal is not likely to significantly impact threatened species or ecological communities or their habitats, within the meaning of the *Biodiversity Conservation Act 2016* or *Fisheries Management Act 1994* and therefore a Species Impact Statement or Biodiversity Development Assessment Report is not required.

The proposal is not likely to significantly impact threatened species, ecological communities or migratory species, within the meaning of the *Environment Protection and Biodiversity Conservation Act 1999*.

6.1.4 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing	Reference
Removal of native vegetation	• native vegetation removal will be minimised through detailed design • vegetation removal will be undertaken in accordance with Guide 4: Clearing of vegetation and removal of bushrock of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) • native vegetation will be re-established in accordance with Guide 3: Re-establishment of native vegetation of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) • the unexpected species find procedure is to be followed under *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011) if threatened ecological communities, not assessed in the biodiversity assessment, are identified in the proposal area.	Contractor	Detailed design / construction /post construction	Additional safeguard

Impact	Environmental safeguards	Responsibility	Timing	Reference
Removal of threatened species habitat and habitat features	• habitat removal will be minimised through detailed design • habitat removal will be undertaken in accordance with *Guide 4: Clearing of vegetation and removal of bushrock* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011) • habitat will be replaced or re-instated in accordance with *Guide 5: Re-use of woody debris and bushrock* and *Guide 8: Nest boxes* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011) • the unexpected species find procedure is to be followed under *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011) if threatened fauna, not assessed in the biodiversity assessment, are identified in the proposal area.	Contactor	Detailed design construction	Additional safeguard
Aquatic impacts	Aquatic habitat will be protected in accordance with Guide 10: Aquatic habitats and riparian zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) and Section 3.3.2 Standard precautions and mitigation measures of the Policy and guidelines for fish habitat conservation and management Update 2013 (DPI (Fisheries NSW) 2013).	Contractor	Construction	Additional safeguard
Groundwater dependent ecosystems	Interruptions to water flows associated with groundwater dependent ecosystems will be minimised through detailed design.	Contractor	Detailed design	Additional safeguard

Impact	Environmental safeguards	Responsibility	Timing	Reference
Changes to hydrology	Changes to existing surface water flows will be minimised through detailed design.	Contractor	Detailed design	Additional safeguard
Edge effects on adjacent native vegetation and habitat	Exclusion zones will be set up at the limit of clearing in accordance with *Guide 2: Exclusion zones* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Contractor	Construction	Additional safeguard
Injury and mortality of fauna	Fauna will be managed in accordance with *Guide 9: Fauna handling* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Contractor	Construction	Additional safeguard
Invasion and spread of weeds	Weed species will be managed in accordance with *Guide 6: Weed management* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Contractor	Construction	Additional safeguard
Invasion and spread of pests	Pest species will be managed within the proposal area.	Contractor	Construction	Additional safeguard
Invasion and spread of pathogens and disease	Pathogens will be managed in accordance with *Guide 2: Exclusion zones* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Contractor	Construction	Additional safeguard
Noise light and vibration	Shading and artificial light impacts will be minimised through detailed design.	Contractor	Detailed design	Additional safeguard

6.2 Soils and water

6.2.1 Existing environment

Soils

Ranging in elevation from 264 metres to 272 metres, the proposal area has a steep batter on either side of Snowy Mountain Highway. On the northern side of the Snowy Mountains Highway (bordering the wetland) there is a level difference of more than four metres from the current road level. On either side of Adelong Road and Capper Street the proposal area is relatively flat and does not feature steep grades or rises. The eastern side of Gocup Road has a steadily increasing level difference between the road and the wetland as it approaches the intersection.

The proposal area is not mapped on the eSPADE database, therefore information was sought from the Geoscience geological maps.

The Geoscience Australia 1:1,000,000 Surface Geology map shows that the proposal area spans the following lithostratigraphic units:

- (Qrc) Colluvium 38491 Colluvium and/or residual deposits, sheetwash, talus, scree; boulder, gravel, sand; may include minor alluvial or sand plain deposits, local calcrete and reworked laterite
- (Qa) Alluvium 38485, Channel and flood plain alluvium; gravel, sand, silt, clay; may be locally calcreted.

According to the Tumut geological map, the proposal intersects two distinct zones (NSW Government, 1990). The first is to the east, and is identified as sedimentary Alluvial sand and gravel, colluvium (Qa) with a lithology of unconsolidated riverine and floodplain clay, silt, sand and gravel (dominant in clay). The second is to the south west, and is identified as sedimentary high level alluvials (Czs) with a dominance in Alluvium.

Under the Tumut LEP, the proposal area is not mapped as being of acid sulfate soil risk. Interrogation of the Australian Soil Resource Information System (ASRIS) indicated that there is an extremely low probability of encountering acid sulfate soils in the proposal area.

Naturally occurring asbestos has been investigated for the area and mapped within 780 metres west of the proposal area. The geological units in the area have a low asbestos potential which is not expected to be a high risk.

A search of the NSW EPA Section 58 Contaminated Sites Register conducted on 27 May 2021 identified no contaminated sites within the Snowy Valleys Council Tumut area. The closes site was 35 kilometres south, namely a top Spoil dump and adjoining river sediments at Lot 5 DP 235380. Contaminated land database search results are provided in Appendix F.

Water

Tumut River is about 320 metres north east of the proposed roundabout, and is classified as Strahler order eight, key fish habitat. There are also smaller creeks, streams and water bodies within the wetland to the north. One waterway traverses the proposal area, a small nameless creek under the Snowy Mountains Highway through culverts that would be extended during construction. The proposal area would encroach on the adjacent northern wetland, which is mapped as being flood planning land (flood liable land) under the Tumut LEP, and is known to be prone to localised flooding.

6.2.2 Potential impacts

Construction

Soils

Potential impacts to soils would be primarily associated with the construction involved in encroachment on the northern wetland, the removal of a large number of trees located along the wetland, and shaping/filling roadside embankments to match road levels. This work would generally be contained within the existing road shoulder, and within a few metres of the road reserve. Excavation would be required to move and replace culverts, utilities, and to move utilities underground. Temporarily exposed surfaces and excavated material have the potential to result in erosion and sediment impacts if appropriate controls were not put in place.

Given the generally flat topography of Adelong Road, Capper Street and the western side of Gocup Road, most of the proposal's potential erosion and sedimentation impacts are likely to be readily mitigated with the application of standard erosion and sediment controls in an Erosion and Sediment Control Plan (ESCP). The ESCP would also include specific control measures to prevent liberated soil from entering the table drain or impacting the wetland to the north of Snowy Mountains Highway.

Excavated materials and wastes would be temporarily stockpiled at the compound site prior to onsite reuse or offsite disposal, where appropriate. Stockpiles would be managed in accordance with the Transport for NSW *Stockpile Site Management Guideline* (EMS-TG-10) to prevent potential erosion and sediment impacts.

Based on the outcomes of database search results, it is unlikely that either acid sulfate soils or contamination would present a risk to the construction of the proposal. The Construction Environmental Management Plan (CEMP) would detail unexpected finds procedures if either potential acid sulfate soils or contamination is encountered during construction.

Water

Activities during construction which may negatively impact upon water quality include the following:

- accidental spills into stormwater, table drains or detention basins from chemicals or leaks from machinery and vehicles
- gross pollution from construction materials
- affected stormwater runoff from the proposal entering the stormwater system.

Given the minimum offset distance of 320m to Tumut River, this particular watercourse is not anticipated to be directly affected by the proposal, however there is potential for indirect impacts through affected stormwater captured in the stormwater system or smaller nameless waterways and water bodies within the wetland which could discharge into Tumut River. There are also impacts expected for the small creek that flows under Snowy Mountains Highway due to construction works extending and moving culverts in the waterway. Mitigation measures as provided in section 6.2.3 would be implemented as part of the CEMP to prevent negative impacts to water quality during construction.

The SES advised that the proposal has minimal risk when reviewed against flood risk information, as provided in their response to ISEPP consultation (Appendix D).

Operation

Soils

There is expected to be minimal impact to soils following completion of the proposal and once disturbed areas have been stabilised, groundcover has been established and suitable site drainage is in place.

Water

Upgraded and repositioned culverts may provide better access and flow for waterways in the wetland resulting in positive impacts compared to preconstruction levels. Positive impacts include possibly increased waterflow beneath the Highway due to wider, better positioned and cleared culvert pipes.

The general operation and maintenance of the road would be managed under similar practices that are used at present to prevent any spillage or contaminant risk. As such, there is expected to be no net change or impact from maintaining the road.

6.2.3 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing	Reference
Soil and Water	A Soil and Water Management Plan (SWMP) will be implemented as part of the CEMP. The SWMP will identify all reasonably foreseeable risks relating to soil erosion and water pollution and describe how these risks will be addressed during construction. The Soil and Water Management Plan (SWMP) will be reviewed by a soil conservationist on the Roads and Maritime list of Registered Contractors for Erosion, Sedimentation and Soil Conservation Consultancy Services. The SWMP will then be revised to address the outcomes of the review.	Contractor	Pre-construction	Core standard safeguard Section 2.1 of QA G38 *Soil and Water Management*
Erosion and sediment impacts	A site specific Erosion and Sediment Control Plan (ESCP) will be prepared and implemented as part of the Soil and Water Management Plan (SWMP). The Plan will include arrangements for managing wet weather events, including monitoring of potential high risk events (such as storms) and specific controls and follow-up measures to be applied in the event of wet weather.	Contractor	Detailed design/ Pre-construction	Additional safeguard
Erosion and sediment impacts	Consistent with any specific requirements of the approved SWMP and ESCP, control measures will be implemented	Contractor	Pre-construction/ construction	Additional safeguard

Impact	Environmental safeguards	Responsibility	Timing	Reference
	to minimise risks associated with erosion and sedimentation and entry of materials to drainage lines and waterways. That will include, but not necessarily be limited to: • early set up and implementation of sediment management devices, such as fencing, hay bales, sand bags, catch drains and outlet protection structures • measures to divert or capture and filter water prior to discharge, such as drainage channels and first flush • scour protection and energy dissipaters at locations of high erosion risk • installation of measures at work entry and exit points to minimise movement of material onto adjoining roads, such as rumble grids and regular road sweeping • appropriate location and storage of construction materials, fuels and chemicals, including bunding where appropriate • pre-construction and construction water quality monitoring and testing upstream and downstream of the work site (to ensure no dirty water leaves site).			
Soil and water	Establish clearing limits and work boundaries that are well defined using barrier tape (or equivalent) prior to construction, clearing or stripping works commencing.	Contractor	Construction	Additional safeguard
Erosion and sediment impacts	Erosion and sedimentation controls are to be checked and maintained on a regular basis (including clearing of sediment	Contractor	Construction	Additional safeguard

Impact	Environmental safeguards	Responsibility	Timing	Reference
	from behind barriers) and records kept and provided on request.			
Erosion and sediment impacts	Work areas are to be stabilised progressively during the works.	Contractor	Construction	Additional safeguard
Erosion and sediment impacts	Erosion and sediment control measures are not to be removed until the works are complete and areas are stabilised.	Contractor	Construction	Additional safeguard
Erosion and sediment impacts	The maintenance of established stockpile sites to be in accordance with the Roads and Maritime Services *Stockpile Site Management Guidelines* (EMS-TG-10).	Contractor	Construction	Additional safeguard
Contaminated land	Where excavation in existing fill material will be required, testing for waste classification and the presence of asbestos will be undertaken prior to disposal or reuse, in accordance with TfNSW waste guidelines.	Contractor	Construction	Additional safeguard
Contaminated land	If contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the immediate risks of contamination. All other work that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the Transport Environment Manager and/or EPA.	Contractor	Detailed design/Pre-construction	Additional safeguard
Accidental spill	A site specific emergency spill plan will be developed, and include spill management measures in accordance with the Transport for NSW *Code of Practice for Water Management* (RTA, 1999) and relevant EPA guidelines. The plan will address measures to be implemented in the event of a	Contractor	Detailed design/Pre-construction	Additional safeguard

Impact	Environmental safeguards	Responsibility	Timing	Reference
	spill, including initial response and containment, notification of emergency services and relevant authorities (including Transport and EPA officers).			
Water quality	There is to be no release of dirty water into drainage lines and/or waterways.	Contractor	Construction	Additional safeguard
Water quality	Water quality control measures are to be used to prevent any materials (e.g. concrete, grout, sediment etc) entering drain inlets or waterways.	Contractor	Construction	Additional safeguard
Water quality	All workers will be advised of the location of the spill kit and trained in its use.	Contractor	Construction	Additional safeguard
Water quality	Vehicles and plant must be properly maintained and regularly inspected for fluid leaks.	Contractor	Construction	Additional safeguard
Water quality	Refuelling of plant and equipment is to occur in impervious bunded areas located a minimum of 50 metres from drainage lines or waterways.	Contractor	Construction	Additional safeguard

6.3 Traffic and transport

6.3.1 Existing environment

Snowy Mountains Highway is a classified road (State Highway) connecting Tumut to the Hume Highway in the west, and Cooma in the east (as well as acting as a gateway into northern Kosciuszko National Park). Transport is the road authority for Gocup Road, the Snowy Mountains Highway, Adelong Road and Capper Street.

Gocup Road is an important connection between Tumut and Gundagai; Capper Street links this intersection with Tumut's town centre (all classified as main roads). At the intersection of Gocup Road, Capper Street and the Snowy Mountains Highway (the intersection), the speed limit for Snowy Mountains Highway is 50km/h, 50km/h for Gocup Road (traveling southbound), and 50km/h for Capper Street (traveling northbound). A combination of road users travel along these roads and access adjacent local roads from the intersection, including light vehicles, heavy vehicles, buses, cyclists and pedestrians (with moderate to high traffic levels). On street parking is available on Capper Street in the road shoulder. There are no dedicated cyclist facilities or bus stops, and limited pedestrian facilities.

The intersection of Gocup Road and Snowy Mountains Highway is an unregulated high risk location, particularly for vehicles travelling south from Gocup Road and north from Capper Street who must give way to traffic on the Snowy Mountains Highway (Transport for NSW, 2020). The intersection is in the top 2.1 per cent of risk in NSW due to narrow lanes/shoulder width and road curve as Snowy Mountains Highway bends left with dense vegetation blocking views as it approaches the Gocup Road/Capper Street intersection (traveling westbound).

A Traffic Modelling Report was prepared by Transport in November 2020 for the Gocup Road/Snowy Mountains Highway intersection. The modelling showed in the current situation the longest delay in the AM is 16.5 seconds and 17.8 seconds in the PM, however, with the implementation of the proposal this would be reduced to 9.4 seconds in the AM and PM. The modelling report showed that by 2030 keeping the intersection as is would increase the delay to 22.3 seconds in the AM and 26.4 seconds in the PM, but with the proposal this would be 10.1 seconds in the AM and 10.3 seconds in the PM.

6.3.2 Potential impacts

Construction

During construction, access would be provided through the intersection utilising traffic control and closures of lanes. A 40km/hour speed limit would be implemented during construction. Any closures of adjacent footpaths would provide alternat routes for pedestrians and cyclists.

Construction of the proposal would result in additional construction vehicle movements, as outlined in Table 6-2. Additional construction vehicles on the road network have the potential to contribute to traffic delays and queues for local traffic.

Given the proximity of the compound site being about 500 metres west of the proposal area (and the intention to leave some construction vehicles staged within the compound site), minimal traffic related impacts are anticipated from movements between these two areas. Stockpile sites are located between 3.2 and 14 kilometres from the proposal area, which involves long distance travel between stockpile sites and the proposal area. For construction vehicle movements from the broader road network such as for deliveries, waste removal and supply of machinery, State Roads would be used as far as possible for construction vehicle routes to minimise impacts to local roads.

Table 6-2 Additional construction vehicle movements

Construction stage	Typical number of heavy and light vehicle movements per day/period
General site establishment	Two heavy vehicles, two light vehicles per shift
Pavement widening, shoulder/ verge works, safety barrier reinstallation and line marking	Four heavy vehicles, two light vehicles per shift
Construction vehicle movement at peak during earthworks phase	Average about 50 vehicles per day
Site clean- up and commissioning of upgraded facility	Two heavy vehicles, two light vehicles per shift

Traffic control would be implemented in accordance with a site-specific Traffic Management Plan (TMP) for the duration of the construction period. This would involve a combination of long-term traffic controls such as rigid traffic barriers to separate construction workers from live traffic and short-term measures implemented as needed such as traffic cones, reduced speed limits and lane closures. Where possible, construction work would be carried out during the day behind the rigid traffic barriers. Some construction work would be carried out at night to minimise disruption to traffic. At times, diversions, stop/slow, and one lane closure would be in place with traffic control alternatingly directing traffic through a shared lane. Temporary lane closures would be implemented when traffic volumes are typically lower, such as during the night period. Construction traffic management would prioritise maintaining traffic flow with short delays, and maintaining property access and access to the wetland.

Operation

During operation, the proposal would result in the following positive benefits:

- improved visibility on approach to intersection due to vegetation removal and reduced approach angle for vehicles on Snowy Mountains Highway
- improved safety barriers in case of crashes along Snowy Mountains Highway
- increased lane and shoulder widths allowing for safer turning
- improving visibility of signposting and line marking to make approach to intersection clearer and safer
- reduced queuing for vehicles as above
- provision for future improved pedestrian and cyclist accessibility around the intersection
- improved road safety and access.

With further traffic growth predicted in coming years, the proposal would ensure the intersection can manage increasing traffic volumes.

6.3.3 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing	Reference
Traffic	A TMP will be prepared and implemented as part of the CEMP. The TMP will be prepared in accordance with the Roads and	Contractor	Detailed design/ Pre-construction	Additional safeguard

Impact	Environmental safeguards	Responsibility	Timing	Reference
	Maritime *Traffic Control at Work Sites Manual* (RTA, 2010) and *QA Specification G10 Control of Traffic* (Roads and Maritime, 2008). The TMP will include: • confirmation of haulage routes • measures to maintain access to local roads and properties • site specific traffic control measures (including signage) to manage and regulate traffic movement • measures to maintain pedestrian and cyclist access including alternate routes during construction when required • requirements and methods to consult and inform the local community of impacts on the local road network • access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads • a response plan for any construction traffic incident • consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic • monitoring, review and amendment mechanisms.			
Traffic	A Variable Message Sign (VMS) and traffic alert will be used to notify road users of the planned night works and lane closures.	Contractor	Pre-construction/ construction	Additional safeguard
Access	Where possible, current property accesses are to be maintained during the works. Any disturbance is to be minimised to prevent unnecessary traffic delays.	Contractor	Construction	Additional safeguard

6.4 Noise and vibration

6.4.1 Methodology

A Noise and Vibration Impact Assessment (NVIA) was prepared by SLR Consulting Australia Pty Ltd (SLR) (SLR, 2021) to quantify potential construction noise and vibration impacts, and operational road traffic impacts to surrounding receivers (refer to Appendix H). Additionally, the NVIA recommends reasonable and feasible noise mitigation measures where required.

Noise monitoring was undertaken in the study area between 16 June 2021 and 28 June 2021. The measured noise levels were used to establish the pre-project noise environment and assist in establishing suitable noise limits to assess the proposal's noise emissions. A noise "logger" was located in a nature strip opposite 1-5 Capper Street, Tumut, with the measured existing noise levels at this location to be considered representative of the background noise levels experienced at receivers likely be the most affected by the construction and operation of the proposal.

The noise monitoring equipment continuously measured existing noise levels in 15-minute periods during the daytime, evening and night-time. All equipment carried current National Association of Testing Authorities (NATA) calibration certificates and calibration was checked before and after the noise monitoring survey.

The results of the noise monitoring were analysed to exclude noise from extraneous events and data affected by unsuitable weather conditions, such as strong wind or rain (wind and rain information was sourced from Canberra Airport BOM station) to establish existing ambient noise levels for the study area.

6.4.2 Existing environment

Noise levels in the study area are dominated by road traffic noise from the existing road network. Surrounding the proposal are primarily residential lots with scattered commercial/industrial. The area north and east of the proposal is primarily rural landscape (The Tumut Wetlands).

The nearest receivers to the proposal are commercial and residential properties to the west and south of the proposal intersection, with the nearest/most affected presented in Table 6-3 and Figure 6-1.

Table 6-3 Noise sensitive receivers

ID	Address	Type	Distance (m)	Direction
R01	2 Gocup Rd, Tumut	Commercial	290	NW
R02	1-13 Adelong Rd, Tumut	Commercial	80	W
R03	1-5 Capper St, Tumut	Commercial	30	SW
R04	34a Adelong Rd, Tumut	Residential	140	W
R05	38 Adelong Rd, Tumut	Residential	180	W
R06	Riverglade Caravan Park 2 Fitzroy St, Tumut	Residential	420	E
R07	7 Capper St, Tumut	Residential	50	S

Noise data sourced from the noise logger (Figure 6-1) is presented in Table 6-4. Assessed periods are as follows:

- Daytime - 7:00 am to 6:00 pm
- Evening - 6:00 pm to 10:00 pm
- Night-time - 10:00pm to 7:00 am.

Table 6-4 Noise monitoring survey results

ID	Address	Ambient Noise Level (dBA)					
		Background Noise (RBL)			**Average Noise (L_{Aeq})**		
		Day	Evening	Night	Day	Evening	**Night**
L01	Capper Street, Tumut	45	37	30	56	51	51

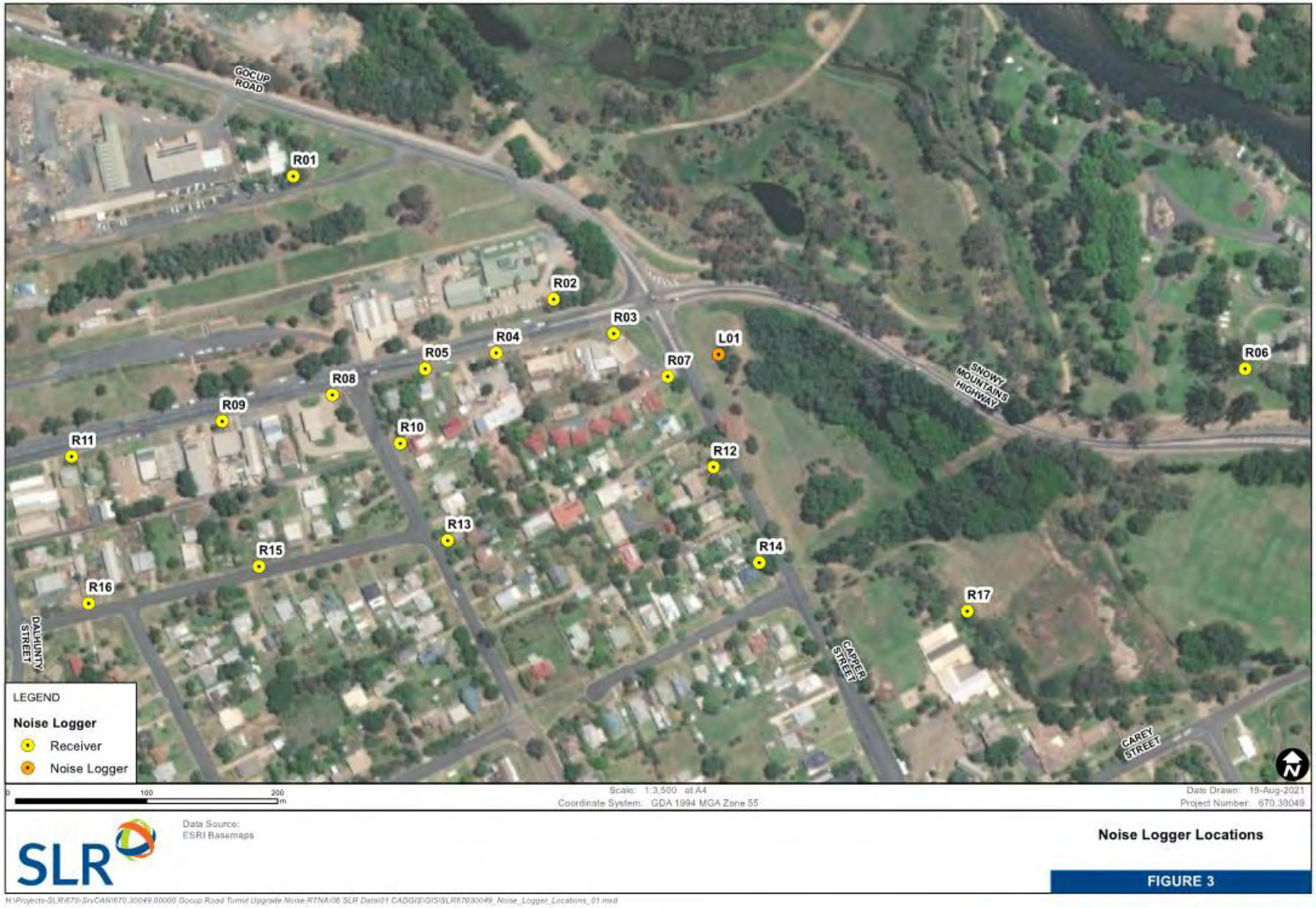


Figure 6-1 Sensitive receivers and noise monitoring locations (SLR, 2021)

6.4.3 Criteria

Construction noise

The NSW *Interim Construction Noise Guideline* (DECC, 2009) was used to assess and manage potential construction noise emitted during construction works and activities associated with the proposal.

The ICNG contains procedures for determining project specific Noise Management Levels (NMLs) for sensitive receivers based on the existing background noise in the area. The 'worst-case' noise levels from construction of the proposal are predicted and then compared to the NMLs in a 15-minute assessment period to determine potential for adverse effects associated with construction of the proposal.

The NMLs are not mandatory limits, however, where construction noise levels are predicted or measured to be above the NMLs, feasible and reasonable work practices to minimise noise emissions are to be investigated.

The approach for determining NML's at residential receivers is presented in Table 6-5.

Table 6-5 ICNG NML's for residential receivers

Time of Day	NML $L_{Aeq(15minute)}$	How to Apply
Standard Construction Hours **Monday to Friday 7:00 am to 6:00 pm** **Saturday** **8:00 am to 1:00 pm** **No work on Sundays or public holidays**	RBL[1] + 10 dB 55 dBA	• The noise affected level represents the point above which there may be some community reaction to noise • Where the predicted or measured LAeq(15minute) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practises to meet the noise affected level • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly Noise Affected 75 dBA	• The Highly Noise Affected (HNA) level represents the point above which there may be strong community reaction to noise • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restructuring the hours that the very noisy activities can occur, taking into account: o Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools or mid-morning or mid-afternoon for works near residences o If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.

Time of Day	NML $L_{Aeq(15minute)}$	How to Apply
Outside Standard Construction Hours	RBL + 5 dB 35 dBA	• A strong justification would typically be required for works outside the recommended standard hours • The proponent should apply all feasible and reasonable work practices to meet the noise affected level • Where all feasible and reasonable practises have been applied and noise is more than 5 dB above the noise affected level, the proponent should negotiate with the community.

Several commercial land uses were identified in the study area. The ICNG NML for those receivers has been adopted to be 70 dBA.

It is understood that construction works would be completed during Standard Construction Hours where possible. Where Out of Hours Works (OOHW) are to be required, an assessment of the proposed activities, including an assessment of the potential for sleep disturbance, must be undertaken during the preparation of the NVIA in accordance with the ICNG.

Consideration of noise associated with construction traffic related to the proposal has been undertaken in accordance with the NSW Road Noise Policy (RNP) and Construction Noise and Vibration Guideline (CNVG). An initial assessment is first applied to evaluate if existing road traffic noise levels are expected to increase by more than 2 dB as a result of construction traffic. Where this is considered likely, further assessment is required based on the criteria

Table 6-6 RNP/CNVG criteria for assessing construction traffic on public roads

Road Category	Type of Project/Land Use	Assessment Criteria (dBA)	
		Daytime (7 am – 10 pm)	**Night-time** **(10 pm – 7 am)**
Freeway/ arterial/ **sub-arterial roads**	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	$L_{Aeq(15hour)}$ 60 (external)	$L_{Aeq(9hour)}$ 55 (external)
Local roads	Existing residences affected by additional traffic on existing local roads generated by land use developments	$L_{Aeq(1hour)}$ 55 (external)	$L_{Aeq(1hour)}$ 50 (external)

Construction vibration

Effects of vibration from construction work is divided into the following three categories:

- Disturbance to occupants of buildings (human comfort). Vibration from construction work tends to be intermittent in nature and the EPA's *Assessing Vibration: a technical guideline* (DEC, 2006) provides criteria for intermittent vibration based on the Vibration Dose Value (VDV). Construction activities for the proposal are not expected to result in continuous or impulsive vibration impacts

- Disturbance to the contents of a building (building contents). It is not necessary to set separate criteria for vibration effects on typical building contents for this proposal
- Disturbance where the integrity of the building may be compromised (structural/cosmetic damage). If vibration from construction work is sufficiently high it can cause cosmetic damage to elements of affected buildings. Industry standard cosmetic damage vibration limits are specified in British Standard BS 7385 and German Standard DIN 4150.

Operational noise and vibration

This proposal is considered as minor works under the following definition in the NSW RMS Noise Criteria Guideline (NCG) (RMS, 2015):

Some works may be primarily to improve safety. This may include minor straightening of curves, installing traffic control devices, intersection widening and turning bay extensions or making minor road realignments.

These works are not considered redeveloped or new as they are not intended to increase the traffic carrying capacity of the overall road or accommodate a significant increase in heavy vehicle traffic.

Therefore, the RNP assessment criteria would not be applied for the assessment of operational impacts for this proposal, with impacts assessed under the NCG.

A noise model of the study area was used to predict noise levels from the operation of the proposal to the surrounding receivers. The model uses Calculation of Road Traffic Noise (CoRTN) (UK Department of Transport, 1988) prediction method within the SoundPLAN predictive modelling software.

Local terrain, receiver buildings and structures were digitised in the noise model to develop a three-dimensional representation of the proposal and surrounding areas.

For the purposes of this assessment, a comparison in noise level between the build and no-build scenario was undertaken. The most significant difference between those two scenarios is the change in the alignment of the roadway.

It is understood that traffic volumes and composition would not change as a result of the proposal.

6.4.4 Potential impacts

Construction noise

Scenarios were developed based on the various construction works and activities as per Table 6-7.

Table 6-7 Construction scenario descriptions

ID	Scenario	Description
W.01	General site establishment	• Establishment of compound, stockpiles sites, and fencing, where required • Implement of traffic control, including partial road closures and closures of side streets • Installation of erosion and sediment controls.

ID	Scenario	Description
W.02 and W.03	Pavement widening and Shoulder/ verge works	• Widening of existing pavement (with removal of pavement layers in some locations) and disposal/reuse of this pavement and subgrade material • Construction of access way to become pathway • Bulk earthworks including placement of road surfaces • Drainage works (culverts, subsoils, kerb and gutter) • Street lighting • Relocation of active travel path for pedestrian and cyclist to northeast (to be closed during construction period with detours along alternative pedestrian/cycle paths within the wetland) • Modification of the pavement (in widening areas) with lime.
W.04	Safety barrier reinstallation	• Installation of new and upgrading of safety barrier.
W.05	Line marking	• Installation of line marking and any roadside furniture including medians and signs.

Construction work scenarios, together with the proposed plant/equipment for the proposal and their associated sound power level (SWL) are presented in Table 6-8.

Table 6-8 Equipment lists and sound power levels

Equipment		Asphalt Milling Machine	Back Hoe (7.5 tonne)	Bitumen Spray Truck	Circular Saw	Excavator (14 tonne)(	Excavator (22 tonne)	Flatbed truck	Generator	Grader	Hydraulic Post Driver (Impact)	Hydro mulching Equipment	Lighting - Diesel Generator	Line Marking Plant	Padfoot Roller	Paving Machine	Pneumatic hammer	Road Profiler	Roller - Smooth Drum	Semi Trailer	Tipper Truck	Trench Roller	Truck	Ute	Water Tanker
Sound Power Level[1]		111	102	100	106	97	99	100	102	108	118	97	98	98	101	105	114	107	107	106	97	104	107	98	**98**
Ref	Scenario																								
W.01	General Site Establishment								X														X	X	
W.02	Pavement Widening	X			X											X		X	X		X		X		X
W.03	Shoulder/Verge Works		X	X		X	X			X		X			X					X	X		X		X
W.04	Safety Barrier Installation							X			X						X			X			X		
W.05	Line Marking												X	X									X	X	

[1] Sound power level data is taken from the DEFRA Noise Database, RMS Construction and Vibration Guideline and TfNSW Construction Noise and Vibration Strategy.

A summary of the predicted construction noise impacts for each receiver is shown in Table 6-9. For most work, the construction noise impacts would frequently be lower than predicted as the worst-case situation is typically only apparent for a relatively short period when noisy equipment is in use nearby (near). Noise levels at sensitive receptors can be substantially lower than the worst-case scenario when the construction works move to a more distant location in a works area (far) Exceedances of daytime NMLs have been highlighted in orange. Exceedances of the "Highly Noise Affected" criterion (75 dBA) have been highlighted in red.

Table 6-9 Predicted range of construction noise impacts

NCA	NML (Standard Construction Hours)	Range of Noise Levels in Noise Catchment Area									
		W.01		W.02		W.03		W.04		**W.05**	
		Far	Near	Far	Near	Far	Near	Far	Near	Far	**Near**
R01	70	39	49	47	57	44	54	50	60	36	46
R02	70	47	69	55	77	52	74	58	80	44	66
R03	70	49	76	57	84	54	81	60	87	46	73
R04	55	38	60	46	68	43	65	49	71	35	57
R05	55	39	52	47	60	44	57	50	63	36	49
R06	55	39	49	47	57	44	54	50	60	36	46
R07	55	49	77	57	85	54	82	60	88	46	74

The assessment in Table 6-9 presenting worst case noise impacts shows that:

- The highest noise levels are predicted to occur during W.04 – Safety Barrier Installation, driven by the use of post driving rigs
- The "highly noise affected" criterion is predicted at nearby residences during all scenarios except for W.05. This is unavoidable when inherently noisy works occur and equipment operates very close to the receivers
- Exceedances of daytime NMLs are predicted at sensitive receptors at times within about 250 m of works/activities during all scenarios.

It is noted that for most scenarios, the noisiest work would only be required for a relatively short period of the total proposal duration. Construction noise at other times would be much lower than the predicted worst-case levels.

Based on these outcomes, mitigation measures in section 6.4.5 to minimise noise from the site as far as practicable should be implemented.

Construction traffic

The number of heavy and light vehicle movements per day as per section 3.3.7 is a relatively small number of construction vehicle movements in relation to the existing traffic volumes on the road network, with construction traffic not predicted to increase road traffic noise levels by more than 2 dBA.

Therefore, construction road traffic noise mitigation or management measures are not required.

Construction vibration

Minimum safe working distances for cosmetic damage and human comfort associated with vibration intensive construction equipment that may be used during the proposal is presented in Table 6-10.

Table 6-10 Recommended minimum working distances from vibration intensive plant

Plant Item	Rating/Description	Minimum Distance		
		Cosmetic Damage		Human Response (NSW EPA Guideline)
		Residential/Light Commercial (BS 7385)	Heritage Items (DIN 4150, Group 3)	
Vibratory Roller	<50 kN (1 - 2 tonne)	5 m	11 m	15 m to 20 m
	<100 kN (2 - 4 tonne)	6 m	13 m	20 m
	<200 kN (4 - 6 tonne)	12 m	15 m	40 m
	<300 kN (7 - 13 tonne)	15 m	31 m	100 m
	>300 kN (13 - 18 tonne)	20 m	40 m	100 m
	>300 kN (>18 tonne)	25 m	50 m	100 m
Medium Hydraulic Hammer	900 kg (12t - 18t excavator)	7 m	15 m	23 m
Large Hydraulic Hammer	1,600 kg (18t - 34t excavator)	22 m	44 m	73 m
Vibratory Pile Driver	Sheet piles	2 m to 20 m	5 m to 40 m	20 m
Piling Rig – Bored	≤ 800 mm	2 m (nominal)	5 m	4 m

The main potential source of vibration would occur when vibratory rollers operate during shoulder/verge and road surfacing activities close to the residences in Capper Street. Those properties may be about 15m from such works. It is recommended to use as light a vibratory roller as practicable, but no greater than 13t in that area.

The occupants of those receptors and several others may also perceive vibration at times when vibration intensive equipment is in use. Where vibration is perceptible, it would likely only be apparent for relatively short durations and not expected to result in significant adverse effects.

Buildings in other parts of the study area are generally sufficiently distant to be outside the minimum safe working distances.

Buildings within the distances described in Table 6-10 would be included in the dilapidation survey. This includes the residences on Capper Street within 15m and nearest to the works. Other buildings may be included following review of construction activities and equipment by the contractor; refer to minimum distances for plant in Table 6-10. Mitigation measures are discussed in section 6.4.5.

Operation

Traffic flow information from the Transport for NSW SIDRA Report for the intersection (TfNSW, 2020) was used in the modelling assessment as shown in Table 6-11.

Table 6-11 Modelled traffic volumes

	AM Peak Traffic Volume (veh/h)	Heavy Vehicles, %
South: Capper Street	103	8.2
East: Snowy Mountains Highway	225	16.8
North: Gocup Road	99	18.1
West: Snowy Mountains Highway	260	11.3

The predicted noise level difference between ‘build’ and ‘no build’ scenarios at identified receivers is presented in Table 6-12.

Table 6-12 Road traffic noise level difference between ‘build’ and ‘no build’ scenarios

ID	Address	Predicted Build v No Build Level Difference (dBA)
R01	2 Gocup Rd, Tumut	+0.1
R02	1-13 Adelong Rd, Tumut	+0.1
R03	1-5 Capper St, Tumut	0
R04	34a Adelong Rd, Tumut	-0.1
R05	38 Adelong Rd, Tumut	0
R06	Riverglade Caravan Park 2 Fitzroy St, Tumut	0
R07	7 Capper St, Tumut	-0.1
R08	42-44 Adelong Rd, Tumut	+0.1

Changes of less than 1 dBA between the scenarios are expected, which is less than the minor works criterion of 2.0 dBA. Therefore, the intersection upgrade to include a roundabout would not be expected to result in adverse noise effects at nearby receptors and no further assessment is required.

6.4.5 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing	Reference
Noise and vibration	A Construction Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP. The NVMP will generally follow the approach in the Interim *Construction Noise Guideline* (ICNG) (DECC, 2009) and identify: • Nearby sensitive receivers • Description of the works, equipment and hours of work • Criteria and relevant licence and approval conditions • Requirements for noise monitoring • All potential significant noise and vibration generating activities associated with the activity • Feasible and reasonable mitigation measures to be implemented, taking into account *Beyond the Pavement: urban design policy, process and principles* (Transport for NSW, 2014) • Details of how community consultation would be completed • Procedures for handling complaints • In the case of complaint, a monitoring program to assess performance against relevant noise and vibration criteria will occur • Arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures • Contingency measures to be implemented in the event of non-compliance with noise and vibration criteria.	Contactor	Detailed design / pre-construction	Section 4.6 of QA *G36 Environment Protection*

Impact	Environmental safeguards	Responsibility	Timing	Reference
	• Details on how respite would be applied where ongoing high impacts are seen at certain receivers.			
Implement community consultation or notification measures	For activities where the construction noise is predicted to exceed the "Highly Noise Affected" Level: • Notification detailing work activities, dates and hours, impacts and mitigation measures, indication of work schedule, any operational noise benefits from the works (where applicable) and contact telephone number • Notification shall be a minimum of 7 calendar days prior to the start of works. For projects other than maintenance works more advanced consultation or notification may be required • Undertake noise verification measurements, if required • Website (if required) • Contact telephone number for community Email distribution list (if required) • Community drop in session (if required by approval conditions).	Contactor	Detailed design / pre-construction	Additional safeguard
Site inductions	All employees, contractors and subcontractors will receive an environmental induction. The induction must at least include: • All project specific and relevant standard noise and vibration mitigation measures • Relevant licence and approval conditions • Permissible hours of work • Any limitations on high noise generating activities • Location of nearest sensitive receivers	Contractor	Pre-construction/ construction	Additional safeguard

Impact	Environmental safeguards	Responsibility	Timing	Reference
	• Construction employee parking areas • Designated loading/unloading areas and procedures • Site opening/closing times (including deliveries) • Environmental incident procedures.			
Behavioural practices	• No unnecessary shouting or loud stereos/radios on site • No dropping of materials from height throwing of metal items, door slams etc.	Contractor	Construction	Additional safeguard
Building condition surveys	Building dilapidation surveys will be undertaken on all buildings located within the buffer zone identified in Table 6-10 (15m for most buildings) prior to commencement of activities with the potential to cause property damage. It is noted that this requirement can be avoided if measures such as control (light roller) can be used.	Contractor	Pre-construction	Additional safeguard
Construction hours and scheduling	Where feasible and reasonable, construction will be carried out during the standard daytime working hours. Work generating high noise and/or vibration levels will be scheduled during less sensitive time periods.	Contractor	Construction	Additional safeguard
Equipment selection	• Use quieter and less vibration emitting construction methods where feasible and reasonable. • Ensure plant including the silencer is well maintained.	Contractor	Construction	Additional safeguard
Plant noise levels	The noise levels of plant and equipment must have operating Sound Power or Sound Pressure Levels no higher than those in Table 6-8.	Contractor	Construction	Additional safeguard
Use and siting of plant	• The offset distance between noisy plant and adjacent	Contractor	Construction	Additional safeguard

Impact	Environmental safeguards	Responsibility	Timing	Reference
	sensitive receivers will be maximised • Plant used intermittently to be throttled down or shut down • Noise-emitting plant to be directed away from sensitive receivers • Only have necessary equipment on site.			
Plan worksites and activities to minimise noise and vibration	• Locate compounds away from sensitive receivers and discourage access from local roads • Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site • Where additional activities or plant may only result in a marginal noise increase and speed up works, limit duration of impact by concentrating noisy activities at one location and move to another as quickly as possible • Very noisy activities will be scheduled for normal working hours. If the work cannot be undertaken during the day, it will be completed before 11:00 pm • Where practicable, work will be scheduled to avoid major student examination periods when students are studying for examinations such as before or during Higher School Certificate and at the end of higher education semesters • If programmed night work is postponed the work will be re-programmed and the approaches in this guideline apply again.	Contractor	Pre-construction/ construction	Additional safeguard

Impact	Environmental safeguards	Responsibility	Timing	Reference
Reduced equipment power	Use only the necessary size and power-rating for plant and equipment. Select the minimum where practical to do so, including the vibratory roller.	Contractor	Construction	Additional safeguard
Non-tonal and ambient sensitive reversing alarms	• Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work • Consider the use of ambient sensitive alarms that adjust output relative to the ambient noise level.	Contractor	Construction	Additional safeguard
Minimise disturbance arising from delivery of goods to construction sites	• Loading and unloading of materials/deliveries is to occur as far as possible from sensitive receivers • Select site access points and roads as far as possible away from sensitive receivers. Dedicated loading/unloading areas to be shielded if close to sensitive receivers • Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible • Avoid or minimise these out of hours movements where possible.	Contractor	Construction	Additional safeguard
Engine compression brakes	• Limit the use of engine compression brakes • Ensure vehicles are fitted with a maintained Original Equipment Manufacturer exhaust silencer or a silencer that complies with the National Transport • Commission's 'In-service test procedure' and standard.	Contractor	Construction	Additional safeguard
Shield stationary noise	Stationary noise sources will be enclosed or shielded where feasible	Contractor	Construction	Additional safeguard

Impact	Environmental safeguards	Responsibility	Timing	Reference
sources such as pumps, compressors, fans etc.	and reasonable whilst ensuring that the occupational health and safety of workers is maintained. Materials suitable for shielding will have a surface mass of at least 12kg/m^3.			
Shield sensitive receivers from noisy activities	Use structures to shield residential receivers from noise such as site shed placement; earth bunds; fencing; erection of operational stage noise barriers (where practical) and consideration of site topography when situating plant.	Contractor	Construction	Additional safeguard
Structural surveys and vibration monitoring	• At locations where there are high-risk receptors (receptors within the minimum safe work distance), pre-start and ongoing vibration monitoring will be conducted during the activities causing vibration • Where work is within the minimum working distances and considered likely to exceed the cosmetic damage criteria: o Investigate alternate construction methods with lower source vibration levels and implement, where feasible (including light vibration roller) o Undertake attended vibration measurements at the start of the work to determine actual vibration levels at the item. Work shall be ceased if the monitoring indicates vibration levels are likely to, or do, exceed the relevant criteria.	Contractor	Pre-construction/ construction	Additional safeguard

6.5 Aboriginal cultural heritage and non-Aboriginal heritage

6.5.1 Methodology

Aboriginal heritage

A Stage two assessment was carried out in accordance with the *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI) (Roads and Maritime, 2011). As part of this assessment, a database search of the Aboriginal Heritage Information Management System (AHIMS) was completed on 20 April 2021. The Stage two PACHCI letter is provided in Appendix B, and AHIMS search results are provided in Appendix F.

Non-Aboriginal heritage

The following database searches were carried out on 21 May 2021:

- Tumut LEP heritage items
- NSW Heritage Database (including the Transport for NSW Section 170 register and State Heritage Inventory (SHI))
- Australian Heritage Database (including the Register of the National Estate, National Heritage List, World Heritage List and Commonwealth Heritage List).

Refer to Appendix F for results of the relevant searches.

6.5.2 Existing environment

Aboriginal heritage

Much of the proposal area has been highly disturbed by urban development, roadworks and other infrastructure. The portion of the proposal area comprising Capper Street, Snowy Mountains Highway and Gocup Road reserves and the vacant land south of Snowy Mountains Highway, was identified as significantly disturbed. This disturbance within the road corridor is due to previous road construction and associated infrastructure such as footpaths, safety rails, culverts, drainage, embankments, and the installation of multiple underground utilities and overhead powerlines. The wetlands are characterised by low lying lagoons, oxbow lakes, marshlands and drainages into the Tumut River. These kinds of areas may have been utilised for resources by Aboriginal people but is unlikely to be used for camping and due to the low lying nature of the wetlands and as such is deemed to contain low potential for archaeological deposits.

The results of the NSW SHI database search indicated there is one previously recorded Aboriginal Place listed under the *National Parks and Wildlife Act* within the Snowy Valleys LGA. This item (Hannibal Hamilton Grave) is not located within or adjacent to the proposal area.

The Stage two PACHCI assessment identified five AHIMS sites within one kilometre of the proposal area (all culturally modified trees), however, it also concluded that the proposal area does not contain landscape features that indicate the presence of Aboriginal objects.

Non-Aboriginal heritage

The results of the NSW SHI database search indicated there are four previously recorded historical heritage sites listed under the *NSW Heritage Act* within the Snowy Valleys LGA. The results of the NSW SHI database search indicated there are 74 previously recorded non-Aboriginal heritage sites listed by the Local and State

Agencies within the Snowy Valleys LGA. Two of these lots are located immediately adjacent to the proposal area, extending into the proposal area. These include:

- Tumut Butter Factory (I48) at 1–13 Adelong Road, Lot 3, DP 1005490; now used as a visitor information centre
- Tumut Railway Station Group, Railway Station and Residence (former Station Masters Residence), Cootamundra-Tumut Railway, Tumut Station and associated buildings (I47) at 15–55 Adelong Road, Lot 1, DP 839094 and Lot 1, DP 829420.

6.5.3 Potential impacts

Construction

Aboriginal heritage

Given no Aboriginal sites or areas of archaeological potential were identified within the disturbed areas (seen in Figure 6-2) of the proposal area, construction is not anticipated to have a high likelihood of potential impacts in these sections. Based on the assessment carried out within the Stage two PACHCI, construction of the proposal is unlikely to impact on Aboriginal heritage as there are no known Aboriginal heritage sites within the proposal area. However, it is noted this may be the result of a lack of data, and so the precautionary principle is encouraged. Unexpected finds procedures would be included in the CEMP, to guide the management of potential heritage finds during construction.

The Compound Stockpile Site was located on an elevated terrace overlooking several unnamed drainage lines, Gilmore Creek and the floodplain of the Tumut River and was considered to have potential for subsurface archaeological deposits (PAD 1). If Transport was to use this location for stockpiling, Stage three of the PACHCI must be undertaken with a programme of subsurface testing within PAD 1. All subsurface testing can be conducted in accordance with the *Code of Practice for Archaeological Investigations.* The Brungle-Tumut LALC representatives onsite during the site inspection also agreed with this assessment.

Non-Aboriginal heritage

During construction there would be impacts to the heritage items Tumut Butter Factory and the Tumut Railway Station Group as these properties are directly adjacent to the proposal area on the western edge of Gocup Road. Works in this area include:

- removal of trees
- shaping embankment to match recently completed works
- ripping and topsoiling existing pavement outside of proposed kerb
- utilities adjustments.

These earthworks may cause vibration and noise impacts which are examined in more detail in section 6.4. In brief, the road would be moved some metres further away from the heritage items. Only a small part of the proposal footprint would potentially fall inside the heritage boundary, with the road edge already 50 metres from the nearest building. For these reasons it is unlikely that the vegetation removal and construction works would impact on the overall landscape value of the heritage items, with the implementation of the safeguards and management measures listed in 6.5.4. Unexpected finds procedures would be included in the CEMP, to guide the management of potential heritage finds during construction.

Operation

The proposal is not anticipated to impact on any items of Aboriginal heritage or non-Aboriginal heritage in the operational phase.

Figure 6-2 Heritage Landforms within the proposal area (NGH Pty Ltd, 2021)

6.5.4 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing	Reference
Aboriginal heritage	• the Standard Management Procedure - *Unexpected Heritage Items* (Roads and Maritime, 2015) will be followed in the event that an unknown or potential Aboriginal object/s, including skeletal remains, is found during construction. This applies where Transport does not have approval to disturb the object/s or where a specific safeguard for managing the disturbance (apart from the Procedure) is not in place • work will only re-commence once the requirements of that Procedure have been satisfied.	Contractor	Detailed design/ pre-construction	Section 4.9 of QA *G36 Environment Protection*
Non-Aboriginal heritage	• the *Standard Management Procedure - Unexpected Heritage Items* (Roads and Maritime, 2015) will be followed in the event that any unexpected heritage items, archaeological remains or potential relics of Non-Aboriginal origin are encountered • work will only re-commence once the requirements of that Procedure have been satisfied.	Contractor	Detailed design/pre-construction	Section 4.10 of QA *G36 Environment Protection*
Non-Aboriginal heritage	• if an existing heritage item or item identified on the Roads and Maritime Services s.170 register is on site or in the near vicinity of the works, the item is to be protected to prevent any damage or disturbance.	Contractor	Detailed design/pre-construction	Additional safeguard

6.6 Visual impacts

6.6.1 Methodology

The landscape character and visual impact assessment was carried out in accordance with the *Guideline for landscape character and visual impact assessment EIA-N04* (Landscape character and VIA guideline) (Transport for NSW, 2020). As per Table 2 of the Landscape character and Visual Impact Assessment (VIA) guideline, it was concluded that a landscape character assessment was not required as the proposal is for a medium sized intersection upgrade. Accordingly, only a visual impact assessment has been carried out following Section six of the Landscape character and VIA guideline.

Sensitivity and magnitude provide measures to assess visual impacts from the proposal. The combination of sensitivity and magnitude gives an impact rating for visual impacts based on Table 6-13.

Table 6-13 Landscape character and VIA guideline grading matrix (TfNSW, 2020)

	Magnitude				
Sensitivity		High	Moderate	Low	Negligible
	High	High	High-Moderate	Moderate	Negligible
	Moderate	High-Moderate	Moderate	Moderate-Low	Negligible
	Low	Moderate	Moderate-Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

6.6.2 Existing environment

Visually, the proposal area incorporates views of residential buildings, road infrastructure, wetlands, and some commercial/ retail buildings (including Tumut Valley Tyre Service). The road infrastructure on Snowy Mountains Highway and Gocup Road are the dominant visual feature in the proposal area, which includes a single lane in either direction, with narrow shoulders and visibility blocking vegetation on either side.

A landscape character map is provided in Figure 6-3 which shows the predominant landscape zones surrounding the proposal area are residential and recreational, with photographs taken during the site visit included in Appendix G.

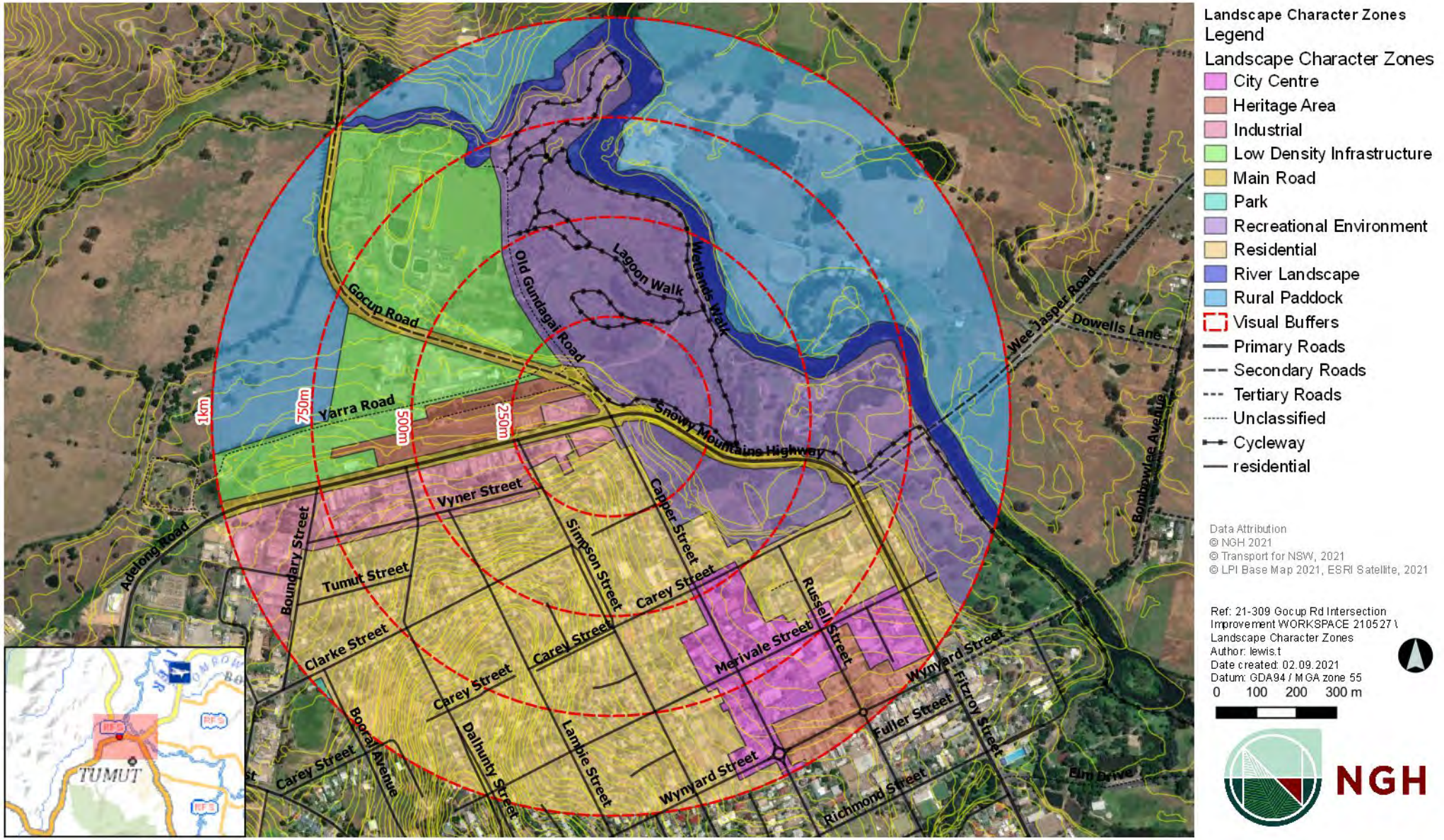


Figure 6-3 Landscape characteristics of the proposal

6.6.3 Potential impacts

Construction

Potential visual impacts during construction may be perceived by residential receivers within the proposal area and road users that travel within the proposal area. These impacts may occur from the active construction area (including machinery and traffic bollards) and views of the construction compound 500m west at Tumut Transport for NSW Depot.

Removal of selected mature vegetation to north western corner of the intersection would be undertaken between the Tumut Visitor Centre and Gocup Road. This would involve removing five trees, some of which are mature planted trees. The removal of these five trees has been agreed upon with the landholder as they reduce the sight distance for traffic approaching the intersection. Approximate location of trees to be removed are shown in the detailed design (see Appendix A).

The sensitivity of the proposal area is considered low given it is already an operational road corridor and construction would not add significant elements to the landscape. The magnitude of the impact is considered low as the construction would be of limited duration. Sensitivity, magnitude and potential visual impacts are considered manageable with the application of the mitigation measures and safeguards outlined (Section 6.6.4), such as maintaining a tidy site and removing wastes at the end of each shift. Therefore, the overall visual impact during construction is low.

As construction work may be required at night, there is potential for temporary construction lighting to impact residences, if not appropriately positioned. Mitigation measures provided in section 6.6.4 would prevent light spill impacts to residences.

Operation

Once operational, the potential views, or ‘visual envelope’ of the proposal is likely to incorporate the area shown in Figure 6-4. The proposal would alter the appearance of the proposal area by installing a roundabout, and moving the intersection north east, as well as clearer signage, line markings, vegetation clearing and minor widening of the road corridor. However, this view would still be in keeping with the existing road corridor and would not introduce new features that are not consistent with road infrastructure. Additional visibility is a safety feature of the proposal and deemed a positive visual impact. Accordingly, the overall operational visual impact is assessed as being low. No specific safeguards are required to mitigate operational visual impacts.

Figure 6-4 Visual envelope of the proposal (operation)

6.6.4 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing	Reference
Visual	Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.	Contractor	Construction	Additional safeguard
Visual	Construction lighting will be aligned to minimise light spill on adjacent land users, and installed and operated in accordance with AS4282:1997 Control of the Obtrusive Effect of Outdoor Lighting. Residents that may be impacted by light spill will be notified of the work and potential impacts prior to commencement of work requiring artificial lighting.	Contractor	Construction	Additional safeguard
Visual	Rehabilitation and beautification works in keeping with the existing character of the location will be undertaken to soften the visual impact of the new roundabout and associated works.	Contractor	Rehabilitation	Additional safeguard

6.7 Property, land use and socio-economic

6.7.1 Existing environment

The proposal area is identifiable by urban development, roadworks and other infrastructure. It is highly disturbed with road construction, foot paths, safety rails, culverts, drainage, embankments, and multiple underground utilities and overhead powerlines. The main feature of the intersection is the road infrastructure of Snowy Mountains Highway, and Gocup Road. Nearby properties include the Tumut Visitor Centre, Tumut Broom Factory, and Tumut River Brewing, as shown in Figure 6-5. The proposal includes land zoned as follows:

- SP2 – Infrastructure
    - to provide for infrastructure and related uses
    - to prevent development that is not compatible with or that may detract from the provision of infrastructure.
- RE1 – Private Recreation
    - to enable land to be used for private 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.

According to the 2016 Census, Tumut has a population of 6,230 people with a median age of 43, mostly married couples, full time working, and Australian citizens (Australian Bureau of Statistics, 2016). The most common occupations for Tumut are:

1. technicians and trade workers (16.7%)
2. labourers (15%)
3. professionals (13.7%)
4. machinery operators and drivers (12.8%)
5. clerical and administrative workers 10.8%).

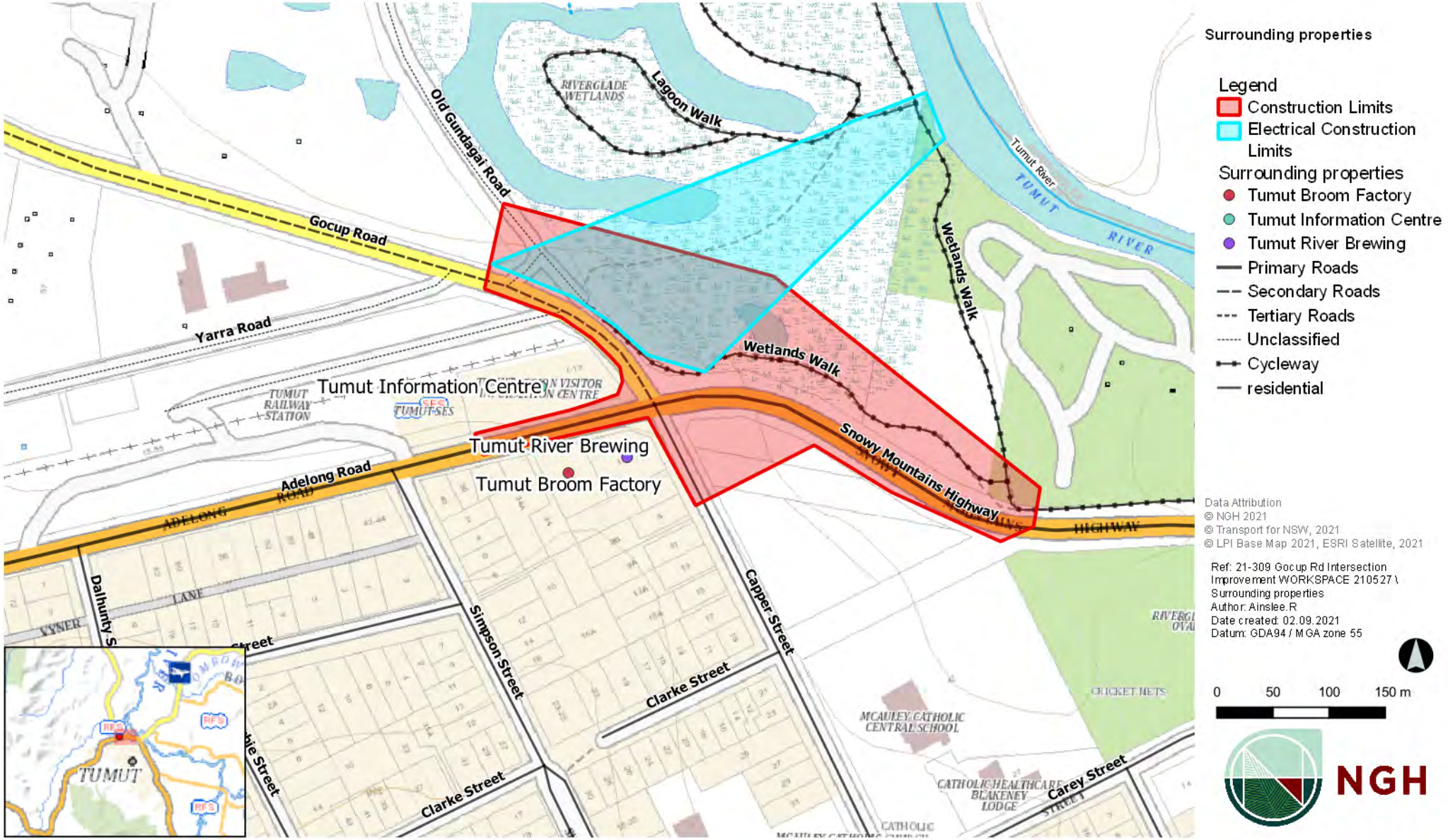


Figure 6-5 Surrounding properties

6.7.2 Potential impacts

Construction

No changes to land use are anticipated during construction, however there may be short term delays during construction periods involving traffic management including minor vehicle delays which could impact private property and traffic flow. These impacts are expected to be short term and minimal, with property access to be maintained throughout. Disruptive works would also be planned outside of peak periods to reduce impacts on heavy vehicle haulage, public transport, and residential use. Safeguards and management measures relating to traffic management can be found in section 6.3.3.

The construction of the proposal may result in minor potential impacts to the community in the form of noise/vibration and air quality/waste impacts. The receivers who would be most susceptible to these impacts include the Tumut Visitor Centre, Tumut Broom Factory, and Tumut Valley Tyre Service who are closest to operating machinery. Safeguards and management measures relating to noise/vibration can be found in section 6.4.5, and air quality/waste in section 6.8.3.

Property acquisition of Crown land is required on Lot 7042/ DP1068148 and Lot 7315/ DP1155552 as per section 3.6.Pedestrian access in the Tumut Wetland would be impacted during construction as the Wetlands Walking trail would be intermittently blocked as it is relocated further north east. Alternative access is provided for pedestrians/cyclists on nearby tracks within the wetland which can be utilised and detours signposted during construction.

The workforce used during the construction phase would contribute to the local and regional economy during the construction phase that would see workers use local services and amenities.

Operation

No changes to land use are anticipated during operation, as the intersection would simply replace the unregulated intersection with a roundabout intersection of the same visual design scheme.

During operation, the proposal would provide broad traffic benefits to the wider traveling population, both in the immediate term to manage traffic flow, and in the future. This would include improved traffic and efficiency for all users.

During operation, the proposal would improve the safety of access to businesses along Gocup Road and Snowy Mountains Highway, as vehicles would no longer be turning into large queues of traffic. This would have a positive social impact with improvement in safety and a positive economic impact in terms of supporting the viability and attractiveness of local businesses.

Pedestrian access would be similar to existing during operation, as the Wetlands Walking trail would only be relocated (rather than changed in any significant way). Preliminary design measures would be installed to facilitate possible future pedestrian/cycle infrastructure upgrades such as a crossing at Snowy Mountains Highway.

6.7.3 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing	Reference
Property acquisition	All property acquisition will be carried out in accordance with the *Land Acquisition Information Guide* (Transport for NSW, 2012)	Transport project manager	Pre-construction and construction	Additional safeguard

Impact	Environmental safeguards	Responsibility	Timing	Reference
	and the *Land Acquisition (Just Terms Compensation) Act 1991.*			
Property Access	Property access will be maintained as far as practicable throughout construction.	Contractor	Construction	Additional safeguard
Consultation	Transport will continue to consult with various residents and businesses in the area and carry out communication activities as the proposal progresses and informing the community through the Transport for NSW website and notifications.	Transport /Contractor	Pre-construction/ Construction	Additional safeguard
Wetland walkways	Signage will be erected at the beginning and end points of the walkway to be closed, advising of alternate routes.	Contractor	Construction	Additional safeguard

6.8 Air quality and Waste

6.8.1 Existing environment

Air quality

Air quality within the proposal area is predominantly influenced by exhaust emissions from traffic on Snowy Mountains Highway and the nearby industries in the surrounding area. A search of the Department of Agriculture, Water and Environment (DAWE) National Pollutant Inventory (NPI) on 20 July 2021 identified three industrial operations within seven kilometres of the proposal which may contribute to existing air quality conditions, which include the Tumut Sawmill, Borg Plantations, and Visy Pulp Paper Mill. Not included on the NPI but still in close proximity is the Tumut Wastewater Treatment Plant and Tumut Wetlands which may both also contribute to odour in the area.

A search of the Bureau of Meteorology's (BOM) climate data (Bureau of Meteorology, 2021) for station 072044 (Tumut, Simpson Street) showed the annual rainfall for Tumut in 2020 was 936.5mm, with the highest rainfall generally experienced in April. The mean maximum temperature for 2020 at the nearest station reading recent temperature (73141 (Gundagai, Nangus Road)) ranged between 34.0 C(January) to 14.1 C (August), and the mean minimum temperature ranged between 18.1 C (January) and 2.6 C (July).

Waste

The proposal area is an operational road corridor which generates no direct waste types. Some incidental waste may be present at times, such as roadside litter.

Within the Wetland incidental litter from those using the pathways, as well as litter washed into the wetlands through the stormwater drains may be experienced, however, the proposal would not exacerbate this.

6.8.2 Potential impacts

Construction

Air quality

The closest sensitive receivers are within 15m of the construction limits (Tumut River Brewing). Potential air quality impacts from the proposal during construction on nearby receivers would include dust emissions from exposed surfaces and emissions (both odour and air quality) from construction machinery. Receivers in proximity to the proposal may have the potential to be impacted by air quality changes during construction.

To minimise impacts, construction would be carried out in stages and disturbed areas would be progressively rehabilitated. Therefore, large areas of soil would not be exposed at any one time. Safeguards as identified below and in section 6.8.3 would further reduce the potential for dust emissions. Due to the nature of the construction activities being within a limited disturbance footprint and of short duration, there are unlikely to be substantial air emissions from machinery with the implementation of the appropriate safeguards in section 6.8.3.

Waste

The main waste streams during construction would include removed trees, trimmed vegetation, general construction waste and construction worker wastes. All waste would be removed from the proposal area at the end of each shift and temporarily stored in the site compound prior to reuse onsite or disposal in accordance with NSW EPA *Waste Classification Guidelines* (EPA, 2014).

Operation

Air quality

The roundabout is expected to assist in improving traffic flow, reducing vehicle queues and improving travel efficiency throughout the proposal area as per section 6.3. As such, there may be localised, positive impacts from the proposal reducing emissions from queuing vehicles.

Waste

There is not anticipated to be any operational waste impacts as a result of the proposal.

6.8.3 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing	Reference
Waste	A Waste Management Plan must be prepared that follows the Roads and Maritime Services Technical Guide: *Management of road construction and maintenance waste*. The Waste Management Plan is to include the following measures: • if coal tar asphalt is identified and is to be removed, it is to be disposed of to landfill in accordance with Roads and Maritime Environmental Direction No.21 – Coal Tar Asphalt Handling and Disposal • there is to be no disposal or re-use of construction waste on to other land • waste is not to be burnt on site • waste material, other than vegetation and tree mulch, is not to be left on site once the works have been completed • working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day • disposal of wastes would be undertaken in accordance with the NSW EPA Waste Classification Guidelines (EPA, 2014) and transported to a suitably licensed waste facility.	Contractor	Pre-construction	Section 4.2 of QA *G36 Environment Protection*
Waste	Resource management hierarchy principles are to be followed: • avoid unnecessary resource consumption as a priority • avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery)	Contractor	Construction	Additional safeguard

Impact	Environmental safeguards	Responsibility	Timing	Reference
	• disposal is undertaken as a last resort (in accordance with the Waste Avoidance & Resource Recovery Act 2001).			
Air quality	An Air Quality Management Plan (AQMP) will be prepared and implemented as part of the CEMP. The AQMP will include, but not be limited to: • potential sources of air pollution • air quality management objectives consistent with any relevant published EPA and/or OEH guidelines • mitigation and suppression measures to be implemented • methods to manage work during strong winds or other adverse weather conditions • a progressive rehabilitation strategy for exposed surfaces.	Contactor	Detailed design / pre-construction	Section 4.4 of QA *G36 Environment Protection*
Air quality	Measures (including watering or covering exposed areas) are to be used to minimise or prevent air pollution and dust.	Contractor	Construction	Additional safeguard
Air quality	Works (including the spraying of paint and other materials) are not to be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely.	Contractor	Construction	Additional safeguard
Air quality	Vehicles transporting waste or other materials that may produce odours or dust are to be covered during transportation.	Contractor	Construction	Additional safeguard
Air quality	Disturbed areas are to be progressively rehabilitated	Contractor	Construction	Additional safeguard

6.9 Other impacts

6.9.1 Existing environment and potential impacts

Environmental factor	Existing environment	Potential impacts
Utilities	Multiple utilities are present beneath the proposal area in the form of gas, optic fibre, electrical, Telstra, sewer, overhead powerlines, and a large Visy watermain. In addition, a powerline is located to the north of the intersection (running parallel with Gocup Road), and a powerline runs north east through the adjacent wetland.	The construction design has been moved north east to avoid the majority of these utilities. Those that are unavoidable have been considered in design including the overhead powerlines (to be placed underground), Visy watermain (to be moved), and the powerline through wetland (to be diverted west).
Hazard and risk management	The intersection has been identified as being in the top 2.1 per cent of intersections in NSW for risk due to approach speeds, poor visibility, land and shoulder width, road curve and safety barriers (Transport for NSW, 2020).	Whilst the proposal would dramatically improve safety during operation, there is still a risk to driver and worker safety during construction which may be mitigated with appropriate safeguards and management measures outlined in section 6.9.2.

6.9.2 Safeguards and management measures

Table 6-14 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing	Reference
Utilities	Prior to the commencement of works: • the location of existing utilities and relocation details will be confirmed following consultation with the affected utility owners • if the scope or location of proposed utility relocation works falls outside of the assessed proposal scope and footprint, further assessment will be undertaken.	Contactor	Detailed design / pre-construction	Additional safeguard
Hazards and risk management	A Hazard and Risk Management Plan (HRMP) will be prepared and implemented as part of the CEMP. The HRMP will include, but not be limited to: • details of hazards and risks associated with the activity • measures to be implemented during construction to minimise these risks • record keeping arrangements, including information on the materials present on the site, material safety data sheets, and personnel trained and authorised to use such materials • a monitoring program to assess performance in managing the identified risks • contingency measures to be implemented in the event of unexpected hazards or risks arising, including emergency situations. The HRMP will be prepared in accordance with relevant guidelines and standards, including relevant Safe Work Australia Codes of Practice, and EPA or Office of Environment and Heritage publications.	Contactor	Detailed design / pre-construction	Additional safeguard

6.10 Cumulative impacts

6.10.1 Study area and broader program of work

The cumulative impact assessment has considered all works within the suburb of Tumut.

The proposal is the second construction works in recent years at the intersection of Snowy Mountains Highway and Gocup Road. The original works included the installation of a designated right hand turn bay into Capper Street and the installation of island on Gocup Road to prevent uncontrolled slip lane movements on the Snowy Mountains Highway. The previous works also included the installation of vehicle activated signs to advised motorists of approaching intersection and to advise road to “Slow Down”.

6.10.2 Potential impacts

Given the nature of the proposal being a State Road upgrade, with impacts mostly limited to the operational road corridor, an assessment of cumulative impacts with local Council development applications has been summarised in Table 6-15. Council development applications typically include small scale residential development, which is unlikely to result in material cumulative impacts with the proposal (as is the case in the projects identified on the Snowy Valleys LGA website and summarised in Table 6-15). A review of projects listed on the NSW Planning Portal Major Projects Register (DPIE, 2021) was conducted on 20 July 2021 which identified one Major Project in Tumut of interest: Tumut Paper Mill Expansion.

The Tumut Paper Mill Expansion project is for State significant development of wood, paper and pulp manufacturing and whilst its determination date was 1 May 2007, it has undergone additional modifications as recently as 21 August 2020. The most recent modification is seeking an exemption to operational noise limits where written agreements have been entered into between the applicant and relevant landholders off Snowy Mountains Highway. This project is unlikely to produce cumulative noise impacts for receivers near Gocup Road developments as the two sites are over seven kilometres apart.

Table 6-15 Past, present and future projects (Snowy Valleys Council, 2020)

Project	Construction impacts	Operational impacts
Fitzrov Park Amenities: Design and build new toilets in Fitzroy Park consisting of one disabled access toilet and three unisex toilets.	Draft designs currently being developed and is unlikely to overlap with the proposal.	No additional impacts to proposal operation expected from this project.
Pioneer Park Upgrades: Upgrade Pioneer Park with new nature-based play spaces, additional green infrastructure, construction of new amenities building, improved pathways with solar lighting, picnic areas and seating.	Draft masterplan and concept plan costings in development and is unlikely to overlap with the proposal.	No additional impacts to proposal operation expected from this project.
Tumut Aerodrome Upgrade St 1: Stage 1 of the project upgrade includes a sealed taxiway and apron to service the NSW Rural Fire Service facility, drainage improvement works, and renewal of animal-proof fencing.	Earthworks for taxiway and drainage works in progress. Construction vehicles from these works may cumulatively contribute to additional strain to traffic and air quality along Snowy Mountains Highway.	No additional impacts to proposal operation expected from this project.

Project	Construction impacts	Operational impacts
Tumut Aerodrome Upgrade St 2: Stage two of the project will deliver significant upgrades to the non-commercial Tumut Aerodrome. Upgrades to drainage, fencing, runway, lighting and control systems, and the installation of precision path indicators will help facilitate fire-fighting capabilities and permit air-ambulance access to the regional centre, improving the liveability and resilience of this region.	Master Planning underway. Timing is unlikely to overlap with the proposal.	No additional impacts to proposal operation expected from this project.
Emergency Evacuation and Multipurpose Centre: The Project will provide an Indoor Sports Stadium which has sufficient capacity to double as an Evacuation Centre in times of emergency such as the recent bushfires.	Council will consult further with potential users of the facility as the concept designs are developed and refined and is unlikely to overlap with the proposal.	No additional impacts to proposal operation expected from this project.
Tumut Pool Upgrade St 2: Tumut Pool Stage two will improve swimming facilities for babies and young children. The project will see replacement of the toddler and baby pools with a splash play area and learn-to-swim pool as well as separate pool filtration and chlorination systems.	As per the funding deed the project is to be delivered by 30 June 2023 and so won't overlap with the proposal.	No additional impacts to proposal operation expected from this project.

6.10.3 Safeguards and management measures

No specific safeguards and management measures are required to address cumulative impacts, however all safeguards, as included in section 7.2, would assist in addressing cumulative impacts.

7. Environmental management

This chapter describes how the proposal would be managed to reduce potential environmental impacts throughout detailed design, construction and operation. A framework for managing the potential impacts is provided. A summary of site-specific environmental safeguards is provided and the licence and/or approval requirements required prior to construction are also listed.

7.1 Environmental management plans (or system)

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

A Construction Environmental Management Plan (CEMP) would be prepared to describe the safeguards and management measures identified. The CEMP would provide a framework for establishing how these measures would be implemented and who would be responsible for their implementation.

The CEMP would be prepared prior to construction of the proposal and must be reviewed and certified by the Transport for NSW Environment Officer, Riverina region prior to the commencement of any on-site works. The CEMP would be a working document, subject to ongoing change and updated as necessary to respond to specific requirements. The CEMP would be developed in accordance with the specifications set out in the [adjust as necessary: QA Specification *G36 – Environmental Protection (Management System)*, QA Specification *G38 – Soil and Water Management (Soil and Water Plan)*, QA Specification *G40 – Clearing and Grubbing*, QA Specification *G10 – Traffic Management.*

7.2 Summary of safeguards and management measures

Environmental safeguards and management measures outlined in this REF would be incorporated into the detailed design phase of the proposal and during construction and operation of the proposal, should it proceed. These safeguards and management measures would minimise any potential adverse impacts arising from the proposed works on the surrounding environment. The safeguards and management measures are summarised in Table 7-1.

Table 7-1 Summary of safeguards and management measures

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
GEN1	General - minimise environmental impacts during construction	A CEMP will be prepared and submitted for review and endorsement of the Transport for NSW Environment Manager prior to commencement of the activity. As a minimum, the CEMP will address the following: • any requirements associated with statutory approvals • details of how the project will implement the identified safeguards outlined in the REF • issue-specific environmental management plans • roles and responsibilities • communication requirements • induction and training requirements • procedures for monitoring and evaluating environmental performance, and for corrective action • reporting requirements and record-keeping	Contractor / Transport for NSW project manager	Pre-construction / detailed design	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		• procedures for emergency and incident management • procedures for audit and review. The endorsed CEMP will be implemented during the undertaking of the activity.			
GEN2	General - notification	All businesses, residential properties and other key stakeholders (eg schools, local councils) affected by the activity will be notified at least five days prior to commencement of the activity.	Contractor / Transport for NSW project manager	Pre-construction	
GEN3	General – environmental awareness	All personnel working on site will receive training to ensure awareness of environment protection requirements to be implemented during the project. This will include up-front site induction and regular "toolbox" style briefings. Site-specific training will be provided to personnel engaged in activities or areas of higher risk. These include: • areas of Aboriginal heritage sensitivity • threatened species habitat	Contractor / Transport for NSW project manager	Pre-construction / detailed design	

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		• adjoining residential areas requiring particular noise management measures.			
Biodiversity	Removal of native vegetation	• native vegetation removal will be minimised through detailed design • vegetation removal will be undertaken in accordance with *Guide 4: Clearing of vegetation and removal of bushrock* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011) • native vegetation will be re-established in accordance with *Guide 3: Re-establishment of native vegetation* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011) the unexpected species find procedure is to be followed under *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011) if threatened ecological communities, not assessed in the biodiversity assessment, are identified in the proposal area.	Contractor	Detailed design / construction/post construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
Biodiversity	Removal of threatened species habitat and habitat features	• habitat removal will be minimised through detailed design • habitat removal will be undertaken in accordance with *Guide 4: Clearing of vegetation and removal of bushrock* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011) • habitat will be replaced or re-instated in accordance with *Guide 5: Re-use of woody debris and bushrock* and *Guide 8: Nest boxes* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011) the unexpected species find procedure is to be followed under *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011) if threatened fauna, not assessed in the biodiversity assessment, are identified in the proposal area.	Contactor	Detailed design construction	Additional safeguard
Biodiversity	Aquatic impacts	Aquatic habitat will be protected in accordance with Guide 10: Aquatic habitats and riparian zones of the Biodiversity Guidelines: Protecting and	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		managing biodiversity on RTA projects (RTA 2011) and Section 3.3.2 Standard precautions and mitigation measures of the Policy and guidelines for fish habitat conservation and management Update 2013 (DPI (Fisheries NSW) 2013).			
Biodiversity	Groundwater dependent ecosystems	Interruptions to water flows associated with groundwater dependent ecosystems will be minimised through detailed design.	Contractor	Detailed design	Additional safeguard
Biodiversity	Changes to hydrology	Changes to existing surface water flows will be minimised through detailed design.	Contractor	Detailed design	Additional safeguard
Biodiversity	Edge effects on adjacent native vegetation and habitat	Exclusion zones will be set up at the limit of clearing in accordance with *Guide 2: Exclusion zones* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Contractor	Construction	Additional safeguard
Biodiversity	Injury and mortality of fauna	Fauna will be managed in accordance with *Guide 9: Fauna handling* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Contractor	Construction	Additional safeguard
Biodiversity	Invasion and spread of weeds	Weed species will be managed in accordance with *Guide 6: Weed*	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		management of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).			
Biodiversity	Invasion and spread of pests	Pest species will be managed within the proposal area.	Contractor	Construction	Additional safeguard
Biodiversity	Invasion and spread of pathogens and disease	Pathogens will be managed in accordance with *Guide 2: Exclusion zones* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Contractor	Construction	Additional safeguard
Biodiversity	Noise light and vibration	Shading and artificial light impacts will be minimised through detailed design.	Contractor	Detailed design	Additional safeguard
Soils and Water	Soil and Water	A Soil and Water Management Plan (SWMP) will be implemented as part of the CEMP. The SWMP will identify all reasonably foreseeable risks relating to soil erosion and water pollution and describe how these risks will be addressed during construction. The Soil and Water Management Plan (SWMP) will be reviewed by a soil conservationist on the Roads and Maritime list of Registered Contractors for Erosion, Sedimentation and Soil Conservation Consultancy	Contractor	Pre-construction	Core standard safeguard Section 2.1 of QA G38 *Soil and Water Management*

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		Services. The SWMP will then be revised to address the outcomes of the review.			
Soils and Water	Erosion and sediment impacts	A site specific Erosion and Sediment Control Plan (ESCP) will be prepared and implemented as part of the Soil and Water Management Plan (SWMP). The Plan will include arrangements for managing wet weather events, including monitoring of potential high risk events (such as storms) and specific controls and follow-up measures to be applied in the event of wet weather.	Contractor	Detailed design/ Pre-construction	Additional safeguard
Soils and Water	Erosion and sediment impacts	Consistent with any specific requirements of the approved SWMP and ESCP, control measures will be implemented to minimise risks associated with erosion and sedimentation and entry of materials to drainage lines and waterways. That will include, but not necessarily be limited to: • early set up and implementation of sediment management devices, such as fencing, hay bales, sand bags, catch drains and outlet protection structures • measures to divert or capture and filter water prior to	Contractor	Pre-construction/ construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		discharge, such as drainage channels and first flush • scour protection and energy dissipaters at locations of high erosion risk • installation of measures at work entry and exit points to minimise movement of material onto adjoining roads, such as rumble grids and regular road sweeping • appropriate location and storage of construction materials, fuels and chemicals, including bunding where appropriate • pre-construction and construction water quality monitoring and testing upstream and downstream of the work site (to ensure no dirty water leaves site).			
Soils and Water	Soil and water	Establish clearing limits and work boundaries that are well defined using barrier tape (or equivalent) prior to construction, clearing or stripping works commencing.	Contractor	Construction	Additional safeguard
Soils and Water	Erosion and sediment impacts	Erosion and sedimentation controls are to be checked and maintained on a regular basis (including clearing of sediment	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		from behind barriers) and records kept and provided on request.			
Soils and Water	Erosion and sediment impacts	Work areas are to be stabilised progressively during the works.	Contractor	Construction	Additional safeguard
Soils and Water	Erosion and sediment impacts	Erosion and sediment control measures are not to be removed until the works are complete and areas are stabilised.	Contractor	Construction	Additional safeguard
Soils and Water	Erosion and sediment impacts	The maintenance of established stockpile sites to be in accordance with the Roads and Maritime Services *Stockpile Site Management Guidelines* (EMS-TG-10).	Contractor	Construction	Additional safeguard
Soils and Water	Contaminated land	Where excavation in existing fill material will be required, testing for waste classification and the presence of asbestos will be undertaken prior to disposal or reuse, in accordance with TfNSW waste guidelines.	Contractor	Construction	Additional safeguard
Soils and Water	Contaminated land	If contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the immediate risks of contamination. All other work that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific	Contractor	Detailed design/Pre-construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		controls or further actions identified in consultation with the Transport Environment Manager and/or EPA.			
Soils and Water	Accidental spill	A site specific emergency spill plan will be developed, and include spill management measures in accordance with the Transport for NSW *Code of Practice for Water Management* (RTA, 1999) and relevant EPA guidelines. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including Transport and EPA officers).	Contractor	Detailed design/Pre-construction	Additional safeguard
Soils and Water	Water quality	There is to be no release of dirty water into drainage lines and/or waterways.	Contractor	Construction	Additional safeguard
Soils and Water	Water quality	Water quality control measures are to be used to prevent any materials (e.g. concrete, grout, sediment etc) entering drain inlets or waterways.	Contractor	Construction	Additional safeguard
Soils and Water	Water quality	All workers will be advised of the location of the spill kit and trained in its use.	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
Soils and Water	Water quality	Vehicles and plant must be properly maintained and regularly inspected for fluid leaks.	Contractor	Construction	Additional safeguard
Soils and Water	Water quality	Refuelling of plant and equipment is to occur in impervious bunded areas located a minimum of 50 metres from drainage lines or waterways.	Contractor	Construction	Additional safeguard
Traffic and Transport	Traffic	A TMP will be prepared and implemented as part of the CEMP. The TMP will be prepared in accordance with the Roads and Maritime *Traffic Control at Work Sites Manual* (RTA, 2010) and *QA Specification G10 Control of Traffic* (Roads and Maritime, 2008). The TMP will include: • confirmation of haulage routes • measures to maintain access to local roads and properties • site specific traffic control measures (including signage) to manage and regulate traffic movement • measures to maintain pedestrian and cyclist access including alternate routes during construction when required • requirements and methods to consult and inform the local	Contractor	Detailed design/ Pre-construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		community of impacts on the local road network • access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads • a response plan for any construction traffic incident • consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic • monitoring, review and amendment mechanisms.			
Traffic and Transport	Traffic	A Variable Message Sign (VMS) and traffic alert will be used to notify road users of the planned night works and lane closures.	Contractor	Pre-construction/ construction	Additional safeguard
Traffic and Transport	Access	Where possible, current property accesses are to be maintained during the works. Any disturbance is to be minimised to prevent unnecessary traffic delays.	Contractor	Construction	Additional safeguard
Noise and Vibration	Noise and vibration	A Construction Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP.	Contactor	Detailed design / pre-construction	Section 4.6 of QA *G36 Environment Protection*

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		The NVMP will generally follow the approach in the Interim *Construction Noise Guideline* (ICNG) (DECC, 2009) and identify: • nearby sensitive receivers • description of the works, equipment and hours of work • criteria and relevant licence and approval conditions • requirements for noise monitoring • all potential significant noise and vibration generating activities associated with the activity • feasible and reasonable mitigation measures to be implemented, taking into account *Beyond the Pavement: urban design policy, process and principles* (Transport for NSW, 2014) • details of how community consultation would be completed • procedures for handling complaints • in the case of complaint, a monitoring program to assess performance against relevant			

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		noise and vibration criteria will occur • arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures • contingency measures to be implemented in the event of non-compliance with noise and vibration criteria • details on how respite would be applied where ongoing high impacts are seen at certain receivers.			
	Implement community consultation or notification measures	For activities where the construction noise is predicted to exceed the “Highly Noise Affected” Level: • notification detailing work activities, dates and hours, impacts and mitigation measures, indication of work schedule, any operational noise benefits from the works (where applicable) and contact telephone number • notification shall be a minimum of 7 calendar days prior to the start of works. For projects other than maintenance works	Contactor	Detailed design / pre-construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		more advanced consultation or notification may be required • undertake noise verification measurements, if required • website (if required) • contact telephone number for community Email distribution list (if required) • community drop in session (if required by approval conditions).			
	Site inductions	All employees, contractors and subcontractors will receive an environmental induction. The induction must at least include: • all project specific and relevant standard noise and vibration mitigation measures • relevant licence and approval conditions • permissible hours of work • any limitations on high noise generating activities • location of nearest sensitive receivers • construction employee parking areas • designated loading/unloading areas and procedures	Contractor	Pre-construction/ construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		• site opening/closing times (including deliveries) • environmental incident procedures.			
	Behavioural practices	• no unnecessary shouting or loud stereos/radios on site • no dropping of materials from height throwing of metal items, door slams etc.	Contractor	Construction	Additional safeguard
	Building condition surveys	Building dilapidation surveys will be undertaken on all buildings located within the buffer zone identified in Table 6-10 (15m for most buildings) prior to commencement of activities with the potential to cause property damage. It is noted that this requirement can be avoided if measures such as control (light roller) can be used.	Contractor	Pre-construction	Additional safeguard
	Construction hours and scheduling	Where feasible and reasonable, construction will be carried out during the standard daytime working hours. Work generating high noise and/or vibration levels will be scheduled during less sensitive time periods.	Contractor	Construction	Additional safeguard
	Equipment selection	• use quieter and less vibration emitting construction methods	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		where feasible and reasonable. • ensure plant including the silencer is well maintained.			
	Plant noise levels	The noise levels of plant and equipment must have operating Sound Power or Sound Pressure Levels no higher than those in Table 6-8.	Contractor	Construction	Additional safeguard
	Use and siting of plant	• the offset distance between noisy plant and adjacent sensitive receivers will be maximised • plant used intermittently to be throttled down or shut down • noise-emitting plant to be directed away from sensitive receivers • only have necessary equipment on site.	Contractor	Construction	Additional safeguard
	Plan worksites and activities to minimise noise and vibration	• locate compounds away from sensitive receivers and discourage access from local roads • plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site • where additional activities or plant may only result in a	Contractor	Pre-construction/ construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		marginal noise increase and speed up works, limit duration of impact by concentrating noisy activities at one location and move to another as quickly as possible • very noisy activities will be scheduled for normal working hours. If the work cannot be undertaken during the day, it will be completed before 11:00 pm • where practicable, work will be scheduled to avoid major student examination periods when students are studying for examinations such as before or during Higher School Certificate and at the end of higher education semesters • if programmed night work is postponed the work will be re-programmed and the approaches in this guideline apply again.			
	Reduced equipment power	Use only the necessary size and power-rating for plant and equipment. Select the minimum where practical to do so, including the vibratory roller.	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
	Non-tonal and ambient sensitive reversing alarms	• non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work • consider the use of ambient sensitive alarms that adjust output relative to the ambient noise level.	Contractor	Construction	Additional safeguard
	Minimise disturbance arising from delivery of goods to construction sites	• loading and unloading of materials/deliveries is to occur as far as possible from sensitive receivers • select site access points and roads as far as possible away from sensitive receivers. Dedicated loading/unloading areas to be shielded if close to sensitive receivers • delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible • avoid or minimise these out of hours movements where possible.	Contractor	Construction	Additional safeguard
	Engine compression brakes	• limit the use of engine compression brakes	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		• ensure vehicles are fitted with a maintained Original Equipment Manufacturer exhaust silencer or a silencer that complies with the National Transport • commission's 'In-service test procedure' and standard.			
	Shield stationary noise sources such as pumps, compressors, fans etc.	Stationary noise sources will be enclosed or shielded where feasible and reasonable whilst ensuring that the occupational health and safety of workers is maintained. Materials suitable for shielding will have a surface mass of at least 12kg/m^3.	Contractor	Construction	Additional safeguard
	Shield sensitive receivers from noisy activities	Use structures to shield residential receivers from noise such as site shed placement; earth bunds; fencing; erection of operational stage noise barriers (where practical) and consideration of site topography when situating plant.	Contractor	Construction	Additional safeguard
	Structural surveys and vibration monitoring	• at locations where there are high-risk receptors (receptors within the minimum safe work distance), pre-start and ongoing vibration monitoring will be conducted during the activities causing vibration • where work is within the minimum working distances	Contractor	Pre-construction/ construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		and considered likely to exceed the cosmetic damage criteria: o Investigate alternate construction methods with lower source vibration levels and implement, where feasible (including light vibration roller) o Undertake attended vibration measurements at the start of the work to determine actual vibration levels at the item. Work shall be ceased if the monitoring indicates vibration levels are likely to, or do, exceed the relevant criteria.			
Aboriginal cultural heritage and non-Aboriginal heritage	Aboriginal heritage	• the Standard Management Procedure - *Unexpected Heritage Items* (Roads and Maritime, 2015) will be followed in the event that an unknown or potential Aboriginal object/s, including skeletal remains, is found during construction. This applies where Transport does not have approval to disturb the object/s or where a specific safeguard for managing the	Contractor	Detailed design/ pre-construction	Section 4.9 of QA *G36 Environment Protection*

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		disturbance (apart from the Procedure) is not in place • work will only re-commence once the requirements of that Procedure have been satisfied.			
Aboriginal cultural heritage and non-Aboriginal heritage	Non-Aboriginal heritage	• the *Standard Management Procedure - Unexpected Heritage Items* (Roads and Maritime, 2015) will be followed in the event that any unexpected heritage items, archaeological remains or potential relics of Non-Aboriginal origin are encountered • work will only re-commence once the requirements of that Procedure have been satisfied.	Contractor	Detailed design/pre-construction	Section 4.10 of QA *G36 Environment Protection*
Aboriginal cultural heritage and non-Aboriginal heritage	Non-Aboriginal heritage	• if an existing heritage item or item identified on the Roads and Maritime Services s.170 register is on site or in the near vicinity of the works, the item is to be protected to prevent any damage or disturbance.	Contractor	Detailed design/pre-construction	Additional safeguard
Visual impacts	Visual	• working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
Visual impacts	Visual	Construction lighting will be aligned to minimise light spill on adjacent land users, and installed and operated in accordance with AS4282:1997 Control of the Obtrusive Effect of Outdoor Lighting. • residents that may be impacted by light spill will be notified of the work and potential impacts prior to commencement of work requiring artificial lighting.	Contractor	Construction	Additional safeguard
Visual impacts	Visual	• rehabilitation and beautification works in keeping with the existing character of the location will be undertaken to soften the visual impact of the new roundabout and associated works.	Contractor	Rehabilitation	Additional safeguard
Air quality and Waste	Waste	A Waste Management Plan must be prepared that follows the Roads and Maritime Services Technical Guide: *Management of road construction and maintenance waste*. The Waste Management Plan is to include the following measures: • if coal tar asphalt is identified and is to be removed, it is to	Contractor	Pre-construction	Section 4.2 of QA *G36 Environment Protection*

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		be disposed of to landfill in accordance with Roads and Maritime Environmental Direction No.21 – Coal Tar Asphalt Handling and Disposal • there is to be no disposal or re-use of construction waste on to other land • waste is not to be burnt on site • waste material, other than vegetation and tree mulch, is not to be left on site once the works have been completed • working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day disposal of wastes would be undertaken in accordance with the NSW EPA Waste Classification Guidelines (EPA, 2014) and transported to a suitably licensed waste facility.			
Air quality and Waste	Waste	Resource management hierarchy principles are to be followed: • avoid unnecessary resource consumption as a priority • avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery)	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		disposal is undertaken as a last resort (in accordance with the Waste Avoidance & Resource Recovery Act 2001).			
Air quality and Waste	Air quality	An Air Quality Management Plan (AQMP) will be prepared and implemented as part of the CEMP. The AQMP will include, but not be limited to: • potential sources of air pollution • air quality management objectives consistent with any relevant published EPA and/or OEH guidelines • mitigation and suppression measures to be implemented • methods to manage work during strong winds or other adverse weather conditions. a progressive rehabilitation strategy for exposed surfaces.	Contactor	Detailed design / pre-construction	Section 4.4 of QA *G36 Environment Protection*
Air quality and Waste	Air quality	Measures (including watering or covering exposed areas) are to be used to minimise or prevent air pollution and dust.	Contractor	Construction	Additional safeguard
Air quality and Waste	Air quality	• Works (including the spraying of paint and other materials) are not to be carried out during	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		strong winds or in weather conditions where high levels of dust or air borne particulates are likely.			
Air quality and Waste	Air quality	• Vehicles transporting waste or other materials that may produce odours or dust are to be covered during transportation.	Contractor	Construction	Additional safeguard
Air quality and Waste	Air quality	• Disturbed areas are to be progressively rehabilitated	Contractor	Construction	Additional safeguard
Other impacts	Utilities	Prior to the commencement of works: • the location of existing utilities and relocation details will be confirmed following consultation with the affected utility owners • if the scope or location of proposed utility relocation works falls outside of the assessed proposal scope and footprint, further assessment will be undertaken.	Contactor	Detailed design / pre-construction	Additional safeguard
Other impacts	Hazards and risk management	A Hazard and Risk Management Plan (HRMP) will be prepared and implemented as part of the CEMP. The HRMP will include, but not be limited to:	Contactor	Detailed design / pre-construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		• details of hazards and risks associated with the activity • measures to be implemented during construction to minimise these risks • record keeping arrangements, including information on the materials present on the site, material safety data sheets, and personnel trained and authorised to use such materials • a monitoring program to assess performance in managing the identified risks • contingency measures to be implemented in the event of unexpected hazards or risks arising, including emergency situations. • the HRMP will be prepared in accordance with relevant guidelines and standards, including relevant Safe Work Australia Codes of Practice, and EPA or Office of Environment and Heritage publications.			

7.3 Licensing and approvals

Additional approvals required for the proposal are summarised below in Table 7-2.

Table 7-2 Summary of licensing and approvals required

Instrument	Requirement	Timing
Crown Land Management Act 2016 (Division 3.4, 5.5 and 5.6)	Lease or licence to occupy areas of Crown land.	Prior to start of the activity
Roads Act 1993 (NSW) (s138)	A road occupancy licence (ROL) for road closures associated with construction. SZA- Speed Zone Authorisation to temporarily reduce road speed limit during construction activities.	Prior to start of the activity

8. Conclusion

This chapter provides the justification for the proposal taking into account its biophysical, social and economic impacts, the suitability of the site and whether or not the proposal is in the public interest. The proposal is also considered in the context of the objectives of the EP&A Act, including the principles of ecologically sustainable development as defined in Schedule two of the Environmental Planning and Assessment Regulation 2000.

8.1 Justification

The proposal being an intersection upgrade at the intersection of Gocup Road and Snowy Mountain Highway is anticipated to address safety concerns and improve efficiency of traffic via roundabout construction. The adverse environmental impacts as a result of the proposal are manageable with safeguards and management measures outlined in section 7.2, and outweighed by the beneficial effects of the proposal on road user safety at the intersection of Gocup Road and Snowy Mountains Highway.

As additional traffic growth is predicted in the surrounding area in future years, and due to the crash history, an upgrade of this road infrastructure is necessary to ensure the intersection can cater for increasing traffic volumes.

8.1.1 Social factors

As outlined in Chapter 6, there would-be short-term impacts to the local community during construction (noise, visual and traffic), with positive long-term impacts during operation (improved road safety and traffic efficiency). The safety benefits and improved traffic efficiency post upgrade would outweigh possible risks to immediate receivers as a result of temporary construction impacts.

8.1.2 Biophysical factors

The proposal would result in the clearing of up to 0.596ha of PCT 283, and the loss of threatened fauna foraging and breeding habitat. However, the Biodiversity Assessment determined that the proposal is unlikely to have a significant impact on any NSW and nationally listed biodiversity value or listed entity to a significant degree. This is in part due to pre-existing edge effects and low quality habitat potential immediately adjacent to the Snowy Mountains Highway where clearing is to occur. Any indirect impacts on the environment during construction would be managed satisfactorily using standard safeguards.

There would be no long-term impacts on the environment as a result of the proposal.

8.1.3 Economic factors

The proposal selects a preferred design that would minimise impacts on adjacent businesses and residential properties, while supporting the future development and growth of the Riverina Region. Improved road safety and travel time, including maintaining access for freight and buses would have regional economic benefits as it would produce productivity through improved travel times and access. The workforce used during the construction phase would contribute to the local and regional economy during the construction phase that would see workers use local services and amenities.

8.1.4 Public interest

The proposal recognises the need to improve the road capacity and performance to improve road safety and avoid future increased delays and congestion locally. The proposal would:

- improve safety for all road users by reducing potential for, and severity of, motor vehicle accidents
- improve traffic flow and efficiency, particularly heavy vehicles
- improve connections to regional communities.

Overall, the proposal is believed to be justified in meeting its objectives with few residual long-term impacts, whilst meeting public request for the development, and is therefore in the interest of the public interest.

8.2 Objects of the EP&A Act

Object	Comment
1.3(a) To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources.	The proposal would have limited impact on the environment and natural resources, as the proposal area is an operational road corridor and would mostly only impact on maintained road reserve and planted street trees. Up to 1.036ha of native vegetation would be removed (including up to 0.596ha of PCT 283) along the edge of the adjacent wetlands, however, safeguards to manage this have been identified in section 7.2.
1.3(b) To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.	Ecologically sustainable development is considered in section 8.2.1.
1.3(c) To promote the orderly and economic use and development of land.	The proposal area is contained within the existing road corridor and is consistent with the land use zoning provisions of the Tumut LEP.
1.3(d) To promote the delivery and maintenance of affordable housing.	Not relevant to the project.
1.3(e) To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.	Minimal direct impacts to threatened species are predicted, with biodiversity impacts limited to the maintained road reserve, planted street trees and trees along the edge of the adjacent wetlands as assessed in section 6.1. Unexpected finds procedures have been included in section 6.1.4 to guide the management of fauna or flora during construction.
1.3(f) To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	The proposal area contains two items of non-Aboriginal heritage. Transport has followed the PACHCI process and completed a Stage two assessment that confirmed there would be no impacts to Aboriginal heritage and no further assessment is required as long as no works are undertaken within the boundary of PAD 1, the stockpile compound.

Object	Comment
1.3(g) To promote good design and amenity of the built environment.	The proposal has been designed in accordance with applicable road design guidelines. The proposal extends the benefits provided by the previous road upgrade works and would further improve the amenity and safety of the intersection.
1.3(h) To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.	Not relevant to the proposal.
1.3(i) To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.	Not relevant to the project.
1.3(j) To provide increased opportunity for community participation in environmental planning and assessment.	Transport has consulted the community through the consultation strategy provided in section 5.1, with the outcomes of the consultation contributing to amendments in the final concept design. Consultation describes the detail of how the public has been consulted and how they would be involved as the proposal develops.

8.2.1 Ecologically sustainable development

Ecologically sustainable development (ESD) is development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends. The principles of ESD have been an integral consideration throughout the development of the project.

ESD requires the effective integration of economic and environmental considerations in decision-making processes. The four main principles supporting the achievement of ESD are discussed below.

The precautionary principle

The precautionary principle deals with reconciling scientific uncertainty about environmental impacts with certainty in decision-making. It provides that where there is a threat of serious or irreversible environmental damage, the absence of full scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation.

This precautionary principle was considered as best available technical information, environmental standards and measures have been used to minimise environmental risks. The precautionary principle has guided the assessment of environmental impacts for this REF and the development of mitigation measures.

Intergenerational equity

Social equity is concerned with the distribution of economic, social and environmental costs and benefits. Inter-generational equity introduces a temporal element with a focus on minimising the distribution of costs to future generations.

Intergenerational equity was considered as issues that have potential long-term implications were minimised or avoided, for example the proposal was moved north east to minimise impacts on utilities and adjacent residents through route/concept selection. The application of management measures would further enhance intergenerational equity.

Conservation of biological diversity and ecological integrity

The proposal has considered the conservation of biological diversity and ecological integrity through the following:

- appropriate scope considered for connectivity and key corridors for species likely to occur in the area
- site selection criteria were established for construction phase facilities that include minimising native vegetation clearance
- the cultural significance of the remaining areas of native vegetation and native fauna to the local Aboriginal community was considered.

Improved valuation, pricing and incentive mechanisms

The principle of internalising environmental costs into decision making requires consideration of all environmental resources which may be affected by the carrying out of a project, including air, water, land and living things.

The proposal has considered a valuation of environmental resources through the following:

- environmental issues were considered as key matters in the route selection process and in the economic and financial feasibility assessments for the project
- minimising the division of individual properties and the subsequent potential economic impacts on affected property owners were considered
- the value of the project to the community in terms of improved safety was recognised
- mitigation measures for the avoidance, reuse, recycling and management of waste during construction and operation are to be implemented.

8.3 Conclusion

The proposed safety upgrade at the intersection of Gocup Road and the Snowy Mountains Highway is subject to assessment under Division 5.1 of the EP&A Act. The REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

This has included consideration (where relevant) of conservation agreements and plans of management under the NPW Act, biodiversity stewardship sites under the BC Act, wilderness areas, areas of outstanding value, impacts on threatened species and ecological communities and their habitats and other protected fauna and native plants. It has also considered potential impacts to matters of national environmental significance listed under the Federal EPBC Act.

A number of potential environmental impacts from the proposal have been avoided or reduced during the concept design development and options assessment. The proposal as described in the REF best meets the project objectives but would still result in some impacts including construction amenity impacts (noise and visual), and removal of some trees within the wetland bordering the northern extent of the proposal. Safeguards and management measures as detailed in this REF would ameliorate or minimise these expected impacts. The proposal would also improve safety, improve traffic efficiency at the intersection and ensure the intersection can manage with increasing traffic volumes. On balance the proposal is considered justified and the following conclusions are made.

Significance of impact under NSW legislation

The proposal would be unlikely to cause a significant impact on the environment. Therefore it is not necessary for an environmental impact statement to be prepared and approval to be sought from the

Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act. A Biodiversity Development Assessment Report or Species Impact Statement is not required. The proposal is subject to assessment under Division 5.1 of the EP&A Act. Consent from Council is not required.

Significance of impact under Australian legislation

The proposal is not likely to have a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the *Environment Protection and Biodiversity Conservation Act 1999*. A referral to the Australian Department of Agriculture, Water and the Environment is not required.

9. Certification

This review of environmental factors provides a true and fair review of the proposal in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposal.

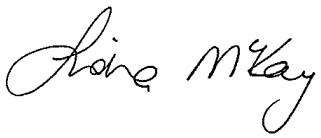
Lewis Tinley

Environmental Consultant

NGH Pty Ltd

Date: 6 September 2021

Reviewed by:



Fiona McKay

Principal Environmental Consultant

NGH Pty Ltd

Date: 6 September 2021

I have examined this review of environmental factors and accept it on behalf of Transport for NSW.

Insert name

[Position title, eg Project Manager]

[Insert relevant Transport for NSW region/program]

Date:

10. References

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Terms and acronyms

Term / Acronym/Initialisation	Description
AusLink	Mechanism to facilitate cooperative transport planning and funding by Commonwealth and state and territory jurisdictions
ACHA	Aboriginal Cultural Heritage Assessment
ALR Act	*Aboriginal Land Rights Act 1983* (NSW)
AQMP	Air Quality Management Plan
BAM	biodiversity assessment method
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BDAR	Biodiversity Development Assessment Report
CEMP	Construction environmental management plan
CFRS	Centre for Road Safety
CLM Act	*Crown Land Management Act 2016* (NSW)
CM SEPP	State Environmental Planning Policy (Coastal Management) 2018
CNVG	Construction Noise and Vibration Guideline
CP	Communication Plan
dBA	A-weighted decibel
DPI	NSW Department of Primary Industries
EIA	Environmental impact assessment
EIS	Environmental Impact Statement
EPA	NSW Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
EPL	Environment protection licence
ESCP	Erosion and Sediment Control Plan
ESD	Ecologically sustainable development. Development which uses, conserves and enhances the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased
ESD	Ecologically sustainable development
FM Act	*Fisheries Management Act 1994* (NSW)
Heritage Act	*Heritage Act 1977* (NSW)
HRMP	Hazard and Risk Management Plan
IBRA	Interim Biogeographic Regionalisation for Australia

Term / Acronym/Initialisation	Description
ICNG	Interim Construction Noise Guideline
ISEPP	State Environmental Planning Policy (Infrastructure) 2007
KFH	Key fish habitat
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan. A type of planning instrument made under Part three of the EP&A Act.
LGA	Local Government Area
LoS	Level of Service. A qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers.
MNES	Matters of national environmental significance under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*
NATA	National Association of Testing Authorities
NML	Noise Management Levels
NPI	National Pollutant Inventory
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
NVIA	Noise and Vibration Impact Assessment
OOHW	Out of hours works
PACHCI	*Procedure for Aboriginal Cultural Heritage Consultation and Investigation*
PAD	Potential for subsurface archaeological deposits
PCT	Plant Community Type
QA Specifications	Specifications developed by Transport for NSW for use with road work and bridge work contracts let by Transport for NSW.
REF	Review of Environmental Factors
Roads and Maritime	NSW Roads and Maritime Services, now known as Transport for NSW
ROL	Road Occupancy Licence
RTA	NSW Roads & Traffic Authority, now known as Transport for NSW
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part three of the EP&A Act.
SIS	Species Impact Statement
SWL	Sound power level
TMP	Traffic Management Plan
Unregulated Road	No traffic indication as to right of way

Term / Acronym/Initialisation	Description
VDV	Vibration Dose Value
VIA	Visual Impact Assessment
VMS	Variable Message Sign

Appendix A
Detailed Design

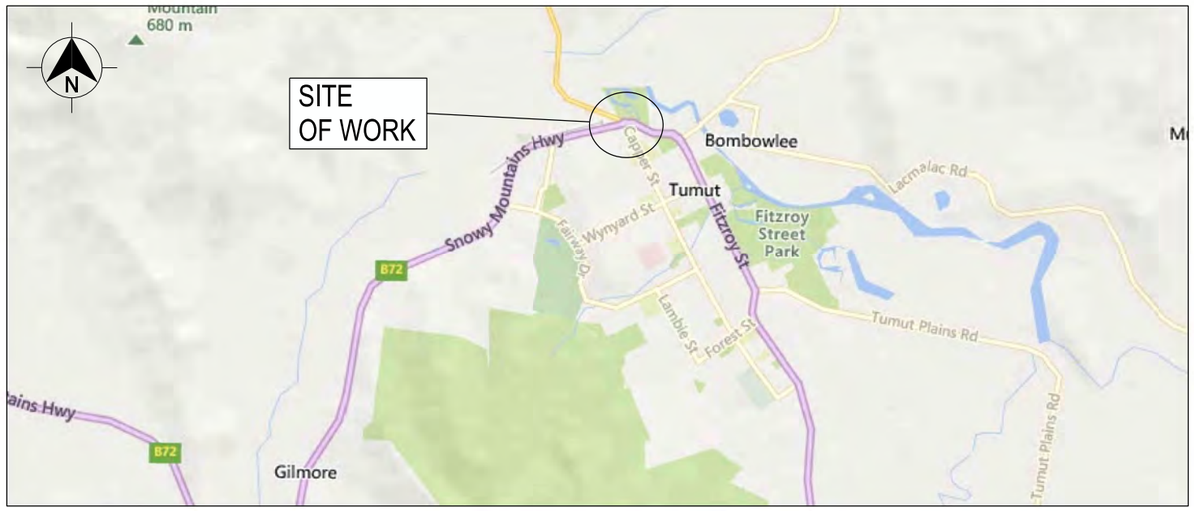
SNOWY VALLEY COUNCIL

HW4 - SNOWY MOUNTAINS HIGHWAY
MR279 - GOCUP ROAD

TUMUT ROUNDABOUT

0.870km TO 1.320km FROM TUMUT

ROAD DESIGN



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SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY
TUMUT ROUNDABOUT UPGRADE
0.870KM TO 1.320KM FROM TUMUT

A3

RMS PROJECT No. P.0055766

RMS REGISTRATION No. DS2020/000808 — PART

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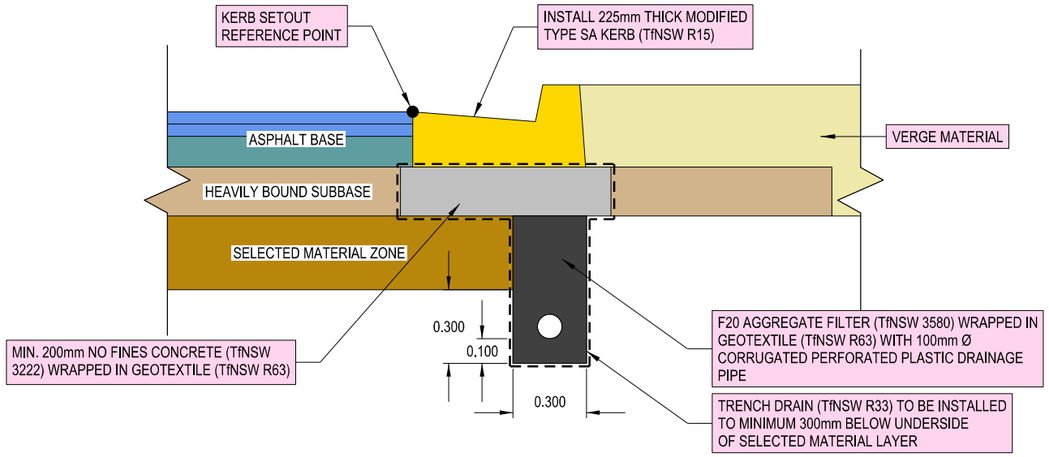

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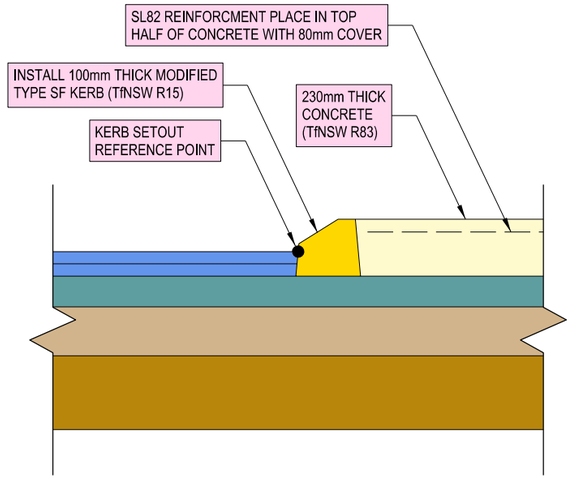

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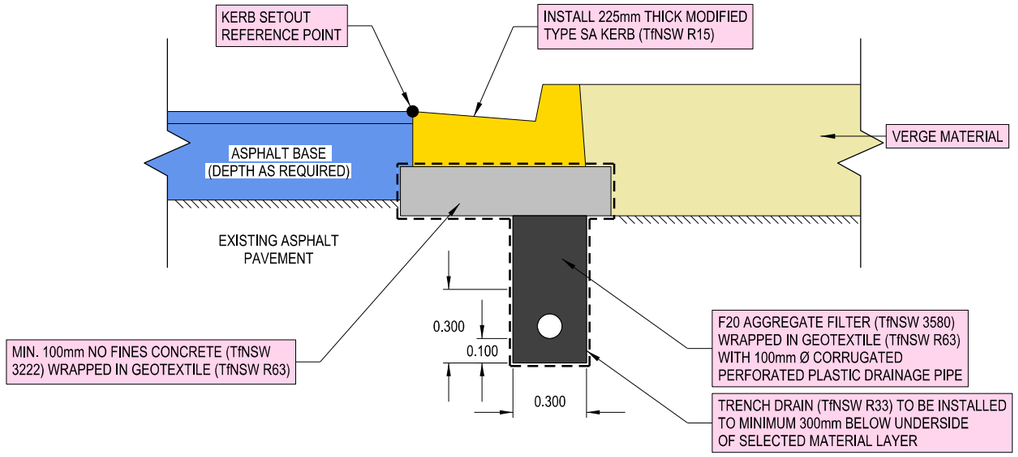

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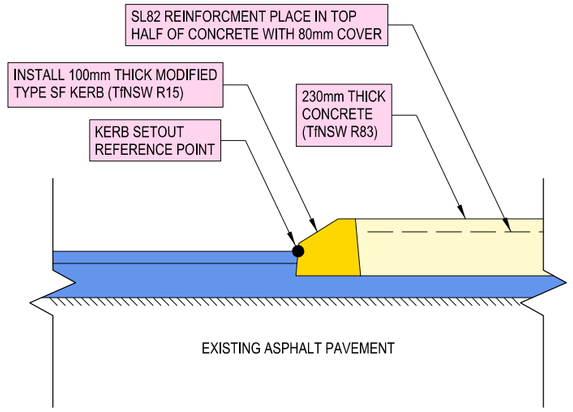

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RAISED ISLANDS SHALL HAVE A STENCILLED, TERRACOTA COLOURED FINISHED SURFACE.

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CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
GENERAL ARRANGEMENT PLAN
TYPICAL DETAILS - SHEET 1

A3

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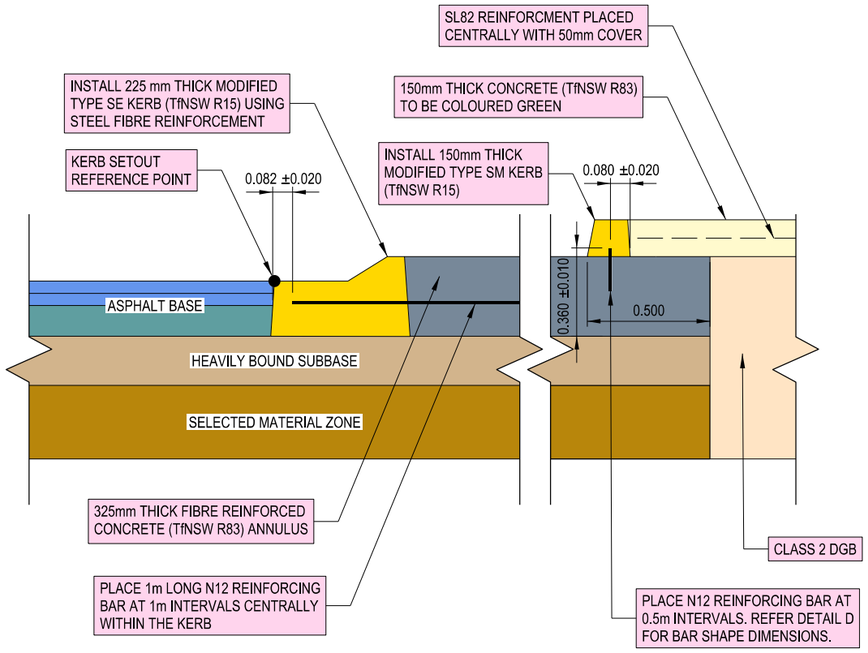

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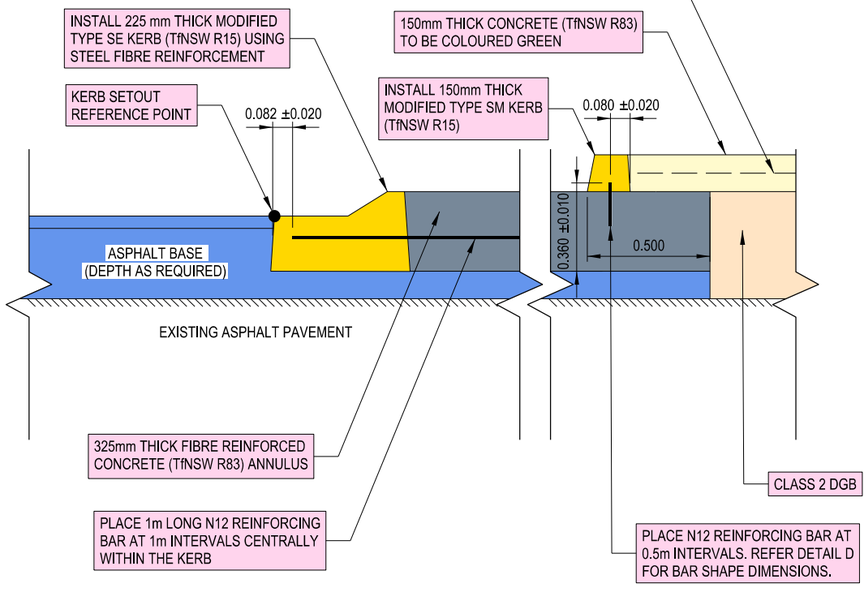

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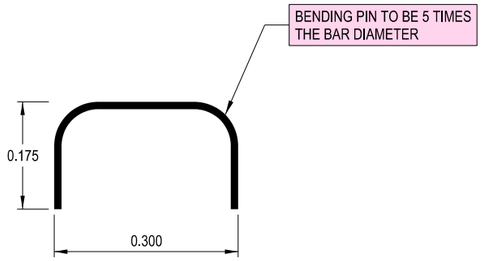

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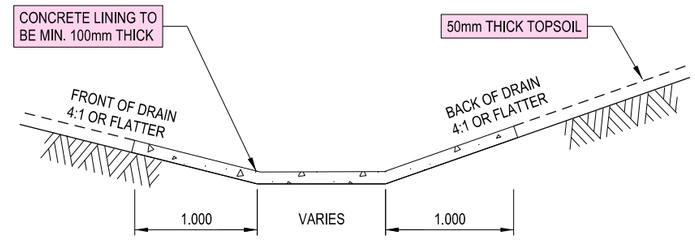

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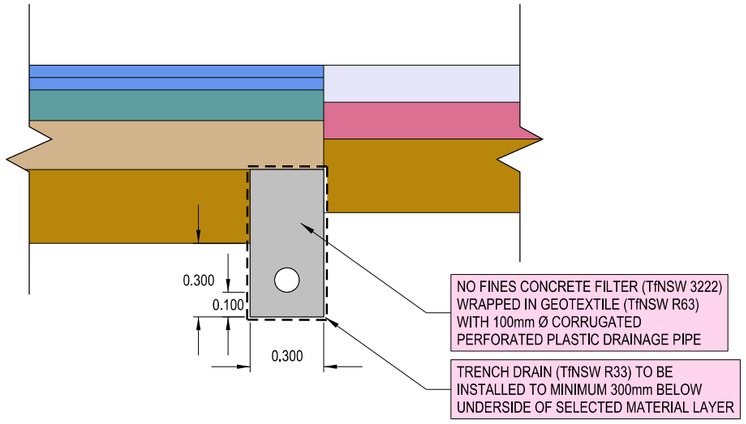

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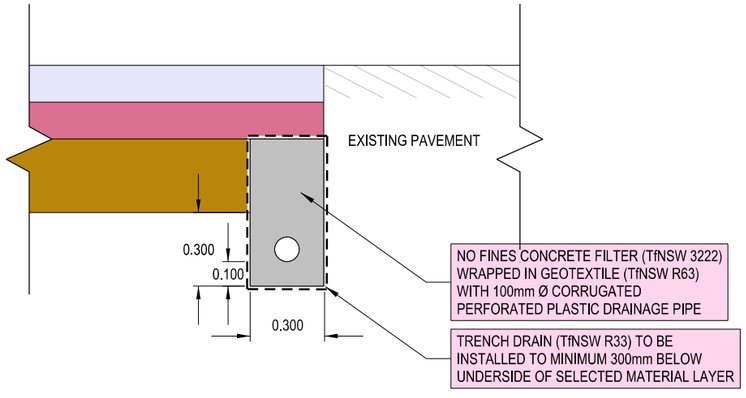

DETAIL F - EIXSTING PAVEMENT INTERFACE DRAIN DETAIL

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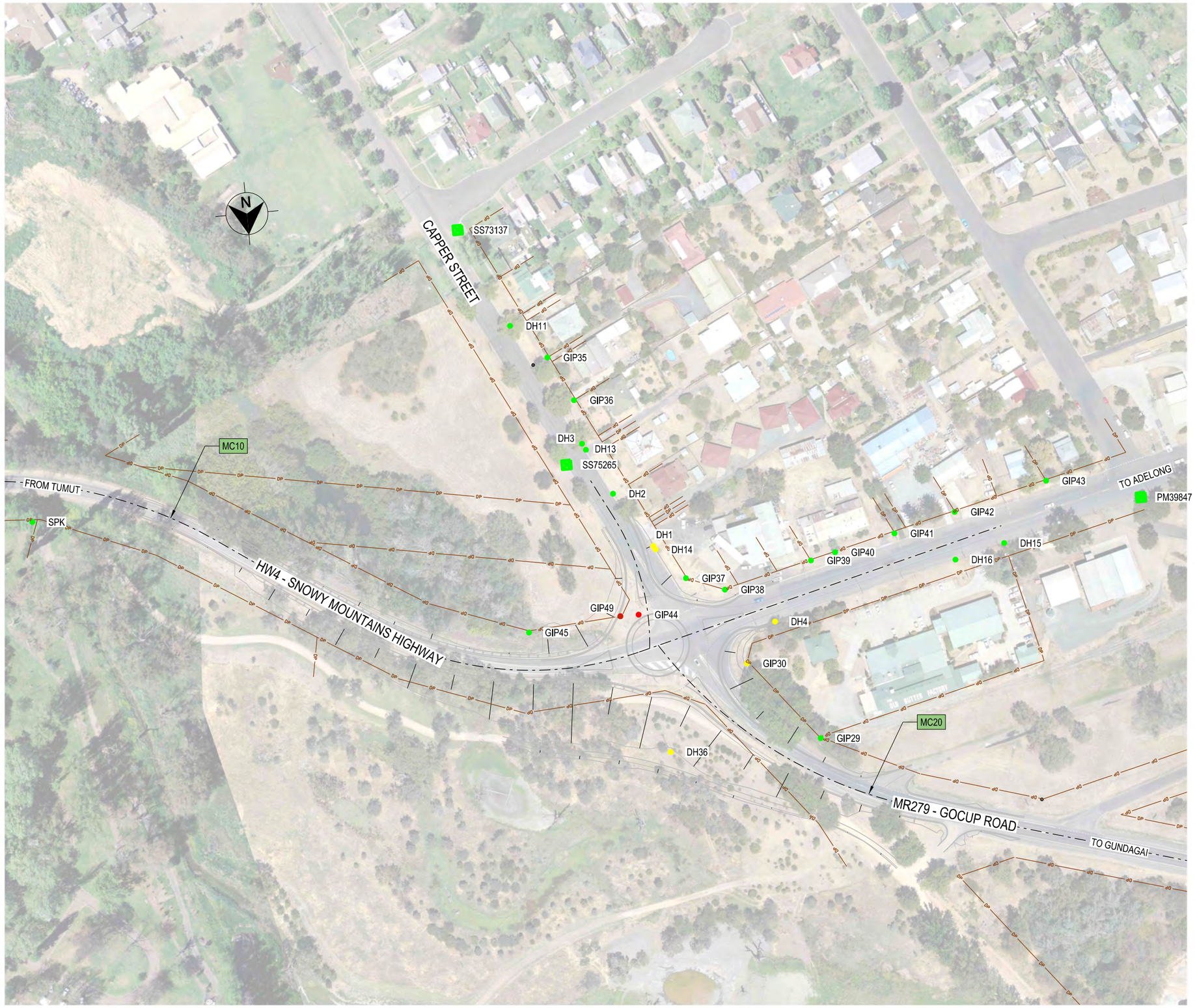

LEGEND

- DP — CADASTRAL BOUNDARY OVERLAY
- TB — PROPOSED TITLE BOUNDARY

SURVEY INFRASTRUCTURE LEGEND

- PM — PERMANENT SURVEY MARK
- SS — STATE SURVEY MARK
- BP — CADASTRAL - BOUNDARY PEG
- PI — CADASTRAL - IRON PIPE
- SURVEY MARK DESTROYED
- SURVEY MARK IS VULNERABLE
- SURVEY MARK IS CLEAR
- SURVEY MARK ALREADY GONE

POSI DISCLAIMER

CARE, PROTECTION AND PRESERVATION OF PERMANENT SURVEY AND CADASTRAL REFERENCE MARKS.

WARNING: PENALTIES APPLY FOR THE REMOVAL, DAMAGE, DESTRUCTION, DISPLACEMENT AND DISTURBANCE OF PERMANENT SURVEY AND CADASTRAL REFERENCE MARKS (SURVEY INFRASTRUCTURE) WITHOUT AUTHORISATION BY THE SURVEYOR GENERAL AS PER THE REQUIREMENTS UNDER SECTION 24 OF THE SURVEYING AND SPATIAL INFORMATION ACT 2002. AUTHORISATION MUST BE SOUGHT PRIOR TO ANY ACTIVITIES ON SITE WHICH MAY IMPACT ON THE SURVEY INFRASTRUCTURE AS DETAILED IN THE SURVEYING AND SPATIAL INFORMATION REGULATION 2017.

THIS DRAWING HIGHLIGHTS SURVEY INFRASTRUCTURE IN THE GENERAL VICINITY OF THE PROPOSED CONSTRUCTION FOOTPRINT FOR WORKS UNDER THE CONTRACT. THE SURVEY INFRASTRUCTURE SHOWN HAS BEEN DERIVED FROM AN OFFICE INTERPRETATION OF EXISTING DEPOSITED PLAN INFORMATION AND/OR SCIMS SEARCH. IT IS PROVIDED AS GENERAL INFORMATION FOR THE CONTRACTOR AND SHOULD BE VERIFIED FOR COMPLETENESS PRIOR TO ANY SITE ACTIVITY WITHIN OR NEAR CONSTRUCTION LIMITS.

ROADS AND MARITIME G71 - CONSTRUCTION SURVEYS SPECIFICATION SETS OUT THE PROCESS TO BE FOLLOWED AND ALIGNS WITH THE PROCESS DETAILED IN THE SURVEYOR GENERAL'S DIRECTIONS NO.11 PRESERVATION OF SURVEY INFRASTRUCTURE.

EXTRA CARE IS REQUIRED FOR ASSOCIATED WORKS SUCH AS:
- UTILITY ADJUSTMENTS
- TEMPORARY ACCESS TRACKS
- SITE OFFICE AND COMPOUNDS
- STOCKPILES
- ENVIRONMENTAL CONSTRAINTS LIMITS
- TRAFFIC CONTROL (IN ADVANCE OF WORKS)
- SIGNAGE PLACEMENT
- DESIGN CHANGES

ADVICE MUST BE SOUGHT FROM THE ROADS AND MARITIME SURVEYING SECTION WELL IN ADVANCE OF ANY SITE WORKS COMMENCING.

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INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ROAD DESIGN SOUTH

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CLIENT: NSW GOVERNMENT Transport for NSW
PREPARED FOR: TRANSPORT FOR NSW REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
PRESERVATION OF SURVEY INFRASTRUCTURE PLAN
CADASTRAL MARKS

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	GE-0007	X

PRESERVATION OF SURVEY INFRASTRUCTURE (POSI) REGISTER - HW4 & MR279 Intersection - 1007/2019 - MGA ZONE 55 GDA94

Mark ID	Type	Source / Plan	MGA Easting	MGA Northing	Class	Order	Date	AHD	Class	Order	Date	Status	Date	Project Impact	Comments
SS75265	SSM	SCIMS	610584.33	6093475.02	B	2	21/02/19	272.660	B	3	21/02/19	Found	4/03/19	Safe	
		RMS	N/A	N/A				272.670	LD	L4	26/02/19				
DH4	DH&W	DP609843	610487.70	6093562.98	D	4	4/03/19					Found	4/03/19	Vulnerable	
DH1	DH&W	UNKNOWN	610544.80	6093518.56	D	4	4/03/19					Found	4/03/19	Vulnerable	
DH2	DH&W	DP827332	610562.53	6093491.60	D	4	4/03/19					Found	4/03/19	Safe	
DH3	DH&W	UNKNOWN	610575.66	6093465.21	D	4	4/03/19					Found	4/03/19	Safe	
GIP43	RM GIP	DP609843	610345.90	6093505.40	E	5						Calculated	4/03/19	Safe	
GIP42	RM GIP	DP609843	610393.00	6093516.70	E	5						Calculated	4/03/19	Safe	
GIP41	RM GIP	DP609843	610424.00	6093524.60	E	5						Calculated	4/03/19	Safe	
GIP40	RM GIP	DP609843	610454.50	6093531.20	E	5						Calculated	4/03/19	Safe	
GIP39	RM GIP	DP609843	610467.00	6093534.20	E	5						Calculated	4/03/19	Safe	
GIP38	RM GIP	DP609843	610511.20	6093544.70	E	5						Calculated	4/03/19	Safe	
DH14	DH&W	DP839942	610543.90	6093521.40	E	5						Calculated	4/03/19	Vulnerable	
DH13	DH&W	DP827332	610574.00	6093468.40	E	5						Calculated	4/03/19	Safe	
GIP44	RM GIP	32092-1603	610555.4	6093553.1	E	5						Calculated	43528	To Be Destroyed	
GIP49	RM GIP	32092-1603	610564.6	6093553	E	5						Calculated	43528	To Be Destroyed	
GIP45	RM GIP	32092-1603	610611.00	6093556.90	E	5						Calculated	4/03/19	Safe	
DH36	DH&W	DP1025402	610545.90	6093623.10	E	5						Calculated	4/03/19	Vulnerable	
GIP30	RM GIP	DP1025402	610503.70	6093582.50	E	5						Calculated	4/03/19	Vulnerable	
GIP29	RM GIP	DP1025402	610470.40	6093623.30	E	5						Calculated	4/03/19	Safe	
DH15	DH&W	DP609843	610369.70	6093534.50	E	5						Calculated	4/03/19	Safe	
DH16	DH&W	DP609843	610394.80	6093540.50	E	5						Calculated	4/03/19	Safe	
GIP37	RM GIP	32092-1603	610530.10	6093537.20	E	5						Calculated	4/03/19	Safe	

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-GE.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

PLOT DATE / TIME / PLOT BY

CLIENT: NSW GOVERNMENT Transport for NSW

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
PRESERVATION OF SURVEY INFRASTRUCTURE PLAN
CADASTRAL METADATA

A3

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: NOT TO SCALE

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

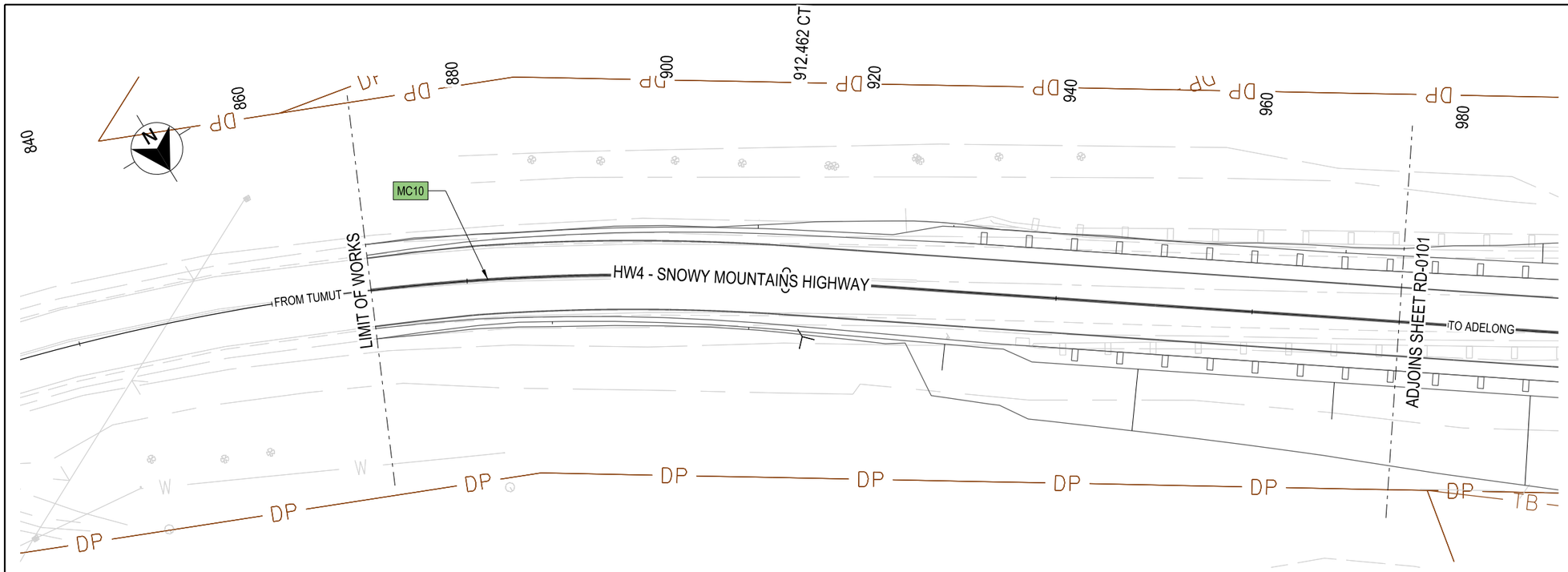
DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME	TITLE	NAME	DATE
	DRAWN	X. X. XXXXXXXX	XX.XX.XX
	DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
	DESIGN	X. X. XXXXXXXX	XX.XX.XX
	DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
	DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
	PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	GE-0008	X



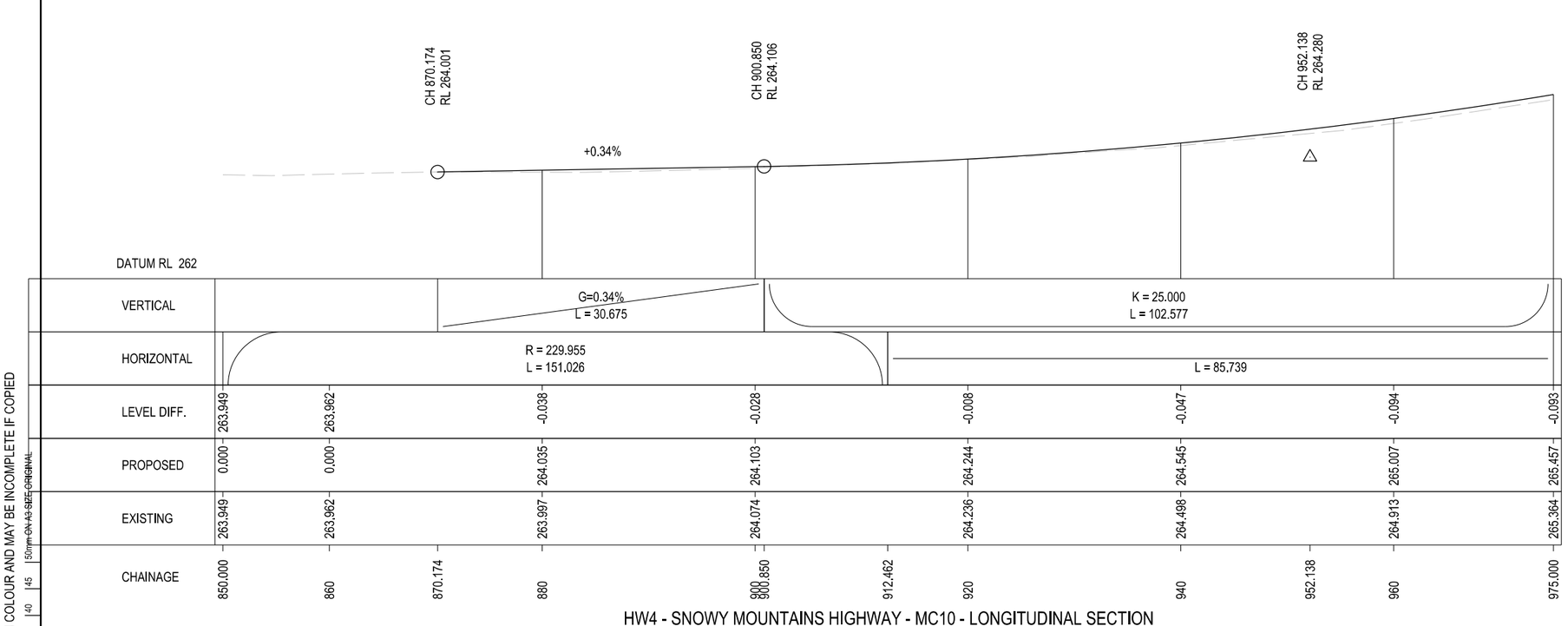
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - PLAN

LEGEND

XXXX	DESIGN CONTROL CALLOUT
DP	CADASTRAL BOUNDARY OVERLAY
TB	PROPOSED TITLE BOUNDARY
TS	TANGENT TO SPIRAL
SC	SPIRAL TO CURVE
CS	CURVE TO SPIRAL
ST	SPIRAL TO TANGENT
CTC	CURVE TO TANGENT TO CURVE
TC	TANGENT TO CURVE
CT	CURVE TO TANGENT

SURVEY INFRASTRUCTURE LEGEND

PM	PERMANENT SURVEY MARK - DO NOT DISTURB
SS	STATE SURVEY MARK - DO NOT DISTURB
BP	CADASTRAL - BOUNDARY PEG - DO NOT DISTURB
PI	CADASTRAL - IRON PIPE - DO NOT DISTURB
NB	SURVEY STAR PICKET MARK



HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - LONGITUDINAL SECTION

NOTES

1. ANY SURVEY PMS OR SSMS THAT ARE DESTROYED ARE TO BE REPLACED, CO-ORDINATED AND DOCUMENTED TO LANDS DEPARTMENT STANDARDS. REFER TO RMS TECHNICAL DIRECTION SD02. PENALTIES MAY APPLY FOR NON-CONFORMANCE.
2. PURSUANT TO THE SURVEYING AND SPATIAL INFORMATION ACT, ANY CADASTRAL REFERENCE MARKS THAT ARE ON KERBS, FOOTPATHS OR SIMILAR THAT MAY BE AFFECTED BY CONSTRUCTION OR MAINTENANCE, NEED TO BE IDENTIFIED AND SURVEYED BY A REGISTERED SURVEYOR BEFORE THEY ARE DESTROYED OR DISTURBED. PERSONAL FINES APPLY FOR BREACH OF THE ACT.
3. ALL SURVEY CONTROL IS NOT TO BE DISTURBED BEFORE ASSESSMENT BY SURVEYOR.
4. REFER TO SHEET RD-0107 FOR ALIGNMENT SETOUT DETAILS.
5. REFER TO SHEET RD-0108 FOR SURVEY CONTROL SCHEDULE.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-RD.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING

0 5 10 15 20
HORIZONTAL SCALE 1:500m
0 1 2 3 4
VERTICAL SCALE 1:100m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94)
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME		PLOT BY
TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

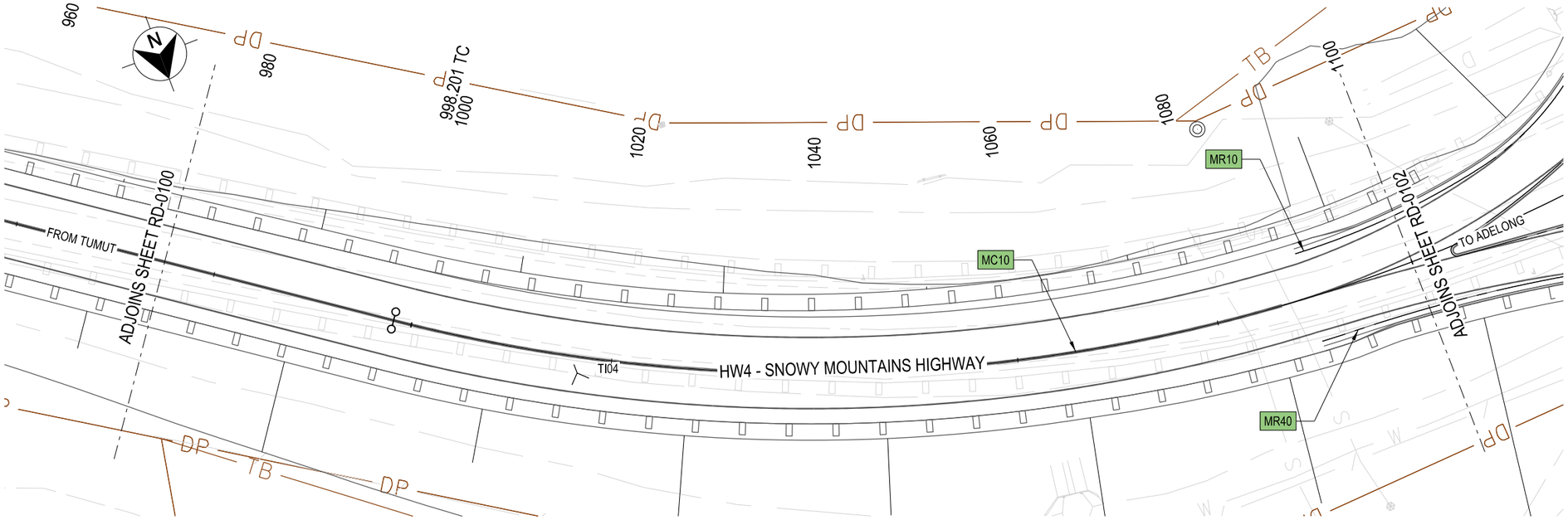
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN, ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
ALIGNMENT PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH. 870.000 TO CH. 975.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RD-0100	X



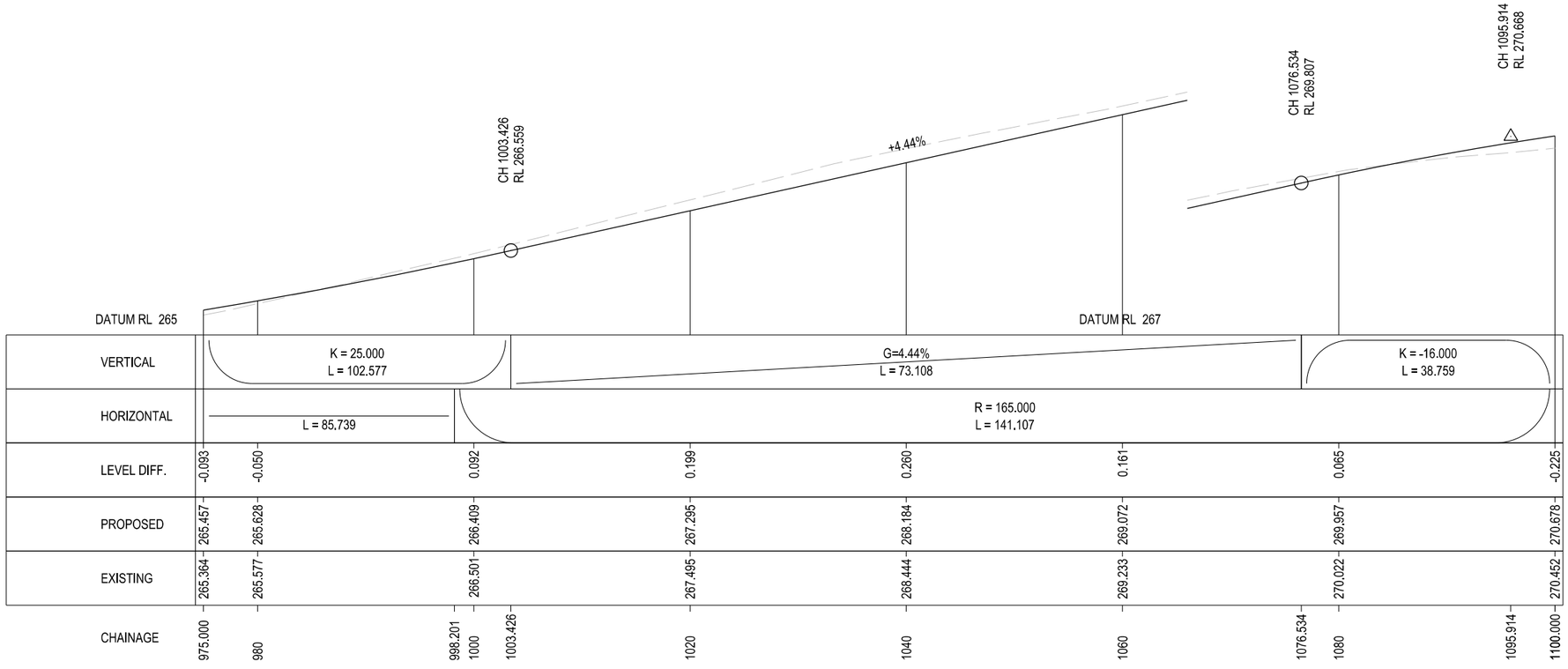
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - PLAN

LEGEND

XXXX	DESIGN CONTROL CALLOUT
DP	CADASTRAL BOUNDARY OVERLAY
TB	PROPOSED TITLE BOUNDARY
TS	TANGENT TO SPIRAL
SC	SPIRAL TO CURVE
CS	CURVE TO SPIRAL
ST	SPIRAL TO TANGENT
CTC	CURVE TO TANGENT TO CURVE
TC	TANGENT TO CURVE
CT	CURVE TO TANGENT

SURVEY INFRASTRUCTURE LEGEND

PM	PERMANENT SURVEY MARK - DO NOT DISTURB
SS	STATE SURVEY MARK - DO NOT DISTURB
BP	CADASTRAL - BOUNDARY PEG - DO NOT DISTURB
PI	CADASTRAL - IRON PIPE - DO NOT DISTURB
NB	SURVEY STAR PICKET MARK



HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - LONGITUDINAL SECTION

NOTES

1. ANY SURVEY PMS OR SSMS THAT ARE DESTROYED ARE TO BE REPLACED, CO-ORDINATED AND DOCUMENTED TO LANDS DEPARTMENT STANDARDS. REFER TO RMS TECHNICAL DIRECTION SD02. PENALTIES MAY APPLY FOR NON-CONFORMANCE.
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4. REFER TO SHEET RD-0107 FOR ALIGNMENT SETOUT DETAILS.
5. REFER TO SHEET RD-0108 FOR SURVEY CONTROL SCHEDULE.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-RD.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES

REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: HORIZONTAL SCALE 1:500m; VERTICAL SCALE 1:100m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME PLOT BY

TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

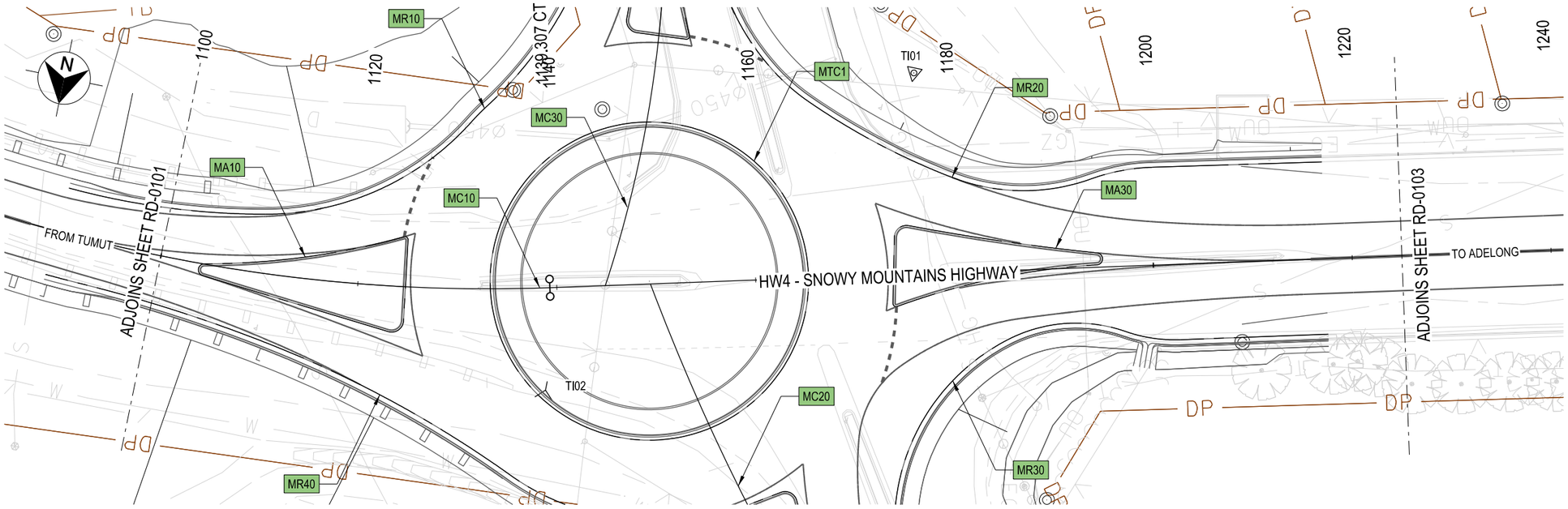
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
ALIGNMENT PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH. 975.000 TO CH. 1100.000

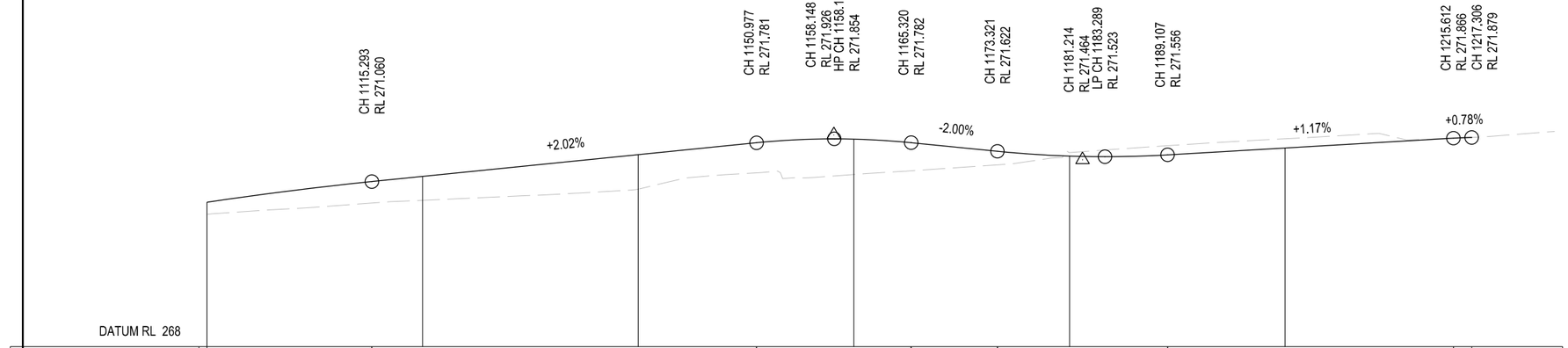
A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RD-0101	X



HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - LONGITUDINAL SECTION



HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - LONGITUDINAL SECTION

LEGEND

XXXX	DESIGN CONTROL CALLOUT
DP	CADASTRAL BOUNDARY OVERLAY
TB	PROPOSED TITLE BOUNDARY
TS	TANGENT TO SPIRAL
SC	SPIRAL TO CURVE
CS	CURVE TO SPIRAL
ST	SPIRAL TO TANGENT
CTC	CURVE TO TANGENT TO CURVE
TC	TANGENT TO CURVE
CT	CURVE TO TANGENT

SURVEY INFRASTRUCTURE LEGEND

PM	PERMANENT SURVEY MARK - DO NOT DISTURB
SS	STATE SURVEY MARK - DO NOT DISTURB
BP	CADASTRAL - BOUNDARY PEG - DO NOT DISTURB
PI	CADASTRAL - IRON PIPE - DO NOT DISTURB
NB	SURVEY STAR PICKET MARK

NOTES

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NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

150mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-RD.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES

REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: HORIZONTAL SCALE 1:500m; VERTICAL SCALE 1:100m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME PLOT BY

TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

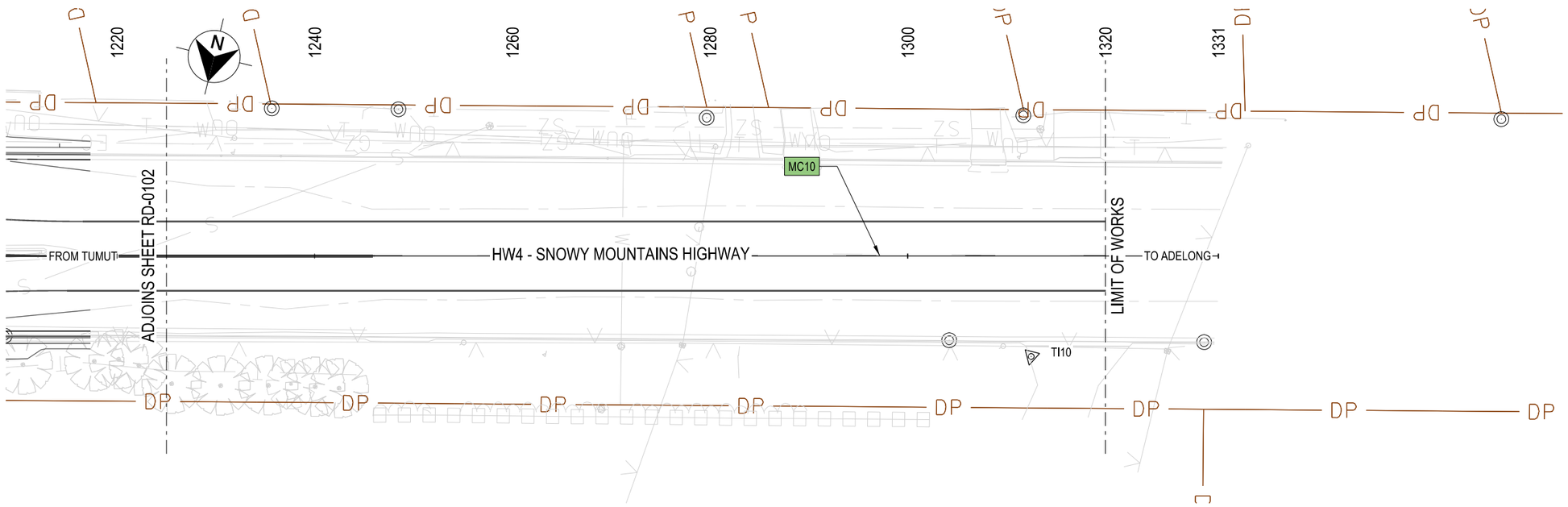
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
ALIGNMENT PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH. 1100.000 TO CH. 1225.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RD-0102	X



HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - PLAN

LEGEND

XXXX	DESIGN CONTROL CALLOUT
DP	CADASTRAL BOUNDARY OVERLAY
TB	PROPOSED TITLE BOUNDARY
TS	TANGENT TO SPIRAL
SC	SPIRAL TO CURVE
CS	CURVE TO SPIRAL
ST	SPIRAL TO TANGENT
CTC	CURVE TO TANGENT TO CURVE
TC	TANGENT TO CURVE
CT	CURVE TO TANGENT

SURVEY INFRASTRUCTURE LEGEND

PM	PERMANENT SURVEY MARK - DO NOT DISTURB
SS	STATE SURVEY MARK - DO NOT DISTURB
BP	CADASTRAL - BOUNDARY PEG - DO NOT DISTURB
PI	CADASTRAL - IRON PIPE - DO NOT DISTURB
NB	SURVEY STAR PICKET MARK

NOTES

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5. REFER TO SHEET RD-0108 FOR SURVEY CONTROL SCHEDULE.

DATUM RL 270

VERTICAL	MATCH EXISTING					
HORIZONTAL	L = 192.122					
LEVEL DIFF.						
PROPOSED						
EXISTING	271.991	272.210	272.497	272.768	272.981	273.118	0.000
CHAINAGE	1225.000	1240	1260	1280	1300	1320	1350.000

HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - LONGITUDINAL SECTION

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-RD.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: HORIZONTAL SCALE 1:500m (0 5 10 15 20); VERTICAL SCALE 1:100m (0 1 2 3 4)

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

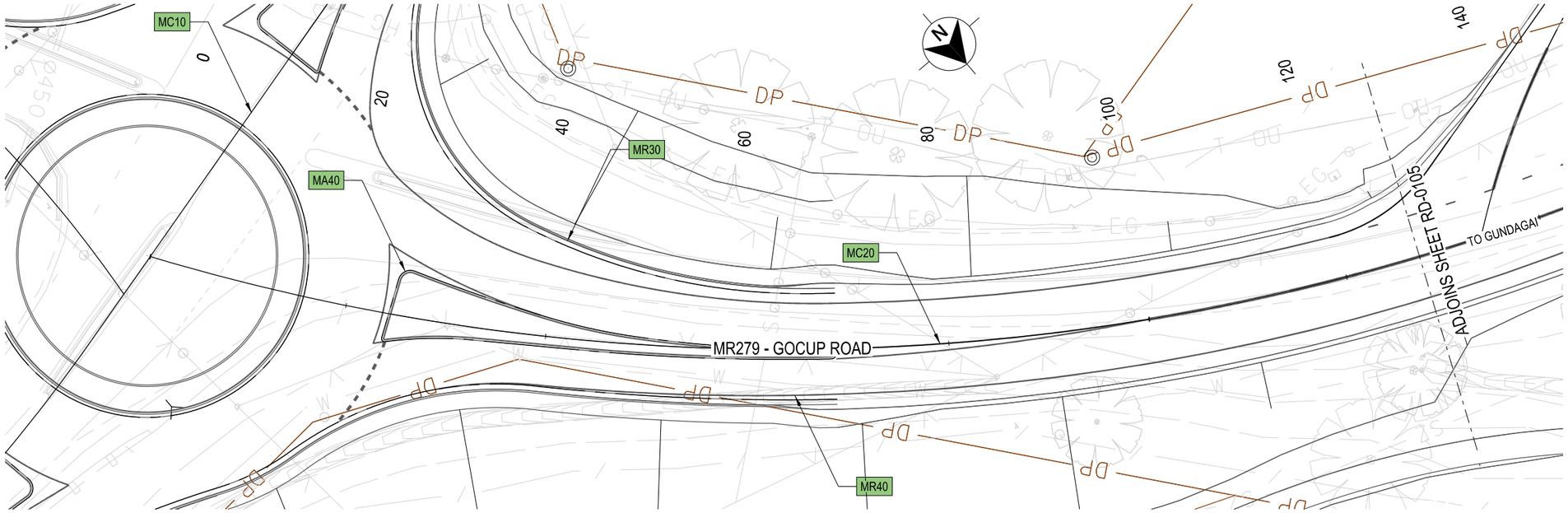
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
ALIGNMENT PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH. 1225.000 TO CH. 1320.000

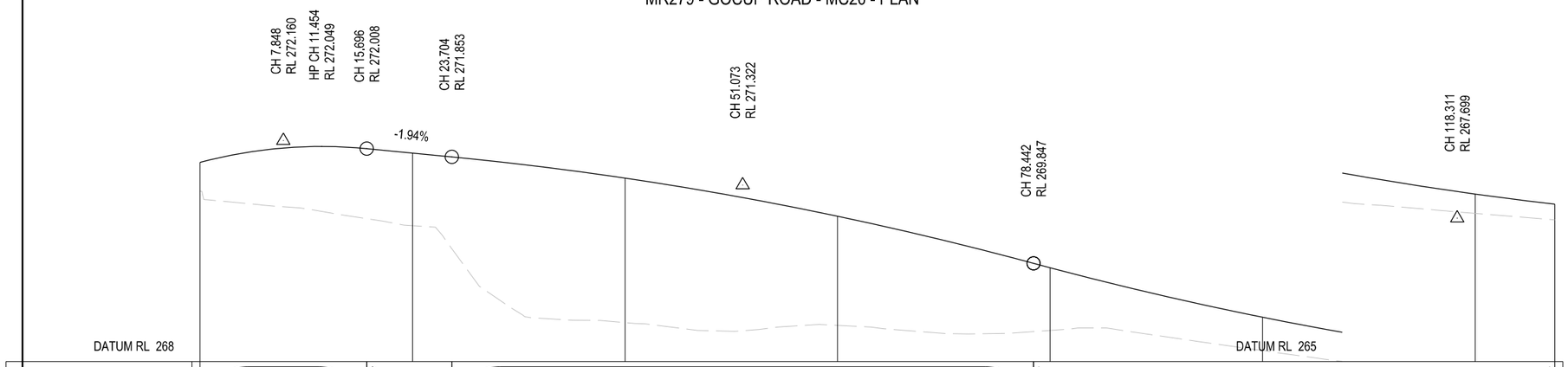
A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RD-0103	X



MR279 - GOCUP ROAD - MC20 - PLAN



MR279 - GOCUP ROAD - MC20 - LONGITUDINAL SECTION

LEGEND

XXXX	DESIGN CONTROL CALLOUT
DP	CADASTRAL BOUNDARY OVERLAY
TB	PROPOSED TITLE BOUNDARY
TS	TANGENT TO SPIRAL
SC	SPIRAL TO CURVE
CS	CURVE TO SPIRAL
ST	SPIRAL TO TANGENT
CTC	CURVE TO TANGENT TO CURVE
TC	TANGENT TO CURVE
CT	CURVE TO TANGENT

SURVEY INFRASTRUCTURE LEGEND

PM	PERMANENT SURVEY MARK - DO NOT DISTURB
SS	STATE SURVEY MARK - DO NOT DISTURB
BP	CADASTRAL - BOUNDARY PEG - DO NOT DISTURB
PI	CADASTRAL - IRON PIPE - DO NOT DISTURB
NB	SURVEY STAR PICKET MARK

NOTES

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5. REFER TO SHEET RD-0108 FOR SURVEY CONTROL SCHEDULE.

NOT FOR CONSTRUCTION

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DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES

REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: HORIZONTAL SCALE 1:500m; VERTICAL SCALE 1:100m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME PLOT BY

	NAME	DATE
TITLE		
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

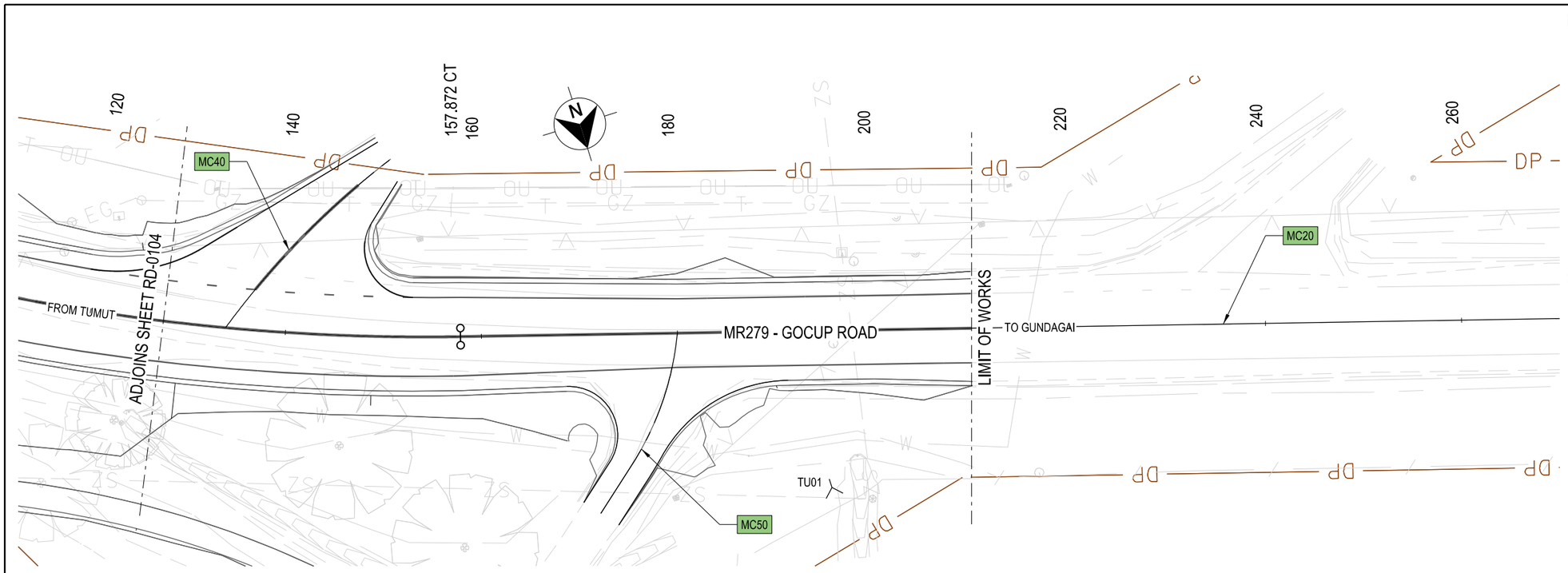
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
ALIGNMENT PLAN
MR279 - GOCUP ROAD - MC20 - CH. 0.000 TO CH. 125.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RD-0104	X



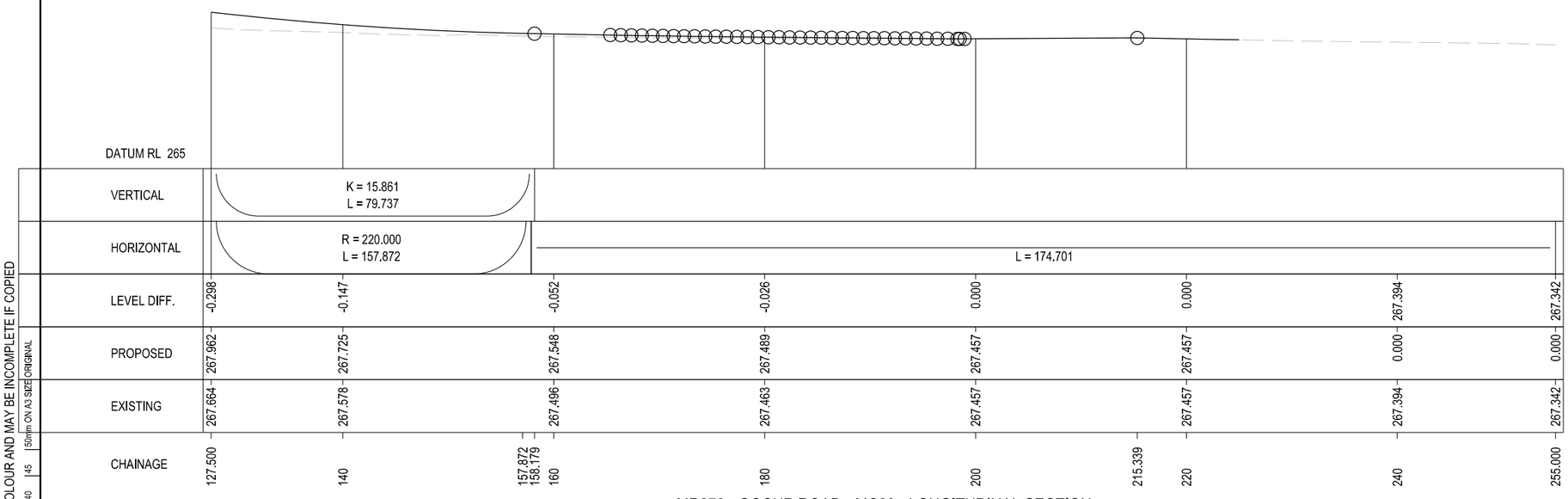
MR279 - GOCUP ROAD - MC20 - LONGITUDINAL SECTION

LEGEND

XXXX	DESIGN CONTROL CALLOUT
DP	CADASTRAL BOUNDARY OVERLAY
TB	PROPOSED TITLE BOUNDARY
TS	TANGENT TO SPIRAL
SC	SPIRAL TO CURVE
CS	CURVE TO SPIRAL
ST	SPIRAL TO TANGENT
CTC	CURVE TO TANGENT TO CURVE
TC	TANGENT TO CURVE
CT	CURVE TO TANGENT

SURVEY INFRASTRUCTURE LEGEND

PM	PERMANENT SURVEY MARK - DO NOT DISTURB
SS	STATE SURVEY MARK - DO NOT DISTURB
BP	CADASTRAL - BOUNDARY PEG - DO NOT DISTURB
PI	CADASTRAL - IRON PIPE - DO NOT DISTURB
NB	SURVEY STAR PICKET MARK



MR279 - GOCUP ROAD - MC20 - LONGITUDINAL SECTION

NOTES

1. ANY SURVEY PMS OR SSMS THAT ARE DESTROYED ARE TO BE REPLACED, CO-ORDINATED AND DOCUMENTED TO LANDS DEPARTMENT STANDARDS. REFER TO RMS TECHNICAL DIRECTION SD02. PENALTIES MAY APPLY FOR NON-CONFORMANCE.
2. PURSUANT TO THE SURVEYING AND SPATIAL INFORMATION ACT, ANY CADASTRAL REFERENCE MARKS THAT ARE ON KERBS, FOOTPATHS OR SIMILAR THAT MAY BE AFFECTED BY CONSTRUCTION OR MAINTENANCE, NEED TO BE IDENTIFIED AND SURVEYED BY A REGISTERED SURVEYOR BEFORE THEY ARE DESTROYED OR DISTURBED. PERSONAL FINES APPLY FOR BREACH OF THE ACT.
3. ALL SURVEY CONTROL IS NOT TO BE DISTURBED BEFORE ASSESSMENT BY SURVEYOR.
4. REFER TO SHEET RD-0107 FOR ALIGNMENT SETOUT DETAILS.
5. REFER TO SHEET RD-0108 FOR SURVEY CONTROL SCHEDULE.

NOT FOR CONSTRUCTION

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DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES

REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: HORIZONTAL SCALE 1:500m (0 5 10 15 20); VERTICAL SCALE 1:100m (0 1 2 3 4)

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME: PLOT BY

TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

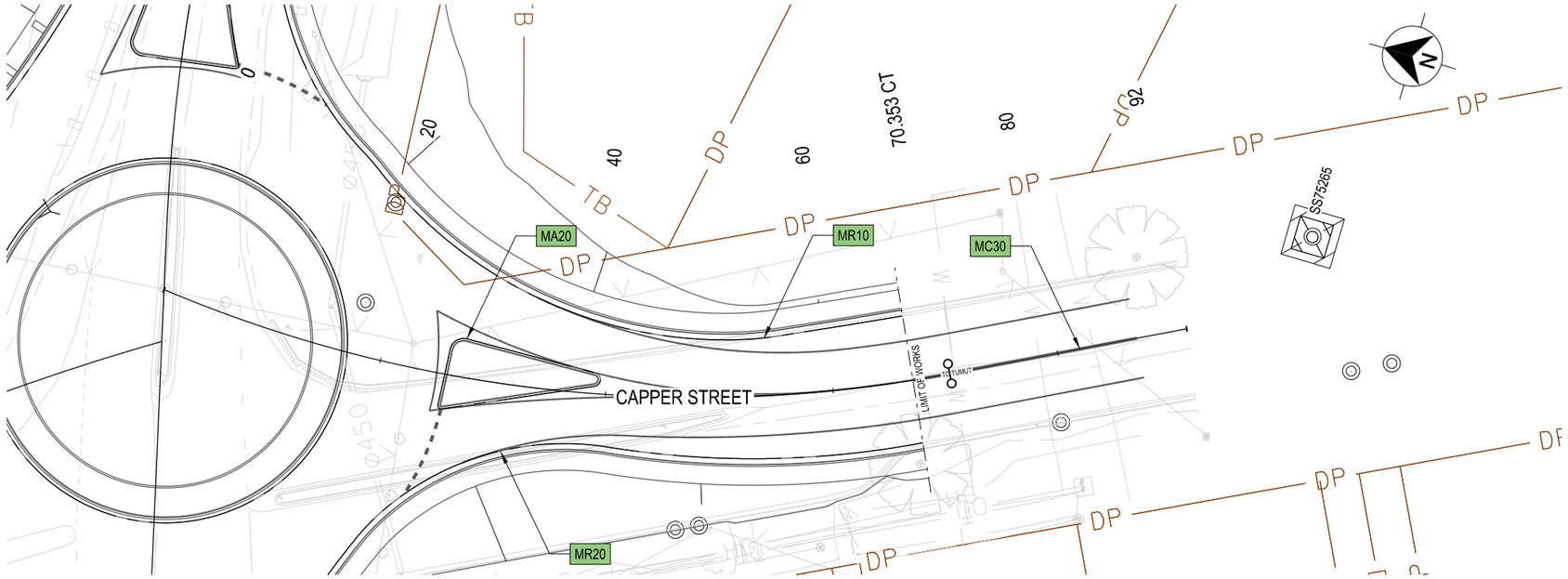
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
ALIGNMENT PLAN
MR279 - GOCUP ROAD - MC20 - CH. 125.000 TO CH. 210.000

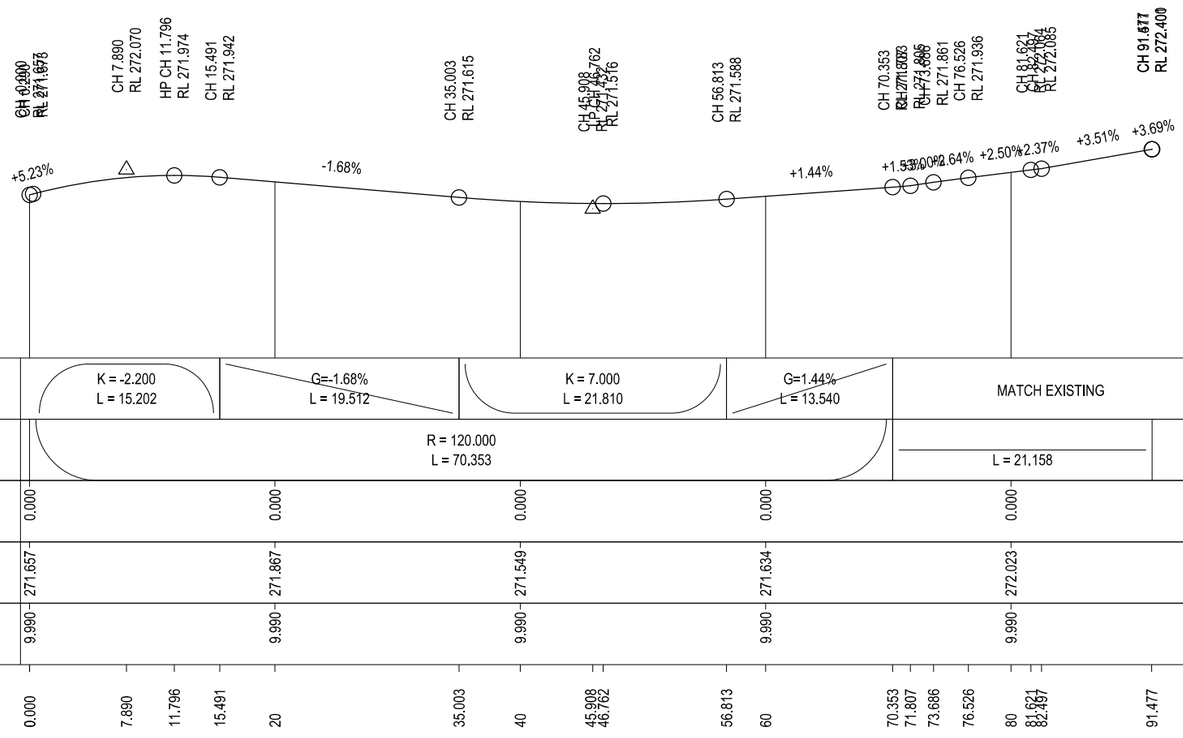
A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RD-0105	X



CAPPER STREET - MC30 - PLAN



CAPPER STREET - MC30 - LONGITUDINAL SECTION

LEGEND

XXXX	DESIGN CONTROL CALLOUT
DP	CADASTRAL BOUNDARY OVERLAY
TB	PROPOSED TITLE BOUNDARY
TS	TANGENT TO SPIRAL
SC	SPIRAL TO CURVE
CS	CURVE TO SPIRAL
ST	SPIRAL TO TANGENT
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TC	TANGENT TO CURVE
CT	CURVE TO TANGENT

SURVEY INFRASTRUCTURE LEGEND

PM	PERMANENT SURVEY MARK - DO NOT DISTURB
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NOT FOR CONSTRUCTION

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-RD.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES

REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: HORIZONTAL SCALE 1:500m (0 5 10 15 20); VERTICAL SCALE 1:100m (0 1 2 3 4)

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME PLOT BY

	TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX	
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX	
DESIGN	X. X. XXXXXXXX	XX.XX.XX	
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX	
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX	
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX	

CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
ALIGNMENT PLAN
CAPPER STREET - MC30 - CH. 0.000 TO CH. 67.060

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RD-0106	X

HORIZONTAL ALIGNMENT REPORT - MC10

POINT	CHAINAGE	EASTING	NORTHING	ELEVATION	ELEMENT	LENGTH	BEARING
START	730.067	610935.232	6093456.800	264.001			
					STRAIGHT	31.368	267°30'44.4"
TC	761.435	610903.893	6093455.439	264.001			267°30'44.4"
CC		610893.912	6093685.177		R = +229.955	151.026	
CT	912.462	610761.549	6093497.136	264.172			305°08'31.5"
					STRAIGHT	85.739	305°08'31.5"
TC	998.201	610691.438	6093546.488	266.332			305°08'31.5"
CC		610596.463	6093411.563		R = -165.000	141.107	
CT	1139.307	610556.946	6093571.761	271.545			256°08'35.5"
					STRAIGHT	192.122	256°08'35.5"
END	1331.429	610370.415	6093525.749	271.879			

HORIZONTAL ALIGNMENT REPORT - MC20

POINT	CHAINAGE	EASTING	NORTHING	ELEVATION	ELEMENT	LENGTH	BEARING
START	0.000	610547.128	6093569.340	271.749			327°41'57.1"
CC		610361.172	6093451.779		R = -220.000	157.872	
CT	157.872	610423.964	6093662.628	267.556			286°35'01.9"
					STRAIGHT	174.701	286°35'01.9"
END	332.572	610256.530	6093712.491	267.438			

HORIZONTAL ALIGNMENT REPORT - MC30

POINT	CHAINAGE	EASTING	NORTHING	ELEVATION	ELEMENT	LENGTH	BEARING
START	0.000	610551.536	6093570.427	271.657			186°32'12.2"
CC		610670.755	6093556.766		R = -120.000	70.353	
CT	70.353	610563.886	6093502.186	271.783			152°56'44.1"
					STRAIGHT	21.158	152°56'44.1"
END	91.511	610573.510	6093483.343	272.401			

HORIZONTAL ALIGNMENT REPORT - MC40

POINT	CHAINAGE	EASTING	NORTHING	ELEVATION	ELEMENT	LENGTH	BEARING
START	0.000	610446.540	6093654.541	267.830			233°42'34.1"
CC		610396.721	6093722.385		R = +84.171	24.160	
END	24.160	610425.294	6093643.212	267.478			250°09'20.2"

HORIZONTAL ALIGNMENT REPORT - MC50

POINT	CHAINAGE	EASTING	NORTHING	ELEVATION	ELEMENT	LENGTH	BEARING
START	0.000	610402.766	6093668.941	267.489			22°49'13.0"
CC		610430.418	6093657.306		R = +30.000	14.349	
CT	14.349	610411.225	6093680.363	266.377			50°13'30.0"
					STRAIGHT	5.892	50°13'30.0"
END	20.241	610415.753	6093684.132	265.563			

HORIZONTAL ALIGNMENT REPORT - MA10

POINT	CHAINAGE	EASTING	NORTHING	ELEVATION	ELEMENT	LENGTH	BEARING
START	0.000	610571.964	6093579.385	271.203			
					STRAIGHT	19.478	95°06'53.7"
TC	19.478	610591.365	6093577.648	270.778			95°06'53.7"
CC		610591.311	6093577.050		R = +0.600	1.709	
CTC	21.187	610591.433	6093576.463	270.803			258°19'49.7"
CC		610606.603	6093503.013		R = -75.000	20.338	
CTC	41.525	610572.313	6093569.715	271.230			242°47'36.8"
CC		610572.176	6093569.982		R = +0.300	0.569	
CT	42.094	610571.879	6093569.938	271.239			351°29'11.7"
					STRAIGHT	8.164	351°29'11.7"
TC	50.258	610570.670	6093578.012	271.239			351°29'11.7"
CC		610571.857	6093578.189		R = +1.200	2.170	
END	52.429	610571.964	6093579.385	271.203			95°06'53.7"

HORIZONTAL ALIGNMENT REPORT - MA20

POINT	CHAINAGE	EASTING	NORTHING	ELEVATION	ELEMENT	LENGTH	BEARING
START	0.000	610554.876	6093543.702	271.675			
					STRAIGHT	11.649	178°26'27.4"
TC	11.649	610555.193	6093532.057	271.507			178°26'27.4"
CC		610554.593	6093532.040		R = +0.600	1.641	
CT	13.291	610554.048	6093531.789	271.541			335°11'16.3"
					STRAIGHT	13.552	335°11'16.3"
TC	26.843	610548.361	6093544.090	271.746			335°11'16.3"
CC		610548.634	6093544.215		R = +0.300	0.580	
CT	27.423	610548.613	6093544.515	271.755			85°57'50.8"
					STRAIGHT	4.992	85°57'50.8"
TC	32.414	610553.592	6093544.866	271.720			85°57'50.8"
CC		610553.676	6093543.669		R = +1.200	1.937	
END	34.351	610554.876	6093543.702	271.675			178°26'27.4"

HORIZONTAL ALIGNMENT REPORT - MA30

POINT	CHAINAGE	EASTING	NORTHING	ELEVATION	ELEMENT	LENGTH	BEARING
START	0.000	610522.915	6093558.332	271.587			268°57'14.3"
CC		610527.023	6093333.370		R = -225.000	19.156	
CTC	19.156	610503.800	6093557.168	271.594			264°04'33.0"
CC		610503.738	6093557.765		R = +0.600	1.789	
CTC	20.945	610503.582	6093558.344	271.613			74°54'45.8"
CC		610485.362	6093625.931		R = -70.000	20.587	
CTC	41.532	610522.392	6093566.528	271.566			58°03'43.0"
CC		610522.551	6093566.273		R = +0.300	0.583	
CT	42.116	610522.846	6093566.328	271.578			169°25'35.3"
					STRAIGHT	6.690	169°25'35.3"
TC	48.805	610524.073	6093559.752	271.613			169°25'35.3"
CC		610522.893	6093559.532		R = +1.200	2.084	
END	50.890	610522.915	6093558.332	271.587			268°57'14.3"

HORIZONTAL ALIGNMENT REPORT - MA40

POINT	CHAINAGE	EASTING	NORTHING	ELEVATION	ELEMENT	LENGTH	BEARING
START	0.000	610528.306	6093587.696	271.696			334°37'54.8"
CC		610442.467	6093546.994		R = -95.000	18.434	
CTC	18.434	610518.847	6093603.484	271.282			323°30'51.3"
CC		610519.329	6093603.840		R = +0.600	1.752	
CTC	20.185	610519.721	6093604.295	271.313			130°46'29.7"
CC		610602.011	6093699.712		R = -126.000	21.187	
CTC	41.372	610536.851	6093591.869	271.746			121°08'26.5"
CC		610536.696	6093591.612		R = +0.300	0.615	
CT	41.987	610536.852	6093591.356	271.760			238°36'50.3"
					STRAIGHT	8.008	238°36'50.3"
TC	49.995	610530.015	6093587.185	271.749			238°36'50.3"
CC		610529.390	6093588.210		R = +1.200	2.011	
END	52.006	610528.306	6093587.696	271.696			334°37'54.8"

HORIZONTAL ALIGNMENT REPORT - MR40

POINT	CHAINAGE	EASTING	NORTHING	ELEVATION	ELEMENT	LENGTH	BEARING
START	0.000	610504.803	6093624.321	270.201			129°46'31.9"
CC		610361.172	6093451.779		R = +224.500	12.946	
CTC	12.946	610514.508	6093615.756	270.757			133°04'46.6"
CC		610588.852	6093695.258		R = -108.847	47.206	
CTC	60.153	610554.800	6093591.875	271.495			108°13'50.5"
CC		610547.292	6093569.079		R = +24.000	2.350	
CTC	62.503	610556.993	6093591.031	271.461			113°50'30.9"
CC		610602.805	6093694.694		R = -113.334	27.560	
CTC	90.064	610583.302	6093583.050	270.898			99°54'31.8"
CC		610609.114	6093730.813		R = -150.000	20.000	
CTC	110.064	610603.174	6093580.930	270.314			92°16'09.8"
CC		610596.463	6093411.563		R = +169.500	3.696	
END	113.760	610606.866	6093580.744	270.186			93°31'07.8"

HORIZONTAL ALIGNMENT REPORT - MR10

POINT	CHAINAGE	EASTING	NORTHING	ELEVATION	ELEMENT	LENGTH	BEARING
START	0.000	610606.314	6093571.761	270.186			273°31'08.7"
CC		610601.711	6093496.902		R = -75.000	20.000	
CTC	20.000	610586.425	6093570.328	270.854			258°14'24.8"
CC		610592.079	6093543.168		R = -27.743	23.333	
CTC	43.333	610568.066	6093557.061	271.382			210°03'05.6"
CC		610547.292	6093569.079		R = +24.000	2.337	
CTC	45.670	610566.799	6093555.098	271.419			215°37'49.5"
CC		610597.983	6093532.748		R = -38.366	35.543	
CTC	81.213	610561.382	6093521.243	271.296			162°33'03.8"
CC		610590.002	6093530.239		R = -30.000	4.106	
CT	85.318	610562.877	6093517.423	271.316			154°42'34.2"
					STRAIGHT	5.723	154°42'34.2"
HIP	91.042	610565.322	6093512.248	271.377			
					STRAIGHT	5.173	154°10'58.3"
END	96.215	610567.575	6093507.591	271.449			

HORIZONTAL ALIGNMENT REPORT - MR20

POINT	CHAINAGE	EASTING	NORTHING	ELEVATION	ELEMENT	LENGTH	BEARING
START	0.000	610557.401	6093502.742	271.581			
					STRAIGHT	0.747	333°26'40.4"
TC	0.747	610557.067	6093503.411	271.561			333°26'40.4"
CC		610628.627	6093539.176		R = +80.000	27.018	
CTC	27.765	610549.259	6093529.142	271.397			352°47'40.8"
CC		610525.029	6093526.078		R = -24.422	20.363	
CTC	48.128	610539.045	6093546.079	271.796			305°01'17.6"
CC		610527.567	6093529.700		R = -20.000	4.161	
CTC	52.289	610535.414	6093548.096	271.775			293°06'05.5"
CC		610508.427	6093484.830		R = -68.781	16.478	
CTC	68.768	610519.631	6093552.693	271.516			279°22'29.0"
CC		610516.373	6093532.960		R = -20.000	14.275	
CTC	83.043	610505.917	6093550.009	271.463			238°28'44.6"
CC		610495.461	6093567.058		R = +20.000	6.282	
CT	89.325	610500.138	6093547.613	271.525			256°28'29.3"
					STRAIGHT	17.059	256°28'29.3"
END	106.383	610483.553	6093543.623	271.782			

HORIZONTAL ALIGNMENT REPORT - MR30

POINT	CHAINAGE	EASTING	NORTHING	ELEVATION	ELEMENT	LENGTH	BEARING
START	0.000	610479.401	6093560.447	271.431			
					STRAIGHT	14.855	76°06'02.2"
TC	14.855	610493.821	6093564.015	271.235			76°06'02.2"
CC		610497.424	6093549.454		R = +15.000	5.625	
CTC	20.480	610499.404	6093564.323	271.229			97°35'13.6"
CC		610501.385	6093579.192		R = -15.000	12.177	
CTC	32.657	610510.810	6093567.522	271.303			51°04'25.6"
CC		610497.615	6093583.859		R = -21.000	26.729	
CTC	59.386	610517.106	6093591.676	271.302			338°08'49.5"
CC		610461.417	6093569.342		R = -60.000	29.000	
CTC	88.386	610500.348	6093614.998	270.295			310°27'14.9"
CC		610361.172	6093451.779		R = -214.500	2.542	
END	90.928	610498.404	6093616.636	270.172			309°46'30.3"

HORIZONTAL ALIGNMENT REPORT - MTC1

POINT	CHAINAGE	EASTING	NORTHING	ELEVATION	ELEMENT	LENGTH	BEARING
START	0.000	610558.606	6093557.766	271.653			225°00'00.0"
CC		610547.292	6093569.079		R = +16.000	100.531	
END	150.796	610558.606	6093557.766	271.653			225°00'00.0"

NOT FOR CONSTRUCTION

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50mm ON A3 SIZE ORIGINAL

0 5 10 15 20 25 30 35 40 45

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-RD.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES

REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: NOT TO SCALE

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME PLOT BY

TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
DETAIL PLAN
DESIGN ALIGNMENT CONTROL SCHEDULE

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS: NOT FOR CONSTRUCTION | EDMS No.: SF2016/159601 | SHEET No.: RD-0107 | ISSUE: X

CONTROL NETWORK DETAILS

SURVEY INSTRUCTION NO.	:	2019/1007
PROJECT NAME	:	HW4 AND MR279 DETAIL SURVEY FOR GOCUP ROAD INTERSECTION UPGRADE
ROAD NO. & NAME	:	HW4 (SNOWY MOUNTAIN HIGHWAY) OR MR279 (GOCUP ROAD)
JOB LOCATION	:	TUMUT
	:	
HORIZONTAL DATUM & ZONE	:	MGA - ZONE 55
HORIZONTAL DATUM ORIGIN	:	SS75265 & TI01
H. CONTROL SURVEY METHC	:	TRAV
HORIZONTAL ADJUSTMENT B	:	COMPNET
COMPUTED BY	:	P. APLIN
	:	
HEIGHT DATUM	:	AHD
VERTICAL DATUM ORIGIN	:	PM39847
V. CONTROL SURVEY METHC	:	DIFF LEVELLING
VERTICAL ADJUSTMENT BY	:	COMPNET
COMPUTED BY	:	P. APLIN
	:	
SCIMS SEARCH NUMBER & D.	:	600881 & 21/2/2019
CONTROL SURVEY PLAN NO.	:	N/A
CONTROL SURVEY PLAN DAT	:	N/A
COMPUTED BY	:	N/A

RMS DISCLAIMER FOR DETAIL SURVEYS

THE SURVEY FROM WHICH THIS MODEL WAS CREATED WAS CARRIED OUT TO COMPLY WITH THE REQUIREMENTS OF THE CLIENT, AS DEFINED IN THE SURVEY INSTRUCTION. ANY PERSON OR ORGANISATION WHO RELIES ON THIS SURVEY FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT WAS CARRIED OUT, DOES SO AT THEIR OWN RISK.

SURVEY CONTROL INFORMATION IS REGARDED AS SUITABLE FOR THE SURVEY AND CORRECT AT THE TIME OF SURVEY, BUT SHOULD BE VERIFIED BEFORE BEING USED FOR ANY OTHER PURPOSE.

ANY PUBLIC UTILITIES AND SERVICES SHOWN IN THIS MODEL HAVE BEEN LOCATED BY USING VISIBLE SURFACE FEATURES ONLY AND COMPLY WITH THE REQUIREMENTS SPECIFIED BY THE CLIENT IN THE SCOPE OF WORKS. A FULL INVESTIGATION OF SUBSURFACE UTILITIES, INCLUDING A 'CLASS A' LOCATION SURVEY (REFER TO AUSTRALIAN STANDARD AS5488), MAY BE REQUIRED BEFORE CARRYING OUT ANY DESIGN OR CONSTRUCTION ACTIVITY IN OR NEAR THE SURVEYED AREA.

PROPERTY BOUNDARY OVERLAYS, WHERE SUPPLIED, VARY IN ACCURACY ACCORDING TO REQUIREMENTS SPECIFIED BY THE CLIENT IN THE SCOPE OF WORKS, AND THE UNDERLYING AGE AND ACCURACY OF THE CADASTRE. THEREFORE, A LAND SURVEY, AS DEFINED UNDER THE SURVEYING AND SPATIAL INFORMATION ACT (CURRENT VERSION), SHOULD BE UNDERTAKEN BEFORE ANY DESIGN OR CONSTRUCTION ACTIVITY IS CARRIED OUT ON OR NEAR THE LAND BOUNDARIES DEPICTED BY THIS MODEL.

PROPERTY AND STATE CONTROL SURVEY MARKS ARE PROTECTED UNDER SECTION 24 OF THE SURVEYING AND SPATIAL INFORMATION ACT. REFER TO SECTION 88 OF THE SURVEYING AND SPATIAL INFORMATION REGULATION FOR THE PROCESS TO REMOVE OR OBLITERATE MARKS.

PRIMARY SURVEY CONTROL MARK SCHEDULE

STATION	EASTING	NORTHING	H. CLASS	SOURCE	DATE	HEIGHT	V. CLASS	SOURCE	DATE	MARK DESCRIPTION
TU01	610392.467	6093688.709	C/3	RMS	16/11/2016	265.391	LD/L4	RMS	16/11/2016	1/2 S.PICKET [C]
SS75265	610584.332	6093475.024	B/2	SCIMS	21/02/2019	272.67	LD/L4	RMS	26/02/2019	BRASS PLAQUE [P]
PM39847	610299.308	6093518.066	B/2	SCIMS	21/02/2019	272.877	LB/L2	SCIMS	21/02/2019	PIN+BOX [P]
TI01	610525.509	6093543.191	C/3	RMS	27/02/2019	271.544	LD/L4	RMS	26/02/2019	NAIL IN CONC [C]
TI02	610555.29	6093581.94	C/3	RMS	27/02/2019	270.652	LD/L4	RMS	26/02/2019	1/2 S.PICKET [C]
TI03	610386.37	6093540.15	C/3	RMS	27/02/2019	272.663	LD/L4	RMS	26/02/2019	NAIL IN CONC DWAY [C]
TI04	610676.402	6093557.716	C/3	RMS	27/02/2019	267.315	C/3	RMS	7/03/2019	1/2 S.PICKET [C]
TI05	610763.118	6093502.92	C/3	RMS	Feb-19	264.011	C/3	RMS	7/03/2019	1/2 S.PICKET [C]
TI06	610679.816	6093591.558	D/4	RMS	7/03/2019	261.205	D/4	RMS	7/03/2019	GI NAIL [N]
TI07	610634.005	6093608.839	D/4	RMS	7/03/2019	261.352	D/4	RMS	7/03/2019	GI NAIL [N]
TI08	610584.14	6093609.598	D/4	RMS	7/03/2019	264.326	D/4	RMS	Mar-19	GI NAIL [N]

MEAN COMBINED SCALE FACTOR (CSF) = 0.999705

[P] = PERMANENT MARK MUST BE PROTECTED DURING CONSTRUCTION IN ACCORDANCE WITH SPECIFICATION G71
[C] = SUITABLE FOR CONSTRUCTION AND MUST NOT BE DISTURBED UNTIL ASSESSMENT BY SURVEYOR
[N] = NOT SUITABLE FOR CONSTRUCTION AS SURVEY MARK MAY BE UNSTABLE

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-RD.dgn
DESIGN LOT CODE: XXXXXXX
DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

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	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: NOT TO SCALE
CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY:
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY		
TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

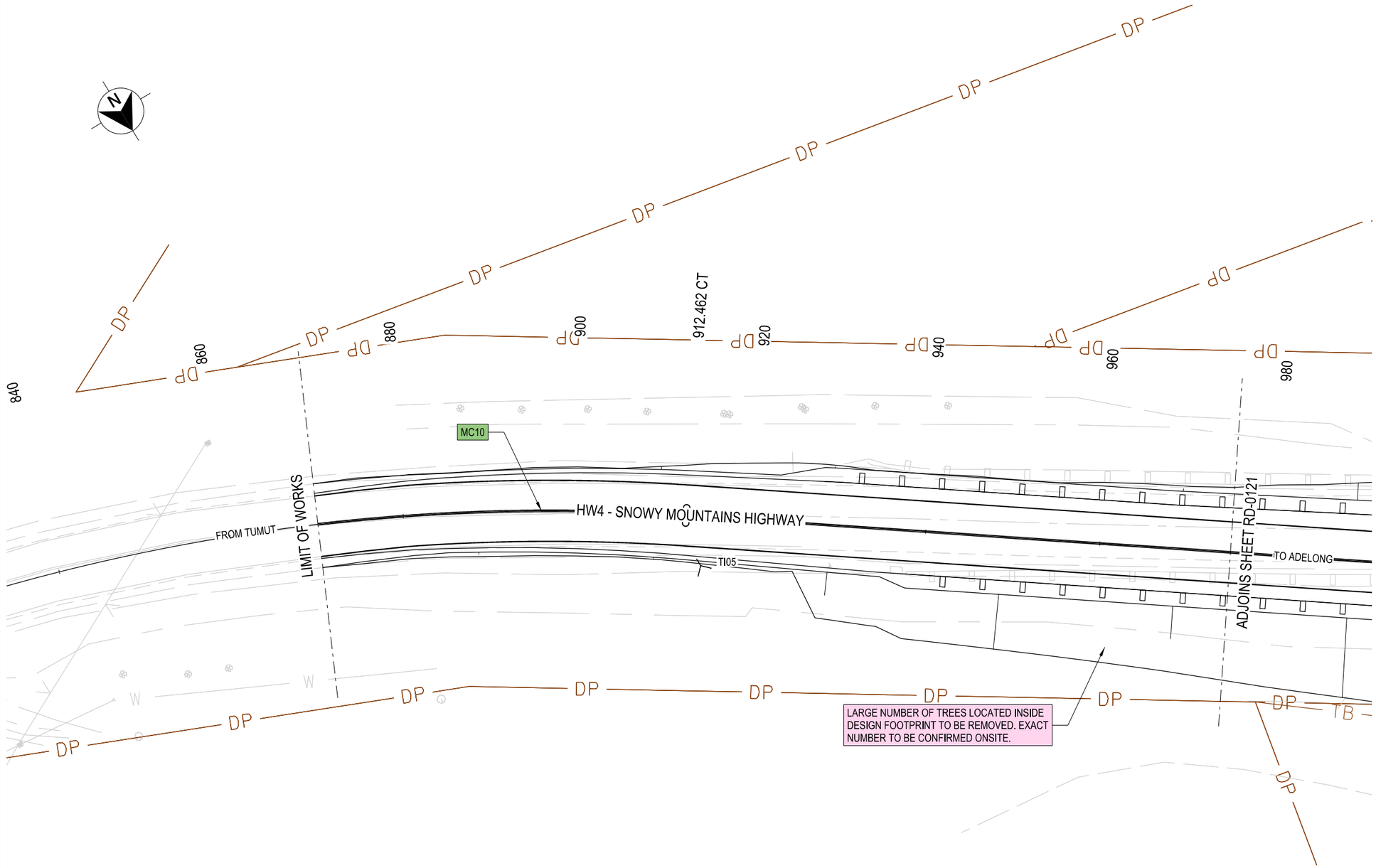
CLIENT: NSW GOVERNMENT Transport for NSW
PREPARED FOR: TRANSPORT FOR NSW REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
DETAIL PLAN
SURVEY CONTROL SCHEDULE

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RD-0108	X



LEGEND

- MCXX — DESIGN CONTROL CALLOUT
- XXXX — CONSTRUCTION CALLOUT
- DP — CADASTRAL BOUNDARY OVERLAY
- TB — APPROVED BOUNDARY
- PM — PERMANENT SURVEY MARK - DO NOT DISTURB
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- NB — SURVEY STAR PICKET MARK
- EXISTING PROPERTY GATE
- EXISTING PROPERTY FENCE
- TREES TO BE REMOVED
- TREES TO BE RETAINED
- HAZARD FREE ZONE

NOTES

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2. CONTRACTOR TO CONFIRM LOCATION OF ALL SERVICES, DRAINAGE WORKS AND UNDERGROUND INFRASTRUCTURE PRIOR TO COMMENCING WORK. CONTRACTOR TO ENSURE ADOPTED METHOD OF CONSTRUCTION AND PROPOSED WORKS WILL AVOID DAMAGE TO ALL SERVICES AND DRAINAGE WORKS, INCLUDING CLEARANCES TO OVERHEAD POWER LINES.
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5. PAVEMENT AREAS EXCLUDE PAVEMENT UNDER KERBS AND VERGES. REFER TO SHEET (PAVEMENT TYPICAL DETAILS SHEET) FOR DETAILS.
6. REFER TO SHEET PV-0507 FOR PAVEMENT PROFILES.
7. REFER TO MODEL DRAWING R0300-01 FOR KERB PROFILES.

NOT FOR CONSTRUCTION

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0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

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DESIGN LOT CODE: XXXXXXX

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	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY		
TITLE	NAME	DATE
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DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

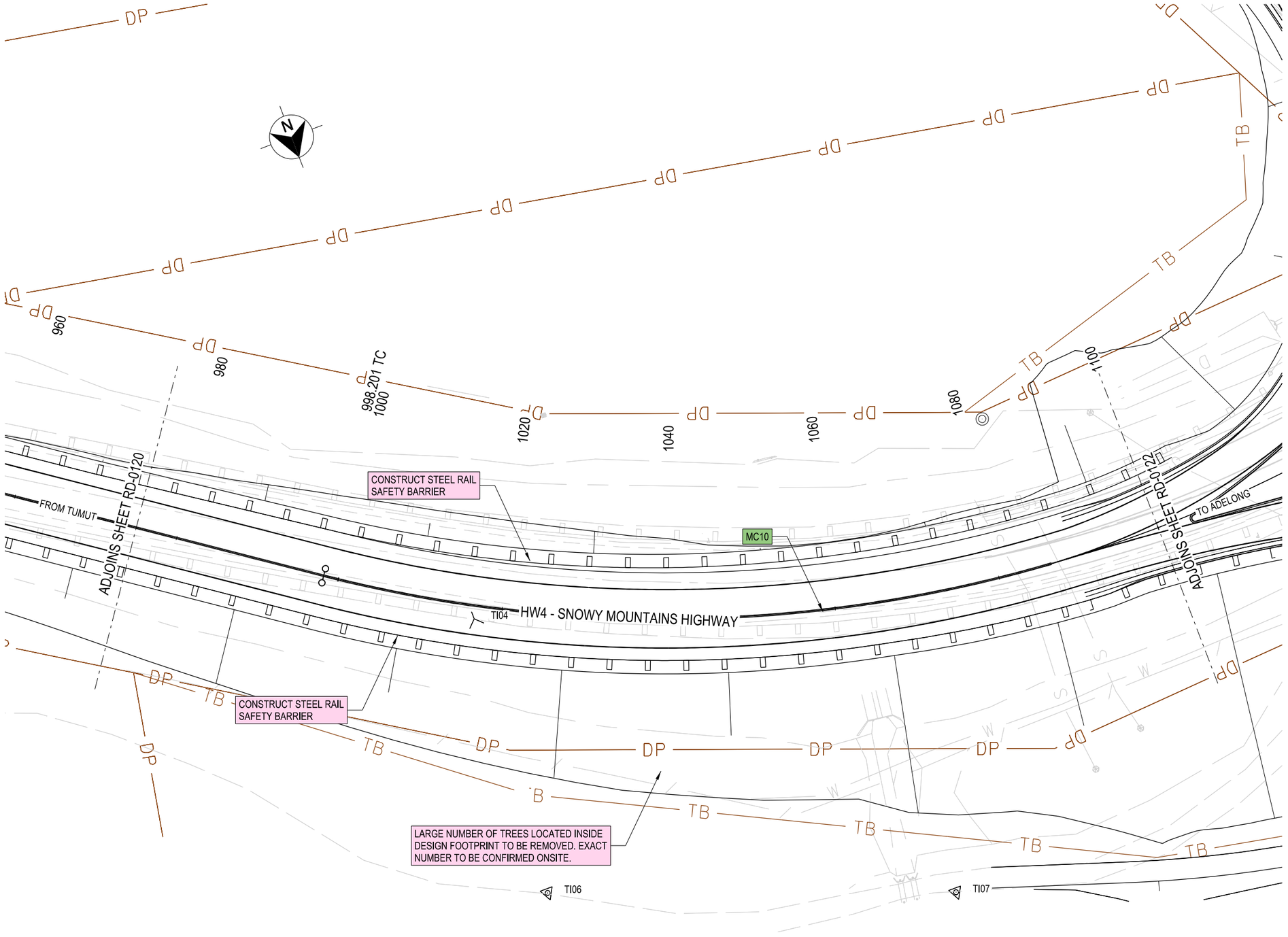
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
DETAIL PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH. 870.000 TO CH. 975.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RD-0120	X



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NOT FOR CONSTRUCTION

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DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

PLOT DATE / TIME / PLOT BY

TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
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DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

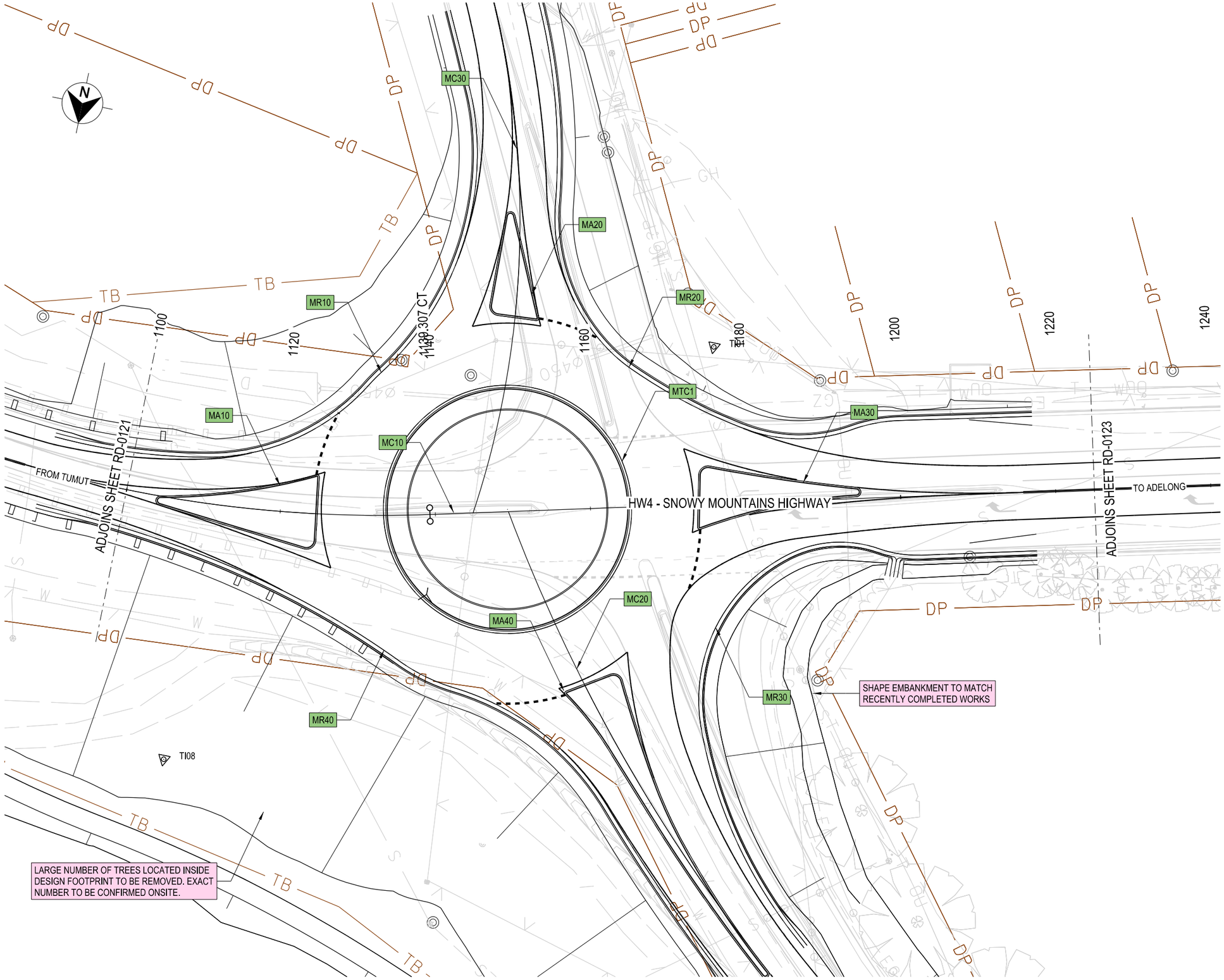
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
DETAIL PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH. 975.000 TO CH. 1100.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RD-0121	X



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NOT FOR CONSTRUCTION

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50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-RD.dgn				DESIGN LOT CODE: XXXXXXX	
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) | HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY	TITLE	NAME	DATE
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CLIENT: NSW GOVERNMENT Transport for NSW

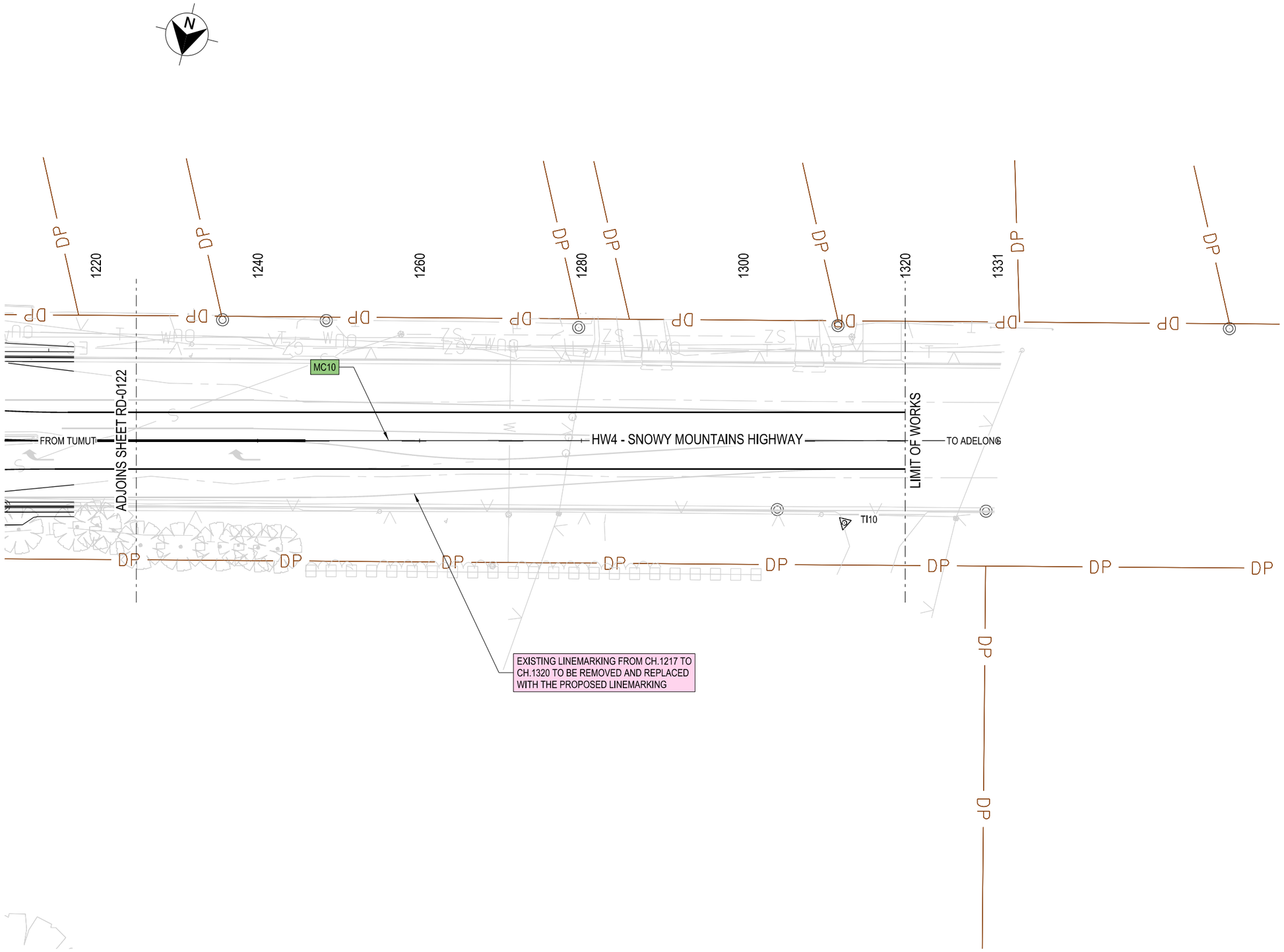
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN, ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
DETAIL PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH. 1100.000 TO CH. 1225.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RD-0122	X



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	DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
	PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

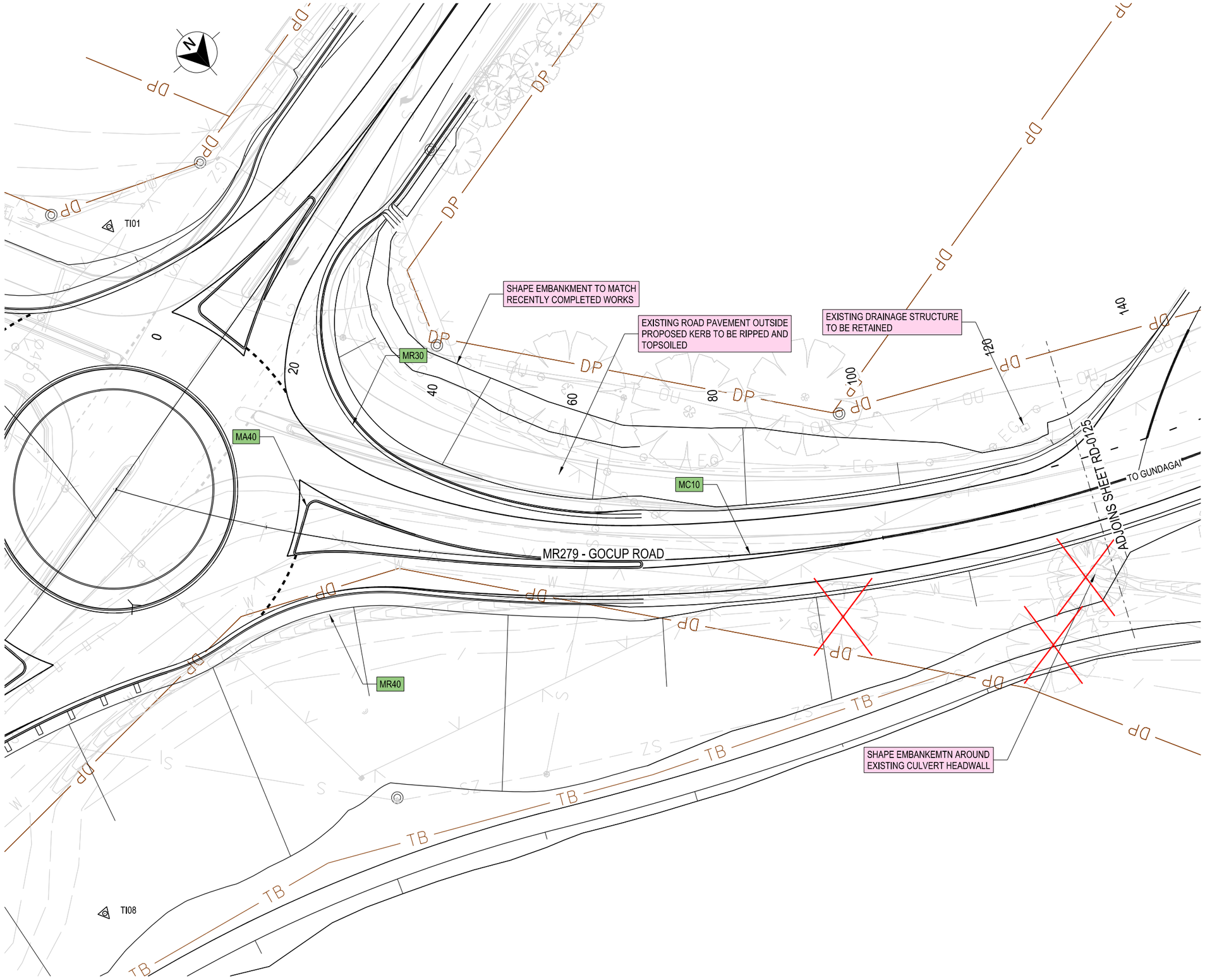
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
DETAIL PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH. 1225.000 TO CH. 1320.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RD-0123	X



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DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME		PLOT BY
TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

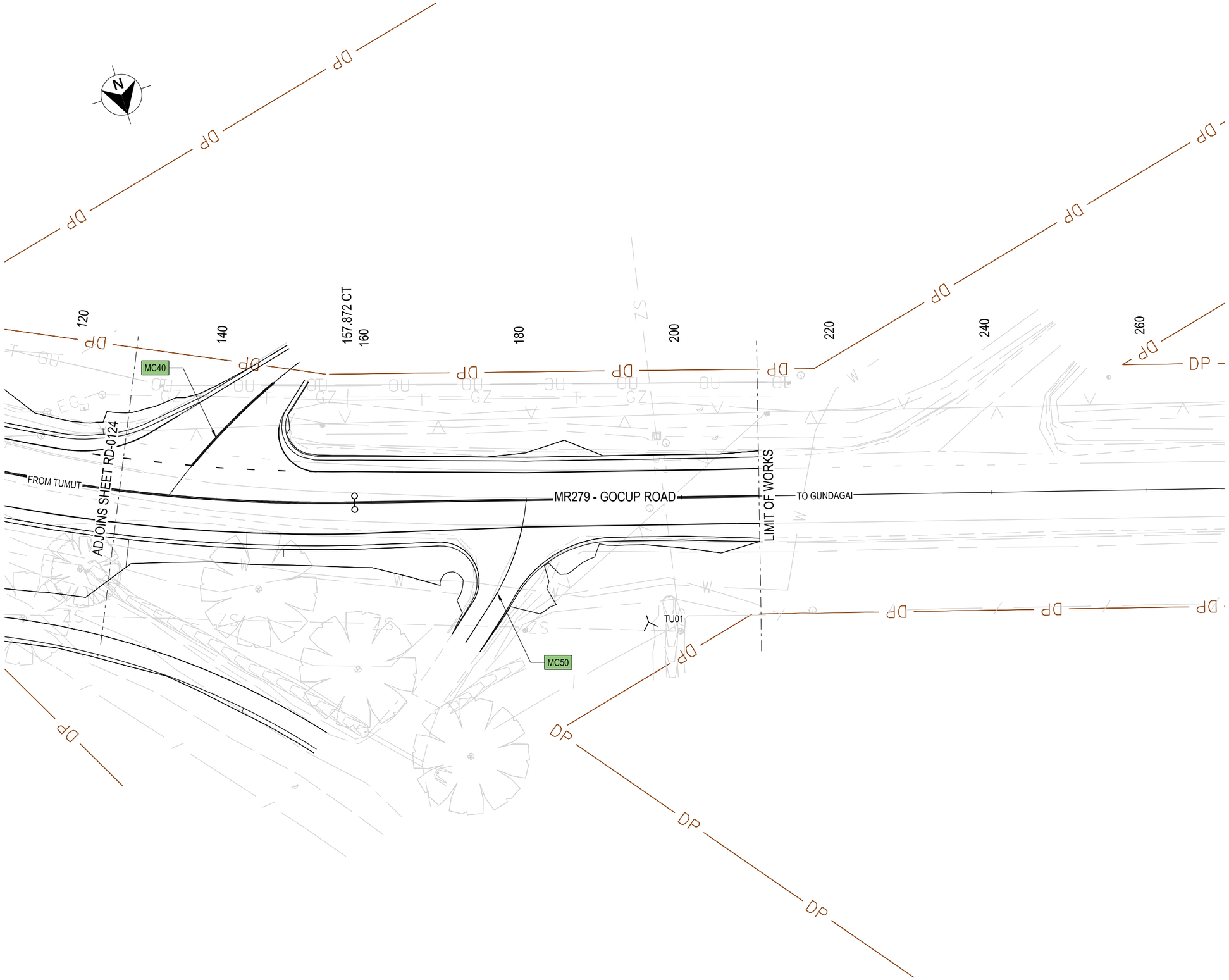
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
DETAIL PLAN
MR279 - GOCUP ROAD - MC20 - CH. 0.000 TO CH. 125.000

A3

RMS REGISTRATION No.: DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RD-0124	X



LEGEND

- MCXX — DESIGN CONTROL CALLOUT
- XXXX — CONSTRUCTION CALLOUT
- DP — CADASTRAL BOUNDARY OVERLAY
- TB — APPROVED BOUNDARY
- PM — PERMANENT SURVEY MARK - DO NOT DISTURB
- SS — STATE SURVEY MARK - DO NOT DISTURB
- NB — SURVEY STAR PICKET MARK
- EXISTING PROPERTY GATE
- EXISTING PROPERTY FENCE
- TREES TO BE REMOVED
- TREES TO BE RETAINED
- HAZARD FREE ZONE

NOTES

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT TRANSPORT FOR NSW QA SPECIFICIATIONS AND AUSTRALIAN STANDARDS UNLESS OTHERWISE STATED.
2. CONTRACTOR TO CONFIRM LOCATION OF ALL SERVICES, DRAINAGE WORKS AND UNDERGROUND INFRASTRUCTURE PRIOR TO COMMENCING WORK. CONTRACTOR TO ENSURE ADOPTED METHOD OF CONSTRUCTION AND PROPOSED WORKS WILL AVOID DAMAGE TO ALL SERVICES AND DRAINAGE WORKS, INCLUDING CLEARANCES TO OVERHEAD POWER LINES.
3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE. ALL LEVELS, METERAGES, CHAINAGES AND CO-ORDINATES ARE EXPRESSED IN METRES
4. ACCESS TO PROPERTIES TO BE MADE AVAILABLE BY THE CONTRACTOR AT ALL TIMES DURING CONSTRUCTION.
5. PAVEMENT AREAS EXCLUDE PAVEMENT UNDER KERBS AND VERGES. REFER TO SHEET (PAVEMENT TYPICAL DETAILS SHEET) FOR DETAILS.
6. REFER TO SHEET PV-0507 FOR PAVEMENT PROFILES.
7. REFER TO MODEL DRAWING R0300-01 FOR KERB PROFILES.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-RD.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY	TITLE	NAME	DATE
	DRAWN	X. X. XXXXXXXX	XX.XX.XX
	DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
	DESIGN	X. X. XXXXXXXX	XX.XX.XX
	DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
	DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
	PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD

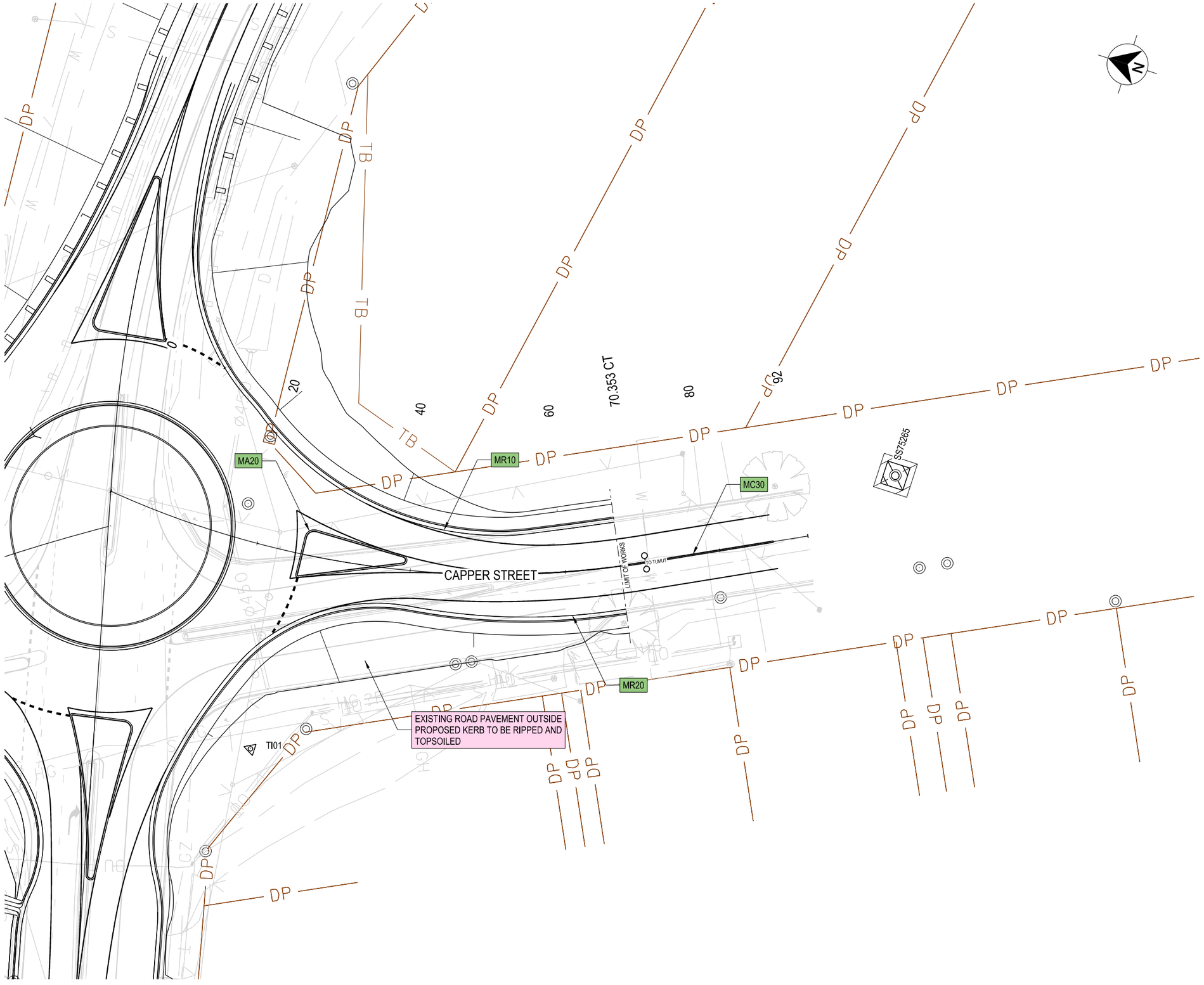
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
DETAIL PLAN

MR279 - GOCUP ROAD - MC20 - CH. 125.000 TO CH. 210.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RD-0125	X



LEGEND

- MCXX — DESIGN CONTROL CALLOUT
- XXXX — CONSTRUCTION CALLOUT
- DP — CADASTRAL BOUNDARY OVERLAY
- TB — APPROVED BOUNDARY
- PM — PERMANENT SURVEY MARK - DO NOT DISTURB
- SS — STATE SURVEY MARK - DO NOT DISTURB
- NB — SURVEY STAR PICKET MARK
- EXISTING PROPERTY GATE
- EXISTING PROPERTY FENCE
- TREES TO BE REMOVED
- TREES TO BE RETAINED
- HAZARD FREE ZONE

NOTES

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT TRANSPORT FOR NSW QA SPECIFICIATIONS AND AUSTRALIAN STANDARDS UNLESS OTHERWISE STATED.
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3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE. ALL LEVELS, METERAGES, CHAINAGES AND CO-ORDINATES ARE EXPRESSED IN METRES
4. ACCESS TO PROPERTIES TO BE MADE AVAILABLE BY THE CONTRACTOR AT ALL TIMES DURING CONSTRUCTION.
5. PAVEMENT AREAS EXCLUDE PAVEMENT UNDER KERBS AND VERGES. REFER TO SHEET (PAVEMENT TYPICAL DETAILS SHEET) FOR DETAILS.
6. REFER TO SHEET PV-0507 FOR PAVEMENT PROFILES.
7. REFER TO MODEL DRAWING R0300-01 FOR KERB PROFILES.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-RD.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY		
TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

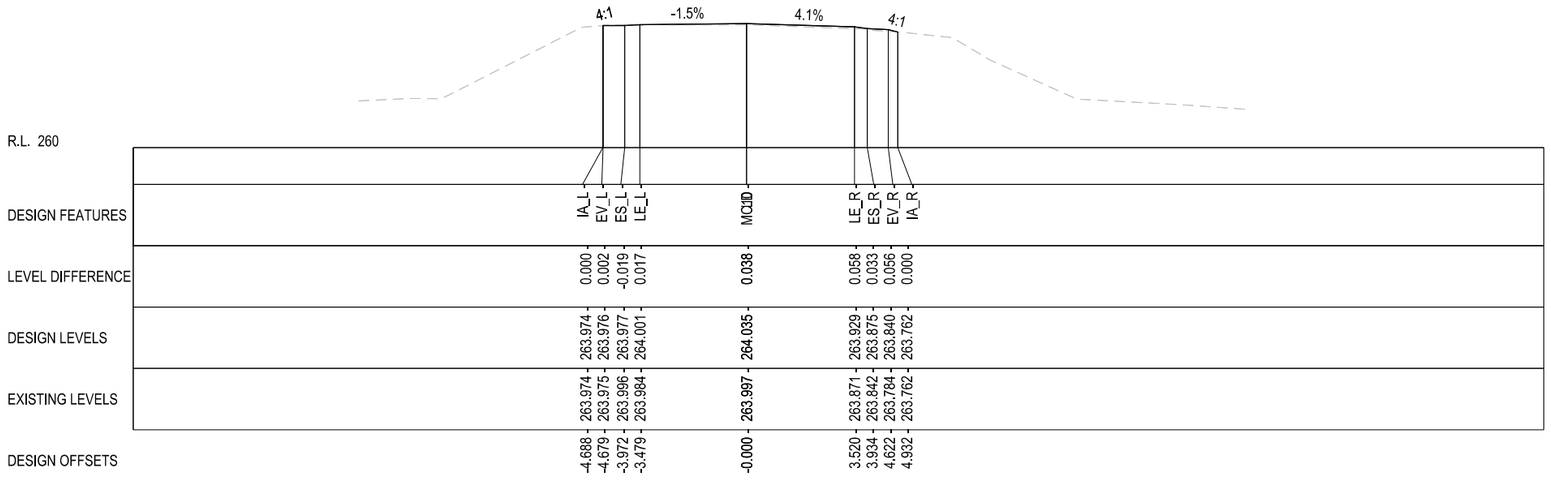
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
DETAIL PLAN
CAPPER STREET - MC30 - CH. 0.000 TO CH. 67.303

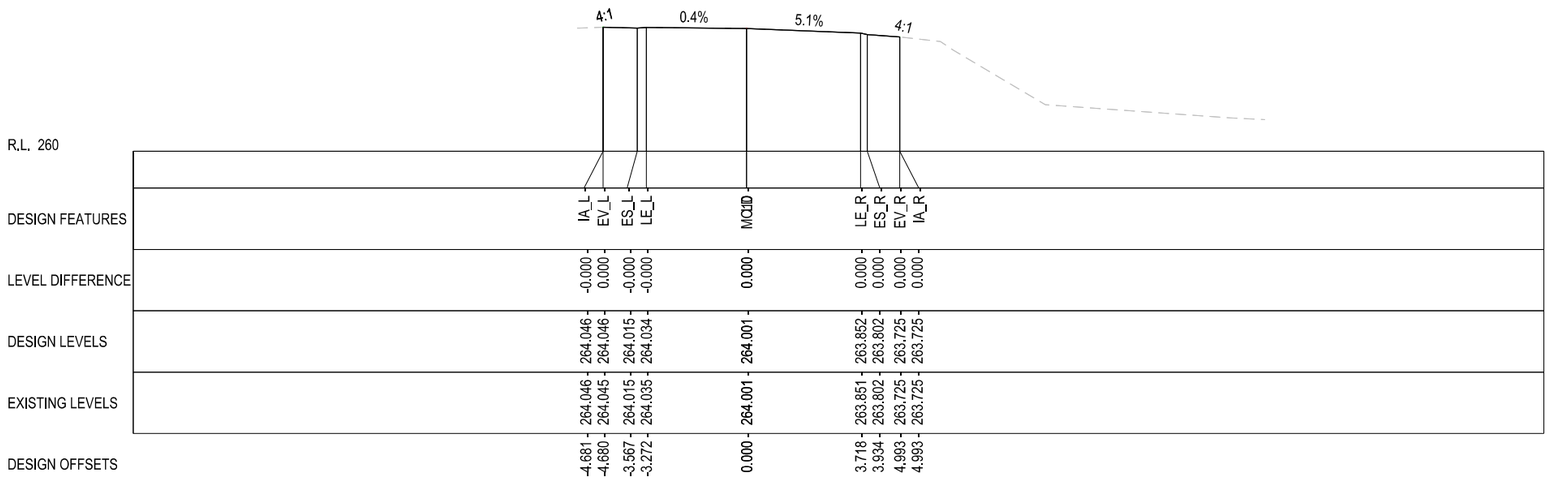
A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RD-0126	X



880.000



870.174

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Cross Sections\P-XSEC-MC10.dgn				DESIGN LOT CODE XXXXXXX		DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING		PLOT DATE / TIME 13/05/2021 1:48 PM		PLOT BY newmanmd		CLIENT NSW GOVERNMENT Transport for NSW	SNOWY VALLEYS HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD ROUNDABOUT UPGRADE 0.870km TO 1.320km FROM TUMUT CROSS SECTION HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.870.174 TO CH.880.000
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE	NAME	DATE			
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX	0 2 4 6 8 SCALE 1:200m	TRANSPORT FOR NSW INFRASTRUCTURE & PLACE TECHNICAL SERVICES ROAD DESIGN SOUTH	DRAWN	X. X. XXXXXXXX	XX.XX.XX			
								DRG CHECK	X. X. XXXXXXXX	XX.XX.XX			
								DESIGN	X. X. XXXXXXXX	XX.XX.XX			
								DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX			
								DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX			
								PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX			
						CO-ORDINATE SYSTEM MGA ZONE 55 (GDA94)	HEIGHT DATUM AHD				PREPARED FOR TRANSPORT FOR NSW REGIONAL & OUTER METROPOLITAN ASSETS SOUTH	RMS REGISTRATION No. DS2020/000808	A3
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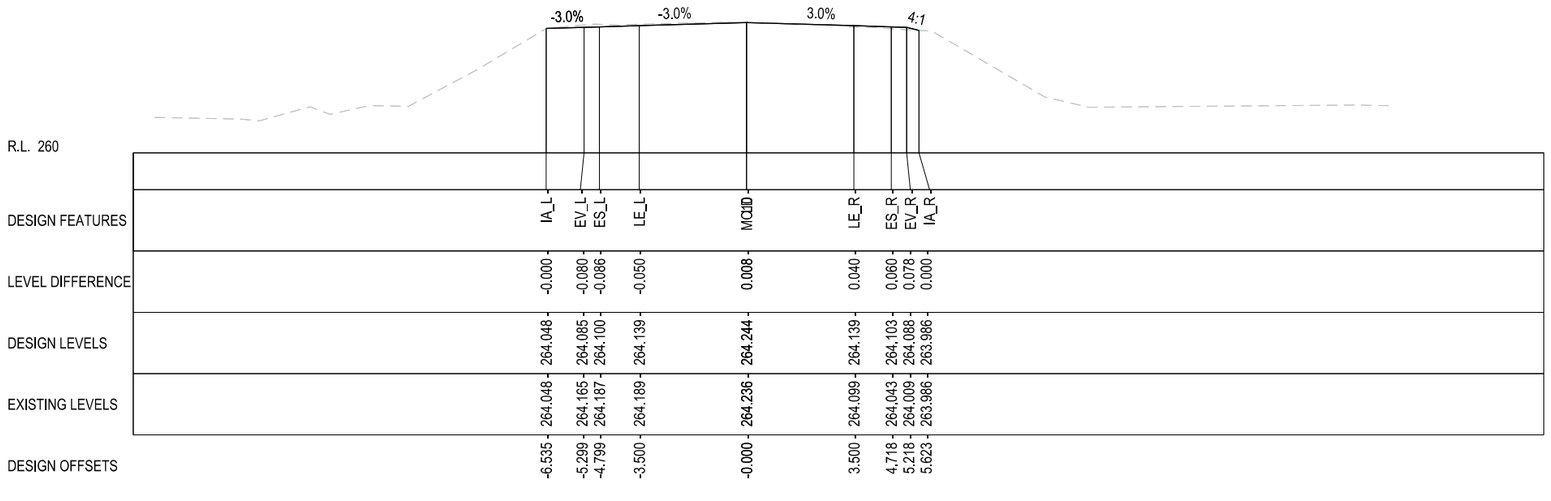

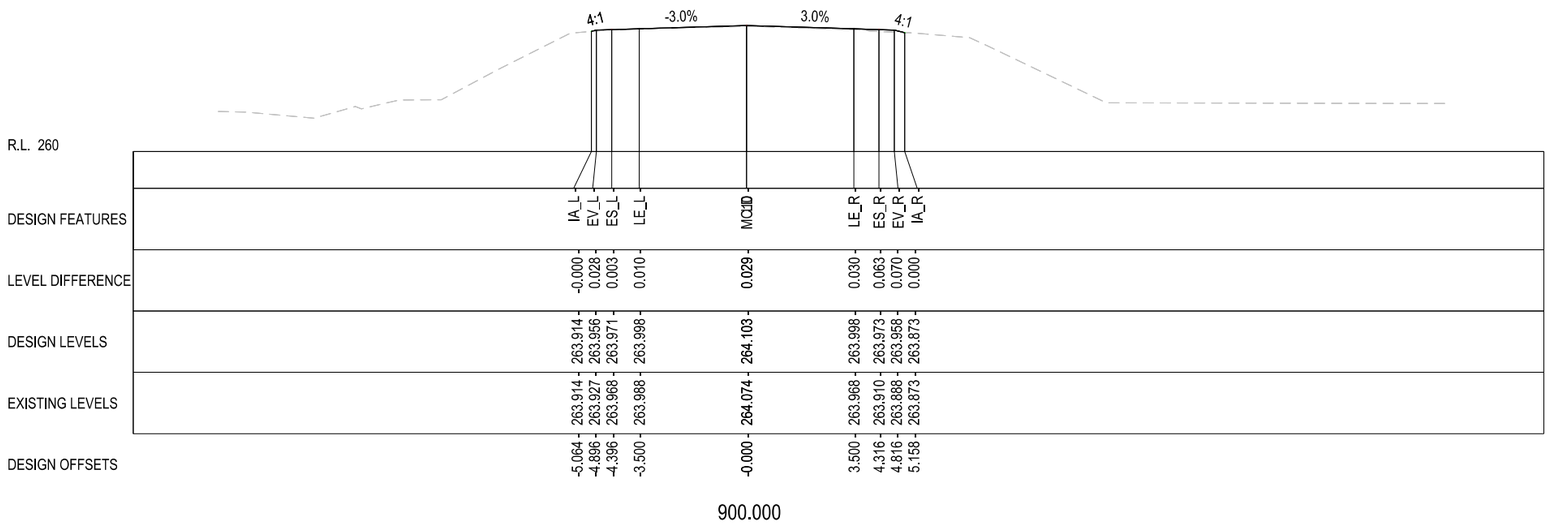

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Cross Sections\P-XSEC-MC10.dgn				DESIGN LOT CODE XXXXXXX	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING		PLOT DATE / TIME	PLOT BY		CLIENT NSW GOVERNMENT Transport for NSW	SNOWY VALLEYS HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD ROUNDABOUT UPGRADE 0.870km TO 1.320km FROM TUMUT CROSS SECTION HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.900.000 TO CH.920.000	A3
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE	NAME	DATE			
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX	0 2 4 6 8 SCALE 1:200m	TRANSPORT FOR NSW INFRASTRUCTURE & PLACE TECHNICAL SERVICES ROAD DESIGN SOUTH	DRAWN	X. X. XXXXXXXX	XX.XX.XX			
								DRG CHECK	X. X. XXXXXXXX	XX.XX.XX			
								DESIGN	X. X. XXXXXXXX	XX.XX.XX			
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								DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX			
								PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX			
						CO-ORDINATE SYSTEM MGA ZONE 55 (GDA94)	HEIGHT DATUM AHD				PREPARED FOR TRANSPORT FOR NSW REGIONAL & OUTER METROPOLITAN ASSETS SOUTH	RMS REGISTRATION No. DS2020/000808	
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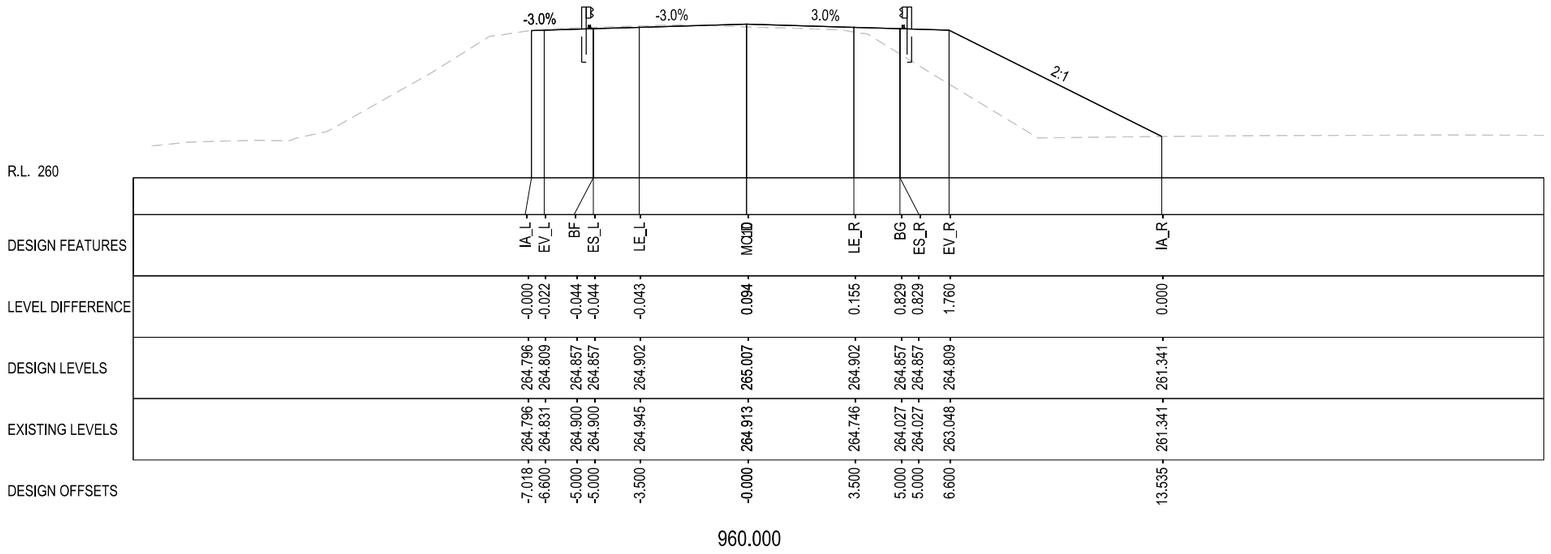
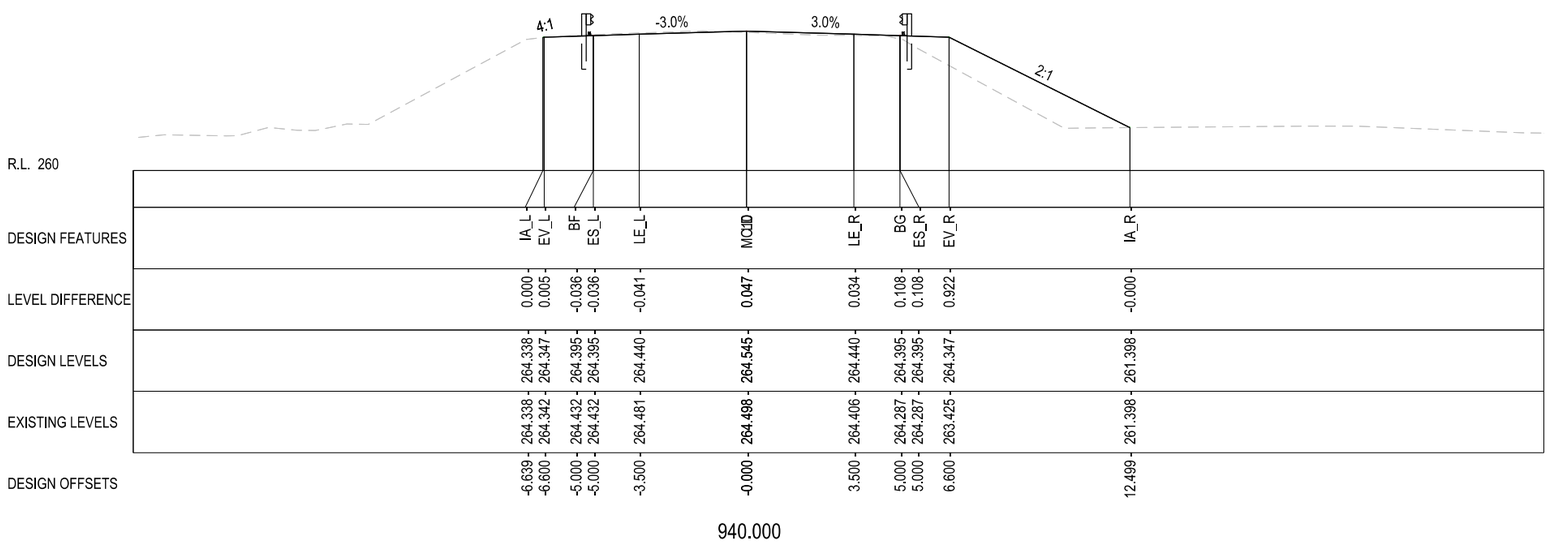




NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Cross Sections\P-XSEC-MC10.dgn				DESIGN LOT CODE: XXXXXXX	
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

SCALES ON A3 SIZE DRAWING: 0 2 4 6 8 — SCALE 1:200m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

PLOT BY

CLIENT: NSW GOVERNMENT Transport for NSW

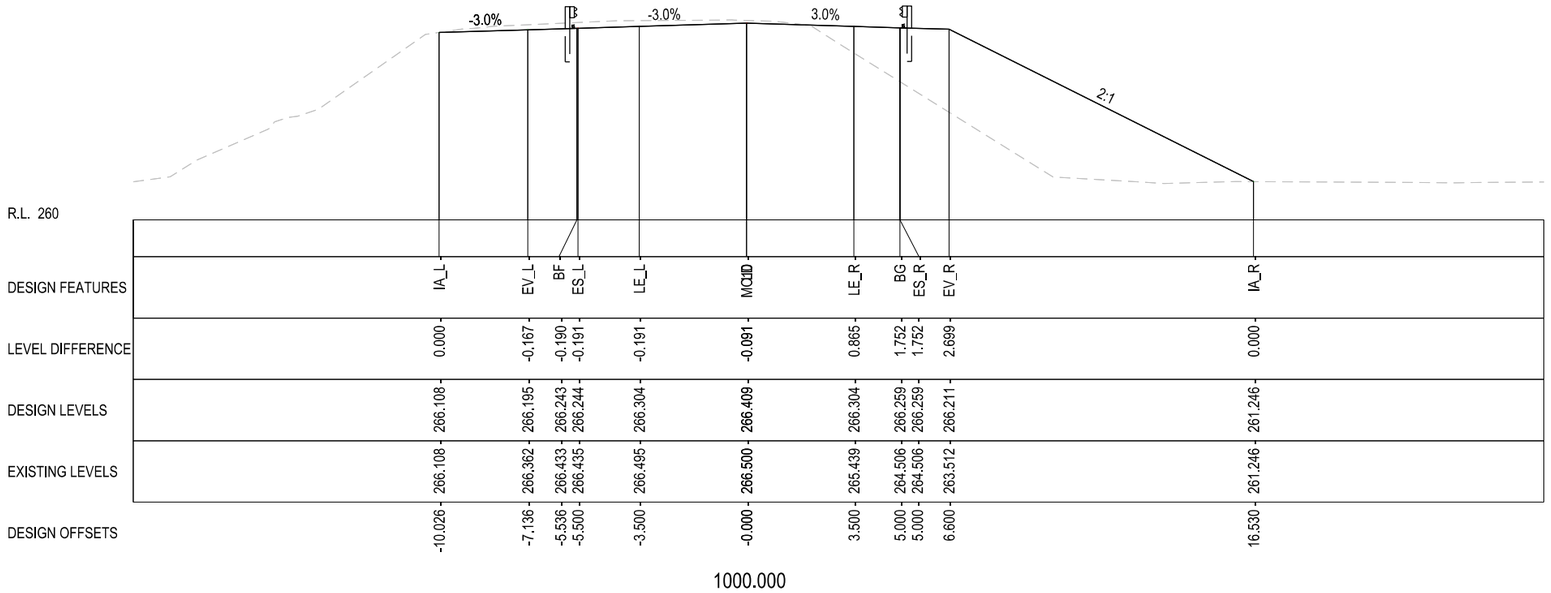
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

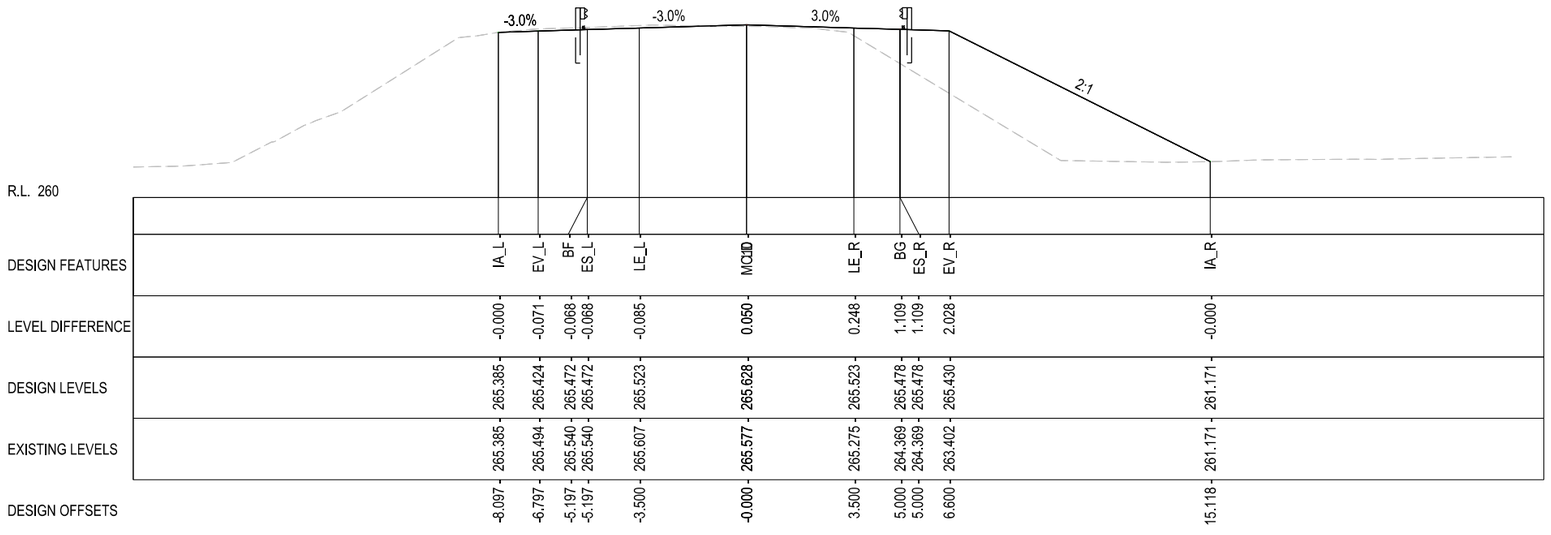
SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
CROSS SECTION
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.940.000 TO CH.960.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RC-0202	X





THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

NOT FOR CONSTRUCTION

DRAWING FILE LOCATION / NAME C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Cross Sections\P-XSEC-MC10.dgn				DESIGN LOT CODE XXXXXXX	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING		PLOT DATE / TIME	PLOT BY		CLIENT	SNOWY VALLEYS HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD ROUNDABOUT UPGRADE 0.870km TO 1.320km FROM TUMUT CROSS SECTION HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.980.000 TO CH.1000.000	A3
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE	NAME	DATE	NSW GOVERNMENT Transport for NSW		
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX	0 2 4 6 8 SCALE 1:200m	TRANSPORT FOR NSW INFRASTRUCTURE & PLACE TECHNICAL SERVICES ROAD DESIGN SOUTH	DRAWN	X. X. XXXXXXXX	XX.XX.XX			
								DRG CHECK	X. X. XXXXXXXX	XX.XX.XX			
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								DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX			
								PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX			
						CO-ORDINATE SYSTEM MGA ZONE 55 (GDA94)	HEIGHT DATUM AHD				PREPARED FOR TRANSPORT FOR NSW REGIONAL & OUTER METROPOLITAN ASSETS SOUTH	RMS REGISTRATION No. DS2020/000808	
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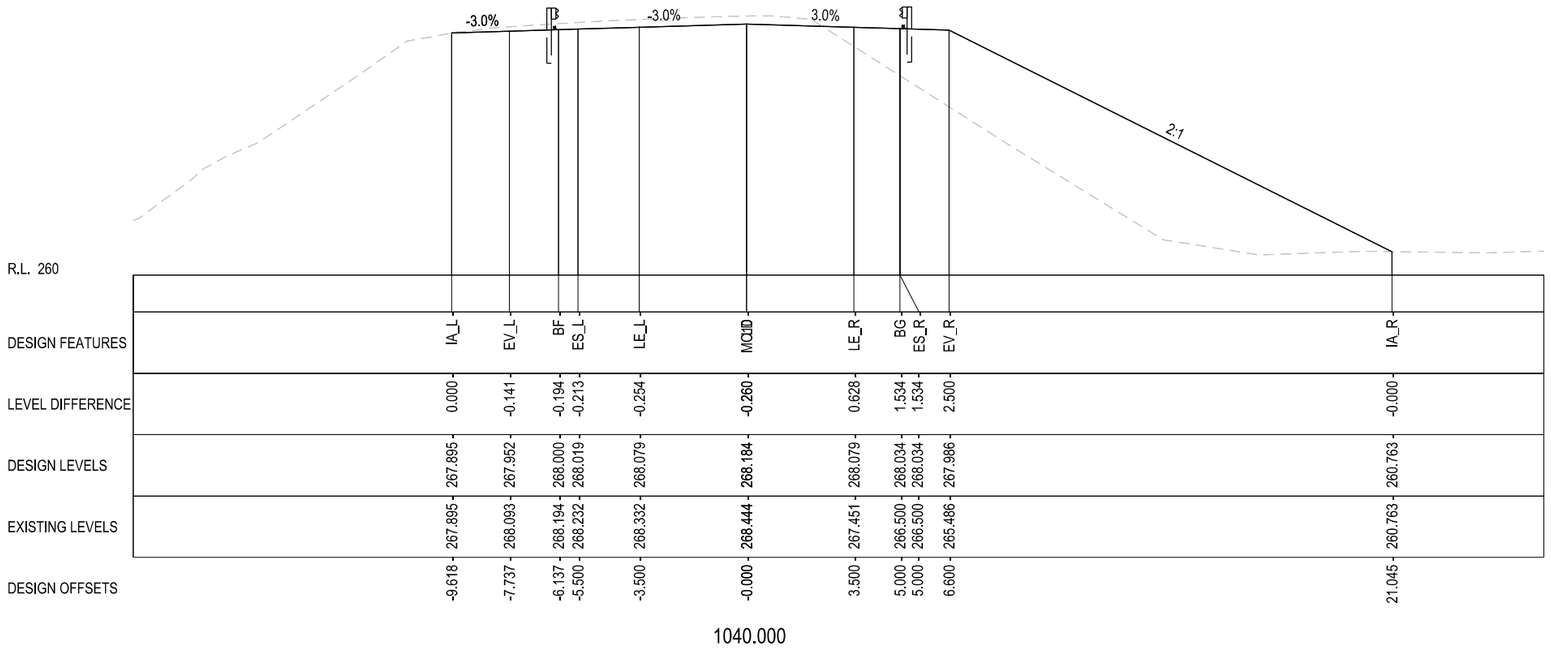

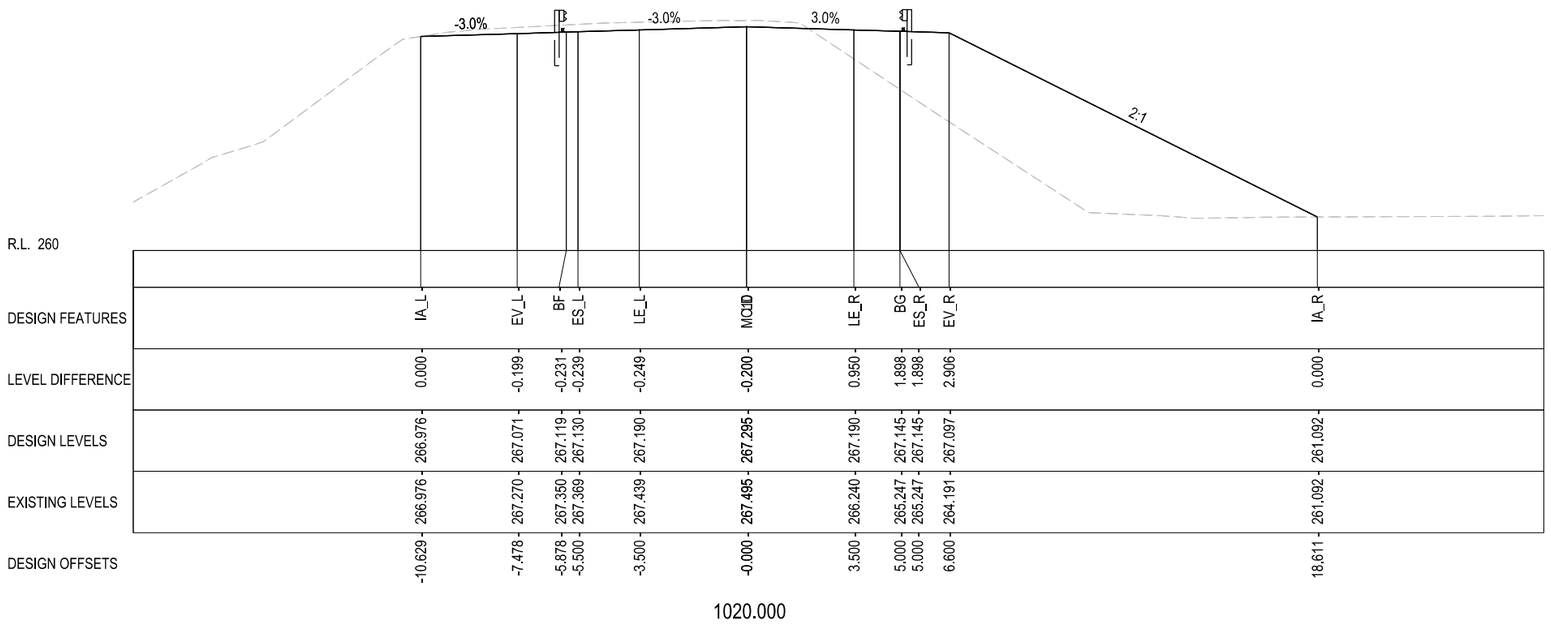

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Cross Sections\P-XSEC-MC10.dgn				DESIGN LOT CODE XXXXXXX		DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING		PLOT DATE / TIME		PLOT BY	CLIENT NSW GOVERNMENT Transport for NSW	SNOWY VALLEYS HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD ROUNDABOUT UPGRADE 0.870km TO 1.320km FROM TUMUT CROSS SECTION HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.1020.000 TO CH.1040.000	A3
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE	NAME	DATE			
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX	0 2 4 6 8 SCALE 1:200m	TRANSPORT FOR NSW INFRASTRUCTURE & PLACE TECHNICAL SERVICES ROAD DESIGN SOUTH	DRAWN	X. X. XXXXXXXX	XX.XX.XX			
								DRG CHECK	X. X. XXXXXXXX	XX.XX.XX			
								DESIGN	X. X. XXXXXXXX	XX.XX.XX			
								DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX			
								DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX			
								PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX			
						CO-ORDINATE SYSTEM MGA ZONE 55 (GDA94)	HEIGHT DATUM AHD				PREPARED FOR TRANSPORT FOR NSW REGIONAL & OUTER METROPOLITAN ASSETS SOUTH	RMS REGISTRATION No. DS2020/000808	
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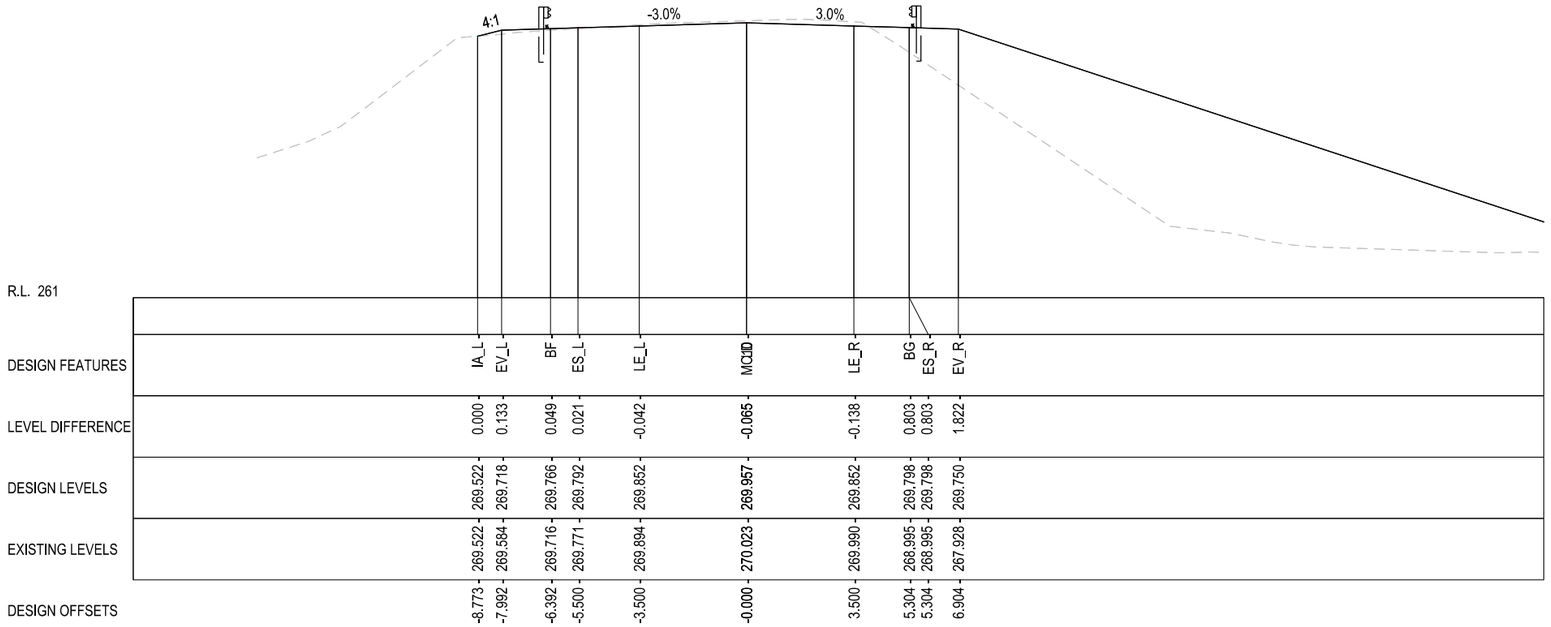

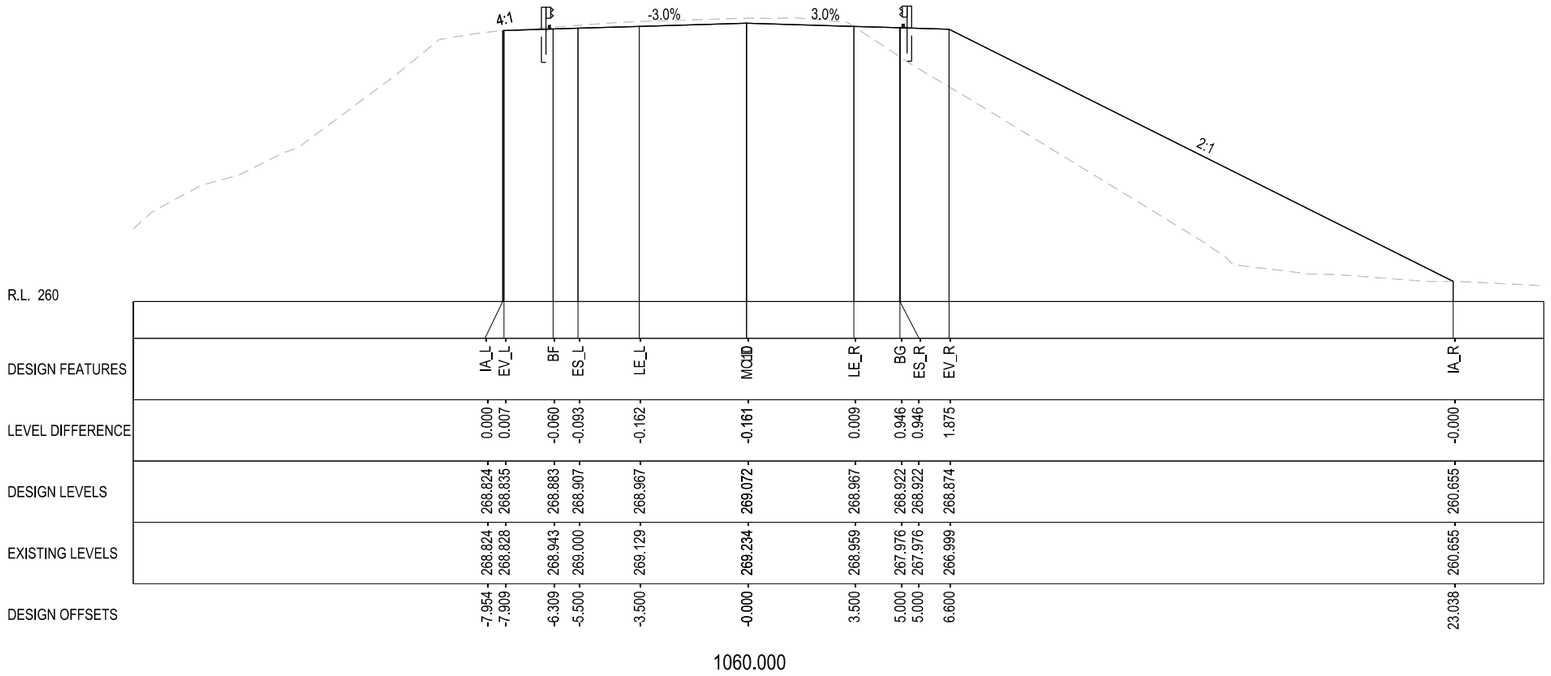

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Cross Sections\P-XSEC-MC10.dgn				DESIGN LOT CODE XXXXXXX		DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING		PLOT DATE / TIME		PLOT BY	CLIENT NSW GOVERNMENT Transport for NSW
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE	NAME	DATE	
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX	0 2 4 6 8 SCALE 1:200m	TRANSPORT FOR NSW INFRASTRUCTURE & PLACE TECHNICAL SERVICES ROAD DESIGN SOUTH	DRAWN	X. X. XXXXXXXX	XX.XX.XX	
								DRG CHECK	X. X. XXXXXXXX	XX.XX.XX	
								DESIGN	X. X. XXXXXXXX	XX.XX.XX	
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								DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX	
						CO-ORDINATE SYSTEM MGA ZONE 55 (GDA94)	HEIGHT DATUM AHD	PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX	

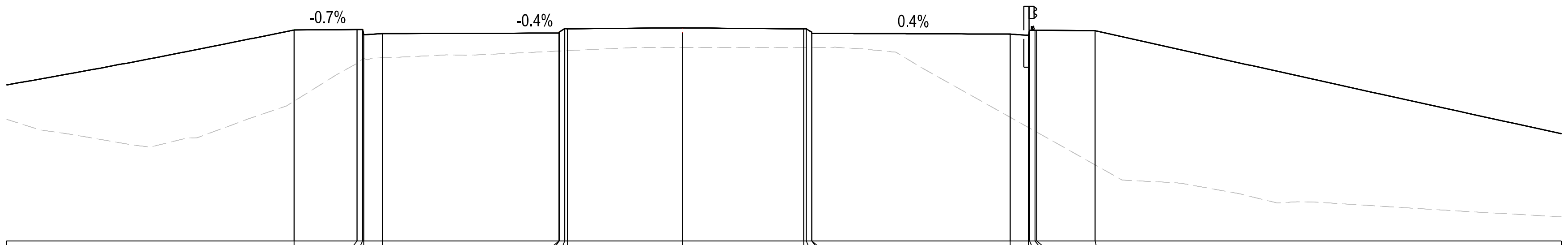
PREPARED FOR
TRANSPORT FOR NSW
REGIONAL & OUTER METROPOLITAN
ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
CROSS SECTION
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.1060.000 TO CH.1080.000

A3

RMS REGISTRATION No. DS2020/000808

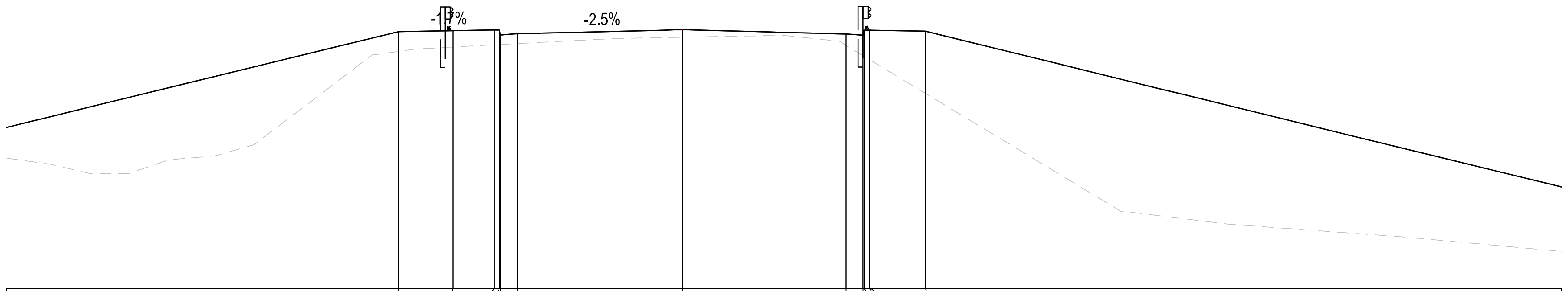
ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RC-0205	X



R.L. 265

DESIGN FEATURES	EV	CB	CT	CF	CE	C0	C3	CT	CB	MC10	CB	CT	C3	C0	CE	CF	CT	CB	BF	EV
LEVEL DIFFERENCE	2.106	0.996	0.872	0.705	0.719	0.533	0.563	0.654	0.650	0.443	0.553	0.553	0.452	0.422	2.457	2.722	2.890	2.982	3.011	3.959
DESIGN LEVELS	271.228	271.240	271.239	271.088	271.122	271.136	271.166	271.265	271.264	271.155	271.260	271.260	271.161	271.131	271.105	271.069	271.219	271.221	271.220	271.202
EXISTING LEVELS	269.122	270.245	270.367	270.383	270.403	270.603	270.603	270.611	270.614	270.711	270.707	270.707	270.709	270.709	268.648	268.347	268.329	268.239	268.209	267.243
DESIGN OFFSETS	-11.493	-9.636	-9.468	-9.435	-8.880	-3.657	-3.653	-3.486	-3.413	-0.000	3.585	3.657	3.821	3.824	9.693	10.231	10.263	10.424	10.478	12.201

1120.000



R.L. 263

DESIGN FEATURES	EV	BF	CB	CT	CF	CE	MC10	CE	CF	CT	CB	BF	EV
LEVEL DIFFERENCE	0.587	0.484	0.441	0.433	0.281	0.294	0.225	0.344	0.609	0.777	0.869	0.899	1.844
DESIGN LEVELS	270.620	270.647	270.669	270.668	270.518	270.557	270.678	270.548	270.509	270.659	270.660	270.659	270.632
EXISTING LEVELS	270.032	270.163	270.228	270.236	270.237	270.264	270.452	270.204	269.900	269.882	269.791	269.760	268.787
DESIGN OFFSETS	-8.397	-6.793	-5.569	-5.418	-5.388	-4.887	-0.000	4.839	5.341	5.371	5.521	5.572	7.179

1100.000

NOT FOR CONSTRUCTION

DRAWING FILE LOCATION / NAME
C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Cross Sections\P-XSEC-MC10.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING
0 2 4 6 8
SCALE 1:200m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94)
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ROAD DESIGN SOUTH

PLOT DATE / TIME
PLOT BY

TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT
NSW GOVERNMENT Transport for NSW

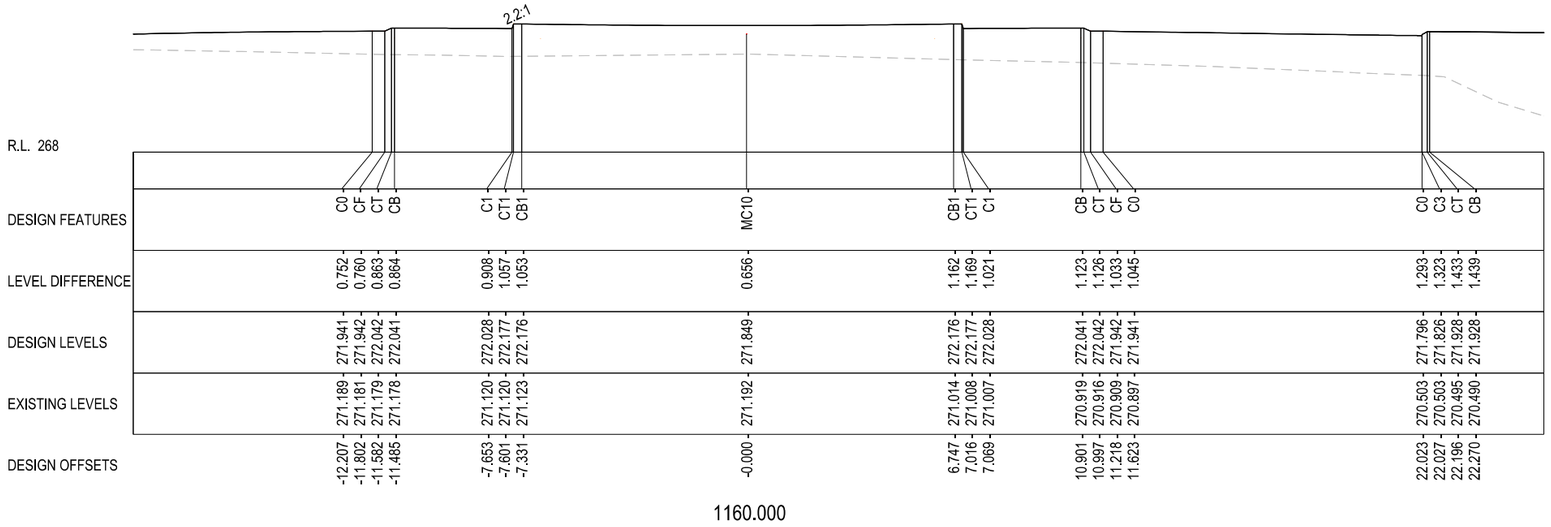
PREPARED FOR
TRANSPORT FOR NSW
REGIONAL & OUTER METROPOLITAN
ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
CROSS SECTION
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.1100.000 TO CH.1120.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS: NOT FOR CONSTRUCTION
EDMS No.: SF2016/159601
SHEET No.: RC-0206
ISSUE: X



NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Cross Sections\P-XSEC-MC10.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES

REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 2 4 6 8 SCALE 1:200m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME PLOT BY	NAME	DATE
TITLE		
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

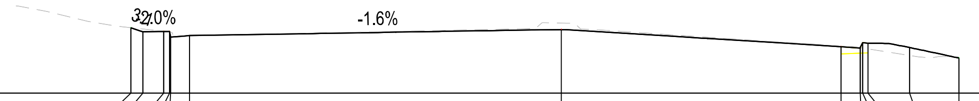
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
CROSS SECTION
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.1140.000 TO CH.1160.000

A3

RMS REGISTRATION No. DS2020/000808

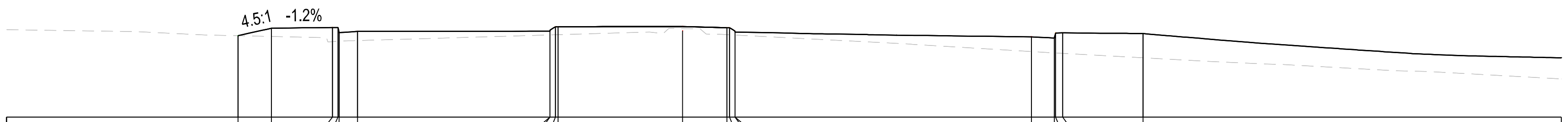
ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RC-0207	X



R.L. 270

DESIGN FEATURES	LEVEL DIFFERENCE	DESIGN LEVELS	EXISTING LEVELS	DESIGN OFFSETS
IA	0.000	271.727	271.727	-11.388
EV	-0.073	271.621	271.694	-11.070
CB	0.005	271.632	271.627	-10.520
CT	0.018	271.632	271.613	-10.370
CF	-0.130	271.482	271.612	-10.340
CE	0.010	271.522	271.512	-9.840
MC10	-0.170	271.684	271.854	0.000
CE	0.016	271.228	271.212	7.396
CF	-0.011	271.189	271.199	7.904
CT-L	0.142	271.330	271.189	7.972
CB-L	0.150	271.317	271.166	8.114
EH-L	0.211	271.205	270.994	9.214
IA4	270.927	270.927	0.000	10.516

1200.000



R.L. 269

DESIGN FEATURES	LEVEL DIFFERENCE	DESIGN LEVELS	EXISTING LEVELS	DESIGN OFFSETS
IA	-0.000	271.390	271.390	-13.156
EV	0.240	271.609	271.369	-12.167
CB	0.417	271.631	271.214	-10.363
CT	0.404	271.630	271.227	-10.199
CF	0.251	271.480	271.229	-10.166
CE	0.272	271.517	271.245	-9.621
C0	0.110	271.523	271.413	-3.926
C3	0.139	271.553	271.413	-3.923
CT	0.234	271.652	271.418	-3.760
CB	0.232	271.652	271.420	-3.688
MC10	-0.065	271.533	271.598	0.000
CB	0.207	271.626	271.419	1.313
CT	0.211	271.626	271.415	1.385
C3	0.119	271.526	271.406	1.549
C0	0.090	271.496	271.406	1.552
CE	0.435	271.357	270.923	10.317
CF	0.438	271.321	270.883	10.995
CT	0.591	271.471	270.881	11.036
CB	0.603	271.473	270.869	11.242
EV	0.713	271.454	270.741	13.621

1180.000

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

0 5 10 15 20 25 30 35 40 45

DRAWING FILE LOCATION / NAME
C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Cross Sections\P-XSEC-MC10.dgn

DESIGN LOT CODE
XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING
0 2 4 6 8
SCALE 1:200m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94)
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ROAD DESIGN SOUTH

PLOT DATE / TIME
PLOT BY

TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT
NSW GOVERNMENT | Transport for NSW

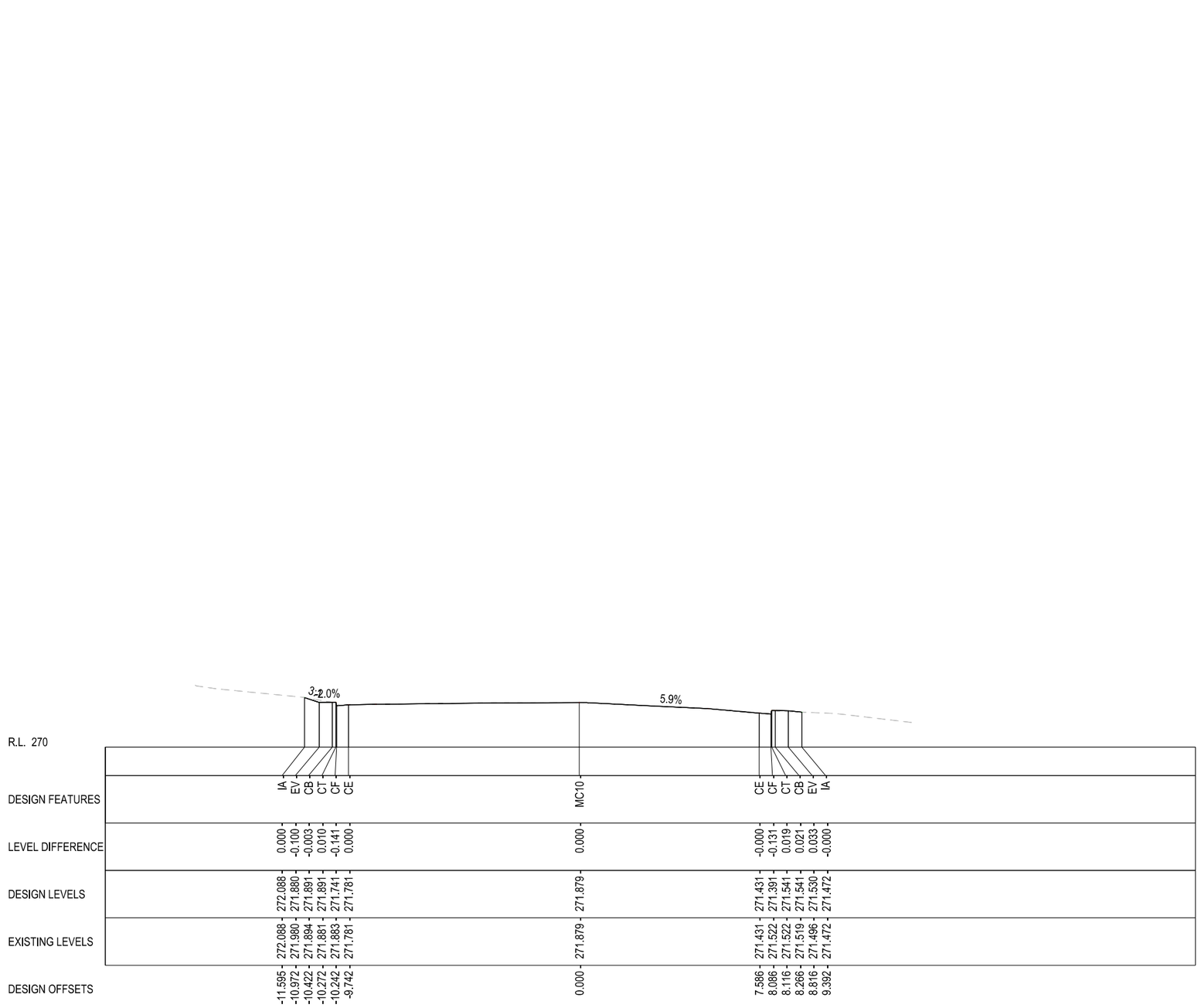
PREPARED FOR
TRANSPORT FOR NSW
REGIONAL & OUTER METROPOLITAN
ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
CROSS SECTION
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.1180.000 TO CH.1200.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RC-0208	X



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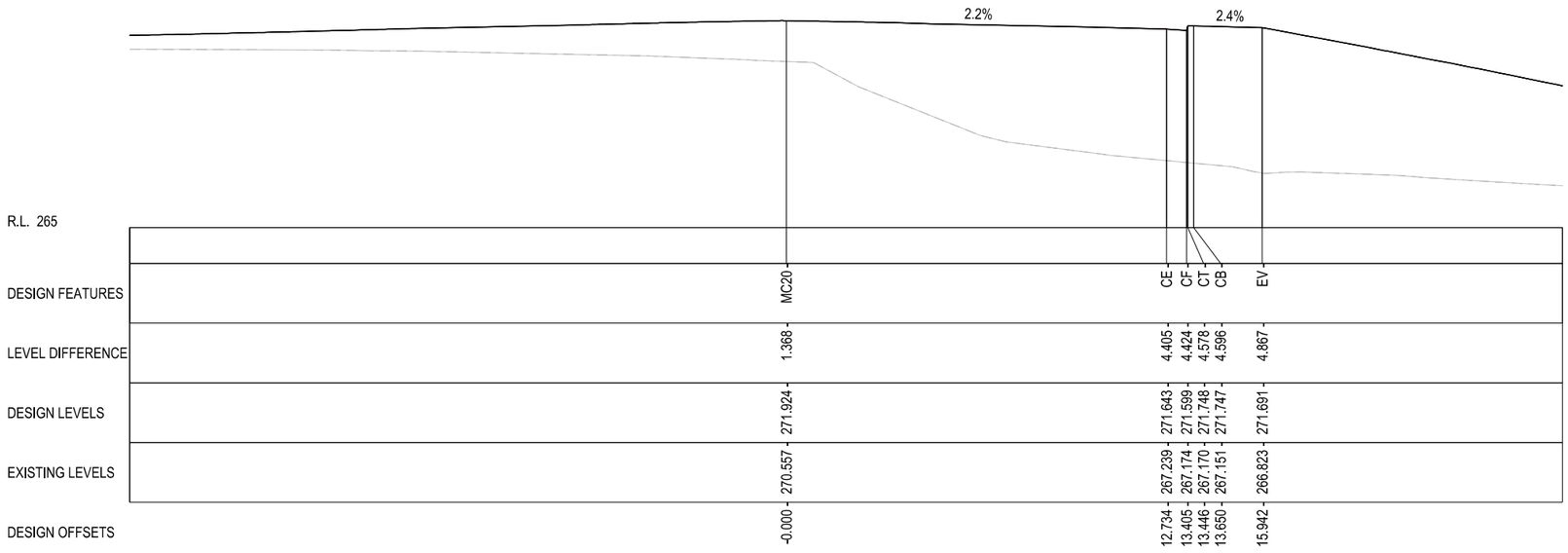
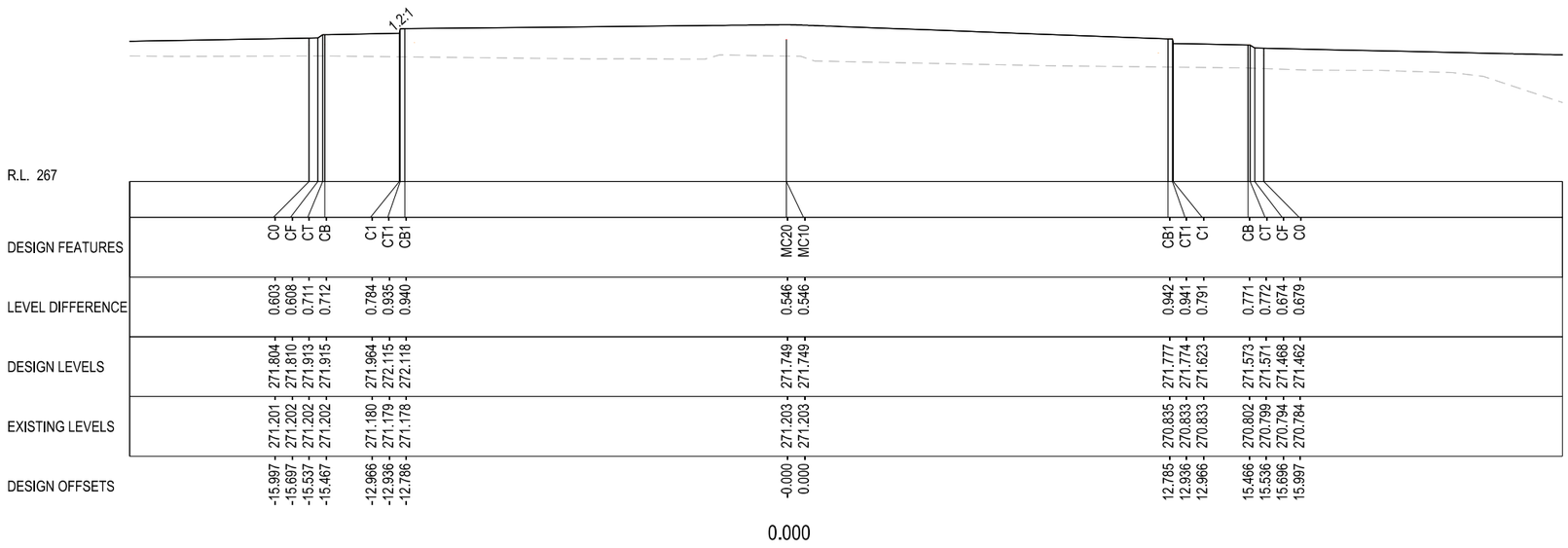
THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Cross Sections\P-XSEC-MC10.dgn				DESIGN LOT CODE XXXXXXX		DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING		PLOT DATE / TIME	PLOT BY		CLIENT NSW GOVERNMENT Transport for NSW	SNOWY VALLEYS HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD ROUNDABOUT UPGRADE 0.870km TO 1.320km FROM TUMUT CROSS SECTION HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.1217.287	A3
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE	NAME	DATE	PREPARED FOR TRANSPORT FOR NSW REGIONAL & OUTER METROPOLITAN ASSETS SOUTH	RMS REGISTRATION No. DS2020/000808	
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX	0 2 4 6 8 SCALE 1:200m	TRANSPORT FOR NSW INFRASTRUCTURE & PLACE TECHNICAL SERVICES ROAD DESIGN SOUTH	DRAWN	X. X. XXXXXXXX	XX.XX.XX			
								DRG CHECK	X. X. XXXXXXXX	XX.XX.XX			
								DESIGN	X. X. XXXXXXXX	XX.XX.XX			
								DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX			
								DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX			
						CO-ORDINATE SYSTEM MGA ZONE 55 (GDA94)	HEIGHT DATUM AHD	PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX		ISSUE STATUS NOT FOR CONSTRUCTION / EDMS No. SF2016/159601 / SHEET No. RC-0209 / ISSUE X	





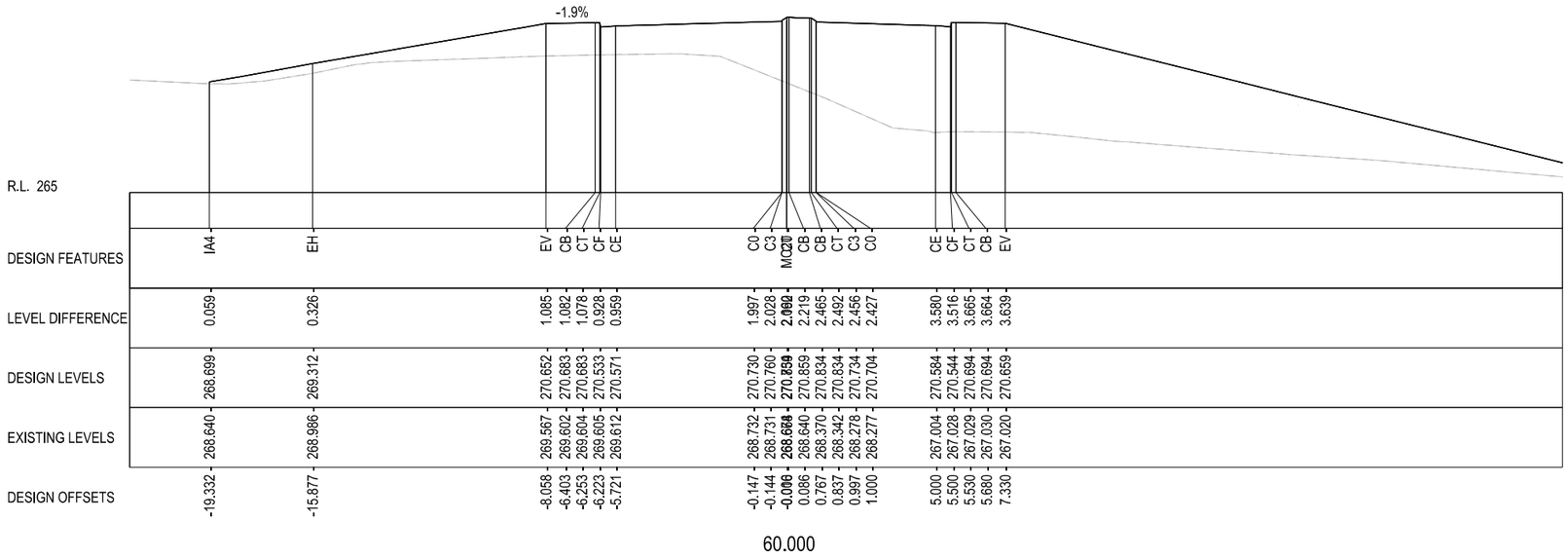
NOT FOR CONSTRUCTION

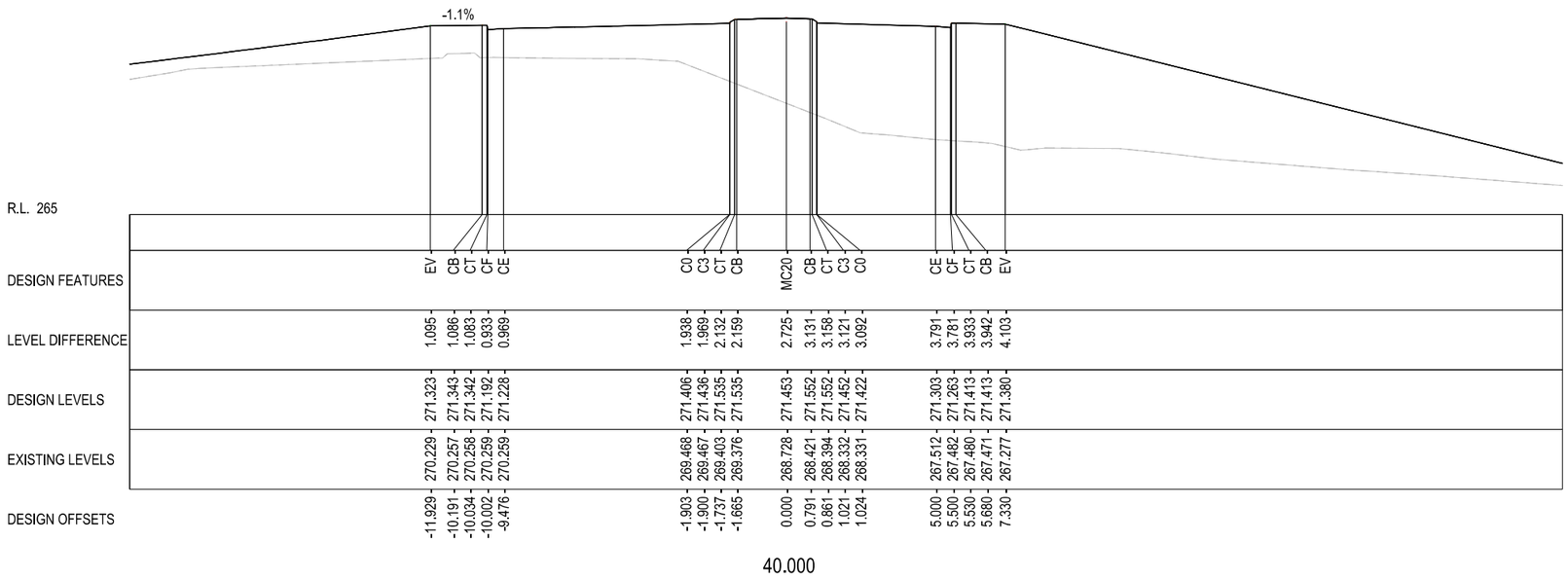
THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Cross Sections\P-XSEC-MC10.dgn				DESIGN LOT CODE XXXXXXX		DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING		PLOT DATE / TIME	PLOT BY		CLIENT NSW GOVERNMENT Transport for NSW
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE	NAME	DATE	
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX	0 2 4 6 8 SCALE 1:200m	TRANSPORT FOR NSW INFRASTRUCTURE & PLACE TECHNICAL SERVICES ROAD DESIGN SOUTH	DRAWN	X. X. XXXXXXXX	XX.XX.XX	
								DRG CHECK	X. X. XXXXXXXX	XX.XX.XX	
								DESIGN	X. X. XXXXXXXX	XX.XX.XX	
								DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX	
								DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX	
								PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX	
						CO-ORDINATE SYSTEM MGA ZONE 55 (GDA94)	HEIGHT DATUM AHD				

PREPARED FOR TRANSPORT FOR NSW REGIONAL & OUTER METROPOLITAN ASSETS SOUTH	SNOWY VALLEYS HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD ROUNDABOUT UPGRADE 0.870km TO 1.320km FROM TUMUT CROSS SECTION MR279 - GOCUP ROAD - MC20 - CH.0.000 TO CH.20.000			A3
	RMS REGISTRATION No. DS2020/000808			
	ISSUE STATUS NOT FOR CONSTRUCTION	EDMS No. SF2016/159601	SHEET No. RC-0210	ISSUE X





NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Cross Sections\P-XSEC-MC10.dgn				DESIGN LOT CODE: XXXXXXX	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX	0 2 4 6 8 SCALE 1:200m
						CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ROAD DESIGN SOUTH

PLOT DATE / TIME	PLOT BY	
TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

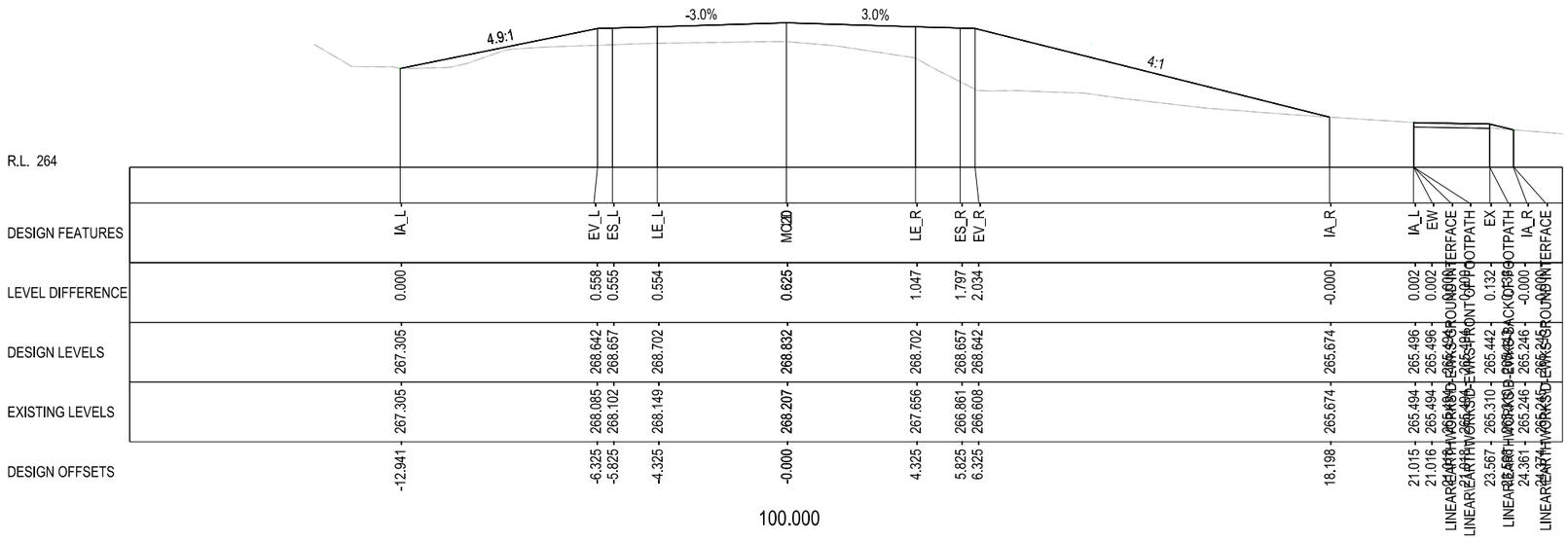
PREPARED FOR: TRANSPORT FOR NSW
REGIONAL & OUTER METROPOLITAN
ASSETS SOUTH

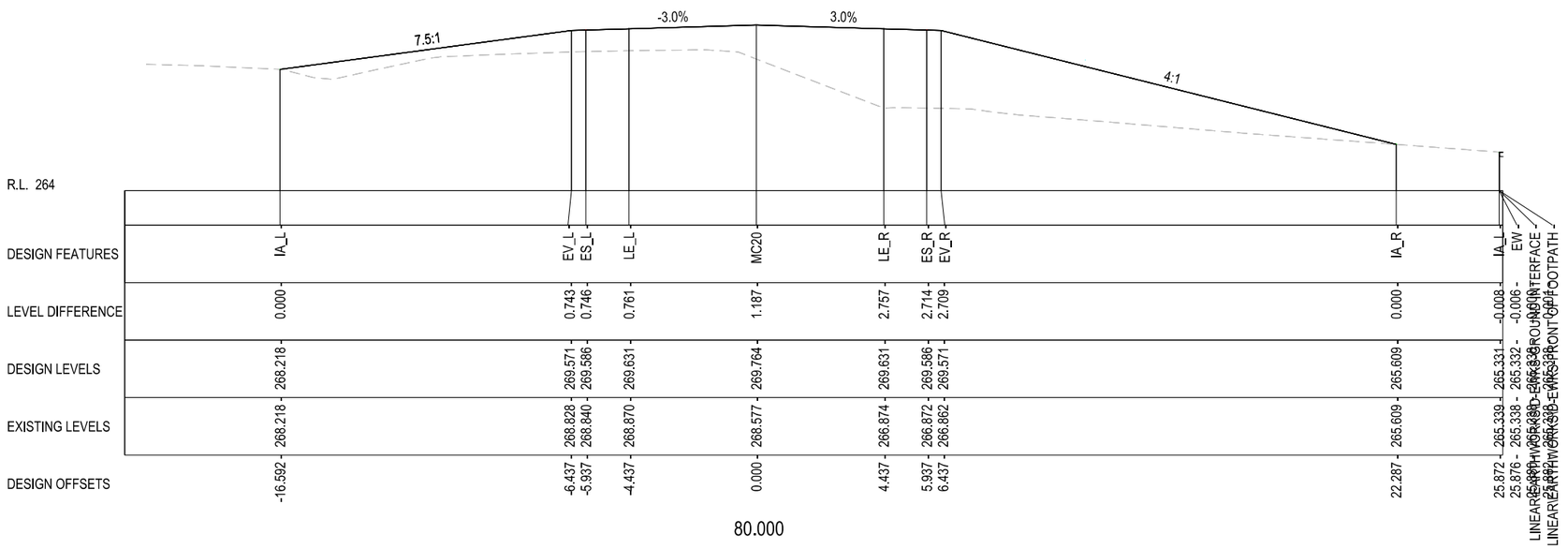
SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
CROSS SECTION
MR279 - GOCUP ROAD - MC20 - CH.40.000 TO CH.60.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RC-0211	X





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50mm ON A3 SIZE ORIGINAL

NOT FOR CONSTRUCTION

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Cross Sections\P-XSEC-MC10.dgn				DESIGN LOT CODE: XXXXXXX	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 2 4 6 8 SCALE 1:200m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME	PLOT BY	
TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

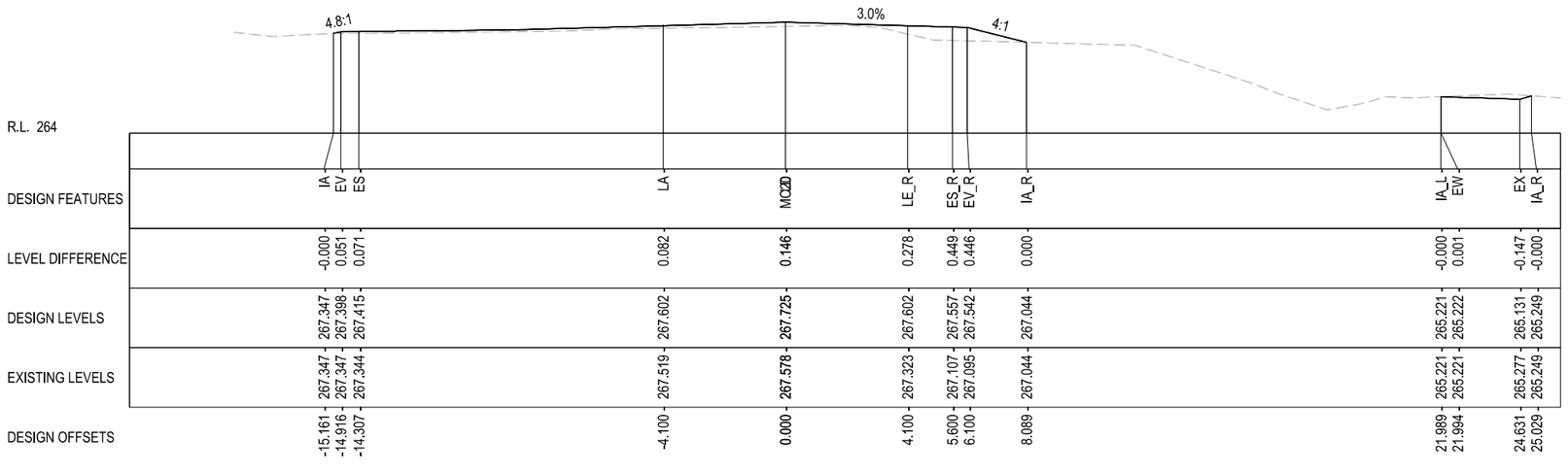
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

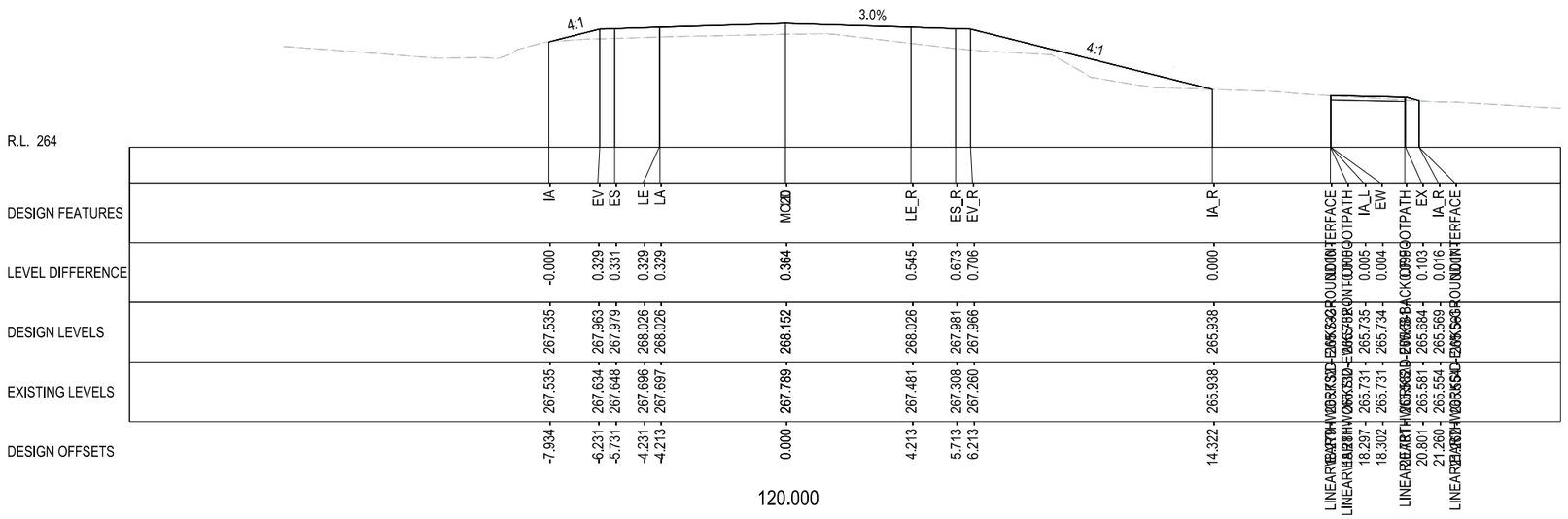
SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
CROSS SECTION
MR279 - GOCUP ROAD - MC20 - CH.80.000 TO CH.100.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RC-0212	X





NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME	DESIGN LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	PLOT DATE / TIME	PLOT BY
C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Cross Sections\P-XSEC-MC10.dgn	XXXXXXX			

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 2 4 6 8 SCALE 1:200m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

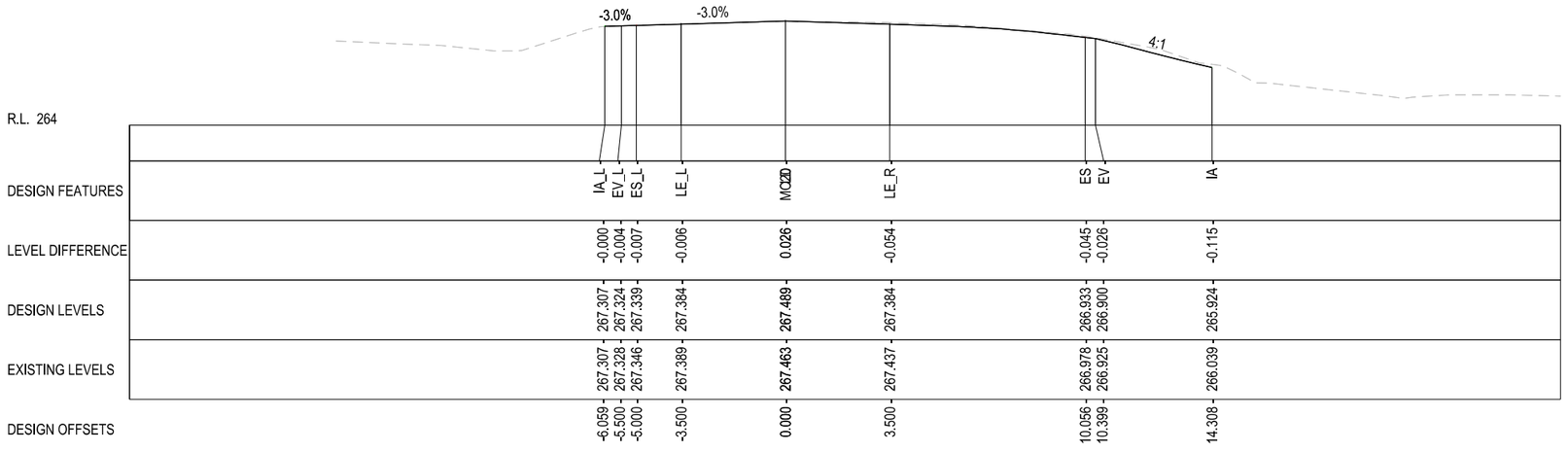
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

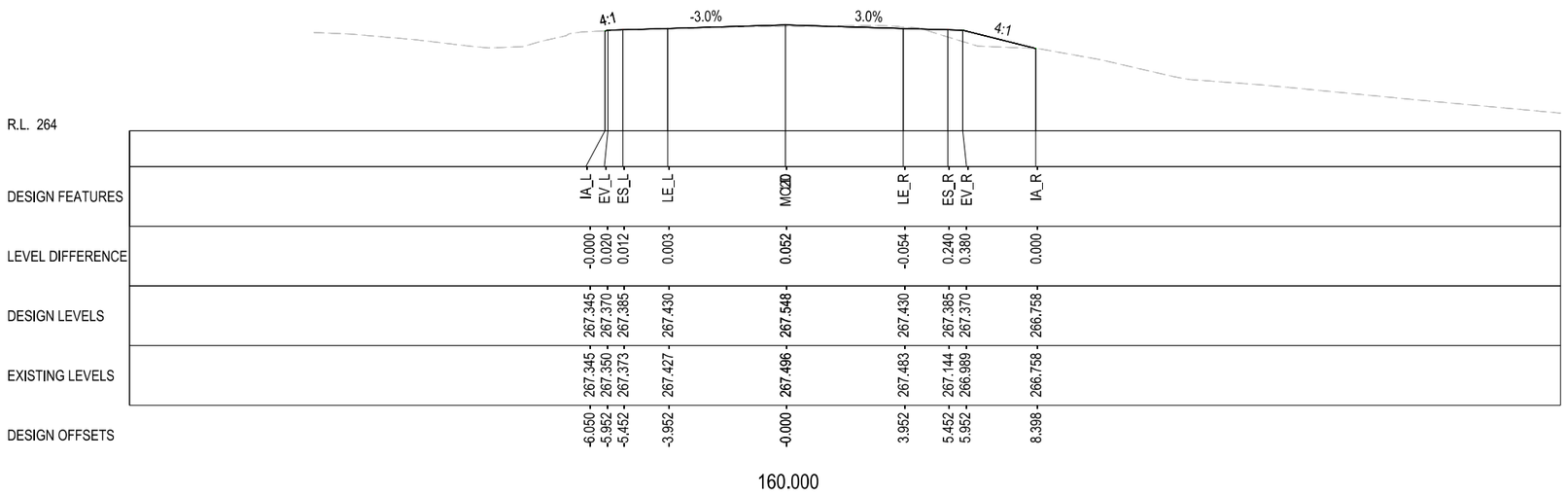
SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
CROSS SECTION
MR279 - GOCUP ROAD - MC20 - CH.120.000 TO CH.140.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RC-0213	X





NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Cross Sections\P-XSEC-MC10.dgn				DESIGN LOT CODE XXXXXXX	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX	0 2 4 6 8 SCALE 1:200m
						CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
TRANSPORT FOR NSW INFRASTRUCTURE & PLACE TECHNICAL SERVICES ROAD DESIGN SOUTH

PLOT DATE / TIME	PLOT BY	
TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT
NSW GOVERNMENT Transport for NSW

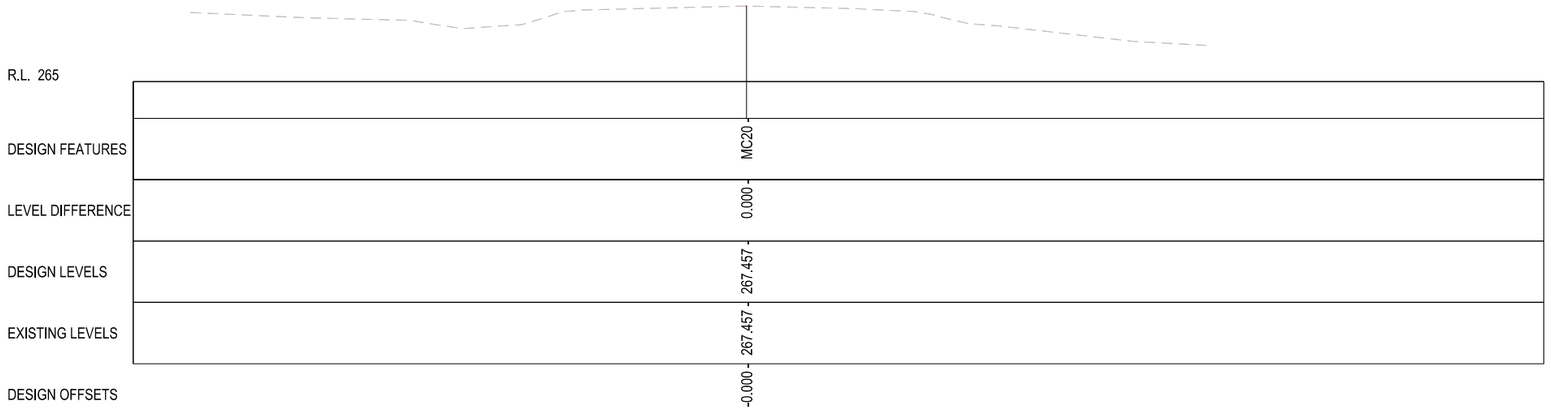
PREPARED FOR
TRANSPORT FOR NSW
REGIONAL & OUTER METROPOLITAN
ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
CROSS SECTION
MR279 - GOCUP ROAD - MC20 - CH.160.000 TO CH.180.000

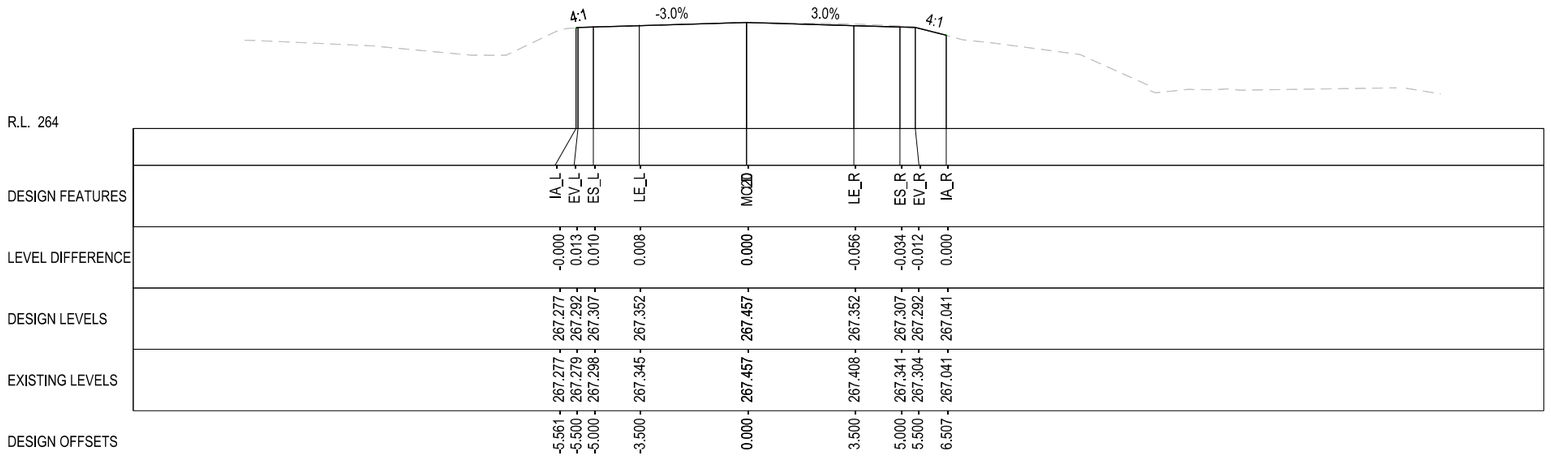
A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RC-0214	X



220.000



200.000

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Cross Sections\P-XSEC-MC10.dgn	DESIGN LOT CODE: XXXXXXX	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	PLOT DATE / TIME / PLOT BY
CLIENT: NSW GOVERNMENT Transport for NSW	SNOWY VALLEYS HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD ROUNDABOUT UPGRADE 0.870km TO 1.320km FROM TUMUT CROSS SECTION MR279 - GOCUP ROAD - MC20 - CH.200.000 TO CH.220.000		A3

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 2 4 6 8 SCALE 1:200m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

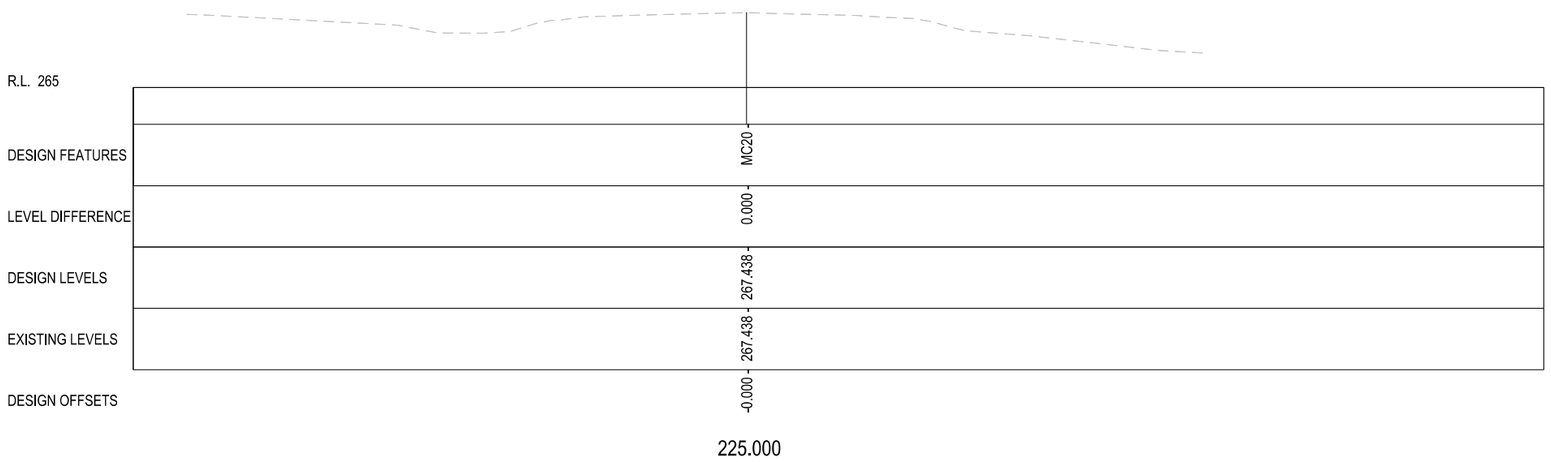
DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RC-0215	X



NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

0 5 10 15 20 25 30 35 40 45

DRAWING FILE LOCATION / NAME
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DESIGN LOT CODE
XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING
0 2 4 6 8
SCALE 1:200m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94)
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ROAD DESIGN SOUTH

PLOT DATE / TIME
PLOT BY

TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT
NSW GOVERNMENT Transport for NSW

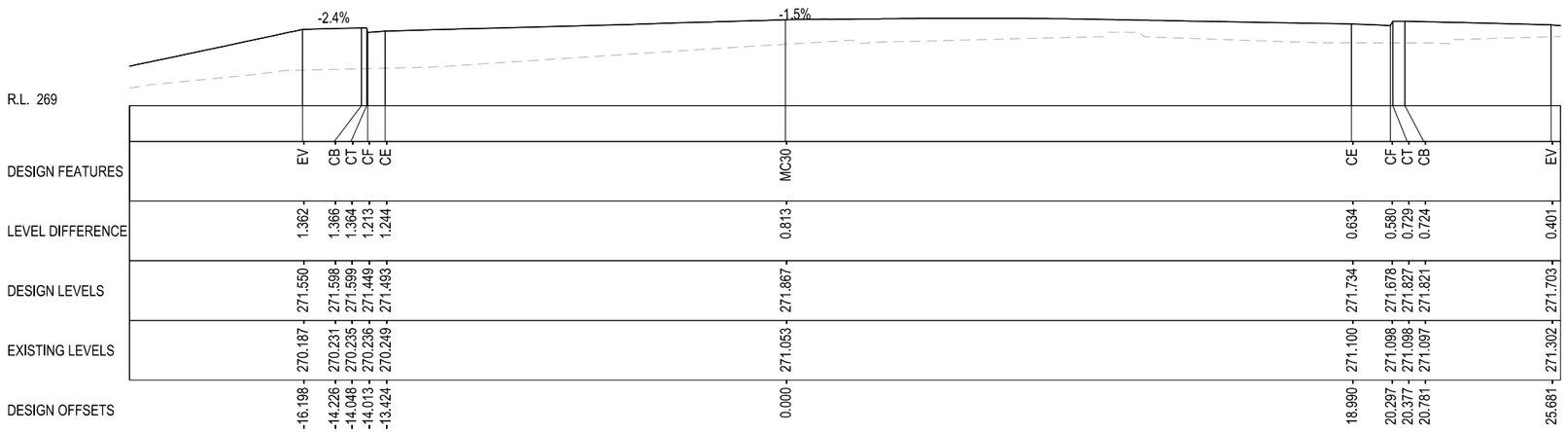
PREPARED FOR
TRANSPORT FOR NSW
REGIONAL & OUTER METROPOLITAN
ASSETS SOUTH

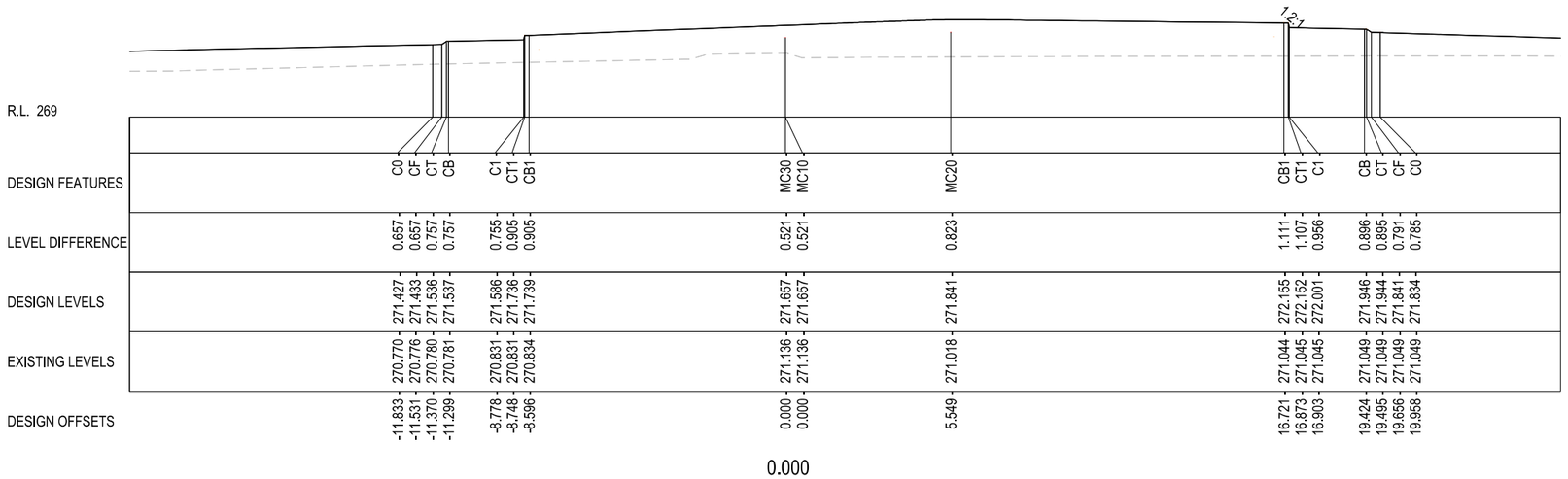
SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
CROSS SECTION
MR279 - GOCUP ROAD - MC20 - CH.225.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RC-0216	X



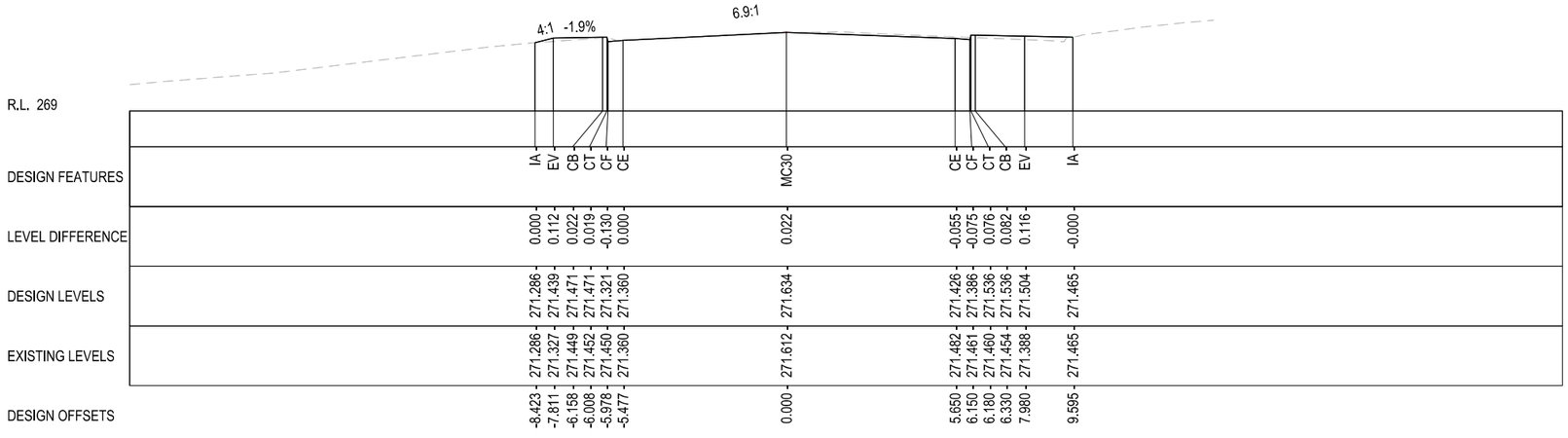


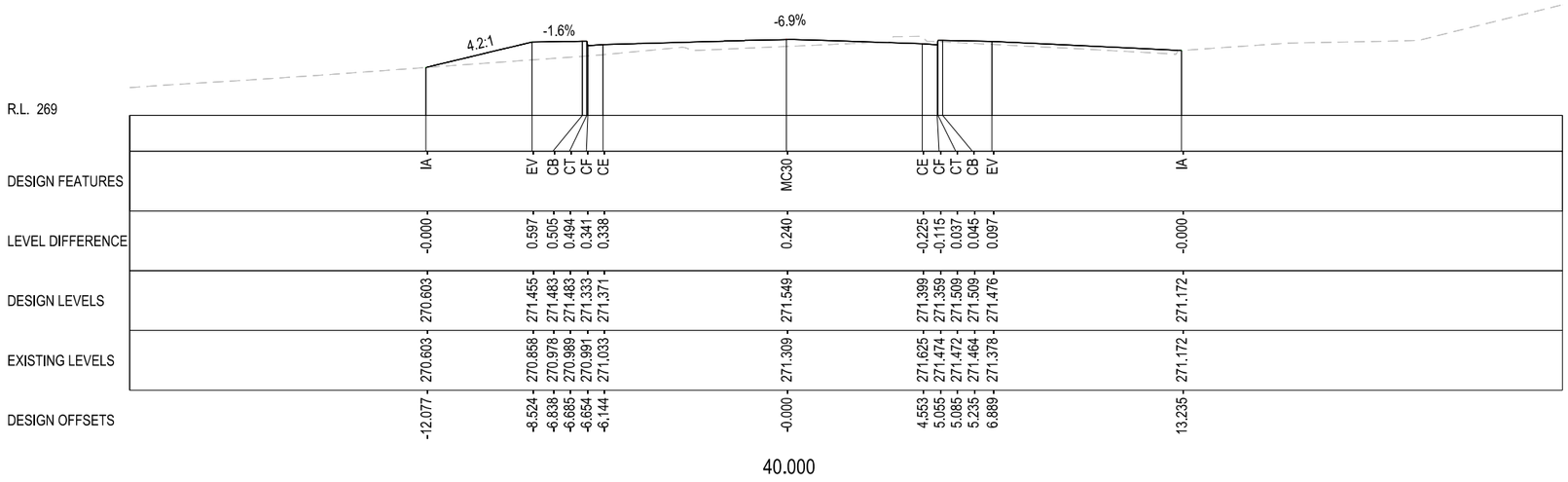
NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Cross Sections\P-XSEC-MC10.dgn				DESIGN LOT CODE XXXXXXX		DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING		PLOT DATE / TIME		PLOT BY
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE	NAME	DATE
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX	0 2 4 6 8 SCALE 1:200m	TRANSPORT FOR NSW INFRASTRUCTURE & PLACE TECHNICAL SERVICES ROAD DESIGN SOUTH	DRAWN	X. X. XXXXXXXX	XX.XX.XX
								DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
								DESIGN	X. X. XXXXXXXX	XX.XX.XX
								DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
								DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
								PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CO-ORDINATE SYSTEM MGA ZONE 55 (GDA94)	HEIGHT DATUM AHD	CLIENT NSW GOVERNMENT Transport for NSW	SNOWY VALLEYS HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD ROUNDABOUT UPGRADE 0.870km TO 1.320km FROM TUMUT CROSS SECTION CAPPER STREET - MC30 - CH.0.000 TO CH.20.000	A3
		PREPARED FOR TRANSPORT FOR NSW REGIONAL & OUTER METROPOLITAN ASSETS SOUTH	RMS REGISTRATION No. DS2020/000808	
			ISSUE STATUS: NOT FOR CONSTRUCTION EDMS No.: SF2016/159601 SHEET No.: RC-0217 ISSUE: X	





NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Cross Sections\P-XSEC-MC10.dgn				DESIGN LOT CODE: XXXXXXX	
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

SCALES ON A3 SIZE DRAWING: 0 2 4 6 8 SCALE 1:200m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

PLOT BY

CLIENT: NSW GOVERNMENT Transport for NSW

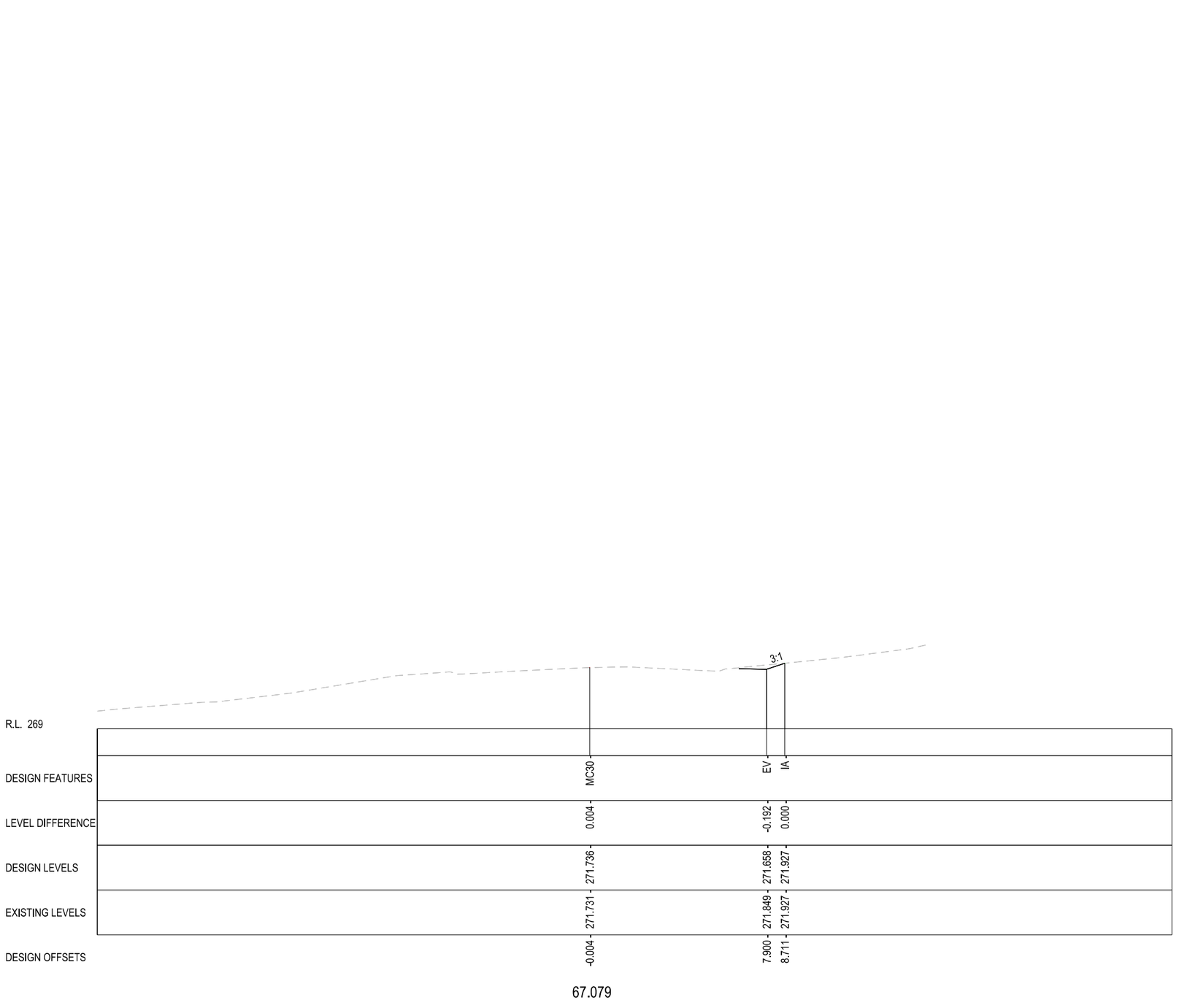
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
CROSS SECTION
CAPPER STREET - MC30 - CH.40.000 TO CH.60.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RC-0218	X



NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Cross Sections\P-XSEC-MC10.dgn				DESIGN LOT CODE XXXXXXX		DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING		PLOT DATE / TIME	PLOT BY		CLIENT NSW GOVERNMENT Transport for NSW	SNOWY VALLEYS HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD ROUNDABOUT UPGRADE 0.870km TO 1.320km FROM TUMUT CROSS SECTION CAPPER STREET - MC30 - CH.67.079	A3
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE	NAME	DATE			
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX	0 2 4 6 8 SCALE 1:200m	TRANSPORT FOR NSW INFRASTRUCTURE & PLACE TECHNICAL SERVICES ROAD DESIGN SOUTH	DRAWN	X. X. XXXXXXXX	XX.XX.XX			
								DRG CHECK	X. X. XXXXXXXX	XX.XX.XX			
								DESIGN	X. X. XXXXXXXX	XX.XX.XX			
								DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX			
						CO-ORDINATE SYSTEM MGA ZONE 55 (GDA94)	HEIGHT DATUM AHD	DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX	PREPARED FOR TRANSPORT FOR NSW REGIONAL & OUTER METROPOLITAN ASSETS SOUTH	RMS REGISTRATION No. DS2020/000808	
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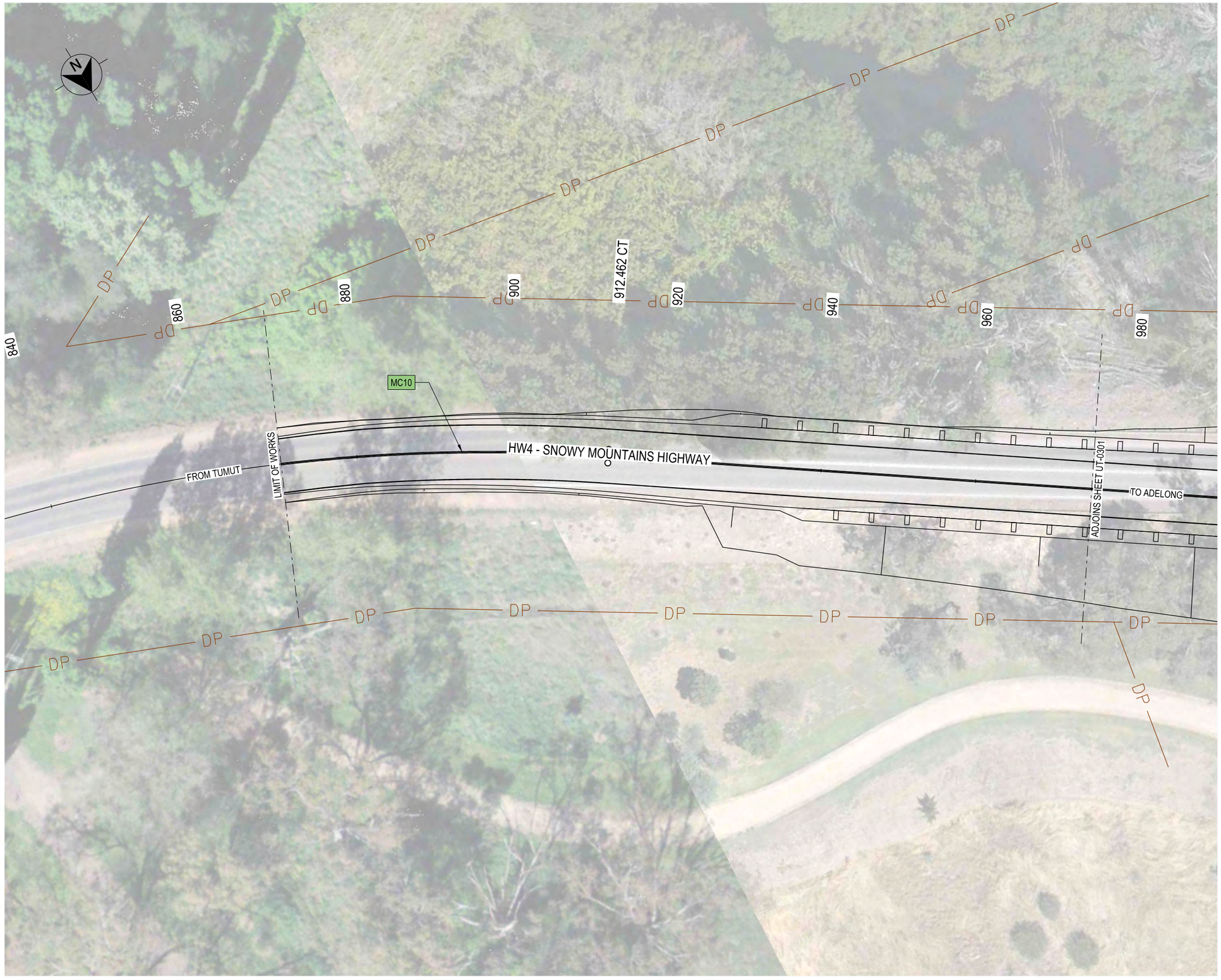


LEGEND

- MC10 — DESIGN CONTROL CALLOUT
- UTILITY - UT-XXXX — UTILITY LABEL - SHEET REFERENCE
- DP — CADASTRAL BOUNDARY OVERLAY
- PM — PERMANENT SURVEY MARK - DO NOT DISTURB
- SS — STATE SURVEY MARK - DO NOT DISTURB

UTILITES

- OU — OPTIC FIBRE
- T — TELECOMMUNICATION LINE
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER
- EXISTING POTHOLE
- PROPOSED POTHOLE

NOTES

1. PERMANENT AND STATE SURVEY CONTROL MARKS ARE NOT TO BE DISTURBED UNLESS ASSESSED BY TRANSPORT FOR NSW SURVEY IN ACCORDANCE WITH LPI STANDARDS - FINES APPLY
2. REFER TO SHEET UT-0318 FOR SUBSURFACE UTILITY INFORMATION
3. THE FOOTINGS OF ALL LIGHT POLES SHALL BE COVERED TO ENSURE THEY DO NOT PROJECT ABOVE THE EARTH EMBANKMENT.
4. REFER TO DRAWING DS20XX / XXXXXX FOR ELECTRICAL DESIGN.

UTILITY INFORMATION SHOWN ON THE PLANS DOES NOT DEPICT ANY MORE THAN THE PRESENCE OF A SERVICE, BASED ON AVAILABLE DOCUMENTARY EVIDENCE. THE PRESENCE OF A UTILITY SERVICE, ITS SIZE AND LOCATION SHOULD BE CONFIRMED BY FIELD INSPECTION, PRIOR TO THE COMMENCEMENT OF ROADWORKS AND THE RELEVANT UTILITY PLANS OBTAINED BY DIALLING PH 1100 OR FAX 1300 652 077 (DIAL BEFORE YOU DIG). CAUTION SHOULD BE EXERCISED WHEN WORKING IN THE VICINITY OF ALL UTILITY SERVICES.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-UT.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

PLOT BY

CLIENT: NSW GOVERNMENT Transport for NSW

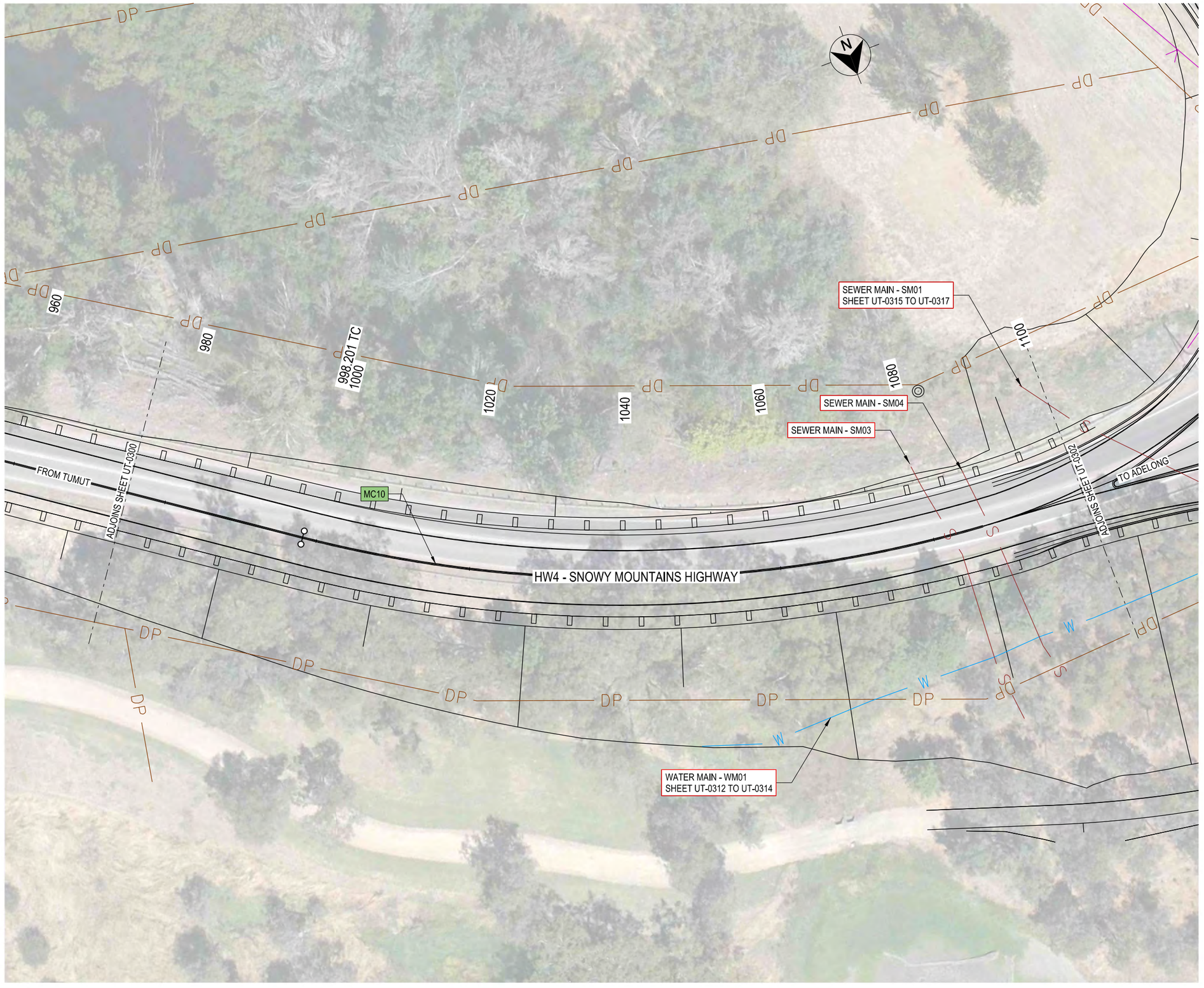
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
UTILITY PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.870.000 TO CH.975.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	UT-0300	X



LEGEND

- MC10 — DESIGN CONTROL CALLOUT
- UTILITY - UT-XXXX — UTILITY LABEL - SHEET REFERENCE
- DP — CADASTRAL BOUNDARY OVERLAY
- PM — PERMANENT SURVEY MARK - DO NOT DISTURB
- SS — STATE SURVEY MARK - DO NOT DISTURB

UTILITES

- OU — OPTIC FIBRE
- T — TELECOMMUNICATION LINE
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER
- EXISTING POTHOLE
- PROPOSED POTHOLE

NOTES

1. PERMANENT AND STATE SURVEY CONTROL MARKS ARE NOT TO BE DISTURBED UNLESS ASSESSED BY TRANSPORT FOR NSW SURVEY IN ACCORDANCE WITH LPI STANDARDS - FINES APPLY
2. REFER TO SHEET UT-0318 FOR SUBSURFACE UTILITY INFORMATION
3. THE FOOTINGS OF ALL LIGHT POLES SHALL BE COVERED TO ENSURE THEY DO NOT PROJECT ABOVE THE EARTH EMBANKMENT.
4. REFER TO DRAWING DS20XX / XXXXXX FOR ELECTRICAL DESIGN.

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NOT FOR CONSTRUCTION

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0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-UT.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY	TITLE	NAME	DATE
	DRAWN	X. X. XXXXXXXX	XX.XX.XX
	DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
	DESIGN	X. X. XXXXXXXX	XX.XX.XX
	DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
	DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
	PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

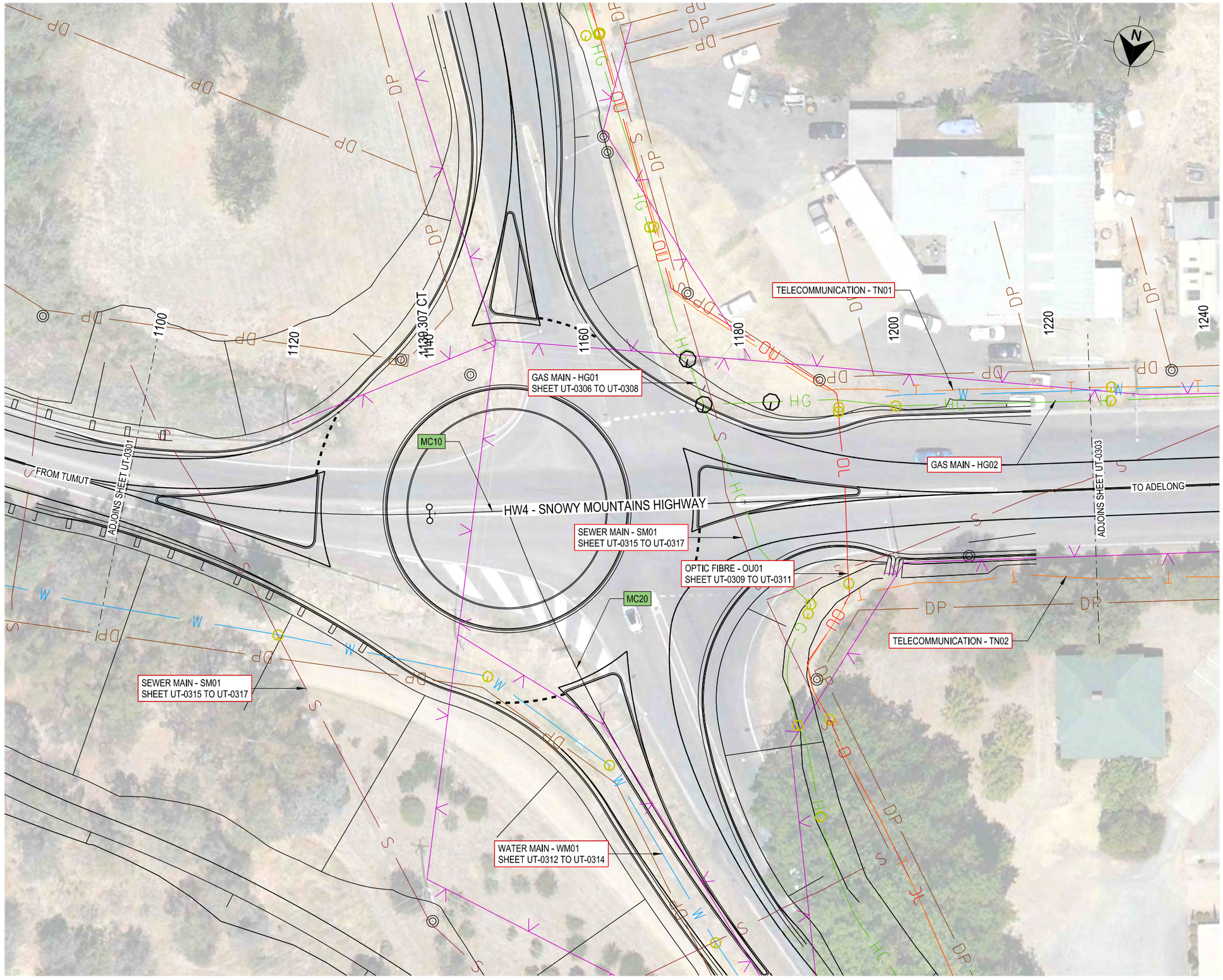
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN, ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
UTILITY PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.975.000 TO CH.1100.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	UT-0301	X



LEGEND

- MC10 — DESIGN CONTROL CALLOUT
- UTILITY - UT-XXXX — UTILITY LABEL - SHEET REFERENCE
- DP — CADASTRAL BOUNDARY OVERLAY
- PM — PERMANENT SURVEY MARK - DO NOT DISTURB
- SS — STATE SURVEY MARK - DO NOT DISTURB

UTILITES

- OU — OPTIC FIBRE
- T — TELECOMMUNICATION LINE
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER
- EXISTING POTHOLE
- PROPOSED POTHOLE

NOTES

1. PERMANENT AND STATE SURVEY CONTROL MARKS ARE NOT TO BE DISTURBED UNLESS ASSESSED BY TRANSPORT FOR NSW SURVEY IN ACCORDANCE WITH LPI STANDARDS - FINES APPLY
2. REFER TO SHEET UT-0318 FOR SUBSURFACE UTILITY INFORMATION
3. THE FOOTINGS OF ALL LIGHT POLES SHALL BE COVERED TO ENSURE THEY DO NOT PROJECT ABOVE THE EARTH EMBANKMENT.
4. REFER TO DRAWING DS20XX / XXXXXX FOR ELECTRICAL DESIGN.

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NOT FOR CONSTRUCTION

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0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-UT.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY

TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

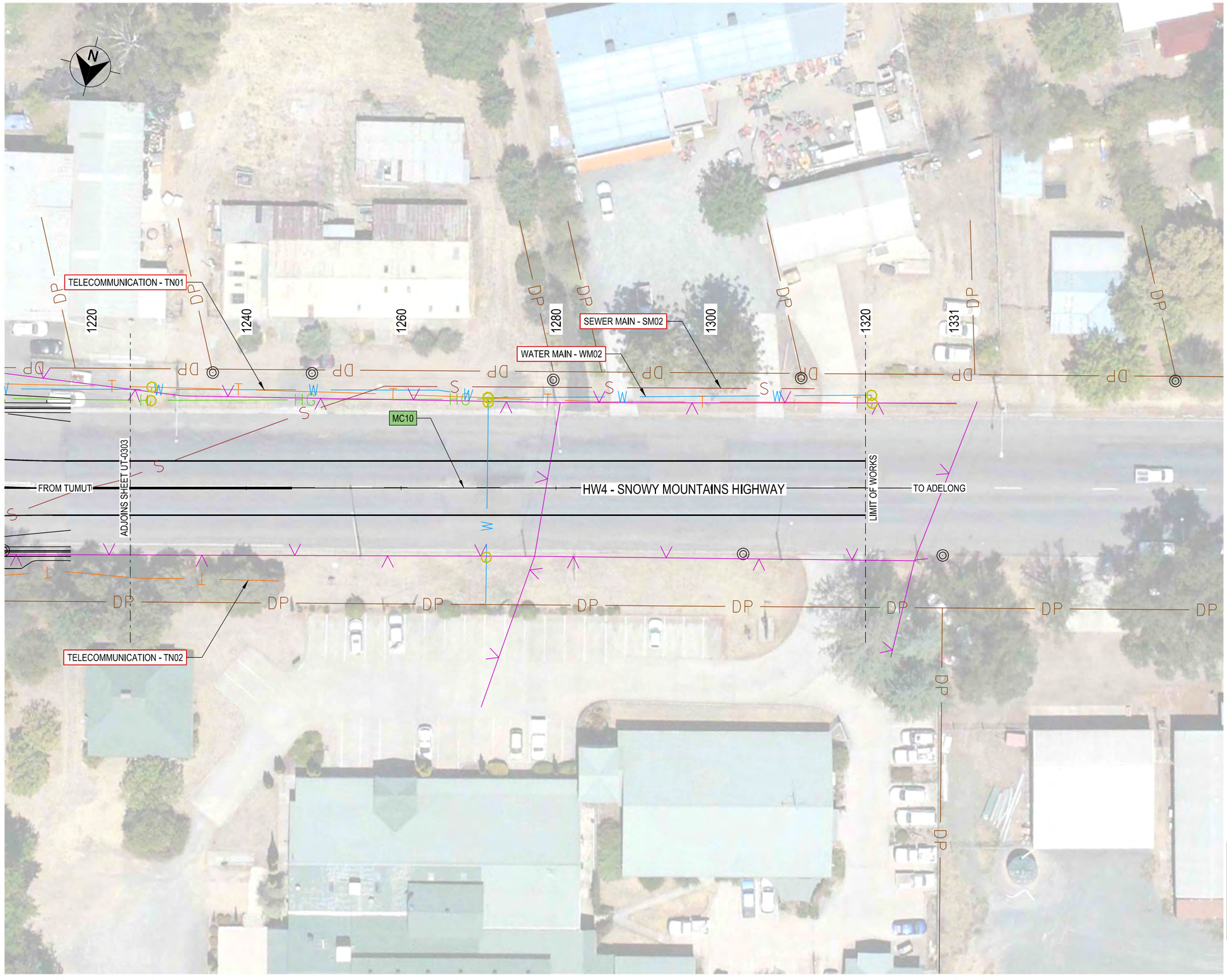
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
UTILITY PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.1100.000 TO CH.1225.000

A3

RMS REGISTRATION No.: DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	UT-0302	X



LEGEND

- MC10 — DESIGN CONTROL CALLOUT
- UTILITY - UT-XXXX — UTILITY LABEL - SHEET REFERENCE
- DP — CADASTRAL BOUNDARY OVERLAY
- PM — PERMANENT SURVEY MARK - DO NOT DISTURB
- SS — STATE SURVEY MARK - DO NOT DISTURB

UTILITES

- OU — OPTIC FIBRE
- T — TELECOMMUNICATION LINE
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER
- EXISTING POTHOLE
- PROPOSED POTHOLE

NOTES

1. PERMANENT AND STATE SURVEY CONTROL MARKS ARE NOT TO BE DISTURBED UNLESS ASSESSED BY TRANSPORT FOR NSW SURVEY IN ACCORDANCE WITH LPI STANDARDS - FINES APPLY
2. REFER TO SHEET UT-0318 FOR SUBSURFACE UTILITY INFORMATION
3. THE FOOTINGS OF ALL LIGHT POLES SHALL BE COVERED TO ENSURE THEY DO NOT PROJECT ABOVE THE EARTH EMBANKMENT.
4. REFER TO DRAWING DS20XX / XXXXXX FOR ELECTRICAL DESIGN.

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NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-UT.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY

TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

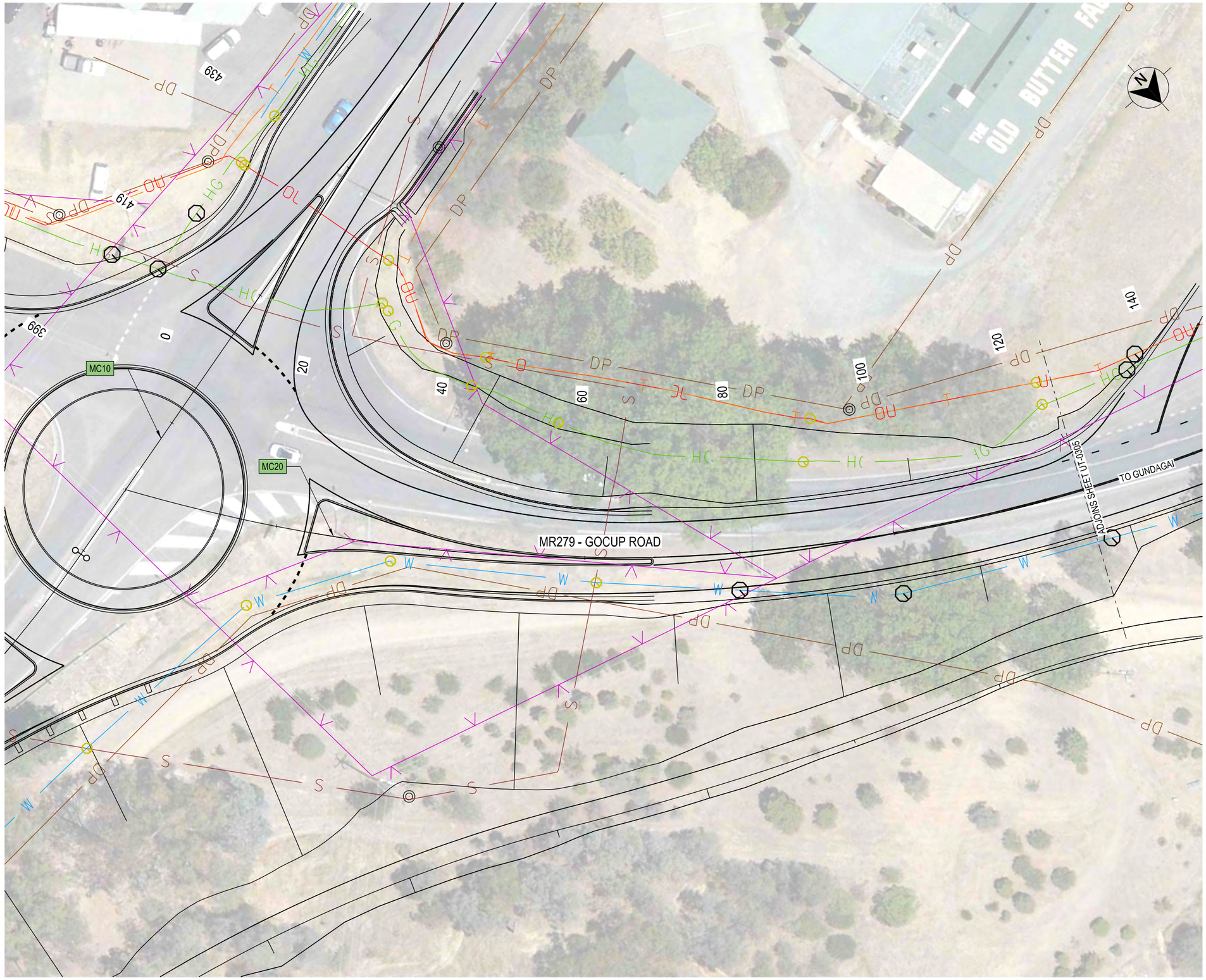
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN, ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
UTILITY PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.1225.000 TO CH.1315.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	UT-0303	X



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50mm ON A3 SIZE ORIGINAL

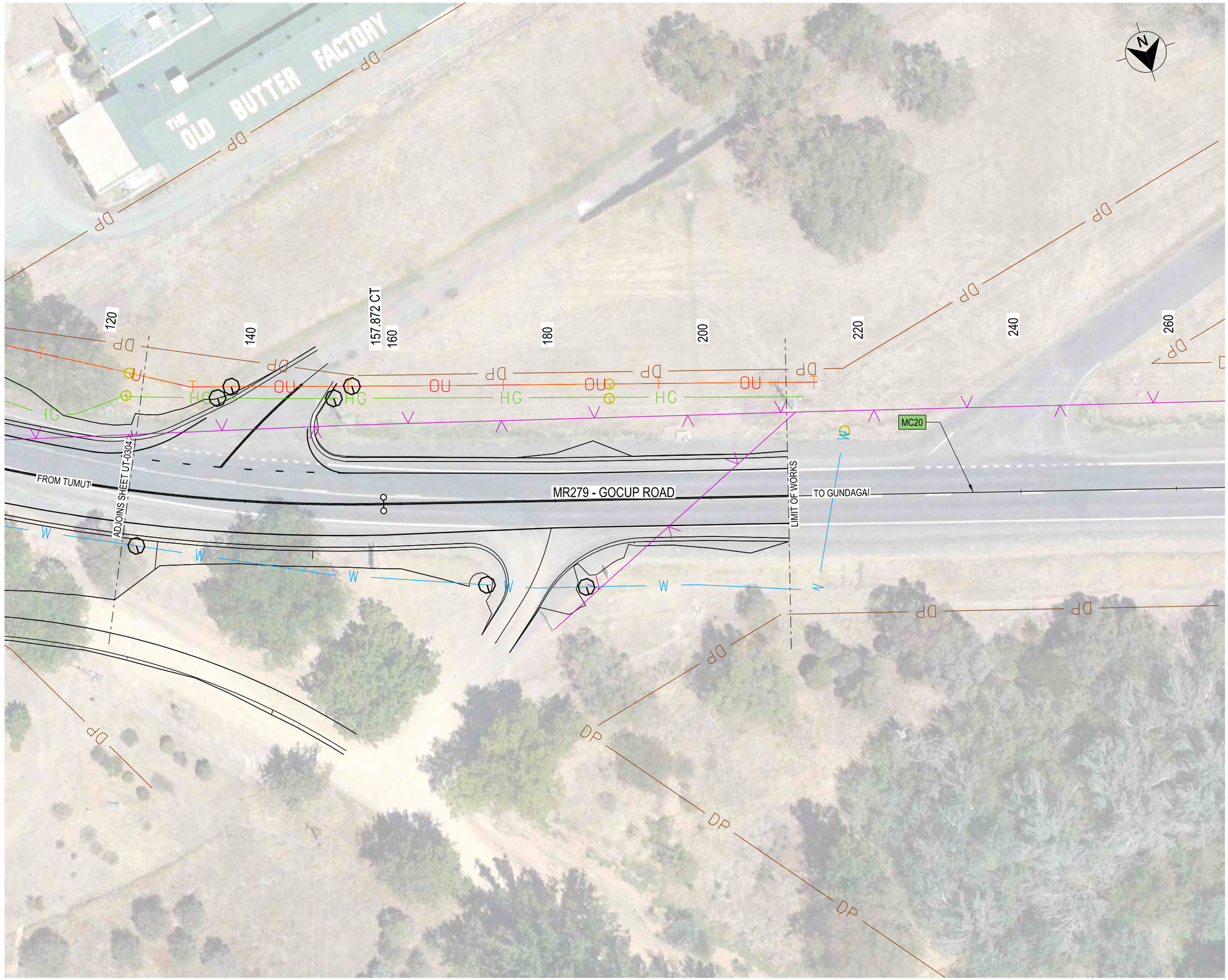
DRAWING FILE LOCATION / NAME C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-UT.dgn				DESIGN LOT CODE XXXXXXX		DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING		PLOT DATE / TIME		PLOT BY	CLIENT NSW GOVERNMENT Transport for NSW
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE	NAME	DATE	
P-PLAN-UT.dgn A3_Border.dgn A3_Border_Legends.dgn	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX	0 5 10 15 20 SCALE 1:500m	TRANSPORT FOR NSW INFRASTRUCTURE & PLACE TECHNICAL SERVICES ROAD DESIGN SOUTH	DRAWN	X. X. XXXXXXXX	XX.XX.XX	
								DRG CHECK	X. X. XXXXXXXX	XX.XX.XX	
								DESIGN	X. X. XXXXXXXX	XX.XX.XX	
								DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX	
								DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX	
						CO-ORDINATE SYSTEM MGA ZONE 55 (GDA94)	HEIGHT DATUM AHD	PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX	PREPARED FOR TRANSPORT FOR NSW REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
UTILITY PLAN
MR279 - GOCUP ROAD - MC20 - CH.0.000 TO CH.125.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	UT-0304	X



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0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-UT.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
P-PLAN-UT.dgn A3_Border.dgn A3_Border_Legends.dgn	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY

	NAME	DATE
TITLE		
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

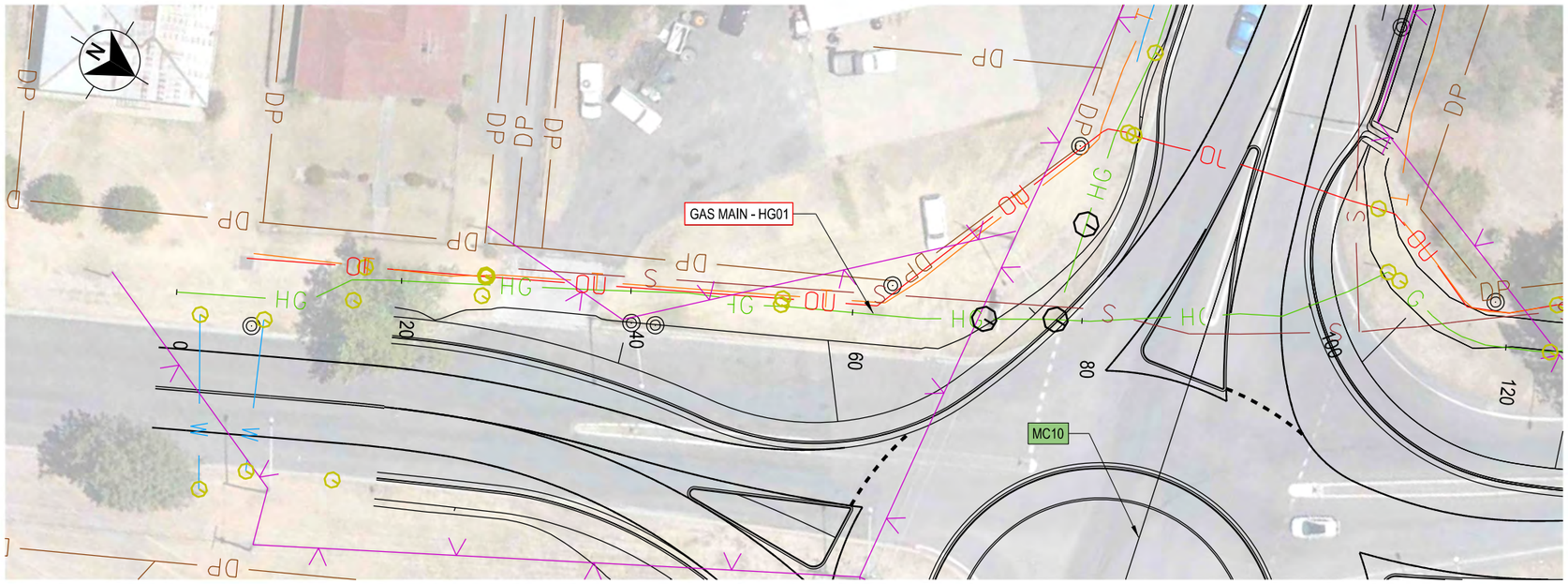
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
UTILITY PLAN
MR279 - GOCUP ROAD - MC20 - CH.125.000 TO CH.250.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	UT-0305	X



GAS MAIN - PLAN - HG01

LEGEND

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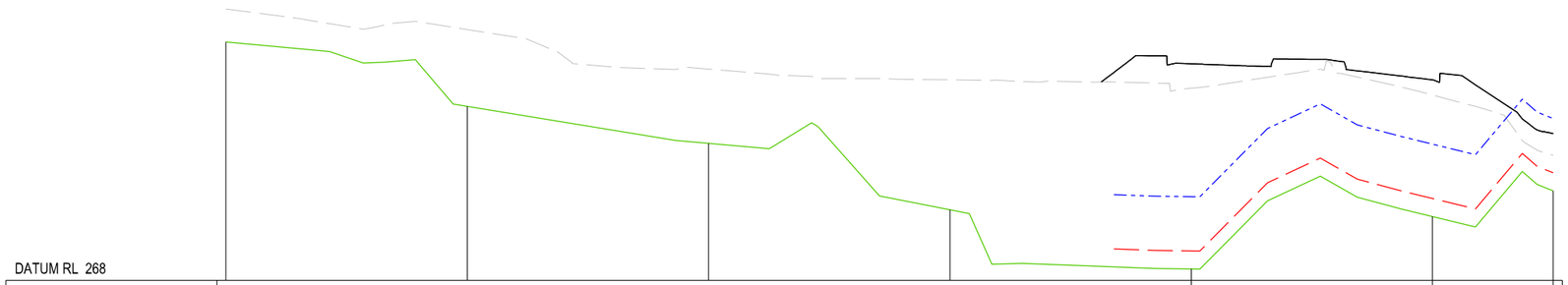
- S — SEWER MAIN
- OVERHEAD POWER
- EXISTING POTHOLE
- PROPOSED POTHOLE

LONG SECTION

- 300mm WORKING COVER
- 1200mm FINISHED COVER



DATUM RL 268

LEVEL DIFFERENCE						3.404		2.267		0.948
UTILITY LEVELS	271.955		270.884		270.271		269.170	268.188	269.058	269.485
DESIGN LEVELS								271.591	271.324	270.433
EXISTING SURFACE LEVELS	272.500		272.157		271.503		271.326	271.186	271.072	270.074
CHAINAGE	0.000		20		40		60	80	100	110.000

GAS MAIN - LONGITUDINAL SECTION - HG01

NOTES

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NOT FOR CONSTRUCTION

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0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-UT.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
P-PLAN-UT.dgn A3_Border.dgn A3_Border_Legends.dgn	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING

0 5 10 15 20
HORIZONTAL SCALE 1:500m
0 1 2 3 4
VERTICAL SCALE 1:100m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94)
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY		
TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

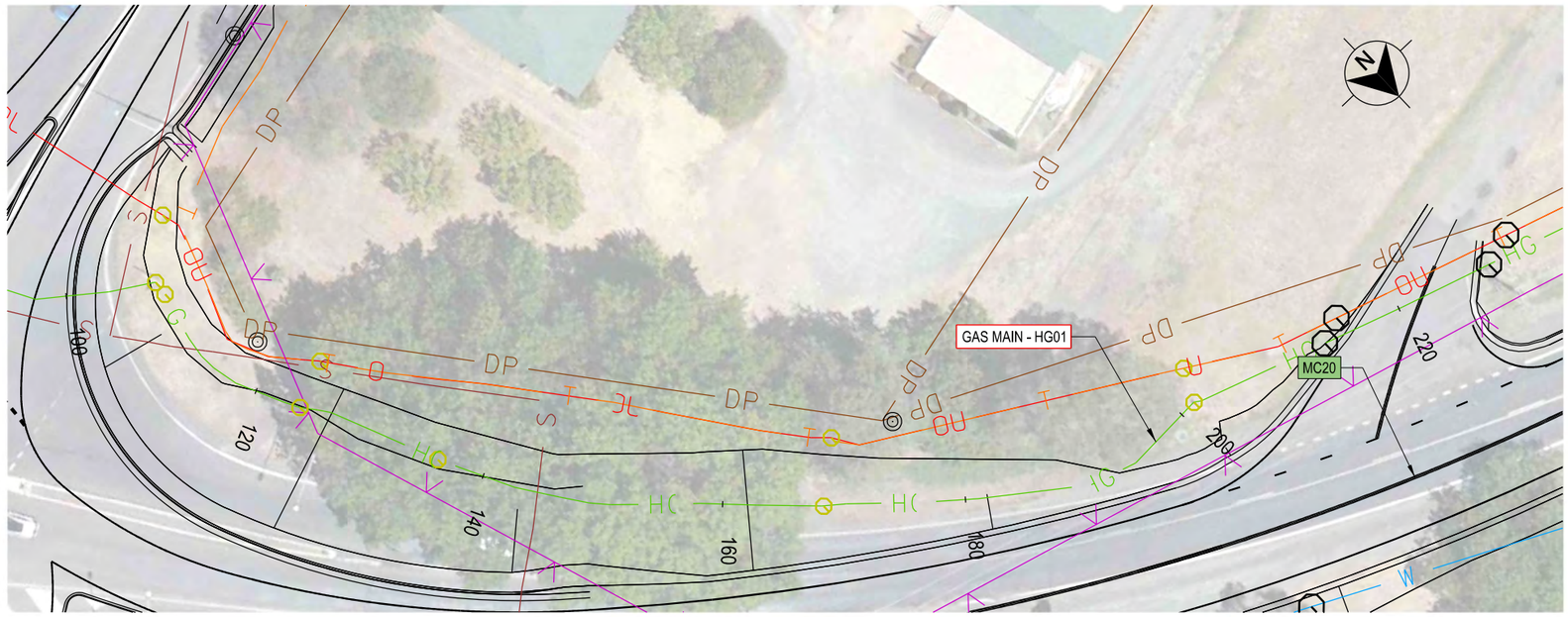
PREPARED FOR
TRANSPORT FOR NSW
REGIONAL & OUTER METROPOLITAN
ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
UTILITY PLAN
GAS MAIN - PLAN AND PROFILE - HG01 - CH.0.000 TO CH 110.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	UT-0306	X



GAS MAIN - PLAN - HG01

LEGEND

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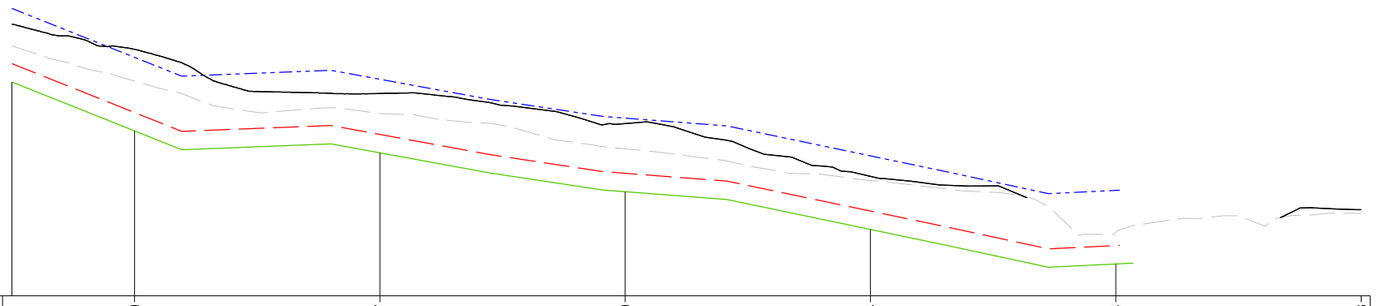
- EXISTING POTHOLE
- PROPOSED POTHOLE

LONG SECTION

- 300mm WORKING COVER
- 1200mm FINISHED COVER



DATUM RL 266

	120	140	160	180	200	220
LEVEL DIFFERENCE	1.330	0.967	1.109	0.864	0.754	267.403
UTILITY LEVELS	268.688	268.332	267.698	267.083	266.519	0.000
DESIGN LEVELS	270.018	269.299	268.807	267.948	267.274	267.403
EXISTING SURFACE LEVELS	269.501	268.971	268.397	267.877	267.035	267.346
CHAINAGE	120	140	160	180	200	220

GAS MAIN - LONGITUDINAL SECTION - HG01

NOTES

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0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-UT.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
P-PLAN-UT.dgn A3_Border.dgn A3_Border_Legends.dgn	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING
HORIZONTAL SCALE 1:500m (0 5 10 15 20)
VERTICAL SCALE 1:100m (0 1 2 3 4)
CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94)
HEIGHT DATUM: AHD

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TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY		
TITLE	NAME	DATE
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CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR
TRANSPORT FOR NSW
REGIONAL & OUTER METROPOLITAN
ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
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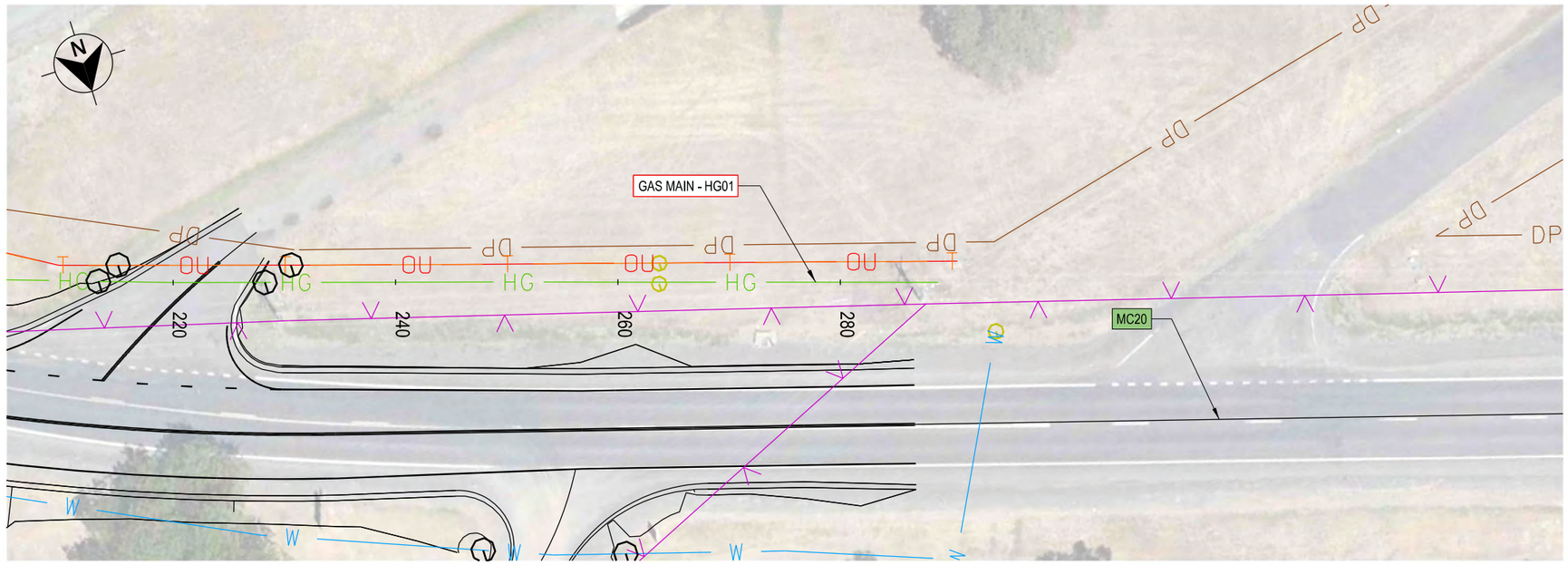
UTILITY PLAN
GAS MAIN - PLAN AND PROFILE - HG01 - CH.110.000 TO CH.220.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	UT-0307	X



GAS MAIN - PLAN - HG01

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- PROPOSED POTHOLE

DATUM RL 264

LEVEL DIFFERENCE	0.000	0.000	0.000
UTILITY LEVELS	0.000	0.000	0.000
DESIGN LEVELS	0.000	0.000	0.000
EXISTING SURFACE LEVELS	267.106	266.686	266.792
CHAINAGE	220.000	240	260	280

GAS MAIN - LONGITUDINAL SECTION - HG01

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P-PLAN-UT.dgn A3_Border.dgn A3_Border_Legends.dgn	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING
0 5 10 15 20
HORIZONTAL SCALE 1:500m
0 1 2 3 4
VERTICAL SCALE 1:100m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94)
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

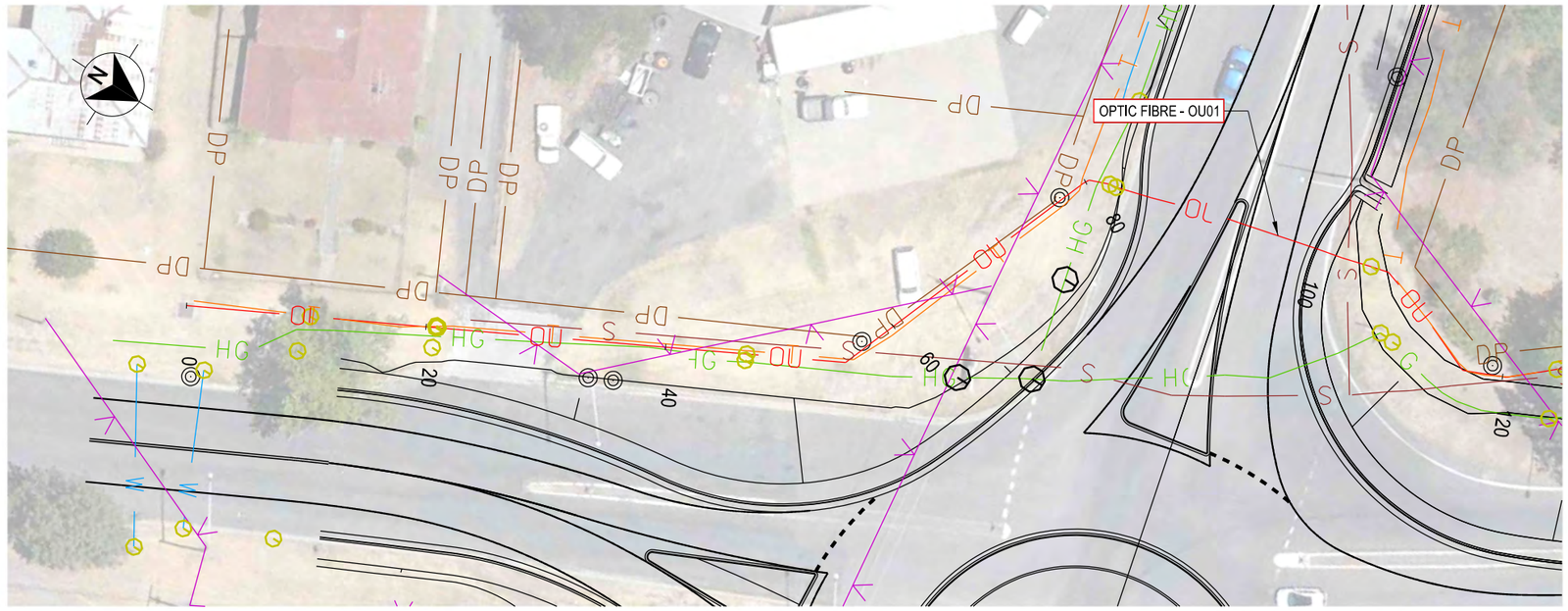
PREPARED FOR
TRANSPORT FOR NSW
REGIONAL & OUTER METROPOLITAN
ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
UTILITY PLAN
GAS MAIN - PLAN AND PROFILE - HG01 - CH.220.000 TO CH.290.737

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	UT-0308	X



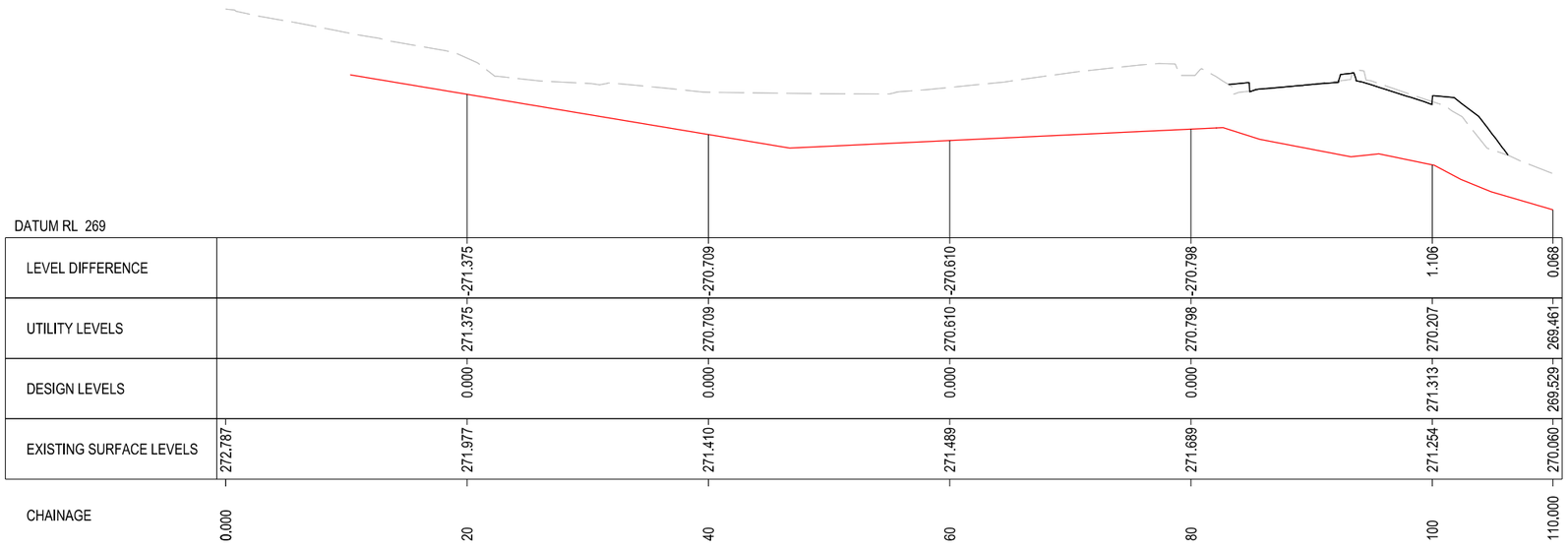
OPTIC FIBRE - PLAN - OU01

LEGEND

- MC10 — DESIGN CONTROL CALLOUT
- UTILITY - UT-XXXX — UTILITY LABEL - SHEET REFERENCE
- DP — CADASTRAL BOUNDARY OVERLAY
- PM — PERMANENT SURVEY MARK - DO NOT DISTURB
- SS — STATE SURVEY MARK - DO NOT DISTURB

UTILITES

- OU — OPTIC FIBRE
- T — TELECOMMUNICATION LINE
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER
- EXISTING POTHOLE
- PROPOSED POTHOLE



OPTIC FIBRE - LONGITUDINAL SECTION - OU01

NOTES

1. PERMANENT AND STATE SURVEY CONTROL MARKS ARE NOT TO BE DISTURBED UNLESS ASSESSED BY TRANSPORT FOR NSW SURVEY IN ACCORDANCE WITH LPI STANDARDS - FINES APPLY
2. REFER TO SHEET UT-0318 FOR SUBSURFACE UTILITY INFORMATION
3. THE FOOTINGS OF ALL LIGHT POLES SHALL BE COVERED TO ENSURE THEY DO NOT PROJECT ABOVE THE EARTH EMBANKMENT.
4. REFER TO DRAWING DS20XX / XXXXXX FOR ELECTRICAL DESIGN.

UTILITY INFORMATION SHOWN ON THE PLANS DOES NOT DEPICT ANY MORE THAN THE PRESENCE OF A SERVICE, BASED ON AVAILABLE DOCUMENTARY EVIDENCE. THE PRESENCE OF A UTILITY SERVICE, ITS SIZE AND LOCATION SHOULD BE CONFIRMED BY FIELD INSPECTION, PRIOR TO THE COMMENCEMENT OF ROADWORKS AND THE RELEVANT UTILITY PLANS OBTAINED BY DIALLING PH 1100 OR FAX 1300 652 077 (DIAL BEFORE YOU DIG). CAUTION SHOULD BE EXERCISED WHEN WORKING IN THE VICINITY OF ALL UTILITY SERVICES.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-UT.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
P-PLAN-UT.dgn A3_Border.dgn A3_Border_Legends.dgn	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: HORIZONTAL SCALE 1:500m (0 5 10 15 20); VERTICAL SCALE 1:100m (0 1 2 3 4)

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY		
TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

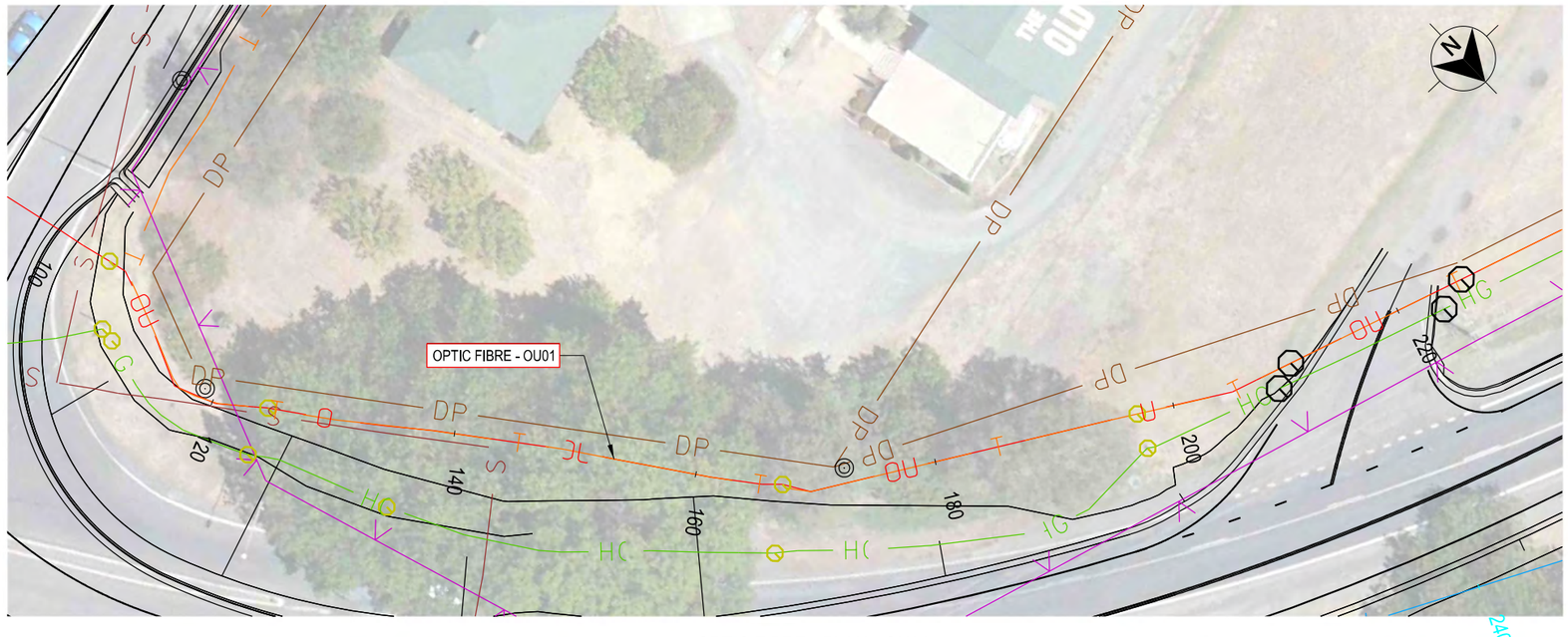
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
UTILITY PLAN
OPTIC FIBRE - PLAN AND PROFILE - OU01 - CH.0.000 TO CH.110.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	UT-0309	X



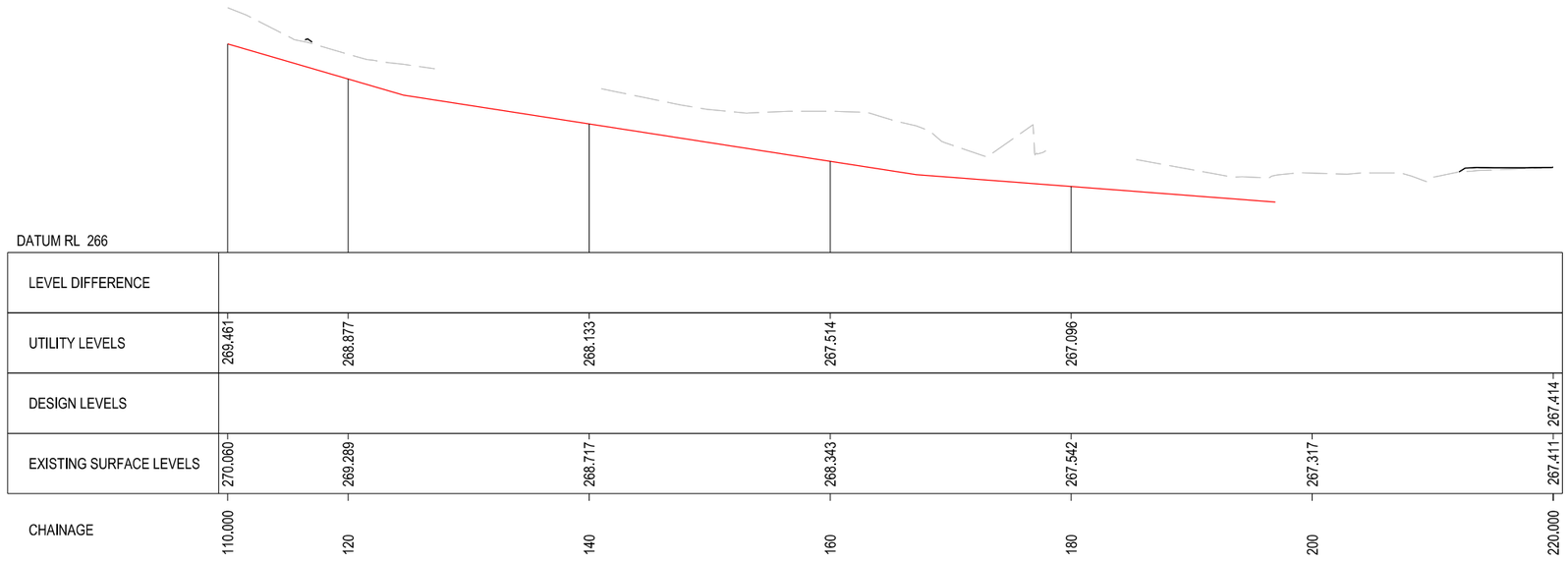
OPTIC FIBRE - PLAN - OU01

LEGEND

- MC10 — DESIGN CONTROL CALLOUT
- UTILITY - UT-XXXX — UTILITY LABEL - SHEET REFERENCE
- DP — CADASTRAL BOUNDARY OVERLAY
- PM — PERMANENT SURVEY MARK - DO NOT DISTURB
- SS — STATE SURVEY MARK - DO NOT DISTURB

UTILITES

- OU — OPTIC FIBRE
- T — TELECOMMUNICATION LINE
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER
- EXISTING POTHOLE
- PROPOSED POTHOLE



OPTIC FIBRE - LONGITUDINAL SECTION - OU01

NOTES

1. PERMANENT AND STATE SURVEY CONTROL MARKS ARE NOT TO BE DISTURBED UNLESS ASSESSED BY TRANSPORT FOR NSW SURVEY IN ACCORDANCE WITH LPI STANDARDS - FINES APPLY
2. REFER TO SHEET UT-0318 FOR SUBSURFACE UTILITY INFORMATION
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4. REFER TO DRAWING DS20XX / XXXXXX FOR ELECTRICAL DESIGN.

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NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-UT.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
P-PLAN-UT.dgn A3_Border.dgn A3_Border_Legends.dgn	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING
0 5 10 15 20
HORIZONTAL SCALE 1:500m
0 1 2 3 4
VERTICAL SCALE 1:100m
CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94)
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY		
TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

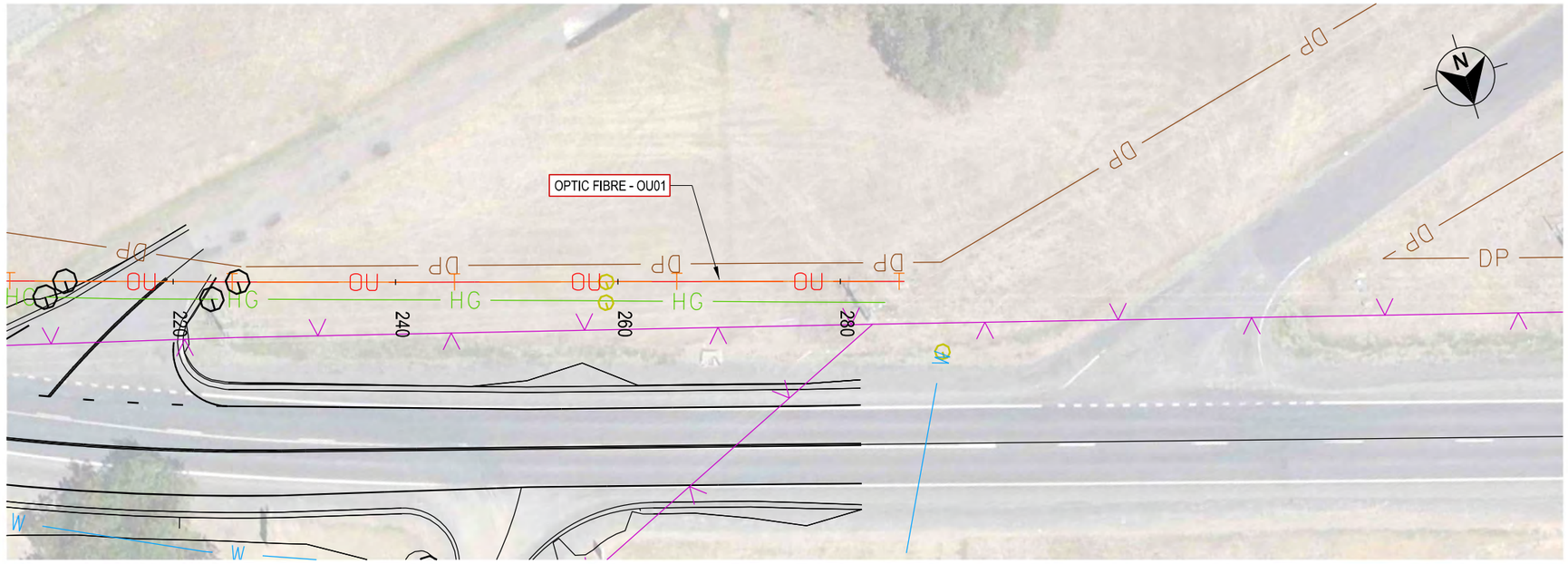
PREPARED FOR
TRANSPORT FOR NSW
REGIONAL & OUTER METROPOLITAN
ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
UTILITY PLAN
OPTIC FIBRE - PLAN AND PROFILE - OU01 - CH.110.000 TO CH.220.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	UT-0310	X



OPTIC FIBRE - PLAN - OU01

LEGEND

- MC10 — DESIGN CONTROL CALLOUT
- UTILITY - UT-XXXX — UTILITY LABEL - SHEET REFERENCE
- DP — CADASTRAL BOUNDARY OVERLAY
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UTILITES

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- T — TELECOMMUNICATION LINE
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER
- EXISTING POTHOLE
- PROPOSED POTHOLE

DATUM RL 264

LEVEL DIFFERENCE				
UTILITY LEVELS				
DESIGN LEVELS				
EXISTING SURFACE LEVELS		267.028	266.772	266.936
CHAINAGE	220.000	240	260	280

OPTIC FIBRE - LONGITUDINAL SECTION - OU01

NOTES

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4. REFER TO DRAWING DS20XX / XXXXXX FOR ELECTRICAL DESIGN.

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NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-UT.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
P-PLAN-UT.dgn A3_Border.dgn A3_Border_Legends.dgn	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING
0 5 10 15 20 HORIZONTAL SCALE 1:500m
0 1 2 3 4 VERTICAL SCALE 1:100m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY	NAME	DATE
TITLE		
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

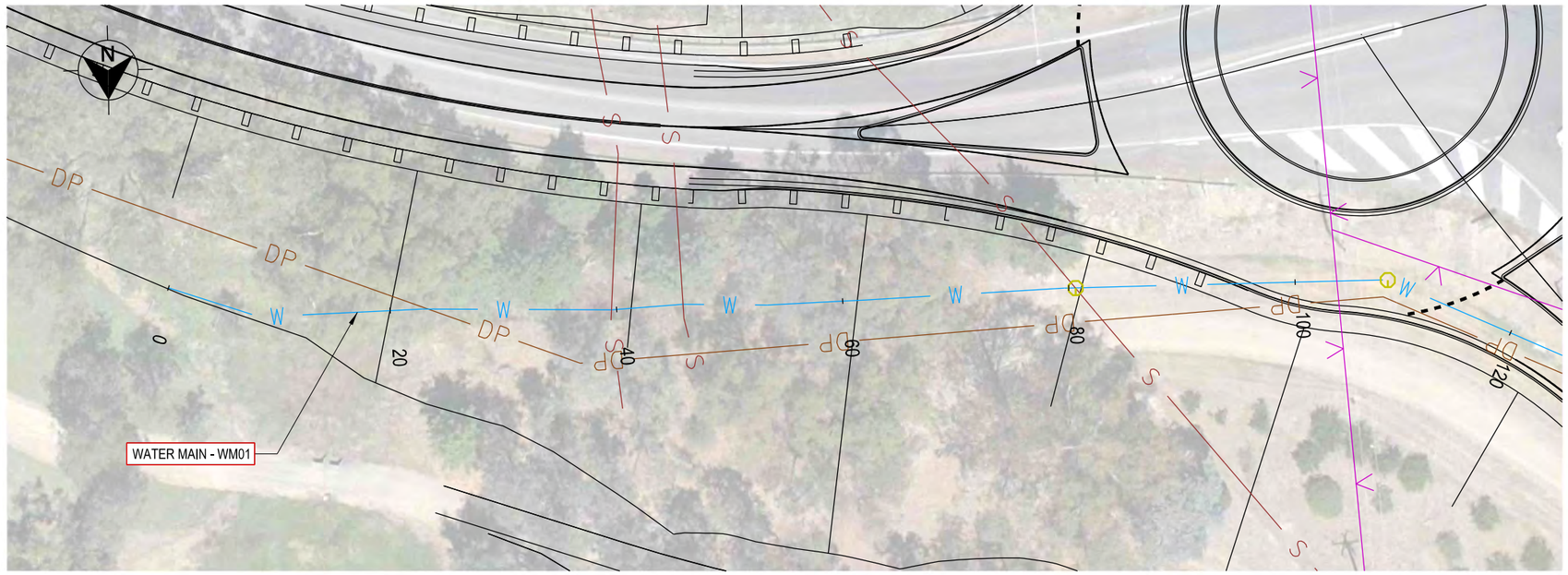
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
UTILITY PLAN
OPTIC FIBRE - PLAN AND PROFILE - OU01 - CH.220.000 TO CH.285.767

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	UT-0311	X



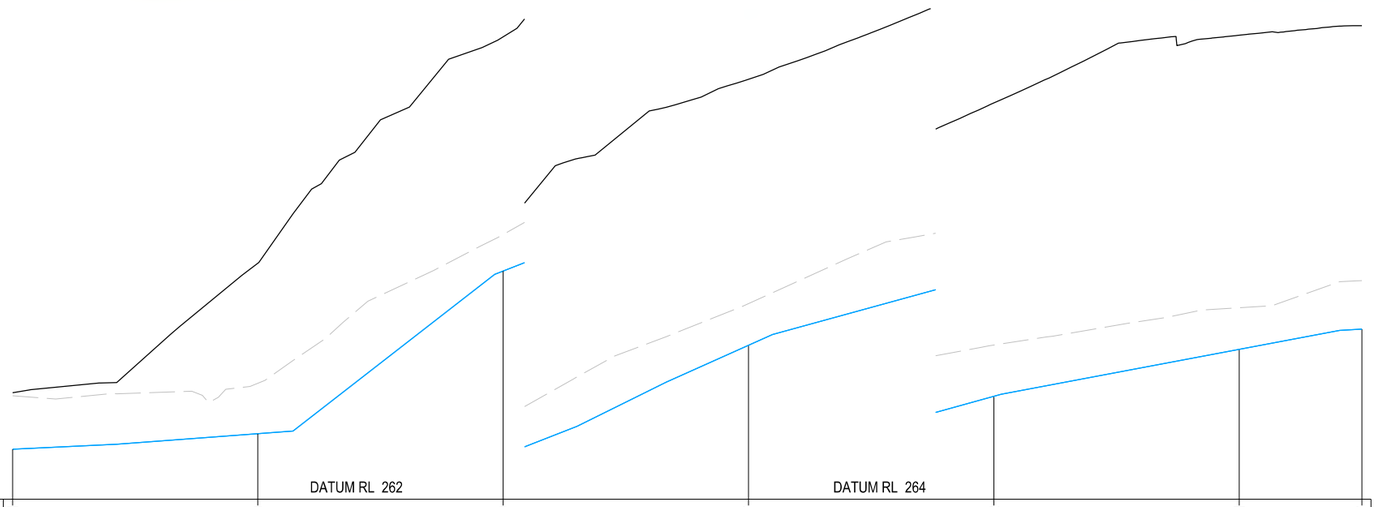
WATER MAIN - PLAN - WM01

LEGEND

- MC10 — DESIGN CONTROL CALLOUT
- UTILITY - UT-XXXX — UTILITY LABEL - SHEET REFERENCE
- DP — CADASTRAL BOUNDARY OVERLAY
- PM — PERMANENT SURVEY MARK - DO NOT DISTURB
- SS — STATE SURVEY MARK - DO NOT DISTURB

UTILITES

- OU — OPTIC FIBRE
- T — TELECOMMUNICATION LINE
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER
- EXISTING POTHOLE
- PROPOSED POTHOLE



CHAINAGE	0.000	20	40	60	80	100	110.000
LEVEL DIFFERENCE	0.921	2.780	3.819	4.337	4.782	5.121	4.947
UTILITY LEVELS	259.815	260.068	262.720	264.509	265.678	266.444	266.774
DESIGN LEVELS	260.736	262.848	266.539	268.847	270.460	271.565	271.721
EXISTING SURFACE LEVELS	260.687	260.892	263.315	265.190	266.513	267.122	267.563

WATER MAIN - LONGITUDINAL SECTION - WM01

NOTES

1. PERMANENT AND STATE SURVEY CONTROL MARKS ARE NOT TO BE DISTURBED UNLESS ASSESSED BY TRANSPORT FOR NSW SURVEY IN ACCORDANCE WITH LPI STANDARDS - FINES APPLY
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4. REFER TO DRAWING DS20XX / XXXXXX FOR ELECTRICAL DESIGN.

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NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-UT.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
P-PLAN-UT.dgn A3_Border.dgn A3_Border_Legends.dgn	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING
0 5 10 15 20
HORIZONTAL SCALE 1:500m
0 1 2 3 4
VERTICAL SCALE 1:100m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94)
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ROAD DESIGN SOUTH

PLOT DATE / TIME	PLOT BY	
TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

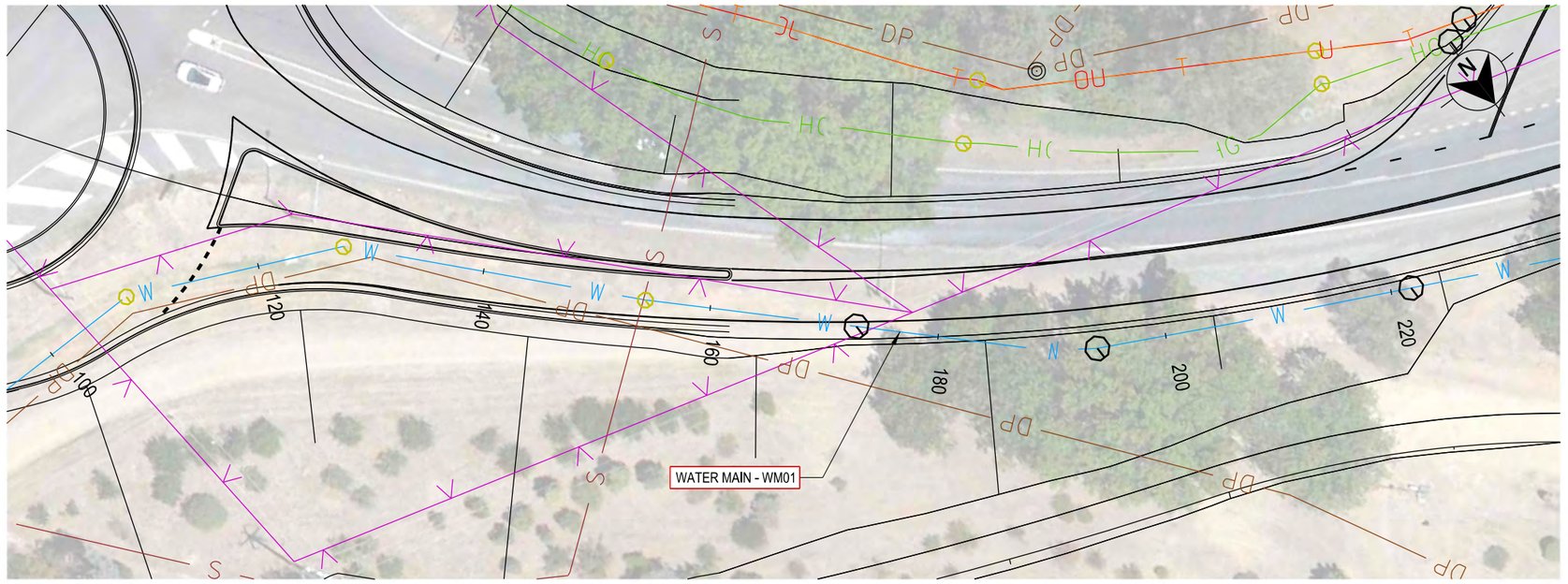
PREPARED FOR
TRANSPORT FOR NSW
REGIONAL & OUTER METROPOLITAN
ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
UTILITY PLAN
WATER MAIN - PLAN AND PROFILE - WM01 - CH.0.000 TO CH.110.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	UT-0312	X



WATER MAIN - PLAN - WM01

LEGEND

- MC10 — DESIGN CONTROL CALLOUT
- UTILITY - UT-XXXX — UTILITY LABEL - SHEET REFERENCE
- DP — CADASTRAL BOUNDARY OVERLAY
- PM — PERMANENT SURVEY MARK - DO NOT DISTURB
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UTILITES

- OU — OPTIC FIBRE
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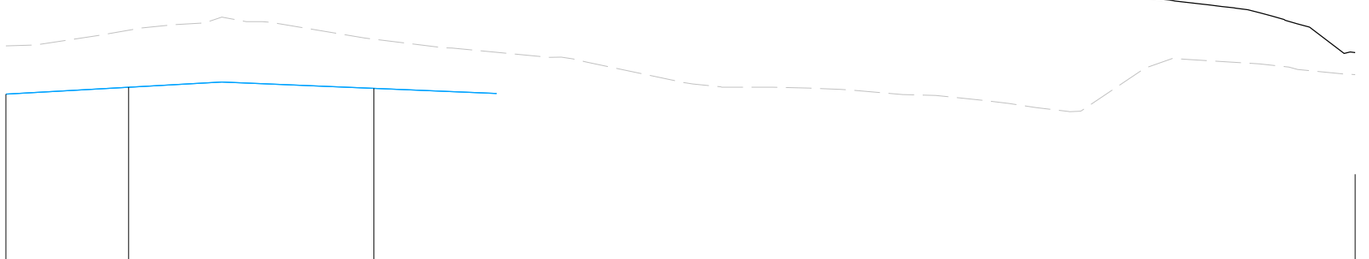
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER
- EXISTING POTHOLE
- PROPOSED POTHOLE



DATUM RL 264

LEVEL DIFFERENCE	4.947	4.773	4.281				
UTILITY LEVELS	266.774	266.887	266.870				
DESIGN LEVELS	271.721	271.660	271.150	270.313	269.393	268.431	267.451
EXISTING SURFACE LEVELS	267.563	267.817	267.670	267.186	266.824	266.818	267.092
CHAINAGE	110.000	120	140	160	180	200	220.000

WATER MAIN - LONGITUDINAL SECTION - WM01

NOTES

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NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-UT.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES: P-PLAN-UT.dgn, A3_Border.dgn, A3_Border_Legends.dgn

REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: HORIZONTAL SCALE 1:500m (0 5 10 15 20); VERTICAL SCALE 1:100m (0 1 2 3 4)

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY

	TITLE	NAME	DATE
	DRAWN	X. X. XXXXXXXX	XX.XX.XX
	DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
	DESIGN	X. X. XXXXXXXX	XX.XX.XX
	DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
	DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
	PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

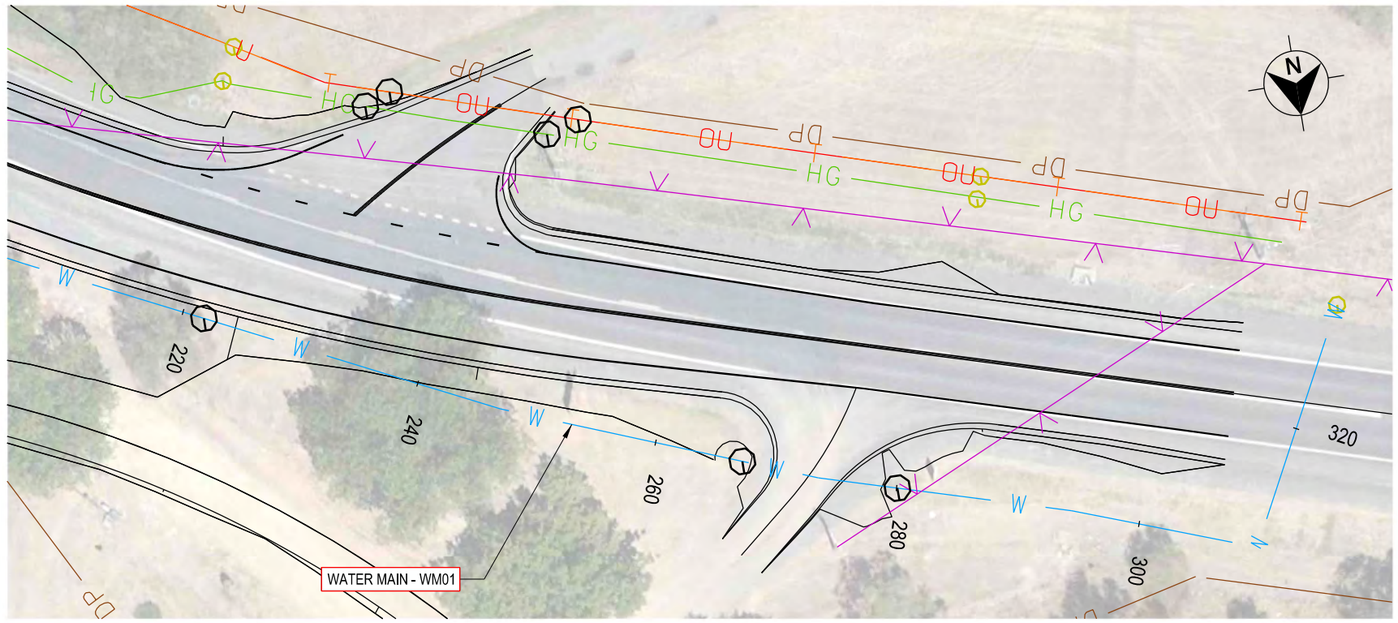
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
UTILITY PLAN
WATER MAIN - PLAN AND PROFILE - WM01 - CH.110.000 TO CH.220.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	UT-0313	X



WATER MAIN - PLAN - WM01

LEGEND

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- UTILITY - UT-XXXX — UTILITY LABEL - SHEET REFERENCE
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- OVERHEAD POWER
- EXISTING POTHOLE
- PROPOSED POTHOLE

	220.000	240	260	280	300	320	330.000
DATUM RL 262							
LEVEL DIFFERENCE							
UTILITY LEVELS		265.469	265.469	265.469	265.469	265.180	
DESIGN LEVELS							
EXISTING SURFACE LEVELS		266.978	266.360	266.430	266.381	267.427	266.819
CHAINAGE							

WATER MAIN - LONGITUDINAL SECTION - WM01

NOTES

1. PERMANENT AND STATE SURVEY CONTROL MARKS ARE NOT TO BE DISTURBED UNLESS ASSESSED BY TRANSPORT FOR NSW SURVEY IN ACCORDANCE WITH LPI STANDARDS - FINES APPLY
2. REFER TO SHEET UT-0318 FOR SUBSURFACE UTILITY INFORMATION
3. THE FOOTINGS OF ALL LIGHT POLES SHALL BE COVERED TO ENSURE THEY DO NOT PROJECT ABOVE THE EARTH EMBANKMENT.
4. REFER TO DRAWING DS20XX / XXXXXX FOR ELECTRICAL DESIGN.

UTILITY INFORMATION SHOWN ON THE PLANS DOES NOT DEPICT ANY MORE THAN THE PRESENCE OF A SERVICE, BASED ON AVAILABLE DOCUMENTARY EVIDENCE. THE PRESENCE OF A UTILITY SERVICE, ITS SIZE AND LOCATION SHOULD BE CONFIRMED BY FIELD INSPECTION, PRIOR TO THE COMMENCEMENT OF ROADWORKS AND THE RELEVANT UTILITY PLANS OBTAINED BY DIALLING PH 1100 OR FAX 1300 652 077 (DIAL BEFORE YOU DIG). CAUTION SHOULD BE EXERCISED WHEN WORKING IN THE VICINITY OF ALL UTILITY SERVICES.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-UT.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
P-PLAN-UT.dgn A3_Border.dgn A3_Border_Legends.dgn	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING
0 5 10 15 20 — HORIZONTAL SCALE 1:500m
0 1 2 3 4 — VERTICAL SCALE 1:100m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

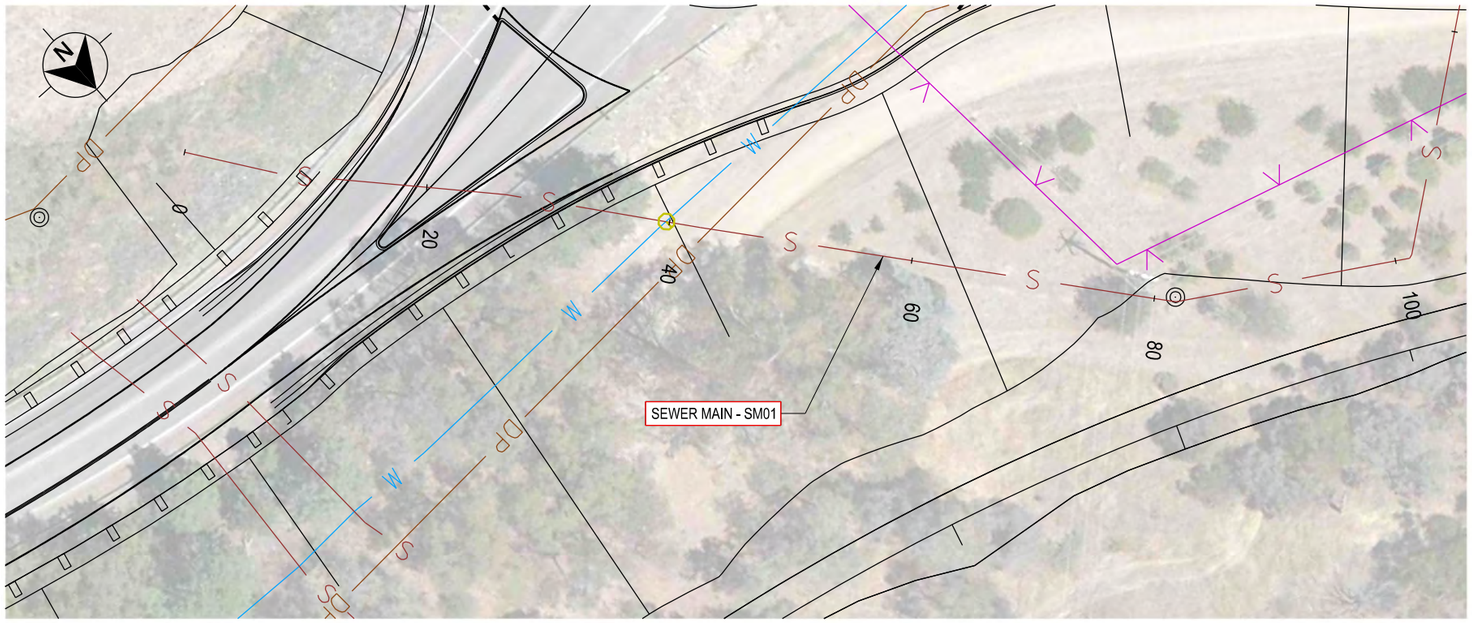
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
UTILITY PLAN
WATER MAIN - PLAN AND PROFILE - WM01 - CH.220.000 TO CH.330.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	UT-0314	X



SEWER MAIN - PLAN - SM01

LEGEND

- MC10 — DESIGN CONTROL CALLOUT
- UTILITY - UT-XXXX — UTILITY LABEL - SHEET REFERENCE
- DP — CADASTRAL BOUNDARY OVERLAY
- PM — PERMANENT SURVEY MARK - DO NOT DISTURB
- SS — STATE SURVEY MARK - DO NOT DISTURB

UTILITES

- OU — OPTIC FIBRE
- T — TELECOMMUNICATION LINE
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER
- EXISTING POTHOLE
- PROPOSED POTHOLE

DATUM RL 264 — DATUM RL 261

LEVEL DIFFERENCE						2.464	3.829
UTILITY LEVELS						263.219	263.982
DESIGN LEVELS	268.484	271.072	270.441	268.229	265.449	265.683	267.811
EXISTING SURFACE LEVELS	266.582	270.584	266.493	266.037	265.504	265.354	266.152
CHAINAGE	0.000	20	40	60	80	100	110.000

SEWER MAIN - LONGITUDINAL SECTION - SM01

NOTES

1. PERMANENT AND STATE SURVEY CONTROL MARKS ARE NOT TO BE DISTURBED UNLESS ASSESSED BY TRANSPORT FOR NSW SURVEY IN ACCORDANCE WITH LPI STANDARDS - FINES APPLY
2. REFER TO SHEET UT-0318 FOR SUBSURFACE UTILITY INFORMATION
3. THE FOOTINGS OF ALL LIGHT POLES SHALL BE COVERED TO ENSURE THEY DO NOT PROJECT ABOVE THE EARTH EMBANKMENT.
4. REFER TO DRAWING DS20XX / XXXXXX FOR ELECTRICAL DESIGN.

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NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-UT.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

SCALES ON A3 SIZE DRAWING
HORIZONTAL SCALE 1:500m (0 5 10 15 20)
VERTICAL SCALE 1:100m (0 1 2 3 4)

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94)
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
P-PLAN-UT.dgn A3_Border.dgn A3_Border_Legends.dgn	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

PLOT DATE / TIME	PLOT BY		
TITLE	NAME	DATE	
DRAWN	X. X. XXXXXXXX	XX.XX.XX	
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX	
DESIGN	X. X. XXXXXXXX	XX.XX.XX	
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX	
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX	
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX	

CLIENT: NSW GOVERNMENT Transport for NSW

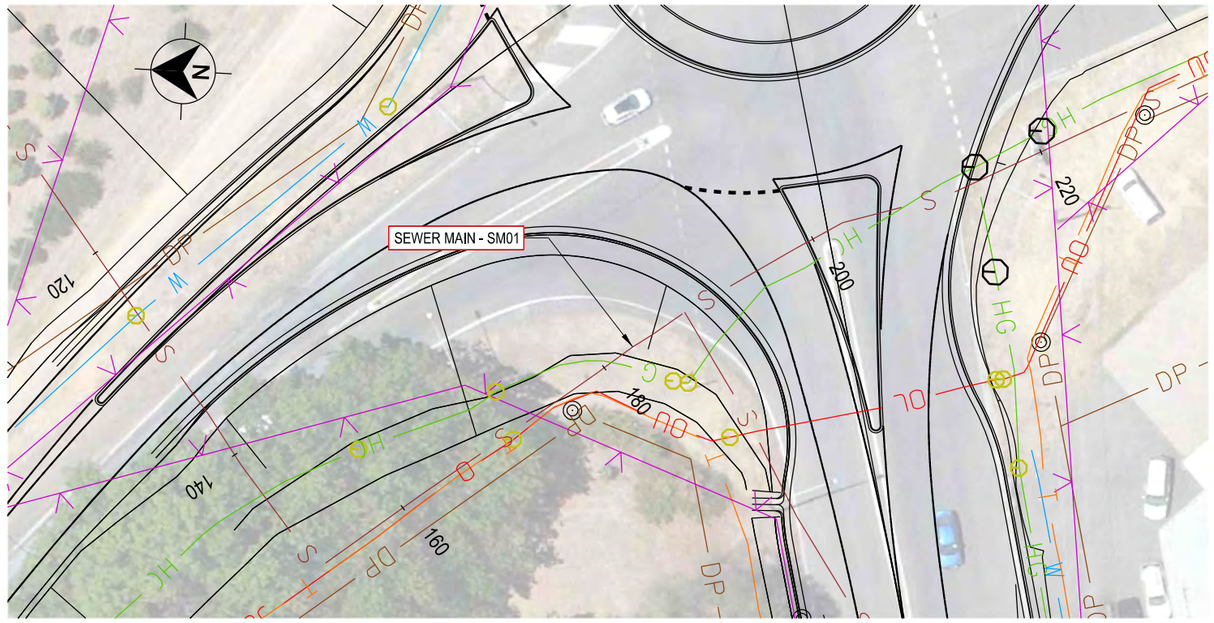
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN, ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
UTILITY PLAN
SEWER MAIN - PLAN AND PROFILE - SM01 - CH.0.000 TO CH.110.000

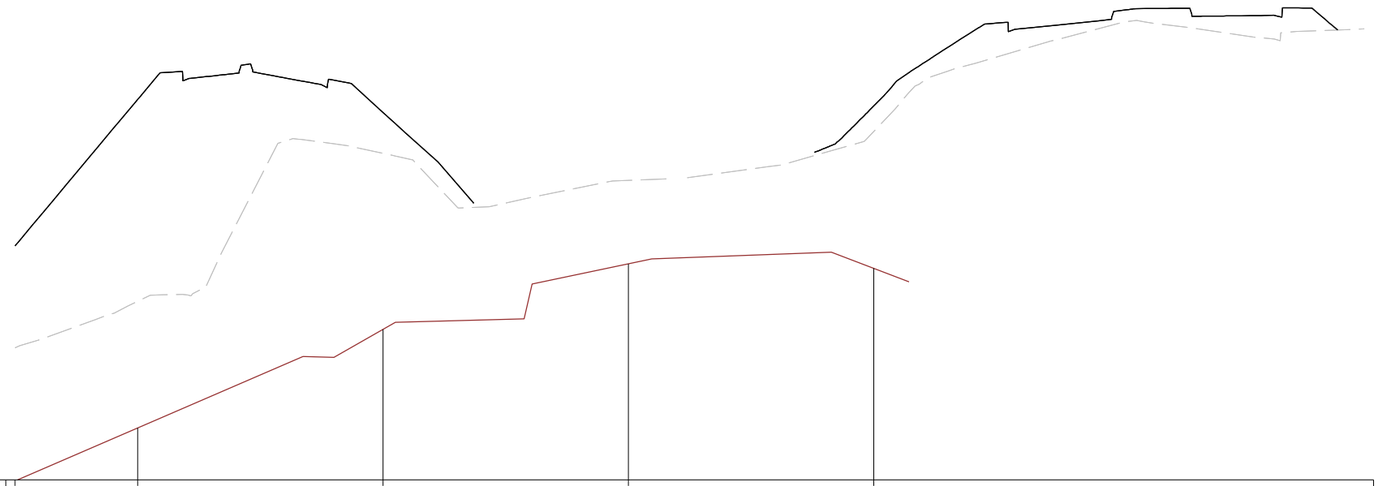
A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	UT-0315	X



SEWER MAIN - PLAN - SM01



LEVEL DIFFERENCE	3.829		5.353		3.536		1.816		2.644														
UTILITY LEVELS	263.982		264.847		266.452		267.520		267.448														
DESIGN LEVELS	267.811		270.200		269.988		269.336		270.092		271.644												
EXISTING SURFACE LEVELS	266.152		266.910		269.321		268.880		269.677		271.441		271.351										
CHAINAGE	110.000		120		140		160		180		200		220.000										

SEWER MAIN - LONGITUDINAL SECTION - SM01

LEGEND

- MC10 — DESIGN CONTROL CALLOUT
- UTILITY - UT-XXXX — UTILITY LABEL - SHEET REFERENCE
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UTILITES

- OU — OPTIC FIBRE
- T — TELECOMMUNICATION LINE
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER
- EXISTING POTHOLE
- PROPOSED POTHOLE

NOTES

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NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-UT.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
P-PLAN-UT.dgn A3_Border.dgn A3_Border_Legends.dgn	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING
HORIZONTAL SCALE 1:500m (0 5 10 15 20)
VERTICAL SCALE 1:100m (0 1 2 3 4)
CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94)
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME	PLOT BY	
TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

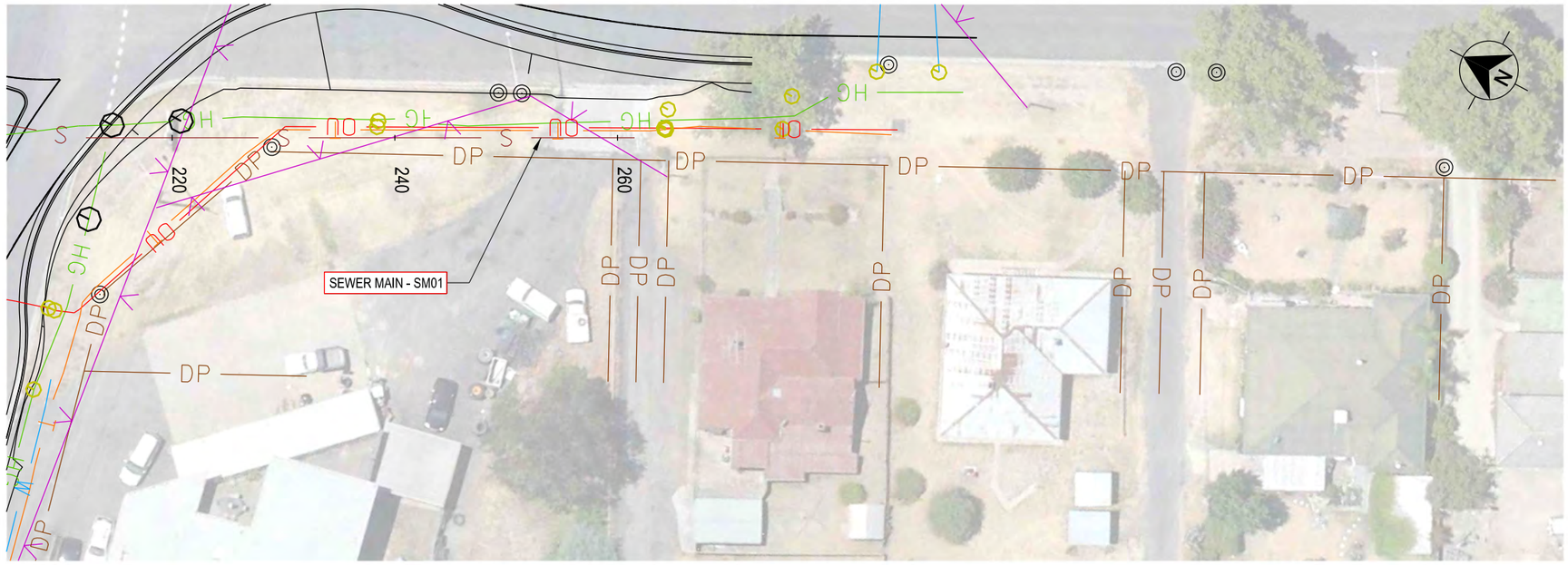
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
UTILITY PLAN
SEWER MAIN - PLAN AND PROFILE - SM01 - CH.110.000 TO CH.220.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	UT-0316	X



SEWER MAIN - PLAN - SM01

LEGEND

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UTILITES

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- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER
- EXISTING POTHOLE
- PROPOSED POTHOLE

DATUM RL 267

LEVEL DIFFERENCE			
UTILITY LEVELS			
DESIGN LEVELS			
EXISTING SURFACE LEVELS		271.428	271.724
CHAINAGE	220.000	240	260

SEWER MAIN - LONGITUDINAL SECTION - SM01

NOTES

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0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-UT.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
P-PLAN-UT.dgn A3_Border.dgn A3_Border_Legends.dgn	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING
HORIZONTAL SCALE 1:500m (0 5 10 15 20)
VERTICAL SCALE 1:100m (0 1 2 3 4)
CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94)
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY	NAME	DATE
TITLE		
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
UTILITY PLAN
SEWER MAIN - PLAN AND PROFILE - SM01 - CH.220.000 TO CH.261.534

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	UT-0317	X

TfNSW DISCLAIMER FOR UTILITY MODEL

THE LOCATIONS OF UTILITIES, WHICH WERE REPORTED TO EXIST AT THE TIME OF SURVEY, WERE COMPILED FROM A COMBINATION OF FIELD TECHNIQUES AND AVAILABLE DATA FROM CO-OPERATING UTILITY AUTHORITIES.

WHILST ALL CARE WAS TAKEN IN LOCATING THE UTILITIES, THE ROADS AND TRAFFIC AUTHORITY CANNOT GUARANTEE THAT THE LOCATIONS DETERMINED BY THIS SURVEY ARE WITHOUT FLAW OF ANY KIND. THEREFORE, THE AUTHORITY EXPRESSLY DISCLAIMS ALL LIABILITY FOR ERRORS OR OMISSIONS OF ANY KIND WHATSOEVER OR FROM ANY LOSS, DAMAGE OR OTHER CONSEQUENCES THAT MAY ARISE FROM ANY PERSON RELYING ON THE LOCATIONS OF UTILITIES DETERMINED BY THIS SURVEY.

IT IS RECOMMENDED THAT THE USERS UNDERTAKE "POTHOLING" TO DIRECTLY CONFIRM LOCATIONS WHERE CONFLICT WITH CONSTRUCTION/DESIGN MAY OCCUR. DUE CAUTION SHOULD ALSO BE EXERCISED DURING ANY EXCAVATION ACTIVITY IN PLACES WHERE UTILITIES MAY REASONABLY BE EXPECTED TO OCCUR, WHETHER LOCATED OR NOT.

THIS REPORT DOES NOT REPLACE THE LEGAL REQUIREMENT FOR A CURRENT DIAL BEFORE YOU DIG SEARCH ON SITE AT THE TIME OF ANY EXCAVATION, BORING OR OTHER WORKS THAT MAY INTERFERE WITH BURIED UTILITIES. PLEASE NOTE UNDER NEW LEGISLATION "ENERGY LEGISLATION AMENDMENT (INFRASTRUCTURE PROTECTION) ACT 2009 NO 31" PENALTIES FOR FAILURE TO HAVE CURRENT DIAL BEFORE YOU DIG PLANS ON SITE WHEN EXCAVATING INCLUDE: PERSONAL AND COMPANY FINES. THESE FINES ARE IN ADDITION TO COSTS REQUIRED TO RESTORE ANY DAMAGED UTILITIES.

SURVEY 20191007 UTILITY METADATA

QUALITY LEVEL A: HIGHEST QUALITY / POTHOLED

POTHOLE	DATE	EASTING	NORTHING	RL	Measured Depth	ASSET TYPE	MATERIAL	DIAMETER (m)	Surveyed	HZL ACC. (+/-)	VRT ACC. (+/-)	COMMENTS
1	Apr-2019	610577.009	6093495.187	270.061	-1.557	WATER	CU	0.025	Top Centre	0.010	0.010	
2	Apr-2019	610573.512	6093497.827	270.791	-0.941	WATER	CU	0.025	Top Centre	0.010	0.010	
3	Apr-2019	610570.215	6093504.602	270.171	-1.383	WATER	PVC	0.150	Top Centre	0.010	0.010	
4	Apr-2019	610552.983	6093497.306	271.697	-0.690	OPTIC	AC	0.100	Top Centre	0.010	0.010	
5	Apr-2019	610555.973	6093497.936	270.960	-1.134	WATER	PVC	0.150	Top Centre	0.010	0.010	
6	Apr-2019	610564.045	6093487.260	271.487	-0.789	WATER	CU	0.025	Top Centre	0.010	0.010	
7	Apr-2019	610561.493	6093492.228	271.326	-0.741	WATER	CU	0.025	Top Centre	0.010	0.010	
8	Apr-2019	610548.060	6093506.741	271.626	-0.266	WATER	CU	0.025	Top Centre	0.010	0.010	
9	Apr-2019	610548.165	6093506.636	271.358	-0.545	OPTIC	AC	0.100	Top Centre	0.010	0.010	
10	Apr-2019	610548.028	6093506.562	271.590	-0.335	WATER	PVC	0.150	Top Centre	0.010	0.010	
11	Apr-2019	610549.730	6093507.236	271.018	-0.656	WATER	PVC	0.150	Top Centre	0.010	0.010	
12	Apr-2019	610508.049	6093547.558	270.820	-0.849	OPTIC	AC	0.100	Top Centre	0.010	0.010	
13	Apr-2019	610507.975	6093548.134	270.823	-0.771	OPTIC	AC	0.100	Top Centre	0.010	0.010	
14	Apr-2019	610536.159	6093529.608	270.485	-0.908	OPTIC	AC	0.100	Top Centre	0.010	0.010	
15	Apr-2019	610536.663	6093529.784	270.601	-0.755	WATER	STEEL	0.025	Top Centre	0.010	0.010	DISUSED SERVICE - 2 PIPES FD.
16	Apr-2019	610500.885	6093545.915	271.011	-0.747	GAS	PE	0.040	Top Centre	0.010	0.010	
17	Apr-2019	610473.864	6093539.603	271.680	-0.603	GAS	PE	0.040	Top Centre	0.010	0.010	
18	Apr-2019	610474.158	6093537.873	271.948	-0.634	OPTIC	AC	0.100	Top Centre	0.010	0.010	
19	Apr-2019	610431.621	6093528.822	272.204	-0.730	WATER	PVC	0.150	Top Centre	0.010	0.010	
20	Apr-2019	610431.498	6093529.384	272.179	-0.713	WATER	PVC	0.125	Top Centre	0.010	0.010	
21	Apr-2019	610431.696	6093528.774	272.358	-0.579	OPTIC	AC	0.100	Top Centre	0.010	0.010	
22	Apr-2019	610383.616	6093516.637	273.204	-0.465	WATER	STEEL	0.150	Top Centre	0.010	0.010	
23	Apr-2019	610383.285	6093517.607	273.250	-0.323	OPTIC	CONC	0.150	Top Centre	0.010	0.010	
24	Apr-2019	610502.174	6093569.569	269.760	-0.702	OPTIC	AC	0.150	Top Centre	0.010	0.010	
25	Apr-2019	610506.416	6093573.181	269.804	-0.511	GAS	PE	0.090	Top Centre	0.010	0.010	
26	Apr-2019	610506.524	6093574.417	269.591	-0.566	GAS	PE	0.090	Top Centre	0.010	0.010	
27	Apr-2019	610504.899	6093588.823	268.382	-0.917	GAS	PE	0.063	Top Centre	0.010	0.010	
28	Apr-2019	610501.082	6093587.208	268.610	-0.512	OPTIC	AC	0.150	Top Centre	0.010	0.010	
29	Apr-2019	610499.644	6093599.753	268.477	-0.590	GAS	PE	0.063	Top Centre	0.010	0.010	
30	Apr-2019	610479.293	6093624.394	267.571	-0.631	GAS	PE	0.063	Top Centre	0.010	0.010	
31	Apr-2019	610474.962	6093620.753	267.293	-0.808	OPTIC	AC	0.150	Top Centre	0.010	0.010	
32	Apr-2019	610451.328	6093639.205	266.533	-0.615	GAS	PE	0.063	Top Centre	0.010	0.010	
33	Apr-2019	610450.014	6093636.591	266.837	-0.443	OPTIC	AC	0.150	Top Centre	0.010	0.010	
34	Apr-2019	610364.557	6093671.698	265.728	-1.049	WATER	STEEL	0.375	Top Centre	0.010	0.010	MAYBE STEEL/COLOURED GREEN
35	Apr-2019	610392.162	6093658.506	266.259	-0.424	TEL	PVC	0.025	Top Centre	0.010	0.010	DISUSED SERVICE, NO GAS FD.
36	Apr-2019	610391.589	6093656.742	266.226	-0.543	OPTIC	AC	0.150	Top Centre	0.010	0.010	
37	Apr-2019	610509.583	6093618.427	266.752	-0.622	WATER	STEEL	0.375	Top Centre	0.010	0.010	MAYBE STEEL/COLOURED GREEN
38	Apr-2019	610527.651	6093598.779	266.972	-1.059	WATER	STEEL	0.375	Top Centre	0.010	0.010	MAYBE STEEL/COLOURED GREEN
39	Apr-2019	610545.330	6093590.770	266.754	-0.792	WATER	STEEL	0.375	Top Centre	0.010	0.010	MAYBE STEEL/COLOURED GREEN
40	Apr-2019	610572.909	6093591.009	265.711	-0.821	WATER	STEEL	0.375	Top Centre	0.010	0.010	MAYBE STEEL/COLOURED GREEN
41	Apr-2019	610426.934	6093548.883	271.569	-0.697	WATER	STEEL	0.100	Top Centre	0.010	0.010	

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

0 5 10 15 20 25 30 35 40 45

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-UT.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

PLOT DATE / TIME / PLOT BY

CLIENT: NSW GOVERNMENT Transport for NSW

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
UTILITY PLAN
SUBSURFACE UTILITY INFORMATION METADATA

A3

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: NOT TO SCALE

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

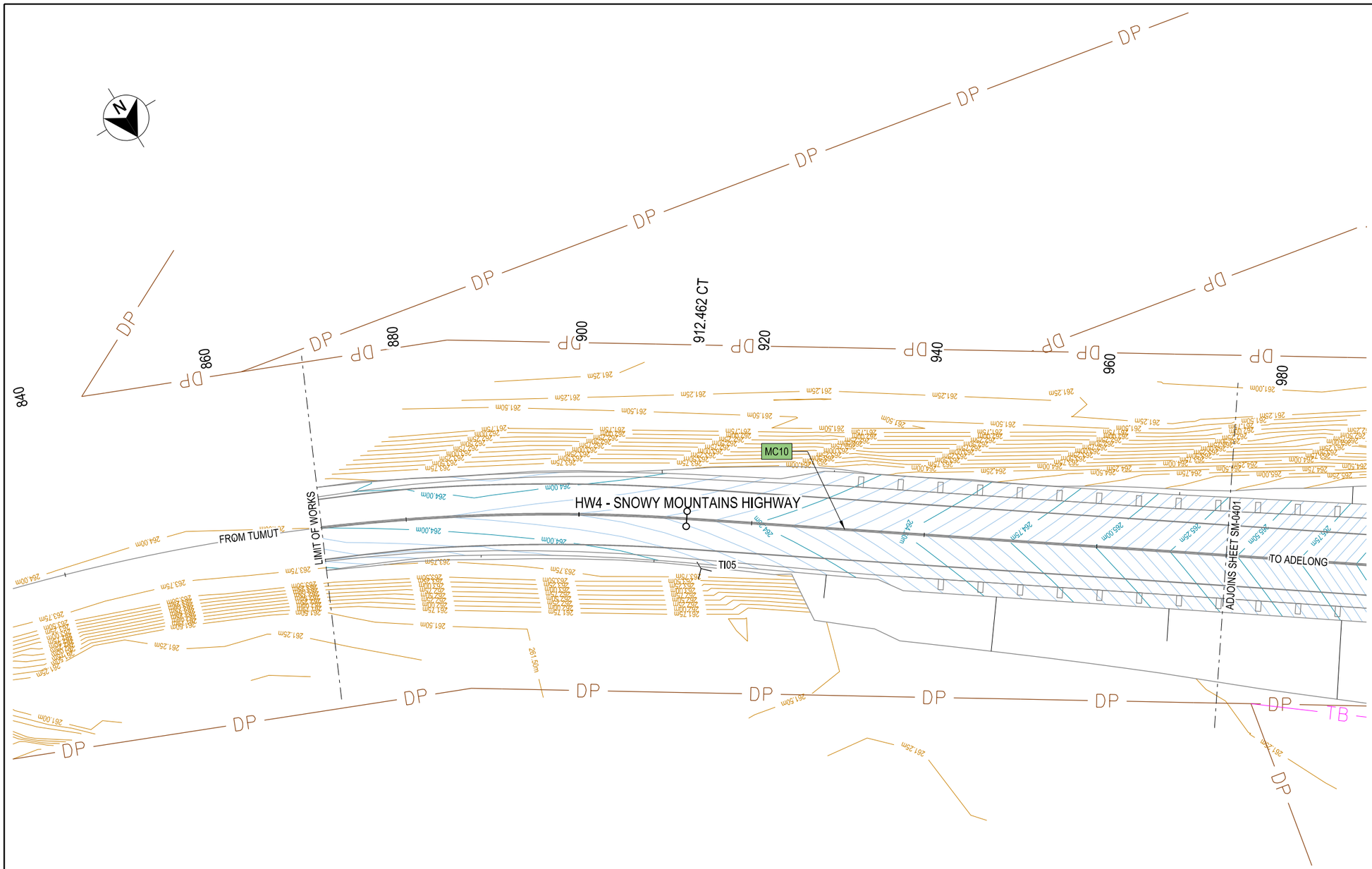
DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

	TITLE	NAME	DATE
	DRAWN	X. X. XXXXXXXX	XX.XX.XX
	DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
	DESIGN	X. X. XXXXXXXX	XX.XX.XX
	DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
	DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
	PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	UT-0318	X



LEGEND

- DT1.1 / 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- CATCH DRAIN - LINED
- IF — PAVEMENT INTERFACE DRAIN
- TD — SUBSURFACE VERGE DRAIN
- SUBSURFACE DRAIN OUTLET
- ROCK PROTECTION
- OU — OPTIC FIBRE
- T — TELECOMMUNICATION LINE
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER

NOTES

1. REFER TO SHEET SM-XXXX FOR DRAINAGE SETOUT DETAILS.
2. REFER TO TRANSPORT FOR NSW STANDARD DRAWING R0240-01 FOR INSTALLATION OF CONCRETE PIPES.
3. REFER TO TRANSPORT FOR NSW STANDARD DRAWING SERIES R0210 FOR STANDARD HEADWALL DETAILS AND R0220 FOR STANDARD GULLY PIT DETAILS.
4. UNLESS OTHERWISE SPECIFIED, ROCK PROTECTION FOR CULVERT HEADWALLS SHALL BE NOMIAL 300mm DIA ('D50') AND A LENGTH APPROXIMATELY 4 TIMES THE PIPE DIA. OF THE CULVERT.
5. REFER TO SHEET SM-XXXX FOR TYPICAL ROCK PROTECTION DETAILS

UTILITY INFORMATION SHOWN ON THE PLANS DOES NOT DEPICT ANY MORE THAN THE PRESENCE OF A SERVICE, BASED ON AVAILABLE DOCUMENTARY EVIDENCE. THE PRESENCE OF A UTILITY SERVICE, ITS SIZE AND LOCATION SHOULD BE CONFIRMED BY FIELD INSPECTION, PRIOR TO THE COMMENCEMENT OF ROADWORKS AND THE RELEVANT UTILITY PLANS OBTAINED BY DIALLING PH 1100 OR FAX 1300 652 077 (DIAL BEFORE YOU DIG). CAUTION SHOULD BE EXERCISED WHEN WORKING IN THE VICINITY OF ALL UTILITY SERVICES.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-SM.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) | HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY	TITLE	NAME	DATE
	DRAWN	X. X. XXXXXXXX	XX.XX.XX
	DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
	DESIGN	X. X. XXXXXXXX	XX.XX.XX
	DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
	DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
	PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

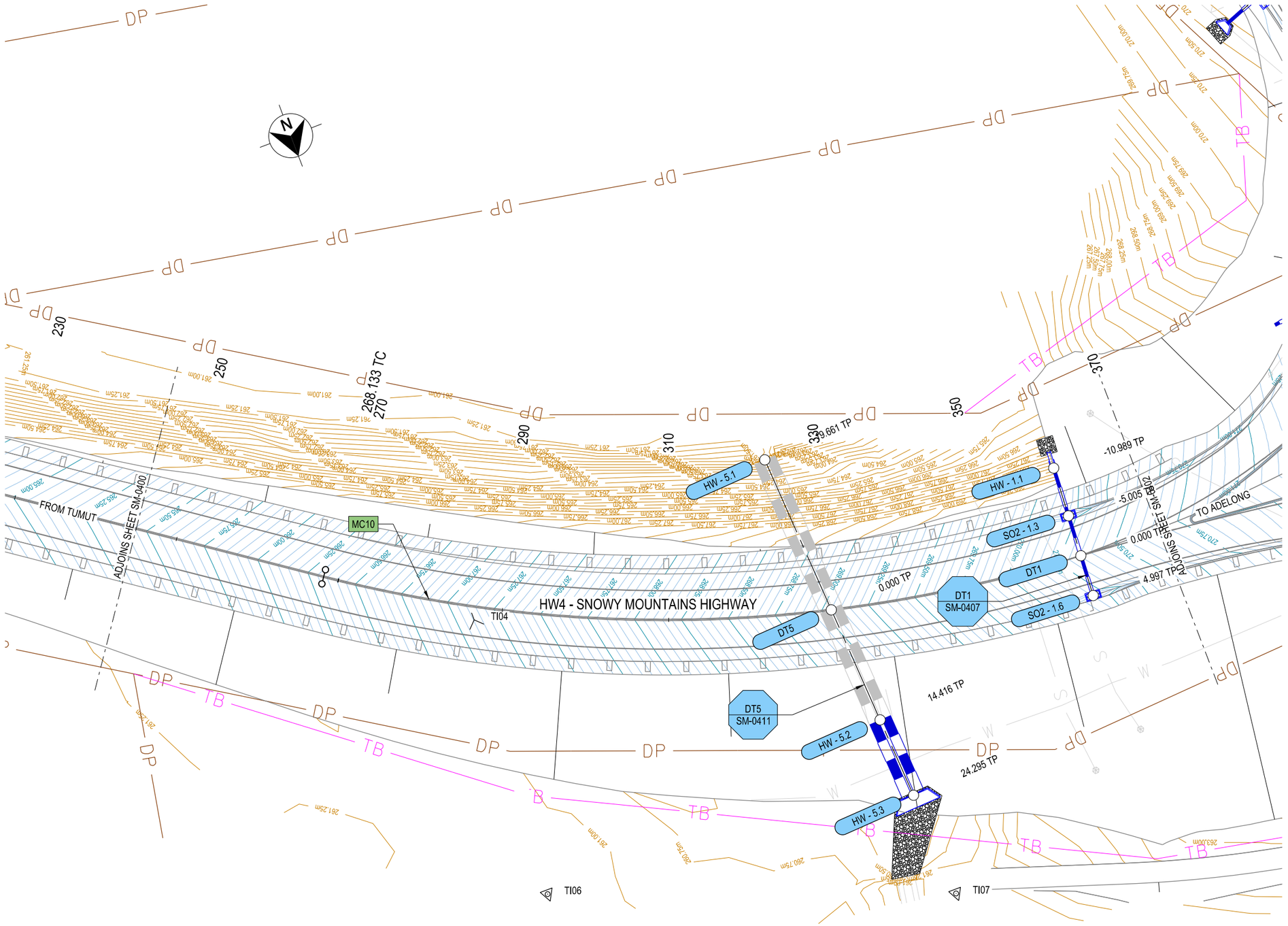
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN, ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
STORMWATER MANAGEMENT PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH. 870.000 TO CH. 975.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	SM-0400	X



LEGEND

- DT1.1 / 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- CATCH DRAIN - LINED
- IF — PAVEMENT INTERFACE DRAIN
- TD — SUBSURFACE VERGE DRAIN
- SUBSURFACE DRAIN OUTLET
- ROCK PROTECTION
- OU — OPTIC FIBRE
- T — TELECOMMUNICATION LINE
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER

NOTES

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3. REFER TO TRANSPORT FOR NSW STANDARD DRAWING SERIES R0210 FOR STANDARD HEADWALL DETAILS AND R0220 FOR STANDARD GULLY PIT DETAILS.
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5. REFER TO SHEET SM-XXXX FOR TYPICAL ROCK PROTECTION DETAILS

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NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-SM.dgn
DESIGN LOT CODE: XXXXXXX
DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING
PLOT DATE / TIME / PLOT BY

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m
CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

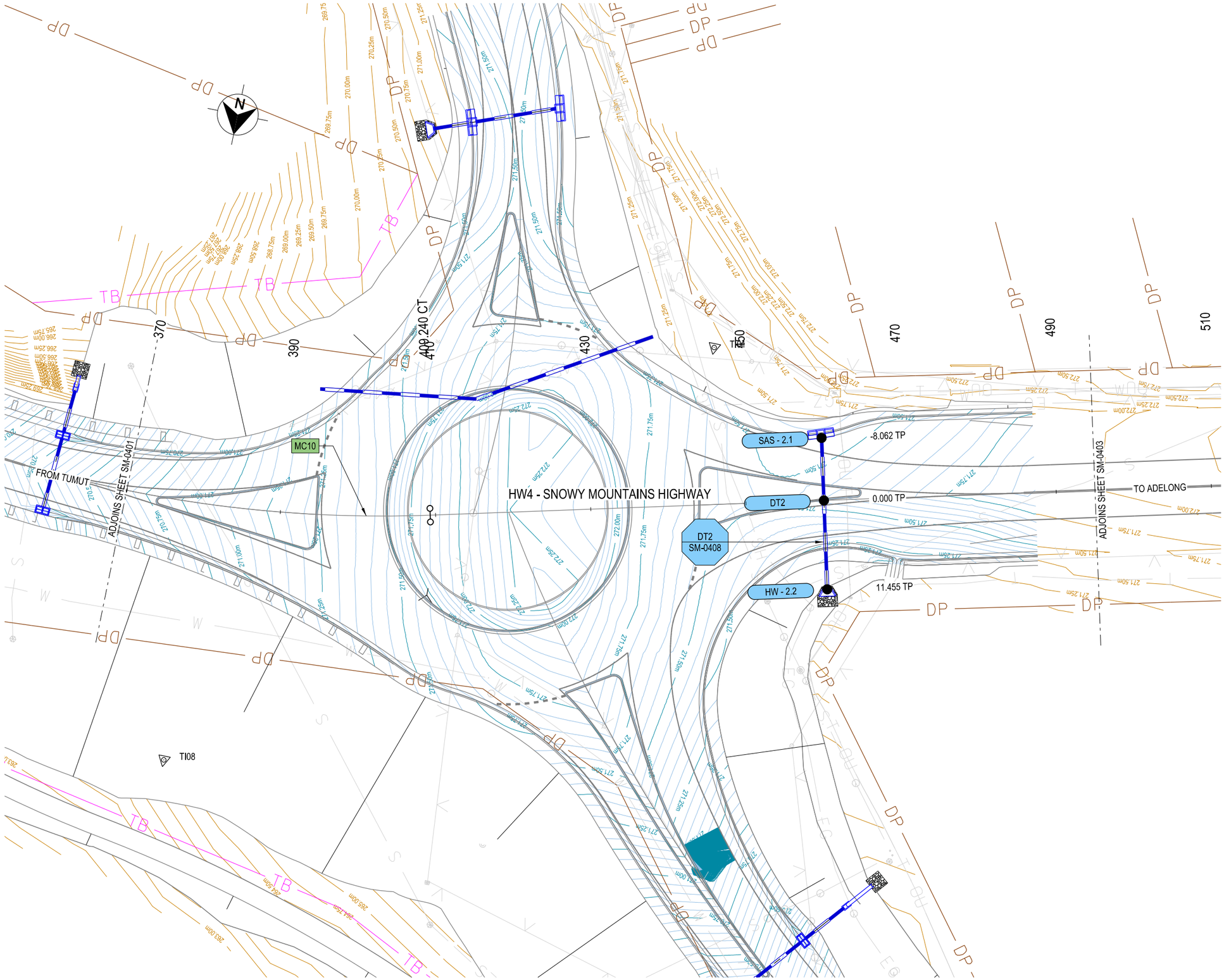
CLIENT: NSW GOVERNMENT Transport for NSW
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
STORMWATER MANAGEMENT PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH. 975.000 TO CH. 1100.000

A3

RMS REGISTRATION No.: DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	SM-0401	X



LEGEND

- DT1.1 / 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- CATCH DRAIN - LINED
- IF — PAVEMENT INTERFACE DRAIN
- TD — SUBSURFACE VERGE DRAIN
- SUBSURFACE DRAIN OUTLET
- ROCK PROTECTION
- OU — OPTIC FIBRE
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- OVERHEAD POWER

NOTES

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NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL: 0 5 10 15 20 25 30 35 40 45 50

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-SM.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY

TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

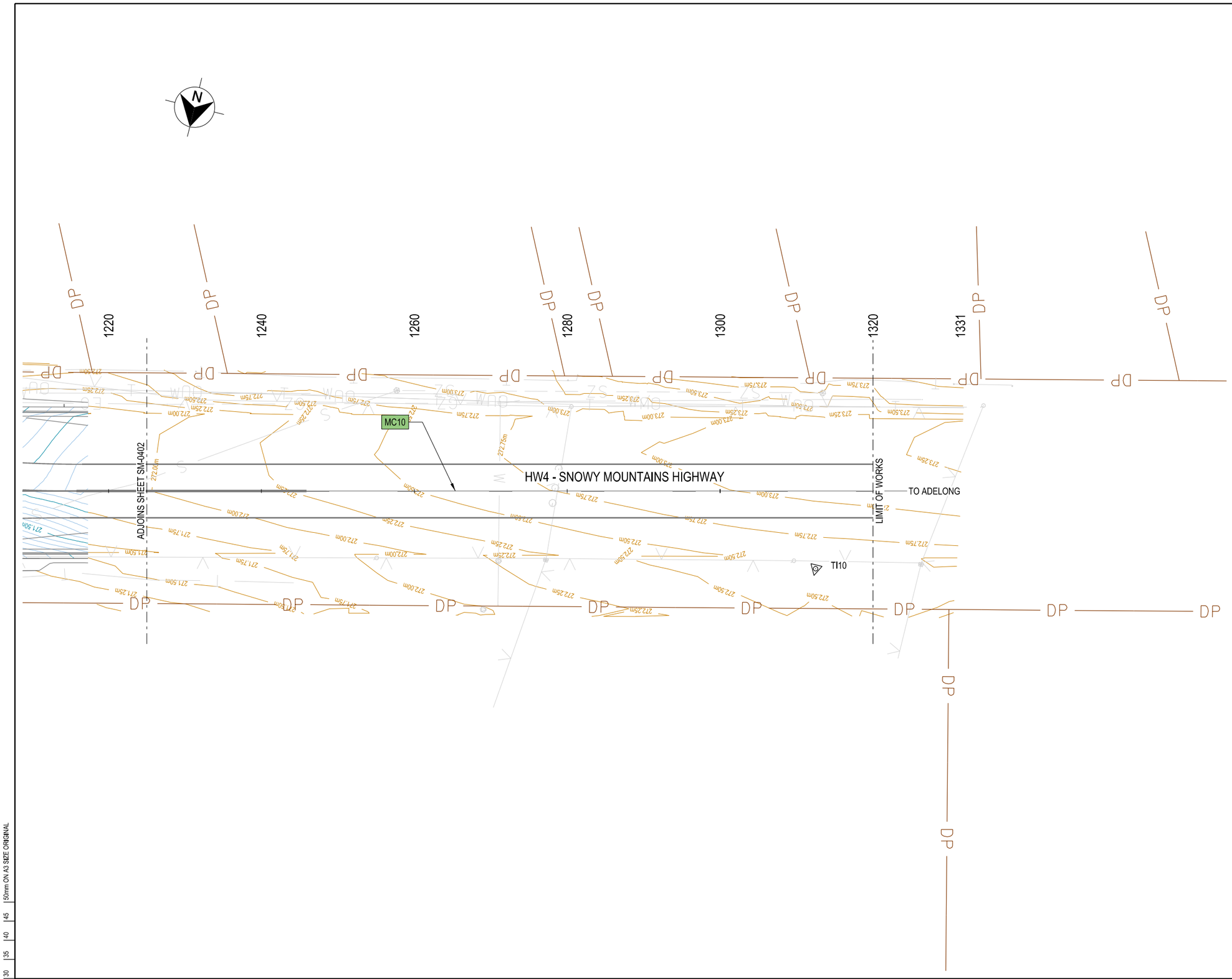
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
STORMWATER MANAGEMENT PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH. 1100.000 TO CH. 1225.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	SM-0402	X



LEGEND

- DT1.1 / 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- CATCH DRAIN - LINED
- IF — PAVEMENT INTERFACE DRAIN
- TD — SUBSURFACE VERGE DRAIN
- SUBSURFACE DRAIN OUTLET
- ROCK PROTECTION
- OU — OPTIC FIBRE
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- OVERHEAD POWER

NOTES

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NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-SM.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY		
TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

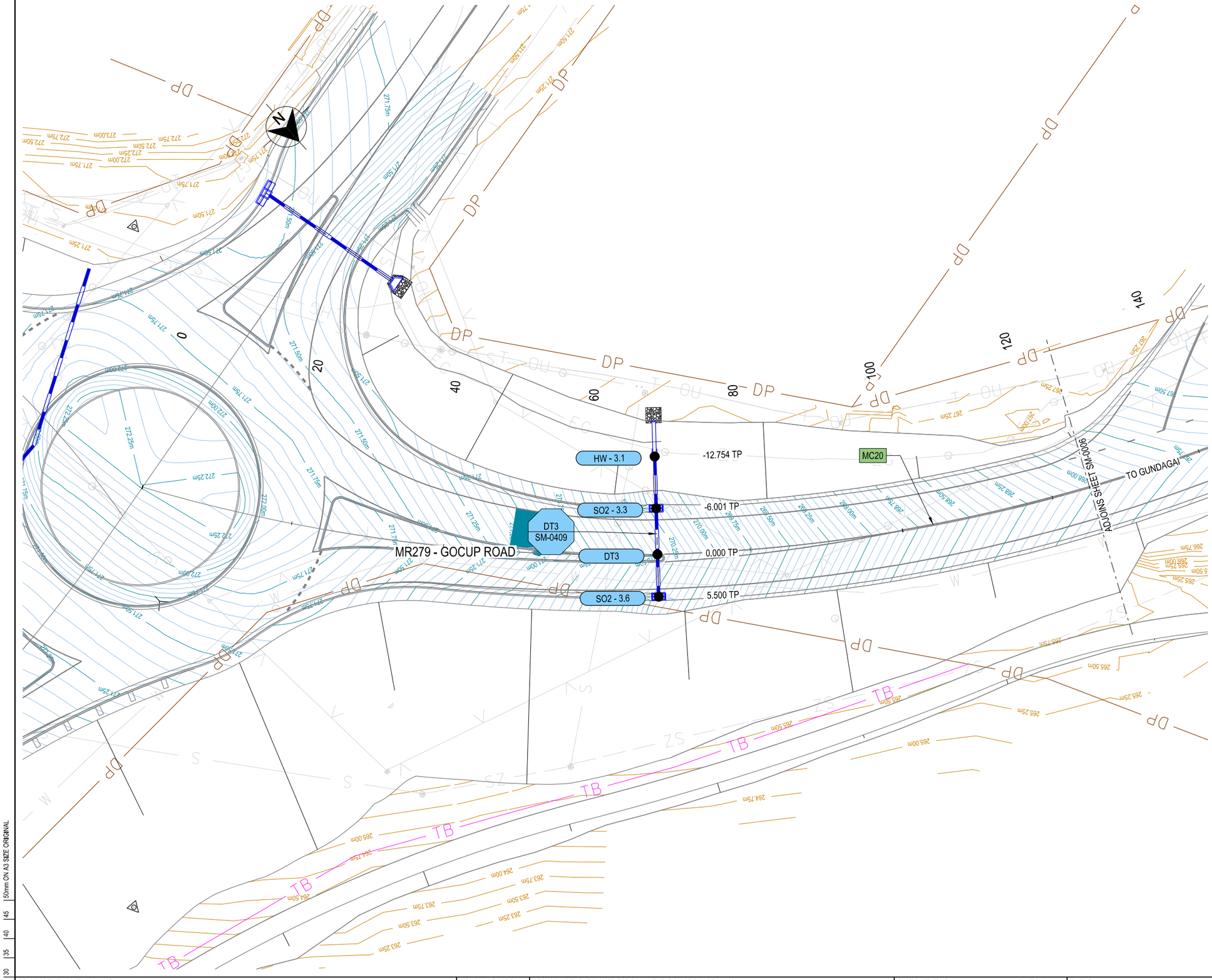
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
STORMWATER MANAGEMENT PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH. 1225.000 TO CH. 1320.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	SM-0403	X



LEGEND

- DT1.1 / 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- EXISTING DRAINAGE PIPE
- EXISTING PIT
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- CATCH DRAIN - LINED
- IF — PAVEMENT INTERFACE DRAIN
- TD — SUBSURFACE VERGE DRAIN
- SUBSURFACE DRAIN OUTLET
- ROCK PROTECTION
- OU — OPTIC FIBRE
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NOTES

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NOT FOR CONSTRUCTION

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0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-SM.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) | HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME	PLOT BY		
TITLE	NAME	DATE	
DRAWN	X. X. XXXXXXXX	XX.XX.XX	
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX	
DESIGN	X. X. XXXXXXXX	XX.XX.XX	
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX	
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX	
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX	

CLIENT: NSW GOVERNMENT Transport for NSW

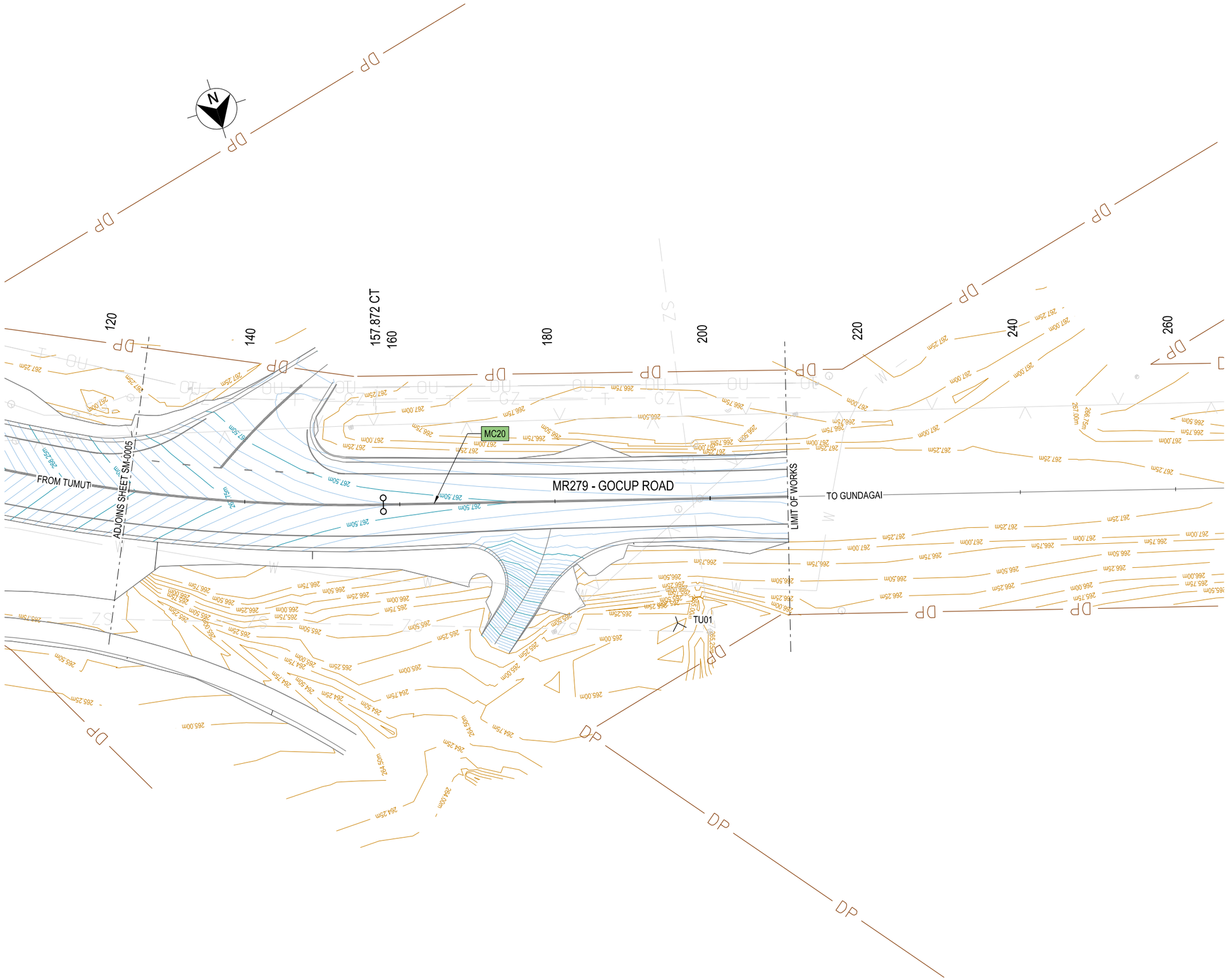
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
STORMWATER MANAGEMENT PLAN
MR279 - GOCUP ROAD - MC20 - CH. 0.000 TO CH. 125.000

A3

RMS REGISTRATION No.: DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	SM-0404	X



LEGEND

- STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER (DT1.1 / 0610)
- STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER (SAS - 1.2 / 3)
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
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- CATCH DRAIN - LINED
- IF — PAVEMENT INTERFACE DRAIN
- TD — SUBSURFACE VERGE DRAIN
- SUBSURFACE DRAIN OUTLET
- ROCK PROTECTION
- OU — OPTIC FIBRE
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NOTES

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5. REFER TO SHEET SM-XXXX FOR TYPICAL ROCK PROTECTION DETAILS

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NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-SM.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY	NAME	DATE
TITLE		
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

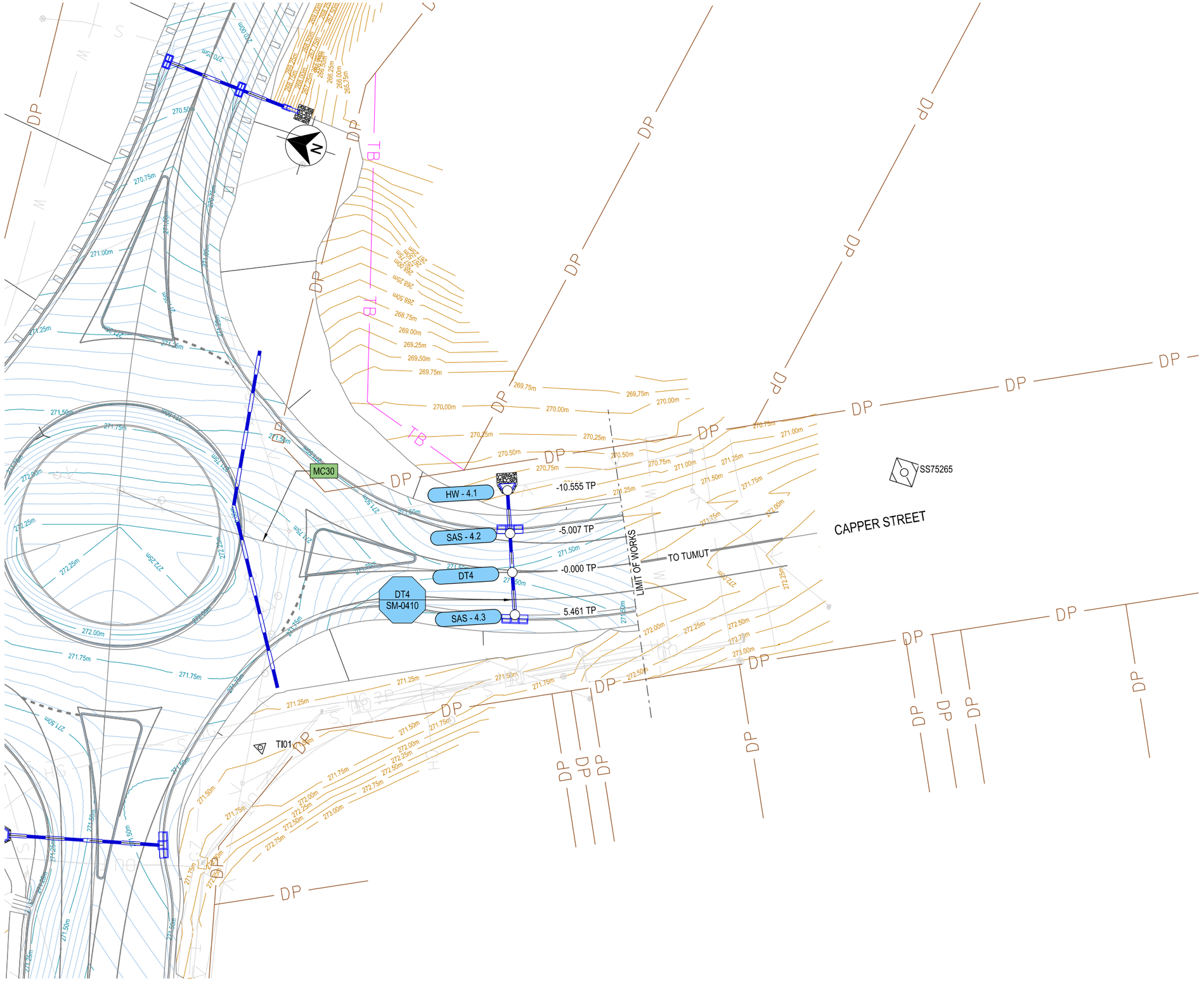
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
STORMWATER MANAGEMENT PLAN
MR279 - GOCUP ROAD - MC20 - CH. 125.000 TO CH. 250.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	SM-0405	X



LEGEND

- DT1.1 / 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- CATCH DRAIN - LINED
- IF — PAVEMENT INTERFACE DRAIN
- TD — SUBSURFACE VERGE DRAIN
- SUBSURFACE DRAIN OUTLET
- ROCK PROTECTION
- OU — OPTIC FIBRE
- T — TELECOMMUNICATION LINE
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER

NOTES

1. REFER TO SHEET SM-XXXX FOR DRAINAGE SETOUT DETAILS.
2. REFER TO TRANSPORT FOR NSW STANDARD DRAWING R0240-01 FOR INSTALLATION OF CONCRETE PIPES.
3. REFER TO TRANSPORT FOR NSW STANDARD DRAWING SERIES R0210 FOR STANDARD HEADWALL DETAILS AND R0220 FOR STANDARD GULLY PIT DETAILS.
4. UNLESS OTHERWISE SPECIFIED, ROCK PROTECTION FOR CULVERT HEADWALLS SHALL BE NOMIAL 300mm DIA ('D50') AND A LENGTH APPROXIMATELY 4 TIMES THE PIPE DIA. OF THE CULVERT.
5. REFER TO SHEET SM-XXXX FOR TYPICAL ROCK PROTECTION DETAILS

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NOT FOR CONSTRUCTION

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50mm ON A3 SIZE ORIGINAL | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-SM.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

PLOT DATE / TIME: PLOT BY

EXTERNAL REFERENCE FILES

REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) | HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

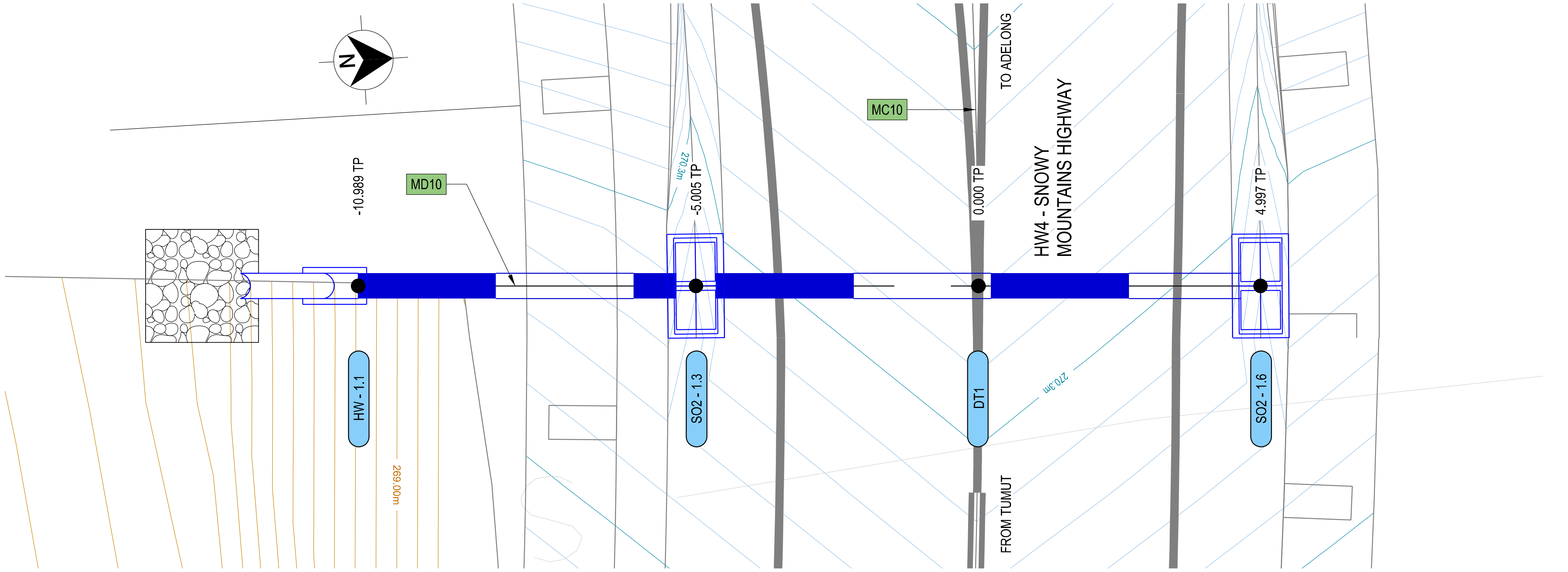
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
STORMWATER MANAGEMENT PLAN
CAPPER STREET - MC30 - CH 0.000 TO CH 70.353

A3

RMS REGISTRATION No. DS2020/000808

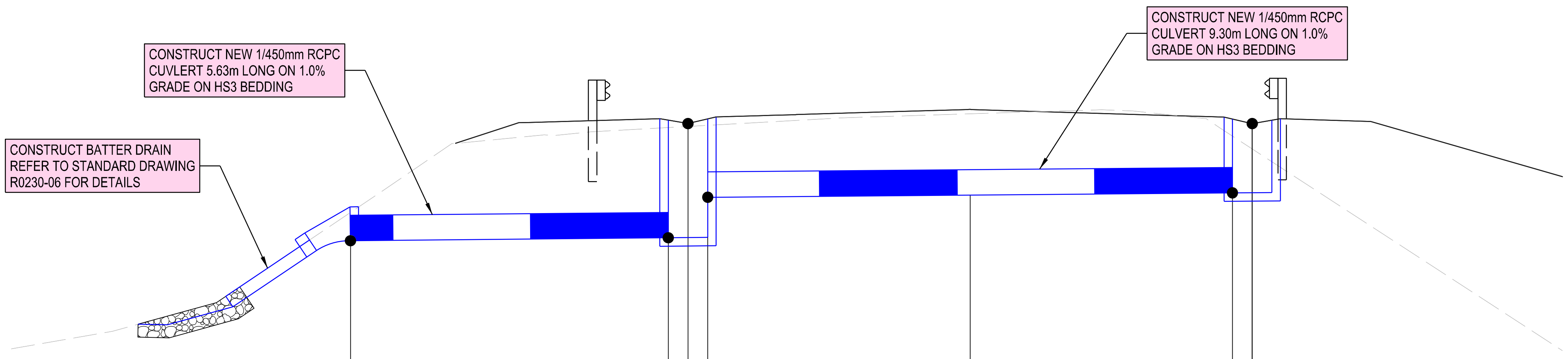
ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	SM-0406	X



DT1.0 - PLAN - CH 1090.187 (MC10)

LEGEND

- STRUCTURE LABEL (DT1.1) / STORMWATER MANAGEMENT SHEET NUMBER (0610)
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- CATCH DRAIN - LINED
- IF — PAVEMENT INTERFACE DRAIN
- TD — SUBSURFACE VERGE DRAIN
- SUBSURFACE DRAIN OUTLET
- ROCK PROTECTION
- OU — OPTIC FIBRE
- T — TELECOMMUNICATION LINE
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER



R.L. 265

FEATURE NAME	INVERTS	DESIGN LEVELS	EXISTING LEVELS	DESIGN OFFSETS
HW - 1.1	268.025	268.025	268.532	-10.987
IA		269.755	269.755	-9.129
EV		270.120	269.861	-8.003
CT		270.191	270.027	-5.503
INV - 1.2	268.081	268.081	270.035	-5.353
CF		270.106	270.054	-5.003
SO2 - 1.3	270.106	270.106	270.054	-5.003
INV - 1.4	268.792	268.792	270.074	-4.653
CE		270.221	270.082	-4.503
LE6		270.250	270.136	-3.539
MC10		270.355	270.278	-0.000
DT1	268.839	268.839	270.278	0.000
LE7		270.249	270.261	3.527
CE		270.219	269.982	4.500
INV - 1.5	268.885	268.885	269.885	4.649
SO2 - 1.6	270.104	270.104	269.658	4.999
SO2 - 1.6	270.104	270.104	269.658	4.999
CF		270.104	269.657	5.000
CT		270.189	269.332	5.500
EV		270.150	268.470	6.825

DT1.0 - LONGITUDINAL SECTION - CH 1090.187 (MC10)

NOTES

1. REFER TO SHEET SM-XXXX FOR DRAINAGE SETOUT DETAILS.
2. REFER TO TRANSPORT FOR NSW STANDARD DRAWING R0240-01 FOR INSTALLATION OF CONCRETE PIPES.
3. REFER TO TRANSPORT FOR NSW STANDARD DRAWING SERIES R0210 FOR STANDARD HEADWALL DETAILS AND R0220 FOR STANDARD GULLY PIT DETAILS.
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NOT FOR CONSTRUCTION

DRAWING FILE LOCATION / NAME
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DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

PLOT DATE / TIME — PLOT BY

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 1 2 3 4 — SCALE 1:100m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ROAD DESIGN SOUTH

TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT — Transport for NSW

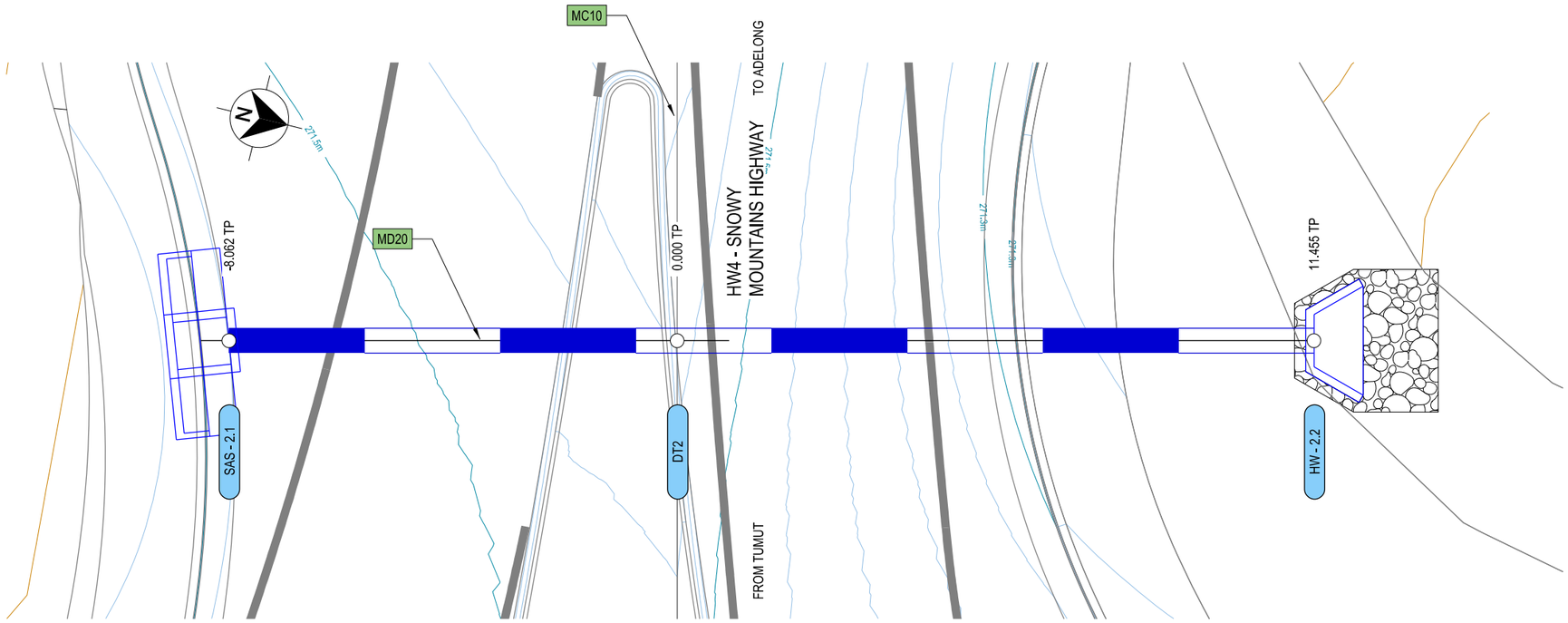
PREPARED FOR
TRANSPORT FOR NSW
REGIONAL & OUTER METROPOLITAN
ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
STORMWATER MANAGEMENT PLAN
DT1.0 - DRAINAGE DETAILS - MD10

A3

RMS REGISTRATION No. DS2020/000808

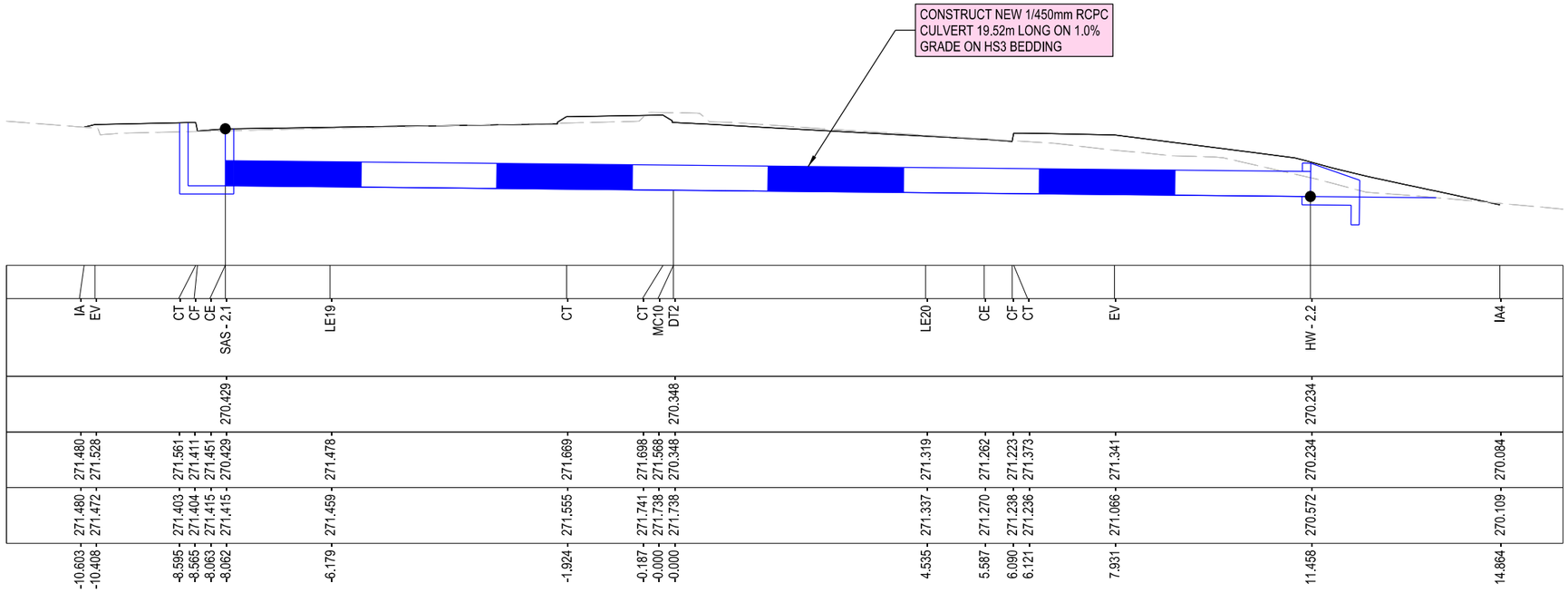
ISSUE STATUS: NOT FOR CONSTRUCTION — EDMS No. SF2016/159601 — SHEET No. SM-0407 — ISSUE X



DT2.0 - PLAN - CH 1190.058 (MC10)

LEGEND

- DT1.1 / 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- CATCH DRAIN - LINED
- IF — PAVEMENT INTERFACE DRAIN
- TD — SUBSURFACE VERGE DRAIN
- SUBSURFACE DRAIN OUTLET
- ROCK PROTECTION
- OU — OPTIC FIBRE
- T — TELECOMMUNICATION LINE
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER



DT2.0 - LONGITUDINAL SECTION - CH 1190.058 (MC10)

NOTES

1. REFER TO SHEET SM-XXXX FOR DRAINAGE SETOUT DETAILS.
2. REFER TO TRANSPORT FOR NSW STANDARD DRAWING R0240-01 FOR INSTALLATION OF CONCRETE PIPES.
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NOT FOR CONSTRUCTION

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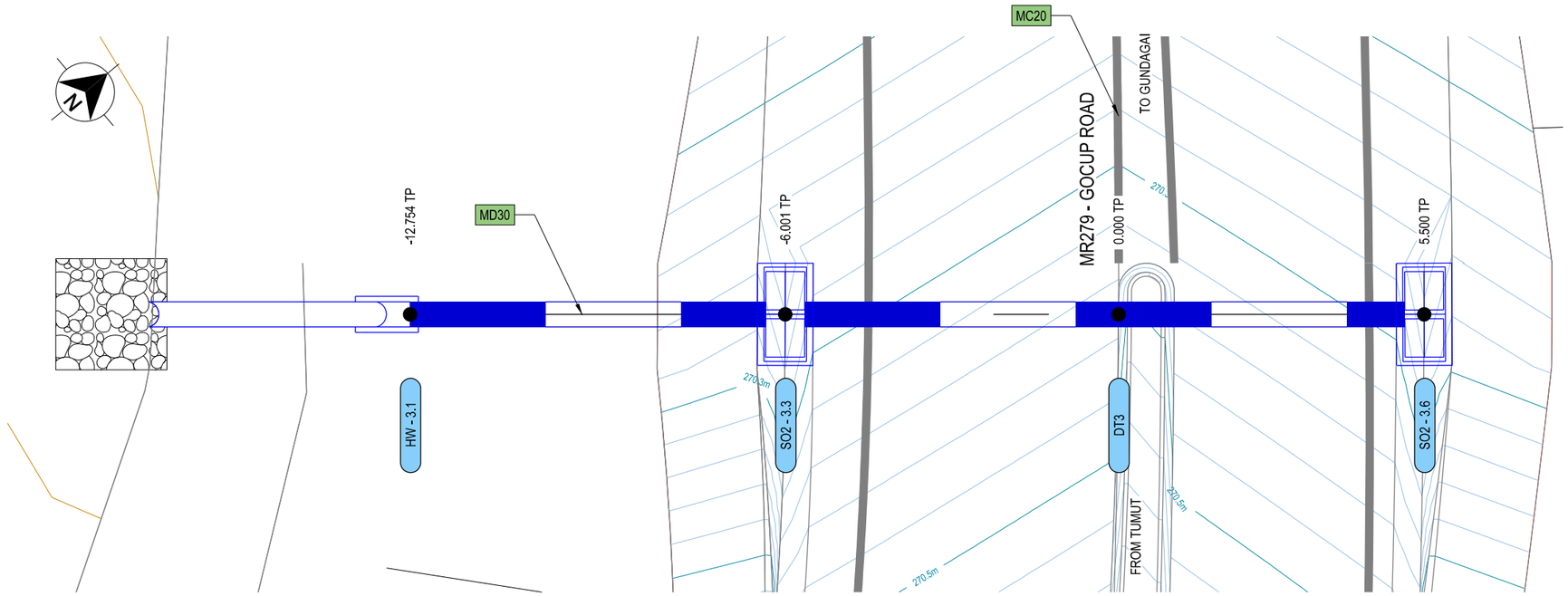
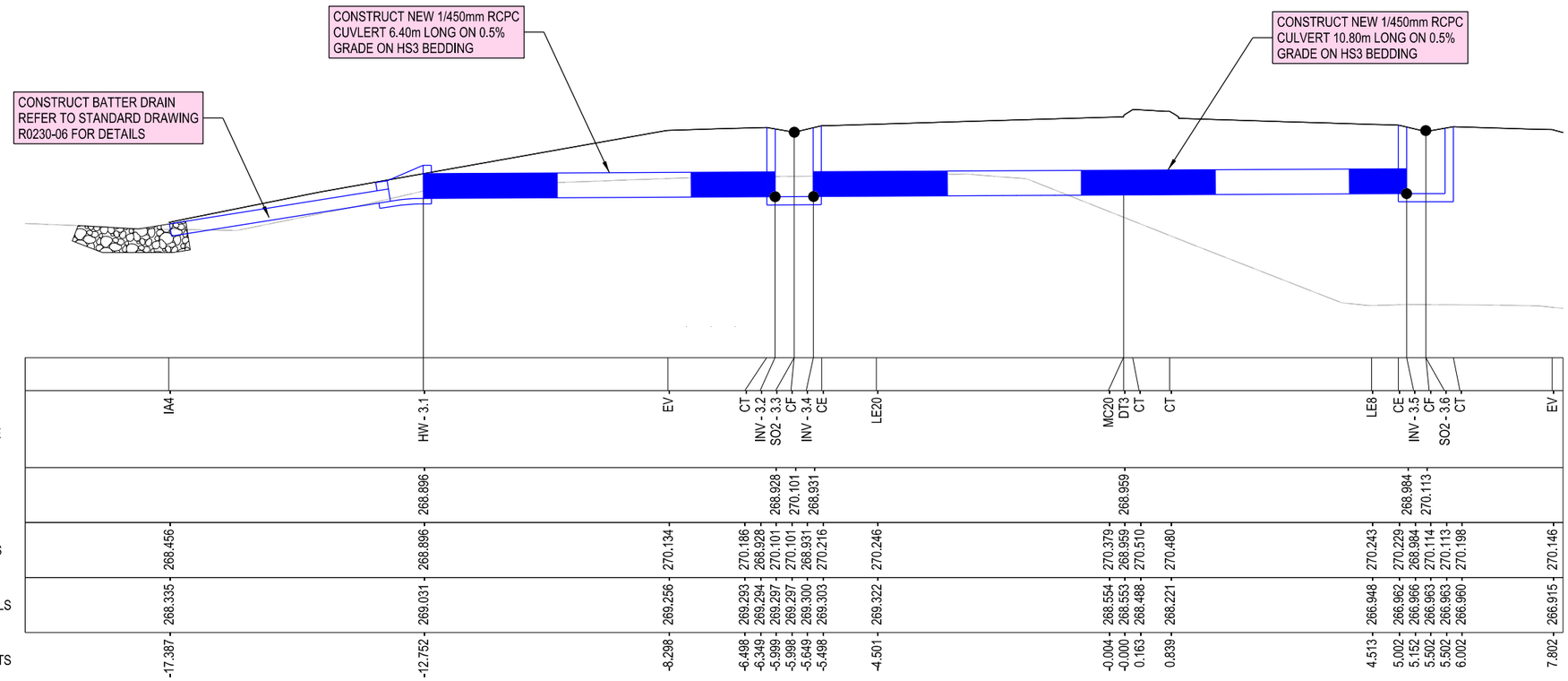
50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-SM.dgn				DESIGN LOT CODE XXXXXXX		DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING		PLOT DATE / TIME		PLOT BY	CLIENT NSW GOVERNMENT Transport for NSW
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE	NAME	DATE	
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX	0 1 2 3 4 SCALE 1:100m	TRANSPORT FOR NSW INFRASTRUCTURE & PLACE TECHNICAL SERVICES ROAD DESIGN SOUTH	DRAWN	X. X. XXXXXXXX	XX.XX.XX	
								DRG CHECK	X. X. XXXXXXXX	XX.XX.XX	
								DESIGN	X. X. XXXXXXXX	XX.XX.XX	
								DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX	
								DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX	
								PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX	

CO-ORDINATE SYSTEM MGA ZONE 55 (GDA94)	HEIGHT DATUM AHD	PREPARED FOR TRANSPORT FOR NSW REGIONAL & OUTER METROPOLITAN ASSETS SOUTH	SNOWY VALLEYS HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD ROUNDABOUT UPGRADE 0.870km TO 1.320km FROM TUMUT STORMWATER MANAGEMENT PLAN DT2.0 - DRAINAGE DETAILS - MD20	A3
			RMS REGISTRATION No. DS2020/000808	
			ISSUE STATUS: NOT FOR CONSTRUCTION	EDMS No.: SF2016/159601 / SHEET No.: SM-0408 / ISSUE: X



DT3.0 - PLAN - CH 67.903 (MC20)



DT3.0 - LONGITUDINAL SECTION - CH 67.903 (MC20)

LEGEND

- DT1.1 / 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- CATCH DRAIN - LINED
- IF — PAVEMENT INTERFACE DRAIN
- TD — SUBSURFACE VERGE DRAIN
- SUBSURFACE DRAIN OUTLET
- ROCK PROTECTION
- OU — OPTIC FIBRE
- T — TELECOMMUNICATION LINE
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER

NOTES

1. REFER TO SHEET SM-XXXX FOR DRAINAGE SETOUT DETAILS.
2. REFER TO TRANSPORT FOR NSW STANDARD DRAWING R0240-01 FOR INSTALLATION OF CONCRETE PIPES.
3. REFER TO TRANSPORT FOR NSW STANDARD DRAWING SERIES R0210 FOR STANDARD HEADWALL DETAILS AND R0220 FOR STANDARD GULLY PIT DETAILS.
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50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-SM.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES

REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 1 2 3 4 — SCALE 1:100m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

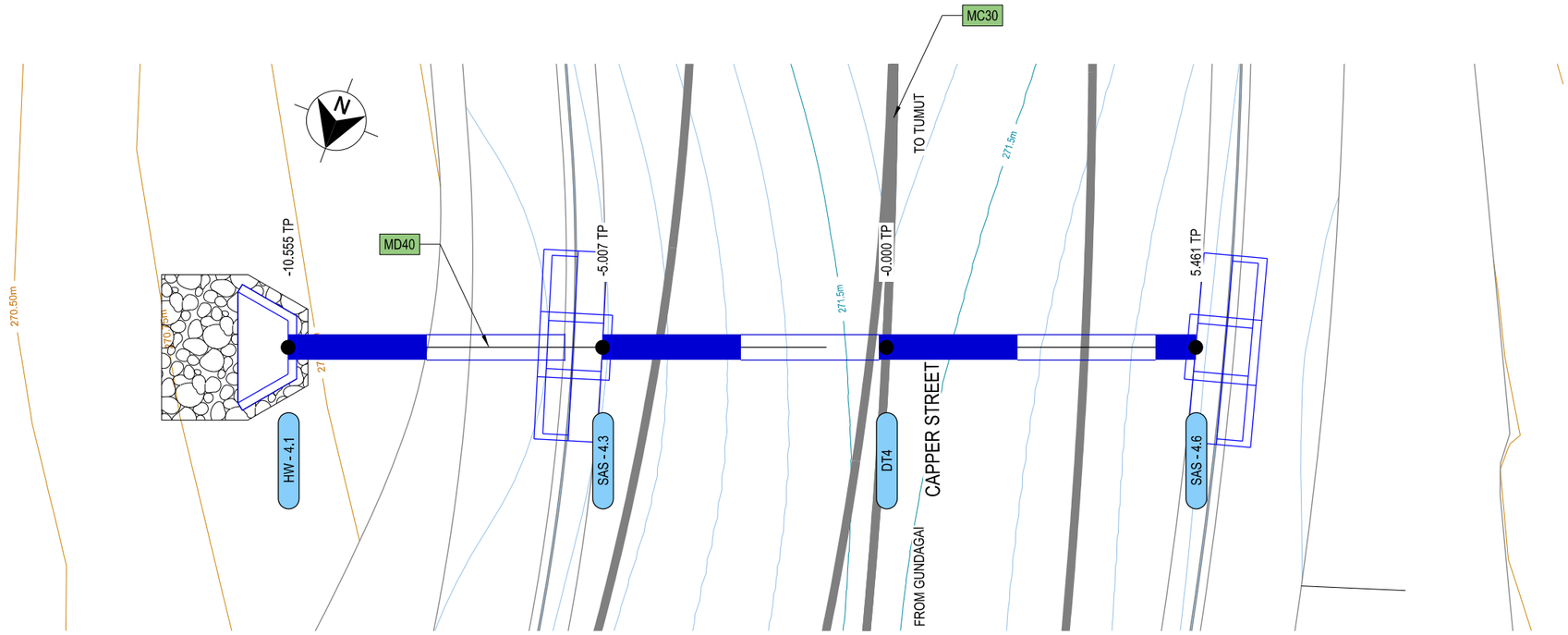
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
STORMWATER MANAGEMENT PLAN
DT3.0 - DRAINAGE DETAILS - MD30

A3

RMS REGISTRATION No. DS2020/000808

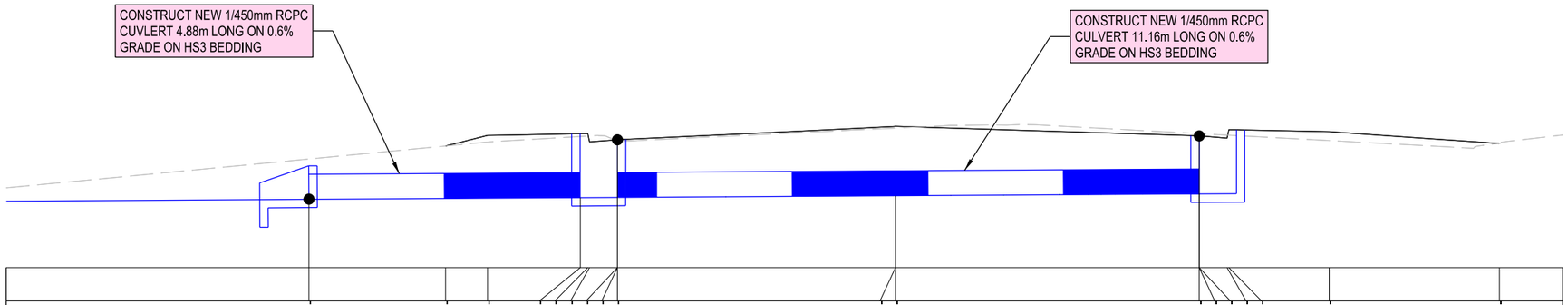
ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	SM-0409	X



DT4.0 - PLAN - CH 53.941 (MC30)

LEGEND

- DT1.1 / 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- CATCH DRAIN - LINED
- IF — PAVEMENT INTERFACE DRAIN
- TD — SUBSURFACE VERGE DRAIN
- SUBSURFACE DRAIN OUTLET
- ROCK PROTECTION
- OU — OPTIC FIBRE
- T — TELECOMMUNICATION LINE
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER



FEATURE NAME	HW - 4.1	IA	EV	INV - 4.2	CT	CF	CE	INV - 4.4	SAS - 4.3	MC30 DT4	CE	INV - 4.5	SAS - 4.6	CF	CT	EV	IA
INVERTS	270.225							270.255	270.259	271.296	270.289	270.322		271.365			
DESIGN LEVELS	270.225	271.184	271.373	270.255	271.406	271.256	271.296	270.259	271.296	271.536	270.289	271.365	270.322	271.365	271.325	271.475	271.442	271.227
EXISTING LEVELS	270.950	271.184	271.256	271.353	271.361	271.363	271.272	271.272	271.272	271.507	271.507	271.404	271.404	271.404	271.377	271.376	271.280	271.227
DESIGN OFFSETS	-10.554	-8.095	-7.341	-5.674	-5.538	-5.508	-5.007	-5.007	-5.007	-0.004	-0.000	5.461	5.461	5.461	5.963	5.993	7.799	10.862

DT4.0 - LONGITUDINAL SECTION - CH 53.941 (MC30)

NOTES

1. REFER TO SHEET SM-XXXX FOR DRAINAGE SETOUT DETAILS.
2. REFER TO TRANSPORT FOR NSW STANDARD DRAWING R0240-01 FOR INSTALLATION OF CONCRETE PIPES.
3. REFER TO TRANSPORT FOR NSW STANDARD DRAWING SERIES R0210 FOR STANDARD HEADWALL DETAILS AND R0220 FOR STANDARD GULLY PIT DETAILS.
4. UNLESS OTHERWISE SPECIFIED, ROCK PROTECTION FOR CULVERT HEADWALLS SHALL BE NOMIAL 300mm DIA ('D50') AND A LENGTH APPROXIMATELY 4 TIMES THE PIPE DIA. OF THE CULVERT.
5. REFER TO SHEET SM-XXXX FOR TYPICAL ROCK PROTECTION DETAILS

UTILITY INFORMATION SHOWN ON THE PLANS DOES NOT DEPICT ANY MORE THAN THE PRESENCE OF A SERVICE, BASED ON AVAILABLE DOCUMENTARY EVIDENCE. THE PRESENCE OF A UTILITY SERVICE, ITS SIZE AND LOCATION SHOULD BE CONFIRMED BY FIELD INSPECTION, PRIOR TO THE COMMENCEMENT OF ROADWORKS AND THE RELEVANT UTILITY PLANS OBTAINED BY DIALLING PH 1100 OR FAX 1300 652 077 (DIAL BEFORE YOU DIG). CAUTION SHOULD BE EXERCISED WHEN WORKING IN THE VICINITY OF ALL UTILITY SERVICES.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-SM.dgn
DESIGN LOT CODE: XXXXXXX
DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING:
EXTERNAL REFERENCE FILES:

REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 1 2 3 4 — SCALE 1:100m
CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY:
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ROAD DESIGN SOUTH

PLOT DATE / TIME: PLOT BY

	TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

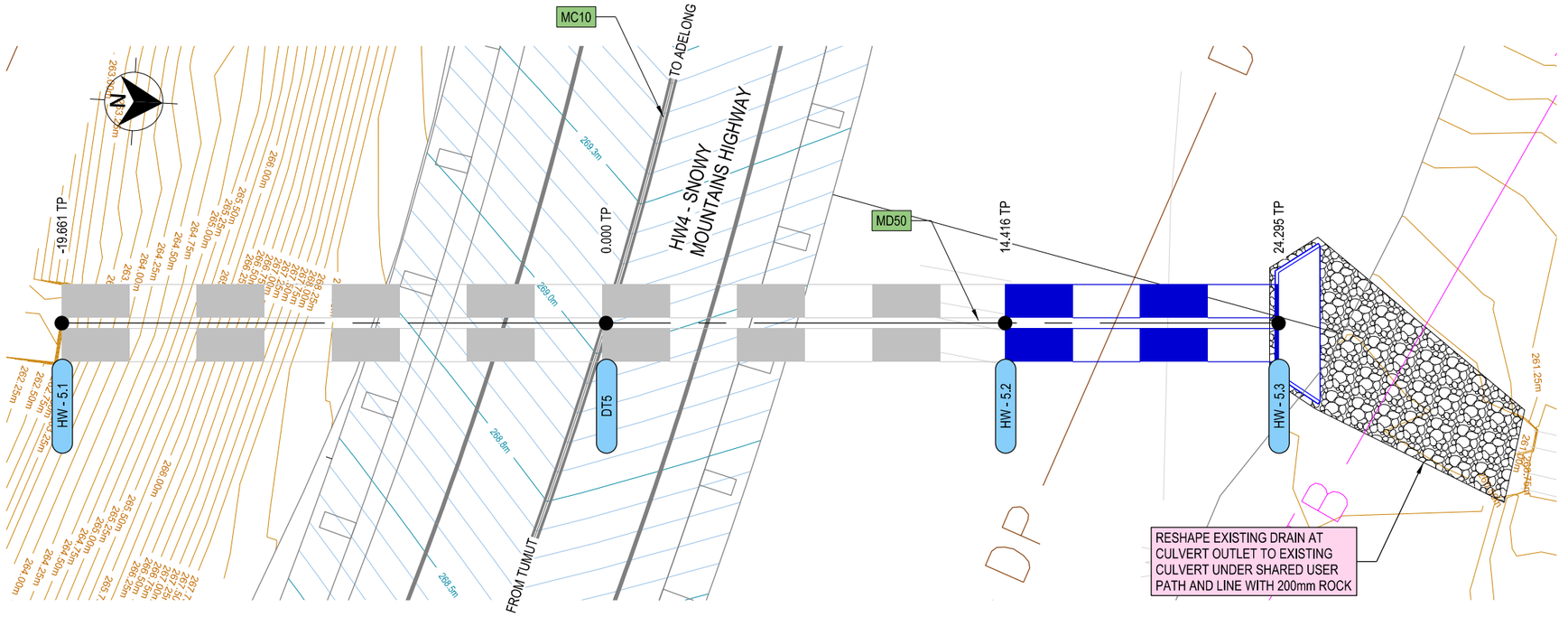
CLIENT: NSW GOVERNMENT Transport for NSW
PREPARED FOR: TRANSPORT FOR NSW REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
STORMWATER MANAGEMENT PLAN
DT4 - DRAINAGE DETAILS - MD40

A3

RMS REGISTRATION No.: DS2020/000808

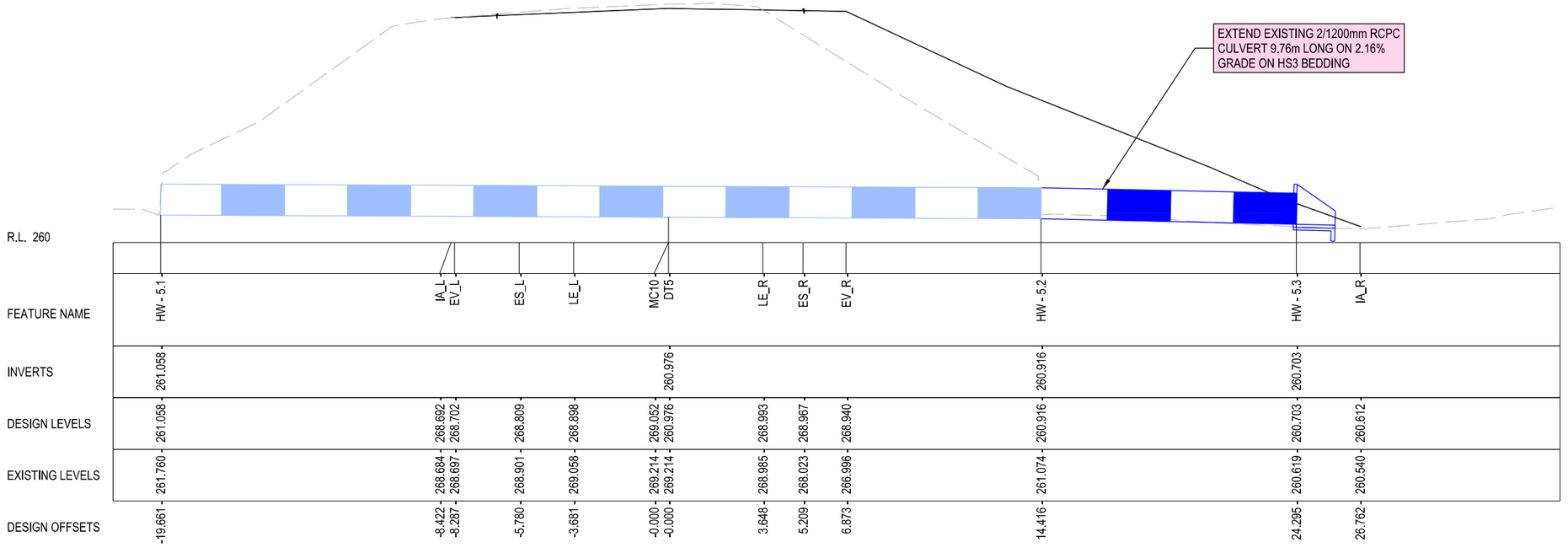
ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	SM-0410	X



DT5.0 - PLAN - CH 1059.561 (MC10)

LEGEND

- STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER (DT1.1 / 0610)
- STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER (SAS - 1.2 / 3)
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- CATCH DRAIN - LINED
- IF — PAVEMENT INTERFACE DRAIN
- TD — SUBSURFACE VERGE DRAIN
- SUBSURFACE DRAIN OUTLET
- ROCK PROTECTION
- OU — OPTIC FIBRE
- T — TELECOMMUNICATION LINE
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER



DT5.0 - LONGITUDINAL SECTION - CH 1059.561 (MC10)

NOTES

1. REFER TO SHEET SM-XXXX FOR DRAINAGE SETOUT DETAILS.
2. REFER TO TRANSPORT FOR NSW STANDARD DRAWING R0240-01 FOR INSTALLATION OF CONCRETE PIPES.
3. REFER TO TRANSPORT FOR NSW STANDARD DRAWING SERIES R0210 FOR STANDARD HEADWALL DETAILS AND R0220 FOR STANDARD GULLY PIT DETAILS.
4. UNLESS OTHERWISE SPECIFIED, ROCK PROTECTION FOR CULVERT HEADWALLS SHALL BE NOMIAL 300mm DIA ('D50') AND A LENGTH APPROXIMATELY 4 TIMES THE PIPE DIA. OF THE CULVERT.
5. REFER TO SHEET SM-XXXX FOR TYPICAL ROCK PROTECTION DETAILS

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NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-SM.dgn
DESIGN LOT CODE: XXXXXXX
DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 2 4 6 8 — SCALE 1:200m
CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME	NAME	DATE
PLOT BY		
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

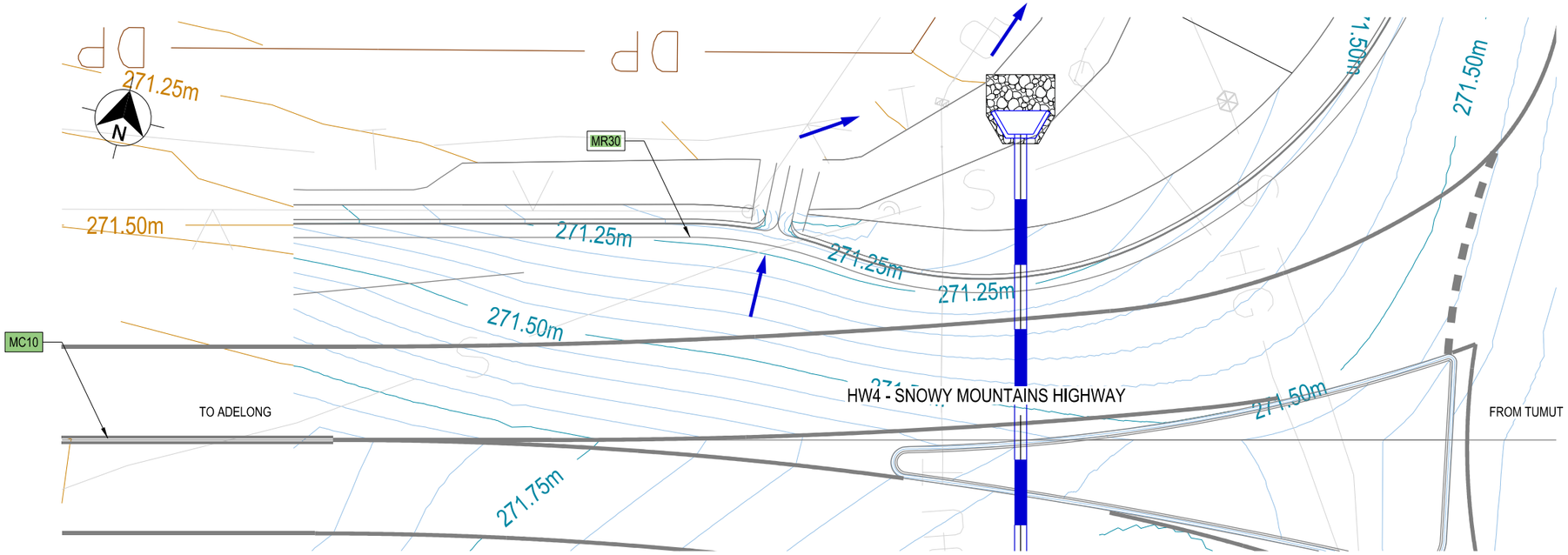
CLIENT: NSW GOVERNMENT Transport for NSW
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN, ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
STORMWATER MANAGEMENT PLAN
DT5.0 - DRAINAGE DETAILS - MD50

A3

RMS REGISTRATION No. DS2020/000808

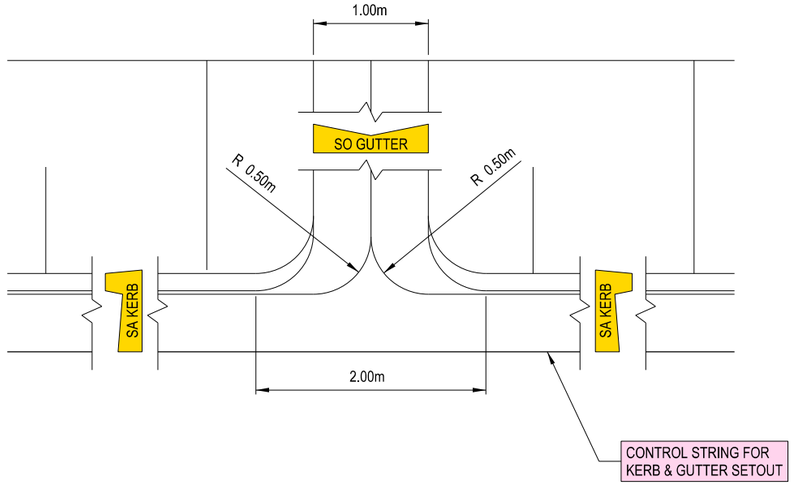
ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	SM-0411	X



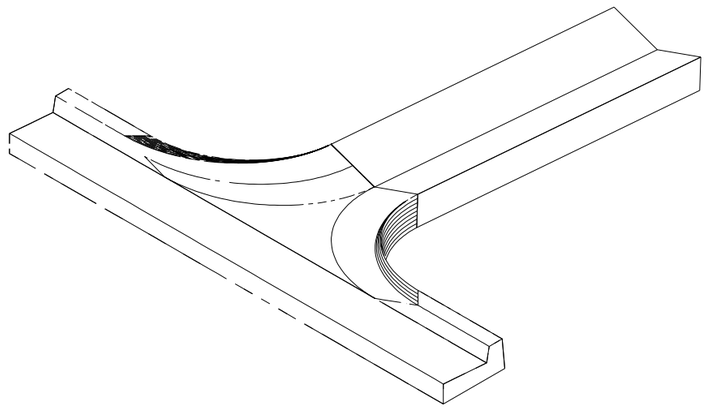
TYPE SA KERB TURN OUT - PLAN - CH 1199.339 (MC10)

LEGEND

- STRUCTURE LABEL (DT1.1 / 0610) — STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- CATCH DRAIN - LINED
- IF — PAVEMENT INTERFACE DRAIN
- TD — SUBSURFACE VERGE DRAIN
- SUBSURFACE DRAIN OUTLET
- ROCK PROTECTION
- OU — OPTIC FIBRE
- T — TELECOMMUNICATION LINE
- W — WATER MAIN
- HG — UNDERGROUND GAS
- S — SEWER MAIN
- OVERHEAD POWER



NOT TO SCALE



NOTES

1. REFER TO SHEET SM-XXXX FOR DRAINAGE SETOUT DETAILS.
2. REFER TO TRANSPORT FOR NSW STANDARD DRAWING R0240-01 FOR INSTALLATION OF CONCRETE PIPES.
3. REFER TO TRANSPORT FOR NSW STANDARD DRAWING SERIES R0210 FOR STANDARD HEADWALL DETAILS AND R0220 FOR STANDARD GULLY PIT DETAILS.
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NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-SM.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 2 4 6 8 — SCALE 1:200m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY	NAME	DATE
TITLE		
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

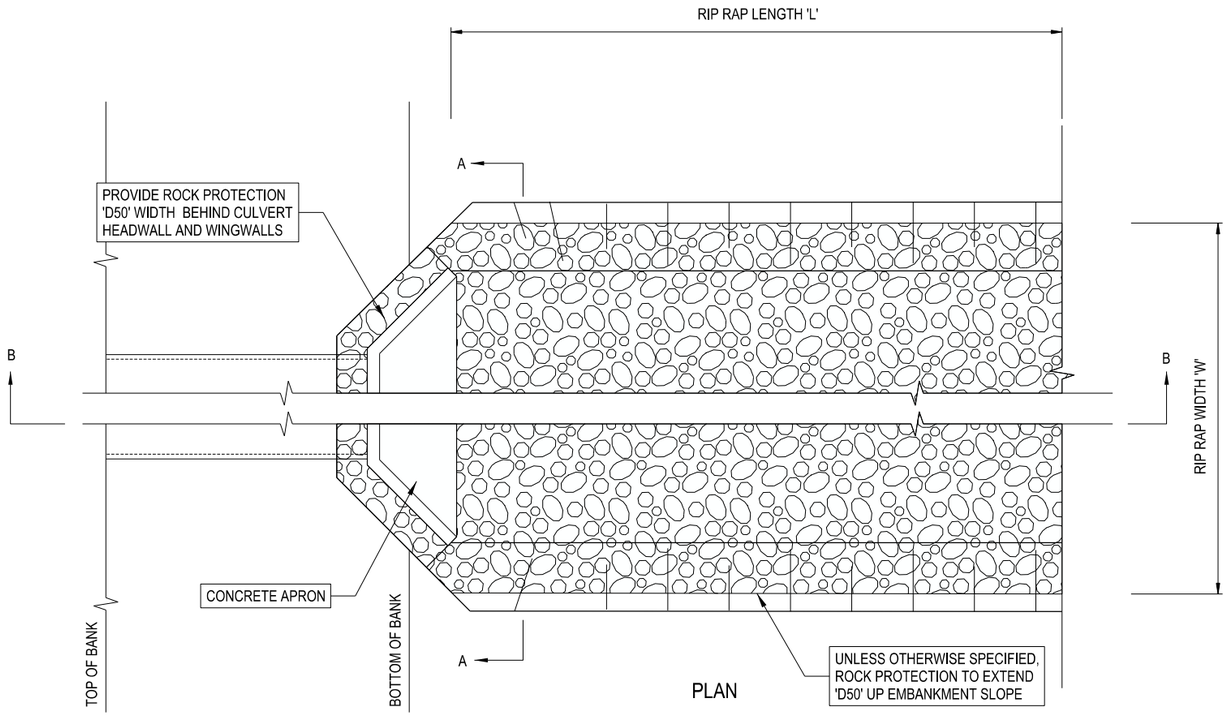
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
STORMWATER MANAGEMENT PLAN
TYPE SA KERB TURNOUT DETAILS

A3

RMS REGISTRATION No. DS2020/000808

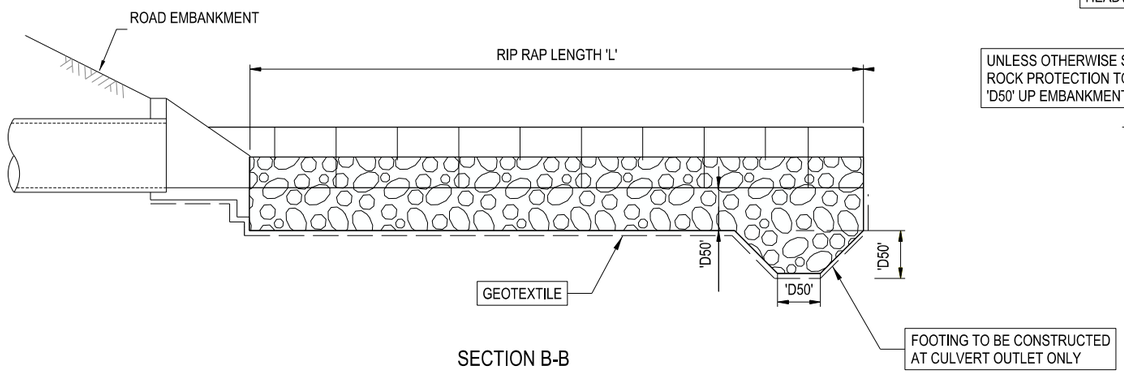
ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	SM-0412	X



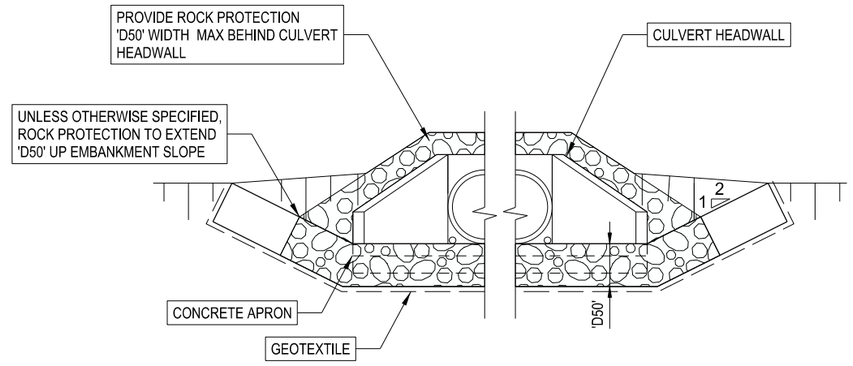
PLAN

LEGEND

ROCK PROTECTION



SECTION B-B



SECTION A-A

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-SM.dgn				DESIGN LOT CODE XXXXXXX		DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING		PLOT DATE / TIME 9/7/2005 7:08:02 PM		PLOT BY newmanmd	CLIENT NSW GOVERNMENT Transport for NSW
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE	NAME	DATE	PREPARED FOR TRANSPORT FOR NSW REGIONAL & OUTER METROPOLITAN ASSETS SOUTH
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX	NOT TO SCALE	TRANSPORT FOR NSW INFRASTRUCTURE & PLACE TECHNICAL SERVICES ROAD DESIGN SOUTH	DRAWN	X. X. XXXXXXXX	XX.XX.XX	
								DRG CHECK	X. X. XXXXXXXX	XX.XX.XX	
								DESIGN	X. X. XXXXXXXX	XX.XX.XX	
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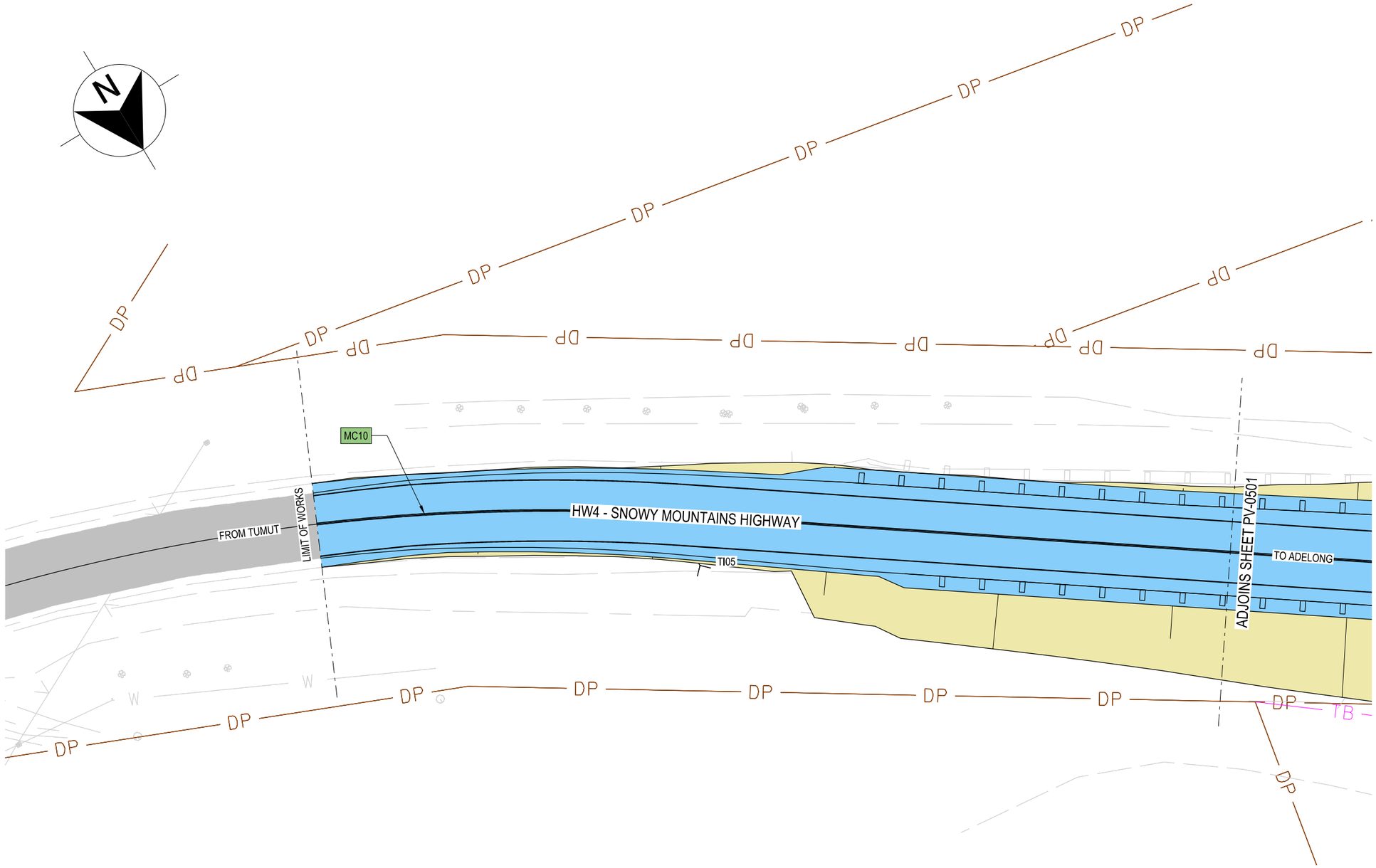
								DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX	
						CO-ORDINATE SYSTEM MGA ZONE 55 (GDA94)	HEIGHT DATUM AHD	PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX	

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
STORMWATER MANAGEMENT PLAN
TYPICAL ROCK PROTECTION DETAIL

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	SM-0413	X



LEGEND

- XXXX — DESIGN CONTROL CALLOUT
- XXXX — CONSTRUCTION CALLOUT
- PAVEMENT TYPE 1
- PAVEMENT TYPE 2
- PAVEMENT TYPE 3
- ROUNDABOUT ANNULUS
- CENTRAL ISLAND
- CONCRETE KERB
- VERGE AND BATTERS
- EXISTING PAVEMENT

NOTES

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT TRANSPORT FOR NSW QA SPECIFICIATIONS AND AUSTRALIAN STANDARDS UNLESS OTHERWISE STATED.
2. REFER TO SHEET PV-0507 FOR PAVEMENT DETAILS.
3. REFER TO SHEET PV-XXXX FOR PAVEMENT INTERFACE DETAILS.
4. REFER TO STORMWATER MANAGEMENT PLANS FOR SUBSURFACE DRAIN LOCATIONS.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-PV.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

PLOT DATE / TIME: PLOT BY

CLIENT: NSW GOVERNMENT Transport for NSW

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

	NAME	DATE
TITLE		
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

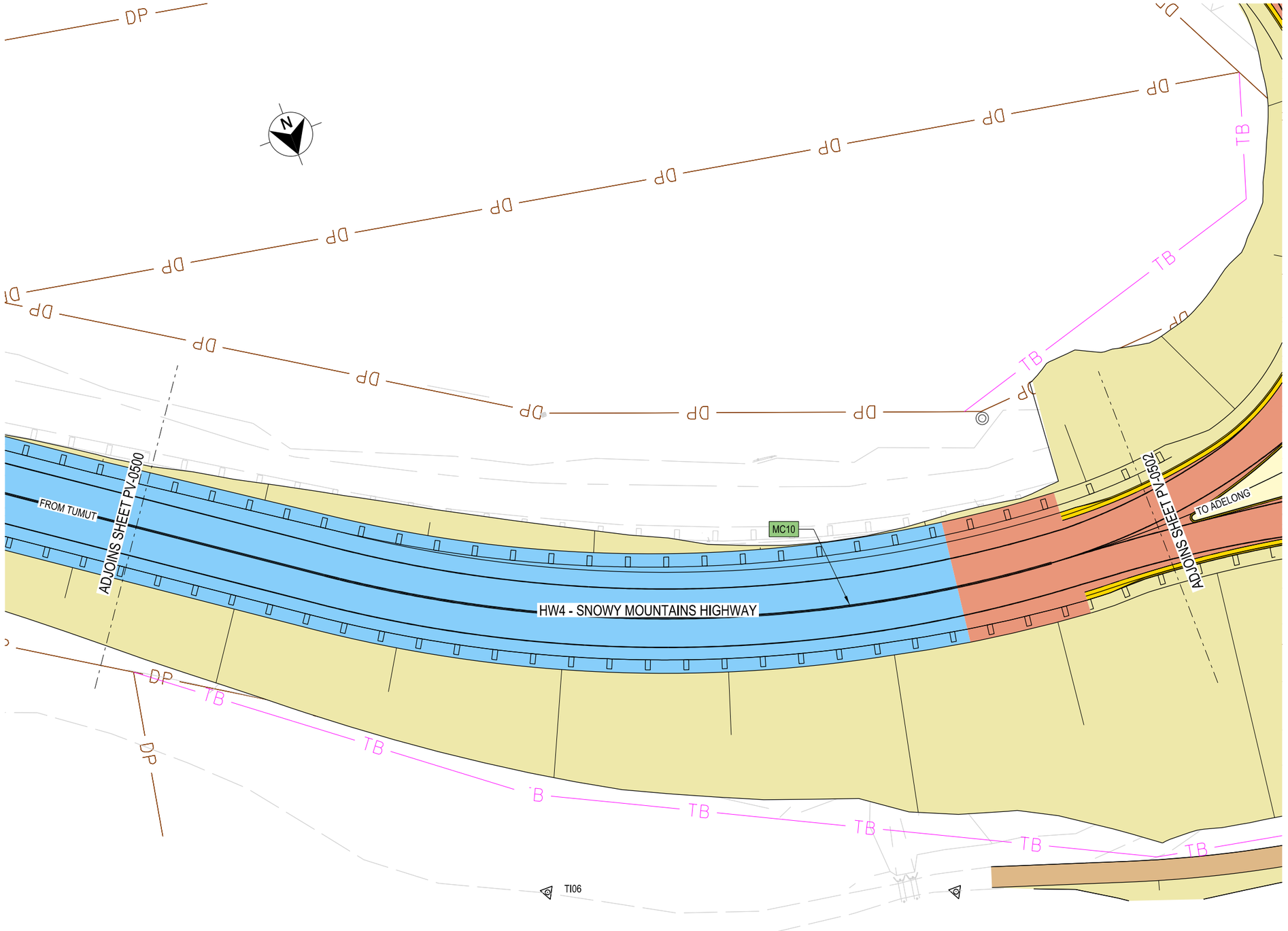
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
PAVEMENT PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.850.000 TO CH.975.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	PV-0500	X



LEGEND

- XXXX — DESIGN CONTROL CALLOUT
- XXXX — CONSTRUCTION CALLOUT
- PAVEMENT TYPE 1
- PAVEMENT TYPE 2
- PAVEMENT TYPE 3
- ROUNDABOUT ANNULUS
- CENTRAL ISLAND
- CONCRETE KERB
- VERGE AND BATTERS
- EXISTING PAVEMENT

NOTES

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2. REFER TO SHEET PV-0507 FOR PAVEMENT DETAILS.
3. REFER TO SHEET PV-XXXX FOR PAVEMENT INTERFACE DETAILS.
4. REFER TO STORMWATER MANAGEMENT PLANS FOR SUBSURFACE DRAIN LOCATIONS.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-PV.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME		PLOT BY
TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

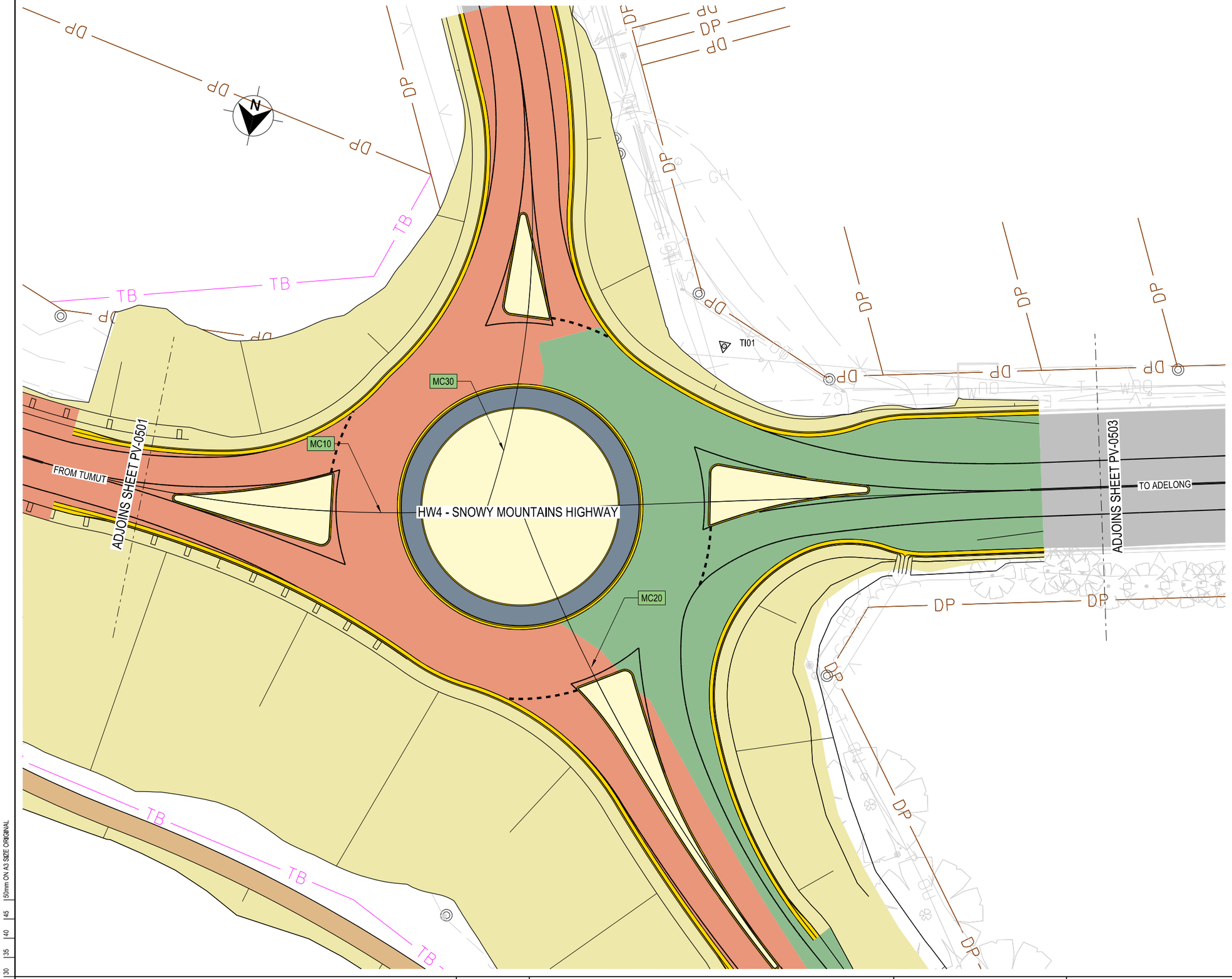
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
PAVEMENT PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.975.000 TO CH.1100.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	PV-0501	X



LEGEND

- XXXX — DESIGN CONTROL CALLOUT
- XXXX — CONSTRUCTION CALLOUT
- PAVEMENT TYPE 1
- PAVEMENT TYPE 2
- PAVEMENT TYPE 3
- ROUNDABOUT ANNULUS
- CENTRAL ISLAND
- CONCRETE KERB
- VERGE AND BATTERS
- EXISTING PAVEMENT

NOTES

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT TRANSPORT FOR NSW QA SPECIFICIATIONS AND AUSTRALIAN STANDARDS UNLESS OTHERWISE STATED.
2. REFER TO SHEET PV-0507 FOR PAVEMENT DETAILS.
3. REFER TO SHEET PV-XXXX FOR PAVEMENT INTERFACE DETAILS.
4. REFER TO STORMWATER MANAGEMENT PLANS FOR SUBSURFACE DRAIN LOCATIONS.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

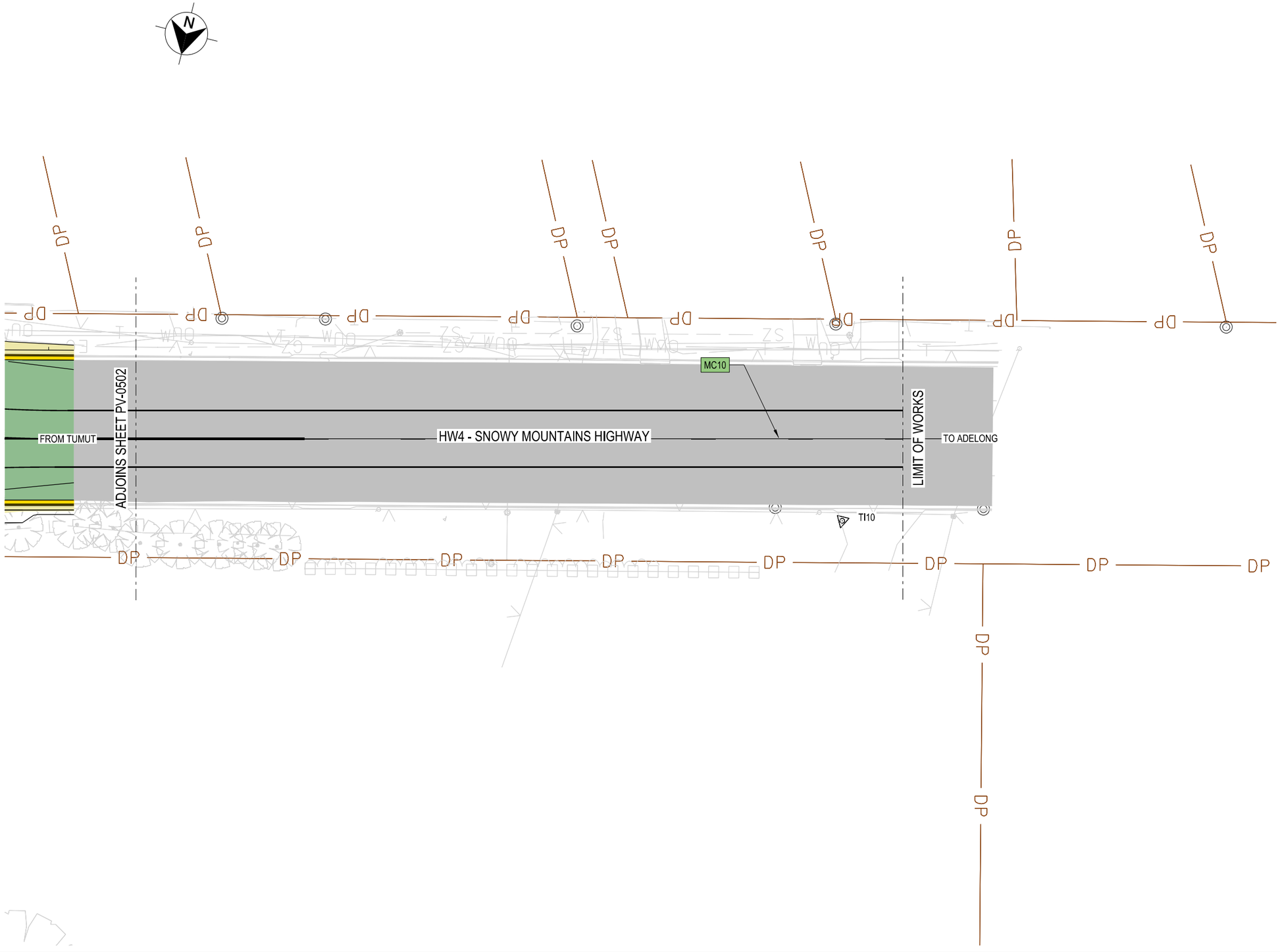
50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-PV.dgn				DESIGN LOT CODE XXXXXXX		DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING		PLOT DATE / TIME		PLOT BY	CLIENT NSW GOVERNMENT Transport for NSW	SNOWY VALLEYS HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD ROUNDABOUT UPGRADE 0.870km TO 1.320km FROM TUMUT PAVEMENT PLAN HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.1100.000 TO CH.1225.000	A3
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE	NAME	DATE			
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX	0 5 10 15 20 SCALE 1:500m	TRANSPORT FOR NSW INFRASTRUCTURE & PLACE TECHNICAL SERVICES ROAD DESIGN SOUTH	DRAWN	X. X. XXXXXXXX	XX.XX.XX			
								DRG CHECK	X. X. XXXXXXXX	XX.XX.XX			
								DESIGN	X. X. XXXXXXXX	XX.XX.XX			
								DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX	PREPARED FOR TRANSPORT FOR NSW REGIONAL & OUTER METROPOLITAN ASSETS SOUTH	RMS REGISTRATION No. DS2020/000808	
						CO-ORDINATE SYSTEM MGA ZONE 55 (GDA94)	HEIGHT DATUM AHD	DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX			
								PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX			

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	PV-0502	X

LEGEND

- XXXX — DESIGN CONTROL CALLOUT
- XXXX — CONSTRUCTION CALLOUT
- PAVEMENT TYPE 1
- PAVEMENT TYPE 2
- PAVEMENT TYPE 3
- ROUNDABOUT ANNULUS
- CENTRAL ISLAND
- CONCRETE KERB
- VERGE AND BATTERS
- EXISTING PAVEMENT



NOTES

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT TRANSPORT FOR NSW QA SPECIFICIATIONS AND AUSTRALIAN STANDARDS UNLESS OTHERWISE STATED.
2. REFER TO SHEET PV-0507 FOR PAVEMENT DETAILS.
3. REFER TO SHEET PV-XXXX FOR PAVEMENT INTERFACE DETAILS.
4. REFER TO STORMWATER MANAGEMENT PLANS FOR SUBSURFACE DRAIN LOCATIONS.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-PV.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY	TITLE	NAME	DATE
	DRAWN	X. X. XXXXXXXX	XX.XX.XX
	DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
	DESIGN	X. X. XXXXXXXX	XX.XX.XX
	DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
	DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
	PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

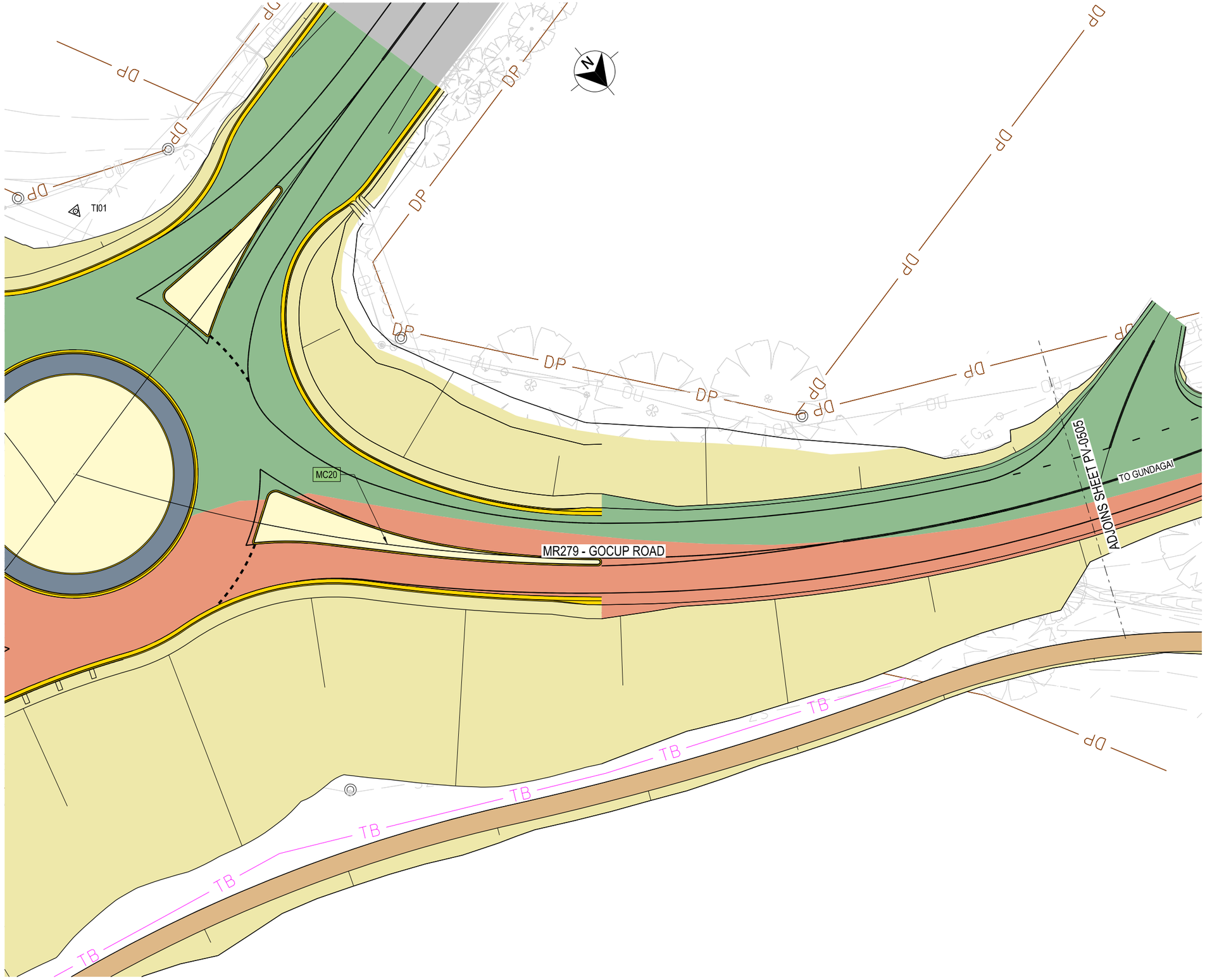
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
PAVEMENT PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.1225.000 TO CH 1351

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	PV-0503	X



LEGEND

- XXXX — DESIGN CONTROL CALLOUT
- XXXX — CONSTRUCTION CALLOUT
- PAVEMENT TYPE 1
- PAVEMENT TYPE 2
- PAVEMENT TYPE 3
- ROUNDABOUT ANNULUS
- CENTRAL ISLAND
- CONCRETE KERB
- VERGE AND BATTERS
- EXISTING PAVEMENT

NOTES

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2. REFER TO SHEET PV-0507 FOR PAVEMENT DETAILS.
3. REFER TO SHEET PV-XXXX FOR PAVEMENT INTERFACE DETAILS.
4. REFER TO STORMWATER MANAGEMENT PLANS FOR SUBSURFACE DRAIN LOCATIONS.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-PV.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY	TITLE	NAME	DATE
	DRAWN	X. X. XXXXXXXX	XX.XX.XX
	DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
	DESIGN	X. X. XXXXXXXX	XX.XX.XX
	DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
	DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
	PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD

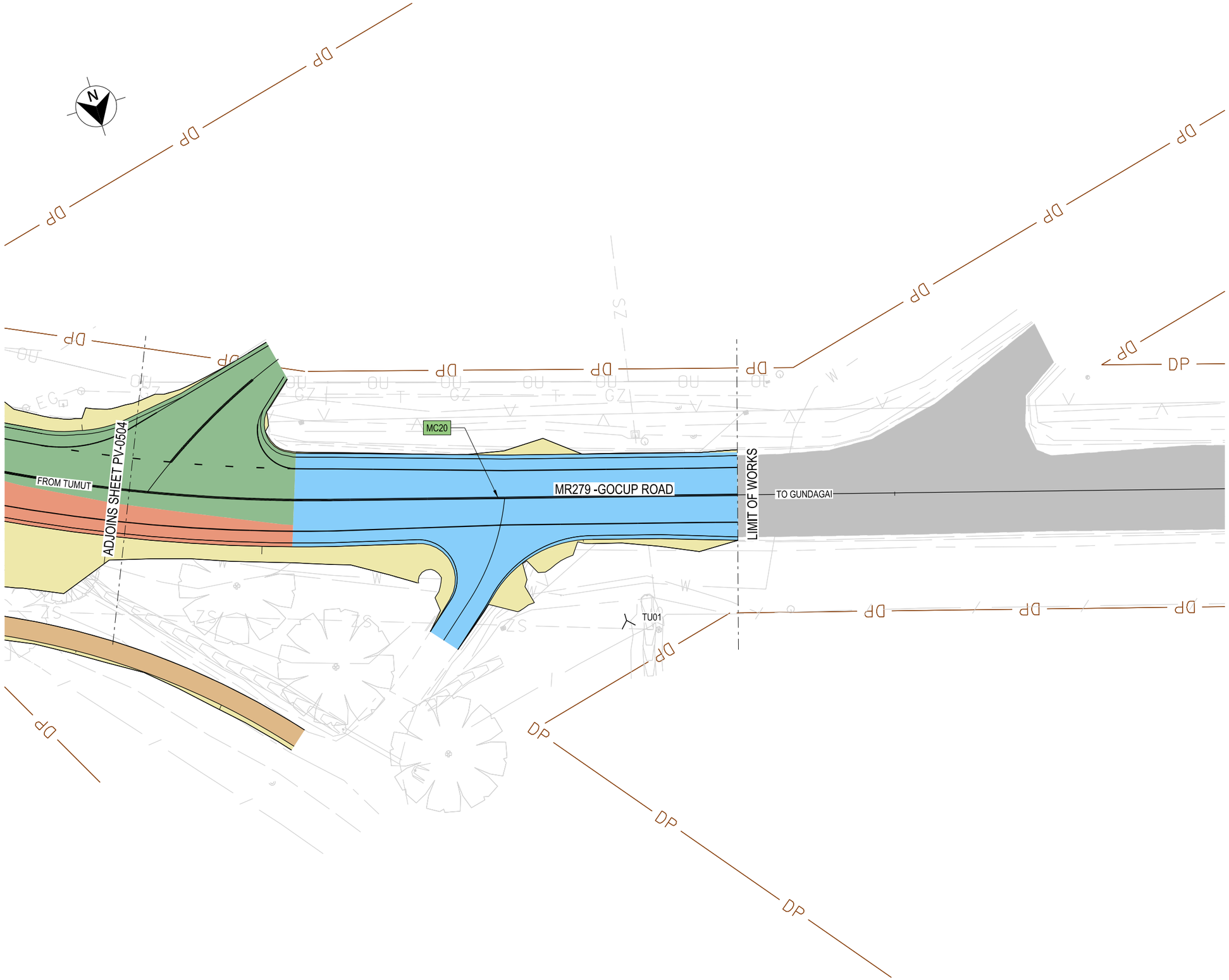
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
PAVEMENT PLAN

MR279 - GOCUP ROAD - MC20 - CH.0.000 TO CH.135.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS: NOT FOR CONSTRUCTION | EDMS No.: SF2016/159601 | SHEET No.: PV-0504 | ISSUE: X



NOTES

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3. REFER TO SHEET PV-XXXX FOR PAVEMENT INTERFACE DETAILS.
4. REFER TO STORMWATER MANAGEMENT PLANS FOR SUBSURFACE DRAIN LOCATIONS.

NOT FOR CONSTRUCTION

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50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-PV.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

PLOT DATE / TIME

PLOT BY

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

	NAME	DATE
TITLE		
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD

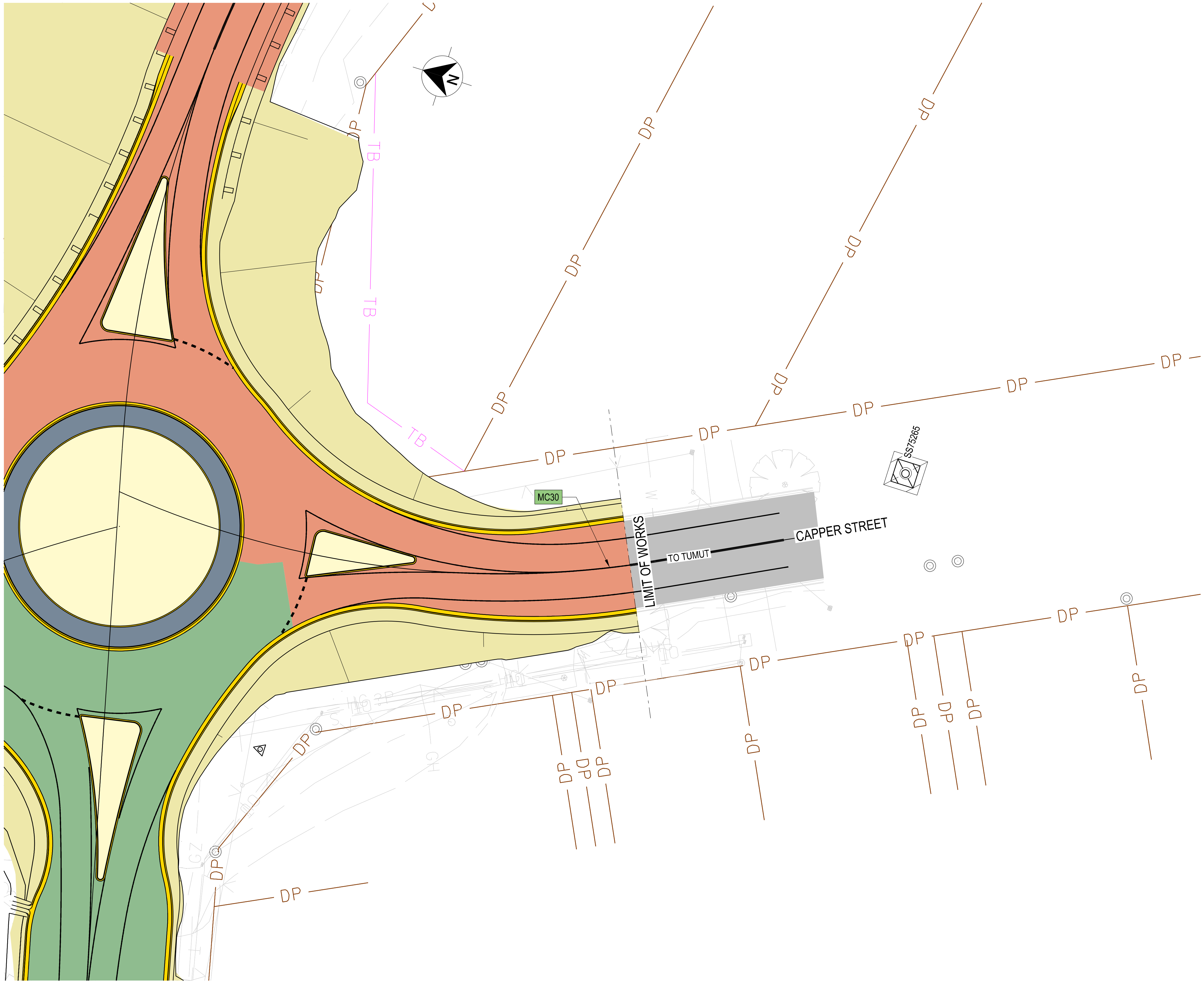
A3

ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
PAVEMENT PLAN

MR279 - GOCUP ROAD - MC20 - CH.135.000 TO CH.225.000

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	PV-0505	X



LEGEND

- XXXX — DESIGN CONTROL CALLOUT
- XXXX — CONSTRUCTION CALLOUT
- PAVEMENT TYPE 1
- PAVEMENT TYPE 2
- PAVEMENT TYPE 3
- ROUNDABOUT ANNULUS
- CENTRAL ISLAND
- CONCRETE KERB
- VERGE AND BATTERS
- EXISTING PAVEMENT

NOTES

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2. REFER TO SHEET PV-0507 FOR PAVEMENT DETAILS.
3. REFER TO SHEET PV-XXXX FOR PAVEMENT INTERFACE DETAILS.
4. REFER TO STORMWATER MANAGEMENT PLANS FOR SUBSURFACE DRAIN LOCATIONS.

NOT FOR CONSTRUCTION

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50mm ON A3 SIZE ORIGINAL

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DRAWING FILE LOCATION / NAME
C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-PV.dgn

DESIGN LOT CODE
XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING
0 5 10 15 20
SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94)
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ROAD DESIGN SOUTH

PLOT DATE / TIME
PLOT BY

TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT
NSW GOVERNMENT Transport for NSW

PREPARED FOR
TRANSPORT FOR NSW
REGIONAL & OUTER METROPOLITAN
ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
PAVEMENT PLAN
CAPPER STREET - MC30 - CH.0.000 TO CH.70.000

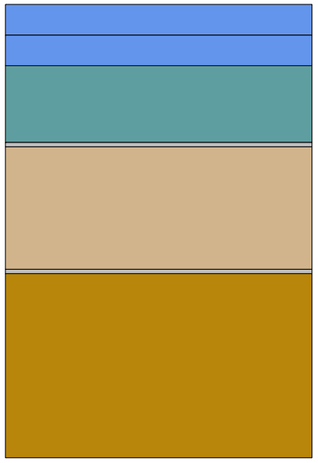
A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS: NOT FOR CONSTRUCTION
EDMS No.: SF2016/159601
SHEET No.: PV-0506
ISSUE: X

PAVEMENT TYPE 1

FINISHED SURFACE LEVEL



50mm DENSE GRADED AC14 PMB (A15E)

50mm DENSE GRADED AC14 AR450 (TfNSW R116)

125mm DENSE GRADED AC20 (AR450) PLACED IN ONE 60mm UPPER LAYER AND ONE 65mm LOWER LAYER (TfNSW R116)

7mm EMULSION SEAL (TfNSW R111)

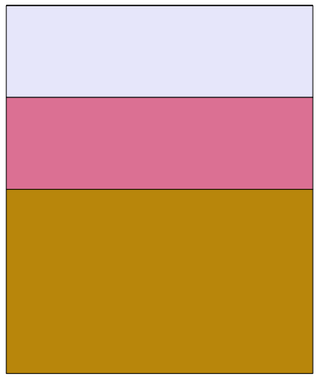
200mm PLANT MIXED HEAVILY BOUND (TfNSW R73)

7mm EMULSION SEAL (TfNSW R111)

300mm SELECTED MATERIAL ZONE (TfNSW 3071) PLACED IN 2 x 150mm LAYERS (TfNSW R44)

PAVEMENT TYPE 2

FINISHED SURFACE LEVEL



PRIMER SEAL, FOLLOWED BY FINAL SEAL (TfNSW R106)

150mm DGB20 CLASS 1 (TfNSW R71)

150mm DGS20 (TfNSW R71)

300mm SELECTED MATERIAL ZONE (TfNSW 3071) PLACED IN 2 x 150mm LAYERS (TfNSW R44)

PAVEMENT TYPE 3

FINISHED SURFACE LEVEL

50mm DENSE GRADED AC14 PMB (A15E)

DEPTH AS REQUIRED, DENSE GRADED AC14 AR450 (TfNSW R116)

PAVEMENT TYPE 4

FINISHED SURFACE LEVEL

150mm DGB20 CLASS 2 (TfNSW R71)

150mm DGS20 (TfNSW R71)

NOTES

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS UNLESS OTHERWISE STATED.
2. FORMATION MATERIALS AND GROUND TREATMENTS IN ACCORADNACE WITH TfNSW PROJECT SPECIFICATION R44.
3. ALL IMPORTED GENERAL FILL MATERIAL SHALL BE CBR ≥ 5% AND PI <25%.

NOT FOR CONSTRUCTION

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-PV.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

PLOT DATE / TIME: 9/7/2005 7:08:02 PM

PLOT BY: newmanmd

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: NOT TO SCALE

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94)

HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

	NAME	DATE
TITLE		
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
PAVEMENT PLAN
PAVEMENT DETAILS

A3

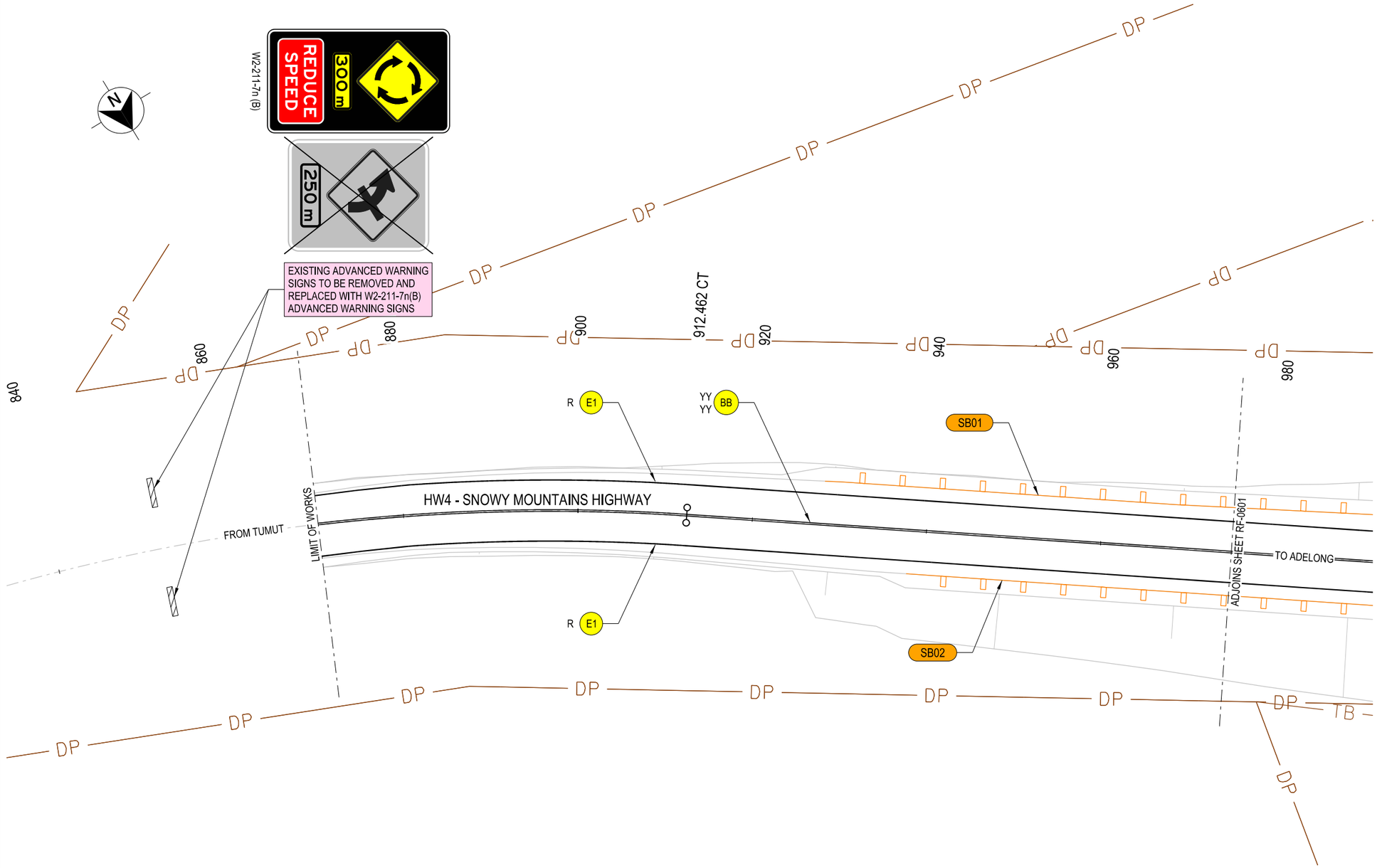
RMS REGISTRATION No.: DS2020/000808

ISSUE STATUS: NOT FOR CONSTRUCTION

EDMS No.: SF2016/159601

SHEET No.: PV-0507

ISSUE: X



LEGEND

- DESIGN CONTROL CALLOUT (MC??)
- CONSTRUCTION CALLOUT (XXXX)
- LINEMARKING / RAISED PAVEMENT MARKER CALLOUT (BB)
- SAFETY BARRIER CALLOUT (SB01)
- KERB CALLOUT (K01)
- STEEL RAIL SAFETY BARRIER
- SAFETY BARRIER TO BE REMOVED
- EXISTING SIGNAGE LOCATION
- PROPOSED SIGNAGE LOCATION
- PROPOSED GUIDE POSTS
- NEW SIGN TO BE INSTALLED
- EXISTING SIGN TO BE RETAINED OR RELOCATED
- EXISTING SIGN TO BE REMOVED

NOTES

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT TRANSPORT FOR NSW QA SPECIFICIATIONS AND AUSTRALIAN STANDARDS UNLESS OTHERWISE STATED.
2. ALL DELINEATION TO BE INSTALLED IN ACCORDANCE WITH TRANSPORT FOR NSW DELINEATION MANUAL AND AS1742.
4. SIGNPOSING LOCATION AND ORIENTATION TO BE INSTALLED IN ACCORDANCE WITH AS1742.2 AND TRANSPORT FOR NSW SUPPLEMENTS.
5. EXISTING SIGNS TO BE REMOVED OR RELOCATED HAVE BEEN IDENTIFIED ONLY. EXISTING SIGNS WHICH ARE NOT NOTED ARE TO REMAIN UNLESS APPROVED BY THE PRINCIPALS REPRESENTATIVE.
6. FOR SIGN POST AND FOOTING DETAILS REFER TO TRANSPORT FOR NSW ACCEPTANCE DOCUMENT FOR FRANGIBLE SIGN POST PRODUCT.
7. REFER TO SHEET RF-XXXX FOR BARRIER SETOUT DETAILS
8. REFER TO STANDARD DRAWING R0300-01 FOR KERB PROFILES.
9. INCLINE FACE OF RAISED MEDIANS SHALL BE MARKED WITH TYPE E6 LINEMARKING.

NOT FOR CONSTRUCTION

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-RF.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

PLOT BY

CLIENT: NSW GOVERNMENT Transport for NSW

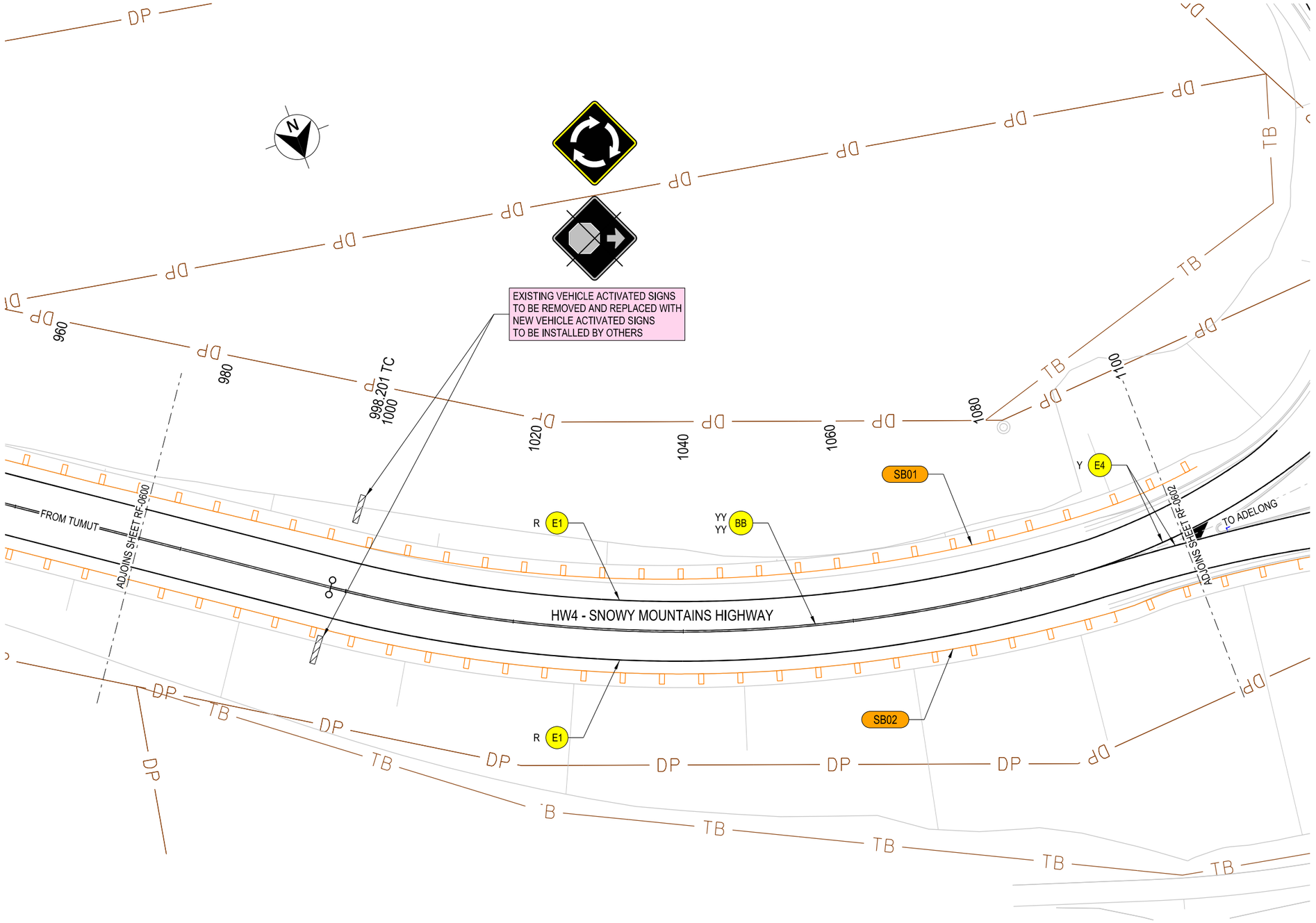
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
ROAD FURNITURE AND PAVEMENT MARKING PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH. 870.000 TO C. 975.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RF-0600	X



LEGEND

- DESIGN CONTROL CALLOUT (MC??)
- CONSTRUCTION CALLOUT (XXXX)
- LINEMARKING / RAISED PAVEMENT MARKER CALLOUT (BB)
- SAFETY BARRIER CALLOUT (SB01)
- KERB CALLOUT (K01)
- STEEL RAIL SAFETY BARRIER
- SAFETY BARRIER TO BE REMOVED
- EXISTING SIGNAGE LOCATION
- PROPOSED SIGNAGE LOCATION
- PROPOSED GUIDE POSTS
- NEW SIGN TO BE INSTALLED
- EXISTING SIGN TO BE RETAINED OR RELOCATED
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NOTES

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7. REFER TO SHEET RF-XXXX FOR BARRIER SETOUT DETAILS
8. REFER TO STANDARD DRAWING R0300-01 FOR KERB PROFILES.
9. INCLINE FACE OF RAISED MEDIANS SHALL BE MARKED WITH TYPE E6 LINEMARKING.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-RF.dgn
DESIGN LOT CODE: XXXXXXX
DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m
CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) | HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

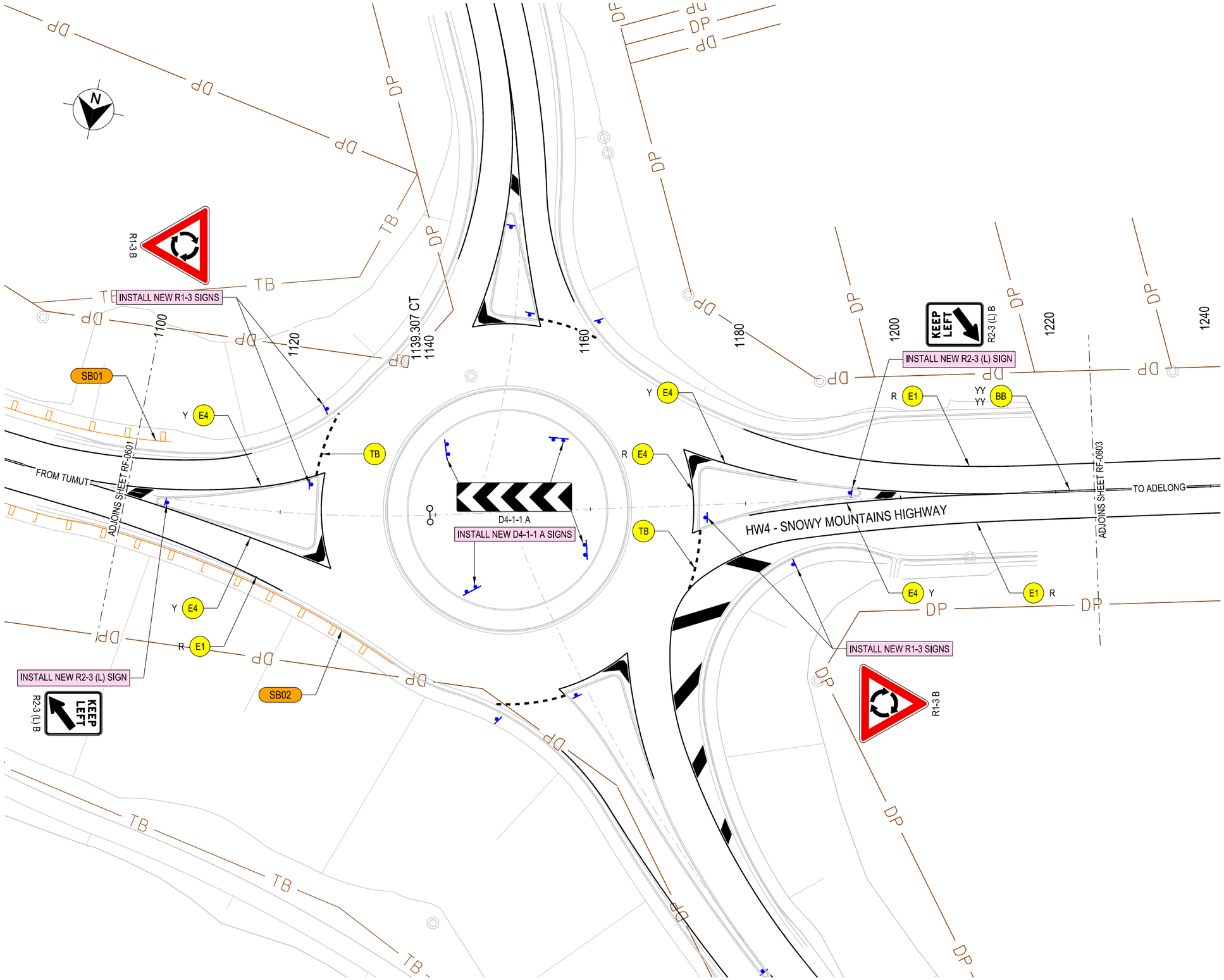
CLIENT: NSW GOVERNMENT Transport for NSW
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
ROAD FURNITURE AND PAVEMENT MARKING PLAN
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH. 975.000 TO CH. 1100.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RF-0601	X



LEGEND

- MC?? — DESIGN CONTROL CALLOUT
- XXXX — CONSTRUCTION CALLOUT
- BB — LINEMARKING / RAISED PAVEMENT MARKER CALLOUT
- SB01 — SAFETY BARRIER CALLOUT
- K01 — KERB CALLOUT
- STEEL RAIL SAFETY BARRIER
- SAFETY BARRIER TO BE REMOVED
- EXISTING SIGNAGE LOCATION
- PROPOSED SIGNAGE LOCATION
- PROPOSED GUIDE POSTS
- NEW SIGN TO BE INSTALLED
- EXISTING SIGN TO BE RETAINED OR RELOCATED
- EXISTING SIGN TO BE REMOVED

NOTES

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4. SIGNPOSING LOCATION AND ORIENTATION TO BE INSTALLED IN ACCORDANCE WITH AS1742.2 AND TRANSPORT FOR NSW SUPPLEMENTS.
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7. REFER TO SHEET RF-XXXX FOR BARRIER SETOUT DETAILS
8. REFER TO STANDARD DRAWING R0300-01 FOR KERB PROFILES.
9. INCLINE FACE OF RAISED MEDIANS SHALL BE MARKED WITH TYPE E6 LINEMARKING.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-RF.dgn				DESIGN LOT CODE: XXXXXXX	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME	PLOT BY	
TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS — A3

HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD

ROUNDABOUT UPGRADE

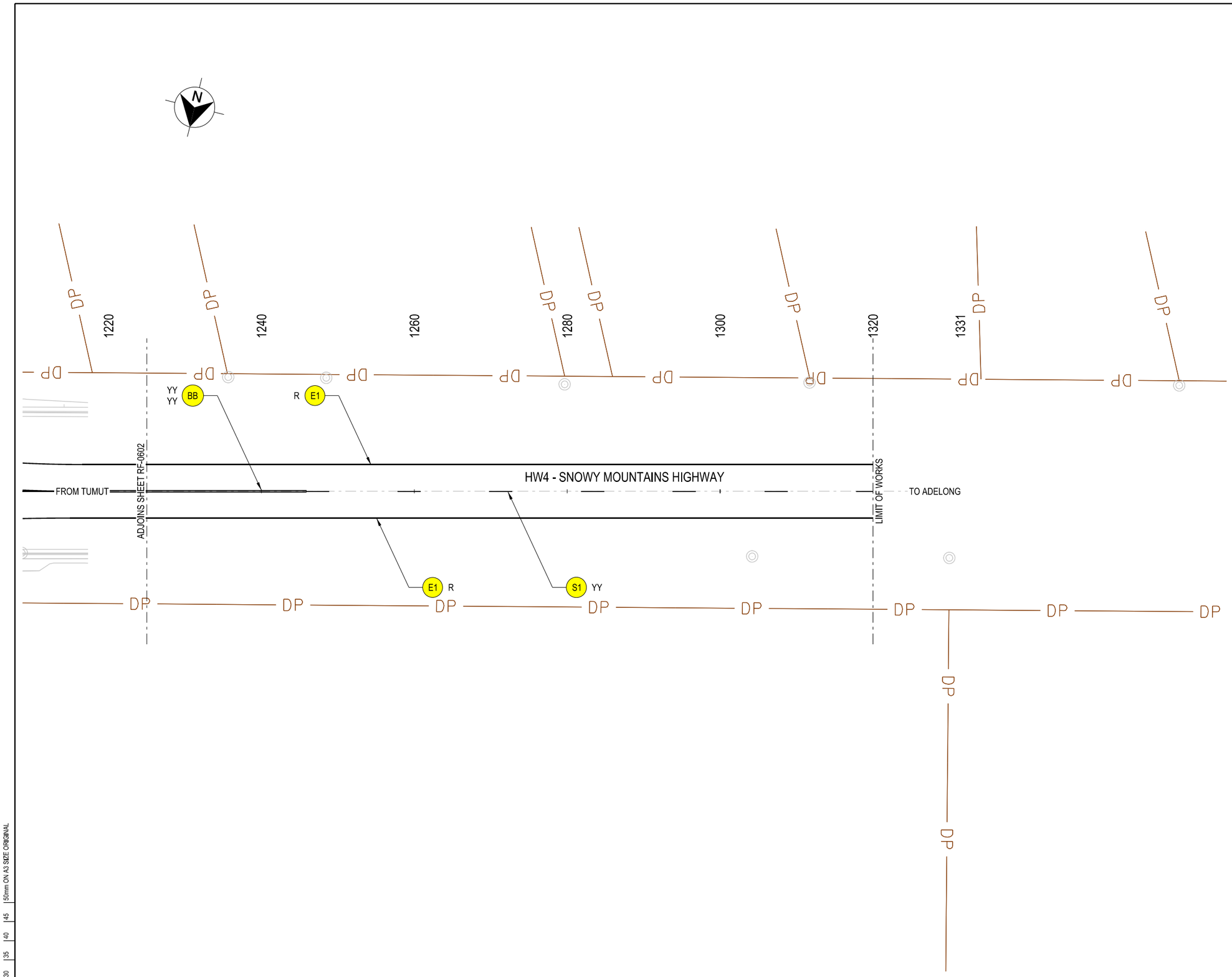
0.870km TO 1.320km FROM TUMUT

ROAD FURNITURE AND PAVEMENT MARKING PLAN

HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH. 1100.000 TO CH. 1225.000

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RF-0602	X



LEGEND

- MC?? — DESIGN CONTROL CALLOUT
- XXXX — CONSTRUCTION CALLOUT
- BB — LINEMARKING / RAISED PAVEMENT MARKER CALLOUT
- SB01 — SAFETY BARRIER CALLOUT
- K01 — KERB CALLOUT
- STEEL RAIL SAFETY BARRIER
- SAFETY BARRIER TO BE REMOVED
- EXISTING SIGNAGE LOCATION
- PROPOSED SIGNAGE LOCATION
- PROPOSED GUIDE POSTS
- NEW SIGN TO BE INSTALLED
- EXISTING SIGN TO BE RETAINED OR RELOCATED
- EXISTING SIGN TO BE REMOVED

NOTES

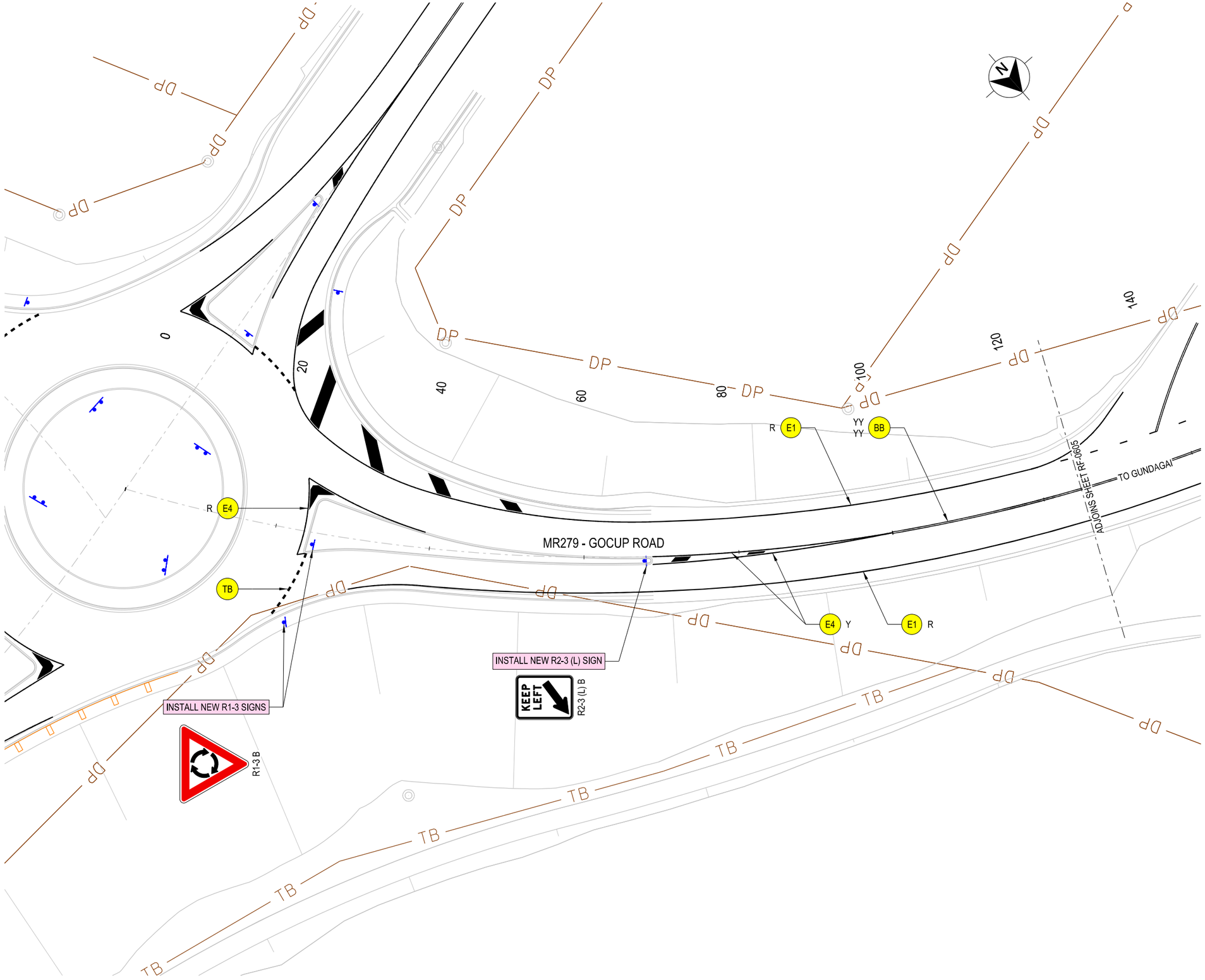
1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT TRANSPORT FOR NSW QA SPECIFICIATIONS AND AUSTRALIAN STANDARDS UNLESS OTHERWISE STATED.
2. ALL DELINEATION TO BE INSTALLED IN ACCORDANCE WITH TRANSPORT FOR NSW DELINEATION MANUAL AND AS1742.
4. SIGNPOSING LOCATION AND ORIENTATION TO BE INSTALLED IN ACCORDANCE WITH AS1742.2 AND TRANSPORT FOR NSW SUPPLEMENTS.
5. EXISTING SIGNS TO BE REMOVED OR RELOCATED HAVE BEEN IDENTIFIED ONLY. EXISTING SIGNS WHICH ARE NOT NOTED ARE TO REMAIN UNLESS APPROVED BY THE PRINCIPALS REPRESENTATIVE.
6. FOR SIGN POST AND FOOTING DETAILS REFER TO TRANSPORT FOR NSW ACCEPTANCE DOCUMENT FOR FRANGIBLE SIGN POST PRODUCT.
7. REFER TO SHEET RF-XXXX FOR BARRIER SETOUT DETAILS
8. REFER TO STANDARD DRAWING R0300-01 FOR KERB PROFILES.
9. INCLINE FACE OF RAISED MEDIANS SHALL BE MARKED WITH TYPE E6 LINEMARKING.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-RF.dgn				DESIGN LOT CODE XXXXXXX		DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING		PLOT DATE / TIME		PLOT BY	CLIENT
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE	NAME	DATE	NSW GOVERNMENT Transport for NSW
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX	0 5 10 15 20 SCALE 1:500m	TRANSPORT FOR NSW INFRASTRUCTURE & PLACE TECHNICAL SERVICES ROAD DESIGN SOUTH	DRAWN	X. X. XXXXXXXX	XX.XX.XX	
								DRG CHECK	X. X. XXXXXXXX	XX.XX.XX	
								DESIGN	X. X. XXXXXXXX	XX.XX.XX	
								DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX	
								DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX	
								PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX	

CO-ORDINATE SYSTEM MGA ZONE 55 (GDA94)	HEIGHT DATUM AHD	PREPARED FOR TRANSPORT FOR NSW REGIONAL & OUTER METROPOLITAN ASSETS SOUTH	SNOWY VALLEYS HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD ROUNDABOUT UPGRADE 0.870km TO 1.320km FROM TUMUT ROAD FURNITURE AND PAVEMENT MARKING PLAN HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH 1225.000 TO CH. 1320.000	A3
			RMS REGISTRATION No. DS2020/000808	
ISSUE STATUS NOT FOR CONSTRUCTION			EDMS No. SF2016/159601	SHEET No. RF-0603	ISSUE X



LEGEND

- MC?? — DESIGN CONTROL CALLOUT
- XXXX — CONSTRUCTION CALLOUT
- BB — LINEMARKING / RAISED PAVEMENT MARKER CALLOUT
- SB01 — SAFETY BARRIER CALLOUT
- K01 — KERB CALLOUT
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- SAFETY BARRIER TO BE REMOVED
- EXISTING SIGNAGE LOCATION
- PROPOSED SIGNAGE LOCATION
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- NEW SIGN TO BE INSTALLED
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9. INCLINE FACE OF RAISED MEDIANS SHALL BE MARKED WITH TYPE E6 LINEMARKING.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-RF.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES

REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY	NAME	DATE
TITLE		
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

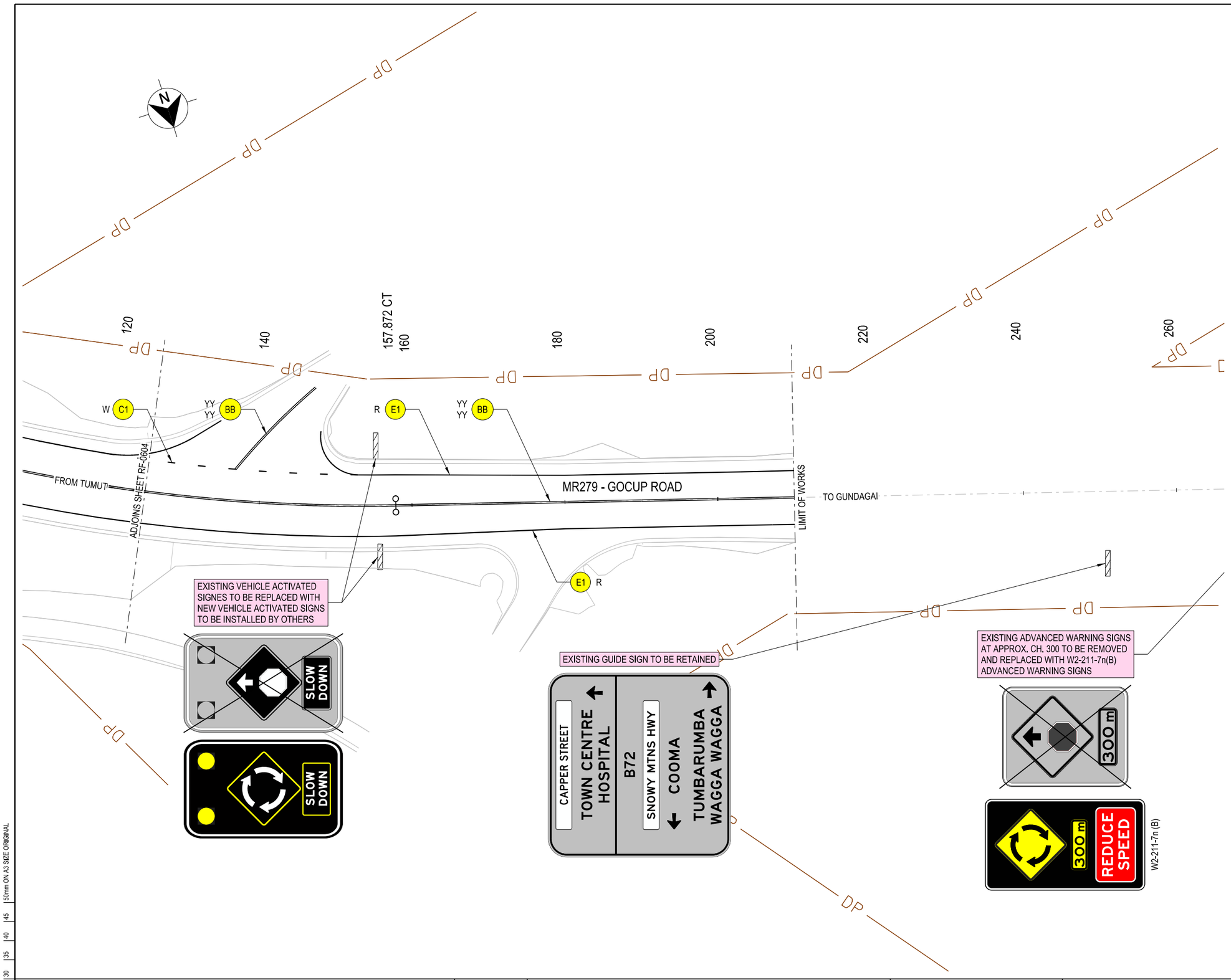
PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
ROAD FURNITURE AND PAVEMENT MARKING PLAN
MR279 - GOCUP ROAD - MC20 - CH. 0.000 TO CH. 125.000

A3

RMS REGISTRATION No.: DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RF-0604	X



LEGEND

- MC?? — DESIGN CONTROL CALLOUT
- XXXX — CONSTRUCTION CALLOUT
- BB — LINEMARKING / RAISED PAVEMENT MARKER CALLOUT
- SB01 — SAFETY BARRIER CALLOUT
- K01 — KERB CALLOUT
- STEEL RAIL SAFETY BARRIER
- SAFETY BARRIER TO BE REMOVED
- EXISTING SIGNAGE LOCATION
- PROPOSED SIGNAGE LOCATION
- PROPOSED GUIDE POSTS
- NEW SIGN TO BE INSTALLED
- EXISTING SIGN TO BE RETAINED OR RELOCATED
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7. REFER TO SHEET RF-XXXX FOR BARRIER SETOUT DETAILS
8. REFER TO STANDARD DRAWING R0300-01 FOR KERB PROFILES.
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NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-RF.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES

REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) | HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY	TITLE	NAME	DATE
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	DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
	DESIGN	X. X. XXXXXXXX	XX.XX.XX
	DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
	DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
	PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD

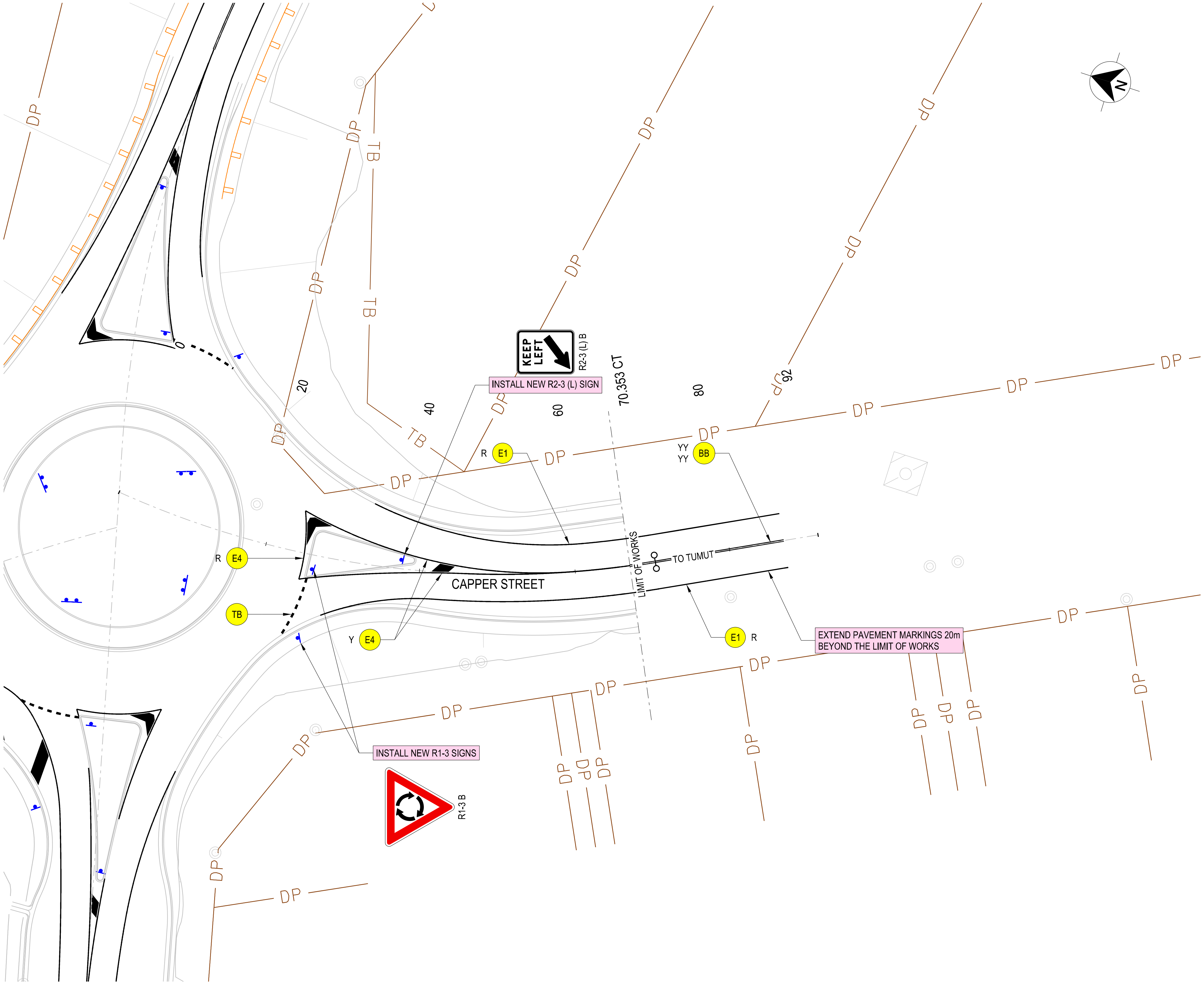
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
ROAD FURNITURE AND PAVEMENT MARKING PLAN

MR279 - GOCUP ROAD - MC20 - CH. 125.000 TO CH. 210.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RF-0605	X



LEGEND

Symbol	Description
MC??	DESIGN CONTROL CALLOUT
XXXX	CONSTRUCTION CALLOUT
BB	LINEMARKING / RAISED PAVEMENT MARKER CALLOUT
SB01	SAFETY BARRIER CALLOUT
K01	KERB CALLOUT
	STEEL RAIL SAFETY BARRIER
	SAFETY BARRIER TO BE REMOVED
	EXISTING SIGNAGE LOCATION
	PROPOSED SIGNAGE LOCATION
	PROPOSED GUIDE POSTS
	NEW SIGN TO BE INSTALLED
	EXISTING SIGN TO BE RETAINED OR RELOCATED
	EXISTING SIGN TO BE REMOVED

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8. REFER TO STANDARD DRAWING R0300-01 FOR KERB PROFILES.
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NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME
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DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

PLOT DATE / TIME — PLOT BY

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING
0 5 10 15 20
SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94)
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ROAD DESIGN SOUTH

TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT
NSW GOVERNMENT | Transport for NSW

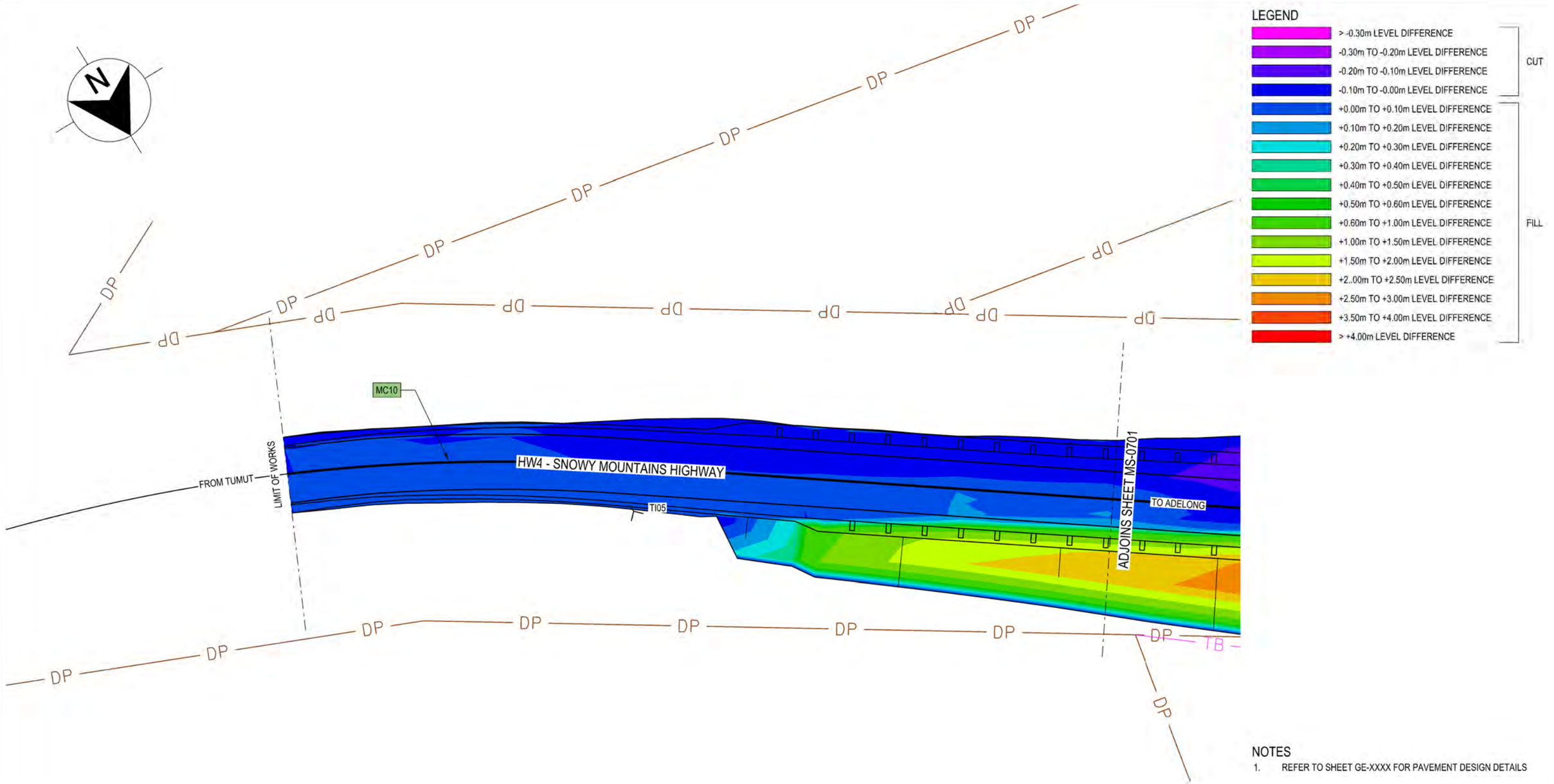
PREPARED FOR
TRANSPORT FOR NSW
REGIONAL & OUTER METROPOLITAN
ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
ROAD FURNITURE AND PAVEMENT MARKING PLAN
CAPPER STREET - MC30 - CH. 0.000 TO CH. 67.060

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	RF-0606	X



NOTES

1. REFER TO SHEET GE-XXXX FOR PAVEMENT DESIGN DETAILS

UTILITY INFORMATION SHOWN ON THE PLANS DOES NOT DEPICT ANY MORE THAN THE PRESENCE OF A SERVICE, BASED ON AVAILABLE DOCUMENTARY EVIDENCE. THE PRESENCE OF A UTILITY SERVICE, ITS SIZE AND LOCATION SHOULD BE CONFIRMED BY FIELD INSPECTION, PRIOR TO THE COMMENCEMENT OF ROADWORKS AND THE RELEVANT UTILITY PLANS OBTAINED BY DIALLING PH 1100 OR FAX 1300 652 077 (DIAL BEFORE YOU DIG). CAUTION SHOULD BE EXERCISED WHEN WORKING IN THE VICINITY OF ALL UTILITY SERVICES.

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-MS.dgn

DESIGN LOT CODE: XXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	DRAWING No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME: PLOT BY

TITLE	NAME	DATE
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR: TRANSPORT FCR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS — A3

HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD

ROUNDABOUT UPGRADE

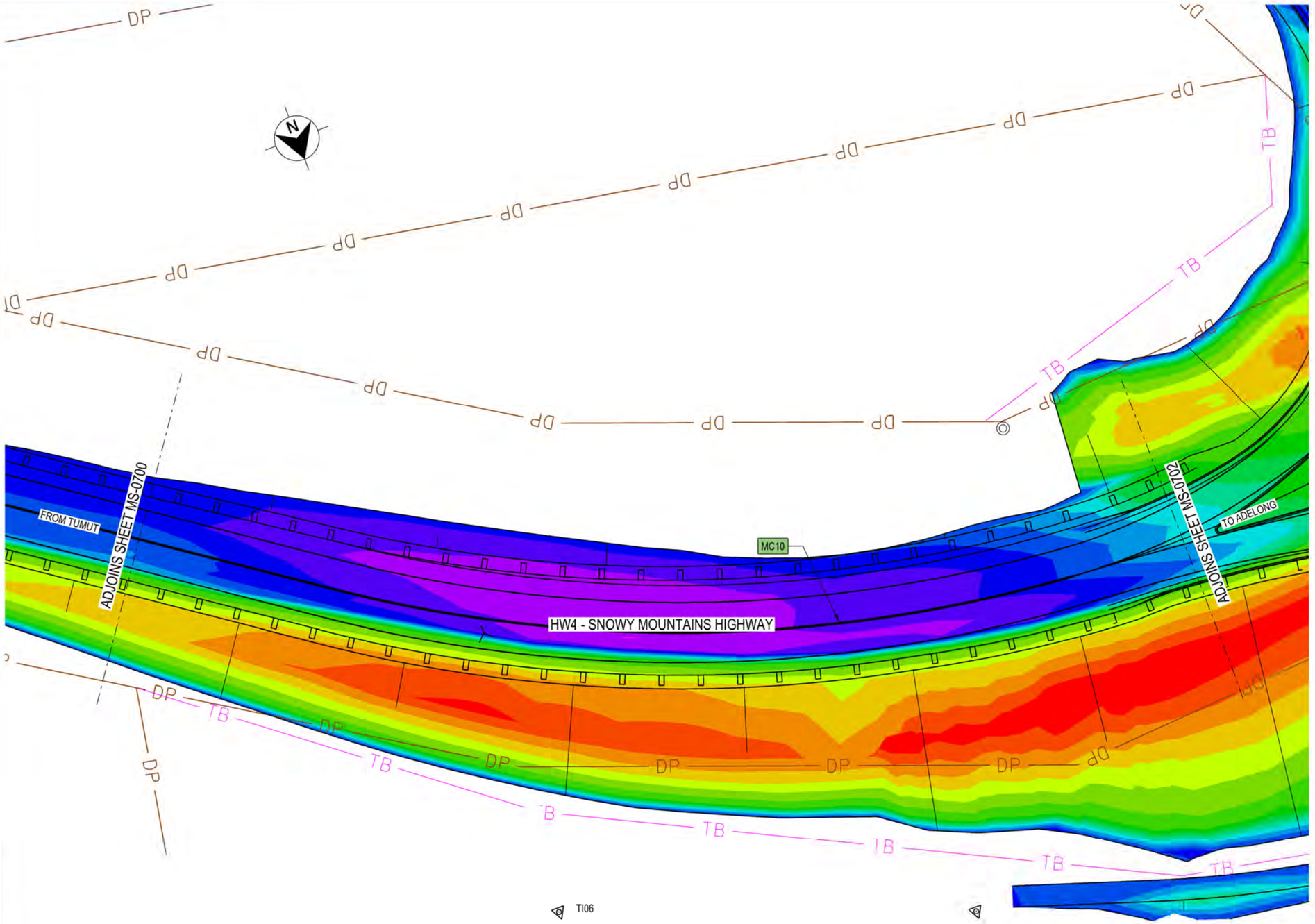
0.870km TO 1.320km FROM TUMUT

ISOPACHYTE PLANS

HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.850.000 TO CH.975.000

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	MS-0700	X



LEGEND

CUT
- > -0.30m LEVEL DIFFERENCE
- -0.30m TO -0.20m LEVEL DIFFERENCE
- -0.20m TO -0.10m LEVEL DIFFERENCE
- -0.10m TO -0.00m LEVEL DIFFERENCE

FILL
- +0.00m TO +0.10m LEVEL DIFFERENCE
- +0.10m TO +0.20m LEVEL DIFFERENCE
- +0.20m TO +0.30m LEVEL DIFFERENCE
- +0.30m TO +0.40m LEVEL DIFFERENCE
- +0.40m TO +0.50m LEVEL DIFFERENCE
- +0.50m TO +0.60m LEVEL DIFFERENCE
- +0.60m TO +1.00m LEVEL DIFFERENCE
- +1.00m TO +1.50m LEVEL DIFFERENCE
- +1.50m TO +2.00m LEVEL DIFFERENCE
- +2..00m TO +2.50m LEVEL DIFFERENCE
- +2.50m TO +3.00m LEVEL DIFFERENCE
- +3.50m TO +4.00m LEVEL DIFFERENCE
- > +4.00m LEVEL DIFFERENCE

NOTES
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NOT FOR CONSTRUCTION

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10 5 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\DataWorksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-MS.dgn

DESIGN LOT CODE: XXXXXXX

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

PLOT DATE / TIME / PLOT BY

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

	NAME	DATE
TITLE		
DRAWN	X. X. XXXXXXXX	XX.XX.XX
DRG CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN	X. X. XXXXXXXX	XX.XX.XX
DESIGN CHECK	X. X. XXXXXXXX	XX.XX.XX
DESIGN MNGR	X. X. XXXXXXXX	XX.XX.XX
PROJECT MNGR	X. X. XXXXXXXX	XX.XX.XX

CLIENT: NSW GOVERNMENT Transport for NSW

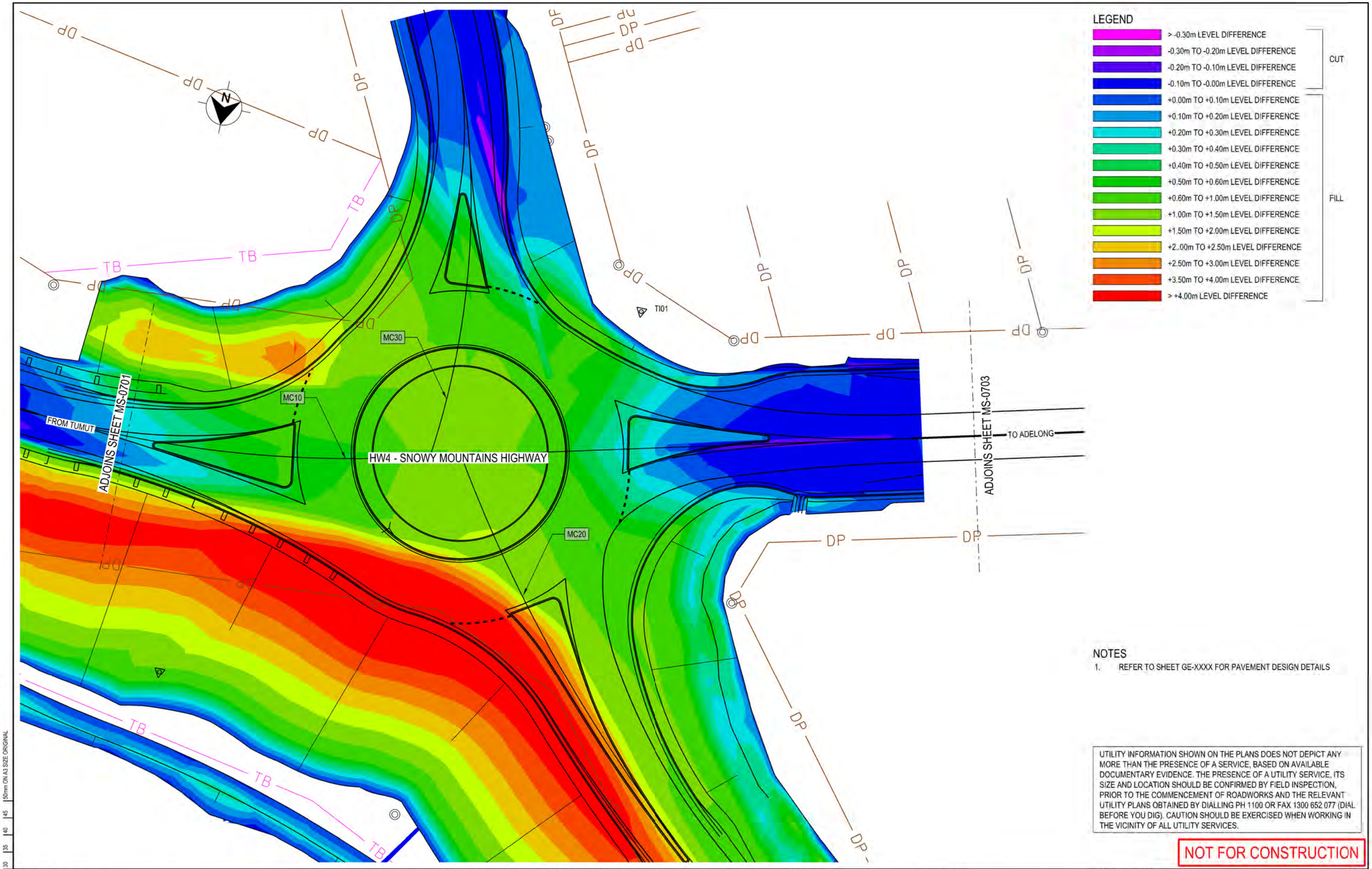
PREPARED FOR: TRANSPORT FCR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
ISOPACHYTE PLANS
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.975.000 TO CH.1100.000

A3

RMS REGISTRATION No. DS2020/000808

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
NOT FOR CONSTRUCTION	SF2016/159601	MS-0701	X



NOTES

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NOT FOR CONSTRUCTION

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50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\GocupRd\dgn\07-Drawing Production\Plan and Profile\P-PLAN-MS.dgn				DESIGN LOT CODE: XXXXXXX	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 5 10 15 20 — SCALE 1:500m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) | HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ROAD DESIGN SOUTH

PLOT DATE / TIME — PLOT BY		
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PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
ISOPACHYTE PLANS
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.1100.000 TO CH.1225.000

A3

RMS REGISTRATION No.: DS2020/000808

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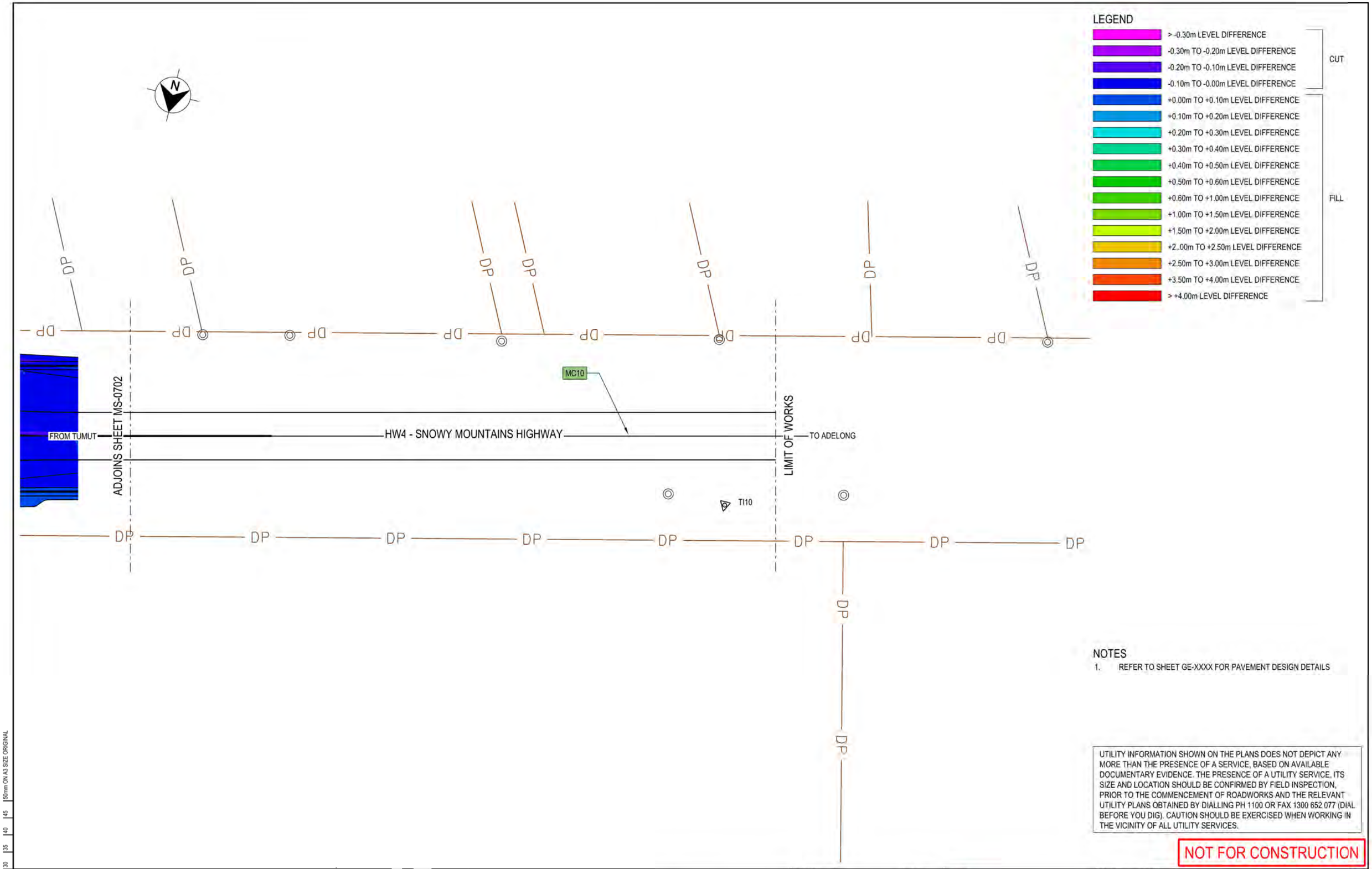

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SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
ISOPACHYTE PLANS
HW4 - SNOWY MOUNTAINS HIGHWAY - MC10 - CH.1225.000 TO CH.1351

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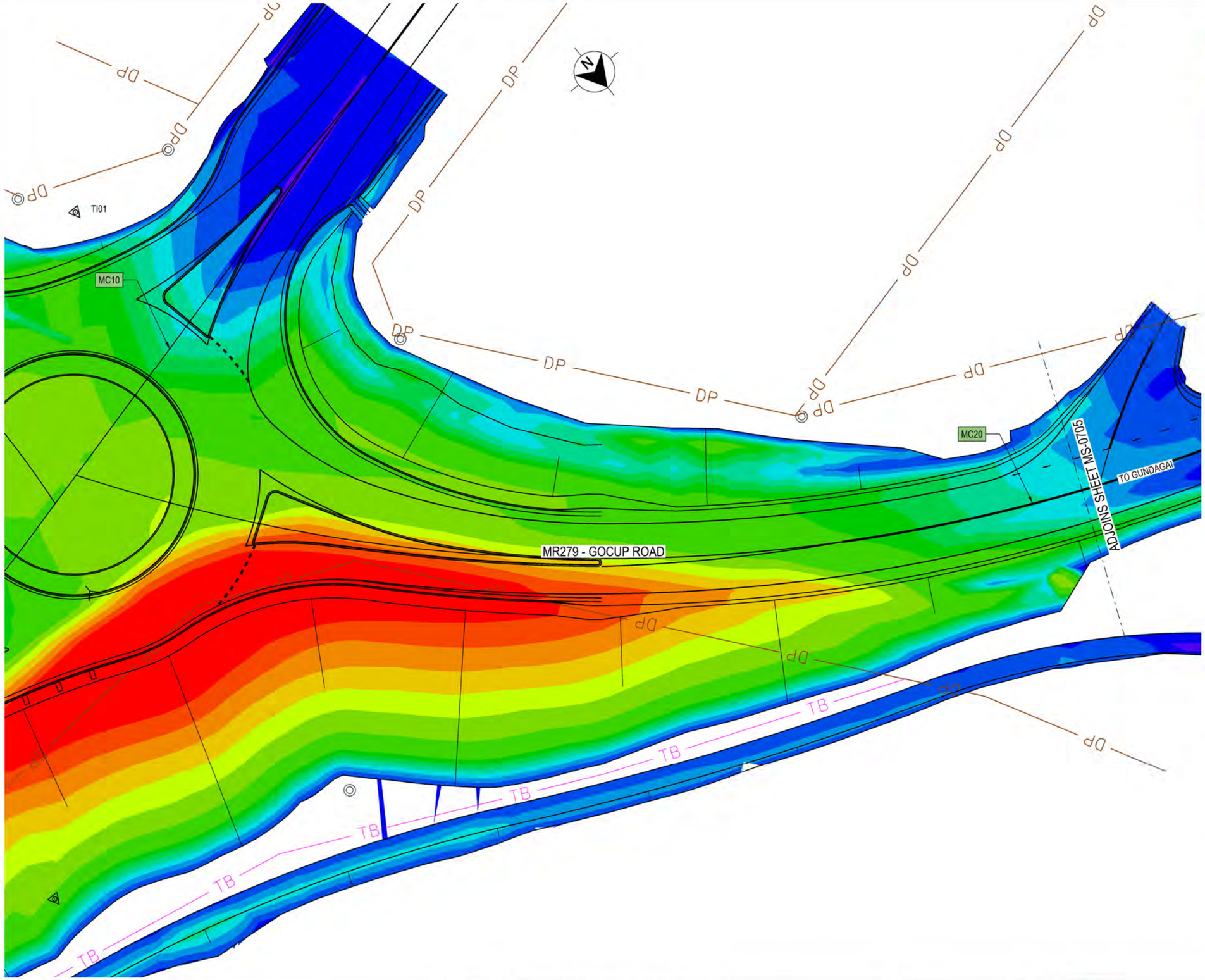

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CLIENT: NSW GOVERNMENT Transport for NSW
PREPARED FOR: TRANSPORT FCR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
ISOPACHYTE PLANS
MR279 - GOCUP ROAD - MC20 - CH.0.000 TO CH.135.000

A3

RMS REGISTRATION No.: DS2020/000808

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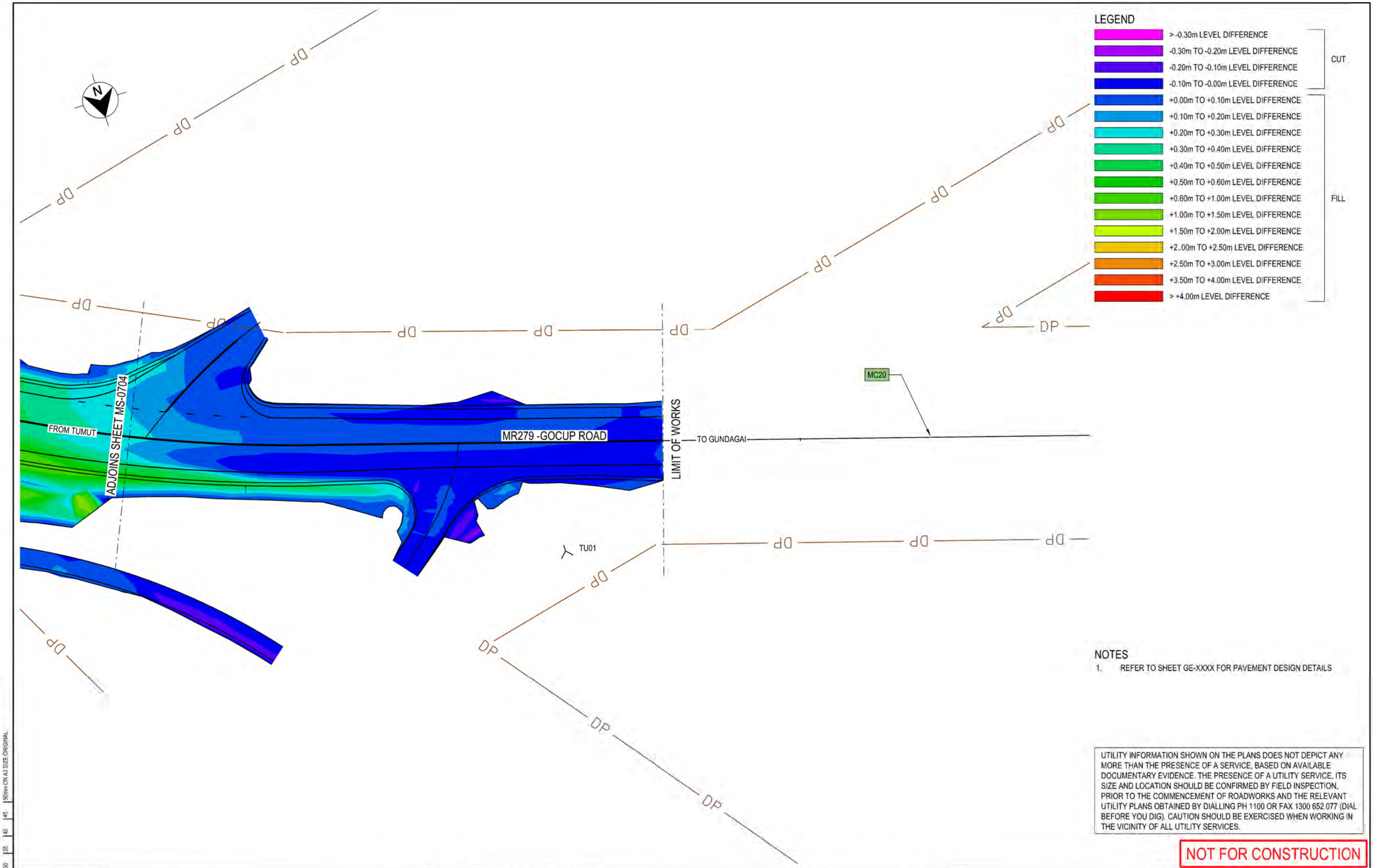

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PREPARED FOR: TRANSPORT FCR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS — A3

HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD

ROUNDABOUT UPGRADE

0.870km TO 1.320km FROM TUMUT

ISOPACHYTE PLANS

MR279 - GOCUP ROAD - MC20 - CH.135.000 TO CH.225.000

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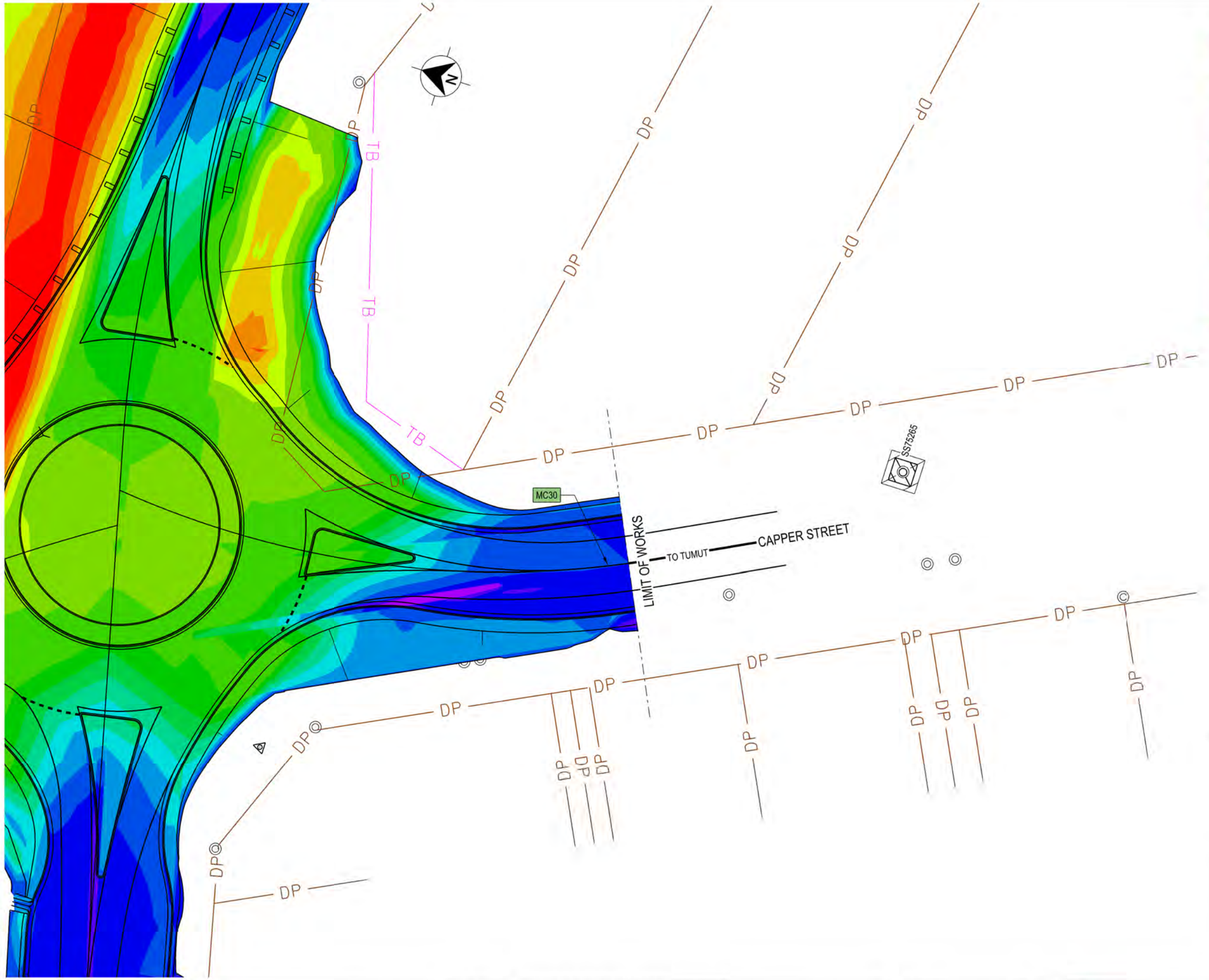

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CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR: TRANSPORT FOR NSW, REGIONAL & OUTER METROPOLITAN ASSETS SOUTH

SNOWY VALLEYS
HW4 - SNOWY MOUNTAINS HIGHWAY & MR279 - GOCUP ROAD
ROUNDABOUT UPGRADE
0.870km TO 1.320km FROM TUMUT
ISOPACHYTE PLANS
CAPPER STREET - MC30 - CH.0.000 TO CH.70.000

A3

RMS REGISTRATION No.: DS2020/000808

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Appendix B

Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI)

ABORIGINAL ARCHAEOLOGICAL SURVEY REPORT (STAGE 2 PACHCI)

Snowy Mountains Highway / Gocup Road Intersection Improvement

June 2021

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DOCUMENT VERIFICATION

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Project Number:	21-138
Project File Name:	21-138 Snowy Mountains Highway Gocup Road Intersection Improvement PACHCI Stage 2 Draft V.1_24062021

Revision	Date	Prepared by	Reviewed by	Approved by
Draft	24/06/2021	Tony Miscamble and Jill Taylor	Ali Byrne	Ali Byrne

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TABLE OF CONTENTS

FIGURES

TABLES

PLATES

ACRONYMS AND ABBREVIATIONS

Aboriginal object	"any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises NSW, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction and includes Aboriginal remains" (DECCW 2010:18)
Aboriginal place	"a place declared under s.84 of the NPW Act that, in the opinion of the Minister, is or was of special significance to Aboriginal culture" (DECCW 2010:18). Aboriginal places have been gazetted by the Minister.
Activity	A project, development, or work (this term is used in its ordinary meaning and is not restricted to an activity as defined by Part 5 EP&A Act 1979)
AHIMS	Aboriginal heritage information management system
AHIP	Aboriginal Heritage Impact Permit
DECCW	Refer to OEH
Due diligence	"taking reasonable and practical steps to determine whether a person's actions will harm an Aboriginal object and, if so, what measures can be taken to avoid that harm" (DECCW 2010:18)
DPIE	Department of Planning, Industry and Environment
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
ha	hectares
Harm	A statutory term meaning '... any act or omission that destroys, defaces, damages an object or place or, in relation to an object – moves the object from the land on which it had been situated' (s.5 NPW Act).
KNC	Kelleher Nightingale Consultancy Pty Ltd
km	kilometres
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
m	Metres
NGH	NGH Pty Ltd
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
OEH	Office of Environment and Heritage, formerly Department of Environment, Climate Change and Water (NSW)
PACHCI	Procedure for Aboriginal Cultural Heritage Consultation and Investigation
PAD	Potential Archaeological Deposit
Proposal Area	The Proposal Area is the area subject to the proposed activity including stockpile use.
SHI	State Heritage Inventory
TfNSW	Transport for New South Wales (formerly NSW Roads and Maritime Services)

EXECUTIVE SUMMARY

NGH Pty Ltd was commissioned by Transport for New South Wales to prepare an Aboriginal archaeological survey report in accordance with Stage 2 of the *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI) (NSW Roads and Maritime Services 2011) for the proposed intersection upgrade between the Snowy Mountains Highway and Gocup Road, Tumut NSW, in the Snowy Valleys Council Local Government Area.

The proposed work includes but is not limited to the following activities that may disturb the ground surface:

- Site establishment (compound site, stockpile locations and fencing)
- Implementation of a traffic control plan including signs and devices
- Implementation of environmental control measures
- Tree and vegetation trimming and removal
- Formation widening
- Roundabout Construction
- Slope / batter work
- Utility Relocation
- Retaining wall construction
- Improve stormwater drainage system including culvert extension work
- Safety barrier installation
- Shared Path construction.

BACKGROUND AND DESKTOP ASSESSMENT

An extensive search of the AHIMS database was undertaken over an area centred on the Proposal Area. There were 71 Aboriginal sites recorded within this search area and one declared Aboriginal Place.

The most common site types present in the local area are modified trees, followed by artefact sites including isolated finds, and scatters. There are no registered sites within the boundary of the Proposal Area, however there are 5 sites within less than one kilometre, listed below:

- 56-3-0059 Culturally Modified Tree
- 56-3-0060 Culturally Modified Tree
- 56-3-0061 Culturally Modified Tree
- 56-3-0108 Culturally Modified Tree
- 56-3-0109 Culturally Modified Tree.

The declared Aboriginal Place, known as Hannibal Hamilton Grave, is over 4 km from the Proposal Area and will not be impacted as a result of the proposed works.

Much of the Proposal Area has been significantly disturbed by the construction of the Snowy Mountains Highway and urban and infrastructure development for the Tumut township. However, it is within 200 m of the Tumut River and associated wetlands. Landforms associated with watercourses have an elevated potential to contain Aboriginal objects. The Proposal Area also occurs within an area of significant cultural value to the local Aboriginal community, and mature native trees remain within the Proposal Area that may be impacted by the proposed works. Additionally, the proposed Compound Stockpile Site is situated on an elevated terrace overlooking the wetlands of the Tumut River within 100m of two registered AHIMS sites (56-3-0108 & 56-3-0109), which brings increased potential for Aboriginal cultural heritage in this location. Therefore a field survey was required to inform the current assessment.

FIELD ASSESSMENT

A visual inspection was undertaken on the 24th of May 2021 by qualified NGH archaeologist Jill Taylor. Two representatives of the Brungle-Tumut Local Aboriginal Land Council (LALC), Matthew Marlowe and Rebecca Russell, were engaged to participate in the site inspection and to provide any cultural information related to the Proposal Area and the wider surroundings. TfNSW Environmental Officer Robert Norton also attended the site inspection.

The entirety of the Proposal Area was examined on foot. Overall visibility was poor, averaging less than 5% with tall weeds and grasses and thick mowed lawn covering the majority of the Proposal Area. Most of the works are to be undertaken within the road corridor along the Snowy Mountain Highway, Gocup Road and along Capper Street. The exception to this is the placing of power poles in the wetlands area. The works will protrude north of the Snowy Mountains Highway encompassing some parkland up to the walking track paralleling the Snowy Mountains Highway and the vacant land on the corner of Capper Street and the Snowy Mountains Highway. These areas were found to be highly disturbed, predominantly from underground services installation and maintenance and prior road construction/infrastructure. No Aboriginal sites or objects were recorded within this area, and it was deemed that the area has low potential to contain *in situ* subsurface deposits due to the high level of disturbance and being a landform that is considered low sensitivity for Aboriginal objects. The Brungle-Tumut LALC representatives onsite during the site inspection also agreed with this assessment and did not raise any issues or concerns with the proposed intersection upgrade between the Snowy Mountains Highway and Gocup Road being undertaken in this highly disturbed area.

The wetland area to the north of the walking track adjacent to the Snowy Mountains Highway was less disturbed, although due to its low-lying nature and propensity for flooding was considered to have low potential to contain Aboriginal objects. Representatives from the Brungle-Tumut LALC noted that the wetland area north of the walking track was an area that contained elevated resource potential and was therefore potentially of significant cultural value.

The Compound Stockpile Site was located on an elevated terrace overlooking several unnamed drainage lines, Gilmore Creek and the floodplain of the Tumut River and was considered to have potential for subsurface archaeological deposits (PAD 1). If TfNSW was to use this location for stockpiling, Stage 3 of the PACHCI must be undertaken with a programme of subsurface testing within PAD 1. All subsurface testing can be conducted in accordance with the *Code of Practice for Archaeological Investigations.* The Brungle-Tumut LALC representatives onsite during the site inspection also agreed with this assessment.

All old growth native trees within the Proposal Area were examined however none had scarring that was considered to conform in any way to the standard scarring morphology accepted for Aboriginal modification.

IMPACT ASSESSMENT SUMMARY

As no Aboriginal sites or areas of archaeological potential were identified within the disturbed area of the Proposal Area as identified in Figure 6-1, it is concluded that the proposed intersection upgrade between the Snowy Mountains Highway and Gocup Road as assessed in this report would not require any further heritage investigation and works can proceed with caution. A potential archaeological deposit (PAD 1) was identified within the Compound Stockpile Site. In order to use this location Stage 3 of the PACHCI must be undertaken with a programme of subsurface testing within PAD 1. The wetlands north of the walking track up to the Tumut River were identified as containing significant cultural value by representatives of the Brungle -Tumut LALC and this should be considered moving forward.

RECOMMENDATIONS

It is recommended that:

1. Further heritage assessment in the form of a Stage 3 PACHI must be completed prior to any works being undertaken within the boundary of PAD 1, the stockpile compound. To negate the need to conduct further archaeological assessment TfNSW must avoid PAD1.
2. Works within the Proposal Area that are outside the boundary of PAD1, the stockpile compound, can proceed with caution.
3. Given the potential for cultural values to be associated with the Tumut Wetlands area within the Proposal Area, NGH suggests further consultation with the Brungle-Tumut LALC regarding the cultural significance and potential impact any ground disturbing works may have on land outside the disturbed areas (demarked with orange hashing in Figure 6-1) this would include works carried out in the electrical construction limits.
4. Any activity proposed outside of the current assessment area should also be subject to an Aboriginal heritage assessment.
5. If any items suspected of being Aboriginal in origin are discovered during the work, all work in the immediate vicinity must stop and the standard procedures for TfNSW Unexpected Heritage Finds followed. If any items are confirmed to be Aboriginal in origin, Heritage NSW must be notified via the Environment Line 131 555.
6. In the unlikely event that human remains are identified during development works, all work must cease in the immediate vicinity and the area must be cordoned off. The proponent must contact the local NSW Police who will make an initial assessment as to whether the remains are part of crime scene or possible Aboriginal remains. If the remains are thought to be Aboriginal, Heritage NSW must be notified by ringing the Enviroline (131 555).

TfNSW is reminded that it is an offence under the NSW *National Parks and Wildlife Act 1974* to disturb, damage or destroy and Aboriginal object without a valid Aboriginal Heritage Impact Permit.

1. INTRODUCTION

NGH Pty Ltd (NGH) was commissioned by Transport for New South Wales (TfNSW) to prepare an Aboriginal archaeological survey report in accordance with Stage 2 of the *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI) (Roads and Maritime Services 2011) for proposed intersection improvements between the Snowy Mountains Highway and Gocup Road in Tumut, NSW. The purpose of this assessment is to determine whether any Aboriginal objects are present, or likely to be present, within the impact areas of the proposed works. This assessment will be used to assist TfNSW in determining whether further assessment and Aboriginal community consultation is required for this proposal.

1.1. PROPOSAL AREA

The Proposal Area, located on the northern side of Tumut in the Snowy Valleys Local Government Area (LGA), consists of road corridor along Capper Street from Clarke Street, across the Snowy Mountains Highway to Gocup Road and its intersection with Old Gundagai Road. The Proposal Area is bifurcated by the Snowy Mountains Highway between the Tumut Wetlands in the north and vacant land bordering Capper Street in the south. Located in the Parish of Tumut, County of Wynyard, the Proposal Area is within the Tumut 1:100,000 topographic map sheets (GDA 94, Zone 55). The Compound Stockpile Site is located away from the Proposal Area on Yarra Road (Figure 1-1). An area delineated as Electrical Construction Limits for the relocation and placement of overhead power lines extends from the north of Gocup Road reserve northwest to the Tumut River.

1.2. PROPOSED WORKS

TfNSW proposes to make improvements to the intersection of the Snowy Mountains Highway and Gocup Road Tumut, NSW.

The works to occur within the road corridor and Proposal Area include:

- Site establishment (compound site, stockpile locations and fencing)
- Implementation of a traffic control plan including signs and devices
- Implementation of environmental control measures
- Tree and vegetation trimming and removal
- Formation widening
- Roundabout construction
- Slope / batter work
- Utility Relocation
- Retaining wall construction
- Improve stormwater drainage system including culvert extension work
- Safety barrier installation
- Shared path construction.

TfNSW also propose use of the following site for stockpiling and compound purposes:

- Compound Stockpile Site located about 350 m northwest of the Proposal Area on Yarra Road, Tumut (TfNSW registered stockpile site).

All works would be undertaken to ensure this section of the Snowy Mountains Highway continues to meet NSW road safety requirements.

1.3. PROJECT PARTICIPANTS

The PACHCI Stage 2 Aboriginal heritage assessment was carried out by qualified archaeologists Tony Miscamble and Jill Taylor of NGH. This included background research, field inspection and the completion of this report. NGH Senior Heritage Consultant Ali Byrne completed a technical and quality assurance review of the report.

Under the TfNSW PACHCI guidelines, Stage 2, Action 1 requires that the TfNSW cultural heritage advisor (or appropriate equivalent role) will identify key Aboriginal stakeholders for a project. In this case it was determined that consultation must be with the Brungle-Tumut Local Aboriginal Land Council (LALC). The Brungle-Tumut LALC were engaged to participate in the field survey and to provide any cultural knowledge associated with the wider area.

The representatives for the Brungle-Tumut LALC during the field inspection were:

- Matthew Marlowe; and
- Rebecca Russell.

The site inspection was undertaken on Tuesday the 24th of May 2021 by:

- NGH archaeologists Jill Taylor;
- Brungle-Tumut LALC representatives Matthew Marlowe and Rebecca Russell; and
- TfNSW Environment Officer Robert Norton.

1.4. APPROACH AND FORMAT OF THIS REPORT

This report has been drafted in keeping with the TfNSW *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* sequence of steps and with Resource 09: Aboriginal archaeological (survey) report – standard brief, which requires that the report be prepared in accordance with Requirements 1 to 13 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010) (Code of Practice). The Code of Practice provides guidance on the completion of archaeological investigations.

Reference is also made to the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW 2010) (Due Diligence Code). The Due Diligence Code provides a five-step approach to determine if an activity is likely to cause harm to an Aboriginal object, as defined by the NSW *National Parks and Wildlife Act 1974*. This process has been determined to be appropriate for this stage of works, and further assessment may be required in the event that Aboriginal Heritage Impact Permit application is necessary.

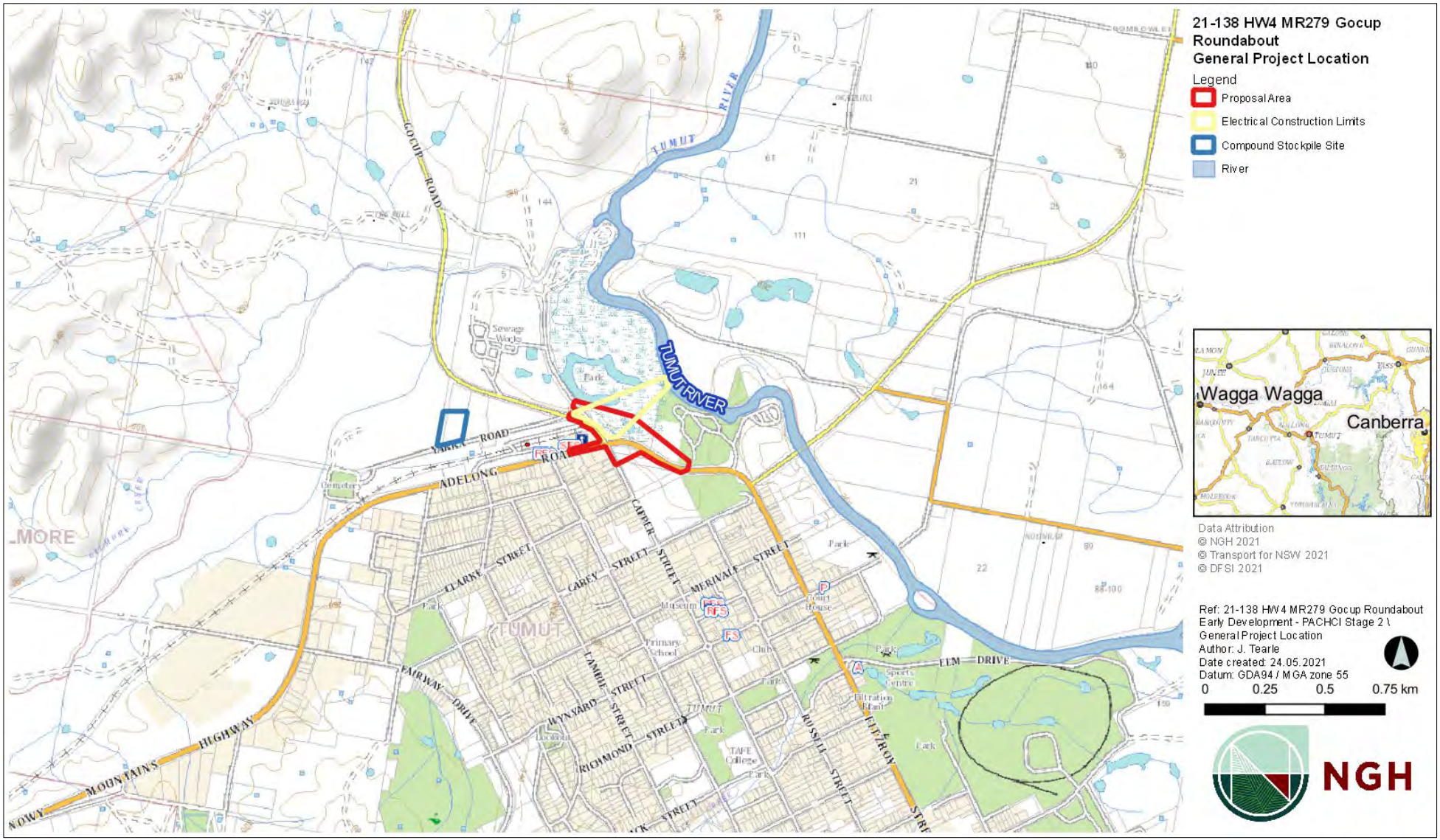

Figure 1-1 Overview Map of the Proposal Area and Compound Stockpile Site.

Figure 1-2 Proposal Area

2. LEGISLATION

In NSW, Aboriginal heritage is principally protected by two legislative acts:

- *The National Parks and Wildlife Act 1974* (NPW ACT); and
- *The Environmental Planning and Assessment Act 1979* (EP&A Act).

2.1. THE NATIONAL PARKS AND WILDLIFE ACT 1974

Part 6 of the NPW Act concerns Aboriginal objects and places and various sections describe the offences, defences and requirements to harm an Aboriginal object or place. All Aboriginal material receives blanket protection under the NPW Act of NSW. The main offences under section 86 of the NPW Act are:

- A person must not harm or desecrate an object that the person knows is an Aboriginal object.
- A person must not harm an Aboriginal object.
- For the purposes of this section, "circumstances of aggravation" are:
    - that the offence was committed in the course of carrying out a commercial activity, or
    - that the offence was the second or subsequent occasion on which the offender was convicted of an offence under this section.
- A person must not harm or desecrate an Aboriginal place.

Under section 87 of the NPW Act, there are specified defences to prosecution including authorisation through an Aboriginal Heritage Impact Permit (AHIP) or through exercising due diligence or compliance through the regulation.

Section 89A of the Act also requires that a person who is aware of an Aboriginal object, must notify the Director-General in a prescribed manner. In effect, this section requires the completion of site cards for all sites located during heritage surveys.

The strict liability offence of harming Aboriginal objects has a number of defences and include the statutory defence of due diligence through complying with an adopted industry code of practise, or compliance with the conditions of an AHIP.

This report has been prepared to determine whether the proposal will harm (or is likely to harm) Aboriginal objects with reference to Section 87 of this Act.

2.2. ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) is legislation for the management of development in NSW. It sets up a planning structure that requires developers (individuals or companies) to consider the environmental impacts of new proposals. Under this Act, cultural heritage is considered to be a part of the environment. It provides for the identification, protection and management of heritage items through inclusion of these items into schedules off planning instruments, such as Local Environmental Plans (LEPs) or Regional Environmental Plans. This Act requires that Aboriginal cultural heritage and the possible impacts to Aboriginal heritage that development may have are formally considered in land-use planning and development approval processes.

The proposed works will be assessed under Part 5 of the EP&A Act and this document has been prepared to inform the Review of Environmental Factors being prepared by TfNSW for the proposal.

3. GROUND DISTURBANCE

TfNSW proposes to upgrade the intersection of the Snowy Mountains Highway and Gocup Road, Tumut NSW. The upgrade activities would include but are not limited to those listed below and detailed in Section 1.2.

- Site establishment (compound site, stockpile locations and fencing)
- Implementation of a traffic control plan including signs and devices
- Implementation of environmental control measures
- Tree and vegetation trimming and removal
- Formation widening
- Roundabout construction
- Slope / batter work
- Utility Relocation
- Retaining wall construction
- Improve stormwater drainage system including culvert extension work
- Safety barrier installation
- Shared path construction.

The proposed works and activities would require significant ground disturbance, the use of heavy machinery, stockpile location and removal of native trees. Any Aboriginal sites within the disturbance footprint would therefore be subject to harm. The confirmation that ground disturbance would occur requires the next step in the assessment process.

4. REGISTER SEARCH AND LANDSCAPE ASSESSMENT

4.1. AHIMS DATABASE AND HERITAGE REGISTER SEARCHES

A search of relevant heritage registers for Aboriginal sites and places provides an indication of the presence of previously recorded sites. It is to be noted that a register search is not conclusive, as it reflects only those areas that have been surveyed and that sites recorded are added to the register. As a starting point the search will indicate whether any sites are known within or adjacent to the investigation area. The Aboriginal Heritage Information Management System (AHIMS) provides a database of Aboriginal heritage sites registered previously. The results of the search are valid for 12 months for the purposes of a due diligence level assessment.

On the 20th of April 2021 a search of the AHIMS database was undertaken over an area of approximately 20 km x 20 km centred on the Proposal Area (from latitude -35.3675, longitude 148.1011 to latitude -35.2234, longitude 148.3297 with a buffer of 50 m). The AHIMS Client Service Number was 585987. There were 71 Aboriginal sites recorded within this search area and one declared Aboriginal Place. The declared Aboriginal place name is Hannibal Hamilton Grave, which is approximately 4 km from the Proposal Area on the eastern outskirts of Tumut. Table 4-1 below shows the breakdown of the 71 sites by type and Figure 4-1 shows the location of the AHIMS sites in relation to the Proposal Area and Figure 4-2 shows AHIMS sites within 1km of the Proposal Area.

Table 4-1 Previously recorded Aboriginal sites within the AHIMS search area.

Site Type	Number
Modified Tree (Carved or Scarred): 1	38
Artefact: - Isolated Find	17
Artefact Scatter	6
Artefact, Aboriginal Ceremony and Dreaming	2
Aboriginal Ceremony and Dreaming, Modified Tree (Carved or Scarred)	2
Burial	2
Modified Tree (Carved or Scarred), Aboriginal Ceremony and Dreaming	1
Artefact: - Isolated Find, Potential Archaeological Deposit (PAD)	1
Modified Tree (Carved or Scarred): 2	1
Potential Archaeological Deposit (PAD)	1
TOTAL	**71**

None of the registered sites would be impacted by the proposed works. It should, however, also be noted that the lack of registered sites in the immediate area does not confirm that sites are not present, but rather may be a result of the lack of previous archaeological investigations that have occurred in this location. There is also a high proportion of modified trees recorded in the area, specifically where there are remnant stands of

native trees. Scarred trees provide tangible links to the past and provide evidence of Aboriginal subsistence activities through the deliberate removal of bark or wood. It is likely that the high proportion of scarred trees in the 20 km area surrounding the Proposal Area is related both to a lack of surveys in the area and the more obtrusive nature of scarred trees when compared to small artefact scatters and isolated stone artefacts.

The five AHIMS sites within 1 km of the Proposal Area are culturally modified trees as described in Table 4-2 and Figure 4-2 below.

Table 4-2 AHIMS sites within 1 km of Proposal Area.

AHIMS Site #	Site name of Modified Tree
56-3-0059	Riverglade Wetlands 1
56-3-0060	Riverglade Wetlands 2
56-3-0061	Riverglade Wetlands 3
56-3-0108	Tumut DMR TSR scar tree 1
56-3-0109	Tumut DMR TSR Scar Tree 2

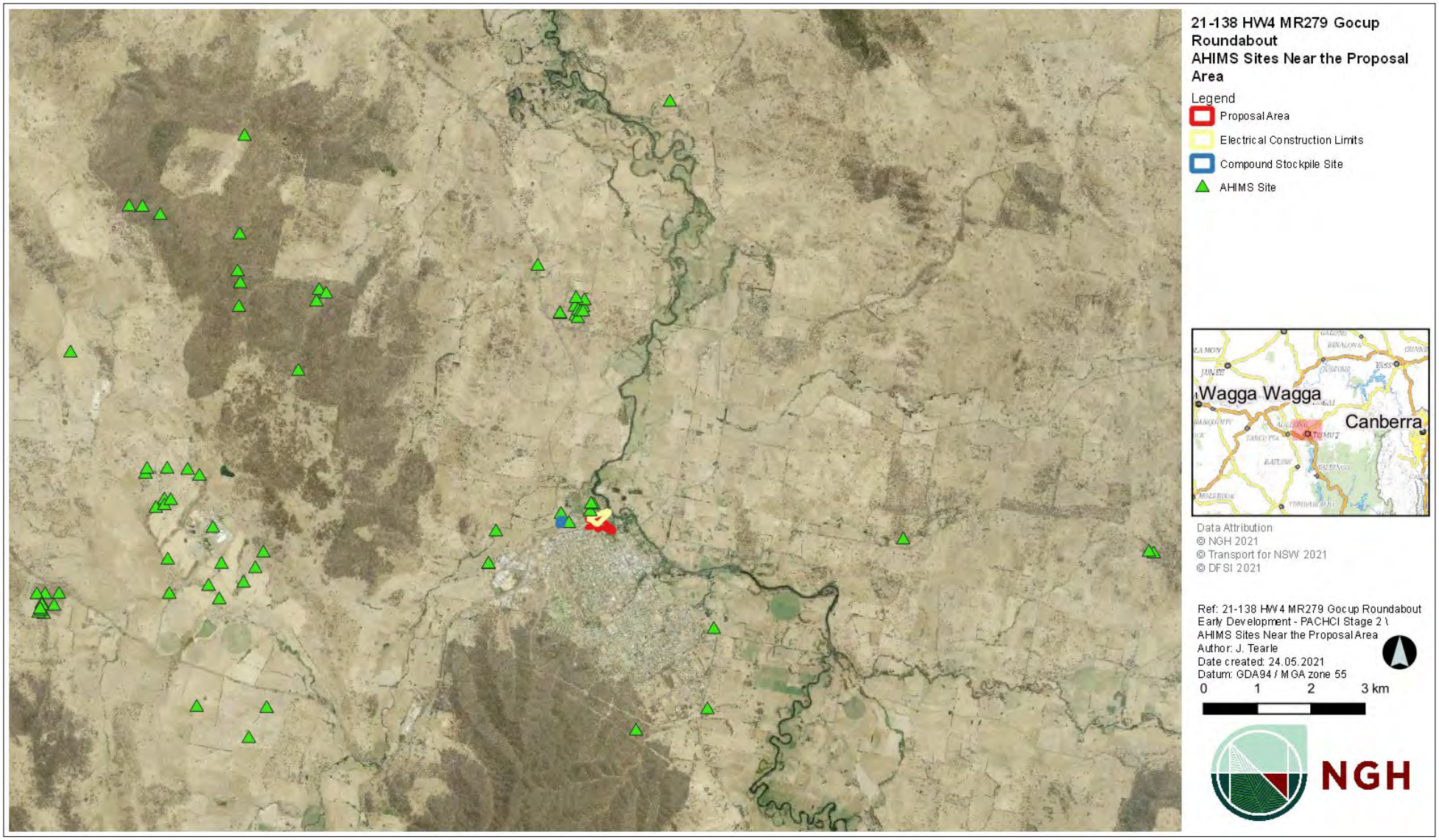

Figure 4-1 AHIMS Sites near the Proposal Area.

Figure 4-2 AHIMS Sites within 1 km of the Proposal Area.

4.1.1. Additional Searches

Searches of other heritage registers were also undertaken to identify any items or places in proximity to the Proposal Area. The following resources were used as part of this review:

- The NSW State Heritage Inventory (SHI) includes items on the State Heritage Register and items listed by state agencies and local Government, to identify any items currently listed within or adjacent to the proposal site. It also includes Aboriginal Places listed under the NPW Act.
- The Australian Heritage Database includes items on the National and Commonwealth Heritage Lists, to identify any items that are currently listed within or adjacent to the proposal site.

The results of the NSW SHI database search indicated there is one previously recorded Aboriginal Place listed under the *National Parks and Wildlife Act* within the Snowy Valleys LGA. As noted above, this item (Hannibal Hamilton Grave) is not located within or adjacent to the Proposal Area.

The results of the NSW SHI database search indicated there are four previously recorded historical heritage sites listed under the *NSW Heritage Act* within the Snowy Valleys LGA however none are known to be related to Aboriginal sites, places, or people.

The results of the NSW SHI database search indicated there are 74 previously recorded non-Aboriginal heritage sites listed by the Local and State Agencies within the Snowy Valleys LGA. Two of these, the Tumut Butter Factory and the Tumut Railway Station Group, are located within or extending into the Proposal Area (Figure 4-3).

Consideration of the impacts on the heritage items are outside the scope of this assessment.

Figure 4-3 Heritage sites near the Proposal Area

4.2. LOCAL ARCHAEOLOGICAL CONTEXT

While a number of previous archaeological investigations have been completed in the wider Snowy Valleys region, few archaeological investigations have been completed in close proximity to the Proposal Area. A summary of those studies undertaken near the Proposal Area is provided below.

In 1973, Flood completed a PhD thesis on Aboriginal life in the tablelands and highlands of the Southern Uplands of Australia and subsequently published a book, *The Moth Hunters,* in 1980. She examined social organisation including kinship relationships, language, material culture, resource use, religion and occupation patterns. She concluded that sites were generally located on well-drained, elevated ground within 100 m of a water source, but rarely at the water's edge (Flood 1973; Flood 1980).

In 1982, Sams recorded a ground edge axe in the backyard of a property in Mayday Road, Batlow, approximately 24 km south east of the current assessment area. The axe was identified next to Reedy Creek but was determined to not be *in situ.* The report concluded that it was possible for other artefacts to be located nearby (Sams 1982: 43).

In 1993, Hamm completed an archaeological assessment of the proposed optical fibre cable routes from Adelong to Gilmore and from Adelong to Wondalga to Batlow. The Adelong to Gilmore section of the proposed cable route lies approximately 2 km south east of the current assessment area. No sites of Aboriginal cultural heritage or areas or archaeological potential were identified during the surveys of either cable route (Hamm 1993: 3-8).

In 2001, Mills and Kelton completed an assessment for a proposed Transgrid transmission line easement to the northeast of Batlow near Blowering Reservoir and approximately 20 km south east of the current Proposal Area. A total of 26 artefact scatters were identified, with three sites containing more than 500 artefacts (Mills and Kelton 2001: 45). In the area from Jounama Pondage to Batlow Road, seven artefact scatters and one isolated find were recorded (Mills and Kelton 2001: 39).

In 2009, Comber Consultants Pty Ltd, completed an Aboriginal Cultural Heritage Assessment for the proposed Kunama Dam at Batlow approximately 30 km south west of the current Proposal Area. The survey area was located in the valley between the slopes of two undulating hills on a bend in Little Gilmore Creek and the associated ridge crest. No sites of Aboriginal cultural heritage or areas of archaeological potential were identified during the survey (Comber Consultants Pty Ltd 2009).

In 2009, Kelleher Nightingale Consulting Pty Ltd (KNC) completed an Aboriginal Cultural Heritage Assessment for the Hume Highway Town Bypass at Tarcutta, approximately 23 km from the current Proposal Area. The Bypass area was approximately 7 km in length on a generally flat and straight alignment. The assessment involved an intensive survey and test excavation program. A total of 13 artefact scatters and four scarred trees were identified with scatters commonly recorded in areas which had good visibility. Quartz was the dominant lithology recorded and was noted to be present in the assemblages of all the sites. The scarred trees were generally located in areas of gentle sloping land while the sites with stone artefacts were generally associated with hill crests or spurs overlooking Tarcutta and Keajura Creeks and the floodplain. The first PAD (T-PAD-4) was identified on moderately sloped hill overlooking Tarcutta Creek. Test excavation of T-PAD-4 revealed very shallow soils and that erosional and colluvial activities have relocated most of the artefacts affecting the integrity of the area. The second PAD (T-PAD-5) was identified within a slightly raised landform along a remnant channel of Keajura Creek. Test excavations of T-PAD-5 revealed a low-density artefact scatter and a number of alluvial layers. The composition of the alluvial layers suggested low intensity flooding had occurred across the area (Kelleher Nightingale Consulting Pty Ltd 2009).

In 2010, Comber Consultants Pty Ltd, completed an Aboriginal Cultural Heritage Assessment for the proposed water supply pipeline from Tumut to Adelong. No sites of Aboriginal cultural heritage or areas of archaeological potential were identified during the survey, due to previous clearing for grazing and agricultural purposes (Comber Consultants Pty Ltd 2010).

In 2015, KNC undertook an Archaeological and Heritage Management Report for Roads and Maritime Services (now TfNSW) for proposed upgrade works along a section of Gocup Road between Gundagai and Tumut with the Tumut section of the road located approximately 14 km east from the Proposal Area. The proposed upgrade works were required to accommodate modern freight demands and address vehicle safety requirements. A total of six Aboriginal cultural sites (Sites A-F) had previously been recorded within the study area by Waters Consultancy Pty Ltd. These previously recorded cultural sites included two ceremonial pathways, one seasonal pathway, one meeting place and camping area, one pathway associated with specific resource use and one remnant wetland that constituted a resource gathering area. All six cultural sites were noted to be impacted by the proposed works. The KNC assessment of the proposed works along Gocup Road between Gundagai and Tumut also incorporated the results of a 2012 survey of the study area undertaken by KNC which had recorded ten sites including eight artefact scatters, an isolated artefact and a potential archaeological deposit. Six of the recorded archaeological sites were noted to overlap the identified Aboriginal cultural sites previously recorded by Waters Consultancy Pty Ltd. Two of the archaeological Aboriginal sites were able to be avoided by the proposed works however eight sites with stone artefacts would be impacted and an AHIP was recommended to be sought for the entire proposed works area. The sites within the study area were generally noted to be located within 200 m of water on low gradient slopes, floodplains, ridge lines and spurs. The majority of sites had medium to high level disturbance from the construction and maintenance of infrastructure and services, housing construction and erosion. The artefacts recorded within the archaeological site assemblages were predominately made of quartz with some made of tuff, dark volcanic and fined grained siliceous. They consisted of several cores as well as flakes and flaked pieces and were determined as being sourced from the local region (KNC 2015).

In 2019, OzArk completed a Due Diligence assessment for a TransGrid replacement of 234 wooden poles with steel or concrete ones and installation of optical ground wire. The study area covered approximately 80 kms from Wagga Wagga to Gadara, with a portion of the study area running directly north of and adjacent to the current Proposal Area. A total of eight Aboriginal sites including six previously recorded AHIMS sites were located. The sites recorded included six scarred trees, one artefact scatter and an isolated find. The closest sites to the current area are scarred trees which lie within the Ellerslie Nature Reserve, approximately 8 kms west of the current Proposal Area (OzArk 2019).

In 2019, NGH completed a Stage 2 PACHCI assessment of proposed road upgrades, compound and stockpiles within a site on the Snowy Mountains Highway, near Adelong. The proposal areas included three stockpile sites and a portion of the highway designated for new overtaking lane works. The section of the Snowy Mountains Highway assessed is located approximately 670 m east of the road corridor assessed in this report. No sites or areas of archaeological potential were identified during the survey within the proposed road upgrade area or in the stockpile areas. This was noted to likely be due to the high historical disturbances from road and bridge construction, ploughing, grazing and the installation of road culverts and reserves in the area (NGH 2019).

In 2021, NGH undertook an Aboriginal Cultural Heritage Assessment for Snowy Valleys Council of a bridge replacement over Bombowlee Creek, which is approximately 4 km north east of Tumut and the Proposal Area. Ground surface visibility in the assessment area was generally poor with a single volcanic core providing the only artefact recorded at surface. Four PADs were identified for subsurface archaeological testing and subsequently yielded 13 artefacts from six of the test pits. The pattern of artefact distribution was characterised by discrete low density clusters of artefacts interspersed with areas of very low or no artefactual material. The survey and subsurface testing results support the modelling for the region that sites and artefacts are present and generally located in elevated areas adjacent to waterways. The density of the surface and subsurface assemblage indicated short-term camps by small groups across the proposal area at Bombowlee Creek. No direct evidence of longer-term base camps was identified (NGH 2021).

The results of the previous heritage investigations in the region suggest that larger artefact sites are most likely to be identified in elevated areas of flat land within 200 m of a watercourse in areas that have not been subjected to extensive historical disturbances. Small, low density artefact scatters and isolated finds tend to occur on major ridgelines or near minor watercourses, which are likely representative of the opportunistic

resource procurement or transitory movement of Aboriginal people through the landscape. Any remnant old growth trees within the area are noted to have the potential to contain evidence of Aboriginal scarring.

4.3. LANDSCAPE ASSESSMENT

Understanding the landscape context of the Proposal Area may also assist us to better understand the archaeological modelling of the area and assist to identify local resources which may have been utilised by Aboriginal people. This information can then potentially be used in predicting the nature of Aboriginal occupation across the landscapes within and adjacent to the Proposal Area. Factors that are typically used to inform the archaeological potential of landscapes include the presence or absence of resources that would have been utilised by Aboriginal people including water, animal and plant foods, stone and other resources.

Factors that are typically used to inform the archaeological potential of landscapes include the presence or absence of resources that would have been utilised by Aboriginal people including water, animal and plant foods, stone, and other resources. The landscape context assessment for the Proposal Area is based on a number of classifications that have been made at national, regional, and local levels to help us better understand the archaeological modelling of the area based on the geology, topography, hydrology, flora and fauna and past land disturbances within and adjacent to the Proposal Area.

4.3.1. Geology

The Geoscience Australia 1:1,000,000 Surface Geology map shows that the Proposal Area spans the following lithostratigraphic units:

- (Qrc) Colluvium 38491 Colluvium and/or residual deposits, sheetwash, talus, scree; boulder, gravel, sand; may include minor alluvial or sand plain deposits, local calcrete and reworked laterite.
- (Qa) Alluvium 38485, Channel and flood plain alluvium; gravel, sand, silt, clay; may be locally calcreted.

Within 1 km of the Proposal Area, to the north and south, are units of Blowering Formation (Ss), an igneous felsic volcanic lithostratigraphy comprising dacite, dacitic tuff, slate, slaty siltstone, quartzite, feldspathic and lithic sandstone, conglomerate; minor trachyandesite crystal tuff, quartz trachyandesite, chert, mudstone; slightly to very foliated.

Within 2km to the west of the Proposal Area are units of the Bumbolee Creek Formation (Ss), also with an igneous felsic volcanic lithostratigraphy but comprising quartz-rich shale/slate, and fine sandstone; quartz-rich sandstone and fine lithic conglomerate.

At 3 km west of the Proposal Area, the Gocup Granite (Dg) unit of igneous felsic intrusive material features fine to coarse-grained biotite granite; minor coarse-grained muscovite-biotite granite; very minor aplite dykes, quartz veins; and rare pegmatite dykes.

Chert, quartzite and volcanic material are known choices for raw materials for lithic tool production and if outcropping occurs, stone artefacts may be produced from these lithologies.

4.3.2. Topography and hydrology

The Proposal Area lies within the floodplain of the Tumut River and straddles topography that descends from river terrace through wetlands to the Tumut River. The Tumut River would have been a focal point in the landscape as a resource rich environment and occupied by various groups throughout different times of the year. Nearby ephemeral streams and Gilmore Creek north of the proposed Compound Stockpile site are tributaries of the Tumut River and, in combination with the Tumut Wetlands, represent a diversity of habitats and an abundance of natural resources. The proposed Compound Stockpile site and the Proposal Area occupy river terrace landforms which would have increased potential for occupation sites as they are elevated, north-facing locations overlooking the resource rich and culturally significant riparian and wetlands environment. The

presence of two scarred trees (AHIMS 56-3-0108 and 56-3-0109) near the elevated proposed Compound Stockpile site and another three scarred trees (AHIMS 56-3-0059, 56-3-0060, 56-3-0061) in the lower wetlands area provide further material indications of Aboriginal occupation of this landscape.

4.3.3. Soils

No soil landscape mapping was available from eSpade, however, Mitchell (2002) details soil descriptions for the landscape units near and over the Proposal Area. However, two soil profile reports have been completed within 800 m at elevations above and below the Proposal Area.

The elevation of the Proposal Area is approximately 270 m mAHD, straddling the Minjary Hills and Ranges and Tumut channels and Floodplain landscape units. The soil profile from a location approximately 36 m above the Proposal Area details two soil horizons changing in texture from fine sandy clay loam at surface to a base level of coarse sandy clay, one metre below. The acidity of the soil horizons decreases from an acidic pH of 5.5 at surface to a neutral pH of 7.0 at base. Approximately 15 m below the Proposal Area the soil profile from near the Tumut River is 1.2 m deep and consists of slightly acidic clay to sandy loam with a consistent pH approaching neutral at 6.5. These soil profiles and pH measures may provide context for potential preservation of artefacts, bone or other organic materials evident at the varying elevations of the Proposal Area.

4.3.4. Vegetation

Information provided herein is intended as a generalised summary of the endemic flora and fauna present within the Proposal Area and local area and is not to be used as a substitute for detailed ecological studies and assessments.

The vegetation across the Proposal Area spans both the Minjary Hills and Ranges unit and the Tumut Channels and Floodplain.

Minjary Hills and Ranges vegetation is described as open forest of; grey box (*Eucalyptus microcarpa*), white box (*Eucalyptus albens*), apple box (*Eucalyptus bridgesiana*), red stringybark (*Eucalyptus macrorhyncha*), red ironbark (*Eucalyptus nidroxyzone*), tumbledown gum (*Eucalyptus dealbata*), broad-leaved peppermint (*Eucalyptus dives*), black cypress pine (*Callitris endlicheri*) with grasses and shrubs.

The Tumut Channels and Floodplain landscape unit features river red gum (*Eucalyptus camaldulensis*) along the stream, yellow box (*Eucalyptus melliodora*) on the valley floor. If mature native trees remain, there is a likelihood that scarred trees may be present, as Red River Gum and Yellow Box are known to have been favoured species for the extraction of bark for use as canoes, shields, and containers by Aboriginal people. The confluence of woodland and wetland environments within the Tumut Wetlands would have provided a mixed subsistence strategy for local Aboriginal people. Species such as the bracken fern would be used for food, river oak for medicinal purposes, and stingy bark to manufacture rope (Donaldson 2006). Wetlands also provide habitat for a range of fish, animals and birds that would have been important food resources and potentially of totemic significance to Aboriginal people. It is likely that the Tumut Wetlands would have been of elevated resource and cultural significance and may retain archaeological evidence for this.

4.3.5. Historic Land Use

The Proposal Area consists of road corridor along Capper Street from Clarke Street, across the Snowy Mountains Highway to Gocup Road and its intersection with Old Gundagai Road. The Proposal Area is bifurcated by the Snowy Mountains Highway between the Tumut Wetlands in the north and vacant land bordering Capper Street in the south. The Proposal Area in general has been historically significantly disturbed by the construction of the Snowy Mountains Highway and urban and infrastructure development for the Tumut township. Most of the vegetation in the Tumut wetlands is relatively young, having been planted within the past 40 years. The Compound Stockpile Site, located away from the main Proposal Area on Yarra Road it is part of a travelling stock reserve and would have been somewhat disturbed through clearing and grazing. Although

the area adjacent to the Compound Stockpile Site is significantly disturbed, two scarred trees are recorded near this allotment. Mature trees in the less disturbed portions of the Proposal Area, such as the Tumut Wetlands retain an elevated potential for Aboriginal cultural heritage.

4.3.6. Aboriginal Site Prediction Statements

Based on the assessment of information from the environmental context and results of previous archaeological studies in and around the area, several predictive modelling statements can be made. These are included in Table 4-3 below.

Table 4-3 Aboriginal Site Prediction Statements

Site Type	Site Description	Potential
Modified trees	Trees that have undergone cultural modification.	The most commonly occurring site type in the area. Have potential to occur within the Proposal Area where remnant mature native trees occur.
Stone artefact scatters and isolated artefacts	Artefact scatter sites can range from high-density concentrations through to isolated finds.	Artefact scatters and isolated artefacts are the second-most commonly occurring site types in the area and have potential to occur in low to moderate densities on hill crests, gentle gradient spurs and flat raised undisturbed areas near water. Disturbance in the Proposal Area is variable. In highly disturbed areas adjacent to roadworks the potential to find artefact scatters is low but may increase in adjacent less disturbed locations. Isolated finds may occur.
Potential Archaeological Deposits (PADs)	Potential subsurface deposits of archaeological material.	Moderate potential to occur within areas less disturbed elevated areas in the Proposal Area.
Burials	Aboriginal burial sites.	Low potential to occur in highly disturbed locations of the Proposal Area and the low lying nature of the floodplain.
Cultural Sites	Sites of tangible and intangible values which provide evidence of the diverse values, activities and knowledge of Aboriginal people. Sites include resource gathering sites, ceremonial sites and Song Lines.	High potential to occur as the water sources and associated wetland areas were highly valued areas to Aboriginal people.

4.3.7. Landscape Assessment Summary

In summary it is concluded following the landscape assessment that while much of the Proposal Area has been highly disturbed by urban development, roadworks and other infrastructure, it is lies within an archaeologically sensitive landform with the potential for Aboriginal objects to be present. Further there are mature native trees located within the Proposal Area that may be impacted by the proposed works. Given the possibility of the potential for Aboriginal objects within the sensitive landform and culturally modified trees remaining in the Proposal Area a site inspection should occur.

5. IMPACT AVOIDANCE

The proposed location of the intersection upgrade between the Snowy Mountains Highway and Gocup Road is located in an area of landscape potential given its close proximity to water, including the Tumut River and its associated wetlands. The proposed works are unlikely to be able to be amended to avoid this archaeologically sensitive landscape and meet current NSW road safety standards. There is potential to amend the location of the Stockpile Compound Site on Yarra Road.

The desktop assessment alone is not sufficient to conclusively appraise the archaeological potential of the landscape or the location of any sites. Therefore, the next step in the process, a visual inspection, must be conducted to properly appraise the presence and potential for Aboriginal sites to occur within the Proposal Area.

6. VISUAL INSPECTION

The assessment process is primarily a desktop exercise, using available information such as the AHIMS results, environmental context and relevant archaeological reports that have been previously completed in the area. The desktop assessment revealed that much of the Proposal Area is highly disturbed however, it is located within 200 m of the Tumut River and associated wetlands, a sensitive landform that may have potential to contain Aboriginal objects. The Proposal Area also contains mature trees that have potential to have been culturally modified. Thus, an archaeological field inspection was necessary. A visual inspection of the Proposal Area was undertaken by NGH Archaeologist Jill Taylor with two representatives of the Brungle-Tumut LALC (Matthew Marlowe and Rebecca Russell) and the TfNSW Environment Officer Robert Norton on 24 May 2021.

The field survey was undertaken by walking and inspecting the entire length of the Proposal Area in transects 5 m apart where possible with a focus on any areas of exposure or increased visibility. The ground visibility was poor and averaged less than 5%. Due to dense vegetation making some areas impenetrable in parts of the Proposal Area, spacing was adjusted accordingly.

Table 6-1 below shows the calculations of effective survey coverage for the survey and Plates 6-1 to 6-10 below show examples of the disturbances, landforms and visibility within the Proposal Area. The landforms surveyed as part of this archaeological survey report are shown in Figure 6-1.

6.1. DISTURBED AREA

The portion of the Proposal Area comprising Capper Street, Snowy Mountains Highway and Gocup Road reserves and the vacant land south of Snowy Mountains Highway was significantly disturbed due to previous road construction, foot paths, safety rails, culverts, drainage, embankments, and the installation of multiple underground utilities and overhead powerlines and is shown as the orange hashed section in Figure 6-1 (Plate 1 to Plate 3).

The area delineated by orange hashing was surveyed on foot using 5m spaced transects and can be characterised as a flat low lying wetland of the Tumut River approximately 185 m to the north east. Visibility was generally poor, averaging about 5% with high grasses and weeds or thick, mowed grass in most places except for the walking track, which was constructed using imported material (Plate 4 to Plate 7). While some isolated mature alive native trees and dead trees were noted none had scarring that was considered to conform in any way to the standard scarring morphology accepted for Aboriginal modification (cf. Long 2005) (Plate 8).

No Aboriginal sites or objects were recorded within these disturbed areas of the Proposal Area (see Figure 6-1), and it was deemed that the area has low potential to contain *in situ* subsurface deposits due to the high level of disturbance and low lying nature of the landform. It may be concluded therefore, that the proposed works within these disturbed areas are unlikely to impact on Aboriginal heritage objects and works can proceed with caution. The Brungle-Tumut LALC representatives onsite during the site inspection also agreed with this assessment and did not raise any issues or concerns with the proposed intersection upgrade between the Snowy Mountains Highway and Gocup Road in these disturbed areas.

6.2. WETLANDS AREA

The area delineated as the blue shaded area in Figure 6-1 was surveyed on foot using 5 m spaced transects. Visibility was generally poor, averaging about 5% with high grasses and weeds or thick, mowed grass. While some utilities were present in the area, namely overhead powerlines and a large walking/vehicle access track had been constructed leading north east towards the Tumut River, it was considered less disturbed. The track was constructed of fill material in parts and small culverts had been placed where the track passed over drainage lines (Plate 8 and Plate 9). This area is characterised as a low lying wetland area of the Tumut River and was comprised of lagoons, oxbow lakes and marshland and drainages leading into the Tumut River. While Aboriginal people would have utilised the resource rich area in the past, it is highly unlikely that the area was

used for camping due to the propensity for waterlogging. It is more likely that Aboriginal people would have utilised these wetlands areas for the many valuable resources they provided but camped away from them, instead using the elevated terraces leading down to the area.

Because of the low lying nature of the wetlands it was therefore deemed to contain low potential for archaeological deposits. Representatives from the Brungle-Tumut LALC expressed the importance of the Tumut wetlands to the local Aboriginal community and considered it to hold significant cultural value (see Figure 6-2). There is some concern about potential ground disturbance that may be undertaken in this area, in particular the placement of the electricity poles. NGH suggests further consultation with the Brungle-Tumut LALC regarding the potential cultural significance and impact any ground disturbing works may have on the cultural values in this area.

6.3. COMPOUND STOCKPILE SITE

The Compound Stockpile Site was characterised as an elevated terrace overlooking the floodplain of the Tumut River, Gilmore Creek and an unnamed drainage (see Figure 6-1). Visibility was less than 5% with only very limited exposures on the eastern fence line. The compound was an active travelling stock reserve and had been completely cleared of trees. Two large dead trees were lying down within the travelling stock reserve with one, just outside the Stockpile Compound boundary being a registered scarred tree (AHIMS # 56-3-0108). Aside from the clearing of trees, the area was relatively undisturbed. Due to the location and the lack of identifiable disturbances the elevated terrace landform which encompasses Compound Stockpile Site location is considered to have potential to contain subsurface archaeological deposits (Figure 6-2).

As the Compound Stockpile Site contains a potential archaeological deposit (PAD 1) in order to utilise this location Stage 3 of the PACHI must be undertaken with a programme of subsurface testing within PAD 1. The Brungle-Tumut LALC representatives onsite during the site inspection also agreed with this assessment.

6.4. OTHER POTENTIAL HERITAGE ITEMS

An historic scarred tree was located in the carpark of the Tumut Wetland on the northern section of Gocup Road, where it intersects with the Old Gundagai Road. This tree contains historic surveyors' markings blazed on the tree with a metal axe. The tree is dead and has been trimmed down to show just the trunk and its historic markings. While the assessment of this tree is not within the scope of this project, it should however be protected from any works that are to be carried out in the area and an historic assessment is recommended.

6.5. SUMMARY

With the exception of the PAD associated with the Compound Stockpile Site, all other areas within the Proposal Area are considered to have negligible potential for Aboriginal objects to occur and low potential for *in situ* subsurface deposits due to previous ground disturbances and the low lying nature of the landform. No Aboriginal sites or objects were recorded within the Proposal Area. It may be concluded therefore, that the proposed works within the disturbed areas bordering and including the Snowy Mountains Highway and Gocup Road reserve areas (as denoted in orange in Figure 6-1) is unlikely to impact on Aboriginal heritage objects and works can proceed with caution. The Brungle-Tumut LALC representatives onsite during the site inspection also agreed with this assessment. However, they did raise concerns with the impact any works undertaken in the less disturbed areas of the Tumut Wetlands (as denoted in blue in Figure 6-1 and Figure 6-2). If works are to occur in this less disturbed wetland area NGH suggests that TfNSW liaise with the Brungle-Tumut LALC.

Plate 1 View north towards the eastern bend of the Snowy Mountains Highway with culverts, drainage and previous ground disturbances

Plate 2 View north towards the Snowy Mountains Highway

Plate 3 View northwest towards the Snowy Mountains Highway

Plate 4 View west from northern side of Snowy Mountains Highway

Plate 5 View of existing disturbances including underground utilities and Visy raw water main

Plate 6 View southwest from northern side of Snowy Mountains Highway

	
Plate 7 Several remaining mature native trees were closely inspected	Plate 8 View northeast towards the Tumut River along the track in the Electrical Construction Limits area
	
Plate 9 Northern boundary of Electrical Construction Limits Area where is meets the Tumut River	Plate 10 View north from PAD 1

Figure 6-1 Landforms within the Proposal Area

Table 6-1 Transect Information

Study Area	Landforms	Number of Survey Transect	Exposure type	Area ha	Surveyed area (length m x width m)	Survey Area m^2	Average Visibility (%)	Effective coverage (area x visibility) m^2	Area surveyed (ha)	% of Proposal Area effectively surveyed	Survey result
Proposed Works Area	Disturbed	1	Bare ground, gate entrances, fence lines, walking paths	3.83	100 x 30 310 x 30	3000 9300	5 15	150 1395	0.015 0.1395	0.39 3.64	No sites identified.
	Wetland	1	Minimal exposure	1.5	440 x 10	4400	1	44	0.0044	0.29	Culturally Sensitive Area as identified by the Brungle-Tumut LALC
Stockpile Compound Area	Elevated Terrace	2	Minimal exposure along fence line	1.4	260 x 30	6900	3	207	0.02	1.43	1 PAD
Electrical Construction Limits	Wetland	1	Walking paths	3	340 x 20	6800	15	1020	0.102	3.4	Culturally Sensitive Area as identified by the Brungle-Tumut LALC
	Disturbed	2	Walking paths, fence lines, car parking area	0.9	320 x 30	9600	15	1440	0.144	16	No sites identified.
TOTAL				**10.63**		**40000**		**4256**	**0.4249**	**-**	

Figure 6-2 Location of PAD and Culturally Sensitive Area

7. CONCLUSION

The Code of Practice and the TfNSW PACHCI guidelines state that if, after the desktop research and visual inspection is completed, it is evident that harm would occur to Aboriginal objects or heritage places, then further and more detailed assessment is required. If, however, the research and inspection conclude that there are no, or unlikely to be any, objects impacted by the proposed activity, then the activity can proceed with caution. Further assessment for the proposed intersection upgrade between the Snowy Mountains Highway and Gocup Road is summarised in Table 7-1 below.

As no Aboriginal sites or areas of archaeological potential were identified within the disturbed area of the Proposal Area as identified in orange hashing in Figure 6-1, it is concluded that the proposed intersection upgrade between the Snowy Mountains Highway and Gocup Road as assessed in this report would not require any further heritage investigation and works can proceed with caution.

As no Aboriginal sites or areas of archaeological potential were identified within the less disturbed wetland area of the Proposal Area as identified in blue shading in Figure 6-1 and Figure 6-2, it is concluded that the proposed intersection upgrade between the Snowy Mountains Highway and Gocup Road as assessed in this report would not require any further heritage investigation and works can proceed with caution. However the wetlands were identified as containing significant cultural value by representatives of the Brungle-Tumut LALC NGH suggests TfNSW consult with the Brungle-Tumut LALC.

A potential archaeological deposit (PAD 1) was identified within the Compound Stockpile Site (as delineated in green shading in Figure 6-1 and Figure 6-2). In order to use this location Stage 3 of the PACHCI must be undertaken with a programme of subsurface testing within PAD 1.

Table 7-1 Further Assessment

Study Area	Landform	Archaeological Potential	Further Assessment	Recommendation
Proposed Works Area	Disturbed (Orange hashed area)	Low due to disturbance and low lying nature of the landform.	No further assessment required.	
	Wetland (Blue shaded area)	Low potential for Aboriginal sites or areas of archaeological potential. High cultural significance to Brungle Tumut LALC.	No further archaeological assessment required.	NGH suggests TfNSW consult with Brungle-Tumut LALC regarding the potential impacts to culturally significant areas.
Stockpile Compound Area	Elevated Terrace (Green shaded area)	Elevated potential for Aboriginal sites and areas of archaeological potential.	Further Assessment required.	PACHI Stage 3 required.
Electrical Construction Limits	Disturbed (Orange hashed area)	Low due to disturbance and low lying nature of the landform.	No further archaeological assessment required.	
	Wetland	Low potential for Aboriginal sites or	No further archaeological assessment required.	NGH suggests TfNSW consult with Brungle-Tumut LALC

Study Area	Landform	Archaeological Potential	Further Assessment	Recommendation
	(Blue shaded area	areas of archaeological potential. High cultural significance to Brungle Tumut LALC.		regarding the potential impacts to culturally significant areas.

8. RECOMMENDATIONS

The following recommendations are based on the results of this Aboriginal Heritage Assessment, having considered the:

- Background research into the area;
- Landscape assessment;
- Field inspection;
- Consideration of the proposed works; and
- Legislative context for the development proposal.

1. Further heritage assessment in the form of a Stage 3 PACHI must be completed prior to any works being undertaken within the boundary of PAD 1, the stockpile compound. To negate the need to conduct further archaeological assessment TfNSW must avoid PAD1.
2. Works within the Proposal Area that are outside the boundary of PAD1, the stockpile compound, can proceed with caution.
3. Given the potential for cultural values to be associated with the Tumut Wetlands area within the Proposal Area, NGH suggests further consultation with the Brungle-Tumut LALC regarding the cultural significance and potential impact any ground disturbing works may have on land outside the disturbed areas (demarked with orange hashing in Figure 6-1) this would include works carried out in the electrical construction limits.
4. Any activity proposed outside of the current assessment area should also be subject to an Aboriginal heritage assessment.
5. If any items suspected of being Aboriginal in origin are discovered during the work, all work in the immediate vicinity must stop and the standard procedures for TfNSW Unexpected Heritage Finds followed. If any items are confirmed to be Aboriginal in origin, Heritage NSW must be notified via the Environment Line 131 555.
6. In the unlikely event that human remains are identified during development works, all work must cease in the immediate vicinity and the area must be cordoned off. The proponent must contact the local NSW Police who will make an initial assessment as to whether the remains are part of crime scene or possible Aboriginal remains. If the remains are thought to be Aboriginal, Heritage NSW must be notified by ringing the Enviroline (131 555).

TfNSW is reminded that it is an offence under the NSW *National Parks and Wildlife Act 1974* to disturb, damage or destroy and Aboriginal object without a valid Aboriginal Heritage Impact Permit.

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Appendix C

Biodiversity Assessment (BA)

Gocup Road Intersection Improvement, Tumut

Biodiversity Assessment Report

Transport for New South Wales June 2021

NSW GOVERNMENT

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Gocup Road Intersection Improvement, Tumut

Biodiversity Assessment Report

Roads and Maritime Services | June 2021

NSW GOVERNMENT

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Gocup Road Intersection Improvement

Review of Environmental Factors

Transport for NSW | June 2021

Prepared by NGH and Transport for NSW

Document controls

Approval and authorisation

Title	Gocup Road Intersection Improvement Review of Environmental Factors
Accepted on behalf of Transport for NSW by:	
Signed:	
Dated:	

Document status

Document status	Date	Prepared by	Reviewed by
Draft 1.0	21/07/2021	Z. Renner	J. Gooding

Executive summary

Transport for NSW (TfNSW) proposes to construct a roundabout at the Gocup Road and Snowy Mountain Highway Intersection. The Snowy Mountain Highway is a single carriageway with signposted speed limit of 50 km/h at the Gocup Road Intersection.

The proposal is located in Southern NSW in the Snowy Valleys Council Local Government Area (LGA). The proposal area is located in the inland slopes subregion of the South Western Slopes NSW Interim Biogeographical Regionalisation for Australia (IBRA) Bioregion.

A day survey was undertaken on June 4th by NGH Pty Ltd (NGH) to determine the biodiversity value of the proposal area. A large portion of the proposal area contained planted native vegetation and disturbed exotic vegetation. During the field work two Plant Community Types (PCTs) were identified;

- One area of planted native vegetation best representing PCT 283 *Apple Box – Blakely's Red Gum moist valley and foot slopes grass-forb open forest of the NSW South Western Slopes Bioregion*
- Remnant scattered trees representing PCT 79 *River Red Gum shrub/grass riparian tall woodland or open forest wetland mainly in the upper slopes of the sub-region of the NSW South Western Slopes Bioregion and western South Eastern Highlands bioregion*

Of these two, despite being planted PCT 283 is considered part of the Threatened Ecological Community (TEC) - *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions.*

A large portion of the proposal area contained planted native vegetation that did not conform to a PCT.

Eight threatened woodland bird species were identified as having a moderate or higher likelihood of occurring within the proposal area. These species are:

- Dusky Woodswallow (*Artamus cyanopterus*)
- Gang-gang Cockatoo (*Callocephalon fimbriatum*)
- Speckled Warbler (*Pyrrholaemus sagittatus*)
- Brown Treecreeper (*Climacteris picumnus victoriae*)
- Varied Sittella (*Daphoenositta chrysoptera*)
- Turquoise Parrot (*Neophema pulchella*)
- Scarlet Robin (*Petroica boodang*)
- Diamond Firetail (*Stagonopleura guttata*)

Avoidance and minimisation of biodiversity impacts was achieved through early planning to the project design. Nevertheless, the proposal would require the removal of;

- 0.6 ha of PCT 283 - *Apple Box – Blakely's Red Gum moist valley and foot slopes grass-forb open forest of the NSW South Western Slopes Bioregion*
- 0.44 ha of Planted Native Vegetation not conforming to a PCT.

Thus, the following general impacts on biodiversity could potentially occur;

- Removal of native vegetation
- Removal of potential habitat for threatened fauna species
- Aquatic impacts
- Injury and mortality of fauna
- Indirect disturbance of fauna

- Invasion and spread of weeds
- Invasion and spread of pests
- Invasion and spread of pathogens and disease.

An Assessment of Significance (AoS) was completed to assess the impact of the proposal works on the threatened fauna species. The results found that no significant impact would likely occur to any of these species during the proposed works.

0.60 ha of the TEC - *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions* would be impacted by the proposal. An AoS was undertaken to assess the impact of the proposal on this TEC. The results found that no significant impacted would occur to this TEC during the proposed works.

No federally listed species or ecological communities are considered to occur within the proposal area.

No offsets would be trigged by the proposed works in accordance with the TfNSW Guidelines for Biodiversity Offsets.

The implementation of the recommended mitigation measures would minimise the risk of general impacts on biodiversity.

Contents

Tables

Figures

Annexures

Glossary of terms for this template

Definitions	
Biodiversity offsets	Management actions that are undertaken to achieve a gain in biodiversity values on areas of land in order to compensate for losses to biodiversity values from the impacts of development (OEH 2017).
Construction footprint	The area to be directly impacted by the proposal during construction activities. Analogous with subject land (see definition for subject land).
Cumulative impact	The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Refer to Clause 228(2) of the EP&A Regulation 2000 for cumulative impact assessment requirements.
Direct impact	Direct impacts on biodiversity values include those related to clearing native vegetation and threatened species habitat, and impacts on biodiversity values prescribed by the Biodiversity Conservation Regulation 2017 (the BC Regulation)(BAM 2017)
Habitat	An area or areas occupied, or periodically or occasionally occupied, by a species, population or ecological community, including any biotic or abiotic component.
Indirect impact	Indirect impacts include but not limited to: (a) indirect impacts on adjacent vegetation and habitat during construction (b) indirect impacts on adjacent vegetation and habitat during operation I impacts on adjacent vegetation and habitat arising from a change in land-use patterns (BAM 2017)
Local population	The population that occurs in the proposal area. In cases where multiple populations occur in the proposal area or a population occupies part of the proposal area, impacts on each subpopulation must be assessed separately (OEH 2017).
MNES	A matter of national environmental significance (MNES) protected by a provision of Part 3 of the EPBC Act
Mitchell landscape	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000 (OEH 2014).
Mitigation	Action to reduce the severity of an impact (OEH 2014).
Mitigation measure	Any measure that facilitates the safe movement of wildlife and/or prevents wildlife mortality or injury.
Native vegetation	(a) trees (including any sapling or shrub or any scrub), (b) understorey *plants*, (c) groundcover (being any type of herbaceous vegetation), (d) *plants* occurring in a wetland. A *plant* is native to New South Wales if it was established in New South Wales before European settlement (BC Act).

Definitions	
OEH BAM Credit Calculator (BCC)	An online application of the Biodiversity Assessment Method (BAM). The calculator uses the rules and calculations outlined in the BAM, and allows the user to apply the BAM at a site and observe the results of the assessment.
Operational footprint	The area that will be subject to ongoing operational impacts from the proposal. This includes the road, surrounding safety verges and infrastructure, fauna connectivity structures and maintenance access tracks and compounds.
Population	A group of organisms, all of the same species, occupying a particular area (BAM 2017).
Proposal area/ proposal site/ development footprint	The area of land that is directly impacted on by the proposal that is being assessed under the EP&A Act, including access roads, and areas used to store construction materials (OEH 2014). It includes the construction and operational areas for the proposal.
Proposal area	The area directly affected by the development and any additional areas likely to be affected by the development, either directly or indirectly (OEH 2014).
Target species	A species has been identified within the proposal area or is considered to have a moderate to high likelihood of occurrence and may be impacted by the proposal.

Abbreviations	
BC Act	Biodiversity Conservation Act 2017
BOS	Biodiversity Offset Scheme under the BC Act
CEEC	Critically Endangered Ecological Community
CEMP	Construction Environmental Management Plan
DoEE	Department of Environment and Energy
DP&E	Department of Planning and Environment
DPI	Department of Primary Industries
EEC	Endangered ecological community
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth).
FM Act	Fisheries Management Act 1994 (NSW)
GDE	Groundwater dependent ecosystems
IBRA	Interim Biogeographically Regionalisation of Australia
MNES	Matters of National Environmental Significance
OEH	Office of Environment and Heritage
PCT	Plant Community Type
REF	Review of Environmental Factors
SEPP	State Environmental Planning Policy

Abbreviations	
TECs	Threatened Ecological Communities
TBDC	Threatened Biodiversity Data Collection
VEC	Vulnerable Ecological Community
VIS	Vegetation information system

1. Introduction

1.1 Proposal background

Transport for New South Wales (TfNSW) have engaged NGH Pty Ltd to complete a Biodiversity Assessment Report (BR) for the Gocup Road intersection improvement. TfNSW proposes to construct a roundabout on the Snowy Mountain Highway at the intersection with Gocup Road, Cappers Street and Snowy Mountains Highway, Tumut. The existing roads are single carriageway with a sign posted speed of 50 km/h. The intersection has a history of road safety and traffic efficiency issues

The proposal is located in Southern NSW in the Snowy Valleys Council Local Government Area (LGA) and is approximately 3 kilometres north-west from the township centre of Tumut, NSW The proposal area is located in the inland slopes subregion of the South Western Slopes NSW Interim Biogeographical Regionalisation for Australia (IBRA) Bioregion and 'Tumut Channels and Floodplains' and 'Minjary Hills and Ranges' Mitchell Landscapes. The Tumut wetlands occur to the North East of the Gocup Road intersection. The Tumut River runs around 300m from the intersection adjacent to the Tumut Wetlands.

The location of the proposal is shown in Figure 1-2 to Figure 1-4. Chapter 1.2 describes the Proposal in detail.

The following definitions are used in this BAR.

- **Proposal**: All works involved in the implementation and operation of the works described in this BAR.
- **Proposal area**: The total area where works are to be conducted along the Snowy Mountain Highway at the Gocup Road intersection.
- **Construction footprint**: The area of land directly impacted by the Proposal, including all vegetation clearance and ground disturbance.
- **Locality**: The area within a 10 km radius of the Proposal area.

1.2 The proposal

The Proposal proposes to upgrade the intersection of Gocup Road and the Snowy Mountains Highway (Figure 1-1). The proposal aims to significantly increase the safety of this intersection through the installation of a roundabout and key features including:

- Rehabilitating approach span gradient to improve vehicle sight distance
- Widening road shoulders and lane widths where needed
- Reinforcing road earthworks using retaining walls
- Clearing and trimming of vegetation including mature trees
- Relocating overhead powerlines and power poles to below surface level
- Enhancing the visibility of signposting and line marking
- Upgrading the protection and visible permeability of guardrails on approach spans
- Improving pedestrian and cyclist accessibility around the intersection.

To undertake these works, the following construction activities are proposed:

- Establishment of compound, stockpiles sites, and fencing, where required

- Implementation of traffic control, including partial road closures and closures of side streets, where necessary
- Installation of erosion and sediment controls
- Relocation of utilities and power poles. A powerline that runs north east through the adjacent wetland will need to be diverted to the west (meeting at a different power pole at the end of the project on Gocup road) to avoid construction. Vegetation clearing will be kept to a minimal
- Clearing of vegetation including mature trees
- Removal of topsoil
- Extension of existing drainage structure (cast insitu and/or precast unit)
- Widening and construction of table drains
- Widening of existing pavement (with removal of pavement layers in some locations) and disposal/reuse of this pavement and subgrade material
- Placement of sub-base material, base material and bitumen wearing surfaces
- Relocation of active travel path for pedestrian and cyclist to northeast (to be closed during construction period with detours along alternative pedestrian/cycle paths within the wetland)
- Modification of the pavement (in widening areas) with lime
- Installation of new and upgrading of existing safety barrier
- Installation of line marking and any roadside furniture including medians and signs
- Site clean-up and removal of stockpiles
- Landscaping and remediation of disturbed areas
- Removal of traffic controls and any erosion and sediment controls.

Stockpile sites for the works would include (refer Figure 1-6):

- SWT4 Tumut TfNSW Depot Compound Site (500 metres west of project location)
- SWA 013 Stockpile Site (3.2 kilometres north of project location – Gocup Road)
- SWA 014 Stockpile Site (7.3 kilometres north of project location – Gocup Road)
- SWA 016 Stockpile Site (16.1 kilometres north of project location – Gocup Road)
- SWT4/10 Stockpile Site (14 kilometres west of project location – Snowy Mountains Highway)

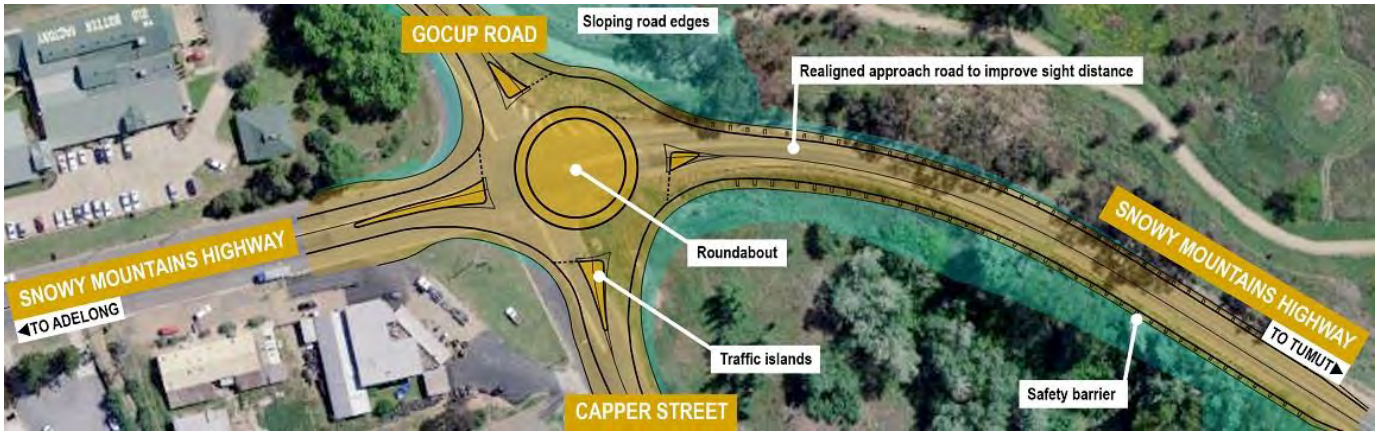

Figure 1-1 Key features of the proposal, media release imagery (Tranport for NSW, 2021)

1.3 Legislative context

A Review of Environmental Factors (REF) is prepared to satisfy Roads and Maritime Services duties under s.111 of the EP&A Act to "examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity" and s.112 in making decisions on the likely significance of any environmental impacts. This biodiversity impact assessment forms part of the REF being prepared for the Gocup Road Intersection Improvement, and assesses the biodiversity impacts of the proposal to meet the requirements of the EP&A Act.

Sections 7.2 A of the BC Act and Part 7A of the FM Act require that the significance of the impact on threatened species, and endangered ecological communities is assessed using a five-part test. Where a significant impact is likely to occur, a species impact statement (SIS) must be prepared in accordance with the Director-General's requirements or a Biodiversity Development Assessment Report (BDAR) must be prepared by an accredited assessor in accordance with the BAM.

Until such time as the DoEE endorse the Biodiversity Assessment Method, a BDAR will not be pursued as an assessment option by RMS for projects with significant impacts on MNES without further consultation with DoEE.

In September 2015, a "strategic assessment" approval was granted by the Federal Minister in accordance with the EPBC Act. The approval applies to Roads and Maritime activities being assessed under Division 5.1 (formerly Part 5) of the EP&A Act with respect to potential impacts on nationally listed threatened species, ecological communities and migratory species.

As a result, Roads and Maritime proposals assessed via an REF:

- must address and consider potential impacts on nationally listed threatened species, populations, ecological communities and migratory species, including application of the "avoid, minimise, mitigate and offset" hierarchy
- do not require referral to the Federal Department of the Environment for these matters, even if the activity is likely to have a significant impact.

To assist with this, assessments are required in accordance with the *Matters of National Environmental Significance: Significant impact guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999* (DoE 2013).

The commencement of the BC Act has affected the operation of the strategic assessment in the following ways:

- The previous biodiversity assessment method, the Framework for Biodiversity Assessment, (FBA) has been superseded by the BAM;
- DoEE have not (yet) endorsed the BAM as a suitable method to assess impacts or calculate offsetting requirements;
- DoEE have not (yet) endorsed the Biodiversity Offset Fund as a suitable avenue to meet offset obligations.

Until DoEE have endorsed the BAM, a BDAR should not be used to assess project impacts or calculate offset requirements for Division 5.1 REF projects that are likely to have a significant impact on nationally listed species and communities without consultation with DoEE.

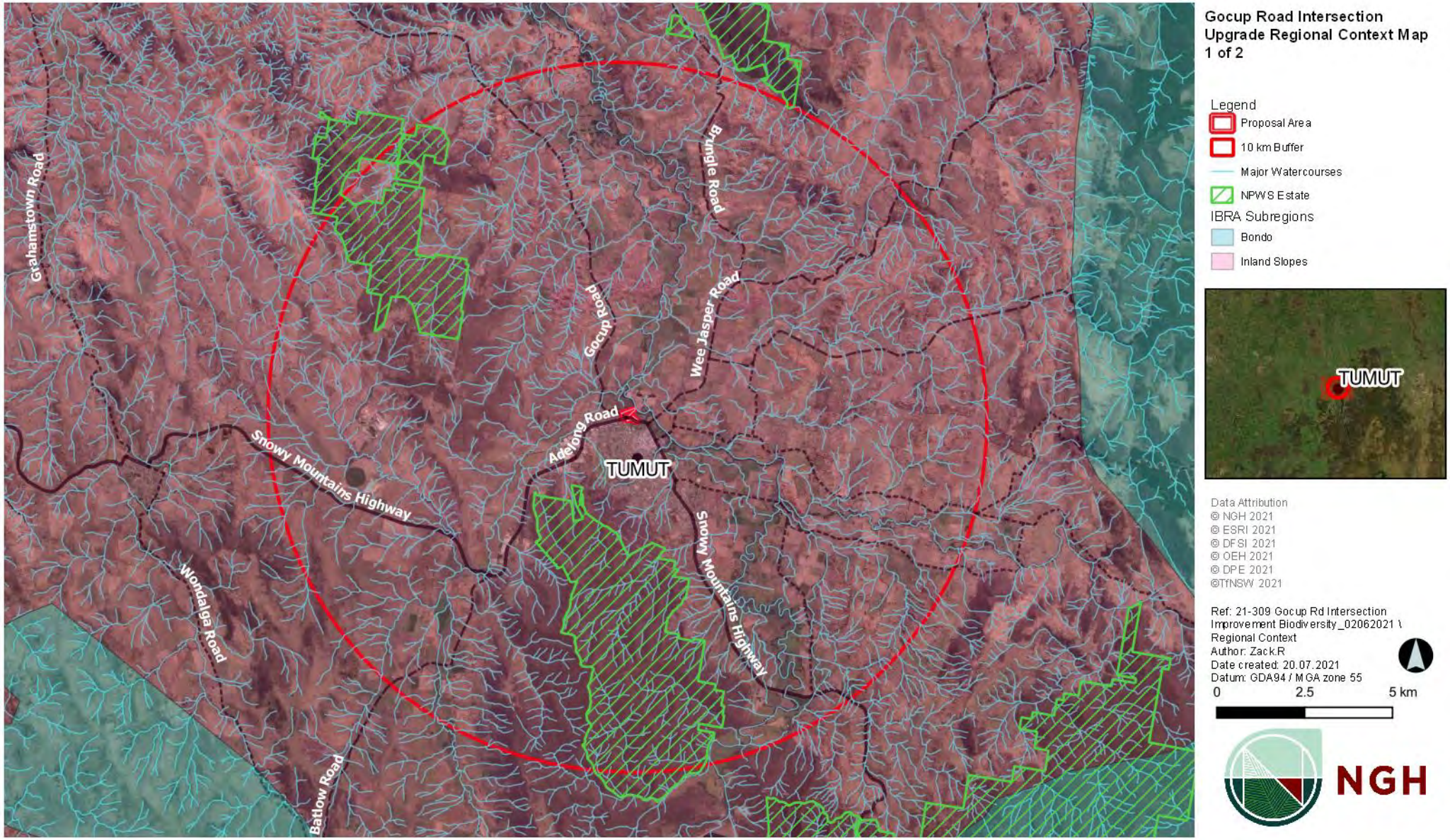

Figure 1-2 Regional Context Map 1 of 2

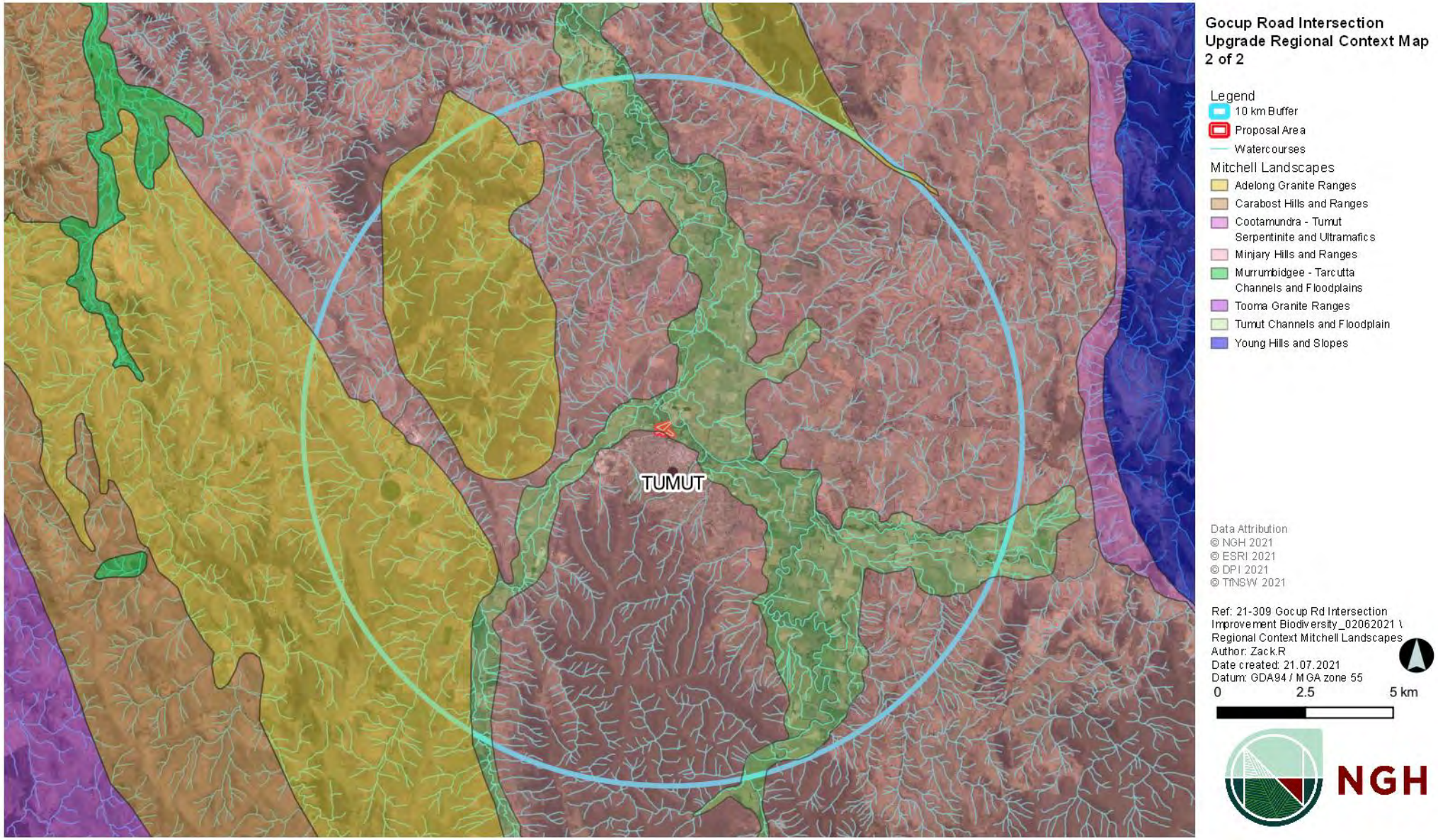

Figure 1-3 Regional Context Map 2 of 2

Figure 1-4 Proposal Area Map 1 of 2

Figure 1-5 Proposal Area Map 2 of 2

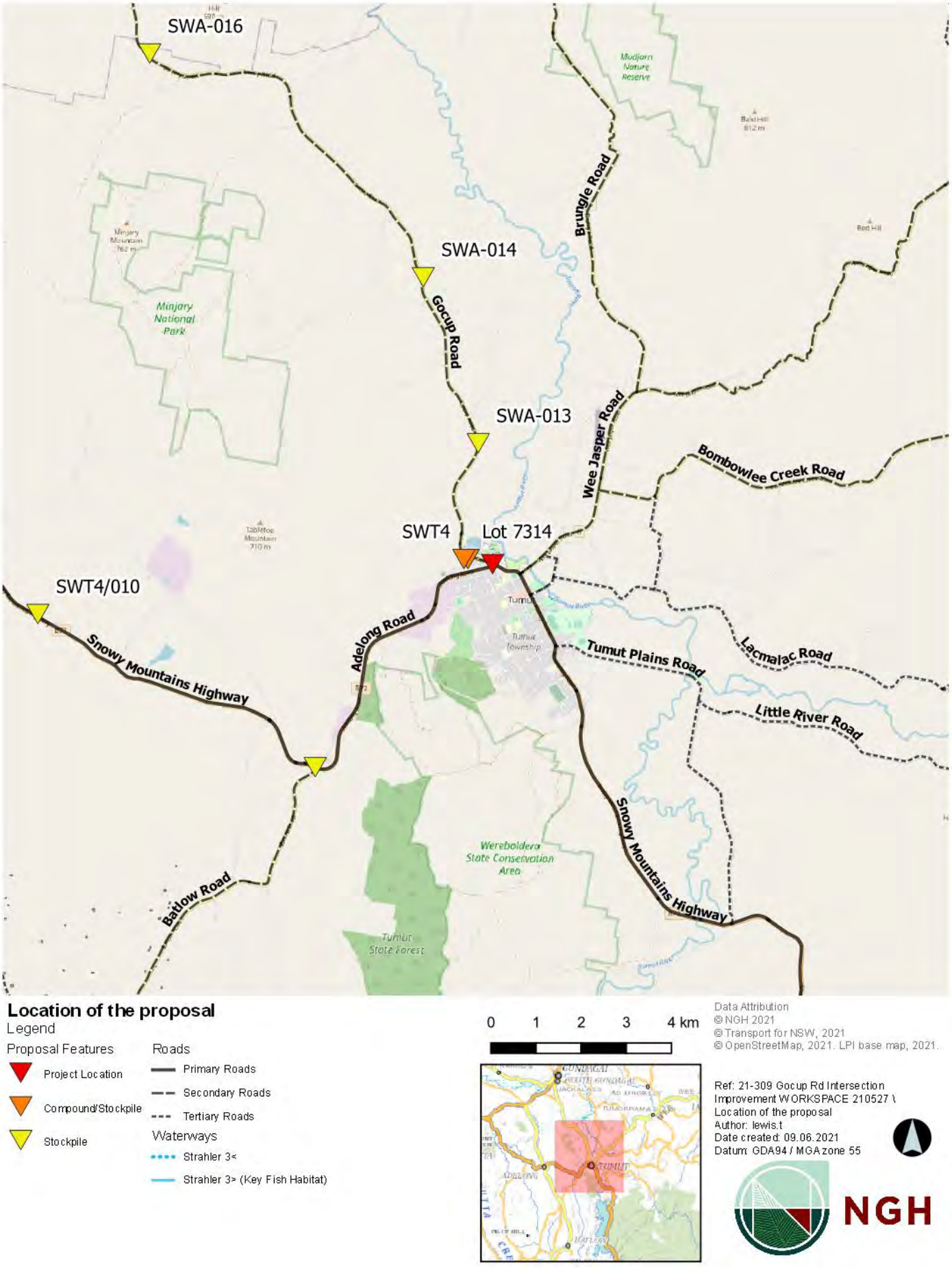

Figure 1-6 Stockpile Locations

2. Methods

2.1 Personnel

This assessment was undertaken by Julie Gooding (Ecologist – BAM accredited BAAS 18074) and Zackary Renner (Ecologist).

2.2 Background research

Background searches undertaken for the purposes of the assessment included Commonwealth and State databases to determine potential occurrence of threatened flora and fauna species, populations, ecological communities, migratory species and Areas of Outstanding Biodiversity Value within the proposal area. Additional searches were conducted to determine general biodiversity features such as Groundwater Dependant Ecosystems Database and Priority Weeds. Details on background searches including search area and timing are shown in Table 2-1.

Table 2-1 Background searches undertaken

Resource	Target	Search Area	Timing
NSW BioNet Atas Threatened Species Search	Threatened flora and fauna species, populations and ecological communities listed under the BC Act	Locality (10km radius from proposal area)	27/05/2021
NSW DPI Fisheries (Spatial Data)	Threatened freshwater spatial mapping provided by the NSW DPI fisheries for the indicative presence of threatened species and Key Fish Habitat	Locality	27/05/2021
Koala Habitat identify by the Koala Habitat Protection SEPP	Occurrence of Koala habitat.	Proposal Area	27/05/2021
State Vegetation Mapping Riverina_VIS_ID_4469	Candidate PCTs that may occur within the proposal area	Proposal Area	27/05/2021
Biodiversity Values Map and Threshold Tool (BVMAT)	Land which exceeds the Biodiversity Offsets Scheme Threshold	Proposal Area	27/05/2021
OEH Threatened Species Search “NSW South Western Slopes”	Threatened flora, fauna, and populations	Inland Slopes sub-region	27/05/2021
EPBC Act Protected Matters Search Tool (10km Locality)	Threatened flora and fauna, endangered populations and ecological communities and migratory species	Locality	27/05/2021
NSW WeedWise	Priority weeds declared for Snowy Valleys LGA	Riverina	27/05/2021
BOM’s Atlas of Groundwater Dependent Ecosystems	Groundwater Dependent Ecosystems	Proposal area	27/05/2021

2.3 Habitat assessment

The threatened species identified by the background searches were evaluated for their potential to occur in the proposal area. A habitat assessment table was completed (Annexure C) to assess the likelihood of their occurrence based on habitat and vegetation assessments undertaken during field surveys.

Species were considered likely to occur where:

- The geographic distribution of the species is known or predicted to include the IBRA subregion in which the proposal area is located, and
- The proposal area contains habitat features associated with and suitable for the species, or
- Past surveys undertaken at the proposal area indicate that the species is present.

Refer to Annexure C for the habitat assessment table which assesses the likelihood of each threatened species, population or community identified with the potential to occur in the locality. The likely occurrence of threatened biodiversity is based on the presence, condition and type of habitat and previous records.

2.4 Field survey

Field surveys were conducted by two ecologists on 4th June 2021 between 10am and 4pm. The conditions were overcast with an average temperature of 12°C. Vegetation surveys were conducted in line with Biodiversity Assessment Method and opportunistic approach as well. Fauna surveys were conducted through opportunistic surveys while on site.

2.4.1 Vegetation surveys

Vegetation surveys were conducted in line with the Biodiversity Assessment Method(BAM), (OEH 2020). The entire proposal area was surveyed using the random meander method to determine the Plant Community Types (PCTs) present, along with their condition and extent. Plant Community Types (PCTs) were identified according to the OEH BioNet Vegetation Classification (OEH, 2017). Vegetation zones were classified within each PCT as areas with the same broad condition type. Once PCTs and zones were determined, representative BAM plots were undertaken in each of the zones. The number of BAM plots required per zone was calculated per the BAM 2020 (Table 2-2).

Three BAM floristic surveys based on a nested 20m x 50m quadrat were undertaken within the proposal area. The location of these plots are shown in Figure 2-1. All flora species observed in each plot were recorded to species level along with the percentage cover and abundance of each species. In addition to the BAM plots, areas outside the plots were surveyed using the random meander method (Cropper 1993) to search for additional species.

Where relevant, Threatened Ecological Communities (TEC) were confirmed based on the relevant Scientific Committee – final determinations for each TEC.

Table 2-2: Minimum number of plots required per zone area

Vegetation zone area (ha)	Minimum number of plots
<2	1 plot
>2-5	2 plots
>5-20	3 plots

Vegetation zone area (ha)	Minimum number of plots
>20-50	4 plots
> 50–100	5 plots
> 100–250	6 plots
> 250–1000	7 plots; more plots may be needed if the condition of the vegetation is variable across the zone
> 1000	8 plots; more plots may be needed if the condition of the vegetation is variable across the zone

2.4.2 Targeted flora surveys

The proposal area has been highly disturbed in the past, with the majority of the native vegetation having been planted over an exotic ground layer. No flora species were considered as having a moderate to high chance of occurring within the proposal area (Appendix A). As such no targeted flora surveys were conducted.

2.4.3 Targeted fauna surveys

A general fauna habitat assessment was undertaken to identify the location, extent and condition of important features for threatened species such as hollow bearing trees, fallen timber, aquatic resources rocky outcrops and microhabitats.

Opportunistic fauna surveys were undertaken during the field surveys. This included recording sightings and vocal records of birds species and observations of scats, scratches, nests and burrows.

Based on the habitat assessment eight fauna species were identified as having the potential to occur within the proposal area. These are;

- Dusky Woodswallow (*Artamus cyanopterus*)
- Gang-gang Cockatoo (*Callocephalon fimbriatum*)
- Speckled Warbler (*Pyrrholaemus sagittatus*)
- Brown Treecreeper (*Climacteris picumnus victoriae*)
- Varied Sittella (*Daphoenositta chrysoptera*)
- Turquoise Parrot (*Neophema pulchella*)
- Scarlet Robin (*Petroica boodang*)
- Diamond Firetail (*Stagonopleura guttata*)

No targeted fauna surveys were undertaken for these species. As suitable habitat exists, these species are assumed to occur within the proposal area.

2.4.4 Aquatic Surveys

Background searches were undertaken to determine presence of threatened fish distributions or Key Fish Habitat

One dam and one billabong occurs within the proposal area and these aquatic areas were assessed for habitat features such as aquatic and bank vegetation, and Coarse Woody Debris (CWD) during the field surveys on the 4th June 2021.

The Tumut River runs 350m to the North West of the intersection but would not be impacted by the proposal and was not assessed

2.4.5 Summary of survey effort and limitations

The proposal area was surveyed using the 'random meander' method, as documented by Cropper (1993). No targeted searches for threatened flora were completed. The flora species recorded at each BAM plot location are considered sufficient to identify vegetation communities present within the proposal area and therefore to evaluate the probability of threatened flora species to occur.

Opportunistic fauna surveys were completed during the site survey. No targeted surveys for threatened species were completed, therefore it is a limitation that not all species that utilise a proposal area will be detected. This is generally due to their mobility and unpredictable movement throughout their habitat. Furthermore, climatic conditions may influence the species present at any one time. The habitat assessment approach has been used to alleviate this limitation.

Table 2-3: Targeted species survey details

Species	Minimum survey requirements[1]	Survey completed
Vegetation Communities	Refer to Table 2-2	3 BAM Plots; 1 in each Vegetation zone

Figure 2-1: Vegetation survey locations

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3. Existing environment

The proposal area is located at the Gocup Road and Snowy Mountain Highway Intersection and is located within the NSW South West Slopes IBRA bioregion. The proposal area occurs in the Inland Slopes subregion, within the 'Tumut Channels and Floodplains' and 'Minjary Hills and Ranges' Mitchell Landscapes. The underlying geology is comprised of Quaternary alluvial deposits.

The vegetation within the proposal area is a mix of exotic and planted native vegetation. Planted native vegetation occurs as a mosaic within the Tumut Wetlands to the North-East of the intersection. Tumut wetlands was used as a town common and was heavily grazed, trampled and infested with weeds such as Willows (**Salix sp.*) and Paspalum Grass (**Paspalum dilitatum*) before it was extensively rehabilitated with native vegetation plantings, revegetated lagoons and walking tracks in 2004 (Riverglades Wetland Management Plan, 2004). Older planted vegetation, around 40 years old also occurs along the North-Eastern corner of the intersection from rehabilitation efforts for the construction of the Snowy Mountains Highway. Planted vegetation is a mix of Eucalypts such as Yellow Box (*Eucalyptus melliodora*) and Apple Box (*Eucalyptus bridgesiana*) and a diverse range of shrubs such as *Acacia* spp, *Callistemon* spp and Banksia sp. Outside the common edge effects, primarily weed incursion and exposure, the planted communities are in moderate condition, with quality improving with distance from roadside. The planted vegetation is interspersed by areas of highly disturbed exotic grasslands of Phalaris (*Phalaris aquatica*) and Paspalum and patches of remnant River Red Gum (*Eucalyptus camaldulensis*).

The South-West and North-West corners of the intersections are comprised of residential and commercial dwellings. Some street plantings of native trees such as Tea tree (*Melaleuca linearifolia* and *Melaleuca stypheloides*) occur along the road verges as well as large mature exotic trees such as Oak (*Quercus robur*) and Pines (**Pinus sp*).

The South-Eastern corner of the intersection is exotic dominated comprised of Poplar (**Populus alba*), Privet (*Ligustrum sinense*) and exotic mown grasses of kikuyu (**Pennisetum clandestinum*).

The five stockpile sites for the proposal are currently used as stockpile sites and contain no native vegetation.

A full flora list can be found in Annexure B.

3.1 Plant community types

The State Vegetation Mapping was reviewed to confirm if Plant Community Types (PCT) have been mapped to occur within the proposal area. PCTs were shown to occur within and adjacent to the proposal area, including:

- PCT 79 – *River Red Gum shrub/grass riparian tall woodland or open forest wetland mainly in the upper slopes subregion of the NSW South Western Slopes Bioregion and Western South Eastern Highlands Bioregion*
- PCT 283 - *Apple Box - Blakely's Red Gum moist valley and footslopes grass-forb open forest of the NSW South Western Slopes Bioregion*
- PCT 277 - *Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion*

The vegetation communities within the proposal area occur in unnatural associations due to being artificially created as a result of the wetland rehabilitation and past highway construction. In these cases a Plant Community Type (PCT) was assigned based on the planted species, surrounding PCTs, landscape and IBRA region (Table 2-1). Two PCTS were identified within the proposal area;

One patch of planted vegetation was assigned a PCT based on characteristic overstory species of Yellow Box (*E. melliodora*), Apple Box (*E. bridgesiana*) and Blakely's Red Gum (*E. blakelyi*). This planted vegetation was most similar to PCT 283: *Apple Box -Blakely's Red Gum moist valley and foot slopes grass-forb open forest of the NSW South Western Slopes Bioregion* which also occurs in the locality.

Remnant scattered trees of mature River Red Gum (*Eucalyptus camaldulensis*) were characteristic of PCT 79: *River Red Gum shrub/grass riparian tall woodland or open forest wetland mainly in the upper slopes of the sub-region of the NSW South Western Slopes Bioregion and western South Eastern Highlands bioregion*

Some of the planted native vegetation was a diverse mix of native shrubs with an exotic understory. These areas have been planted on previously cleared and highly disturbed landscapes. These areas was not representative of any PCT and were not assigned a PCT.

A large proportion of the proposal area was comprised of exotic vegetation such as grasslands of Phalaris (**Phalaris aquatica*) or Kikuyu (**Pennisetum clandestinum*) or exotic trees such as Poplar (**Poplus albus*), Silky Oak (*Grevillea robusta*) or Oak. These areas do not align with any native vegetation and were not assigned a PCT.

Photograph 3 1 Example of exotic vegetation in the South East of the proposal area.

A summary of the plant community types identified in the proposal area is shown in Table 3-1.

Table 3-1: Plant community types

Plant community type (PCT)	Vegetation zone	Vegetation integrity score	Patch size (ha)	Threatened ecological community?	Area (ha) in Proposal Area
Apple Box -Blakely's Red Gum moist valley and foot slopes grass-forb open forest of the NSW South Western Slopes Bioregion (PCT 283)	1	33.9	0.8	Yes (Box-gum Woodland)	0.8
River Red Gum shrub/grass riparian tall woodland or open forest wetland mainly in the upper slopes of the sub-region of the NSW South Western Slopes Bioregion and western South Eastern Highlands bioregion (PCT 79)	2	n/a	1.3	No	1.3
Planted Native Vegetation	3	n/a	n/a	No	2.3
Exotic Vegetation	4	0	n/a	No	2.8
Total					**7.2**

Apple Box -Blakely's Red Gum moist valley and foot slopes grass-forb open forest of the NSW South Western Slopes Bioregion

Vegetation formation: *Grassy Woodlands*

Vegetation class: *Western Slopes Grassy Woodlands*

PCT: *283*

Other mapping sources: *Riverina State Vegetation Mapping_Version 1.2_VIS 4469*

Conservation status: Forms part of the *TEC White Box-Yellow Box-Blakely's' Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin & South Eastern Highlands* listed as Critically Endangered under the NSW BC Act.

Estimate of percent cleared: *91% pre-European extent*

Condition: *Planted Vegetation (Moderate Condition)*

Extent in the proposal area: *0.8ha*

Plots completed:

Composition condition score	Structure condition score	Function condition score	Vegetation integrity score
16.1	32.7	74.2	33.9

Growth form	Typical species
Trees	*Eucalyptus melliodora, Eucalyptus blakelyi, Eucalyptus bridgesiana*
Shrubs	Shrubs absent
Grass and grass like	Native grasses absent, exotic species of **Phalaris aquatica* and **Bromus catharticus* dominant
Forb	Native forbs absent, exotic species of **Cirsium vulgare, *Galium aparine* & **Sonchus oleraceus* dominant
Fern	Native ferns absent
Other	absent

Description: This PCT is typically a tall open forest or woodland dominated by Apple Box often with Blakely's Red Gum or Yellow Box. The shrub layer is usually very sparse of absent, often comprised of wattle species. It occurs on clay loams or silty clay loams on foot slopes, gullies or valley flats (Bionet, 2021).

Within the proposal area this community was typically represented by patches of planted Apple Box (*E. bridgesiana),* Yellow Box (*E. melliodora*) and Blakely's Red Gum (*E. blakelyi*). Trees were similar in ages,

mostly 30-49 cm Diameter at Breast Height(DBH) suggesting they have been planted around 30 years ago. No hollows had formed in any of the trees. The understory was heavily disturbed and dominated by an almost entirely exotic ground cover of Brome Grass (**Bromus catharticus*), Phalaris (**Phalaris aquatica*) and Cleavers (**Galium aparine*).

Photograph 1: PCT 283_Planted

River Red Gum shrub/grass riparian tall woodland or open forest wetland mainly in the upper slopes of the sub-region of the NSW South Western Slopes Bioregion and western South Eastern Highlands bioregion

Vegetation formation: *Forested Wetlands*

Vegetation class: *Inland Riverine Forests*

PCT: *79*

Other mapping sources: *Riverina State Vegetation Mapping_Version 1.2_VIS 4469*

Conservation status: Not threatened

Estimate of percent cleared: 66% of pre-European extent

Condition: Moderate

Extent in the proposal area: 1.3

Plots completed:

This PCT occurred outside the construction footprint and no plots were undertaken.

Growth form	Typical species
Trees	River Red Gum (*Eucalyptus camaldulensis*)
Shrubs	Silver Wattle (*Acacia dealbata*), River Sheoak (*Casuarina cunninghaminana*)
Grass and grass like	Native grasses absent, exotic species of **Phalaris aquatica* and **Paspalum dilatatum* dominant
Forb	Native forbs absent, exotic species of **Cirsium vulgare, *Galium aparine* & **Sonchus oleraceus* dominant
Fern	Native ferns absent
Other	absent

Description: This PCT is typically a very tall riparian woodland dominated by River Red Gum (*Eucalyptus camaldulensis*) with River Oak (*Casuarina cunninghamiana*). The shrub layer is usually sparse and the ground cover is usually densely covered with native grass species along with sedges and rushes in water holding depressions. It occurs on river banks and adjacent flats along major watercourses (Bionet, 2021).

Within the proposal area, scattered remnant River Red Gums occur over an exotic and disturbed ground layer. Mature River Red Gums contain large hollows providing habitat for hollow bearing fauna. Juvenile River Red Gum are regenerating in the understory and some native shrubs have been planted. The groundcover is dominated by exotic grasses of Phalaris and Paspalum.

Photograph 2: PCT 79

Planted Vegetation (Not conforming to PCT)

Vegetation formation: *n/a*

Vegetation class: *n/a*

PCT: *n/a*

Other mapping sources: *Riverina State Vegetation Mapping_Version 1.2_VIS 4469*

Conservation status: *Not threatened*

Estimate of percent cleared: *66% of pre-European extent*

Condition: *Moderate*

Extent in the proposal area: *2.3ha*

Plots completed: One plot was undertaken in this vegetation. As it does not conform to a PCT no vegetation integrity score was calculated.

Growth form	Typical species
Trees	-
Shrubs	Planted shrubs such as *Acacia rubida, Acacia suaveolons, Acacia cultriformis, Callistemon sp, Leptospermum sp.*
Grass and grass like	Dominated by exotic species such as Kikuyu (**Pennisetum clandestinum*), Brome Grass (**Bromus sp.*), Paspalum (**Paspalum dilatatum)* and Rye Grass (**Lolium sp*.)
Forb	Dominated by exotic species such as Medic (**Medicago sp.*), Catsear (**Hypochaeris radiata*) and Mallow (**Malva parvifolia*)
Fern	Absent
Other	Absent

Description: Planted native vegetation around 10 to 20 years old.

Photograph 3 Planted Native vegetation.

Figure 3-1 Vegetation Zones

3.2 Threatened ecological communities

PCT 283 Apple box – Blakely's Red Gum moist valley and footslopes grass-forb open forest of the NSW South Western Slopes Bioregion forms part of the BC Act listed - CE: *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregion* (Box-gum Woodland). The presence of a canopy dominated by Blakely's Red Gum and Yellow Box, grassy understory and location in the South Western Slopes suggested this PCT met the criteria for the Critically Endangered Box-gum Woodland under the NSW BC Act.

The quality of the PCT in the proposal area did not however meet the requirements for the condition of the federally listed *White Box -Yellow Box – Blakely's red gum grassy woodlands and derived native grasslands* TEC due to the exotic dominated understory, small patch size and lack of mature trees.

3.3 Groundwater dependent ecosystems

There are no Groundwater Dependent Ecosystems (GDEs) mapped within the proposal area (Figure 3-2)The Tumut River to the North and West of the proposal area is mapped as an aquatic GDE. The nearest mapped terrestrial GDE is roughly 1.1 km to the south-east. These GDEs are not likely to be impacted by the proposal.

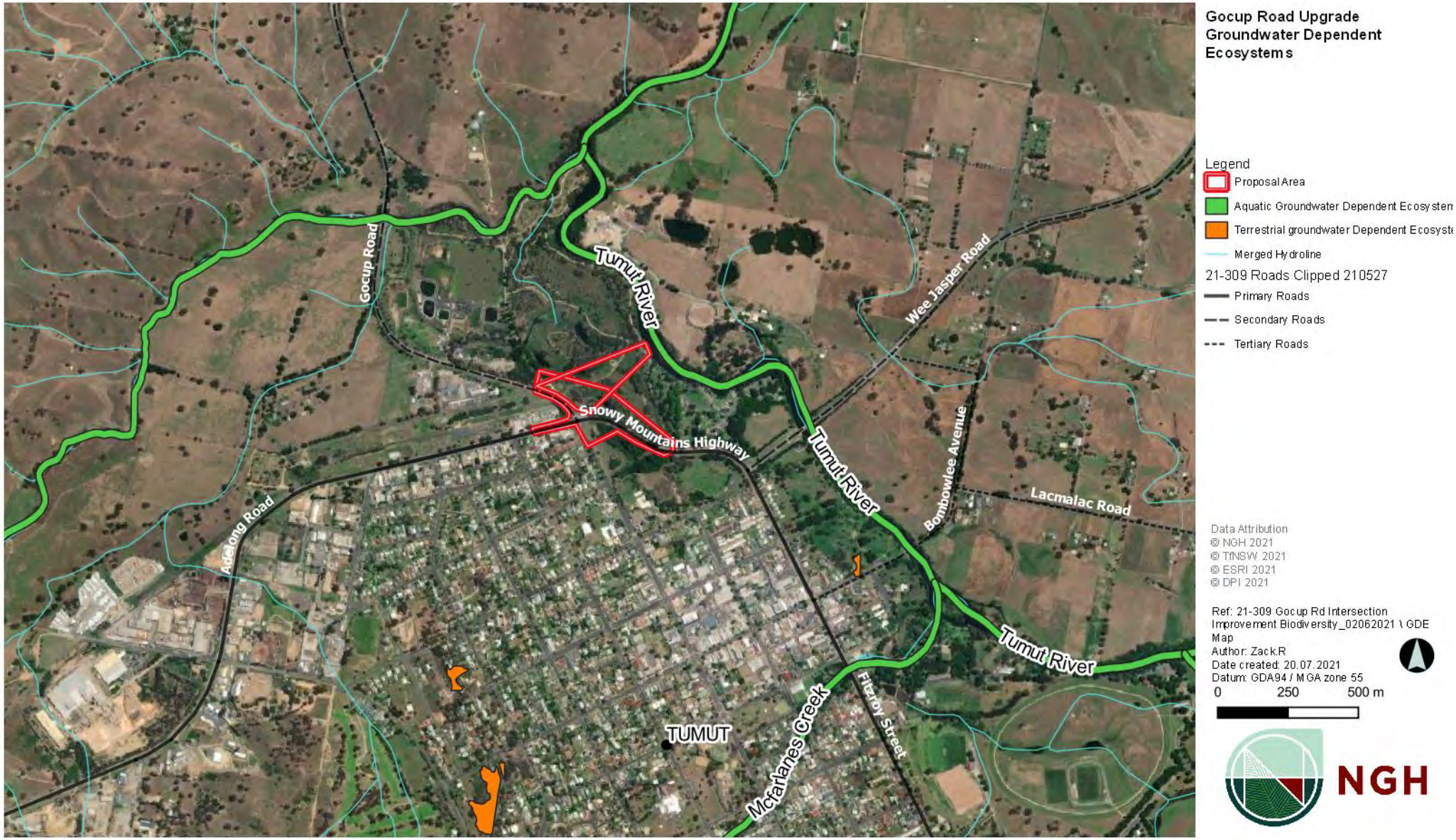

Figure 3-2 Groundwater Dependent Ecosystems

3.4 Threatened species

No threatened flora species were recorded within the proposal area during surveys. However, due to the timing of the survey and cryptic or ephemeral nature of some flora species it is possible that threatened flora species were present but were not recorded. A habitat table with results of the likelihood of occurrence of all threatened flora listed as potentially occurring within the proposal area is shown below in Table 3-2.

No threatened fauna species were recorded within the proposal area during surveys. The proposal area contains a range of habitat values for threatened fauna, though most are common foraging resources that are prevalent in the surrounding landscape. A habitat table with results of likelihood of occurrence of all threatened fauna listed as potentially occurring within the proposal area is below in Table 3-2. An AoS was undertaken for eight species of woodland birds that had a moderate or higher likelihood of occurrence within the proposal area (Annexure C). Figure 3-3 below shows the threatened species habitat areas to be impacted.

Table 3-2: Habitat assessment and surveys results

Scientific name	Common Name	BC Act status	Potential occurrence (Low, Moderate, High, Recorded)
FLORA			
Pultenaea humilis	Dwarf Bush-pea	V	Low
Swainsona sericea	Silky Swainson-pea	V	Low
Ammobium craspedioides	Yass Daisy	V	Low
FAUNA			
Crinia sloanei	Sloane's Froglet	V	Low
Litoria booroolongenis	Booroolong Frog	E	Low
Litoria raniformis	Southern Bell Frog	E	Low
Chalinolobus dwyeri	Large-eared Pied Bat	V	Low
Chalinolobus picatus	Little Pied Bat	V	Low
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	Low
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	Low
Myotis Macropus	Southern Myotis	V	Low
Nyctophilus corbeni	Corben's Long-eared Bat	V	Low
Pteropus poliocephalus	Grey-headed Flying Fox	V	Low

Scientific name	Common Name	BC Act status	Potential occurrence (Low, Moderate, High, Recorded)
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	Low
Anseranas semipalmata	Magpie Goose	V	Low
Anthochaera Phrygia	Regent Honeyeater	CE	Low
Ardeotis australis	Australian Bustard	E	Low
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	Moderate
Botaurus poiciloptilus	Australasian Bittern	E	Low
Burhinus grallarius	Bush Stone-curlew	E	Low
Callocephalon fimbriatum	Gang-gang Cockatoo	V	Moderate
Calyptorhynchus lathami	Glossy Black-cockatoo	V	Low
Certhionyx variegatus	Pied Honeyeater	V	Low
Chthonicola sagittate	Speckled Warbler	V	Moderate
Climacteris picumnus victoriae	Brown Treecreeper (Eastern subspecies)	V	Moderate
Circu assimilis	Spotted Harrier	V	Low
Daphoenositta chrysoptera	Varied Sittella	V	Moderate
Ephippiorhynchus asiaticus	Black-necked Stork	E	Low
Epthianura albifrons	White-front Chat	V	Low
Falco hypoleucos	Grey Falcon	E	Low
Falco subniger	Black Falcon	V	Low
Glossopsitta porphyrocephala	Purple-crowned Lorikeet	V	Low
Grantiella picta	Pied Honeyeater	V	Low
Grus rubicunda	Brogla	V	Low
Aqulia audax	White-bellied Sea Eagle	V	Low
Hamirostra melanosternon	Black-breasted Buzzard	V	Low
Hieraaetus morphnoides	Little Eagle	V	Low

Scientific name	Common Name	BC Act status	Potential occurrence (Low, Moderate, High, Recorded)
Ixobrychus flavicollis	Black Bittern	V	Low
Lathamus discolor	Swift Parrot	E	Low
Leipoa ocellata	Malleefowl	E	Low
Limosa limosa	Black-tailed Godwit	V	Low
Lophochroa leadbeateri	Major Mitchell's Cockatoo	V	Low
Lophoictinia isura	Square-tailed Kite	V	Low
Melanodry42acrocarpata cucullate	Hooded Robbin	V	Low
Melithreptus gularis gularis	Black-chinned Honeyeater (Eastern Subspecies)	V	Low
Merops ornatus	Rainbow Bee-eater		Low
Neophema pulchella	Turquoise Parrot	V	Moderate
Ninox connivens	Barking Owl	V	Low
Ninox strenua	Powerful Owl	V	Low
Oxyura australis	Blue-billed Duck	V	Low
Pachycephala inornate	Gilbert's Whistler	V	Low
Pandion cristatus	Eastern Osprey	V	Low
Petroica boodang	Scarlet Robin	V	Moderate
Petroica phoenicea	Flame Robin	V	Low
Petroica rodinogaster	Pink Robin	V	Low
Polytelis swainsonii	Swift Parrot	V	Low
Pomatostomus temporalis temporalis	Grey-crowned Babbler (Eastern subspecies)	V	Low
Rostratula australis	Australian Painted Snipe	E	Low
Stagonopleura guttata	Diamond Firetail	V	Moderate
Stictonetta naevosa	Freckled Duck	V	Low
Tyto novaehollandiae	Masked Owl	V	Low
Apus pacificus	Fork-tailed Swift		Low
Hirundapus caudacutus	White-throated Needletail		Low
Motacilla flava	Yellow Wagtail		Low

Scientific name	Common Name	BC Act status	Potential occurrence (Low, Moderate, High, Recorded)
Myiagra cyanoleuca	Satin Flycatcher		Low
Rhipidura rufifrons	Rofous Fantail		Low
Calidris ferruginea	Curlew Sandpiper	E	Low
Actitis hypoleucos	Common Sandpiper	E	Low
Calidris acuminata	Sharp-tailed Sandpiper		Low
Calidris melanotos	Pectoral Sandpiper		Low
Gallinago hardwickii	Latham's Sniper		Low
Numenius madagascariensis	Eastern Curlew		Low
Ardea ibis	Cattle Egret		Low
Synemon plana	Golden Sun Moth	E	Low
Cercartetus nanus	Eastern Pygmy-possum	V	Low
Dasyurus maculatus	Spotted-tailed Quoll	V	Low
Petaurus australis	Yellow-bellied Glider	V	Low
Petauroides Volans	Greater Glider		Low
Petaurus norfolcensis	Squirrel Glider	V	Low
Phascogale tapoatafa	Brush-tailed Phascogale	V	Low
Aprasia parapulchella	Pink-tailed Legless Lizard	V	Low
Delma impar	Striped Legless Lizard	V	Low
Hoplocephalus bitorquatus	Pale-headed Snake	V	Low
Varanus rosenbergi	Rosenberg's Goanna	V	Low

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Figure 3-3 Threatened fauna impacted areas

3.4.1 Aquatic results

Tumut River is approximately 360m north east of the proposed roundabout. There are also two smaller waterbodies within the wetlands (Figure 3-5 -Figure 2-5). One watercourse traverses the proposal area, namely a small nameless creek under the Snowy Mountains Highway through culverts that will be extended during construction (Figure 3-6). This creek is not key fish habitat, but provides runoff from the south east as it drains into a small dam.

No threatened aquatic species were observed or heard during the site survey. However due to the timing of the survey some aquatic species, such as frogs may not have been calling, some species such as fish may not have been present and some species may not have been identified due to the presence of water. The occurrence of threatened aquatic species may not be ruled out.

No threatened records from NSW BioNet have been recorded within the proposal area.

A search of NSW DPI Key Fish Habitat (KFH) mapping found the Tumut River and Tumut Wetlands mapped as KFH and classed as Class 1 Major Key Fish Habitat. The Tumut River was also mapped as potential important habitat to the Murray Crayfish (*Euastacus armatus*).

Under the NSW DPI Fisheries Spatial Data Portal the section of the Tumut River adjacent to the proposal area is mapped as 'Very Poor Condition' Freshwater Fish Community.

Observation of the waterbodies within the proposal area determined a moderate condition class:

- Limited flow, areas of pooled water >30cm
- Riparian vegetation along banks
- Macrophytes present
- Aquatic vegetation present
- Native vegetation including large areas of established remnant native vegetation
- Minimal pollution was observed (rubbish)

During the survey, an abundance of frogs were recorded, including the Whistling Tree Frog (*Litoria verreauxii)*, Clicking Froglet (*Crinia signifera*) and Beeping Froglet (*Crinia parinsignifera*). Macrophytes were also noted within the Wetlands.

The proposal works would be limited to the roadside and is not expected to impact any aquatic habitat as seen below in Figure 3-4.

Figure 3-4 Key fish habitat and Murray Crayfish Habitat

Figure 3-5 Dam within the proposal area

Figure 3-6 Culvert under the Snowy Mountains Highway

3.5 Areas of outstanding biodiversity value (where applicable)

No areas of outstanding biodiversity value occur within or adjacent to the proposal area. Areas mapped as High Biodiversity Value under the NSW Biodiversity values map occur north of the proposal area. No areas of mapped high biodiversity value occur within or directly adjacent to the proposal area.

3.6 Wildlife connectivity corridors

The planted vegetation along the Snowy Mountain Highway may also provide limited connectivity for species moving alongside the road corridor. However, the Snowy Mountain Highway is likely to be an existing barrier for sensitive species moving across the landscape.

3.7 State Environmental Planning Policies (SEPPs)

State Environmental Planning Policy – (Koala Habitat Protection) 2021 (Koala Habitat Protection SEPP) encourages the conservation and management of natural vegetation that provides habitat for Koalas. Koalas are listed under the BC Act as a vulnerable species. The Koala Habitat Protection SEPP applies to each local government area listed in Schedule 1. The proposal area is located within the Snowy Valleys Council Local Government Area, which is listed in Schedule 1.

Key to the application of the Koala Habitat Protection SEPP is determining “Core Koala habitat”. Core Koala habitat means (a) an area of land where koalas are present, or (b) an area of land which has been assessed by a suitably qualified and experienced person in accordance with the Guideline as being highly suitable koala habitat, and where koalas have been recorded as being present in the previous 18 years.

As per schedule 2 of the Koala Habitat protection SEPP, Koala Tree species are listed by regions (Koala Management Areas). Under the koala management area plan, River Red Gum is listed as a food source for Koalas.

The proposal area is identified on the Koala Development Application Map which forms part of the Koala Habitat Protection SEPP. This map identifies areas that have highly suitable Koala habitat.

Activities assessed under Part 5 of the EP&A Act are not subject to the Koala Habitat Protection SEPP. Koalas and their habitats are assessed under the BC Act.

No additional SEPPs (including Coastal Management SEPP, SEPP26 Littoral Rainforest) are applicable to this proposal.

3.8 Matters of National Environmental Significance

No EPBC threatened species are likely to occur in the proposal area.

The nearest wetland of international importance is Hattah-kulkyne lakes, between 500-600km upstream. Therefore, there is no apparent interaction between the waterways within the proposal area and Hattah-kulkyne lakes.

There are no heritage places within the proposal area. No migratory species are considered likely to occur in the proposal area.

4. Avoidance and minimisation

In managing biodiversity impacts TfNSW would aim to avoid and minimise impacts prior to mitigating or offsetting, where the biodiversity management hierarchy is:

- Avoid and minimise impacts
- Mitigate impacts where avoidance is not possible
- Offset where residual impacts cannot be avoided

Avoidance and minimisation of biodiversity impacts was achieved through early planning, further assessment, and amendments to the project design.

In addition, direct impacts on clearing of native vegetation and impacts to aquatic habitat would be minimised by:

- Ensuring work is kept to the assessed construction footprint and impact areas
- Ensuring further assessment is conducted if the scope of work changes
- Clearly sign posting identified habitat as ‘Environmentally sensitive’ during construction to avoid disturbance.

5. Impact assessment

5.1 Construction impacts

5.1.1 Removal of native vegetation

The proposal is located along the Snowy Mountain Highway and adjacent Tumut Wetlands. The linear nature of vegetation along the roadside has reduced its quality due to edge effect from the roadside environment. The proposal would result in the direct loss of 1.04 ha of planted native vegetation as summarised in Table 5-1. One patch of planted native vegetation (PCT 283) meets the definition of the Critically Endangered Ecological community – Box-gum Woodland. 0.60 ha of this CEEC would be removed. Estimates of removal have been informed by the design files provided by TfNSW and shown below in Figure 5-1.

Table 5-1: Impacts on vegetation

Plant community type (PCT)	Status		Proposal area[1] (hectares)
	TSC Act	EPBC Act	
PCT 283	CE	-	0.60
PCT 74	-	-	0.00
Planted Native Vegetation	-	-	0.44
Exotic Vegetation	-	-	0.56
Total			**1.60**

1- Area to be cleared based on ground-truthed vegetation mapping within the proposal area.

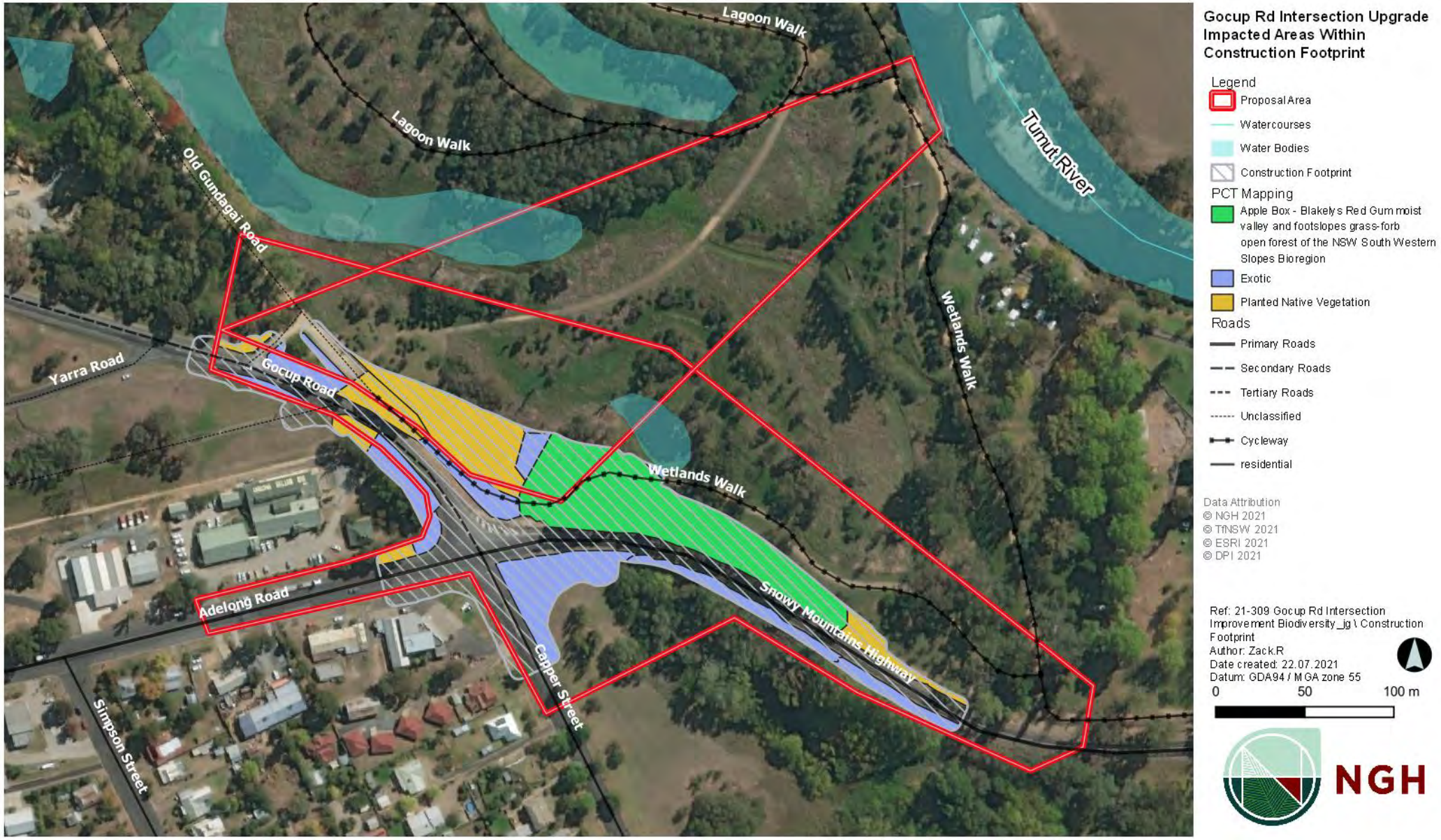

Figure 5-1 Impacted areas within construction footprint

5.1.2 Removal of threatened fauna habitat

The Proposal has the potential to impact threatened fauna habitat including planted vegetation and aquatic habitat. The small amount of planted woodland vegetation to be removed by the proposed works would not isolate or fragment habitat within the proposal area or place any threatened species at risk of extinction. The habitat is of low value due to the existing disturbed environment of the Highway. Threatened fauna are likely to utilise less disturbed habitats away from the direct impacts of the highway traffic.

Table 5-2: Impacts on threatened fauna and fauna habitat

Species	Potential occurrence (Moderate, High, Recorded)	Impacted by proposal?	Impact (ha)
Dusky Woodswallow (*Artamus cyanopterus*)	Moderate	Yes	1.04 ha
Gang-gang Cockatoo (*Callocephalon fimbriatum*)	Moderate – foraging habitat only	Yes	1.04 ha
Speckled Warbler (*Pyrrholaemus sagittatus*)	Moderate	Yes	1.04 ha
Brown Treecreeper (*Climacteris picumnus victoriae*)	Moderate	Yes	1.04 ha
Varied Sittella (*Daphoenositta chrysoptera*)	Moderate	Yes	1.04 ha
Turquoise Parrot (*Neophema pulchella*)	Moderate	Yes	1.04 ha
Scarlet Robin (*Petroica boodang*)	Moderate	Yes	1.04 ha
Diamond Firetail (*Stagonopleura guttata*)	Moderate	Yes	1.04 ha

5.1.3 Removal of threatened flora

No threatened flora were recorded during the surveys or are considered to occur in the proposal area. Therefore, it is unlikely threatened flora would be removed by the proposal.

5.1.4 Aquatic impacts

The Tumut River and Tumut Wetlands are mapped as Key Fish Habitat and are located within and adjacent to the proposal area. However, the project should have minimal impact on any aquatic habitat as it is limited to the road side away from the mapped waterbodies.

5.1.5 Injury and mortality

Injury and mortality of fauna could occur during construction activities and during operation of any new or redeveloped road proposals. If available, road kill data could be used to identify species at risk. Specific impacts to be addressed include:

- During construction when vegetation and habitat are being cleared.
- Machinery and plant.
- Construction and operational traffic.
- Presence of new watering or feed sources or other artificial habitat adjacent to road.

5.2 Indirect/operational impacts

5.2.1 Wildlife connectivity and habitat fragmentation

The Proposal has the potential to impact wildlife connectivity and increase habitat fragmentation.

Up 1.04 ha of native vegetation within the proposal area may incur impacts by the proposed works. These reductions would occur predominately along the edges of planted woodland patches and through disturbed planted vegetation. The Proposal would not further increase any fragmentation of woodland habitat. Existing woodland connectivity within the proposal area would not be removed or reduced.

The existing extent of Snowy Mountain Highway is a barrier to wildlife movements. The Proposal would include widening to the Snowy Mountain Highway. The works, therefore, have the potential to increase the barrier effect of the Snowy Mountain Highway to wildlife movements.

5.2.2 Edge effects on adjacent native vegetation and habitat

Native vegetation removal is proposed for the works. Therefore, the Proposal has the potential to increase edge effects. Clearing of native vegetation would be kept to the minimum requirement for the works to minimise this impact. Native vegetation in the proposal area is already very linear, highly disturbed and receives edge effects from the Highway.

5.2.3 Invasion and spread of weeds

The proposal has the potential to spread weeds during vegetation removal and through the movement of vehicles and machinery into or out of the proposal area. Weeds are easily transported as seeds and propagules on machinery brought to the proposal area. Equally, they can be carried away to other areas from the site or spread within it. If weeds are not controlled prior to work commencing, then there is the potential for spread throughout the site during and following construction.

Rehabilitation of disturbed areas and ongoing weed management after the completion of construction activities would limit the establishment and spread of weed species during operation.

Five priority weeds were recorded in the proposal area including;

- Large-leaved Privet (**Ligustrum lucidum*)
- Small-leaf Privet (**Ligustrum sinense*)
- Blackberry (**Rubus fruticosus* sp. Aggregate)
- Olive (**Olea europaea*)
- Bridal Creeper (**Asparagus asparagoides*)

These priority weeds all have a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Safeguards have been recommended to prevent the invasion and further spread of weeds on site.

5.2.4 Invasion and spread of pests

Disturbance to vegetation and soil and disturbance to native fauna may attract pest species including the European Rabbit and Red Fox to the proposal area. The Proposal has the potential to increase the following KTPs:

- Competition and grazing by feral European Rabbit (*Oryctolagus cuniculus*).
- Predation by European Red Fox (*Vulpes vulpes*).

The proposal area is predominately disturbed and modified. The proposed works are not expected to increase the invasion or spread of pest species.

5.2.5 Invasion and spread of pathogens and disease

The Proposal has the potential to increase the following KTPs:

- Infection of native plants by *Phytophthora cinnamomic.*
- Infection of frogs by amphibian chytrid causing the disease chytridiomycosis.

Safeguards would be implemented to mitigate the invasion and spread of *Phytophthora cinnamomic.*

Amphibians occur within the proposal area. *Chytridiomycosis* has been detected within the Snow Valleys LGA. Therefore, safeguards would be implemented by the proponent to ensure the spread of this disease is not increased by the proposed works, However risks of introducing the disease is low.

5.2.6 Changes to hydrology

The culvert that runs under the Snow Mountain Highway from the south-east and into the Tumut Wetlands will be moved and extended as the batter of the road will increase and size and extended further into the Tumut Wetlands. The new culvert will still provide the run off from the south-east and it will drain into the existing dam so there should be minimal impact on the habitat present. There is potential for increased sedimentation to drain into the wetlands as runoff during the proposed works. Mitigation measures such as sediment traps should be put in place to reduce these impacts.

5.2.7 Noise, light and vibration

Temporary disturbance to wildlife from noise emissions and light spill during construction and night works are likely to be localised to within 50-100 m of the proposal area and are not likely to have a significant long-term impact on wildlife that may occur within the proposal area or surrounding environment.

Noise, light and vibration may disturb any microbats that may be roosting in the bark and hollows of trees within the proposal area. These species are tolerant to these types of anthropogenic disturbance as they commonly roost in culverts and trees beside busy roadways. However, during construction, enough disturbance may be present such that it serves as a deterrent to the species returning to roost. Given any group of individuals present may have a range of roosting locations across its local range, and roosting habitat

(including HBTs) is prevalent in the surrounding landscape, the species is unlikely to be significantly impacted.

5.2.8 Groundwater dependent ecosystems

No aquatic or terrestrial GDE's are mapped within the proposal area.

The proposed works are not expected to alter any GDEs within or adjacent to the proposal area. No further assessment is required.

5.3 Cumulative impacts

The cumulative impact assessment has considered the town of Tumut. Given the nature of the proposal being a State road upgrade, with impacts mostly limited to the operational road corridor, an assessment of cumulative impacts with local, Council development applications has been summarised in Table 5-3. Council development applications typically include small scale residential development, which is unlikely to result in material cumulative impacts with the proposal. A review of projects listed on the NSW Planning Portal Major Projects Register (DPIE, 2021) was conducted on 20 July 2021 which identified one Major Project in Tumut of interest: Tumut Paper Mill Expansion.

The Tumut Paper Mill Expansion project is for state significant development of wood, paper and pulp manufacturing and whilst its determination date was 01 May 2007, it has undergone additional modifications as recently as 21st August 2020. The most recent modification is seeking an exemption to operational noise limits where written agreements have been entered into between the applicant and relevant landholders off Snowy Mountains Highway. This project is unlikely to produce cumulative biodiversity impacts.

The proposal is the second construction works in recent years at the intersection of Snowy Mountains Highway and Gocup road. The original works included the installation of a designated right hand turn bay into Capper street and the installation of island on Gocup road to prevent uncontrolled slip lane movements on Snowy Highway. The previous works also included the installation of vehicle activated signs to advised motorists of approaching intersection and to advise road to "Slow Down".

A small extent of planted native vegetation and habitat is proposed to be removed, however, there is an abundance of quality habitat both adjacent to the proposal area and on a large local context. There are no known threatened species populations present in the proposal area. Water quality is not expected to be impacted by the proposed works.

Due to this the proposal is considered to contribute little to ecological impacts in the local and regional context.

Table 5-3: Proposed Projects in the Tumut Shire

Project	Biodiversity value impacted	Construction impacts	Operational impacts
The upgrade to the Gocup Rd, Snowy Mountain Highway Intersection is proposed in the area. This will increase the road width and include the construction of a new roundabout.	• PCT 283 and • Planted native vegetation • Threatened fauna species	• 1.04 ha of native vegetation and habitat to be cleared • Light, noise and vibration pollution	Roundabout to be placed at Gocup Rd and Snowy Mountain Highway intersection to reduced accidents.
Fitzrov Park Amenities: Design and build new toilets in Fitzroy Park consisting of one disabled access toilet and 3 unisex toilets.	No additional impacts to biodiversity expected from this project	Draft designs currently being developed and is unlikely to overlap with the proposal.	No additional impacts to proposal operation expected from this project.
Pioneer Park Upgrades: Upgrade Pioneer Park with new nature-based play spaces, additional green infrastructure, construction of new amenities building, improved pathways with solar lighting, picnic areas and seating.	No additional impacts to biodiversity expected from this project	Draft masterplan and concept plan costings in development and is unlikely to overlap with the proposal.	No additional impacts to proposal operation expected from this project.
Tumut Aerodrome Upgrade St 1: Stage 1 of the project upgrade includes a sealed taxiway and apron to service the NSW Rural Fire Service facility, drainage improvement works, and renewal of animal-proof fencing.	No additional impacts to biodiversity expected from this project	Earthworks for taxiway and drainage works in progress. Construction vehicles fr	No additional impacts to proposal operation expected from this project.

Project	Biodiversity value impacted	Construction impacts	Operational impacts
Tumut Aerodrome Upgrade St 2: Stage 2 of the project will deliver significant upgrades to the non-commercial Tumut Aerodrome. Upgrades to drainage, fencing, runway, lighting and control systems, and the installation of precision path indicators will help facilitate fire-fighting capabilities and permit air-ambulance access to the regional centre, improving the liveability and resilience of this region.	No additional impacts to biodiversity expected from this project	Master Planning underway. Timing is unlikely to overlap with the proposal.	No additional impacts to proposal operation expected from this project.
Emergency Evacuation and Multipurpose Centre: The Project will provide an Indoor Sports Stadium which has sufficient capacity to double as an Evacuation Centre in times of emergency such as the recent bushfires.	No additional impacts to biodiversity values expected from this project	Council will consult further with potential users of the facility as the concept designs are developed and refined and is unlikely to overlap with the proposal.	No additional impacts to proposal operation expected from this project.
Tumut Pool Upgrade St 2: Tumut Pool Stage 2 will improve swimming facilities for babies and young children. The project will see replacement of the toddler and baby pools with a splash play area and learn-to-swim pool as well as separate pool filtration and chlorination systems.	No additional impacts to biodiversity values expected from this project	As per the funding deed the project is to be delivered by 30 June 2023 and so won't overlap with the proposal.	No additional impacts to proposal operation expected from this project.

5.4 Assessments of significance

Assessments of Significance were undertaken for all threatened species and ecological communities recorded or considered to have a moderate to highly likelihood of occurring within the proposal area. Results are summarised in Table 5-4. Full reports are included in Annexure D. Assessments have been grouped where species share a similar life history and habitat requirement such as woodland birds. No significant impact was considered to occur on any threatened entity.

Part 5 of the EP&A Act in accordance with the Strategic Assessment process. However, significance assessments are still required to be completed.

Table 5-4: Example table that summarises the findings of significance assessments.

BC Act significance assessments						
Threatened species, or communities	Significance assessment question[1]					Likely significant impact?
	a	b	c	d	e	
White B–x - Yellow B–x - Blakely's Red Gum Grassy Woodland (Box-gum Woodland)	X	N	N	N	Y	No
Dusky Woodswallow *Artamus cyanopterus cyanopterus*	N	X	N	N	N	No
Gang-gang Cockatoo – *Callocephalon fimbriatum*	N	X	N	N	N	No
Speckled Warbler – *Chthonicola sagittate*	N	X	N	N	N	No
Brown Treecreeper – *Climacterus picumnus victoriae*	N	X	N	N	N	No
Varied Sittella – *Daphoenositta chrusoptera*	N	X	N	N	N	No
Turquoise Parrot – *Neophema pulchella*	N	X	N	N	N	No
Scarlet Robin – *Petroica boodang*	N	X	N	N	N	No
Diamond Firetail – *Stictonetta naevosa*	N	X	N	N	N	No

6. Mitigation

Mitigation measures recommended for the proposal are detailed in Table 6-1

Table 6-1: Mitigation measures

Impact	Mitigation measures	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated
Removal of native vegetation	Native vegetation removal will be minimised through detailed design.	Detailed design	Effective	Removal of 1.04 ha of planted native vegetation
	Pre-clearing surveys will be undertaken in accordance with *Guide 1: Pre-clearing process* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Prior to construction	Effective	
	Vegetation removal will be undertaken in accordance with *Guide 4: Clearing of vegetation and removal of bushrock* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	During construction	Effective	
	Native vegetation will be re-established in accordance with *Guide 3: Re-establishment of native vegetation* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Post construction	Effective	
	The unexpected species find procedure is to be followed under *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011) if threatened ecological communities, not assessed in the biodiversity assessment, are identified in the proposal site.	During construction	Proven	
Removal of threatened species habitat and habitat features	Habitat removal will be minimised through detailed design.	Detailed design	Effective	Removal of 1.04 ha of native vegetation
	Habitat removal will be undertaken in accordance with *Guide 4: Clearing of vegetation and removal of bushrock* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	During construction	Effective	
	Habitat will be replaced or re-instated in accordance with *Guide 5: Re-use of woody debris and bushrock* and *Guide 8: Nest boxes* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	During construction	Proven	

Impact	Mitigation measures	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated
	The unexpected species find procedure is to be followed under *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011) if threatened fauna, not assessed in the biodiversity assessment, are identified in the proposal site.	During construction	Proven	
Removal of threatened plants	Pre-clearing surveys will be undertaken in accordance with *Guide 1: Pre-clearing process* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	During construction	Proven	Uncertain, threatened flora species may exist within the proposal area that are not detected which could be impacted.
	The unexpected species find procedure is to be followed under *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011) if threatened flora species, not assessed in the biodiversity assessment, are identified in the proposal site.	During construction	Proven	
Aquatic impacts	Aquatic habitat will be protected in accordance with *Guide 10: Aquatic habitats and riparian zones* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011) and Section 3.3.2 *Standard precautions and mitigation measures* of the *Policy and guidelines for fish habitat conservation and management Update 2013* (DPI (Fisheries NSW) 2013).	During construction	Effective	Potential for sediment to drain into the wetlands during construction
Groundwater dependent ecosystems	Interruptions to water flows associated with groundwater dependent ecosystems will be minimised through detailed design.	Detailed design	Effective	None
Changes to hydrology	Changes to existing surface water flows will be minimised through detailed design.	Detailed design	Effective	None
Fragmentation of identified habitat corridors	Connectivity measures will be implemented in accordance with the *Wildlife Connectivity Guidelines for Road Projects* (RTA 2011).	Detailed design, during construction and post construction	Effective	None

Impact	Mitigation measures	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated
	Any connectivity measures implemented will be installed under the supervision of an experienced ecologist.	During construction	Effective	
Edge effects on adjacent native vegetation and habitat	Exclusion zones will be set up at the limit of clearing in accordance with *Guide 2: Exclusion zones* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	During construction	Effective	Minimal
Injury and mortality of fauna	Fauna will be managed in accordance with *Guide 9: Fauna handling* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	During construction	Effective	Minimal
Invasion and spread of weeds	Weed species will be managed in accordance with *Guide 6: Weed management* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	During construction	Effective	Minimal
Invasion and spread of pests	Pest species will be managed within the proposal site.	During construction	Effective	None
Invasion and spread of pathogens and disease	Pathogens will be managed in accordance with *Guide 2: Exclusion zones* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	During construction	Effective	None
Noise, light and vibration	Shading and artificial light impacts will be minimised through detailed design.	Detailed design	Effective	Minimal

7. Offset strategy

7.1 Quantification of impacts

Transport for NSW (TfNSW) will provide biodiversity offsets or where offsets are not reasonable or feasible, supplementary measures for impacts that exceed the following thresholds shown in Table 7-1.

Table 7-1 Quantification of impacts for offsetting requirements

Description of activity or impact	Consider offsets or supplementary measures	Proposal Impact	Offset required
Activities in accordance with Roads and Maritime Services Environmental Assessment procedure: Routine and Minor Works (RTA 2011)	No	n/a	n/a
Works on cleared land, plantation, exotic vegetation where there are no threatened species or habitat present	No	0.56 ha impact on exotic vegetation.	No
Works involving clearing of vegetation planted as part of a road corridor landscaping program (this includes where threatened species or species comprising listed ecological communities have been used for landscaping purposes)	No	0.6 ha of Box-Gum Woodland impacted with a VIS score of 33.9. This vegetation has been planted along side Snowy Mountain Highway.	No
Works involving clearing of national or NSW listed critically endangered ecological communities (CEEC)	Where there is any clearing of an CEEC in moderate to good condition	0.6 ha of Box-Gum Woodland impacted with a VIS score of 33.9 however this vegetation has been planted around 30 years ago during previous upgrades of the Snowy Mountains Highway.	No
Works involving clearing of nationally listed threatened ecological community (TEC) or nationally listed threatened species habitat	Where clearing greater than 1 ha of a TEC or habitat in moderate to good condition	Clearing of less than 1ha (0.6 ha) TEC. No impacts to nationally listed threatened species habitat	No

Description of activity or impact	Consider offsets or supplementary measures	Proposal Impact	Offset required
Works involving clearing of NSW endangered or vulnerable ecological community	Where clearing greater than 5 ha or where ecological community is subject to an SIS	No Clearing greater than 5ha.	No
Works involving clearing of NSW listed threatened species habitat where the species is a species credit species as defined in the OEH Threatened Species Profile Database (TSPD)	Where clearing greater than 1 ha or where the species is subject of an SIS	No clearing of greater than 1 ha on a species credit species	No
Works involving clearing of NSW threatened species habitat and the species is an ecosystem credit species as defined in OEH's Threatened Species Profile database (TSPD)	Where clearing greater than 5 ha or where the species is subject of an SIS	Eight ecosystems species with potential habitat but clearing would not exceed 5ha.	No
Type 1 or Type 2 key fish habitat (as defined by NSW Fisheries)	Where there is any net loss of habitat	No impacts to Key Fish Habitats	No

It is unlikely there will be any residual impact on biodiversity that would trigger the requirement for offsets.

8. Conclusion

The field surveys undertaken found a range of biodiversity values within the proposal including:

- 0.8 ha of PCT 283 – *Apple Box – Blakelys Red Gum moist valley and foot slopes grass-forb open forest of the NSW South Western Slopes Bioregion* forming past of the NSW Critically Endangered White- Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box-gum Woodland).
- 1.3 ha of PCT 79 – R*iver Red Gum shrub/grass riparian tall woodland or open forest wetland mainly in the upper slopes of the subregion of the NSW South Western Slopes Bioregion and Western South Eastern Highlands Bioregion.*
- 2.3 ha of planted native vegetation not comprising a PCT
- Potential habitat for eight threatened woodland bird species considered to have a moderate or higher likelihood of occurring within the proposal area.

The proposal would result in the following residual impacts to NSW listed biodiversity values:

- Clearing of up to 0.60 ha of PCT 283 *Apple Box – Blakelys Red Gum moist valley and foot slopes grass-forb open forest of the NSW South Western Slopes Bioregion* forming past of the Critically Endangered White- Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland
- Clearing of up to 0.44 ha of planted native vegetation
- Loss of 1.04 ha threatened woodland bird habitat however these losses are unlikely to be significant.

No impacts are considered to occur to and federally listed threatened species or communities.

Appropriate significant impact assessments were undertaken for NSW threatened species and ecological communities either recorded or considered as having a moderate or higher likelihood of occurring. These assessments concluded that the proposal is unlikely to have a significant impact on any NSW or nationally listed entity. Therefore, the EPBC Act Strategic Assessment is not triggered for the proposal, nor is TfNSW required to prepare an SIS.

The mitigation measures recommended are commonplace on TfNSW projects and are proven effective. With the effective implementation of safeguards and mitigation measures identified in the BA, risk of impacts to biodiversity can be minimised to satisfactory levels.

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Annexure A

Background Searches

Annexure B

Species recorded

Recorded flora

Family	Scientific Name	Common name	Exotic Species	Status		Cover in each plot*			Incidental observation
				BC Act	EPBC Act	1 PCT Planted	2 PCT 283	3 Exotic	
Trees									
Malvaceae	*Brachychiton populneus*	Kurrajong							X
Casuarinaceae	*Casuarina spp* (Planted).	Sheoak							X
Myrtaceae	*Eucalyptus spp.* (Planted)					5			
Myrtaceae	*Eucalyptus bicostata*	Eurabbie					.01		
Myrtaceae	*Eucalyptus blakelyi* (Planted)	Blak'ly's Red Gum					10		
Myrtaceae	*Eucalyptus bridgesiana* (Planted)	Apple Box					5		
Myrtaceae	*Eucalyptus camaldulensis*	River Red Gum							X
Myrtaceae	*Eucalyptus polyanthemos* (Planted)	Red Box							X
Myrtaceae	*Eucalyptus melliodora* (Planted)	Yellow Box				.05	15	.01	

Family	Scientific Name	Common name	Exotic Species	Status		Cover in each plot*			Incidental observation
				BC Act	EPBC Act	1 PCT Planted	2 PCT 283	3 Exotic	
Myrtaceae	*Eucalyptus sideroxylon* (Planted)	Mugga Ironbark							X
Proteaceae	*Grevillea robusta* (Planted)	Silky Oak	*				0.5		
Pinaceae	*Pinus spp.*		*						X
Salicaceae	*Populus alba*	White Poplar	*						X
Fagaceae	*Quercus robur*	English Oak	*						X
Ulmaceae	*Ulmus parvifolia*	Chinese Elm	*						X
Shrubs									
Fabaceae (Mimosoideae)	*Acacia cultriformis* (Planted)	Cut-leaf Wattle							X
Fabaceae (Mimosoideae)	*Acacia dealbata* (Planted)	Silver Wattle							X
Fabaceae (Mimosoideae)	*Acacia floribunda* (Planted)	White Sally							X
Fabaceae (Mimosoideae)	*Acacia implexa* (Planted)	Hickory Wattle							X
Fabaceae (Mimosoideae)	*Acacia linearifolia* (Planted)	Narrow-leaved Wattle							X

Family	Scientific Name	Common name	Exotic Species	Status		Cover in each plot*			Incidental observation
				BC Act	EPBC Act	1 PCT Planted	2 PCT 283	3 Exotic	
Fabaceae (Mimosoideae)	*Acacia melanoxylon* (Planted)	Blackwood							X
Fabaceae (Mimosoideae)	*Acacia rubida* (Planted)	Red-stemmed Wattle				0.1			
Fabaceae (Mimosoideae)	*Acacia suaveolens* (Planted)	Sweet Wattle							X
Proteaceae	*Banksia ericifolia* (Planted)	Heath-leaved Banksia							X
Myrtaceae	*Callistemon spp* (Planted).					1			
Myrtaceae	*Callistemon citrinus* (Planted)	Crimson Bottlebrush				1			
Myrtaceae	*Leptospermum sp* (Planted).	Teatree							X
Oleaceae	*Ligustrum lucidum*	Large-leaved Privet	*						X
Oleaceae	*Ligustrum sinense*	Small-leaf Privet	*						
Myrtaceae	*Melaleuca linariifolia* (Planted)	Paperbark							X
Myrtaceae	*Melaleuca styphelioides* (Planted)	Prickly-leaved Tea Tree							X
Rosaceae	*Rubus fruticosus sp. agg.*	Blackberry complex	*						X

Family	Scientific Name	Common name	Exotic Species	Status		Cover in each plot*			Incidental observation
				BC Act	EPBC Act	1 PCT Planted	2 PCT 283	3 Exotic	
Oleaceae	*Olea europaea*	Common Olive	*				0.1		
Forbs									
Asteraceae	*Arctotheca calendula*	Capeweed	*			0.5			
Asparagaceae	*Asparagus asparagoides*	Bridal Creeper	*						X
Cyperaceae	*Carex spp.*								X
Asteraceae	*Cirsium vulgare*	Spear Thistle	*				1	0.1	
Asteraceae	*Conyza spp.*	A Fleabane	*						X
Papaveraceae	*Fumaria sp.*	Fumitory	*						
Rubiaceae	*Galium aparine*	Velcro Weed	*				30	0.5	
Geraniaceae	*Geranium solanderi*	Native Geranium					0.2		
Asteraceae	*Hypochaeris radicata*	Catsear	*			0.1			
Asteraceae	*Lactuca serriola*	Prickly Lettuce	*						X
Malvaceae	*Malva parviflora*	Small-flowered Mallow	*			0.5			
Fabaceae (Faboideae)	*Medicago spp.*	A Medic	*			0.5		3	
Malvaceae	*Modiola caroliniana*	Red-flowered Mallow	*			0.5			

Family	Scientific Name	Common name	Exotic Species	Status		Cover in each plot*			Incidental observation
				BC Act	EPBC Act	1 PCT Planted	2 PCT 283	3 Exotic	
Oxalidaceae	*Oxalis perennans*					0.1			
Iridaceae	*Romulea rosea var. australis*	Onion Grass	*					0.5	
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	*			0.1	0.5		
Asteraceae	*Taraxacum officinale*	Dandelion	*						X
Fabaceae (Faboideae)	*Trifolium subterraneum*	Subterranean Clover	*			2			
Fabaceae (Faboideae)	*Vicia sative*	Common Vetch	*						X
Grasses									
Poaceae	*Bromus catharticus*	Praire Grass	*				40	5	
Poaceae	*Bromus spp.*	A Brome	*			3			
Poaceae	*Cynodon dactylon*	Couch							X
Poaceae	*Ehrharta erecta*	Panic Veldtgrass	*						X
Poaceae	*Eleusine tristachya*	Goose Grass	*					5	
Poaceae	*Lolium spp.*	A Ryegrass	*			30			
Poaceae	*Paspalum dilatatum*	Paspalum	*			0.5			
Poaceae	*Pennisetum clandestinum*	Kikuyu Grass	*			60			

Family	Scientific Name	Common name	Exotic Species	Status		Cover in each plot*			Incidental observation
				BC Act	EPBC Act	1 PCT Planted	2 PCT 283	3 Exotic	
Poaceae	*Phalaris aquatica*	Phalarais	*				10	85	
Poaceae	*Rytidosperma spp.*								X
Poaceae	*Vulpia spp.*	'at's-tail Fescue	*			0.5			
Poaceae	*Sorghum sp.*	Sorghum	*				1	0.2	

Note: *Cover should be determined in accordance with the BAM.

Recorded fauna

Taxa/Fauna group	Scientific Name	Common name	Status	
			BC Act	EPBC Act
Bird	*Egretta novaehollandiae*	White-faced Heron		
Bird	*Anas superciliosa*	Pacific Black Duck		
Bird	*Dacelo novaeguineae*	Laughing Kookaburra		
Bird	*Malurus cyaneus*	Superb Fairy-wren		
Bird	*Neochmia temporalis*	Reb-browed Finch		

Taxa/Fauna group	Scientific Name	Common name	Status	
			BC Act	EPBC Act
Bird	*Cacatua galerita*	Sulpher-crested Cockatoo		
Bird	*Cracticus tibicen*	Australian Magpie		
Bird	*Platycercus elegans*	Crimson Rosella		
Bird	*Eolophus roseicapillus*	Galah		
Bird	*Srtepera graculina*	Pied Currawong		
Frog	*Litoria verreauxii*	Whistling Tree Frog		
Frog	*Crinia signifera*	Clicking Froglet		
Frog	*Crinia parinsignifera*	Beeping Froglet		

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Annexure C

Likelihood of occurrence criteria

Likelihood	Criteria
Recorded	The species was observed in the proposal area during the current survey
High	It is highly likely that a species inhabits the proposal area and is dependent on identified suitable habitat (ie. for breeding or important life cycle periods such as winter flowering resources), has been recorded recently in the locality (10km) and is known or likely to maintain resident populations in the proposal area. Also includes species known or likely to visit the proposal area during regular seasonal movements or migration.
Moderate	Potential habitat is present in the proposal area. Species unlikely to maintain sedentary populations, however may seasonally use resources within the proposal area opportunistically or during migration. The species is unlikely to be dependent (ie. for breeding or important life cycle periods such as winter flowering resources) on habitat within the proposal area, or habitat is in a modified or degraded state. Includes cryptic flowering flora species that were not seasonally targeted by surveys and that have not been recorded.
Low	It is unlikely that the species inhabits the proposal area and has not been recorded recently in the locality (10km). It may be an occasional visitor, but habitat similar to the proposal area is widely distributed in the local area, meaning that the species is not dependent (ie. for breeding or important life cycle periods such as winter flowering resources) on available habitat. Specific habitat is not present in the proposal area or the species are a non-cryptic perennial flora species that were specifically targeted by surveys and not recorded.
None	Suitable habitat is absent from the proposal area. Based on a field assessment of the habitat constraints or microhabitats on the proposal area , the habitat is identified as being substantially degraded such that the species is unlikely to utilise the proposal area (or specific vegetation zones), or an expert report that is prepared that states the species is unlikely to be present on the proposal area or specific vegetation zones.

Habitat assessment table

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Trees					
Black Gum *(Eucalyptus aggregate)*	V	V	Grows in the lowest parts of the landscape. Grows on alluvial soils, on cold, poorly-drained flats and hollows adjacent to creeks and small rivers. Often grows with other cold-adapted eucalypts, such as Snow Gum or White Sallee (*Eucalyptus pauciflora*), Manna or Ribbon Gum (*E. viminalis*), Candlebark (*E. rubida*), Black Sallee (*E. stellulata*) and Swamp Gum (*E. ovata*). Black Gum usually occurs in an open woodland formation with a grassy groundlayer dominated either by River Tussock (*Poa labillardierei*) or Kangaroo Grass (*Themeda australis*), but with few shrubs.		None
Eucalyptus alligatrix subsp. alligatrix	V	V	Only known from a single location south-west of Rylstone. Grows in dry sclerophyll woodland on shallow relatively infertile soils (grey brown loam with ironstone). It may have been part of a more-extensive open woodland community prior to the commencement of clearing and grazing.		None

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Robert'on's Peppermint *(Eucalyptus robertsonii subsp. Hemisphaerica)*	V	V	Locally frequent in grassy or dry sclerophyll woodland or forest, on lighter soils and often on granite. Usually found in closed grassy woodlands in locally sheltered sites. Habitats include quartzite ridges, upper slopes and a slight rise of shallow clay over volcanics. Associated vegetation includes variously mixed woodlands of *Eucalyptus piperita, E. goniocalyx, E. dalrympleana, E. dives, E. mannifera* and *E. rossii.*		None
Capertee Stringybark *(Eucalyptus cannonii)*	V		Produces white flowers from January to April. The seed is spread by wind, generally in close proximity (within 30 m) to the parent plant; no dormancy mechanism. Capertee Stringybark can be locally abundant. Associated eucalypt species are diverse: *Eucalyptus viminalis, Eucalyptus mannifera, Eucalyptus polyanthemos, Eucalyptus rossii, Eucalyptus blakelyi, Eucalyptus oblonga, Eucalyptus sparsifolia, Eucalyptus bridgesiana, Eucalyptus dalrympleana, Eucalyptus melliodora, Eucalyptus dives* and *Angophora floribunda*.		None
Shrubs					

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Tumut Grevillea *(Grevillea wilkinsoni)i*					None
Scant Pomaderris *(Pomaderris queenslandica)*	E		Found in moist eucalypt forest or sheltered woodlands with a shrubby understorey, and occasionally along creeks.		None
Clandulla Geebung *(Persoonia marginate)*	V	V	Grows in dry sclerophyll forest and woodland communities on sandstone. The Clandulla Geebung occurs between Kandos and Clarence in the western Blue Mountains. Recorded flowering period varies and includes December and Winter.		None
Cotoneaster Pomaderris *(Pomaderris cotoneaster)*	E	E	Cotoneaster Pomaderris has been recorded in a range of habitats in predominantly forested country. The habitats include forest with deep, friable soil, amongst rock beside a creek, on rocky forested slopes and in steep gullies between sandstone cliffs.		None

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Ausf'ld's Wattle *(Acacia ausfeldii)*	V		Associated species include *Eucalyptus albens, E. blakelyi* and *Callitris spp.,* with an understorey dominated by *Cassinia spp.* and grasses. *Acacia ausfeldii* is likely to have a dormant soil seedbank from which germination is stimulated by fire; a small number of seeds have been observed to germinate in the absence of fire.		None
Dwarf Bush-pea *(Pultenaea humilis)*	V		*Pultenaea humilis* is found in isolated remnants of native woodland and forest communities that occur in extensively cleared agricultural landscapes. Occurs on a variety of soils ranging from sandy loams to clays.	1	Low
Bossiaea fragrans	CE	CE	Occurs on spilite, rhyolite or slate and volcanic substrates and is often associated with Red Stringybark (*Eucalyptus macrorhynch–)* - Red Box (*Eucalyptus polyanthemos)* woodland +/- White Box (*Eucalyptus albens*).		None
Acacia meiantha	E	E	Habitat includes dry sclerophyll forest, montane bogs and ferns, heathlands and grassy woodlands.		None
Phantom Wattle *(Acacia phasmoides)*	V	V	Grows in shrubby woodland on sandy, granitic soil near creeks or in rocky crevices.		None

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Ke'th's Zieria *(Zieria ingramii)*	E	E	Grows in dry sclerophyll forest on light sandy soils. All known populations have been recorded in *Eucalyptus-Callitris* woodland or open forest with a shrubby to heathy understorey. Mostly from gentle slopes in red-brown and yellow-brown sandy loams, often with a rocky surface.		None
Granite Zieria *(Zieria obcordate)*	E	E	Grows in eucalypt woodland or shrubland dominated by species of Acacia on rocky hillsides. Also occurs in *Eucalyptus* and *Callitris* dominated woodland with an open, low shrub understorey, on moderately steep, mainly west to north-facing slopes in sandy loam amongst granite boulders. The altitude range of sites is 500 to 830 metres. In wild populations, plants tend to grow in crevices between granite boulders, often in lines running downslope. Associated vegetation includes *Eucalyptus blakelyi, Brachychiton populneus* and *Acacia implexa* woodland with pockets of low shrub understorey. Also in *E. goniocalyx, E. blakelyi, E. macrorhyncha, A. doratoxylon, A. vestita* and *Callitris glaucophylla* woodland with a shrubby understorey.		None

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Fairy Bells *(Homoranthus darwinioides)*	V	V	Grows in in various woodland habitats with shrubby understoreys, usually in gravely sandy soils. Landforms the species has been recorded growing on include flat sunny ridge tops with scrubby woodland, sloping ridges, gentle south-facing slopes, and a slight depression on a roadside with loamy sand. Associated species include *Callitris endlicheri*, *Eucalyptus crebra, E. fibrosa, C. trachyphloia, E. beyeri subsp. illaquens, E. dwyeri, E. rossii, Leptospermum divaricatum, Melaleu85acrocarata, Calytrix tetragona, Allocasuarina spp.* and *Micromyrtus spp.*		None
Leafless Indigo *(Indigofera efoliata)*	E	E	Recorded in *Eucalyptus crebra* and *Callitris glaucophylla dry sclerophyll forest,* and in *Eucalypt85acrocarparpa* and *Callitris glaucophylla* tall woodland.		None
Forbs					
Austral Pillwort *(Pilularia novae-hollandiae)*	E		Austral Pillwort grows in shallow swamps and waterways, often among grasses and sedges. It is most often recorded in drying mud as this is when it is most conspicuous.		None

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Small Pale Grass-lily *(Caesia parviflora var. minor)*	E		Found in damp places in open forest on sandstone.		None
Small Scurf-pea *(Cullen parvum)*	E		In known populations in Victoria and NSW, plants are found in grassland, River Red Gum (*Eucalyptus camaldulensis*) Woodland or Box-Gum Woodland, sometimes on grazed land and usually on table drains or adjacent to drainage lines or watercourses, in areas with rainfall of between 450 and 700 mm.		None
Silky Swainson-pea *(Swainsona sericea)*	V		Found in Box-Gum Woodland in the Southern Tablelands and South West Slopes. Sometimes found in association with cypress-pines Callitris spp. Habitat on plains unknown. Regenerates from seed after fire.	1	Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Euphrasia arguta	CE	CE	Plants from the Nundle area have been reported from eucalypt forest with a mixed grass and shrub understorey; here, plants were most dense in an open disturbed area and along the roadside, indicating the species had regenerated following disturbance. Euphrasia arguta has an annual habit and has been observed to die off over the winter months, with active growth and flowering occurring between January and April.		None
Yass Daisy *(Ammobium craspedioides)*	V	V	Found in moist or dry forest communities, Box-Gum Woodland and secondary grassland derived from clearing of these communities. Found in a number of TSRs, Crown reserves, cemeteries and roadside reserves within the region.	1	Low
Woolly Ragwort *(Senecio garlandii)*	V		Woolly Ragwort occurs on sheltered slopes of rocky outcrops. Flowering occurs in spring.		None

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Small Purple-pea *(Swainsona recta)*	E	E	Before European settlement the Small Purple-pea occurred in the grassy understorey of woodlands and open-forests dominated by Blakely's Red Gum *Eucalyptus blakelyi, Yellow Box E. melliodora, Candlebark Gum E. rubida* and *Long-leaf Box E. goniocalyx.* Grows in association with understorey dominants that include Kangaroo Grass *Themeda australis,* poa tussocks *Poa spp.* and spear-grasses *Austrostipa spp.*		None
Mueller's Eyebright *(Euphrasia collina subsp. Muelleri)*	E	E	Occurs in woodland with sandy soil, especially that dominated by White Cypress Pine (*Callitris glaucophylla*).		None
Pine Donkey Orchid *(Diuris tricolor)*	V		The Pine Donkey Orchid grows in sclerophyll forest among grass, often with native Cypress Pine (*Callitris spp*.). It is found in sandy soils, either on flats or small rises. Also recorded from a red earth soil in a Bimble Box community in western NSW.		None
Sand-hill Spider Orchid *(Caladenia arenaria)*	E	E	Occurs in woodland with sandy soil, especially that dominated by White Cypress Pine (*Callitris glaucophylla*).		None

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Thick Lip Spider Orchid *(Caladenia tessellate)*	E	V	Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil.		None
Tarengo Leek Orchid *(Prasophyllum petilum)*	E	E	Grows in open sites within Natural Temperate Grassland at the Boorowa and Delegate sites. Also grows in grassy woodland in association with River Tussock *Poa labillardieri*, Black Gum *Eucalypt89acrocarpata* and tea-trees *Leptospermum spp*. near Queanbeyan and within the grassy groundlayer dominated by Kanagroo Grass under Box-Gum Woodland at Ilford (and Hall, ACT).		None
Crimson Spider Orchid *(Caladenia concolor)*	E	V	Habitat is regrowth woodland on granite ridge country that has retained a high diversity of plant species, including other orchids. The dominant trees are Blakely's Red Gum (*Eucalyptus blakelyi*), Red Stringybark (*E. macrorhyncha*), Red Box (*E. polyanthemos*) and White Box (*E. albens*); the diverse understorey includes Silver Wattle (*Acacia dealbata),* Hop Bitter-pea (*Daviesia latifolia),* Common Beard-heath (*Leucopogon virgatus*), Spreading Flax-lily (*Dianella revoluta*) and Poa Tussock (*Poa sieberiana*).		None

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Rosella Spider Orchid *(Caladenia rosella)*		E	Presumed extinct in NSW. In Victoria, the species is found in woodlands and low forests of Red Box (*Eucalyptus polyanthemos*), Long-leaved Box (*E. goniocalyx*) and Red Stringybark (*E. macrorhyncha*) in well-drained, skeletal soils.		None
Graminoids					
Raleigh Sedge *(Carex raleighii)*	E		In NSW Raleigh Sedge is found only in areas above about 1000 metres on the Southern Tablelands. Grows in sphagnum bogs and high mountain wetlands, as well as damp grasslands and stream-edges of sub-alpine plains. Most populations are in Kosciuzsko National Park (eg. Charlottes Pass area, Muellers Pass, Tantangara area and the upper Tooma and Tumut valleys).		None
Creepers					
Tylophora linearis	V	E	Grows in dry scrub and open forest. Recorded from low-altitude sedimentary flats in dry woodlands of *Eucalyptus fibrosa, Eucalyptus sideroxylon, Eucalyptus albens, Callitris endlicheri, Callitris glaucophylla* and *Allocasuarina luehmannii*. Flowers in spring, with flowers recorded in November or May.		None

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Grasses					
Bluegrass *(Dichanthium setosum)*	V	V	Associated with heavy basaltic black soils and red-brown loams with clay subsoil. Often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture.		None
Floating Swamp Wallaby-grass *(Amphibromus fluitans)*	V	V	*Amphibromus fluitans* grows mostly in permanent swamps. The species needs wetlands which are at least moderately fertile and which have some bare ground, conditions which are produced by seasonally-fluctuating water levels. Habitats in south-western NSW include swamp margins in mud, dam and tank beds in hard clay and in semi-dry mud of lagoons with *Potamogeton* and *Chamaeraphis* species.		None
A spear-grass *(Austrostipa wakoolica)*	E	E	Grows on floodplains of the Murray River tributaries, in open woodland on grey, silty clay or sandy loam soils; habitats include the edges of a lignum swamp with box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat; open Cypress Pine forest on low sandy range; and a low, rocky rise.		None

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Threatened Ecological Communities					
White B–x - Yellow B–x - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	CE	CE	Characterised by the presence or prior occurrence of White Box, Yellow Box and/or Blak'ly's Red Gum and a generally grassy understorey. The trees may occur as pure stands, mixtures of the three species or in mixtures with other trees, including wattles. Shrubs are generally sparse or absent, though they may be locally common. Remnants generally occur on fertile lower parts of the landscape where soil fertility is relatively high compared to the surrounding landscape.		Recorded. An AoS has been completed for the TEC in Annexure D.
Coolac-Tumut Serpentinite Shrubby Woodland in the NSW South Western Slopes and South Eastern Highlands Bioregions	E		Serpentinite Shrubby Woodland is restricted to soils derived from serpentinite in the Tumut-Coolac-Gundagai area. The largest occurrence is on the Honeysuckle range to the east of Tumut which extends from Argalong to the Murrumbidgee River. There are other smaller areas near Coolac and Gundagai.		None

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	E		Community occurs on brown loam or clay, alluvial or colluvial soils on prior streams and abandoned channels or slight depressions on undulating plains or flats of the western slopes. Community often occurs upslope from River Red Gum communities above frequently inundated areas of the floodplain. It also occurs on colluvium soils on lower slopes and valley flats. Less than 5% of the original extent is estimated to remain. Shrubs include Wilga, De'ne's Wattle, Hop Bush, Cassia, Water Bush and Sifton Bush.		None

Natural Temperate Grasslands of the South Eastern Highlands		CE	8 distinct assosications within the community. (Sub-montane moist tussock grassland of the South Eastern Highlands bioregion) is a dense moist tussock grassland dominated by Snow Grass and/or Kangaroo grass in the upper stratum with a variety of forbs. Found in cool, moist, high-altitude sites that rim the Monaro region. (Poa labillardierei – Themeda australis – Juncus sp. wet tussock grassland of footslopes, drainage lines and flats of the South Eastern Highlands bioregion) is a tall, dense or mid-dense wet tussock grassland dominated by River Tussock usually with Kangaroo Grass, the sedge Tall Sedge and rushes in the upper stratum and a variety of grasses and forbs in the intertussock spaces. Occurs in damp flats and drainage lines. (Rytidosperma sp. – Themeda australis – Juncus sp. tussock grassland of occasionally wet sites of the South Eastern Highlands bioregion) is a dense to mid-dense, low to mid-high tussock grassland dominated by wallaby-grasses and/or Kangaroo Grass, with rushes in the upper stratum and a variety of smaller grasses, sedges and forbs. Like r2 it is also found in damp areas but has less		None

			River Tussock and a co-occurrence of other grass, rush and forb species. (Lacustrine grass-forbland of the South Eastern Highlands bioregion) is a variable lake-margin and dry lake-bed vegetation type with structure and composition varying in response to lake wetting and drying cycles, with dominant species including Blown Grass, Notched Sedge, rushes and lakebed forbs. Largely confined to the lake beds of Lake George and Lake Bathurst during long droughts (in wet years it transforms to a wetland community). (Rytidosperma sp. – Austrostipa bigeniculata – Chrysocephalum apiculatum tussock grassland of the South Eastern Highlands bioregion) is a mid-dense to dense low to tall tussock grassland dominated by various Wallaby Grasses, Red-leg Grass, Tall Speargrass and Kangaroo Grass along with a variety of forbs including Chrysocephalum apiculatum and Lomand95acrocarpata. A widespread community found in the moister lowland parts of the outer Monaro region, and also in the upper Shoalhaven River valley and areas around Canberra (ACT). (Dry tussock grassland of the Monaro in the South Eastern Highlands bioregion) is		

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
			an open to dense, mid-high to tall tussock grassland dominated by one or more of the following in the upper stratum: Snow Grass, Wallaby Grasses, Kangaroo grass, Rough Speargrass, Tall Speargrass and a variety of forbs. It occurs in cold, dry, rainshadow parts of the Monaro. (Themeda australis – Rytidosperma sp. – Poa sieberiana moist tussock grassland of the South Eastern Highlands bioregion) is an open to dense, mid-high to tall tussock grassland with the upper stratum dominated by Kangaroo Grass and with a sub-dominance of Wallaby Grasses, Snow Grass and several palatable forbs (Themeda australis – Lomandra filiformis – Aristi96acrocosa dry tussock grassland in the South Eastern Highlands bioregion) is an open to dense, mid to tall tussock grassland with the upper stratum dominated by Kangaroo grass, Purple Wiregrass, Wattle Mat-rush and Brush-tail Speargrass and a range of forbs. Its sampled range is relatively restricted and found on steep, exposed sites in the mid-Murrumbidgee catchment and in the upper Shoalhaven and Goulburn districts.		

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Alpine Sphagnum Bogs and Associated Fens			Boggy soils in hollows and drainage lines above 1500 m elevation. The bog soils are generally more acidic and have less phosphorus, nitrogen and potassium than those of the fens, although the two types of wetland are often juxtaposed.		None
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	E	E	Inland Grey Box Woodland occurs on fertile soils of the western slopes and plains of NSW. The community generally occurs where average annual rainfall is 375-800 mm and the mean maximum annual temperature is 22- 26°C. There is a correlation between the distribution of *Eucalypt97acrocarparpa* communities and soils of Tertiary and Quaternary alluvial origin, largely corresponding with the Red Brown Earths. The majority of remnant patches of Inland Grey Box Woodland survive with trees largely intact but with the shrub or ground layers degraded to varying degrees through grazing or pasture modification. Some species that are part of the community appear intolerant to heavy grazing by domestic stock and are confined to the least disturbed remnants.		None
Amphibians					

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Sloane's Froglet *(Crinia sloanei)*	V	E	This species is typically associated with periodically inundated areas in grassland, woodland and disturbed habitats.		Low
Booroolong Frog *(Litoria booroolongenis)*	E	E	Live along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses. Adults occur on or near cobble banks and other rock structures within stream margins. Shelter under rocks or amongst vegetation near the ground on the stream edge. Sometimes bask in the sun on exposed rocks near flowing water during summer.	1	Low
Southern Bell Frog *(Litoria raniformis)*	E	V	Usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. They are also found in irrigated rice crops, particularly where there is no available natural habitat. Can be found in highly disturbed are–s - road verges, table drains, road embankments, ploughed paddocks etc. Tadpoles require standing water for at least 4 months for development and metamorphosis to occur but can take up to 12 months to develop.		Low
Bats					

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Large-eared Pied Bat *(Chalinolobus dwyeri)*	V	V	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (*Petrochelidon ariel*), frequenting low to mid-elevation dry open forest and woodland close to these features. Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in sandstone caves and overhangs. They remain loyal to the same cave over many years. Found in well-timbered areas containing gullies.		Low
Little Pied Bat *(Chalinolobus picatus)*	V		Occurs in dry open forest, open woodland, mulga woodlands, chenopod shrublands, cypress pine forest and mallee and Bimbil box woodlands. Roosts in caves, rock outcrops, mine shafts, tunnels, tree hollows and buildings.		Low
Eastern False Pipistrelle *(Falsistrellus tasmaniensis)*	V		Prefers moist habitats, with trees taller than 20m. Generally, roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings.	1	Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Large Bent-winged Bat *(Miniopterus orianae oceanensis)*	V		Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Hunt in forested areas, catching moths and other flying insects above the treetops.	1	Low
Southern Myotis *(Myotis Macropus)*	V		Generally roost in groups of –0 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface.		Low
Corben's Long-eared Bat *(Nyctophilus corbeni)*	V	V	Inhabits a variety of vegetation types, including Mallee, Bulloke *Allocasuarina leuhmanni* and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark.		Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Grey-headed Flying Fox *(Pteropus poliocephalus)*	V	V	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	2	Low
Yellow-bellied Sheathtail-bat *(Saccolaimus flaviventris)*	V		Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.	1	Low
Birds					
Magpie Goose *(Anseranas semipalmata)*	V		Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges. Equally at home in aquatic or terrestrial habitats; often seen walking and grazing on land; feeds on grasses, bulbs and rhizomes.		Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Regent Honeyeater *(Anthochaera Phrygia)*	CE	CE	The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes.		Low
Australian Bustard *(Ardeotis australis)*	E		Mainly inhabits tussock and hummock grasslands, though prefers tussock grasses to hummock grasses; also occurs in low shrublands and low open grassy woodlands; occasionally seen in pastoral and cropping country, golf courses and near dams.		Low
Dusky Woodswallow *(Artamus cyanopterus cyanopterus)*	V		Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.	11	Moderate

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Australasian Bittern *(Botaurus poiciloptilus)*	E	E	Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (Typha spp.) and spike rushes (Eleocharis spp.). Hides during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails.		Low
Bush Stone-curlew *(Burhinus grallarius)*	E		Inhabits open forests and woodlands with a sparse grassy ground layer and fallen timber.		Low
Gang-gang Cockatoo *(Callocephalon fimbriatum)*	V		In spring and summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas.	13	Moderate – foraging habitat only.
Glossy Black-cockatoo *(Calyptorhynchus lathami)*	V		In the Riverina, birds are associated with hills and rocky rises supporting Drooping Sheoak, but also recorded in open woodlands dominated by Belah (Casuarina cristata).		Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Pied Honeyeater *(Certhionyx variegatus)*	V		Inhabits wattle shrub, primarily Mulga (*Acacia aneura*), mallee, spinifex and eucalypt woodlands, usually when shrubs are flowering; feeds on nectar, predominantly from various species of emu-bushes (*Eremophila spp.*); also from mistletoes and various other shrubs (e.g. *Grevillea spp.*); also eats saltbush fruit, berries, seed, flowers and insects.		Low
Speckled Warbler *(Chthonicola sagittate)*	V		The Speckled Warbler lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy.	8	Moderate

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Brown Treecreeper (Eastern subspecies) *(Climacteris picumnus victoriae)*	V		Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains.	21	Moderate
Spotted Harrier *(Circu assimilis)*	V		Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands.		Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Varied Sittella *(Daphoenositta chrysoptera)*	V		Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland.	15	Moderate
Black-necked Stork *(Ephippiorhynchus asiaticus)*	E		Floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers are the key habitat in NSW for the Black-necked Stork. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries.		Low
White-front Chat *(Epthianura albifrons)*	V		Usually found foraging on bare or grassy ground in wetland areas, singly or in pairs. They are insectivorous, feeding mainly on flies and beetles caught from or close to the ground.	2	Low
Grey Falcon *(Falco hypoleucos)*	E		Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey.		Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Black Falcon *(Falco subniger)*	V		Are widely distributed over NSW, covering hundreds of kilometres. Sometimes found in association with cypress-pines Callitris spp. Habitat on plains unknown. Regenerates from seed after fire.		Low
Purple-crowned Lorikeet *(Glossopsitta porphyrocephala)*	V		Found in open forests and woodlands, particularly where there are large flowering eucalypts. Also recorded from mallee habitats. Feed primarily on nectar and pollen of flowering Eucalypts, including planted trees in urban areas.		Low
Little Lorikeet *(Glossopsitta pusilla)*	V		Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity.	1	Low
Painted Honeyeater *(Grantiella picta)*	V	V	Inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests.		Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Brogla *(Grus rubicunda)*	V		Though Brolgas often feed in dry grassland or ploughed paddocks or even desert claypans, they are dependent on wetlands too, especially shallow swamps, where they would forage with their head entirely submerged.		Low
White-bellied Sea Eagle *(Aqulia audax)*	V		Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest).		Low
Black-breasted Buzzard *(Hamirostra melanosternon)*	V		Lives in a range of inland habitats, especially along timbered watercourses which is the preferred breeding habitat. Also hunts over grasslands and sparsely timbered woodlands. Occurs in highly disturbed areas with no or limited vegetation.		Low
Little Eagle *(Hieraaetus morphnoides)*	V		Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used.		Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Black Bittern *(Ixobrychus flavicollis)*	V		Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves.		Low
Swift Parrot *(Lathamus discolor)*	E	CE	Migrates to the Australian south-east mainland between February and October. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta,* Spotted Gum *Corymb109acrocarata*, Red Bloodwood *C. gummifera,* Forest Red Gum *E. tereticornis*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens.*		Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Malleefowl *(Leipoa ocellata)*	E	V	Predominantly inhabit mallee communities, preferring the tall, dense and floristically-rich mallee found in higher rainfall (3–0 - 450 mm mean annual rainfall) areas. Utilises mallee with a spinifex understorey, but usually at lower densities than in areas with a shrub understorey. Less frequently found in other eucalypt woodlands, such as Inland Grey Box, Ironbark or Bimble Box Woodlands with thick understorey, or in other woodlands such dominated by Mulga or native Cypress Pine species.		Low
Black-tailed Godwit *(Limosa limosa)*	V		Primarily a coastal species. Usually found in sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats.		Low
Major Mitchell's Cockatoo *(Lophochroa leadbeateri)*	V		Inhabits a wide range of treed and treeless inland habitats, always within easy reach of water. Feeds mostly on the ground, especially on the seeds of native and exotic melons and on the seeds of species of saltbush, wattles and cypress pines.		Low
Square-tailed Kite *(Lophoictinia isura)*	V		Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses.		Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Hooded Robbin (South-eastern form) *(Melanodry111acrocarpata cucullate)*	V		Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.	1	Low
Black-chinned Honeyeater (Eastern subspecies) *(Melithreptus gularis gularis)*	V		*Eucalyptus sideroxylon*), White Box (*E. albens*), Inland Grey Box (*111acrocarparpa*), Yellow Box (*E. melliodora*), Blak'ly's Red Gum (*E. blakelyi*) and Forest Red Gum (*E. tereticornis*).	2	Low
Turquoise Parrot *(Neophema pulchella)*	V		Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland.	6	Moderate
Barking Owl *(Ninox connivens)*	V		Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey found on these fertile riparian soils.	1	Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Powerful Owl *(Ninox strenua)*	V		The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats.		Low
Blue-billed Duck *(Oxyura australis)*	V		The Blue-billed Duck prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. The species is completely aquatic, swimming low in the water along the edge of dense cover. It would fly if disturbed, but prefers to dive if approached.		Low
Gilbert's Whistler *(Pachycephala inornate)*	V		The Gilbert's Whistler occurs in a range of habitats within NSW, though the shared feature appears to be a dense shrub layer. It is widely recorded in mallee shrublands, but also occurs in box-ironbark woodlands, Cypress Pine and Belah woodlands and River Red Gum forests, though at this stage it is only known to use this habitat along the Murray, Edwards and Wakool Rivers.		Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Eastern Osprey *(Pandion cristatus)*	V		Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water.		Low
Scarlet Robin *(Petroica boodang)*	V		The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps.	18	Moderate
Flame Robin *(Petroica phoenicea)*	V		Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. The ground layer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense.	2	Low
Pink Robin *(Petroica rodinogaster)*	V		Inhabits rainforest and tall, open eucalypt forest, particularly in densely vegetated gullies.	1	Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Rainbow bee-eater *(Merops ornatus)*		M	The Rainbow Bee-eater is most often found in open forests, woodlands and shrublands, and cleared areas, usually near water. It will be found on farmland with remnant vegetation and in orchards and vineyards. It will use disturbed sites such as quarries, cuttings and mines to build its nesting tunnels.		Low
Superb Parrot *(Polytelis swainsonii)*	V	V	Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. In the Riverina the birds nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the South West Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box.	2	Low
Grey-crowned Babbler (Eastern subspecies) *(Pomatostomus temporalis temporalis)*	V		Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions.		Low
Australian Painted Snipe *(Rostratula australis)*	E	E	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber.		Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Diamond Firetail *(Stagonopleura guttata)*	V		Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Eucalyptus pauciflora Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland.	6	Moderate
Freckled Duck *(Stictonetta naevosa)*	V		Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds. Generally rest in dense cover during the day, usually in deep water.		Low
Masked Owl *(Tyto novaehollandiae)*	V		Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides.		Low
Migratory					

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Fork-tailed Swift *(Apus pacificus)*		M	Preferred habitat includes mountains, near water. This species breeds in the north-east and mid-east Asia and winters in Australia and southern New Guinea. It is a visitor to most parts of Western Australia, beginning to arrive in the Kimberley in late September, in the Pilbara and Eucla in November and in the south-west land division in mid-December, and leaving by late April. They never settle voluntarily on the ground and spend most of their lives in the air, living on the insects they catch in their beaks.		Low
White-throated Needletail *(Hirundapus caudacutus)*	V	V	Migratory and usually seen in eastern Australia from October to April. More common in coastal areas, less so inland. Breeds in forests in south-eastern Siberia, Mongolia, the Korean Peninsula and northern Japan between June-August.	2	Low
Yellow Wagtail *(Motacilla flava)*		M	Widespread wagtail, favouring wet meadows, marshland, grassy and muddy lakeshores.		Low
Satin Flycatcher *(Myiagra cyanoleuca)*		M	Satin Flycatchers inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests		Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Rufous fantail *(Rhipidura rufifrons)*		M	The Rufous Fantail is found in rainforest, dense wet forests, swamp woodlands and mangroves, preferring deep shade, and is often seen close to the ground. During migration, it may be found in more open habitats or urban areas.		Low
Curlew Sandpiper *(Calidris ferruginea)*	E	CE, M	It generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed.		Low
Common Sandpiper *(Actitis hypoleucos)*	E	CE, M	In Australia, the Common Sandpiper is found in coastal or inland wetlands, both saline or fresh. It is found mainly on muddy edges or rocky shores.		Low
Sharp-tailed Sandpiper *(Calidris acuminata)*		M	This species prefers non-tidal wetlands, especially freshly exposed mudflats in drying lakes and on intertidal mudflats.		Low
Pectoral Sandpiper *(Calidris melanotos)*		M	A small number of these birds are known to reach Australia and are believed to be concentrated in south-eastern Australia. This species prefers freshwater mudflats.		Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Latham's Snipe *(Gallinago hardwickii)*		M	This species usually inhabits open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies). However, they can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity.	1	Low
Eastern Curlew *(Numenius madagascariensis)*		CE, M	It generally occupies coastal lakes, inlets, bays and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats and sometimes saltmarsh of sheltered coasts.		Low
Cattle Egret *(Ardea ibis)*		M	The Cattle Egret is found in grasslands, woodlands and wetlands, and is not common in arid areas. It also uses pastures and croplands, especially where drainage is poor.		Low
Invertebrate					

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Golden Sun Moth *(Synemon plana)*	E	CE	Occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which ground layer is dominated by Wallaby grasses *Austrodanthonia spp*. Grasslands dominated by Wallaby grasses are typically low and op–n - the bare ground between the tussocks is thought to be an important microhabitat feature for the Golden Sun Moth, as it is typically these areas on which the females are observed displaying to attract males. Habitat may contain several wallaby grass species, which are typically associated with other grasses particularly spear-grasses *Austrostipa spp.* or Kangaroo Grass *Themeda australis.*	1	Low
Marsupials					
Eastern Pygmy-possum *(Cercartetus nanus)*	V		Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest.		Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Spotted-tailed Quoll *(Dasyurus maculatus)*	V	E	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Quolls use hollow-bearing trees, fallen logs, other animal burrows, small caves and rock outcrops as den sites.	1	Low
Yellow-bellied Glider *(Petaurus australis)*	V		Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south.		Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Greater Glider *(Petauroides Volans)*		V	Greater Gliders are found along the east coast of mainland Australia, from central Queensland to central Victoria. Within Victoria, Greater Gliders are distributed throughout forested parts of eastern Victoria, including inland and southern falls of the Great Dividing Range, as well as the Strzelecki and Strathbogie Ranges. In eastern Victoria, Greater Gliders are absent from high altitude alpine and sub-alpine habitats, Wilson's Promontory and cleared areas. They can be found as far west as Daylesford and the surrounding forested areas but do not occur in the Otway Ranges. Greater Gliders are forest dependent and prefer older tree age classes in moist forest types. They use hollow-bearing trees for shelter and nesting, with each family group using multiple den trees within its home range. They eat mainly young eucalypt leaves, with a preference for certain species.	5	Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Squirrel Glider *(Petaurus norfolcensis)*	V		Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey. Require abundant tree hollows for refuge and nest sites.		Low
Brush-tailed Rock-wallaby *(Petrogale penicillate)*	E	V	Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. Shelter or bask during the day in rock crevices, caves and overhangs and are most active at night when foraging.		None
Brush-tailed Phascogale *(Phascogale tapoatafa)*	V		Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabit heath, swamps, rainforest and wet sclerophyll forest.		Low
Koala *(Phascolarctos cinereums)*	V	V	Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Inactive for most of the day, feeding and moving mostly at night.		None

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Reptiles					
Pink-tailed Legless Lizard *(Aprasia parapulchella)*	V	V	Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (Themeda australis). Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks.		Low
Striped Legless Lizard *(Delma impar)*	V	V	Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. Also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland. Habitat is where grassland is dominated by perennial, tussock-forming grasses such as Kangaroo Grass *Themeda australis*, spear-grasses *Austrostipa spp*. and poa tussocks *Poa spp.,* and occasionally wallaby grasses *Austrodanthonia spp.*	2	Low
Pale-headed Snake *(Hoplocephalus bitorquatus)*	V		Found mainly in dry eucalypt forests and woodlands, cypress forest and occasionally in rainforest or moist eucalypt forest. In drier environments, it appears to favour habitats close to riparian areas.		Low

Common Name (Scientific Name)	BC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence
Rosenberg's Goanna *(Varanus rosenbergi)*	V		Found in heath, open forest and woodland. Associated with termites, the mounds of which this species nests in; termite mounds are a critical habitat component. Shelters in hollow logs, rock crevices and in burrows, which they may dig for themselves, or they may use other species' burrows, such as rabbit warrens.		Low
Fish					
Trout Cod *(Maccullochella macquariensis)*	E	E	Trout Cod habitat is not well understood, but they appear to favour deep, fast flowing waters. Cover is vital, and they are often found sheltering under snags (woody debris).		None
Murray Cod *(Maccullochella peelii)*		V	The species occurs naturally in the waterways of the Murray–Darling Basin in a wide range of warm water habitats that range from clear, rocky streams to slow flowing turbid rivers and billabongs.		None
Macquarie Perch *(Euastacus armatus)*	E	E	This species prefers cool, shaded, upland streams and rivers with deep rocky pools and substantial cover.		None

Annexure D

Assessment of Significance

Biodiversity Conservation Act 2016 Five-part Test

The Biodiversity Conservation Act 2016 (BC Act) specifies a set of five factors which must be considered by decision makers in assessing the effect of a proposed development or activity on threatened species, populations or ecological communities, or their habitats. These factors are collectively referred to as the 'five-part test' or Assessment of Significance (AoS). AoS have been undertaken for the following BC Act listed entities:

Flora

Threatened Ecological Community

- *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregion*

Fauna

Woodland Birds:

- Dusky Woodswallow (*Artamus cyanopterus*)
- Gang-gang Cockatoo (*Callocephalon fimbriatum*)
- Speckled Warbler (*Pyrrholaemus sagittatus*)
- Brown Treecreeper (*Climacteris picumnus victoriae*)
- Varied Sittella (*Daphoenositta chrysoptera*)
- Turquoise Parrot (*Neophema pulchella*)
- Scarlet Robin (*Petroica boodang*)
- Diamond Firetail (*Stagonopleura guttata*)

Threatened Ecological Community

Table 9-1 AoS for TEC

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.
NA
b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: i. Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction. ii. Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

No. The local occurrence (within 10km) of White Box – Yellow Box - Blakley's Red Gum Grassy Woodland and Derived Native Grassland in the NSW South Western Slopes is in excess of 7827 ha (State Vegetation Mapping). The removal of 0.60 ha of Box-Gum Woodland constituting 0.00008% reduction on the sides of the Snowy Mountain Highway prone to edge effects, is not considered likely to place the local occurrence at risk of extinction.
c) In relation to the habitat of a threatened species or ecological community: i. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and ii. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and iii. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.
i. The proposal would remove approximately 0.60 ha of habitat of White Box – Yellow Box - Blakley's Red Gum Grassy Woodland and Derived Native Grassland in the NSW South Western Slopes. ii. The area of habitat is unlikely to become further fragmented or isolated as a result of the proposal. The habitat to be removed is a narrow, linear strip of vegetation along the Snowy Mountain Highway. iii. The extent of White Box – Yellow Box – Blakely's Red Gum Woodland that would be removed for the proposal is not considered important to the long-term survival of the community as it is on the fringe of a large local occurrence and is prone to edge effects.
d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).
The study area does not contain a declared area of outstanding biodiversity value.
e) Whether the proposed development or activity is part of a key threatening process or is likely to increase the impact of a key threatening process.
The proposal is part of, or may contribute to, the following key threatening processes relevant to the listed TECs: • Clearing of native vegetation • Invasion of plant communities by exotic perennial grasses Clearing of native vegetation is a direct impact to White Box- Yellow Box – Blakely's Red Gum Woodland that would result from the proposal. 0.60 hectares of the local occurrence would be removed which is considered unlikely to place it at risk of extinction.

Fauna

Table 9-2 AoS for threatened fauna species

a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.**

Potential habitat for eight listed threatened woodland bird species occurs within the study area Table 5-4. These species were not detected during the site survey; however, no targeted surveys were completed.

Dusky Woodswallow inhabits dry, open eucalypt forests and woodlands with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in farmland, usually at the edges of forest or woodland.

Gang-gang Cockatoo favours vegetation with old growth elements for nesting and roosting. Birds nest in large hollows in the trunk or limbs of living or dead eucalypt trees. Hollows of sufficient size generally do not form in eucalypt trees less than 150 - 200 years old. The species feeds mainly on the fruits of eucalypts and acacias but would feed on other seeds and fruit such as Callitris, garden fruits, Hawthorn (*Crataegus monogyna*) and Callistemon as well as some insects and their larvae.

Speckled Warbler is found in a wide range of *Eucalyptus* dominated communities with a grassy understory. Large relatively undisturbed remnants are required for the species to persist in an area.

Brown Treecreepers are found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest, mainly inhabiting woodlands dominated by stringybarks or other rough-barked eucalypts with an open grassy understorey. The Brown Treecreeper is dependent on hollows for breeding and dead timber for foraging. The species feeds on insects by foraging on tree trunks, amongst leaf litter and on fallen logs.

Varied Sittella inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy. Survival and population viability are sensitive to habitat isolation, reduced patch size and habitat simplification, including reductions in tree species diversity, tree canopy cover, shrub cover, ground cover, logs, fallen branches and litter.

Turquoise Parrot lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland.

Scarlet Robin lives in dry eucalypt forests and woodlands, usually with open grassy understorey with few scattered shrubs. Found in both mature and regrowth vegetation with abundant logs and fallen timbers which are important components of its habitat. Nests usually found above 2 meters in height in the forks of trees.

Diamond Firetail is found in grassy Eucalypt woodlands but also found in open forest, mallee, Natural Temperate Grassland and in other grassland derived from other communities. Often found in riparian areas. Feeds exclusively on the ground on grass, seeds, green leaves and insects. Nests built either in shrubby understorey, or higher up, especially under hawk or raven nest. Roost in dense shrubs or smaller nests built especially for roosting.

The potential for threatened woodland bird species have been identified on the site on the basis of habitat and distribution assessment. None of the species listed were recorded within the proposal area at the time of field survey.

It is possible all forest types recorded in the study area could provide potential habitat for these species as part of a much larger home range. Generally, these species prefer large tracts of undisturbed vegetation, whereas vegetation adjacent to the existing road is largely exotic and planted vegetation at the locations for the proposed road upgrade The habitat within the impact area is likely to support lower quality foraging resources only, but no breeding habitat.

The habitat to be removed is therefore not considered to be important to any of these woodland bird species due to the presence of large tracts of good quality habitat surrounding the proposal area. Loss of

foraging habitat from the disturbance would be limited and not expected to be significant. As these species are mobile and a substantial amount of available habitat would remain within the locality, the proposal would not have an adverse effect on the life cycle of these species such that a viable local population is likely to be placed at risk of extinction.

b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

i. Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

ii. Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

N/A

c) In relation to the habitat of a threatened species or ecological community:

iv. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

v. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

vi. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.

iv. The proposal would remove approximately 1.04 ha of potential habitat. No hollow bearing trees would be removed.

v. The area of habitat is unlikely to become further fragmented or isolated as a result of the proposal. The habitat to be removed is a narrow, linear strip of vegetation along a 200 m section of the Snowy Mountain Highway.

vi. The habitat proposed to be removed is not considered integral to the long-term survival of these woodland birds. The area of habitat to be disturbed/removed is small given the local context. This habitat is not likely to be important for the long-term survival of these species as the area supports low quality foraging habitat and no breeding habitat. Adequate habitat is available elsewhere in the locality.

d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).

The study area does not contain a declared area of outstanding biodiversity value.

e) Whether the proposed development or activity is part of a key threatening process or is likely to increase the impact of a key threatening process.

The BC Act lists numerous key threatening processes (KTP's). KTP's relevant to the proposal including the following:

- Clearing of native vegetation.
- Loss of Hollow bearing trees
- Removal of dead wood and trees

Clearing of native vegetation

Clearing of native vegetation is recognised as a major factor contributing to loss of biological diversity. In the determination, the NSW Scientific Committee found that 'clearing of any area of native vegetation, including areas less than two hectares in extent, may have significant impacts on biological diversity." The proposed works would only clear 1.04 ha of native vegetation and be insignificant in the local context.

Removal of dead wood and dead trees

Dead wood and dead trees provide essential habitat for a wide variety of native animals and are important to the functioning of many ecosystems. The removal of dead wood can have a range of environmental consequences, including the loss of habitat (as they often contain hollows used for shelter by animals), disruption of ecosystem process and soil erosion. As part of the mitigation measures, it is recommended that dead wood and trees removed for the works would be placed adjacent to the development footprint. The works would be a minor contribution to this key threatening process and is not predicted to be a significant impact.

About this release

Reference number	
Title	Biodiversity Assessment Report template
Parent procedure	EIA-N06

Approval and authorisation	
Prepared by	Environment Officer Senior Environmental Specialist (Biodiversity)
Approved by	General Manager Environment

Document status	Date
2.0	June 2018

Version	Date	Revision description
1.0	04/12/15	First issue
1.1	17/10/16	Updated based on consultation outcomes and feedback
2.0	19/06/18	Amended to comply with the BC Act and BAM

Your comments and suggestions to improve this or any of the EIA guidelines may be sent to:

Senior Environmental Specialist (Biodiversity)
Customer, Engagement and Planning Division
Roads and Maritime Services
Level 3, 27 Argyle Street
Parramatta, NSW 2150
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Customer feedback
Roads and Maritime
Locked Bag 928,
North Sydney NSW 2059

January 2018
RMS XX.XXX
ISBN: XXX-X-XXXXXX-XX-X

Appendix D

Statutory consultation checklists

Infrastructure SEPP

Certain development types

Development type	Description	Yes / No	If 'yes' consult with	ISEPP clause
Car Park	Does the project include a car park intended for the use by commuters using regular bus services?	No		ISEPP cl. 95A
Bus Depots	Does the project propose a bus depot?	No		ISEPP cl. 95A
Permanent road maintenance depot and associated infrastructure	Does the project propose a permanent road maintenance depot or associated infrastructure such as garages, sheds, tool houses, storage yards, training facilities and workers' amenities?	No		ISEPP cl. 95A

Development within the Coastal Zone

Issue	Description	Yes / No / NA	If 'yes' consult with	ISEPP clause
Development with impacts on certain land within the coastal zone	Is the proposal within a coastal vulnerability area and is inconsistent with a certified coastal management program applying to that land?	No		ISEPP cl. 15A

Note: See interactive map here: ***https://www.planning.nsw.gov.au/policy-and-legislation/coastal-management***. Note the coastal vulnerability area has not yet been mapped.

Note: a certified coastal zone management plan is taken to be a certified coastal management program

Council related infrastructure or services

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
Stormwater	Are the works likely to have a *substantial* impact on the stormwater management services which are provided by council?	Yes, a consultation letter was provided on 11/08/2021.	Snowy Valleys Council	ISEPP cl.13(1)(a)
Traffic	Are the works likely to generate traffic to an extent that will *strain* the capacity of the existing road system in a local government area?	No		ISEPP cl.13(1)(b)
Sewerage system	Will the works involve connection to a council owned sewerage system? If so, will this connection have a *substantial*	No		ISEPP cl.13(1)(c)

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
	impact on the capacity of any part of the system?			
Water usage	Will the works involve connection to a council owned water supply system? If so, will this require the use of a *substantial* volume of water?	No		ISEPP cl.13(1)(d)
Temporary structures	Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a *minor* or *inconsequential* disruption to pedestrian or vehicular flow?	Yes, a consultation letter was provided on 11/08/2021.	Snowy Valleys Council	ISEPP cl.13(1)(e)
Road & footpath excavation	Will the works involve more than *minor* or *inconsequential* excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	No		ISEPP cl.13(1)(f)

Local heritage items

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
Local heritage	Is there is a local heritage item (that is not also a State heritage item) or a heritage conservation area in the study area for the works? If yes, does a heritage assessment indicate that the potential impacts to the heritage significance of the item/area are more than *minor* or *inconsequential?*	Yes, however potential impacts would not be more than minor or inconsequential. Refer to section 6.5		ISEPP cl.14

Flood liable land

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
Flood liable land	Are the works located on flood liable land? If so, will the works change flood patterns to more than a *minor* extent?	No		ISEPP cl.15
Flood liable land	Are the works located on flood liable land? (to any extent). If so, do the works comprise more than minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance	Yes, a consultation letter was provided on 11/08/2021.	State Emergency Services	ISEPP cl.15AA

Note: Flood liable land means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the manual entitled *Floodplain Development Manual: the management of flood liable* land published by the New South Wales Government.

Public authorities other than councils

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
National parks and reserves	Are the works adjacent to a national park or nature reserve, or other area reserved under the *National Parks and Wildlife Act 1974*, or on land acquired under that Act?	No	Environment, Energy and Science, DPIE	ISEPP cl.16(2)(a)
National parks and reserves	Are the works on land in Zone E1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?	No	Environment, Energy and Science, DPIE	ISEPP cl. 16(2)(b)
Aquatic reserves	Are the works adjacent to an aquatic reserve or a marine park declared under the *Marine Estate Management Act 2014*?	No	Department of Planning, Industry and Environment	ISEPP cl.16(2)(c)
Sydney Harbour foreshore	Are the works in the Sydney Harbour Foreshore Area as defined by the *Sydney Harbour Foreshore Authority Act 1998?*	No	Property NSW	ISEPP cl.16(2)(d)
Bush fire prone land	Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional centre or group home in bush fire prone land?	No	Rural Fire Service	ISEPP cl.16(2)(f)
Artificial light	Would the works increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map? (Note: the dark sky region is within 200 kilometes of the Siding Spring Observatory)	No	Director of the Siding Spring Observatory	ISEPP cl.16(2)(g)
Defence communications buffer land	Are the works on buffer land around the defence communications facility near Morundah? (Note: refer to Defence Communications Facility Buffer Map referred to in clause 5.15 of Lockhardt LEP 2012, Narrandera LEP 2013 and Urana LEP 2011.	No	Secretary of the Commonwealth Department of Defence	ISEPP cl. 16(2)(h)
Mine subsidence land	Are the works on land in a mine subsidence district within the meaning of the *Coal Mine Subsidence Compensation Act 2017*?	No	Mine Subsidence Board	ISEPP cl. 16(2)(i)

Our Ref: ID 1443
Your Ref:

20th August 2021

Mr Lewis Tinley
NGH

Via email: ainslee.r@nghconsulting.com.au

Dear Mr Tinley,

Notification under clause 15AA of the State Environmental Planning Policy (Infrastructure) 2007 in relation to the proposed 21-309 Gocup Rd Intersection Upgrade

Thank you for the notification under clause 15AA of the *State Environmental Planning Policy (Infrastructure) 2007* in relation to the proposed upgrade at 21-309 Gocup Rd Intersection.

The NSW State Emergency Service (NSW SES) has reviewed the proposed upgrade using the information provided with the proposal and the flood risk information (e.g. local flood Plan, flood studies etc.) available to the NSW SES. Based on this review the proposed works appear to have minimal risk to NSW SES response operations.

Please feel free to contact me on 0458 737 188 or via email at maria.frazer1@one.ses.nsw.gov.au should you wish to discuss any of the matters raised in this correspondence.

Yours sincerely,

Maria Frazer
Coordinator Planning
NSW State Emergency Service

STATE HEADQUARTERS
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Appendix E

Consideration of clause 228(2) factors and matters of national environmental significance and Commonwealth land

Clause 228(2) Checklist

In addition to the requirements of the *Is an EIS required?* guideline (DUAP 1995/1996) and the *Roads and Related Facilities EIS Guideline* (DUAP 1996) as detailed in the REF, the following factors, listed in clause 228(2) of the Environmental Planning and Assessment Regulation 2000, have also been considered to assess the likely impacts of the proposal on the natural and built environment.

Factor	Impact
a) Any environmental impact on a community?	
During construction, there would be short term negative impacts on the community. Potential impacts include traffic and transport, noise and vibration and changes to access for pedestrians and cyclists within the wetlands. These impacts have been addressed in Chapter 6 and would be mitigated with the implementation of safeguards as provided in section 7.2. Positive impacts would be achieved in the long term for traffic efficiency and improved road safety.	Short-term, minor negative Long-term, major, positive
b) Any transformation of a locality?	
A compound site would be established at SWT4 Tumut Transport for NSW Depot (500 metres west of the project area), and would utilise existing infrastructure, including fencing, toilets, kitchens and meeting rooms. Once operational, the proposal would not result in a transformation of the locality.	Short-term, minor negative
c) Any environmental impact on the ecosystems of the locality?	
Construction work is contained with the operating road corridor, road shoulder and Tumut wetlands which has limited ecological value. Tree removal and trimming would be required for some street trees, and up to 1.036ha of native vegetation (containing 0.596ha of PCT 283) to allow for correct line of sight or to remove foliage out of the road corridor. The clearing and trimming would be carried out in accordance with the safeguards as provided in section 7.2 of this REF to minimise impacts to the trees and the broader ecosystem value.	Long-term, moderate, negative
d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?	
Public amenity impacts would be temporary, as discussed in section 7.2. Construction would be temporary and with the implementation of safeguards, the works are not likely to reduce the environmental quality or value of the locality in the long term. One exception is the removal of up to 1.036ha of native vegetation (containing 0.596ha of PCT 283) which has been determined to be unlikely to have a significant long term impact on the value of the locality and would be carried out in accordance with the safeguards outlined in section 7.2.	Short-term, minor, negative Long-term, moderate, negative
e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?	
There would be no impacts on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations. The proposal may impact on two local heritage items which intersect the proposal area, however it is unlikely that the vegetation removal and construction works would impact on the overall landscape value of the heritage items and with the implementation of the safeguards outlined in section 7.2.	Nil Short-term, minor, negative

Factor	Impact
f) Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974)?* The small amount of planted woodland vegetation to be removed by the proposed works would not isolate or fragment habitat within the proposal area or place any threatened species at risk of extinction. Safeguards as per section 6.1.4 would minimise any potential impacts.	
g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? The proposal would result in the clearing of up to 1.036ha of native vegetation. The vegetation removal would be carried out in accordance with the safeguards as provided in section 7.2 of this REF to minimise impacts and is not expected to have a significant negative impact on habitat.	Long-term, moderate, negative
h) Any long-term effects on the environment? The proposal would improve road safety and efficiency on Main Road. The proposal would result in the clearing of up to 1.036ha of native vegetation. The vegetation removal would be carried out in accordance with the safeguards as provided in section 7.2 of this REF to minimise impacts and is not expected to have a significant negative impact in the long term.	Long-term, high, positive Long-term, moderate, negative
i) Any degradation of the quality of the environment? The proposal area is an operational road corridor and intersection with limited ecological value (including low quality planted vegetation along the Wetland perimeter). The proposal would result in the clearing of up to 1.036ha of native vegetation, however, is not anticipated to significantly degrade the quality of the environment with the implementation of the proposed mitigation measures.	Long-term, moderate, negative
j) Any risk to the safety of the environment? The proposed works (construction and operation) are unlikely to pose a risk to the safety of the environment with the implementation of the proposed mitigation measures outlined in section 7.2.	Nil
k) Any reduction in the range of beneficial uses of the environment? A temporary compound site would be established at SWT4 Tumut Transport for NSW Depot (500 metres west of the project area). The compound site occurs within an existing Transport owned lot, and would utilise existing infrastructure, including fencing, toilets, kitchens and meeting rooms. The compound is not currently available for public access and so no reductions in the beneficial uses of the environment would occur.	Nil
l) Any pollution of the environment? During construction the main sources of pollution are expected to be from plant and equipment, in particular from hydrocarbon spills, and pollution caused by sediment laden water from erosion and sedimentation. Impacts from pollution would be mitigated with the safeguards discussed in section 7.2.	Short-term, minor, negative
m) Any environmental problems associated with the disposal of waste? The proposal would involve the reuse of materials where possible, and removal and disposal of waste generated by construction works, as discussed in section 6.8. These risks would be confined to construction and would be mitigated with the safeguards discussed in section 7.2.	Short-term, minor, negative

Factor	Impact
n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? The proposal does not require resources that are in short supply.	Nil
o) Any cumulative environmental effect with other existing or likely future activities? The cumulative impacts of this proposal are discussed in section 7.2. No significant other nearby projects are known or expected to occur simultaneously.	Nil
p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? The proposal would not impact on coastal processes and coastal hazards. Projected climate change decisions have been considered in the project design.	Nil

Matters of National Environmental Significance and Commonwealth land

Under the environmental assessment provisions of the EPBC Act 1999, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered to assist in determining whether the proposal should be referred to the Australian Government Department of Agriculture, Water and the Environment.

A referral is not required for proposed actions that may affect nationally listed threatened species, endangered ecological communities and migratory species. Impacts on these matters are still assessed as part of the REF in accordance with Australian Government significant impact criteria and taking into account relevant guidelines and policies.

Factor	Impact
a) Any impact on a World Heritage property? The proposal would not impact on any World Heritage Property.	Nil
b) Any impact on a National Heritage place? The proposal would not impact on any National Heritage place.	Nil
c) Any impact on a wetland of international importance? The proposal would not impact on any wetlands of international importance	Nil
d) Any impact on a listed threatened species or communities? No EPBC threatened species are likely to occur in the proposal area.	Nil
e) Any impacts on listed migratory species? No migratory species are considered likely to occur in the proposal area.	Nil
f) Any impact on a Commonwealth marine area? The proposal would not impact on a Commonwealth marine area.	Nil
g) Does the proposal involve a nuclear action (including uranium mining)? The proposal does not involve a nuclear action.	Nil
h) Does the proposal involve a water resource in relation to coal seam gas development and large coal mining development? The proposal does not involve a water resource in relation to coal seam gas development and large coal mining development.	Nil
i) Would the proposal impact on the Great Barrier Reef Marine Park? The proposal would not impact on the Great Barrier Marine Park.	Nil
j) Additionally, any impact (direct or indirect) on the environment of Commonwealth land? The proposal would not impact on the environment of Commonwealth land.	Nil

Appendix F
Background Searches

Australian Government

Department of Agriculture, Water and the Environment

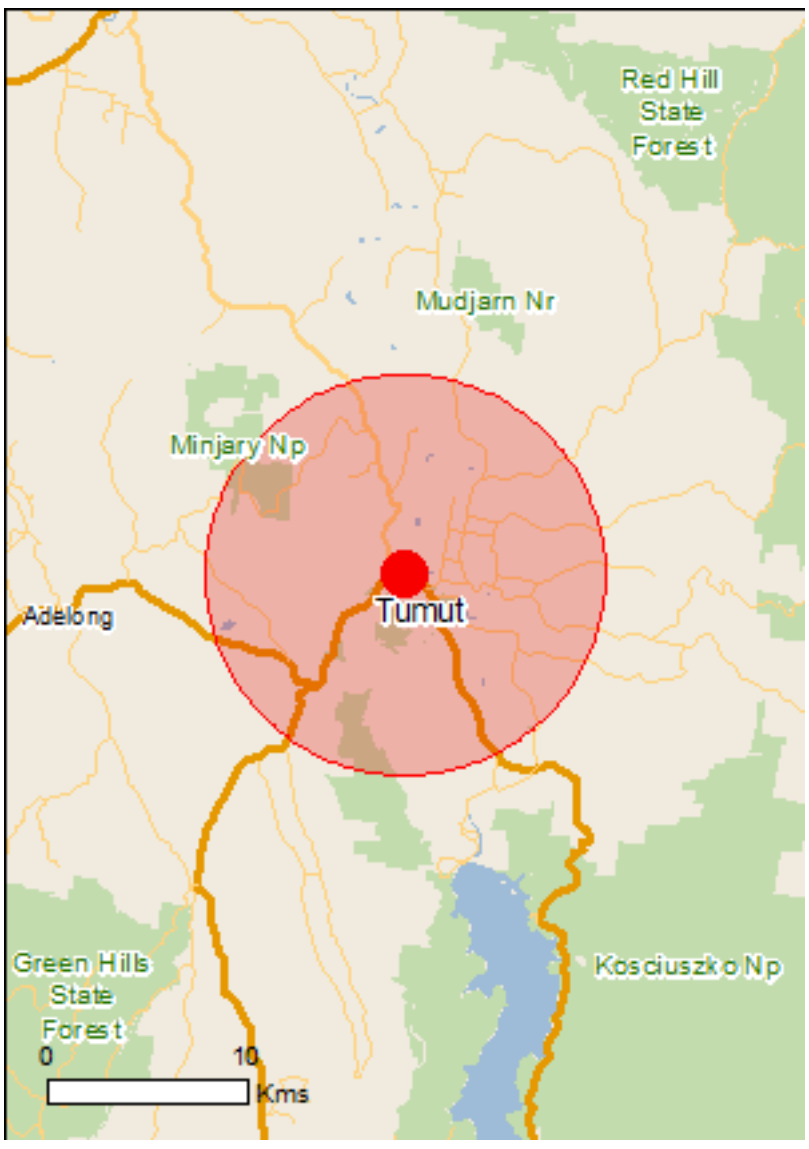
EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 27/05/21 15:55:07



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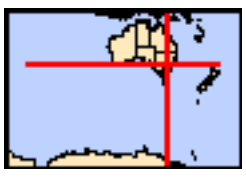
Coordinates

Buffer: 10.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	1
Wetlands of International Importance:	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	31
Listed Migratory Species:	11

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	2
Commonwealth Heritage Places:	1
Listed Marine Species:	17
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	2
Regional Forest Agreements:	1
Invasive Species:	31
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

National Heritage Properties		[Resource Information]
Name	State	Status
Historic		
Snowy Mountains Scheme	NSW	Listed place

Wetlands of International Importance (Ramsar)	[Resource Information]
Name	Proximity
Banrock station wetland complex	700 - 800km upstream
Hattah-kulkyne lakes	500 - 600km upstream
Riverland	600 - 700km upstream
The coorong, and lakes alexandrina and albert wetland	700 - 800km upstream

Listed Threatened Ecological Communities		[Resource Information]
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.		
Name	Status	Type of Presence
Alpine Sphagnum Bogs and Associated Fens	Endangered	Community may occur within area
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Anthochaera phrygia		
Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area
Botaurus poiciloptilus		
Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Falco hypoleucos		
Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta		
Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Hirundapus caudacutus		
White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor		
Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur

Name	Status	Type of Presence within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Fish		
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat may occur within area
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Frogs		
Crinia sloanei Sloane's Froglet [59151]	Endangered	Species or species habitat may occur within area
Litoria booroolongensis Booroolong Frog [1844]	Endangered	Species or species habitat likely to occur within area
Litoria raniformis Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat may occur within area
Insects		
Synemon plana Golden Sun Moth [25234]	Critically Endangered	Species or species habitat known to occur within area
Mammals		
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat known to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Plants		
Ammobium craspedioides Yass Daisy [20758]	Vulnerable	Species or species habitat likely to occur within area
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat may occur within

Name	Status	Type of Presence
		area
Caladenia arenaria		
Sand-hill Spider-orchid [9275]	Endangered	Species or species habitat may occur within area
Grevillea wilkinsonii		
Tumut Grevillea [56396]	Endangered	Species or species habitat likely to occur within area
Pomaderris cotoneaster		
Cotoneaster Pomaderris [2043]	Endangered	Species or species habitat may occur within area
Prasophyllum petilum		
Tarengo Leek Orchid [55144]	Endangered	Species or species habitat may occur within area
Swainsona recta		
Small Purple-pea, Mountain Swainson-pea, Small Purple Pea [7580]	Endangered	Species or species habitat may occur within area
Reptiles		
Aprasia parapulchella		
Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area
Delma impar		
Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat known to occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus		
White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca		
Satin Flycatcher [612]		Species or species habitat likely to occur within area
Rhipidura rufifrons		
Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within

Name	Threatened	Type of Presence
		area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land - Australian Telecommunications Commission
Commonwealth Land - Commonwealth Trading Bank of Australia

Commonwealth Heritage Places [Resource Information]

Name	State	Status
Historic		
Tumut Post Office	NSW	Listed place

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans		
Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]		Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Minjary	NSW
Wereboldera	NSW

Regional Forest Agreements	[Resource Information]

Note that all areas with completed RFAs have been included.

Name	State
Southern RFA	New South Wales

Invasive Species	[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Alauda arvensis Skylark [656]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Nassella neesiana Chilean Needle grass [67699]		Species or species habitat likely to occur within area
Nassella trichotoma Serrated Tussock, Yass River Tussock, Yass Tussock, Nassella Tussock (NZ) [18884]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Solanum elaeagnifolium Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323]		Species or species habitat likely to occur within area
Ulex europaeus Gorse, Furze [7693]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-35.29498 148.21547

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Appendix G
Site photos

Figure 10-1 South-east of the proposal area

Figure 10-2 Existing waterbody east of the proposal area

Figure 10-3 Existing intersection taken from Adelong Road, facing north east

Figure 10-4 Some of the trees to be removed on the left of the image taken from Adelong Road, facing east

Appendix H

Noise and Vibration Assessment

SNOWY MOUNTAIN HIGHWAY - GOCUP ROAD INTERSECTION UPGRADE, TUMUT

Construction and Operation Noise and Vibration Assessment

Prepared for:

NGH
Unit 17, Level 3
21 Mary Street
Surry Hills, NSW 2010

SLR Ref: 670.30049-R01
Version No: -v2.0
September 2021

PREPARED BY

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with NGH (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
670.30049-R01-v2.0	7 September 2021	Robbie Cain	Matt Bryce	Matt Bryce
670.30049-R01-v1.0	19 August 2021	Robbie Cain	Matt Bryce	Matt Bryce

CONTENTS

DOCUMENT REFERENCES

TABLES

CONTENTS

FIGURES

APPENDICES

1 Introduction

1.1 The Proposal

Transport for NSW (TfNSW) proposes to upgrade the intersection of Gocup Road and the Snowy Mountains Highway at Tumut, NSW. The proposal aims to significantly increase the safety of this intersection through the installation of a roundabout and key features including:

- Rehabilitating approach span gradient to improve vehicle sight distance
- Widening road shoulder and lane widths where needed
- Reinforcing road earthworks using retaining wall
- Clearing and trimming of vegetation including mature trees
- Relocating overhead powerlines and power poles to below surface level
- Enhancing the visibility of signposting and line marking
- Upgrading the protection and visible permeability of guardrail on approach spans
- Improving pedestrian and cyclist accessibility around the intersection.

The intersection is located within the Snowy Valleys Council (SVC) Local Government Area (LGA) and is approximately three kilometres north-west from the township centre of Tumut.

The location of the site is shown in **Figure 1** and the construction footprint is shown in **Figure 2**.

Figure 1 Site Location

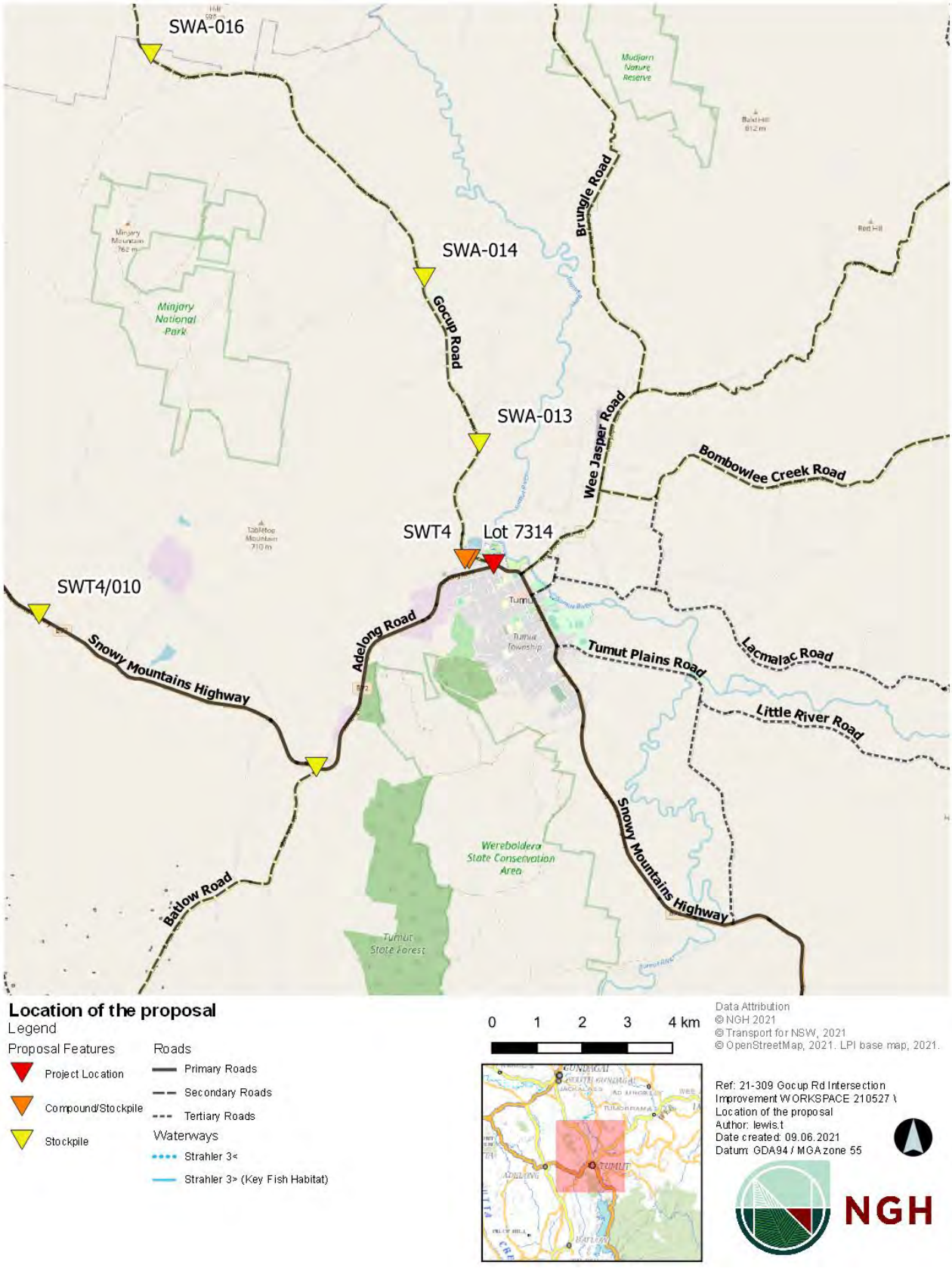


Figure 2 Proposal Construction Footprint

1.2 Approach to the Noise and Vibration Assessment

This Noise and Vibration Assessment Report has been prepared by SLR Consulting Australia Pty Ltd (SLR) on behalf of NGH. The purpose of the assessment is to assess the potential noise and vibration emissions from construction and operation of the proposal, and to recommend mitigation and management measures to be implemented as required. This assessment forms part of the overarching Review of Environmental Factors (REF) in accordance with TfNSW requirements.

1.3 Terminology

The assessment uses specific acoustic terminology and an explanation of common terms is included in **Appendix A**.

2 Existing Ambient Environment

2.1 Site Location and Sensitive Receptors

The proposal is located along the Snowy Mountain Highway, between the intersection of Gocup Road and Capper Street, Tumut. Noise levels in the study area are generally dominated by road traffic noise from the road network. The area directly surrounding the proposal is primarily residential with some scattered commercial/industrial lots. The area north and east of the proposal is primarily rural landscape (The Tumut Wetlands).

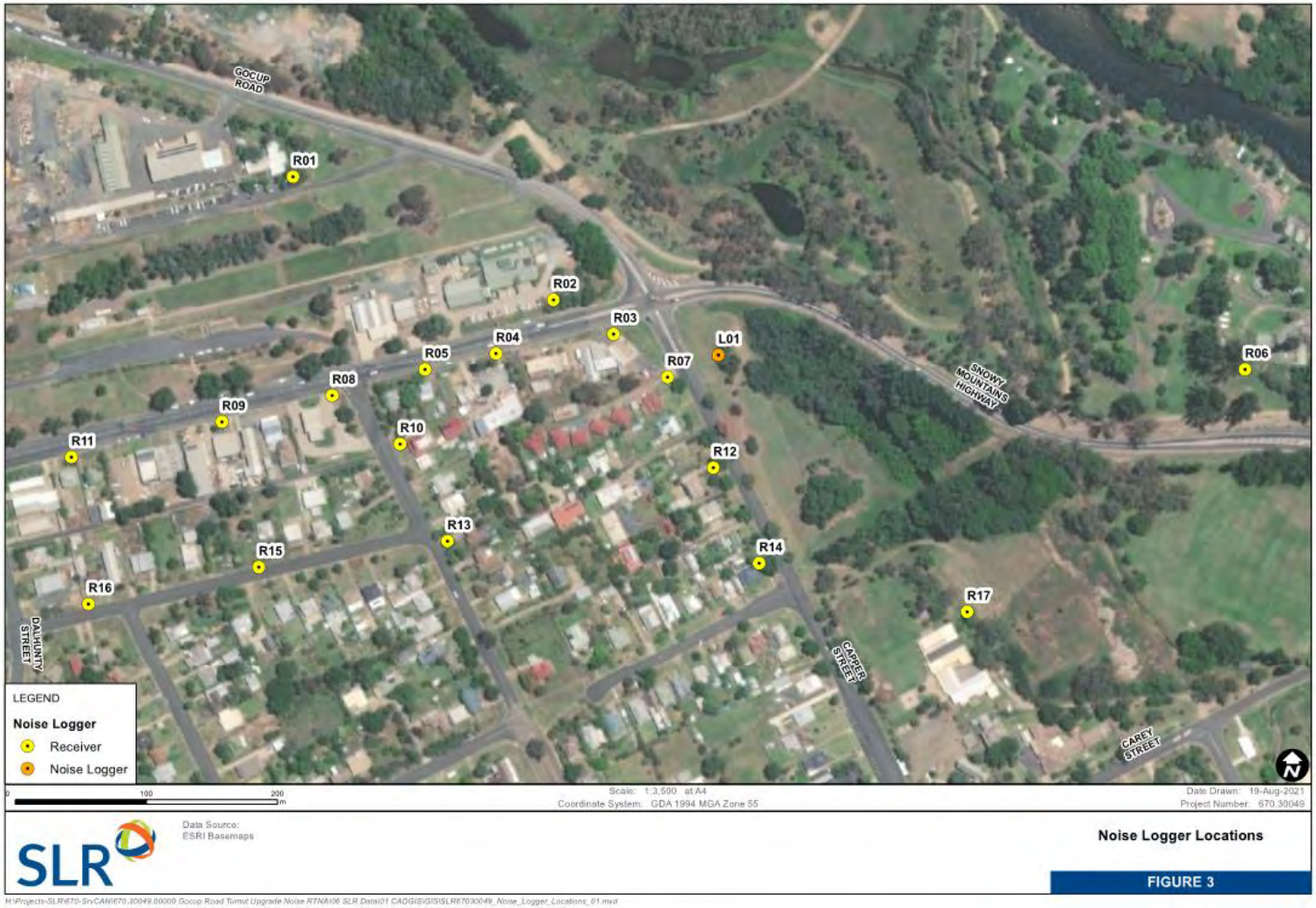
The nearest receivers to the proposal are commercial and residential properties to the west and south of the proposal intersection.

The nearest and potentially most affected sensitive receivers to the project site were identified for this assessment and are shown in **Figure 3** and described in **Table 1**.

Table 1 Noise Sensitive Receivers

ID	Address	Type	Distance (m)	Direction
R01	2 Gocup Rd, Tumut	Commercial	290	NW
R02	1-13 Adelong Rd, Tumut	Commercial	80	W
R03	1-5 Capper St, Tumut	Commercial	30	SW
R04	34a Adelong Rd, Tumut	Residential	140	W
R05	38 Adelong Rd, Tumut	Residential	180	W
R06	Riverglade Caravan Park 2 Fitzroy St, Tumut	Residential	420	E
R07	7 Capper St, Tumut	Residential	50	S

Figure 3 Site Plan, Receivers and Noise Monitoring Locations



2.2 Existing Noise Level Survey

Noise monitoring was completed in the study area between 16 June 2021 and 28 June 2021. The measured noise levels have been used to establish the pre-project noise environment and assist in establishing suitable noise limits assess the project noise emissions.

A noise "logger" was located in a nature strip opposite 1-5 Capper Street, Tumut.

The measured existing noise levels at that location would be considered representative of the background noise levels at other receivers that would likely be most affected by the construction and operation of the proposal.

The noise monitoring equipment continuously measured existing noise levels in 15-minute periods during the daytime, evening and night-time. All equipment carried current National Association of Testing Authorities (NATA) calibration certificates and calibration was checked before and after the noise monitoring survey.

The results of the noise monitoring have been analysed to exclude noise from extraneous events and data affected by unsuitable weather conditions, such as strong wind or rain (wind and rain was sourced from Canberra Airport BOM station) to establish existing ambient noise levels for the area.

The noise monitoring location is shown in **Figure 3** and the results are summarised in **Table 1**. Daily noise monitoring graphs have been presented in **Appendix B**.

Table 1 Summary of Noise Monitoring Survey Results

ID	Address	Ambient Noise Level (dBA)					
		Background Noise (RBL)			Average Noise (L_{Aeq})		
		Day	Evening	Night	Day	Evening	Night
L01	Capper Street, Tumut	45	37	30	56	51	51

Note 1: Assessed periods are:
Daytime - 7:00 am to 6:00 pm
Evening - 6:00 pm to 10:00 pm
Night-time - 10:00pm to 7:00 am.

3 Noise Assessment Criteria

3.1 Construction Noise and Vibration

3.1.1 Interim Construction Noise Guideline

The NSW *Interim Construction Noise Guideline* (ICNG) is used to assess and manage construction noise emitted during construction works and activities in NSW.

The ICNG contains procedures for determining project specific Noise Management Levels (NMLs) for sensitive receivers based on the existing background noise in the area. The 'worst-case' noise levels from construction of a project are predicted and then compared to the NMLs in a 15-minute assessment period to determine potential for adverse effects associated with construction of the project.

The NMLs are not mandatory limits, however, where construction noise levels are predicted or measured to be above the NMLs, feasible and reasonable work practices to minimise noise emissions are to be investigated.

The ICNG approach for determining NMLs at residential receivers, together with the NMLs based on the measured ambient noise levels (RBLs), is shown in **Table 2**.

Table 2 ICNG NMLs for Residential Receivers

Time of Day	NML $L_{Aeq(15minute)}$	How to Apply
Standard Construction Hours Monday to Friday 7:00 am to 6:00 pm Saturday 8:00 am to 1:00 pm No work on Sundays or public holidays	RBL[1] + 10 dB **55 dBA**	• The noise affected level represents the point above which there may be some community reaction to noise • Where the predicted or measured LAeq(15minute) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practises to meet the noise affected level • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.

	Highly Noise Affected
	75 dBA
		• The Highly Noise Affected (HNA) level represents the point above which there may be strong community reaction to noise
		• Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restructuring the hours that the very noisy activities can occur, taking into account:
		  • Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools or mid-morning or mid-afternoon for works near residences
		  • If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.

Outside Standard Construction Hours	RBL + 5 dB **35 dBA**	• A strong justification would typically be required for works outside the recommended standard hours • The proponent should apply all feasible and reasonable work practices to meet the noise affected level • Where all feasible and reasonable practises have been applied and noise is more than 5 dB above the noise affected level, the proponent should negotiate with the community.

Note 1: The RBL is the Rating Background Level and the ICNG refers to the calculation procedures in the NSW *Industrial Noise Policy* (INP). The INP has been superseded by the NSW EPA *Noise Policy for Industry* (NPfI).

Several commercial land uses have been identified in the study area. The ICNG NML for those receivers will be 70 dBA.

It is understood that construction works would be completed during Standard Construction Hours where possible. More stringent requirements are placed on work that is required to be completed outside Standard Construction Hours (ie during the evening or night-time or Sundays, Public Holidays etc), which reflects the greater sensitivity of communities to noise impacts during these periods.

Where Out of Hours Works (OoHW) are to be required, an assessment of the proposed activities, including an assessment of the potential for sleep disturbance, must be undertaken during the preparation of the CNVMP in accordance with the ICNG.

3.1.2 Construction Traffic Noise Guidelines

It is also appropriate to consider noise associated with project-related construction traffic in accordance with the NSW *Road Noise Policy* (RNP) and *Construction Noise and Vibration Guideline* (CNVG).

An initial assessment is first applied to evaluate if existing road traffic noise levels are expected to increase by more than 2 dB as a result of construction traffic. Where this is considered likely, further assessment is required based on the criteria shown in **Table 3**.

Table 3 RNP/NCG Criteria for Assessing Construction Traffic on Public Roads

Road Category	Type of Project/Land Use	Assessment Criteria (dBA)	
		Daytime (7 am – 10 pm)	Night-time (10 pm – 7 am)
Freeway/ arterial/ sub-arterial roads	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	$L_{Aeq(15hour)}$ 60 (external)	$L_{Aeq(9hour)}$ 55 (external)
Local roads	Existing residences affected by additional traffic on existing local roads generated by land use developments	$L_{Aeq(1hour)}$ 55 (external)	$L_{Aeq(1hour)}$ 50 (external)

3.1.3 Construction Vibration

The effects of vibration from construction work can be divided into three categories:

- Those in which the occupants of buildings are disturbed (**human comfort**). Vibration from construction work tends to be intermittent in nature and the EPA's *Assessing Vibration: a technical guideline* (2006) provides criteria for intermittent vibration based on the Vibration Dose Value (VDV), as shown in **Table 4**. While the construction activities for the proposal are generally not expected to result in continuous or impulsive vibration impacts, criteria are provided in **Table 5**.
- Those where building contents may be affected (**building contents**). It is generally not necessary to set separate criteria for vibration effects on typical building contents for this project.
- Those where the integrity of the building may be compromised (**structural/cosmetic damage**). If vibration from construction work is sufficiently high it can cause cosmetic damage to elements of affected buildings. Industry standard cosmetic damage vibration limits are specified in British Standard BS 7385 and German Standard DIN 4150. The limits are shown in **Table 6** and **Table 7**.

Table 4 Human Comfort Vibration – Vibration Dose Values for Intermittent Vibration

Building Type	Assessment Period	Vibration Dose Value[1] ($m/s^{1.75}$)	
		Preferred	Maximum
Residential	Daytime	0.20	0.40

Note 1: The VDV accumulates vibration energy over the daytime and night-time assessment periods, and is dependent on the level of vibration as well as the duration.

Table 5 Human Comfort Vibration – Preferred and Maximum

Location	Assessment Period	Weighted Root Mean Square Values for Continuous and Impulsive Vibration Acceleration (m/s^2) 1–80 Hz			
		Preferred values		Maximum values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Continuous vibration					
Residential	Daytime	0.010	0.0071	0.020	0.014
Impulsive vibration					
Residential	Daytime	0.30	0.21	0.60	0.42

Table 6 Cosmetic Damage –Transient Vibration Values for Minimal Risk of Damage

Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
	4 Hz to 15 Hz	15 Hz and Above
Unreinforced or light framed structures. Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Note 1: Where the dynamic loading caused by continuous vibration may give rise to dynamic magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values may need to be reduced by up to 50%.

Table 7 Cosmetic Damage –Guideline Values for Short-term Vibration on Structures

Type of Structure	Guideline Values Vibration Velocity (mm/s)				
	Foundation, All Directions Frequency, Hz			Topmost Floor, Horizontal	Floor Slabs, Vertical
	1 to 10 Hz	10 to 50 Hz	50 to 100 Hz	All frequencies	All frequencies
Residential buildings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20	15	20

Note 1: It may be necessary to lower the relevant guideline value markedly to prevent minor damage.

3.2 Operational Noise and Vibration

The assessment criteria in the RNP are not intended to be applied where projects are limited to minor road works designed to improve safety, such as straightening curves, installing traffic control devices or making minor road alignments.

Instead, assessment of potential noise impacts from projects involving minor works typically follow the minor works assessment process outlined in NSW RMS *Noise Criteria Guideline* (NCG) Section 6.6 and *Noise Mitigation Guideline* (NMG) Section 6.3.

The project is considered as minor works under the following (NCG) definition:

> *Some works may be primarily to improve safety. This may include minor straightening of curves, installing traffic control devices, intersection widening and turning bay extensions or making minor road realignments.*
>
> *These works are not considered redeveloped or new as they are not intended to increase the traffic carrying capacity of the overall road or accommodate a significant increase in heavy vehicle traffic.*

For minor works, the assessment applies the RNP existing noise criteria, shown in **Table 8**, only if noise levels are predicted to increase by more than 2.0 dB at the most affected receivers.

Table 8 Target Noise Levels for Existing Roads Subject to Minor Works Redevelopment

Existing Road Category	Target Noise Level (dBA)	
	Day (7:00 am – 10:00 pm)	Night (10:00 pm – 7:00 am)
Freeway/arterial/sub-arterial road	$L_{Aeq(15hour)}$ 60 (external)	$L_{Aeq(9hour)}$ 55 (external)
Local road	$L_{Aeq(1hour)}$ 55 (external)	$L_{Aeq(1hour)}$ 50 (external)

Where an assessment is triggered, consideration of mitigation is required where the total noise level for the 'Build' scenario (with project) exceeds the criterion and there is an increase of more than 2.0 dB, relative to the 'No Build' scenario (without project).

4 Construction Noise and Vibration Assessment

4.1 Construction Noise

A noise model of the study area has been used to predict noise levels from the proposed construction works to surrounding receivers. The model uses the ISO 9613 prediction method within the SoundPLAN modelling software package.

Local terrain, receiver buildings and structures were digitised in the noise model to develop a three-dimensional representation of the construction sites and surrounding areas.

4.1.1 Work Description

Scenarios have been developed based on the various construction works and activities for the project. These scenarios are described in **Table 9**. The final construction methodology (including the full plant and equipment list) and the expected construction noise levels may require confirmation during detailed design.

The assessment uses 'realistic worst-case' scenarios to determine the noise levels from the noisiest 15-minute period that may occur for each work scenario.

Table 9 Construction Scenario Descriptions

ID	Scenario[1]	Description
W.01	General site establishment	• Establishment of compound, stockpiles sites, and fencing, where required • Implement of traffic control, including partial road closures and closures of side streets • Installation of erosion and sediment controls
W.02 and W.03	Pavement widening and Shoulder/ verge works	• Widening of existing pavement (with removal of pavement layers in some locations) and disposal/reuse of this pavement and subgrade material • Construction of access way to become pathway • Bulk earthworks including placement of road surfaces • Drainage works (culverts, subsoils, kerb and gutter) • Street lighting • Relocation of active travel path for pedestrian and cyclist to northeast (to be closed during construction period with detours along alternative pedestrian/cycle paths within the wetland) • Modification of the pavement (in widening areas) with lime
W.04	Safety barrier reinstallation	• Installation of new and upgrading of safety barrier
W.05	Line marking	• Installation of line marking and any roadside furniture including medians and signs

4.1.2 Construction Scenarios and Plant/Equipment Sound Data

The construction work scenarios, together with the plant/equipment likely to be used and their associated sound power level (SWL) information, are presented in **Table 10**.

Table 10 Equipment Lists and Sound Power Levels

Equipment		Asphalt Milling Machine	Back Hoe (7.5 tonne)	Bitumen Spray Truck	Circular Saw	Excavator (14 tonne)(	Excavator (22 tonne)	Flatbed truck	Generator	Grader	Hydraulic Post Driver (Impact)	Hydro mulching Equipment	Lighting - Diesel Generator	Line Marking Plant	Padfoot Roller	Paving Machine	Pneumatic hammer	Road Profiler	Roller - Smooth Drum	Semi Trailer	Tipper Truck	Trench Roller	Truck	Ute	Water Tanker
Sound Power Level[2]		111	102	100	106	97	99	100	102	108	118	97	98	98	101	105	114	107	107	106	97	104	107	98	98
Ref	**Scenario**																								
W.01	General Site Establishment								X														X	X	
W.02	Pavement Widening	X			X											X		X	X		X		X		X
W.03	Shoulder/Verge Works		X	X		X	X			X		X			X					X	X		X		X
W.04	Safety Barrier Installation							X			X						X			X			X		
W.05	Line Marking												X	X									X	X	

1. Equipment classed as 'annoying' in the ICNG and requires an additional 5 dB correction.
2. Sound power level data is taken from the DEFRA Noise Database, RMS *Construction and Vibration Guideline* and TfNSW *Construction Noise and Vibration Strategy*.

4.1.3 Predicted Construction Noise Levels

Construction noise associated with each of the scenarios has been predicted at the identified nearest receivers.

The predictions represent construction noise levels without mitigation applied and would be considered conservative as the calculations assume several items of construction equipment are in use at the same time within individual scenarios, which is unlikely to occur.

For most work, the construction noise impacts would frequently be lower than predicted as the worst-case situation is typically only apparent for a relatively short period when noisy equipment is in use nearby. Noise levels at sensitive receptors can be substantially lower than the worst-case scenario when the construction works move to a more distant location in a works area. This concept is shown in **Figure 4**, with the reference distances for the work area for each of the activities shown in **Table 11**.

Figure 4 Conceptual Illustration of Work Areas

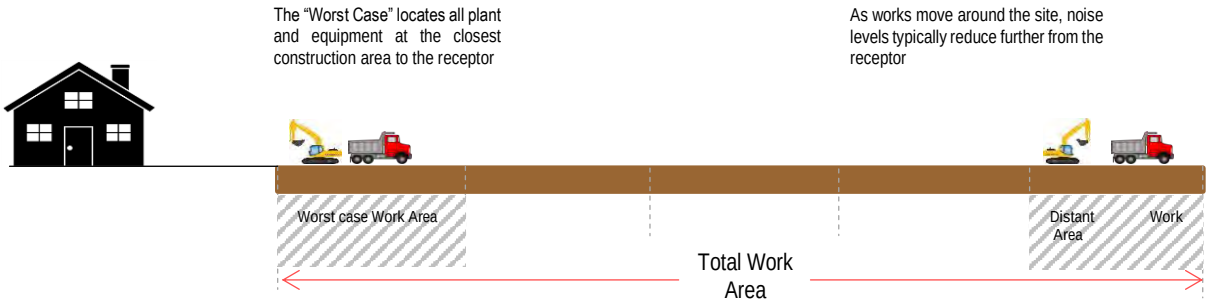


Table 11 Construction Activities – Reference Distances

ID	Address	Type	Separation Distance, m	
			Near ("Worst Case")	Far (Distant Area)
R01	2 Gocup Rd, Tumut	Commercial	200	530
R02	1-13 Adelong Rd, Tumut	Commercial	20	310
R03	1-5 Capper St, Tumut	Commercial	5	260
R04	34a Adelong Rd, Tumut	Residential	70	350
R05	38 Adelong Rd, Tumut	Residential	130	400
R06	Riverglade Caravan Park	Residential	190	430

A summary of the predicted construction noise impacts for each receiver is shown in **Table 12**. Exceedances of daytime NMLs have been highlighted in orange. Exceedances of the "Highly Noise Affected" criterion (75 dBA) have been highlighted in red.

Table 12 Predicted Range of Construction Noise Impacts

NCA	NML (Standard Construction Hours)	Range of Noise Levels in Noise Catchment Area									
		W.01		W.02		W.03		W.04		W.05	
		Far	Near	Far	Near	Far	Near	Far	Near	Far	Near
R01	70	39	49	47	57	44	54	50	60	36	46
R02	70	47	69	55	77	52	74	58	80	44	66
R03	70	49	76	57	84	54	81	60	87	46	73
R04	55	38	60	46	68	43	65	49	71	35	57
R05	55	39	52	47	60	44	57	50	63	36	49
R06	55	39	49	47	57	44	54	50	60	36	46
R07	55	49	77	57	85	54	82	60	88	46	74

The above assessment presenting worst case noise impacts shows that:

- The highest noise levels are predicted to occur during W.04 – Safety Barrier Installation, driven by the use of post driving rigs.
- The "highly noise affected" value may be exceeded during all scenarios except for W.05. This is often unavoidable when inherently noisy works occur and equipment operate very close to the receivers.
- Exceedances of daytime NMLs are predicted at sensitive receptors at times within approximately 250 m of works/activities during all scenarios.

It is noted that for most scenarios, the noisiest work would only be required for a relatively short period of the total proposal duration. Construction noise at other times would be much lower than the predicted worst-case levels.

Based on the outcome of the construction noise assessment, the proponent (or construction contractor) should undertake mitigation measures to minimise noise from the site as far as practicable, and these have been discussed in **Section 5** of this report.

4.1.4 Construction Traffic

The number of heavy and light vehicle movements per day/period and during the various activities is as follows:

- General site establishment – two heavy vehicles, two light vehicles per shift
- Pavement widening, shoulder/ verge works, safety barrier reinstallation and line marking – four heavy vehicles, two light vehicles per shift
- Construction vehicle movement at peak during earthworks phase would average approximately 50 vehicles per day
- Site clean- up and commissioning of upgraded facility – two heavy vehicles, two light vehicles per shift.

Due to the relatively small number of construction vehicle movements in relation to the existing traffic volumes on the road network, construction traffic is not predicted to increase road traffic noise by more than 2 dBA.

Therefore, construction road traffic noise mitigation or management measures are not required.

4.2 Construction Vibration

Minimum safe working distances for cosmetic damage and human comfort associated with vibration intensive construction equipment that may be used on the project are provided in the CNVG and are shown in **Table 13**.

Table 13 Recommended Minimum Working Distances from Vibration Intensive Plant

Plant Item	Rating/Description	Minimum Distance		
		Cosmetic Damage		Human Response (NSW EPA Guideline)
		Residential/Light Commercial (BS 7385)	Heritage Items (DIN 4150, Group 3)	
Vibratory Roller	<50 kN (1 - 2 tonne)	5 m	11 m	15 m to 20 m
	<100 kN (2 - 4 tonne)	6 m	13 m	20 m
	<200 kN (4 - 6 tonne)	12 m	15 m	40 m
	<300 kN (7 - 13 tonne)	15 m	31 m	100 m
	>300 kN (13 - 18 tonne)	20 m	40 m	100 m
	>300 kN (>18 tonne)	25 m	50 m	100 m
Medium Hydraulic Hammer	900 kg (12t - 18t excavator)	7 m	15 m	23 m
Large Hydraulic Hammer	1,600 kg (18t - 34t excavator)	22 m	44 m	73 m
Vibratory Pile Driver	Sheet piles	2 m to 20 m	5 m to 40 m	20 m
Piling Rig – Bored	≤ 800 mm	2 m (nominal)	5 m	4 m

The minimum working distances are indicative and will vary depending on the particular item of equipment and local geotechnical conditions. It is noted that the distances are calculated from empirical data which suggests that where work is further from receivers than the quoted minimum distances then exceedance of the criteria would be unlikely.

The main potential source of vibration would occur when vibratory rollers operate during shoulder/verge and road surfacing activities close to the residences in Capper Street. Those properties may be approximately 15 m from such works. It is recommended to use as lighter vibratory roller as practicable but no greater than 13t in that area.

The occupants of those receptors may also perceive vibration at times when vibration intensive equipment is in use. Where vibration is perceptible, it would likely only be apparent for relatively short durations and not expected to result in significant adverse effects.

Buildings in other parts of the study area are generally sufficiently distant to be outside the minimum safe working distances.

Nonetheless, mitigation and management measures to minimise vibration and its potential effects are discussed further in **Section 5**.

4.3 Operational Noise Assessment

The proposal involves the relocation of the existing intersection further east and the implementation of a large roundabout.

4.3.1 Noise Modelling

A noise model of the study area has been used to predict noise levels from the operation of the proposal to the surrounding receivers. The model uses *Calculation of Road Traffic Noise* (CoRTN) (UK Department of Transport, 1988) prediction method within the SoundPLAN predictive modelling software.

Local terrain, receiver buildings and structures were digitised in the noise model to develop a three-dimensional representation of the proposal and surrounding areas.

The '**No Build**' scenario uses the existing road alignment with all relevant existing structures and features within the road corridor included.

The '**Build**' scenario is based on the proposed design of the new intersection and includes all widening work and changes to existing ground levels such as cuttings and embankments.

For the purposes of this assessment, a comparison in noise level between the build and no-build scenario has been undertaken. The most significant difference between those two scenarios is the change in the alignment of the roadway.

It is understood that traffic volumes and composition would not change as a result of the project[1].

4.3.2 Modelling Inputs

The traffic flow information from the project traffic report[1] shown in **Table 14** was used in the modelling assessment.

Table 14 Modelled Traffic Volumes

	AM Peak Traffic Volume (veh/h)	Heavy Vehicles, %
South: Capper Street	103	8.2
East: Snowy Mountains Highway	225	16.8
North: Gocup Road	99	18.1
West: Snowy Mountains Highway	260	11.3

[1] Based on the Traffic Modelling Report (Transport for NSW SIDRA Report "*Gocup Road/Snowy Mountains Highway Intersection*", November 2020).

4.3.3 Noise Modelling Results and Assessment

The predicted noise level difference between the "Build" and "No Build" scenarios at the identified receivers has been presented in **Table 15**.

Table 15 Road traffic Noise Level Difference - Build and No Build

ID	Address	Predicted Build v No Build Level Difference (dBA)
R01	2 Gocup Rd, Tumut	+0.1
R02	1-13 Adelong Rd, Tumut	+0.1
R03	1-5 Capper St, Tumut	0
R04	34a Adelong Rd, Tumut	-0.1
R05	38 Adelong Rd, Tumut	0
R06	Riverglade Caravan Park 2 Fitzroy St, Tumut	0
R07	7 Capper St, Tumut	-0.1
R08	42-44 Adelong Rd, Tumut	+0.1

It can be seen in **Table 15** that changes of less than 1 dBA between the scenarios are expected, which is less than the minor works criterion of 2.0 dBA.

Therefore the intersection upgrade to include a roundabout would not be expected to result in adverse noise effects at nearby receptors and no further assessment is required.

It is noted that this outcome is consistent with previous similar projects and studies where the project does not result in significant changes to traffic volumes, composition, speed, road surface and road alignment.

5 Construction Noise and Vibration Mitigation

The ICNG recognises that construction works can be inherently noisy, often required in proximity to noise sensitive receptors and that noise mitigation needs to be appropriate for the temporary nature of the works.

Mitigation and management measures and recommendations are presented in **Table 16** and have been made with regard to the ICNG and CNVS guidelines and consider the short-term and mobile nature of the proposed construction activities. The recommendations should be included in a Construction Noise and Vibration Management Plan (CNVMP) for the construction phase of the Project.

A CNVMP would be prepared prior to work commencing which would detail the approach to providing noise and vibration mitigation during construction.

Site and activity-specific assessments would also be completed for work that is required to be undertaken outside of Standard Construction Hours.

Table 16 Construction Noise Mitigation and Management Measures

Action Required	Applies To	Details
Management measures		
Construction Noise and Vibration Management Plan (CNVMP)	Airborne noise Ground-borne noise & vibration	A Construction Noise and Vibration Management Plan (CNVMP) should be prepared before any work begins which would include: • Identification of nearby sensitive receivers • Description of works, construction equipment and hours of work • Criteria for the proposal and relevant licence and approval conditions • Requirements for noise and vibration monitoring • Details of how community consultation would be completed • Procedures for handling complaints • Details on how respite would be applied where ongoing high impacts are seen at certain receivers.
Implement community consultation or notification measures.	Airborne noise Ground-borne noise & vibration	For activities where the construction noise is predicted to exceed the "Highly Noise Affected" Level: Notification detailing work activities, dates and hours, impacts and mitigation measures, indication of work schedule, any operational noise benefits from the works (where applicable) and contact telephone number. Notification should be a minimum of 7 calendar days prior to the start of works. For projects other than maintenance works more advanced consultation or notification may be required. Undertake noise verification measurements, if required. Website (If required) Contact telephone number for community Email distribution list (if required) Community drop in session (if required by approval conditions).
Site inductions	Airborne noise Ground-borne noise & vibration	All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: • all project specific and relevant standard noise and vibration mitigation measures • relevant licence and approval conditions • permissible hours of work • any limitations on high noise generating activities • location of nearest sensitive receivers • construction employee parking areas • designated loading/unloading areas and procedures • site opening/closing times (including deliveries) • environmental incident procedures.
Behavioural practices	Airborne noise	No unnecessary shouting or loud stereos/radios on site. No dropping of materials from height, throwing of metal items, door slams, etc.
Building condition surveys	Ground-borne vibration	It is recommended to undertake building dilapidation surveys on all buildings located within the buffer zone prior to commencement of activities with the potential to cause property damage. The buffer zones would be based on the final construction works program which identifies location of vibration intensive works and plant/equipment to be used. Building condition surveys may not be required if minimum safe work distances can be reduced using judicious plant selection.

Action Required	Applies To	Details
Source controls		
Construction hours and scheduling	Airborne noise Ground-borne noise & vibration	Where feasible and reasonable, construction should be carried out during the standard daytime working hours. Work generating high noise and/or vibration levels should be scheduled during less sensitive time periods.
Equipment selection.	Airborne noise Ground-borne noise & vibration	Use quieter and less vibration emitting construction methods where feasible and reasonable. For example, when piling is required, bored piles rather than impact-driven piles will minimise noise and vibration impacts. Similarly, diaphragm wall construction techniques, in lieu of sheet piling, will have significant noise and vibration benefits. Ensure plant including the silencer is well maintained.
Plant noise levels.	Airborne-noise	The construction contractor should select plant and equipment with operating Sound Power or Sound Pressure Levels no higher than those described in **Table 10**.
Use and siting of plant.	Airborne-noise	The offset distance between noisy plant and adjacent sensitive receivers is to be maximised. Plant used intermittently to be throttled down or shut down. Noise-emitting plant to be directed away from sensitive receivers. Only have necessary equipment on site.
Plan worksites and activities to minimise noise and vibration.	Airborne noise Ground-borne vibration	Locate compounds away from sensitive receivers and discourage access from local roads. Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site. Where additional activities or plant may only result in a marginal noise increase and speed up works, consider limiting duration of impact by concentrating noisy activities at one location and move to another as quickly as possible. Very noise activities should be scheduled for normal working hours. If the work can not be undertaken during the day, it should be completed before 11:00 pm. Where practicable, work should be scheduled to avoid major student examination periods when students are studying for examinations such as before or during Higher School Certificate and at the end of higher education semesters. If programmed night work is postponed the work should be re-programmed and the approaches in this guideline apply again.
Reduced equipment power	Airborne noise Ground-borne vibration	Use only the necessary size and power-rating for plant and equipment. Select the minimum where practical to do so, including the vibratory roller.
Non-tonal and ambient sensitive reversing alarms	Airborne noise	Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work. Consider the use of ambient sensitive alarms that adjust output relative to the ambient noise level.
Minimise disturbance arising from delivery of goods to construction sites.	Airborne noise	Loading and unloading of materials/deliveries is to occur as far as possible from sensitive receivers. Select site access points and roads as far as possible away from sensitive receivers. Dedicated loading/unloading areas to be shielded if close to sensitive receivers. Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible. Avoid or minimise these out of hours movements where possible.
Engine compression brakes	Construction vehicles	Limit the use of engine compression brakes. Ensure vehicles are fitted with a maintained Original Equipment Manufacturer exhaust silencer or a silencer that complies with the National Transport Commission's 'In-service test procedure' and standard.

Action Required	Applies To	Details
Path controls		
Shield stationary noise sources such as pumps, compressors, fans etc.	Airborne noise	Stationary noise sources should be enclosed or shielded where feasible and reasonable whilst ensuring that the occupational health and safety of workers is maintained. Materials suitable for shielding will have a surface mass of at least 12 kg/m^3.
Shield sensitive receivers from noisy activities.	Airborne noise	Use structures to shield residential receivers from noise such as site shed placement; earth bunds; fencing; erection of operational stage noise barriers (where practicable) and consideration of site topography when situating plant.
Receptor control		
Structural surveys and vibration monitoring	Ground-borne vibration	Pre-construction surveys of the structural integrity of vibration sensitive buildings may be warranted where buildings or structures are within the minimum working distances and considered likely to exceed the cosmetic damage criteria during the use of vibration intensive equipment. Where work is within the minimum working distances and considered likely to exceed the cosmetic damage criteria: • Different construction methods with lower source vibration levels should be investigated and implemented, where feasible • Where alternative methodology is not feasible (eg lightweight vibratory roller), attended vibration measurements should be undertaken at the start of the work to determine actual vibration levels at the item. Work should be ceased if the monitoring indicates vibration levels are likely to, or do, exceed the relevant criteria.

6 Conclusion

It is proposed to upgrade the existing intersection at Snowy Mountains Highway and Gocup Road in Tumut NSW with a roundabout.

This report describes the existing noise environment in the study area, outlines the method used in the assessment and identifies the likely impacts from construction and operation of the proposal on the nearby sensitive receivers. Where impacts are predicted, appropriate measures have been recommended to mitigate and manage the impacts.

Construction Noise and Vibration

The nearest residential receivers to the proposal are predicted to be 'Highly Noise Affected' during the worst-case scenario of inherently noisy plant and activities occurring in close proximity. Exceedances of daytime NMLs may occur at times within approximately 250 metres of construction works.

Feasible and reasonable noise mitigation measures and work practices have been recommended to reduce potential noise and vibration emissions during the construction works. Specific strategies would be determined during development of a Construction Noise and Vibration Management Plan prior to construction work commencing.

The need for work outside of standard construction hours has not yet been confirmed and should be assessed during the preparation of a CNVMP.

Operational Road Traffic Noise

The proposal has been assessed under the "Minor Works" criteria within the NSW RMS *Noise Criteria Guideline* (NCG).

Noise modelling has confirmed that the difference between the "Build" and "No-Build" scenarios is expected to result in less than a 2 dBA change in noise level, which would be considered insignificant.

Therefore, no further assessment or mitigation recommendations are required.

APPENDIX A

Acoustic Terminology

1. Sound Level or Noise Level

The terms 'sound' and 'noise' are almost interchangeable, except that 'noise' often refers to unwanted sound.

Sound (or noise) consists of minute fluctuations in atmospheric pressure. The human ear responds to changes in sound pressure over a very wide range with the loudest sound pressure to which the human ear can respond being ten million times greater than the softest. The decibel (abbreviated as dB) scale reduces this ratio to a more manageable size by the use of logarithms.

The symbols SPL, L or LP are commonly used to represent Sound Pressure Level. The symbol LA represents A-weighted Sound Pressure Level. The standard reference unit for Sound Pressure Levels expressed in decibels is 2 x 10^{-5} Pa.

2. 'A' Weighted Sound Pressure Level

The overall level of a sound is usually expressed in terms of dBA, which is measured using a sound level meter with an 'A-weighting' filter. This is an electronic filter having a frequency response corresponding approximately to that of human hearing.

People's hearing is most sensitive to sounds at mid frequencies (500 Hz to 4,000 Hz), and less sensitive at lower and higher frequencies. Different sources having the same dBA level generally sound about equally loud.

A change of 1 dB or 2 dB in the level of a sound is difficult for most people to detect, whilst a 3 dB to 5 dB change corresponds to a small but noticeable change in loudness. A 10 dB change corresponds to an approximate doubling or halving in loudness. The table below lists examples of typical noise levels.

Sound Pressure Level (dBA)	Typical Source	Subjective Evaluation
130	Threshold of pain	Intolerable
120	Heavy rock concert	Extremely noisy
110	Grinding on steel	
100	Loud car horn at 3 m	Very noisy
90	Construction site with pneumatic hammering	
80	Kerbside of busy street	Loud
70	Loud radio or television	
60	Department store	Moderate to quiet
50	General Office	
40	Inside private office	Quiet to very quiet
30	Inside bedroom	
20	Recording studio	Almost silent

Other weightings (eg B, C and D) are less commonly used than A-weighting. Sound Levels measured without any weighting are referred to as 'linear', and the units are expressed as dB(lin) or dB.

3. Sound Power Level

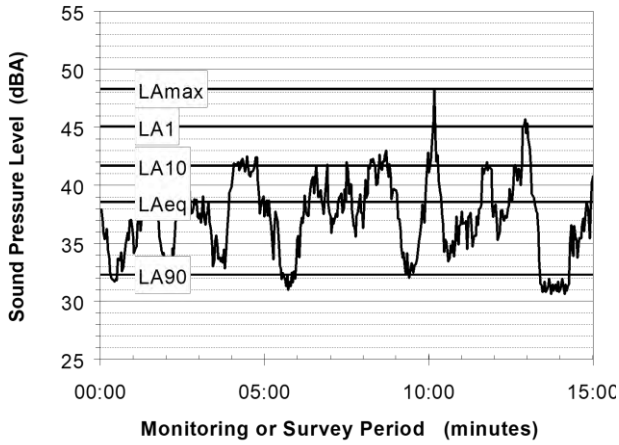
The Sound Power of a source is the rate at which it emits acoustic energy. As with Sound Pressure Levels, Sound Power Levels are expressed in decibel units (dB or dBA), but may be identified by the symbols SWL or LW, or by the reference unit 10^{-12} W.

The relationship between Sound Power and Sound Pressure is similar to the effect of an electric radiator, which is characterised by a power rating but has an effect on the surrounding environment that can be measured in terms of a different parameter, temperature.

4. Statistical Noise Levels

Sounds that vary in level over time, such as road traffic noise and most community noise, are commonly described in terms of the statistical exceedance levels LAN, where LAN is the A-weighted sound pressure level exceeded for N% of a given measurement period. For example, the LA1 is the noise level exceeded for 1% of the time, LA10 the noise exceeded for 10% of the time, and so on.

The following figure presents a hypothetical 15 minute noise survey, illustrating various common statistical indices of interest.



Of particular relevance, are:

LA1 The noise level exceeded for 1% of the 15 minute interval.

LA10 The noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.

LA90 The noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.

LAeq The A-weighted equivalent noise level (basically, the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

5. Frequency Analysis

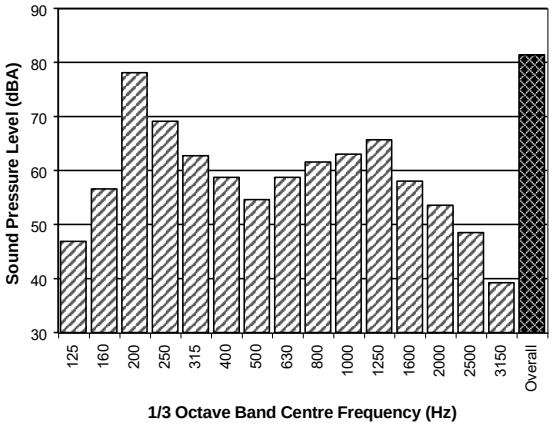
Frequency analysis is the process used to examine the tones (or frequency components) which make up the overall noise or vibration signal.

The units for frequency are Hertz (Hz), which represent the number of cycles per second.

Frequency analysis can be in:

- Octave bands (where the centre frequency and width of each band is double the previous band)
- 1/3 octave bands (three bands in each octave band)
- Narrow band (where the spectrum is divided into 400 or more bands of equal width)

The following figure shows a 1/3 octave band frequency analysis where the noise is dominated by the 200 Hz band. Note that the indicated level of each individual band is less than the overall level, which is the logarithmic sum of the bands.



6. Annoying Noise (Special Audible Characteristics)

A louder noise will generally be more annoying to nearby receivers than a quieter one. However, noise is often also found to be more annoying and result in larger impacts where the following characteristics are apparent:

- **Tonality** - tonal noise contains one or more prominent tones (ie differences in distinct frequency components between adjoining octave or 1/3 octave bands), and is normally regarded as more annoying than 'broad band' noise.
- **Impulsiveness** - an impulsive noise is characterised by one or more short sharp peaks in the time domain, such as occurs during hammering.
- **Intermittency** - intermittent noise varies in level with the change in level being clearly audible. An example would include mechanical plant cycling on and off.
- **Low Frequency Noise** - low frequency noise contains significant energy in the lower frequency bands, which are typically taken to be in the 10 to 160 Hz region.

7. Vibration

Vibration may be defined as cyclic or transient motion. This motion can be measured in terms of its displacement, velocity or acceleration. Most assessments of human response to vibration or the risk of damage to buildings use measurements of vibration velocity. These may be expressed in terms of 'peak' velocity or 'rms' velocity.

The former is the maximum instantaneous velocity, without any averaging, and is sometimes referred to as 'peak particle velocity', or PPV. The latter incorporates 'root mean squared' averaging over some defined time period.

Vibration measurements may be carried out in a single axis or alternatively as triaxial measurements (ie vertical, longitudinal and transverse).

The common units for velocity are millimetres per second (mm/s). As with noise, decibel units can also be used, in which case the reference level should always be stated. A vibration level V, expressed in mm/s can be converted to decibels by the formula 20 log (V/Vo), where Vo is the reference level (10^{-9} m/s). Care is required in this regard, as other reference levels may be used.

8. Human Perception of Vibration

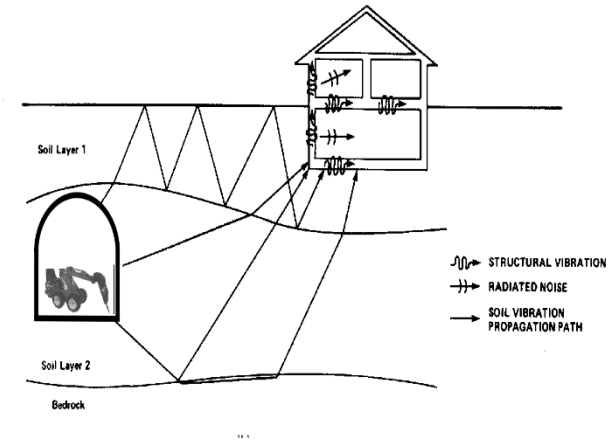
People are able to 'feel' vibration at levels lower than those required to cause even superficial damage to the most susceptible classes of building (even though they may not be disturbed by the motion). An individual's perception of motion or response to vibration depends very strongly on previous experience and expectations, and on other connotations associated with the perceived source of the vibration. For example, the vibration that a person responds to as 'normal' in a car, bus or train is considerably higher than what is perceived as 'normal' in a shop, office or dwelling.

9. Ground-borne Noise, Structure-borne Noise and Regenerated Noise

Noise that propagates through a structure as vibration and is radiated by vibrating wall and floor surfaces is termed 'structure-borne noise', 'ground-borne noise' or 'regenerated noise'. This noise originates as vibration and propagates between the source and receiver through the ground and/or building structural elements, rather than through the air.

Typical sources of ground-borne or structure-borne noise include tunnelling works, underground railways, excavation plant (eg rockbreakers), and building services plant (eg fans, compressors and generators).

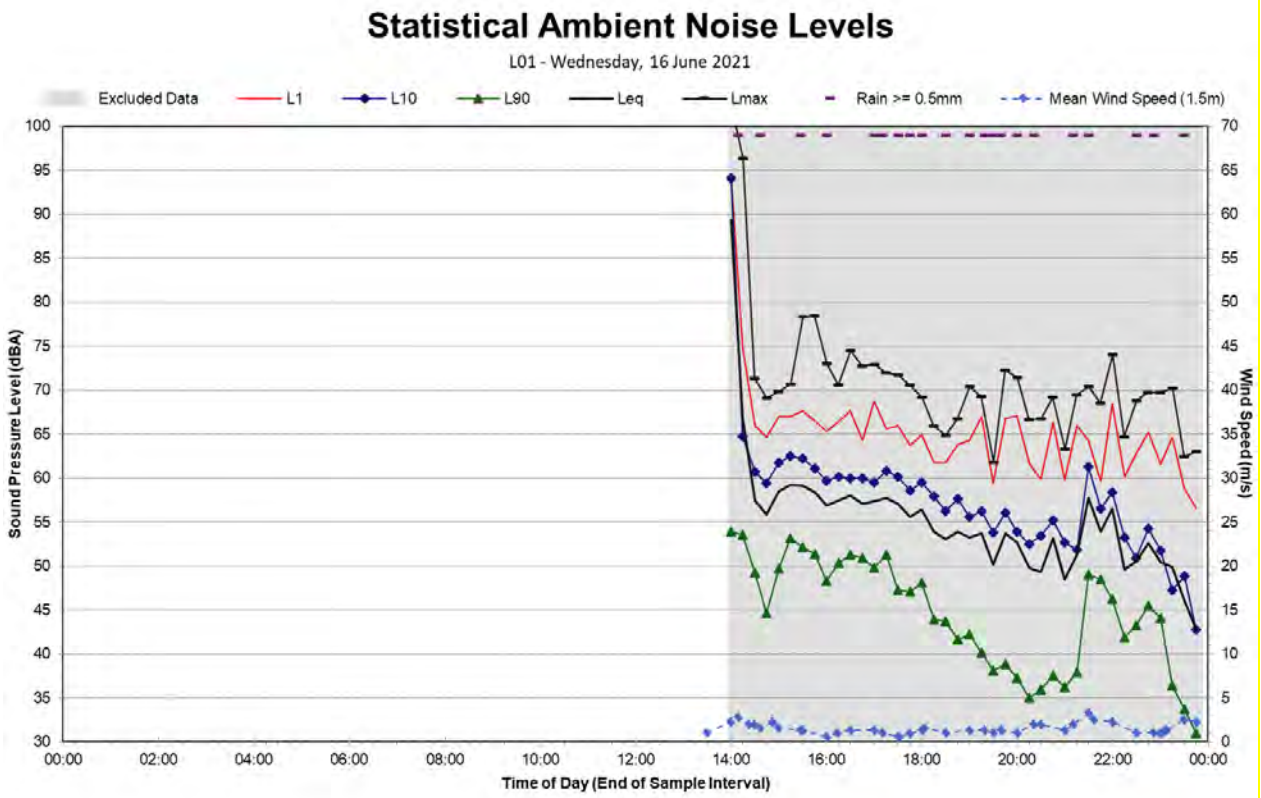
The following figure presents an example of the various paths by which vibration and ground-borne noise may be transmitted between a source and receiver for construction activities occurring within a tunnel.

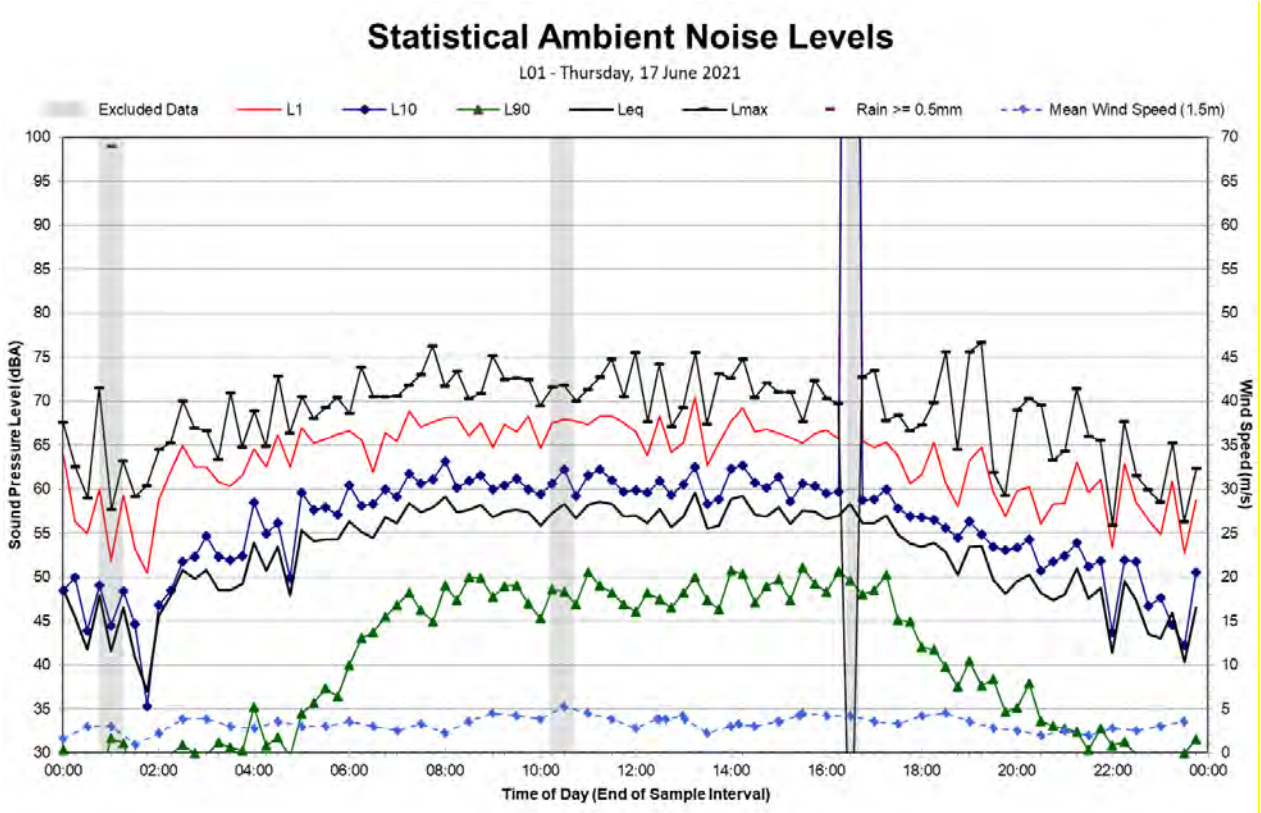


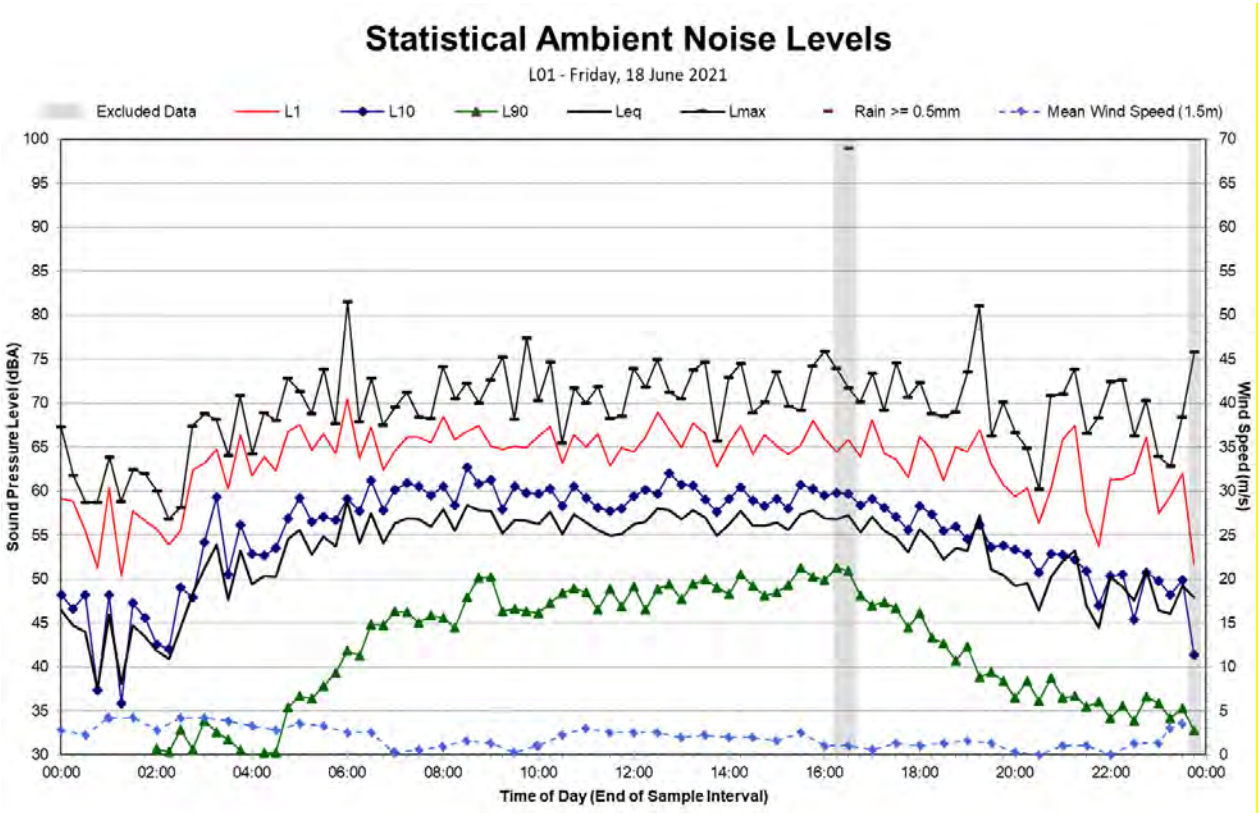
The term 'regenerated noise' is also used in other instances where energy is converted to noise away from the primary source. One example would be a fan blowing air through a discharge grill. The fan is the energy source and primary noise source. Additional noise may be created by the aerodynamic effect of the discharge grill in the airstream. This secondary noise is referred to as regenerated noise.

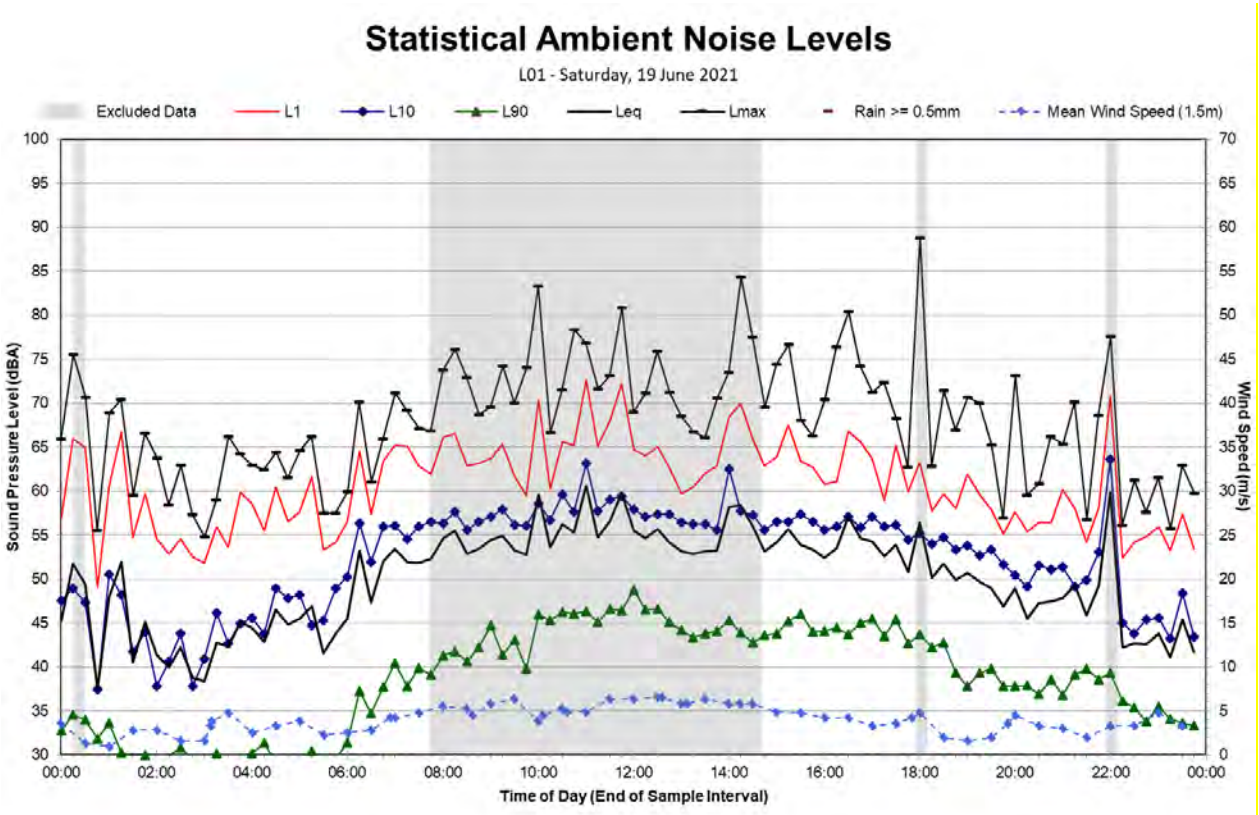
APPENDIX B

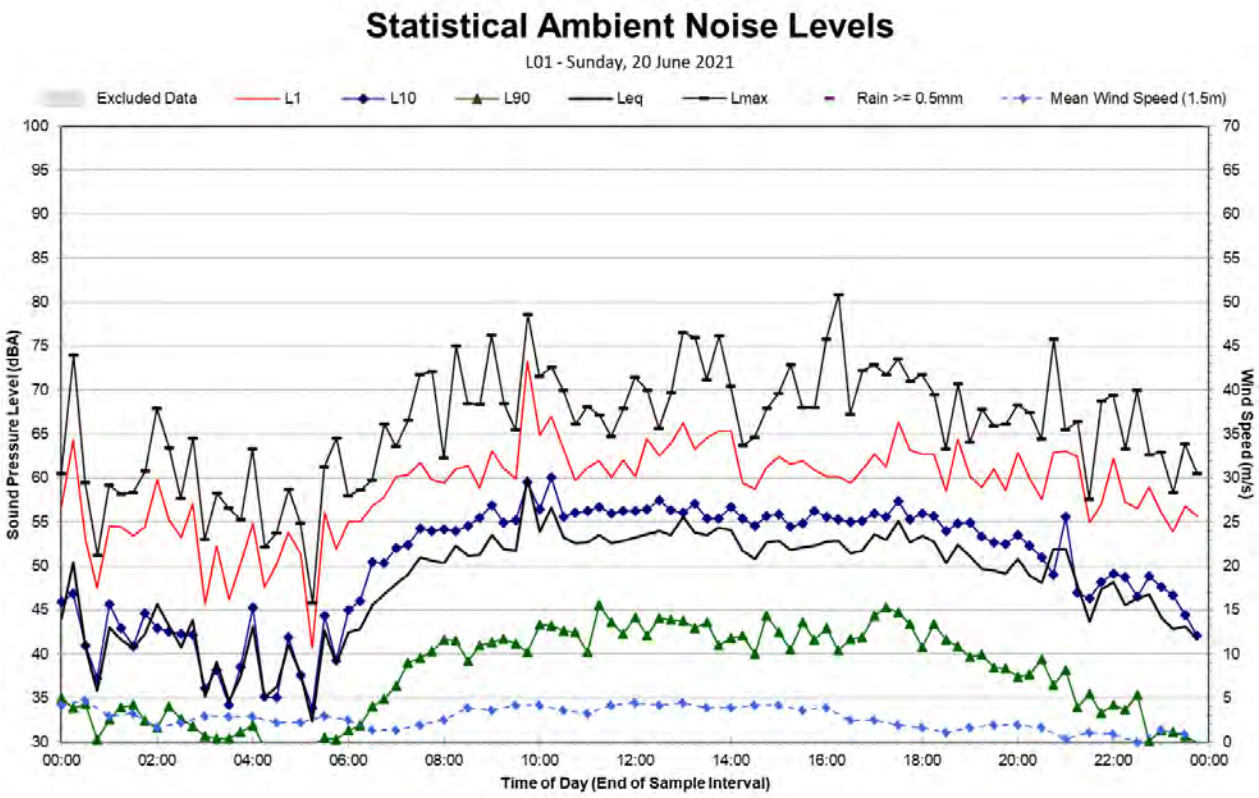
Daily Noise Monitoring Graphs

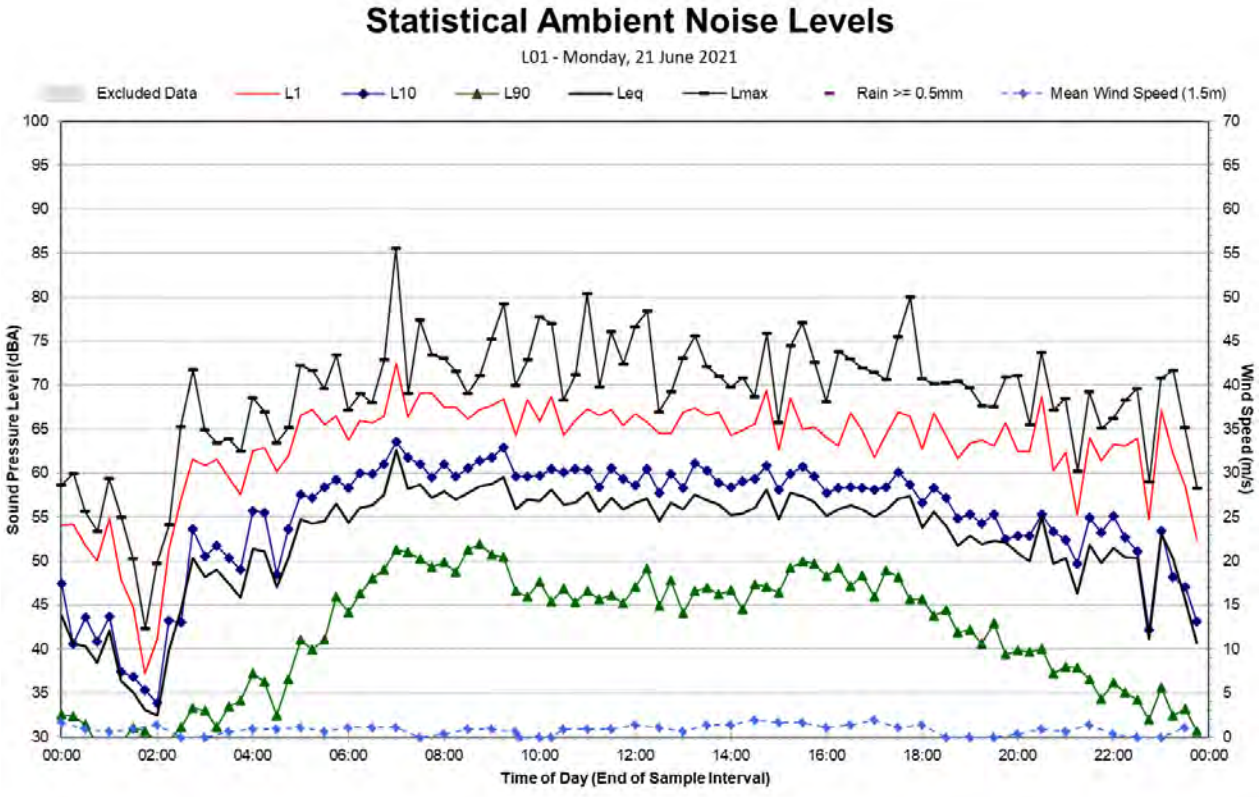

Statistical Ambient Noise Levels
L01 - Wednesday, 16 June 2021
Excluded Data
L1
L10
L90
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

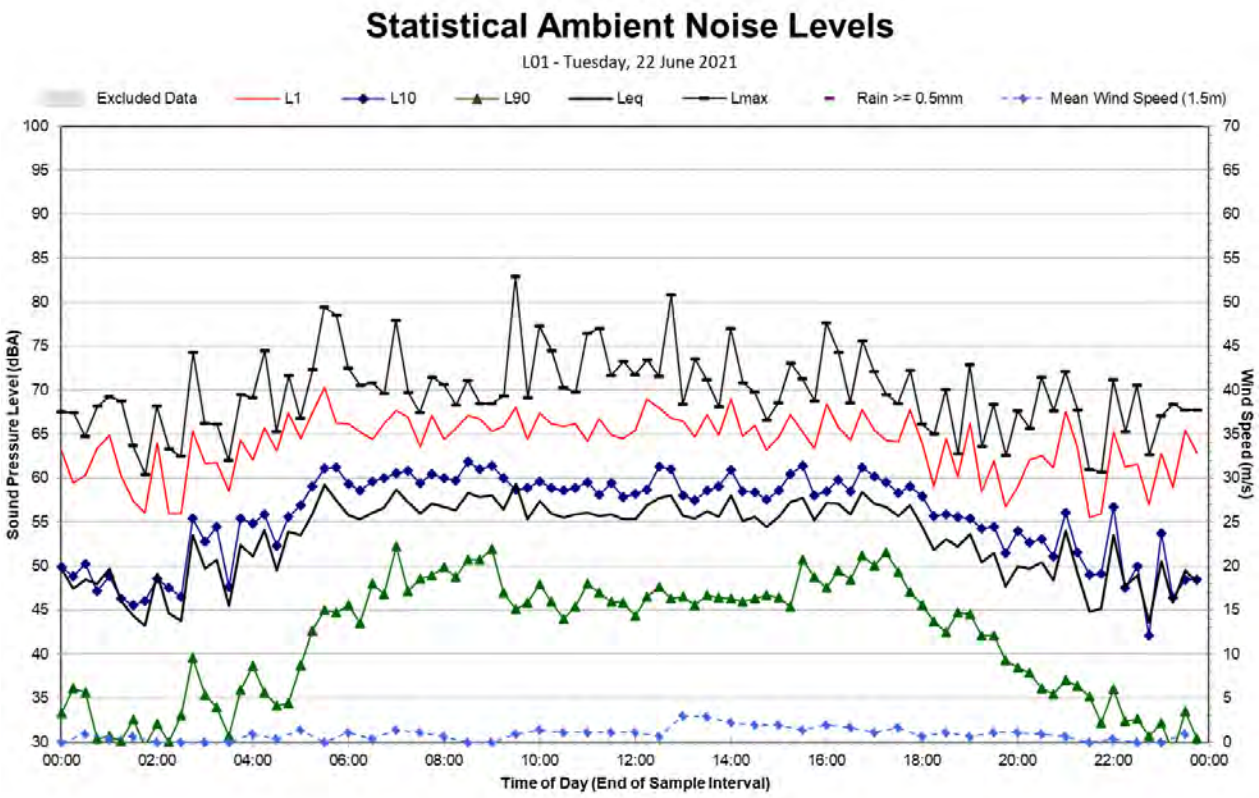

Statistical Ambient Noise Levels
L01 - Thursday, 17 June 2021
Excluded Data
L1
L10
L90
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

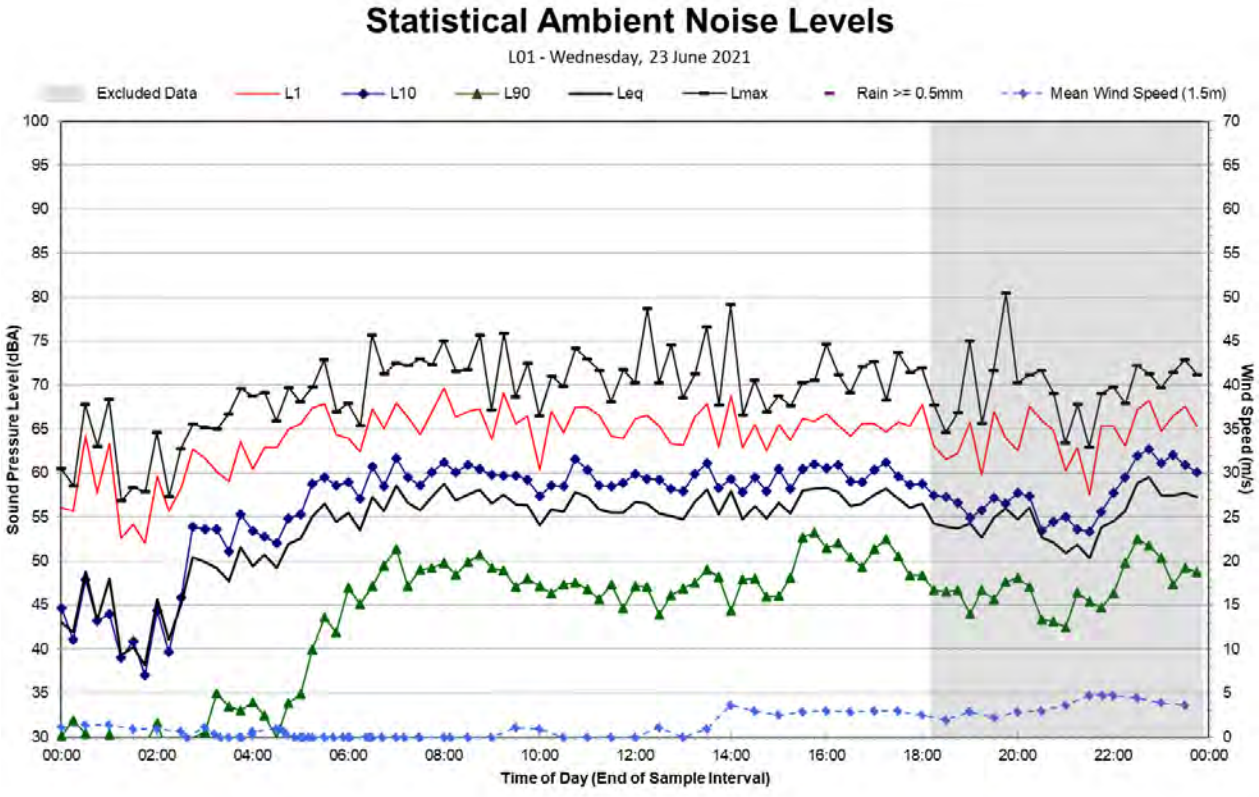

Statistical Ambient Noise Levels
L01 - Friday, 18 June 2021
Excluded Data
L1
L10
L90
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

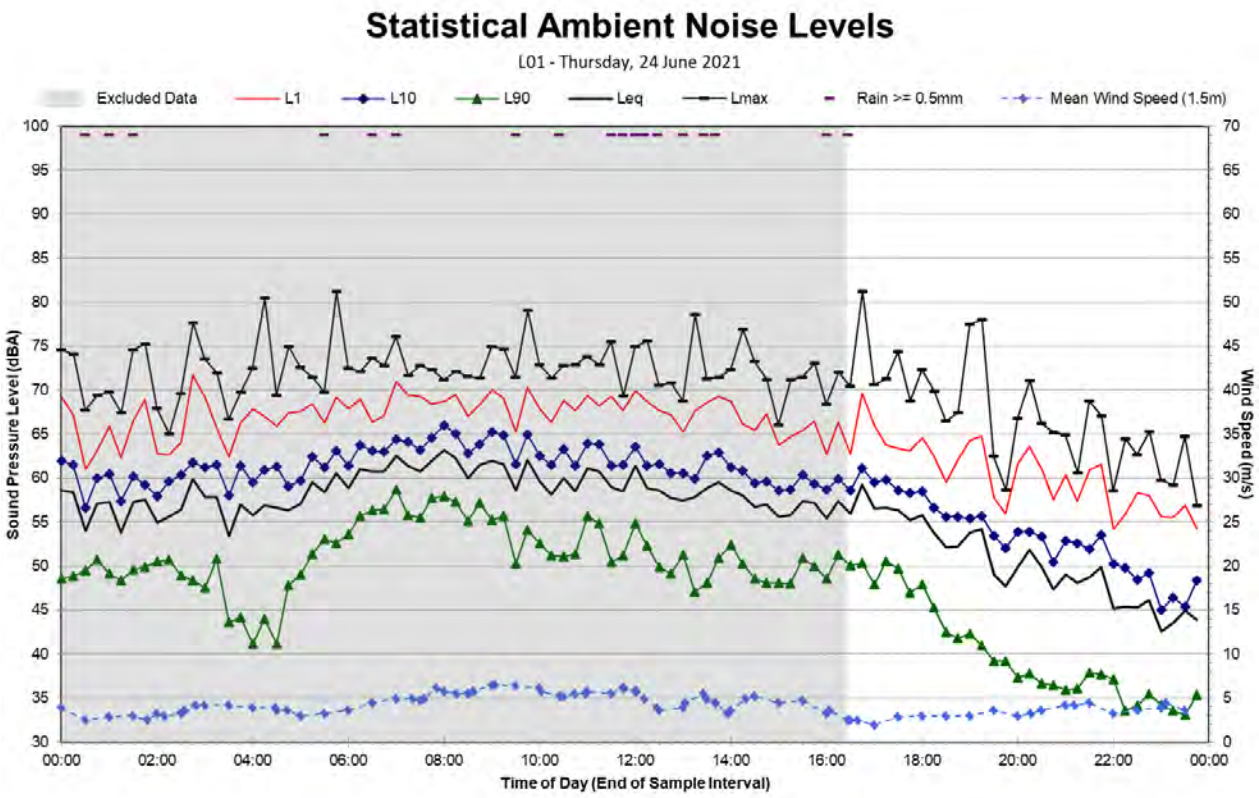

Statistical Ambient Noise Levels
L01 - Saturday, 19 June 2021
Excluded Data
L1
L10
L90
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

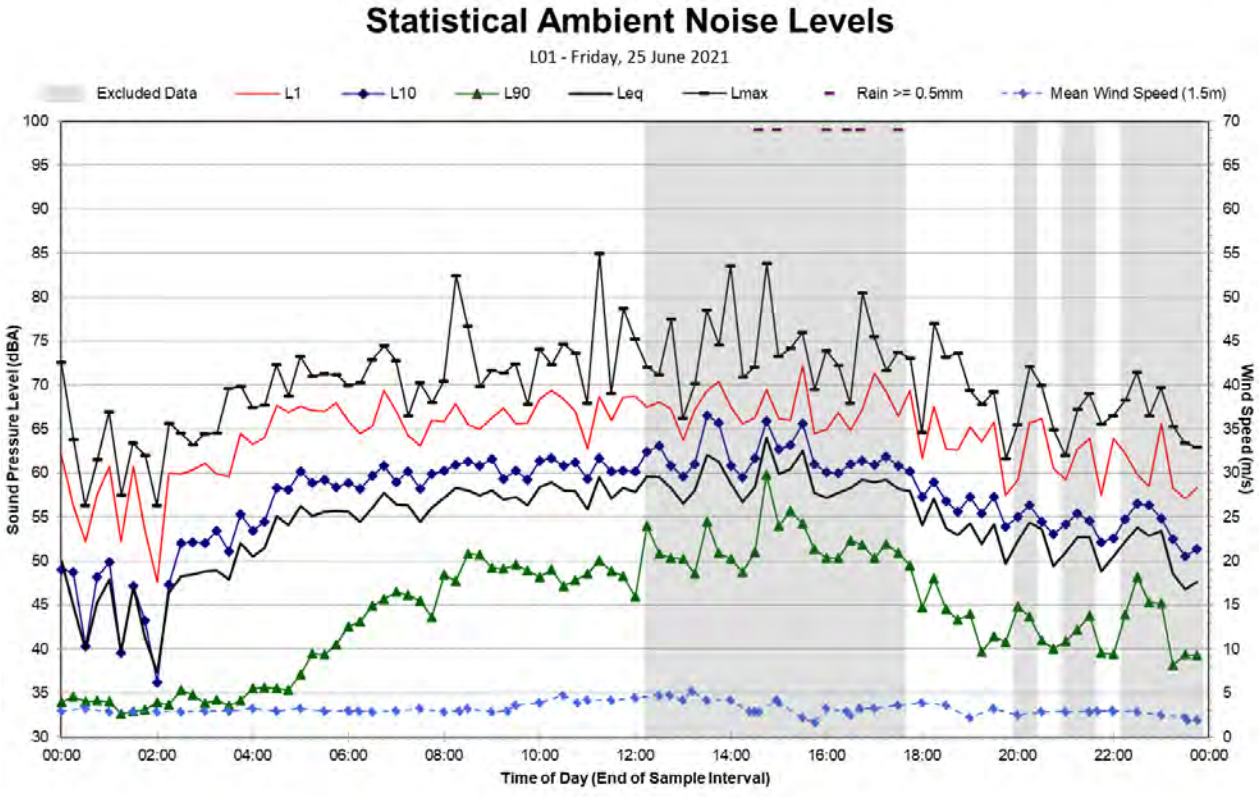

Statistical Ambient Noise Levels
L01 - Sunday, 20 June 2021
Excluded Data
L1
L10
L90
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

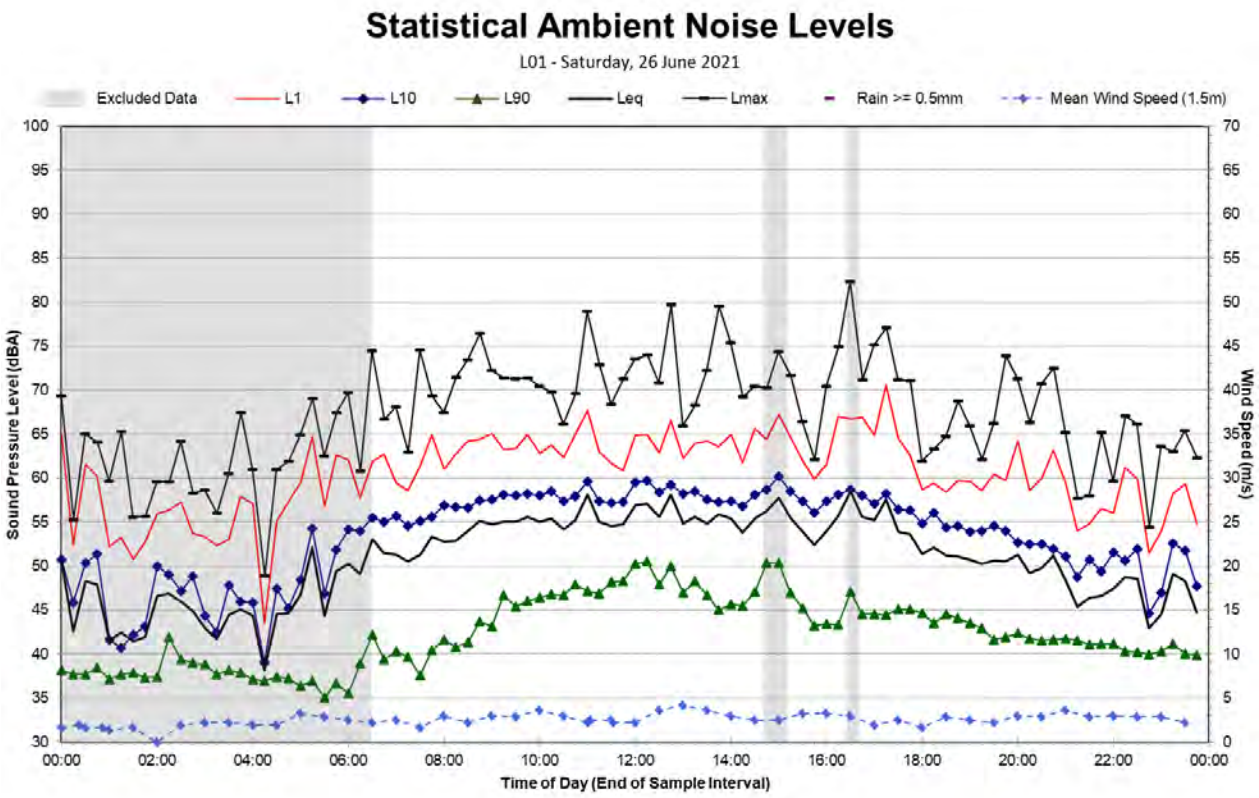

Statistical Ambient Noise Levels
L01 - Monday, 21 June 2021
Excluded Data
L1
L10
L90
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

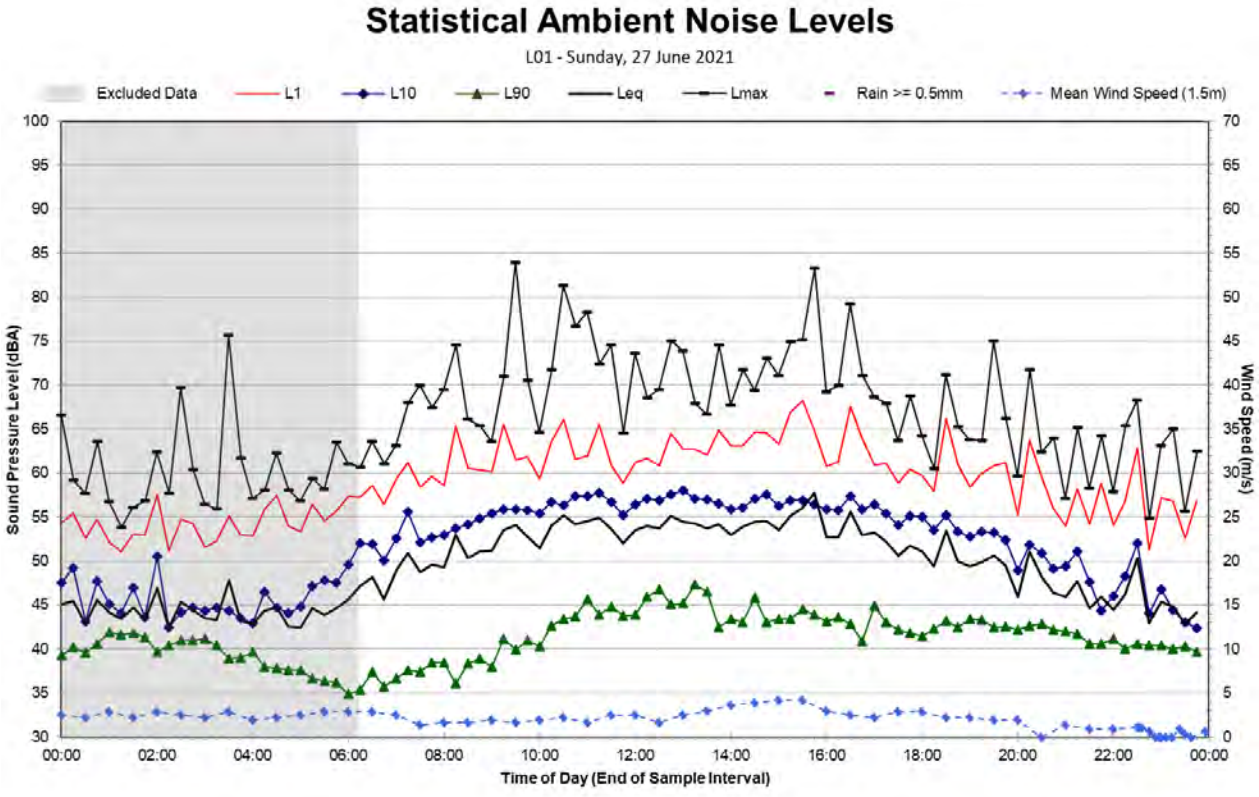

Statistical Ambient Noise Levels
L01 - Tuesday, 22 June 2021
Excluded Data
L1
L10
L90
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

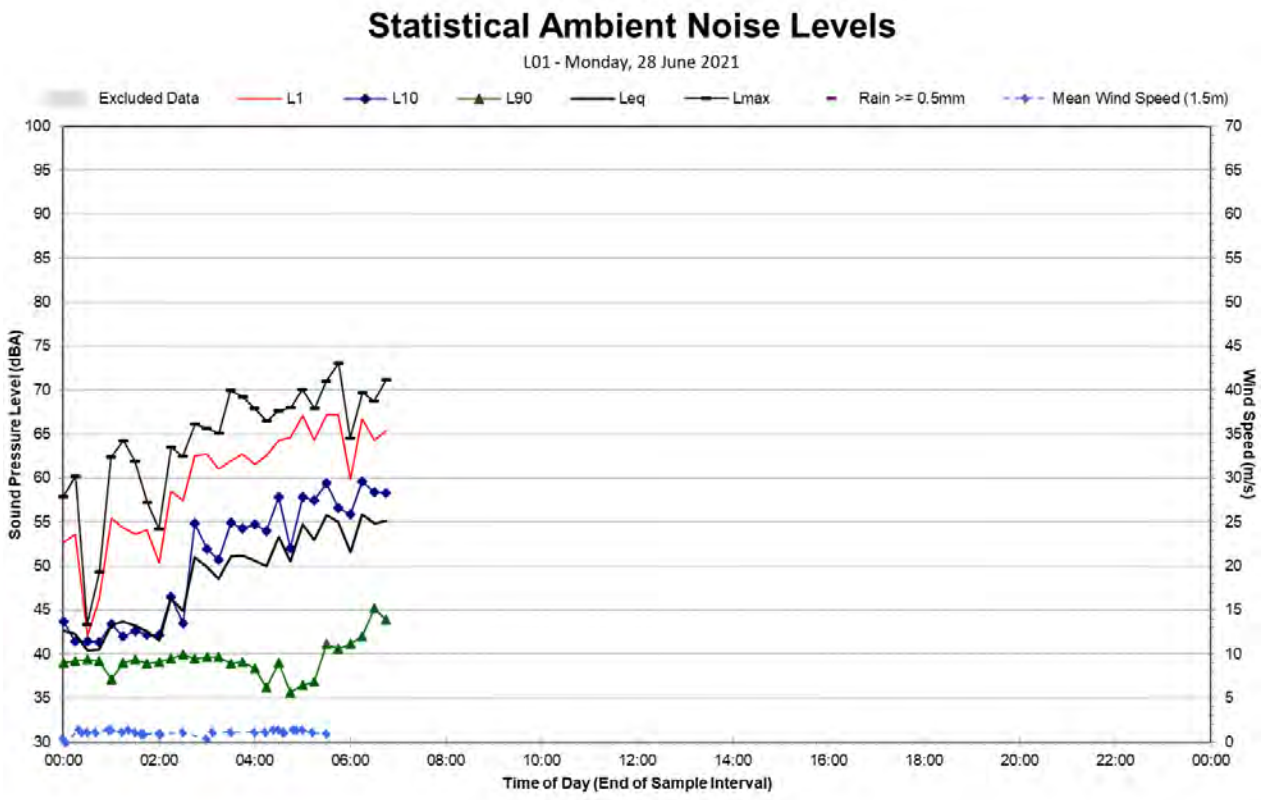

Statistical Ambient Noise Levels
L01 - Wednesday, 23 June 2021
Excluded Data
L1
L10
L90
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L01 - Thursday, 24 June 2021
Excluded Data
L1
L10
L90
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L01 - Friday, 25 June 2021
Excluded Data
L1
L10
L90
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L01 - Saturday, 26 June 2021
Excluded Data
L1
L10
L90
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L01 - Sunday, 27 June 2021
Excluded Data
L1
L10
L90
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L01 - Monday, 28 June 2021
Excluded Data
L1
L10
L90
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
70
65
60
55
50
45
40
35
30
25
20
15
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0
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04:00
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10:00
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22:00
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