

Transport
for NSW

M1 Pacific Motorway - Ourimbah Interchange Upgrade

Minor works review of
environmental factors

January 2023



Acknowledgement of Country

Transport for NSW acknowledges the traditional custodians of the land on which the M1 Pacific Motorway – Ourimbah Interchange Upgrade is proposed.

We pay our respects to Elders past and present and celebrate the diversity of Aboriginal people and their ongoing cultures and connections to the lands and waters of NSW.

Many of the transport routes we use today – from rail lines, to roads, to water crossings – follow the traditional Songlines, trade routes and ceremonial paths in Country that our nation’s First Peoples followed for tens of thousands of years.

Transport for NSW is committed to honouring Aboriginal peoples’ cultural and spiritual connections to the land, waters and seas and their rich contribution to society.



Document review tracking

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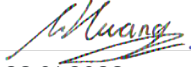
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Signed	
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1. Introduction

The purpose of the Minor Works review of environmental factors (REF) is to describe the proposal, to document the likely impacts of the proposal on the environment, to detail mitigation measures to be implemented and to determine whether or not the proposal can proceed. For the purposes of this work Transport for NSW (Transport) is the proponent and determining authority under Division 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The description of the proposed works and assessment of associated environmental impacts has been undertaken in the context of section 171 of the *Environmental Planning and Assessment Regulation 2021*, Guidelines for Division 5.1 Assessments (DPE, 2022), the *Biodiversity Conservation Act 2016 (NSW)* (BC Act), the *Fisheries Management Act 1994 (NSW)* (FM Act) and the *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)* (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 potential for the proposal to significantly impact a matter of national environmental significance, including nationally listed threatened biodiversity matters, or the environment of Commonwealth land. Where a significant impact is considered likely on nationally listed biodiversity matters, either the proposal must be reconsidered or a Project REF must be prepared.

2. The proposal

2.1 Description

2.1.1 Proposal location details

Table 2-1: Proposal location details

Location details	
Title	M1 Pacific Motorway – Ourimbah Interchange Upgrade
File number	
Road name and number	M1 Pacific Motorway
Closest crossroad(s)	Pacific Highway, Burns Road
Chainage of works	Not applicable
Local government area	Central Coast
Transport for NSW region	Northern

2.1.2 Proposal location description

Transport proposes to upgrade the M1 Pacific Motorway Ourimbah Interchange (the proposal). The proposal includes ramp upgrades to provide increased storage on both M1 Motorway northbound and southbound exit ramps, and signalisation of the western roundabout. The signalisation of the western roundabout is needed to address the incidence of traffic on the northbound exit queuing back onto the motorway. The location of the proposal is shown in Figure 2-1.



Figure 2-1: Location of the proposal

The proposal involves:

- Northbound exit ramp – widen pavement to increase queuing space
- Western roundabout – signalise the southern and the eastern leg; remove full circulation
- Southbound exit ramp – widen pavement to increase queuing space.

The proposed changes to the western roundabout include:

- Fully control the eastern and southern legs using traffic signals
- Move the stop line on the eastern leg forward by closing the eastern side of the circulation lanes to minimise inter-green times (the period between the end of a green period of one phase and the beginning of a green period of the next phase)
- Alter the lane configuration on the southern leg (off ramp) to allow for a double right turn to occur
- Lengthen the right lane of the southern leg to maximise queuing space.

Other aspects of the proposal include

- Traffic signal posts, lanterns and controller
- Adjustments to pavement drainage
- New static advance warning, exit and speed limit signs, and adjustments to existing signage
- Adjustments to line marking
- Removal of the existing crash cushion on the northbound and southbound exits and installation of a new crash cushion to suit modified exit
- Installation of removable bollards across the western roundabout circulation lanes which are to be closed
- Upgrade to safety barriers
- Tree removal to accommodate the proposed works and for sight distances
- Potential tree planting within the proposal area
- Grooving of concrete pavements on both roundabouts and all approaches to improve skid resistance.
- Resurfacing of asphaltic concrete pavements within the proposal area
- Upgrades to street light poles and luminaires where required
- Adjustments to underground electricity conduits to accommodate works.

Typical cross sections for the changes to the northbound exit and the southbound exit are provided in Figure 2-1 and Figure 2-2 respectively. An overview of the proposal is provided in Figure 2-4.

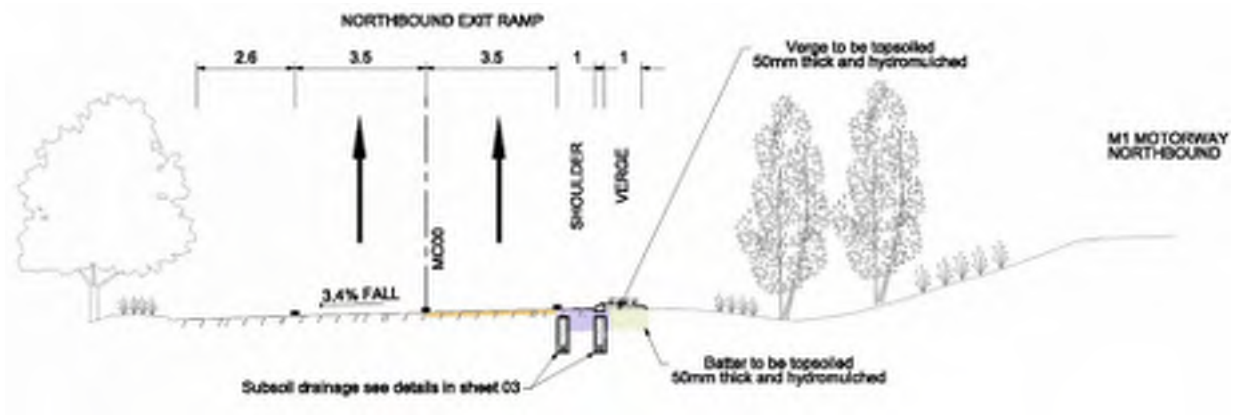


Figure 2-2: Typical cross section – northern exit

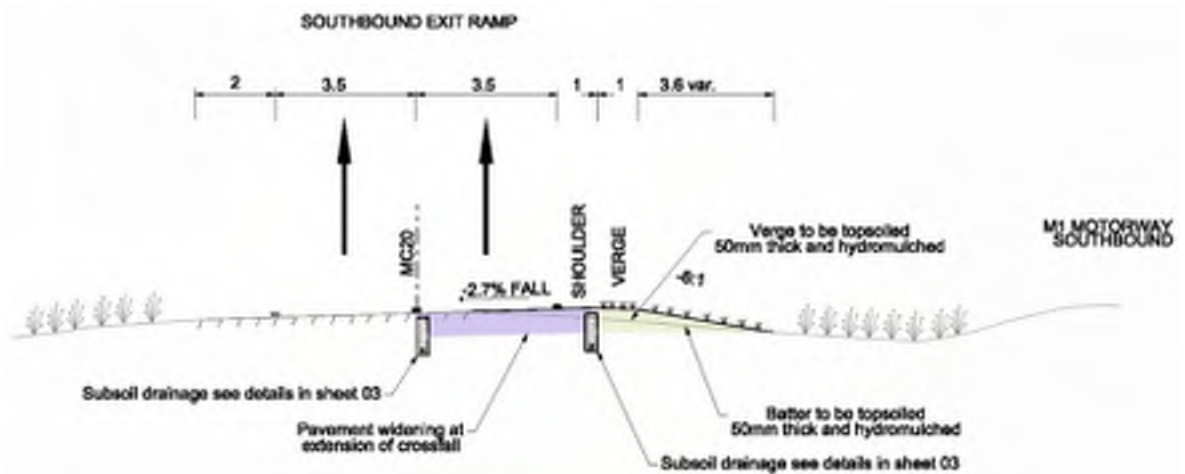


Figure 2-3: Typical cross section – southern exit

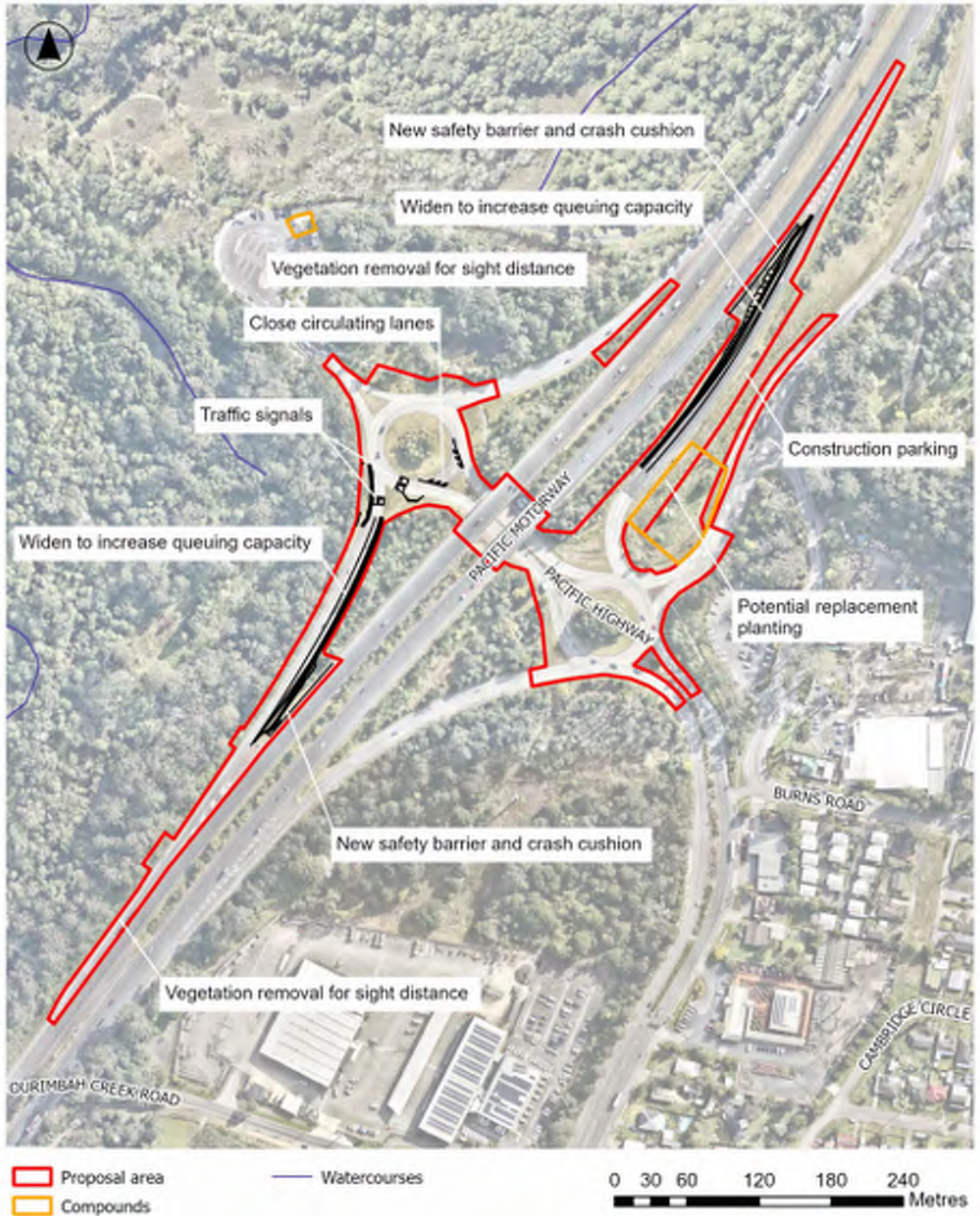


Figure 2-4: Overview of the proposal

2.1.3 Proposal objectives

The objectives of the proposal are to:

- Improve safety for motorists using the M1 Pacific Motorway Ourimbah Interchange
- Minimise environmental and social impacts
- Minimise disruptions to road users and the community

The objective of this project is to develop and deliver an interim upgrade solution to improve the efficiency and safety of the interchange, with an emphasis on improving the queuing traffic on the off ramps from the M1 Pacific Motorway. It is expected the solution will achieve the following outcomes:

- Ensure queuing on the off ramps from the Pacific Motorway are managed to be contained within the existing off ramps
- Maximise efficiency of the interchange to allow for motorists to travel in a safe and efficient manner
- Maintain suitable access to the rest area connecting to the western roundabout.

2.1.4 Ancillary facilities

Table 2-2: Ancillary facilities

Ancillary facilities		
<p>Will the proposal require the use or installation of a compound site?</p> <p>Two compound site facilities would be required for the proposal as shown on Figure 2-5 and Figure 2-6.</p> <p>The western compound site would have an area of about 210 square metres and would be used for site office, worker amenities and some storage. The eastern compound site would have an area of about 3000 square metres and would be used for worker amenities, plant laydown and temporary stockpiling.</p> <p>The Transport facility at Mardi would be used as the main office for the proposal.</p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<p>Will the proposal require the use or installation of a stockpile site?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Are any other ancillary facilities required (e.g. temporary plant, parking areas, access tracks)?</p> <p>Ancillary facilities such as temporary plant and off-site parking to support the works would be located within the two site compounds.</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>



Figure 2-5: Western compound site



Figure 2-6: Eastern compound site

2.1.5 Proposed date of commencement

The indicative date for the commencement of the upgrade is February / March 2023.

2.1.6 Estimated length of construction period

Weather permitting, the anticipated duration for the proposed works would be approximately four to six months.

2.2 Need and options

2.2.1 Options considered

The options considered for the proposal included:

- Option 1 – Do nothing
- Option 2 – Carry out interchange upgrade

The do-nothing option was discarded as it would not address Proposal Objective 1 (Improve safety for motorists). Option 2 addresses Proposal Objective 1 by minimising the risk of queuing back on to the northbound carriageway of the M1 Pacific Motorway. Option 2 would have some environmental impacts which would be minimised by the proposed safeguards and management measures, while native vegetation removal would be offset to ensure no net loss of biodiversity values consistent with the No net loss guidelines (Transport for NSW, 2022) and Tree and hollow replacement guidelines (Transport for NSW, 2022).

Two sub-options were considered for the widening of the southbound exit ramp.

- Sub Option 1 (widening of pavement to the eastern side of the southbound off-ramp)
- Sub Option 2 (widening of pavement to the western of the southbound off-ramp)

Sub Option 2 was selected as preferred because it would keep heavy vehicles in the left lane (safer lane arrangement) and would be easier to construct. These factors outweighed the slightly higher costs for this sub option.

2.2.2 Justification for the proposal

The proposal would improve safety conditions for motorists using the M1 Pacific Motorway Ourimbah Interchange. While the proposal would involve impacts to the surrounding environment, including biodiversity impacts, soil disturbance, visual and noise disturbance, the potential environmental impacts of the proposal have been identified as relatively minor and can be addressed by safeguards and offsets. On balance, the benefits derived from the proceeding with the proposal outweigh the potential impacts.

2.3 Statutory and planning framework

2.3.1 State Environmental Planning Policy (Transport and Infrastructure) 2021

The State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP (Transport and Infrastructure)) aims to facilitate the effective delivery of infrastructure across the state, including for roads and road infrastructure facilities. Section 2.109 of the SEPP (Transport and Infrastructure) 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 appropriately characterised as development for the purposes of a road or road infrastructure facilities and is to be carried out by or on behalf of Transport, it can be assessed under Division 5.1 of the EP&A Act. 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 (Resilience and Hazards) 2021,

State Environmental Planning Policy (Precincts – Eastern Harbour City) 2021, State Environmental Planning Policy (Precincts – Central River City) 2021, State Environmental Planning Policy (Precincts – Western Parkland City) 2021, State Environmental Planning Policy (Precincts – Regional) 2021 or State Environmental Planning Policy (Planning Systems) 2021.

2.3.2 Other relevant legislation and environmental planning instruments

Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) is administered by the NSW Environment Protection Authority (EPA). It provides an integrated system of licenses to set out protection of the environment policies and to adopt more innovative approaches to reduce pollution in the environment, having regard to the need to maintain ecologically sustainable development (ESD). Measures to address potential pollution as a result of the proposal have been prescribed in this Minor Works REF and are included in Sections 3.1 and 3.2.

The POEO Act requires an Environmental Protection Licence (EPL) for scheduled development work and the carrying out of scheduled activities. The proposal does not involve undertaking a scheduled activity and therefore an EPL would not be required.

Heritage Act 1977

The *Heritage Act 1977* provides for the conservation of buildings, work, relics and places that are of historic, scientific, cultural, social, archaeological, architectural, natural or aesthetic significance to the State.

An excavation permit is required to disturb or excavate any land knowing or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed. A permit is also required to disturb or excavate any land on which the person has discovered or exposed a relic. Section 139(4) of the *Heritage Act 1977* makes provision for the issuing of an exception in certain prescribed circumstances. There are no listed heritage items within or near the proposed area (refer to Section 3.5). An excavation permit would not be required for the proposal.

National Parks and Wildlife Act 1974

The proposal is not located on or near land reserved under the *National Parks and Wildlife Act 1979*.

The harming or desecrating of Aboriginal objects or places is an offence under section 86 of the *National Parks and Wildlife Act 1979*. Under section 90, an Aboriginal heritage impact permit may be issued in relation to a specified Aboriginal object, Aboriginal place, land, activity or person or specified types or classes of Aboriginal objects, Aboriginal places, land, activities or persons.

The potential impacts and relevant safeguards are discussed further in Section 3.5. No permits under the *National Parks and Wildlife Act 1979* are required for the proposal.

Environment Protection and Biodiversity Conservation Act 1999

Under the 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 Section 4.2.

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.

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 Climate Change, Energy, the Environment and Water under the EPBC Act.

2.4 Community and agency consultation

2.4.1 SEPP (Transport and Infrastructure) consultation

Part 2.2 of the SEPP (Transport and Infrastructure) contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. This is detailed below:

Table 2-3: Consultation required with Council

Is consultation with Council required under sections 2.10 -2.12 and 2.14 of the SEPP (Transport and Infrastructure)?		
Are the works likely to have a substantial impact on the stormwater management services which are provided by council?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
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?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Will the works involve connection to a council owned sewerage system? If so, will this connection have a substantial impact on the capacity of the system?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
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?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
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 <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Will the works involve more than a minor or inconsequential excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance? Any excavation of local roads would be minor and inconsequential, consultation with Council is not considered necessary.	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Is there a local heritage item (that is not also a state heritage item) or a heritage conservation area in the study area for the works? Heritage Item I182 listed on the Central Coast LEP as 'Dwelling house' is located at 2 Burns Road which is close to, but not within, the proposal area. The proposal would not impact the local heritage item.	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Is the proposal within the coastal vulnerability area and is inconsistent with a certified coastal management program applying to that land? Note: See interactive map at Coastal management - (nsw.gov.au) . 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.	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Are the works located on flood liable land? If so, will the works change flooding patterns to more than a minor extent? 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 Floodplain Development Manual: the management of flood liable land (nsw.gov.au).	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

Much of the proposal area is within the extent of the probable maximum flood (PMF) as identified in the Ourimbah Creek Flood Study (2013). The proposal does not include large areas of fill, increases in impervious surfaces or obstructions to overland flows. In this context, flooding patterns would not be affected to more than a minor extent.

Table 2-4: Consultation with other public authorities

Is consultation with a public authority (other than Council) required under sections 2.13, 2.15 and 2.16 of the SEPP (Transport and Infrastructure)?		
<p>Are the works located on flood liable land? (to any extent) (SEPP (Transport and Infrastructure) s2.13)</p> <p>If so, do the works comprise more than minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance?</p> <p>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 Floodplain Development Manual: the management of flood liable land (nsw.gov.au).</p> <p>The proposal area is within the extent of the PMF. A letter outlining the proposal and inviting comment was sent to the State Emergency Service (SES) on 18 November 2022. A response was received on 8 December 2022 noting that the site is at risk of flooding from Ourimbah Creek, as frequently as the 20% AEP flood (Ourimbah Creek Floodplain Risk Management Study and Plan 2019). The following advice was provided:</p> <ul style="list-style-type: none"> • Consider the impact of flooding on the infrastructure and the community using the infrastructure up to and including the PMF • Pursue, if relevant, site design and stormwater management that minimises any risk to the community • Ensure workers and people using the site during and after the upgrades are aware of the flood risk, for example by using signage • Notify the SES where there are likely to be significant delays in the operation of the roads affected by the upgrades. <p>The road and stormwater design has considered flooding potential. Safeguards have been added (see Section 3.2) to address flooding risk during construction and to ensure the SES is notified of any delays.</p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<p>Are the works adjacent to a national park, nature reserve or other area reserved under the <i>National Parks and Wildlife Act 1974</i>, or on land acquired under that Act?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Are the works on land in Zone C1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Do the works include a fixed or floating structure in or over navigable waters?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional facility or group home in bush fire prone land?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>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 kilometres of the Siding Spring Observatory)</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>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 Lockhart LEP 2012, Narrandera LEP 2013 and Urana LEP 2011).</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Are the works on land in a mine subsidence district within the meaning of the <i>Mine Subsidence Compensation Act 1967</i>?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

Table 2-5: Notification of council and occupiers of adjoining land

Do Council and occupiers of adjoining land need to be notified under section 2.110 of the SEPP (Transport and Infrastructure)?		
Does the proposal include a car park intended for the use by commuters using regular bus services?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Does the proposal include a bus depot?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Does the proposal include a permanent road maintenance depot or associated infrastructure, such as garages, sheds, tool houses, storage yards, training facilities and workers amenities?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

2.4.2 Other agency and community consultation

Central Coast Council was informed of the proposal via email on 20 October 2022.

A community notification will be delivered prior to works commencing and will cover expected traffic changes and impacts during construction.

3. Environmental assessment

This section provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposal. All aspects of the environmental potentially impacted upon by the proposal are considered. This includes consideration of the factors specified in section 171 of the Environmental Planning and Assessment Regulation 2021.

The matters of national environmental significance under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) are also considered in section 4. Site-specific safeguards are provided to ameliorate the identified potential impacts.

3.1 Soil

Table 3-1: Soil

Description of existing environmental and potential impacts		
<p>Are there any known occurrences of salinity or acid sulfate soils in the area?</p> <p>Acid sulfate risk mapping (accessed via datasets.seed.nsw.gov.au/dataset/acid-sulfate-soils-risk0196c) does not identify any risk of acid sulfate soil occurrence for the proposal area. The nearest areas of identified risk are shown by Figure 3-2. The Australian Soil Resource Information System maps the proposal area as probability class C for acid sulfate soils (extremely low probability of occurrence-1-5% chance of occurrence with occurrences in small localised area).</p> <p>Data from eSpade indicates the site and surrounding areas present a low salinity hazard, with no salting evident. Salinity related impacts from the proposed investigations are therefore not expected. Notwithstanding, safeguards have been proposed to minimise the potential for impacts on land and nearby watercourses.</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Does the proposal involve the disturbance of large areas (e.g., >2ha) for earthworks?</p> <p>The total disturbance area for the proposal would be up to 5.5 hectares. Most of this area comprises existing pavements. Earthworks would be limited to widening of the northbound and southbound exists, signage foundations and adjustments to underground electricity connections.</p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<p>Does the site have constraints for erosion and sedimentation controls such as steep gradients or narrow corridors?</p> <p>Parts of the site, particularly adjacent to the northbound exit are narrow. This will need to be appropriately considered in developing the erosion and sediment control plan for the proposal.</p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<p>Are there any sensitive receiving environments that are located in or nearby the likely proposal area or that would likely receive stormwater discharge from the proposal?</p> <p>Sensitive receiving environments include (but are not limited to) wetlands, state forests, national parks, nature reserves, rainforests, drinking water catchments).</p> <p>Part of the proposal area is identified as drinking water catchment under the Central Coast Local Environmental Plan 2022 (Central Coast LEP) (refer to Figure 3-1). While the drinking water catchment provisions of the Central Coast LEP do not directly apply to the proposal, measures have been proposed to address potential water quality impacts.</p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<p>Is there any evidence within or nearby the likely footprint of potential contamination?</p> <p>Searches of EPA Contaminated Land Register (04/10/2022) and list of sites notified to EPA (as at 04/10/22) returned no records within the proposal area. The list of sites notified to EPA returned one result of a service station near the proposal area (at 78-80 Pacific Highway, Ourimbah, about 110 metres to the south-east). The record notes that regulation under the Contaminated Land Management Act is not required for this site.</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

During an inspection of the site on 1 September 2022, litter and dumped household waste was observed within the proposal. No building materials or suspected asbestos containing materials were noted.		
Is the likely proposal footprint in or nearby highly sloping landform?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Is the proposal likely to result in more than 2.5ha (area) of exposed soil? The total disturbance area for the proposal would be up to 5.5 hectares. Most of this area comprises existing pavements. Earthworks would be limited to widening of the northbound and southbound exists, signage foundations and adjustments to underground electricity connections. The works would be progressively stabilised and as a result the area of exposed soil would not exceed 2.4 hectares at any one time.	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>



Figure 3-1: Drinking water catchment (Central Coast LEP 2022)

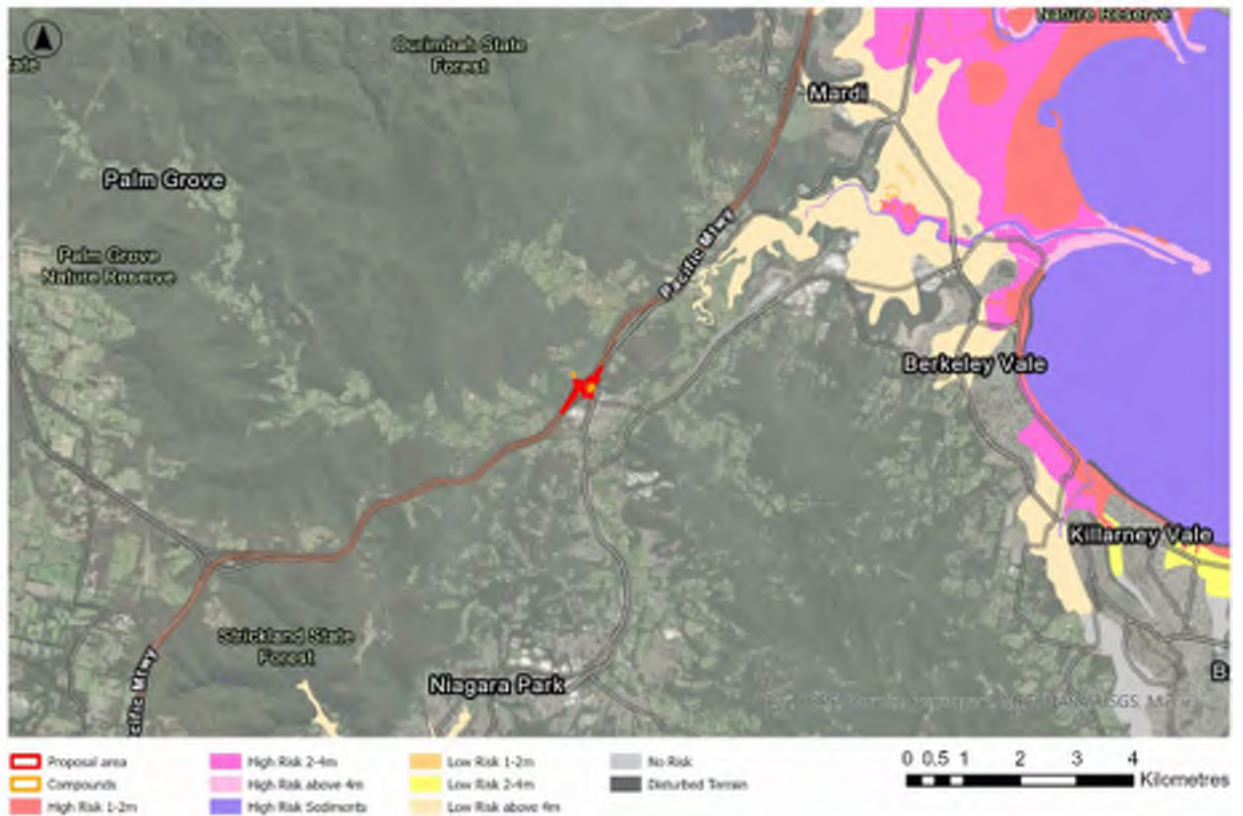


Figure 3-2: Acid sulfate soil risk (Department of Planning and Environment, 1998)

Safeguards

Safeguards to be implemented are:

S1	An Erosion and Sediment Control Plan (ESCP) would be prepared in accordance with the publication Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book, Landcom 2004), outlining measures to be implemented and maintained to: <ul style="list-style-type: none"> • Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets • Reduce water velocity and capture sediment on site • Minimise the amount of material transported from site to surrounding pavement surfaces • Divert clean water around the site.
S2	Erosion and sedimentation controls are to be checked and maintained on a regular basis (including clearing of sediment from behind barriers) and records kept and provided on request.
S3	Erosion and sediment control measures are not to be removed until the works are complete, and areas are stabilised.
S4	Existing ground cover vegetation will be retained to the greatest extent possible to minimise the area of exposed soils.
S5	If contaminated areas are encountered during investigations, appropriate control measures will be implemented to manage the immediate risks of contamination. All other works 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 are identified in consultation with the Transport for NSW Environment Manager and/or EPA.

3.2 Waterways and water quality

Table 3-2: Waterways and water quality

Description of existing environmental and potential impacts		
<p>Is the proposal located within, adjacent to or near a waterway?</p> <p>The proposal area is near Ourimbah Creek (the nearest tributaries being about 80 metres to the west). There would be no impacts on any creek channels or banks. Safeguards have been proposed to address potential water quality impacts.</p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<p>Is the location known to flood or be prone to water logging?</p> <p>Much of the proposal area is within the extent of the probable maximum flood (PMF) and parts of the study area are at risk of flooding from Ourimbah Creek, as frequently as the 20% AEP flood as identified in the Ourimbah Creek Floodplain Risk Management Study and Plan 2019. The proposal does not include large areas of fill, increases in impervious surfaces or obstructions to overland flows. In this context, flooding patterns would not be affected to more than a minor extent.</p> <p>Most of the proposal site is constructed motorway and is not subject to waterlogging.</p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<p>Is the proposal located within or immediately adjacent to the area managed by WaterNSW covered by chapter 8 of State Environmental Planning Policy (Biodiversity and Conservation) 2021 (SEPP (Biodiversity and Conservation))?</p> <p>Note: See map here - Sydney drinking water catchment map.</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Would the proposal be undertaken on a bridge or ferry?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Is the proposal likely to require the extraction of water from a local water course</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

Safeguards

Safeguards to be implemented are:

WQ1	There is to be no release of dirty water into drainage lines and/or waterways.
WQ2	Water quality control measures are to be used to prevent any materials (e.g. bentonite, grout, sediment etc) entering drain inlets or waterways.
WQ3	Plant and equipment will be inspected regularly to ensure there are no leakages of fuel, oil and hydraulic fluid.
WQ4	All fuels, chemicals and liquids will be stored in an impervious bunded area within the compound site when not in use.
WQ5	If refuelling of plant and equipment is required on site it will take place on flat ground only using 20 litre drums within a bunded area large enough to contain 120 per cent of the container's contents.
WQ6	If an incident (e.g. spill) occurs, the Environmental Incident Procedure (Transport for NSW, 2021) is to be followed and the Transport for NSW Contract Manager and Environment Manager notified immediately.
WQ7	An emergency spill kit will be kept on site at all times. All staff are to be made aware of the location of the spill kit and trained in its use.
WQ8	Visual monitoring of local water quality (ie turbidity, hydrocarbon spills/slicks) is to be undertaken on a regular basis to identify any potential spills or deficient silt curtains or erosion and sediment controls.
WQ9	A flood management procedure will be prepared to detail procedures to be implemented where extreme weather is predicted and where there is a risk of flooding affecting the work site and compounds, including removal and storage of plant and equipment and securing of site.
WQ10	The SES will be notified in advance should substantial delays to the operation of the motorway or adjacent road network be expected during construction.

3.3 Noise and vibration

Are there any residential properties or other noise sensitive areas near the location of the proposal that may be affected by the work (i.e., church, school, hospital)?

Table 3-3: Noise and vibration

Description of existing environmental and potential impacts																								
<p>During construction?</p> <p>The nearest noise sensitive receivers are about 100 metres from the proposal area, on the eastern side of the Pacific Highway. Residences on Burns Road are located at a distance of about 140 metres.</p> <p>Potential noise impacts are discussed below.</p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>																						
<p>During operation?</p> <p>Impacts generated by the operational phase of the proposal will be similar to the current environment.</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>																						
<p>Is the proposal going to be undertaken only during standard working hours?</p> <p>Due the large volume of traffic passing through the motorway interchange, most works would need to take place during periods outside of standard working hours when traffic volumes are reduced. Where required, night works would be 7pm to 5am, up to seven days per week.</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>																						
<p>Is any explosive blasting required for the proposal?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>																						
<p>Would construction noise or vibration from the proposal affect sensitive receivers?</p> <p>Noise calculations have been conducted in accordance with the Construction Noise and Vibration Guideline (Transport for NSW, 2022) and associated estimator tool. Recognising the vehicle types, traffic volumes and speeds on the nearby road network, representative noise environment R4 from the estimator was used with the Distance Based Assessment (Construction Scenario) worksheet. Paving and asphaltting was the construction scenario used for assessment, developed settlements was adopted as the landscape type and a line of sight to the nearest receivers was assumed.</p> <p>Key assessment results for the paving and asphaltting scenario are summarised below (refer also to Figure 3-2).</p> <table border="1"> <thead> <tr> <th>Noise impact (day)</th> <th>Distance (m)</th> </tr> </thead> <tbody> <tr> <td>Affected distance (>NML)</td> <td>70</td> </tr> <tr> <td>Moderately intrusive (20-30 dBA > Background)</td> <td>20</td> </tr> <tr> <td>Highly intrusive (>30 dBA > Background)</td> <td>20</td> </tr> <tr> <td>Highly noise affected (> 75 dBA)</td> <td>20</td> </tr> </tbody> </table> <p>Noting that works outside of standard hours would be required, the estimator was also used to calculate the extent of noise impacts during night works which are summarised below.</p> <table border="1"> <thead> <tr> <th>Noise impact (night)</th> <th>Distance (m)</th> </tr> </thead> <tbody> <tr> <td>Affected distance (>NML)</td> <td>280</td> </tr> <tr> <td>Clearly audible (10-20 dBA > Background)</td> <td>180</td> </tr> <tr> <td>Moderately intrusive (20-30 dBA > Background)</td> <td>70</td> </tr> <tr> <td>Highly intrusive (>30 dBA > Background)</td> <td>20</td> </tr> <tr> <td>Highly noise affected (> 75 dBA)</td> <td>20</td> </tr> </tbody> </table>	Noise impact (day)	Distance (m)	Affected distance (>NML)	70	Moderately intrusive (20-30 dBA > Background)	20	Highly intrusive (>30 dBA > Background)	20	Highly noise affected (> 75 dBA)	20	Noise impact (night)	Distance (m)	Affected distance (>NML)	280	Clearly audible (10-20 dBA > Background)	180	Moderately intrusive (20-30 dBA > Background)	70	Highly intrusive (>30 dBA > Background)	20	Highly noise affected (> 75 dBA)	20	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Noise impact (day)	Distance (m)																							
Affected distance (>NML)	70																							
Moderately intrusive (20-30 dBA > Background)	20																							
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Highly intrusive (>30 dBA > Background)	20																							
Highly noise affected (> 75 dBA)	20																							

<p>The results indicate that noise management levels could be exceeded at the nearest receiver (one receiver on the Pacific Highway) during day works and at a number of receivers at night. Moderately or highly intrusive noise is not expected at the nearest receivers and no receivers have been identified as highly noise affected as a result of the proposal.</p> <p>Residences along the Pacific Highway and on Burns Road, within 280 metres of the proposal area, would be notified a minimum of five working days prior to the start of works.</p> <p>Respite periods R1 (no more than three consecutive evenings per week, separated by not less than one week and no more than six evenings per month) and R2 (limited to two consecutive nights separated by not less than one week and no more than six nights per month) are not proposed as substantially they would increase the duration of construction and are likely to be counterproductive in reducing the impact on the community. Duration respite (increasing the number of night shifts to reduce the overall duration of the impact) is therefore proposed and would be raised with potentially affected receivers as part of pre-work notifications.</p>		
<p>Would operation of the proposal alter the noise environment for sensitive receivers? This might include, but not be limited to, altering the line or level of an existing carriageway, changing traffic flow, adding extra lanes, increasing traffic volume, increasing the number of heavy vehicles, removing obstacles that provide shielding including changing the angle of view of the traffic, changing the type of pavement, increasing traffic speeds by more than 10 km/hour or installing audio-tactile line markings.</p> <p>The proposal would not increase traffic volumes, change traffic speeds, alter the traffic mix (light vehicles / heavy vehicles) or move traffic lanes closer to sensitive receivers. In this context, operational traffic noise impacts from the proposal are not expected. The installation of traffic lights on the western roundabout could increase noise associated with stop start movements, however given the distance to the nearest receivers (and the intervening bridge structures and embankments) this is not likely to lead to an increase in maximum noise level events at the nearest receivers.</p>	<p>Yes <input type="checkbox"/></p>	<p>No <input checked="" type="checkbox"/></p>
<p>Would the proposal result in vibration being experienced by any surrounding properties or infrastructure during operation?</p>	<p>Yes <input type="checkbox"/></p>	<p>No <input checked="" type="checkbox"/></p>
<p>Operation of plant and equipment during construction would comply with the recommended minimum working distances for vibration intensive plant specified in Section 7.1 of the Construction Noise and Vibration Guideline (Transport for NSW, 2022). Construction related vibration impacts are therefore not expected.</p>		

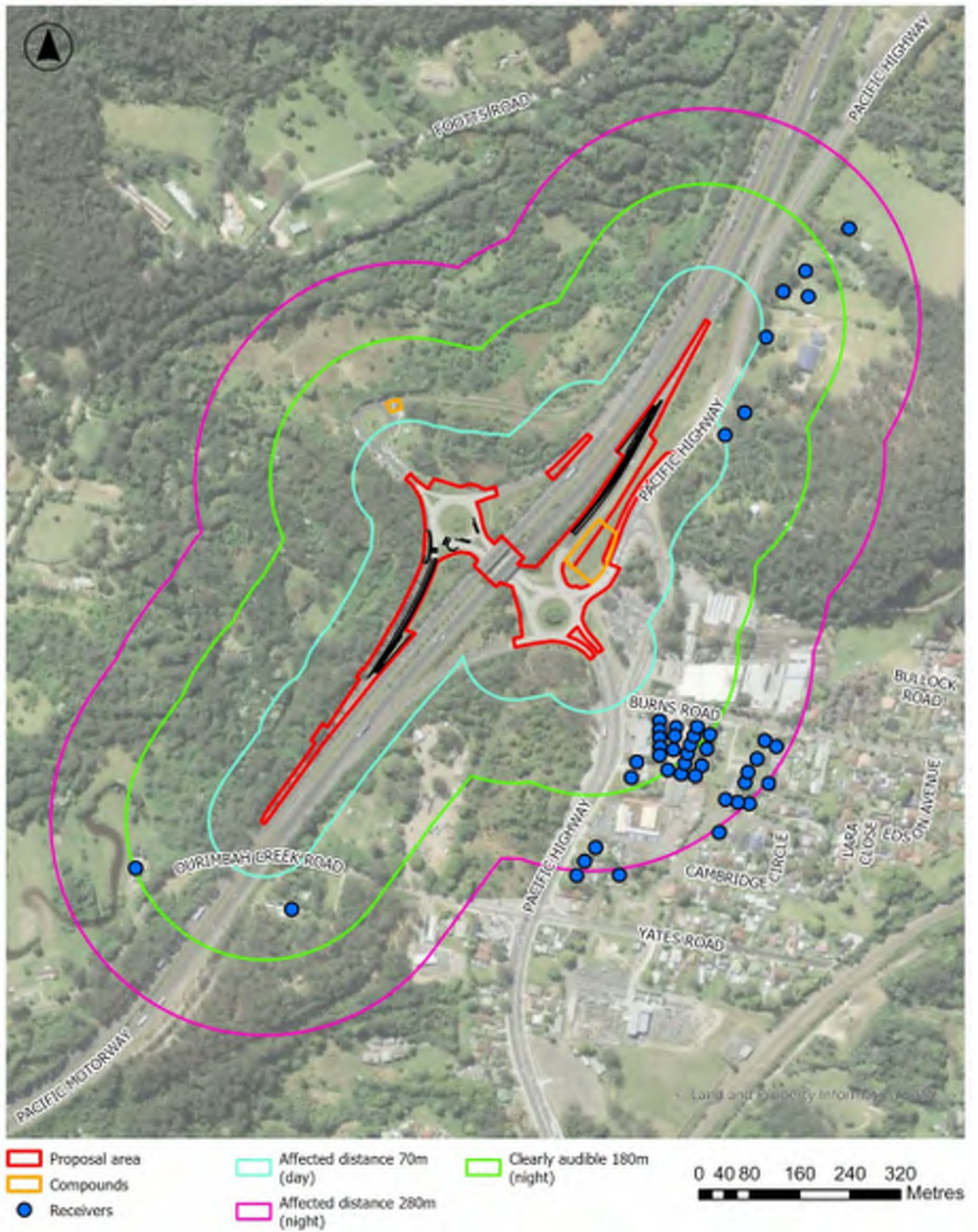


Figure 3-3: Noise affected distances

Safeguards

Safeguards to be implemented are:

NV1	The standard mitigation measures identified in Appendix B of the Construction Noise and Vibration Guideline (Transport for NSW, 2022) will be implemented.
NV2	Where works are proposed to take place outside of standard working hours (Monday-Friday: 7:00am to 6.00pm, Saturday: 8.00am to 1.00pm, Sunday and Public Holidays: no work), residences within 280 metres of the proposal are to be notified a minimum of five working days prior to the start of works: The notification will include information about the proposed works, the hours of work, duration of impacts and a Transport for NSW contact.

3.4 Air quality

Table 3-4: Air quality

Description of existing environmental and potential impacts		
Is the proposal likely to result in large areas (>2ha) of exposed soils?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Are there any dust-sensitive receivers located within the vicinity of the proposal during the construction period? The nearest residential receivers are about 100 metres from the proposal area, while users of the western rest area are largely screened from the proposal site by intervening vegetation. The nearest receivers are not likely to be affected by localised dust from the proposal.	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Is there likely to be an emission to air during construction? Minor exhaust emissions from equipment and vehicles would occur. It is anticipated that the proposal would not result in a material increase in air pollution due to the small number of vehicles to be used and the high traffic volumes on the M1 Motorway.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

Safeguards

Safeguards to be implemented are:

AQ1	Works are not to be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely.
AQ2	Vehicles transporting waste or other materials that may produce odours or dust are to be covered during transportation.

3.5 Aboriginal heritage

Table 3-5: Aboriginal heritage

Description of existing environmental and potential impacts		
Would the proposal involve disturbance in any area that has not been subject to previous ground disturbances? The proposal area is confined to the site of a major motorway interchange, which has been subject to major disturbance. Refer to the proposed safeguards which seek to minimise impacts to Aboriginal heritage.	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

<p>Has an online Aboriginal Heritage Information Management System (AHIMS) search been completed?</p> <p>AHIMS search completed on 13/10/2022 returned no results for Aboriginal places or sites in the proposal area or surrounds (search included in Appendix D).</p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<p>Is there potential for the proposal to impact on any items of Aboriginal heritage?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Would the proposal involve the removal of mature native trees?</p> <p>Retention and protection of mature trees will take place where possible, to manage biodiversity impacts, as per the proposed biodiversity safeguards.</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Is the proposal consistent with the requirements of the legacy <i>Roads and Maritime Procedure for Aboriginal cultural heritage consultation and investigation (PACHCI)</i>?</p> <p>Advice from the Aboriginal Community and Heritage Partner dated 18 November 2022 indicates that the proposal is within disturbed areas and is unlikely to harm known Aboriginal objects or places (refer to Appendix D).</p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

Safeguards

Safeguards to be implemented are:

AH1	If Aboriginal heritage items are uncovered during the works, all works must cease in the vicinity of the find and the Transport for NSW Aboriginal cultural heritage advisor and the Environment Manager contacted immediately. The steps in the Standard Management Procedure: Unexpected Heritage Items (Roads and Maritime Services, 2015) must be followed.
AH2	Site inductions will cover the requirement to avoid impacts on Aboriginal sites.
AH3	All vehicles will use access tracks within the project boundary and existing parking areas at all times.

3.6 Non-Aboriginal heritage

Table 3-6: Non-Aboriginal heritage

Description of existing environmental and potential impacts		
<p>Have online heritage database searches been completed?</p> <ul style="list-style-type: none"> Transport (including legacy Roads and Maritime) section 170 register (searched 05/10/22) NSW Heritage database (searched 04/10/22) Commonwealth Heritage List, established under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) (searched 05/10/22) Central Coast Local Environmental Plan 2022 schedule 5 (searched 05/10/2022). 	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<p>Are there any items of non-Aboriginal heritage or heritage conservation areas listed on relevant heritage databases/registers that are located within the vicinity of the proposal?</p> <p>Heritage Item I182 listed on the Central Coast LEP as ‘Dwelling house’ is located at 2 Burns Road which is close to, but not within, the proposal area.</p> <p>The proposal would not impact the local heritage item.</p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<p>Is the proposal likely to occur in or near features that indicate potential archaeological remains?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

Safeguards

Safeguards to be implemented are:

H1	If unexpected archaeological remains are uncovered during the works, all works must cease in the vicinity of the material/find and the steps in the Standard Management Procedure: Unexpected Heritage Items (Roads and Maritime Services, 2015) must be followed. The Transport for NSW Environment Manager must be contacted immediately.
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3.7 Biodiversity

Table 3-7: Biodiversity

Description of existing environmental and potential impacts		
<p>Have relevant database searches been carried out?</p> <p>During October 2022, the relevant database searches were carried out:</p> <ul style="list-style-type: none"> • Protected Matters Search Tool (10km buffer on study area) • Register of critical habitat • BioNet Atlas (10km buffer on study area) • Areas of Outstanding Biodiversity Value register • NSW WeedWise Database (Greater Sydney) • Fisheries NSW Spatial Data Portal (Central Rivers layer) • BioNet Vegetation Classification database • Biodiversity Values Map and Threshold Tool (study area) • PlantNet • SEED map viewer (study area) • Threatened Species website • Groundwater Dependent Ecosystems Atlas (study area) • National Flying-fox monitoring viewer (study area) <p>Biodiversity Assessment Report (BAR) has also been prepared for the proposal (Appendix C) and was informed by field surveys.</p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<p>Did the database searches identify any endangered ecological communities, threatened flora and/or threatened or protected fauna, or migratory species in or within the vicinity of the proposed works? Both Commonwealth and State listed matters must be considered.</p> <p>The key findings of the BAR are identified below:</p> <p>Vegetation</p> <p>The botanical survey determined that the plant community type (PCT) present within the entire proposal area conformed to PCT 0 (Non-native vegetation).</p> <p>Adjacent to the northbound on and off ramps, a mesh security fence separates the works area from the adjacent woodlands. Beyond this fencing, PCT 1528 Jackwood – Lilly Pilly – <i>Sassafras riparian</i> warm temperate rainforest of the Central Coast was identified in the low alluvial soil vegetated areas and southbound riparian.</p> <p>PCT 1528 is associated with the endangered ecological community (EEC) known as Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions (BC Act Endangered, EPBC Act not listed). Excluding the trimming of some overhanging branches that are limiting views of the existing signage, no impact on this Endangered Ecological Community (EEC) would occur. The proposal would not reduce the extent of this EEC, nor fragment or further isolate the stand from proximate woodland areas. Beyond existing conditions, the works would not introduce pathogens, weeds or other threats to the viability of this EEC, nor will it reduce the extent of its habitat. As no impact on this EEC will arise, and as it occurs beyond the limits of the works, no assessments drawing on the criteria provided under Section 7.3 of the BC Act are required.</p> <p>Threatened flora</p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

<p>No NSW or nationally listed threatened plants are likely to be present or adversely impacted by the proposal.</p> <p>Threatened fauna</p> <p>Of those fauna species recorded, one, the Black-faced Monarch (<i>Monarcha melanopsis</i>) is listed as a Migratory/Marine species under the EPBC Act.</p> <p>One Black-faced Monarch was heard calling from the vegetation to the north-west of the existing north-bound on-ramp. During the course of the investigation, no individuals were heard calling or observed within the required clearing areas. With the retention of the adjacent bushland areas, no habitat for this species would be cleared, and no barriers to its movement patterns imposed.</p> <p>None of the other recorded species are listed, or currently being considered for listing, under the EPBC or BC Acts.</p>		
<p>Is the proposal likely to impact nationally listed threatened species, ecological communities or migratory species?</p> <p>EPBC Act listed threatened species and communities were not identified as present or likely to be present at the proposal site. Potential impacts on the Black-faced Monarch (<i>Monarcha melanopsis</i>) (listed as a Migratory/Marine species under the EPBC Act), are considered above.</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Would the proposal require the removal of any other vegetation?</p> <p>Removal of up to 1.1 hectares of native and exotic species would be required as part of the proposal, although 0.8 hectares of this area has been subject to regular maintenance. The impacted vegetation includes 36 trees (19 small trees and 17 medium trees) as defined by the Tree and hollow replacement guidelines (transport for NSW, 2022). The affected trees include:</p> <ul style="list-style-type: none"> • Casuarina sp. X 14 • Cheese Tree (<i>Glochidion ferdinandi</i>) x 5 • Eucalyptus sp. X 16 • Turpentine (<i>Syncarpia glomulifera</i>) x 1. 	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<p>Would the proposal affect any tree hollows or hollow logs?</p> <p>No hollow-bearing trees or dead stags were recorded within the proposal area. Hollow-bearing trees exist beyond the proposal area, none of which would be impacted by the proposed works.</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Are there any known areas of outstanding biodiversity value or areas mapped as 'littoral rainforest' or 'coastal wetland' under chapter 2 of SEPP (Resilience and Hazards) in or within the vicinity of the proposed work?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Would the proposal provide any additional barriers to the movement of wildlife?</p> <p>The proposal would not have an indirect impact on those fauna corridors that exist beyond the proposal area. The proposal would not further fragment or isolate areas of fauna habitat.</p> <p>Limited connectivity currently exists between areas of vegetation east-west of the proposal area due to the presence of the M1 Motorway. Beyond the area investigated, the extant vegetation connects into a surrounding heavily wooded landscape that forms part of a relatively continuous vegetated corridor.</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Would the proposal disturb any natural waterways or aquatic habitat?</p> <p>Drainage lines are present beyond the works area, impacts on these (beyond existing inputs from urban infrastructure) are considered to be minor. Furthermore, no listed fish or their habitats occur near the Ourimbah interchange.</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Would the proposal disturb any crevices or other locations (such as on bridges and culverts) for potential bat habitat?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

Safeguards

Safeguards to be implemented are:

B1	Pre-clearing surveys will be carried out in accordance with Guide 1: Pre-clearing process of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011).
B2	Native vegetation removal will be minimised through pre-construction planning.
B3	Exclusion zones will be established as per Guide 2: Biodiversity Guidelines Protecting and managing biodiversity on RTA projects (RTA, 2011).
B4	Vegetation removal would be carried out 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).
B5	Native vegetation would 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).
B6	Fauna that may be present on site during works will be managed in accordance with Guide 9: Fauna handling of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011).
B7	Weed species would be managed in accordance with Guide 6: Weed management of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) and the Biosecurity Act 2015 (general duty to prevent, eliminate or minimise any biosecurity risk). This would include disposing of weeds and weed contaminated soil at an appropriate waste management facility.
B8	If unexpected threatened fauna or flora species are discovered, stop works immediately and follow the Unexpected Threatened Species Find Procedure in Pre-clearing process of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011).
B9	To prevent the spread of Myrtle Rust, the Best Practice Hygiene Protocols in Guide 7: Pathogen management of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) will be implemented.
B10	Pathogens will be managed in accordance with Guide 2: Exclusion zones and Guide 7: Pathogen management (RTA 2011).
B11	If unexpected threatened fauna or flora species are discovered, stop works immediately and follow the Unexpected Threatened Species Find Procedure in Pre-clearing process of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011).
B12	Trees removed as part of the proposal will be offset in accordance with the Tree and hollow replacement guidelines (Transport for NSW, 2022)

3.8 Trees

Table 3-8: Trees

Description of existing environmental and potential impacts		
<p>Does the proposal involve pruning, trimming or removal of any tree/s?</p> <p>Removal of approximately 1.1 hectares of native and exotic species. This includes 36 trees (19 small trees and 17 medium trees) as defined by the Tree and hollow replacement guidelines (transport for NSW, 2022). The affected trees include:</p> <ul style="list-style-type: none"> • <i>Casuarina</i> sp. X 14 • Cheese Tree (<i>Glochidion ferdinandi</i>) x 5 • <i>Eucalyptus</i> sp. X 16 • Turpentine (<i>Syncarpia glomulifera</i>) x 1. <p>Trimming will also take place for safety purposes by improving visibility. Any trimming will not have a lasting impact on vegetation.</p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<p>Do the trees form part of a streetscape, an avenue or roadside planting?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

None of the trees being removed would be considered amenity trees.		
Have the trees been planted by a community group, Landcare group or by council or is the tree a memorial or part of a memorial group e.g., has a plaque?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Do the trees form part of a heritage listing or have other heritage value?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

Safeguards

No additional safeguards required. Refer to Section 3.7.

3.9 Traffic and transport

Table 3-9: Traffic and transport

Description of existing environmental and potential impacts		
<p>Is the proposal likely to result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during construction?</p> <p>The proposal would involve short-term lane closures and traffic control for some construction activities, therefore resulting in some disruptions and minor delays to traffic flow. Lane closures would occur outside of peak periods to minimise impacts. There is the potential for disruption to traffic on M1 Pacific Motorway and Pacific Highway, supplementary roadways and Burns Road. This can be managed with traffic control.</p> <p>Pedestrians are not likely to be affected. While paths currently exist, there is minimal east-west pedestrian movement across the interchange. People using the western rest area would not be affected by the proposal, with impacts on parking in this area to be minimised.</p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<p>Is the proposal likely to result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during operation?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Is the proposal likely to affect any other transport nodes or transport infrastructure (e.g., bus stops, bus routes) in the surrounding area? Or result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during operation?</p> <p>There are no bus stops within the proposal area.</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

Safeguards

Safeguards to be implemented are:

T1	During works, traffic would be managed in accordance with Traffic control at work sites Technical Manual (Transport for NSW, 2022).
T2	To minimise impacts on available parking for road users, project work vehicles will only park in designated areas within compounds or within the project area along the western edge of the Pacific Highway.

3.10 Socio-economic

Table 3-10: Socio-economic

Description of existing environmental and potential impacts		
Is the proposal likely to impact on local business?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Is the proposal likely to require any property acquisition?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Is the proposal likely to alter any access for properties (either temporarily or permanently)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Is the proposal likely to alter any on-street parking arrangements (either temporarily or permanently)?</p> <p>The proposed western compound would require the temporary removal of about four spaces within the western compound. This would not adversely affect normal operation of the rest area and a safeguard has been proposed requiring the reinstatement of these spaces during busier periods such as school holidays and long weekends.</p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Is the proposal likely to change pedestrian movements or pedestrian access (either temporarily or permanently)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Is the proposal likely to impact on any items or places of social value to the community (either temporarily or permanently)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Is the proposal likely to reduce or change visibility of any businesses, farms, tourist attractions or the like (either temporarily or permanently)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
A roadside tribute is located on the north-west edge of the western roundabout at the interchange. The tribute would not be affected by the proposal.		

Safeguards

Safeguards to be implemented are:

SE1	Any complaints received during the undertaking of the works are to be recorded and addressed within a reasonable time.
SE2	Parking within the western rest area that is occupied for construction purposes is to be reinstated during school holiday periods and for long weekends.
SE3	The roadside tribute located on the north-west edge of the western roundabout is not to be impacted by construction works.

3.11 Landscape character and visual amenity

Table 3-11: Landscape character and visual amenity

Description of existing environmental and potential impacts		
<p>Is the proposed work over or near an important physical or cultural element or landscape? (For example, heritage items and areas, distinctive or historic built form, National Parks, conservation areas, scenic highways etc.)?</p> <p>The proposed works do not involve the introduction of visually obtrusive structures and are contained largely within the existing motorway corridor. New signage would be consistent with the character of a motorway corridor. Vegetation removal would be noticeable (almost exclusively to road users), with the visual effect becoming less noticeable over time.</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Would the proposal obstruct or intrude upon the character or views of a valued landscape or urban area? For example, locally significant topography, a rural landscape or a park, a river, lake or the ocean or a historic or distinctive townscape or landmark?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Would the proposal require the removal of mature trees or stands of vegetation, either native or introduced?</p> <p>The proposal requires the removal of 36 trees (19 small trees and 17 medium trees) as defined by the Tree and hollow replacement guidelines (transport for NSW, 2022). The affected trees include:</p> <ul style="list-style-type: none"> • Casuarina sp. X 14 • Cheese Tree (<i>Glochidion ferdinandi</i>) x 5 • Eucalyptus sp. X 16 • Turpentine (<i>Syncarpia glomulifera</i>) x 1. <p>While this would result in a noticeable visual change, the magnitude of this impact would reduce over time and may be further minimised should replanting of trees on the eastern side of the southbound exit ramp occur (refer to Figure 2-4).</p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<p>Would the proposal result in large areas of shotcrete visible from the road or adjacent properties?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Would the proposal involve new noise walls or visible changes to existing noise walls?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Would the proposal involve the removal or reuse of large areas of road corridor, landscape, either verges or medians?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Would the proposal involve substantial changes to the appearance of a bridge (including piers, girders, abutments and parapets) that are visible from the road or residential areas?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>If involving lighting, would the proposal create unwanted light spillage on residential properties at night (in construction or operation)?</p> <p>Lighting would be required for the proposed night work. Lighting would be directed at the work area and there would be limited potential for impacts on residential properties due to distance and screening vegetation.</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<p>Would any new structures or features to be constructed, result in over shadowing to adjoining properties or areas?</p>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

Safeguards

Safeguards to be implemented are:

LC1	Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.
LC2	All construction related material and equipment will be removed from the proposal footprint at the completion of work and disturbed areas restored.
LC3	Construction site lighting will be oriented to minimise the risk of light spill impacts on any nearby residences.

3.12 Waste

Table 3-12: Waste

Description of existing environmental and potential impacts		
Is the proposal likely to generate >200 tonnes of waste material (contaminated and /or non-contaminated material)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Is the proposal likely to require a licence from EPA?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Is the proposal likely to require the removal of asbestos?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

Safeguards

Safeguards to be implemented are:

W1	Resource management hierarchy principles are to be followed (in accordance with the Waste Avoidance and Resource Recovery Act 2001): <ul style="list-style-type: none"> • Avoid unnecessary resource consumption as a priority. • Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery). • Disposal is undertaken as a last resort.
W2	Waste material is to be reused in accordance with any waste exemptions or disposed of legally in accordance with its waste classification.
W3	There is to be no disposal or re-use of construction waste on to other land.

4. Consideration of State and Commonwealth environmental factors

4.1 Environmental Planning and Assessment Regulation 2021 factors

The following factors, listed in section 171(2) of the Environmental Planning and Assessment Regulation 2021, have been considered to assess the likely impacts of the proposal on the natural and built environment. This consideration is required to comply with sections 5.5 and 5.7 of the EP&A Act.

Table 4-1: Consideration of section 171 of the EP&A Regulation factors

Environmental factor	Impact
<p>a) Any environmental impact on a community? The proposed works would have minor and short-term impacts on the community attributable to construction noise, visual amenity and minor traffic delays. Safeguards have been proposed to address identified potential impacts.</p>	Negative (short-term)
<p>b) Any transformation of a locality? The proposal involves minor alterations to an existing motorway interchange and would have no transformative impact on the locality.</p>	Nil
<p>c) Any environmental impact on the ecosystems of a locality? The proposal would have limited impact on ecosystems. Potential impacts on BC Act and EPBC Act listed threatened ecological communities have been assessed as not significant. Refer to section 3.7.</p>	Negative (short-term)
<p>d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? The proposal would result in a minor and temporary reduction in aesthetic value of the locality for road users and nearby residents. Safeguards have been proposed to address identified potential impacts. Removal of up to 1.1 hectares of native and exotic species would be required as part of the proposal, although 0.8 hectares of this area has been subject to regular maintenance. Potential replanting of trees on the eastern side of the southbound exit ramp (refer to Figure 2-4) could help reduce the long-term impact of this vegetation clearing. Trimming would also take place to improve safety such as visibility. Any trimming will not have a lasting impact on vegetation.</p>	Negative (short-term) Negative (long-term)
<p>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?</p>	Nil
<p>f) Any impact on habitat of any protected animals (within the meaning of the <i>Biodiversity Conservation Act 2016</i>)? The proposal would not have a significant direct impact on protected animals (including threatened species) potentially occurring in the broader locality. Refer to section 3.7</p>	Nil
<p>g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?</p>	Nil
<p>h) Any long-term effects on the environment?</p>	Nil
<p>i) Any degradation of the quality of the environment?</p>	Negative (short-term)

Environmental factor	Impact
Any impacts on environmental quality (eg noise, visual, socio-economic, transport) would be short-term during construction. Mitigation measures have been proposed to address potential construction noise impacts.	
j) Any risk to the safety of the environment? During the construction phase, the proposal would involve minimal risk to the safety of the environment due to the limited scope of works and the implementation of appropriate work health and safety measures. The overall purpose of the proposal is to improve safety.	Nil
k) Any reduction in the range of beneficial uses of the environment? The proposal would not reduce the range of beneficial uses of the environment.	Nil
l) Any pollution of the environment? Pollution of the environment is not expected to result from the proposal with the implementation of appropriate safeguards.	Nil
m) Any environmental problems associated with the disposal of waste? Any waste generated (and is unsuitable for backfilling) would be removed from site and disposed of legally. No environmental problems are anticipated for the disposal of waste.	Nil
n) Any increased demands on resources, natural or otherwise which are, or are likely to become, in short supply? The proposal would not increase demand for resources, which are, or are likely to become, in short supply.	Nil
o) Any cumulative environmental effect with other existing or likely future activities? The minor nature of the proposal and potential impacts mean that cumulative effects are unlikely.	Nil
p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? The proposal would not influence coastal processes and/or coastal hazards.	Nil
q) Any impact on applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1? The relevant region plan is the Central Coast Regional Plan 2036. The relevant local strategic planning statement is the draft Central Coast Local Strategic Planning Statement 2020. The proposal supports the growth of the Central Coast region and would not negatively affect the aims and objectives of the strategic plans identified above.	Nil
r) Any impact on other relevant environmental factors? In considering the potential impacts of this proposal all relevant environmental factors have been considered, refer to Chapter 3 of this assessment.	Nil

4.2 Matters of National Environmental Significance

Table 4-2: Matters of national environmental significance

Environmental factor	Impact
a) Any impact on a World Heritage property? There are no world heritage properties proximate to the proposal site. Direct or indirect impacts are not anticipated.	Nil

Environmental factor	Impact
<p>b) Any impact on a National Heritage place? There are no national heritage places proximate to the proposal site. Direct or indirect impacts are not anticipated.</p>	Nil
<p>c) Any impact on a wetland of international importance (often called 'Ramsar' wetlands)? There are no wetlands of international importance proximate to the proposal site. Direct or indirect impacts are not expected.</p>	Nil
<p>d) Any impact on nationally threatened species, ecological communities or migratory species?</p>	Nil
<p>e) Any impact on a Commonwealth marine area? There would be no environmental impact on a Commonwealth Marine area.</p>	Nil
<p>f) Does the proposal involve a nuclear action (including uranium mining)? The proposal does not constitute a nuclear action.</p>	Nil
<p>Additionally, any impact (direct or indirect) on the environment of Commonwealth land? Commonwealth land would not be affected by the proposal.</p>	Nil

5. Summary of safeguards and environmental management measures

This section provides a summary of the site-specific environmental safeguards and management measures identified in described in chapters 3 and 4 of this REF. These safeguards will be implemented to reduce potential environmental impacts throughout construction and operation. A framework for managing the potential impacts is provided with reference to environmental management plans and relevant Transport QA specifications. Any potential licence and/or approval requirements required prior to construction are also listed.

Table 5-1: Summary of site-specific safeguards for proposed work

Aspect	ID	Safeguard
Soil	S1	An Erosion and Sediment Control Plan (ESCP) would be prepared in accordance with the publication Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book, Landcom 2004), outlining measures to be implemented and maintained to: <ul style="list-style-type: none"> • Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets • Reduce water velocity and capture sediment on site • Minimise the amount of material transported from site to surrounding pavement surfaces • Divert clean water around the site.
	S2	Erosion and sedimentation controls are to be checked and maintained on a regular basis (including clearing of sediment from behind barriers) and records kept and provided on request.
	S3	Erosion and sediment control measures are not to be removed until the works are complete, and areas are stabilised.
	S4	Existing ground cover vegetation will be retained to the greatest extent possible to minimise the area of exposed soils.
	S5	If contaminated areas are encountered during investigations, appropriate control measures will be implemented to manage the immediate risks of contamination. All other works 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 are identified in consultation with the Transport for NSW Environment Manager and/or EPA.
Waterways and water quality	WQ1	There is to be no release of dirty water into drainage lines and/or waterways.
	WQ2	Water quality control measures are to be used to prevent any materials (e.g. bentonite, grout, sediment etc) entering drain inlets or waterways.
	WQ3	Plant and equipment will be inspected regularly to ensure there are no leakages of fuel, oil and hydraulic fluid.
	WQ4	All fuels, chemicals and liquids will be stored in an impervious bunded area within the compound site when not in use.
	WQ5	If refuelling of plant and equipment is required on site it will take place on flat ground only using 20 litre drums within a bunded area large enough to contain 120 per cent of the container's contents.
	WQ6	If an incident (e.g. spill) occurs, the Environmental Incident Procedure (Transport for NSW, 2021) is to be followed and the Transport for NSW Contract Manager and Environment Manager notified immediately.

Aspect	ID	Safeguard
	WQ7	An emergency spill kit will be kept on site at all times. All staff are to be made aware of the location of the spill kit and trained in its use.
	WQ8	Visual monitoring of local water quality (ie turbidity, hydrocarbon spills/slicks) is to be undertaken on a regular basis to identify any potential spills or deficient silt curtains or erosion and sediment controls.
	WQ9	A flood management procedure will be prepared to detail procedures to be implemented where extreme weather is predicted and where there is a risk of flooding affecting the work site and compounds, including removal and storage of plant and equipment and securing of site.
	WQ10	The SES will be notified in advance should substantial delays to the operation of the motorway or adjacent road network be expected during construction.
Noise and vibration	NV1	The standard mitigation measures identified in Appendix B of the Construction Noise and Vibration Guideline (Transport for NSW, 2022) will be implemented.
	NV2	Where works are proposed to take place outside of standard working hours (Monday-Friday: 7:00am to 6.00pm, Saturday: 8.00am to 1.00pm, Sunday and Public Holidays: no work), residences within 280 metres of the proposal are to be notified a minimum of five working days prior to the start of works: The notification will include information about the proposed works, the hours of work, duration of impacts and a Transport for NSW contact.
Air quality	AQ1	Works are not to be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely.
	AQ2	Vehicles transporting waste or other materials that may produce odours or dust are to be covered during transportation.
Aboriginal heritage	AH1	If Aboriginal heritage items are uncovered during the works, all works must cease in the vicinity of the find and the Transport for NSW Aboriginal cultural heritage advisor and the Environment Manager contacted immediately. The steps in the Standard Management Procedure: Unexpected Heritage Items (Roads and Maritime Services, 2015) must be followed.
	AH2	Site inductions will cover the requirement to avoid impacts on Aboriginal sites.
	AH3	All vehicles will use access tracks within the project boundary and existing parking areas at all times.
Non-Aboriginal heritage	H1	If unexpected archaeological remains are uncovered during the works, all works must cease in the vicinity of the material/find and the steps in the Standard Management Procedure: Unexpected Heritage Items (Roads and Maritime Services, 2015) must be followed. The Transport for NSW Environment Manager must be contacted immediately.
Biodiversity	B1	Pre-clearing surveys will be carried out in accordance with Guide 1: Pre-clearing process of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011).
	B2	Native vegetation removal will be minimised through pre-construction planning.
	B3	Exclusion zones will be established as per Guide 2: Biodiversity Guidelines Protecting and managing biodiversity on RTA projects (RTA, 2011).

Aspect	ID	Safeguard
	B4	Vegetation removal would be carried out 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).
	B5	Native vegetation would 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).
	B6	Fauna that may be present on site during works will be managed in accordance with Guide 9: Fauna handling of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011).
	B7	Weed species would be managed in accordance with Guide 6: Weed management of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) and the Biosecurity Act 2015 (general duty to prevent, eliminate or minimise any biosecurity risk). This would include disposing of weeds and weed contaminated soil at an appropriate waste management facility.
	B8	If unexpected threatened fauna or flora species are discovered, stop works immediately and follow the Unexpected Threatened Species Find Procedure in Pre-clearing process of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011).
	B9	To prevent the spread of Myrtle Rust, the Best Practice Hygiene Protocols in Guide 7: Pathogen management of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011) will be implemented.
	B10	Pathogens will be managed in accordance with Guide 2: Exclusion zones and Guide 7: Pathogen management (RTA 2011).
	B11	If unexpected threatened fauna or flora species are discovered, stop works immediately and follow the Unexpected Threatened Species Find Procedure in Pre-clearing process of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011).
	B12	Trees removed as part of the proposal will be offset in accordance with the Tree and hollow replacement guidelines (transport for NSW, 2022)
	Trees	-
Traffic and transport	T1	During works, traffic would be managed in accordance with Traffic control at work sites Technical Manual (Transport for NSW, 2022)
	T2	To minimise impacts on available parking for road users, project work vehicles will only park in designated areas within compounds or within the project area along the western edge of the Pacific Highway.
Socio-economic	SE1	Any complaints received during the undertaking of the works are to be recorded and addressed within a reasonable time.
	SE2	Parking within the western rest area that is occupied for construction purposes is to be reinstated during school holiday periods and for long weekends.
	SE3	The roadside tribute located on the north-west edge of the western roundabout is not to be impacted by construction works.
Landscape character and	LC1	Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.

Aspect	ID	Safeguard
visual amenity	LC2	All construction related material and equipment will be removed from the proposal footprint at the completion of work and disturbed areas restored.
	LC3	Construction site lighting will be oriented to minimise the risk of light spill impacts on any nearby residences.
Waste	W1	Resource management hierarchy principles are to be followed: <ul style="list-style-type: none"> • Avoid unnecessary resource consumption as a priority. • Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery). • Disposal is undertaken as a last resort. (in accordance with the <i>Waste Avoidance and Resource Recovery Act 2001</i>)
	W2	Waste material is to be reused in accordance with any waste exemptions or disposed of legally in accordance with its waste classification.
	W3	There is to be no disposal or re-use of construction waste on to other land.

5.1 Licensing and approvals

A Road Occupancy Licence would be required if traffic control (short-term lane closures) is needed.

No other licensing or approval requirements have been identified for the proposal.

5.2 Other requirements

Table 5-2: Other requirements

Requirement	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Environmental management plan sent to SMES for review.		

6. Certification, review and decision

6.1 Certification

This minor works REF 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.

Prepared by

Signature

Name: Steven Dando
Position: Environmental Consultant
Company name: BD Infrastructure / Hills Environmental
Date: 10 January 2023

Minor Works REF reviewed by:

Signature

Name: Stuart Hill
Position: Principal - Environment
Company name: BD Infrastructure / Hills Environmental
Date: 10 January 2023

6.2 Environment staff review

The Minor Works REF has been reviewed and considered against the requirements of sections 5.5 and 5.7 of the EP&A Act.

In considering the proposal this assessment has examined and taken into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of that activity as addressed in the Minor Works REF and associated information. This assessment is considered to be in accordance with the factors required to be considered under section 171 of the Environmental Planning and Assessment Regulation 2021.

The proposal described in the Minor Works REF will have some environmental impacts which can be ameliorated satisfactorily. Having regard to the safeguard and management measures proposed, this assessment has considered that these impacts are unlikely to be significant and therefore an approval for the proposal does not need to be sought under Division 5.2 of the EP&A Act.

The assessment has considered the potential impacts of the activity on areas of outstanding value and on threatened species, ecological communities or their habitats for both terrestrial and aquatic species as defined by the *Biodiversity Conservation Act 2016* and the *Fisheries Management Act 1994*.

The proposal described in the Minor Works REF will not affect areas of outstanding value. The activity described in the Minor Works REF will not significantly affect threatened species ecological communities or their habitats. Therefore, a species impact statement is not required.

The assessment has also addressed the potential impacts on the activity on matters of national environmental significance and any impacts on the environment of Commonwealth land and concluded that there will be no significant impacts. Therefore, there is no need for a referral to be made to the Australian Government Department of Climate Change, Energy, the Environment and Water for a decision by the Commonwealth Minister for the Environment on whether assessment and approval is required under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Minor Works REF is considered to meet all relevant requirements.

6.3 Environment staff recommendation

It is recommended that the proposal to upgrade the M1 Pacific Motorway Ourimbah Interchange, as described in this Minor Works REF proceed subject to the implementation of all safeguards identified in the Minor Works REF and compliance with all other relevant statutory approvals, licences, permits and authorisations.

The Minor Works REF has examined and taken into account to the fullest extent possible all matters likely to affect the environment by reason of the activity and established that the activity is not likely to significantly affect the environment or threatened species, ecological communities or their habitats.

The Minor Works REF has concluded that there will be no significant impacts on matters of national environmental significance or any impacts on the environment of Commonwealth land.

The Minor Works REF determination will remain current for five years until October 2027 at which time it shall lapse if works have not been physically commenced. The pre-construction checklist must be completed prior to the commencement of any works.

Recommended by

Signature 

Name: Mark Riddell

Position: A/ Environment and Sustainability Manager

Date: 30/01/2023

6.4 Determination

In accordance with the above recommendation, I certify that I have reviewed and endorsed the contents of this Minor Works REF, and to the best of my knowledge, it is in accordance with the EP&A Act, the EP&A Regulation and the Guidelines approved under Section 170 of the EP&A Regulation, and the information is neither false nor misleading.

I determine that Transport for NSW may proceed with the activity

Signature 

Name: David Pattison

Position: Senior Manager Project Services North

Date: 07/02/2023

6.5 EP&A Regulation publication requirement

Table 6-1: EP&A Regulation publication requirement

Requirement		
Does this Minor Works REF need to be published under section 171(4) of the EP&A Regulation?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

7. Definitions

Table 7-1: Definitions

Term	Definition
AHIMS	Aboriginal Heritage Information Management System
BC Act	<i>Biodiversity Conservation Act 2016 (NSW)</i>
CEMP	Construction Environmental Management Plan
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)</i>
FM Act	<i>Fisheries Management Act 1994</i>
Heritage Act	<i>Heritage Act 1977 INSW.</i>
NSW	New South Wales
PACHCI	Roads and Maritime Procedure for Aboriginal cultural heritage consultation and investigation
PMF	Probable Maximum Flood
PCT ID	Plant Community Type identification (no.)
REF	Review of environmental factors
Roads and Maritime Services	NSW Roads and Maritime Services (former NSW government agency)
RTA	Roads and Traffic Authority (former NSW government agency)
SEED	Sharing and Enabling Environmental Data
SEPP (Transport and Infrastructure)	State Environmental Planning Policy (Transport and Infrastructure) 2021
SES	NSW State Emergency Service
Transport	Transport for NSW

Appendix A: Design drawings

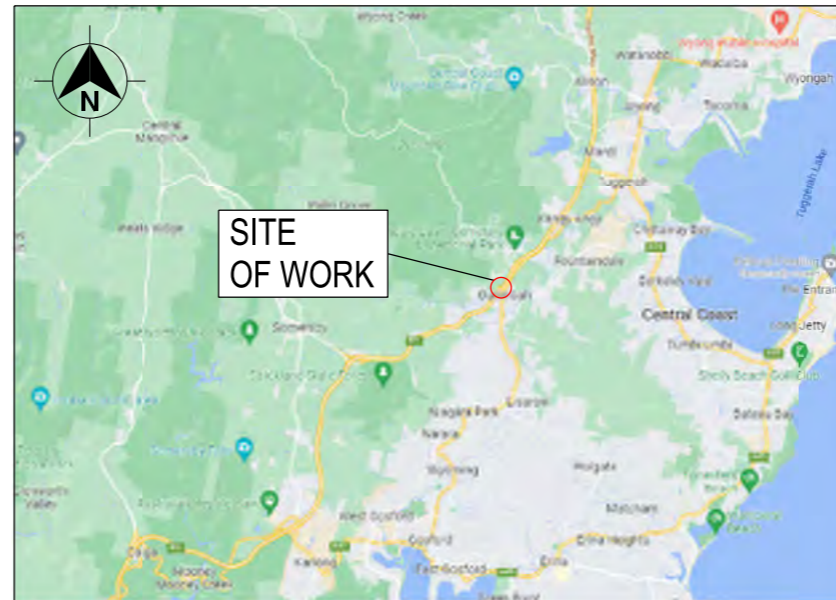
CENTRAL COAST LOCAL GOVERNMENT AREA

M1 - PACIFIC MOTORWAY

OURIMBAH INTERCHANGE UPGRADE

ROAD DESIGN



ISSUED FOR CONSTRUCTION



LOCALITY PLAN
© Google Maps

FOR CONSTRUCTION

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DRAWING FILE LOCATION / NAME D:\Box Sync\PROJECTS - Current\AA0432 - M1 Ourimbah Interchange CD DD\01 Working\Design\Detail\Drawings\DS2022 000636.dgn		LINEAR REFERENCING START: 6003, 1198, B1, 79.134 FINISH: 6003, 1204, C1, 79.910		PLOT DATE / TIME 5/12/2022 5:10:57 PM	PLOT BY Colin Gu		CLIENT CENTRAL COAST COUNCIL M1 - PACIFIC MOTORWAY OURIMBAH INTERCHANGE UPGRADE COVER SHEET		
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02

SHEET NAME	SHEET DESCRIPTION
00	COVER SHEET
01	SHEET REGISTER & STANDARD DRAWING
02	OVERVIEW PLAN
03	TYPICAL SECTION AND DETAILS
04	PAVEMENT DETAILS
05	ALIGNMENT PLAN - NORTHBOUND
06	ALIGNMENT PLAN - SOUTHBOUND
07	SURVEY CONTROL SCHEDULE
08	INFRASTRUCTURE MARK SCHEDULE
09	GENERAL ARRANGEMENT PLAN - NORTHBOUND SHEET 1 OF 2
10	GENERAL ARRANGEMENT PLAN - NORTHBOUND SHEET 2 OF 2
11	GENERAL ARRANGEMENT PLAN - SOUTHBOUND
12	PAVEMENT PLAN - NORTHBOUND
13	PAVEMENT PLAN - SOUTHBOUND
14	KERB AND BARRIER SCHEDULE
15	SIGNAGE AND LINEMARKING PLAN - NORTHBOUND
16	SIGNAGE AND LINEMARKING PLAN - SOUTHBOUND
17	DRAINAGE AND UTILITIES PLAN - NORTHBOUND
18	DRAINAGE AND UTILITIES PLAN - SOUTHBOUND
19	CROSS SECTION MC00 SHEET 01 OF 03
20	CROSS SECTION MC00 SHEET 02 OF 03
21	CROSS SECTION MC00 SHEET 03 OF 03
22	CROSS SECTION MC20 SHEET 01 OF 03
23	CROSS SECTION MC20 SHEET 02 OF 03
24	CROSS SECTION MC20 SHEET 03 OF 03


STANDARD DRAWING	DRAWING TITLE
R0300	Kerb and Channel Series
R0300 - 01	Standard Kerb and Gutter shapes (S381)
R0600	Street Lighting Series
R0600 - 01	Street Lighting Supply Switchboard Electrical Details
R0600 - 02	Street Lighting Poles Plug and Flex Assembly
R0700	Safety Barriers Series
R0710	Safety Barriers Series - Semi-Rigid
R0710 - 01	W Beam and Thrie Beam Safety Barriers - Post and Blockout Components
R0710 - 02	W Beam and Thrie Beam Safety Barriers - Notched Blockout
R0710 - 03	W Beam and Thrie Beam Safety Barriers - Post on Base Plate
R0710 - 04	W Beam and Thrie Beam Safety Barriers - Post on Slip Base Plate
R0710 - 09	W Beam and Thrie Beam Safety Barrier - W Beam to Thrie Beam Transition
R0710 - 12	Thrie Beam 3.5 BMT Rail for Transition to Rigid Barrier
R0720 - 07	Thrie Beam Connection to Type F Barrier or Parapet on Concrete Bridges

FOR CONSTRUCTION

DRAWING FILE LOCATION / NAME D:\Box Sync\PROJECTS - Current\AA0432 - M1 Ourimbah Interchange CD DD\01 Working\Design\Detail\Drawings\DS2022 000636.dgn				DESIGN LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING D M1 OURIMBAH DD 221118	PLOT DATE / TIME 5/12/2022 5:03:35 PM	PLOT BY Colin Gu	CLIENT  Transport for NSW	CENTRAL COAST COUNCIL M1 - PACIFIC MOTORWAY OURIMBAH INTERCHANGE UPGRADE SHEET INDEX & STANDARD DRAWING																					
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY		<table border="1"> <tr><th>TITLE</th><th>NAME</th><th>DATE</th></tr> <tr><td>DRAWN</td><td>C GU</td><td>05/12/22</td></tr> <tr><td>DRG CHECK</td><td>A HILLARD</td><td>05/12/22</td></tr> <tr><td>DESIGN</td><td>C GU</td><td>05/12/22</td></tr> <tr><td>DESIGN CHECK</td><td>A HILLARD</td><td>05/12/22</td></tr> <tr><td>DESIGN MNGR</td><td>A HILLARD</td><td>05/12/22</td></tr> <tr><td>PROJECT MNGR</td><td>L HUANG</td><td>05/12/22</td></tr> </table>	TITLE	NAME	DATE	DRAWN	C GU	05/12/22	DRG CHECK	A HILLARD	05/12/22	DESIGN	C GU	05/12/22	DESIGN CHECK	A HILLARD	05/12/22	DESIGN MNGR	A HILLARD	05/12/22	PROJECT MNGR	L HUANG	05/12/22
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<table border="1"> <tr><th>SCALE</th><th>DESCRIPTION</th></tr> <tr><td>0</td><td>50</td><td>100</td><td>150</td><td>200</td></tr> <tr><td colspan="5">SCALE 1:4000m</td></tr> </table>				SCALE	DESCRIPTION	0	50	100	150	200	SCALE 1:4000m					CO-ORDINATE SYSTEM MGA ZONE 56 (GDA2020)		HEIGHT DATUM AHD		 Transport for NSW PREPARED FOR PROJECT DEVELOPMENT INFRASTRUCTURE DEVELOPMENT GREATER SYDNEY PROGRAM OFFICE	RMS REGISTRATION No. DS2022 000636 ISSUE STATUS FOR CONSTRUCTION EDMS No. SHEET No. 01 ISSUE 02									
SCALE	DESCRIPTION																													
0	50	100	150	200																										
SCALE 1:4000m																														



LEGEND

 Sheet area at 1:1000

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
50mm ON A3 SIZE ORIGINAL

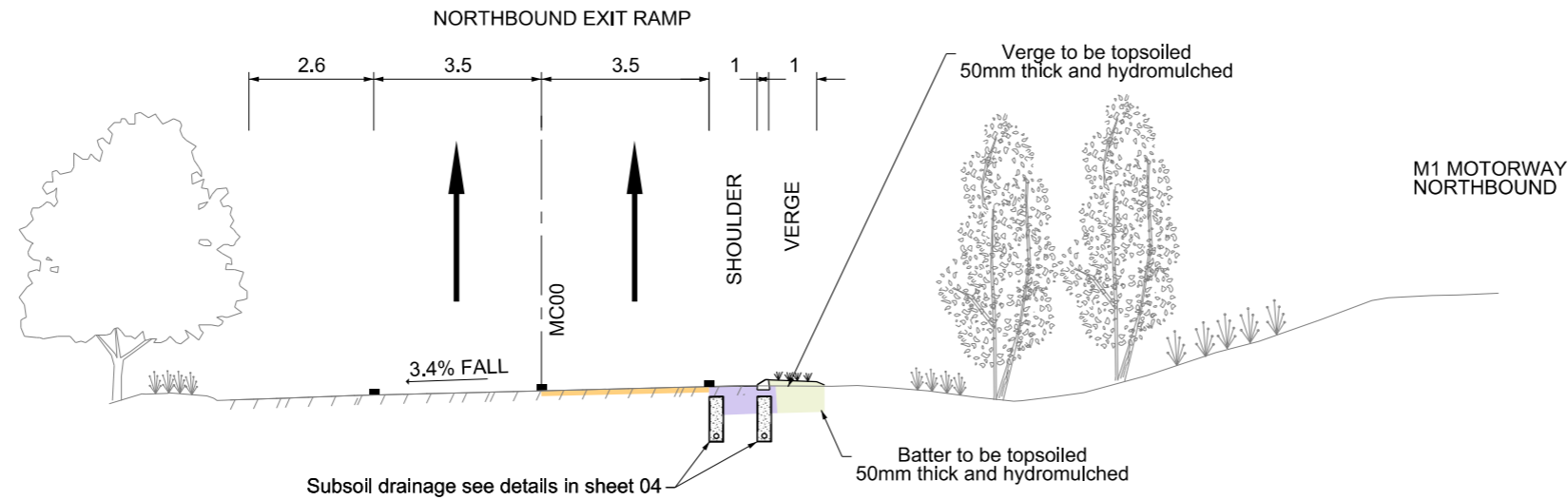


FOR CONSTRUCTION

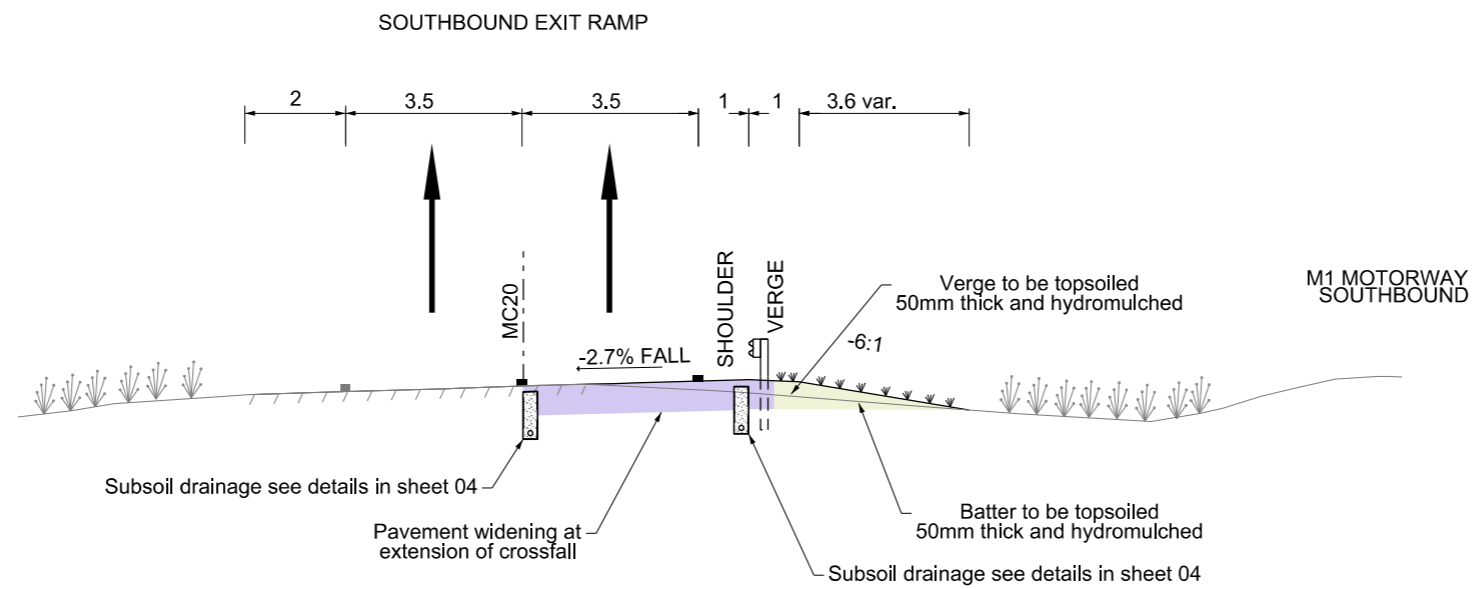
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EXTERNAL REFERENCE FILES	REV 01	DATE 25/11/22	AMENDMENT / REVISION DESCRIPTION ISSUED FOR CONSTRUCTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY																						
				 SCALE 1:4000m		<table border="1"> <thead> <tr> <th>TITLE</th> <th>NAME</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>DRAWN</td> <td>C GU</td> <td>05/12/22</td> </tr> <tr> <td>DRG CHECK</td> <td>A HILLARD</td> <td>05/12/22</td> </tr> <tr> <td>DESIGN</td> <td>C GU</td> <td>05/12/22</td> </tr> <tr> <td>DESIGN CHECK</td> <td>A HILLARD</td> <td>05/12/22</td> </tr> <tr> <td>DESIGN MNGR</td> <td>A HILLARD</td> <td>05/12/22</td> </tr> <tr> <td>PROJECT MNGR</td> <td>L HUANG</td> <td>05/12/22</td> </tr> </tbody> </table>		TITLE	NAME	DATE	DRAWN	C GU	05/12/22	DRG CHECK	A HILLARD	05/12/22	DESIGN	C GU	05/12/22	DESIGN CHECK	A HILLARD	05/12/22	DESIGN MNGR	A HILLARD	05/12/22	PROJECT MNGR	L HUANG	05/12/22	 Transport for NSW
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				CO-ORDINATE SYSTEM MGA ZONE 56 (GDA2020)		HEIGHT DATUM AHD		PREPARED FOR PROJECT DEVELOPMENT INFRASTRUCTURE DEVELOPMENT GREATER SYDNEY PROGRAM OFFICE																					
						RMS REGISTRATION No. DS2022 000636		PART																					
						ISSUE STATUS FOR CONSTRUCTION		EDMS No. SHEET No. 02 ISSUE 01																					

LEGEND

- Road pavement 1
- Road pavement 2
- Topsoil Material
- Existing Pavement
- Existing Surface



A
10
MC00 NORTHBOUND EXIT
 Scale 1:150 Ch 200



B
11
MC20 SOUTHBOUND EXIT
 Scale 1:150 Ch 200

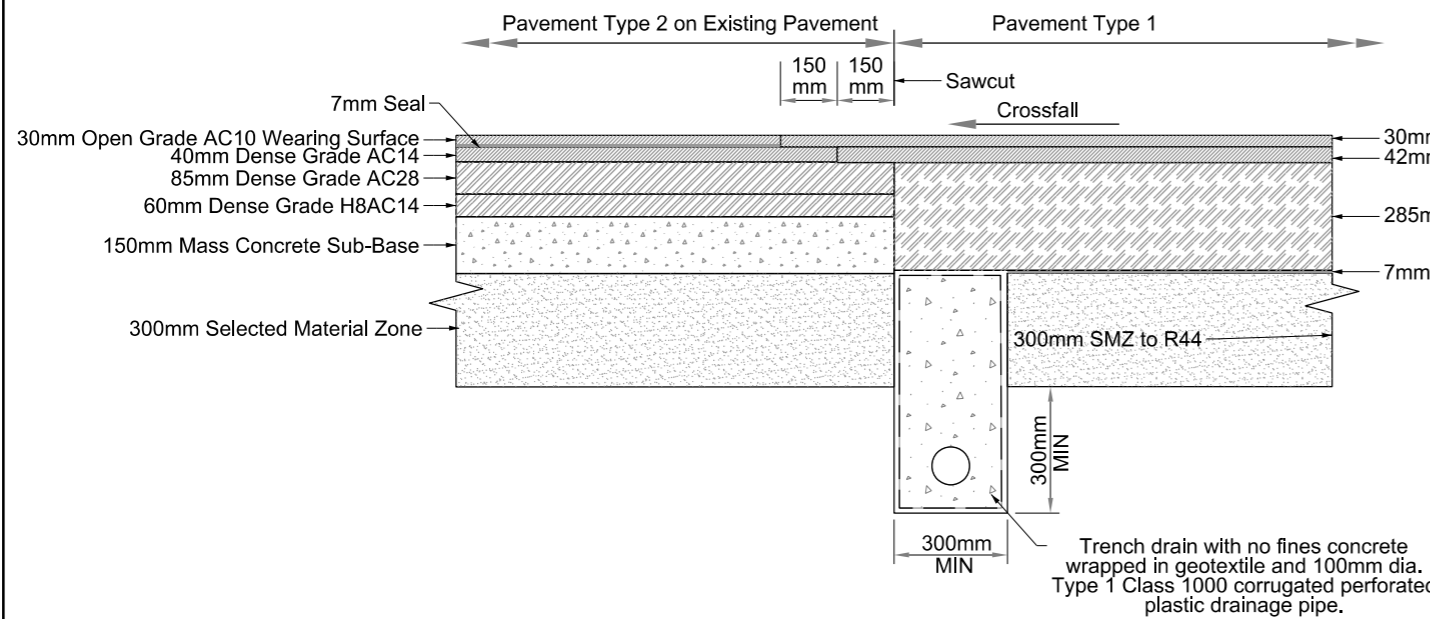
NOTES

- Subsoil drainage outlet location will need to be confirmed during construction. The following 2 options can be considered:
1. To be aligned with existing subsoil drainage outlet along the existing western edge
 2. To be connected to the nearest existing storm water drainage pit at intersection with roundabout.

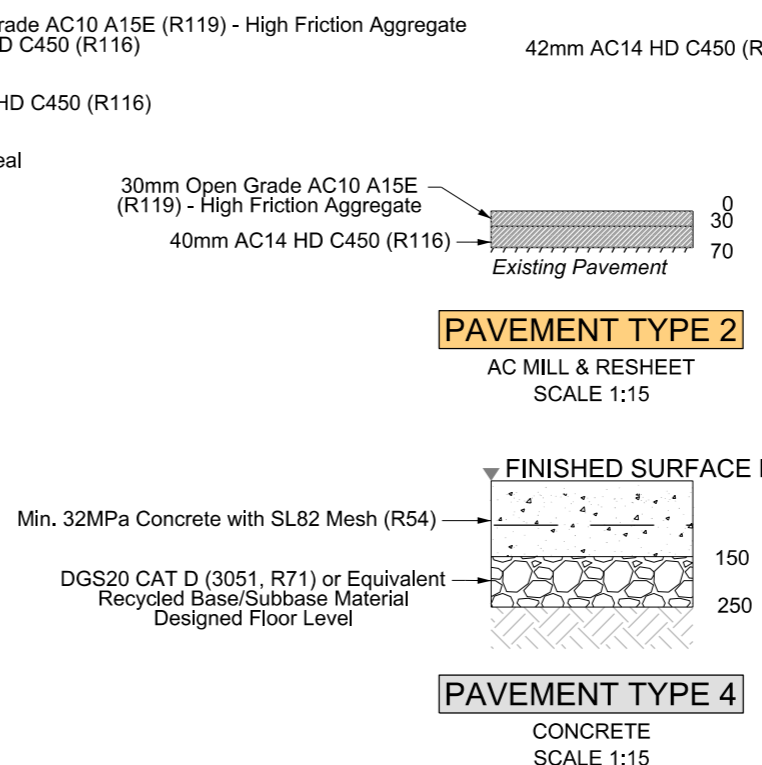
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SCALES ON A3 SIZE DRAWING 0 0.1 0.2 0.3 0.4 0.5 0.6 0.8 SCALE 1:15m 0 1 2 3 4 5 6 8 SCALE 1:150m			DRAWINGS / DESIGN PREPARED BY		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TITLE</th> <th>NAME</th> <th>DATE</th> </tr> <tr> <td>DRAWN</td> <td>C GU</td> <td>05/12/22</td> </tr> <tr> <td>DRG CHECK</td> <td>A HILLARD</td> <td>05/12/22</td> </tr> <tr> <td>DESIGN</td> <td>C GU</td> <td>05/12/22</td> </tr> <tr> <td>DESIGN CHECK</td> <td>A HILLARD</td> <td>05/12/22</td> </tr> <tr> <td>DESIGN MNGR</td> <td>A HILLARD</td> <td>05/12/22</td> </tr> <tr> <td>PROJECT MNGR</td> <td>L HUANG</td> <td>05/12/22</td> </tr> </table>			TITLE	NAME	DATE	DRAWN	C GU	05/12/22	DRG CHECK	A HILLARD	05/12/22	DESIGN	C GU	05/12/22	DESIGN CHECK	A HILLARD	05/12/22	DESIGN MNGR	A HILLARD	05/12/22	PROJECT MNGR	L HUANG	05/12/22	ISSUE STATUS FOR CONSTRUCTION	EDMS No.	SHEET No. 03	ISSUE 01
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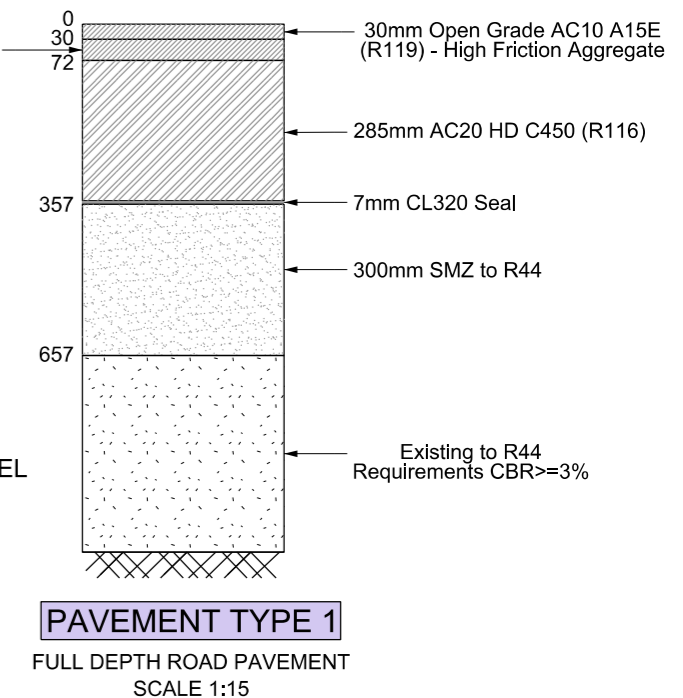


INTERFACE DETAIL
PAVEMENT TYPE 1 WITH SUBSOIL DRAINAGE AND PAVEMENT 2 ON EXISTING PAVEMENT
SCALE 1:20

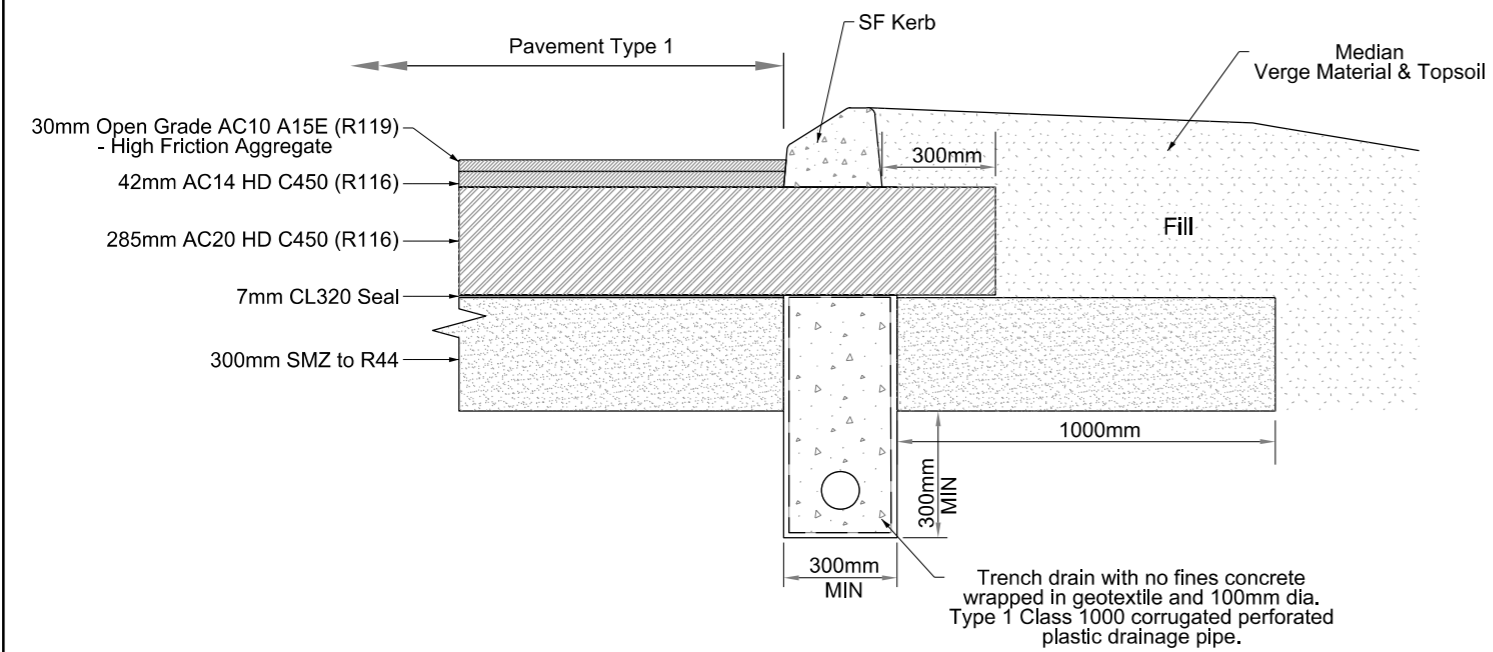


PAVEMENT TYPE 2
AC MILL & RESHEET
SCALE 1:15

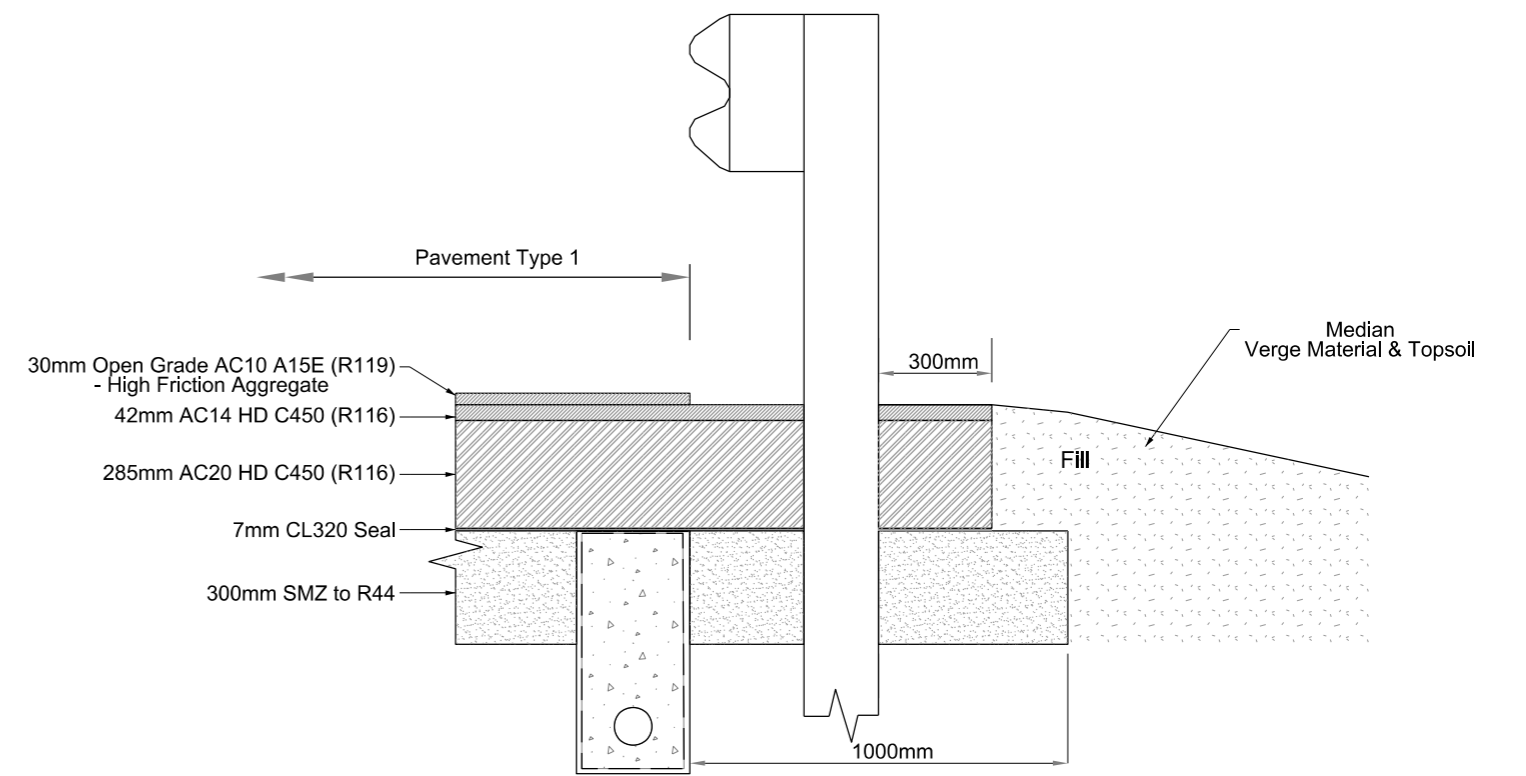
PAVEMENT TYPE 4
CONCRETE
SCALE 1:15



PAVEMENT TYPE 1
FULL DEPTH ROAD PAVEMENT
SCALE 1:15



EDGE DETAIL 1
PAVEMENT TYPE 1 ON SF KERB WITH SUBSOIL DRAINAGE
SCALE 1:20



EDGE DETAIL 2
PAVEMENT TYPE 1 WITH GUARD RAIL
SCALE 1:20

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EXTERNAL REFERENCE FILES	REV 01	DATE 25/11/22	AMENDMENT / REVISION DESCRIPTION ISSUED FOR CONSTRUCTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING 0 0.1 0.2 0.3 0.4 0.5 0.6 0.8 SCALE 1:15m 0 200 400 600 800 1m SCALE 1:20m	DRAWINGS / DESIGN PREPARED BY CCHD
CO-ORDINATE SYSTEM MGA ZONE 56 (GDA2020)		HEIGHT DATUM AHD		TITLE DRAWN DRG CHECK DESIGN DESIGN CHECK DESIGN MNGR PROJECT MNGR		NAME C GU A HILLARD C GU A HILLARD A HILLARD L HUANG	
DATE 05/12/22		DATE 05/12/22		DATE 05/12/22		DATE 05/12/22	
PREPARED FOR PROJECT DEVELOPMENT INFRASTRUCTURE DEVELOPMENT GREATER SYDNEY PROGRAM OFFICE		RMS REGISTRATION No. DS2022 000636		ISSUE STATUS FOR CONSTRUCTION		PART 01	
EDMS No.		SHEET No. 04		ISSUE 01		© Transport for NSW	



LEGEND

- MC00 CONTROL ALIGNMENT LABEL
- CONTROL ALIGNMENT
- SURVEY CONTROL SAFE
- SURVEY CONTROL VULNERABLE
- SURVEY CONTROL TO BE DESTROYED

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. 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.

Disclaimer for Plan of Survey Infrastructure

"Survey Infrastructure" is defined as Permanent Survey Marks and Cadastral Reference Marks that reference the New South Wales Cadastre, both being defined in the "Surveying and Spatial Information Regulation".

This drawing highlights Survey Infrastructure in the general vicinity of the proposed construction footprint. The purpose of this diagram and the associated Survey Infrastructure Schedule is to assist the Contractor to care, protect and preserve Survey Infrastructure as required under the law in New South Wales.

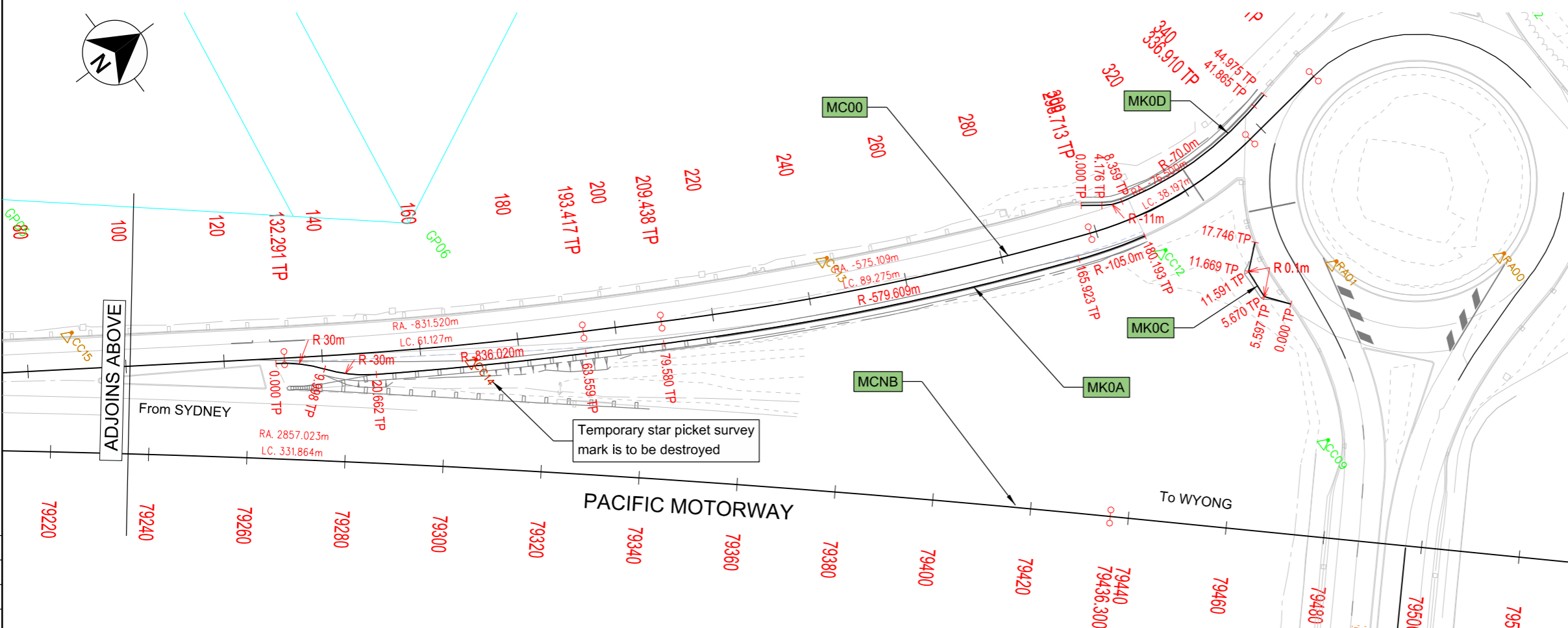
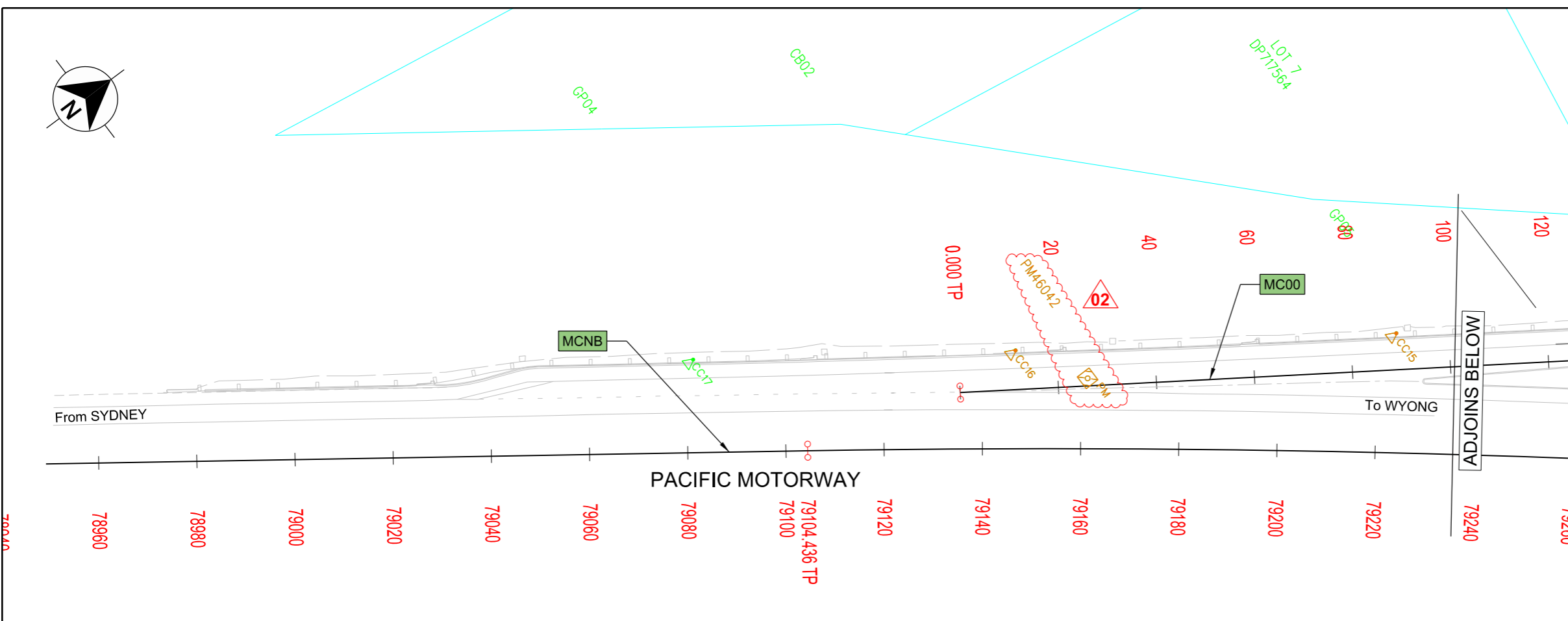
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The supplied coordinates vary in accuracy and shall be verified by a land surveyor, as defined under the Surveying & Spatial Information Act, prior to the commencement of any construction activity within or near the construction limits depicted.

The TfNSW Hunter Survey Unit Manager is the primary point of contact for matters on preservation of survey infrastructure in accordance with the Surveying and Spatial Information Act and Regulation in regard to infrastructure projects managed by TfNSW. Prior to commencement of any construction activities that may affect the Survey Infrastructure, contact the NSW Department of Land and Property Information to obtain the Surveyor General's authority to disturb those survey marks forming part of the Survey Infrastructure affected by the works. Comply with Surveyor General's Directions No.11 "Preservation of Survey Infrastructure". Permanent Survey & Cadastral Reference Marks are protected under section 24 of the Surveying and Spatial Information Act. Refer to an application under Section 88 of the Surveying and Spatial Information Regulation for the process to remove or obliterate marks.

The construction footprint does not extend to associated works such as (but not limited to);

- Utility adjustments
- Temporary Access Tracks
- Stockpiles
- Environmental Constraints Limits
- Traffic Control
- Site Compounds



FOR CONSTRUCTION

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EXTERNAL REFERENCE FILES	REV 01 02	DATE 25/11/22 05/12/22	AMENDMENT / REVISION DESCRIPTION ISSUED FOR CONSTRUCTION ISSUED FOR CONSTRUCTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING 0 10 20 30 40 50 SCALE 1:1000m	DRAWINGS / DESIGN PREPARED BY CCHD
CO-ORDINATE SYSTEM MGA ZONE 56 (GDA2020)		HEIGHT DATUM AHD		TITLE DRAWN DRG CHECK DESIGN DESIGN CHECK DESIGN MNGR PROJECT MNGR		NAME C GU A HILLARD C GU A HILLARD A HILLARD L HUANG	
DATE 05/12/22		ISSUED FOR CONSTRUCTION		RMS REGISTRATION No. DS2022 000636		PART 02	
ISSUE STATUS FOR CONSTRUCTION		EDMS No.		SHEET No. 05		ISSUE 02	

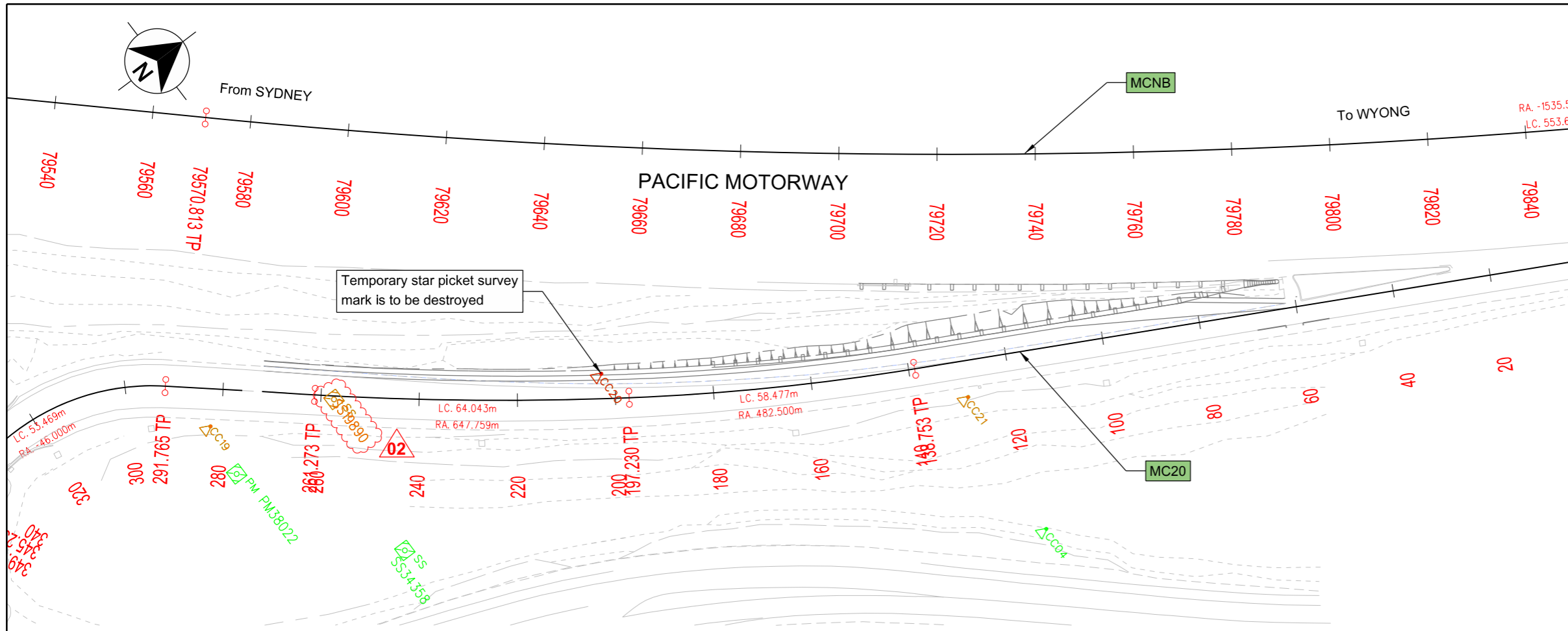


From SYDNEY

To WYONG

LEGEND

- MC00 CONTROL ALIGNMENT LABEL
- CONTROL ALIGNMENT
- SURVEY CONTROL SAFE
- SURVEY CONTROL VULNERABLE
- SURVEY CONTROL TO BE DESTROYED



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- Stockpiles
- Environmental Constraints Limits
- Traffic Control
- Site Compounds

CO-ORDINATES - MC00 - NORTHBOUND EXIT RAMP CL

STATION	EASTING	NORTHING	BEARING	RADIUS
START	0.000	347986.061	6309041.908	34 0 50.1
T.P.	132.291	348060.064	6309151.564	34 0 50.1
CENTRE		347370.835	6309816.711	-831.520
T.P.	193.417	348092.385	6309203.442	29 48 7.2
T.P.	209.438	348100.348	6309217.344	29 48 7.2
CENTRE		347601.298	6309503.176	-575.109
T.P.	298.713	348138.539	6309297.939	20 54 27.5
CENTRE		348067.076	6309325.239	-76.500
T.P.	336.910	348142.887	6309335.489	352 17 59.7
END	355.139	348140.444	6309353.554	352 17 59.7

CO-ORDINATES - MCNB - M1 NORTHBOUND CL

STATION	EASTING	NORTHING	BEARING	RADIUS
START	78862.000	347834.307	6308813.861	36 0 33.6
T.P.	79104.436	347976.840	6309008.972	36 0 33.6
CENTRE		350287.946	6307330.280	2857.023
T.P.	79436.300	348187.083	6309266.502	42 39 52.8
T.P.	79570.813	348278.244	6309365.414	42 39 52.8
CENTRE		347149.129	6310406.042	-1535.515
T.P.	80124.481	348572.781	6309830.697	22 0 19.0
T.P.	80322.609	348647.018	6310014.392	22 0 19.0
CENTRE		349574.168	6309639.700	1000.000
T.P.	81013.590	349098.475	6310619.311	61 35 44.0
END	81187.708	349251.631	6310602.138	61 35 44.0

CO-ORDINATES - MK0A - KERB RETURN

STATION	EASTING	NORTHING	BEARING	RADIUS
START	0.000	348059.942	6309149.568	34 0 51.3
CENTRE		348084.509	6309132.784	30.000
T.P.	9.998	348066.800	6309156.778	53 6 35.5
CENTRE		348048.792	6309180.771	-30.000
T.P.	20.662	348074.025	6309164.545	32 44 30.7
CENTRE		347370.835	6309616.711	-836.020
T.P.	63.559	348096.290	6309201.206	29 48 7.2
T.P.	79.580	348104.253	6309215.108	29 48 7.2
CENTRE		347601.298	6309503.176	-579.609
T.P.	166.923	348141.437	6309292.946	21 15 59.0
CENTRE		348043.587	6309331.030	-105.000
END	180.193	348145.694	6309306.554	

CO-ORDINATES - MK00 - KERB RETURN

STATION	EASTING	NORTHING	BEARING	RADIUS
START	0.000	348132.950	6309299.917	36 46 56.0
T.P.	4.176	348135.451	6309303.262	36 46 56.0
CENTRE		348126.641	6309309.849	-11.000
T.P.	8.359	348137.266	6309307.002	14 59 43.9
CENTRE		348069.650	6309325.114	-70.000
T.P.	41.865	348138.009	6309340.181	347 34 11.4
END	44.975	348137.340	6309343.218	347 34 11.4

CO-ORDINATES - MK0C - HARDSTAND CL

STATION	EASTING	NORTHING	BEARING	RADIUS
START	0.000	348174.673	6309321.910	232 53 9.4
T.P.	5.597	348170.210	6309318.532	232 53 9.4
CENTRE		348170.149	6309318.612	0.100
T.P.	5.670	348170.141	6309318.512	274 53 49.7
T.P.	11.591	348164.242	6309319.018	274 53 49.7
CENTRE		348164.250	6309319.117	0.100
T.P.	11.669	348164.174	6309319.052	319 18 43.7
END	17.746	348160.213	6309323.661	319 18 43.7

CO-ORDINATES - MC20 - SOUTHBOUND EXIT RAMP CL

STATION	EASTING	NORTHING	BEARING	RADIUS
START	0.000	348470.602	6309572.713	207 44 32.9
T.P.	138.753	348406.013	6309449.910	207 44 32.9
CENTRE		347978.977	6309674.513	482.500
T.P.	197.231	348375.726	6309399.928	214 41 11.6
CENTRE		347843.088	6309768.559	647.759
T.P.	268.328	348332.141	6309343.802	220 58 31.2
END	272.052	348329.699	6309340.990	220 58 31.2

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50mm ON A3 SIZE ORIGINAL

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EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	PREPARED FOR PROJECT DEVELOPMENT INFRASTRUCTURE DEVELOPMENT GREATER SYDNEY PROGRAM OFFICE
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	02	05/12/22	ISSUED FOR CONSTRUCTION			ISSUE STATUS FOR CONSTRUCTION


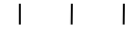



SCALES ON A3 SIZE DRAWING		DRAWINGS / DESIGN PREPARED BY 	
<p>SCALE 1:1000m</p>		CO-ORDINATE SYSTEM MGA ZONE 56 (GDA2020)	
		HEIGHT DATUM AHD	

TITLE	NAME	DATE
DRAWN	C GU	05/12/22
DRG CHECK	A HILLARD	05/12/22
DESIGN	C GU	05/12/22
DESIGN CHECK	A HILLARD	05/12/22
DESIGN MNGR	A HILLARD	05/12/22
PROJECT MNGR	L HUANG	05/12/22

ISSUE STATUS FOR CONSTRUCTION	EDMS No.	SHEET No. 06	ISSUE 02
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FOR CONSTRUCTION

LEGEND

-  CONTROL ALIGNMENT LABEL
-  CONTROL ALIGNMENT
-  SURVEY CONTROL SAFE
-  SURVEY CONTROL VULNERABLE
-  SURVEY CONTROL TO BE DESTROYED

Survey Control Mark Register - HV4473 - MGA Zone 56

MX Mark ID	Mark	Type	GDA2020 Grid Coordinates		Source	AHD	Source	Date	Project Impact	Comments
			Easting	Northing						
7649	PM117649	Permanent Mark	347172.415	6311409.361	SCIMS	25.003	SCIMS	16/11/2016	Safe	Clear of Design Footprint
7748	PM37748	Permanent Mark	346709.882	6309009.011	SCIMS	22.157	SCIMS	16/11/2016	Safe	Clear of Design Footprint
0024	SS160024	State Survey Mark	348264.382	6308831.616	SCIMS	19.820	SCIMS	16/11/2016	Safe	Clear of Design Footprint
8024	PM138024	Permanent Mark	348598.891	6309757.344	SCIMS	18.988	SCIMS	16/11/2016	Safe	Clear of Design Footprint
02	RA00	Concrete Nail	348192.576	6309362.831	RMS	19.094	RMS	16/11/2016	Vulnerable	See Note 2 below
	RA03	Concrete Nail	348105.895	6309410.167	RMS	17.358	RMS	16/11/2016	Safe	Clear of Design Footprint
	RA04	Concrete Nail	348096.034	6309433.082	RMS	16.855	RMS	16/11/2016	Safe	Clear of Design Footprint
	RA05	Concrete Nail	348045.304	6309465.377	RMS	15.728	RMS	16/11/2016	Safe	Clear of Design Footprint
	RA06	Concrete Nail	348042.799	6309495.912	RMS	15.391	RMS	16/11/2016	Safe	Clear of Design Footprint
	RA07	Concrete Nail	348084.021	6309510.511	RMS	14.388	RMS	16/11/2016	Safe	Clear of Design Footprint
	RA08	Concrete Nail	348093.977	6309478.565	RMS	14.603	RMS	16/11/2016	Safe	Clear of Design Footprint
	RAL1	Concrete Nail	348127.809	6309372.393	RMS	18.667	RMS	16/11/2016	Safe	Clear of Design Footprint
	RAL2	Concrete Nail	348152.294	6309397.382	RMS	18.499	RMS	16/11/2016	Safe	Clear of Design Footprint
02	RA01	Concrete Nail	348173.324	6309334.577	RMS	19.099	RMS	16/11/2016	Vulnerable	See Note 2 below
	RA02	Concrete Nail	348056.193	6309464.554	RMS	16.082	RMS	16/11/2016	Safe	Clear of Design Footprint
	CC01	Star Picket	348553.87	6309679.02	CCS	21.615	CCS	16/11/2016	Safe	Clear of Design Footprint
	CC02	Star Picket	348531.734	6309596.339	CCS	21.927	CCS	16/11/2016	Safe	Clear of Design Footprint
	CC03	Star Picket	348522.272	6309507.095	CCS	23.005	CCS	16/11/2016	Safe	Clear of Design Footprint
	CC04	Star Picket	348448.216	6309451.894	CCS	21.818	CCS	16/11/2016	Safe	Clear of Design Footprint
	CC05	Star Picket	348427.819	6309378	CCS	19.885	CCS	16/11/2016	Safe	Clear of Design Footprint
	CC06	Star Picket	348368.994	6309301.244	CCS	18.669	CCS	16/11/2016	Safe	Clear of Design Footprint
	CC07	Concrete Nail	348324.089	6309271.413	CCS	18.982	CCS	16/11/2016	Safe	Clear of Design Footprint
	CC08	Concrete Nail	348257.728	6309296.734	CCS	17.911	CCS	16/11/2016	Safe	Clear of Design Footprint
	CC09	Concrete Nail	348201.372	6309311.299	CCS	18.123	CCS	16/11/2016	Safe	Clear of Design Footprint
	CC10	Concrete Nail	348370.612	6309209.516	CCS	18.304	CCS	16/11/2016	Safe	Clear of Design Footprint
	CC11	Concrete Nail	348363.685	6309080.572	CCS	19.606	CCS	16/11/2016	Safe	Clear of Design Footprint
	CC12	Concrete Nail	348150.541	6309308.165	CCS	18.583	CCS	16/11/2016	Safe	Clear of Design Footprint
	CC13	Star Picket	348110.293	6309252.091	CCS	21.211	CCS	16/11/2016	Vulnerable	See Note 2 below
	CC14	Star Picket	348083.801	6309182.559	CCS	23.395	CCS	16/11/2016	To be destroyed	See Note 1 below
	CC15	Star Picket	348029.887	6309120.101	CCS	23.201	CCS	16/11/2016	Vulnerable	See Note 2 below
	CC16	Star Picket	347985.997	6309056.062	CCS	23.354	CCS	16/11/2016	Vulnerable	See Note 2 below
	CC17	Star Picket	347947.985	6309002.485	CCS	23.873	CCS	16/11/2016	Safe	Clear of Design Footprint
	CC19	Star Picket	348329.074	6309328.32	CCS	19.677	CCS	16/11/2016	Vulnerable	See Note 2 below
	CC20	Star Picket	348368.392	6309398.321	CCS	22.275	CCS	16/11/2016	To be destroyed	See Note 1 below
	CC21	Star Picket	348417.167	6309455.149	CCS	23.423	CCS	16/11/2016	Vulnerable	See Note 2 below
	0020	SS160020	348396.642	6309126.137	CCS	19.683	CCS	16/11/2016	Safe	Clear of Design Footprint
	0023	SS160023	348368.561	6309020.089	CCS	20.285	CCS	16/11/2016	Safe	Clear of Design Footprint

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. 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.

Disclaimer for Plan of Survey Infrastructure

"Survey Infrastructure" is defined as Permanent Survey Marks and Cadastral Reference Marks that reference the New South Wales Cadastre, both being defined in the "Surveying and Spatial Information Regulation".

This drawing highlights Survey Infrastructure in the general vicinity of the proposed construction footprint. The purpose of this diagram and the associated Survey Infrastructure Schedule is to assist the Contractor to care, protect and preserve Survey Infrastructure as required under the law in New South Wales.

The Survey Infrastructure marks shown have been surveyed and/or calculated from the Deposited Plans and the State Control Network and should be verified for completeness.

The supplied coordinates vary in accuracy and shall be verified by a land surveyor, as defined under the Surveying & Spatial Information Act, prior to the commencement of any construction activity within or near the construction limits depicted.

The TfNSW Hunter Survey Unit Manager is the primary point of contact for matters on preservation of survey infrastructure in accordance with the Surveying and Spatial Information Act and Regulation in regard to infrastructure projects managed by TfNSW. Prior to commencement of any construction activities that may affect the Survey Infrastructure, contact the NSW Department of Land and Property Information to obtain the Surveyor General's authority to disturb those survey marks forming part of the Survey Infrastructure affected by the works. Comply with Surveyor General's Directions No.11 "Preservation of Survey Infrastructure". Permanent Survey & Cadastral Reference Marks are protected under section 24 of the Surveying and Spatial Information Act. Refer to an application under Section 88 of the Surveying and Spatial Information Regulation for the process to remove or obliterate marks.

The construction footprint does not extend to associated works such as (but not limited to):

- Utility adjustments
- Temporary Access Tracks
- Stockpiles
- Environmental Constraints Limits
- Traffic Control
- Site Compounds

Note 1 - This survey infrastructure mark is within the proposed design and must be replaced as instructed in the Surveyor General's Direction No.11. Furthermore, please consult with the TfNSW Hunter Survey Manager.

Note 2 - This survey infrastructure mark is close to the proposed design and must be protected. If this is not possible, it shall be replaced as instructed in the Surveyor General's Direction No.11. Furthermore, please consult with the TfNSW Hunter Survey Manager.

FOR CONSTRUCTION

DRAWING FILE LOCATION / NAME D:\Box Sync\PROJECTS - Current\A0432 - M1 Ourimbah Interchange CD DD\01 Working\Design\DetailDrawings\DS2022 000636.dgn		DESIGN LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING D M1 OURIMBAH DD 221118	PLOT DATE / TIME 5/12/2022 5:03:35 PM	PLOT BY Colin Gu	CLIENT  Transport for NSW	CENTRAL COAST COUNCIL M1 - PACIFIC MOTORWAY OURIMBAH INTERCHANGE UPGRADE SURVEY CONTROL MARK SCHEDULE
EXTERNAL REFERENCE FILES	REV 01 02	DATE 25/11/22 05/12/22	AMENDMENT / REVISION DESCRIPTION ISSUED FOR CONSTRUCTION ISSUED FOR CONSTRUCTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING DRAWINGS / DESIGN PREPARED BY 	RMS REGISTRATION No. DS2022 000636
SCALE 1:1000m 0 10 20 30 40 50		CO-ORDINATE SYSTEM MGA ZONE 56 (GDA2020)		HEIGHT DATUM AHD		PREPARED FOR PROJECT DEVELOPMENT INFRASTRUCTURE DEVELOPMENT GREATER SYDNEY PROGRAM OFFICE	ISSUE STATUS FOR CONSTRUCTION
						EDMS No.	SHEET No. 07
						ISSUE 02	

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50mm ON A3 SIZE ORIGINAL

Infrastructure Mark Schedule - HV4473 - MGA Zone 56

Mark ID	Status	Source / Plan	GDA2020 Grid Coordinates		Date	Project Impact	Comments
			MGA Easting	MGA Northing			
CB01	Calculated From	DP1169877	347980.3	6308946.6	20/4/2021	Safe	Clear of Design Footprint
CB02	Calculated From	DP1071101	347919.1	6309056.6	20/4/2021	Safe	Clear of Design Footprint
CB03	Calculated From	DP861858	348120.8	6309084.9	20/4/2021	Safe	Clear of Design Footprint
CB04	Calculated From	DP1071101	348021.1	6309581.5	20/4/2021	Safe	Clear of Design Footprint
CB05	Calculated From	DP1071101	348576.8	6309745.5	20/4/2021	Safe	Clear of Design Footprint
CB06	Calculated From	DP236663	348597.7	6309695.6	20/4/2021	Safe	Clear of Design Footprint
CB07	Calculated From	DP1071101	348347.0	6309134.0	20/4/2021	Safe	Clear of Design Footprint
DH01	Surveyed	DP1222062	348280.8	6308870.3	25/2/2021	Safe	Clear of Design Footprint
DH02	Surveyed	DP1222062	348229.1	6308856.3	25/2/2021	Safe	Clear of Design Footprint
DH03	Surveyed	DP1222062	348144.1	6308856.4	25/2/2021	Safe	Clear of Design Footprint
DH04	Calculated From	DP1222062	348089.7	6308883.6	20/4/2021	Safe	Clear of Design Footprint
DH05	Calculated From	DP1071101	347847.7	6309211.8	20/4/2021	Safe	Clear of Design Footprint
DH06	Calculated From	DP832343	348523.0	6309481.0	20/4/2021	Safe	Clear of Design Footprint
DH07	Surveyed	DP1000356	348516.9	6309112.9	25/2/2021	Safe	Clear of Design Footprint
DH08	Surveyed	DP1169877	348338.9	6308987.5	25/2/2021	Safe	Clear of Design Footprint
GN01	Calculated From	DP260370	347847.5	6309212.4	20/4/2021	Safe	Clear of Design Footprint
GN02	Calculated From	DP260370	347804.1	6309351.0	20/4/2021	Safe	Clear of Design Footprint
GN03	Calculated From	DP1000356	348489.5	6309050.0	20/4/2021	Safe	Clear of Design Footprint
GP01	Calculated From	DP1222062	348081.5	6308889.7	20/4/2021	Safe	Clear of Design Footprint
GP02	Calculated From	DP1169877	348005.1	6308914.1	20/4/2021	Safe	Clear of Design Footprint
GP03	Calculated From	DP1169877	347982.9	6308911.7	20/4/2021	Safe	Clear of Design Footprint
GP04	Calculated From	DP1071101	347899.6	6309015.6	20/4/2021	Safe	Clear of Design Footprint
GP05	Calculated From	DP1071101	347999.9	6309125.4	20/4/2021	Safe	Clear of Design Footprint
GP06	Calculated From	DP717564	348054.0	6309189.1	20/4/2021	Safe	Clear of Design Footprint
GP07	Calculated From	DP1071101	347930.9	6309442.0	20/4/2021	Safe	Clear of Design Footprint
GP08	Calculated From	DP260329	347791.0	6309558.9	20/4/2021	Safe	Clear of Design Footprint
GP09	Calculated From	DP260329	347945.4	6309656.7	20/4/2021	Safe	Clear of Design Footprint
GP10	Calculated From	DP260329	348149.2	6309764.1	20/4/2021	Safe	Clear of Design Footprint
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GP16	Calculated From	DP1071101	348517.3	6309571.9	20/4/2021	Safe	Clear of Design Footprint
GP17	Calculated From	DP507380	348534.5	6309504.5	20/4/2021	Safe	Clear of Design Footprint
GP18	Calculated From	DP832343	348459.0	6309308.7	20/4/2021	Safe	Clear of Design Footprint
GP19	Calculated From	DP1071101	348285.3	6309168.0	20/4/2021	Safe	Clear of Design Footprint
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GP21	Calculated From	DP717564	348202.6	6309091.5	20/4/2021	Safe	Clear of Design Footprint
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GP26	Calculated From	DP396670	348392.3	6309035.4	20/4/2021	Safe	Clear of Design Footprint
GP27	Calculated From	DP1169877	348335.5	6309016.9	20/4/2021	Safe	Clear of Design Footprint
GP28	Calculated From	DP396670	348298.5	6308846.0	20/4/2021	Safe	Clear of Design Footprint
NA01	Calculated From	DP1000356	348432.7	6309046.7	20/4/2021	Safe	Clear of Design Footprint
PM38021	Calculated From	SCIMS	348284.925	6308826.005	20/4/2021	Safe	Clear of Design Footprint
PM38022	Calculated From	SCIMS	348340.005	6309326.74	20/4/2021	Safe	Clear of Design Footprint
PM38023	Calculated From	SCIMS	348530.531	6309573.301	20/4/2021	Safe	Clear of Design Footprint
PM38024	Calculated From	SCIMS	348598.891	6309757.344	20/4/2021	Safe	Clear of Design Footprint
PM46042	Calculated From	SCIMS	347999.377	6309064.379	20/4/2021	Vulnerable	See Note 2 below
PM124090	Calculated From	SCIMS	348012.262	6308905.419	20/4/2021	Safe	Clear of Design Footprint
SS19889	Calculated From	SCIMS	348190	6309229	20/4/2021	Safe	Clear of Design Footprint
SS19890	Calculated From	SCIMS	348339.8	6309351.718	20/4/2021	Vulnerable	See Note 2 below
SS34358	Calculated From	SCIMS	348373.066	6309344.737	20/4/2021	Safe	Clear of Design Footprint
SS110554	Calculated From	SCIMS	348399.437	6309137.52	20/4/2021	Safe	Clear of Design Footprint
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SS160023	Calculated From	SCIMS	348368.565	6309020.089	20/4/2021	Safe	Clear of Design Footprint
SS160024	Calculated From	SCIMS	348264.382	6308831.616	20/4/2021	Safe	Clear of Design Footprint

LEGEND

- ← MC00 CONTROL ALIGNMENT LABEL
- | | CONTROL ALIGNMENT
- △ SURVEY CONTROL SAFE
- △ SURVEY CONTROL VULNERABLE
- △ SURVEY CONTROL TO BE DESTROYED

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The construction footprint does not extend to associated works such as (but not limited to);

- Utility adjustments
- Temporary Access Tracks
- Stockpiles
- Environmental Constraints Limits
- Traffic Control
- Site Compounds

Legend

- DH - Drill Hole and Wing
- GP - Galvanised Pipe
- NA - Nail
- AP - Alignment Pin
- BA - Broad Arrow
- CB - Concrete Block
- SP - Spike
- PG - Boundary Peg
- MM - Miscellaneous Mark
- ST - Star Picket
- PM - Permanent Mark
- SS - State Survey Mark
- TS - Trig Station
- RT - Reference Tree
- Unknown - Mark of unknown origin found
- SCIMS - Survey Control Information Management System

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FOR CONSTRUCTION

DRAWING FILE LOCATION / NAME D:\Box Sync\PROJECTS - Current\A40432 - M1 Ourimbah Interchange CD DD\01 Working\Design\Detail\Drawings\DS2022 000636.dgn		DESIGN LOT CODE D M1 OURIMBAH DD 221118	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING D M1 OURIMBAH DD 221118	PLOT DATE / TIME 5/12/2022 5:03:35 PM	PLOT BY Colin Gu	CLIENT  Transport for NSW	CENTRAL COAST COUNCIL M1 - PACIFIC MOTORWAY OURIMBAH INTERCHANGE UPGRADE INFRASTRUCTURE MARK SCHEDULE
EXTERNAL REFERENCE FILES	REV 01	DATE 05/12/22	AMENDMENT / REVISION DESCRIPTION ISSUED FOR CONSTRUCTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING 0 10 20 30 40 50 SCALE 1:1000m	DRAWINGS / DESIGN PREPARED BY 
CO-ORDINATE SYSTEM MGA ZONE 56 (GDA2020)		HEIGHT DATUM AHD		TITLE DRAWN DRG CHECK DESIGN DESIGN CHECK DESIGN MNGR PROJECT MNGR	NAME C GU A HILLARD C GU A HILLARD A HILLARD L HUANG	DATE 05/12/22 05/12/22 05/12/22 05/12/22 05/12/22 05/12/22	PREPARED FOR PROJECT DEVELOPMENT INFRASTRUCTURE DEVELOPMENT GREATER SYDNEY PROGRAM OFFICE
RMS REGISTRATION No. DS2022 000636		ISSUE STATUS FOR CONSTRUCTION	EDMS No.	SHEET No. 08	ISSUE 01		

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Vegetation removal along m1 northbound needs to be undertaken for better visibility for the off-ramp exit direction signage



From SYDNEY

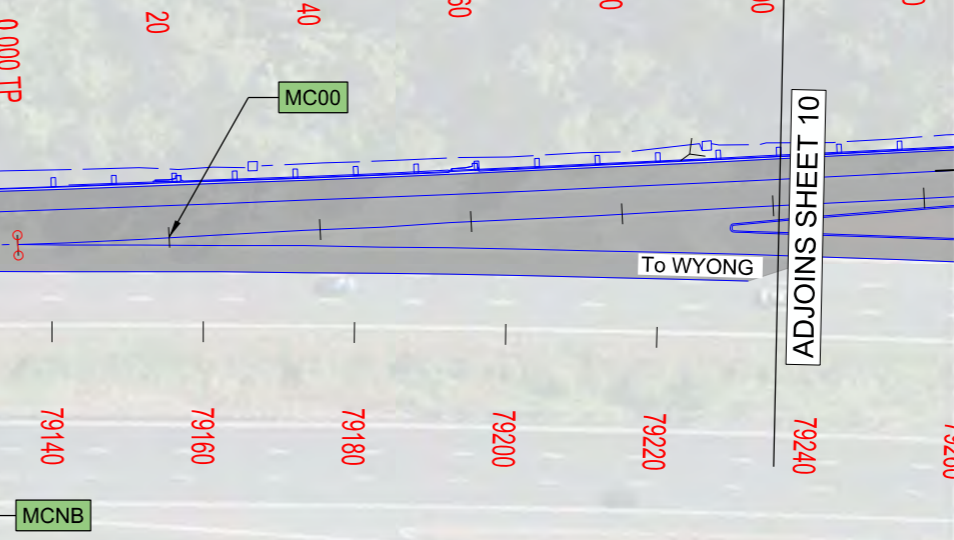
To WYONG

PACIFIC MOTORWAY

ADJOINS SHEET 10

LEGEND

- CONTROL ALIGNMENT LABEL
- CONTROL ALIGNMENT
- EXISTING PAVEMENT
- GUARD RAIL
- BOLLARDS
- EXISTING CADASTRAL BOUNDARY



DATUM RL.22.0

HORIZONTAL CURVES

VERTICAL CURVES

LEVEL DIFFERENCE

DESIGN LEVELS

EXISTING LEVELS

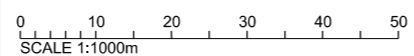
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23.591	23.477	23.402	23.350	23.348	23.370	23.432
23.591	23.477	23.402	23.350	23.348	23.370	23.432

LONGITUDINAL SECTION ALONG MC00
M1 PACIFIC MOTORWAY - NB EXIT (h1:1000 v1:200)

FOR CONSTRUCTION

DRAWING FILE LOCATION / NAME D:\Box Sync\PROJECTS - Current\AA0432 - M1 Ourimbah Interchange CD DD\01 Working\Design\Detail\Drawings\DS2022 000636.dgn		DESIGN LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING D M1 OURIMBAH DD 221118	PLOT DATE / TIME 5/12/2022 5:03:35 PM	PLOT BY Colin Gu	CLIENT Transport for NSW
EXTERNAL REFERENCE FILES	REV 01	DATE 25/11/22	AMENDMENT / REVISION DESCRIPTION ISSUED FOR CONSTRUCTION	WVR No.	APPROVAL	PREPARED FOR PROJECT DEVELOPMENT INFRASTRUCTURE DEVELOPMENT GREATER SYDNEY PROGRAM OFFICE



CO-ORDINATE SYSTEM
MGA ZONE 56 (GDA2020)

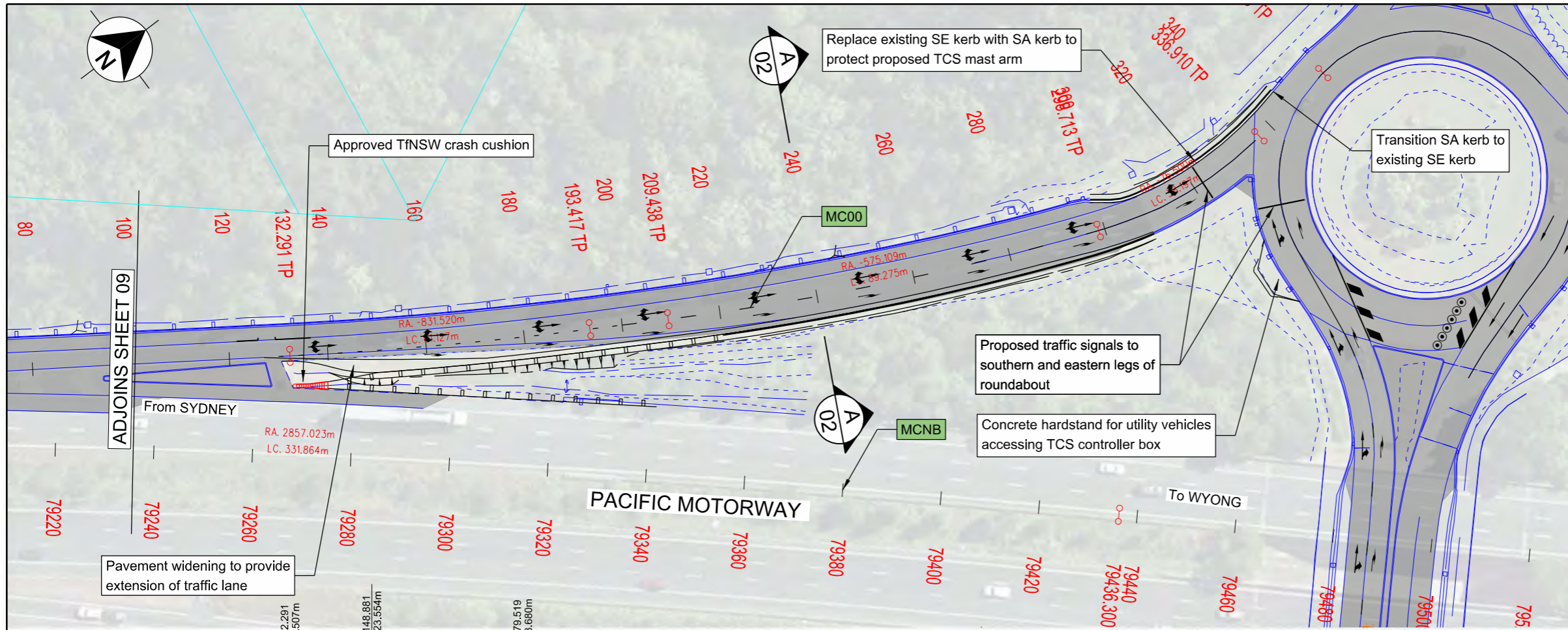
HEIGHT DATUM
AHD



TITLE	NAME	DATE
DRAWN	C GU	05/12/22
DRG CHECK	A HILLARD	05/12/22
DESIGN	C GU	05/12/22
DESIGN CHECK	A HILLARD	05/12/22
DESIGN MNGR	A HILLARD	05/12/22
PROJECT MNGR	L HUANG	05/12/22

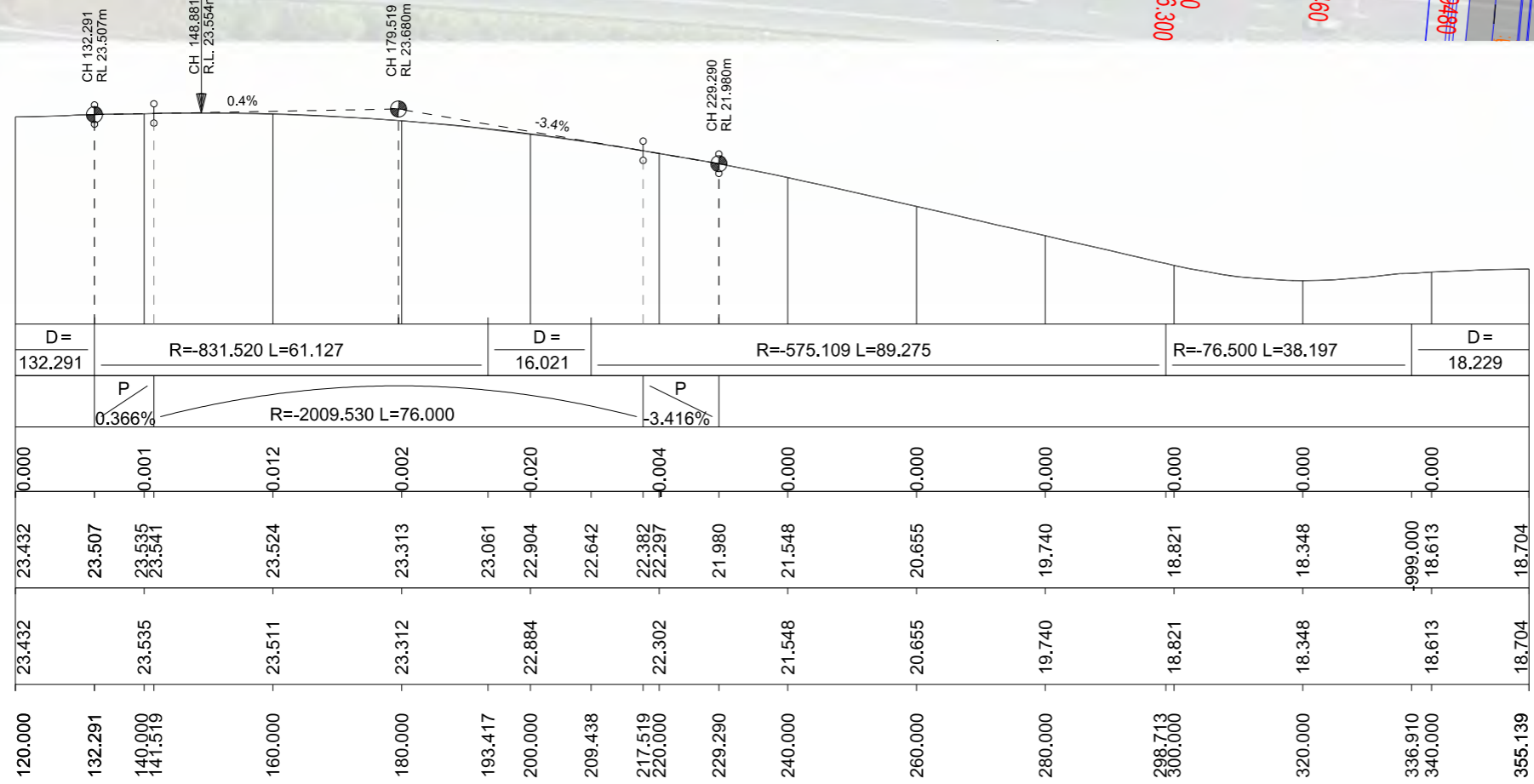
CENTRAL COAST COUNCIL M1 - PACIFIC MOTORWAY OURIMBAH INTERCHANGE UPGRADE GENERAL ARRANGEMENT PLAN - NORTHBOUND SHEET 1 OF 2		RMS REGISTRATION No. DS2022 000636	PART
ISSUE STATUS FOR CONSTRUCTION	EDMS No.	SHEET No. 09	ISSUE 01

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50mm ON A3 SIZE ORIGINAL



LEGEND

	CONTROL ALIGNMENT LABEL
	CONTROL ALIGNMENT
	EXISTING PAVEMENT
	GUARD RAIL
	BOLLARDS
	EXISTING CADASTRAL BOUNDARY



DATUM RL.17.0

HORIZONTAL CURVES

VERTICAL CURVES

LEVEL DIFFERENCE

DESIGN LEVELS

EXISTING LEVELS

CHAINAGE

D=	R=-831.520 L=61.127		D=	R=-575.109 L=89.275			R=-76.500 L=38.197	D=	18.229											
P	R=-2009.530 L=76.000						P													
0.000	0.001	0.012	0.002	0.020	0.004	0.000	0.000	0.000	0.000											
23.432	23.507	23.535	23.541	23.524	23.313	23.061	22.904	22.642	22.382	22.297	21.980	21.548	20.655	19.740	18.821	18.348	18.613	18.704		
23.432	23.535	23.511	23.312	22.884	22.302	21.548	20.655	19.740	18.821	18.348	18.613	18.704								
120.000	132.291	140.000	141.519	160.000	180.000	193.417	200.000	209.438	217.519	220.000	229.290	240.000	260.000	280.000	298.713	300.000	320.000	336.910	340.000	355.139

LONGITUDINAL SECTION ALONG MC00
M1 PACIFIC MOTORWAY - NB EXIT (h1:1000 v1:200)

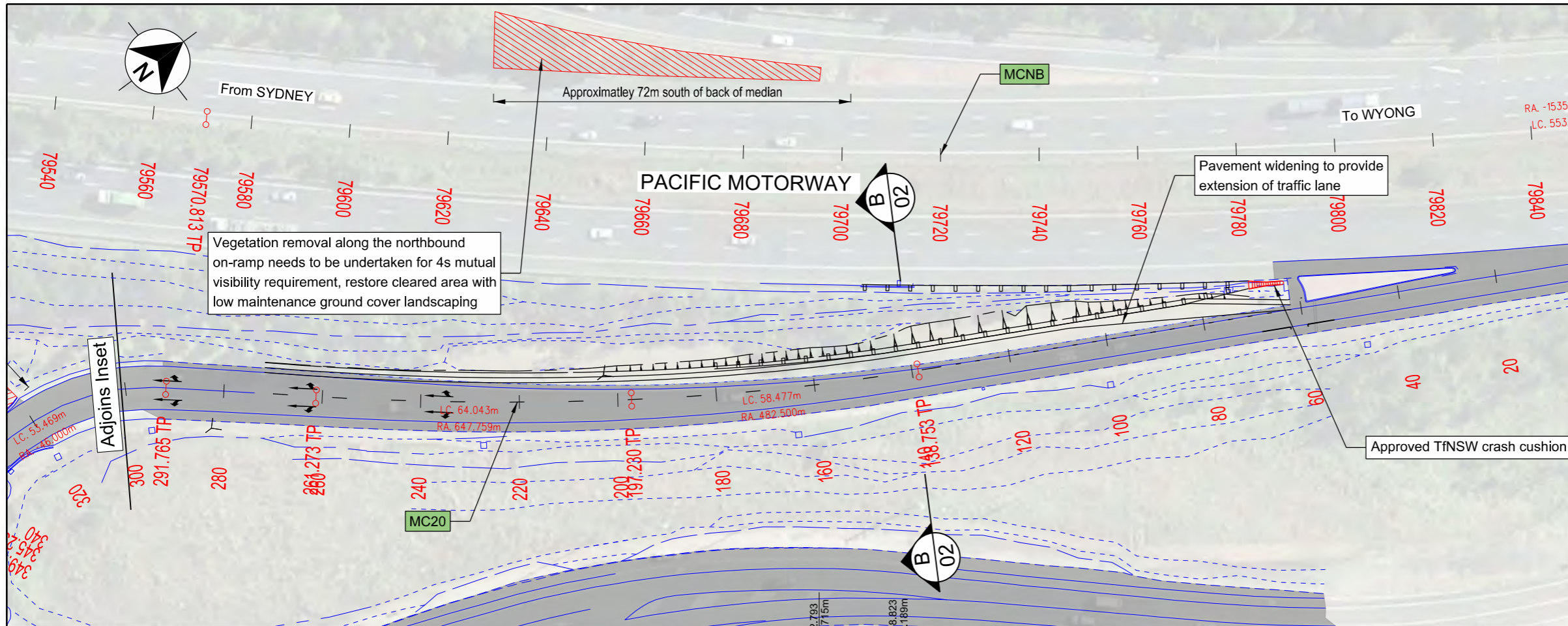
- NOTES**
- Refer to TCS Plan VV5171_1A, VV5171_2A, VV5171_3A for Traffic signal layout
 - Refer to XXX planset for lighting impressment works

FOR CONSTRUCTION

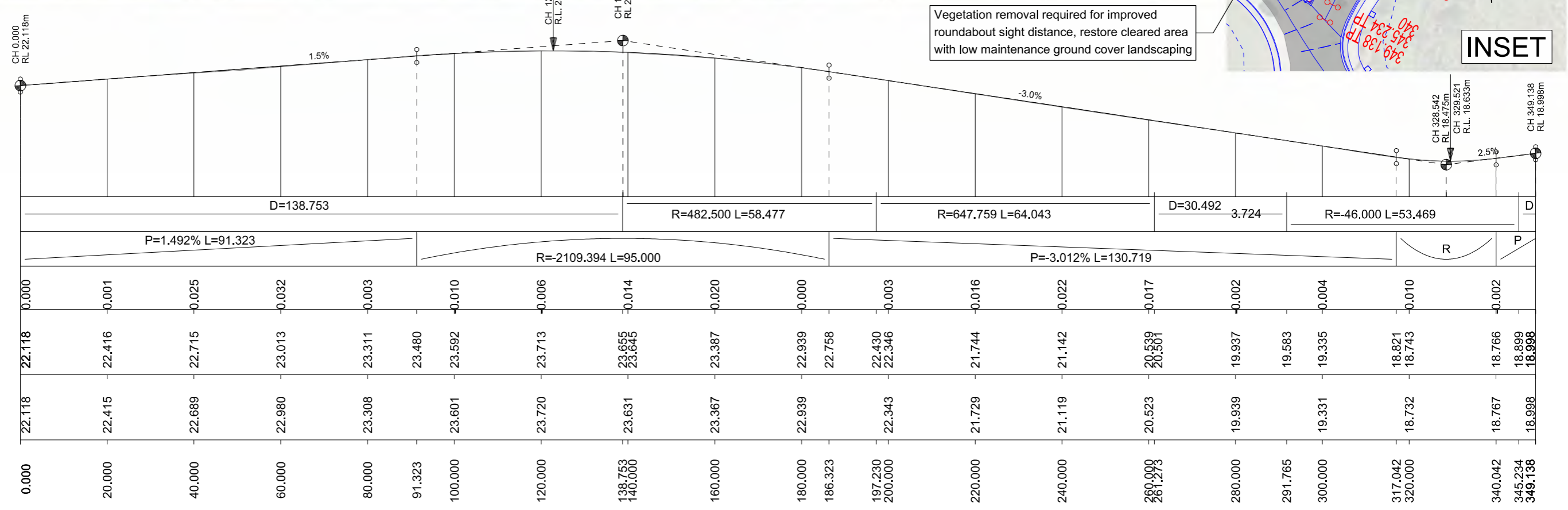
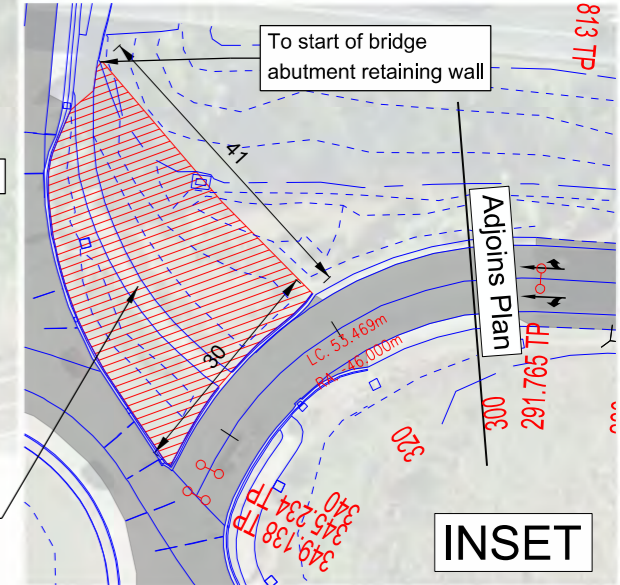
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EXTERNAL REFERENCE FILES	REV 01	DATE 25/11/22	AMENDMENT / REVISION DESCRIPTION ISSUED FOR CONSTRUCTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING 0 10 20 30 40 50 SCALE 1:1000m 0 2 4 6 8 10 SCALE 1:200m	DRAWINGS / DESIGN PREPARED BY
CO-ORDINATE SYSTEM MGA ZONE 56 (GDA2020)		HEIGHT DATUM AHD		TITLE DRAWN DRG CHECK DESIGN DESIGN CHECK DESIGN MNGR PROJECT MNGR		NAME C GU A HILLARD C GU A HILLARD A HILLARD L HUANG	
DATE 05/12/22		DATE 05/12/22		DATE 05/12/22		DATE 05/12/22	
RMS REGISTRATION No. DS2022 000636		EDMS No.		SHEET No. 10		ISSUE 01	

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- ### LEGEND
- CONTROL ALIGNMENT LABEL
 - CONTROL ALIGNMENT
 - EXISTING PAVEMENT
 - GUARD RAIL
 - BOLLARDS
 - EXISTING CADASTRAL BOUNDARY



LONGITUDINAL SECTION ALONG MC20
M1 PACIFIC MOTORWAY - SB EXIT (h1:1000 v1:200)

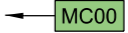






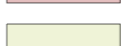


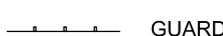
FOR CONSTRUCTION

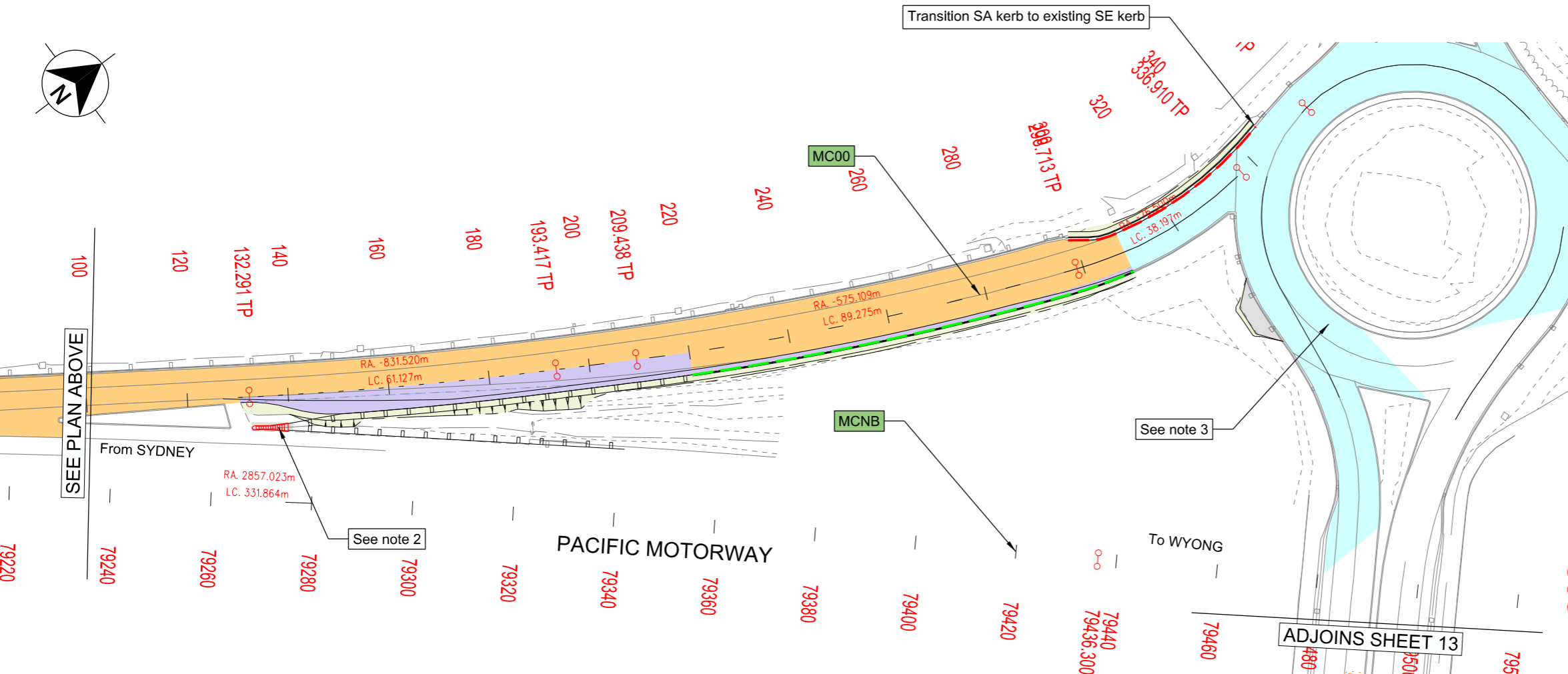
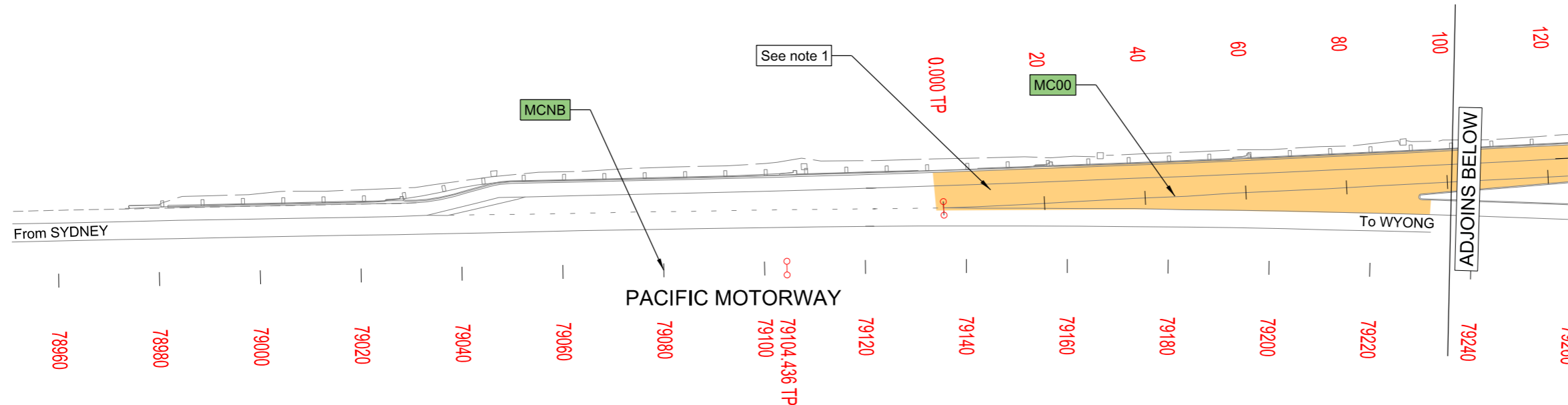
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LEGEND

-  CONTROL ALIGNMENT LABEL
-  CONTROL ALIGNMENT
-  PAVEMENT TYPE 1
FULL DEPTH ROAD PAVEMENT
-  PAVEMENT TYPE 2
AC MILL & RESHEET
-  PAVEMENT TYPE 3
CONCRETE GROOVING
-  PAVEMENT TYPE 4
CONCRETE
-  RAISED CONCRETE MEDIAN
-  TOPSOIL AND TURF
-  SF Kerb
-  SA Kerb
-  GUARD RAIL



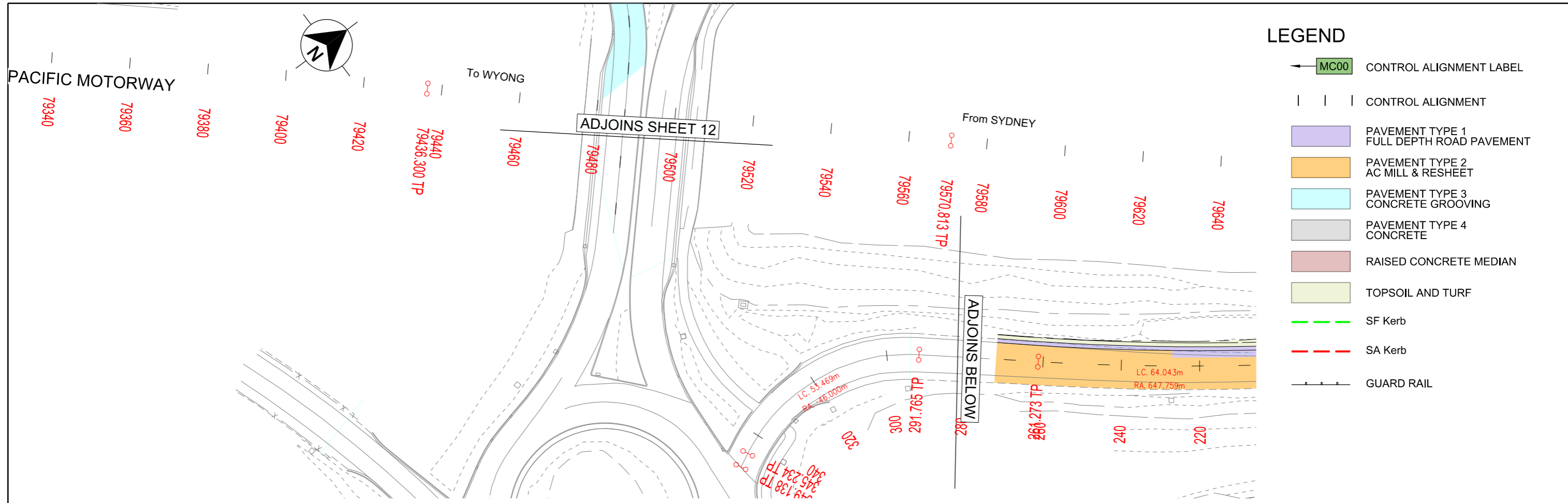
NOTES

1. The area of pavement type 2 AC mill and resheet is proposed based on the following requirements:
 - a. Exit lane lateral shift extent proposed in construction staging drawing, where temporary linemarking will be required to guide traffic during construction, refer to sketch AA0432- SK005 for detail
 - b. At areas where line-marking renewals are required, refer to note 1 of 'SIGNAGE AND LINEMARKING PLAN'.
2. Crash cushion to be placed on concrete pad on the same level as the shoulder of the M1 Motorway, concrete pad to be constructed as required from the selected crash cushion manufacturer specification.
3. Concrete grooving details and extent need to refer to appendix I of the design report - HV4473 SURVEY GROUND DETAILS 2D_OurimbahInterchangeProposed GroovingMODIFIED_09December2022

FOR CONSTRUCTION

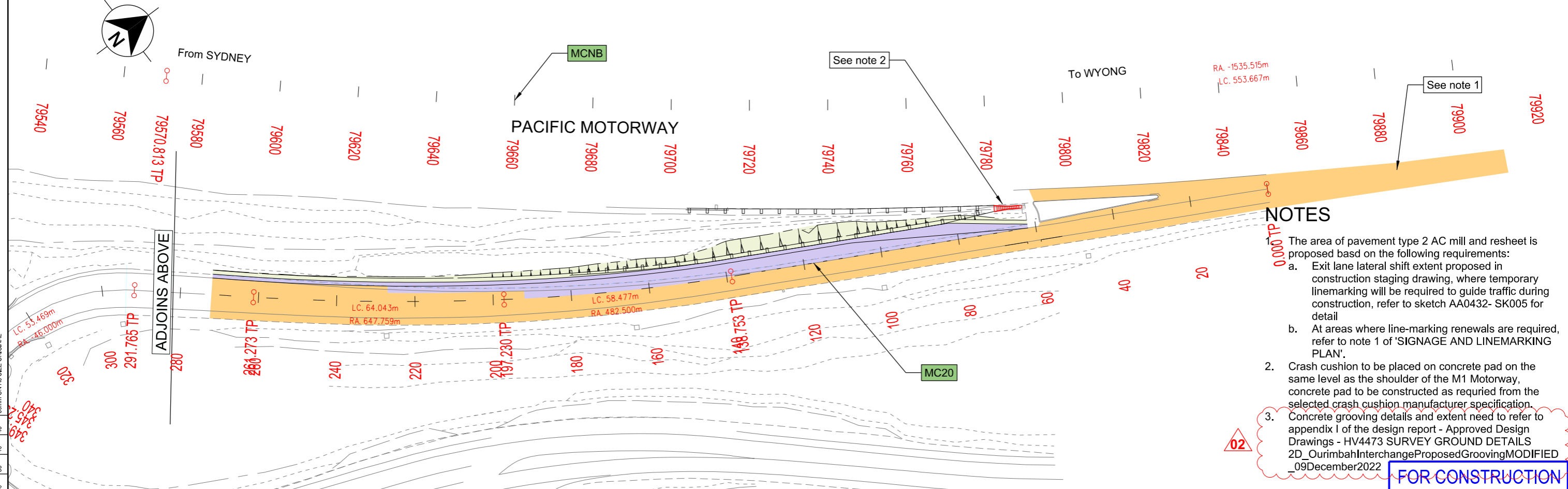
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SCALE ON A3 SIZE DRAWING  SCALE 1:1000m		DRAWINGS / DESIGN PREPARED BY 		TITLE DRAWN DRG CHECK DESIGN DESIGN CHECK DESIGN MNGR PROJECT MNGR	NAME C GU A HILLARD C GU A HILLARD A HILLARD L HUANG	DATE 09/12/22 09/12/22 09/12/22 09/12/22 09/12/22	ISSUE STATUS FOR CONSTRUCTION
CO-ORDINATE SYSTEM MGA ZONE 56 (GDA2020)		HEIGHT DATUM AHD		SHEET No. 12		ISSUE 02	© Transport for NSW



LEGEND

- MC00 CONTROL ALIGNMENT LABEL
- CONTROL ALIGNMENT
- PAVEMENT TYPE 1
FULL DEPTH ROAD PAVEMENT
- PAVEMENT TYPE 2
AC MILL & RESHEET
- PAVEMENT TYPE 3
CONCRETE GROOVING
- PAVEMENT TYPE 4
CONCRETE
- RAISED CONCRETE MEDIAN
- TOPSOIL AND TURF
- SF Kerb
- SA Kerb
- GUARD RAIL



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50mm ON A3 SIZE ORIGINAL

BARRIER SCHEDULE (MC00)			
CHAINAGE	LENGTH (m)	TYPE	Direction
140 - 220	80	W Beam Safety barrier and end terminal at Ch220 to be MASH TL3 compliant, using TfNSW approved product, connecting with crash cushion at Ch 79270 of MCNB	RHS

BARRIER SCHEDULE (MCNB)			
CHAINAGE	LENGTH (m)	TYPE	Direction
79322 - 79333	11	Existing crash cushion to be removed	LHS
79275 - 79327	52	W beam safety barrier to be MASH TL3 or TL4 compliant, connecting with crash cushion at Ch 79270	LHS
79327 - 79333	6	W beam transition to three beam safety barrier, then connecting to existing type F barrier. Refer standard drawing R0720-07.	LHS
79270	-	TfNSW accepted crash cushion to be TL3 or TL4 compliant, connecting with safety barriers	LHS
79704 - 79715	11	Existing crash cushion to be removed	RHS
79710 - 79780	70	W beam safety barrier to be MASH TL3 or TL4 compliant, connecting with crash cushion at Ch 79785	RHS
79704 - 79710	6	W beam transition to three beam safety barrier, then connecting to existing type F barrier. Refer standard drawing R0720-07.	RHS
79785	-	TfNSW accepted crash cushion to be TL3 or TL4 compliant, connecting with safety barriers	RHS

BARRIER SCHEDULE (MC20)			
CHAINAGE	LENGTH (m)	TYPE	Direction
70 - 180	110	W Beam Safety barrier and end terminal at Ch180 to be MASH TL3 compliant, using TfNSW approved product, connecting with crash cushion at Ch 79780 of MCNB	RHS

KERB SCHEDULE (MC00)				
CHAINAGE	LENGTH (m)	TYPE	Direction	Note
298.7 - 343.6	44.9	SA	LHS	Refer to note 3
220 - 310	90	SF	RHS	-



NOTES

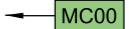











1. Refer to TfNSW R0700 series standard drawings for details of safety barriers, terminals and transitions
2. Refer to TfNSW R0300 series standard drawings for details of kerbs
3. Refer to RMS rigid pavement standard details - construction drawings for details of kerb construction adjacent to concrete pavement

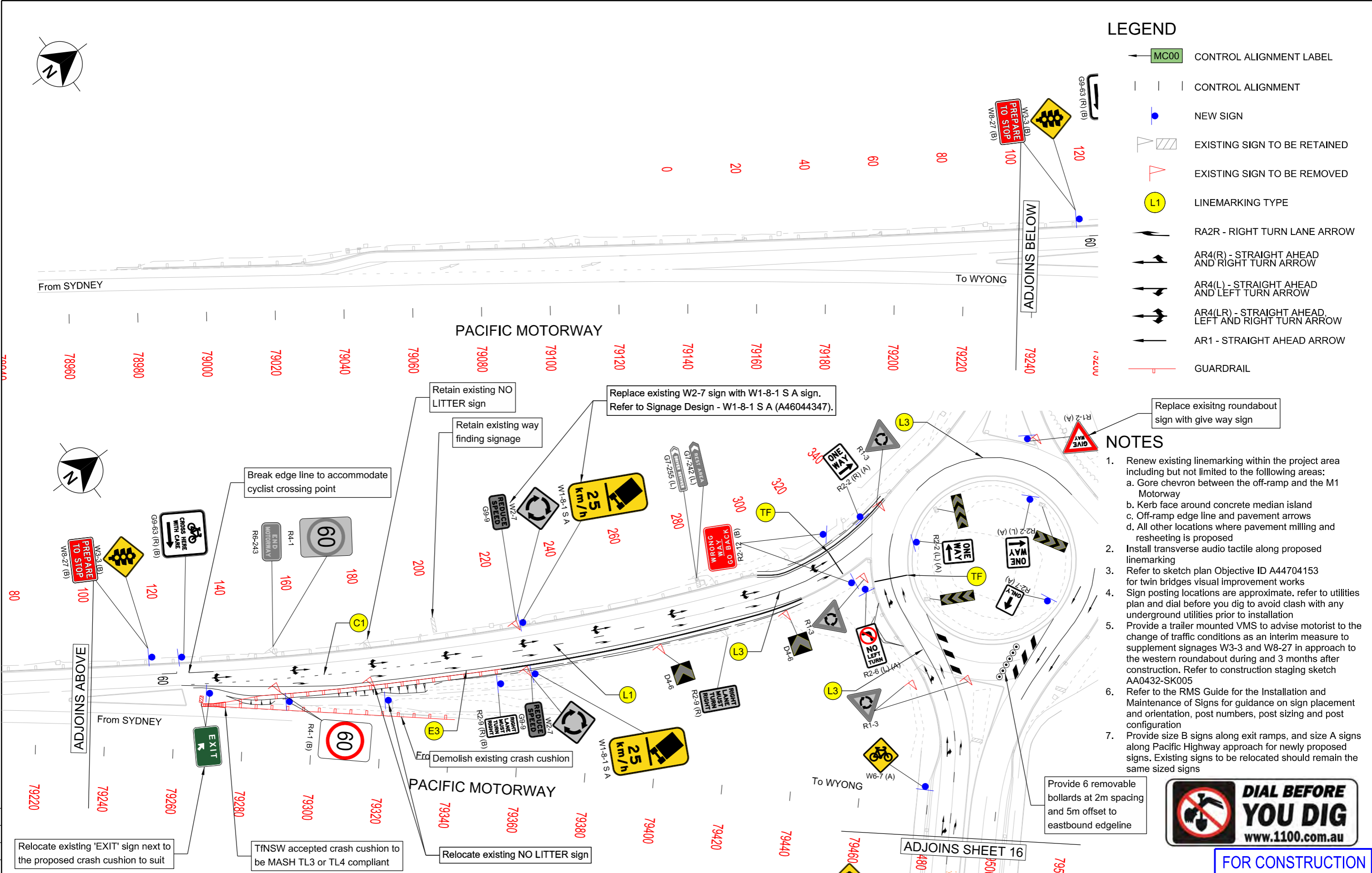
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EXTERNAL REFERENCE FILES	REV 01	DATE 25/11/22	AMENDMENT / REVISION DESCRIPTION ISSUED FOR CONSTRUCTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING 0 10 20 30 40 50 SCALE 1:1000m	DRAWINGS / DESIGN PREPARED BY 	PREPARED FOR PROJECT DEVELOPMENT INFRASTRUCTURE DEVELOPMENT GREATER SYDNEY PROGRAM OFFICE		
CO-ORDINATE SYSTEM MGA ZONE 56 (GDA2020)			HEIGHT DATUM AHD		RMS REGISTRATION No. DS2022 000636		ISSUE STATUS FOR CONSTRUCTION	EDMS No.	SHEET No. 14	PART 01



LEGEND

-  MC00 CONTROL ALIGNMENT LABEL
-  CONTROL ALIGNMENT
-  NEW SIGN
-  EXISTING SIGN TO BE RETAINED
-  EXISTING SIGN TO BE REMOVED
-  LINEMARKING TYPE
-  RA2R - RIGHT TURN LANE ARROW
-  AR4(R) - STRAIGHT AHEAD AND RIGHT TURN ARROW
-  AR4(L) - STRAIGHT AHEAD AND LEFT TURN ARROW
-  AR4(LR) - STRAIGHT AHEAD, LEFT AND RIGHT TURN ARROW
-  AR1 - STRAIGHT AHEAD ARROW
-  GUARDRAIL



NOTES

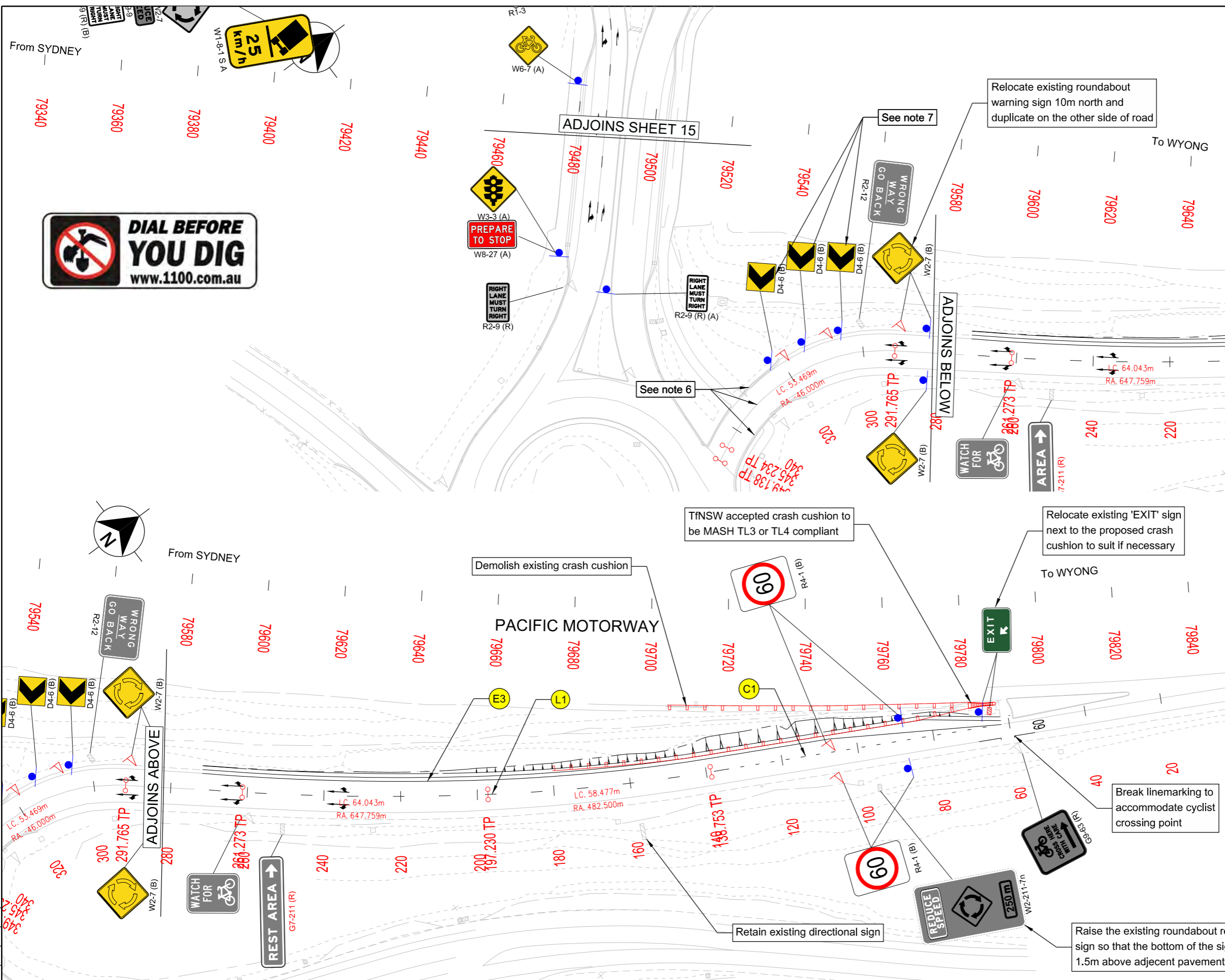
1. Renew existing linemarking within the project area including but not limited to the following areas:
 - a. Gore chevron between the off-ramp and the M1 Motorway
 - b. Kerb face around concrete median island
 - c. Off-ramp edge line and pavement arrows
 - d. All other locations where pavement milling and resheeting is proposed
2. Install transverse audio tactile along proposed linemarking
3. Refer to sketch plan Objective ID A44704153 for twin bridges visual improvement works
4. Sign posting locations are approximate, refer to utilities plan and dial before you dig to avoid clash with any underground utilities prior to installation
5. Provide a trailer mounted VMS to advise motorist to the change of traffic conditions as an interim measure to supplement signages W3-3 and W8-27 in approach to the western roundabout during and 3 months after construction. Refer to construction staging sketch AA0432-SK005
6. Refer to the RMS Guide for the Installation and Maintenance of Signs for guidance on sign placement and orientation, post numbers, post sizing and post configuration
7. Provide size B signs along exit ramps, and size A signs along Pacific Highway approach for newly proposed signs. Existing signs to be relocated should remain the same sized signs



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		HEIGHT DATUM AHD	DESIGN CHECK	A HILLARD	05/12/22
			DESIGN MNGR	A HILLARD	05/12/22
			PROJECT MNGR	L HUANG	05/12/22
RMS REGISTRATION No. DS2022 000636					PART
ISSUE STATUS FOR CONSTRUCTION					EDMS No.
					SHEET No. 15
					ISSUE 01



LEGEND

- MC00 CONTROL ALIGNMENT LABEL
- CONTROL ALIGNMENT
- NEW SIGN
- EXISTING SIGN TO BE RETAINED
- EXISTING SIGN TO BE REMOVED
- LINEMARKING TYPE
- RA2R - RIGHT TURN LANE ARROW
- AR4(R) - STRAIGHT AHEAD AND RIGHT TURN ARROW
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- AR1 - STRAIGHT AHEAD ARROW
- GUARDRAIL

- ### NOTES
- Renew existing linemarking within the project area including but not limited to the following areas:
 - Gore chevron between the off-ramp and the M1 Motorway
 - Kerb face around concrete median island
 - Off-ramp edge line and pavement arrows
 - All other locations where pavement milling and resheeting is proposed
 - Install transverse audio tactile along proposed linemarking
 - Refer to sketch plan Objective ID A44704153 for twin bridges visual improvement works
 - Sign posting locations are approximate, refer to utilities plan and dial before you dig to avoid clash with any underground utilities prior to installation
 - Provide a trailer mounted VMS to advise motorist to the change of traffic conditions as an interim measure to supplement signages W3-3 and W8-27 in approach to the western roundabout during and 3 months after construction. Refer to construction staging sketch AA0432-SK005
 - Re-linemarking and repainting the kerb face to improve delineation of the southbound exit ramp approaching the eastern roundabout
 - Relocate existing Chevron alignment markers (CAMs) and install an additional CAM to improve driver perception of the curve approaching roundabout. All CAMs are to be installed 1m off the edge of pavement at 10m spacing, while the edge of the sign should be no closer than 600mm to the pavement edge
 - Refer to the RMS Guide for the Installation and Maintenance of Signs for guidance on sign placement and orientation, post numbers, post sizing and post configuration
 - Provide size B signs along exit ramps, and size A signs along Pacific Highway approach for newly proposed signs. Existing signs to be relocated should remain the same sized signs.

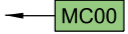






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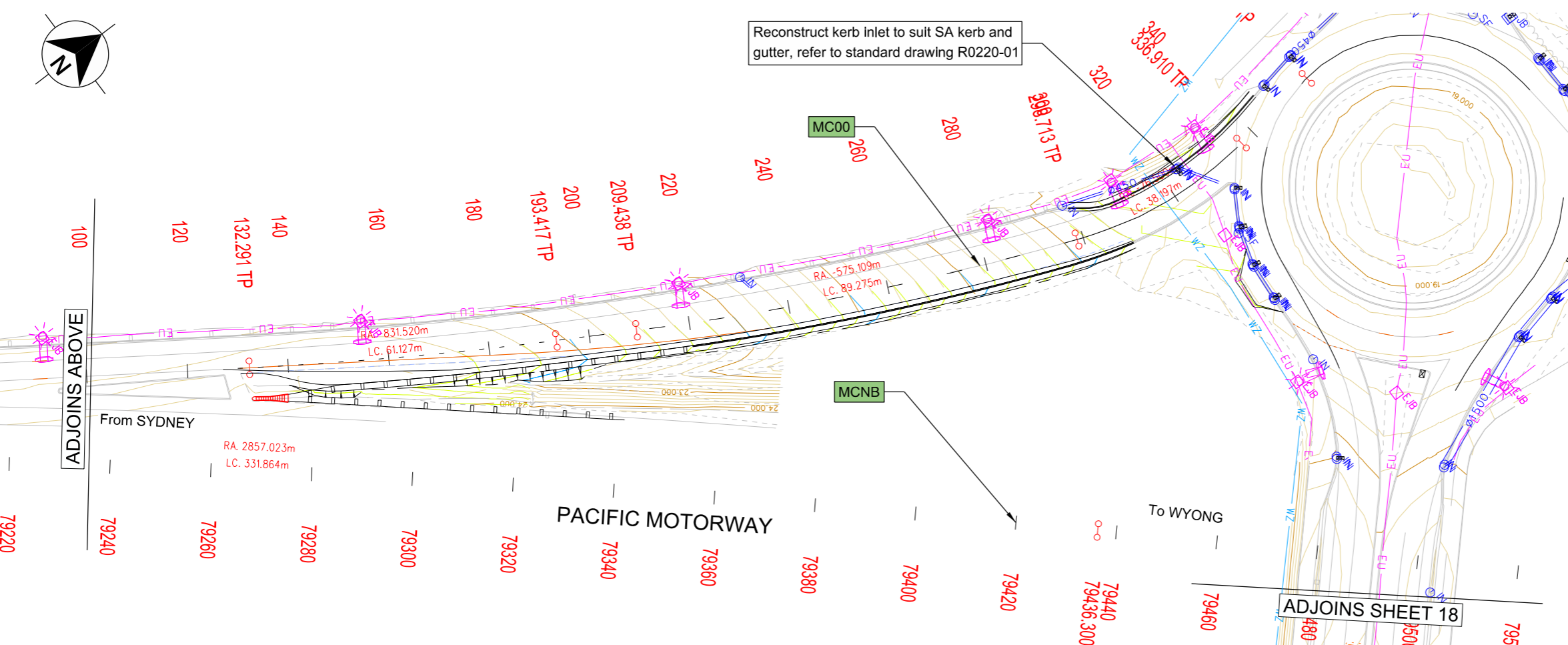
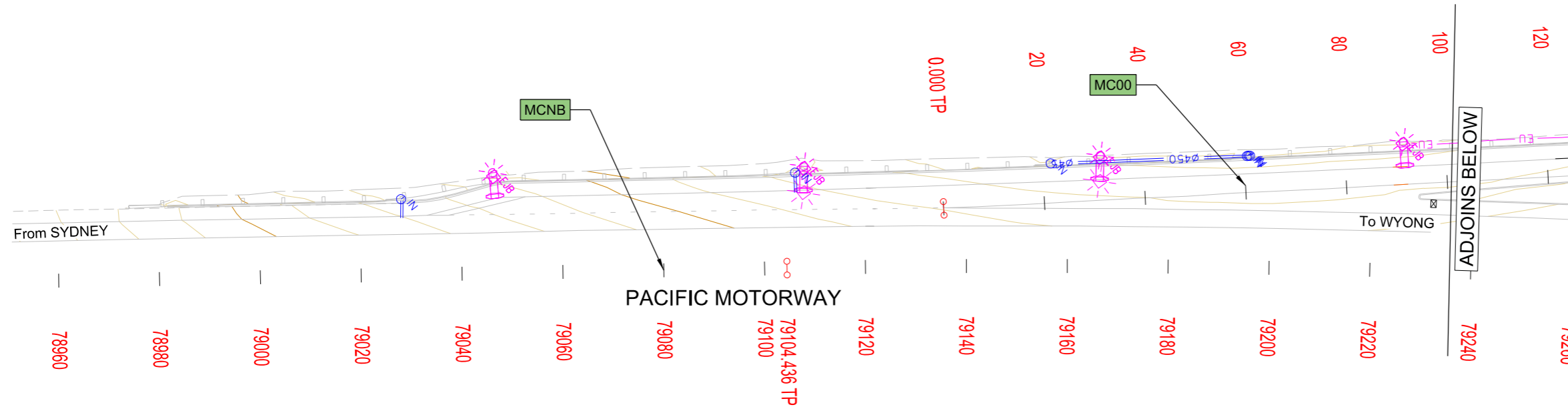
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				DESIGN CHECK A HILLARD 05/12/22		EDMS No.	
				DESIGN MNGR A HILLARD 05/12/22		SHEET No. 16	
				PROJECT MNGR L HUANG 05/12/22		ISSUE No. 01	



LEGEND

-  CONTROL ALIGNMENT LABEL
-  CONTROL ALIGNMENT
-  WATER MAIN
-  UNDERGROUND ELECTRICITY LINE
-  *****CAUTION***
ELECTRICITY LINE UNDER STREET
LIGHTING NOT IDENTIFIED**
-  EXISTING DRAINAGE
-  EXISTING DRAINAGE PIT



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EXTERNAL REFERENCE FILES	REV 01	DATE 25/11/22	AMENDMENT / REVISION DESCRIPTION ISSUED FOR CONSTRUCTION	WVR No.	APPROVAL	PREPARED FOR PROJECT DEVELOPMENT INFRASTRUCTURE DEVELOPMENT GREATER SYDNEY PROGRAM OFFICE	RMS REGISTRATION No. DS2022 000636
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SCALE 1:1000m 			CO-ORDINATE SYSTEM MGA ZONE 56 (GDA2020)		HEIGHT DATUM AHD		EDMS No.
						SHEET No. 17	ISSUE 01

PACIFIC MOTORWAY

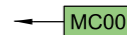






To WYONG

From SYDNEY

ADJOINS SHEET 17

MCNB

LEGEND

-  CONTROL ALIGNMENT LABEL
-  CONTROL ALIGNMENT
-  WATER MAIN
-  UNDERGROUND ELECTRICITY LINE
-  *****CAUTION***
ELECTRICITY LINE UNDER STREET
LIGHTING NOT IDENTIFIED**
-  EXISTING DRAINAGE
-  EXISTING DRAINAGE PIT

*****CAUTION***
ELECTRICITY LINE UNDER STREET
LIGHTING NOT IDENTIFIED**

PACIFIC MOTORWAY

From SYDNEY

To WYONG

PACIFIC MOTORWAY

MCNB

RA. -1535.5'
LC. 553.66'

Replace the damaged
drainage pit inlet grate



ADJOINS ABOVE

MC20

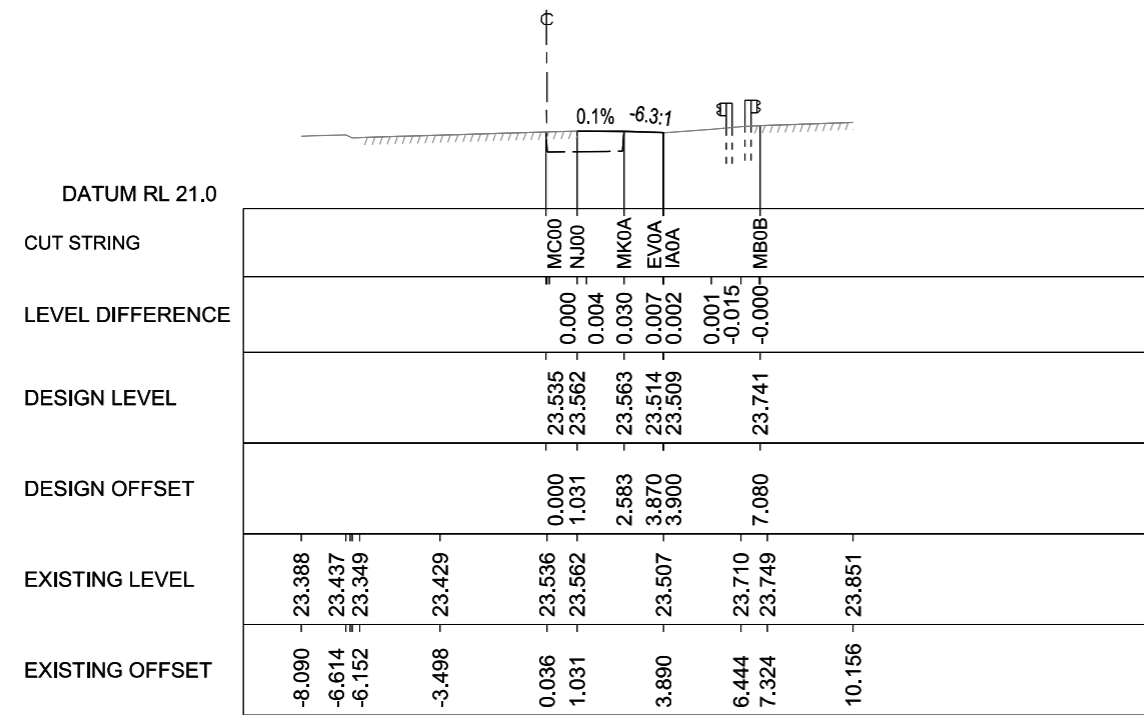


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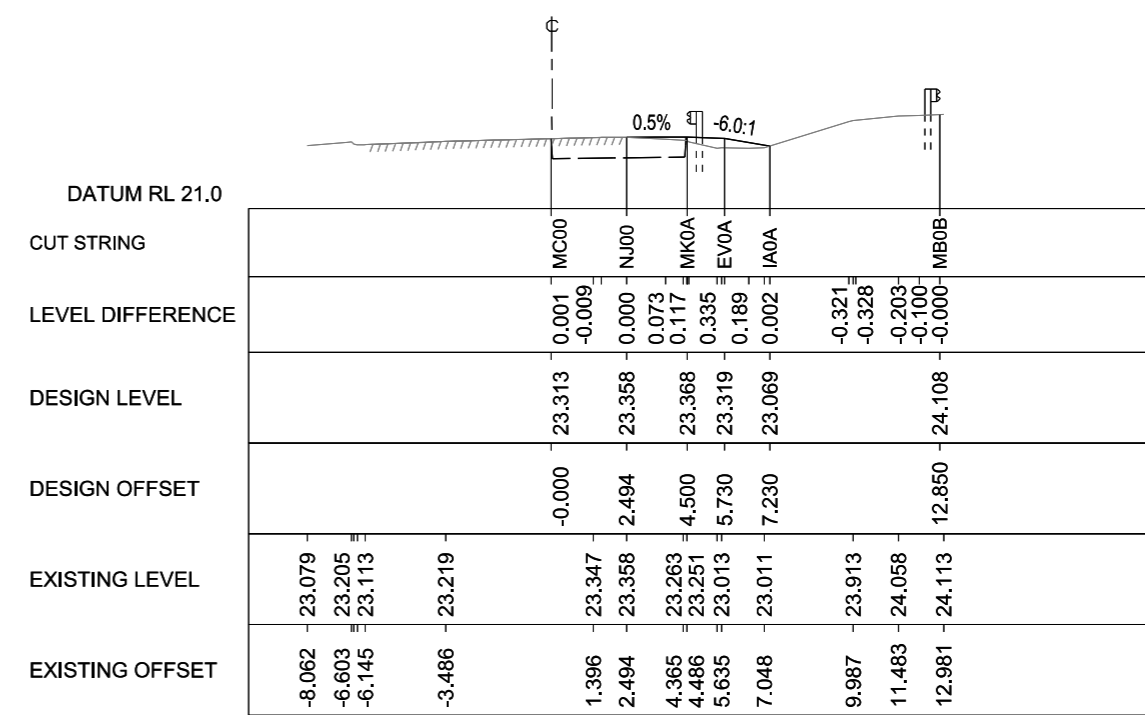
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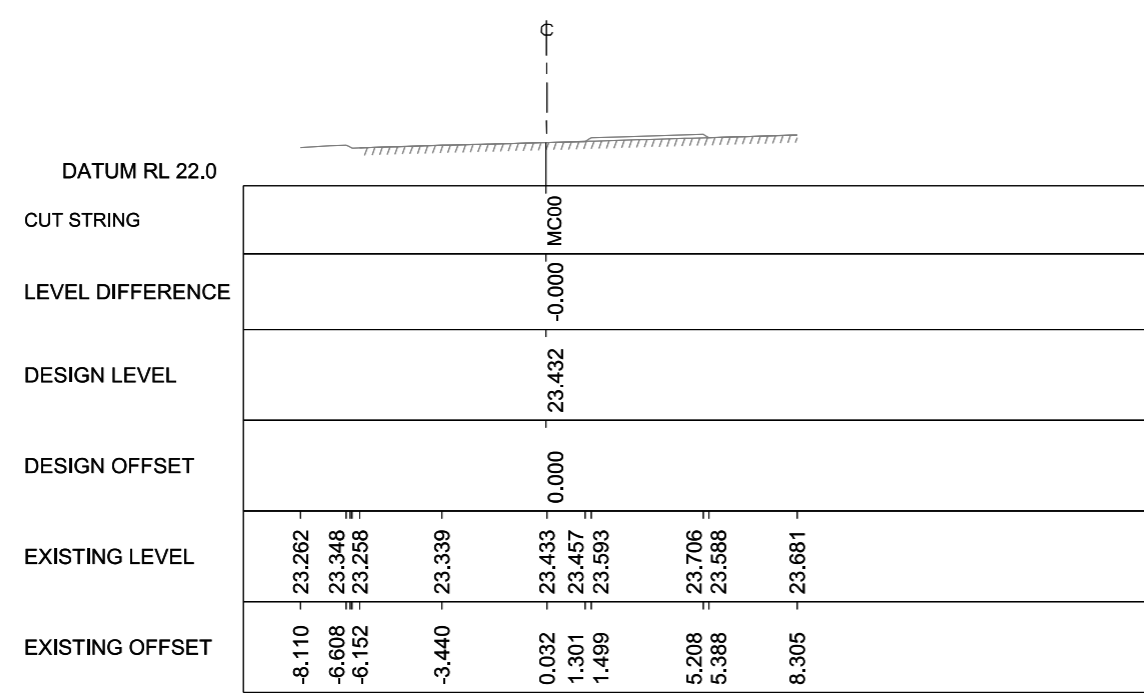
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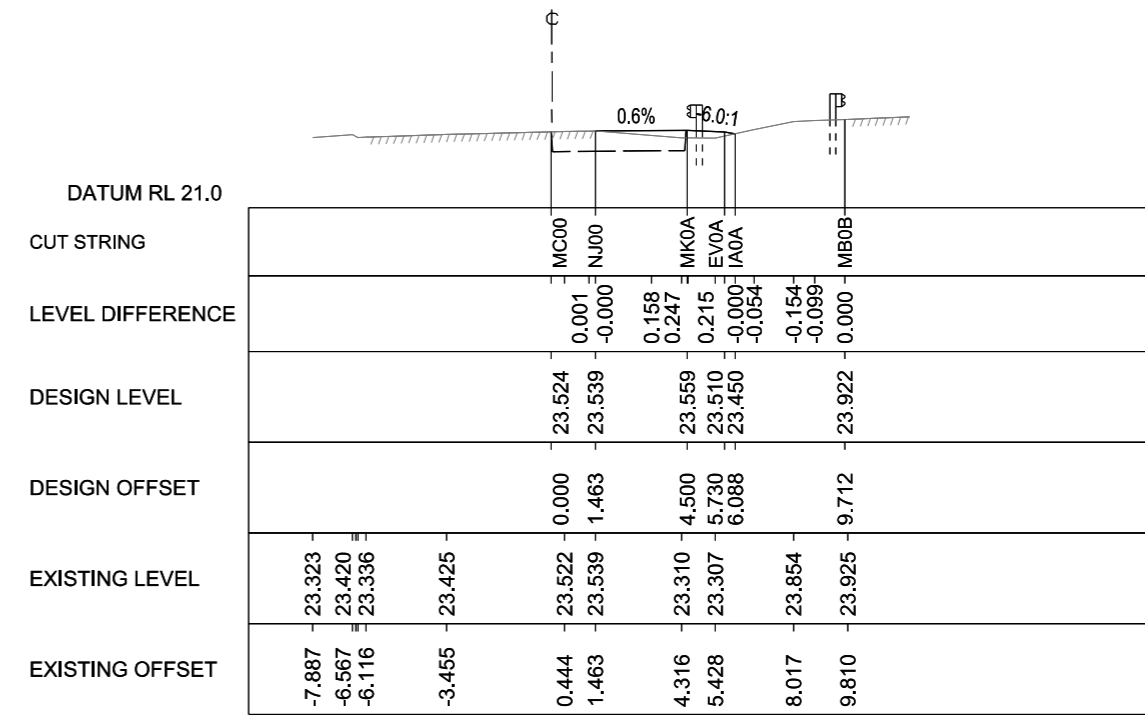
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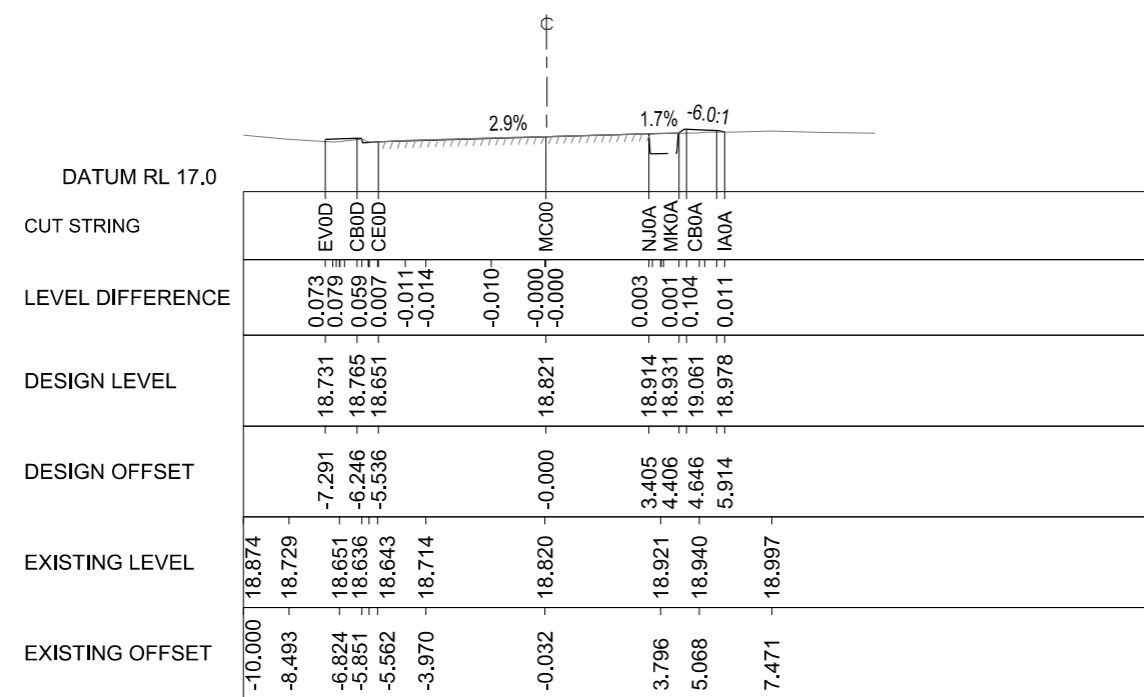


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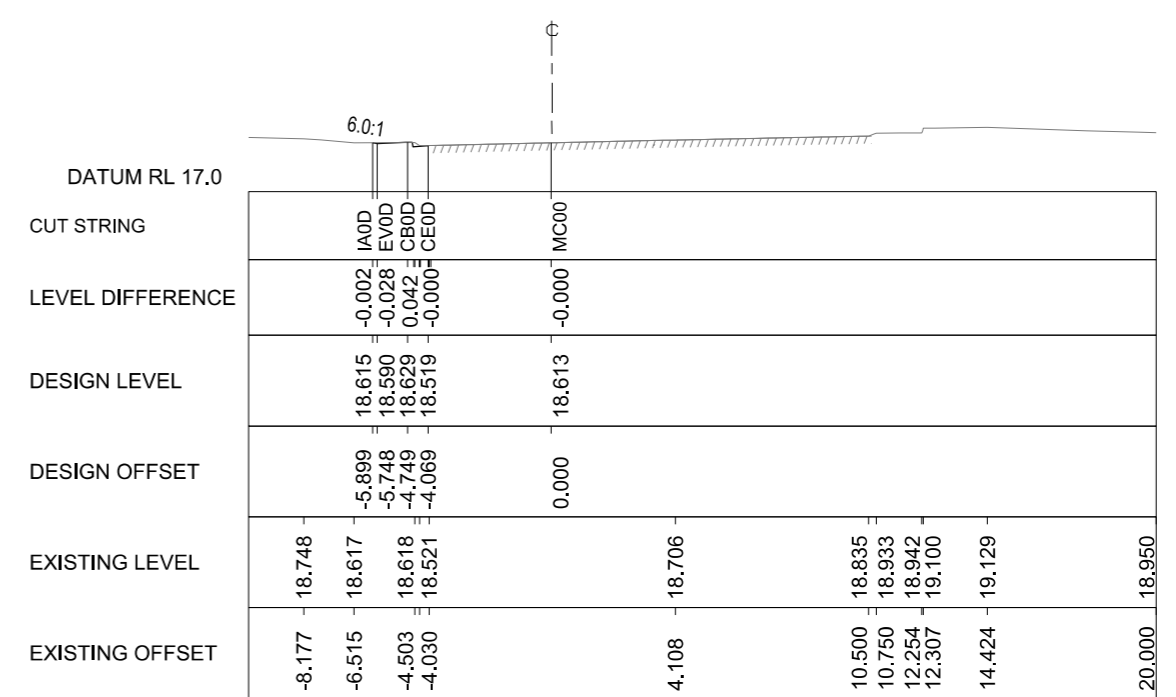
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CO-ORDINATE SYSTEM MGA ZONE 56 (GDA2020)					HEIGHT DATUM AHD				
TITLE DRAWN DRG CHECK DESIGN DESIGN CHECK DESIGN MNGR PROJECT MNGR					NAME C GU A HILLARD C GU A HILLARD A HILLARD L HUANG				
DATE 05/12/22 05/12/22 05/12/22 05/12/22 05/12/22 05/12/22					PREPARED FOR PROJECT DEVELOPMENT INFRASTRUCTURE DEVELOPMENT GREATER SYDNEY PROGRAM OFFICE				
RMS REGISTRATION No. DS2022 000636					PART				
ISSUE STATUS FOR CONSTRUCTION					EDMS No.		SHEET No. 19		ISSUE 01

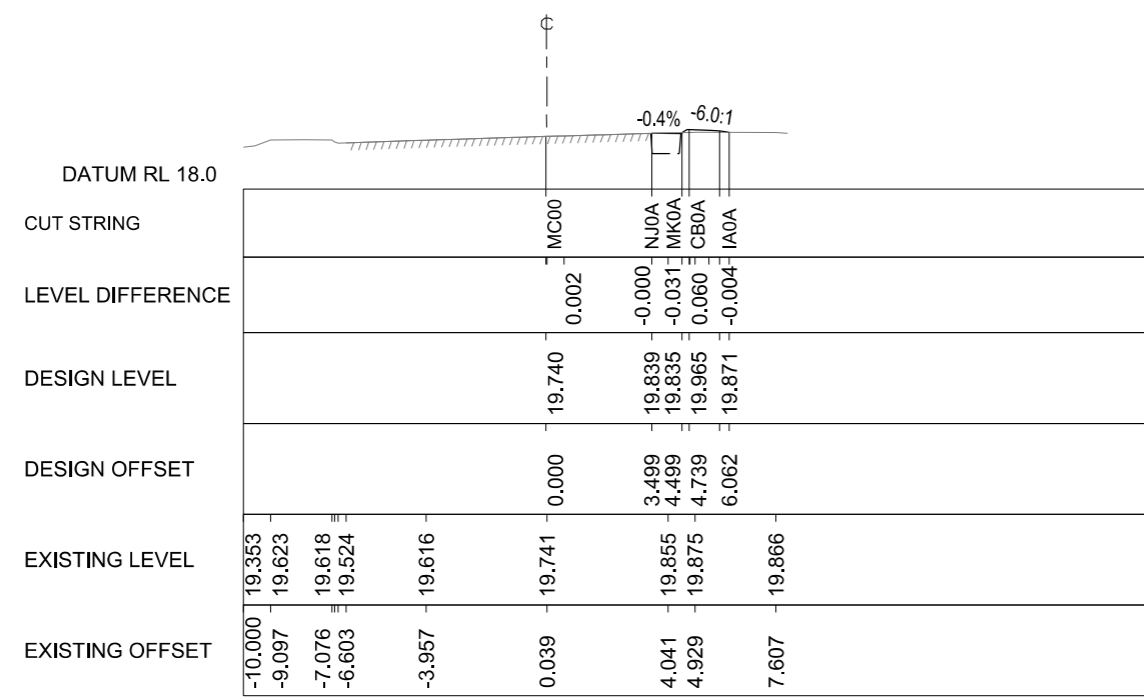
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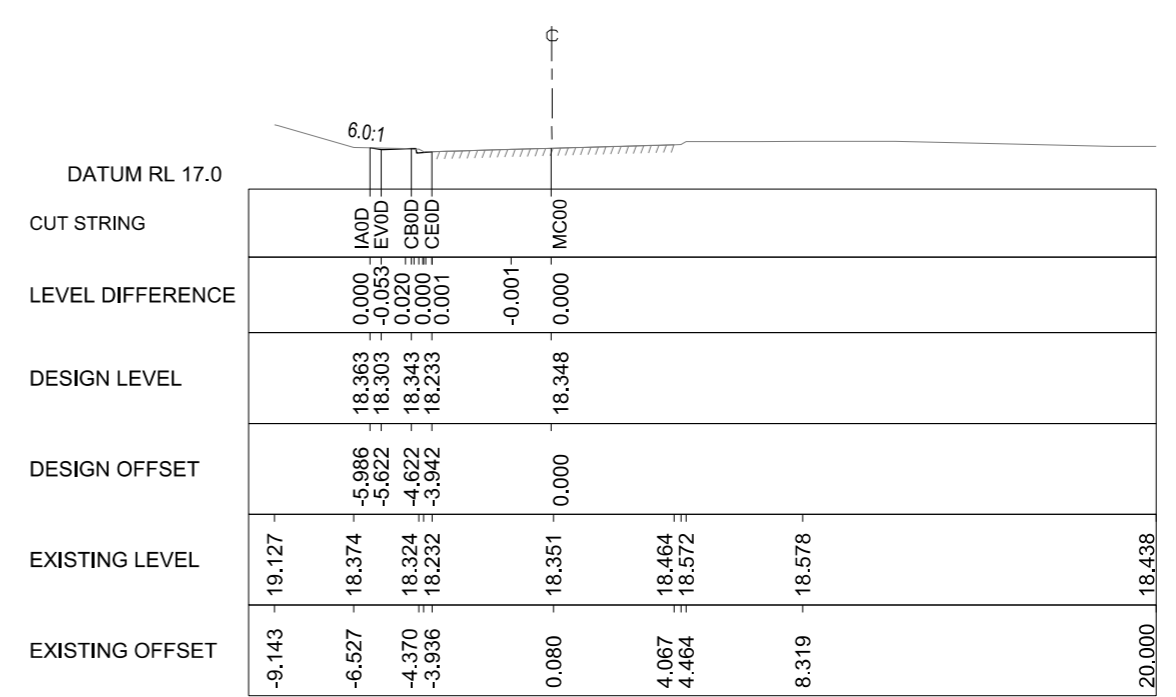
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340.0



280.0

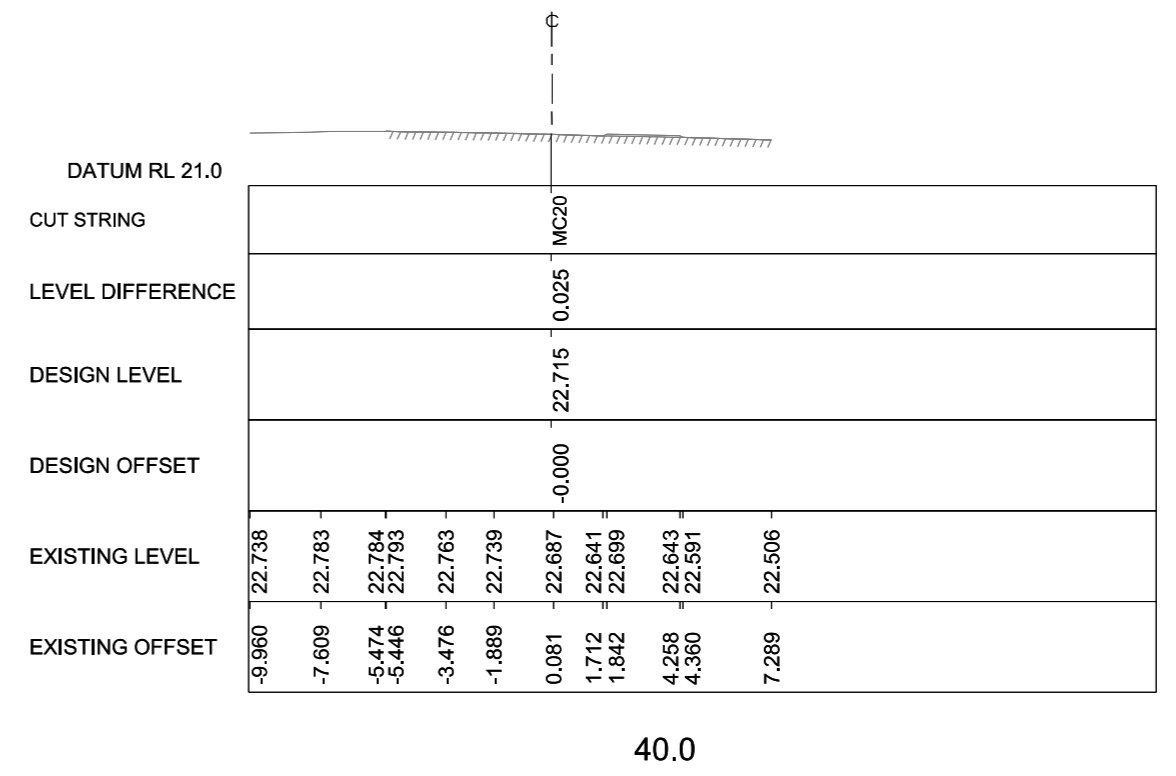
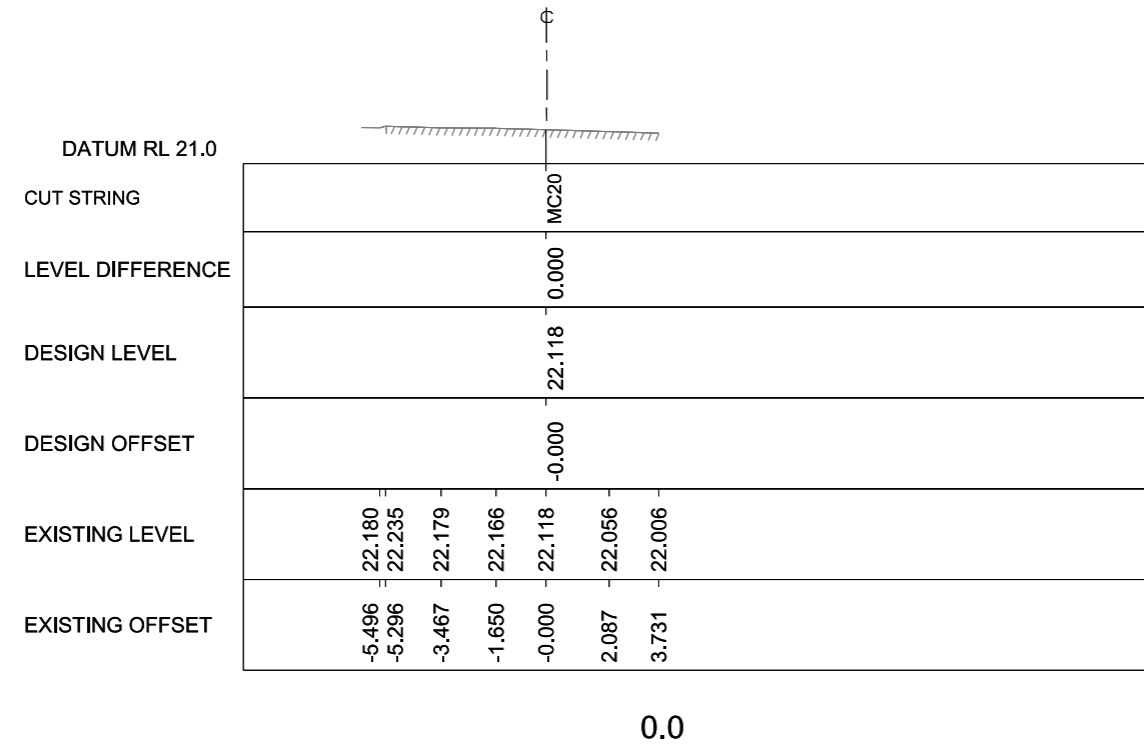
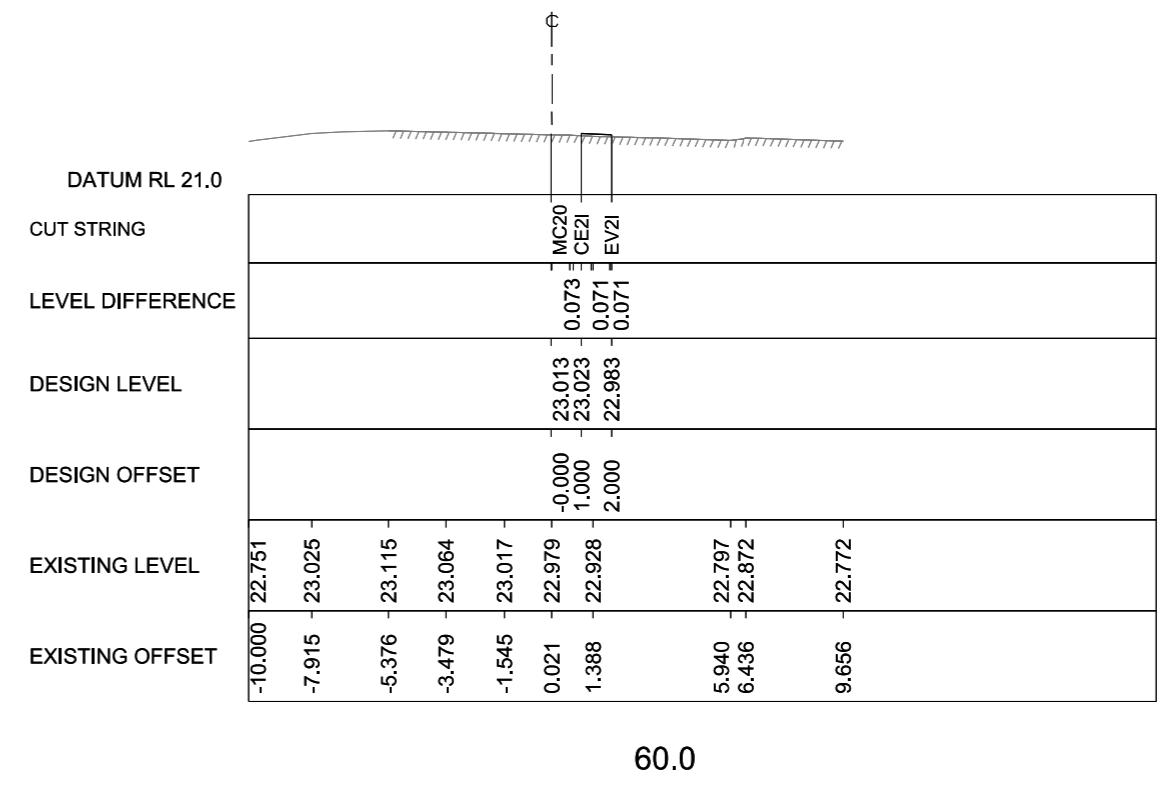
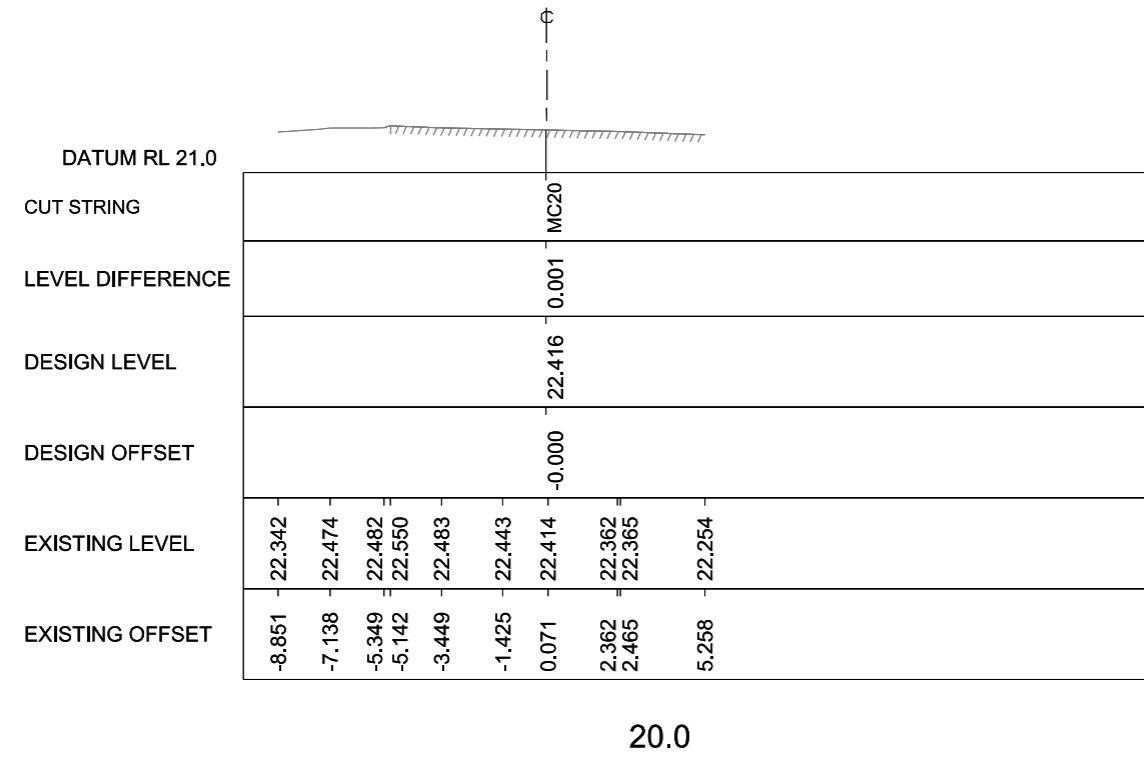


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						EDMS No.
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DESIGN				C GU		05/12/22
DESIGN CHECK				A HILLARD		05/12/22
DESIGN MNGR				A HILLARD		05/12/22
PROJECT MNGR				L HUANG		05/12/22
PREPARED FOR PROJECT DEVELOPMENT INFRASTRUCTURE DEVELOPMENT GREATER SYDNEY PROGRAM OFFICE						PART 01

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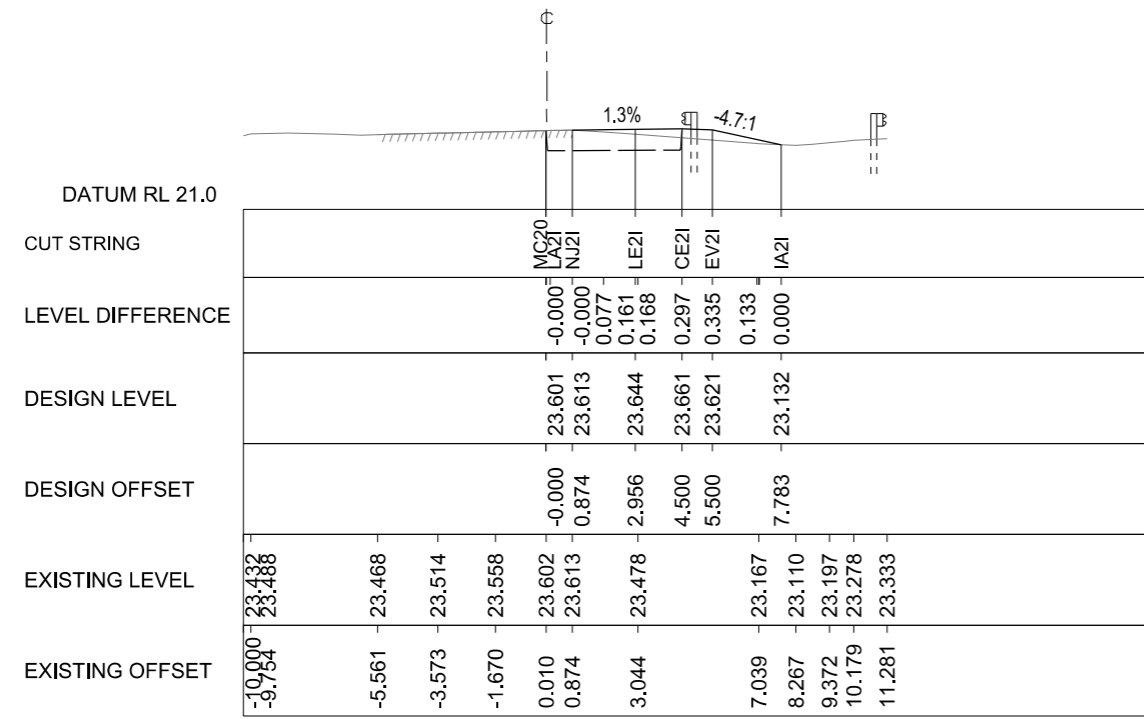


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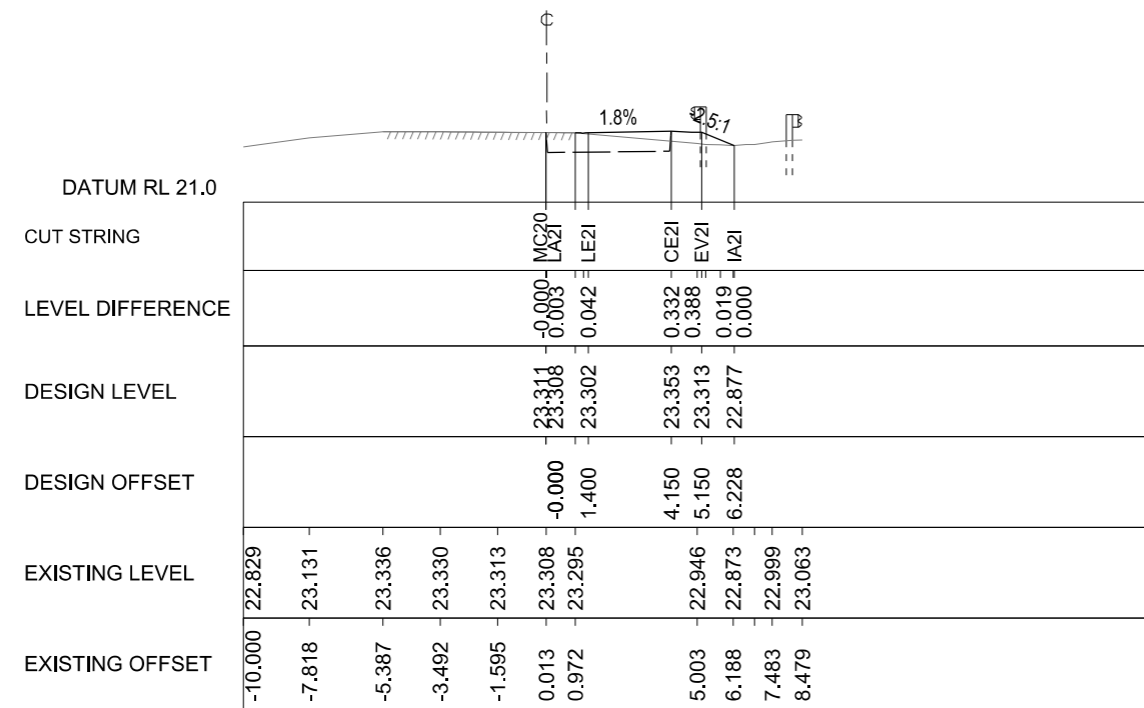
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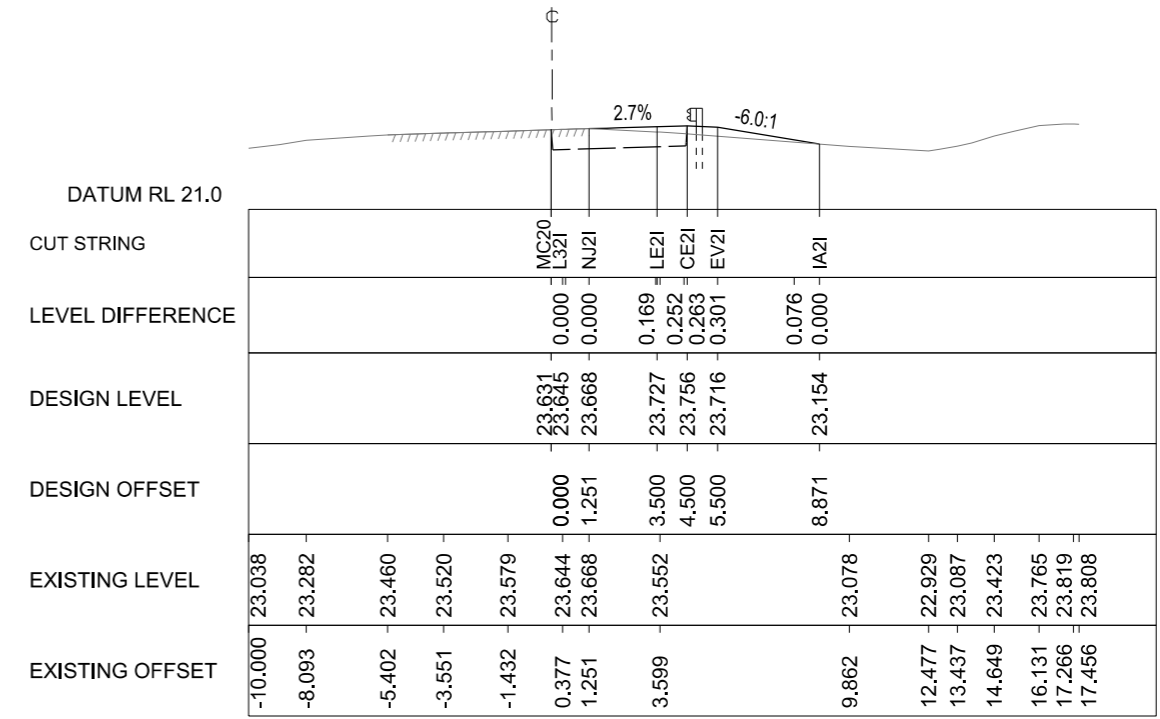
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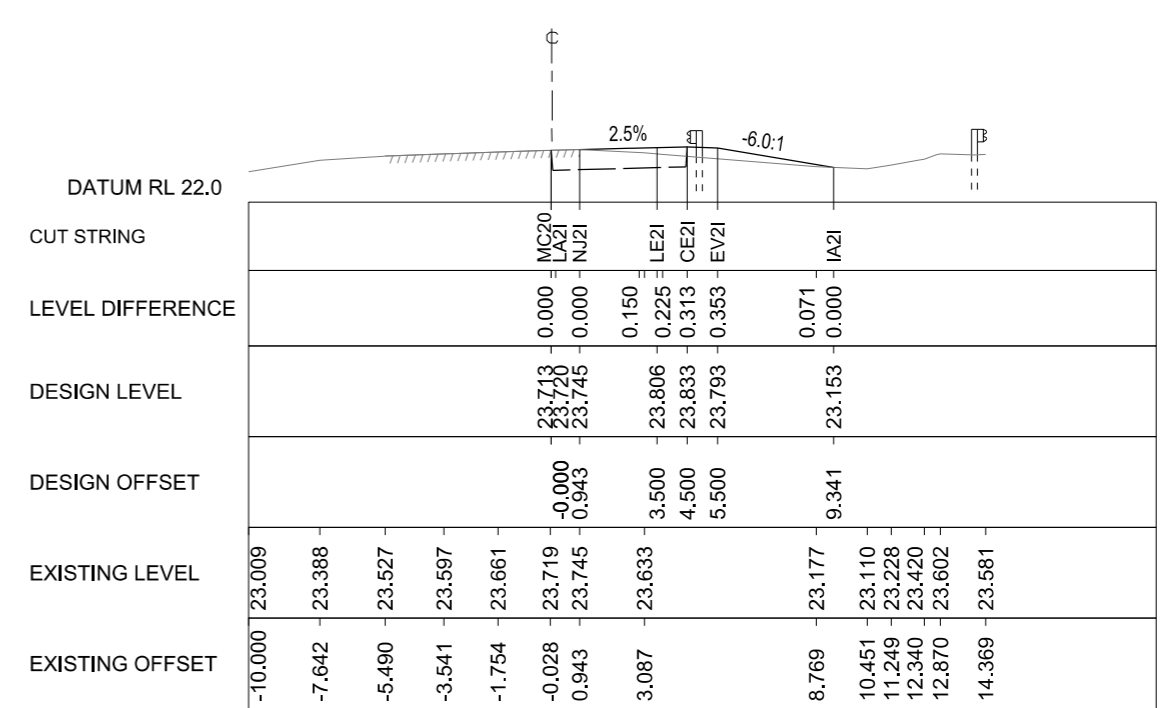
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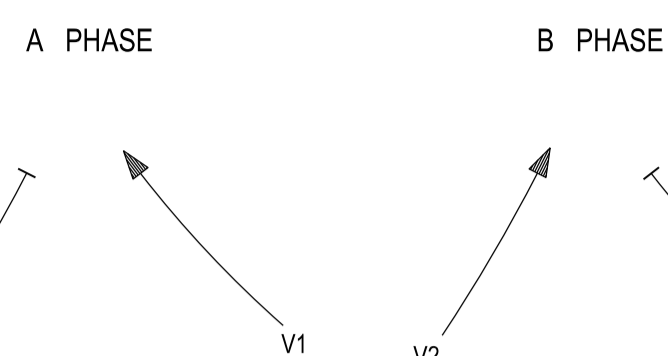


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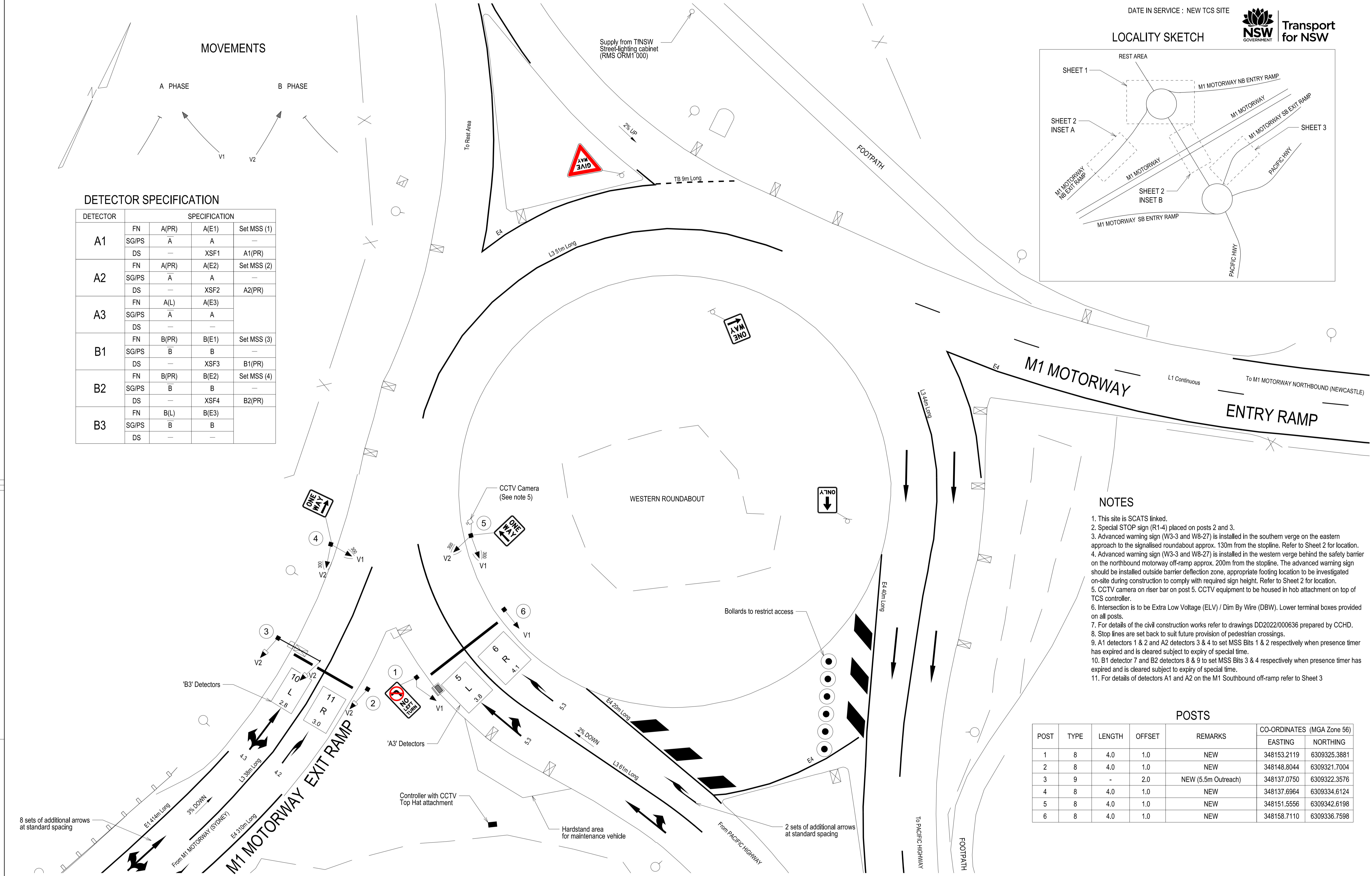
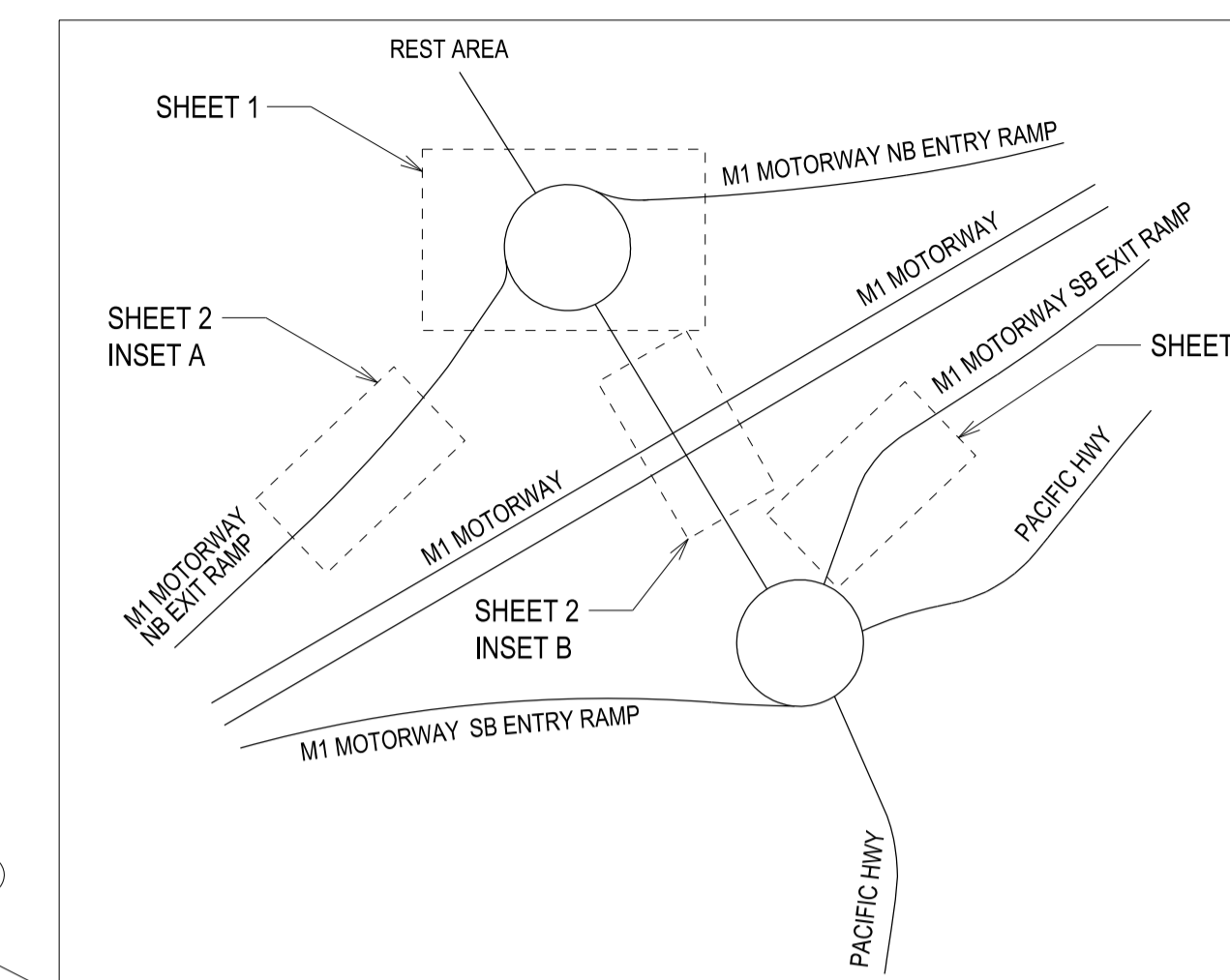
MOVEMENTS



DETECTOR SPECIFICATION

DETECTOR	SPECIFICATION			
	FN	A(PR)	A(E1)	Set MSS (1)
A1	SG/PS	A	A	—
	DS	—	XSF1	A1(PR)
A2	FN	A(PR)	A(E2)	Set MSS (2)
	SG/PS	A	A	—
A3	DS	—	XSF2	A2(PR)
	FN	A(L)	A(E3)	—
B1	SG/PS	A	A	—
	DS	—	XSF3	B1(PR)
B2	FN	B(PR)	B(E1)	Set MSS (3)
	SG/PS	B	B	—
B3	DS	—	XSF4	B2(PR)
	FN	B(L)	B(E3)	—
B3	SG/PS	B	B	—
	DS	—	—	—

LOCALITY SKETCH



NOTES

- This site is SCATS linked.
- Special STOP sign (R1-4) placed on posts 2 and 3.
- Advanced warning sign (W3-3 and W8-27) is installed in the southern verge on the eastern approach to the signalised roundabout approx. 130m from the stopline. Refer to Sheet 2 for location.
- Advanced warning sign (W3-3 and W8-27) is installed in the western verge behind the safety barrier on the northbound motorway off-ramp approx. 200m from the stopline. The advanced warning sign should be installed outside barrier deflection zone, appropriate footing location to be investigated on-site during construction to comply with required sign height. Refer to Sheet 2 for location.
- CCTV camera on riser bar on post 5. CCTV equipment to be housed in hob attachment on top of TCS controller.
- Intersection is to be Extra Low Voltage (ELV) / Dim By Wire (DBW). Lower terminal boxes provided on all posts.
- For details of the civil construction works refer to drawings DD2022/000636 prepared by CCHD.
- Stop lines are set back to suit future provision of pedestrian crossings.
- A1 detectors 1 & 2 and A2 detectors 3 & 4 to set MSS Bits 1 & 2 respectively when presence timer has expired and is cleared subject to expiry of special time.
- B1 detector 7 and B2 detectors 8 & 9 to set MSS Bits 3 & 4 respectively when presence timer has expired and is cleared subject to expiry of special time.
- For details of detectors A1 and A2 on the M1 Southbound off-ramp refer to Sheet 3

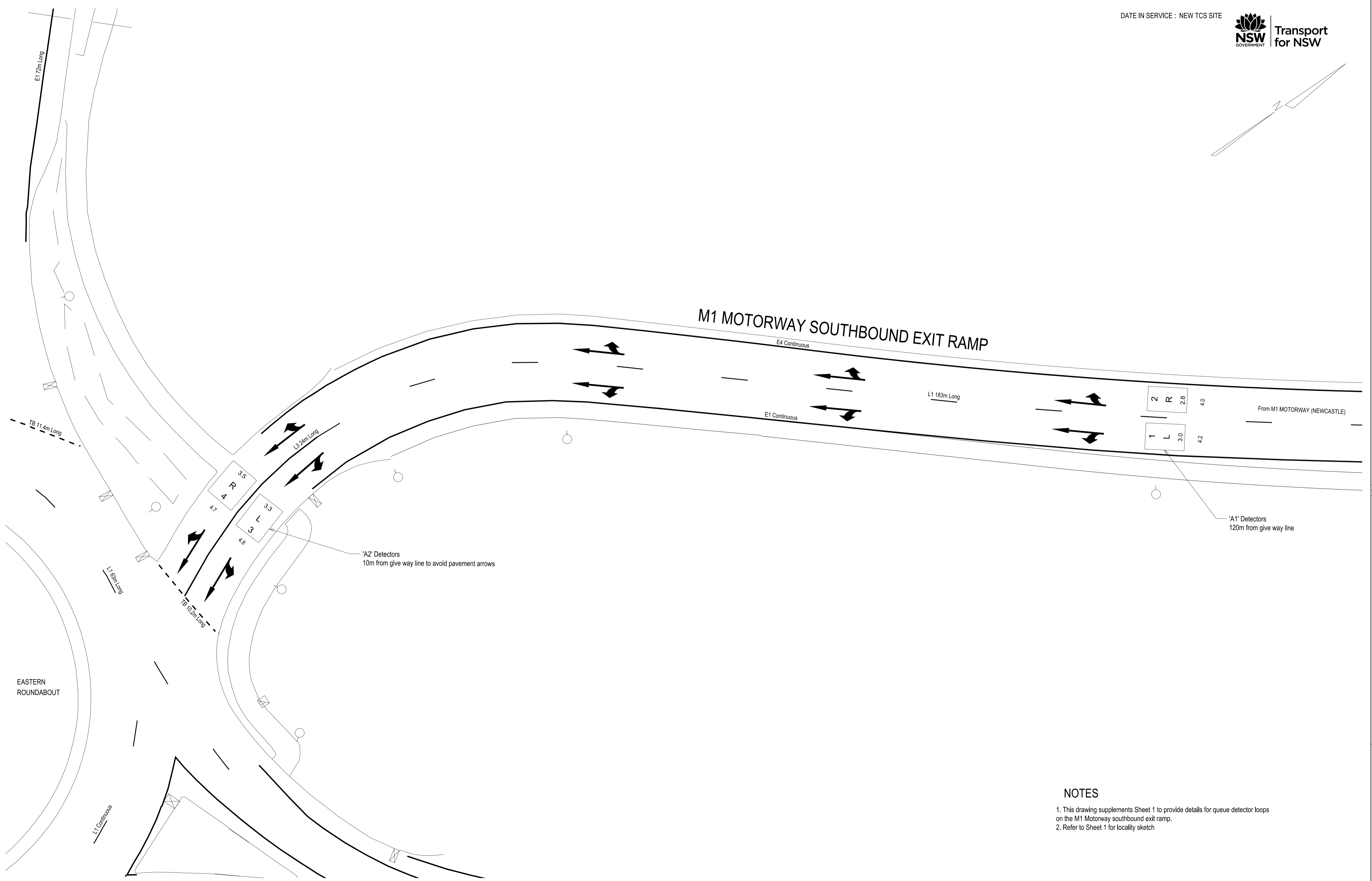
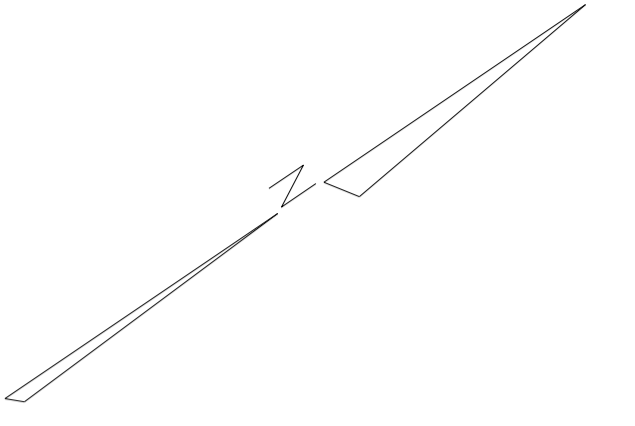
POSTS

POST	TYPE	LENGTH	OFFSET	REMARKS	CO-ORDINATES (MGA Zone 56)	
					EASTING	NORTHING
1	8	4.0	1.0	NEW	348153.2119	6309325.3881
2	8	4.0	1.0	NEW	348148.8044	6309321.7004
3	9	-	2.0	NEW (5.5m Outreach)	348137.0750	6309322.3576
4	8	4.0	1.0	NEW	348137.6964	6309334.6124
5	8	4.0	1.0	NEW	348151.5556	6309342.6198
6	8	4.0	1.0	NEW	348158.7110	6309336.7598

A ORIGINAL ISSUE	PUBLIC UTILITY LEGEND		REFERENCE PLANS		U.B.D. Ref. Map 57 Q16		DESIGN APPROVAL		TFNSW RECOMMENDATION		TFNSW ACCEPTANCE		TRANSPORT FOR NEW SOUTH WALES CENTRAL COAST COUNCIL AREA TRAFFIC SIGNALS AT M1 OURIMBAH INTERCHANGE (WESTERN ROUNDABOUT) OURIMBAH DESIGN LAYOUT				EXISTING <input type="checkbox"/> PROPOSED <input checked="" type="checkbox"/>	
	HYDRANT <input type="checkbox"/> STOP VALVE <input type="checkbox"/> GAS VALVE <input type="checkbox"/> SEWER MANHOLE <input type="checkbox"/> COMMS PIT <input type="checkbox"/> ELECT LIGHT POLE <input type="checkbox"/> POWER POLE <input type="checkbox"/> STAY POLE <input type="checkbox"/> TELEPHONE BOX <input type="checkbox"/> COMMS PILLAR <input type="checkbox"/>		SYMBOLS/ABRVS V0003-6 STD POSN CMPT V0001-5 INSTL STOP DET VC005-17 VEH GROUP OP TS-TN-019 DET LOGIC OP TS-TN-020 PED MVT OP TS-TN-021		I.S.G. E: 334 191 CO-ORDS N: 1 309 042 DESIGNED: ALEX SKATOV CHECKED: ADAM HILLARD SITE CHECKED: ALEX SKATOV RECOMMENDED: ALEX SKATOV		APPROVED NAME: ALEX SKATOV POSITION: PRINCIPAL CONSULTANT DATE: 28/11/2022		ROAD DESIGN ENGINEERING NAME: Michael Manning POSITION: Senior Road Design Mgr DATE: 09/12/2022		ACCEPTED NAME: Joe Krsul POSITION: SM Transport Technical Solutions DATE: 23/01/2023						SCALE 5 0 (1:200) 5 10 FILE SF2022/229224 REG No. DS2022/000799	
	HYDRANT <input type="checkbox"/> STOP VALVE <input type="checkbox"/> GAS VALVE <input type="checkbox"/> SEWER MANHOLE <input type="checkbox"/> COMMS PIT <input type="checkbox"/> ELECT LIGHT POLE <input type="checkbox"/> POWER POLE <input type="checkbox"/> STAY POLE <input type="checkbox"/> TELEPHONE BOX <input type="checkbox"/> COMMS PILLAR <input type="checkbox"/>		SURVEYOR: B.HOLLIDAY DATE: 19/04/2022		DESIGN PREPARED BY SAA Roads		NETWORK OPERATIONS NAME: Dean Russell-Thomas POSITION: ALNO DATE: 13/12/2022		ACCEPTED BY C&P TTS		CADD FILE: VV5171_1A.dgn		REG No. DS2022/000799		SHEET 1			
															Revision 7 - August 2021 © COPYRIGHT TRANSPORT FOR NSW			

TCS 5171

DATE IN SERVICE : NEW TCS SITE



NOTES

1. This drawing supplements Sheet 1 to provide details for queue detector loops on the M1 Motorway southbound exit ramp.
2. Refer to Sheet 1 for locality sketch

A ORIGINAL ISSUE	PUBLIC UTILITY LEGEND HYDRANT □ SYMBOLS/ABRVS V0003-6 STOP VALVE ▲ STD POSN CMPT V0001-5 GAS VALVE ⊕ INSTL STOP DET VC005-17 SEWER MANHOLE ⊕ VEH GROUP OP TS-TN-019 COMMS PIT ⊕ DET LOGIC OP TS-TN-020 ELECT LIGHT POLE ⊕ PED MVT OP TS-TN-021 POWER POLE ○ STAY POLE ○ TELEPHONE BOX ⊕ COMMS PILLAR ⊕		REFERENCE PLANS U.B.D. Ref. Map 57 Q16 I.S.G. E: 334 191 CO-ORDS N: 1 309 042 DESIGNED: ALEX SKATOV CHECKED: ADAM HILLARD ALEX SKATOV SITE CHECKED ALEX SKATOV SURVEYOR: B.HOLLIDAY DATE: 19/04/2022		DESIGN APPROVAL APPROVED NAME: ALEX SKATOV POSITION: PRINCIPAL CONSULTANT DATE: 25/11/2022 DESIGN PREPARED BY SAA Roads		TFNSW RECOMMENDATION ROAD DESIGN ENGINEERING NAME: Michael Manning POSITION: Senior Road Designer DATE: 09/12/2022 NETWORK OPERATIONS NAME: Dean Russell-Thomas POSITION: ALNO DATE: 13/12/2022		TFNSW ACCEPTANCE ACCEPTED NAME: Joe Krsul POSITION: SM Transport Technical Solutions DATE: 23/01/2023 ACCEPTED BY C&P Transport Technical Solutions SECTION		TRANSPORT FOR NEW SOUTH WALES CENTRAL COAST COUNCIL AREA TRAFFIC SIGNALS AT M1 OURIMBAH INTERCHANGE (WESTERN ROUNDABOUT) OURIMBAH DESIGN LAYOUT			EXISTING <input type="checkbox"/> PROPOSED <input checked="" type="checkbox"/> CADD FILE: WV5171_3A.dgn SCALE: 5 0 (1:200) 5 10 FILE: SF2022/229224 REG No. DS2022/000799 TCS No. 5171 Revision 7 - August 2021		ISSUE A SHEET 3 © COPYRIGHT TRANSPORT FOR NSW	
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Appendix B: Correspondence

NSW State Emergency Service

Via email: rra@ses.nsw.gov.au

Date: 18 November 2022

Consultation regarding proposed upgrade to M1 Pacific Motorway Ourimbah Interchange

Transport for NSW is proposing to upgrade the M1 Pacific Motorway Ourimbah Interchange to improve safety (the proposal).

The proposal includes ramp upgrades to provide increased storage on both M1 Pacific Motorway northbound and southbound exit ramps, and signalisation of the western roundabout.

Under section 2.13 of SEPP (Transport and Infrastructure), Transport for NSW is required to undertake consultation with the State Emergency Service for development with impacts on flood liable land under relevant provisions including Division 17 (Roads and traffic). It is noted that most of the proposal site is within the extent of the probable maximum flood (PMF) as identified in the Ourimbah Creek Flood Study (2013).

A description of the proposal is provided in Attachment A to this letter.

It would be appreciated if you could provide any comments on this proposal as soon as possible.

Transport for NSW would be pleased to provide further information if required. In this regard I may be contacted on 0407 135 897 or by email lionel.huang@transport.nsw.gov.au.

Yours faithfully



Lionel Huang
Project Engineer
Project Services North | Maintenance & Delivery | Network & Assets
Regional and Outer Metropolitan
Transport for NSW

ATTACHMENT A

The proposal involves:

- Northbound exit ramp – widen pavement to increase queuing space
- Western roundabout – signalise the southern and the eastern leg; remove full circulation
- Southbound exit ramp – widen pavement to increase queuing space.

The proposed changes to the western roundabout include:

- Fully control the eastern and southern legs using traffic signals
- Move the stop line on the eastern leg forward by closing the eastern side of the circulation lanes to minimise inter-green times (the period between the end of a green period of one phase and the beginning of a green period of the next phase)
- Alter the lane configuration on the southern leg (off ramp) to allow for a double right turn to occur
- Lengthen the right lane of the southern leg to maximise queuing space.

Other aspects of the proposal include:

- Traffic signal posts, lanterns and controller
- Adjustments to pavement drainage
- New static advance warning, exit and speed limit signs, and adjustments to existing signage
- Adjustments to line marking
- Removal of the existing crash cushion on the northbound and southbound exits and installation of a new crash cushion to suit modified exit
- Installation of removable bollards across the western roundabout circulation lanes which are to be closed
- Upgrade to safety barriers
- Tree removal to accommodate the proposed works and for sight distances
- Grooving of concrete pavements on both roundabouts and all approaches to improve skid resistance.
- Resurfacing of asphaltic concrete pavements within the proposal area
- Upgrades to street light poles and luminaires where required
- Adjustments to underground electricity conduits to accommodate works.



- Proposal area
- Compounds
- Watercourses

0 30 60 120 180 240
Metres

Our Ref: ID 1798

08 December 2022

Lionel Huang
Transport for NSW
Level 2, 1 Bryant Drive
Tuggerah NSW 2259

email: Lionel.Huang@transport.nsw.gov.au
CC: mandy.bramble@member.ses.nsw.gov.au

Dear Lionel,

Notification under section 2.13 of the State Environmental Planning Policy (Transport and Infrastructure) 2021 in relation to the proposed M1 Pacific Motorway Ourimbah Interchange upgrade

Thank you for the notification under section 2.13 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* in relation to the proposed upgrade of M1 Pacific Motorway Ourimbah Interchange, Ourimbah. It is understood that the proposed works include:

- Fully control the eastern and southern legs using traffic signals
- Move the stop line on the eastern leg forward by closing the eastern side of the circulation lanes to minimise inter-green times (the period between the end of a green period of one phase and the beginning of a green period of the next phase)
- Alter the lane configuration on the southern leg (off ramp) to allow for a double right turn to occur
- Lengthen the right lane of the southern leg to maximise queuing space.

The NSW State Emergency Service (NSW SES) is the agency responsible for dealing with floods, storms and tsunami in NSW. This role includes, planning for, responding to and coordinating the initial recovery from floods. As such, the NSW SES has an interest in the public safety aspects of the development of flood prone land, particularly the potential for changes to land use to either exacerbate existing flood risk or create new flood risk for communities in NSW.

The NSW SES has reviewed the proposed upgrade and the flood risk information (e.g. Local Flood Plan, Flood Studies etc.) available to the NSW SES. Based on this review, it is noted that the site is at risk of flooding from Ourimbah Creek, as frequently as the 20% AEP flood (Ourimbah Creek Floodplain Risk Management Study and Plan 2019). Therefore the NSW SES provides the following advice:

- consider the impact of flooding on the infrastructure and the community using the infrastructure up to and including the PMF.

- pursue, if relevant, site design and stormwater management that minimises any risk to the community.
- ensure workers and people using the site during and after the upgrades are aware of the flood risk, for example by using signage.

In addition, if the construction phase of the upgrades causes disruption to the operation of local roads, this may impact the ability for emergency vehicles to use these routes. The NSW SES requests that notification be provided where there are likely to be significant delays in the operation of the roads affected by the upgrades.

Please feel free to contact me via email at rra@ses.nsw.gov.au should you wish to discuss any of the matters raised in this correspondence. The NSW SES would also be interested in receiving future correspondence regarding the outcome of this referral via this email address.

Yours Sincerely



Elspeth O'Shannessy
Planning Coordinator, Emergency Risk Management
NSW State Emergency Service

Appendix C: Biodiversity Assessment Report

Biodiversity Assessment Report for REF

Ourimbah Interchange Upgrade

November 2022



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Executive summary

A Biodiversity Assessment has been conducted as Transport for NSW is proposing to upgrade the Ourimbah Interchange at the M1 Pacific Motorway, primarily due to safety concerns relating to traffic pressure during peak periods causing queues backing onto the M1, near Ourimbah, NSW.

The proposal includes upgrades and widening to both M1 entrance and exit ramps, upgraded signalisation and lane vision remediation, and is expected to achieve the following outcomes:

- Queues contained within the existing M1 off ramps, ensuring effective traffic management during peak times
- Maximise efficiency of the interchange to allow for motorists to travel in a safe and efficient manner
- Maintain suitable access to the rest area connecting to the western roundabout.

This Biodiversity Assessment has been carried out by Lesryk Environmental Pty Ltd and forms part of the Review of Environmental Factors being prepared for the proposal. This report assesses the biodiversity impact of the proposal to meet the requirements of the NSW *Environment Planning and Assessment Act 1979*.

To permit the proposal, based on a worst-case estimate, about 1.1 hectares of vegetation would require disturbance/removal. As part of works, an estimated 34 trees (this composed of 17 small, and 17 medium sized, trees) would be removed. No hollow-bearing, large or extra-large trees are required to be removed. In line with Transport for NSW's *Tree and Hollow replacement guidelines*, off-setting through the planting of 102 plants would be required. Alternatively, Transport for NSW may opt to transfer funds into the Transport for NSW Conservation fund at the required rates per the *Tree and Hollow replacement guidelines 2022*.

By completion of the investigation, one migratory species listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* was recorded, this being the Black-faced Monarch (*Monarcha melanopsis*). None of the other recorded species are listed, or currently being considered for listing, under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* or the NSW *Biodiversity Conservation Act 2016*.

Within the project area, no habitat for the Black-faced Monarch was observed. Additionally, in reference to the Black-faced Monarch's Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* 'Marine' listing, the proposed work is not located within the Commonwealth marine area, this being from 3 to 200 nautical miles from the coast. As such, no assessments referencing the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*'s Guidelines that are relevant to this species and the Commonwealth marine environment is considered necessary.

No Endangered Ecological Communities, threatened flora, or their populations, listed, or currently being considered for listing under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* or the NSW *Biodiversity Conservation Act 2016*, were recorded. Similarly, no State listed threatened fauna were recorded or predicted to occur.

The proposal does not trigger a Species Impact Statement, or a Biodiversity Development Assessment Report.

Mitigation measures have been provided in Section 6 of the report. Adoption of these would ensure that the work proposed is carried out in an ecologically sustainable manner.

1. Introduction

1.1 Proposal background

At the request of Hills Environmental Pty Ltd, on behalf of Transport for NSW (TfNSW), a Biodiversity Assessment (BAR) has been carried out at the Ourimbah Interchange, Ourimbah, NSW (Figure 1-1). For reference, extracts of the detailed design plans are provided in Figures 1-2 and 1-3.

In proximity to the interchange, TfNSW are proposing to:

- upgrade and widen several sections of both the north-bound on-ramp, and north-bound and south-bound off-ramps
- signalisation of western roundabout
- enhance site visibility for motorists entering and exiting the interchange.

Ourimbah Interchange includes four M1 ramps (two northbound (i.e. entrance and exit) and two southbound), an overpass, and two roundabouts. As there is limited lane space, three of the ramps present have been identified for upgrading due to safety failures experienced during peak times.

In addition to the proposed ramp upgrading and widening work, installation of signage to provide effective traffic management is required. Currently, the road verges at the M1 entrance and exit ramps exhibit encroaching roadside vegetation that is limiting visibility to traffic in adjoining lanes. At this location, vegetation would be removed or trimmed where necessary to provide a clear line-of-sight for drivers.

The objective of the proposal is to achieve the following outcomes:

- Queues contained within the existing M1 off ramps, ensuring effective traffic management during peak times
- Maximise efficiency of the interchange to allow for motorists to travel in a safe and efficient manner
- Maintain suitable access to the rest area connecting to the western roundabout.

Lesryk Environmental Pty Ltd (Lesryk) has been engaged to conduct the Biodiversity Assessment and investigation to consider and assess all ecological matters affecting or likely to affect the environment as a result of the proposed work. The BAR will accompany the Minor Work Review of Environmental Factors (MWREF) being prepared for the proposal in compliance with the requirements of Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.2 The proposal

The proposed scope of works is as follows (Figure 1-1 to 1-3):

- Northbound Exit-ramp – widen inner lane pavement to increase queue capacity
- Southbound Exit-ramp – widen the inner lane pavement to increase queue capacity.
- Western roundabout – signalise the southern and the eastern leg; remove the circulation
 - Fully control the eastern and southern legs using traffic signals
 - Move the stop line on the eastern leg forward as far as possible by closing the eastern side of the circulation lanes to minimise inter-green times (can consider leaving one lane open to maintain U-turn movements for the rest area)
 - Alter the lane configuration on the southern leg (off ramp) to allow for a double right turn to occur
 - Lengthen the median lane of the southern leg as far as practicable to maximise queuing space.

In addition, general works will include:

- Traffic signal posts and controller to be installed as determined in consultation with Network Operations
- Phasing of the signals should be consistent with that provided by TfNSW
- It has been identified that there is a risk of truck rollover on the western roundabout due to the behaviour of trying to bet the red light. Consideration of safety treatments to discourage this measure was considered including signage and line-marking
- It is understood consideration is currently being given to minor widening on the southbound off ramp to increase the que space for this movement. As it is considered this treatment will also extend the life of the interchange before a major intervention is required, these proposed works will also be supported as part of this project, subject to funding
- The development and delivery of the project needs to be consistent with the funding profile.

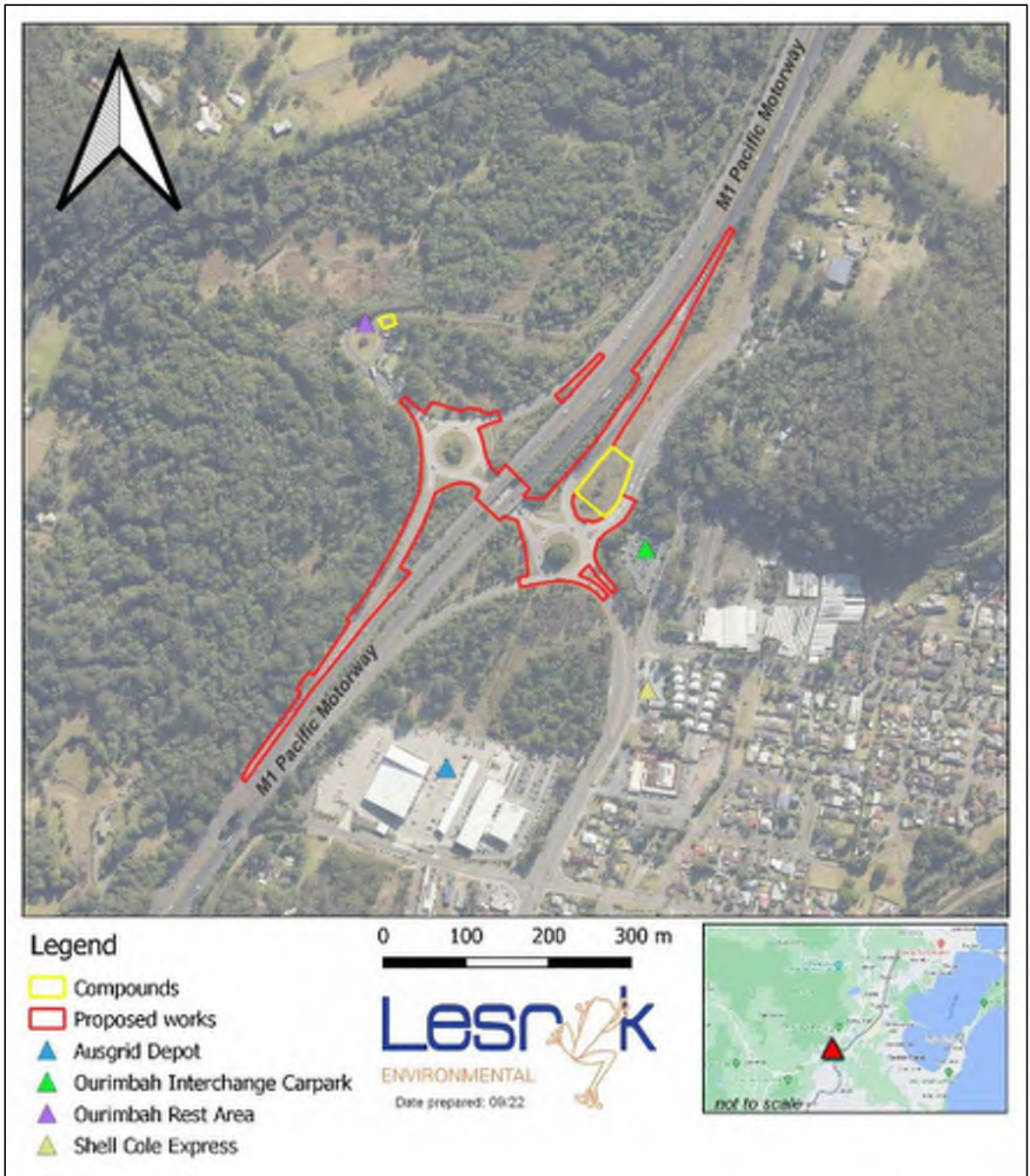


Figure 1-1: Proposal context

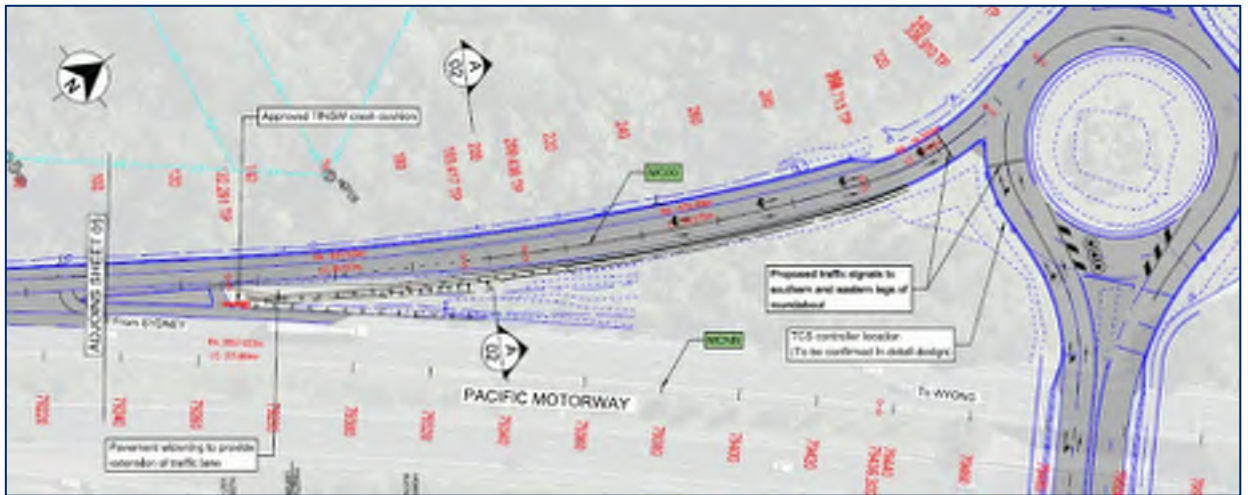


Figure extracts: CCHD, 2022

Figure 1-2: Proposed Detailed Design – Northbound Exit Ramp and Western Roundabout

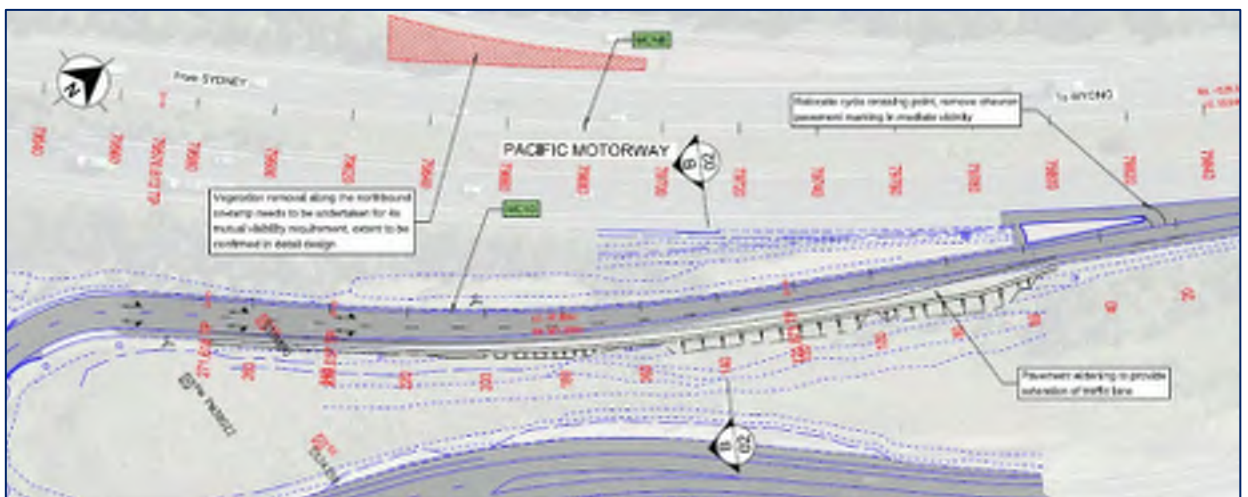


Figure extracts: CCHD, 2022

Figure 1-3: Proposed Detailed Design – Southbound Exit Ramp

Unless a specific aspect is referred to, the work would hereafter be referred to as ‘the proposed work’.

The proposal is anticipated to commence in March 2023 and take approximately 4 to 6 months to complete.

The bulk of construction is expected to occur as night works to mitigate traffic impact on the M1; however, some work during standard construction hours would also occur as required. The disturbed areas will be landscaped by topsoil and hydroseeding and replacement planting (if required).

The Mardi Depot (209 Old Maitland Rd, Mardi) will be used as the main office site compound, with a stockpile area located at the existing TfNSW stockpile site at the M1 Calga Interchange. For an auxiliary site compound to accommodate Lunchroom and Toilet, options identified and assessed were:

1. The existing concrete slab next to the Council sewer pump station access located toward the rear of the nearby Ourimbah Rest Area.
2. An area to the east of the southbound exit ramp access from the Pacific Highway.

1.2.1 Assessment areas

Based on a worst-case estimate, the proposal, being the widening of the ramps at Ourimbah Interchange, would require a work area (i.e. impact footprint in which 'disturbances would occur') totaling about 1.0 ha: this composed of:

- Up to 4 m either side of proposed work elements
- Disturbance/removal of 1.1 ha of exotic and native vegetation to achieve the objectives of the proposal
- The movement of personnel and vehicles/machinery.

The operational footprint of the proposal would be less than this.

The study area is defined as the subject site and any additional areas which are likely to be affected by the proposal, either directly or indirectly.

1.3 Legislative context

A REF is prepared to satisfy TfNSW duties under s.5.5 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.5.5 in making decisions on the likely significance of any environmental impacts. This biodiversity impact assessment forms part of the MWREF being prepared for the Ourimbah Interchange Project, and assesses the biodiversity impacts of the proposal to meet the requirements of the EP&A Act.

Part 7 of the BC Act requires that the significance of the impact on threatened species, populations and threatened ecological communities or their habitats is assessed using a five-part test at Section 7.3 of the BC Act. Where a significant impact is likely to occur, a Species Impact Statement (SIS) must be prepared in accordance with the Environment Agency Head's requirements or a Biodiversity Development Assessment Report (BDAR) must be prepared by an accredited assessor in accordance with the Biodiversity Assessment Method (BAM).

In September 2015, a "strategic assessment" approval was granted by the Federal Minister in accordance with the EPBC Act. The approval applies to TfNSW's road 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, TfNSW road proposals assessed via an REF:

- Must address and consider potential impacts on EPBC Act 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 Department of Climate Change, Energy, the Environment and Water (DCCEEW) for these matters, even if the activity is likely to have a significant impact
- Must use the Biodiversity Assessment Method (BAM) to calculate credits that would offset significant impacts on EPBC Act listed threatened species, populations, ecological communities and migratory species.

To assist with this, assessments are required for all relevant biodiversity values in accordance with the *Matters of National Environmental Significance: Significant impact guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999* (DoE 2013).

2. Methods

2.1 Personnel

Personnel involved in the assessment, and their qualifications, are identified in Table 2-1.

Table 2-1: Personnel

Name	Role	Qualifications
Mr Deryk Engel	Director and Senior Ecologist. Project management, field investigation, report review and quality assurance	B.Env.Sc. (Hons)
Ms Chelsea Tiller	Field ecologist, BAR write-up	B.Soc.Sc
Mr Liam McDonagh	Botanist, site investigation, contribution to BAR	B.Env.Sc, Cert III Land Conservation Mng
Ms Kirsty Bloomfield	Background research, document preparation and review	–

2.2 Background research

Prior to carrying out any fieldwork, known databases and any previous studies conducted in the region were consulted to identify the diversity of ecological communities, flora and fauna species known for, or potentially occurring in, the study region. The identification of those known or potentially occurring native species and communities within this portion of the Central Coast LGA, particularly those listed under the Schedules to the EPBC and/or BC Acts, thereby permits the tailoring of the field survey strategies to the detection of these plants and animals, their vegetation associations and/or necessary habitat requirements. By identifying likely species, particularly any threatened plants and animals, either the most appropriate species-specific survey techniques may be selected [should their associated vegetation communities/habitat requirements be present] or a precautionary approach to their presence adopted.

The carrying out of a literature search also ensures that the results from surveys conducted during different climatic, seasonal and date periods are considered and drawn upon as required. This approach therefore increases the probability of considering the presence of, and possible impact on, all known and likely native species, particularly any plants and animals that are of regional, State and/or national conservation concern. This approach also avoids issues inherent with a one off 'snap-shot' study.

A list of all databases, date these were accessed, and the search area employed is provided in Table 2-2.

Other reports and documents referred to are provided within the bibliography section of this report.

All these databases and reports were reviewed and drawn upon where relevant. While reviewing these documents, particular attention was paid to identifying relevant ecological matters listed, or currently being considered for listing, under the Schedules of the EPBC and/or BC Acts, plants, animals and ecological communities that have been recorded in the region and which may occur within, or in the vicinity of, the proposal area.

As no waterways are present in proximity to the works, and the works are terrestrial in nature, no consideration of the NSW *Fisheries Management Act 1994* were considered necessary. Drainage lines are present beyond the works area, impacts on these (beyond existing inputs from urban infrastructure) considered to be minor. This view is supported through the consultation of those applicable databases listed below, these confirming no listed fish or their habitats occur in proximity to the Ourimbah interchange.

Table 2-2: Database searches

Database/Information sources	Date accessed	Search area
Protected Matters Search Tool (PMST) (DCCEEW 2022a)	October 2022	10 km buffer on study area
Register of critical habitat (DCCEEW 2022c)	October 2022	N/A
BioNet Atlas (DPE 2022a)	October 2022	10 km buffer on study area
Areas of Outstanding Biodiversity Value register (DPE 2022b)	October 2022	N/A
NSW WeedWise Database (DPI 2022a)	October 2022	Greater Sydney
Fisheries NSW Spatial Data Portal (DPI 2022b)	October 2022	Central Rivers layer
BioNet Vegetation Classification database (NSW Government 2022c)	October 2022	N/A
Biodiversity Values Map and Threshold Tool (NSW Government 2022d)	October 2022	Study area
PlantNet (2022)	October 2022	N/A
SEED map viewer (NSW Government 2022e)	October 2022	Study area
Threatened Species website (OEH 2022)	October 2022	N/A
Groundwater Dependent Ecosystems Atlas (BoM 2022b)	October 2022	Study area
National Flying-fox monitoring viewer (DCCEEW 2022d)	October 2022	Study area

Field guides and standard texts used include:

- Brooker and Kleinig (1999) [used to identify eucalypt]
- Costermans (1992) [other vegetation]
- Cogger (2014) [reptiles and frogs]
- Anstis (2017) [frogs]
- Churchill (2008) [flying mammals]
- Simpson and Day (2010) [birds]
- Van Dyck and Strahan (2008) [non-flying mammals]
- Triggs (1996) [identification of scats, tracks and markings].

Nomenclature follows that in these texts, or within the EPBC and BC Acts. It is noted that the current accepted scientific names for some of the threatened fauna species previously recorded in this locality are not consistent with the names used/provided under either the EPBC and/or BC Acts. In these instances, nomenclature used within this report follows the current approved scientific conventions.

Where applicable, any TECs were classified and named according to the NSW Scientific Committee’s Final and Preliminary Determinations [various dates].

The conservation significance of those ecological communities, plants and animals recorded is made with reference to:

- The EPBC and BC Acts
- Vegetation mapping of the study region (State Government and DPIE 2022c)
- The BioNet Vegetation Classification database (NSW Government 2022d)
- The RoTAP publication (Briggs and Leigh 1996).

2.3 Vegetation assessment

2.3.1 Vegetation mapping

Vegetation of the locality has been mapped and described in State Vegetation Type Map (DPE 2022c). Mapping identifies the most likely Plant Community Type (PCT) to occur in the polygon.

The purpose of the vegetation survey was to confirm the dominant species with reference to the mapped PCTs, assess the condition of the vegetation, search for threatened species or their habitats and identify weeds.

When surveying the proposal area, the 'Random Meander Method' (Cropper 1993) was employed. This method involves conducting foot traverses through the site that requires investigation, during which time notes are made on the structure and floristic composition of the native vegetation present.

The 'Random Meander Method' is consistent with the stratified random sampling design as specified in section 5.1 (Stratification, sampling and replication) of the publication titled *Threatened biodiversity survey and assessment: Guidelines for development and activities* (DEC 2004). This method is also mentioned under sections 5.2.1 (Sampling techniques) and 5.2.7 (Targeting threatened plants) of that publication. The Random Meander Method is suitable for covering large areas and for locating any rare species (and their associated vegetation communities/habitat types) that may occur within a particular site.

The 'Random Meander Method' is employed until no new species have been recorded for at least 30 minutes.

Due to the nature of the vegetation present, and scope of works proposed, no surveys conducted in accordance with the BAM were completed for this project. Therefore, associated template tables have been removed from this report.

2.4 Threatened species assessment

A biodiversity assessment of the proposal area was carried out by Deryk Engel, Liam McDonagh and Chelsea Tiller on 27 September 2022. The weather conditions experienced during the site investigation were warm temperatures [$\sim 23^{\circ}\text{C}$], 25% cloud cover, a light breeze, and sunny conditions.

The purpose of the field investigation was to identify those vegetation communities, fauna habitats, plants and animals present within, and in close proximity to, the proposal area that are of State and/or national conservation significance as listed under the Schedules to the EPBC and BC Acts.

While conducting the habitat assessments, efforts were made to identify features such as known vegetation associations, geological features, feed trees, mature trees with hollows, connectivity of fauna corridors, aquatic environments and other habitat features important to the lifecycle requirements of those threatened plants and animals previously recorded in the study region (as listed in Appendix A).

The survey methods employed during the field investigation were:

- The identification of those plants present, including within any areas affected by direct and indirect impact
- The identification of the structure of those vegetation communities and fauna habitats present at, and close to, the subject site
- The direct observation of those fauna species present within or near to the subject site
- Diurnal call identifications of those fauna species present, with all calls being identified in the field
- The identification of any indirect evidence such as tracks, scats, scratchings and diggings that would suggest the presence of a particular fauna species
- Leaf litter and ground debris searches for sheltering reptiles and amphibians.

Where required, a more detailed description on one or more of the survey methods employed is provided below.

As no waterways are present within the proposed work disturbance footprint, no aquatic survey was necessary, and consideration of matters with regard to the NSW *Fisheries Management Act 1994* is not required.

2.4.1 Habitat suitability assessment

An assessment of available habitat for each threatened species, population or community identified in the database searches, and their likelihood of occurrence, is provided in Appendix A.

2.4.2 Targeted flora surveys

Targeted (species specific) surveys for threatened plants were considered based on the results of the literature review, including consideration of the habitat requirements of those threatened flora species identified as potentially occurring in the proposal area (see Appendix A), air photography interpretation and the site specifics of the proposal area.

The survey methods employed and level of effort required were generally based on the descriptions provided in the following:

- The DEC 2004 publication
- The DPIE Surveying threatened plants and their habitats: NSW survey guide for the Biodiversity Assessment Method (2022a).

Given the nature of the site, it is not expected that any threatened species would occur within the required vegetation clearing areas.

2.4.3 Targeted fauna surveys

Based on the observations made during the diurnal investigations, the disturbed and modified nature of the area investigated (i.e. road corridor) and the identification of those habitats present, it was not considered necessary to employ any species-specific fauna survey methods (e.g. nocturnal surveys, echolocation targeting microbats). Those survey methods that were conducted are as follows:

Diurnal investigation

During the field investigation birds were identified using visual identification of observed individuals or aural identification of their vocalisations. Any opportunistic observations obtained whilst carrying out other field activities were also recorded.

If present, other features such as the presence of water bodies, culverts, caves and large logs were also inspected.

Ground debris searches

Ground debris searches were carried out on foot within the limited number of vegetated portions of the subject site. This involved conducting random meanders through this area and turning over any occurrences of natural debris or urban refuse.

While conducting the ground debris searches, tracks, diggings and characteristic scats were also searched for, and identified in the field.

Native tree removal count

Within the proposed tree removal area, individual native trees requiring removal were recorded (Figure 2-1). Within each tree removal area, the position of those native trees that were ≥ 5 cm a DBH at 1 m of height were recorded through use of a Garmen™ hand-held Global Positioning System (GPS). In addition, for each recorded tree, the following data was collected (and is presented in Appendix B):

- Status: whether the tree is alive or dead
- Species identification, if alive
- Height and diameter at breast height (DBH).

Areas maintained in the last 10 years were not required to be offset under the Tree and hollow replacement guidelines, and therefore not included in the native tree removal count (TfNSW, 2022).

Whilst considered during the site inspection, no hollow-bearing trees were observed and, given the age of the road-side vegetation (this a reflection of the interval subsequent to the construction of the interchange), none were considered present.

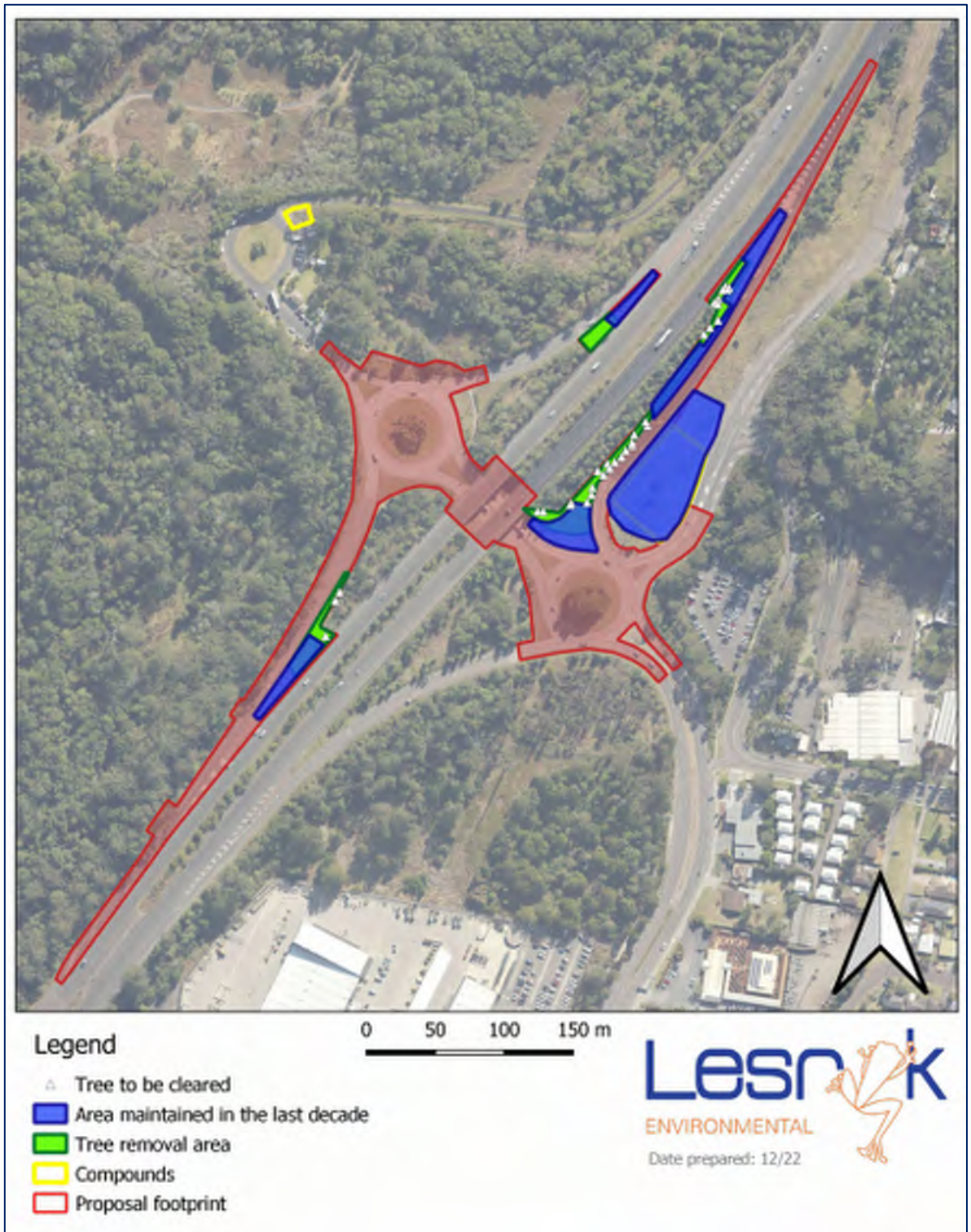


Figure 2-1: Native tree removal

The survey methods employed and level of effort required were generally based on descriptions provided in the following:

- DEC Threatened biodiversity survey and assessment – Guidelines for developments and activities (2004 working draft)
- The DECC Threatened species survey and assessment guidelines - field survey methods for fauna: amphibians (DECC 2009)
- DEWHA survey guidelines for Australia’s threatened bats, bird and frogs (DEWHA 2010a, 2010b, 2010c)
- The DSEWPC survey guidelines for Australia’s threatened mammals and reptiles (DSEWPC 2011a, 2011b, 2011c).

- The 'Species credit' threatened bats and their habitats NSW survey guide for the Biodiversity Assessment Method (State of NSW and OEH 2018a)
- The NSW Survey Guide for Threatened Frogs: A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method (State of NSW and DPIE 2020).

2.5 Aquatic surveys

No waterways are present within the investigated area; therefore, no aquatic surveys were conducted for this project.

2.6 Limitations

By the completion of the field investigation a total of about seven (10.5) person hours of active searches had been accumulated. Given the disturbed nature, physical condition and size of the proposal area, this length of time is considered more than adequate when endeavoring to determine the diversity of native species present, their habitats and vegetation associations, and the conservation status of each of these.

During the field investigation, no adverse seasonal constraints were encountered.

While not considered to compromise the scientific rigor of the field assessment, no specific surveys (i.e. nocturnal work) were carried out. In order to overcome this limitation:

- Database searches were conducted for threatened species, populations and ecological communities known to occur within the region
- The precautionary principle was adopted where necessary (i.e. suitable habitat for those threatened species known to occur, or that have been previously recorded within the surrounding locality, was identified).

Not all animals and plants can be fully accounted for within any given proposal area. The presence of threatened species is not static; it changes across time, often in response to longer term natural forces that can, at any time, be dramatically influenced by human-made disturbances.

This report is based upon data acquired from the current investigation; however, it should be recognised that the data gathered is indicative of the environmental conditions of the site at the time the field work was conducted.

3. Existing environment

For reference, a photographic record of the area investigated is provided in Appendix C.

The proposal area is located within the road corridor of the Pacific Motorway (M1), at the Ourimbah Interchange, including the entrance and exit ramps to both the north-bound and south-bound lanes; near the Ourimbah Rest Area.

The road verges present are previously cleared and generally support maintained areas of exotic grasses and weeds, with isolated plantings of natives such as *Lomandra* sp present. Sections of the road verges that are present by the underpass consisted of pockets of encroaching native and exotic vegetation including shrubs, saplings and isolated trees. It is likely that most of these plants were established as part of landscaping works undertaken post-construction of the interchange. The roundabouts present at either side of the underpass features plantings of palms, with a 4 m radius of surrounding grasses acting as a buffer to the roadside. Several sections of guardrails were present along the investigated length.

A 2 m high metal fence bordered the proposed work areas with the adjacent bushland, with the adjacent eucalypt woodland supporting trees to about 15 m in height, wherein a number of hollow-bearing trees were observed. The species of eucalypt within the adjacent area were not recorded within the subject site and no hollow-bearing trees were observed within the proposed work area. The understorey is comprised of native shrubs to 2 m, with a groundcover of grasses and weeds. Leaf litter, ground debris and encroaching weeds including lantana and small leaf privet, are present.

The investigated road network was exhibiting medium to high volumes of traffic, including the Ourimbah Rest Area, at the time of inspection.

Several sections of encroaching roadside vegetation on the entrance and exit ramps would be removed for safety reasons.

No conservation reserve occurs within or near to the study area; the nearest, Jiliby State Conservation Area, is present about 1.27¹ km east of the proposal area.

While no mapped waterways/bodies occur within the proposal area, Ourimbah Creek (and its associated drainage lines) is present west of the site, from about 90 m west of the nearest proposed work. Reference to the DPI Fisheries NSW Spatial Data Portal (DPI 2022b) [search: Central Rivers] maps Ourimbah Creek as Key Fish Habitat; however, the proposed work would not have any direct or indirect impact this waterway. It is also noted an isolated dam is mapped about 15 m north of the boundary of proposed work at the western roundabout; however, the work would not have a direct or indirect impact on

¹ Direct line

this. Compared to existing inputs, it is not considered that urban runoff from the upgraded sections of road pavement would have an adverse cumulative impact on Ourimbah Creek or the aquatic fauna within this.

Storm water drains are present where stormwater runoff is concentrated, directing surface runoff beyond the proposed works boundary. Two overpasses present within the study area are not part of the proposed scope of work, and would not be impacted by the proposed work.

Reference to the BVMTT (NSW Government 2022d) did not map any biodiversity values within the proposal area.

Reference to the Soil Landscape of the Gosford – Lake Macquarie 1:100,000 Sheet report (Murphy and Tille 1993) and mapping (State Government and DPIE 1993) indicates the proposal area is located within the following two soil landscapes (Figure 3-1):

- Yarramalong
- Erina.



Figure 3-1: Soil Landscape

Yarramalong geology is formed upon the level to gently undulating dissected alluvial plain on Quaternary sediments in the Watagan Mountains and Erina Hills (Murphy and Tille 1993). Soils are deep Alluvial Soils and Siliceous Sands in upper reaches; deep Alluvial Soils and Red Earths along levee banks; deep Yellow Podzolic Soils and Brown Podzolic Soils along the back plain and deep Alluvial Soils and Yellow Earths on terraces. Limitations are flooding hazard, high run-on, seasonal waterlogging; and localized permanent waterlogging, stream bank erosion and foundation hazard.

Erina geology is formed on Terrigal Formation of the Narrabeen Group, and contains lithic and quartz sandstone and siltstone, minor sedimentary breccia, claystone and conglomerate. Some sandstones are highly weathered and friable (Murphy and Tille 1993). Soils are moderately deep to deep Yellow Podzolic Soils on fine-grained bedrock with Yellow Podzolic Soils in poorly drained areas; moderately deep to deep Yellow Podzolic Soils and Yellow Earths on coarse-grained parent material with Yellow Earths on footslopes and deep Structured Loams and Yellow Earths along drainage lines. Limitations are high soil erosion hazard, seasonal waterlogging of footslopes, strongly acid soils of low fertility; and localized mass movement, foundation hazard, and high run-on.

For reference, Table 3-1 identifies attributes of the proposal area investigated.

Table 3-1: Site attributes

Site Attributes	
Estimated size (ha)	About 5.4 ha
ASL	between 15 m and 32 m
Climate ²	Mean summer high: 27.4 °C (January) Mean winter low: 5.9 °C (July) Average annual rainfall – 1127.9 mm
Waterbody	None within proposal area
Critical habitat	No
IBRA Bioregion/Subregion	Wyong / Sydney Basin
Mitchell Landscape	Gosford - Cooranbong Coastal Slopes; Sydney - Newcastle Coastal Alluvial Plains
Soil Landscape	Yarramalong and Erina (Figure 3-1)
NPWS estate	None within, or near to, the study area

3.1 Plant community types and vegetation zones

Reference to the State Vegetation mapping identifies the following Plant Community Types (PCT) are present within, or in proximity to, the study area (Figure 3-2):

- PCT 0 – Non-native vegetation/ cleared
- PCT 3025 – Central Coast Gallery Rainforest
- PCT 3983 – Central Coast Flats Mesic Swamp Forest.

² Mangrove Mountain - AWS – This being the nearest operating weather station to the area investigated

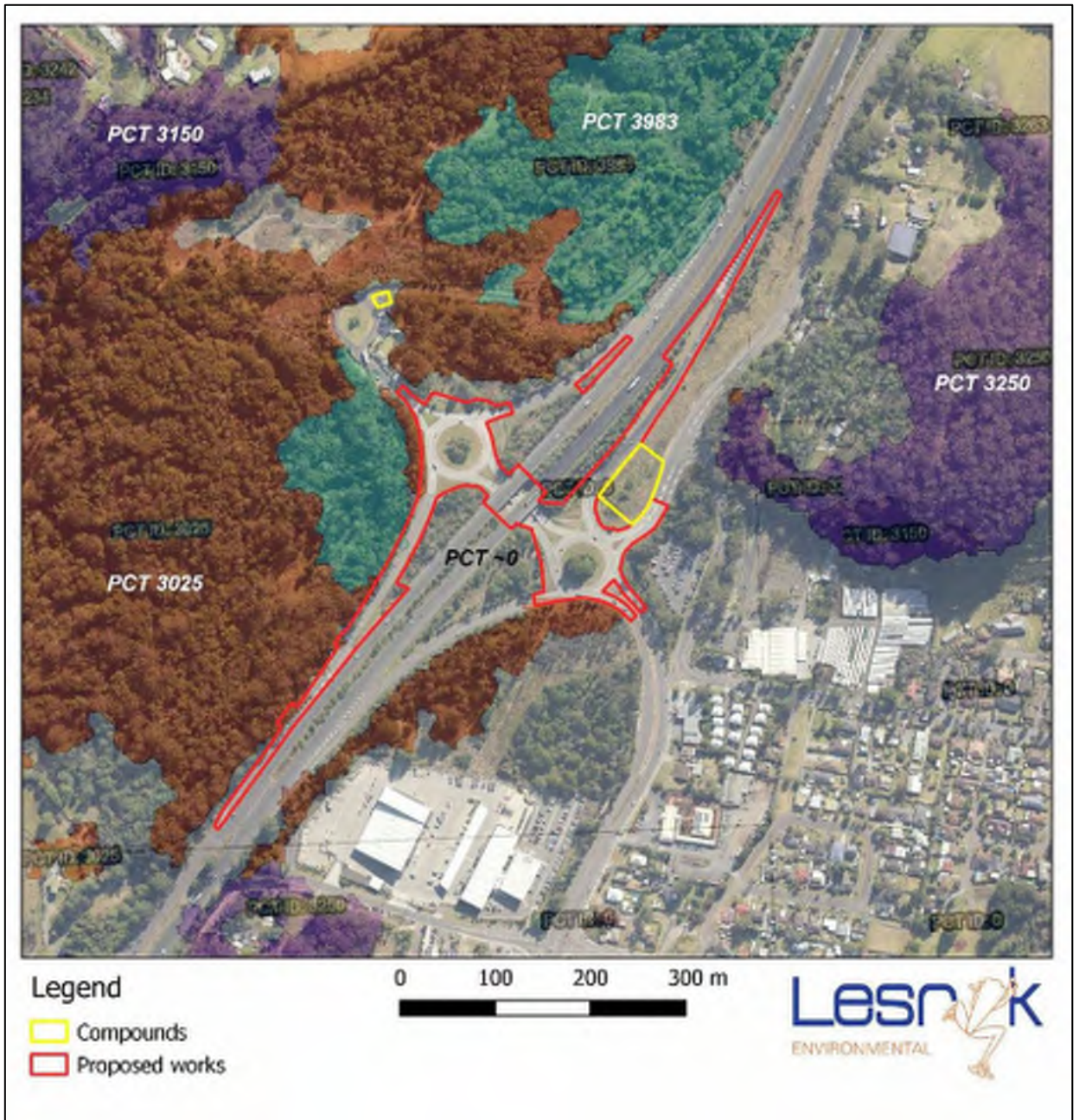


Figure 3-2: Plant community types and vegetation zones

The study area, this being primarily within the ‘non-native/ non-vegetated’ area, supported sections of vegetated roadside verges that have been mapped as fringes of PCT’s 3025 and 3983. Based on the outcomes of the botanical investigation, the areas surveyed were not considered to conform with this mapping, and therefore, at these sites, the mapping is considered to be incorrect. On-ground surveys confirmed that the mapped PCT 3025 and 3983 were highly disturbed and composed (in the case of the roadside vegetation present at the Ourimbah Interchange ramps) as maintained road verges consisting of exotic weeds and isolated exotic and native trees. The majority of these trees are considered ‘planted’, and are not considered vegetation communities.

The botanical survey determined that the PCT present within the entire project area conformed to PCT 0 (Table 3-2). As such, no vegetation communities would be impacted by the proposed works.

Table 3-2: Plant community types and vegetation zones within the proposal

Veg. zone	Plant community type (PCT)	Threatened ecological community	Area (ha)		Patch size class	VI score
			Subject land	Study area		
Proposed works area	PCT 0 – Non-native vegetation	N/A	–	1.1 ha	N/A	0

It is noted that, adjacent to the north-bound on and off ramps, a mesh security fence separates the works area from the adjacent woodlands. Beyond this fencing, the areas identified as PCT 3983 do not meet the flora assemblage requirements for this PCT type, and woodland conforming more to PCT ID 1528 *Jackwood - Lilly Pilly - Sassafras riparian warm temperate rainforest of the Central Coast*. The correct PCT, ID 1528 was identified beyond the limits of the proposed works in the low alluvial soil vegetated areas and south bound riparian banks that are incorrectly mapped as PCT 3983.

PCT1528 is associated with the Endangered Ecological community known as Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions. Excluding the trimming of some overhanging branches that are limiting views of the existing signage, no impact on this EEC will arise. The works will not reduce the extent of this EEC, nor fragment or further isolate the stand from proximate woodland areas. Beyond existing conditions, the works will not introduce pathogens, weeds or other threats to the viability of this EEC, nor will it reduce the extent of its habitat. As no impact on this EEC will arise, and as it occurs beyond the limits of the works, no assessments drawing on the criteria provided under Section 7.3 of the BC Act are required. Similarly, beyond due diligence, no specific mitigation measures are needed.

The area proposed to be disturbed is a highly modified cultural landscape and is considered to have no ecological significance for threatened plants or plant communities. Given these disturbances, no threatened plants could be expected to be present within the soil seed bank across the majority of the site.

The proposal would not require the removal of any large areas of native vegetation. Refer to Table 3-2 for the details of vegetation removal.

With reference to the flora list provided in Appendix D, a total of 22 exotic species were identified within the investigated sections of the roadside verges.

As no State or nationally listed threatened plants are considered to be present or adversely impacted by the proposal, the conducting of assessments referring to the EPBC Act’s Significant Impact Guidelines and Section 7.3 of the BC Act are not required.

3.2 Threatened ecological communities

No TECs are identified within the proposed works.

3.3 Groundwater dependent ecosystems

Groundwater dependent ecosystems (GDE) are communities of plants, animals and other organisms whose extent and life processes are dependent on groundwater. Some examples of ecosystems which depend on groundwater are:

- Wetlands
- Red gum forests, vegetation on coastal sand dunes and other terrestrial vegetation
- Ecosystems in streams fed by groundwater
- Limestone cave systems
- Hanging valleys and swamps.

Reference to the Groundwater Dependent Ecosystems Atlas (BoM 2022b) identified low potential terrestrial GDE within the proposal area. No aquatic or subterranean GDE were identified or analysed for the proposal area (Figure 3-3).

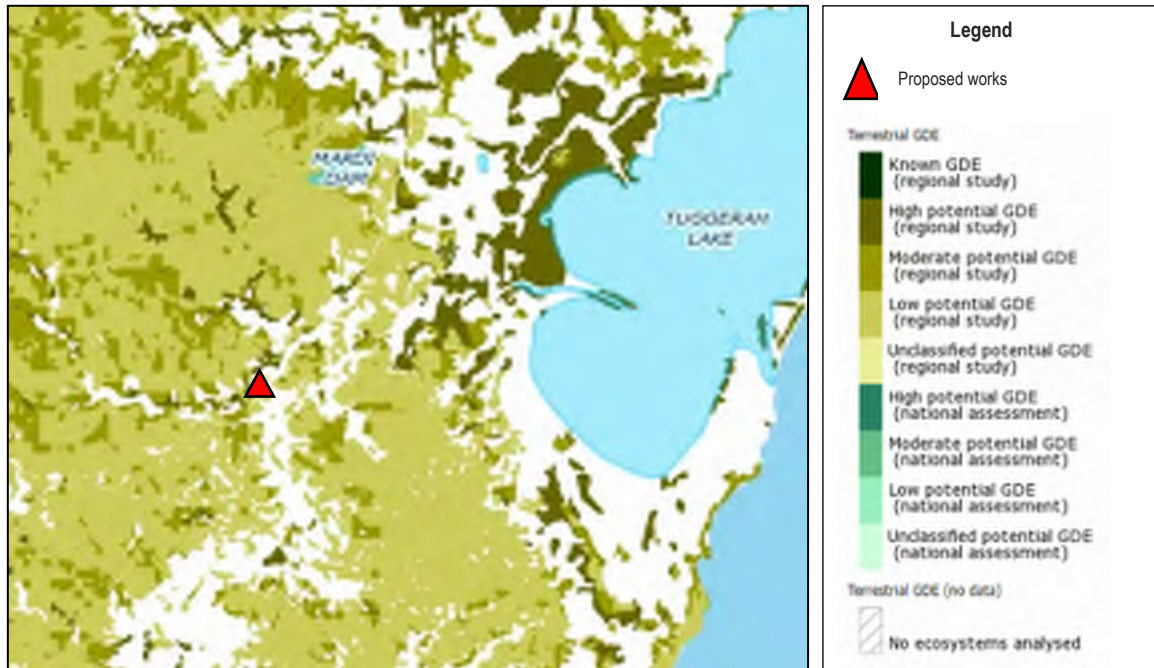


Figure 3-3: Groundwater dependent ecosystems (red triangle indicative of proposal area)

In reference to the DPI’s (Office of Water) Risk Assessment guidelines for GDE (Serov *et al.* 2012), the proposed work would not have any direct or indirect impact on a water source or aquifer structure, it would not involve groundwater extraction, and, with the adoption of mitigation measures, would not contribute to the off-site movement of sediment.

The proposed work would not result in any direct or indirect adverse impact on surface hydrology within the proposal area.

3.4 Threatened species

Prior to conducting the field investigation, a review of the DCCEEW PMST and BioNet databases (DCCEEW 2022a, DPE 2022a) identified 43 threatened plants and/or their populations, and 59 threatened fauna species, listed under the EPBC and/or BC Acts that have been previously recorded or are considered to have habitat within 10 km of the subject site (Appendix A). The majority of the threatened species identified during the literature search as having the potential to occur in the proposal area were assessed to have only a low likelihood of occurrence, given the disturbed and highly modified condition of the locality. Due to a lack of their necessary habitats within the area investigated, oceanic, estuarine, wetland and/or fish species were not considered.

By the completion of the field survey, one mammal, one amphibian and 13 native birds had been recorded within, or in proximity to, the proposal area (Table 3-3). In addition, one introduced bird species was detected.

Of those species recorded, one, the Black-faced Monarch (*Monarcha melanopsis*) is listed as a Migratory/Marine species under the EPBC Act.

One Black-faced Monarch was heard calling from the vegetation to the north-west of the existing north-bound on-ramp. During the course of the investigation, no individuals were heard calling or observed within the required clearing areas. Within the areas that will be affected, no significant habitat for this migratory bird was present. With the retention of the adjacent bushland areas, no habitat for this species will be cleared, and no barriers to its movement patterns erected. As the works will not have an impact on the Black-faced Monarch, an assessment referencing the EPBC Act’s Significant Impact Guidelines relevant to a Migratory species was not required.

In reference to the Black-faced Monarch’s EPBC Act ‘Marine’ listing, the proposed work is not located within the Commonwealth marine area, this being from 3 to 200 nautical miles from the coast; as such, no assessment referencing the EPBC Act’s Guidelines that are relevant to the Commonwealth marine environment is considered necessary. No further legislative consideration [under this Act] has been given to the Marine listing for the Black-faced Monarch within this BAR.

Table 3-3: Recorded fauna

KEY ^M Migratory, ^{MA} Marine, * introduced

Common name	Scientific name	Detection method
AMPHIBIANS		
Eastern Dwarf Tree Frog	<i>Litoria fallax</i>	Heard calling
MAMMALS		
Common Wombat	<i>Vombatus ursinus</i>	Road kill observed
BIRDS		
Pacific Black Duck	<i>Anas superciliosa</i>	Observed
Yellow-tailed Black Cockatoo	<i>Calyptorhynchus funereus</i>	Heard calling
Rainbow Lorikeet	<i>Trichoglossus haematodus</i>	Heard calling
Superb Fairy-wren	<i>Malurus cyaneus</i>	Observed
Yellow-faced Honeyeater	<i>Lichenostomus chrysops</i>	Heard calling
Lewin's Honeyeater	<i>Meliphaga lewinii</i>	Heard calling
Scarlet Honeyeater	<i>Myzomela sanguinolenta</i>	Heard calling
Eastern Whipbird	<i>Psophodes olivaceus</i>	Heard calling
Bell Miner	<i>Manorina melanophrys</i>	Heard calling
Australian Magpie	<i>Cracticus tibicen</i>	Observed
Grey Fantail	<i>Rhipidura albiscapa</i>	Observed
^{M,MA} Black-faced Monarch	<i>Monarcha melanopsis</i>	Heard calling
Silveryeye	<i>Zosterops lateralis</i>	Heard calling
Welcome Swallow	<i>Hirundo neoxena</i>	Observed
* Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	Heard calling

None of the other recorded species are listed, or currently being considered for listing, under the EPBC or BC Acts.

No nests were observed within the proposal area during the investigation. As stated, no hollow-bearing trees are present. Within the works area, no culverts that could be occupied by cave-dependent microbats were observed.

The native species recorded are protected, as defined by the BC Act, but considered to be common to abundant throughout the surrounding region. The species recorded would not be solely reliant upon those habitats present within, or near to, the subject site such that the removal or further disturbance of these would threaten the 'local' occurrence of these animals. The species recorded are all expected to be present within both the proposal area and surrounding locality post-work.

3.5 Areas of outstanding biodiversity value

The DCCEEW's Register of Critical Habitat (DCCEEW 2022c) and DPE's Area of Outstanding Biodiversity Value (AOBV) register (DPE 2022b) (in conjunction with Part 3 of the Biodiversity Conservation Regulation 2017) per listings provided under the EPBC and/or BC Acts, did not identify any gazetted areas of critical habitat or AOBV for any flora or fauna species, populations or communities occurring within or near to the scope of work proposed.

3.6 Wildlife connectivity corridors

The proposed works area is not situated within an important wildlife corridor. Within the area surveyed, no well vegetated bushland links are present.

Numerous barriers to ground traversing fauna are present within the area surveyed, including the highway itself, existing rest area and associated car park and security fencing. The presence of these barriers to fauna movement was evident through the observation of a roadkill Wombat immediately adjacent to the north-bound off-ramp.

Beyond existing influences, the undertaking of the works will not affect any fauna movements nor will they have an adverse cumulative impact when associated with the existing situation. The works will not further fragment or isolate any habitat area, nor present a barrier to fauna dispersal patterns.

Post-work, flying species, and those highly tolerant of traversing urban environments, would still be able to move across and through the works area.

3.7 SEPPs

SEPP (Biodiversity and Conservation) 2021

Chapter 4 - Koala Habitat Protection 2021

The Central Coast Council LGA is identified under Schedule 2 - LGAs of the SEPP, and within the Central Coast Koala management areas. This Policy seeks to encourage the proper conservation and management of areas that provide habitat for Koalas.

Chapter 4 'Koala habitat protection 2021' of the SEPP only applies to development applications assessed under Part 4 of EPA Act, not those considered under Part 5. That stated, it is TfNSW's practice to consider the SEPP criteria as part of the environmental assessment process.

Within the works area, no Koala habitat use trees are present. The presence of the existing highway infrastructure, including security fencing, would preclude Koalas from accessing the subject site.

No Koala Plan of Management exists for the locality. No evidence (i.e. sightings, calls, scats etc.) to suggest that the area investigated supported a resident Koala population were identified. Reference to the BioNet Atlas (DPE 2022a) identified a previous Koala record about 4.5 km east of the proposal area – this being the nearest and most recent detection (sighted in 1999).

In accordance with the following definitions provided under Chapter 4, Section 4.2 of the SEPP, the proposal area is not considered to constitute Core Koala habitat:

- (a) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or
- (b) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years.

The carrying out of the proposed work would not require the preparation of a Plan of Management for the conservation and management of areas of Koala habitat

3.8 Matters of National Environmental Significance

By the completion of the field investigation, one fauna species listed as migratory under the EPBC Act was recorded, being the Black-faced Monarch. This species was heard calling west of the north-bound on ramp, within habitat characteristic of this bird's life cycle needs.

The Black-faced Monarch may traverse over, and perch within the subject site on occasion; however, the proposed works will not remove a significant amount of habitat relied upon by this species such that its local presence would be compromised. The work will not adversely affect any of this species' breeding or foraging habitat, nor will it present any barriers to its movement patterns.

No TEC, or threatened flora listed under the EPBC Act had been recorded within, or near to, the proposal area. Similarly, none were considered likely to occur or rely upon the habitat to be disturbed for any of their necessary lifecycle requirements.

Reference to the PMST did not identify any World or national heritage listed places, nor Wetlands of international importance, within, or near to, the proposal area. Additionally, no threatened species or ecological communities predicted to occur near the subject site would be reliant upon the fauna habitats or vegetation communities present, and none would be affected by the conducting of the activities proposed.

4. Avoidance and minimisation

The key principles of Transport's Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011), and the associated impact on the natural and social environment, is that Transport should aim to:

- Avoid and minimise the impact first
- Mitigate the impact where avoidance is not possible
- Offset where residual impact cannot be avoided.

4.1 Application of avoid and minimise principles

The objective of the proposal is to widen the existing M1 entrance and exit ramps at Ourimbah Interchange, and improve the safety of this location for motorists. As the proposed work would take place within and adjacent to the existing disturbed road corridor of the investigated section of the M1, the potential to avoid impact to biodiversity is low. While disturbance/removal of about 1.1 ha of vegetation to achieve the objectives of the project is unavoidable, the amount and quality to be cleared is considered to provide minimal habitat resources for those species recorded, or potentially occurring, given the extent of similar retained vegetation within the surrounding locality.

The proposed work would only remove trees that are ≥ 5 cm in DBH where these compromise the conducting of the activities or require removal to successfully complete the proposal. An estimated 34 trees (17 small, 17 medium, sized trees) are anticipated to require clearing, none of these considered to be hollow-bearing, large or extra-large trees; however, similar resources would be retained within the proposal area and beyond. To off-set the removal of these plants, the Biodiversity offset strategy/tree and hollow replacement plan would require 102 trees to be planted. Refer to Section 7.2 of this report for details. The retention of mature trees within the investigated and surrounding area will continue to maintain habitat connectivity.

Vegetation clearance would be limited to the minimum required to successfully complete the proposal; with the selection of equipment to also minimise clearance requirements.

Vegetation clearance and work limits would be identified both on site maps/plans and on-site through the erection of temporary exclusion fencing, bunting or similar in accordance with Guide 2 of Transport's Biodiversity Guidelines (RTA 2011). Fencing etc. would be established at the outer limits of the drip line of any retained trees present and the areas marked as 'no-go zones', to avoid indirect impact.

The proposed M1 widening works have been designed to minimise impact on the ecological values of the subject site wherever possible.

The temporary compound/stockpile sites required to assist the proposal would be located within existing cleared/disturbed sites, being an existing paved area that is present within the Ourimbah Rest Area, and, within the eastern extent of the proposal area, in an area previously cleared and disturbed as part road-works. Use of these two areas would not require the removal of any native vegetation.

5. Impact assessment

Potential impacts as a result of conducting the activity include the disturbance/removal of up to 1.1 ha of native and exotic vegetation, including an estimated 34 trees anticipated to require clearing, none of these considered to be hollow-bearing, large or extra-large trees.

By the completion of the field investigation, one fauna species was recorded:

- Black-faced Monarch – listed as a migratory, marine.

Further potential impact includes temporary noise and/or vibration levels, erosion, injury and/or mortality to fauna, edge effects, weed proliferation and introduction of pathogens.

Given the land use history of the proposal site, its levels of long-term modification and disturbance, no TEC's, threatened flora, or their populations, were recorded. Similarly, none were considered likely to occur or rely upon the habitats/vegetation communities to be disturbed/removed for any of their necessary lifecycle requirements.

No significant adverse impact is expected during the operational phase of the proposal.

Mitigation measures have been provided in Section 6 of this report.

5.1 Construction direct impacts

5.1.1 Removal of native vegetation

Based on a worst-case estimate it is expected that 1.1 ha of native and exotic vegetation would be disturbed/removed to permit the proposal, as identified in Table 5-1. Similar resources will be retained within the proposal area and beyond.

Table 5-1: Removal of native vegetation and PCT type

Veg. zone	Plant community type (PCT)	Broad condition class	TEC	Area to be impacted (ha or m ²)
Veg disturbance Area	PCT N/A – 'cleared'	Disturbed	N/A	1.1 ha ³

At the completion of the fieldwork, 34 native trees were identified within the tree removal areas (Figure 2-1, Appendix B). The required offsetting for those trees cleared is identified in Table 5-2. It is noted that no hollow-bearing trees, large or very large trees were recorded. The Biodiversity offset strategy/tree and hollow replacement plan would require 102 trees to be planted. Refer to Section 7.2 of this report for details.

Given the limited size of the road corridor at this location, as opposed to planting trees, it may be appropriate for TfNSW to transfer \$10625 into the Conservation fund, this complying with the required rates per the *Tree and Hollow replacement guidelines 2022* for those trees being cleared (Table 5-2).

The works proposed do not meet any of the activities excluded from the requirement of replacing trees or hollows (TfNSW 2022). The works proposed are not considered low-risk activities and the area in which the activity is to occur is unlikely to naturally regenerate given the suite of plants recorded.

³ It is acknowledged that 0.8 ha of this has been subject to ongoing and regular maintenance work.

Table 5-2: Biodiversity offset strategy/tree and hollow replacement plan

	Total trees	Required number of replacement trees	Contribution required per tree	Total contribution
Small trees	17	34	\$125	\$2125
Medium trees	17	68	\$500	\$8500
Total		102		\$10625

None of the trees being removed would be considered amenity trees.

Relevant to the proposed work, 'Clearing of native vegetation' is a Key Threatening Processes (KTP) listed under the BC Act. Given the extent of similar resources within the proposal area and beyond, and provided recommended mitigation measures are adopted, the loss of this amount of native vegetation is not considered to significantly contribute to, or increase the impact of, this KTP.

Clearing within the proposal area would be carried out in accordance with Guide 4 of the Biodiversity Guidelines (RTA 2011) to minimize disturbance to surrounding flora and fauna habitats.

5.1.2 Removal of threatened fauna habitat

The recorded Black-faced Monarch may traverse over, and perch within the surrounding area on occasion; however, the proposed works not remove a significant amount of habitat relied upon by this species such that its local presence would be compromised. The work will not adversely affect any of this species' breeding or foraging habitat, nor will it present any barriers to its movement patterns.

No habitat for those threatened fauna previously recorded in the surrounding region was recorded/observed during the investigation. No hollow-bearing trees or dead stags were recorded within the proposed impact footprint. Hollow-bearing trees exist beyond the boundary of the subject site, none of which would be impacted by the proposed works.

No culverts, cave-substitutes, developed woodlands, wetlands, drainage lines and so forth were present.

Clearing of native vegetation is a KTP listed under the BC Act. Given the extent of similar resources within the proposal area and beyond, and provided the recommended mitigation measures are adopted, the proposal is not considered to significantly contribute to, or increase the impact of, these KTP. –

Removal of habitat within the proposal area would be carried out in accordance with Guide 4 of the Biodiversity Guidelines (RTA 2011).

5.1.3 Removal of threatened flora

No threatened flora species listed under the EPBC or BC Acts were recorded or considered likely to occur within the area investigated; as such, as no threatened species are considered to be adversely impacted by the proposal, the conducting of assessments referring to the EPBC Act's Significant Impact Guidelines and Section 7.3 of the BC Act is not required.

5.1.4 Aquatic impacts

Beyond existing conditions, the works proposed would not directly or indirectly impact the surface run-off or hydrology of the area, and is not expected to impact any of those drainage lines that occur beyond the limits of the work.

5.1.5 Injury and mortality

Vegetation clearing to permit the proposal would involve the removal of up to about 1.1 ha. Within this vegetation, no signs of resident occupation by native fauna (e.g. nests, white-wash, scats) was obtained.

The existing road network is resulting in native fauna interacting with motor vehicles, resulting in road kills; however, the proposal is not considered to have an adverse cumulative impact when associated with the current situation.

During the construction phase of the proposal some urban adaptable, sheltering fauna species (i.e. frogs and ground-traversing mammals) could be present and be subject to injury. Mitigation measures such as checking beneath vehicles/machinery prior to their use have been provided to address this matter.

Beyond current levels of impact associated with the existing presence of M1, and the volume of traffic that typically uses this network, the operation phase of the proposal is not expected to significantly increase injuring or mortality of fauna within the proposal area. The proposal is not expected to significantly alter vehicle strikes on those fauna species recorded or potentially occurring than may be currently transpiring. The proposal would not have an adverse impact on the long-term viability of these species or their local populations.

5.1.6 Groundwater dependent ecosystems

Low potential terrestrial GDE has been identified within the proposal area (BoM 2022b).

In reference to the DPI (Office of Water)'s *Risk assessment guidelines for groundwater dependent ecosystems* (Serov *et al* 2012), the proposed Ourimbah Interchange upgrade and widening of the ramps would not have any direct or indirect impact on a water source or aquifer structure, it would not involve groundwater extraction, and, with the adoption of mitigation measures, would not contribute to the off-site movement of sediment.

5.2 Indirect and operational impacts

5.2.1 Edge effects on adjacent native vegetation and habitat

Weeds are readily spread by existing dispersal factors such as wind, birds, water and the movement of vehicles along the road. Clearing and opening up of new vegetation edges can facilitate the recruitment of these species and provide opportunity for the establishment of other weed species. These weeds are often able to out-compete native flora and fauna species and reduce the habitat values of these areas. While this is the case, edge effects beyond those that are currently occurring within the section of M1 investigated are not expected to be exaggerated due to the carrying out of the proposed work.

5.2.2 Wildlife connectivity and habitat fragmentation

The works proposed will not have an indirect impact on those fauna corridors that exist beyond the limits of the activity. The works will not further fragment or isolate areas of fauna habitat.

Limited connectivity currently exists between areas of vegetation east-west of the proposal area due to the presence of the M1. Beyond the area investigated, the extant vegetation connects into a surrounding heavily wooded landscape that forms part of a relatively continuous vegetated corridor.

Temporary measures incorporated as part of the proposed work (i.e. erosion and sediment controls, exclusion fencing) would be established in accordance with applicable guidelines to prevent direct or indirect impact on fauna.

Species currently negotiating this road network and surrounding area are considered to continue to do so post-work.

5.2.3 Injury and mortality

Considering the habitats present and the scope of works proposed, the activity would not have any indirect impacts in regards to this matter. The potential for fauna injury and mortality impact, beyond that identified during the construction phase of the proposal (Section 5.1.5) or currently occurring along the M1 at this location, would not increase during the operational phase of the proposal.

5.2.4 Invasion and spread of weeds

Under the *Biosecurity Act 2015*, 'all plants are regulated with a general biosecurity duty to prevent, eliminate or minimize any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimized, so far as is reasonably practicable.'

Of those introduced plants recorded, Fireweed (*Senecio madagascariensis*) and Lantana (*Lantana camara*) is listed:

- Under Schedule 3 of the NSW Biosecurity Regulation 2017

- As a WoNS (Weeds Australia 2022)⁴.
- Priority weed for the Greater Sydney Region (DPI 2022a).

Treatment of these weeds prior to the commencement of the road works is recommended. That stated, it is noted that both weeds were observed beyond the limits of the work, within the adjacent 'fenced' woodland; as such, dispersal of seed from these adjacent areas into the M1 road corridor will occur post-construction. As part of the ongoing maintenance of the M1 corridor, regular treatment of these weeds is recommended.

5.2.5 Invasion and spread of pests

Beyond the existing diversity of exotic species and pests recorded and predicted to occur, the operation of the proposed works will not have an adverse cumulative impact. The works will not benefit any exotic pests at the expense of native species. Exotic plants and animals current occupy, and occur in proximity to, the proposed road works site.

5.2.6 Invasion and spread of pathogens and disease

There is a risk that the proposal would introduce, spread or exacerbate the plant diseases caused by *Phytophthora cinnamomi* and Myrtle Rust (*Puccinia psidii*). These diseases are most likely introduced or spread through the importation or movement of soil, water and landscaping materials, either directly or through incidental attachment to machinery.

Although there was no obvious evidence for the presence of *Phytophthora cinnamomi* or Myrtle Rust in the vegetation of the proposal area, recommendations to disinfect vehicles and machinery prior to its use in construction activities have been presented in Section 6.

5.2.7 Changes to hydrology

The proposed work would not result in any direct or indirect adverse impact on surface hydrology within the proposal area.

5.2.8 Noise, light, dust and vibration

During construction, activities associated with the proposal may cause additional noise and vibration; however, given the presence of the existing road network, it is not considered that the proposal would result in adverse changes to existing levels of noise, vibration and/or light from this existing source such that there would be a significant impact to native fauna species.

The proposed work impact is considered to be temporary and short-term. The Draft Construction Noise Guideline (EPA 2020) would be referenced, as would compliance of all vehicles and machinery with industry noise guidelines.

5.3 Cumulative impacts

When associated with the existing road infrastructure and the traffic volumes that traverse this, the activity proposed would not have an adverse cumulative impact. The works will not remove any threatened species or EEC, or any areas of their habitat, nor further fragment or isolate areas of bushland.

The proposal, being the widening of the M1 ramps and upgrading of the associated utilities (i.e lighting) to meet the safety concerns regarding the traffic influx during peak seasons, necessitates the clearing of vegetation. To off-set the removal of this vegetation, within which an estimated 34 trees occur, TfNSW will either plant 34 small, and 68 medium, sized trees or transfer funds into the TfNSW Conservation fund at the required rates per the *Tree and Hollow replacement guidelines 2022*.

The proposal is not expected to have a cumulative impact on any existing or planned developments within the surrounding locality.

The proposal is not considered to contribute to an adverse cumulative ecological impact in a local and regional context; nor is it considered to further contribute to the decline of any threatened species, populations or ecological communities within the locality.

⁴ The list of WoNS is part of a combined State and Commonwealth initiative to combat invasive species.

5.4 Assessments of significance

As no State or Federal threatened species or ecological communities were recorded or predicted to be present within or close to the disturbance footprint, preparation of Assessments of Significance is not required.

6. Mitigation

Table 6-1 provides a number of mitigation measures that aim to ensure that the proposed work carried out does not have an adverse impact on those environments that occur within or near to the proposal area.

Where applicable, safeguards are made with reference to Transport's *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).

Table 6-1: Mitigation measures

ID	Impact	Mitigation measure	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated?	Responsibility
B01	General	An Erosion Sediment Control Plan (ESCP) would be prepared for the proposal and would be in line with the publication <i>Managing Urban Stormwater: Soils & Construction Guidelines</i> (Landcom 2004).	Detailed design	Effective		Project Manager/ Contractor
B02		A Construction Environmental Management Plan (CEMP) would be prepared for the proposal.	Prior to construction	Effective		Project Manager/ Contractor
B03		The temporary stockpile site will be located within the identified existing cleared area within the northern extent of the proposal area.	Prior/during construction	Effective		Project Manager/ Contractor
B04		Spill kits commensurate with the type and quantity of hazardous material used must be available on-site.	During construction	Effective		Project Manager
B05	Removal of native vegetation	Native vegetation removal will be minimised through detailed design.	Detailed design	Effective	There would be a residual impact from the loss of 1.1 ha of native/exotic vegetation, including 34 plants (composed of 17 small, and 17 medium sized, trees).	Project Manager/ Botanist
B06		Vegetation clearance limits would be identified both on site maps/plans and on-site through the erection of temporary exclusion fencing, bunting or similar in accordance with <i>Guide 2: Exclusion Zones</i> (RTA 2011). Fencing etc. would be established at the outer limits of the drip line of any retained trees and the areas marked as 'no-go zones' to avoid direct impact.	Prior to construction	Effective		Botanist/ Project Manager/ Contractor
B07		Pre-clearing surveys will be conducted in accordance with <i>Guide 1: Pre-clearing process</i> (RTA 2011).	Prior to construction	Effective		Ecologist
B08		Vegetation removal will be conducted in accordance with <i>Guide 4: Clearing of vegetation and removal of bushrock</i> (RTA 2011). Clearing of native vegetation would be limited to the minimum required to successfully permit the proposal.	During construction	Effective		Contractor

ID	Impact	Mitigation measure	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated?	Responsibility
B09		Removed native and non-seed-bearing exotic vegetation would be mulched or re-used on-site.	During/post construction	Effective		Contractor
B10		Native vegetation will be re-established in accordance with <i>Guide 3: Re-establishment of native vegetation</i> (RTA 2011).	Post-construction	Proven		Contractor
B11		To off-set the removal of an estimated 34 trees, TfNSW will either plant 102 trees within M1 the road corridor or transfer \$10625 into the TfNSW Conservation fund.	Post-construction	Effective		Contractor/TfNSW
B12		The unexpected species find procedure is to be followed under <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011) if threatened ecological communities, not assessed in the biodiversity assessment, are identified in the proposal site.	During construction	Proven		Environment Manager
B13	Removal of threatened fauna habitat	Threatened fauna habitat removal will be minimised through detailed design.	Detailed design	Effective		Ecologist/ Project Manager
B14		Habitat removal will be conducted in accordance with <i>Guide 4: Clearing of vegetation and removal of bushrock</i> (RTA 2011).	During construction	Effective		Contractor
B15		Retained hollow-bearing trees would be clearly identified on-site prior to the commencement of work to ensure they are not indirectly impacted or cleared.	Prior to construction	Effective		Ecologist/ Project Manager
B16		Habitat will be relocated, replaced or re-instated in accordance with <i>Guide 5: Re-use of woody debris and bushrock</i> and <i>Guide 8: Nest boxes</i> (RTA 2011) to minimise loss or damage to native fauna habitats.	During construction	Proven		Ecologist/ Project Manager
B17		The unexpected species find procedure is to be followed (RTA 2011) if threatened fauna, not assessed in the biodiversity assessment, are identified in the proposal site.	During construction	Proven		Environment Manager
B18	Removal of threatened flora	The unexpected species find procedure is to be followed (RTA 2011) if threatened flora species, not assessed in the biodiversity assessment, are identified in the proposal site.	During construction	Proven		Environment Manager
B19	Groundwater dependent ecosystems	Interruptions to water flows associated with groundwater dependent ecosystems will be minimised through detailed design.	Detailed design	Effective		Project Manager

ID	Impact	Mitigation measure	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated?	Responsibility
B20	Changes to hydrology	Changes to existing surface water flows will be minimised through detailed design.	Detailed design	Effective		Project Manager
B21	Fragmentation of identified habitat corridors	Connectivity measures will be considered/implemented in accordance with the <i>Wildlife Connectivity Guidelines for Road Projects</i> (RTA 2011) or equivalent updated NSW Guidelines.	Detailed design, during construction and post construction	Effective		Project Manager/ Ecologist
B22	Edge effects on adjacent native vegetation and habitat	Exclusion zones will be set up at the limit of clearing in accordance with <i>Guide 2: Exclusion zones</i> (RTA 2011).	During construction	Effective		Ecologist/ Project Manager
B23	Injury and mortality of fauna	The presence of fauna on-site pre-work would be in accordance with <i>Guide 1: Pre-clearing process</i> (RTA 2011).	Prior to construction	Effective		Ecologist or licensed wildlife carer
B24		Fauna will be managed in accordance with <i>Guide 9: Fauna handling</i> (RTA 2011).	During construction	Effective		Ecologist or licensed wildlife carer
B25		Inspections for the presence of any sheltering fauna would be carried out beneath vehicles/machinery prior to use.	During construction	Effective		Contractor
B26		Any sheltering native species would be collected and relocated locally (nocturnal species to be released on dusk). If injured, native wildlife would be taken to a local veterinarian or wildlife carer for treatment. Exotic injured wildlife would be taken to a local veterinarian for assessment.	During construction	Effective		Ecologist or licensed wildlife carer
B27	Invasion and spread of weeds	Weed species will be managed in accordance with <i>Guide 6: Weed management</i> (RTA 2011).	Prior/during construction	Effective		Botanist or similarly qualified personnel
B28		In accordance with the NSW <i>Biosecurity Act 2015</i> , Fireweed and Lantana identified on site would be controlled, thereby resulting in their suppression.	Prior/during construction	Effective		Botanist or similarly qualified personnel

ID	Impact	Mitigation measure	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated?	Responsibility
B29	Invasion and spread of pests	If applicable, pest species will be managed within the proposal site.	During construction	Effective		Ecologist or licensed wildlife carer
B30	Invasion and spread of pathogens and disease	<p>Pathogens will be managed in accordance with <i>Guide 2: Exclusion zones</i> and <i>Guide 7: Pathogen management</i> (RTA 2011), including the following hygiene protocols:</p> <ul style="list-style-type: none"> • Before entering the work site, workers are to remove excess soil and mud and then spray boots, tools, gloves and small equipment with recommended disinfectant supplied by the contractor (70% Methylated spirits / 30% Water) until runoff is clear. • When leaving the work site, workers are to remove excess soil and mud and then spray boots, tools, gloves and small equipment with recommended disinfectant until runoff is clear. • Avoid unnecessary soil disturbance. 	During construction	Effective		Contractor/ Project Manager
B31	Noise, light, dust and vibration	Noise and vibration impact will be minimised through detailed design.	Detailed design	Effective		Project Manager
B32		<p>Construction activities would be limited to the period provided in the Draft Construction Noise Guideline (EPA 2020):</p> <ul style="list-style-type: none"> • 7.00 am to 6.00 pm Monday to Friday, and 8.00 am to 1.00 pm on Saturday. • No work on Sundays or public holidays. 	During construction	Effective		Contractor

7. Offsets and other measures

7.1 Thresholds

The proposed works would trigger thresholds set out by No Net Loss Guidelines (TfNSW 2022) listed in Table 7-1 (refer to Section 7.2 of this report).

Table 7-1: Offset thresholds (TfNSW No Net Loss Guidelines)

Impact	Threshold	Triggered
Works involving clearing of a <u>CEEC</u>	Where there is any clearing of an <u>CEEC</u> in 'moderate to good' condition	No
Works involving clearing of an <u>EEC</u>	Where clearing of a <u>EEC</u> ≥ 2 ha in 'moderate to good' condition	No
Works involving clearing of <u>VEC</u>	Where clearing of <u>VEC</u> ≥ 5 ha in 'moderate to good' condition	No
Works involving clearing of any habitat for a known species credit fauna species or clearing of breeding habitat (as defined by the TBDC) for dual-credit fauna species (excluding exotic and planted vegetation that cannot be assigned to a plant community type)	Where clearing ≥ 1 ha in 'moderate to good' condition	No
Works involving removal of known threatened flora species and their habitat	Where loss of individuals is ≥ 10 or where clearing of habitat is ≥ 1 ha	No
Type 1 or Type 2 key fish habitats	Where there is a net loss of habitat	No
Any residual biodiversity impact that doesn't require offsets in accordance with the No Net Loss Guideline is to be assessed against the requirements of the Tree and Hollow Replacement Guideline.	Any clearing of hollows and/or trees ≥ 5 cm DBH	Yes

Table 7-2: Offset thresholds

Description of activity or impact	Consider offsets or supplementary measures	Subject species/Subject EEC meeting threshold
Activities in accordance with Roads and Maritime Services Environmental assessment procedure: Routine and Minor Works (RTA 2011)	No	N/A
Works on cleared land, plantations, exotic vegetation where there are no threatened species or habitat present	No	N/A
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)	Yes	Clearing of 34 native trees ≥ 5 cm DBH (non-hollow-bearing)
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	N/A

Works involving clearing of nationally listed TEC or nationally listed threatened species habitat	Where clearing > 1 ha of a TEC or habitat in moderate to good condition	N/A. No nationally listed TEC or threatened species habitat recorded.
Works involving clearing of NSW endangered or vulnerable ecological community	Where clearing > 5 ha or where the ecological community is subject to an SIS	N/A
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	Where clearing > 1 ha or where the species is the subject of an SIS	N/A
Works involving clearing of NSW listed threatened species habitat and the species is an ecosystem credit species as defined in OEH's Threatened Species Profile Database	Where clearing > 5 ha or where the species is the subject of an SIS	N/A
Type 1 or Type 2 key fish habitats (as defined by NSW Fisheries)	Where there is any net loss of habitat	No

Table 7-3: Assessment of vegetation impacts against thresholds

Veg. zone	Plant community type (PCT)	Condition	TEC	Impact area (ha or m ²) ¹	Threshold triggered?
Proposal Area	PCT 0	Disturbed	Not a TEC	1.1 ha	Tree replacement is required.

7.2 Biodiversity offset strategy/tree and hollow replacement plan

At the completion of the fieldwork, a number of trees were identified within the three survey plots (Appendix B). Extrapolating the results of the plot surveys to the entire tree clearing areas, the required offsetting for those trees cleared is identified (Table 5-2). It is noted that no hollow-bearing trees, large or very large trees were recorded.

It is estimated that 34 native trees ⁵(17 small, 17 medium trees) would be removed, with 102 off-set plantings required. Alternatively, TfNSW may wish to transfer funds into the TfNSW Conservation fund at the required rates per the *Tree and Hollow replacement guidelines 2022*.

⁵'Trees' are required to have a ≥ 5 cm DBH

8. Conclusion

Within the area investigated, no TEC or threatened flora species, or their populations, listed or currently being considered for listing under the EPBC or BC Acts were recorded. Similarly, considering the quality and structure of the PCT's present, no threatened plants were considered likely to occur.

One fauna species, the Black-faced Monarch (listed as a migratory, marine under the EPBC Act) was recorded. Assessments referencing the EPBC Act's Significant Impact Guidelines for a migratory and marine listed species were not considered necessary given the lack of habitat for this species within the project limits.

No State listed threatened animals were recorded, or predicted to occur based on a consideration of the habitats present.

To permit the proposal, based on a worst-case estimate, about 1.1 ha of vegetation would require disturbance/removal. As part of this removal, an estimated 17 small, and 17 medium, sized trees, will be cleared. No hollow-bearing, large or very large trees would be cleared. To offset the trees being removed, a total of 102 trees would be planted, alternatively TfNSW may wish to transfer funds into the TfNSW Conservation fund at the required rates per the *Tree and Hollow replacement guidelines* 2022.

With reference to Chapter 4 of SEPP (Biodiversity and Conservation) 2021, the preparation of a Koala Plan of Management is not required.

Mitigation measures have been recommended in Section 6, to reduce any ecological impact as a result of the proposed work. Two primary measures include:

- Minimising impact through detailed design.
- Adhering to Transport's *Biodiversity Guidelines* (RTA 2011).

In addition, the following key mitigation measures have been provided:

- Prepare an ESCP to minimise soil erosion and sediment transfer off-site
- Limit vegetation removal to the minimum required to successfully permit the proposal
- Revegetation to off-set the removal of those trees cleared.

With adherence to those recommendations provided in this report, no ecological constraints to the proposal proceeding as planned were identified or considered likely to occur.

The adoption of the mitigation measures provided would ensure that the proposal is carried out in an ecologically sustainable manner.

9. Glossary

Term	Definition
Accredited person or assessor	Means as person accredited under section 6.10 (of the BC Act) to prepare reports in accordance with the BAM.
Biodiversity Assessment Method	The Biodiversity Assessment Method is established under section 6.7 of the BC Act. The BAM is established for the purpose of assessing certain impacts on threatened species and threatened ecological communities (TECs), and their habitats, and the impact on biodiversity values.
Biodiversity Assessment Method Calculator	Biodiversity Assessment Method Calculator (BAM-C) – the online computer program that provides decision support to assessors and proponents by applying the BAM and referred to as the BAM-C. The BAM-C contains biodiversity data from the BioNet Vegetation Classification and the Threatened Biodiversity Data Collection that the assessor is required to use in a BAM assessment. The BAM-C applies the equations used in the BAM, including those to determine the number and class of biodiversity credits required to offset the impacts of a development, or created at a biodiversity stewardship site. It is published by the Department (DPIE 2020a).
Biodiversity credit report	The report produced by the BAM-C that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a development site, or on land to be biodiversity certified, or that sets out the number and class of biodiversity credits that are created at a biodiversity stewardship site (DPIE 2020a).
Biodiversity offsets	The gain in biodiversity values achieved from the implementation of management actions on areas of land, to compensate for losses to biodiversity values from the impacts of development (DPIE 2020a).
Biodiversity Offsets and Agreement Management System	The online system used to administer the Biodiversity Offsets Scheme. The BOAMS is used by accredited assessors (to carry out specific BAM-related tasks involving access to the BAM-C to perform assessments, submit data, generate credits and calculate a credit price), by landholders (to apply for a Biodiversity Stewardship Agreement and manage ongoing reporting obligations for their agreement) and by proponents of developments (to view their credit obligation or the payment required to the Biodiversity Conservation Fund).
Biodiversity risk weighting	A factor of the formulas used by the BAM to calculate credits. The biodiversity risk weighting (BRW) is a score given to each vegetation zone and species based on the ‘sensitivity to loss’ versus the ‘sensitivity to gain’. The value is set for threatened species and listed in the TBDC. The BRW for vegetation is calculated for each vegetation zone by the BAM-C using a factor of the ‘sensitivity to loss’ of the PCT or TEC (located in the BioNet vegetation classification) and the ‘sensitivity to gain’ of the ecosystem credit species (in the TBDC) that are predicted to occur.
Biodiversity Stewardship site	Refers to land which is the subject to a Biodiversity Stewardship Agreement under the BC Act.
BioNet Atlas	The DPIE database of flora and fauna records (formerly known as the NSW Wildlife Atlas). The Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails listed under the BC Act) and some fish (DPIE 2020a).
BioNet Vegetation classification	Refers to the vegetation community-level classification for use in vegetation mapping programs and regulatory biodiversity impact assessment frameworks in NSW. Refer About BioNet Vegetation Classification NSW Environment and Heritage (DPE 2020a).
Construction footprint	The area to be directly impacted by the proposal during construction activities. See also 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) (DPIE 2020a).
Ecosystem credit species	Threatened species or components of species habitat that are identified in the Threatened Species Data Collection as requiring assessment for ecosystem credits. This is analogous with the definition of 'predicted species'.
Ecosystem credits	A measurement of the value of threatened ecological communities, threatened species habitat for species that can be reliably predicted to occur with a PCT, and PCTs generally. Ecosystem credits measure the loss in biodiversity values at a development, activity, clearing or biodiversity certification site and the gain in biodiversity values at a biodiversity stewardship site (DPIE 2020a).
Habitat	An area or areas occupied, or periodically or occasionally occupied, by a species, population or ecological community, including any biotic or abiotic component (DPIE 2020a).
Indirect impact	Impacts that occur when the proposal affects native vegetation and threatened species habitat beyond the development footprint or within retained areas (e.g. transporting weeds or pathogens, dumping rubbish). This includes impacts from activities related to the construction or operational phase of the proposal and prescribed impacts (DPIE 2020a).
Landscape assessment area	The area which includes the subject land and a 1500 m buffer surrounding the outside edge of the boundary of the subject land or 500 m along each side of the centre line of a linear-shaped proposal
Local population	The population that occurs in the study area. The assessment of the local population may be extended to include individuals beyond the study area if it can be clearly demonstrated that contiguous or interconnecting parts of the population continue beyond the study area, according to the following definitions: <ul style="list-style-type: none"> • <i>The local population of a threatened plant species comprises those individuals occurring in the study area or the cluster of individuals that extend into habitat adjoining and contiguous with the study area that could reasonably be expected to be cross-pollinating with those in the study area.</i> • <i>The local population of resident fauna species comprises those individuals known or likely to occur in the study area, as well as any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to utilise habitats in the study area.</i> • <i>The local population of migratory or nomadic fauna species comprises those individuals that are likely to occur in the study area from time to time or return year to year (OEH 2018).</i>
Matter of national environmental significance	A matter of national environmental significance (MNES) is any of the nine defined components protected by a provision of Part 3 of the EPBC Act (Commonwealth).
Mitigation	Action to reduce the severity of an impact.
Native vegetation	Has the same meaning as in section 1.6 of the BC Act and section 60B of the LLS Act. In summary, <ol style="list-style-type: none"> trees (including any sapling or shrub or any scrub) understorey <u>plants</u> groundcover (being any type of herbaceous vegetation)

	<p>d) <u>plants</u> occurring in a wetland.</p> <p>A <u>plant</u> is native to New South Wales if it was established in New South Wales before European settlement (BC Act).</p> <p>Native vegetation does not extend to marine vegetation (being mangroves, seagrasses or any other species of plant that at any time in its life cycle must inhabit water other than fresh water). Marine vegetation is covered by the provisions of the FM Act.</p>
NSW (Mitchell) landscape	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000 (DPIE 2020a).
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.
Patch size	<p>An area of native vegetation that:</p> <ul style="list-style-type: none"> • <i>occurs on the development site or biodiversity stewardship site</i> • <i>includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤30 m for non-woody ecosystems).</i> <p>Patch size may extend onto adjoining land that is not part of the development site or biodiversity stewardship site (DPIE 2020a).</p>
PlantNET	An online database of the flora of New South Wales which contains currently accepted taxonomy for plants found in the State, both native and exotic.
Population	A group of organisms, all of the same species, occupying a particular area (DPIE 2020a).
Spatial datasets	<p>Spatial databases required to prepare a BAR</p> <ul style="list-style-type: none"> • <i>BioNet NSW (Mitchell) Landscapes – Version 3.1</i> • <i>NSW Interim Biogeographic Regions of Australia (IBRA region and sub-regions) – Version 7</i> • <i>NSW soil profiles</i> • <i>Hydrogeological landscapes</i> • <i>Acid sulfate soils risk</i> • <i>Digital cadastral database</i> • <i>Vegetation Information Systems maps</i> • <i>Geological sites of NSW.</i>
Species credit species	Threatened species or components of species habitat that are identified in the Threatened Species Data Collection as requiring assessment for species credits (DPIE 2020a). This is analogous with the definition of ‘candidate species’.
Species credits	The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection (DPIE 2020a).
Species polygon	An area of land identified in Chapter 5 (of the BAM) that contains habitat or is occupied by a threatened species (DPIE 2020a).
Study area	The area directly affected by the proposal (subject land or construction footprint) and any additional areas likely to be affected by the proposal, either directly or indirectly.
Subject land	Land subject to a development, activity, clearing, biodiversity certification or a biodiversity stewardship proposal. It excludes the landscape assessment area which surrounds the subject land (i.e., the area of land in the 1500 m buffer zone around the subject land or 500m buffer zone for linear proposals). In the case of a biodiversity certification proposal, subject land includes the biodiversity certification assessment area (DPIE 2020a). See also definition for construction footprint.

Threatened Biodiversity Data Collection	A publicly assessable online database (registration required) which contains information for listed threatened species, populations and ecological communities (DPIE 2020a). Part of the BioNet database, published by the EHG and accessible from the BioNet website at www.bionet.nsw.gov.au .
Tree	As per Australian Standard 4970-2009 a tree is considered to be a long lived woody perennial plant greater than (or usually greater than) 3 m in height with one or relatively few main stems or trunks (or as defined by the determining authority)
Tree and hollow replacement ratios	Trees and hollows will be replaced using the following ratios: <ul style="list-style-type: none"> • <i>Very large tree (DBH greater than 100 cm) – Plant a minimum 16 trees and provide three artificial hollows for every occupied hollow removed (assuming a 20% occupancy rate).</i> • <i>Large tree (DBH between 50 cm and 100 cm) - Plant minimum eight trees and provide three artificial hollows for every occupied hollow removed (assuming a 20% occupancy rate).</i> • <i>Medium tree (DBH greater than 20 cm, but less than 50 cm) - Plant minimum four trees and provide three artificial hollows for every occupied hollow removed (assuming a 20% occupancy rate).</i> • <i>Small tree (DBH greater than 5 cm, but less than 20 cm) – Provide at least two trees</i> Artificial hollows should be provided in accordance with relevant guidelines.
Vegetation integrity (score)	The condition of native vegetation assessed for each vegetation zone against the benchmark for the PCT. The vegetation integrity score is the quantitative measure of vegetation condition calculated by the BAM-C (DPIE 2020a).
Vegetation zone	A relatively homogeneous area of native vegetation on a development site, clearing site, land to be biodiversity certified or biodiversity stewardship site that is the same PCT and has the same broad condition state (DPIE 2020a).

10. Abbreviations

Term	Definition
AOBV	Area of Outstanding Biodiversity Value
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method calculator
BC Act	<i>Biodiversity Conservation Act 2016 (NSW)</i>
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
BDAR	Biodiversity Development Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
BOS	Biodiversity Offset Scheme
BRW	Biodiversity risk weighting
CEEC	Critically Endangered Ecological Community
CEMP	Construction Environmental Management Plan
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DIWA	Directory of Important Wetlands in Australia
DPE	Department of Planning and Environment
DPI	Department of Primary Industries
EEC	Endangered ecological community
EHG	NSW Environment and Heritage Group within the Department of Planning and Environment
EIS	Environmental Impact Statement
EP&A Act	<i>Environment Planning and Assessment Act 1979 (NSW)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)</i>
Fisheries NSW Policy and guidelines	Fisheries NSW Policy and guidelines for fish habitat conservation and management (Update 2013)
FM Act	<i>Fisheries Management Act 1994 (NSW)</i>
GDE	Groundwater dependent ecosystems
IBRA	Interim Biogeographically Regionalisation of Australia
MNES	Matters of national environmental significance
PCT	Plant community type
PMST	Protected Matters Search Tool
REF	Review of Environmental Factors
SAIL	Serious and Irreversible Impacts
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SSD	State Significant Development
SSI	State Significant Infrastructure
TBDC	Threatened Biodiversity Data Collection
TECs	Threatened ecological communities (VECs, EECs and CEECs)
TfNSW	Transport for NSW
VEC	Vulnerable Ecological Community

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Appendix A: Likelihood of Occurrence

Key

V – vulnerable E – endangered CE – critically endangered M – migratory

A State or nationally listed threatened species is considered to have a:

- **High** likelihood of occurrence if it has been recorded within 10 km of the subject site and there is either suitable habitat present or the potential for the animal to fly over the site (while animal may fly over, it is acknowledged that for some species no suitable habitat will be present within the subject site).
- **Moderate** likelihood of occurrence if they have a predicted occurrence (via the EPBC Act PMST or OEH geographic search) and there is either suitable habitat present or the potential for the animal to fly over the site (while the animal may fly over, it is acknowledged that for some species no suitable habitat will be present within the subject site).
- **Low** likelihood of occurrence if suitable habitat for a species is not present regardless of whether they have been recorded within 10 km or have a predicted occurrence.

Note: Species underlined are those which only the EPBC PMST predicted as having habitat in the search area. All other species have been recorded within 10 km of the study area.

Note: As these habitats are not present, no pelagic, estuarine, wetland or fish species have been included in the following table. Given that the proposed work is not located within the Commonwealth marine area, this being from 3 to 200 nautical miles from the coast, no species listed as marine under the EPBC Act have been considered; nor has the marine status of any species been acknowledged.

* - habitat requirements were generally extracted from DCCEW (2022a), BioNet Atlas (DPE 2022b), Harden (1992-2002), Frith (2007), Churchill (2008), Cogger (2014) and Van Dyck and Strahan (2008) with other references used being identified in the bibliography.

Common Name	Status		Primary habitat requirements	Likelihood of Occurrence ⁶	Number of records	Assessment required
	EPBC Act	BC Act				
MAMMALS						
Spotted-tailed Quoll <i>Dasyurus maculatus</i>	E	V	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.	Low	OEH PMST	No
Eastern Pygmy-possum <i>Cercartetus nanus</i>		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. Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes	Low	OEH	No

⁶ For the site to support, and be important for the lifecycle requirements of, a locally viable population of this species.

Common Name	Status		Primary habitat requirements	Likelihood of Occurrence ⁶	Number of records	Assessment required
	EPBC Act	BC Act				
Eastern False Pipistrelle <i>Falsistrellus tasmaniensis</i>		V	Prefers moist habitats, with trees taller than 20 m. Generally, roosts in hollow-bearing trees (eucalypts), but has also been found under loose bark on trees or in buildings.	Low	OEH	No
Long-nosed Potoroo <i>Potorous tridactylus</i>	V	V	Inhabits coastal heath and dry and wet sclerophyll forests with dense cover which provides diurnal sheltering sites and protection from predators, while foraging in adjacent, open areas.	Low	OEH PMST	No
Koala <i>Phascolarctos cinereus</i>	V	V	Open eucalypt forest and woodland, containing a variety of 'preferred' food tree species.	Low	OEH PMST	No
Brush-tailed Rock-wallaby <i>Petrogale penicillata</i>	V	E	Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges.	Low	PMST	No
Yellow-bellied Glider <i>Petaurus australis</i>		V	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils.	Low	OEH PMST	No
Squirrel Glider <i>Petaurus norfolkensis</i>		V	Inhabits woodlands and dry sclerophyll forests, usually in diverse stands of shrubs and trees. Shelters and breeds in tree hollows, and is primarily an insectivorous animal but, has also been known to ingest plant exudates.	Low	OEH	No
Greater Glider <i>Petauroides volans</i>	V		Largely restricted to eucalypt forests and woodlands, utilising tree hollows.	Low	OEH PMST	No
Grey-headed Flying-fox <i>Pteropus poliocephalus</i>	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.	Low	OEH PMST	No
Large-eared Pied Bat <i>Chalinolobus dwyeri</i>	V	V	Cave-roosting bat that forages in timbered woodland and dry sclerophyll forest.	Low	PMST	No
Southern Myotis <i>Myotis macropus</i>		V	Generally roost in groups of 10 - 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.	Moderate	OEH	Yes
Little Bent-winged Bat <i>Miniopterus australis</i>		V	Generally found in well-timbered areas. Roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day.	Low	OEH	No
Large Bent-winged Bat <i>Miniopterus orianae oceanensis</i>		V	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.	Low	OEH	No
Eastern Coastal Free-tailed Bat <i>Mormopterus norfolkensis</i>		V	Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures.	Moderate	OEH	Yes
New Holland Mouse <i>Pseudomys novaehollandiae</i>	V		Open heathland, open woodland with a heathland understorey and vegetated sand dunes.	Low	PMST	No

Common Name	Status		Primary habitat requirements	Likelihood of Occurrence ⁶	Number of records	Assessment required
	EPBC Act	BC Act				
Greater Broad-nosed Bat <i>Scoteanax rueppellii</i>		V	Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Usually roosts in tree hollows but also in buildings.	Low	<u>OEH</u>	No
Eastern Cave Bat <i>Vespadelus troughtoni</i>		V	A cave-roosting species that is usually found in dry open forest and woodland, near cliffs or rocky overhangs; has been recorded roosting in disused mine workings.	Low	<u>OEH</u>	No
Yellow-bellied sheathtail bat <i>Saccolaimus flaviventris</i>		V	Widespread in Australia, except in the very arid inland areas, the Yellow-bellied Sheathtail Bat roosts in large hollow trees or tree sprouts. The Yellow-bellied Sheathtail Bat is normally a solitary rooster, although groups of two to six individuals have been found. This species preys on insects, that are collected well above the forest canopy. This species habit of flying high above the forest canopy results in few captures or detection's and this appears to account for the species' apparent rarity.	Low	<u>PMST</u>	No
BIRDS						
Black-necked Stork <i>Ephippiorhynchus asiaticus</i>		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	OEH	No
<u>Australasian Bittern</u> <i>Botaurus poiciloptilus</i>	E	E	Occupies shallow, vegetated freshwater or brackish swamps, usually dominated by tall, dense reed beds of <i>Typha</i> sp., <i>Juncus</i> sp. and <i>Phragmites</i> sp. Nests on platforms of reeds and rushes, usually built over water in dense cover.	Low	OEH	No
Gang-gang Cockatoo <i>Callocephalon fimbriatum</i>		V	Prefers tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests during summer, these being at higher altitudes. In winter, occurs at lower altitudes in drier, more open eucalypt forests and woodlands, or in dry forest in coastal areas.	Low	OEH	No
White-throated Needletail <i>Hirundapus caudacutus</i>	V, M		Almost exclusively aerial. Takes insects on wing over a range of habitat types. Recorded most often above wooded areas, including open forest and rainforest.	Low	OEH	No
Eastern Osprey <i>Pandion cristatus</i>	M	V	Occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands.	Low	OEH	No
Square-tailed Kite <i>Lophoictinia isura</i>		V	Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses.	Low	OEH	No
<u>Red Goshawk</u> <i>Erythrotriorchis radiatus</i>	V	CE	Very rare in NSW, extending south to about 30°S, with most records north of this, in the Clarence River Catchment, and a few around the lower Richmond and Tweed Rivers. Formerly, it was at least occasionally reported as far south as Port Stephens. In NSW, preferred habitats include mixed subtropical rainforest, <i>Melaleuca</i> swamp forest and riparian <i>Eucalyptus</i> forest of coastal rivers.	Low	PMST	No

Common Name	Status		Primary habitat requirements	Likelihood of Occurrence ⁶	Number of records	Assessment required
	EPBC Act	BC Act				
White-bellied Sea-eagle <i>Haliaeetus leucogaster</i>		V	Found in coastal habitats (especially those close to the sea-shore) and around terrestrial wetlands in tropical and temperate regions of mainland Australia.	Low	OEH	No
Little Eagle <i>Hieraetus morphnoides</i>		V	Occupies open eucalypt forest, woodland or open woodland. Sheoak or <i>Acacia</i> woodlands and riparian woodlands of interior NSW are also used.	Low	OEH	No
Masked Owl <i>Tyto novaehollandiae</i>		V	Lives in dry eucalypt forests and woodlands from sea level to 1100 m.			
Grey Falcon <i>Falco hypoleucos</i>	V	E	Sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. 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.	Low	OEH PMST	No
<u>Australian Painted Snipe</u> <u><i>Rostratula australis</i></u>	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	OEH	No
Grey-crowned Babbler (eastern subspecies)		V	Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (<i>Eucalyptus sideroxylon</i>), White Box (<i>E. albens</i>), Inland Grey Box (<i>E. microcarpa</i>), Yellow Box (<i>E. melliodora</i>), Blakely's Red Gum (<i>E. blakelyi</i>) and Forest Red Gum (<i>E. tereticornis</i>).		OEH	
Glossy Black-cockatoo <i>Calyptorhynchus lathami</i>		V	Inhabits eucalypt woodland and feeds almost exclusively on Casuarina fruits.	Low	OEH PMST	No
Little Lorikeet <i>Glossopsitta pusilla</i>		V	Forages primarily in the open Eucalypt forest and woodland canopies, particularly along water courses; occasionally in Angophoras, Melaleucas and other tree species, also riparian habitats are used.	Low	OEH	No
<u>Swift Parrot</u> <u><i>Lathamus discolor</i></u>	CE	E	Eucalypt forests. When over-wintering on the mainland, this species is dependent on winter-flowering eucalypt species.	Low	OEH	No
Powerful Owl <i>Ninox strenua</i>		V	Inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest.	Low	OEH	No
Barking Owl <i>Ninox connivens</i>		V	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland.	Low	OEH	No
Sooty Owl <i>Tyto tenebricosa</i>		V	Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests.	Low	OEH	No
Speckled Warbler <i>Chthonicola Sagittata</i>		V	Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy.	Low	OEH	No
Regent Honeyeater <i>Anthochaera phrygia</i>	CE	CE	Inhabits dry open forest and woodland. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes.	Low	OEH PMST	No
<u>Painted Honeyeater</u> <u><i>Grantiella picta</i></u>	V	V	Inhabits Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on	Low	PMST	No

Common Name	Status		Primary habitat requirements	Likelihood of Occurrence ⁶	Number of records	Assessment required
	EPBC Act	BC Act				
			woodland eucalypts and acacias. Prefers mistletoes of the genus <i>Amyema</i> .			
Varied Sittella <i>Daphoenositta chrysoptera</i>		V	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and <i>Acacia</i> woodland.	Low	OEH	No
Black Bittern <i>Ixobrychus flavicollis</i>		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	OEH	No
Bush Stone-curlew <i>Burhinus grallarius</i>		E	Inhabits open forests and woodlands with a sparse grassy ground layer and fallen timber.	Low	OEH	No
Flesh-footed Shearwater		V	Ranges throughout the Pacific and Indian Oceans. There are two main breeding areas in the world: one in the South West Pacific includes Lord Howe Island and New Zealand; the other along the coast of Western Australia.	Low	OEH	No
Superb Fruit-Dove <i>Ptilinopus superbus</i>		V	Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species such as figs and palms. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees	Low	OEH	No
Wompoo Fruit-Dove <i>Ptilinopus magnificus</i>		V	Occurs in, or near rainforest, low elevation moist eucalypt forest and brush box forests.	Low	OEH	No
AMPHIBIANS						
Green and Golden Bell Frog <i>Litoria aurea</i>	V	E	Inhabits a variety of environments, including disturbed sites, ephemeral ponds, wetlands, marshes, dams and stream-sides, particularly those that contain one or more of the following aquatic plants: bullrush (<i>Typha</i> spp.), spikerush (<i>Eleocharis</i> spp.), <i>Juncus kraussii</i> , <i>Schoenoplectus littoralis</i> and <i>Sporobolus virginicus</i> .	Low	OEH PMST	No
Stuttering Frog <i>Mixophyes halbus</i>	V	E	Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range.	Low	OEH PMST	No
Giant Burrowing Frog <i>Heleioporus australiacus</i>	V	V	Found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based.	Low	OEH PMST	No
Red-crowned Toadlet <i>Pseudophryne australis</i>		V	Occurs in open forests, mostly on Hawkesbury and Narrabeen Sandstones. Inhabits periodically wet drainage lines below sandstone ridges that often have shale lenses or cappings.	Low	OEH	No
Green-thighed Frog <i>Litoria brevipalmata</i>		V	Green-thighed Frogs occur in a range of habitats from rainforest and moist eucalypt forest to dry eucalypt forest and heath, typically in areas where surface water gathers after rain. It prefers wetter forests in the south of its range, but extends into drier forests in northern NSW and southern Queensland.	Low	OEH	No
Mahony's Toadlet <i>Uperoleia mahonyi</i>		E	Mahony's Toadlet inhabits ephemeral and semi-permanent swamps and swales on the coastal fringe of its range. Known records occur in heath or wallum habitats almost exclusively associated with leached	Low	OEH	No

Common Name	Status		Primary habitat requirements	Likelihood of Occurrence ⁶	Number of records	Assessment required
	EPBC Act	BC Act				
			(highly nutrient impoverished) white sand. Commonly associated with acid paperbark swamps, Mahony's Toadlet also is known to occur in wallum heath, swamp mahogany-paperbark swamp forest, heath shrubland and Sydney red gum woodland. Recent studies suggest intact vegetation adjacent to and within water bodies is an important habitat feature for this species.			
Wallum Froglet <i>Crinia tinnula</i>		V	Wallum Froglets are found in a wide range of habitats, usually associated with acidic swamps on coastal sand plains. They typically occur in sedgelands and wet heathlands. They can also be found along drainage lines within other vegetation communities and disturbed areas, and occasionally in swamp sclerophyll forests.	Low	OEH	No
Littlejohn's Tree Frog, Heath Frog <i>Litoria littlejohni</i>	V	V	This species breeds in the upper reaches of permanent streams and in perched swamps.	Low	PMST	No
Giant Barred Frog, Southern Barred Frog <i>Mixophyes iteratus</i>	E	E	Giant Barred Frogs are found along freshwater streams with permanent or semi-permanent water, generally (but not always) at lower elevation.	Low	PMST	No
REPTILES				Low		No
Pale-headed Snake <i>Hoplocephalus bitorquatus</i>		V	Found mainly in dry eucalypt forests and woodlands, cypress forest and occasionally in rainforest or moist eucalypt forest.	Low	OEH	No
Stephens' Banded Snake <i>Hoplocephalus stephensii</i>		V	Rainforest and eucalypt forests and rocky areas up to 950 m in altitude. Stephens' Banded Snake is nocturnal, and shelters between loose bark and tree trunks, amongst vines, or in hollow trunks limbs, rock crevices or under slabs during the day.	Low	OEH	No
Broad-headed Snake <i>Hoplocephalus bungaroides</i>	V	E	The Broad-headed Snake is largely confined to Triassic and Permian sandstones, including the Hawkesbury, Narrabeen and Shoalhaven groups, within the coast and ranges in an area within approximately 250 km of Sydney. Shelters in rock crevices and under flat sandstone rocks on exposed cliff edges during autumn, winter and spring.	Low	PMST	No
PLANTS						
<u>Scrub Turpentine</u> <i>Rhodamnia rubescens</i>	CE	CE	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils. Recorded just north of the study area.	High	PMST OEH	No
<u>Magenta Lilly Pilly</u> <i>Syzygium paniculatum</i>	V	E	Found only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest. Restricted mainly to remnant stands of littoral (coastal) rainforest. Also commonly planted in gardens and parks.	Low	PMST OEH	No
<u>Euphrasia arguta</u>	CE	CE	<i>Euphrasia arguta</i> was rediscovered in the Nundle area of the NSW north western slopes and tablelands in 2008. Prior to this, it had not been collected for 100 years. Historically, <i>Euphrasia arguta</i> has only been recorded from relatively few places within an area extending from Sydney to Bathurst and north to Walcha. Historic records of the	Low	PMST	No

Common Name	Status		Primary habitat requirements	Likelihood of Occurrence ⁶	Number of records	Assessment required
	EPBC Act	BC Act				
			species noted the following habitats: 'in the open forest country around Bathurst in sub humid places', 'on the grassy country near Bathurst', and 'in meadows near rivers'.			
<u>Eastern Underground Orchid</u> <i>Rhizanthella slateri</i>	E	V	Habitat requirements are poorly understood and no particular vegetation type has been associated with the species, although it is known to occur in sclerophyll forest.	Low	PMST	No
<u>Eucalyptus parramattensis subsp. decadens</u>	V	V	Generally, occupies deep, low-nutrient sands, often those subject to periodic inundation or where water tables are relatively high. It occurs in dry sclerophyll woodland with dry heath understorey. It also occurs as an emergent in dry or wet heathland. Often where this species occurs, it is a community dominant.	Low	PMST	No
<u>Heath Wrinklewort</u> <i>Rutidosia heterogama</i>	V	V	Grows in heath on sandy soils and moist areas in open forest, and has been recorded along disturbed roadsides.	Low	PMST	No
<u>Austral Toadflax</u> <i>Thesium australe</i>	V	V	Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast.	Low	PMST	No
<u>Brown Pomaderris</u> <i>Pomaderris brunnea</i>	V	E	Grows in moist woodland or forest on clay and alluvial soils of flood plains and creek lines.	Low	PMST	No
<u>Bynoe's Wattle</u> <i>Acacia bynoeana</i>	V	E	Primarily restricted to the Richmond district, with an outlier population found at Voyager Point, Liverpool. Grows in Castlereagh woodland on lateritic soil. Found in open woodland.	Low	PMST	No
<i>Tetratheca glandulosa</i>		V	Occurs in Heath and woodland on sandstone.	Low	OEH	No
<i>Epacris purpurascens var. purpurascens</i>		V	Occurs in Damp places in woodland on sandstone.	Low	OEH	No
Rainforest Cassia <i>Senna acclinis</i>		E	Grows on the margins of subtropical, littoral and dry rainforests. Often found as a gap phase shrub.	Low	OEH	No
<i>Maundia triglochinosoides</i>		V	Grows in swamps, lagoons, dams, channels, creeks or shallow freshwater 30 - 60 cm deep on heavy clay, low nutrients	Low	OEH	No
Tranquillity Mintbush <i>Prostanthera askania</i>	E	E	Occurs adjacent to, but not immediately in, drainage lines on flat to moderately steep slopes formed on Narrabeen sandstone and alluvial soils derived from it.	Low	OEH PMST	No
Charmhaven Apple <i>Angophora inopina</i>	V	V	<i>A. inopina</i> is found in open dry sclerophyll woodland of <i>Eucalyptus haemastoma</i> and <i>Corymbia gummifera</i> with a dense shrub understorey. The woodland occurs on deep white sandy soils over sandstone, often with some gravelly laterite.	Low	OEH PMST	No
<i>Melaleuca biconvexa</i>	V	V	Biconvex Paperbark generally grows in damp places, often near streams or low-lying areas on alluvial soils of low slopes or sheltered aspects.	Low	OEH PMST	No
Native Guava <i>Rhodomyrtus psidioides</i>	CE	CE	Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines.	Low	OEH PMST	No



Common Name	Status		Primary habitat requirements	Likelihood of Occurrence ⁶	Number of records	Assessment required
	EPBC Act	BC Act				
Macadamia Nut <i>Macadamia integrifolia</i>	V		The Macadamia Nut grows in remnant rainforest, preferring partially open areas such as rainforest edges.	Low	OEH	No
Somersby Mintbush <i>Prostanthera junonis</i>	E	E	The species is restricted to the Somersby Plateau. It occurs on both the Somersby and Sydney Town soil landscapes on gently undulating country over weathered Hawkesbury sandstone within open forest/low woodland/open scrub. It occurs in both disturbed and undisturbed sites.	Low	PMST	No
<i>Cynanchum elegans</i>	E	E	Usually occurs on the edge of dry rainforest. Other associated vegetation types include littoral rainforest; Coastal Tea-tree (<i>Leptospermum laevigatum</i>) - Coastal Banksia (<i>Banksia integrifolia</i> subsp. <i>integrifolia</i>) coastal scrub; Forest Red Gum (<i>Eucalyptus tereticornis</i>) aligned open forest and woodland; Spotted Gum (<i>Corymbia maculata</i>) aligned open forest and woodland; and Bracelet Honey-myrtle (<i>Melaleuca armillaris</i>) scrub to open scrub (OEH 2013).	Low	PMST	No
<i>Asterolasia elegans</i>	E	E	Occurs on Hawkesbury sandstone. Found in sheltered forests on mid- to lower slopes and valleys.	Low	PMST	No
<i>Persoonia hirsuta</i>	E	E	Heath and woodland on sandstone.	Low	PMST	No
<i>Acacia terminalis</i> subsp. <i>terminalis</i> MS	E	E	Usually dry sclerophyll forest on sandstone	Low	PMST	No
Bauer's Midge Orchid <i>Genoplesium baueri</i>		V	Shady places in woodland.	Low	PMST	No
<i>Olearia cordata</i>	V	V	Dry open sclerophyll forest and open shrubland, on sandstone ridges.	Low	PMST	No
<i>Acacia pubescens</i>	V	V	Open sclerophyll forest and woodland on clay soils	Low	PMST	No
<i>Cryptostylis hunteriana</i>	V	V	Scrubby swamp fringes to steep bare hillsides in tall eucalypt forest.	Low	PMST	No
<i>Lasiopetalum joyceae</i>	V	V	Grows in heath on sandstone.	Low	PMST	No
<i>Astrotricha crassifolia</i>	V	V	Occurs in dry sclerophyll woodland on sandstone near Patonga (Gosford LGA), in Royal NP and on the Woronora Plateau (Sutherland and Campbelltown LGA's).	Low	PMST	No
<i>Eucalyptus camfieldii</i>	V	V	Coastal scrub heath on sandy soils on sandstone, often of restricted drainage.	Low	PMST	No
<i>Micromyrtus blakelyi</i>	V	V	Restricted to areas near the Hawkesbury River, north of Sydney. Distribution extends from north of Maroota in the north, to Cowan in the south. All known populations occur within the Baulkham Hills and Hornsby local government areas Typically occurs within heathlands in shallow sandy soil in cracks and depressions of sandstone rock platforms.	Low	PMST	No
Black-eyed Susan <i>Tetratheca juncea</i>	V	V	It is usually found in low open forest/woodland with a mixed shrub understorey and grassy groundcover. However, it has also been recorded in heathland and moist forest.	Low	PMST	No

Common Name	Status		Primary habitat requirements	Likelihood of Occurrence ⁶	Number of records	Assessment required
	EPBC Act	BC Act				
Square Raspwort <i>Haloragis exalata</i> subsp. <i>exalata</i>	V	V	Square Raspwort appears to require protected and shaded damp situations in riparian habitats.	Low	PMST	No
Dense Cord-rush <i>Baloskion longipes</i>	V	V	Commonly found in swamps or depressions in sandy alluvium, sometimes growing with sphagnum moss.	Low	PMST	No
Thick Lip Spider Orchid <i>Caladenia tessellata</i>	V	E	Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil.	Low	PMST	No
<i>Prostanthera densa</i>	V	V	<i>Prostanthera densa</i> generally grows in sclerophyll forest and shrubland on coastal headlands and near coastal ranges, chiefly on sandstone, and rocky slopes near the sea.	Low	PMST	No
Small-flower Grevillea <i>Grevillea parviflora</i> subsp. <i>parviflora</i>	V	V	Grows in sandy or light clay soils usually over thin shales, often with lateritic ironstone gravels and nodules. Sydney region occurrences are usually on Tertiary sands and alluvium, and soils derived from the Mittagong Formation. Soil landscapes include Lucas Heights or Berkshire Park.	Low	PMST	No
<i>Darwinia biflora</i>	V	V	Occurs on the edges of weathered shale-capped ridges, where these intergrade with Hawkesbury Sandstone.	Low	PMST	No
Deane's Paperbark <i>Melaleuca deanei</i>	V	V	Deane's Paperbark occurs in two distinct areas, in the Ku-ring-gai/Berowra and Holsworthy/Wedderburn areas respectively. There are also more isolated occurrences at Springwood (in the Blue Mountains), Wollemi National Park, Yalwal (west of Nowra) and Central Coast (Hawkesbury River) areas.	Low	PMST	No
<i>Diuris praecox</i>	V	V	Grows on hills and slopes of near-coastal districts in open forests which have a grassy to fairly dense understorey	Low	PMST	No
<i>Grevillea shiressii</i>	V	V	Grows along creek banks in wet sclerophyll forest with a moist understorey in alluvial sandy or loamy soils.	Low	PMST	No
<i>Pimelea curviflora</i> var. <i>curviflora</i>	V	V	Occurs on shaley/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes amongst woodlands. Also recorded in Illawarra Lowland Grassy Woodland habitat at Albion Park on the Illawarra coastal plain	Low	PMST	No
<i>Persicaria elatior</i>	V	V	This species normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance	Low	PMST	No

Appendix B: Transect Tree Removal Data

Tree Number	Scientific Name	Common Name	Tree Height (m)	Status	DBH (cm)	Size Size Classification	Notes
1	<i>Casurina sp.</i>	Casurina sp.	6 m	Alive	14	Small	
2	<i>Casurina sp.</i>	Casurina sp.	6 m	Alive	12.7	Small	
3	<i>Casurina sp.</i>	Casurina sp.	6 m	Alive	13.4	Small	
4	<i>Casurina sp.</i>	Casurina sp.	6 m	Alive	10.3	Small	
5	<i>Glochidion ferdinandi</i>	Cheese Tree	7 m	Alive	36.5	Medium	
6	<i>Glochidion ferdinandi</i>	Cheese Tree	5 m	Alive	17.6	Small	
7	<i>Casurina sp.</i>	Casurina sp.	4 m	Alive	7	Small	
8	<i>Glochidion ferdinandi</i>	Cheese Tree	7 m	Alive	9.7	Small	
9	<i>Casurina sp.</i>	Casurina sp.	6 m	Alive	8.4	Small	
10	<i>Casurina sp.</i>	Casurina sp.	9 m	Alive	16.1	Small	
11	<i>Casurina sp.</i>	Casurina sp.	7 m	Alive	11.7	Small	
12	<i>Casurina sp.</i>	Casurina sp.	7 m	Alive	11.3	Small	
13	<i>Eucalyptus sp.</i>	Eucalyptus sp.	7 m	Alive	13.2	Small	
14	<i>Eucalyptus sp.</i>	Eucalyptus sp.	6 m	Alive	10	Small	
15	<i>Syncarpia glomulifera</i>	Turpentine	12 m	Alive	29.4	Medium	
16	<i>Eucalyptus sp.</i>	Eucalyptus sp.	7 m	Alive	23.5	Medium	
17	<i>Eucalyptus sp.</i>	Eucalyptus sp.	8 m	Alive	16.6	Small	
18	<i>Eucalyptus sp.</i>	Eucalyptus sp.	10 m	Alive	24.3	Medium	Double Trunk
19	<i>Eucalyptus sp.</i>	Eucalyptus sp.	10 m	Alive	27.5	Medium	
20	<i>Eucalyptus sp.</i>	Eucalyptus sp.	10 m	Alive	23.1	Medium	Double Trunk
21	<i>Eucalyptus sp.</i>	Eucalyptus sp.	10 m	Alive	24.6	Medium	
22	<i>Eucalyptus sp.</i>	Eucalyptus sp.	10 m	Alive	22.5	Medium	
23	<i>Eucalyptus sp.</i>	Eucalyptus sp.	10 m	Alive	26.4	Medium	
24	<i>Eucalyptus sp.</i>	Eucalyptus sp.	10 m	Alive	20.1	Medium	
25	<i>Eucalyptus sp.</i>	Eucalyptus sp.	10 m	Alive	23.8	Medium	
26	<i>Casurina sp.</i>	Casurina sp.	7 m	Alive	11.2	Small	
27	<i>Eucalyptus sp.</i>	Eucalyptus sp.	9 m	Alive	26.4	Medium	
28	<i>Eucalyptus sp.</i>	Eucalyptus sp.	9 m	Alive	20.3	Medium	
29	<i>Casurina sp.</i>	Casurina sp.	7 m	Alive	11.5	Small	
30	<i>Casurina sp.</i>	Casurina sp.	10 m	Alive	35	Medium	
31	<i>Glochidion ferdinandi</i>	Cheese Tree	10 m	Alive	46.5	Medium	
32	<i>Glochidion ferdinandi</i>	Cheese Tree	10 m	Alive	23.7	Medium	
33	<i>Eucalyptus sp.</i>	Eucalyptus sp.	8 m	Alive	18	Small	
34	<i>Eucalyptus sp.</i>	Eucalyptus sp.	8 m	Alive	23.5	Medium	

Appendix C: Photographic Record

	<p>Characteristics of the encroaching roadside vegetation present at the entrance and exit ramps where the widening would occur.</p>
	<p>Characteristics of the encroaching roadside vegetation present at the north-bound overpass where the trimming would occur for visibility.</p>



Vegetated character of the stockpile site present towards the center of the study site.



Vegetated character of the associated road verges where the trimming and widening would occur. The entrance and exit ramps are present in the background.



Character of entrance round-a-bout present at the Ourimbah Rest Area, including the ramp in the background and the adjacent woodland present to the left of the image. High traffic was present at the time of inspection.

	
	<p>Character of northbound-exit ramp and associated vegetation. The area is primarily weeded with Lantana (present to the right of the image).</p>
	<p>Character of overpasses and surrounding encroaching vegetation. The vegetation at these locations would be trimmed back or removed for visibility.</p>



Appendix D: Flora Recorded

Family Name	Scientific Name	Common Name
Apocynaceae	<i>Parsonsia straminea</i>	Common Silkpod Vine
Araliaceae	<i>Polyscias sambucifolia</i>	Elderberry Panax
Arecaceae	<i>Livistona australis</i>	Cabbage Palm
	<i>Conyza sp.</i>	*Fleabane
Asteraceae	<i>Senecio madagascariensis</i>	*Fireweed
	<i>Taraxacum officinale</i>	*Dandelion
Bignoniaceae	<i>Pandorea pandorana</i>	Wonga Wonga Vine
Caprifoliaceae	<i>Lonicera japonica</i>	*Honeysuckle vine
Casuarinaceae	<i>Casuarina littoralis</i>	Forest Oak
Dennstaedtiaceae	<i>Pteridium esulentum</i>	Common Braken Fern
Euphorbiaceae	<i>Breynia oblongifolia</i>	Coffee Bush
	<i>Glochidion ferdinandi</i>	Cheese tree
Fabaceae - Faboideae	<i>Erythrina sykesii</i>	*Indian Coral Tree
	<i>Trifolium repens</i>	*White Clover
	<i>Vicia sativa</i>	*Narrow-leaved vetch
Fabaceae: Mimosoideae	<i>Acacia irrorata subsp. Irrorata</i>	Green Wattle
	<i>Acacia implexa</i>	Hickory Wattle
	<i>Acacia longiflora var. longifolia</i>	Sydney Golden Wattle
	<i>Acacia melanoxylon</i>	Black Wattle
	<i>Acacia oshanesii</i>	
Lauraceae	<i>Cryptocaria glaucescens</i>	Jackwood
	<i>Cinammomum camphora</i>	*Camphor Laurel
Lomandraceae	<i>Lomandra longifolia</i>	Spiney Head Matt-rush
Malvaceae	<i>Androcalva fraseri</i>	
Meliaceae	<i>Synoum glandulosum</i>	Scentless Rosewood
Myrtaceae	<i>Syzygium smithii</i>	Lilly Pilly (Major)
	<i>Angophora costata</i>	Sydney Red Gum
	<i>Eucalyptus deanei</i>	Mountain Bluegum
	<i>Eucalyptus saligna</i>	Sydney Bluegum
	<i>Syncarpia glomulifera</i>	Turpentine
Oleaceae	<i>Ligustrum sinense</i>	*Chinese Privet
	<i>Ligustrum lucidum</i>	*Large-leaved Privet
Passifloraceae	<i>Passiflora edulis</i>	*Passionfruit Vine
Plantaginaceae	<i>Plantago lanceolata</i>	*Lamb's Tongue
Poaceae	<i>Anthoxanthum odoratum</i>	*Sweet Vernal Grass
	<i>Oplismenus imbecillis</i>	Basket Grass
	<i>Andropogon virginicus</i>	*Whisky Grass
	<i>Briza minor</i>	*Quaking Grass
	<i>Cenchrus clandestinus</i>	*Kikuyu Grass
	<i>Lolium sp.</i>	*Perennial Ryegrass
	<i>Paspalum dilatatum</i>	*Large-leaved Paspalum
	<i>Sporobolus africanus</i>	*Parramatta Grass
Polygonaceae	<i>Acetosa sagittaria</i>	*Rambling Dock
	<i>Rumex brownii</i>	Swamp Dock
Rhamnaceae	<i>Alphitonia excelsa</i>	Red Ash
Rubiaceae	<i>Gynochthodes jasminoides</i>	Sweet Morinda
Sapindaceae	<i>Guioa semiglauca</i>	Guioa
Sapotaceae	<i>Pouteria australis</i>	Black Apple
Smilacaceae	<i>Smilax glyciphylla</i>	Sassparilla Smilax
Verbenaceae	<i>Lantana camara</i>	*Lantana
Vitaceae	<i>Cissus antarctica</i>	Water Vine



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Appendix D: Aboriginal cultural heritage advice

18 November 2022

Lionel Huang
Project Manager
Transport for NSW

Dear Lionel,

Preliminary assessment results for the M1 Pacific Motorway – Ourimbah Interchange Upgrade based on Stage 1 of the *Procedure for Aboriginal cultural heritage consultation and investigation* (the procedure).

The project, as described in the Stage 1 assessment checklist, was assessed as being unlikely to have an impact on Aboriginal cultural heritage.

The assessment is based on the following due diligence considerations:

- The project works are within the existing road and maintenance corridor (disturbed zones).
- The project is unlikely to harm known Aboriginal objects or places (AHIMS sites).
- The AHIMS search indicated that there are no recorded Aboriginal sites within the study area.
- The study area does contain landscape features that indicate the presence of Aboriginal objects, based on the Office of Environment and Heritage's *Due diligence Code of Practice for the Protection of Aboriginal objects in NSW* and the Roads and Maritime Services' procedure, however, the cultural heritage potential of the study area appears to be reduced due to past disturbances in the form of the construction of the M1 Pacific Motorway.
- There is an absence of sandstone rock outcrops likely to contain Aboriginal art.

Your project may proceed in accordance with the environmental impact assessment process, as relevant, and all other relevant approvals.

If the scope of your project changes you must contact me and your regional environmental staff Mark Riddell to reassess any potential impacts on Aboriginal cultural heritage.

If any potential Aboriginal objects (including skeletal remains) are discovered during the course of the project, all works in the vicinity of the find must cease. Follow the steps outlined in the Transport for NSW *Unexpected Heritage Items Procedure*.

For further assistance in this matter do not hesitate to contact me.

Yours sincerely



Lee Davison
Aboriginal Community and Heritage Partner

Project area



Appendix E: Database searches

Steven Dando

Date: 13 October 2022

Level 10 66 Clarence Street
Sydney New South Wales 2000

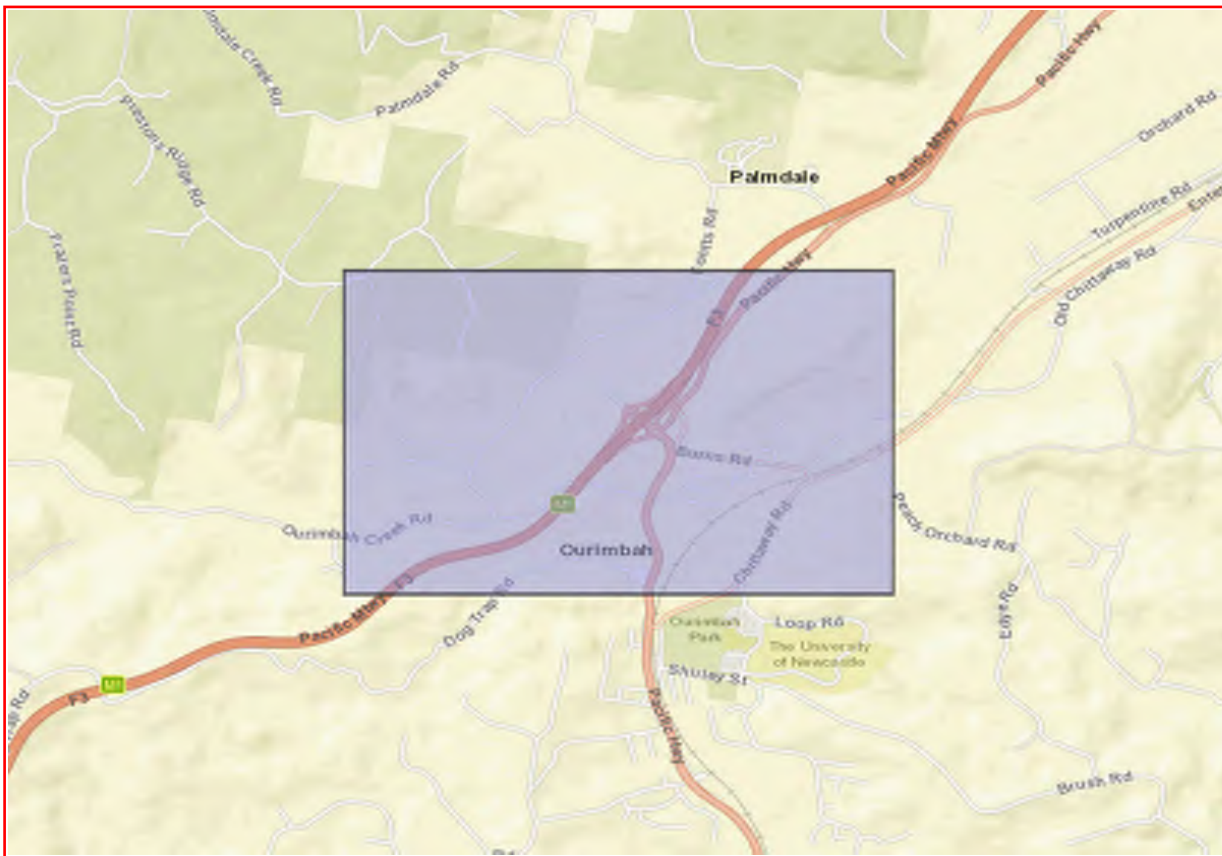
Attention: Steven Dando

Email: steven.dando@bdinfrastructure.com

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -33.3544, 151.3523 - Lat, Long To : -33.3365, 151.3832, conducted by Steven Dando on 13 October 2022.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the [NSW Government Gazette \(https://www.legislation.nsw.gov.au/gazette\)](https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not to be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.



Item Name	Location	LGA	SHR Id	Item Type	Record Owner
"Bangalow Creek" - farm house	119 Cutrock Road OURIMBAH NSW 2258	Central Coast		Built	LGOV
"Hillside" - dwelling	7 Peach Orchard Road (RMB 5035) OURIMBAH NSW 2258	Central Coast		Built	LGOV
"Nellie Ville" - dwelling	35 Chittaway Road OURIMBAH NSW 2258	Central Coast		Built	LGOV
"Sunnybank" - dwelling	16 Chittaway Road OURIMBAH NSW 2258	Central Coast		Built	LGOV
Brownlee's Sawmill	2 Brownlee Street OURIMBAH NSW 2258	Central Coast		Built	LGOV
Dwelling	2 Burns Road OURIMBAH NSW 2258	Central Coast		Built	LGOV
Dwelling	23 Pacific Highway OURIMBAH NSW 2258	Central Coast		Built	LGOV
Dwelling	25 Pacific Highway OURIMBAH NSW 2258	Central Coast		Built	LGOV
Dwelling	27 Pacific Highway OURIMBAH NSW 2258	Central Coast		Built	LGOV
Dwelling	29 Pacific Highway OURIMBAH NSW 2258	Central Coast		Built	LGOV
Dwelling	100 Shirley Street OURIMBAH NSW 2258	Central Coast		Built	LGOV
Dwelling	133 Pacific Highway OURIMBAH NSW 2258	Central Coast		Built	LGOV

Group of Araucaria trees	35 Chittaway Road OURIMBAH NSW 2258	Central Coast		Landscape	LGOV
Homestead complex	37 Howes Road OURIMBAH NSW 2258	Central Coast		Built	LGOV
Ourimbah Methodist Church	111 Pacific Highway OURIMBAH NSW 2258	Central Coast		Built	LGOV
Ourimbah Public School	121 Pacific Highway OURIMBAH NSW 2258	Central Coast		Built	LGOV
Ourimbah Public School - Building B00E	121-123 Pacific Highway OURIMBAH NSW 2258	Central Coast		Built	SGOV
Ourimbah Railway Station and stationmaster's house	1 Mill Street OURIMBAH NSW 2258	Central Coast		Built	LGOV
Ourimbah Railway Station Group and Residence	Pacific Highway OURIMBAH NSW 2258	Central Coast		Built	SGOV
Post office and residence	1 Station Street OURIMBAH NSW 2258	Central Coast		Built	LGOV
Shop	21 Pacific Highway OURIMBAH NSW 2258	Central Coast		Built	LGOV
Utility structure	1A Jaques Road (corner Glen Road) OURIMBAH NSW 2258	Central Coast		Built	LGOV
WW1 monument	1 Mill Street (near Railway Station) OURIMBAH NSW 2258	Central Coast		Built	LGOV



Australian Government

Department of Climate Change, Energy,
the Environment and Water

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. Please see the caveat for interpretation of information provided here.

Report created: 10-Jan-2023

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment 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:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	53
Listed Migratory Species:	17

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 <https://www.dcceew.gov.au/parks-heritage/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 Lands:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	1
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	2
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

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.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Coastal Swamp Oak (<i>Casuarina glauca</i>) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur	In feature area within area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community may occur	In feature area within area
Coastal Upland Swamps in the Sydney Basin Bioregion	Endangered	Community may occur	In buffer area only within area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community likely to occur	In feature area within area

Listed Threatened Species

[[Resource Information](#)]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur	In feature area within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur	In feature area within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur	In buffer area only within area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat likely to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area	In buffer area only
FROG			
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area	In feature area
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat known to occur within area	In feature area
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Vulnerable	Species or species habitat likely to occur within area	In feature area
MAMMAL			
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
Notamacropus parma Parma Wallaby [89289]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area	In feature 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]	Endangered	Species or species habitat known to occur within area	In feature area
Potorous tridactylus tridactylus Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
PLANT			
Acacia bynoeana Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat may occur within area	In feature area
Asterolasia elegans [56780]	Endangered	Species or species habitat may occur within area	In buffer area only
Baloskion longipes Dense Cord-rush [68511]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diuris praecox Newcastle Doubletail [55086]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Eucalyptus camfieldii Camfield's Stringybark [15460]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Genoplesium baueri Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid [7528]	Endangered	Species or species habitat likely to occur within area	In feature area
Melaleuca biconvexa Biconvex Paperbark [5583]	Vulnerable	Species or species habitat known to occur within area	In feature area
Melaleuca deanei Deane's Melaleuca [5818]	Vulnerable	Species or species habitat may occur within area	In feature area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Persoonia hirsuta Hairy Geebung, Hairy Persoonia [19006]	Endangered	Species or species habitat may occur within area	In feature area
Prostanthera askania Tranquillity Mintbush, Tranquillity Mintbush [64958]	Endangered	Species or species habitat likely to occur within area	In feature area
Prostanthera junonis Somersby Mintbush [64960]	Endangered	Species or species habitat may occur within area	In buffer area only
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area	In feature area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Rutidosia heterogama Heath Wrinklewort [13132]	Vulnerable	Species or species habitat may occur within area	In feature area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat known to occur within area	In feature area
Tetradlea juncea Black-eyed Susan [21407]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area

REPTILE

Hoplocephalus bungaroides Broad-headed Snake [1182]	Vulnerable	Species or species habitat may occur within area	In feature area
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Listed Migratory Species

[[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area

Migratory Terrestrial Species

Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area	In buffer area only
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

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.

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian & Overseas Telecommunications Corporation [11744]	NSW	In buffer area only

Listed Marine Species [\[Resource Information \]](#)

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat may occur within area overfly marine area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

State and Territory Reserves [\[Resource Information \]](#)

Protected Area Name	Reserve Type	State	Buffer Status
Jilliby	State Conservation Area	NSW	In buffer area only

Regional Forest Agreements [\[Resource Information \]](#)

Note that all areas with completed RFAs have been included.

RFA Name	State	Buffer Status
North East NSW RFA	New South Wales	In feature area

EPBC Act Referrals [[Resource Information](#)]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
New Intercity Fleet Maintenance Facility Kangy Angy, NSW	2016/7681	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area

Bioregional Assessments

SubRegion	BioRegion	Website	Buffer Status
Hunter	Northern Sydney Basin	BA website	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and 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

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a 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 detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

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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