

Winterbourne Wind Farm

Amended Traffic Impact Assessment

19 September 2024

Reference: 100 rep 240919 final

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Prepared for: Environmental Resource Management Australia Pty Ltd

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Executive Summary

Amber Organisation Pty Ltd has been engaged by Environmental Resource Management Australia Pty Ltd on behalf of WinterbourneWind Pty Ltd to conduct a review of the traffic implications of the Winterbourne Wind Farm (the 'Project') and to prepare a Traffic Impact Assessment.

The Winterbourne Wind Farm Environmental Impact Statement (EIS) was submitted to the NSW Department of Planning, Housing and Infrastructure (DPHI, formerly DPE) and publicly exhibited between Friday 18 November 2022 and Monday 23 January 2023. Following the public exhibition of the EIS, submissions relating to the Project were received from government agencies, local councils, organisations and members of the public. The Project has been amended to respond to matters raised in the submissions and agency advice, and this Amended Traffic Impact Assessment has been updated to assess the impacts associated with the amended Project.

The Project will accommodate 118 turbines with an installed capacity of around 700MW. The Project also includes the construction of two substations on-site and approximately 44 kilometres of new 330kV overhead transmission line running through the Project Area and northwest to a proposed switching station at the point of connection near Uralla, NSW.

The Project is located northeast of Walcha in the Northern Tablelands. It is located approximately 25 kilometres southeast of Uralla, 35 kilometres south of Armidale, and 75 kilometres northeast of Tamworth. It is situated within the Walcha and Uralla Local Government Areas (LGAs). The Project Area encompasses approximately 21,850 hectares (excluding the transmission line to the northwest of the proposed wind farm). Land within the Project Area and the surrounding area is predominantly used for agriculture. Vehicular access to the Project Area is proposed via 31 intersections with the local road network.

Traffic generated by the Project can be separated into three distinct stages: construction, operation and decommissioning. The peak traffic generating potential for the Project is during construction which generates trips associated with staff accessing the site and the delivery of raw materials and plant. During operation the Project is expected to generate up to 32 vehicles per day associated with maintenance and operations staff accessing the site. Decommissioning of the Project is anticipated to generate a similar level of traffic to the construction stage.

The Project construction is expected to commence in 2026 and take approximately 52 months, with the peak construction period expected to occur between months 16-24 (i.e. 9 month period). A construction workforce of up to 390 personnel is expected to be on-site during the peak construction phase, with the workforce likely to travel from the nearby towns of Walcha, Uralla, Armidale, and Tamworth.

It is anticipated that during peak construction the Project could generate up to 142 heavy and 512 light vehicle movements per day. The Project is expected to generate up to 222 vehicle movements during the morning and evening peak hours during the peak construction period, with an average of 123 peak hour vehicle movements across the entire construction period. In order to assess the traffic impacts generated during the construction of the Project, an analysis of the operation of the following intersections was carried out using the SIDRA modelling program:

- New England Highway / Oxley Highway.
- New England Highway (Bridge Street) / Salisbury Street.
- Fitzroy Street / Derby Street.
- Thunderbolts Way / Darjeeling Road.
- Thunderbolts Way (Uralla Road & Derby Street) / Jamieson Street.

Overall, the construction traffic is expected to have a minimal impact on the operation of each intersection. Accordingly, it is concluded that the road network is able to accommodate the traffic generated by the development during the construction period.

The access route is the route taken by the oversize and overmass vehicles to deliver larger plant to the Project, including the wind turbine and the substation components. The Port of Newcastle has been identified as the preferred port where the large plant will be imported. The preferred access route from the port to the Project has been identified within a Route Study prepared by Rex J Andrews Pty Ltd, a specialist transport provider. The proposed transport route identifies a number of road upgrades which are required to facilitate transport of oversize and overmass vehicles to the site. The Route Study and proposed upgrades are presented within Appendix A of this document.

Assessment and design of the proposed site access locations and local road intersections has been undertaken by icubed consulting and is provided in Appendix B. All access locations have been designed to accommodate the largest vehicles expected to access the Project Area at each location. An assessment of the Safe Intersection Sight Distance has also been carried out at all site access locations to ensure vehicles are able to safely enter the road network.

An assessment of the local road network has been carried out by Constructive Solutions which identifies a range of recommended road upgrades to accommodate the Project traffic. A copy of the report is provided within Appendix C which includes a schedule of the proposed road upgrades for each road.

In order to mitigate the impacts of the Project during construction, a Traffic Management Plan will be prepared which should include the recommendations provided within this document.

Based on the assessment, it is concluded that the road network is able to accommodate the expected vehicle types and traffic volumes during the construction, operation, and decommissioning phases of the Project subject to the proposed road upgrades and traffic management measures. Further, the site access locations have been suitably designed to allow vehicles to safely enter and exit the road network.

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Definitions

Term	Definition
Project	A wind farm as described within the EIS to which this Application applies.
Project Area	Boundary shown on Figure 1 to which the Application applies (unless otherwise stipulated).
Applicant	WinterbourneWind Pty Ltd.
Application	Application for Development Consent under Part 4.7 of the EP&A Act; and Determination under Part 9 of the EPBC Act.
EIS	Environmental Impact Statement.

1. Introduction

1.1 Background

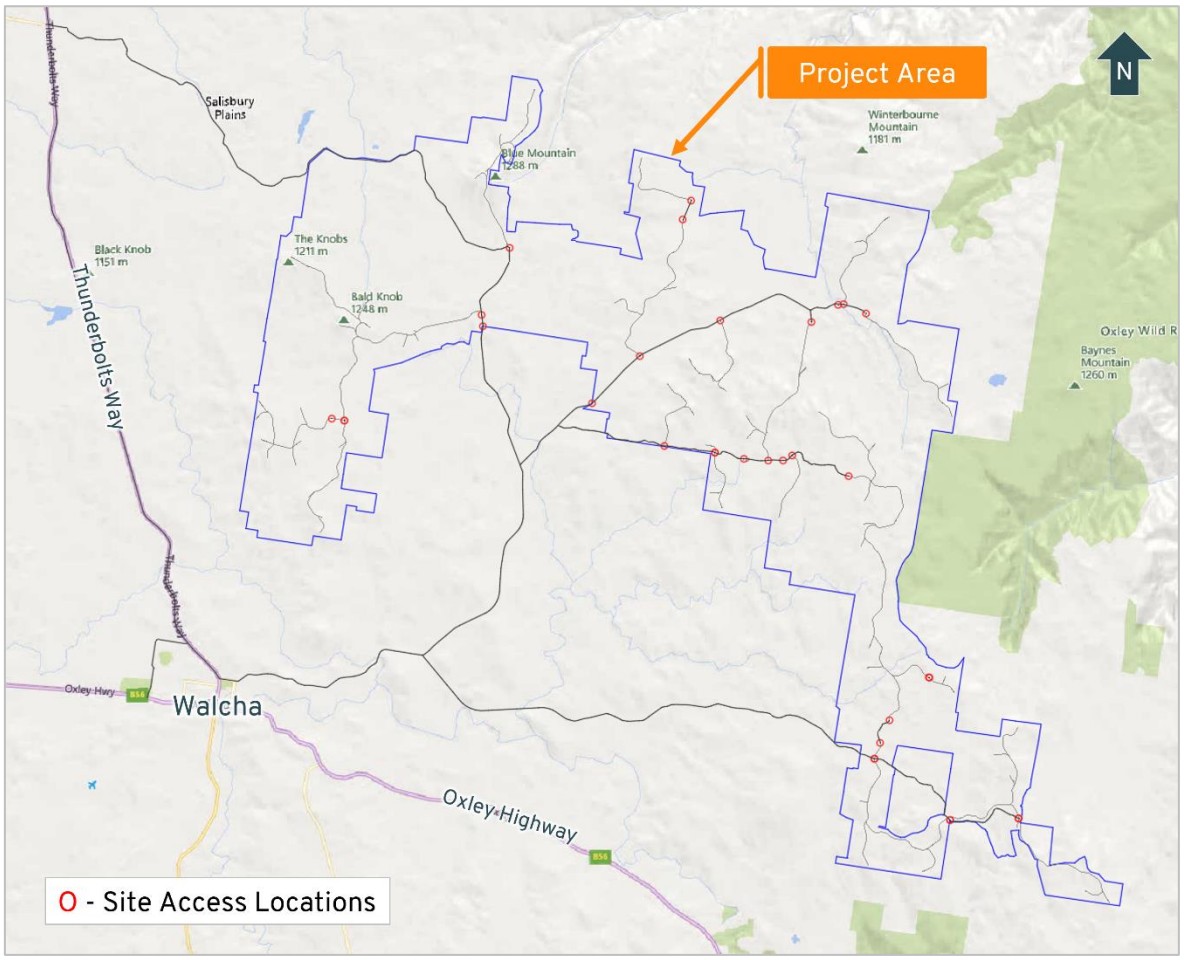
Amber Organisation Pty Ltd has been engaged by Environmental Resource Management Australia Pty Ltd on behalf of WinterbourneWind Pty Ltd to conduct a review of the traffic and parking implications of the Winterbourne Wind Farm (the 'Project') and to prepare a Traffic Impact Assessment.

The Project will accommodate 118 turbines with an installed capacity of around 700MW. The Project also includes the construction of three substations on-site and approximately 44 kilometres (km) of new 330kV overhead transmission line running through the Project Area and continuing northwest to connect into the existing grid approximately 7km south of Uralla.

The Project is located northeast of Walcha in the Northern Tablelands and is roughly bounded by Thunderbolts Way to the west, Oxley Highway to the south, the Oxley Wild Rivers National Park to the east and south, and the Salisbury Plains to the north. The Project is situated within the Walcha and Uralla Local Government Areas (LGAs), with the closest main town centres being Tamworth (75km southwest) and Armidale (35km north). An overview of the proposed Project layout is provided in Figure 1.

Vehicular access is proposed to be provided via a number of new access roads that will connect directly with a mixture of sealed and unsealed local rural roads, and subsequently Thunderbolts Way and Oxley Highway. All plant associated with the wind turbine components will be delivered from the Port of Newcastle. Construction personnel are expected to be located within the nearby town centres of Walcha, Uralla, Armidale and Tamworth. Gravel and water will be sourced onsite where possible or from within the surrounding area. Other materials will also be sourced from within the local region where possible.

Figure 1: Project Layout



1.2 Project Update

A previous Traffic Impact Assessment was prepared by Amber, dated 1 November 2022, which was submitted to support the Winterbourne Wind Farm Environmental Impact Assessment (EIS). The EIS was placed on public exhibition from Friday 18 November 2022 until Monday 23 January 2023. During this time, members of the public and government agencies were invited to review the proposal in full and make submissions.

The Applicant has amended the Project in response to issues raised in submissions. This version of the Traffic Impact Assessment reflects the Amended Project. The changes are summarised in Table 1.

Table 1: Amended Project Summary

Project Elements	EIS (original) Project	Amended Project	Difference between EIS and Amended Project
Project Area	• 22,285 ha	• 21,852 ha (excl. TL) • 22,090 ha (incl. TL)	• Negligible (1% decrease)
Permanent disturbance Footprint	• 474 ha	• 217 ha	• Decrease by 257 ha (54%)
Temporary disturbance footprint	• 107 ha (in addition to permanent disturbance footprint)	• 739 ha	• Increase by 631 ha (691%)
WTG number / dimensions (maximum)	• Up to 119 • 230 m tip height • 149 m hub height	• Up to 118 • 230 tip height • 149 m hub height	• Reduction of 1 WTG • No change in tip height • No change in hub height
Met mast number	• Up to 4 x temporary • Up to 2 x permanent	• Up to 4 x temporary • Up to 2 x permanent	• No change
Indicative WTG Model	• V162-6.2 MW	• V162-6.2 MW	• No change
Electrical reticulation	• 2 x 33/330 kV substations	• 2 x 33/330 kV substations	• No change
	• 324 km of internal 33 kV electrical reticulation network, underground and overhead	• 210.5 km of internal 33 kV electrical reticulation network, comprising 25.6 km overhead and 184.9 km underground	• Decrease of 113.6 km (35%)
	• 50 km of 330 kV overhead transmission line to connect the project to the existing transmission network	• 44 km of 330 kV overhead transmission line to connect the project to the existing transmission network	• Decrease in overhead 330 kV transmission line length by 6 km
BESS	• 100 MW / 200 MWh lithium-ion battery (indicative)	• 100 MW / 200 MWh lithium-ion battery (indicative)	• No change

Project Elements	EIS (original) Project	Amended Project	Difference between EIS and Amended Project
New internal access tracks	• Approx. 15 m wide formation including 5.5 m roadway plus shoulders and drainage as required • 113 km total length	• Approx. 15 m wide formation including 5.5 m roadway plus shoulders and drainage as required • 115.3 km total length	• Increase of 2.3 km
CONSTRUCTION			
Construction Duration	• Approximately 30 months	• Approximately 52 months	• Expected increase in duration of construction by 22 months
Construction Workforce	• Up to 400 FTE	• Up to 390 FTE	• Reduction of 10 FTE workforce
On-site Temporary Infrastructure	• Concrete batching plants (up to 3), laydown areas (up to 8), site office, including parking etc. (up to 3)	• Concrete batching plants (up to 3), laydown areas (up to 14), site office, including parking etc. (up to 3)	• Increase of 6 potential contractor laydown areas
Ancillary Activities	• Import of external gravel, aggregate and sand to site for on-site construction use • Import water to site for onsite construction use	• Onsite quarry to supply gravel and potentially aggregate and bedding material for construction purposes • Onsite water supply from existing/new groundwater bores	• Construction materials including gravel and potentially aggregate and bedding material sourced onsite • Water for construction purposes sourced onsite where possible
Transport Route	• Via Port of Newcastle • OSOM vehicle movements via Oxley Highway • Associated external road upgrades (also used for operational maintenance or decommissioning activities)	• Via Port of Newcastle • Inbound OSOM vehicle movements via new road to be constructed south of Uralla • Associated external road upgrades (also used for operational maintenance or decommissioning activities)	• Avoidance of Oxley Highway for inbound OSOM vehicle movements and instead via the newly constructed road
OPERATION			
Operational Workforce	• Up to 16 FTE	• Up to 16 FTE	• No change
Operational Duration	• 30 years	• 30 years	• No change

1.3 Environmental Assessment Requirements

This report supports a State Significant Development Consent application under Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* (SSD-10471), as an appendix to the EIS for the Project. NSW Department of Planning, Housing and Infrastructure (DPHI, formerly DPE) issued Secretary's Environmental Assessment Requirements (SEARs) for the Project on 17 September 2020. A response to each of the traffic related SEARs has been provided below.

Table 2: SEARs and Response

SEARs	Response
Assess the construction, operational and decommissioning traffic impacts of the development on the local and State road network (including New England Highway, Oxley Highway, Thunderbolts Way and all local roads proposed to be used).	The assessment presented within Section 4 provides a SIDRA analysis for key intersections on New England Highway, Oxley Highway, Thunderbolts Way, and key local roads. A midblock assessment has also been undertaken for these roads and all local roads proposed to be utilised by the Project. The assessment indicates the road network is expected to continue to operate with acceptable conditions during peak construction periods. During operation the Project is expected to generate a lower level of traffic associated with maintenance and operation services. The Project will operate with approximately 16 employees on-site at any time and has an operational lifespan of 30 years. The Project is expected to generate up to 32 vehicles per day and the additional traffic during the operational phase can be readily accommodated on the road network given the existing low traffic volumes. Traffic generation during decommissioning would be similar to traffic generation during the construction period. A comprehensive Traffic Management Plan (TMP) would be prepared prior to the decommissioning phase in conjunction with the relevant road authorities to ensure adequate road safety and road network operations are maintained.
Provide details of the peak and average traffic volumes (both light and heavy vehicles) and transport and haulage routes during construction, operation and decommissioning, including traffic associated with sourcing raw materials (water, sand and gravel).	Overall, it is anticipated that during peak construction the site could generate up to 142 heavy and 512 light vehicle movements per day. Sections 4.2 and 4.3 summarise the traffic movement and distribution generated by the Project.

SEARs	Response
Assess the potential traffic impacts of the project on road network function including intersection performance, site access arrangements, site access and haulage routes, and road safety, including school bus routes and school zones.	In order to determine the traffic impacts generated during construction, an assessment of the operation of 5 intersections has been carried out and is provided in Section 4.5.1. The assessment found that the road network would continue to operate with a good level of service. The site access arrangements are assessed within Section 8. A review of the existing road safety data and casualty crash history is provided within Section 2.7 which indicates that the road network is operating in a relatively safe manner. A TMP is to be developed prior to construction of the Project which should include the recommendations provided within this document. The adoption of the mitigation measures outlined within the TMP would ensure construction traffic has a minimal impact to the capacity and safety of the surrounding road network. Heavy vehicles should avoid travel during peak bus travel times to limit the interaction of larger vehicles and vulnerable road users.
Assess the capacity of the existing road network to accommodate the type and volume of traffic generated by the project (including over-mass / over-dimensional traffic haulage routes from port) during construction, operation and decommissioning.	The traffic assessment provided within this report demonstrates that the local road network is expected to continue to operate with a good level of service with ample spare capacity during construction, operation, and decommissioning. Refer to Section 4 for the full assessment of the traffic impacts of the Project.
An assessment of the likely transport impacts to the site access and haulage routes, site access point, any rail safety issues, any Crown Land, particularly in relation to the capacity and conditions of the roads.	The haulage route for heavy vehicles (excluding OSOM vehicles) arriving from the Port of Newcastle is assessed within Section 5. The access route utilises roads that are designated for 25/26m B-Doubles within the TfNSW Restricted Access Vehicles network map. The access routes taken by the OSOM vehicles to deliver the wind turbine and tower components to the Project Area have been identified within a Route Study prepared by Rex J Andrews Pty Ltd which identifies a number of road upgrades are required in order to allow the transport vehicles to successfully access the site from the Port of Newcastle. The Route Study is provided within Appendix A and discussed within Section 6.

SEARs	Response
Provide details of measures to mitigate and / or manage potential impacts including a schedule of all required road upgrades (including resulting from over mass / over dimensional traffic haulage routes), road maintenance contributions, and any other traffic control measures, developed in consultation with the relevant road authority.	A TMP is to be developed prior to construction of the Project which should include the recommendations provided within this document. The adoption of the mitigation measures outlined within the TMP would ensure construction traffic has a minimal impact on the capacity and safety of the surrounding road network. The assessment has identified a number of traffic management measures that are to be implemented during construction and recommended to be included in the TMP. The key measures are summarised in Section 9. The following road upgrades are also proposed to be completed prior to construction of the Project commencing: • Road upgrades to accommodate oversize/overmass vehicles are outlined within the RJA report provided in Appendix A. • Proposed designs for the upgrade of intersections and construction of site access locations have been prepared by icubed consulting and are provided in Appendix B. • Road upgrades proposed along the local road network are outlined within the Constructive Solutions report provided in Appendix C.

The Traffic Impact Assessment has also been prepared in response to the Agency Advice provided by TfNSW and City of Newcastle on the EIS. Responses to each of the comments provided within the Agency Advice are outlined within Appendix D.

1.4 Road/Rail Authority Consultation

The updated traffic assessment has been undertaken in consultation with Walcha Council, Uralla Shire Council and Muswellbrook Shire Council, with a summary provided within Table 3. It is noted that previous consultation has also been undertaken with TfNSW and other relevant Councils as part of the EIS (previous Traffic Impact Assessment). Additional consultation has also been undertaken between the Project team and relevant stakeholders with further detail provided within the Submissions Report.

Table 3: Road Authority Consultation

Road Authority	Method	Correspondence
Walcha Council	Meeting	Meeting on 29 September 2023 to provide an update on project development and activities undertaken to address comments raised by Council during exhibition of the EIS. Discussion of proposed new transport route to avoid Oxley Highway and efforts to reduce number of heavy vehicles to address concerns raised by community members during exhibition of the EIS.
	Meeting	Meeting on 7 May 2024 to discuss the roads proposed to be utilised by the Project and investigations completed to date. Key discussion topics are outlined as follows: • The proposed OSOM route is proposed to be amended to travel north along New England Highway past Oxley Highway, then travel east along Staces Road, along a newly constructed part of road east of Racecourse Road (Crown Land), down Thunderbolts Way, and turning left at Jamieson Street. • Thunderbolts Way has not been assessed at this stage in terms of current condition, however Council did note the sections that have not been recently upgraded have poor pavement and subgrade. • Council to share updated drawings for footpath from town to Summervale in case co-ordination of works is required to prevent footpath being built and restricting road upgrades. • Austroads is used by council where practical. Council confirm they are open to deviations from Austroads in instances where compliance isn't achievable or practical. • Council agrees to keeping roads on existing alignments where practical and possible (i.e. using existing fences as road corridor) understanding cadastral boundaries are currently not in line with existing roads. • Council confirmed that responsibility for Thunderbolts Way sits with Walcha Shire. The volume of drawings and design to be reviewed for Winterbourne was discussed with the best strategy to start this early to ensure sufficient time for the review and approval period.
Uralla Shire Council	Meeting	Meeting on 1 March 2024 to discuss the proposed new access route along New England Highway to Staces Road and through the Crown Land property to Thunderbolts Way.
	Meeting	Meeting on 28 September 2023 to provide an update on project development and activities undertaken to address comments raised by Council during exhibition of the EIS. Discussion of proposed new transport route along Staces Road and across Crown Land and the approval mechanism for this as between Council and Crown Lands.
Muswellbrook Shire Council	Meeting	Meeting on 9 March 2023 to discuss Council's concerns raised during public exhibition of the EIS, and to further discuss the proposed transport route and other activities being undertaken by EnergyCo and other renewable energy proponents.

1.5 Purpose of Document

This Amended Traffic Impact Assessment has been prepared to assess the proposed transport and access arrangements for the Project, and the potential construction, operational and decommissioning traffic impacts of the Project. The assessment responds to the SEARs and

details how road impacts of the Project traffic, particularly from heavy vehicle use and oversize/overmass vehicles, will be avoided or managed using road-use management strategies.

More specifically, the report addresses the following key matters:

- Details of both light and heavy vehicle traffic volumes and proposed transport routes during construction, operation, and decommissioning;
- An assessment of the potential traffic impacts of the Project on road network function and safety;
- An assessment of the capacity of the existing road network to accommodate the type and volume of traffic generated by the Project, including OSOM vehicles;
- Details of measures to mitigate and/or manage potential impacts, including construction traffic control, road dilapidation surveys and measures to control soil erosion and dust generated by traffic volumes; and
- Details of access roads and how these connect to the existing road network and ongoing operational maintenance.

A detailed Route Study for the transportation of the OSOM turbine and transformer components from the Port of Newcastle has been prepared by Rex J Andrews Pty Ltd and is provided in Appendix A.

Assessment and design of each local road intersection has been undertaken by icubed consulting and is provided in Appendix B.

An assessment of the local road network has been carried out by Constructive Solutions to review the existing conditions along each road and identify any road upgrades required to accommodate the Project traffic. A copy of the report is provided within Appendix C which includes a schedule of the proposed upgrades for each road.

The traffic assessment has been undertaken in accordance with the *RTA Guide to Traffic Generating Developments* and relevant Austroads Guidelines. It has also been undertaken in consultation with Transport for New South Wales and the surrounding local councils.

2. Transport Environment

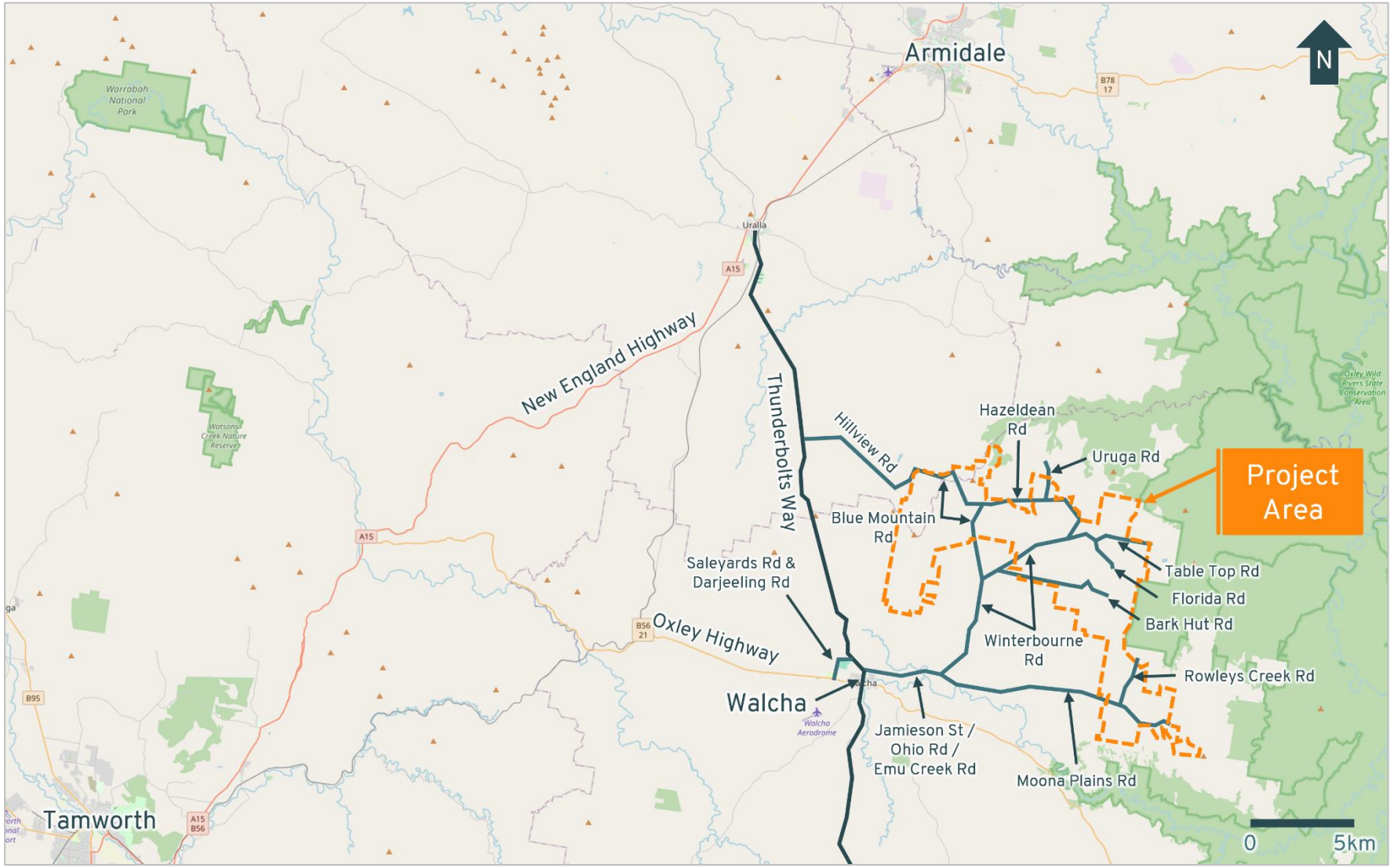
2.1 Site Location

The Project is located approximately 425 kilometres (by road) from Sydney, to the northeast of Walcha in the Northern Tablelands. The Project is roughly bounded by Thunderbolts Way to the west, Oxley Highway to the south, the Oxley Wild Rivers National Park to the east and south, and the Salisbury Plains to the north. The nearest town centres include Uralla (25km northwest), Armidale (35km north), and Tamworth (75km west).

The location of the Project in relation to the nearby town centres and the surrounding road network is provided within Figure 2.

The Project Area encompasses approximately 21,850 hectares (excluding the transmission line to the northwest of the proposed wind farm) and is situated within the Walcha and Uralla LGAs. The Project Area comprises land zoned RU1 – Primary Production, a rural zone primarily intended to promote sustainable primary industry production. The areas surrounding the Project Area are generally also zoned RU1, with the exception of the E1 National Parks and Nature Reserve (Oxley Wild Rivers National Park) to the east and south of the Project Area, and a mixture of land uses within the Walcha town centre located approximately 6km southwest from the closest edge of the Project Area.

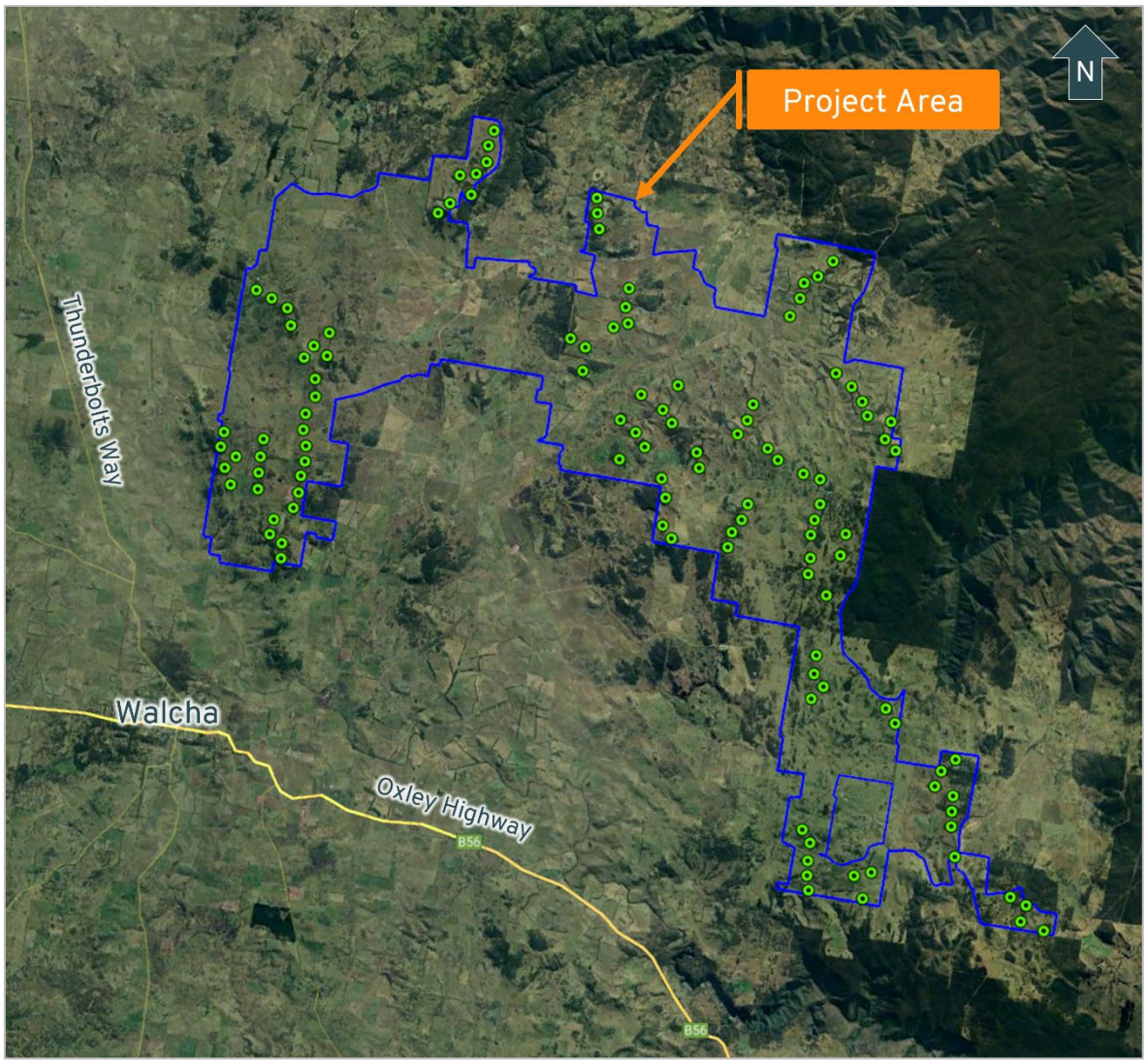
Figure 2: Site Location



Source: OpenStreetMap

An aerial image of the proposed Project Area and turbine locations is shown in Figure 3.

Figure 3: Aerial Photograph of Site and Surrounding Area



Source: WinterbourneWind Pty Ltd

2.2 Road Network

Vehicles accessing the Project from the west (Tamworth) will utilise New England Highway and Oxley Highway, and vehicles travelling from the north (Uralla and Armidale) will utilise Thunderbolts Way. Vehicles will then utilise the local road network to travel to the various access locations along the perimeter of the Project Area. The following provides a description of the surrounding road network.

2.2.1 State and Regional Road Network

State Roads are the major arterial links throughout NSW and within major urban areas. They are the principal traffic carrying and linking routes for the movement of people and goods within the Sydney, Newcastle, Wollongong and Central Coast urban areas and which connect between these urban centres, the major regional towns, the major regions of the State and the major connections

interstate. TfNSW takes responsibility for managing the primary traffic function of State Roads including funding and determining priorities and regulates the activities of third parties on the road and access to adjoining land to promote road safety, traffic efficiency and protect the road asset.

Regional Roads are routes, together with the State Roads, that provide the main connections to and between smaller towns and districts and perform a sub arterial function in major urban areas. Regional Roads are the responsibility of councils to fund, determine priorities and carry out works.

An overview of the relevant State and Regional Road network within the vicinity of the Project Area is provided in Table 4.

Table 4: State and Regional Road Network

Road	Class	Typical Carriageway Width	Speed Limit	Alignment
New England Highway	State Road	13.0m accommodating one lane of traffic in each direction and sealed shoulders on both sides. Two lanes are provided in each direction through the Moonbi Hills where it has a steep alignment, and intermittent passing lanes are provided in both directions between Tamworth and Armidale.	100 km/hr (50 km/hr in built-up areas)	Northwest-southeast alignment from Newcastle to Muswellbrook, before running in a general north-south alignment to its termination at the Queensland border.
Oxley Highway	State Road	9.0m accommodating one lane of traffic in each direction.	100 km/hr (50 km/hr in built-up areas)	East-west alignment linking Port Macquarie and the Pacific Highway to the New England Highway near Bendemeer. The road continues west of Tamworth through Gunnedah and extends to link with the Newell Highway near Coonabarabran. It terminates at its connection with the Mitchell Highway at Nevertire.
Thunderbolts Way (also Uralla Road, Derby Street)	Regional Road	6.0-8.0m accommodating one lane of traffic in each direction.	100 km/hr (50 km/hr in built-up areas)	Extends south from Gwydir Highway through Uralla and Walcha and terminates at Scone Road in Barrington.

The State and Regional Road network in the vicinity of the site consists of Thunderbolts Way as a Regional Road which runs to the west of the Project Area and connects with Oxley Highway to the south (in the town of Walcha) and New England Highway to the north (in the town of Uralla). All State and Regional Roads have been designed to accommodate regular heavy vehicle movements.

2.2.2 Local Road Network

An overview of the surrounding local road network is provided in Table 5. The local road network is generally subject to the default speed limits which are 50 km/hr in built-up areas (including towns) and 100 km/h in regional areas.

Table 5: Local Road Network

Road	Typical Surface	Typical Width	Alignment
Saleyards Road, Darjeeling Road	Sealed	7.0m	Saleyards Road extends north from Oxley Highway and connects with Darjeeling Road, which in turn connects with Thunderbolts Way. The two roads combine to provide a route around the north-western side of Walcha.
Jamieson Street	Sealed	13.5m	Jamieson Street extends east from Thunderbolts Way for approximately 600m before continuing as Ohio Road for 300m, and then continues further east as Emu Creek Road. Emu Creek Road continues as Winterbourne Road approximately 9.3km northeast of Walcha. It extends through the Project Area and terminates at Cheyenne Boundary Trail.
Ohio Road	Sealed	13.5m	
Emu Creek Road	Sealed	5.5 – 7.5m	
Winterbourne Road	Sealed	5.4 – 6.1m	
Moona Plains Road	Sealed	5.3 – 6.0m	Extends southeast from Emu Creek Road through the Project Area and terminates at its connection with Bukeiro Road.
Blue Mountain Road	Unsealed	3.1 – 6.0m	Extends north from Winterbourne Road to its connection with Hazeldean Road and then extends in a northwest alignment to its termination at Hillview Road. The section between Winterbourne Road and Hazeldean Road is generally wider than the section between Hazeldean Road and Hillview Road which reduces to a single lane width.
Hazeldean Road	Unsealed	7.0m	Extends in a general east-west alignment between Blue Mountain Road and Winterbourne Road.
Uruga Road	Unsealed	3.4 – 3.9m	Extends north from Hazeldean Road for approximately 5.0km to its termination.
Bark Hut Road	Unsealed	3.0 – 3.5m	Extends east from Winterbourne Road for approximately 8.2km to its termination.
Table Top Road	Unsealed	4.0 – 5.7m	Extends east for 9.3km from Winterbourne Road to its termination at Puppy Hill Trail.
Florida Road	Unsealed	3.1 – 6.0m	Extends south for 3.2km from Table Top Road to its termination.
Rowleys Creek Road	Unsealed	3.1 – 3.2m	Extends north from Moona Plains Road for approximately 4.1km to its termination.
Hillview Road	Unsealed	3.1 – 6.0m	Extends in a general northeast-southwest alignment between Thunderbolts Way and Gostwyck Road. The road width varies along the road but is generally wider toward the western side (near Thunderbolts Way) and narrower toward the east where it reduces to a single lane width.

The sealed local roads generally have a good, sealed surface, although in some locations the seal appears to be thinning. The unsealed roads are generally in good condition. The surrounding landscape is rolling which results in some undulation and moderate corners.

2.2.3 Key Intersections

An overview of the key intersections within the surrounding area is provided in Table 6.

Table 6: Intersection Summary

Intersection	Configuration	Control
New England Highway / Oxley Highway	T-intersection	'Stop' signage and associated line marking are provided for vehicles exiting Oxley Highway. A channelised right turn lane and a basic left turn treatment are provided at the intersection to facilitate turning movements from New England Highway.
New England Highway (Bridge Street) / Salisbury Street	Cross Intersection	'Give Way' signage and associated line marking are provided for vehicles exiting Salisbury Street. Channelised right turn lanes are provided at the intersection to facilitate turning movements from New England Highway.
Oxley Highway (Fitzroy Street) / Thunderbolts Way (Derby Street)	Roundabout	Roundabout signage and associated linemarking is installed for all approaches.
Thunderbolts Way / Darjeeling Road	T-intersection	Priority controlled with vehicles exiting Darjeeling Road required to give way.
Oxley Highway / Saleyards Road	T-intersection	Priority controlled with vehicles exiting Saleyards Road required to give way.
Thunderbolts Way / Jamieson Street	T-intersection	'Give Way' signage and associated line marking are provided for vehicles exiting Jamieson Street.

The intersections across the local road network in the vicinity of the site are all priority controlled.

2.3 Road Upgrades and Events

In consultation with the road authorities, the following road upgrades and events have been identified which are currently proposed within the vicinity of the Project Area and along the proposed transport routes.

2.3.1 Walcha

- Upgrade of Darjeeling Road including footpaths and shoulder widening. It is understood that Council is seeking grant funding and is open to coordinating construction works with Winterbourne Wind Farm.
- Construction of a footpath from the town centre to Summervale Village. It is understood that Council is open to coordinating construction works where required to accommodate potential road upgrades for Winterbourne Wind Farm.
- Upgrade of the intersection of Thunderbolts Way (Derby Street / Uralla Road) and Jamieson Street. The proposed design has been provided within Appendix E which shows

that the intersection is proposed to be provided with a new seal and linemarking including a dedicated right turn lane from Thunderbolts Way. In addition, the existing barrier in the south-eastern corner of the intersection will be set back from the carriageway. Works are anticipated to commence mid-2024 and would require approximately 8-10 months to complete.

2.3.2 Tamworth

- Duplication of New England Highway (Goonoo Goonoo Road) between Jack Smyth Drive and Calala Lane in Tamworth. The project includes installing a set of traffic signals at the intersection of New England Highway and Calala Lane, installing a roundabout at the intersection of New England Highway and Craigends Lane, and intersection improvements at The Ringers Road and Greg Norman Drive. The project also involves installing a central median to separate oncoming traffic and a new pedestrian and cycle path along the western side of New England Highway. It is understood that TfNSW are planning to commence major works in December 2024 and works are expected to be completed in 2027. The works are expected to be completed prior to the transport of wind turbine components associated with the Winterbourne Wind Farm.

TfNSW has provided initial comments on the Project following their review of the EIS and have not noted any other current long-term works that are likely to coincide with the project delivery timeframes.

2.4 Traffic Volumes

2.4.1 Intersection Volumes

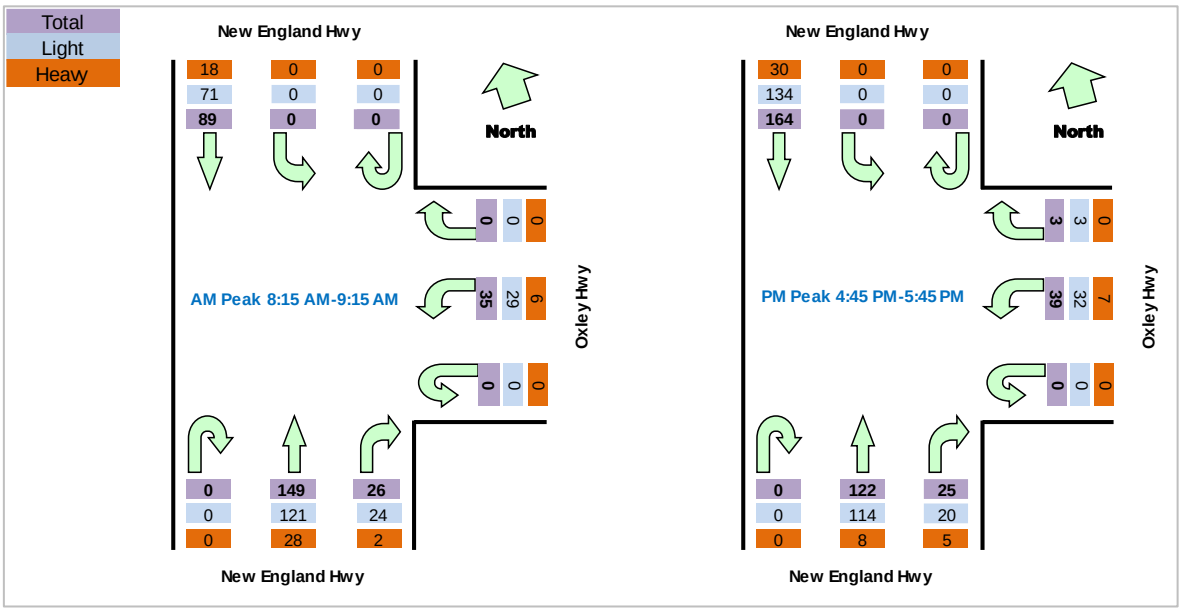
Amber commissioned turning movement count surveys at the following intersections in order to determine the existing traffic conditions in the area:

- New England Highway / Oxley Highway
  - Surveyed Thursday 16 February 2023 from 6:00am-9:30am and 3:00pm-7:00pm.
- New England Highway (Bridge Street) / Salisbury Street
  - Surveyed Thursday 8 June 2023 from 6:00am-9:30am and 3:00pm-7:00pm.
- Fitzroy Street / Derby Street
  - Surveyed Thursday 9 November 2023 from 6:00am-10:00am and 3:00pm-7:00pm.
- Thunderbolts Way / Darjeeling Road
  - Surveyed Wednesday 22 November 2023 from 6:00am-10:00am and 3:00pm-7:00pm.
- Thunderbolts Way (Uralla Road & Derby Street) / Jamieson Street
  - Surveyed Thursday 9 November 2023 from 6:00am-10:00am and 3:00pm-7:00pm.

A summary of the results for each site is provided below with the full survey results presented within Appendix F.

2.4.1.1 New England Highway / Oxley Highway

Figure 4: New England Highway / Oxley Highway Turning Movement Count - Peak Hour Results

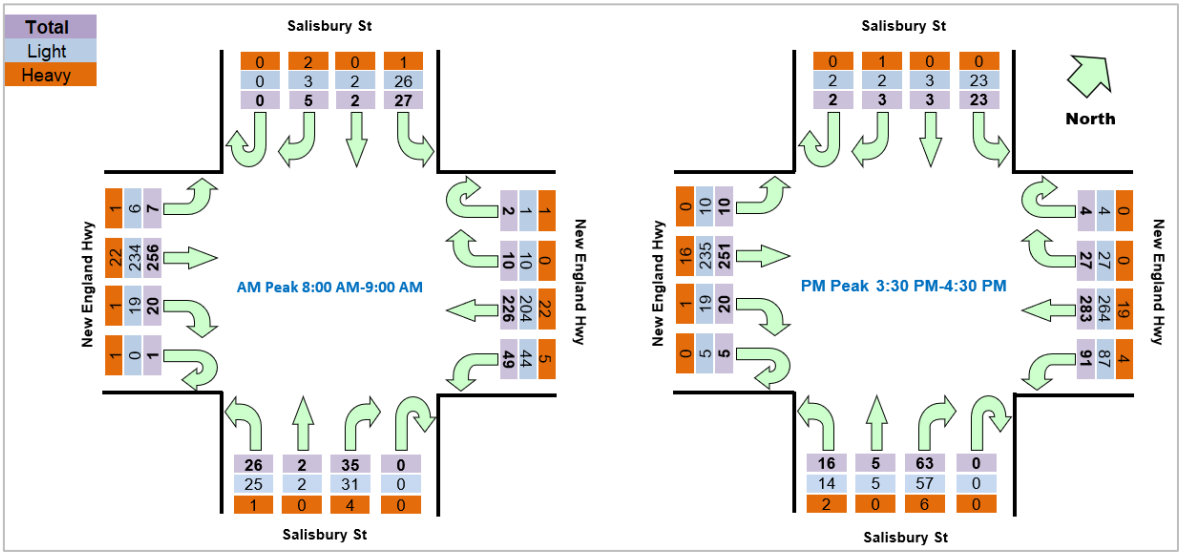


The survey results indicate the intersection currently carries a moderate level of traffic in the order of 299 and 353 vehicle trips in the morning and evening peak hour, respectively. The morning peak hour was recorded from 8:15am to 9:15am and the evening peak hour was recorded from 4:45pm to 5:45pm.

The majority of vehicle trips are through movements on New England Highway. Oxley Highway accommodated 61 and 67 vehicle trips in the morning and evening peak hour which are predominantly to/from the south.

2.4.1.2 New England Highway (Bridge Street) / Salisbury Street

Figure 5: New England Highway / Salisbury Street Turning Movement Count - Peak Hour Results

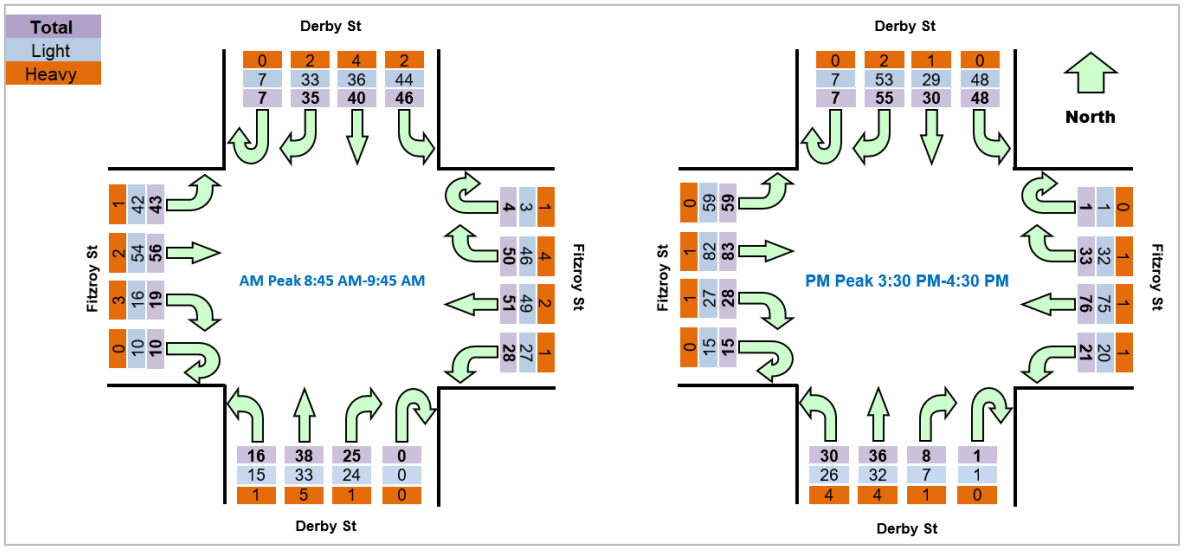


The survey results indicate that there is a moderate level of through traffic along New England Highway which is generally split between both travel directions. Salisbury Street accommodates a relatively low level of traffic with under 100 vehicle trips per hour in each direction during the

morning and evening peaks. There is a higher demand for the right turn movement out of Salisbury Street from the south, with comparatively lower demand for the left turn movement.

2.4.1.3 Fitzroy Street / Derby Street

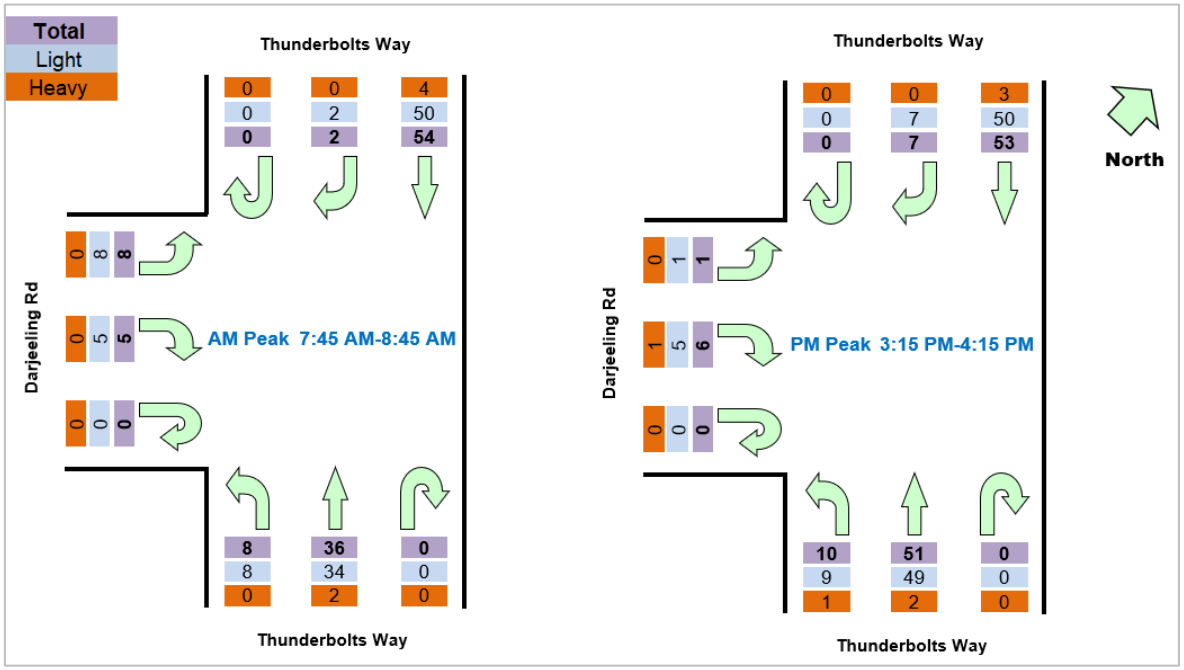
Figure 6: Fitzroy Street / Derby Street Turning Movement Count - Peak Hour Results



The survey results indicate the intersection currently carries a moderate level of traffic in the order of 468 and 531 vehicle trips in the morning and evening peak hour, respectively. The highest recorded movements are associated with through traffic on Fitzroy Street however trips are generally distributed across the various movements at the intersection.

2.4.1.4 Thunderbolts Way / Darjeeling Road

Figure 7: Thunderbolts Way / Darjeeling Road Turning Movement Count - Peak Hour Results

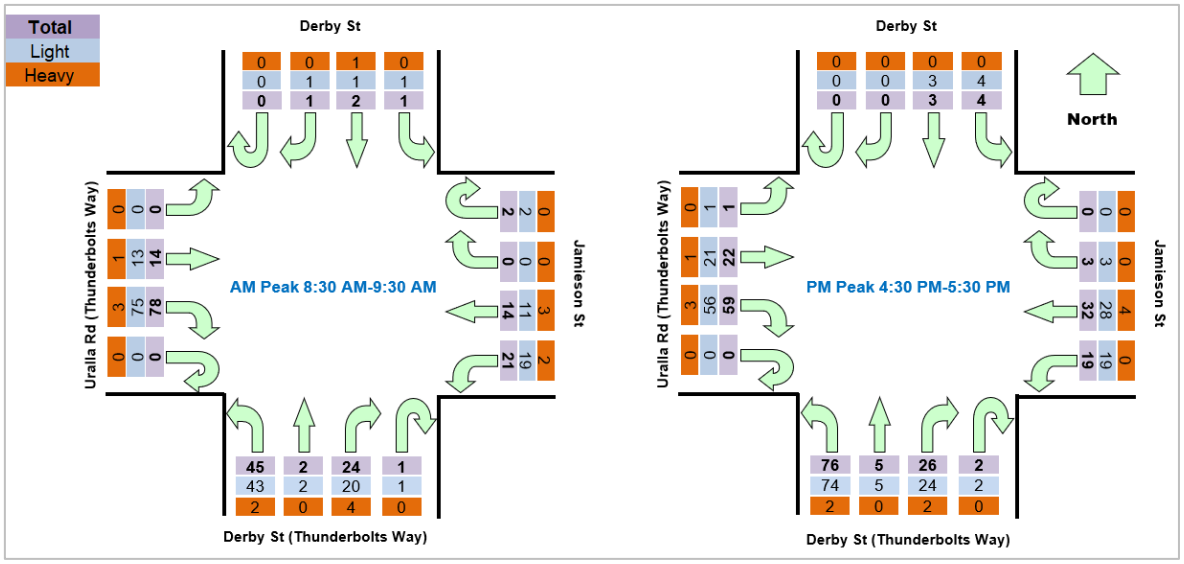


The survey results indicate that there is a low level of through traffic along Thunderbolts Way which is generally southbound in the morning peak and split between both travel directions in the

evening peak. Darjeeling Road accommodates a very low level of traffic which predominantly arrives from the south via Thunderbolts Way.

2.4.1.5 Thunderbolts Way (Uralla Road and Derby Street) / Jamieson Street

Figure 8: Thunderbolts Way / Jamieson Street Turning Movement Count - Peak Hour Results



The survey results indicate that the majority of vehicle trips are through movements along Thunderbolts Way (i.e. between Uralla Road and Derby Street to the south). Jamieson Street carries approximately 40 and 50 vehicles per hour in each direction during the morning and evening peak hour, respectively.

2.4.2 Midblock Traffic Volumes - State and Regional Roads

Traffic volume data has been collected from the TfNSW Traffic Volume Viewer which provides traffic count data in NSW. Data is available throughout NSW from 2006 up to the current year. The map provides the traffic volume in vehicles per day (vpd) and at some site locations information is provided based on vehicles per hour (vph) and differentiates between light and heavy vehicles. A summary of the traffic volumes is provided within Table 7. As the data is provided for previous years, growth rates have been applied to calculate the current estimated 2024 traffic volumes.

Table 7: State and Regional Road Traffic Volumes

Road	Survey Location	Station ID	Survey Year	Recorded Volume	Growth Factor	Current Estimated 2024 Traffic Volume
New England Highway	South of Bendemeer - 140 metres south of Caroline Street	T0257	2021	4,003 vpd 76% light 24% heavy	1.5%	4,186 vpd
	Between Uralla and Bendemeer - 1.66km west of Glenburnie Road	92057	2008	3,623 vpd*	1.5%	4,598 vpd
	Uralla - 100 metres west of Hill Street	92502	2011	8,093 vpd*	1.5%	9,821 vpd
	Between Uralla and Armidale – 560 metres west of Arding Road	92060	2011	6,128 vpd 91% light 9% heavy	1.5%	7,437 vpd
Oxley Highway	Walcha – 100 metres west of Towers Street	92695	2011	1,019 vpd 90% light 10% heavy	1.0%	1,237 vpd
	Between Bendemeer and Woolbrook – 1.66km east of Back Woolbrook Road	92702	2011	622 vpd 83% light 17% heavy	1.0%	755 vpd
Thunderbolts Way	Between Uralla and Walcha – 2.45km north of Mirani Road	92677	2011	1,121 vpd 91% light 9% heavy	1.0%	1,360 vpd

***** Light and heavy vehicle percentages are not available.

The traffic volume data indicates that the State and Regional Road network currently carries a modest level of traffic which is well within the existing road capacity. It is noted that the higher traffic volumes recorded on New England Highway west of Hill Street is indicative of the survey location within the Uralla township. Traffic volumes within the township are expected to be higher given the local traffic and associated vehicles circulating with people accessing the shops and community facilities.

2.4.3 Local Road Network

Traffic volume data was provided by Walcha Council on 2 September 2020 for all local roads within the proximity of the Project. The traffic volume information is summarised in Table 8.

Table 8: Local Road Traffic Volumes

Road	Traffic Volume (vpd)	Heavy Vehicle Percentage
Saleyards Road	90	45%
Darjeeling Road	120	40%
Jamieson Street	720	18%
Ohio Road*	400	15%
Emu Creek Road	123	13%
Winterbourne Road	40	20%
Moona Plains Road	62	45%
Blue Mountain Road*	30	40%
Hazeldean Road*	30	30%
Uruga Road*	20	40%
Bark Hut Road*	30	40%
Table Top Road*	30	40%
Florida Road*	20	40%
Rowleys Creek Road*	20	40%
Hillview Road*	30	40%

* No data available – estimate provided by Council

The traffic volume data suggests that the local road network currently carries a low level of traffic, which is not surprising given a number of the local roads are currently unsealed. Jamieson Street, Ohio Road and Emu Creek Road carry a higher level of traffic as they provide access to nearby residential properties within the Walcha Township. Overall, the local road network generally carries a low level of traffic which is well within the operating capacity of the road network.

2.4.4 Summary

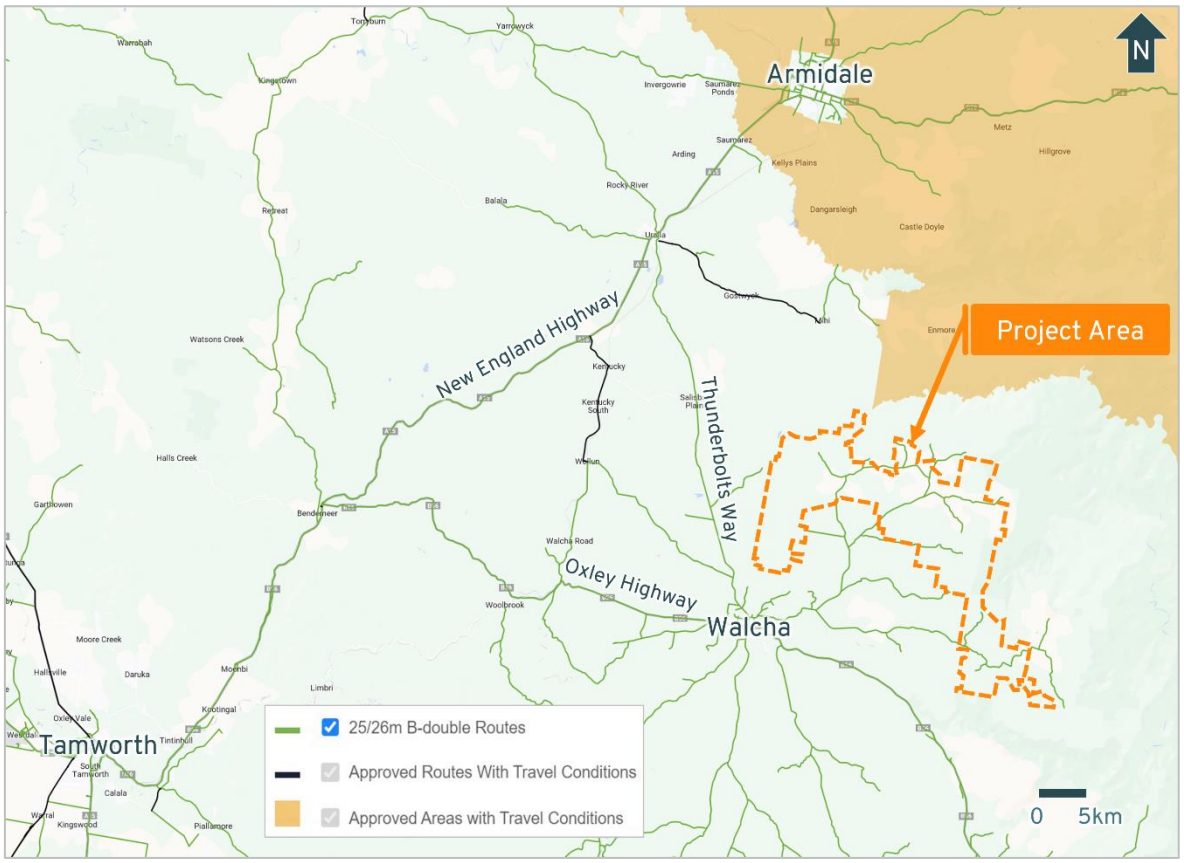
Overall, the traffic data indicates the surrounding road network currently accommodates a low to moderate level of traffic for the respective road classifications and is able to accommodate an increase in vehicle movement.

2.5 Restricted Vehicle Access

2.5.1 B-Doubles

The TfNSW Restricted Vehicle Access Map for the surrounding area is provided within Figure 9. The green lines indicate approved B-Double routes while the black lines represent approved routes with travel conditions. The figure shows that all roads within the vicinity of the Project Area are approved for 26m B-Doubles.

Figure 9: TfNSW Restricted Access Vehicle Map



Source: TfNSW Restricted Vehicle Access Map

2.5.2 Class 1 OSOM Vehicles

The TfNSW Oversize Overmass Load Carrying Vehicles Network map for the surrounding area is provided within Figure 10. The map shows approved routes for eligible vehicles operating under the Multi-State Class 1 Load Carrying Vehicles Mass and Mass Exemption Notices. Within New South Wales, a summary of allowances under each exemption notice are as follows:

- Dimension: up to 5.0m wide, 5.0m high, 30.0m long and 7.5m rear overhang on approved (State owned) routes in NSW.
- Mass: up to 115.0 tonnes for rows of 8 tyres low loaders and up to 77.5 tonnes for rows of 4 tyres low loader combinations.

Vehicles operating in the daytime and not exceeding 3.5m wide or 26m long generally do not require a pilot vehicle.

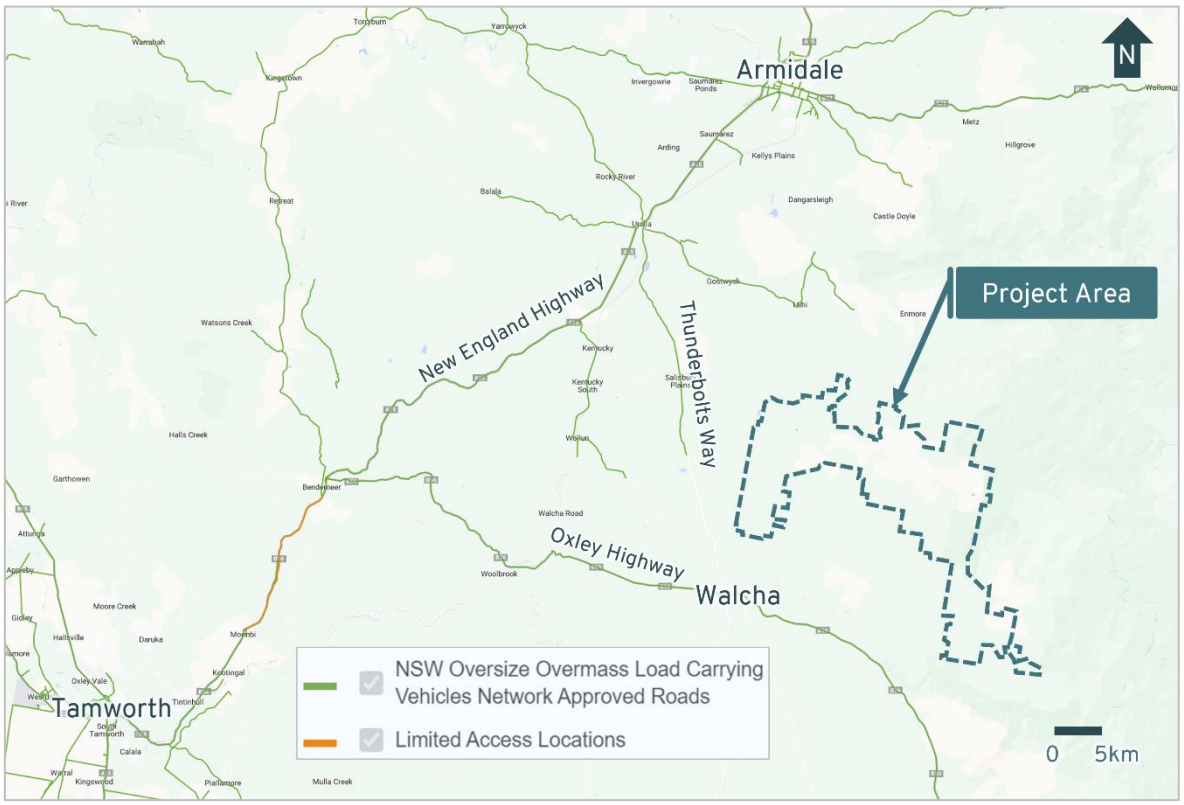
The green lines indicate approved B-Double routes while the orange lines represent limited access locations. Accordingly, the Project Area does not currently have access to the Class 1 OSOM approved road network, with all roads connecting to the site unrated for OSOM vehicles. Roads that are not approved on the map require an access permit from the National Heavy Vehicle Regulator or the relevant road manager.

It is noted that Oxley Highway, New England Highway and a 25km section of Thunderbolts Way south of Uralla are part of the approved network, although the following travel conditions are applicable along New England Highway south of Bendemeer:

Condition applies to Southbound only. Police escort required when width exceeds 3.5 metres.

It is understood the Applicant will seek approval for Class 1 OSOM vehicles to utilise the relevant unrated sections of the network following determination of the Project.

Figure 10: TfNSW Class 1 Oversize Overmass Load Carrying Vehicles Network Approved Roads



Source: TfNSW Restricted Vehicle Access Map

2.5.3 Special Purpose Vehicles (SPVs)

Vehicles built for a purpose other than carrying goods such as a mobile crane, a concrete pump or drill rig are defined as Special Purpose Vehicles (SPVs).

The NSW Special Purpose Vehicle Network map provides details of the approved roads as well as conditions of access and travel restrictions for eligible special purpose vehicles operating under the:

- National Class 1 Special Purpose Vehicle Notice;
- NSW Class 1 4-Axle & 5-Axle All Terrain Mobile Crane Mass and Dimension Exemption Notice; or
- NSW Class 1 All Terrain Mobile Crane and Dolly Combination Mass and Dimension Exemption Notice.

There are six SPV access networks for cranes travelling on approved State Roads in NSW:

- SPV Level 1: Cranes and SPVs up to 40 tonnes that comply with the Bridge Formula.
- SPV Level 2: Crane and dolly combinations up to 70 tonnes that comply with the Bridge Formula.

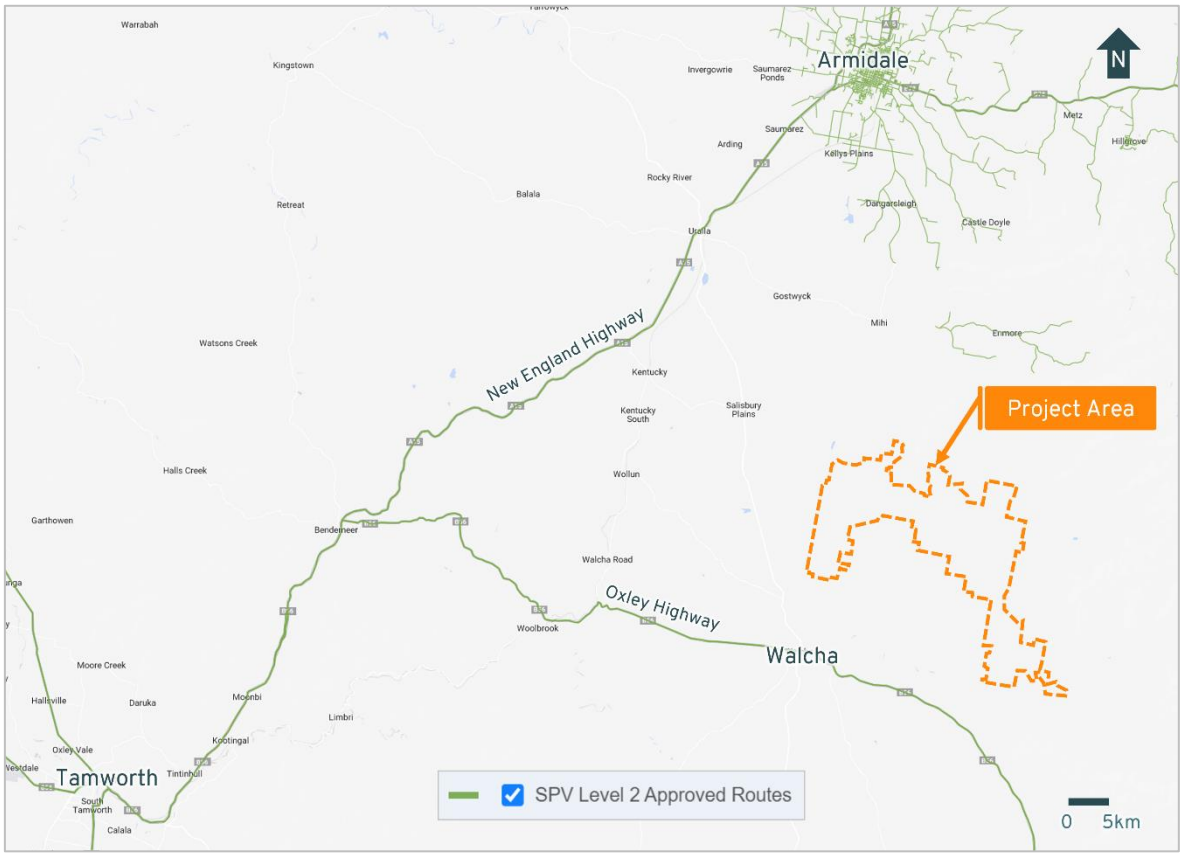
- SPV Level 3: 3-axle All Terrain Cranes up to 36 tonnes and 4-axle All Terrain Cranes up to 43 tonnes.
- SPV Level 4: 4-axle All Terrain Cranes up to 45.8 tonnes and 5-axle All Terrain Cranes up to 50 tonnes.
- SPV Level 4 / 12t per axle: 4-axle All Terrain Cranes up to 48 tonnes and 5-axle All Terrain Cranes up to 50 tonnes.
- SPV Level 6: 5-axle All Terrain Cranes up to 60 tonnes.

The approved routes for SPV Level 2 vehicles travelling within the surrounding area are identified within Figure 11. Accordingly, the Project Area does not currently have access to the SPV approved road network, with all roads connecting to the site unrated for SPVs. Roads that are not approved on the map require an access permit from the National Heavy Vehicle Regulator or the relevant road manager.

It is noted that Oxley Highway and New England Highway are part of the approved network. Approved routes near the Project Area for SPVs classified Level 3 or above are limited due to restricted structures (bridges), including Oxley Highway bridge over Northern Railway at Woolbrook (24.4km west of Walcha).

It is understood the Applicant will seek approval for SPVs to utilise the relevant unrated sections of the network following determination of the Project.

Figure 11: TfNSW SPV Level 2 – Approved Roads



Source: TfNSW Restricted Vehicle Access Map

2.6 Public Transport Services

Oxley Explorer and Moona Bus provide school bus services on the local road network within the vicinity of the Project Area. Oxley Explorer have advised the following with regards to the local roads within the vicinity of the site:

> *'…all of the roads (discussed within Section 2.2 of this report) are utilised by bus services between the hours of 6.50am and 9am and 2.50pm and 5pm Monday to Friday with the exception of school holidays.'*

Moona Bus have provided the bus route and associated times the bus is anticipated at each stop. The school bus is expected to be operating on the local road network from 8:00am to 8:35am and from 3:05pm to 3:40pm. The schedule and bus route are provided within Appendix G which shows the bus route extends from Moona Plains Road to Walcha via Emu Creek Road and Jamieson Street, and vice versa.

2.7 Crash History

Amber has conducted a review of the TfNSW Centre for Road Safety Crash and Casualty Statistics database for all injury crashes within the surrounding area of the Project. The crash database provides the location and severity of all injury and fatal crashes for the five-year period from 2018 to 2022. The search area included the following roads:

- New England Highway between Nundle Road and Oxley Highway;
- Oxley Highway between New England Highway and Thunderbolts Way;
- Thunderbolts Way between Gostwyck Road and Oxley Highway;
- All local roads as described within Section 2.2; and
- All associated intersections.

The results of the crash search are summarised in Table 9.

It is noted that there were no injury crashes recorded at the intersection of Oxley Highway with New England Highway or Thunderbolts Way, and no crashes were recorded on the local road network.

The crash search indicates that there are no discernible crash trends within the surrounding road network, and the crashes are widely distributed on the network with no 'Black Spots'. Whilst the crash search indicates a large number of crashes, including some resulting in fatalities, the crash results are not unexpected when considering the large search area, the associated traffic volumes on the roads, the road classifications, and the high speed and rural nature of the State and Regional Road network. Overall, it is concluded that the road network is currently operating in a relatively safe manner.

Table 9: Crash Search Results

Road	Injury Type	Number of Crashes	Crash Type
New England Highway	Fatal	1	• 1 x off-road to left on right bend, hitting object located 12.8km from Oxley Highway
	Serious	13	• 1 x rear end • 2 x off-road to the left, hitting object • 1 x off-road to the left on right bend, hitting object • 1 x off-road to right on right bend, hitting object • 1 x right turn sideswipe • 1 x head on crash • 1 x out of control while overtaking • 1 x off road to the left • 1 x right rear • 1 x off road to the right • 1 x left turn sideswipe • 1 x off-road to the left on left bend, hitting object
	Moderate	12	• 4 x rear end • 3 x off-road to left, hitting object • 1 x off-road to left on right bend • 1 x off-road to right, hitting object • 1 x lane change right • 1 x other same direction • 1 x off-road to right on right bend, hitting object
	Minor	5	• 1 x head on crash • 2 x off road to the left, hitting object • 1 x rear end • 1 x other same direction
Oxley Highway	Fatal	4	• 1 x off-road to right on left bend, hitting object crash located 6.8km east of New England Highway • 1 x head on crash located 0.7km east of Wullum Road • 1 x off-road to left on right bend, hitting object located 17.4km from New England Highway • 1 x right near located 10km from Thunderbolts Way
	Serious	1	• 1 x off-road to left on right bend, hitting object
	Moderate	1	• 1 x off-road to the right on left bend, hitting object
Thunderbolts Way	Serious	2	• 1 x off-road to the left on right bend • 1 x struck animal
	Moderate	3	• 1 x off-road to the left on right bend, hitting object • 1 x cross traffic crash at the intersection with Hill Street • 1 x off-road to the left on right bend
	Minor	1	• 1 x off-road to left, hitting object
Darjeeling Road	Moderate	1	• 1 x off-road to the left on right bend, hitting object
Emu Creek Road	Moderate	2	• 1 x off-road to the left on right bend, hitting object • 1 x off-road to the left, hitting object
	Minor	1	• 1 x off-road to the left, hitting object

3. Project Description

3.1 Site Location

The Project will be located in the New England North West region of NSW, approximately 75km northeast of Tamworth and 35km south of Armidale within the Walcha and Uralla LGAs. The Project Area encompasses approximately 21,850 hectares (excluding the transmission line to the northwest of the proposed wind farm). Land within the Project Area and the surrounding area is predominantly used for agriculture.

The Project is situated within the New England Renewable Energy Zone (REZ) which is one of five REZs across the State and will play a crucial role in delivering affordable energy to help replace the State's existing power stations as they retire over the next 15 years. It has an intended network capacity of 8GW and is centred around Armidale, extending to Glen Innes in the north and Walch to the south. It is understood that EnergyCo is the NSW-Government-controlled statutory authority that will lead the delivery of the REZ including road upgrade services as needed to support the construction and operations/maintenance of projects located within the REZ.

3.2 Proposed Works

The Project is proposed to accommodate 118 turbines with an installed capacity of around 700MW. The wind turbine model selected for the Project is expected to have an output capacity of 6.2MW and a maximum tip height of 230 metres. The Project will operate with approximately 16 employees on-site at any time and has an operational lifespan of 30 years. The Project also includes the following:

- An internal electrical reticulation network (both overhead and underground).
- Two on-site substations.
- A new switchyard and other electrical equipment providing connection to the existing 330kV transmission network.
- New and upgraded access roads (combined total length of approximately 115 km).
- Temporary construction facilities (including concrete batching plants).
- Operation and maintenance buildings.

The proposed location of the wind turbines and layout of the existing and proposed road network are shown within Figure 1. Vehicular access will be provided via a number of new access roads that will connect directly with a mixture of sealed and unsealed local rural roads, and subsequently Thunderbolts Way and Oxley Highway.

Large-scale battery storage is also proposed on-site to support stabilising the supply of electricity to the national electricity market. Indicatively, the battery unit would have 100MW / 200MWh capacity, and would utilise lithium-ion technology.

The Project also includes a new 330kV overhead transmission line running through the Project Area and continuing northwest, connecting to the existing grid network operated by TransGrid at a new switching station which is to be constructed approximately 7km south of Uralla. The proposed overhead transmission line will primarily run across private land, though it will be necessary to cross Thunderbolts Way and Hillview Road. An overview of the construction methodology and relevant vehicle trips associated with these components is provided in Section 4.2.1.2.

3.3 Construction Information

The construction of the Project is anticipated to commence in 2026 and take approximately 52 months, with the proposed working hours as follows:

- Monday to Friday: 7am – 6pm;
- Saturday: 8am – 6pm;
- No work on Sundays or public holidays.

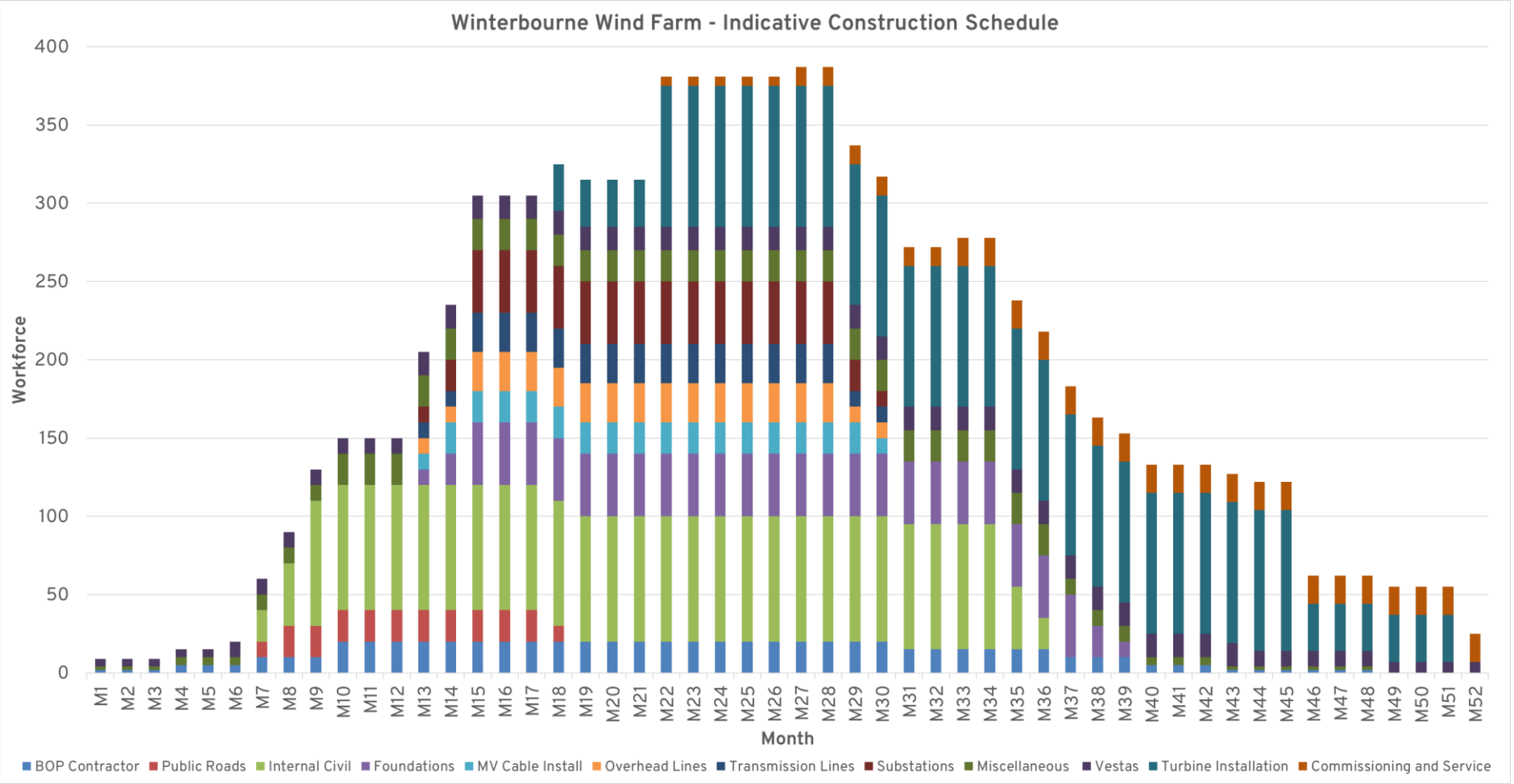
Any construction outside of these normal working hours would only be undertaken with prior approval from relevant authorities and consultation with impacted road users.

Up to 390 personnel are expected to be on-site during the peak construction phase, with the peak construction period expected to take approximately 9 months between Months 16-24. The construction schedule and the number of staff expected on-site throughout the various stages of the Project are provided within Figure 12.

Construction staff are expected to travel from the nearby towns of Armidale, Tamworth, Uralla, and Walcha.

All plant associated with the wind turbine components will be delivered from the Port of Newcastle. Gravel and water will be sourced onsite where possible or from within the surrounding area. Other materials will also be sourced from within the local region where possible. Construction also includes fixed or mobile concrete batching plant(s), and office buildings and substations for the construction and operational phases of the Project.

Figure 12: Indicative Construction Schedule



Source: WinterbourneWind Pty Ltd

4. Traffic Assessment

Traffic generated by the Project can be separated into three distinct stages: construction, operation and decommissioning. The peak traffic generating potential for the wind farm is during construction which generates trips associated with staff accessing the Project and the delivery of raw materials and plant. During operation the Project is expected to generate a minimal amount of traffic with only a small number of maintenance staff accessing the Project each day. Decommissioning of the Project is anticipated to generate a similar level of traffic to the construction stage, although the number of OSOM vehicle movements is able to be reduced by cutting the blades into smaller sections prior to transport.

The following provides an assessment of the potential traffic impacts of the Project on the road network function for each of the three stages.

4.1 Definitions

The following terminology is referenced throughout this section and within the remainder of the report.

Table 10: Traffic Assessment Definitions

Terminology	Definition
Volume	The number of vehicles travelling in one direction past a given point in the road. In traffic flow analysis, a volume usually relates to only one direction of flow. For the purposes of this assessment a vehicle would be included when travelling towards the Project Area and again when departing.
Vehicles per Day (vpd)	The volume of traffic occurring within a 24-hour period. For traffic volumes associated with the Project, this value is generally an even number to reflect the arrival and departure of each vehicle.
Vehicles per Hour (vph)	The volume of traffic occurring within a one hour period.
Heavy Vehicle	A vehicle with a Gross Vehicle Mass (GVM) or Aggregate Trailer Mass (ATM) of more than 4.5 tonnes as defined in the Heavy Vehicle National Law (HVNL).
General Access Vehicle (GAV)	Under the national mass and loading arrangements, general access heavy vehicles have unrestricted access to the road network, except where sign posted otherwise. No specific access restrictions apply and no additional permits are required if vehicles have current registration appropriate to the vehicle configuration.

4.2 Traffic Generation

4.2.1 Construction Traffic

4.2.1.1 Wind Farm

Construction traffic generated by the Project on a day-to-day basis can be broadly separated into the following categories as outlined in Table 11.

Table 11: Standard Construction Traffic

Terminology	Definition
Light Vehicles	The use of light vehicles will be associated with transporting the workforce to/from the Project. For the purposes of this assessment a vehicle occupancy of approximately 2.0 people per car has been adopted to calculate the staff traffic generation noting that a carpooling program would be implemented for the workforce as outlined within the recommendations for the TMP in Section 9.2. In some instances, shuttle buses may be used by specific contractors where a group of people are working in the same area however at this stage it has conservatively been assumed that all staff would travel by light vehicle.
Heavy Vehicles	
Rigid Trucks	Rigid Trucks will be used to deliver materials and smaller plant and have a typical length between 8 and 13 metres.
Truck and Dog	Truck and Dog vehicles consist of a rigid truck towing either a dog trailer or a pig trailer and are not more than 19 metres in length. A dog trailer is a trailer with axles at either end of the trailer, a pig trailer has the axles centred on the trailer. These vehicles will be utilised to transport materials to/from the site.
Semitrailers	Semitrailers will be used to transport larger equipment and materials. These vehicles consist of a truck and a single trailer with a total length of 19 metres.
B-Doubles	B-Doubles may also occasionally be used to transport larger plant. B-Doubles consist of a truck with two trailers and have a maximum length of 26 metres.

The peak hour for construction traffic will occur at the start and end of the day when workers are transported to/from the Project Area. Most workers will typically arrive on-site between 6:00am and 7:00am and depart between 5:00pm and 7:00pm. Workers generally have staggered finish times which results in the evening peak hour being less pronounced, however for the purposes of this assessment it is conservatively assumed that the evening peak hour Project traffic is the same as the morning peak, and the evening peak hour occurs from 6:00pm to 7:00pm.

The traffic volumes for the Project have been determined based on the information provided by the Applicant which is included within Appendix H. It is anticipated that during peak construction the Project would generate up to 512 light vehicles and 142 heavy vehicles per day. Table 12 summarises the forecast traffic expected to be generated by the Project.

Table 12: Traffic Generation During Construction Period

Vehicle Type		Average Over Entire Construction Period			Maximum During Peak Construction Period		
		Return Trips per Day	Vehicles per Day (vpd)	Peak Hour Volume (vph)	Return Trips per Day	Vehicles per Day (vpd)	Peak Hour Volume (vph)
Light Vehicles		115	230	115	256	512	194
Heavy Vehicles	Rigid Trucks	5	10	2	13	26	5
	Truck and Dog	10	20	4	43	86	17
	Semitrailers	5	10	2	14	28	6
	B-Doubles	0	0	0	1	2	0
	HV Subtotal	*20*	*40*	*8*	*71*	*142*	*28*
Total		**135**	**270**	**123**	**327**	**654**	**222**

Overall, the Project is expected to generate up to 222 vph in the morning and evening peak hours during the peak construction period, with an average of 123 vph over the entire construction period.

4.2.1.2 Transmission Line and Switching Station

The construction of the transmission line and switching station is expected to occur between Month 13 and Month 30 of the project which also overlaps with the peak construction period of the project. The anticipated vehicle trips associated with these components are outlined below and these vehicles are included within the overall project figures provided in Table 12.

Table 13: Traffic Generation – Transmission Line and Switching Station

Vehicle Type		Return Trips Per Day	Vehicles per Day (vpd)	Peak Hour Volume (vph)
Light Vehicles		13	26	13
Heavy Vehicles	Rigid Trucks	7	14	2
	Truck and Dog	25	50	2
	Semitrailers	4	8	1
	B-Doubles	0	0	0
	Subtotal	*36*	*72*	*5*
Total		**49**	**98**	**18**

Further details of the construction methodology and vehicle movements associated with the transmission line are as follows:

- The transmission poles will be transported to site with one semitrailer required per pole.
- Bored pier foundations will be constructed for each transmission pole approximately 8m deep and 1.8m diameter. Approximately 3 concrete trucks will be required for each pole foundation, resulting in 414 concrete trucks for 138 poles. Concrete would be produced at one of the on-site batching plants and driven to the transmission line pole locations.
- The conductor is expected to be a twin mango type which has a weight of 1440 kg/km. Approximately 100km of conductor material is required over the 44km length of transmission line, resulting in a total of approximately 1440 tonnes. The conductor will be transported to the Project Area using semitrailers with 2-3 reels of 5km lengths per truck (i.e. up to 15km) resulting in approximately 7 trucks required.

It is noted that the switching station is proposed to be located on the western side of Thunderbolts Way, approximately 7km south of Uralla. Further details of the construction methodology and vehicle movements associated with the switching station are provided as follows:

- The majority of vehicle trips generated by the switching station are expected to result from the earthworks including benching. Based on a volume of approximately 9000 cubic metres, the bulk earthworks for the site will likely require approximately 400-600 trucks throughout a period of 15-20 days depending on the construction schedule. Truck and dog configurations will be utilised with each transporting 15-25 cubic metres.
- The concrete footings for the switching station will be constructed utilising approximately 1 rigid concrete truck per footing.
- A total of approximately 78 trucks are expected to access the Project Area for the high voltage equipment, bus bar footings and other components.

- Fencing will also be constructed with 1 rigid concrete truck supplying approximately 15m worth of fencing, resulting in approximately 20 concrete trucks for the 300m switchyard perimeter.
- Upon completion of the earthworks, gravel surfacing to a depth of approximately 80-100mm will be required. The gravel volume will be approximately 1300 tonnes with each truck carrying approximately 15-20 tonnes, resulting in up to 87 trucks accessing the site.
- The high voltage equipment will be delivered on rigid flat-bed trucks, with approximately 1-2 pieces per truck. It is estimated that approximately 30 trucks will be required to access the site.
- One OSOM vehicle is expected to be required for the switching station to transport the building. The load will exceed 19m and will be transported by a semitrailer which is expected to be a Class 1 OSOM vehicle.
- In addition to the above there will be a number of standard trucks used for miscellaneous deliveries, rubbish, cables, steelwork, disposal etc. There will also be light vehicles associated with workers accessing the site for the length of construction.

4.2.1.3 OSOM vehicles

Restricted Access Vehicle / OSOM vehicles will also be required for the delivery of large plant and equipment as follows:

- OSOM vehicles which exceed the Class 1 mass and/or dimension requirements and are subject to separate permit applications and regulations. This includes vehicles associated with the delivery of the turbine components and substation transformers.

- Class 1 OSOM vehicles which can operate on the approved network outlined in Section 2.5.2 subject to travel conditions. It is understood the Applicant will also seek approval for Class 1 OSOM vehicles to utilise the relevant unrated sections of the network following determination of the Project.

Vehicles built for a purpose other than carrying goods such as a mobile crane, a concrete pump or drill rig are defined as Special Purpose Vehicles (SPVs) and may also be classified as OSOM vehicles.

The anticipated OSOM and SPVs to be utilised over the construction phases of the Project are summarised in Table 14, excluding the wind turbine component transport vehicles which are assessed separately in Section 6. The table shows that these vehicles would be spread across the construction period. It is noted that the peak traffic volumes associated with each vehicle may not coincide with other vehicles (i.e. the maximum number of vehicles per day is not the sum of all the vehicle volumes).

OSOM vehicles will contribute the smallest percentage of trips to the Project during the construction period and are subject to separate permit applications and regulations. The movement and impact of these vehicles, and the subsequent road upgrades required, are discussed within Section 6. The following assessment focuses on the impacts of the regular light and heavy vehicles outlined in Section 4.2.1.1 which generate the bulk of the traffic and represent the typical traffic impact of the project on a day-to-day basis.

Table 14: OSOM and SPVs (excluding wind turbine components)

Load Type	Load Vehicle	Construction Phase	Vehicles per Day (Peak)	Estimated Total No. of Trips
Over-Dimensional Vehicle Movements Requiring Pilot Vehicle Escort				
Earthmoving Plant	Low Loader	Bulk Earthworks	16	100
Crawler Crane - Body	Low Loader	Turbine Installation	5	40
Main Transformer	Prime Mover	Electrical Assembly	1	4
Switchroom Building	Prime Mover	Electrical Assembly	1	2
Subtotal			**23**	**146**
Over-Dimensional Vehicle Movements Not Requiring Escort				
Earthmoving Plant	Low Loader	Bulk Earthworks	20	230
Mobile Crane	Special Purpose Vehicle	Turbine Installation	10	35
Site Offices	Tilt Tray	Site Establishment	10	60
Concrete Boom Pump	Special Purpose Vehicle	Concrete Pours	2	600
Subtotal			**42**	**925**

4.2.2 Operational Traffic

During operation the wind farm is expected to generate a low level of traffic associated with maintenance and operation services. The Project will operate with approximately 16 employees on-site at any time and has an operational lifespan of 30 years. The Project is expected to generate up to 32 vehicles per day which would result in a negligible change to the road environment.

4.2.3 Decommissioning Traffic

At the end of the operational life of the Project all above ground infrastructure will be dismantled and removed from the Project Area. Internal roads, if not required for ongoing farming purposes or fire access, would be removed and the Project Area reinstated as close as possible to its original state.

Traffic generation during decommissioning would be similar to traffic generation during the average construction period. A comprehensive Traffic Management Plan would be prepared prior to the decommissioning phase in conjunction with the relevant road authorities. This would aim to ensure adequate road safety and road network operations are maintained.

4.3 Traffic Distribution

Vehicles travelling to/from the west (e.g. Tamworth) will utilise New England Highway and Oxley Highway to reach Walcha. Light vehicles will continue through the town centre to access the Project Area via Thunderbolts Way (Derby Street), while all heavy vehicles will bypass the town

centre via Saleyards Road and Darjeeling Road to access Thunderbolts Way. Vehicles travelling to/from the north (e.g. Uralla and Armidale) will utilise Thunderbolts Way.

All vehicles are proposed to access the Project Area from Walcha via Jamieson Street, Ohio Road, and Emu Creek Road. Light vehicles will then continue on Emu Creek Road and Winterbourne Road to access the northern and western portions of the Project Area, or Moona Plains Road to reach the southern and eastern portions. The majority of heavy vehicles will travel to the north along Winterbourne Road and would reach the various site access locations via the local road network and internal tracks, however a small number of heavy vehicles (average of 1 movement per day) may also utilise Moona Plains Road.

It is estimated that up to 24 vehicles per day (i.e. two-way trips) associated with the construction of the transmission line may periodically utilise Hillview Road to access the Project Area from Thunderbolts Way. The vehicles would generally travel toward the site in the morning and away from the site in the afternoon. It is noted that Hillview Road is not proposed to accommodate regular construction traffic, and the majority of vehicles are expected to be light vehicles with only a small number of heavy vehicles (average of 1 movement per day). The traffic generated by the project would be limited to a shorter time period in the order of up to 12 months. It is noted that a small proportion of the project traffic would also temporarily access the switching station on the western side of Thunderbolts Way, however for the purposes of the assessment all vehicles are conservatively considered to travel to/from the Project Area northeast of Walcha.

The following provides a breakdown of the access distribution for each of the construction vehicle classifications outlined within Table 12:

- Light Vehicles: It is estimated that 30% of staff will travel from the Tamworth area and 20% will be located in Walcha. These vehicles will access the Project from the west/south. It is anticipated that 40% of staff will travel from the Armidale area and 10% will travel from the Uralla area and will travel from the north.

- Rigid Trucks: These vehicles will predominantly transport materials such as steel which will be sourced within the surrounding area. The vehicle trips have been assumed to be distributed with 60% from the west/south and 40% from the north. It is noted that vehicle movements occurring internally within the Project Area, such as water trucks and the transport of quarry materials, are not included within the traffic volumes.

- Truck and Dog / Semitrailers / B-Doubles: The majority of plant and larger equipment will be transported via Newcastle and Tamworth from the west/south. It has been assumed that 70% will be transported from the west/south and 30% from the north.

During the morning peak all vehicles would travel towards the Project Area and in the evening peak all vehicles would travel away from the Project Area. Heavy vehicles would be distributed throughout the day and the number of inbound and outbound vehicles would be split evenly.

The resulting peak hour volumes generated by the Project are outlined in Figure 13 for the morning peak hour and Figure 14 for the evening peak hour.

Figure 13: Project Traffic – AM Peak

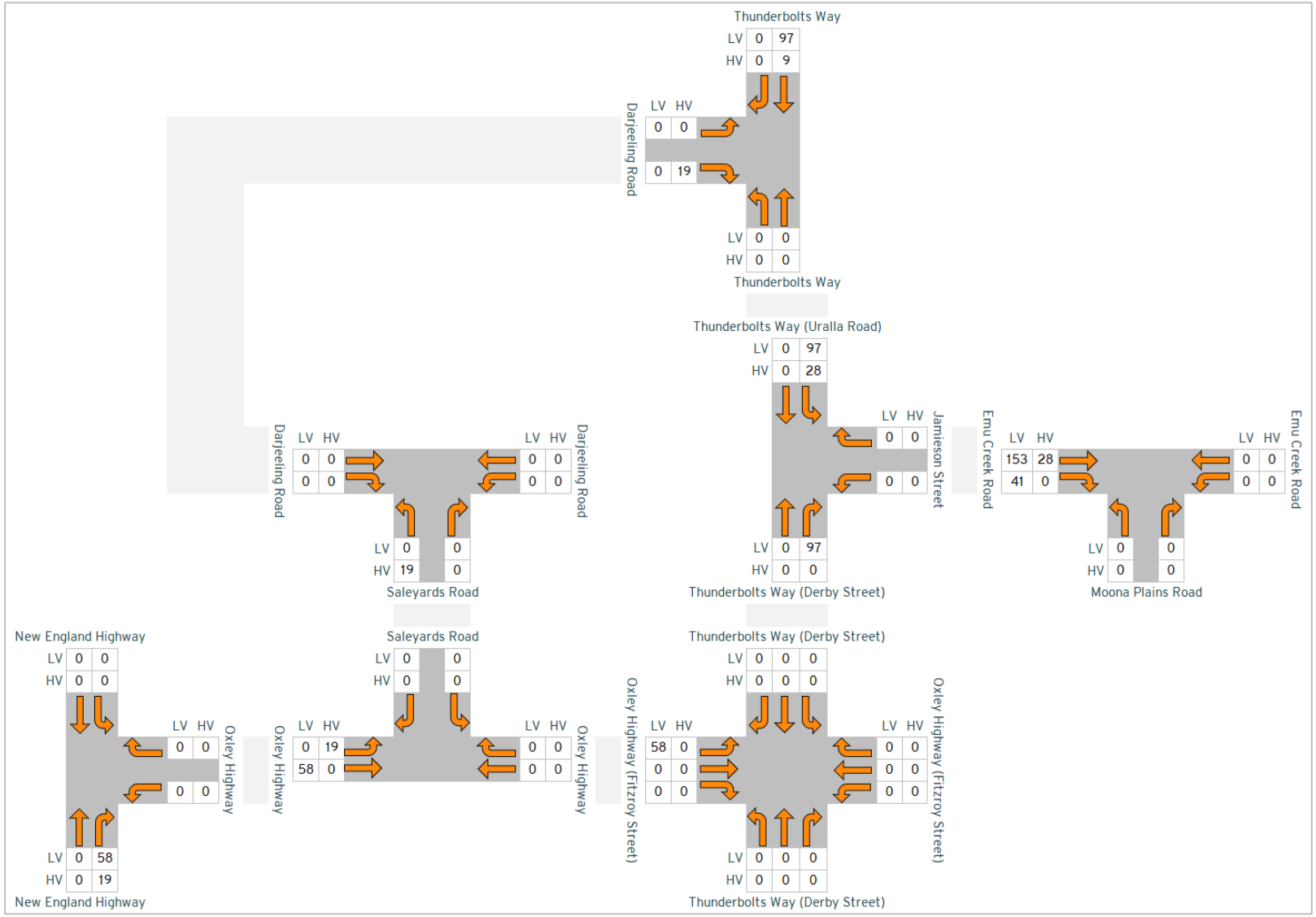
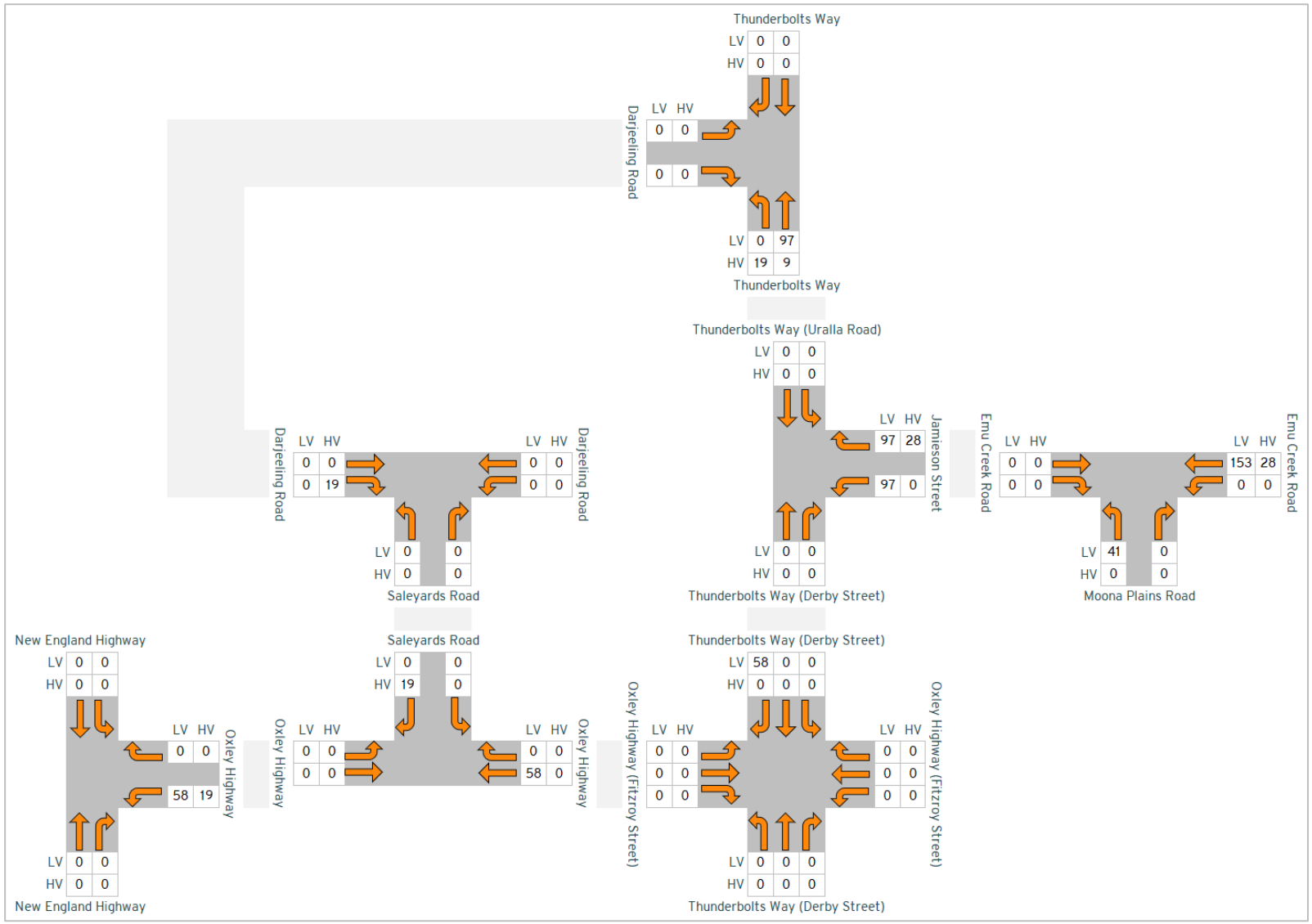


Figure 14: Project Traffic – PM Peak



4.4 Cumulative Traffic Impacts

The primary traffic impact of the wind farm is generated during construction which is anticipated to commence in 2026 and take approximately 52 months. An assessment of the cumulative traffic impacts of major projects that are proposed in the surrounding area is provided within Table 15, which provides a description of each project to determine the potential overlap of construction traffic. Projects which are highlighted in the table have the potential to generate additional vehicle movements along New England Highway and/or Oxley Highway during the construction period.

Table 15: Assessment of Cumulative Traffic Impacts of Nearby Developments

Project	Description	Potential Vehicle Conflict
Wind Projects		
Thunderbolt Wind Farm (Approved)	Development of a wind farm with up to 32 turbines and associated infrastructure in the Kentucky area approximately 47km northeast of Tamworth.	The construction periods for the projects could potentially overlap. Both projects are anticipated to have staff located in Armidale, Uralla, and Tamworth and will use part of the same transport route to deliver plant from the Port of Newcastle. The traffic generated by the projects may interact along New England Highway.
Hills of Gold Wind Farm (Approved)	The wind farm is located approximately 60km southeast of Tamworth and will provide approximately 65 turbines. Vehicles accessing the site will utilise the local road network that connects with New England Highway.	The construction periods for the projects could potentially overlap. The Hills of Gold Wind Farm may generate traffic along New England Highway south of Tamworth, and along Nundle Road east of Tamworth. These road sections are not anticipated to be utilised by general traffic associated with the Winterbourne Wind Farm. It is noted that OSOM vehicles may utilise these roads which would be carried out in accordance with the TMP and with pilot vehicles and police escort.
Rangoon Wind Farm (Prepare EIS)	The Rangoon Wind Farm comprises two parts, Rangoon Wind Farm South and Rangoon Wind Farm North. The project includes approximately 25 wind turbines and a battery energy storage system. The project is near the villages of Ben Lomond and Glencoe, approximately 60km north of Armidale and 40km south of Glen Innes.	The timing for the construction of this project is not reliably known as the project is still in the 'Prepare EIS' phase. It is expected that the construction phase of the project would commence after the completion of the Winterbourne project and there would be no overlap.
Solar Projects		
Oxley Solar Farm (Approved)	Amber Organisation has assisted in the preparation of a Traffic Assessment for the solar farm, which is located approximately 10km southeast of Armidale, to the south of Waterfall Way. Construction workers are proposed to be located in Armidale, with access proposed via Waterfall Way and Gara Road.	It is expected that the construction phase of the project would be completed before the start of construction of the Winterbourne project. Should the construction periods overlap, traffic generated by the projects may interact within the township of Armidale where staff for both projects are proposed to be located, although the peak periods will would not be likely to occur at the same time. During operation the projects are both expected to generate a minimal level of traffic.

Project	Description	Potential Vehicle Conflict
Bendemeer Solar Farm (Response to Submissions)	The solar farm is proposed to have a capacity of 210MW and will also include a battery energy storage system with an indicative capacity of 200MW. The site is located at 4409-4461 Oxley Highway and is situated 1.5 kilometres east of Bendemeer, with access to the site is proposed via a new connection with Oxley Highway. Staff are expected to primarily be located in Tamworth, with all plant expected to be delivered from Port of Newcastle.	There is potential for construction of both projects to overlap. The traffic generated by the projects may interact along New England Highway, Oxley Highway and within the townships of Armidale and Tamworth where staff for both projects are proposed to be located.
Tilbuster Solar Farm (Approved)	Amber Organisation has prepared a Traffic Assessment for the solar farm, which is located approximately 13km north of Armidale. Construction workers are proposed to be located in Armidale, with access proposed via New England Highway.	There is potential for construction of both projects to overlap, though it is possible that construction of the solar farm would be completed prior to commencement of construction of the proposed wind farm. The traffic generated by the projects may interact along New England Highway and within the township of Armidale where staff for both projects are proposed to be located.
Middlebrook Solar Farm (Assessment)	Amber Organisation has prepared a Traffic Assessment for the solar farm, which is located approximately 16km south of Tamworth. Construction workers are proposed to be located in Tamworth, with access proposed via Middlebrook Road which will connect with New England Highway.	There is potential for construction of both projects to overlap. The traffic generated by the projects may interact within the township of Tamworth where staff for both projects are proposed to be located. Upgrades are proposed to the intersection of Middlebrook Road / New England Highway to allow vehicles to turn safely from the state road.
Nottingham Park Solar Farm (Prepare EIS)	Development of a 250MW solar farm, associated infrastructure and battery storage located approximately 15km west of Tamworth.	The timing for the construction of this project is not reliably known. Should the construction periods overlap, the traffic generated by the projects may interact within Tamworth.
Other Development		
Armidale East BESS (Prepare EIS)	Development of a 500 MW / 1000 MWh BESS with associated infrastructure located east of Armidale.	There is potential for construction of both projects to overlap. The traffic generated by the projects may interact within the township of Armidale where staff for both projects are proposed to be located.
Eathorpe BESS (Prepare EIS)	Development of a 100 MW / 200 MWh BESS at 112 Eathorpe Road in Armidale with associated infrastructure and connection works.	There is potential for construction of both projects to overlap. The traffic generated by the projects may interact within the township of Armidale where staff for both projects are proposed to be located.

Project	Description	Potential Vehicle Conflict
Oven Mountain Pumped Hydro Energy Storage Project (Response to Submissions)	Development of a 900 MW pumped hydro energy storage and generation project, grid connection and ancillary infrastructure located in Carrai.	There is potential for construction of both projects to overlap. The traffic generated by the projects may interact within the township of Armidale. Temporary accommodation will be required for the construction workforce which will be identified during detailed design and EIS preparation and may be outside the project area. Broader transport logistics options are still under consideration and may include the use of local ports, including the Port of Newcastle.
Tamworth BESS (Response to Submissions)	Development of a 200 MW battery energy storage facility with associated infrastructure located on Burgmanns Lane to the south of Tamworth.	There is potential for construction of both projects to overlap. The traffic generated by the projects may interact within the township of Tamworth where staff for both projects are proposed to be located.
Kingswood BESS (Collate Submissions)	Development of a 500MW / 1000MWh BESS and associated infrastructure approximately 6km southeast of Tamworth. Construction is anticipated to commence in late 2025 and would take up to 15 months to complete.	There is potential for construction of both projects to overlap. The traffic generated by the projects may interact within the township of Tamworth where staff for both Projects are proposed to be located.

The above assessment indicates that a number of projects are expected to generate additional vehicle movements within the towns of Armidale and Tamworth. These vehicle movements would be distributed on the surrounding road network and are expected to have a minimal cumulative impact on the operation of the road network.

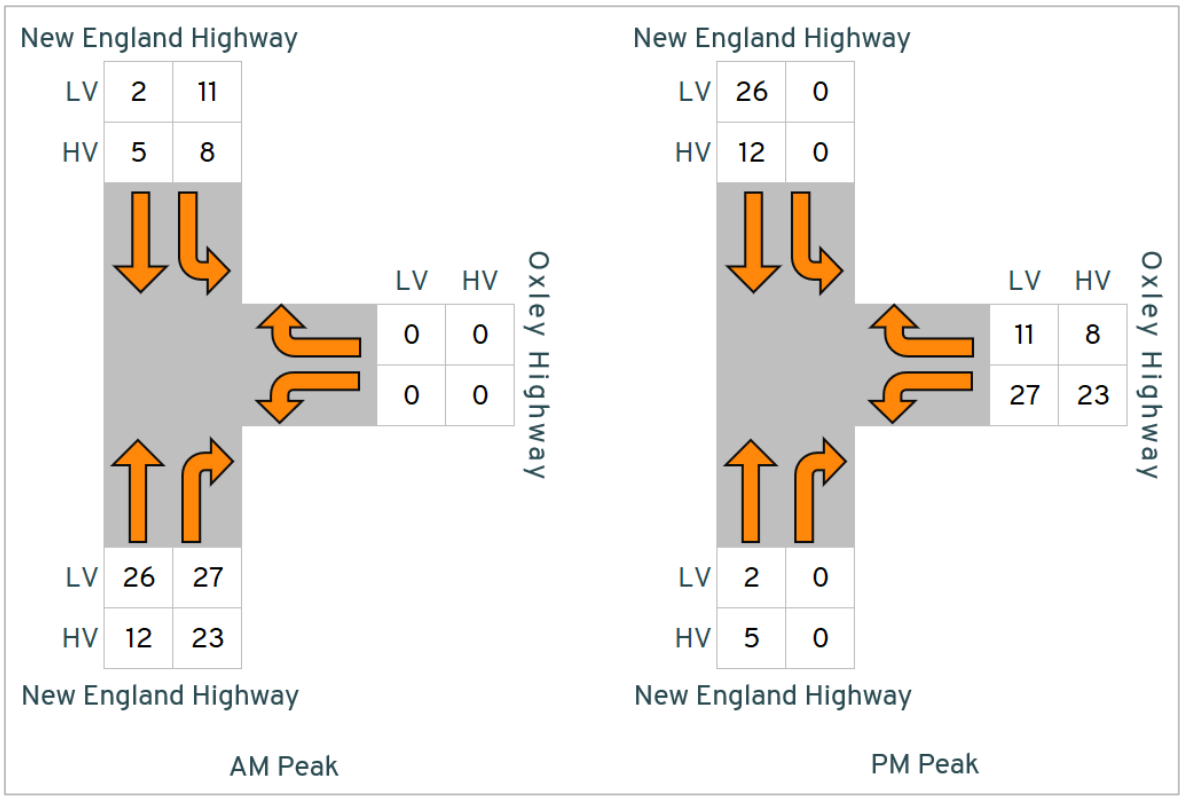
The following projects which are highlighted in the table have the potential to generate additional vehicle movements along New England Highway and/or Oxley Highway during the construction period:

- Thunderbolt Wind Farm;
- Bendemeer Solar Farm; and
- Tilbuster Solar Farm.

Figure 15 shows the additional cumulative traffic generated at the New England Highway / Oxley Highway intersection by these projects based on the Traffic Impact Assessments available for each project.

It is noted that there are no cumulative traffic impacts expected along Thunderbolts Way or the local road network near the Project Area.

Figure 15: Additional Peak Hour Cumulative Traffic Volumes



4.5 Traffic Assessment

4.5.1 Intersection Performance

In order to determine the ability of the road network to accommodate the traffic expected to be generated during the peak construction period, a traffic modelling exercise has been undertaken for the following intersections using the SIDRA intersection modelling software:

- New England Highway / Oxley Highway.
- New England Highway (Bridge Street) / Salisbury Street.
- Fitzroy Street / Derby Street.
- Thunderbolts Way / Darjeeling Road.
- Thunderbolts Way (Uralla Road and Derby Street) / Jamieson Street.

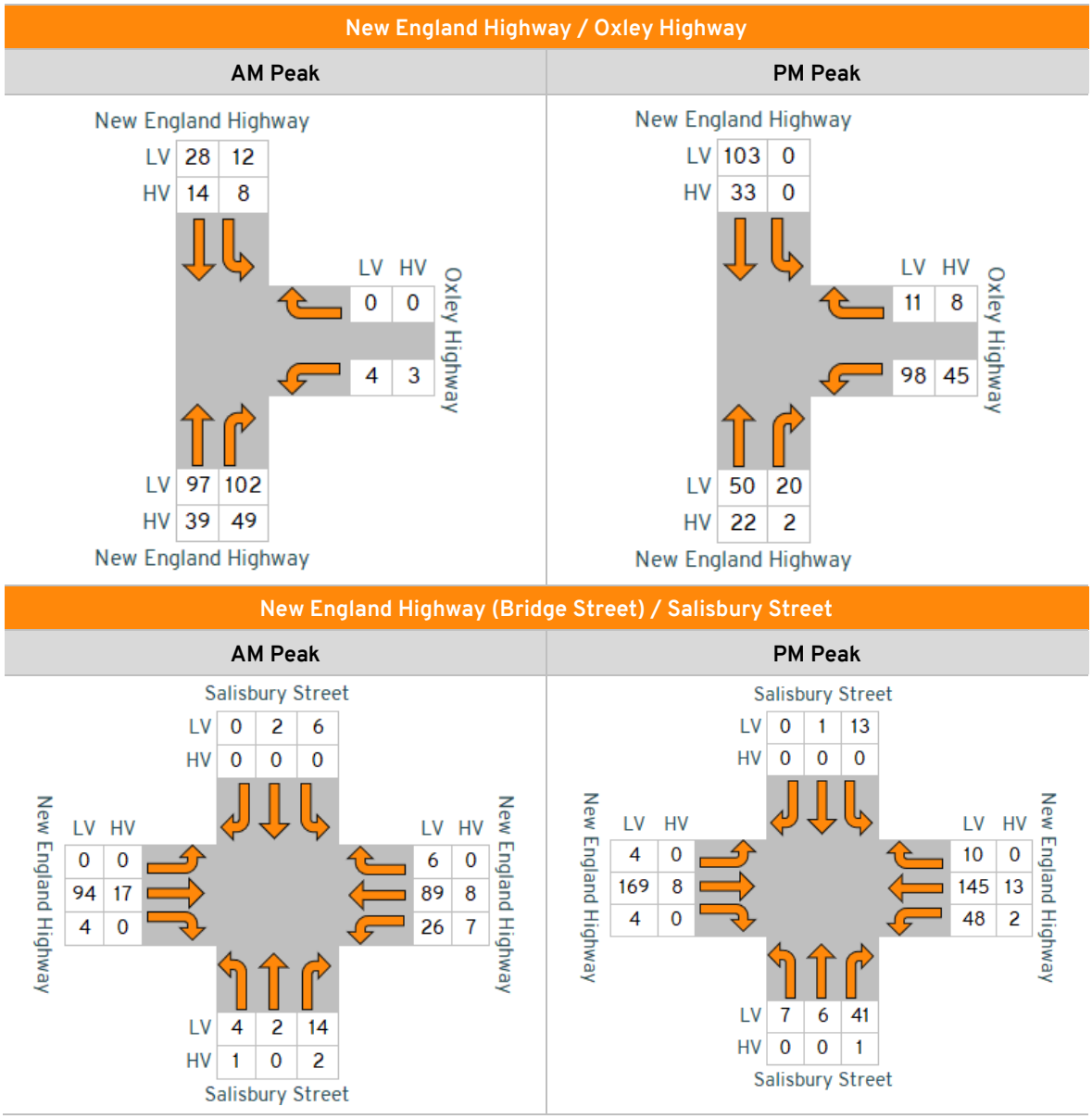
Level of Service is a qualitative measure used to describe the operating conditions of a section of road or an intersection. Levels of Service are designated from A to F from best (free flow conditions) to worst (forced flow with stop start operation, long queues and delays) and represent the perception of the road conditions by motorists including speed and travel time, freedom to manoeuvre, traffic interruptions, comfort and convenience, and safety. The assessment of the level of service for sign-controlled intersections is based on the average delay (seconds/vehicle) of the critical movement.

The modelled traffic volumes at each intersection have been based on the morning peak hour of construction (6:00am to 7:00am) and evening peak hour (6:00pm to 7:00pm). The traffic volumes consist of the sum of the following:

- Existing surveyed traffic volumes in Appendix F adjusted by an estimated 1.5% compounded annual growth rate over 7 years to reflect the end of the construction period in 2030;
- Construction traffic volumes outlined within Figure 13 and Figure 14; and
- Cumulative traffic volumes from nearby projects outlined in Figure 15.

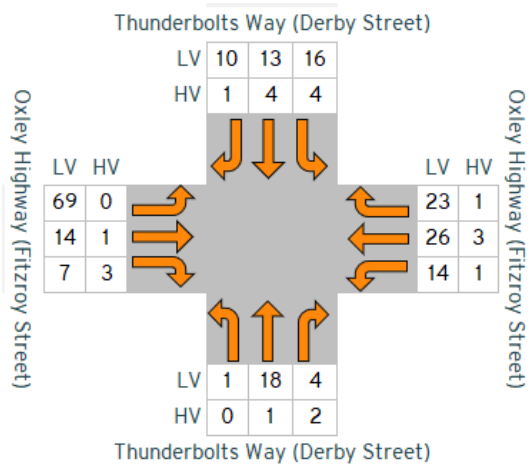
The resulting total traffic volumes used for the assessment are provided in Figure 16.

Figure 16: Peak Hour Volumes During Peak Construction

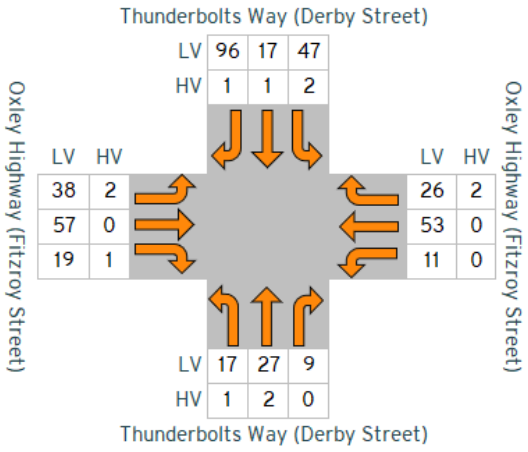


Fitzroy Street / Derby Street

AM Peak

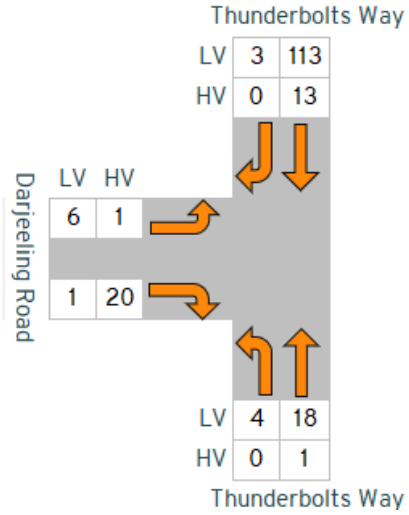


PM Peak

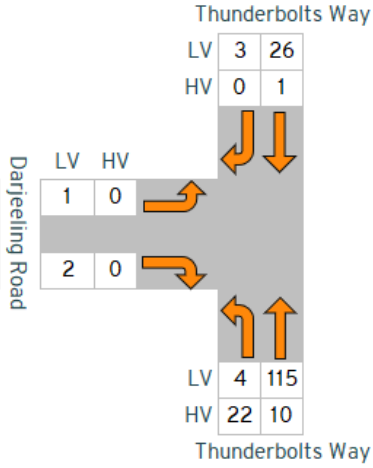


Thunderbolts Way / Darjeeling Road

AM Peak

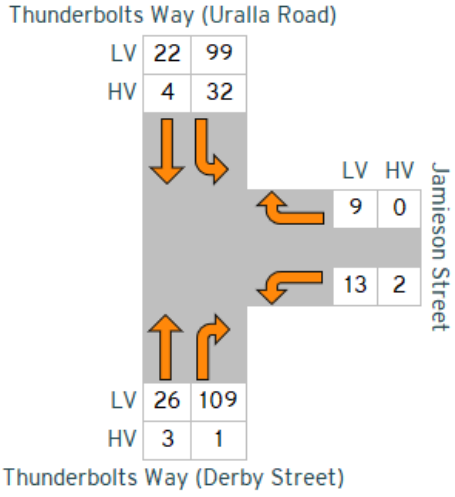


PM Peak

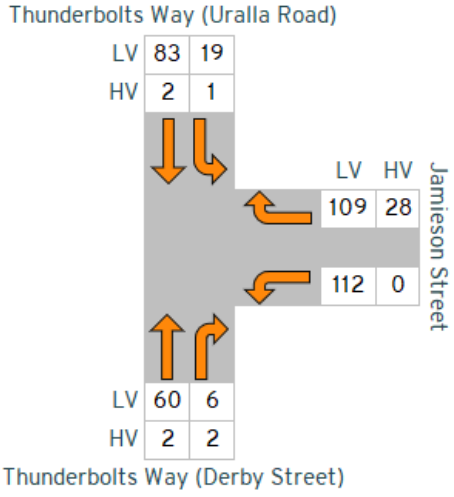


Thunderbolts Way (Uralla Road & Derby Street) / Jamieson Street

AM Peak



PM Peak



The results of the SIDRA analysis for the morning and evening peak hours at each intersection are provided within Appendix I and summarised in Table 16.

Table 16: SIDRA Analysis Results Summary

Approach	Movement	Morning Peak Hour			Evening Peak Hour		
		Average Delay (sec)	95% Queue (m)	Level of Service	Average Delay (sec)	95% Queue (m)	Level of Service
New England Highway / Oxley Highway							
New England Hwy (South)	Through	0.0	0.0	A	0.0	0.0	A
	Right	8.6	4.8	A	8.2	0.5	A
Oxley Hwy (East)	Left	9.2	0.3	A	9.4	6.0	A
	Right	9.9	0.3	A	11.5	6.0	A
New England Hwy (North)	Left	8.9	0.0	A	7.8	0.0	A
	Through	0.0	0.0	A	0.0	0.0	A
New England Highway (Bridge Street) / Salisbury Street							
Salisbury Street (Southeast)	Left	5.2	1.0	A	5.3	2.7	A
	Through	5.3	1.0	A	6.9	2.7	A
	Right	7.4	1.0	A	9.2	2.7	A
New England Hwy (Northeast)	Left	4.8	0.0	A	4.6	0.0	A
	Through	0.0	0.0	A	0.0	0.0	A
	Right	4.9	0.1	A	5.1	0.2	A
Salisbury Street (Northwest)	Left	5.0	0.2	A	5.3	0.4	A
	Through	5.4	0.2	A	6.9	0.4	A
	Right	6.6	0.2	A	8.3	0.4	A
New England Hwy (Southwest)	Left	4.6	0.0	A	4.6	0.0	A
	Through	0.0	0.0	A	0.0	0.0	A
	Right	4.9	0.1	A	5.2	0.1	A

Approach	Movement	Morning Peak Hour			Evening Peak Hour		
		Average Delay (sec)	95% Queue (m)	Level of Service	Average Delay (sec)	95% Queue (m)	Level of Service
Fitzroy Street / Derby Street							
Derby Street (South)	Left	2.8	0.8	A	3.4	1.9	A
	Through	2.5	0.8	A	3.2	1.9	A
	Right	6.1	0.8	A	6.4	1.9	A
Fitzroy Street (East)	Left	2.7	2.0	A	3.2	3.0	A
	Through	2.4	2.0	A	2.9	3.0	A
	Right	5.7	2.0	A	6.3	3.0	A
Derby Street (North)	Left	2.8	1.6	A	3.0	5.2	A
	Through	2.5	1.6	A	2.7	5.2	A
	Right	5.7	1.6	A	5.9	5.2	A
Fitzroy Street (West)	Left	2.7	2.7	A	2.8	3.5	A
	Through	2.5	2.7	A	2.5	3.5	A
	Right	6.0	2.7	A	5.9	3.5	A
Thunderbolts Way / Darjeeling Road							
Thunderbolts Way (Southeast)	Left	7.8	0.0	A	10.0	0.0	A
	Through	0.0	0.0	A	0.0	0.0	A
Thunderbolts Way (Northwest)	Through	0.0	0.1	A	0.1	0.1	A
	Right	7.4	0.1	A	7.9	0.1	A
Darjeeling Road (Southwest)	Left	5.8	1.4	A	5.9	0.1	A
	Right	7.9	1.4	A	6.0	0.1	A
Thunderbolts Way (Uralla Road & Derby Street) / Jamieson Street							
Derby Street (South)	Left	5.0	3.1	A	4.5	0.4	A
	Right	5.1	3.1	A	4.8	0.4	A
Jamieson Street (East)	Left	4.8	0.5	A	4.9	7.1	A
	Right	4.9	0.5	A	5.2	7.1	A
Uralla Road (Northwest)	Left	4.8	1.6	A	4.5	2.1	A
	Right	4.6	1.6	A	4.1	2.1	A

The SIDRA analysis indicates each intersection is expected to operate with minimal queue lengths on all legs and LOS A for all movements. Accordingly, each intersection is expected to continue to operate efficiently with minimal queuing and delays expected during the peak construction period.

4.5.2 Carriageway Level of Service

Table 4.5 of the RTA Guide sets out two-way hourly road capacities for two-lane roads for different levels of service and based on different terrain types. The maximum volume to achieve LOS A for a rolling terrain rural road (40% no overtaking opportunities) with approximately 15% heavy vehicle traffic is in the order of 310 vehicles per hour. For the purposes of the assessment, it has conservatively been assumed that the capacity of all unsealed roads is reduced by 50%.

An assessment has been carried out on the mid-block sections of the surrounding road network for the peak construction traffic volumes as outlined in Table 17. The assessment demonstrates that all roads will continue to operate with a LOS A and can readily accommodate the construction traffic volumes.

Table 17: Peak Construction Period Carriageway Capacity Assessment

Road Segment	Existing Peak Hour Traffic Volume (vph)	Project Traffic Generation (vph)	Existing and Project Traffic Volume (vph)	LOS
Oxley Highway	62	77	139	A
Thunderbolts Way	112	125	237	A
Jamieson Street	72	222	294	A
Moona Plains Road	6	30	36	A
Rowleys Creek Road	2	36	38	A
Winterbourne Road	4	109	113	A
Bark Hut Road	3	80	83	A
Table Top Road	3	19	22	A
Blue Mountain Road	4	41	45	A
Uruga Road	2	4	6	A

4.6 Summary

The Project is expected to generate the highest level of traffic during the peak construction period. The assessment presented above indicates that the road network is able to accommodate the Project traffic during the peak construction period. All intersections are expected to operate within minimal queues and delays, and the mid-block sections within the vicinity of the site are expected to continue to operate with a good level of service. The assessment also included a review of the cumulative traffic generated by other major Projects within the surrounding area.

During construction the traffic volumes throughout the middle of the day are expected to be predominantly associated with heavy vehicles with an average of up to 11 vehicles per hour. This increase in traffic can be readily accommodated on the road network given the existing low traffic volumes particularly outside of peak times.

During operation the periodic increase in traffic of up to 32 vehicles per day would result in a negligible change to the traffic environment.

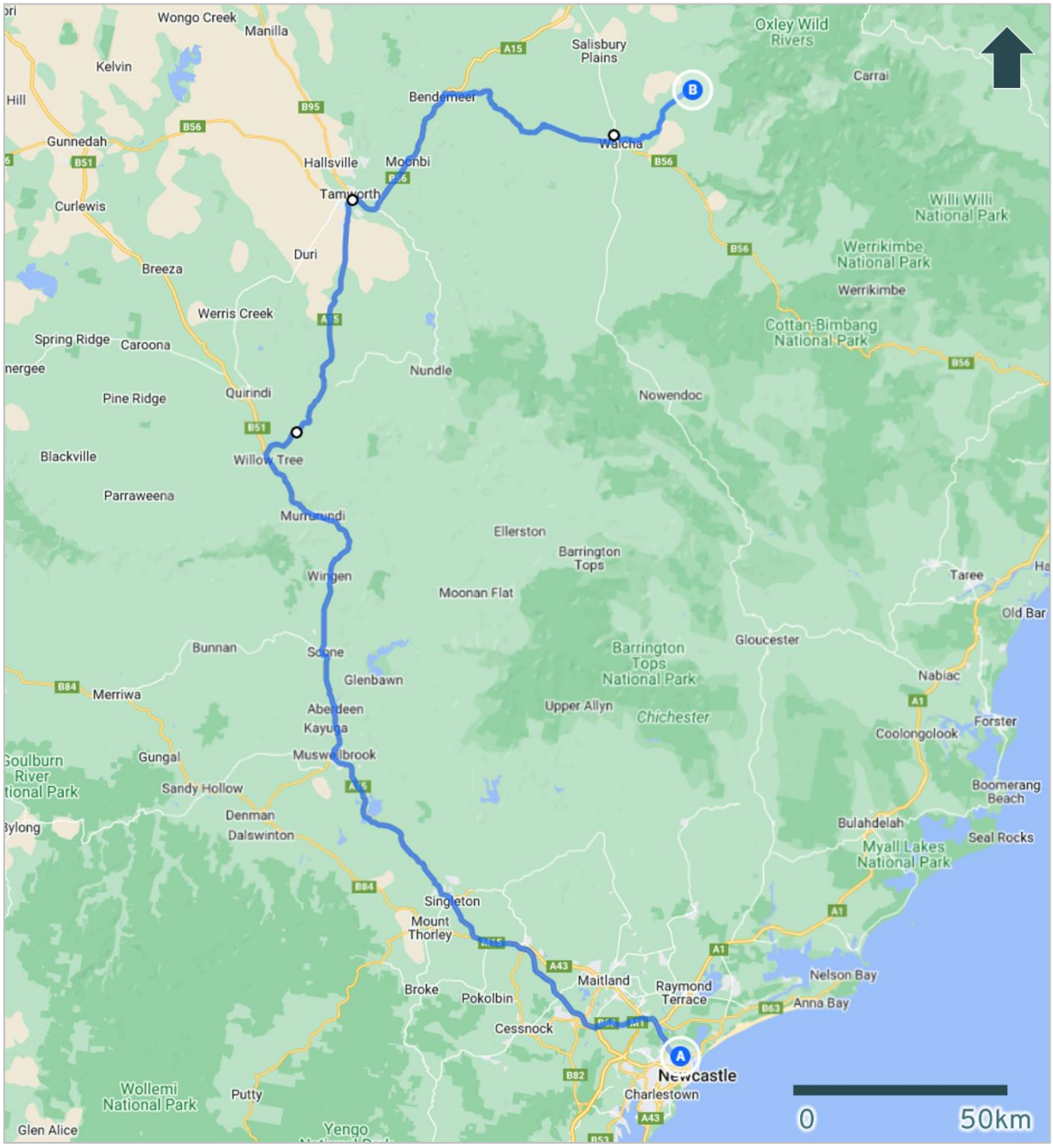
Accordingly, the road network is able to readily accommodate the traffic generated by the Project during the construction, operation, and decommissioning periods.

5. Heavy Vehicle Route Assessment

5.1 Access Route (GAV and B-Doubles)

The following provides a review of the access routes associated with the delivery of plant from the Port of Newcastle using General Access Vehicles and B-Doubles (excludes OSOM vehicles which are assessed separately in Section 6). The proposed construction traffic access route to the site is outlined in Figure 17 with a summary of the relevant roads provided in Table 18.

Figure 17: Heavy Vehicle Access Route from the Port of Newcastle (excludes OSOM)



Source: Google Maps - Link

Table 18: Heavy Vehicle Route – Access Roads (excludes OSOM)

Road Name	Jurisdiction	B-Double Approved
Industrial Drive	TfNSW	Approved
John Renshaw Drive		
Hunter Expressway		
New England Highway		
Oxley Highway		
Saleyards Road	Walcha Council	
Darjeeling Road		
Thunderbolts Way		
Jamieson Street		
Ohio Road		
Emu Creek Road		
Winterbourne Road		
Local Road Network Connections to Project Area		

The access route utilises roads that are designated for B-Double vehicles as outlined within the TfNSW Restricted Access Vehicle Map. Accordingly, the roads along the access route are able to accommodate the heavy vehicle traffic to be generated during construction of the Project.

5.2 Local Road Network

An assessment of the local road network has been carried out by Constructive Solutions to review the existing conditions along each road and identify any road upgrades required to accommodate the Project traffic. A copy of the report is provided within Appendix C which includes a schedule of the proposed road upgrades for each road.

The Constructive Solutions report indicates the following local road sections are proposed to be widened to provide a minimum carriageway width of 6.2m with a minimum shoulder width of 0.5m and additional shoulder widening as per swept path requirements on any curves:

- Emu Creek Road.
- Winterbourne Road.
- Bark Hut Road.
- Blue Mountain Road between Winterbourne Road and Hazeldean Road.
- Uruga Road (southern portion, approximately 700m from Hazeldean Road).
- Table Top Road between Florida Road and Site Entrance 6 (including bridge bypass).
- Florida Road (northern portion, approximately 500m from Table Top Road).
- Rowleys Creek Road (900m section).

The proposed carriageway width has considered the requirements of *Austroads Guide to Road Design Part 3: Geometric Design* and would allow opposing vehicles to pass along each road. It is noted that Jamieson Street and Ohio Road are already provided with total road widths of approximately 13.5m which are sufficient to accommodate passing vehicles.

It is proposed to maintain the existing carriageway widths along the following local roads as outlined in Table 19.

Table 19: Local Road Network Assessment Summary

Local Road	Project Vehicles	Existing Road Width	Peak Hour Proposed Traffic (vph)	Assessment
Moona Plains Road	LV, HV	5.3-6.0m	36	Existing road width is sufficient to accommodate light vehicles and low levels of heavy vehicle traffic (average 1 movement per day) which would generally travel during the middle of the day. The Applicant has advised that suitable traffic management measures will be implemented if required to coordinate vehicle movements in each direction.
Blue Mountain Road between Hazeldean Road and Hillview Road	LV, HV	3.1-6.0m	45	Not proposed for regular use by project traffic. Existing road width is sufficient to accommodate light vehicles and low levels of heavy vehicle traffic (average 1 movement per hour) which would generally travel during the middle of the day. The Applicant has advised that suitable traffic management measures will be implemented if required to coordinate vehicle movements in each direction.
Table Top Road between Winterbourne Road and Florida Road	LV	4.0-5.7m	22	Existing road width is sufficient to accommodate low levels of light vehicle traffic which would generally be tidal i.e. arriving in the morning and departing in the afternoon.
Hillview Road	LV, HV (transmission line)	3.1-6.0m	9	Not proposed for regular use by project traffic. Existing road width is sufficient to accommodate light vehicles and low levels of heavy vehicle traffic (average 1 movement per hour) which would generally travel during the middle of the day. It is noted that no B-Doubles are proposed to utilise the road. The Applicant has advised that suitable traffic management measures will be implemented if required to coordinate vehicle movements in each direction.

Assessment and design of each local road intersection has been undertaken by icubed consulting and is provided in Appendix B:

- Winterbourne Road / Blue Mountain Road
- Winterbourne Road / Bark Hut Road
- Winterbourne Road / Table Top Road

- Emu Creek Road / Moona Plains Road
- Table Top Road / Florida Road

Each intersection has been designed to accommodate two-way vehicle movement for B-Double construction vehicles and OSOM vehicle movements where relevant.

Accordingly, the proposed upgrades to the local road network are considered acceptable to accommodate the traffic movements generated by the Project.

5.3 Unsealed Road Network

The *Australian Road Research Board Best Practice Guide for Unsealed Roads 2* (ARRB Guide), dated October 2020, provides a breakdown of the unsealed road classifications based on a functional classification system which is reflective of the approach taken within the Austroads Guidelines. It is noted that the traffic volumes refer to Average Daily Traffic (two-way). A summary of the classifications outlined within Table 3.9 of the ARRB Guide is provided below.

Table 20: Unsealed Roads Classification System (ARRB Guide)

Road Class	Class Type	Service Function Description	Road Type Description
4A	Main Road > 150 vpd	This type of road is used for major movements between population centres and connection to adjacent areas. High traffic volumes occur, and the road can carry large vehicles.	• All weather road, predominantly two-lane and unsealed. Can be sealed if economically justified. • Operating speed standard of 50–80 km/h according to terrain. • Minimum carriageway width is 7m.
4B	Minor Road 50-150 vpd	This type of road is used for connection between local centres of population and links to the primary network.	• All-weather two-lane road formed and gravelled or single-lane sealed road with gravel shoulders. • Operating speed standard of 30–70 km/h according to terrain. • Minimum carriageway width is 5.5m.
4C	Access Road 10-50 vpd	Provides access to low use areas or individual rural property sites and forest areas. Caters for low travel speed and a range of vehicles and may be seasonally closed.	• Substantially a single lane two-way, generally dry weather, formed road. • Operating speeds standard of < 20–40 km/h according to terrain. • Minimum carriageway width is 4m.
4D	Tracks < 10 vpd	Mainly used for fire protection purposes, management access and limited recreational activities.	• Predominantly a single-lane two-way earth track (unformed) at or near the natural surface level. • Predominantly not conforming to any geometric design standards. • Minimum cleared width is 3m.

Unsealed roads would typically be considered for sealing when they accommodate between 200 and 500 vpd. The ARRB Guide notes that roads may warrant paving when maintenance costs increase to unacceptable levels, in wet climates, or when economic or social benefits are evident.

The anticipated daily traffic volumes along the unsealed local road network are provided in Table 21.

Table 21: Assessment of Unsealed Local Roads

Unsealed Road Segment	Existing Daily Traffic (vpd)	Project Traffic Generation (vpd)	Existing and Project Traffic Volume (vpd)
Blue Mountain Road	30	138	168
Uruga Road	20	11	31
Bark Hut Road	30	276	306
Table Top Road	30	65	95
Florida Road	20	65	85
Rowleys Creek Road	20	119	139
Hillview Road	30	24	54

The assessment demonstrates that the unsealed road network is not anticipated to accommodate more than 500 vehicles per day during peak construction. Given the low expected traffic volume on the unsealed roads and as the increase in traffic is only temporary it is considered acceptable for the roads to remain unsealed. However, it is noted that the Applicant is proposing to seal the first 1.2 km (approximately) of Bark Hut Road to mitigate potential noise and dust impacts for nearby residential dwellings, subject to agreement and discussion with Walcha Council.

5.4 Mitigation Measures

A TMP is to be developed which is recommended to include the following measures to minimise the impact of construction traffic:

- Prior to construction, a pre-condition survey of the relevant sections of the existing road network should also be undertaken in consultation with Council. During construction the sections of the road network utilised by the proposal are to be monitored and maintained to ensure continued safe use by all road users, and any faults attributed to construction of the Project would be rectified. At the end of construction, a post-condition survey would be undertaken to ensure the road network is left in a condition equivalent to that at the start of construction.
- Neighbours of the wind farm are to be consulted and notified regarding the timing of major deliveries which may require additional traffic control and disrupt access.
- Heavy vehicles should avoid travel during peak school bus times to limit the interaction of larger vehicles and vulnerable road users.

Therefore, it is concluded that based on implementation of these and other mitigation measures to be outlined in the TMP, the road network will be suitable to accommodate the future light and heavy vehicle traffic volumes generated by the Project.

6. OSOM Vehicle Route Study

The Port of Newcastle is the preferred port where the wind turbine components, substations and large plant will be imported and then transported by road to the site. The following provides an assessment of the proposed route by vehicles transporting the OSOM loads and the impact of the relevant transport vehicles. The assessment considers the following categories of OSOM vehicle movement which will be generated by the Project:

- Turbine Components Requiring Pilot Vehicle Escort (Section 6.1).
- Other OSOM Transport Requiring Pilot Vehicle Escort (Section 6.2).
- OSOM Transport Not Requiring Escort (Section 6.3).

6.1 Turbine Components Requiring Pilot Vehicle Escort

6.1.1 Load Details

Dimensions and loads for the major components of the turbines and associated infrastructure to be transported from the Port of Newcastle to the Project are detailed in Table 22.

Table 22: Turbine Components - Load Dimensions and Masses

Component	Height	Width	Length	Weight
Blades	4.0m	4.5m	81.1m	32.0T
Hub	4.0m	4.5m	5.0m	64.0T
Nacelle	4.4m	4.2m	18.1m	84.0T
Power Train	3.4m	3.0m	8.1m	97.0T
Tower*	4.0-5.5m	4.2-5.9m	9.3-30.0m	66.0-89.0T

***** The tower is comprised of eight sections with varying diameters and weights

All components will require pilot vehicle escort. A Route Study has been prepared by Rex J Andrews Pty Ltd (RJA Report) for the transport of the wind turbine components and is provided in Appendix A. Rex J Andrews Pty Ltd is a transportation company that has extensive experience providing specialised transport services for similar wind farm projects throughout NSW.

6.1.2 Typical Delivery Vehicles

Restricted Access Vehicles (RAVs) (i.e. OSOM vehicles) will be used to deliver the turbine components to the Project. Whilst these vehicles will contribute the smallest percentage of traffic to the Project Area during the construction period, they present challenges due to their size from a vehicle access perspective and would require some road and intersection upgrades to the existing network.

The largest components to be transported to the site are the wind turbine blades and tower sections. The blades would be transported in one piece and form the longest component, while the towers are comprised of several sections which can be assembled on-site however, each section generally forms a wide cylindrical load shape.

The typical OSOM vehicle configurations to be used to transport each of the turbine components are illustrated within the RJA Report. The final selection of transport vehicle would be considered in consultation with authorities as part of the development of the Traffic Management Plan and route approvals. This assessment has been undertaken based on the vehicles provided within the RJA Report which is understood to represent the worst-case scenario. It is expected that an independent steerable rear trailer may be utilised which would improve vehicle manoeuvrability. The turbine blades would also be transported using an extendable trailer which would significantly reduce turning constraints on the return journey.

6.1.3 OSOM Traffic Volumes

The overall traffic generation per wind turbine is expected to be between 15 to 20 trucks. Out of this, it is expected that a maximum of 13 trucks will be OSOM vehicles with the remainder being general heavy vehicles (e.g. flatbed trucks or articulated vehicles). The turbine deliveries are expected to occur over approximately 30 months. A breakdown of the OSOM traffic volumes and vehicle arrangements associated with the turbine components is provided in Table 23.

Table 23: Wind Turbine Components - OSOM Traffic Volumes and Vehicle Configurations

Component	Vehicle Configuration	One-Way OSOM Vehicles	Approx. Duration	Average Deliveries per Month
Blades	Prime mover with 3x8 3x8 Extending Platform	354	30 months	11
Hub	Prime mover with 2x8 5x8 Platform	118		4
Nacelle	Prime mover with 4x8 4x8 Extending Platform	118		4
Power Train	Prime mover with 8x8 Platform	118		4
Tower Sections	Prime mover with 5x8 5x8 Bookend (lower sections) Prime mover with 4x8 5x8 Extending Platform (middle sections) Prime mover with 4x4 Dolly and 3x8 Jinker trailer (top sections)	826		27
Total		**1,655**		**50**

At least two pilot vehicles will accompany each OSOM vehicle to guide the vehicle and manage traffic under the direction of police. Police vehicles will provide traffic management at 'pinch points' as identified in the RJA Report. The OSOM vehicles will leave at specific intervals and regroup at specific pinch points to allow police to implement the required traffic management, such as road closures. This will be detailed in a Traffic Management Plan to be prepared prior to the commencement of construction in consultation with TfNSW and relevant councils.

6.1.4 Access Route

The following provides an assessment of the proposed access routes for the turbine components from the Port of Newcastle. Each access route is outlined within the RJA Report provided within Appendix A with a summary provided in Table 24. It is noted that Oxley Highway is not proposed for use by OSOM vehicles due to concerns raised by the local community as well as constraints associated with Surveyors Creek Bridge. The proposed route instead continues north from Bendemeer along New England Highway before heading east along Staces Road with a section of new road proposed through an easement to connect with Thunderbolts Way.

Table 24: Wind Turbine Components – OSOM Access Routes

Ref.	Component	Distance (km)	Route Overview		Map Link
			Roads	Authority	
Port of Newcastle to Walcha					
1	Blades, Towers, Nacelle >5.2m overall height	448	1. Selwyn Street	Port Authority	*Route 1*
			2. George Street	City of Newcastle	
			3. Industrial Drive 4. Maitland Road 5. New England Highway 6. John Renshaw Drive 7. Hunter Expressway 8. New England Highway 9. Golden Highway 10. Denman Road	TfNSW	
			11. Bengalla Road 12. Wybong Road 13. Kayuga Road 14. Ivermein Street 15. Stair Street 16. Dartbrook Mine Access Road	Muswellbrook Shire	
			17. New England Highway	TfNSW	
			18. Staces Road (plus extension through Crown Land)	Uralla Shire	
			19. Thunderbolts Way	Uralla Shire / Walcha Council	
			20. Jamieson Street	Walcha Council	
2	Powertrain, Hub, other components <5.2m overall height	406	*Roads 1-8 as per Route 1 above*		*Route 2*
			9. Bell Street 10. Victoria Street	Muswellbrook Shire	
			Route continues onto New England Highway at Roads 17-20 as per Route 1 above.		
Alternative Route through Tamworth					
3	Blades	11.7	1. Whitehouse Lane 2. Marsden Park Road 3. O'Briens Lane 4. Nundle Road	Tamworth Regional Council	*Route 3*
Walcha to Site Access Locations					
A	Northern Site Access – All Components	22	1. Jamieson Street 2. Emu Creek Road 3. Winterbourne Road 4. Blue Mountain Road	Walcha Council	*Route A*
B	Eastern Site Access – All Components	28	*Roads 1-3 as per Route A above*		*Route B*
			4. Bark Hut Road / Table Top Road / Florida Road (various site entrances)	Walcha Council	

The access route will depart from the Port of Newcastle via the local road network which connects with the State Road network at Industrial Drive. The route then utilises the State Road network to travel toward the northwest via New England Highway. A detour is proposed in order to avoid the Muswellbrook township via Golden Highway, Denman Road and various local roads. North of Muswellbrook, the route travels along New England Highway to reach Staces Road south of Uralla, where vehicles will head east to reach Thunderbolts Way before continuing south into Walcha. All OSOM vehicles will then access the Project Area via Jamieson Street, Emu Creek Road and Winterbourne Road, before either heading north on Blue Mountain Road or east along Table Top Road to reach the various site access locations.

A design has been prepared by icubed consulting for the proposed new section of road extending from Staces Road to Thunderbolts Way. The new section of road is proposed to accommodate OSOM vehicles associated with the Project only, and gates are proposed to be installed to prevent access for general traffic from both directions. The design is provided within Appendix J and includes swept path assessment of the relevant OSOM vehicles.

6.1.5 Route Survey

RJA completed a route survey along the transportation routes from the Port of Newcastle to the site access locations. This includes a swept path analysis for the transportation of the turbine blades at key locations along the access route in order to identify 'pinch points' and areas where vehicles are able to pull over for fatigue breaks or emergency parking.

As part of the 'pinch point' identification, Rex J Andrews Pty Ltd also identified a number of infrastructure upgrades to facilitate the proposed OSOM movements which are presented in Appendix A. These identified 'pinch points' have been used to form the required traffic management arrangements including under bridges and through road narrowing (i.e. pedestrian crossing facilities and road bridges/ culverts).

Amber has undertaken an assessment and driven the routes identified by RJA to confirm the preferred access route. The assessment identified no further upgrades to the road network to those identified in the RJA Report.

Further assessment is provided below of the rail and bridge infrastructure along the route as well as impacts to vulnerable road users, school bus services and emergency vehicles. Recommendations are also provided for inclusion within the Traffic Management Plan.

6.1.6 Rail and Bridge Infrastructure

A desktop identification has been undertaken by icubed consulting to confirm all rail and bridge infrastructure along the proposed OSOM routes. The assessment is provided in Appendix K and has identified a total of 133 assets across all routes including:

- 55 bridges
- 28 potential bridges / large scale box culverts
- 3 railway level crossings
- 12 railway overpasses
- 4 railway underpasses
- 9 road overpasses
- 22 road underpasses.

The location, description and relevant authority for each asset is outlined within the report prepared by icubed consulting with further assessment of each asset type provided below.

6.1.6.1 Bridges and Overpasses

The RJA Report identifies that the proposed route from Port of Newcastle to Uralla has been previously utilised for loads up to 120 tonnes. It is noted that all structures between New England Highway and the Project Area will require assessment for axle loads, which would be undertaken as part of the permit application process.

icubed consulting has undertaken a preliminary assessment of all bridges within the Walcha Council area. The assessment is provided in Appendix K and found that the assessed bridges on Moona Plains Road, Winterbourne Road, and Table Top Road are likely to have adequate strength to accommodate the Project vehicles however further analysis is required to determine if the bridge on Emu Creek Road has adequate capacity for the transformer vehicle.

6.1.6.2 Underpasses

An assessment of the height clearances along each route has been undertaken within the RJA report with a summary of the limitations provided below:

- Route 1: Suitable for overall transport heights of up to 5.9m, limited by the bridge along New England Highway at Tarro.
- Route 2: Suitable for overall transport heights of up to 5.2m, limited by the Liddell Overpass.
- Routes 3, A and B: No height clearance issues.

It is also noted that some overhead electrical cables along the route may require lifting which would be confirmed prior to construction. Accordingly, the proposed routes are able to accommodate the height clearances required for OSOM vehicles.

6.1.6.3 Railway Level Crossings

A total of 2 railway level crossings have been identified along the OSOM routes as outlined in Table 25.

Table 25: Railway Level Crossing Assessment

Railway Crossing Location	Route	Rail Authority	Notes
Selwyn Street near the Port of Newcastle	Routes 1 and 2 for all OSOM components	ARTC	ARTC have been contacted and have indicated that the level crossing on Selwyn Street will require the attendance of an ARTC accredited Rail Protection Officer for every crossing due to the length of the load and the timings of the level crossing not being set for the longer loads. A copy of the relevant email correspondence is provided in Appendix L.
Thunderbolts Way south of Uralla		UGL Regional Linx	Rail manager approval required to cross rail line.

Accordingly, the impacts of OSOM traffic on the level crossings are expected to be suitably managed through the treatments and mitigation measures to be determined with each of the rail authorities through the permit application process.

6.1.7 Vulnerable Road Users

A review of the OSOM access routes has been undertaken to identify locations where vulnerable road users may be present on the road network. The assessment focuses on facilities such as schools and hospitals that are attended by vulnerable road users including children or people with disabilities. Table 26 identifies locations where these facilities are provided and the probability of vulnerable road users being present on or adjacent to the access route. Locations identified as having the potential for OSOM vehicles to interact with vulnerable road users are highlighted within the table. The peak operating times at these locations should be identified and, where possible, OSOM transport avoided near these facilities during these peak times which would be included as part of the TMP.

Table 26: Assessment of Vulnerable Road Users Along the Access Route

Route	Site	Location	Road Environment and Pedestrian Access Arrangements	Likelihood of Conflict
Newcastle				
1, 2	Hunter Christian School	South of Industrial Drive, with access provided from Bull Street and Kerr Street.	No pedestrian footpaths are provided on Industrial Drive and all pedestrian access is from the local road network.	Unlikely
1, 2	Mayfield West Demonstration School	300 metres travel distance south from Industrial Drive.	No pedestrian footpaths are provided on Industrial Drive and all pedestrian access is from the local road network.	Unlikely
Muswellbrook				
2	Richard Gill School	Immediately south of New England Highway, west of Bimbadeen Drive.	No significant residential land use provided on the northern side of New England Highway in the vicinity of the school, and all pedestrian access expected from the south via the local road network.	Unlikely
2	TAFE NSW – Muswellbrook and Muswellbrook South Public School	Immediately south of New England Highway, opposite Bell Street	Both facilities are located on New England Highway. Signalised pedestrian crossing facilities are provided on New England Highway opposite the public school and at the intersection with Bell Street.	Unlikely
2	Muswellbrook High School	North of Bell Street / Victoria Street	A dedicated pedestrian bridge is provided along Bell Street. A zebra crossing and school zone is provided along Victoria Street.	Possible
Regional Towns				
1, 2	Aberdeen Preschool and Public School, and St Joseph's High School	100-300 metres west of New England Highway between Bedford Street and Graeme Street.	New England Highway and the adjacent railway line are expected to create a barrier which would deter people walking to the schools from the east and crossing New England Highway.	Unlikely

Route	Site	Location	Road Environment and Pedestrian Access Arrangements	Likelihood of Conflict
1, 2	Blandford Public School	Located on New England Highway opposite Timor Road.	The school is located on New England Highway, however given the limited residential land use students are expected to be driven or bused to the school.	Unlikely
1, 2	Murrurundi Kindergarten and Pre-School and Murrurundi Public School	Both located on New England Highway within the township.	Both facilities are located on New England Highway, with pedestrian crossing facilities provided adjacent to both schools.	Possible
1, 2	Willow Tree Preschool and Public School	Located on Merriwa Road, 200 metres southwest of New England Highway.	Given the minimal pedestrian facilities in the area most students are expected to be driven to the schools.	Unlikely
1, 2	Wallabadah Public School	Located on Martyn Street.	Given the minimal pedestrian facilities in the area most students are expected to be driven to the school and are not anticipated to cross New England Highway.	Unlikely
1, 2	Timbumburi Public School	Located on the western side of New England Highway, south of Tamworth.	Given the minimal pedestrian facilities in the area most students are expected to be driven to the schools.	Unlikely
1, 2	Liberty Primary School	Located on the eastern side of New England Highway, south of Tamworth.	Given the minimal pedestrian facilities in the area most students are expected to be driven to the schools.	Unlikely
3	Farrer Memorial Agricultural High School	Located on the western side of O'Briens Lane in Calala.	Given the minimal pedestrian facilities in the area most students are expected to be driven to the school.	Unlikely
Tamworth				
1, 2	Bullimbal School and Parry School	Degance Street located 500 metres north of New England Highway.	Located away from the access route. Limited residential use on the opposite side of New England Highway.	Unlikely
1, 2	St Nicholas Primary School	Located on Carthage Street, 500 metres north of New England Highway.	Located away from the access route. Limited residential use on the opposite side of New England Highway.	Unlikely
Moonbi				
1, 2	Moonbi Public School	400 metres east of New England Highway on Charles Street.	A school crossing is provided along New England Highway near Charles Street.	Possible
Walcha				
1, 2	Walcha Preschool	Located on Thunderbolts Way (Uralla Road).	A footpath is provided along the western side of Thunderbolts Way (Uralla Road).	Possible

Route	Site	Location	Road Environment and Pedestrian Access Arrangements	Likelihood of Conflict
A, B	Walcha Central School	500m south of Ohio Road on North Street.	Located away from the access route. Limited residential use on the north side of Ohio Road.	Unlikely

6.1.8 Public Transport and School Bus Routes

No public transport services are provided within the vicinity of the Project. However, a number of school bus routes are provided which have been outlined within Section 2.6. Given the low volume of OSOM vehicle deliveries of the wind turbine components, it is not anticipated that the OSOM deliveries will cause adverse impacts to school bus services. Nonetheless, during the OSOM deliveries, the following mitigation measures shall be incorporated in the Traffic Management Plan for the Project:

- Drivers must reduce their speed and or stop in accordance with the law when passing a school bus which is slowing down, stopped, or accelerating in relation to picking up or setting down children;
- Drivers must reduce their speed in accordance with the law when:
  - Passing children walking, cycling or waiting on the side of the road;
  - Passing an oncoming school bus.
- Truck drivers travelling on school bus routes at the same time as an oncoming school bus are to use their CB radio to identify the location of the bus and pull over in a safe location before the school bus reaches and passes them.

Adoption of the above measures will ensure safety is maintained to vulnerable road users waiting for or alighting the school buses during delivery of larger plant.

6.1.9 Emergency Services

A review has been undertaken to identify locations along the OSOM routes where emergency service vehicles require access. The following locations were identified:

- Mayfield West Fire and Rescue.
- Muswellbrook Fire and Rescue.
- Aberdeen Fire and Rescue.
- Murrurundi Fire and Rescue.
- South Tamworth Fire and Rescue.

Access should be maintained to the above properties to ensure continuation of emergency services. When aware of any emergency vehicles, approaching from in front or behind, drivers must pull over well in advance to provide unimpeded movement.

6.1.10 Other Route Options Assessed

Route 3 provides an alternate bypass route for blade transport vehicles to avoid travelling through Tamworth. This alternative route would utilise Whitehouse Lane, Marsden Park Road, O'Briens Lane and Nundle Road, and would require a short reversing manoeuvre and two traffic control

procedures. This alternative route would avoid the requirement to impact private land at the roundabout intersection along New England Highway (Scott Road / Goonoo Goonoo Road). However, the proposed bypass is prone to flooding, and the road currently has a 25-tonne limit.

Oxley Highway between Bendemeer and Walcha is not proposed for use by OSOM vehicles due to concerns raised by the local community as well as constraints associated with Surveyors Creek Bridge. The proposed route instead continues north from Bendemeer along New England Highway before heading east along Staces Road with a section of new road proposed through an easement to connect with Thunderbolts Way. Two alternative routes from Bendemeer were also considered by RJA that have not been included within their report as outlined below:

- Alternative Route through Kentucky: An alternative route was considered through Kentucky that utilised New England Highway, Kentucky Road, Eastern Avenue, Terrible Vale Road, and Thunderbolts Way. The route would require significant upgrades, is prone to flooding, and would likely require Terrible Vale Road to be closed to the public when OSOM vehicles are using the road due to its narrow width. Accordingly, the use of Staces Road is the preferred access route.

- Alternative Route through Uralla: An alternative route was proposed through the Uralla township, however due to the potential increased interaction with local traffic and pedestrians, the Staces Road bypass route is the preferred option.

Based on the RJA assessment, it is concluded the proposed access routes 1 and 2 provide the most appropriate route alignments, with the alternative Tamworth bypass route (Route 3) to be considered further prior to construction.

6.1.11 Alternative Muswellbrook Route Options

Amber, in coordination with Rex J Andrews Pty Ltd, have reviewed alternative access routes that could potentially accommodate the turbine blade transport vehicles. Proposed potential options are summarised below:

- Travel further west to avoid Muswellbrook: Alternative access options have been assessed which look to utilise State and local roads and travel further west to avoid the route around Muswellbrook. However, all of the routes assessed result in the blades being required to travel through small townships (such as Dunedoo, Gilgandra, Coonabarabran, and Gunnedah) which are not able to accommodate the blade vehicle. Alternatively, local roads can be utilised to avoids the towns. However, these routes all generate similar issues to the current access route and would only add to the length of the transport route. This option ultimately results in more towns along the route which increases the number of issues compared to the current option resulting in a less desirable outcome.
- Travel north along the coast: A route has been assessed that would utilise State Roads to travel north from Newcastle along the coast. This route is not considered appropriate as there are no suitable roads from the coast up to the Northern Tablelands and subsequently to the site.
- Change delivery port to Brisbane: The route is significantly longer than the current access route and has a number of challenging locations which would require significant road upgrades to be able to accommodate the blade transport vehicle. In particular there are a number of towns (such as Warwick, Stanthorpe, Tenterfield, and Glen Innes) which would be unable to accommodate the blade vehicles. Overall, the route generates similar issues to the Muswellbrook route but results in a significant increase to the length of the route.

Based on the assessment outlined above, it is concluded that the routes proposed within the RJA Report provide the most appropriate route options primarily as they result in shorter travel lengths, less townships to travel through, and subsequently require less road upgrades. It is noted that the majority of the route has also recently been approved for OSOM vehicles associated with the Thunderbolt Wind Farm. The proposed routes within the RJA Report are concluded to provide a feasible transport option and as such are recommended to be adopted for the Project subject to approval from the relevant authorities.

6.2 Other OSOM Transport Requiring Pilot Vehicle Escort

An overview of the additional OSOM transport vehicles requiring pilot vehicle escort is provided in Table 27 which includes the relevant construction phase for the delivery of each component. All vehicles travelling from the Port of Newcastle would utilise the same routes as the wind turbine components as outlined within the RJA Report and Section 6.1 above.

Table 27: Other OSOM Transport Requiring Pilot Vehicle Escort

Component	Estimated Vehicle Arrangement	Construction Phase	Peak Daily One-Way OSOM Vehicles	Total OSOM Vehicles
D10 bulldozers, 60-120t excavators	Prime mover with low loader trailer	Bulk Earthworks	15	100
WTG Erection Cranes	Prime mover with low loader trailer	Turbine Installation	5	40
Main Transformers	Prime mover with platform trailer	Electrical Assembly	1	4
Switchrooms	Prime mover with platform trailer	Electrical Assembly	1	2
			Total	***146***

A total of 146 additional OSOM vehicles requiring pilot vehicle escort would access the Project Area during the construction period. The vehicles would generally be spread across the various construction phases as outlined above and would be subject to permits which would be applied for prior to construction.

6.3 OSOM Transport Not Requiring Escort

Table 28 provides an overview of the proposed OSOM vehicles (including SPVs) which meet the Class 1 mass and/or dimension requirements and can operate on the approved network outlined in Section 2.5.2 subject to travel conditions. All vehicles are proposed to travel in the daytime and would not exceed 3.5m wide or 26m long, and therefore would generally not require a pilot vehicle escort.

Table 28: OSOM Transport Not Requiring Pilot Vehicle Escort

Component	Estimated Vehicle Arrangement	Construction Phase	Peak Daily One-Way OSOM Vehicles	Total OSOM Vehicles
Earthmoving equipment (dump trucks, compactors, rollers, 20-50t excavators)	Prime mover with low loader trailer	Bulk Earthworks	20	230
Sheds / site compounds	Prime mover with tilt tray trailer	Site Establishment	10	60
Cranes or similar	Special Purpose Vehicle	Turbine Installation	10	35
Boom pump	Special Purpose Vehicle	Concrete Pours	2	600
			Total	***925***

A total of 925 additional OSOM vehicles would access the Project Area during the construction period. The vehicles would generally be spread across the various construction phases as outlined above and it is understood the Applicant will seek approval for Class 1 OSOM vehicles to utilise the relevant unrated sections of the network following determination of the Project.

7. Intersection Assessment

7.1 Turn Treatments

7.1.1 Thunderbolts Way / Jamieson Street

The requirement to provide turn facilities at the State/Regional Road intersections is primarily generated during the morning peak hour when the workforce access the site, which occurs from 6:00am to 7:00am. An assessment has been undertaken for the Thunderbolts Way (Uralla Road & Derby Street) / Jamieson Street intersection.

Austroads Guide to Traffic Management Part 6: Intersections, Interchanges, and Crossings specifies the turn treatments required at intersections. Figure 3.25 of the guide specifies the required turn treatments on the major road at unsignalised intersections and has been utilised for the following turn treatment assessment.

The traffic volumes used for the assessment are provided in Figure 18 and have been plotted against the Austroads Guide in Figure 19. Table 29 identifies the required turn treatments at the intersection.

Figure 18: Traffic Volumes at Regional Road Intersection

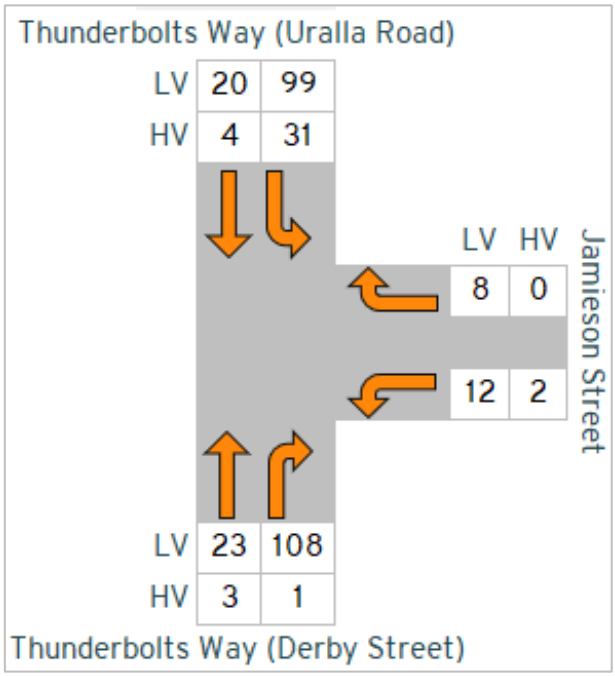


Figure 19: Austroads Turn Treatment Assessment Plot

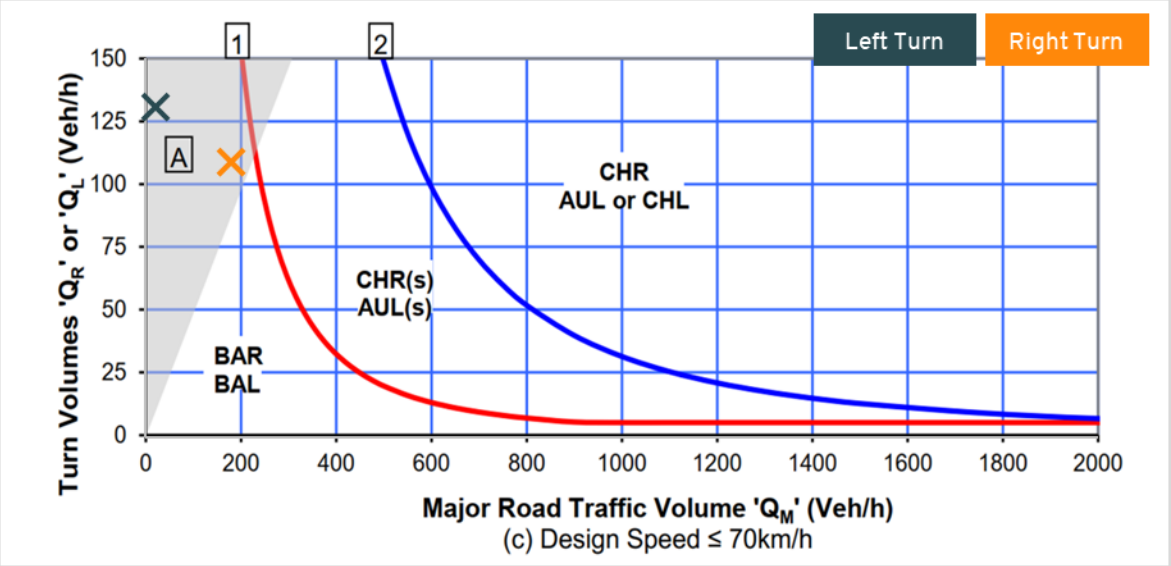


Table 29: Turning Volumes and Turn Treatment Requirements – Regional Road Intersection

Intersection	Turn Treatment	Traffic Volume (vph)		Requirement*
		Turn Volume	Major Road	
Thunderbolts Way / Jamieson Street	Right Turn	109	180	BAR
	Left Turn	130	24	BAL

**BAL/R = Basic Left/Right Turn*

Based on the assessment, the Thunderbolts Way (Uralla Road & Derby Street) / Jamieson Street intersection would require a Basic Right Turn (BAR) and a Basic Left Turn (BAL) turn treatment.

It is considered that the intersection is essentially provided with the basic turn treatments due to the wide carriageway width of Thunderbolts Way, with each lane having a width of approximately 6.5m. A swept path assessment has been carried out by icubed consulting to confirm the intersection can accommodate two-way movement for B-Doubles and is provided in Appendix B. Accordingly, the intersection turning facilities are considered appropriate and in accordance with the Austroads requirements.

It is noted that the intersection is also proposed to be upgraded by Walcha Council with the proposed design provided within Appendix E. The upgrade includes a new seal and linemarking including a dedicated right turn lane from Thunderbolts Way which would exceed the Austroads turn treatment requirements for this Project. In addition, the existing barrier in the south-eastern corner of the intersection will be set back from the carriageway to improve access for OSOM vehicles.

7.1.2 Thunderbolts Way / Hillview Road

It is anticipated that a low volume of traffic associated with the construction of the transmission line may periodically utilise Hillview Road to access the Project Area from Thunderbolts Way. The estimated traffic would result in up to 24 vehicles per day (i.e. two-way trips) including up to 9 vehicles in each of the AM and PM peak hours. The vehicles would generally travel toward the site in the morning and away from the site in the afternoon. It is noted that Hillview Road is not proposed to accommodate regular construction traffic or heavy vehicles, and the additional traffic would be limited to a shorter time period in the order of up to 12 months.

It is proposed to retain the existing intersection layout which is considered acceptable due to the short-term temporary nature of the vehicle movements associated with the transmission line construction. It is also noted that the Project traffic would generally travel toward the Project Area in the morning and away in the afternoon, and each approach provides excellent sight distance for following vehicles to observe and react to any vehicles slowing to turn at the intersection.

7.2 Sight Distance

An assessment of the Safe Intersection Sight Distance has been carried out at the Regional Road intersections to ensure vehicles are able to safely enter the road network. *Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections* specifies the Safe Intersection Sight Distance (SISD) as the minimum sight distance which should be provided along the major road at any intersection. Table 3.1 of the guide specifies the SISD required for various design speeds:

- Thunderbolts Way / Jamieson Street: 123m for 60km/h design speed, 2.0s reaction time.
- Thunderbolts Way / Hillview Road: 300m for 110km/h design speed, 2.5s reaction time.

The sight distance for each intersection is depicted within Figure 20.

Figure 20: Sight Distance Assessment – Regional Road Intersections

Thunderbolts Way (Uralla Road & Derby Street) / Jamieson Street	
Facing north	**Facing south**
	
Thunderbolts Way / Hillview Road	
Facing north	**Facing south**
	

The available sight distance at each intersection exceeds the requirements of the Austroads Guide. Accordingly, vehicles are expected to be able to safely enter the Regional Road network at each intersection.

8. Site Access Assessment

8.1 Design

The Project layout and proposed access locations are detailed in Figure 1 with the access designs and swept path assessments provided in Appendix B. The layout shows a total of 32 connections are proposed with the road network as detailed in Table 30.

Table 30: Overview of Site Access Locations

Site Access Locations	Road Connection
1, 2	Blue Mountain Road
3, 4	Winterbourne Road
5, 6	Table Top Road
7	Florida Road
8-13, 27, 28, 31	Bark Hut Road
14, 15	Rowleys Creek Road *Light vehicle access via Bark Hut Road or Moona Plains Road and internal tracks.* *Heavy vehicle access via Bark Hut Road only.*
16, 29	Rowleys Creek Road *Heavy vehicle access via Bark Hut Road and internal tracks only.*
17-22	Moona Plains Road *Heavy vehicle access via Bark Hut Road and internal tracks only.*
23, 24, 30	Gill Road *All vehicle access via Blue Mountain Road and internal tracks.*
25	Uruga Road / Hazeldean Road intersection *All vehicle access via Winterbourne Road and internal tracks.*
26	Uruga Road
32 - Switching station	Thunderbolts Way

The access for the switching station on the western side of Thunderbolts Way has been designed with Basic Left and Right Turn treatments reflecting the relatively low volume of traffic expected to access this area as outlined in Section 4.2.1.2. The design is included within Appendix B.

8.2 Sight Distance

An assessment of the Safe Intersection Sight Distance (SISD) as specified within the *Austroads Guide to Road Design – Part 4A: Unsignalised Intersections* has been carried out by icubed consulting at the proposed access locations with an overview provided within Table 31. The design speeds used for the assessment have been based on the road characteristics from on-site observations given the rural and sometimes unsealed nature of the local road network which results in the operating speed being lower than the prevailing speed limit. It is understood that a reduced coefficient of deceleration has been applied for braking on unsealed roads in accordance with *Austroads Guide to Road Design – Part 3: Geometric Design* and the SISD requirements have been adjusted for the vertical grades along each approach.

Table 31: Sight Distance Assessment

Access Location	Road	Road Surface	Design Speed (km/h)	Approach	Required SISD (m)	Available SISD (m)
1	Blue Mountain Road	Unsealed	80	N	218	270+
				S	207	260+
2	Blue Mountain Road	Unsealed	80	W	215	270+
			40	E	75	90
3	Winterbourne Road	Sealed	110	SW	289	340+
				NE	282	330+
4	Winterbourne Road	Sealed	110	SW	281	330+
				NE	290	153
5	Table Top Road	Unsealed	60	W	132	132
			70	E	179	330+
6	Table Top Road	Unsealed	60	W	132	*132* [1]
			70	E	186	210
7	Florida Road	Unsealed	50	N	106	106
				S	105	160+
8	Bark Hut Road	Unsealed	80	W	218	143
				E	221	221
9	Bark Hut Road	Unsealed	70	W	165	165
			50	E	109	140
10	Bark Hut Road	Unsealed	70	W	165	104
			50	E	109	140
11	Bark Hut Road	Unsealed	80	W	207	240
				E	221	181
12	Bark Hut Road	Unsealed	70	SW	163	210+
			60	NE	164	164
13	Bark Hut Road	Unsealed	80	Site Entry 13 is not an intersection, but a continuation of the road beyond the end of the road corridor.		
14	Rowleys Creek Road	Unsealed	50	SW	101	150+
				NE	121	150
15	Rowleys Creek Road	Unsealed	50	SW	101	150+
				NE	121	150
16	Rowleys Creek Road	Unsealed	50	SW	103	150+
				NE	108	80
17	Moona Plains Road	Sealed	90	W	207	260+
			80	E	186	186

Access Location	Road	Road Surface	Design Speed (km/h)	Approach	Required SISD (m)	Available SISD (m)
18	Moona Plains Road	Sealed	90	W	207	260+
			80	E	186	186
19	Moona Plains Road	Sealed	40	NW	143	70
			70	SE	163	132
20	Moona Plains Road	Sealed	40	NW	143	70
			70	SE	163	132
21	Moona Plains Road	Sealed	90	W	198	70
			40	E	74	*<74*
22	Moona Plains Road	Sealed	90	W	198	198
			40	E	74	*74* [2]
23	Gill Road	Unsealed	60	W	131	150
				E	134	*180+* [2]
24	Gill Road	Unsealed	60	Site Entry 24 is not an intersection but is a continuation of the road beyond the end of the road corridor.		
25	Hazeldean Road	Unsealed	80	W	222	270+
				E	208	260+
26	Uruga Road	Unsealed	70	SW	173	220+
				NE	168	220+
27	Bark Hut Road	Unsealed	80	W	201	250
				E	224	183
28	Bark Hut Road	Unsealed	70	W	160	180
				E	181	230
29	Rowleys Creek Road	Unsealed	50	No Right Turn permitted		
				S	112	160+
30	Gill Road	Unsealed	60	W	131	*150* [2]
				E	134	*180+* [2]
31	Bark Hut Road	Unsealed	80	W	197	250+
				E	201	250+
32	Thunderbolts Way	Sealed	110	NW	296	<296
				SE	317	317

Source: icubed consulting

[1] SISD achieved subject to clearing/benching which is proposed to be undertaken as part of the site access construction works.

[2] SISD achieved subject to localised clearing and regrading of verge which is proposed to be undertaken as part of the site access construction works.

Based on the above assessment, several access locations do not currently provide sufficient sight distances to meet the recommended provisions outlined within the Austroads Guidelines and are highlighted red within the table above. Each non-compliant approach would require either physical works such as benching or regrading of the road, vegetation clearing/trimming or adoption of traffic mitigation measures to reduce operating speeds along the road. Plans showing the SISD assessment and required works at each non-compliant location are provided in Appendix M. It is understood that the Applicant will further liaise with Council to determine the required solution for each access to ensure vehicles are able to safely enter the road network from the Project Area.

9. Traffic Management Plan

It is recommended that a TMP be prepared prior to commencement of construction of the development. The TMP should be prepared and implemented in accordance with Australian Standard 1742.3 and the Work Health and Safety Regulation 2017. The TMP would provide additional information regarding the traffic volumes and distribution of construction vehicles that is not available at this time including:

- Road transport volumes, distribution and vehicle types broken down into:
  - Hours and days of construction.
  - Schedule for phasing/staging of the Project.
- The origin, destination and routes for:
  - Employee and contractor light vehicles.
  - Heavy vehicles.
  - Oversize and overmass vehicles.
- A map of the primary haulage routes highlighting critical locations.
- An induction process for vehicle operators and regular toolbox meetings.
- A complaint resolution and disciplinary procedure.
- Local climatic conditions that may impact road safety of employees throughout all Project phases (e.g. fog, wet and significant dry, dusty weather).

The following provides recommended measures that should be adopted within the TMP to minimise the impact of construction traffic along the road network.

9.1 Information and Communication

The implementation of a community information and awareness program would assist in managing the traffic impacts. Prior to construction commencing and during the construction period, a program of consultation should be initiated to ensure local residents are aware of construction traffic accessing the Project. This program may include elements of the following as appropriate to the phase of works:

- Press releases in local newspapers;
- Specific emails, newsletters and individual letter drops to neighbouring residents along the access route to the Project;
- Provision of a website providing details of the status of works and contact details for complaints or enquiries;
- Provision of key contact personnel and contact details, including out of hours contact information to residents, schools, public activities and business operating alongside the local route; and
- Consultation with neighbours to the Project regarding the timing of major deliveries which may require additional traffic control and disrupt access.

9.2 Carpooling Program

The Applicant has advised that a carpooling program would be implemented to support sharing of vehicle trips for the workforce travelling to/from the site. The program would include:

- Incentives or benefits to encourage the use of carpooling.
- A roster system to rotate the carpooling drivers.
- Regular toolbox meeting sessions identifying method of travel to work and facilitating cooperation between workers.
- Identifying the drop off/pick up locations for participating vehicles.
- Allocating a team member to be responsible for management of the carpooling program.
- Identifying mechanisms to be put in place if an average light vehicle occupancy of 2 people per vehicle is not achieved across the workforce.

9.3 Signage

If deemed necessary, specific warning signs advising of the changed traffic operations and presence of heavy vehicles are to be appropriately located on approaches to and from the transport routes on Council roads. These should warn existing road users of changed traffic conditions. The use of day warning notices where signs are activated on a specific day to warn local road users of construction activities may also be applied.

9.4 Management of Vehicular Access

Management of vehicular access to and from the site is essential to maintain the safety of the general public as well as the labour force. The following code is to be implemented as a measure to maintain safety within the site:

- Utilisation of only the designated transport routes.
- Construction vehicles are to abide by finalised schedules as agreed by the relevant authorities.
- All vehicles associated with the Project construction, operation and/or decommissioning will enter and exit the Project Area via the designated site access locations as shown in Figure 1.

9.5 On-Site Mitigation Measures

On-site mitigation measures targeted at safety and reducing the impact of on-site transport would include:

- On-site speed restrictions.
- Appropriate dust suppression measures.
- Maintenance program for on-site access tracks to ensure safe access.
- Loading and unloading is proposed to occur within the work area. No streets or roads would be used for material storage at any time.

- Sufficient car parking is to be provided on-site to ensure vehicles do not park on the surrounding road network.
- All car parking and loading areas to be designed in accordance with the relevant Australian Standard (2890 series) and Council requirements.

9.6 Driver Protocols

Management of vehicular access to and from the site is essential in order to maintain the safety of the general public as well as the workforce. A Driver Code of Conduct is to be implemented as a measure to maintain safety within and around the site:

- All vehicles would enter and exit the site in a forward direction.
- Heavy vehicle movements should avoid peak school bus times to limit the interaction of larger vehicles and vulnerable road users.
- Safety initiatives for impacts to residential areas and/or school bus zones.
- Utilisation of only the designated transport routes.
- Construction vehicle movements are to abide by finalised schedules as agreed by the relevant authorities.
- All permits for working within the road reserve must be received from the relevant authority prior to works commencing.

The above recommendations will ensure the construction traffic would have a minimal impact to the capacity and safety of the surrounding road network. The TMP would be prepared in conjunction with consultation with Transport for NSW and the relevant Councils.

9.7 Oversize/Overmass Operating Protocols

Management of vehicular access to and from the Project is essential in order to maintain the safety of the general public as well as the labour force. Driver protocols for delivery of larger plant and equipment shall include the following:

- The arrangements for the delivery of OSOM loads and turbine components to the Project should avoid peak periods of traffic on the network as far as practicable and minimise disruption and disturbance to residents.
- OSOM load permits for turbine components shall be appended to the TMP.
- Pilots shall be in radio contact with other trucks to ensure passing occurs at safe and convenient locations.
- In the event of a breakdown, accident or road failure, the transporter crew shall do the following:
    - Park the pilot vehicles in locations where they maximise safety, considering overhanging components, and blind bends on approaches.
    - Contact emergency services (including Police) as is appropriate in the case of an accident.
    - Contact the project manager.
    - Contact the Council or other road controlling authority as may be appropriate in the case of the incident.

  - Contact the site manager to advise all other project traffic, and local traffic via CB radio as appropriate in the case of the incident.
  - Follow all instructions from Police and the road controlling authority.
- In the case of an accident, the vehicles involved should not be moved until instructed by Police.
- Utilisation of only the designated transport routes.
- Construction vehicle movements are to abide by finalised schedules as agreed by the relevant authorities.

The above recommendations will ensure the construction traffic will create a minimal impact to the capacity and safety of the surrounding road network.

10. Mitigation Measure Summary

The assessment has identified a number of traffic management measures that are to be implemented during construction and recommended to be included in the TMP. The key measures are summarised below:

- Prior to construction, a pre-condition survey of the relevant sections of the existing road network should be undertaken in consultation with Council. During construction the sections of the road network utilised by the Project are to be monitored and maintained to ensure continued safe use by all road users, and any faults attributed to construction of the solar farm would be rectified. At the end of construction, a post-condition survey would be undertaken to ensure the road network is left in a condition equivalent to that at the start of construction.
- Neighbours of the Project are to be consulted and notified regarding the timing of major deliveries which may require additional traffic control and disrupt access.
- It is recommended that the movement of OSOM vehicles is timed to not coincide with other OSOM vehicles within the surrounding area to limit the impact to the road network, which can be undertaken as part of the permit application.
- Heavy vehicles should avoid peak school bus times to limit the interaction of larger vehicles and vulnerable road users.

11. Schedule of Road Upgrades

Prior to the commencement of the relevant phase of construction the Applicant will undertake any road upgrades developed in consultation with and to the satisfaction of the relevant road authority. Works will be undertaken by a suitably qualified contractor subject to the relevant authorisation. Site establishment and construction works may be undertaken in parallel with the road upgrades subject to preparation, approval and implementation of a TMP in consultation with the relevant road authority. Project access points would be gated and secured, and appropriate warning signs erected.

The specific road infrastructure upgrades that may be required and/or would need to be considered by the chosen transport contractor prior to commencement of construction would be developed in consultation with the relevant Council and designed to their satisfaction. Reference should also be made to the RJA Report and its findings for potential road infrastructure upgrades along the transport route from the Port of Newcastle. It is acknowledged that some of the works identified within the RJA Report may have already been undertaken recently due to other projects in the area and thus an updated site assessment in consultation with TfNSW and the relevant Councils would identify the required road infrastructure upgrades dependant on the actual road conditions pre-construction.

A schedule of the road upgrades proposed to accommodate general construction traffic and OSOM vehicles is as outlined below:

- Road upgrades to accommodate oversize/overmass vehicles are outlined within the RJA report provided in Appendix A.
- Proposed designs for the upgrade of intersections and construction of site access locations have been prepared by icubed consulting and are provided in Appendix B.
- Road upgrades proposed along the local road network are outlined within the Constructive Solutions report provided in Appendix C.

12. Road Safety

Based on the above assessment it is concluded that the traffic generated by the construction, operation and decommissioning of the Project can be accommodated on the road network in a safe manner. A summary of the key safety matters is provided below:

- Three railway level crossings are located on the OSOM access routes which can be crossed in a safe manner.
- The access routes for OSOM vehicles are proposed to avoid areas during peak times where vulnerable road users are present. It is noted that Oxley Highway is not proposed for use by OSOM vehicles due to concerns raised by the local community as well as constraints associated with Surveyors Creek Bridge.
- Peak school bus times are proposed to be avoided where possible by OSOM and heavy vehicles to limit the impact to vulnerable road users.
- Access to key properties accommodating emergency service vehicles is proposed to be maintained at all times.
- The road network will continue to operate with a good level of service.
- Suitable sight distance is generally provided at key intersections and accesses, and where insufficient sight distance has been identified road upgrades and/or mitigation measures are proposed to ensure the road network continues to operate in a safe manner.
- A TMP will be prepared by the appointed contractor with the following key safety initiatives to be adopted:
  - Driver Code of Conduct.
  - OSOM vehicle operating protocols.
  - Key information relating to road safety to be provided to all staff.
  - Consultation with neighbours and local authorities regarding delivery of OSOM plant.
  - Regular dilapidation reports to be provided to ensure the road network is kept in a safe condition.
  - Suitable signage provided to advise road users.
- The surrounding road network currently operates in a relatively safe manner given the road classifications and there are no crash trends. Accordingly, Project traffic is anticipated to be able to be accommodated in a safe manner subject to the adoption of the above measures.

Accordingly, the proposed operation of the Project and the management of development traffic is concluded to be in line with TfNSW Future Transport 2056 and the Towards Zero vision.

13. Conclusion

Amber has undertaken an assessment of the traffic impacts of the Winterbourne Wind Farm located approximately 17 kilometres northeast of Walcha in the Northern Tablelands.

The Winterbourne Wind Farm Environmental Impact Statement (EIS) was submitted to the NSW Department of Planning, Housing and Infrastructure (formerly DPE) and publicly exhibited between Friday 18 November 2022 and Monday 23 January 2023. Following the public exhibition of the EIS, submissions relating to the Project EIS were received from government agencies, local councils, organisations and members of the public. The Project has been amended to respond to matters raised in the submissions and agency advice, and this Traffic Impact Assessment has been updated to assess the impacts associated with the amended Project.

The Project will accommodate 118 turbines with an installed capacity of around 700MW. The Project also includes the construction of two substations on-site and approximately 44 kilometres of new 330kV overhead transmission line running through the Project Area and northwest to a proposed switching station at the point of connection near Uralla, NSW.

The Project Area encompasses approximately 21,850 hectares (excluding the transmission line to the northwest of the proposed wind farm). Land within the Project Area and the surrounding area is predominantly used for agriculture. Vehicular access to the Project Area is proposed via 31 intersections with the local road network.

The Project construction is expected to take approximately 52 months, with the peak construction period expected to occur between months 16-24 (i.e. 9 month period). A construction workforce of up to 390 personnel is expected to be on-site during the peak construction phase and are expected to travel from the nearby towns of Armidale, Tamworth, Uralla, and Walcha.

All plant associated with the wind turbine components will be delivered from the Port of Newcastle. Gravel and water will be sourced onsite where possible or from within the surrounding area. Other materials will also be sourced from within the local region where possible. Construction also includes fixed or mobile concrete batching plant(s), and office buildings and substations for the construction and operational phases (e.g. maintenance) of the Project.

The above assessment addressed the following key matters:

- Details of both light and heavy vehicle traffic volumes and proposed transport routes during construction, operation, and decommissioning;
- An assessment of the potential traffic impacts of the Project on road network function and safety;
- An assessment of the capacity of the existing road network to accommodate the type and volume of traffic generated by the Project, including OSOM vehicles;
- Details of measures to mitigate and / or manage potential impacts, including construction traffic control, road dilapidation surveys and measures to control soil erosion and dust generated by traffic volumes; and
- Details of access roads within the Project including how these connect to the existing road network and ongoing operational maintenance.

This report is supported by the following:

- An OSOM Vehicle Route Study provided by Rex J Andrews Pty Ltd (RJA Report, Appendix A) who specialise in the transport of large plant and have worked on similar wind farm projects.
- Assessment and design of key intersections and site access locations carried out by icubed consulting (Appendix B).
- An assessment of the local road network carried out by Constructive Solutions (Appendix C) which identifies a range of recommended road upgrades to accommodate the Project traffic.
- A review of the RJA Report carried out by icubed consulting (Appendix K) which further investigates the key pinch points and provides a desktop assessment of all rail and bridge infrastructure along the proposed OSOM routes.

This assessment has also been undertaken in conjunction with consultation with TfNSW and the relevant Councils.

Overall, the following conclusions are provided:

- The Project is expected to generate up to 654 vehicle movements per day during the peak construction period, including 142 heavy vehicle movements.
- The road network is able to accommodate the traffic generated by the development during the construction, operation and decommissioning stages based on the SIDRA analysis undertaken for 5 key intersections and the results of the mid-block assessment. The assessment included cumulative impacts of nearby projects.
- The proposed construction traffic access route for vehicles up to B-Doubles travelling from the Port of Newcastle is designated for B-Double vehicles and is therefore able to accommodate the loads and types of heavy vehicle traffic to be generated during construction of the wind farm.
- Oversize and overmass vehicles would be required to deliver larger plant and equipment to the site including the wind turbine blades and towers. The vehicles are subject to specific road permits that would be applied for by the contractor. The access routes taken by the OSOM vehicles to deliver these components to the Project Area from the Port of Newcastle have been considered within a Route Study prepared by RJA (Appendix A) which identifies a number of road upgrades are required in order to allow the transport vehicles to successfully access the site.
- The intersection of Thunderbolts Way / Jamieson Street is proposed to be upgraded by Walcha Council with the proposed design provided within Appendix E. The upgrade includes a new seal and linemarking including a dedicated right turn lane from Thunderbolts Way which would exceed the Austroads turn treatment requirements for this Project. The intersection is provided with adequate sight distance to allow vehicles to safely enter the Regional Road network.
- It is anticipated that a low volume of traffic associated with the construction of the transmission line may periodically utilise Hillview Road to access the Project Area from Thunderbolts Way. It is proposed to retain the existing intersection layout which also provides adequate sight distance.
- A sight distance assessment has been carried out by icubed consulting at all of the proposed access locations. Several access locations do not currently provide sufficient sight distances to meet the recommended provisions outlined within the Austroads Guidelines. Each non-compliant approach would require either physical works such as benching or regrading of the road, or adoption of traffic mitigation measures to reduce operating speeds along the road. It is understood that the Applicant will further liaise

with Council to determine the required solution for each access to ensure vehicles are able to safely enter the road network from the Project Area.

- In order to mitigate the impacts of the development during construction a TMP would be prepared which should include the recommendations provided within this document.
- A schedule of the road upgrades proposed to accommodate general construction traffic and OSOM vehicles is as outlined below:
  - Road upgrades to accommodate oversize/overmass vehicles are outlined within the RJA report provided in Appendix A.
  - Proposed designs for the upgrade of intersections and construction of site access locations have been prepared by icubed consulting and are provided in Appendix B.
  - Road upgrades proposed along the local road network are outlined within the Constructive Solutions report provided in Appendix C.

Accordingly, based on the assessment above, it is concluded that the proposed access arrangements for the Project are suitable to accommodate the expected construction vehicle types and traffic volumes during the construction, operation, and decommissioning phases of the Project subject to the proposed mitigation measures and road upgrades.

Appendix A

Rex J Andrews - Route Study

REX J ANDREWS
ENGINEERED TRANSPORTATION

ROUTE STUDY

CLIENT: VESTAS
PROJECT: WINTERBOURNE WINDFARM
SITE LOCATION: WALCHA, NSW
PORT OF IMPORT: MAYFIELD #4 BERTH NEWCASTLE
VERSION: REV08 (26/08/2024)

Rev.	Date	Change	Responsible	Checked
00	01/10/20	Route Assessed	J Stokes	✓
00	01/10/20	Report Compiled	J Stokes	✓
00	01/10/20	Report Completed	J Stokes	✓
01	22/10/2020	Routes from Walcha to Site Entries added	J Stokes	✓
02	26/10/2020	Formatting Improvements	J Stokes	✓
03	26/10/2022	Various edits	W Andrews	✓
04	07/07/2022	Various edits	W Andrews	✓
05	13/12/2023	Trailers Updates Additional Route Added	J Stokes	✓
06	04/02/2024	Major Route Updates	J Stokes	✓
07	04/03/2024	Various edits	J Stokes	✓
08	26/08/2024	Various edits	J Stokes	✓

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1.0 Introduction

This document describes observations and previous experience on route and explains the Transport of Wind turbine equipment from Newcastle to Winterbourne Windfarm.

This Route survey took place on 20/09/2020 with a follow up on 17/11/2023.

2.0 Evaluation

1	No Cost
2	Some Work
3	Moderate Amount of Work
4	Extreme Amount of Work

(Mark below boxes with an X)

		1	2	3	4
A	Harbour		X		
B	Road Modification				X
C	Road Furnishings				X
D	Trees			X	
E	Site Entrance			X	
F	Bridge Calculations			X	
G	Traffic Control		X		

3.0 Project data

Date of latest Route Assessment: 17/11/2023
Survey undertaken by: (Rex J Andrews P/L)
Project name: Winterbourne Windfarm
Location: Newcastle port (NSW) to Walcha (NSW)
Turbine type: (V162 Enventus 6.2 MW)
Rotor size 162 metre with a hub height of 149 Metres

4.0 Transport combinations (Examples)

Base Towers (9.31l x 5.86 x 5.5 x 83T)
Configuration. Prime mover with 5x8 5x8 Bookend
Overall dimension: 40.0l x 5.9w x 6.1h x 174.5T (+ Push truck)

Section 2 Towers (15.58l x 5.5 x 5.5 x 87T)
Configuration. Prime mover with 5x8 5x8 Bookend
Overall dimension: 47.0l x 5.6w x 6.1h x 174.5T (+ Push truck)

Section 3 Towers (17.64l x 5.5 x 4.95 x 87T)
Configuration. Prime mover with 5x8 5x8 Bookend
Overall dimension: 49.0l x 5.5w x 6.1h x 174.5T (+ Push truck)

Section 4 Towers (20.44l x 4.95 x 4.65 x 87T)
Configuration. Prime mover with 4x8 5x8 Extending Platform
Overall dimension: 34.0l x 5.0w x 6.1h x 159.5T (+ Push truck)

Section 5 Towers (26.32l x 4.65 x 4.4 x 89T)
Configuration. Prime mover with 4x8 5x8 Extending Platform
Overall dimension: 38.0l x 4.7w x 6.1h x 159.5T (+ Push truck)

Section 6 Towers (26.88l x 4.4 x 4.15 x 71T)
Configuration. Prime mover with 4x4 Dolly and 4x8 Jinker trailer
Overall dimension: 38.0l x 4.5w x 5.8h x 114.5T (+ Push truck)

Top Towers (30.0l x 4.15w x 3.98h x 66T)
Configuration. Prime mover with 4x4 Dolly and 3x8 Jinker trailer
Overall dimension: 41.0l x 4.3w x 5.8h x 99.5T (+ Push truck)

Nacelles (18.1l x 4.2 w x 4.35h x 84.0T)
Configuration. Prime mover with 4x8 4x8 Extending Platform
Overall dimensions: 35.0l x 4.3w x 5.4h x 159.5T (+ Push truck)

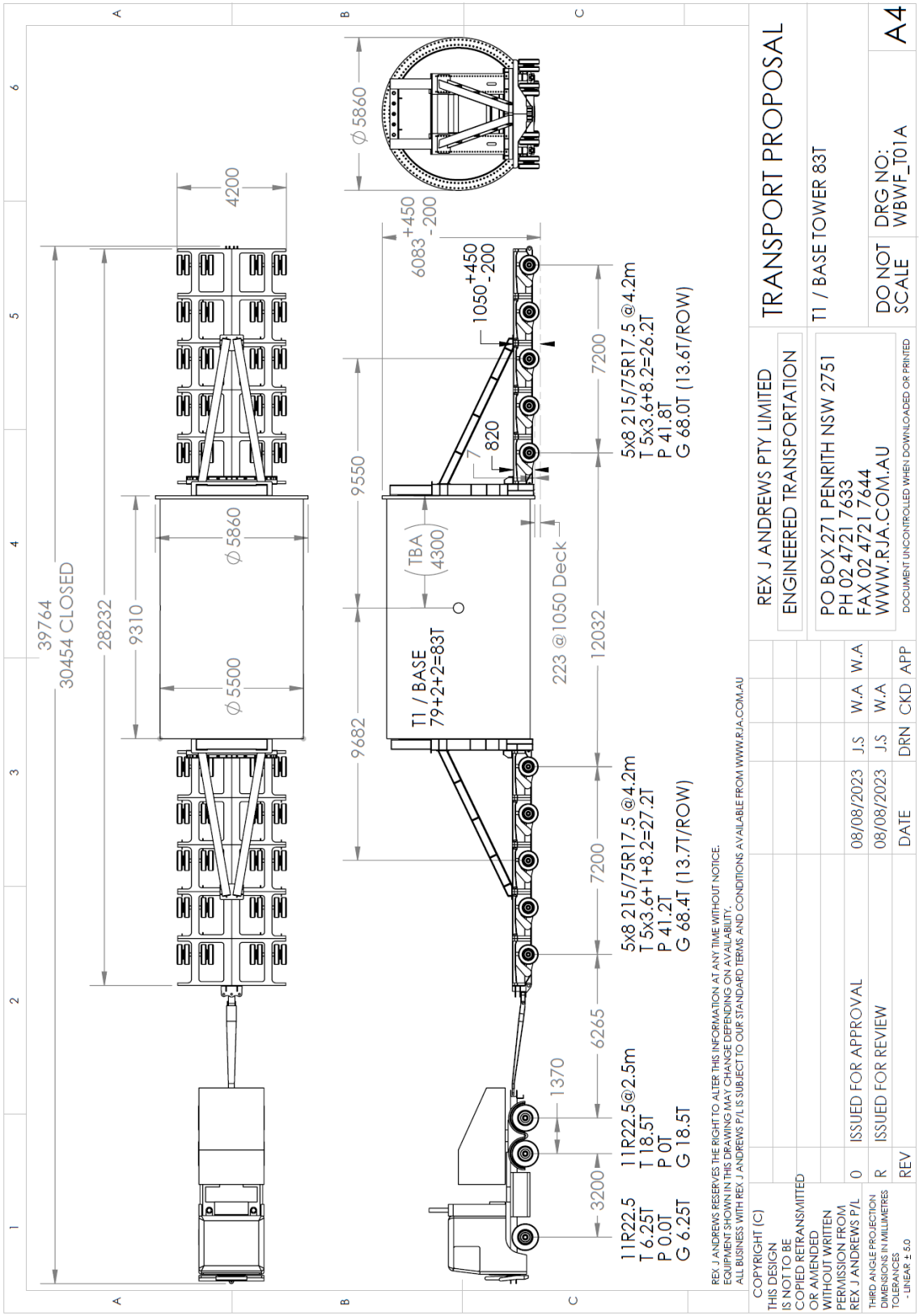
Drive trains (8.1l x 3. w x 3.4h x 97.0T)
Configuration. Prime mover with 8x8 Platform
Overall dimensions: 28.0l x 4.3w x 4.8h x 150.0T (+ Push truck)

Hubs (5.0l x 4.5w x 4.0h x 64.0T)
Configuration. Prime mover with 2x8 5x8 Platform
Overall dimension: 27.0l x 4.6w x 5.1h x 108.5T

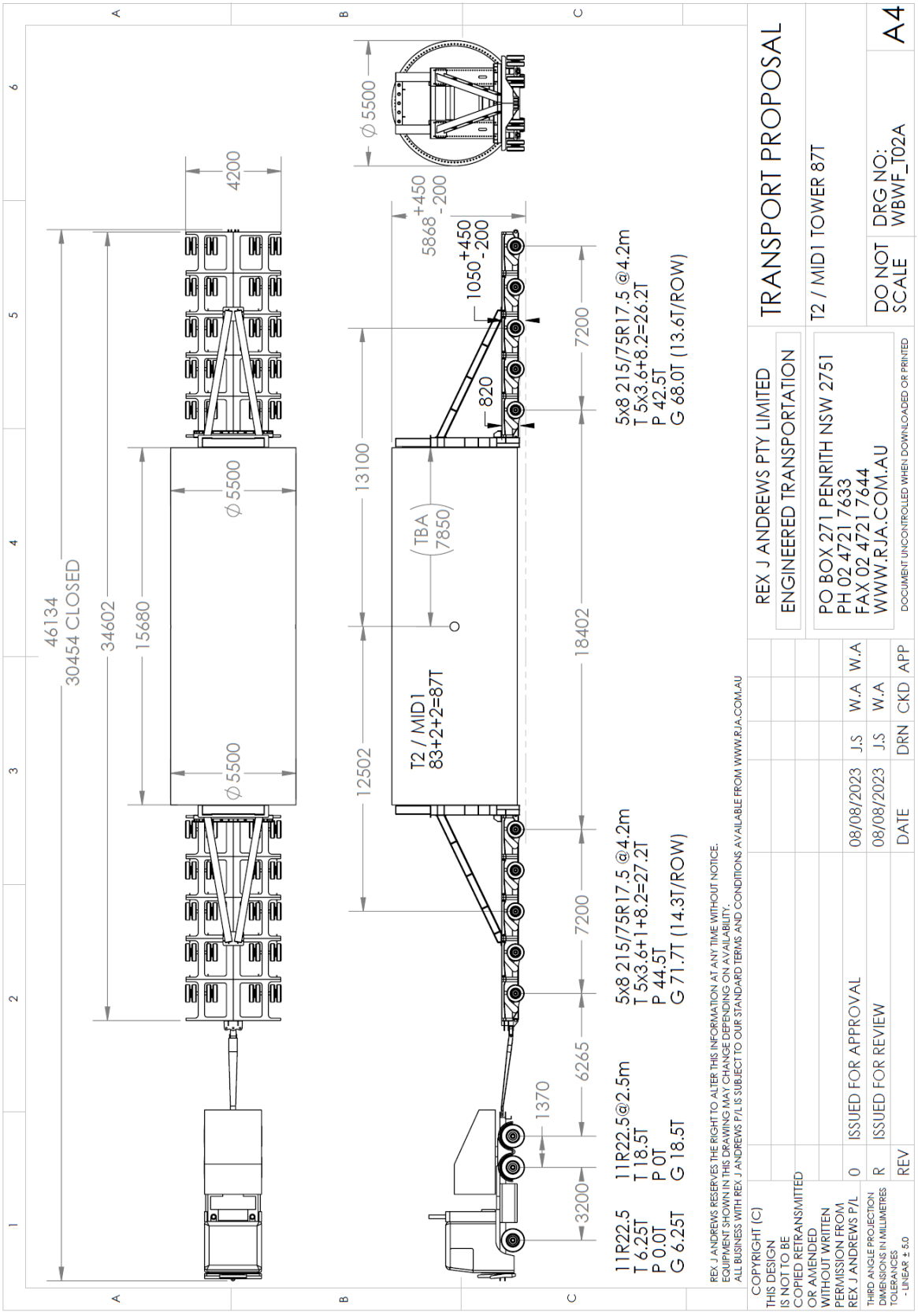
Blades (81.1l x 4.5w x 4.0h x 32.0T)
Configuration. Prime mover with 3x8 3x8 Extending Platform
Overall dimension: 94.0l x 4.5w x 4.9h x 96.5T

5.0 Transport drawings (Possible combinations)

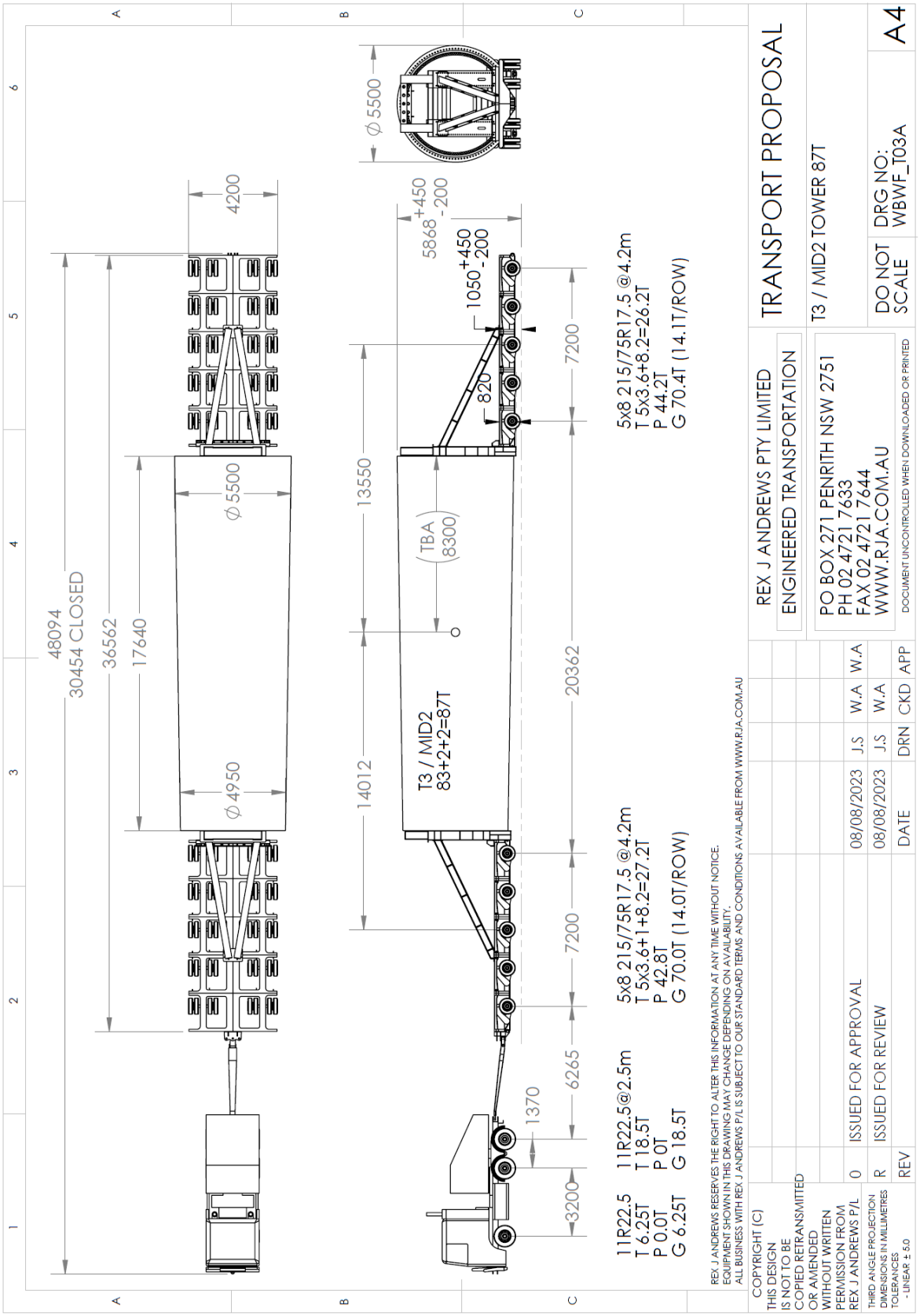
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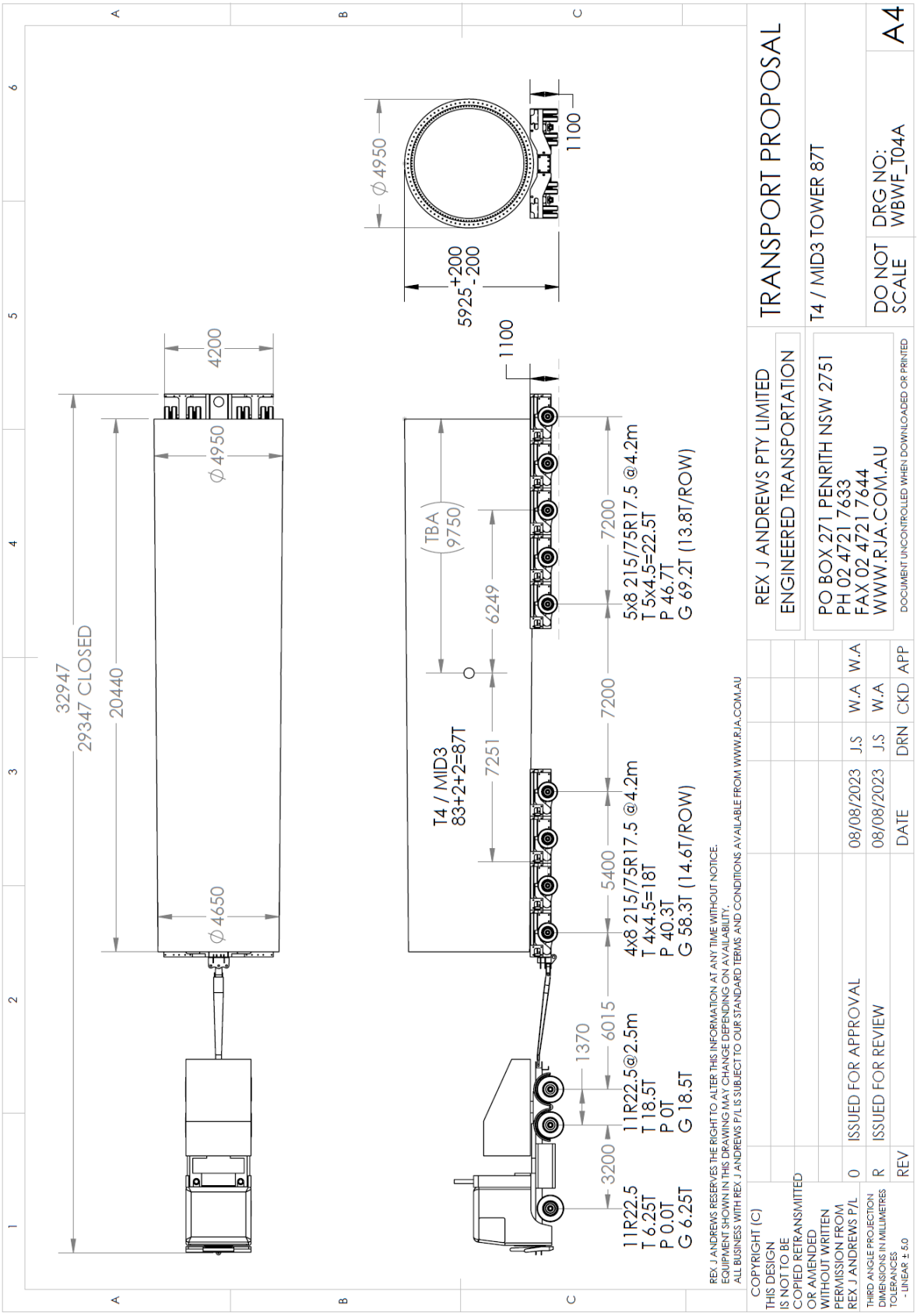
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46134
30454 CLOSED
34602
15680
4200
Ø 5500
Ø 5500
Ø 5500
13100
12502
T2 / MID1
83+2+2=87T
(TBA 7850)
5868 +450 -200
1050 +450 -200
820
7200
18402
7200
6265
1370
3200
11R22.5@2.5m
T 6.25T
P 0.0T
G 6.25T
11R22.5@2.5m
T 18.5T
P 0T
G 18.5T
5x8 215/75R17.5 @4.2m
T 5x3.6+1+8.2=27.2T
P 44.5T
G 71.7T (14.3T/ROW)
5x8 215/75R17.5 @4.2m
T 5x3.6+8.2=26.2T
P 42.5T
G 68.0T (13.6T/ROW)
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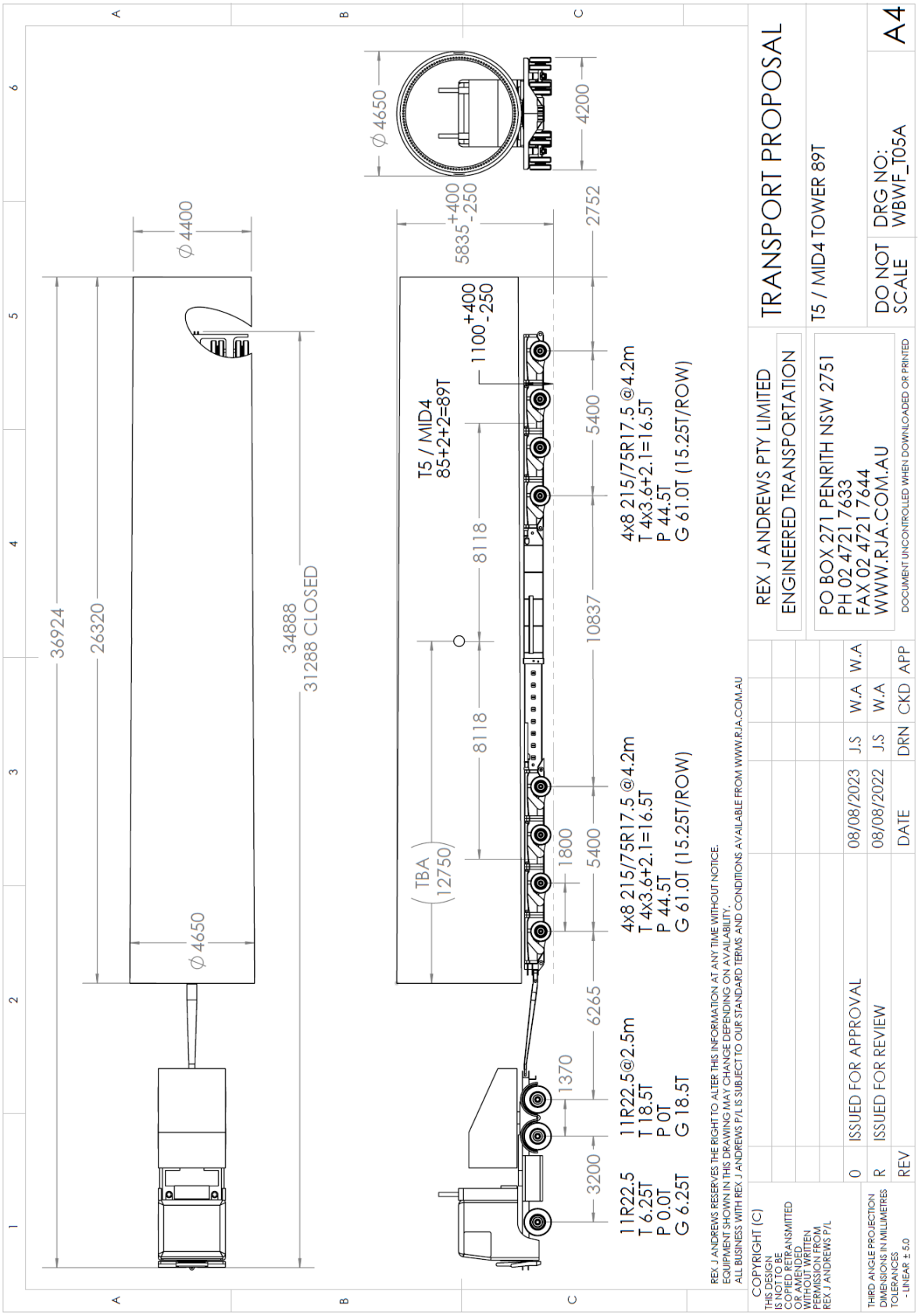
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4200
Ø5500
Ø4950
Ø5500
13550
14012
T3 / MID2
83+2+2=87T
(TBA)
(8300)
5868 +450 -200
1050 +450 -200
820
7200
20362
7200
6265
1370
3200
11R22.5 11R22.5@2.5m
T 6.25T T 18.5T
P 0.0T P 0T
G 6.25T G 18.5T
5x8 215/75R17.5 @4.2m
T 5x3.6+1+8.2=27.2T
P 42.8T
G 70.0T (14.0T/ROW)
5x8 215/75R17.5 @4.2m
T 5x3.6+8.2=26.2T
P 44.2T
G 70.4T (14.1T/ROW)
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T3 / MID2 TOWER 87T
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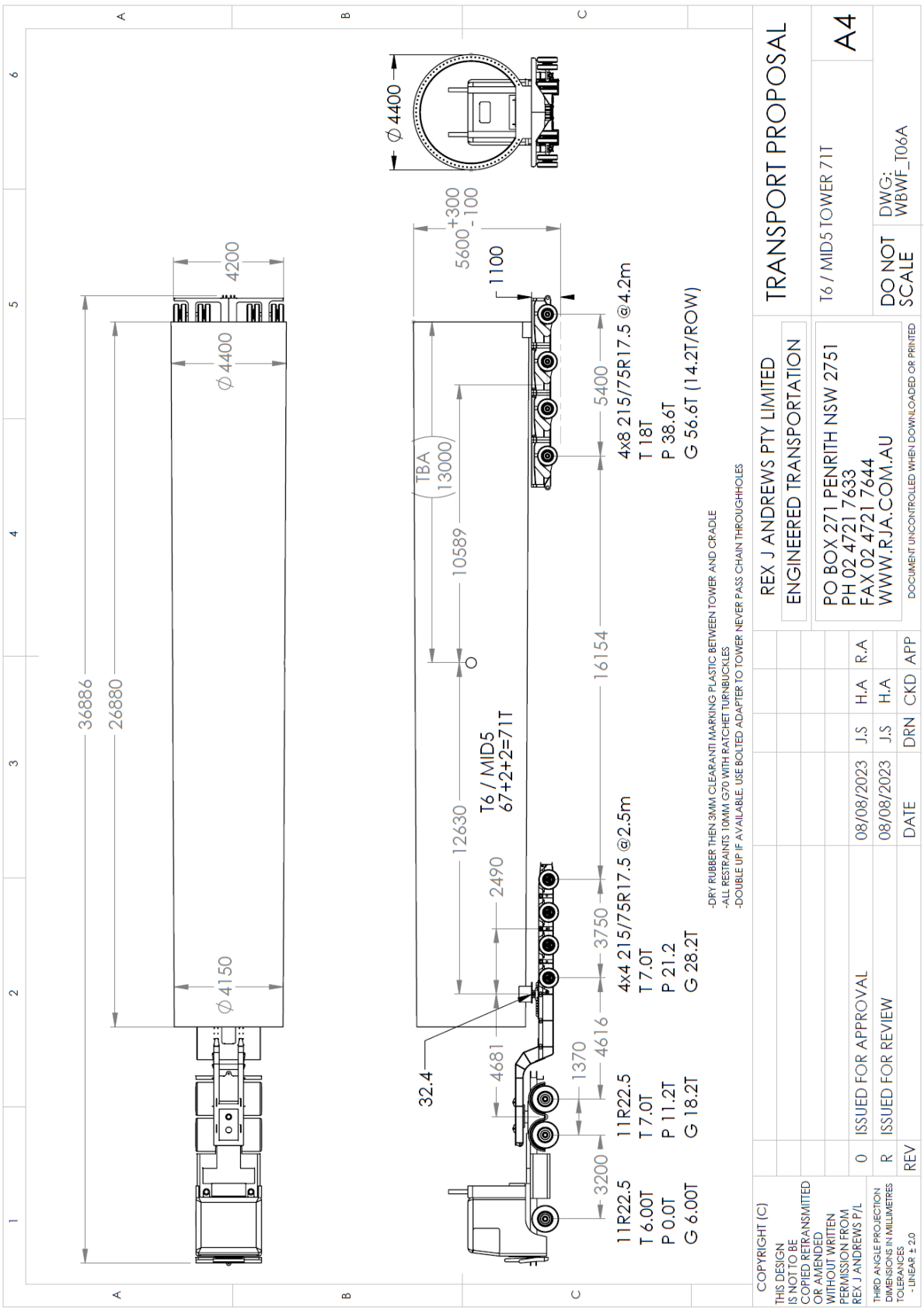
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29347 CLOSED
20440
4200
Ø4950
Ø4650
11R22.5
T 6.25T
P 0.0T
G 6.25T
3200
11R22.5@2.5m
T 18.5T
P 0T
G 18.5T
1370
6015
4x8 215/75R17.5 @4.2m
T 4x4.5=18T
P 40.3T
G 58.3T (14.6T/ROW)
5400
T4 / MID3
83+2+2=87T
7251
(TBA)
9750
6249
7200
5x8 215/75R17.5 @4.2m
T 5x4.5=22.5T
P 46.7T
G 69.2T (13.8T/ROW)
7200
1100
Ø4950
5925 +200 -200
1100
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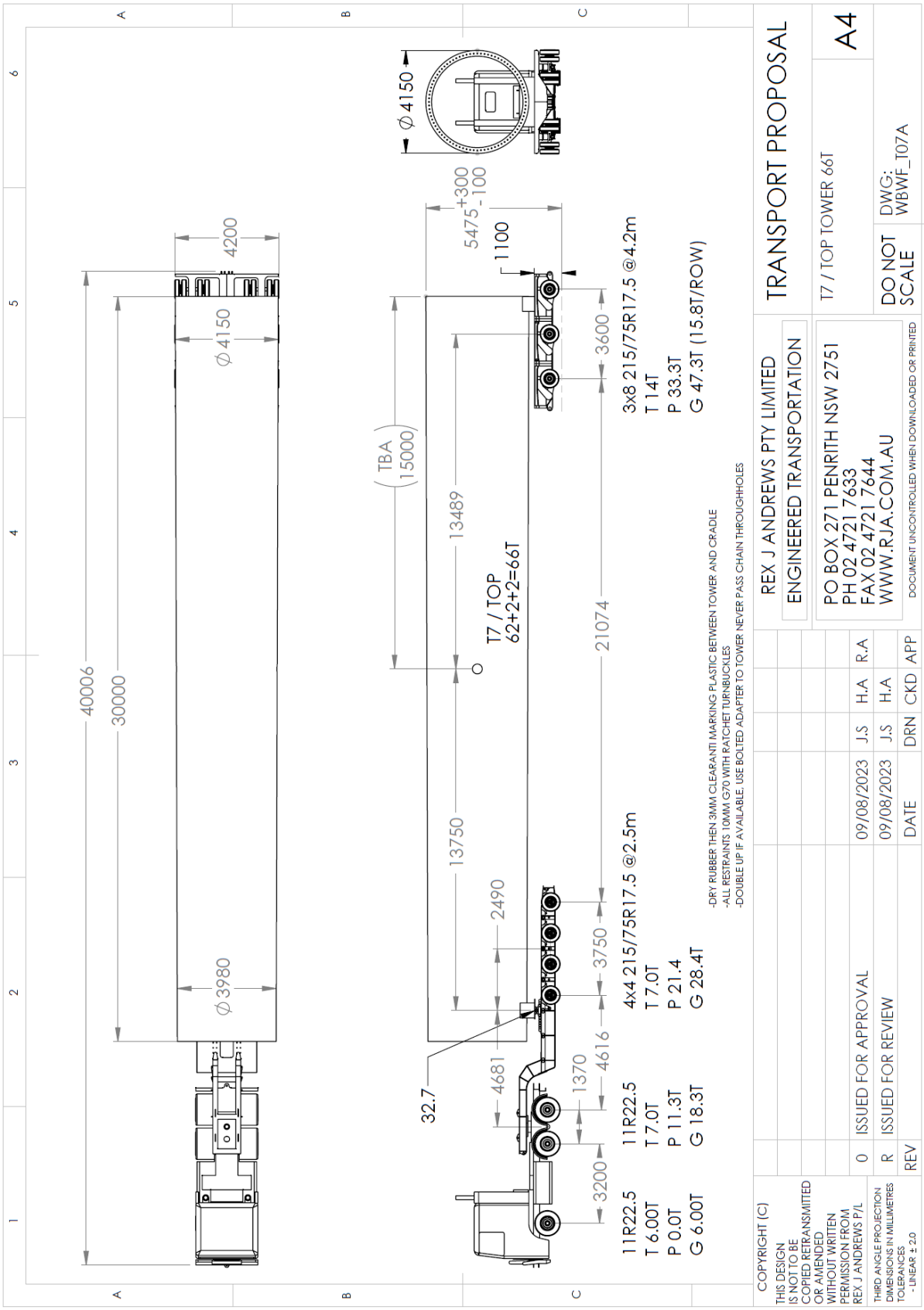
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T5 / MID4
85+2+2=89T
4x8 215/75R17.5 @4.2m
T 4x3.6+2.1=16.5T
P 44.5T
G 61.0T (15.25T/ROW)
11R22.5@2.5m
T 18.5T
P 0T
G 18.5T
11R22.5
T 6.25T
P 0.0T
G 6.25T
TBA
12750
8118
1800
5400
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1370
3200
2752
4200
Ø4650
Ø4400
36924
26320
34888
31288 CLOSED
1100+400-250
5835+400-250
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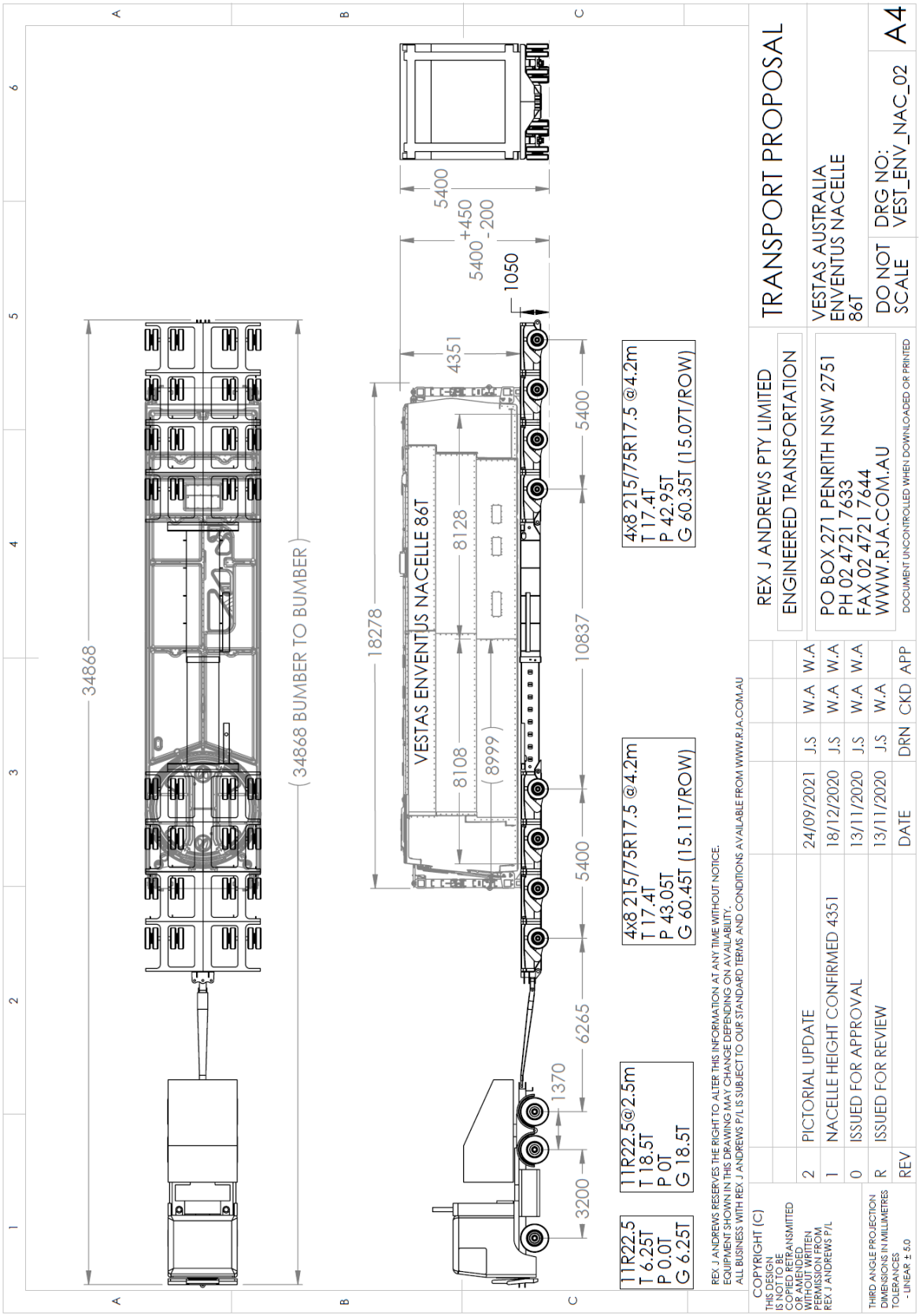
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A4
T6 / MID5 TOWER 71T
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R ISSUED FOR REVIEW 08/08/2023 J.S H.A
-DRY RUBBER THEN 3MM CLEARANTI MARKING PLASTIC BETWEEN TOWER AND CRADLE
-ALL RESTRAINTS 10MM G70 WITH RATCHET TURNBUCKLES
-DOUBLE UP IF AVAILABLE. USE BOLTED ADAPTER TO TOWER NEVER PASS CHAIN THROUGHHOLES
T6 / MID5
67+2+2=71T
11R22.5 T 6.00T P 0.0T G 6.00T
11R22.5 T 7.0T P 11.2T G 18.2T
4x4 215/75R17.5 @2.5m T 7.0T P 21.2 G 28.2T
4x8 215/75R17.5 @4.2m T 18T P 38.6T G 56.6T (14.2T/ROW)
3200
4616
1370
4681
2490
12630
10589
TBA (13000)
3750
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5400
1100
5600 +300 -100
32.4
Ø 4400
Ø 4150
Ø 4400
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36886

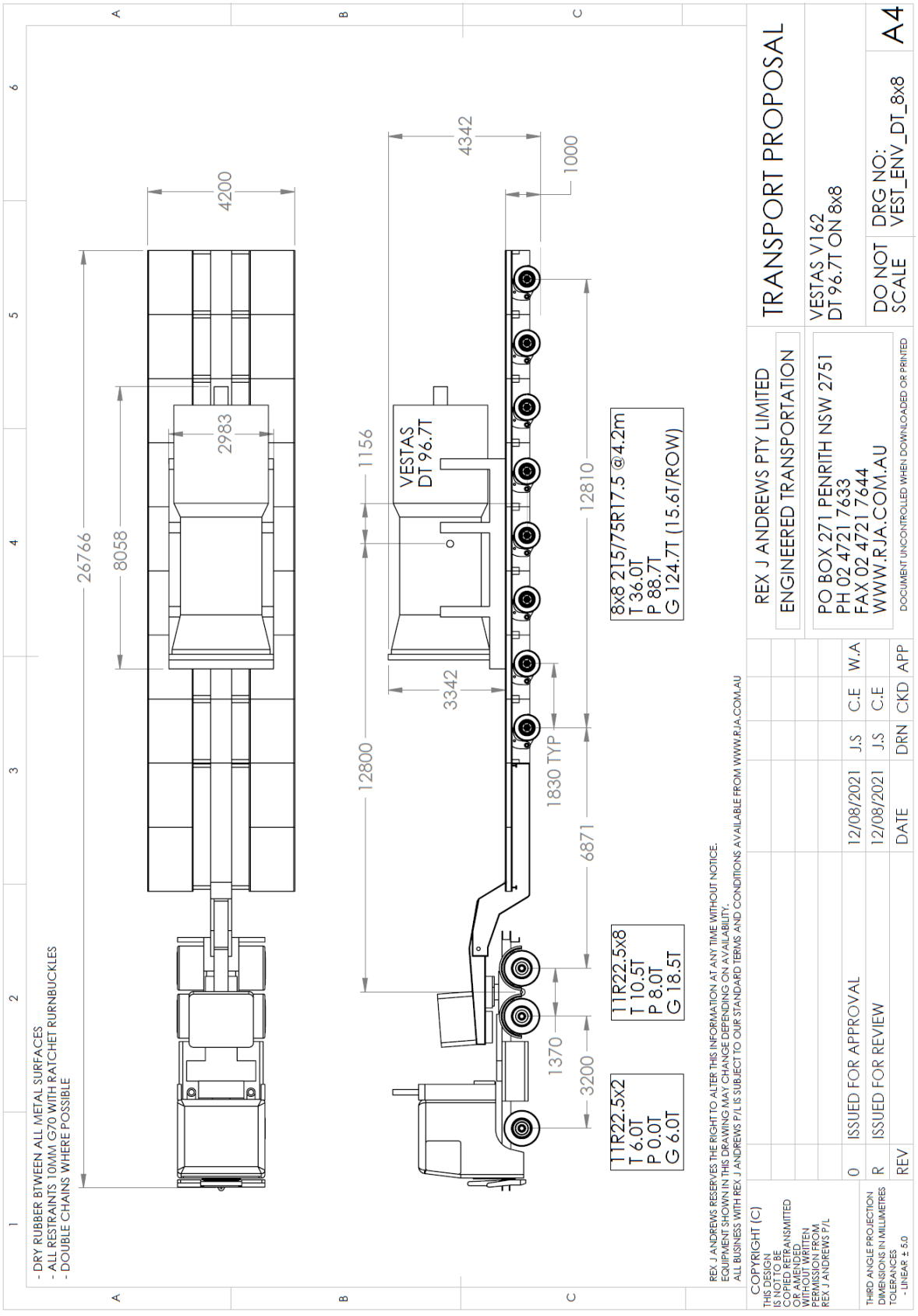
T7:


TRANSPORT PROPOSAL
T7 / TOP TOWER 66T
A4
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-ALL RESTRAINTS 10MM G70 WITH RATCHET TURNBUCKLES
-DOUBLE UP IF AVAILABLE. USE BOLTED ADAPTER TO TOWER NEVER PASS CHAIN THROUGHHOLES
T7 / TOP
62+2+2=66T
11R22.5 T 6.00T P 0.0T G 6.00T
11R22.5 T 7.0T P 11.3T G 18.3T
4x4 215/75R17.5 @2.5m T 7.0T P 21.4 G 28.4T
3x8 215/75R17.5 @4.2m T 14T P 33.3T G 47.3T (15.8T/ROW)
Ø4150
Ø3980
4200
40006
30000
5475 +300 -100
1100
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13489
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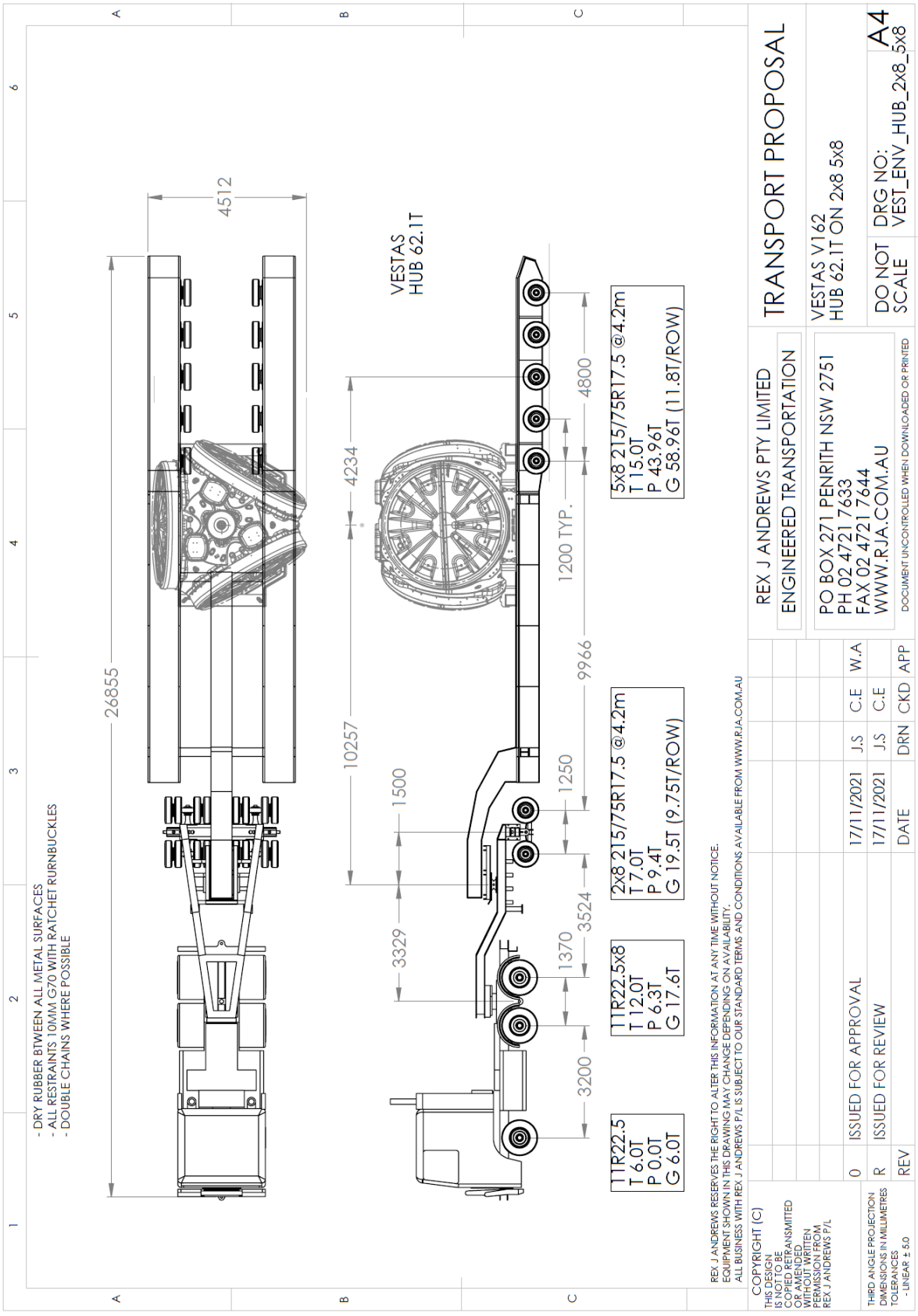
Nacelle:


34868
34868 BUMBER TO BUMBER
18278
VESTAS ENVENTUS NACELLE 86T
8108
8128
(8999)
4351
5400
+450
5400 -200
1050
5400
5400
10837
5400
6265
1370
3200
11R22.5
T 6.25T
P 0.0T
G 6.25T
11R22.5@2.5m
T 18.5T
P 0T
G 18.5T
4x8 215/75R17.5 @4.2m
T 17.4T
P 43.05T
G 60.45T (15.11T/ROW)
4x8 215/75R17.5 @4.2m
T 17.4T
P 42.95T
G 60.35T (15.07T/ROW)
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1 NACELLE HEIGHT CONFIRMED 4351 18/12/2020 J.S W.A W.A
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VESTAS AUSTRALIA
ENVENTUS NACELLE
86T
DO NOT SCALE
DRG NO: VEST_ENV_NAC_02
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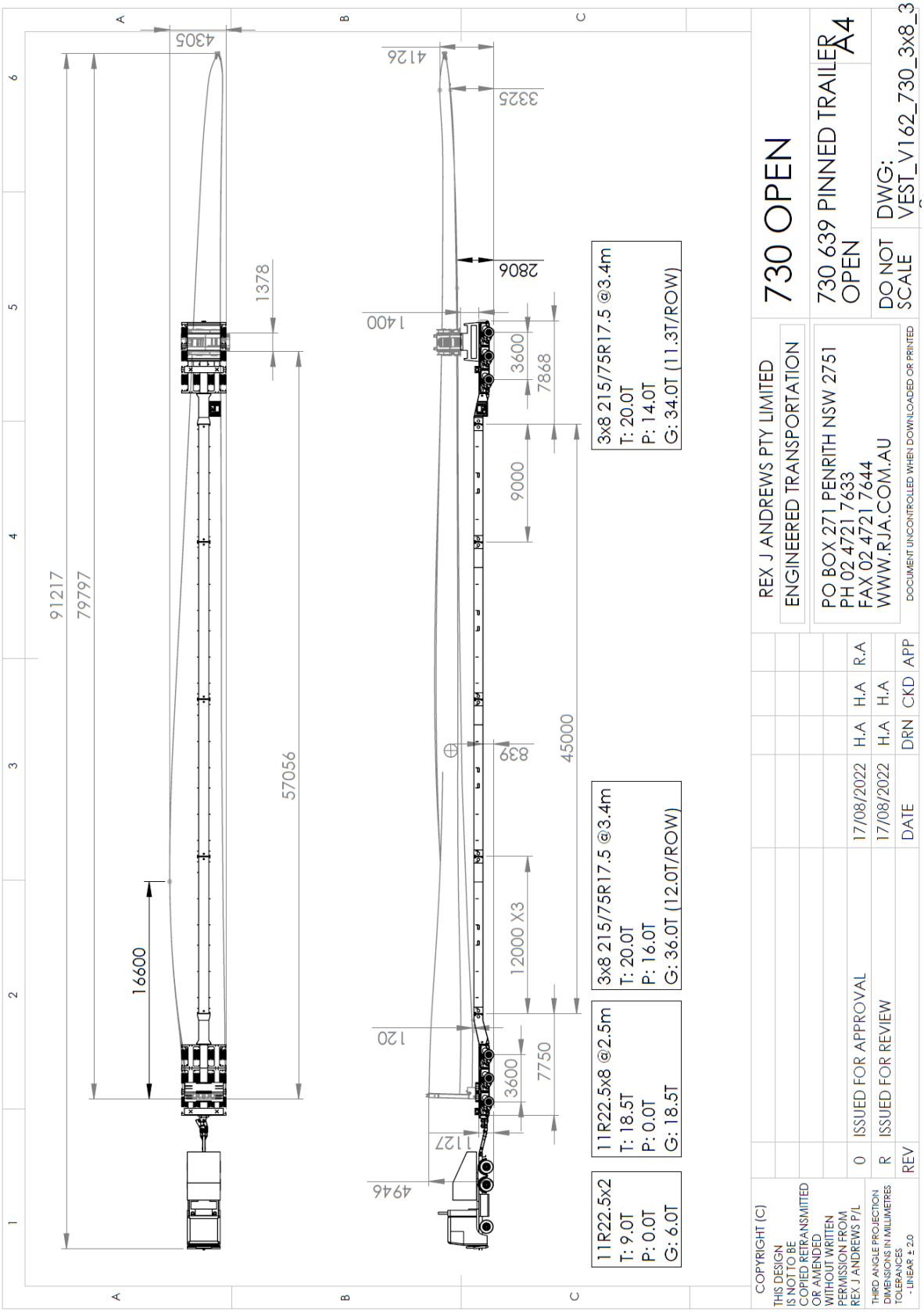
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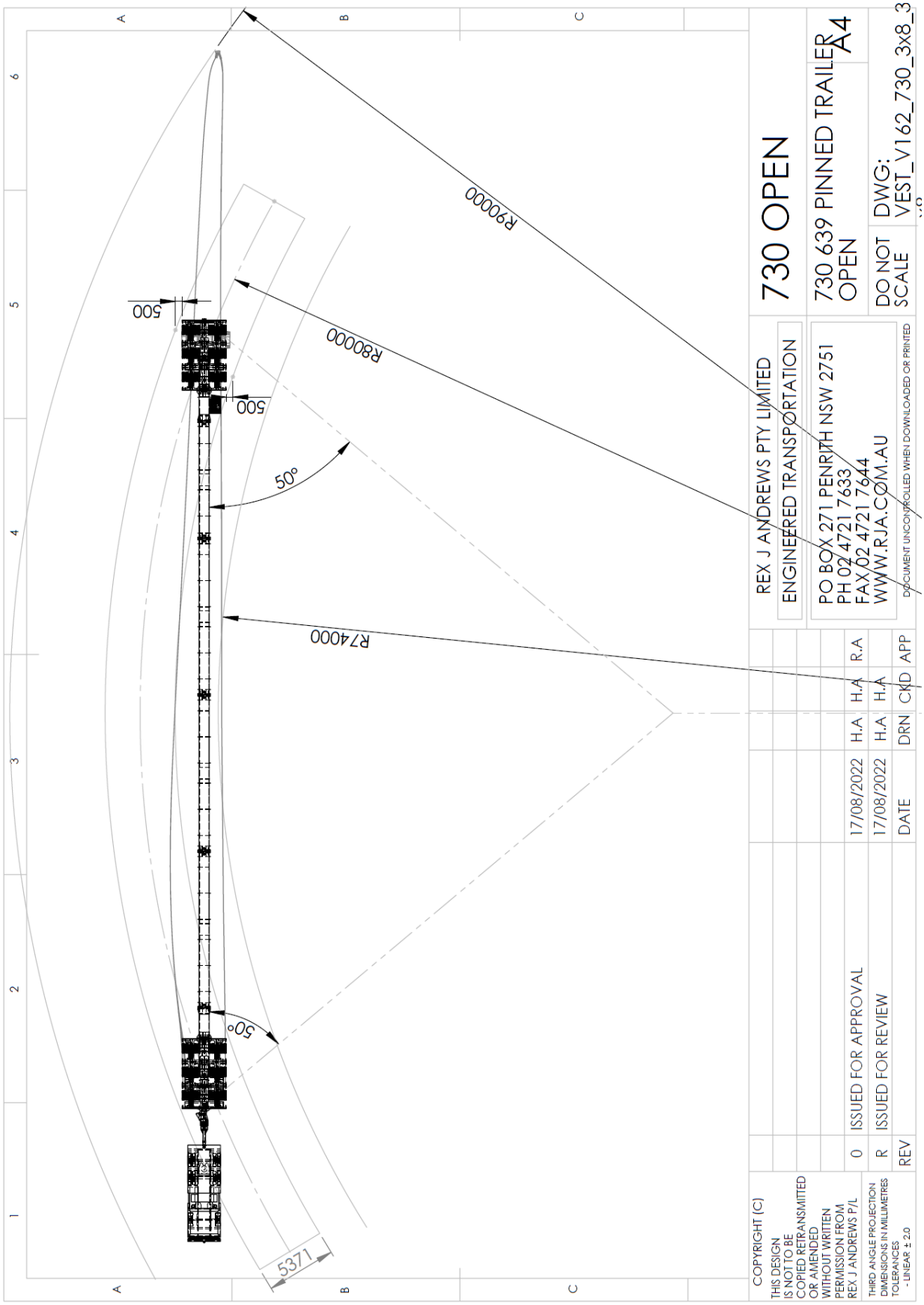

- DRY RUBBER BTWEEN ALL METAL SURFACES
- ALL RESTRAINTS 10MM G70 WITH RATCHET RURNBUCKLES
- DOUBLE CHAINS WHERE POSSIBLE
26766
8058
4200
2983
12800
1156
VESTAS
DT 96.7T
3342
4342
1000
12810
1830 TYP
6871
1370
3200
11R22.5x2
T 6.0T
P 0.0T
G 6.0T
11R22.5x8
T 10.5T
P 8.0T
G 18.5T
8x8 215/75R17.5 @4.2m
T 36.0T
P 88.7T
G 124.7T (15.6T/ROW)
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TRANSPORT PROPOSAL
VESTAS V162
DT 96.7T ON 8x8
DO NOT SCALE
DRG NO: VEST_ENV_DT_8x8
A4

Hub:


- DRY RUBBER BTWEEN ALL METAL SURFACES
- ALL RESTRAINTS 10MM G70 WITH RATCHET RURNBUCKLES
- DOUBLE CHAINS WHERE POSSIBLE
VESTAS
HUB 62.1T
4512
26855
10257
4234
1500
3329
1200 TYP.
4800
9966
1250
1370
3524
3200
11R22.5
T 6.0T
P 0.0T
G 6.0T
11R22.5x8
T 12.0T
P 6.3T
G 17.6T
2x8 215/75R17.5 @4.2m
T 7.0T
P 9.4T
G 19.5T (9.75T/ROW)
5x8 215/75R17.5 @4.2m
T 15.0T
P 43.96T
G 58.96T (11.8T/ROW)
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THIRD ANGLE PROJECTION
DIMENSIONS IN MILLIMETRES
TOLERANCES
- LINEAR ± 5.0
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TRANSPORT PROPOSAL
VESTAS V162
HUB 62.1T ON 2x8 5x8
DO NOT SCALE
DRG NO: VEST_ENV_HUB_2x8_5x8
A4

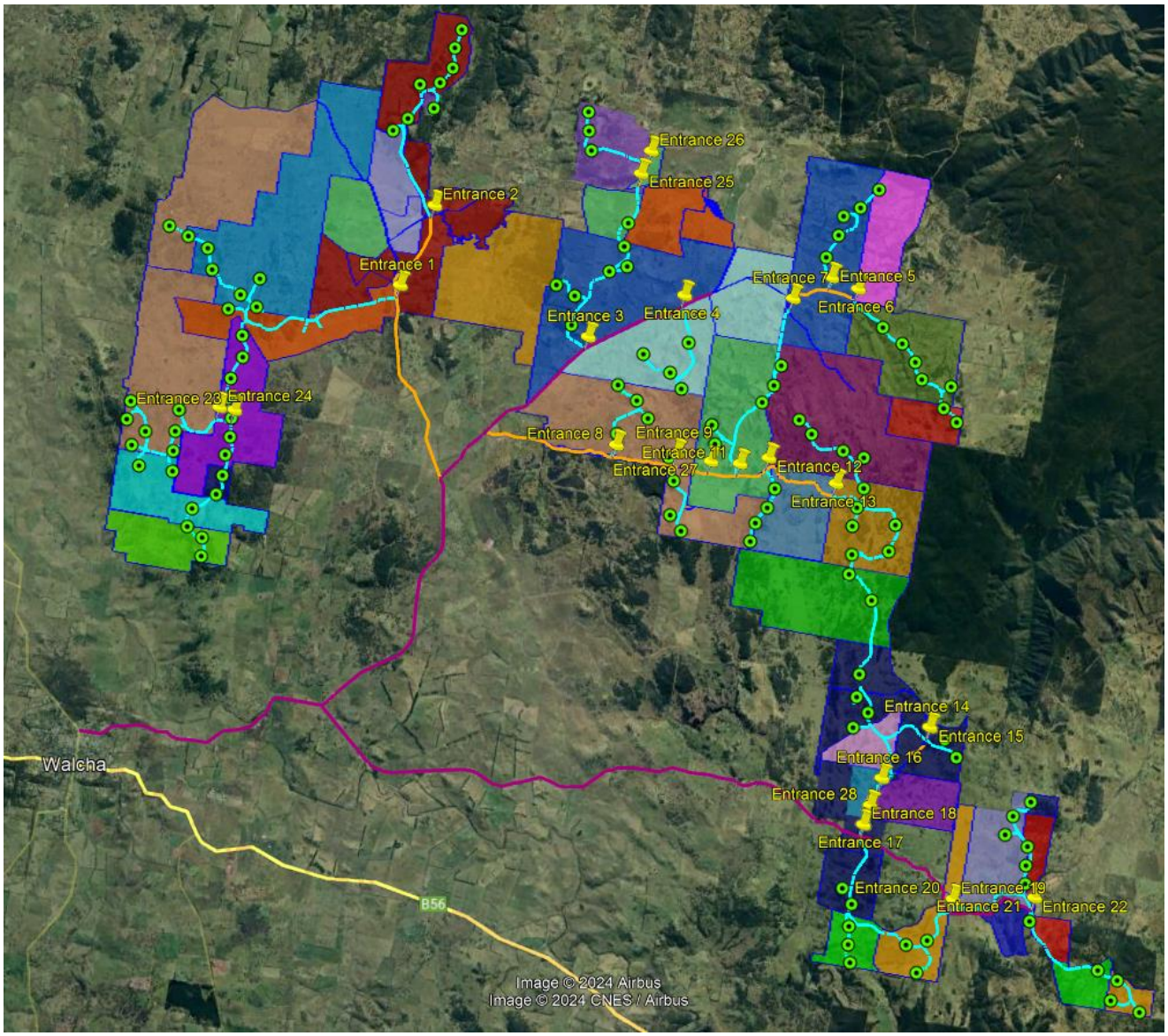
Blade


4305
1378
91217
79797
57056
16600
4126
3325
2806
1400
3600
7868
9000
45000
839
12000 X3
120
3600
7750
1127
4946
11R22.5x2
T: 9.0T
P: 0.0T
G: 6.0T
11R22.5x8 @2.5m
T: 18.5T
P: 0.0T
G: 18.5T
3x8 215/75R17.5 @3.4m
T: 20.0T
P: 16.0T
G: 36.0T (12.0T/ROW)
3x8 215/75R17.5 @3.4m
T: 20.0T
P: 14.0T
G: 34.0T (11.3T/ROW)
730 OPEN
730 639 PINNED TRAILER
OPEN
A4
DO NOT SCALE
DWG: VEST_V162_730_3x8_3
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DIMENSIONS IN MILLIMETRES
TOLERANCES - LINEAR ± 2.0


R90000
R80000
R74000
500
500
50°
50°
5371
730 OPEN
730 639 PINNED TRAILER OPEN
A4
DO NOT SCALE
DWG: VEST_V162_730_3x8_3
REX J ANDREWS PTY LIMITED
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6.0 Site Location and layout

The Winterbourne wind farm is located 20 Km's North East of Walcha and 425 Kilometers by road from the Port of Newcastle.



7.0 Port of Import

The wind turbine equipment will be imported from various countries and will arrive on ships into the Port of Newcastle. The client may alternately source local towers. The ideal berth for these shipments is the Mayfield #4 Berth. This facility has a hardstand storage area of roughly 100,000 s/q meters, adjacent to the berth.

Access from the storage to the public roads, is via a port operated road onto Selwyn Street. There will need to be a small amount of road modifications within the port.

Image 1: Port overview

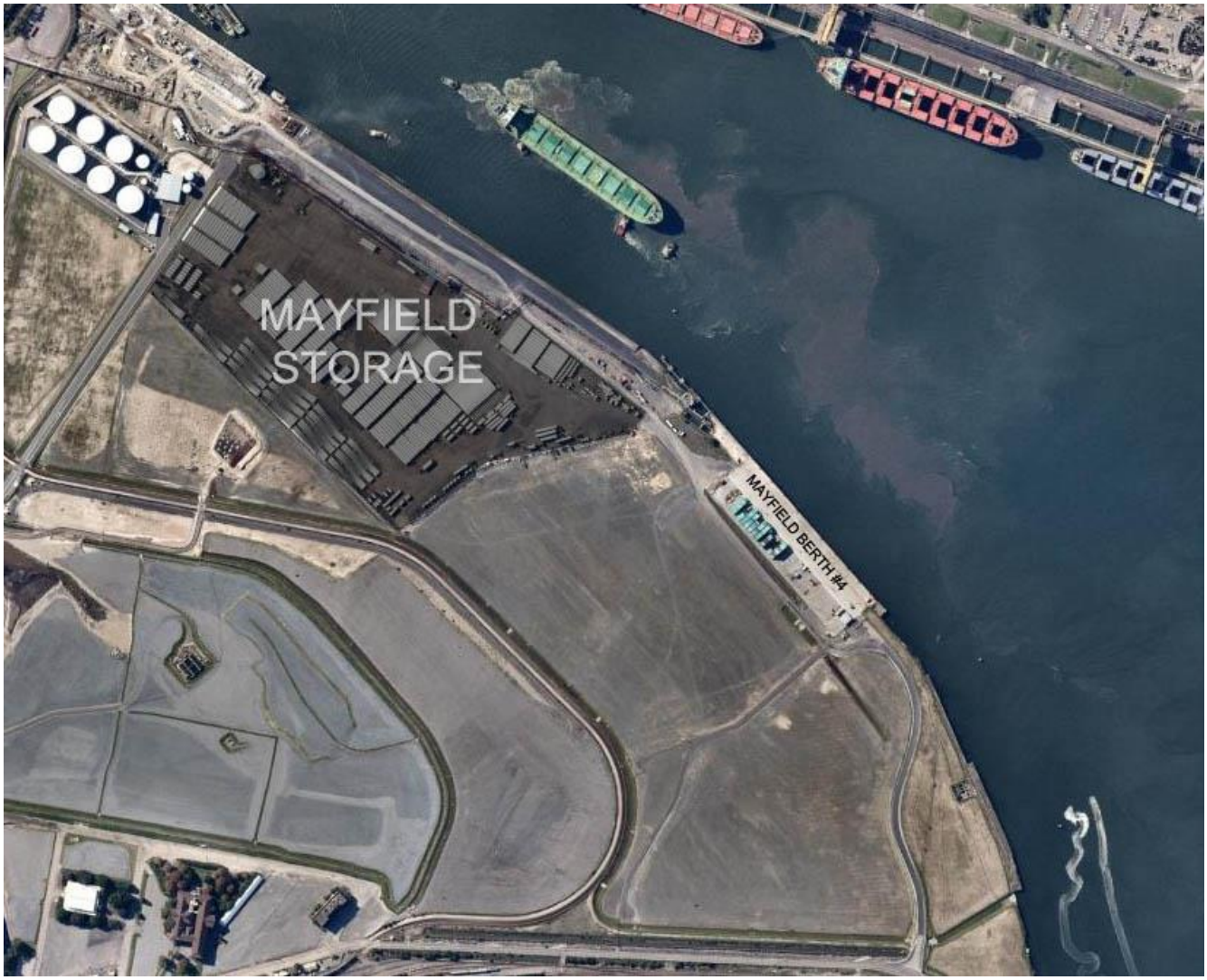


Image 2: Mayfield #4 Port storage area

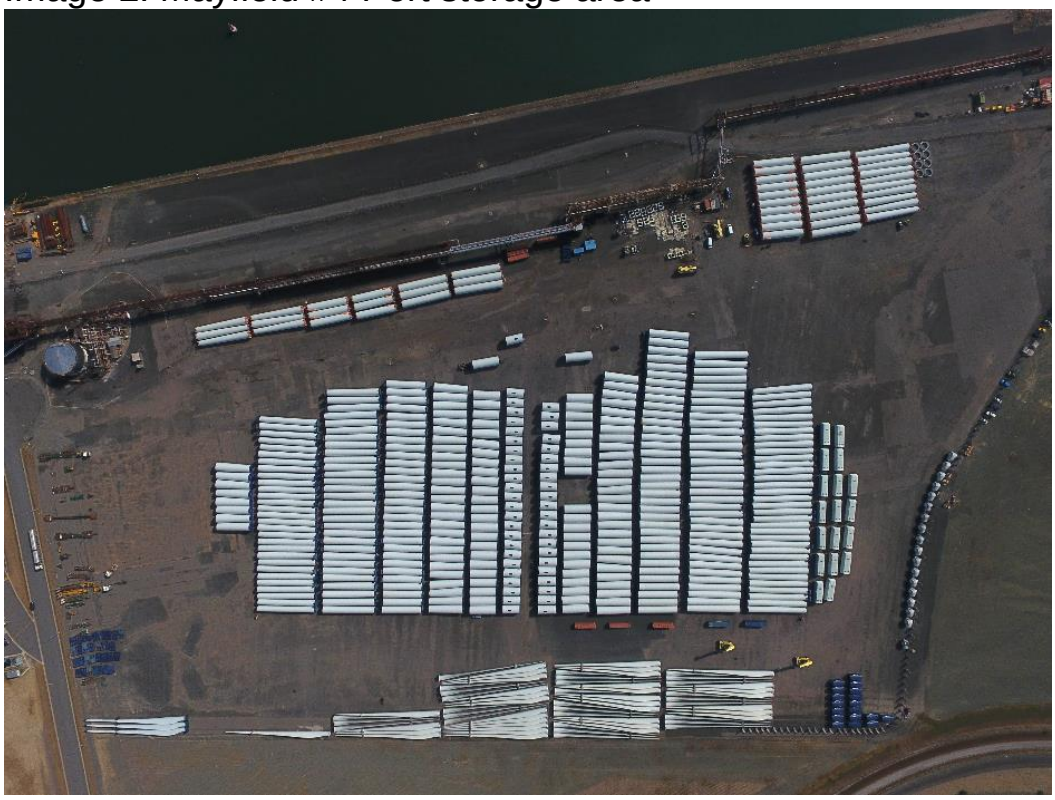


Image 3: Mayfield #4 Port storage area



8.0 Transport Summary

We have based this study on the turbine components, and towers entering Australia via the Port of Newcastle. The following shows 3 different routes for the components up until Walcha, and a further 3 local routes from Walcha through to the site delivery points.

ROUTE SURVEY 1: PORT OF NEWCASTLE TO WALCHA >5.2m

COMPONENTS: Blades, Towers and Nacelle over 5.2 metres in overall height.

DISTANCE: 448 kilometres

GPS Link: https://maps.app.goo.gl/WSoBw8yBidQNURXJ9

Via: Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Golden Highway, Putty Road, Jerrys Plains Road, Golden Highway, Denman Road, Bengalla Road, Wybong Road, Kayuga Road, Invermein Street, Stair Street, Dartbrook Mine access Road, New England Highway, (Tamworth bypass via Scott Street, Marius Street), New England Highway, Staces Road, Thunderbolts Way and Jamieson Street.

ROUTE SURVEY 2: PORT OF NEWCASTLE TO WALCHA <5.2m

COMPONENTS: Powertrain, Hub and small components under 5.2 metres in overall height.

DISTANCE: 406 kilometres

GPS Link: https://maps.app.goo.gl/pUEjXnAdb6CN1wUX9

Via: Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Bell St, Victoria St, Bridge St, New England Highway, (Tamworth bypass via Scott Street, Marius Street), New England Highway, Staces Road, Thunderbolts Way and Jamieson Street.

ROUTE SURVEY 3: ALTERNATIVE ROUTE THROUGH TAMWORTH

COMPONENTS: Blades.

DISTANCE: 11.7 kilometres

GPS Link: https://goo.gl/maps/iKHEcvAagaESySBHA

This route is currently limited to 25T GVM, is subject to flooding and would entail 800m of reversing on Nundle Road and the New England Highway.

Via: Whitehouse Lane, Marsden Park Road, O'Briens Lane and Nundle Road.

ROUTE SURVEY A: WALCHA TO NORTHERN SITE ENTRIES

COMPONENTS: All components.

DISTANCE: 22.0 kilometres

GPS Link: https://maps.app.goo.gl/8MV63fEKBi3fyybZ6

This route took us via Jamieson Street, Emu Creek Road, Winterbourne Road and Blue Mountain Road.

ROUTE SURVEY B: WALCHA TO EASTERN SITE ENTRIES INCLUDING BARK HUT ROAD

COMPONENTS: All components.

DISTANCE: 28.0 kilometres

GPS Link: https://goo.gl/maps/ReBSgz3xgF9arY7dA

This route took us via Jamieson Street, Emu Creek Road, Winterbourne Road and Table Top Road.

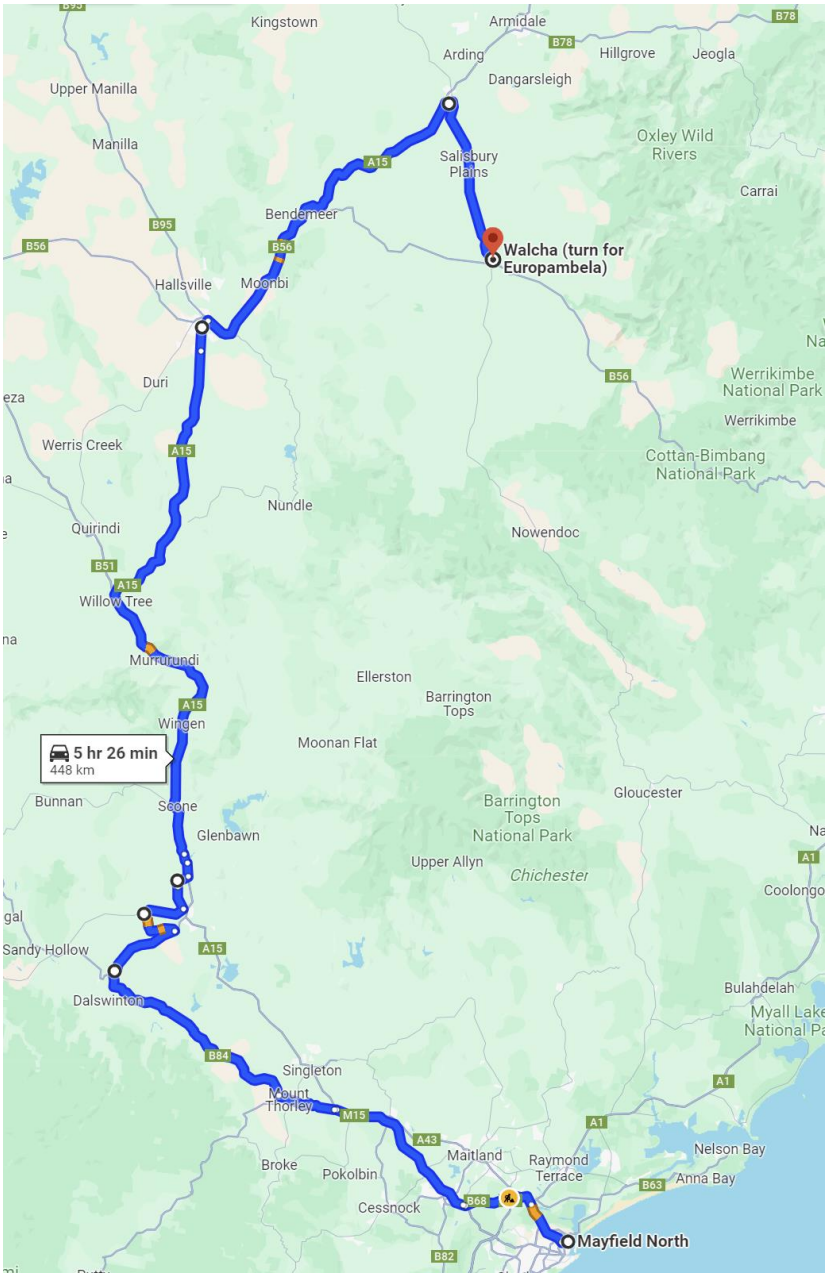
9.0 Route Survey 1: Newcastle Port to Walcha >5.2m

COMPONENTS: Blades, Towers and Nacelle over 5.2 metres in overall height.

DISTANCE: 448 kilometres

GPS Link: https://maps.app.goo.gl/WSoBw8yBidQNURXJ9

This route took us via Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Golden Highway, Putty Road, Jerrys Plains Road, Golden Highway, Denman Road, Bengalla Road, Wybong Road, Kayuga Road, Invermein Street, Stair Street, Dartbrook Mine access Road, New England Highway, (Tamworth bypass via Scott Street, Marius Street), New England Highway, Staces Road, Thunderbolts Way and Jamieson Street.



KEY	
MODIFICATIONS REQUIRED	
MINOR WORKS OR CAUTION	
PARKING	

KM index	Location	Section of road	Current Measurement	Procedure	Comments 162m rotor
0.0	Mayfield	Mayfield #4 berth onto Selwyn Street https://maps.app.goo.gl/eeFTZ9XRHqDq2Vjr8	Length: 70.0 metres Width: 8.0 metres	Right hand turn	Has already been modified for Rye Park.
0.4	Mayfield	Selwyn Street rail crossing https://maps.app.goo.gl/QsvtkJSqC8ASwK1G6	Width: 9.0 metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
1.3	Mayfield	Selwyn Street onto George Street https://maps.app.goo.gl/n7hsoTJR2msPpArs8	Length: 70.0 metres Width: 8.0 metres	Right hand turn	Has already been modified for Rye Park.
1.4	Mayfield	George Street onto Industrial Drive https://maps.app.goo.gl/bNk9jDHY5QetGSUF6	Length: 70.0 metres Width: 7.0 metres	Right hand turn	Entering Industrial Drive, the loads will cross from the correct side to the incorrect side. Some hardstands will need to be placed on the south side of the intersection. A spotter would need to help the load through this intersection.
4.9	Mayfield	Industrial Drive under traffic signals https://maps.app.goo.gl/SZbqMPaVNvVJW1uN6	Height: 5.4 Metres	Travel directly ahead	The lowest traffic signal on route is at the intersection of Steel River Blvd. Trucks that exceed 5.3 metres will need to travel in the right hand lane.
5.5	Mayfield West	Industrial Drive onto Maitland Road https://maps.app.goo.gl/brpx5z6aC5pVVpuK8	Length: 80.0 metres Width: 7.0 metres	Right hand turn	The blades will need to cross to the incorrect side 150 metres prior to the intersection then return to the correct side 120 metres past the intersection.
14.8	Tarro	New England Highway https://goo.gl/maps/aED5Y4ccdW3A47x37	Length: 90.0m Width: 8.0m	Left hand bend	No problems with this section of road.
17.4	Tarro	New England Highway onto John Renshaw Drive https://maps.app.goo.gl/8UigCfWW1kXaNVhEA	Width: 12.0 metres	Left hand merge	No problems with this section of road.
18.4	Beresfield	John Renshaw Drive through M1 intersection https://maps.app.goo.gl/pfFUCkDM3v2JSfsb6	Width: 9.0 metres Height: 5.9 metres	Travel directly ahead	No problems with this section of road.

KM index	Location	Section of road	Current Measurement	Procedure	Comments 162m rotor
28.7	Buchanan	John Renshaw Drive onto the Hunter Expressway https://maps.app.goo.gl/1rn5HrpCK85bU1cR8	Length: 70.0 metres Width: 7.0 metres	Right hand turn	The blades will need to cross to the incorrect side then down the off-ramp onto the incorrect side of the expressway. Approx 600 metres along the expressway there is a break in the road, which will allow the blades to cross back to the correct side of the expressway. The signs on the right in the off ramp will need to be made removable and likely to require hardstand to cross the expressway.
58.9	Branxton	The Hunter Expressway onto New England Highway https://maps.app.goo.gl/XwCX3HiRTtdA3owY6	Width: 9.0 metres	Travel directly ahead	No problems with this section of road.
67.3	Whittingham	The New England Highway onto the Golden Highway https://maps.app.goo.gl/2Ndnp42wshHvwuTd6	Clearance: Width: 12.0 metres Length:	Left Hand turn	Some signs to be made removable.
67.4	Whittingham	Golden Highway https://maps.app.goo.gl/MackyuvoHjiTHAa77	Clearance: 115.0 x 9.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
77.3	Whittingham	Golden Highway intersection with the Putty Road https://maps.app.goo.gl/R1QZEXnUq5rr44Ut9	Clearance: Length: 85.0 metres Width: 12.0 metres	Left hand turn	Some signs to be made removable.
77.4	Mount Thorley	Golden Highway https://maps.app.goo.gl/gAqNsbdUS2r8Riye9	Clearance: 100.0 x 10.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
80.8	Mount Thorley	Golden Highway intersection with Mt Thorley Road https://maps.app.goo.gl/4Ff4dzUHctp5yZZw7	Clearance: Length: 45.0 metres Width: 8.0 metres Height: 5.6 metres	Right hand turn	Loads over the listed clearances will need to travel along the incorrect side of the road. Loads will need to cross to the incorrect side 100 metres prior to the Mt Thorley Road underpass.
98.0	Warkworth	Golden Highway https://maps.app.goo.gl/gAqNsbdUS2r8Riye9	Clearance: 100.0 x 8.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
107.0	Jerrys Plains	Golden Highway through Jerrys Plains village https://maps.app.goo.gl/5qK3pwFh4hoo38jz7	Clearance: Length: 70.0 metres Width: 9.0 metres	Dogleg	Hardstand and likely sign removal required.

KM index	Location	Section of road	Current Measurement	Procedure	Comments 162m rotor
126.0	Ogilvy	Golden Highway https://maps.app.goo.gl/cpJqafWT6hSDVdKe9	6% gradient	Travel directly ahead	This section of road has a steep mountain range that will require additional pull trucks to assists loads that exceed 80T gross weight. Additionally the NSW Government is currently upgrading this section of road. It is recommended that you monitor the progress of the upgrades, and that any changes are thoroughly looked at.
141.9	Denman	Golden Highway onto Denman Road https://maps.app.goo.gl/4Zv86eZEUSXiywTY8	Clearance: Length: 60.0 metres Width: 10.0 metres	Right hand turn	Some signs to be made removable.
149.0	Muswellbrook	Denman Road onto Bengalla Road https://goo.gl/maps/CJYMtSMTttJ2	Length: 65.0 metres Width: 8.0 metres	Left hand turn	Hardstand required and some signed to be relocated.
158.5	Muswellbrook	Bengalla Road onto Wybong Road https://goo.gl/maps/vibQtvHkxXE2	Length: 70.0 metres Width: 8.0 metres	Right hand turn	Sign to be relocated
168.1	Muswellbrook	Wybong Road onto Kayuga Road https://goo.gl/maps/xVscKUT1isJ2	Length: 40.0 metres Width: 7.0 metres	Left hand turn	Loads to cross from the incorrect side to the incorrect side. Permission will be required from the landowner to travel over the private land. This will require removal and realigning the fence and adding hardstand. Additionally, some hardstand will be required on the exit of the corner.
173.0	Muswellbrook	Kayuga Road onto Ivermein Street https://goo.gl/maps/JpTfmcsZ6Sk	Width: 8.0 metres	Width: 8.0 metres	Travel directly ahead
174.0	Muswellbrook	Ivermein Street onto Stair Street https://goo.gl/maps/ddMHa4CmXK32	Length: 50.0 metres Width: 7.0 metres	Right hand turn	Loads to cross from the correct side to the correct side. Some signs will need to be made removable and some hardstand added to the inside and outside of the corner. Additionally, a pipe will need to be extended on the inside of the corner.
174.8	Muswellbrook	Curve on Stair Street https://goo.gl/maps/u9vSXiSV7Jt	Length: 60.0 metres Width: 8.0 metres	Right hand turn	Hardstand Required and signs to be relocated
177.0	Muswellbrook	Stair Street onto New England Highway https://goo.gl/maps/twTsmUKaED82	Length: 60.0 metres Width: 7.0 metres	Left hand turn	Hardstand Required and signs to be relocated
179.3	Aberdeen	New England highway (Township) https://maps.app.goo.gl/iVCMvh4qrxwViDw67	120 x 5.0 metres	Shoulder	Suitable parking for Fatigue breaks.
233.0	Murrurundi	New England highway (Township) https://goo.gl/maps/Sj3ixAkhujt	60.0 x 5.0 metres	Parking Bay	Suitable parking for Fatigue breaks.

KM index	Location	Section of road	Current Measurement	Procedure	Comments 162m rotor
238.0	Murrurundi Hill	New England highway Nowlands Gap https://goo.gl/maps/R5yufobPeMG2	120.0 x 12.0 metres	Parking Bay	Emergency parking only.
244.0	Willow Tree	New England highway https://goo.gl/maps/XLTq7CRV7EU2	Width: 7.0 metres Length: 35 metres Height: 5.2 metres	Kankool weighbridge	It is likely that the towers and defiantly the blades will not fit into this facility. Engineered documentation showing correct weights for all loads will be required.
251.0	Willow Tree Township	New England highway https://goo.gl/maps/gw38qmvVfTC2	60.0 x 5.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
253.00	Willow Tree Truck Stop	New England highway https://goo.gl/maps/RRdPVHupGCs	120.0 x 12.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
269.0	Wallabadah	New England highway https://goo.gl/maps/QWCyeHQSohS2	80.0 x 5.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
301.0	Goono Goono	New England highway https://goo.gl/maps/im4QhUfW24D2	100.0 x 8.0 metres	Parking Bay	Emergency parking only. Incorrect side of the road
319.0	Tamworth	Standard roundabout on the New England https://goo.gl/maps/j1tpfb8JJf83jjt2A	Length: 66.0 metres Width: 6.0 metres	Drive directly ahead	Several signs will need to be made removable.
321.0	Tamworth	Standard roundabout on the New England https://goo.gl/maps/UM9a6UEw14GhSAXm8	Length: 66.0 metres Width: 6.0 metres	Drive directly ahead	Several signs need to be made removable and a tree removed.
321.5	Tamworth	Standard roundabout on the New England https://goo.gl/maps/3J9dCHxtYim	Length: 66.0 metres Width: 6.0 metres	Drive directly ahead	The roundabout has delineators at approx. 800mm high, and small shrubs at a similar height. These signs may need to be relocated or made removable. Additionally, the tail swing will travel close to the roundabout warning signs, these will also need to be made removable.
322.0	Tamworth	New England Highway onto the heavy vehicle bypass at Scott Road. https://goo.gl/maps/BXdwaSiLSBw	Length: 66.0 metres Width: 6.0 metres	Right hand turn	The swept path for the loads will require the blade to travel through the landowners' boundaries on the north side of the intersection and would require 1 pole to be relocated. Additionally, extra hardstand would be required on the centre median strip as well as the landowners' boundaries and some signs made removable. Some trees will need to be removed from the tailswing.

KM index	Location	Section of road	Current Measurement	Procedure	Comments 162m rotor
324.0	Tamworth	Scott Road onto Murray Street https://goo.gl/maps/nix2oREeh6H2	Length: 66.0 metres Width: 6.0 metres	Drive directly ahead	Blades swept path will travel over the edge of the roundabout. To do these 2 palm trees will need to be removed along with numerous signs to be made removable. Alternatively, the Light Pole could be relocated to allow blade to steer around the palm trees.
324.2	Tamworth	Murray Street onto New England Highway https://goo.gl/maps/45dffqHmUcs	Length: 66.0 metres Width: 6.0 metres	Right hand turn	Loads to cut across the wrong side of the roundabout from correct side to correct side. This intersection will require the 2 median strips to be hardstand, and several signs made removable.
325.0	East Tamworth	New England highway https://goo.gl/maps/9cpBrT5qUAU2	200.0 x 8.0 metres	Parking Bay	Suitable parking for Fatigue breaks
344.0	Moonbi	New England highway https://goo.gl/maps/E3TL2KkEctG2	80.0 x 6.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
351.0	Moonbi	New England highway https://goo.gl/maps/pv1wtcjgB91a1iLM6	8% gradient	Travel directly ahead	This section of road has a steep mountain range that will require additional pull trucks to assists loads that exceed 80T gross weight.
356.0	Moonbi range	New England highway https://goo.gl/maps/rwJQaAYkLTQ2	120.0 x 12.0 metres	Parking Bay	Suitable parking for Fatigue breaks
408.0	Kingswood	New England tom Staces Road https://maps.app.goo.gl/G6pu4wkUc75JqSV69		Turn Right	Hardstand required on outside of the corner.
409.0	Uralla	Easement between Staces Road and Thunderbolts Way https://maps.app.goo.gl/8J8aBM1ehFVxFGLA		Travel slightly to left	950m of road to be built through easement.
410.0	Uralla	Easement onto Thunderbolts Way https://maps.app.goo.gl/qkY3p8to5b58qQHYA		Turn Right	Significant road widening and tree removal required.
448.0	Walcha	Thunderbolts way onto Jamieson Street https://goo.gl/maps/qwhPw85k3M7frFRq6	Length: 65.0 metres Width 6.0 metres	Left hand turn	Several signs to be relocated or made removable

0.0 Km's: Mayfield #4 onto Selwyn Street at Mayfield



GPS LINK FOR SECTION OF ROAD: https://maps.app.goo.gl/eeFTZ9XRHqDq2Vjr8

PROCEDURE: Right hand turn.

COMMENTS: Intersection has already been upgraded for Rye Park.

A spotter will need to keep the driver informed throughout the procedure. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: No work required.

0.4 Km's: Rail crossing over Selwyn Street at Mayfield



GPS LINK FOR SECTION OF ROAD: https://maps.app.goo.gl/QsvtkJSqC8ASwK1G6

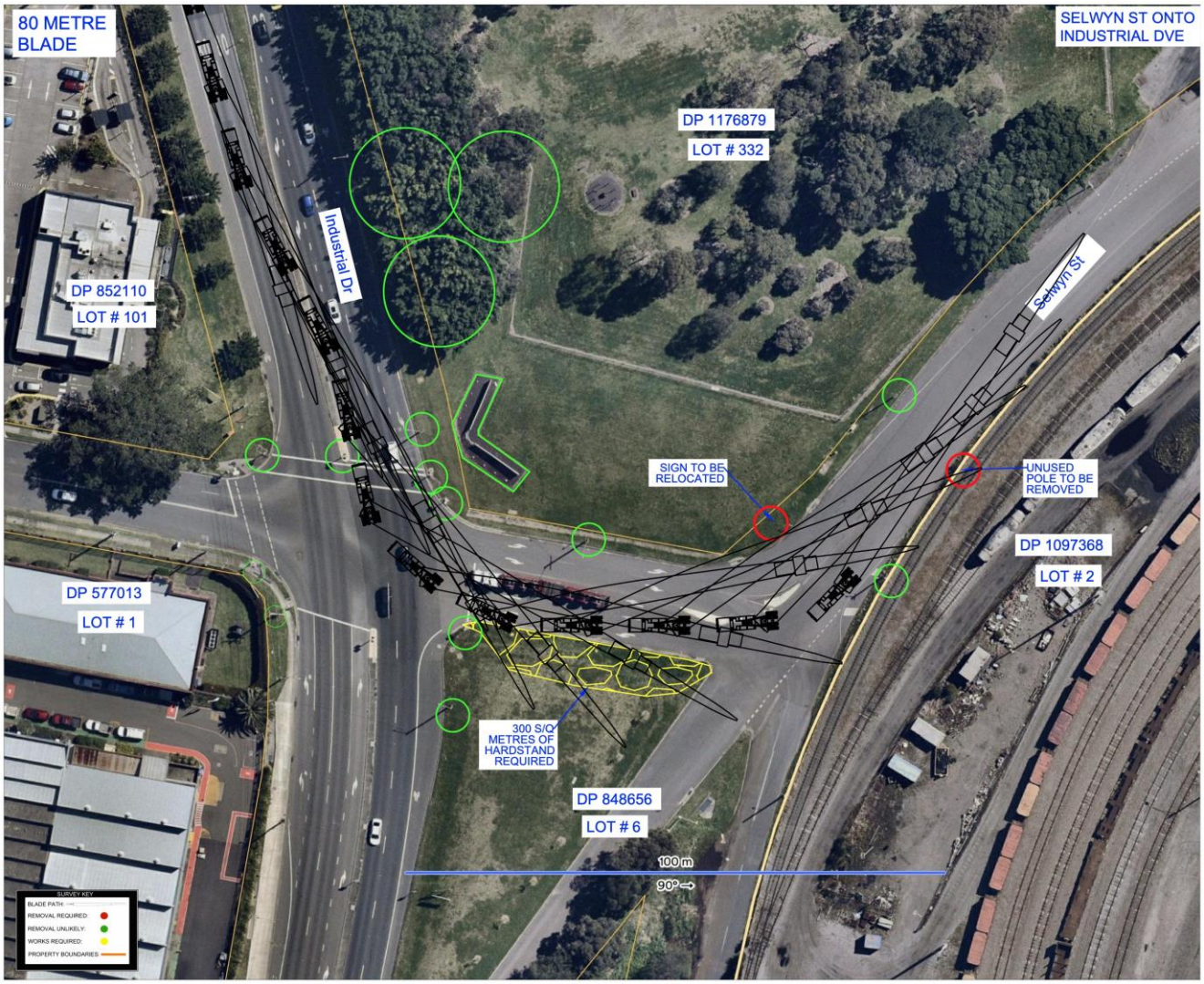
PROCEDURE: Travel directly ahead over the crossing.

COMMENTS: Large width clearance and good ground clearance over this crossing.

Police and escorts to control local traffic either side of the crossing. ARTC approval will need to be obtained to travel over this crossing. Likely to cross with caution, no escort required.

ROAD MODIFICATIONS: No works are required.

1.3 Km's: Selwyn Street onto Industrial Drive, via George Street at Mayfield



GPS LINK FOR SECTION OF ROAD: https://maps.app.goo.gl/n7hsoTJR2msPpArs8

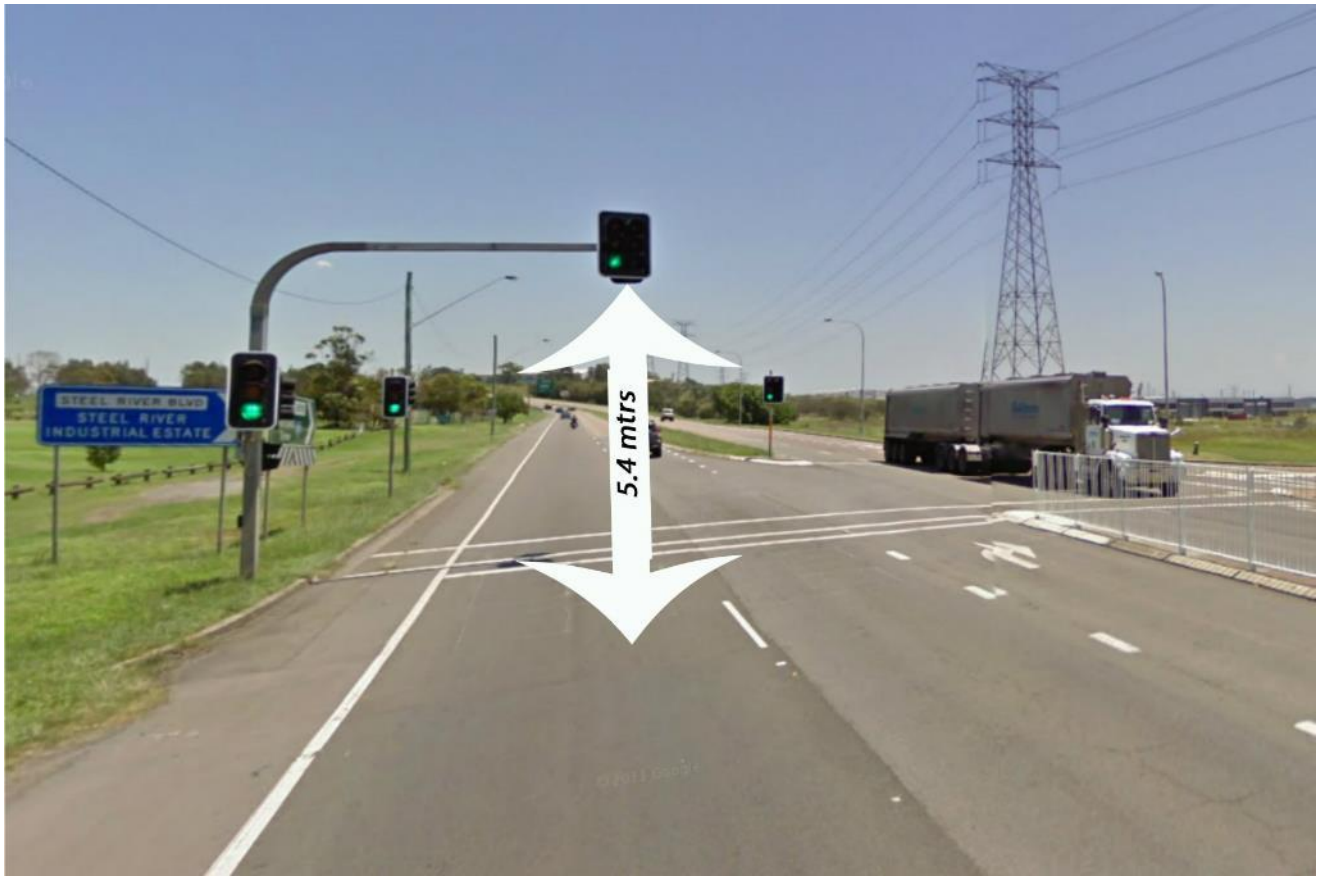
PROCEDURE: Right hand turn from Selwyn Street through George Street and onto Industrial Drive.

COMMENTS: Intersection has already been upgraded for Rye Park.

Entering Industrial Drive, the loads will cross from the correct side to the incorrect side. A spotter would need to help the load through this intersection.

ROAD MODIFICATIONS: No work required.

4.9 Km's: Standard overhanging Traffic signals Mayfield to Hunter Expressway



GPS LINK FOR SECTION OF ROAD: https://maps.app.goo.gl/SZbqMPaVNvVJW1uN6

PROCEDURE: Overhanging signals while travelling through the intersection.

COMMENTS: The lowest traffic signal on route has 5.4 metres clearance. This signal is on the corner of Steel River Blvd at Mayfield West. Loads with an overall height of 5.3 or higher, can avoid this signal by travelling in the centre lane. Loads to slow down while doing this manoeuvre. All other signals exceed 5.6 metres high on this section of road.

ROAD MODIFICATIONS: No works are required.

5.5 Km's: Industrial Drive onto Maitland Road at Mayfield West



GPS LINK FOR SECTION OF ROAD: https://maps.app.goo.gl/brpx5z6aC5pVVpuK8

PROCEDURE: Right hand turn from Industrial Drive onto Maitland Road.

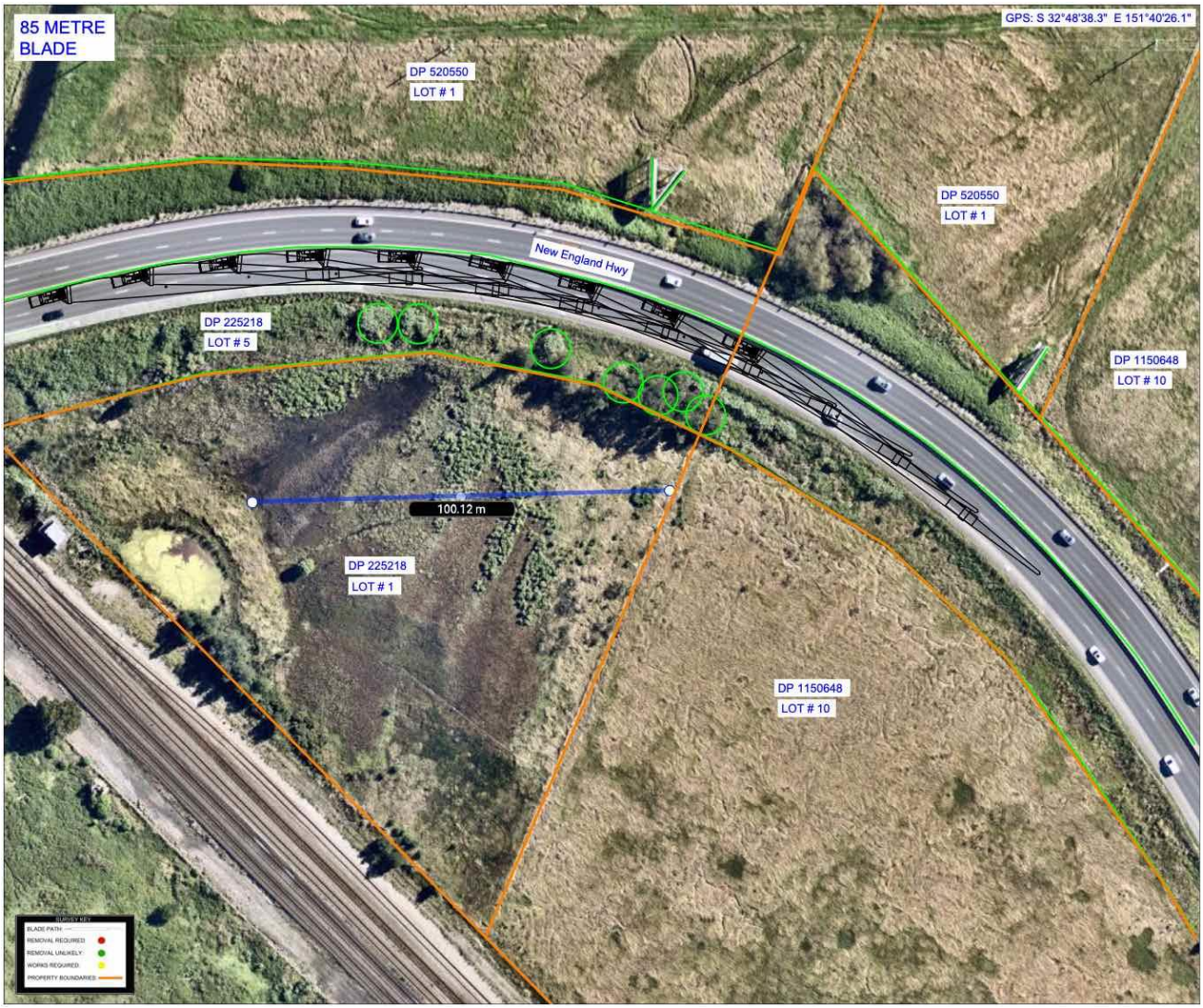
COMMENTS: The loads will need to cross to the incorrect side of the intersection, before crossing back over 200 metres to the north.

Spotter to keep the driver informed throughout the procedure.

Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: No work required.

14.8 Km's: New England Highway at Tarro.



GPS LINK FOR THIS LOCATION: https://goo.gl/maps/aED5Y4ccdW3A47x37
PROCEDURE: Right hand turn from Industrial Drive onto Maitland Road.
COMMENTS: Prime mover to travel around the corner in the right-hand lane.
Spotter to keep the driver informed throughout the procedure.
ROAD MODIFICATIONS: No works required.

28.7 Km's: John Renshaw Drive onto the Hunter Expressway at Buchanan.

Image 1:



Image 2:



PROCEDURE: Right hand turn onto the incorrect side of the Motorway, before crossing back onto the correct side at the crossover bay.

GPS LINK FOR SECTION OF ROAD: https://maps.app.goo.gl/1rn5HrpCK85bU1cR8

COMMENTS: Cross to the incorrect side than down the off-ramp onto the incorrect side of the expressway. Approx 600 metres along the expressway there is a break in the road, which will allow the blades to cross back to the correct side of the expressway.

Signs to be made removable.

Spotter to keep the driver informed throughout the procedure.

Traffic control and or police will be required to perform this procedure.

ROAD MODIFICATIONS: Yes, a small amount of work is required.

67.4 Km's: New England Highway onto Golden highway at Whitingham



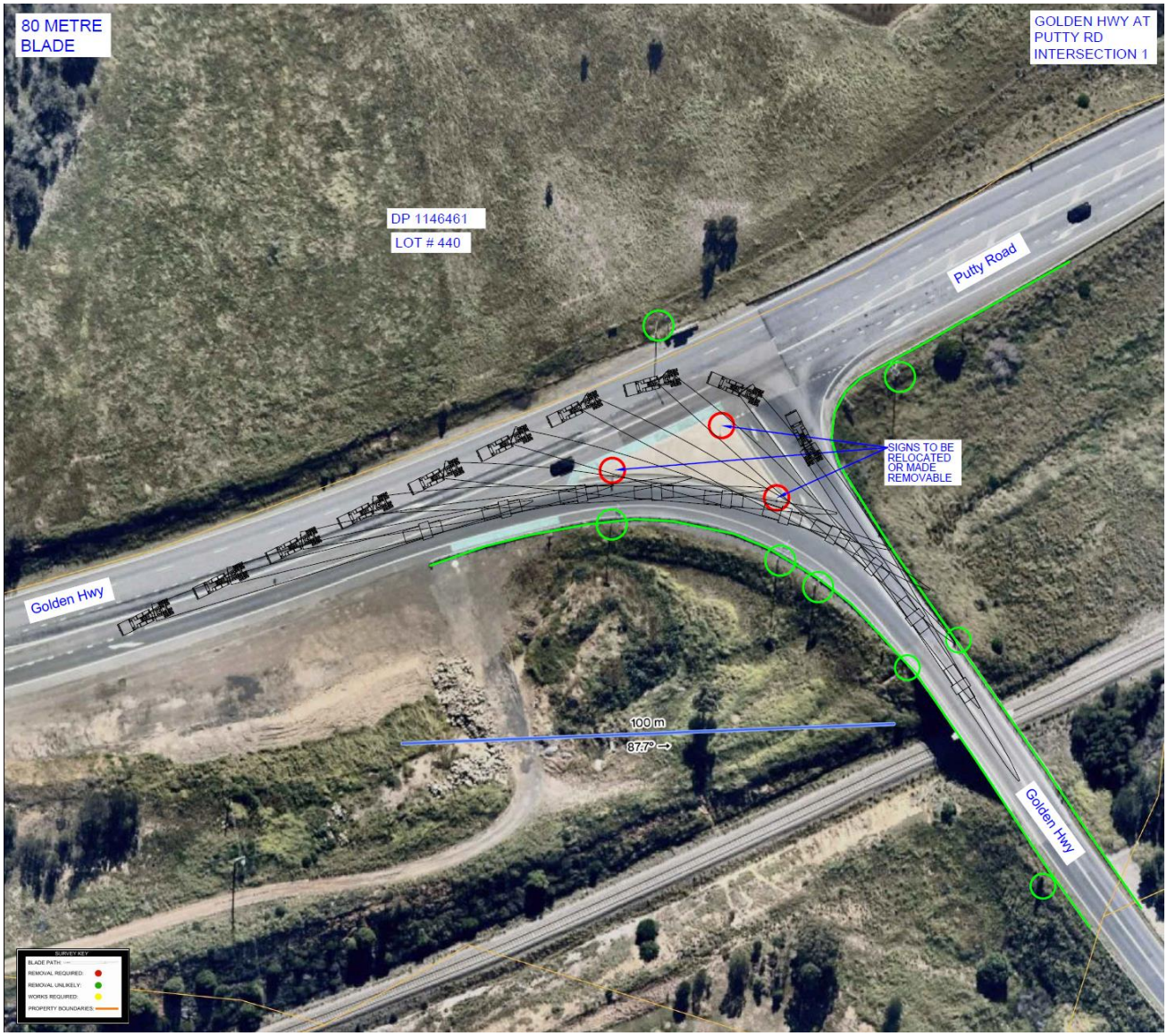
GPS LINK FOR SECTION OF ROAD: https://maps.app.goo.gl/2Ndnp42wshHvwuTd6

PROCEDURE: Left hand turn from the New England Highway onto Golden Highway.

COMMENTS: Loads to turn from the incorrect side to the incorrect side. The signs in the center median will need to be made removable.

ROAD MODIFICATIONS: Yes, a small amount of work is required.

77.3 Km's: Golden Highway onto Putty Road at Whitingham



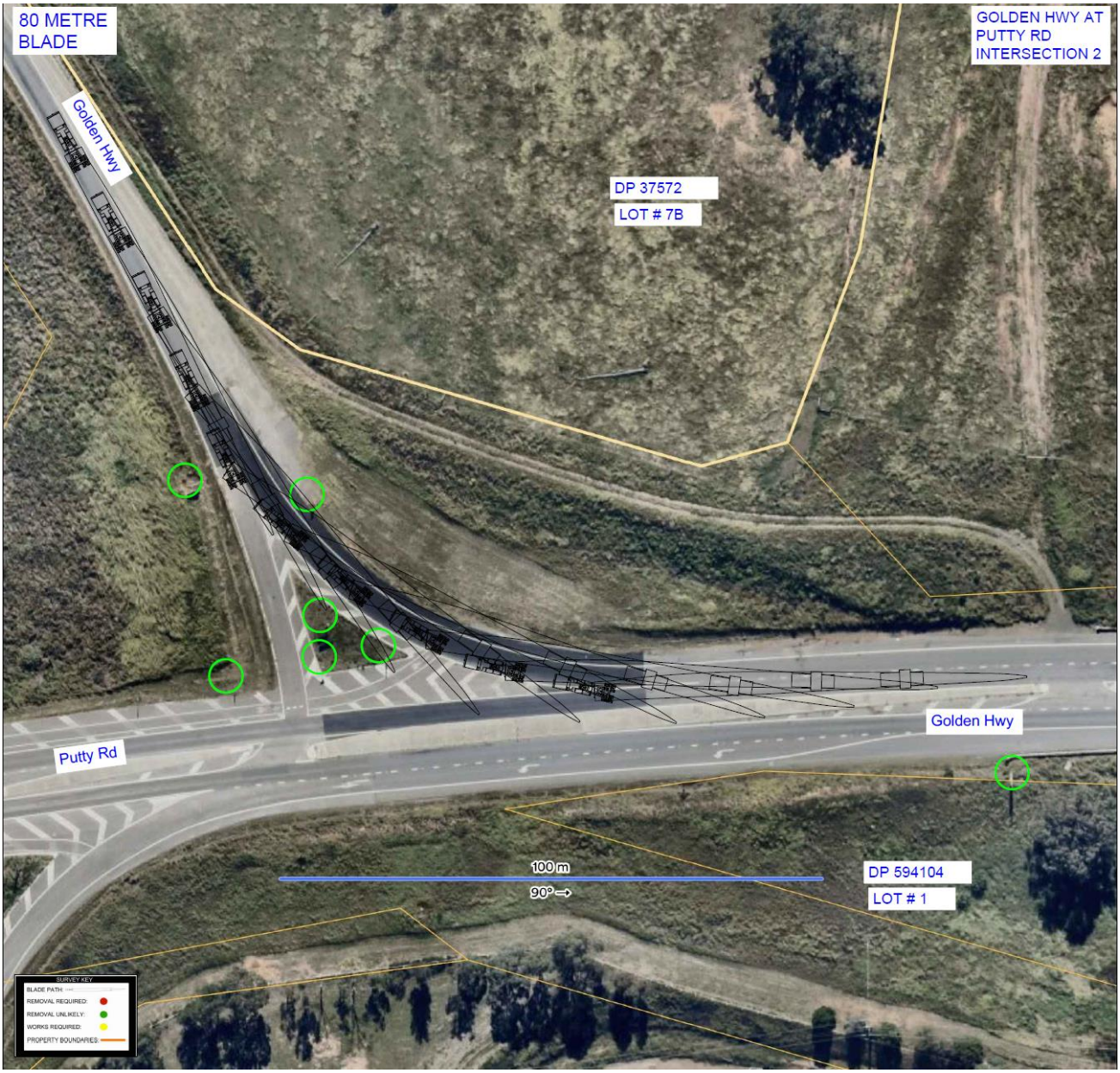
GPS LINK FOR SECTION OF ROAD: https://maps.app.goo.gl/R1QZEXnUq5rr44Ut9

PROCEDURE: Left hand turn from Golden highway onto Putty Road.

COMMENTS: Loads to turn from the incorrect side to the incorrect side. Some signs will need to be made removable.

ROAD MODIFICATIONS: Yes, a moderate amount of work is required.

80.8 Km's: Putty Road onto Mt Thorley Road at Mt Thorley



GPS LINK FOR SECTION OF ROAD: https://maps.app.goo.gl/4Ff4dzUHctp5yZZw7

PROCEDURE: Right hand turn from Putty Road onto Mt Thorley Road.

COMMENTS: Loads to turn from the incorrect side to the incorrect side. Some signs will need to be made removable.

Load under 45m length and 5.6m in height can use the correct side slip lane / on ramp.

ROAD MODIFICATIONS: Yes, a moderate amount of work is required.

107.0 Km's: Golden Highway through Jerry Plains.

Image 1:

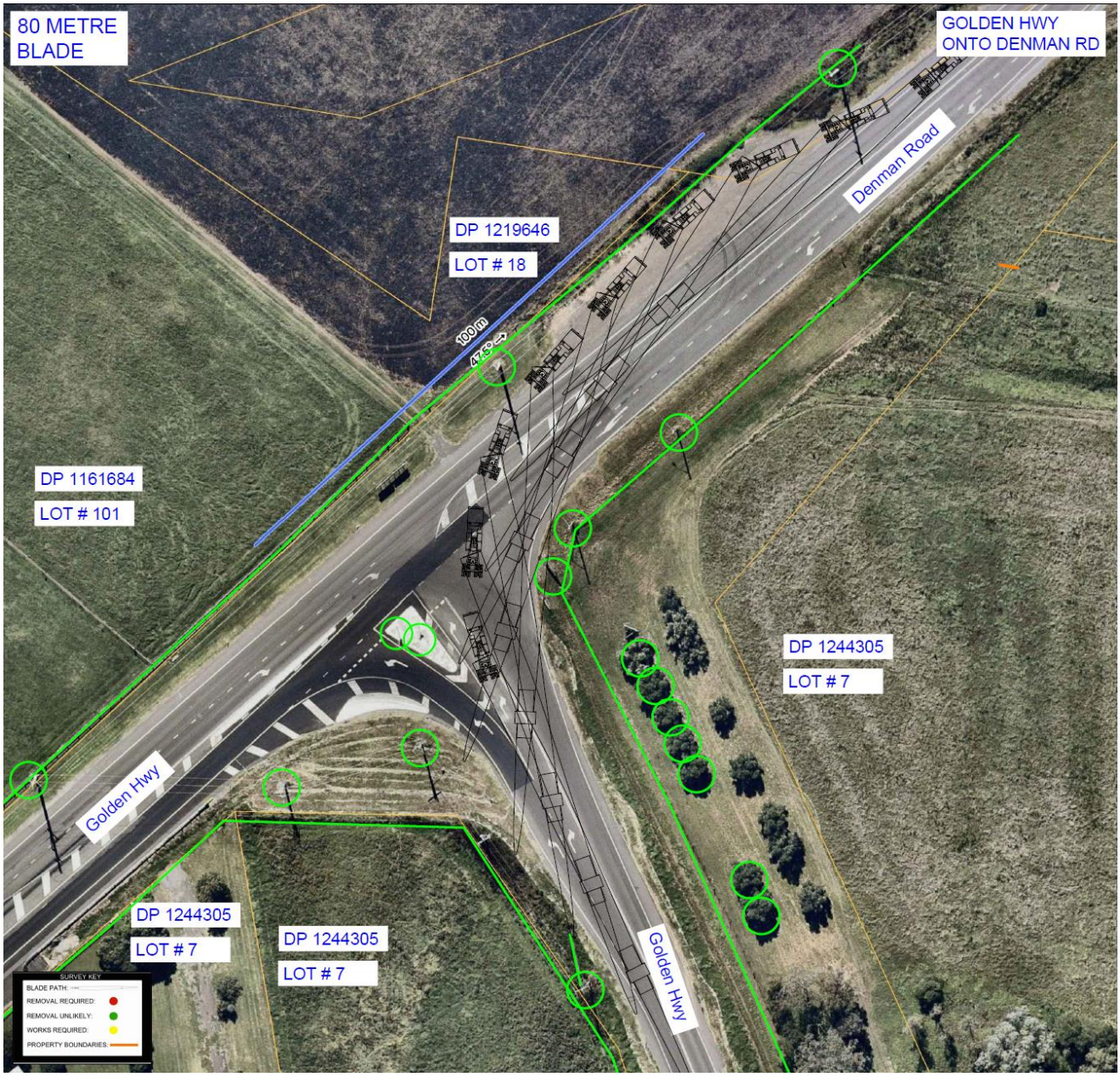


Image 2:



GPS LINK FOR SECTION OF ROAD: https://maps.app.goo.gl/5gK3pwFh4hoo38jz7
PROCEDURE: Right and Left curves through Jerry Plains.
COMMENTS: Hardstand required.
ROAD MODIFICATIONS: Yes, a moderate amount of work is required.

141.9 Km's: Golden Highway onto Denman Road at Denman.



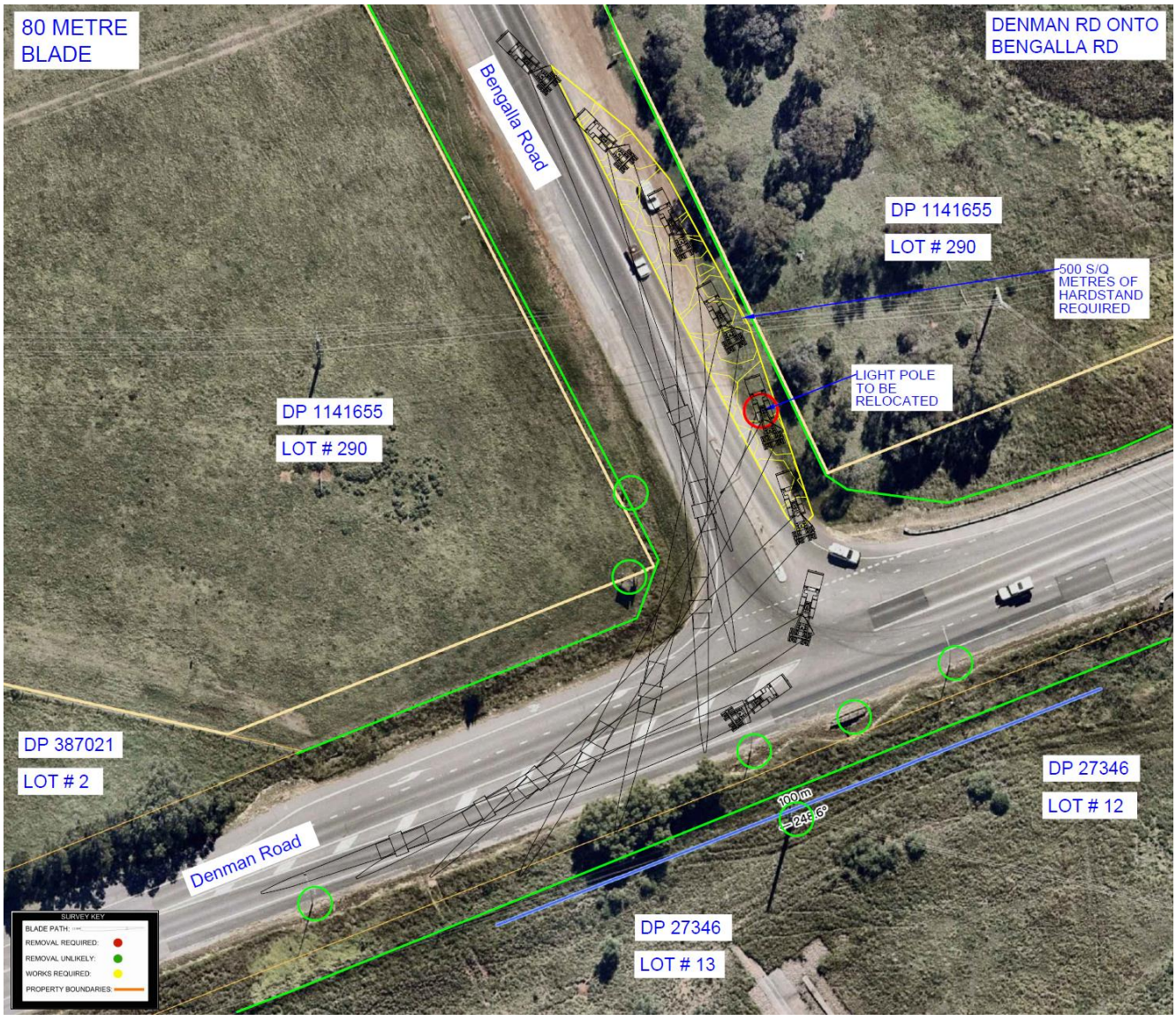
GPS LINK FOR SECTION OF ROAD: https://maps.app.goo.gl/4Zv86eZEUSXiywTY8

PROCEDURE: Righthand hand turn from Golden Highway onto Denman Road.

COMMENTS: Loads to turn from the correct side to the incorrect side. Some signs will need to be made removable.

ROAD MODIFICATIONS: Yes, a minor amount of work is required.

149.0 Km's: Denman Road onto Bengalla Road at Muswellbrook.



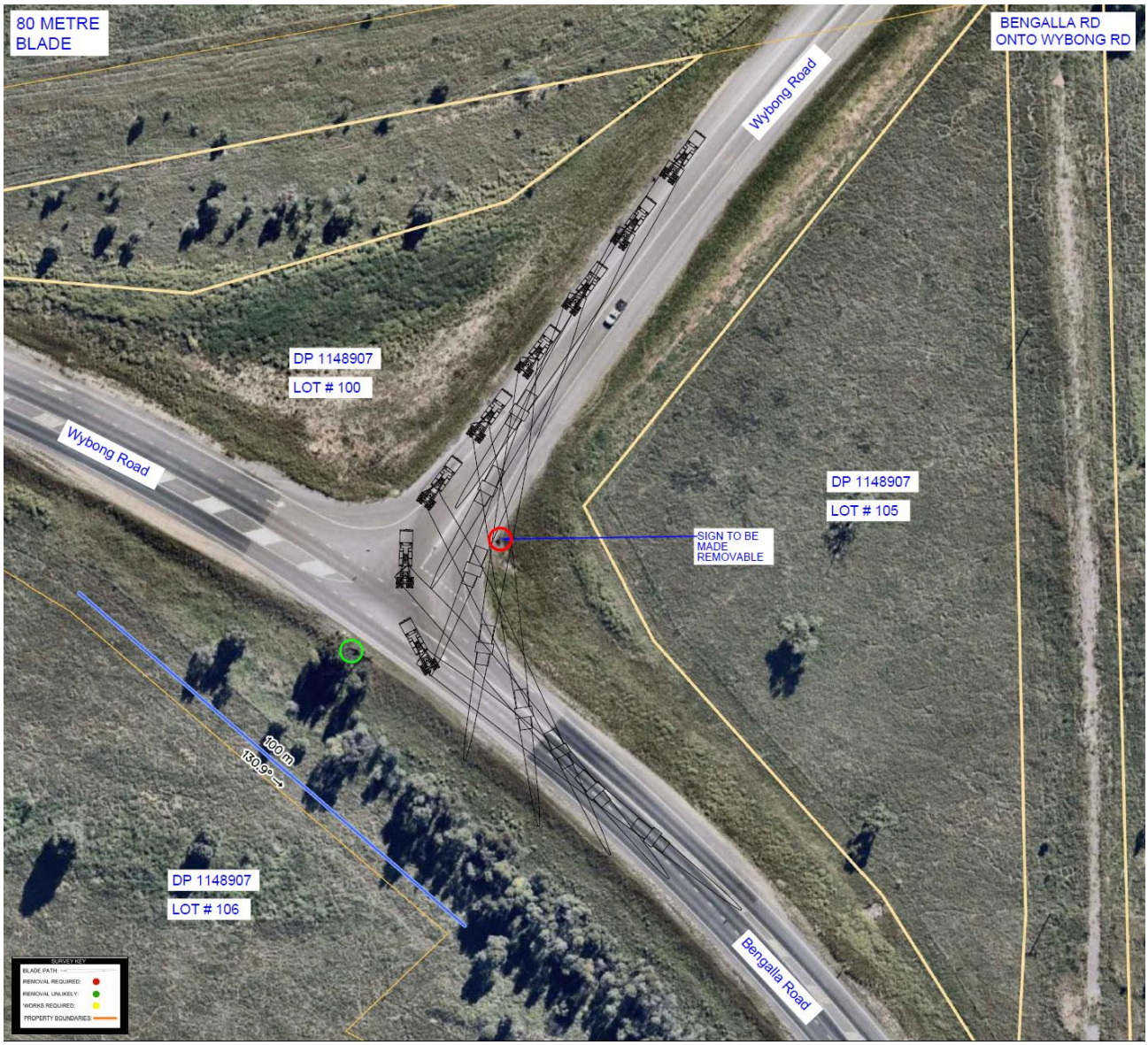
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/CJYMtSMTttJ2

PROCEDURE: Left hand turn from Denman Road onto Bengalla Road.

COMMENTS: Loads to turn from the incorrect side to the incorrect side. Some signs will need to be made removable, and hardstand added.

ROAD MODIFICATIONS: Yes, a moderate amount of work is required.

158.5 Km's: Bengalla Road onto Wybong Road at Muswellbrook.



GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/vibQtvHkxXE2

PROCEDURE: Right hand turn from Bengalla Road onto Wybong Road.

COMMENTS: Loads to turn from the correct side to the correct side. Some signs will need to be made removable.

Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: Yes, a minor amount of work is required.

168.1 Km's: Wybong Road onto Kayuga Road at Muswellbrook.

Image 1:



Image 2:



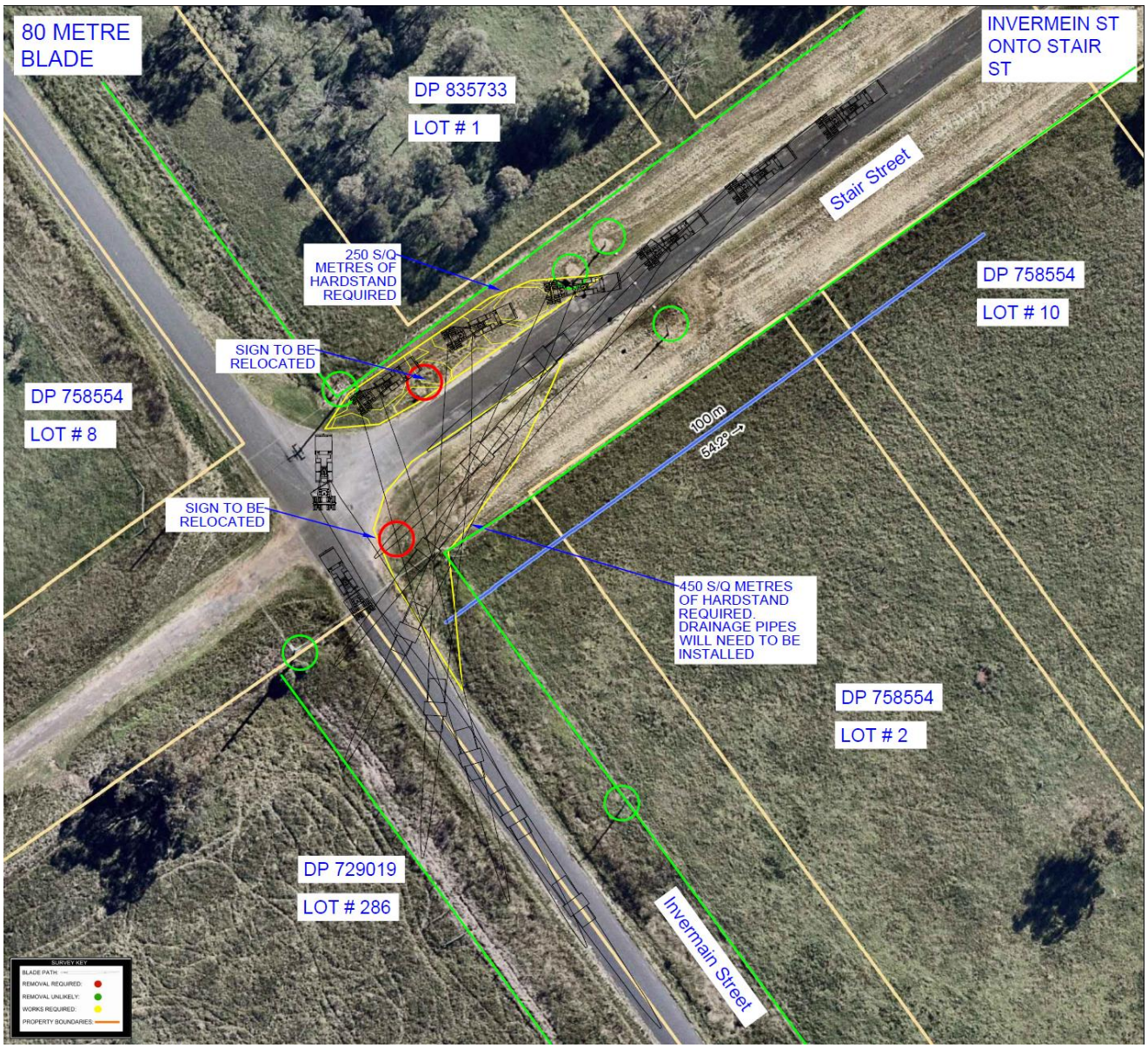
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/xVscKUT1isJ2

PROCEDURE: Left hand turn from Wybong Road onto Kayuga Road.

COMMENTS: Loads to cross from the incorrect side to the incorrect side.
Permission will be required from the landowner to travel over the private land. This will require removal and realigning the fence and adding hardstand. Additionally, some hardstand will be required on the exit of the corner.
Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: A large amount of work is required.

173.0 Km's: Ivermein Street onto Stair Street at Muswellbrook.



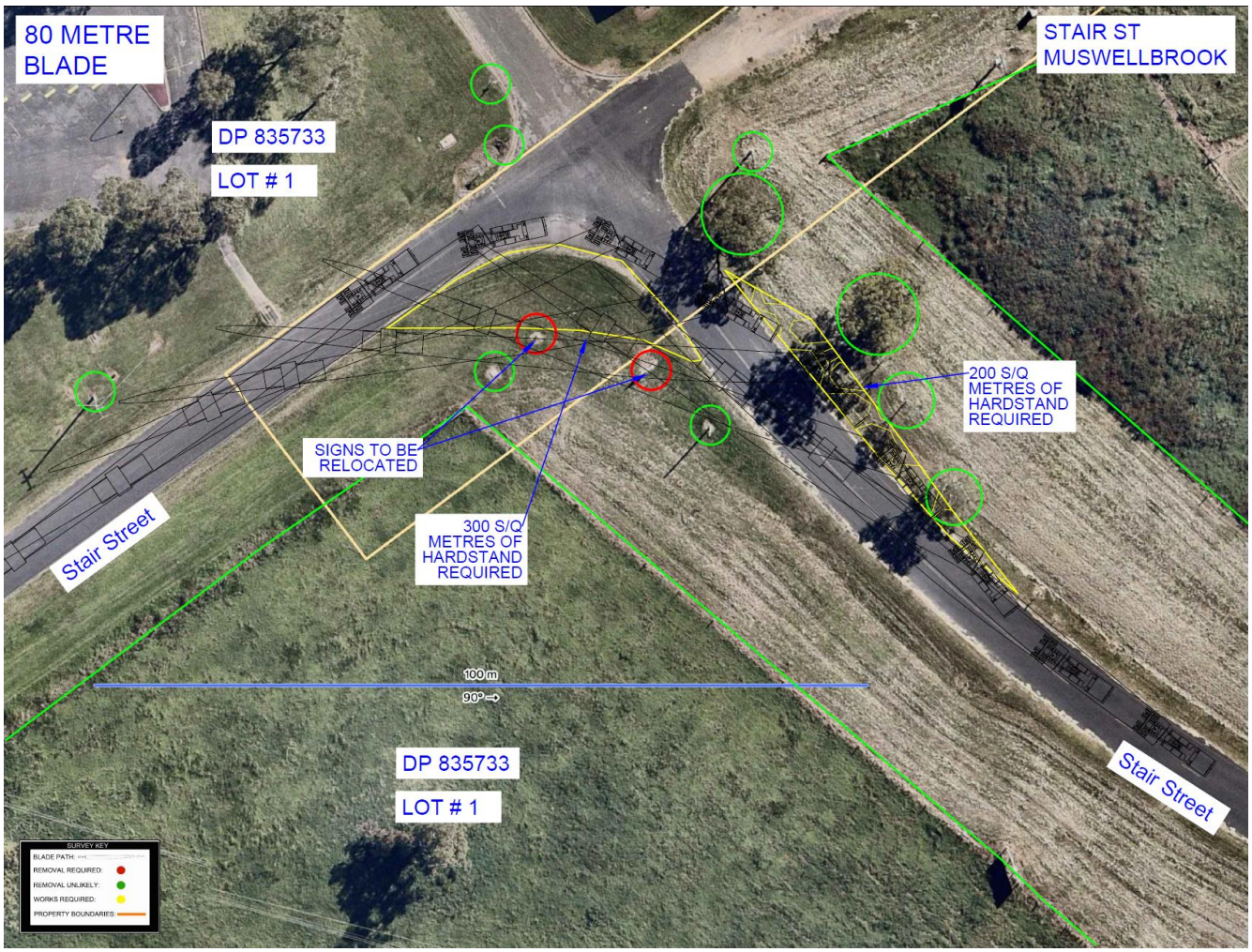
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/ddMHa4CmXK32

PROCEDURE: Right hand turn from Ivermain Street onto Stair Street.

COMMENTS: Blades to cross from the correct side to the correct side. Some signs will need to be relocated or made removable and some hardstand added to the inside and outside of the corner. Additionally, a pipe will need to be extended on the inside of the corner.
Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: A large amount of work is required.

174.8 Km's: Curve on Stair Street at Muswellbrook



GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/u9vSXiSV7Jt

PROCEDURE: Right hand curve on Stair Street.

COMMENTS: Blades to cross from the correct side to the correct side but cut across the inside of the corner. Some signs will need to be relocated or made removable and some hardstand will need to be added to the inside and outside of the corner.

Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: A Large amount of work is required.

177.0 Km's: Stair Street onto New England Highway at Muswellbrook.

Image 1:



Image 2:



GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/twTsmUKaED82

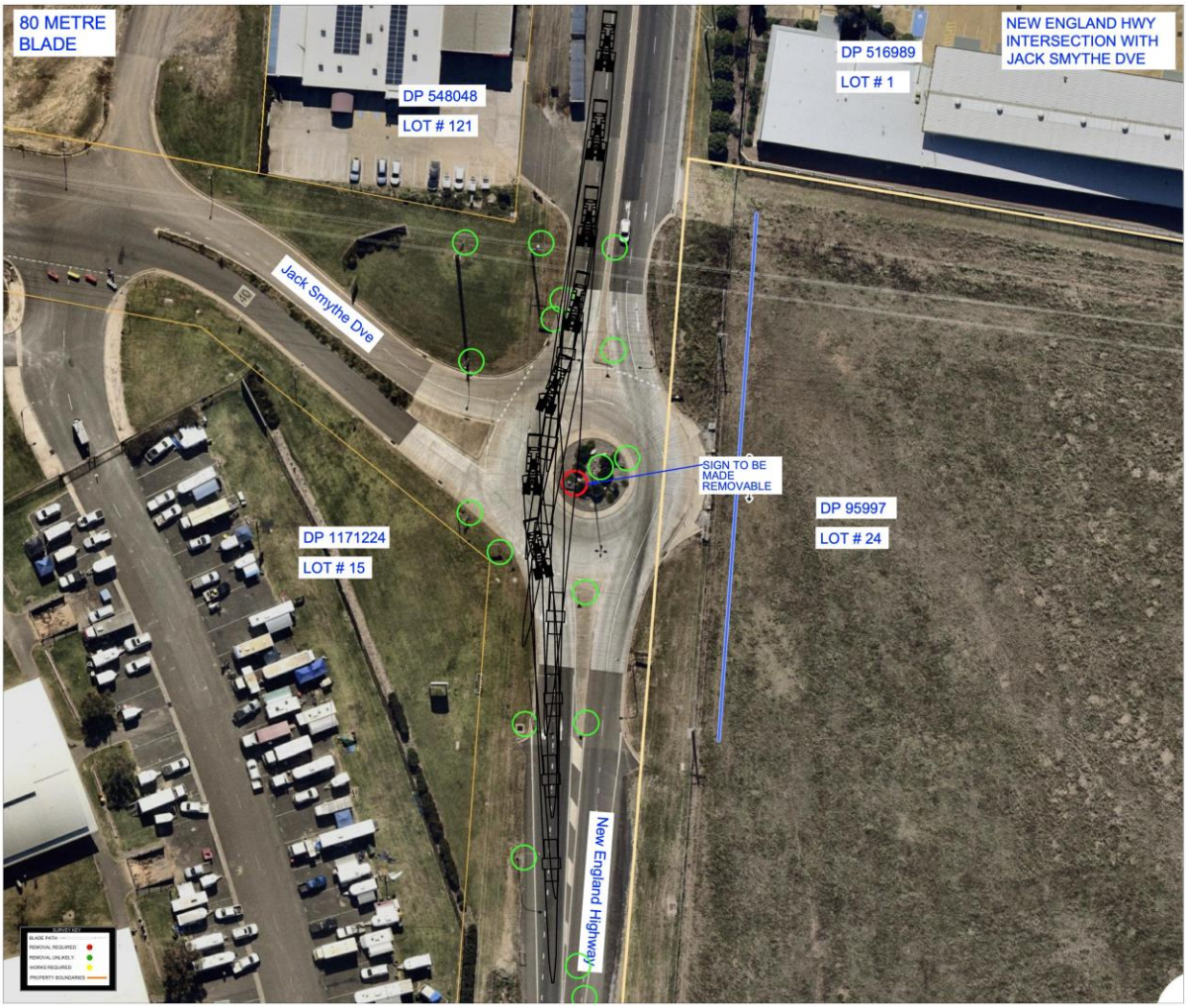
PROCEDURE: Left hand turn from Stair Street onto New England Highway.

COMMENTS: Blades to cross from the incorrect side to the incorrect side. Some signs will need to be relocated or made removable, and some hardstand added to the inside of the corner.

Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: A moderate amount of work is required.

319.0 Km's: New England Highway and Jack Smyth Drive at Tamworth



PROCEDURE: Loads to travel straight ahead through the roundabout.
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/j1tpfb8JJf83jjt2A
COMMENTS: Several signs need to be made removable.
ROAD MODIFICATIONS: A small amount of work is required.

321.0 Km's: New England Highway and Calala Lane at Tamworth



PROCEDURE: Loads to travel straight ahead through the roundabout.
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/UM9a6UEw14GhSAXm8
COMMENTS: Several signs need to be made removable and a tree removed.
ROAD MODIFICATIONS: A small amount of work is required.

321.5 Km's: New England Highway and Wilburtree Street at Tamworth



PROCEDURE: Loads to travel straight ahead through the roundabout.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/jnxxpqLbWfoKyp5dA

COMMENTS: The roundabout has delineators at approx. 800mm high, and small shrubs at a similar height. These signs may need to be relocated or made removable. Additionally, the tail swing will travel close to the roundabout warning signs, these will also need to be made removable.

ROAD MODIFICATIONS: A moderate amount of work is required.

322.0 Km's: New England Highway onto Scott Road at Tamworth



GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/EBDySH8meKgYWuPL8

PROCEDURE: Loads to cut across the wrong side of the roundabout from correct side to correct side.

COMMENTS: The swept path for the loads will require the blade to travel through the landowners' boundaries on the north side of the intersection and would require 1 pole to be relocated.

Additionally, extra hardstand would be required on the centre median strip as well as the landowners' boundaries and some signs made removable. Some trees will need to be removed from the tailswing.

ROAD MODIFICATIONS: A significant amount of work is required.

324.0 Km's: Scott Road onto Murray Street at Tamworth



PROCEDURE: Loads to travel through the roundabout on the correct side.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/nix2oREeh6H2

COMMENTS: The blades swept path will travel over the edge of the roundabout. To do this some trees will need to be removed along with numerous signs to be made removable.

Some hardstand will also need to be added inside the roundabout.

ROAD MODIFICATIONS: A large amount of work is required.

324.2 Km's: Murray Street onto New England Highway at Tamworth



GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/45dffqHmUcs

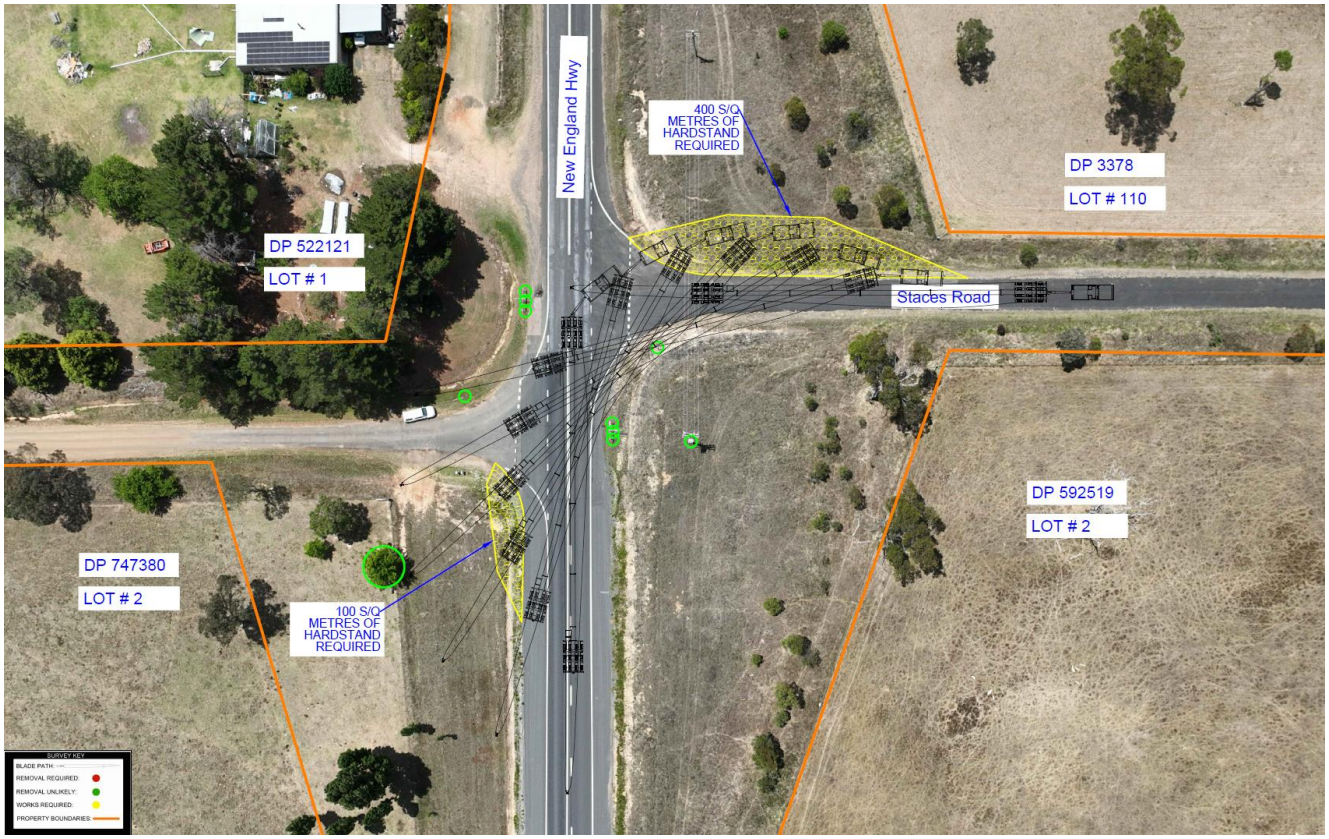
PROCEDURE: Loads to cut across the wrong side of the roundabout from correct side to correct side.

COMMENTS: This intersection will require several signs to be relocated, including one large sign. Additionally, a pole will need to be relocated and no parking placed on either side of the road. The 2 Median strips will need extra hardstand added.

ROAD MODIFICATIONS: A large amount of work is required.

366.0 Km's: New England Highway onto Staces Road at Uralla

Image 1:



GPS LINK FOR SECTION OF ROAD: https://maps.app.goo.gl/G6pu4wkUc75JqSV69

PROCEDURE: Turn Right.

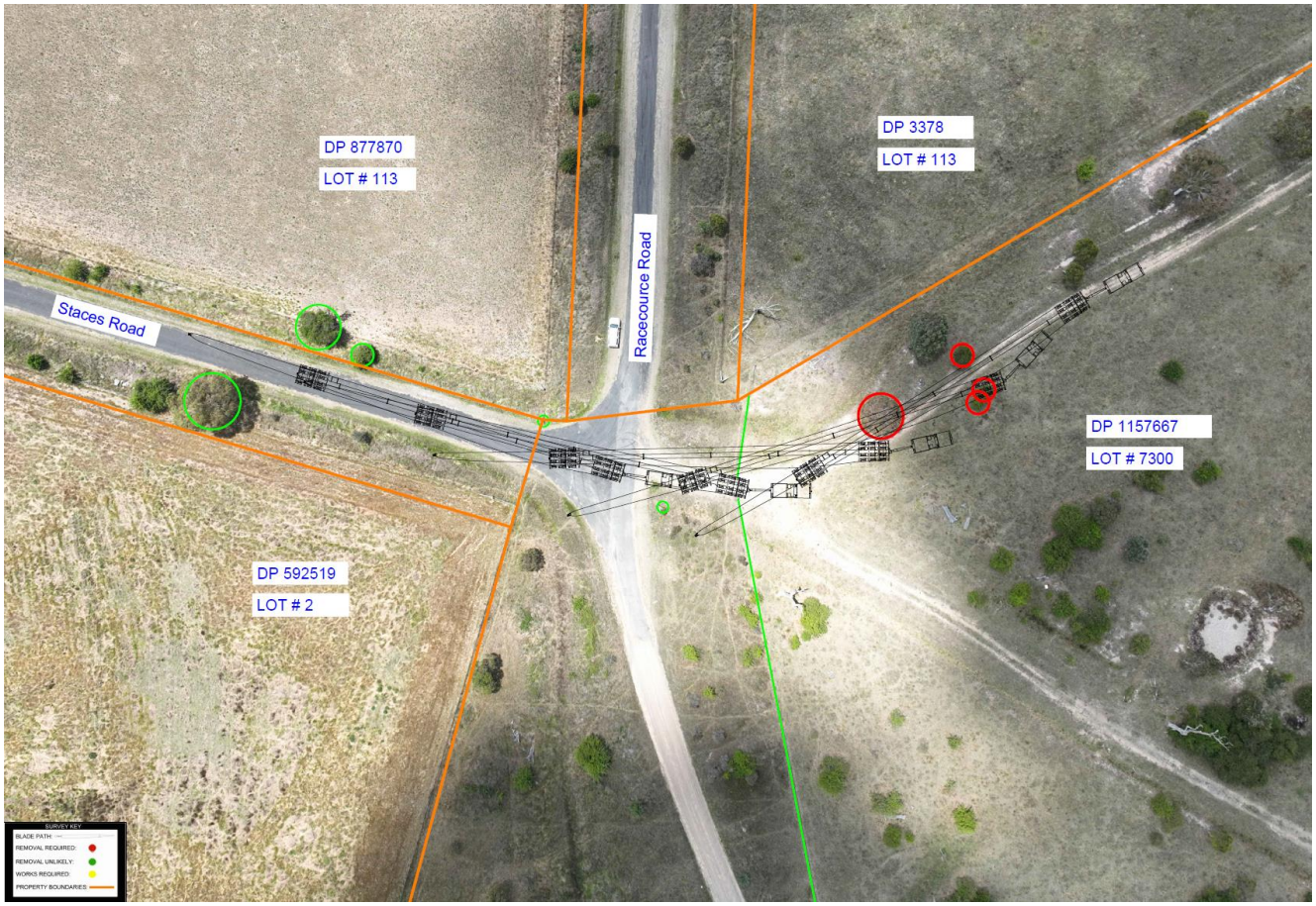
COMMENTS: Some hardstand will need to be added to the outside of the corner on the approach and exit.

A spotter will need to keep the driver informed throughout the procedure.

ROAD MODIFICATIONS: A large amount of work is required.

367.0 Km's: Staces Road onto Easement

Image 1:



GPS LINK FOR SECTION OF ROAD: https://maps.app.goo.gl/8J18aBM1ehFVxFGLA

PROCEDURE: Travel ahead and slightly to the left.

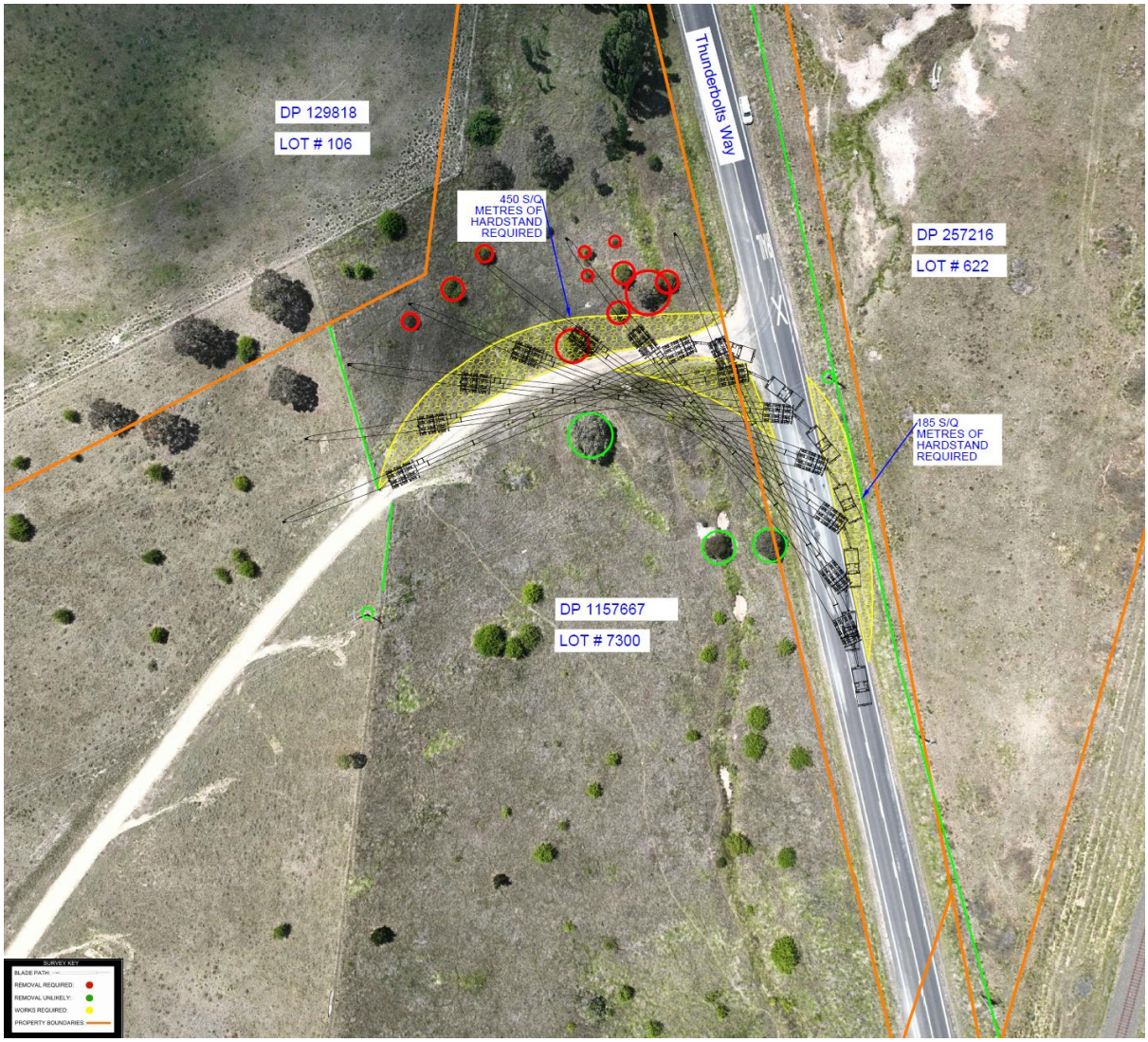
COMMENTS: Road will need to be build for 950m length of easement and a number of trees removed.

A spotter will need to keep the driver informed throughout the procedure. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: A massive amount of work is required.

368.0 Km's: Easement onto Thunderbolts Way

Image 1:



GPS LINK FOR SECTION OF ROAD: https://maps.app.goo.gl/qkY3p8to5b58qQHYA

PROCEDURE: Right hand turn.

COMMENTS: Significant road widening will be required for turn onto Thunderbolts Way. A spotter will need to keep the driver informed throughout the procedure. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: A massive amount of work is required.

406.0 Km's: Thunderbolts Way onto Jamieson Street at Walcha

Image 1:



Image 2:



GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/qwhPw85k3M7frFRg6

PROCEDURE: Left hand turn.

COMMENTS: Several signs to be relocated and/or made removable.

A spotter will need to keep the driver informed throughout the procedure. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: A small amount of work is required.

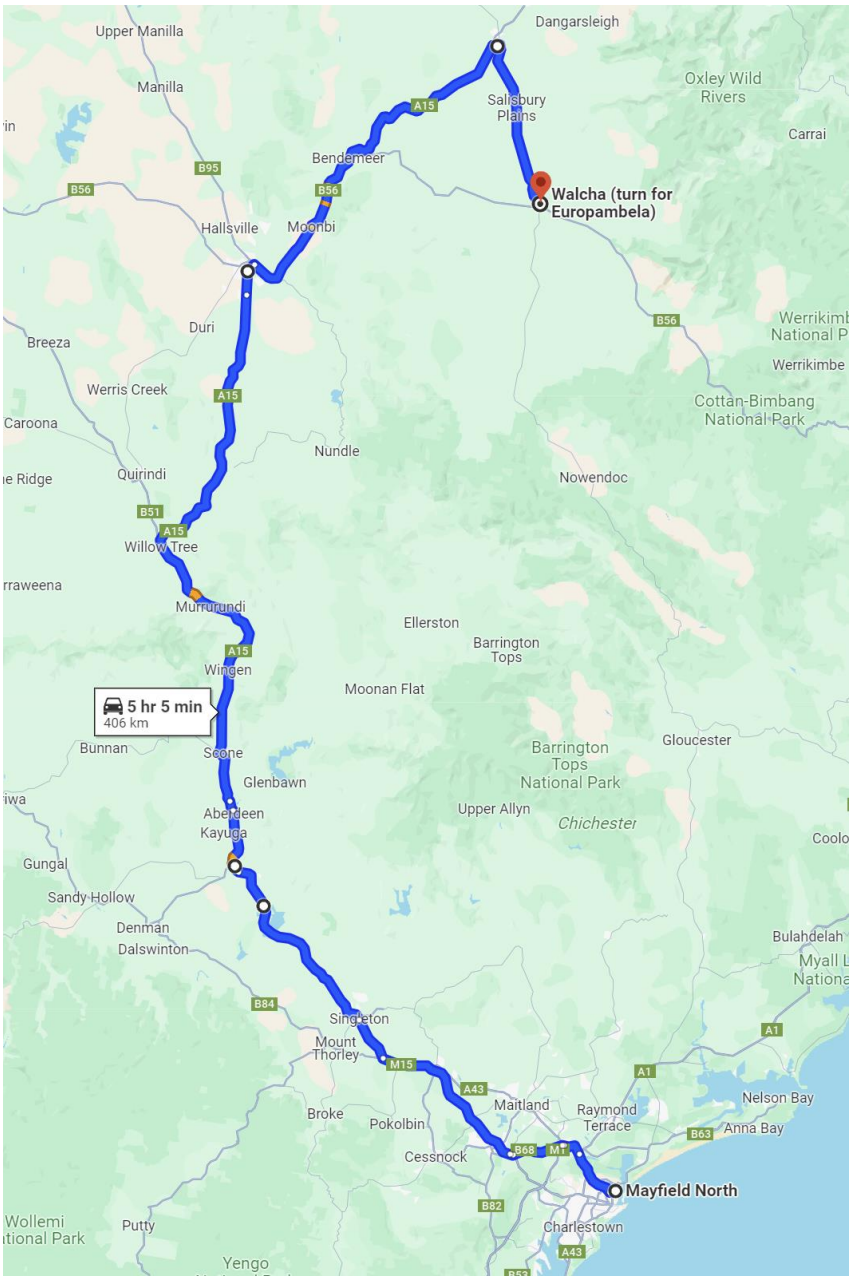
10.0 Route Survey 2: Newcastle Port to Walcha <5.2m

COMPONENTS: Powertrain, Hub and small components under 5.2 metres in overall height.

DISTANCE: 406 kilometres

GPS Link: https://maps.app.goo.gl/pUEjXnAdb6CN1wUX9

This route took us via Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Bell St, Victoria St, Bridge St, New England Highway, (Tamworth bypass via Scott Street, Marius Street), New England Highway, Staces Road, Thunderbolts Way and Jamieson Street.



KEY	
MODIFICATIONS REQUIRED	
MINOR WORKS OR CAUTION	
PARKING	

KM index	Location	Section of road	Current Measurement	Procedure	Comments 162m rotor
0.0	Mayfield	Mayfield #4 berth onto Selwyn Street https://maps.app.goo.gl/eeFTZ9XRHqDq2Vjr8	Length: 70.0 metres Width: 8.0 metres	Right hand turn	No problems with this section of road.
0.4	Mayfield	Selwyn Street rail crossing https://maps.app.goo.gl/QsvtkJSqC8ASwK1G6	Width: 9.0 metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
1.3	Mayfield	Selwyn Street onto George Street https://maps.app.goo.gl/n7hsoTJR2msPpArs8	Length: 70.0 metres Width: 8.0 metres	Right hand turn	No problems with this section of road.
1.4	Mayfield	George Street onto Industrial Drive https://maps.app.goo.gl/bNk9jDHY5QetGSUF6	Length: 70.0 metres Width: 7.0 metres	Right hand turn	No problems with this section of road.
4.9	Mayfield	Industrial Drive under traffic signals https://maps.app.goo.gl/SZbqMPaVNvVJW1uN6	Height: 5.4 Metres	Travel directly ahead	No problems with this section of road.
5.5	Mayfield West	Industrial Drive onto Maitland Road https://maps.app.goo.gl/brpx5z6aC5pVVpuK8	Length: 80.0 metres Width: 7.0 metres	Right hand turn	No problems with this section of road.
14.8	Tarro	New England Highway https://goo.gl/maps/aED5Y4ccdW3A47x37	Length: 90.0m Width: 8.0m	Left hand bend	No problems with this section of road.
17.4	Tarro	New England Highway onto John Renshaw Drive https://maps.app.goo.gl/8UigCfWW1kXaNVhEA	Width: 12.0 metres	Left hand merge	No problems with this section of road.
18.4	Beresfield	John Renshaw Drive through M1 intersection https://maps.app.goo.gl/pfFUCkDM3v2JSfsb6	Width: 9.0 metres Height: 5.9 metres	Travel directly ahead	No problems with this section of road.

KM index	Location	Section of road	Current Measurement	Procedure	Comments 162m rotor
28.7	Buchanan	John Renshaw Drive onto the Hunter Expressway https://maps.app.goo.gl/1rn5HrpCK85bU1cR8	Length: 70.0 metres Width: 7.0 metres	Right hand turn	No problems with this section of road.
58.9	Branxton	The Hunter Expressway onto New England Highway https://maps.app.goo.gl/XwCX3HiRTtdA3owY6	Width: 9.0 metres	Travel directly ahead	No problems with this section of road.
83.0	Rix's creek	New England highway https://goo.gl/maps/aDTehvkQxq7mm7zx7	110.0 x 8.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
109.0	Liddell	New England highway https://goo.gl/maps/tuA5D4mJ8vFFggmU7	Height: 5.2 Metres	Travel under this structure in the right-hand lane	Loads over 5.2 metres in overall height are not to travel on this route. They are to use Route 2. Loads over 5.0 metres but not 5.2 metres are to travel under this structure in the right-hand lane, and at walking speed with the use of a spotter.
125.0	Muswellbrook	New England Highway onto Bell St https://maps.app.goo.gl/RSprFWRFDYvVpR75A	Length: 35.0 metres Width: 5.0 metres	Right hand turn	Trucks to turn from correct side to correct side
125.5	Muswellbrook	Bell Street onto Victoria Street https://maps.app.goo.gl/tdkkGUWignTrdY649	Length: 35.0 metres Width: 5.0 metres	Left hand turn	Trucks to turn from correct side to correct side
126.0	Muswellbrook	Market Street onto New England highway https://maps.app.goo.gl/zLsjKbuqwjcZXjpHA	Length: 35.0 metres Width: 5.0 metres	Right hand turn	Truck to use wrong side to navigate roundabout.
137.3	Aberdeen	New England highway (Township) https://maps.app.goo.gl/iVCMvh4grxwViDw67	120 x 5.0 metres	Shoulder	Suitable parking for Fatigue breaks.
191.0	Murrurundi	New England highway (Township) https://goo.gl/maps/Sj3ixAkhujt	60.0 x 5.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
196.0	Murrurundi Hill	New England highway Nowlands Gap https://goo.gl/maps/R5yufobPeMG2	120.0 x 12.0 metres	Parking Bay	Emergency parking only.
202.0	Willow Tree	New England highway https://goo.gl/maps/XLTg7CRV7EU2	Width: 7.0 metres Length: 35 metres Height: 5.2 metres	Kankool weighbridge	It is likely that the towers and defiantly the blades will not fit into this facility. Engineered documentation showing correct weights for all loads will be required.
209.0	Willow Tree Township	New England highway https://goo.gl/maps/gw38qmvVfTC2	60.0 x 5.0 metres	Parking Bay	Suitable parking for Fatigue breaks.

KM index	Location	Section of road	Current Measurement	Procedure	Comments 162m rotor
211.00	Willow Tree Truck Stop	New England highway https://goo.gl/maps/RRdPVHupGCs	120.0 x 12.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
227.0	Wallabadah	New England highway https://goo.gl/maps/QWCyeHQSohS2	80.0 x 5.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
259.0	Goono Goono	New England highway https://goo.gl/maps/im4QhUfW24D2	100.0 x 8.0 metres	Parking Bay	Emergency parking only. Incorrect side of the road
277.0	Tamworth	Standard roundabout on the New England https://goo.gl/maps/j1tpfb8JJf83jjt2A	Length: 66.0 metres Width: 6.0 metres	Drive directly ahead	No problems with this section of road.
279.0	Tamworth	Standard roundabout on the New England https://goo.gl/maps/UM9a6UEw14GhSAXm8	Length: 66.0 metres Width: 6.0 metres	Drive directly ahead	No problems with this section of road.
279.5	Tamworth	Standard roundabout on the New England https://goo.gl/maps/3J9dCHxtYim	Length: 66.0 metres Width: 6.0 metres	Drive directly ahead	No problems with this section of road.
280.0	Tamworth	New England Highway onto the heavy vehicle bypass at Scott Road. https://goo.gl/maps/BXdwaSiLSBw	Length: 66.0 metres Width: 6.0 metres	Right hand turn	No problems with this section of road.
282.0	Tamworth	Scott Road onto Murray Street https://goo.gl/maps/nix2oREeh6H2	Length: 66.0 metres Width: 6.0 metres	Drive directly ahead	No problems with this section of road.
282.0	Tamworth	Murray Street onto New England Highway https://goo.gl/maps/45dffqHmUcs	Length: 66.0 metres Width: 6.0 metres	Right hand turn	No problems with this section of road.
283.0	East Tamworth	New England highway https://goo.gl/maps/9cpBrT5qUAU2	200.0 x 8.0 metres	Parking Bay	Suitable parking for Fatigue breaks
302.0	Moonbi	New England highway https://goo.gl/maps/E3TL2KkEctG2	80.0 x 6.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
308.0	Moonbi	New England highway https://goo.gl/maps/pv1wtcjgB91a1iLM6	8% gradient	Travel directly ahead	This section of road has a steep mountain range that will require additional pull trucks to assists loads that exceed 80T gross weight.
314.0	Moonbi range	New England highway https://goo.gl/maps/rwJQaAYkLTQ2	120.0 x 12.0 metres	Parking Bay	Suitable parking for Fatigue breaks

KM index	Location	Section of road	Current Measurement	Procedure	Comments 162m rotor
366.0	Kingswood	New England tom Staces Road https://maps.app.goo.gl/G6pu4wkUc75JqSV69		Turn Right	No problems with this section of road.
367.0	Uralla	Easement between Staced Road and Thunderbolts Way https://maps.app.goo.gl/8J18aBM1ehFVxFGLA		Travel slightly to left	950m of road to be built through easement.
368.0	Uralla	Easement onto Thunderbolts Way https://maps.app.goo.gl/qkY3p8to5b58qQHYA		Turn Right	Significant road widening and tree removal required.
406.0	Walcha	Thunderbolts way onto Jamieson Street https://goo.gl/maps/qwhPw85k3M7frFRg6	Length: 65.0 metres Width 6.0 metres	Left hand turn	No problems with this section of road.

11.0 Route Survey 3: Alternative Route through Tamworth

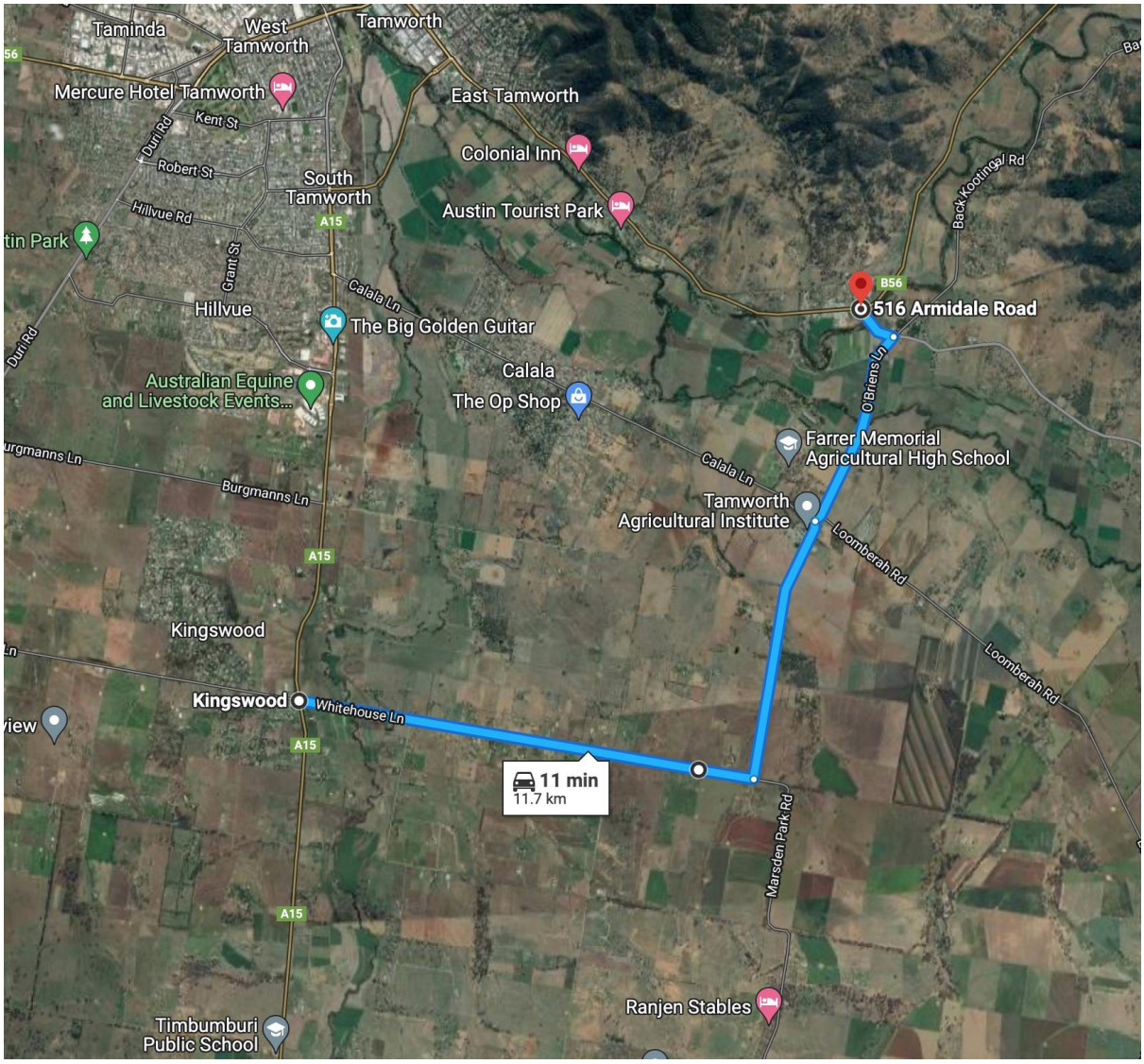
This route is currently limited to 25T GVM, is subject to flooding and would entail two traffic control procedures either side of Tamworth.

COMPONENTS: Blades.

DISTANCE: 11.7 kilometres

GPS Link: https://goo.gl/maps/GDCLZ8y1X94xJtcH6

This route took us via Whitehouse Lane, Marsden Park Road, O'Briens Lane and Nundle Road.



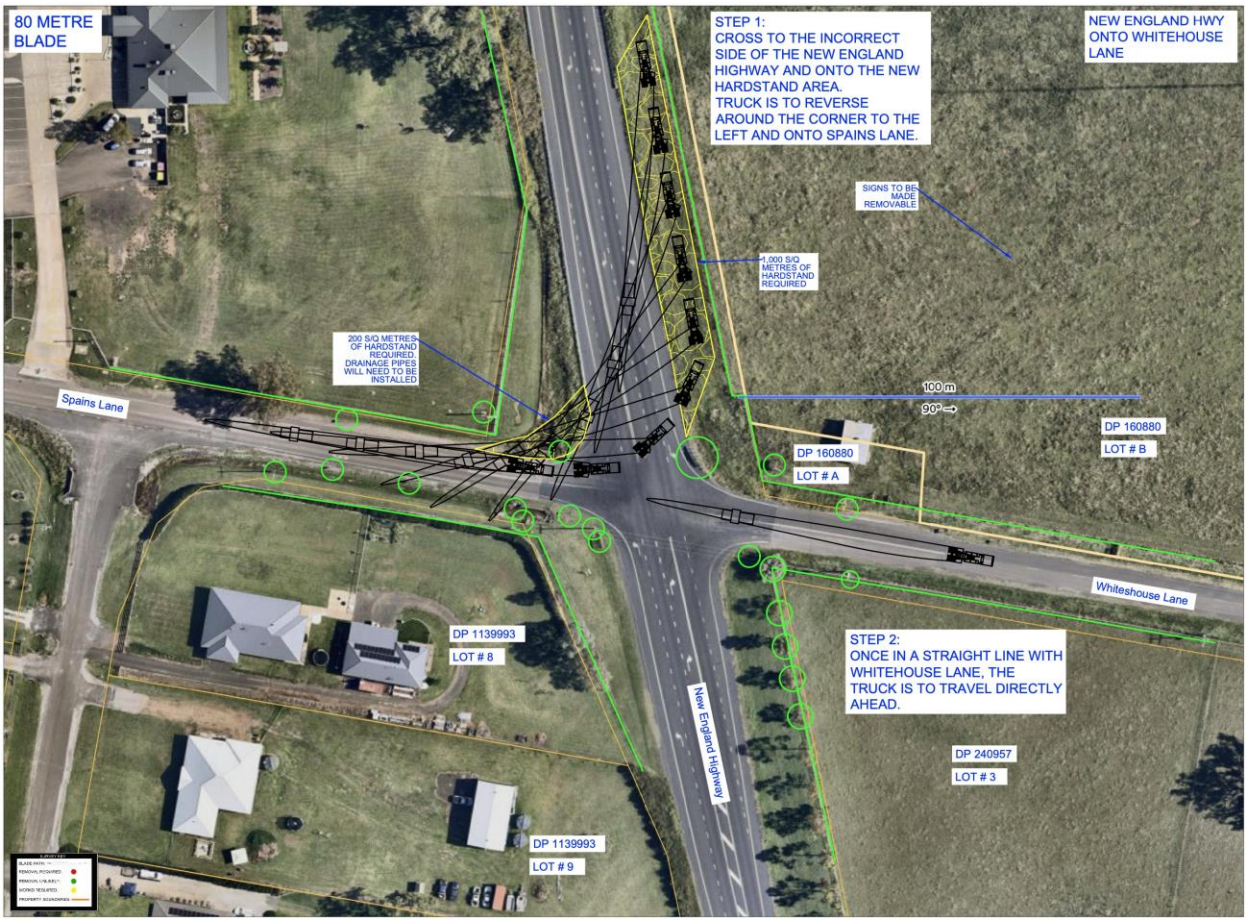
KEY	
MODIFICATIONS REQUIRED	
MINOR WORKS OR CAUTION	
PARKING	

KM index	Location	Section of road	Current Measurement	Procedure	Notes
0.0	Kingswood	New England Highway onto Whitehouse https://goo.gl/maps/A1stJyarGCgjR5zQ8	Length: 50.0 metres Width: 6.0 metres	Right hand turn	Load to travel past the intersection and onto the incorrect side of the New England Highway. Once past the intersection, the load will reverse into Spain's Lane. Once load is in a straight line with Whitehouse Lane, the load will than travel directly ahead. Some hardstand will need to be added to the left-hand side of the New England Highway to the north of the intersection. Some signs will need to be relocated and or made removable. Traffic control to hold traffic for approx. 3 to 5 minutes while this procedure is performed.
0.75	Kingswood	Goonoo Goonoo Creek Bridge https://goo.gl/maps/EDWpGMWsBAuAFs3q9	Width: 6.0 metres	Travel directly ahead	Structure to be checked for capacity.
1.9	Kingswood	Goonang Creel Floodway https://goo.gl/maps/m54q8xSVcqnuJuaM7	Width: 6.0 metres		Prone to flooding
5.5	Calala	Whitehouse Lane onto Marsden Park Road https://goo.gl/maps/RoXqBR8G8WmYh89C9	Length: 50.0 metres Width: 6.0 metres	Left hand turn	Left hand turn from the incorrect side to the incorrect side of the road. Hardstand will need to be added to the inside and outside of the corner. A power pole will also need to be relocated.
8.7	Calala	Marsden Park Road onto Obrien's Lane https://goo.gl/maps/XdtLrmt7ubNNw96u6	Length: 70.0 metres Width: 6.0 metres	Right hand turn	Some signs will need to be relocated or made removable.
9.8	Calala	Reedy Creek Floodway https://goo.gl/maps/GqSZbfNpqQeEu7TaA	Width: 6.0 metres	Travel directly ahead	Structure to be checked for capacity.
10.0	Nemingha	Peel River Bridge https://goo.gl/maps/QcBdp4Harycb9pjy6	Width: 6.0 metres	Travel directly ahead	Structure to be checked for capacity.
10.6	Nemingha	Piallamore Anabranch Bridge https://goo.gl/maps/X5AwekD1dkB645zE6	Width: 6.0 metres	Travel directly ahead	Structure to be checked for capacity.
11.2	Nemingha	Obriens Lane and Nundle Road https://goo.gl/maps/PSGB73osASZmf7uN9	Length: 70.0 metres Width: 6.0 metres	Right hand turn, then reverse.	Some hardstand will need to be added to the outside of the corner, and a pole will need to be relocated. Some signs will need to be made removable. Exit Corner in reverse

KM index	Location	Section of road	Current Measurement	Procedure	Notes
11.6	Nemingha	Cockburn River Bridge https://goo.gl/maps/hkME4cUyaT2uHj9u6	Width: 7.0 metres	Travel directly ahead	Structure to be checked for capacity.
11.7	Nemingha	Nundle Road onto New England Highway https://goo.gl/maps/nF56socgHEiULidA7	Length: 70.0 metres Width: 6.0 metres	Reverse through left hand corner, than drive directly ahead	Several signs to be made removable. Approach corner in reverse Traffic control to hold traffic for approx. 3 to 5 minutes while this procedure is performed.

0.0 Km's: New England Highway onto Whitehouse Lane at Kingswood

Image 1:



GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/A1siJyarGCgjR5zQ8

PROCEDURE: Load to travel past the intersection and onto the incorrect side of the New England Highway.

Once past the intersection, the load will reverse into Spain's Lane. Once load is in a straight line with Whitehouse Lane, the load will than travel directly ahead.

COMMENTS: Some hardstand will need to be added to the left-hand side of the New England Highway to the north of the intersection. Some signs will need to be relocated and or made removable.

A spotter will need to keep the driver informed throughout the procedure.

Traffic control and Police and escorts to control local traffic either side of the intersection.

Traffic will be stopped for between 3-5 minutes for this procedure to take place.

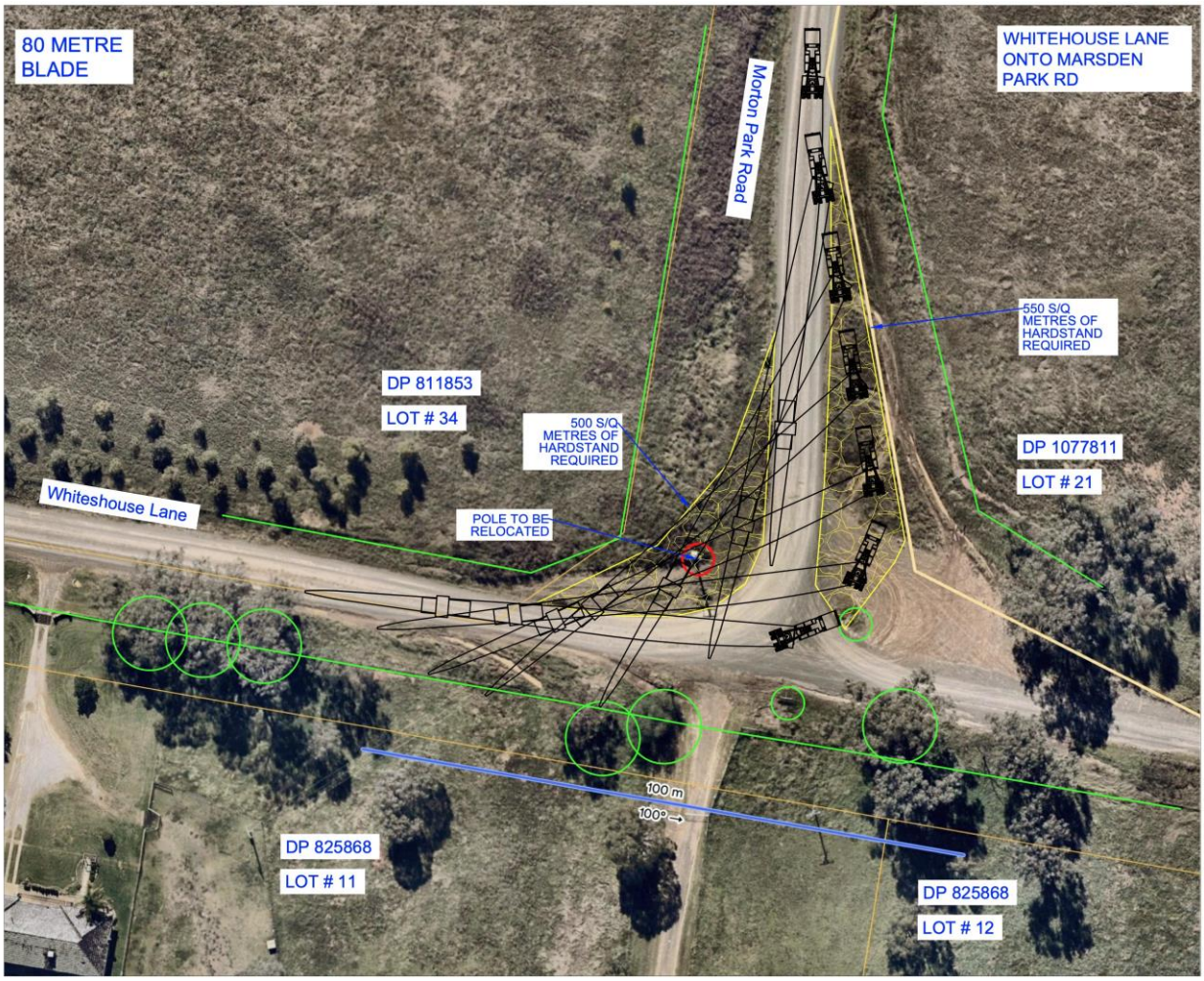
ROAD MODIFICATIONS: A large amount of work is required.

5.5 Km's: Whitehouse Lane onto Marsden Park Road at Calala

Image 1:



Image 2:



GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/RoXqBR8G8WmYh89C9

PROCEDURE: Left hand turn from the incorrect side to the incorrect side of the road.

COMMENTS: Hardstand will need to be added to the inside and outside of the corner. A power pole will also need to be relocated.

A spotter will need to keep the driver informed throughout the procedure. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: A large amount of work is required.

8.7 Km's: Marsden Park Road onto OBriens Lane at Calala



GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/XdtLrmt7ubNNw96u6

PROCEDURE: Right hand turn.

COMMENTS: Some signs will need to be made removable or relocated.

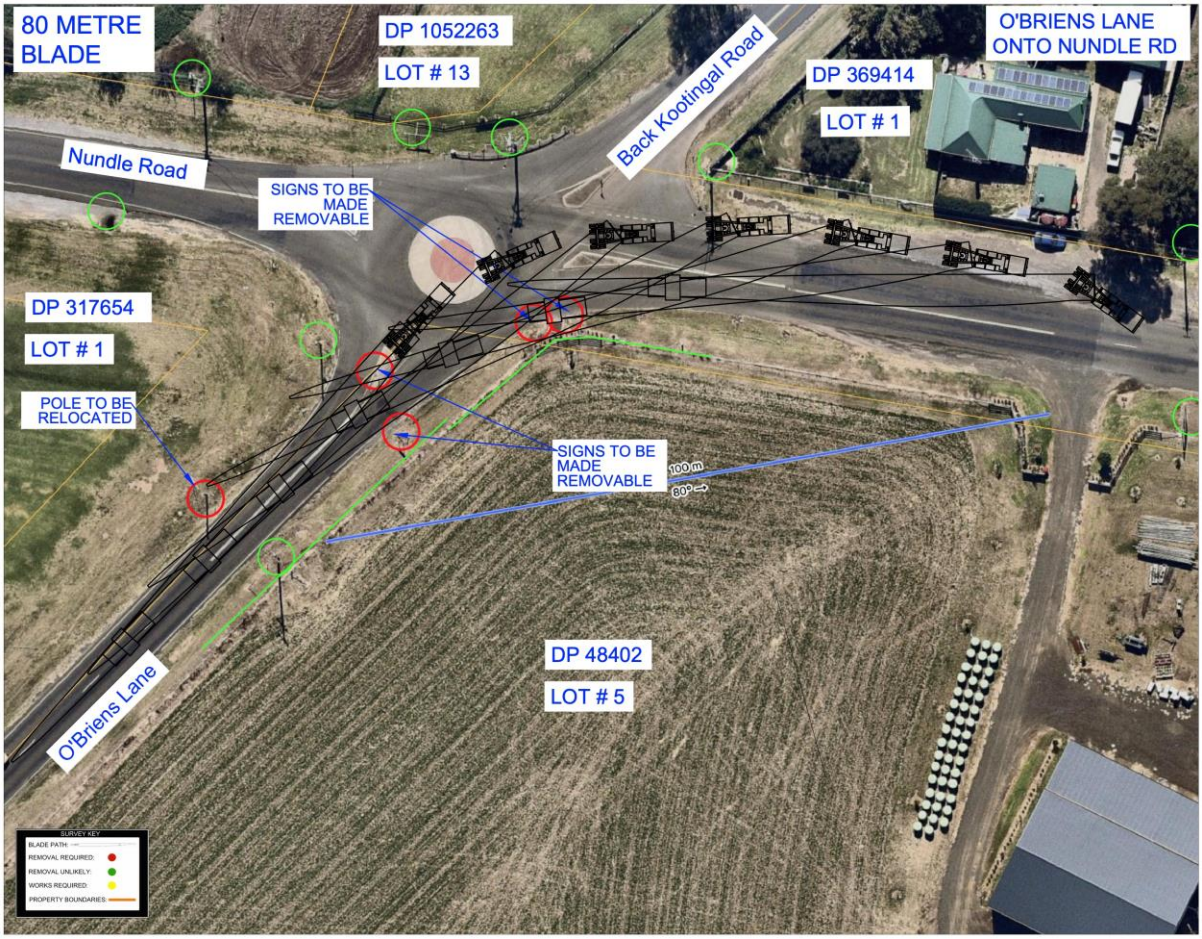
A spotter will need to keep the driver informed throughout the procedure. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: A minor amount of work is required.

11.2 Km's: OBriens Lane onto Nundle Road at Nemingah
Image 1:



Image 2:



GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/PSGB73osASZmf7uN9

PROCEDURE: Right hand turn, before reversing north on Nundle Road.

COMMENTS: Some hardstand will need to be added to the outside of the corner, and a pole will need to be relocated. Some signs will need to be made removable.

A spotter will need to keep the driver informed throughout the procedure. Police and escorts to control local traffic either side of the intersection.

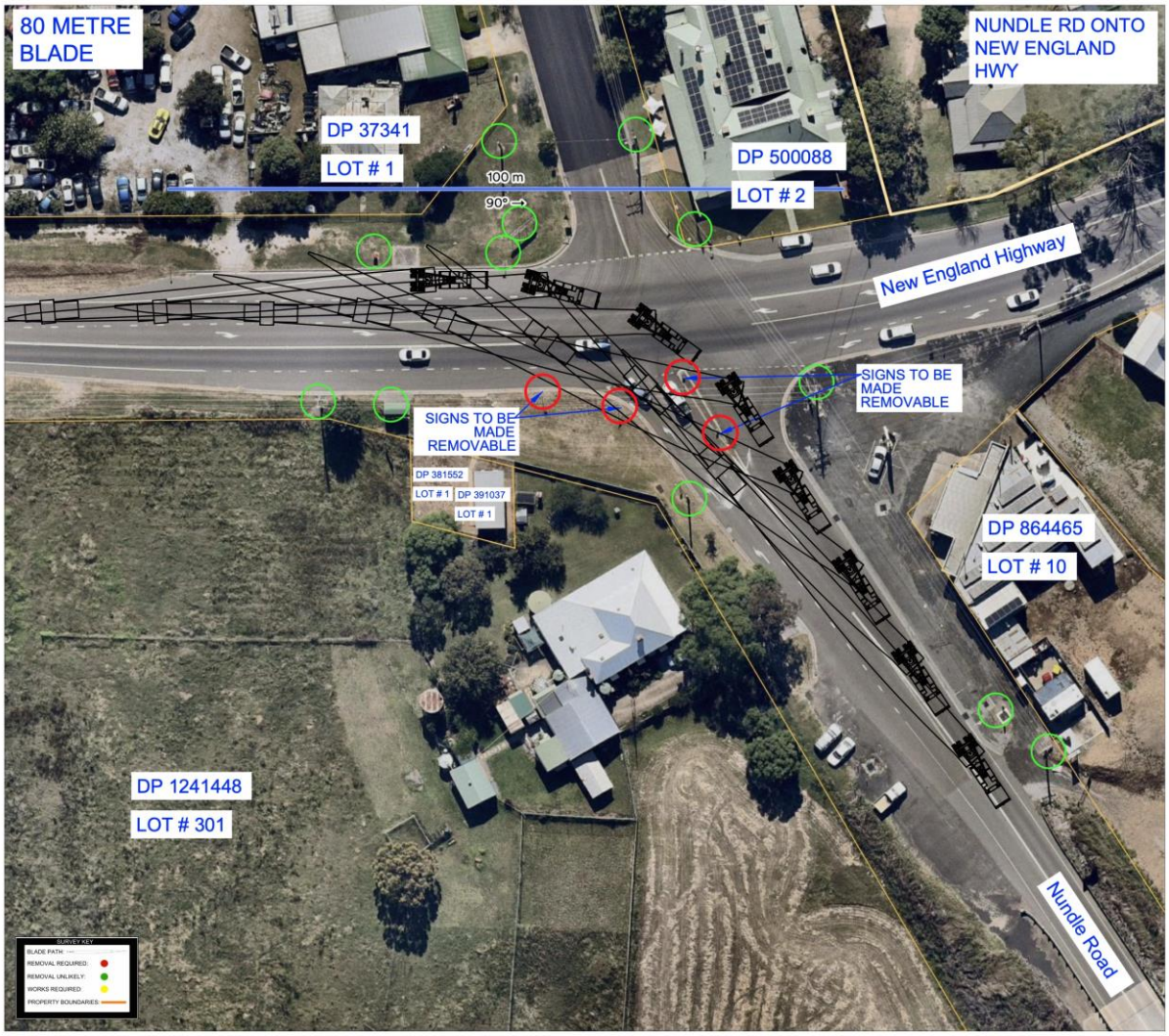
ROAD MODIFICATIONS: A large amount of work is required.

11.7 Km's: Nundle Road onto New England highway at Nemingah

Image 1:



Image 2:



GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/nF56socgHEiULidA7

PROCEDURE: Reverse around right hand corner, before traveling north along the New England Highway.

COMMENTS: Some signs will need to be made removable.

A spotter will need to keep the driver informed throughout the procedure.

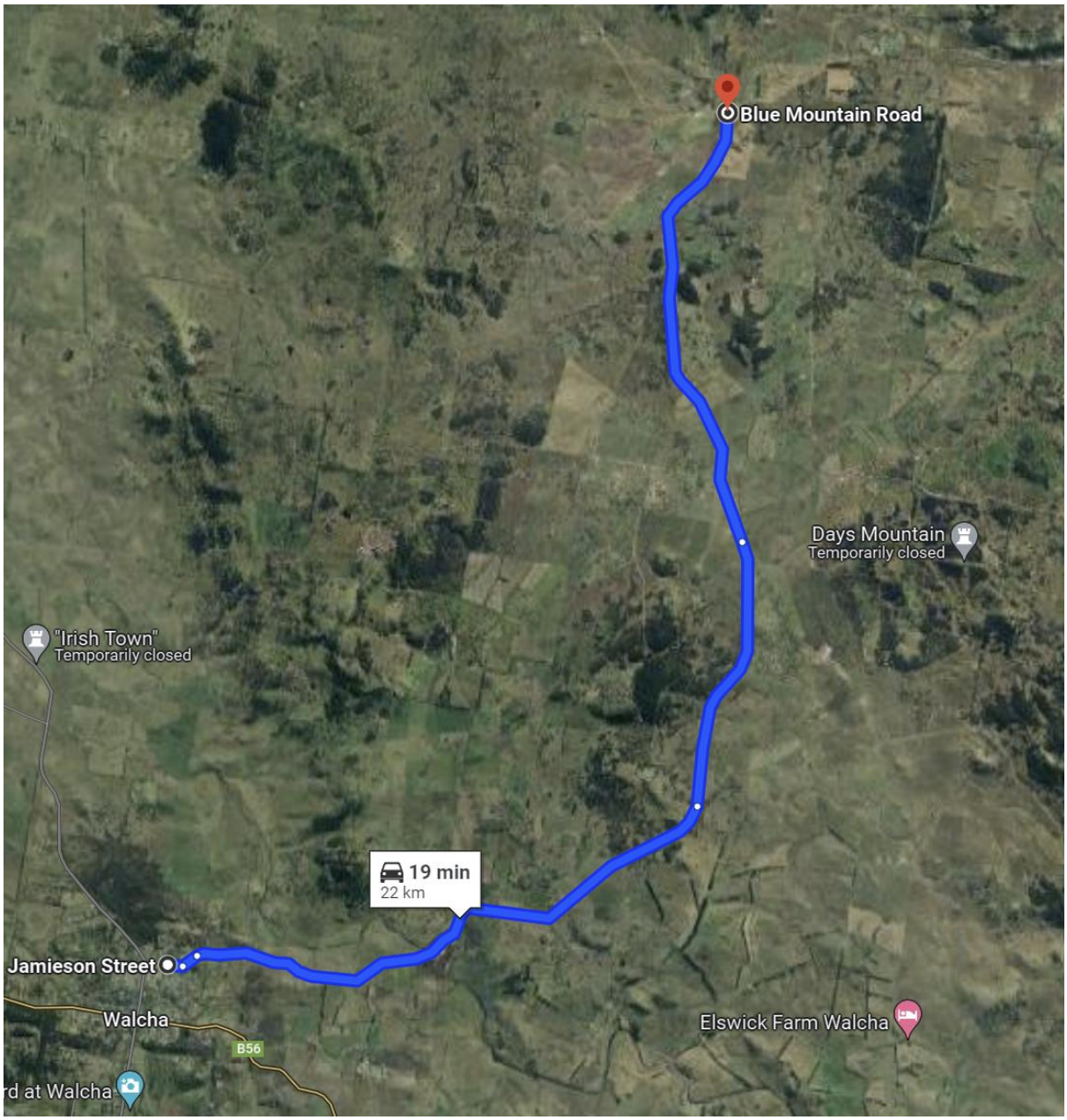
Traffic control and Police and escorts to control local traffic either side of the intersection.

Traffic will be stopped for between 3-5 minutes for this procedure to take place.

ROAD MODIFICATIONS: A minor amount of work is required.

12.0 Route Survey A: Walcha to Northern Site Entries

Distance: 22.0 Kilometres
GPS Link: https://maps.app.goo.gl/8MV63fEKBi3fyybZ6
Via: Jamieson Street, Emu Creek Road, Winterbourne Road and Blue Mountain Road.



KEY	
MODIFICATIONS REQUIRED	
MINOR WORKS OR CAUTION	
PARKING	

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
2.0	Walcha	Right hand Curve on Emu Creek Road https://goo.gl/maps/yzHpM3JTaHp7HFKP9	Length: 70.0 metres Width: 7.0 metres	Right hand curve	Remove dead trees on tailswing.
5.1	Walcha	Ohio Creek Bridge https://goo.gl/maps/TeU7jhAY2DgXF32d9	Width >6.0 metres	Travel directly ahead	Structure to be checked for capacity.
6.8	Walcha	Intersection of Emu Creek Road and Moona Plains Road https://goo.gl/maps/GVDg9AoNmq7da1J98	Length: 85.0 metres Width: 7.0 metres	Left hand Curve	No problems with this section of road.
14.3	Walcha	Blue Mountain Road https://goo.gl/maps/CT7fcmHvNkuBHi626	Clearance Width <5.0m in places	Travel directly ahead	Current road width less than 5.0m in places – will need to be widened.to 5m to 5.5m with .05m verge on each side.
19.9	Walcha	Possible Western Site Entry https://goo.gl/maps/oZVQLr8URmdqPV7F8	Clearance Length 30.0 metres	Left hand turn	Site entrance to be made suitable for the swept path of the largest loads.
22.0	Walcha	Blue Mountain Road to site entry https://goo.gl/maps/4vFwoCbrrwWgrUWX6	Clearance Length 75.0 metres	Right hand curve	Road is narrow in sections and may need to be widened.

2.0 Km's: Right hand curve on Emu Creek Road Walcha

Image 1:



GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/yzHpM3JTaHp7HFKP9

PROCEDURE: Right hand curve.

COMMENTS: Hardstand required on inside of corner to avoid trees with tail swing.

A spotter will need to keep the driver informed throughout the procedure. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: A small amount of work is required.

6.8 Km's: Intersection Emu Creek Road and Moona Plains Road Walcha

Image 1:



GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/GVDg9AoNmq7da1J98

PROCEDURE: Left hand curve.

COMMENTS: A spotter will need to keep the driver informed throughout the procedure. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: No works required.

14.3 Km's: Blue Mountain Road Walcha

Image 1:



Image 2:



Image 3:



Image 4:



PROCEDURE: Travel directly ahead.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/CT7fcmHvNkuBHi626

COMMENTS: 8 kilometres of roads with less than 5.0m in width. Will need to widened to 5.0m to 5.5m with a 0.5m verge on each side.

Current over mass trailers are up to 4.2m at the wheels, but there is a possibility future projects will be 5.0m at the wheels to achieve a lower overall height if required for the route.

ROAD MODIFICATIONS: A significant amount of work is required.

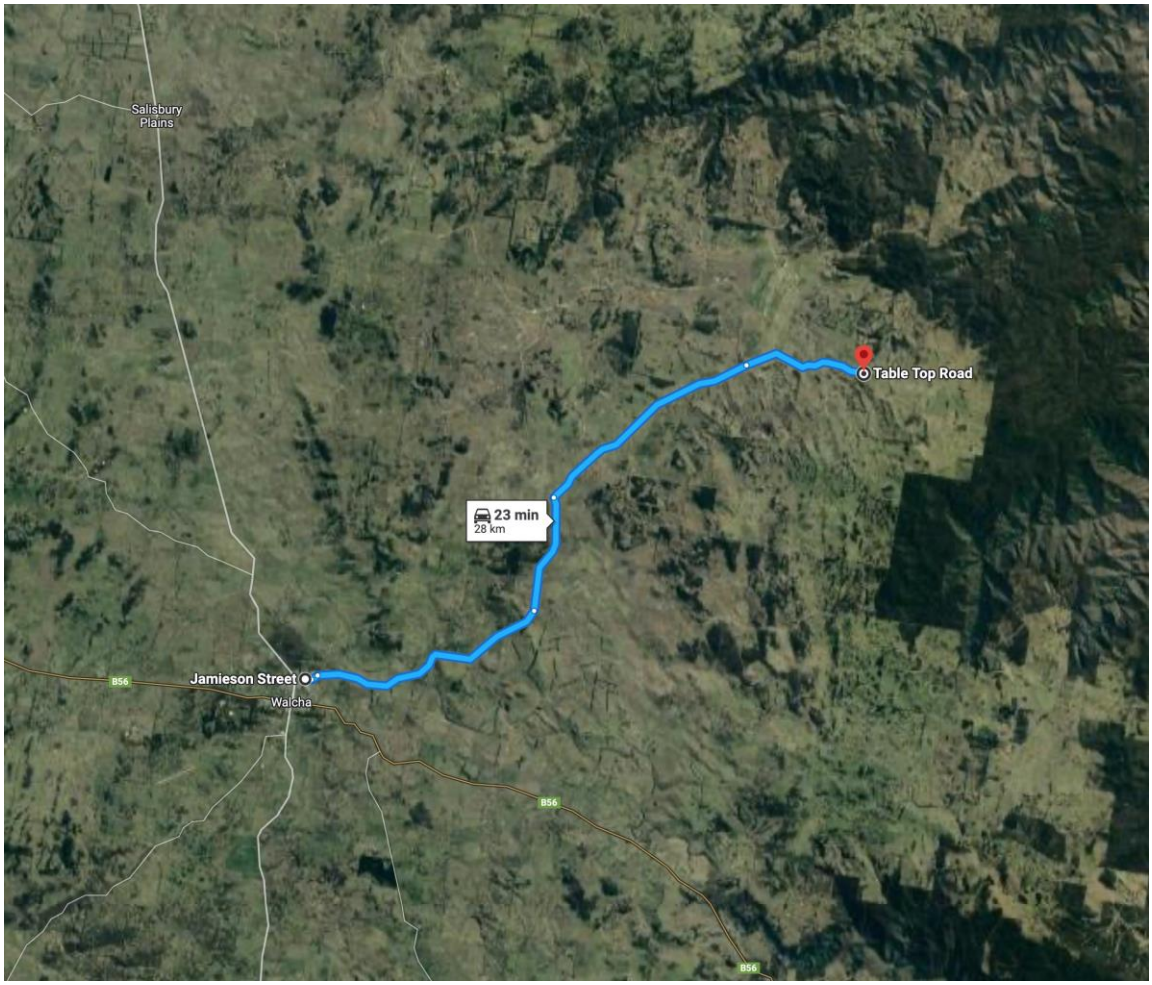
19.9 Km's: Possible Western Site Entry from Blue Mountain Road



PROCEDURE: Left hand turn.
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/oZVQLr8URmdqPV7F8
COMMENTS: Site entrance to be made suitable for the swept path of the largest load.
R**OAD MODIFICATIONS:** A significant amount of work is required.

13.0 Route Survey B: Walcha to Eastern Site Entries

Distance: 28.0 Kilometres
GPS Link: https://goo.gl/maps/32kSFuPTcRX2Y8BR8
Via: Jamieson Street, Emu Creek Road, Winterbourne Road and Table Top Road.



KEY	
MODIFICATIONS REQUIRED	
MINOR WORKS OR CAUTION	
PARKING	

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
2.0	Walcha	Right hand Curve on Emu Creek Road https://goo.gl/maps/yzHpM3JTaHp7HFKP9	Length: 70.0 metres Width: 7.0 metres	Right hand curve	Remove dead trees on tailswing.
5.1	Walcha	Ohio Creek Bridge https://goo.gl/maps/TeU7jhAY2DgXF32d9	Width >6.0 metres	Travel directly ahead	Structure to be checked for capacity.
6.8	Walcha	Intersection of Emu Creek Road and Moona Plains Road https://goo.gl/maps/GVDg9AoNmq7da1J98	Length: 85.0 metres Width: 7.0 metres	Left hand Curve	No problems with this section of road.
14.3	Walcha	Winterbourne Road at Blue Mountain Road https://goo.gl/maps/QbZYeu1Fxw8Z6Ei98	Clearance Length 82.0 metres	Right hand curve	Hardstand is required to the exit of the corner.
15.0	Walcha	Emu Creek Bridge https://goo.gl/maps/Aqvpa3rGYRDqWnp29	Clearance: Width 6.1 metres	Travel directly ahead	Structure to be checked for capacity.
16.1	Walcha	Winterbourne Road onto Bark Hut Road https://goo.gl/maps/mrzZGY745566CJS67	Clearance Length 55 metres	Right hand turn	Significant hardstand required on inside of corner and culvert to be extended.
25.6	Walcha	Table Top Road and Florida Road https://goo.gl/maps/iQq38fUMSQmLxjke6	Clearance Length 55 metres	Left hand curve	Remove Cattle Grid
26.6	Walcha	Winterbourne Creek Bridge https://goo.gl/maps/Pzm35wi2w6mwTwh17	Clearance: Width 6.1 metres	Straight ahead	May need to be widened if transport required 5.0m wide wheels to achieve a lower overall height.
27.5	Walcha	S Bend along Table Top Road https://goo.gl/maps/mx5rYazJHQwKPaS37	Clearance Length 82.0 metres	S bend	Proceed with caution
28.0	Walcha	Possible Northern Site Entry https://goo.gl/maps/b9jSqVrDHoQ5wiew9	Clearance Length 20.0 metres	Right hand turn	Site entrance to be made suitable for the swept path of the largest loads.

Route up until 14.3 kilometres is the same as Route A.

14.3 Km's: Right hand curve on Winterbourne Road Walcha

Image 1:



PROCEDURE: Right hand curve.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/QbZYeu1Fxw8Z6Ei98

COMMENTS: Hardstand required on the exit to the corner.

A spotter will need to keep the driver informed throughout the procedure. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: A moderate amount of work is required.

15.0 Km's: Emu Creek Bridge Walcha

Image 1:



Image 2:



PROCEDURE: Travel directly ahead.
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/Aqvpa3rGYRDqWnp29
COMMENTS: Bridge to be assessed for over mass transport.

16.1 Km's: To Site Entries exiting from Bark Hut Road

Image 1:



GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/mrzZGY745566CJS67

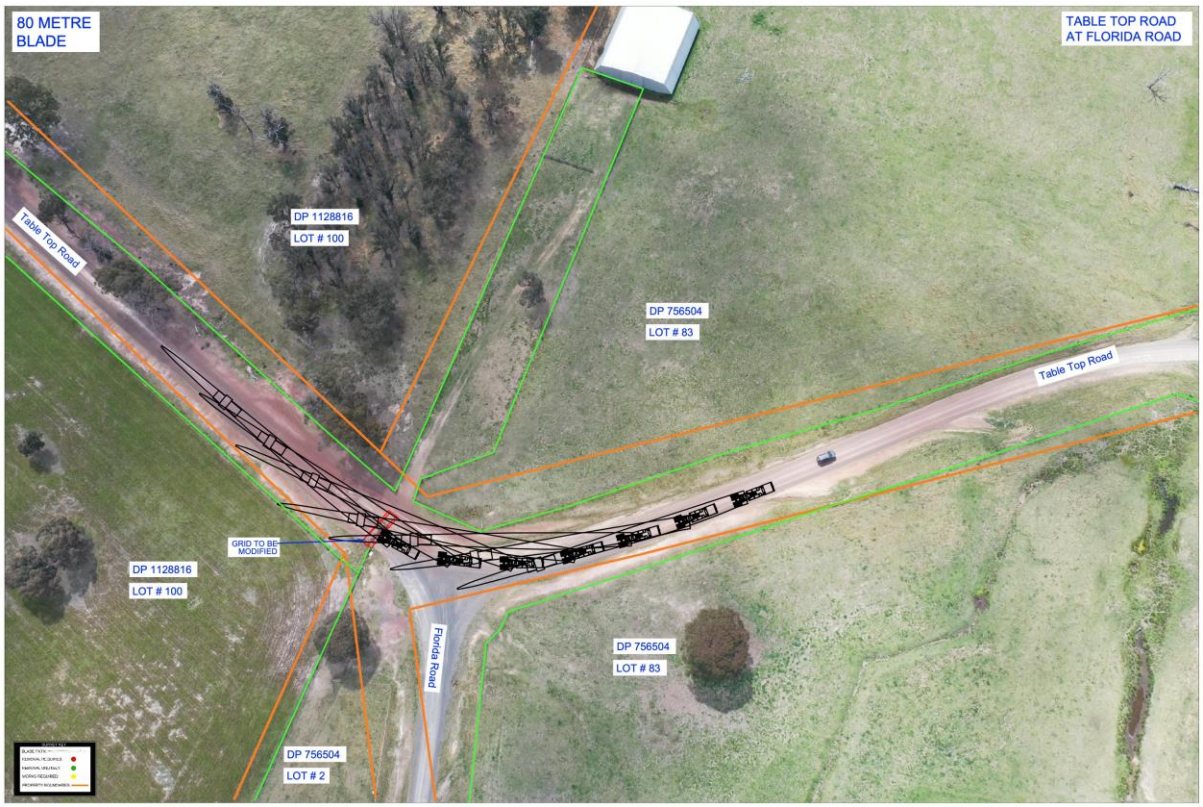
PROCEDURE: Right hand turn.

COMMENTS: Hardstand required on inside of corner to avoid trees with tail swing and culvert to be extended.

A spotter will need to keep the driver informed throughout the procedure. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: A significant amount of work is required.

25.6 Km's: Left hand curve on Table Top Road at Florida Road Walcha



GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/iQq38fUMSQmLxjke6

PROCEDURE: Left hand curve.

COMMENTS: Remove cattle grid to allow use of full road.

A spotter will need to keep the driver informed throughout the procedure. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: A minor amount of work is required.

26.6 Km's: Winterbourne Creek Bridge

Image 1:



Image 2:


80 90 4100 10 20 30 40 50 60 70 80 90 4200 10 20 30 40 50 60 70 80 90 4300 10 20 30 40 50 60 70 80 90 4400 10 20 30 40

Image 3:



PROCEDURE: Travel directly ahead.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/Pzm35wi2w6mwTwh17

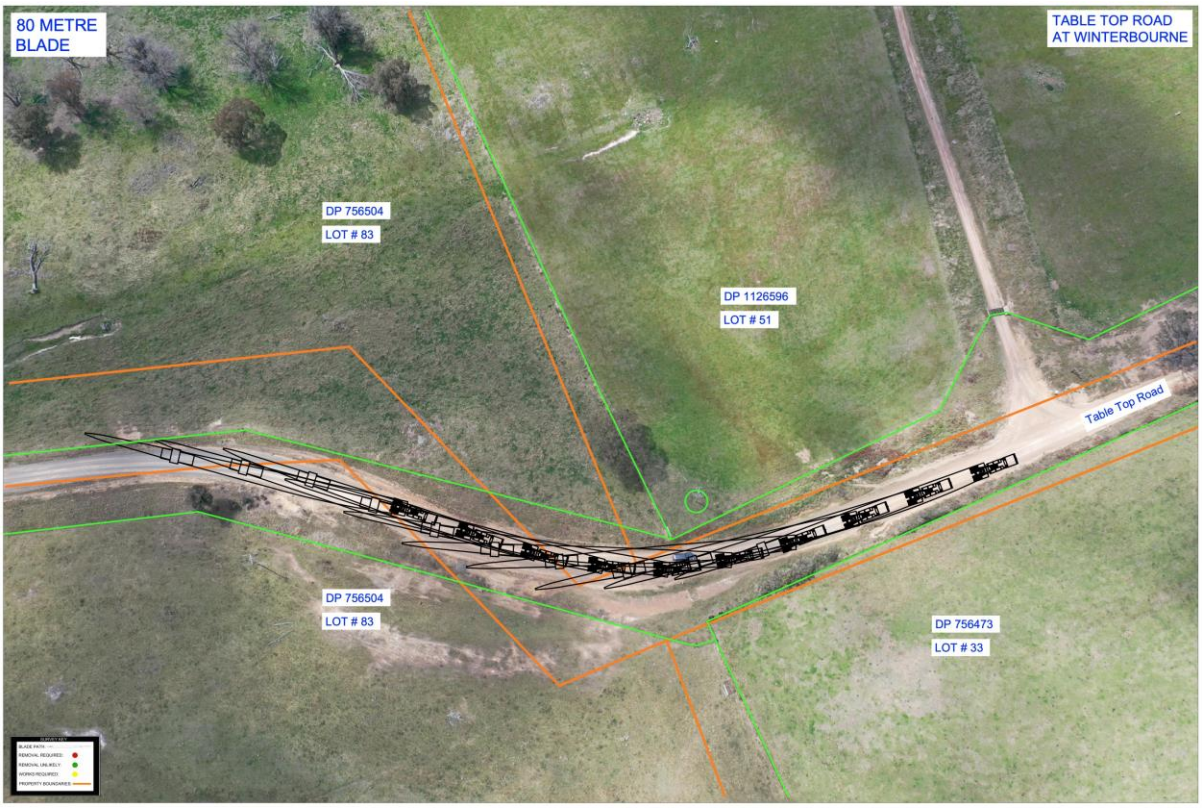
COMMENTS: Bridge is 4.4m wide, so will be a tight squeeze for 4.2m wide trailers but will not be possible with 5.0m wide trailers.

Current over mass trailers are up to 4.2m at the wheels, but there is a possibility future projects will be 5.0m at the wheels to achieve a lower overall height if required for the route.

Will need to be assessed for over mass transport.

ROAD MODIFICATIONS: May need to be widened if 5.0m wide trailers are required to achieve a lower overall height along the route.

27.5 Km's: S Bend on Table Top Road Walcha



GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/mx5rYazJHQwKPaS37

PROCEDURE: S bend curve.

COMMENTS: Proceed with caution.

A spotter will need to keep the driver informed throughout the procedure. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: No work is required.

28.0 Km's: Possible Southern Site Entry from Table Top Road



PROCEDURE: Right hand turn.
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/b9jSqVrDHoQ5wiew9
COMMENTS: Site entrance to be made suitable for the swept path of the largest load.
R**OAD MODIFICATIONS:** A significant amount of work is required.

14.0 Conclusion:

MAIN ROUTES: (Newcastle Port to Walcha)

After studying all options and undertaking a route survey, it was observed that the components would need to be transported on several different routes through to Winterbourne as listed in the report. Routes 1 and 2 are selected due to the component size. Additionally, Route 3 is a real option to avoid the issues that a blade of this size would have through Tamworth.

WALCHA TO SITE ENTRANCE ROUTES:

After studying all options and undertaking a route survey, it was observed that the components would need to be transported on 2 different routes through to each Winterbourne site access points as listed in the report. These routes are listed as A and B in this report.

NEWCASTLE:

Works between the Port John Renshaw drive have recently been completed for Rye Park Windfarm and it isn't anticipated any additional works will be required for Winterbourne.

HUNTER EXPRESSWAY:

The blades will not make it around the roundabout from John Renshaw Drive onto the Hunter Expressway.

Traffic control/Police will be required to block the eastbound lanes of the Hunter expressway while the blades travel down the incorrect side before crossing over at the centre crossover point approx. 400 metres to the west of the offramp. This procedure would take less than 5 minutes to complete.

MUSWELLBROOK:

Several different routes are required to travel through Muswellbrook, listed below is a summary of these routes.

- BLADES, TOWERS AND COMPOENNTS OVER 5.2 METRES IN OVERALL HEIGHT:

  VIA: New England Highway, Golden Highway, Denman Road, Bengalla Road, Wybong Road, Kayuga Road, Ivermein Street, Dartbrook Mine access Road, New England Highway.

  This route is suitable in its current form for loads up to 40 metres long and 5.6 metres in height. Approval required from Muswellbrook Shire Council and Dartbrook Mine.

- COMPONENTS UNDER 5.2 METRES IN OVERALL HEIGHT VIA: New England Highway, Bell Street, Victoria St, Bridge Street and New England Highway.

TAMWORTH:

Several corners will require major upgrades. It is likely that access over private land will be required, large amounts of hard standing required along with a streetlight to be relocated. Additionally, some palm trees will need to be removed. All other components are okay to use this route in its current form.

An alternate route has been provided for the blades, but currently has a 25T limit, and requires 2 traffic control procedures on the New England Highway at each side of Tamworth.

URALLA:

Several corners will require major upgrades.

WALCHA TO SITE ENTRANCES VIA ROUTES A ND B:

- The roads will need to be widened in multiple places due to the width of the tower trailers. Some bridge structures will need to be modified, and large amounts of hardstand will be required on multiple corners.
- There will also need to be large amounts of vegetation trimming due to the length and height of the loads.
- Several sections of road will require access to private landowners boundaries, due to the swept path of the blades.

SUMMARY OF ROUTES:

After reviewing all both main routes and site access routes, we are under the opinion that the loads could be delivered through to Winterbourne with a large number of upgrades.
The 80 metre blades would require a detour around Muswellbrook and approvals would still need to be sought to confirm that this is possible.
Also, the blades may be better suited on route 3 to bypass Tamworth.

GENERAL ROAD ACCESS:

BRIDGE CROSSINGS:

This route from Newcastle to Uralla has been used in the past for items up to 120T. Further investigations would be required if item mass exceeds this. Additionally, once the loads turn off the New England Highway all structures that require the loads to travel over them, will need to be assessed for axle loads.

OVERHEAD STRUCTURES:

On Route 1 a maximum height of 5.9 metres would be the lowest structure that cannot be avoided. This structure is on the New England Highway at Tarro.

On Route 2 the lowest structure is the Liddell overpass. This bridge is 5.2 metres in the centre carriageway and 5.3 metres in the far-right lane. Loads that exceed 5.2 metres in overall height will need to bypass this bridge via Route 1.

Large GVM loads may need to bypass Tarro, which would result in a maximum height of 5.6m.

Loads for these routes are not to exceed 5.9 metres in height and may be limited to 5.6m for heavy components.

OVERHEAD WIRES:

This route would need to be assessed to handle a loaded height of up to 6.0 metres. It is likely that there are wires that will need to be permanently lifted.

RAIL ASSETS:

There are a number of rail overbridges and crossings on route that will require approval from authorities before loads can access the routes.

FLOODWAYS:

There are a number of floodway's on the access roads that will need to be raised and widened. These floodway's vary considerably, and some would need moderate to large amount of works, where others would only need minor upgrades. Each floodway should be assessed on its own merit.

CRESTS:

Hydraulic lift trailers could overcome these obstacles without the need for additional road works.

PAVEMENT:

The Pavement up to Walcha is of suitable highway grade, following Walcha there are places where the pavement appears to thin in places.

Blue Mountain Road is likely to require widening to suit wide over mass trailers.

ROADWORKS:

Road works are likely to be continuous on any route within NSW, as this is common practice. Some roads will just have general maintenance, and resealing, while other sections will have complete realignment. It is recommended that the project discuss any major works well in advance with the authorities.

PORT:

The port has an excellent Break bulk berth that runs at approximately 60% berth occupancy.

The berth has axle and crane loadings well above what is required for this project.

The storage area is asphalt hardstand with a current area of 100,000 s/q metres available, all level. It is adjacent to the port, and within 300 metres of the berth, all within the Port grounds. No local roads need to be used during the discharge.

Access to the local roads from the port is while require some upgrades, including adding hardstand and relocating fences.

APPROVALS:

At a minimum, the following are required for approval to access these routes.

- NHVR
- RMS
- Newcastle Council
- Muswellbrook Council
- Tamworth Regional Council
- Walcha Shire Council
- Uralla Shire Council
- NSW Police
- Ausgrid
- Essential Energy
- Telstra
- CRN JHG (Rail)
- ARTC (Rail)

15.0 References:

Rex J Andrews Pty. Ltd.
Rex J Andrews Route survey # 336
Vestas
Google Earth/Maps
Nearmaps
NHVR
NHVAS Maintenance Management (NHVAS21193)
NHVAS Basic Fatigue Management (NHVAS21193)

Disclaimer: This route study is a guide only; government approvals would be required before these routes could be deemed suitable for transporting the components over the listed routes.

Any, and all parties using information contained this submission do so at own risk.

RJA accept no responsibility for the use of all information contained within this report.

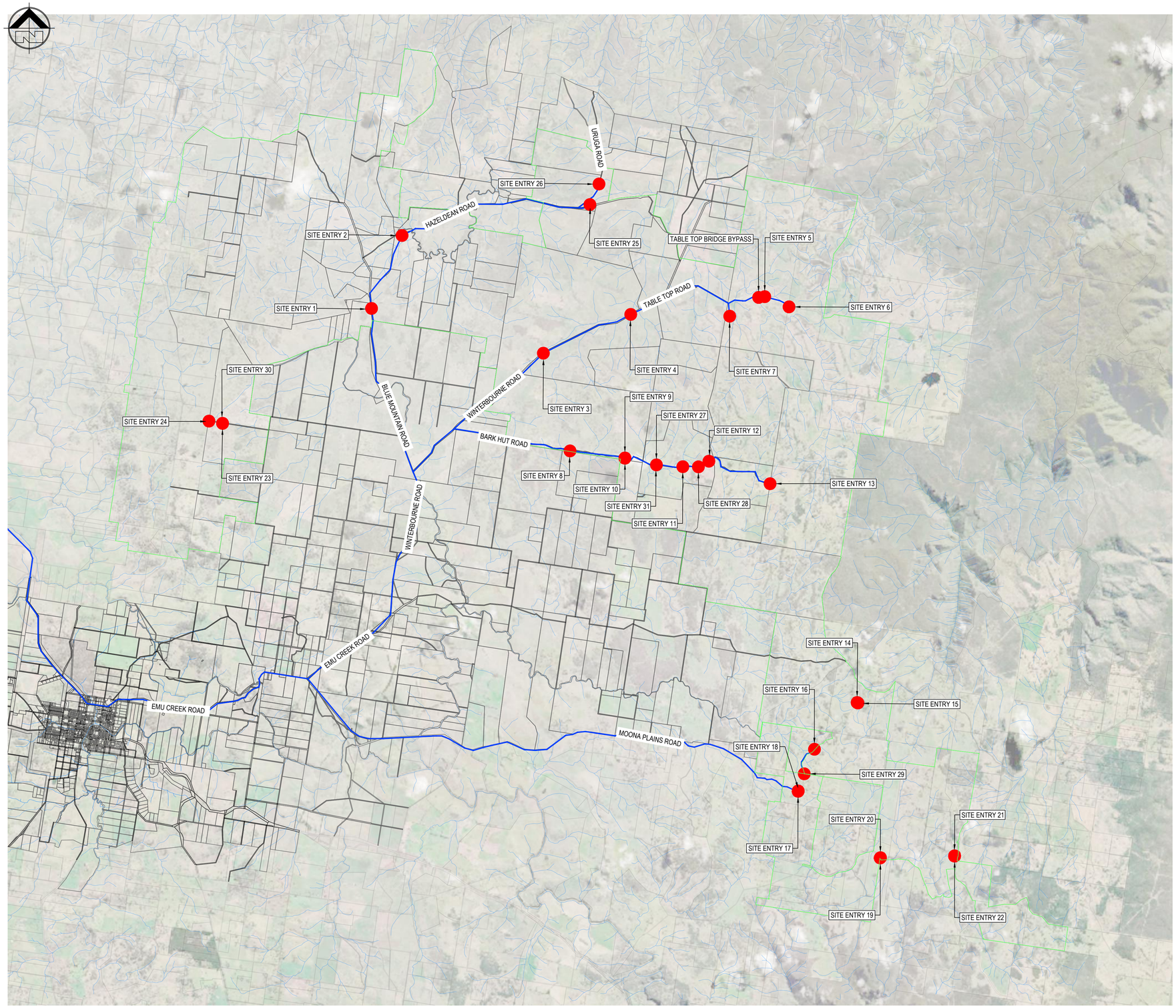
Actual approved routes may differ from those surveyed.

Proposed routes may change subject to approvals from authorities.

This study was undertaken using data supplied by Rex J Andrews P/L. Equipment and swept paths might vary if using transport methodology other than the data supplied by Rex J Andrews.

Appendix B

Site Access and Intersection Designs (prepared by icubed consulting)



KEY PLAN LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING WATERCOURSE (NSW MAPPING)
- EXTERNAL ROAD PLAN
- PROJECT BOUNDARY
- SITE ENTRY

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
C	SITE ENTRY 31 ADDED	P.J.M.	P.J.M.	J.M.	J.M.	17.04.2024
B	NUMBERING UPDATED	J.M.	J.M.	J.M.	J.M.	04.03.2024
A	FOR REVIEW	M.W.	A.G.	J.M.	N.C.	23.02.2024

REVISION HISTORY

icubed consulting
innovation ingenuity inspiration
Development Services | Engineering | Project Delivery
www.icubed.com.au

Vestas

Winterbourne Wind

SIZE A1 | SCALE AS SHOWN

STATUS PRELIMINARY
NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM
GDA2020 MGA Z56

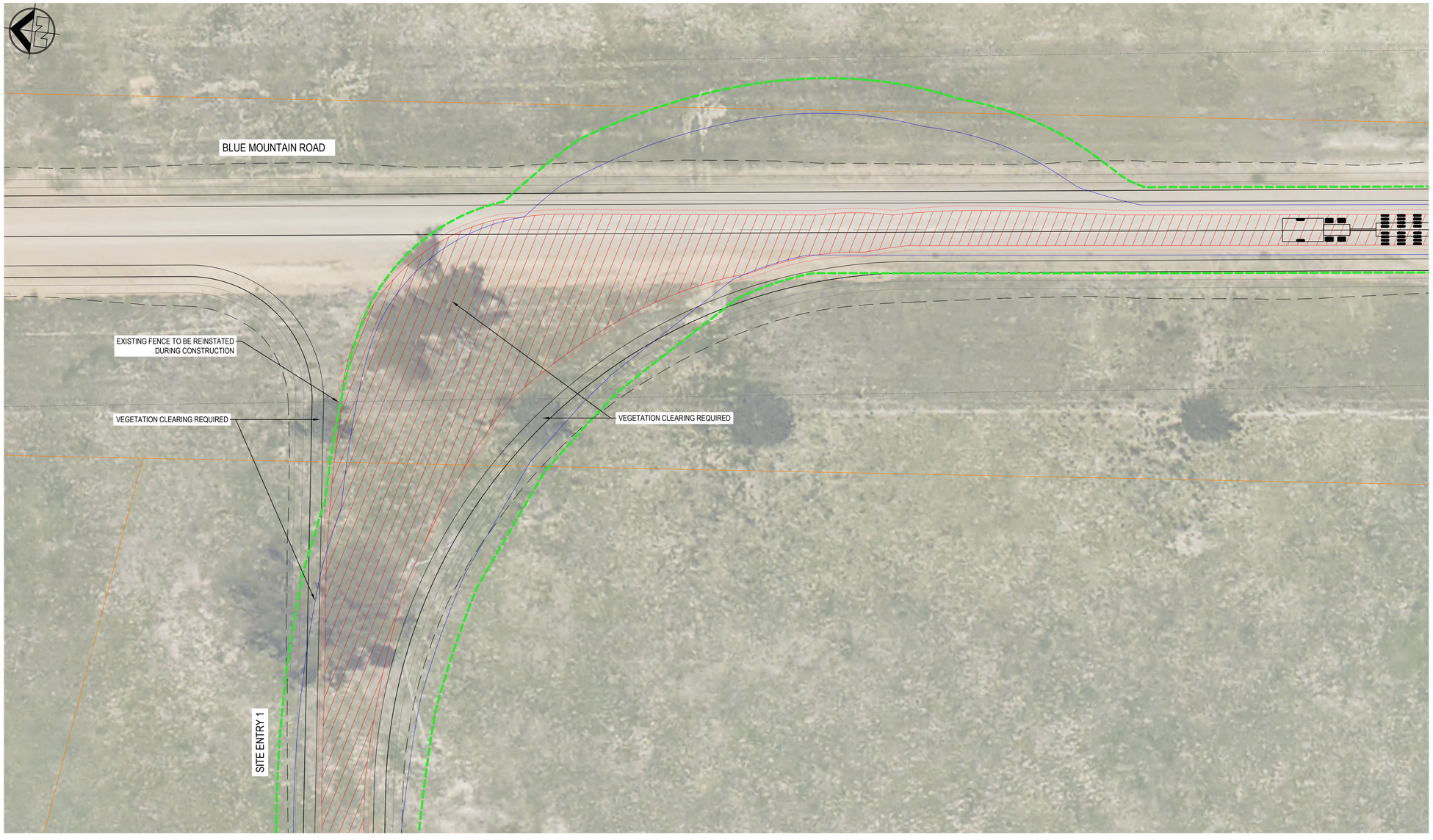
PROJECT WINTERBOURNE WIND FARM

TITLE WINTERBOURNE WIND FARM - EXTERNAL ROADS SITE ENTRY KEY PLAN

DRAWING No. 22-094-WWF-EXT-0002-1

REV C

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INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE

TURNING PATH LEGEND

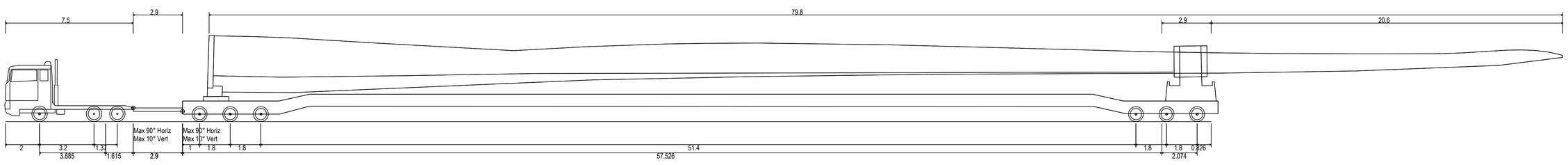
- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

BLUE MOUNTAIN ROAD SITE ENTRY 1

SCALE 1:250



79m BLADE TRAILER PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
C	INTERSECTION LOCATION AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	17.04.2024
B	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

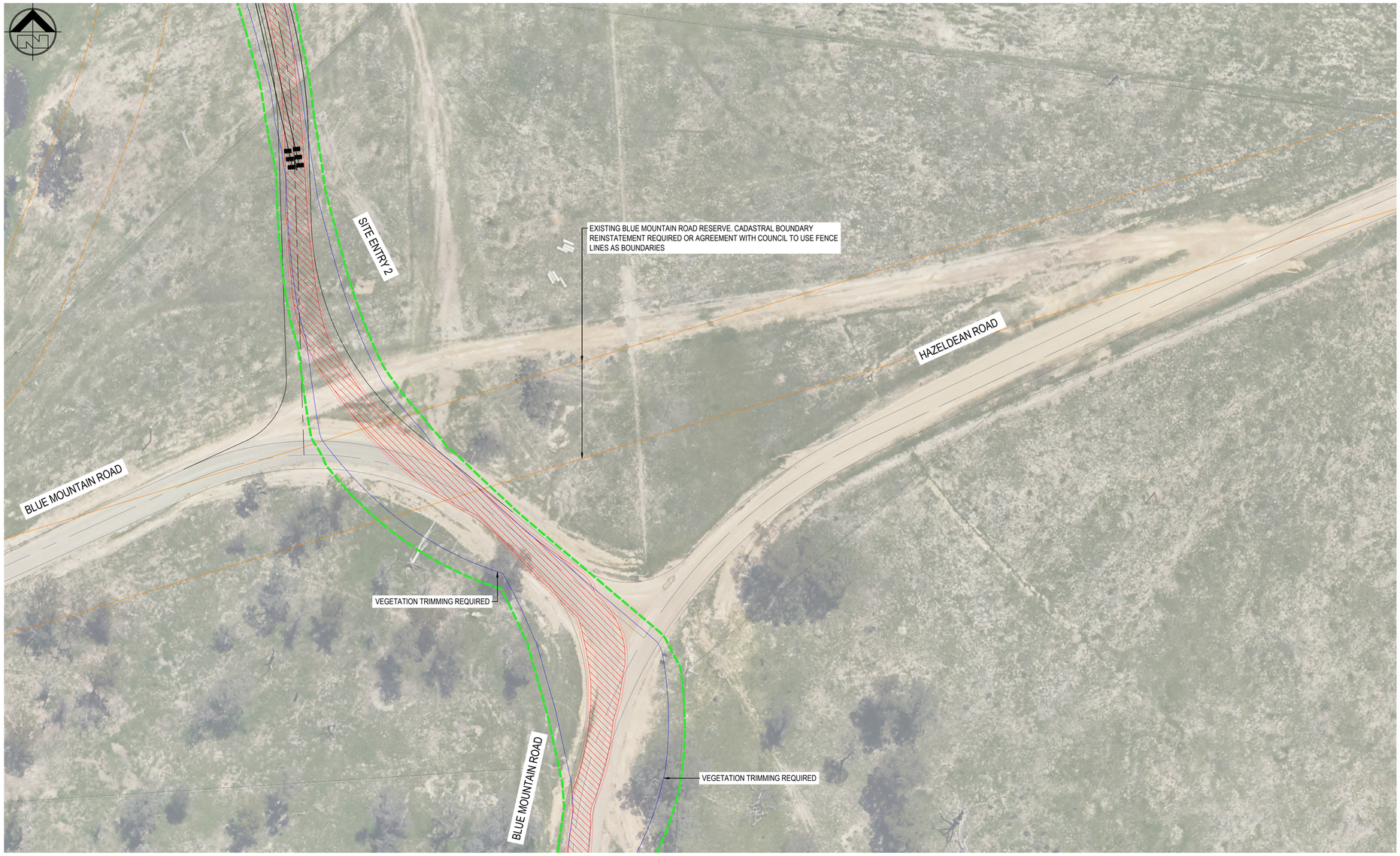
REVISION HISTORY

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Vestas
Winterbourne Wind

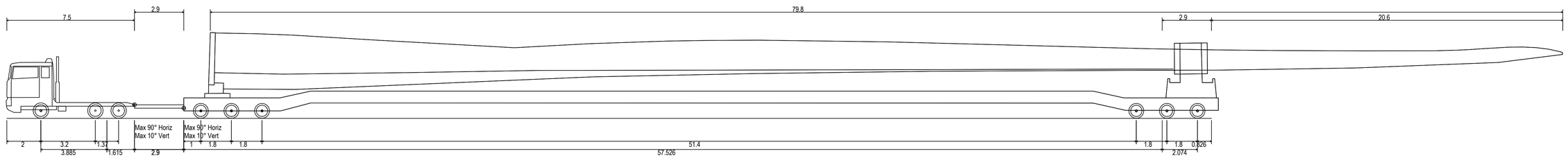
SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	BLUE MOUNTAIN ROAD SITE ENTRY 1
DRAWING No.	22-094-WWF-EXT-0025-1
REV	C

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HAZELDEAN ROAD & BLUE MOUNTAIN ROAD SITE ENTRY 2

SCALE 1:250



79m BLADE TRAILER PROFILE

NTS

INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE

TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	01.02.2024

REVISION HISTORY

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Vestas
Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	HAZELDEAN ROAD & BLUE MOUNTAIN ROAD SITE ENTRY 2
DRAWING No.	22-094-WWF-EXT-0026-1
REV	A

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INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE

TURNING PATH LEGEND

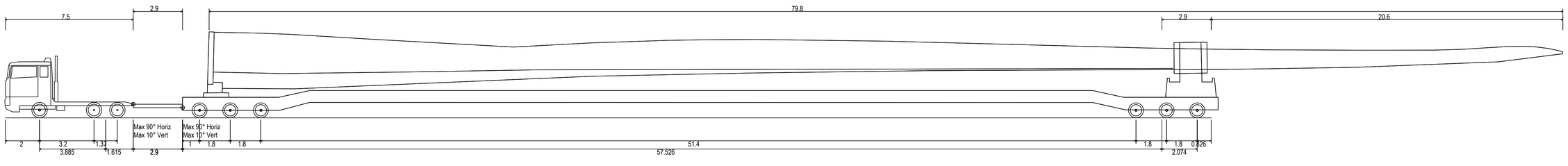
- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

WINTERBOURNE ROAD SITE ENTRY 3

SCALE 1:250



79m BLADE TRAILER PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

REVISION HISTORY

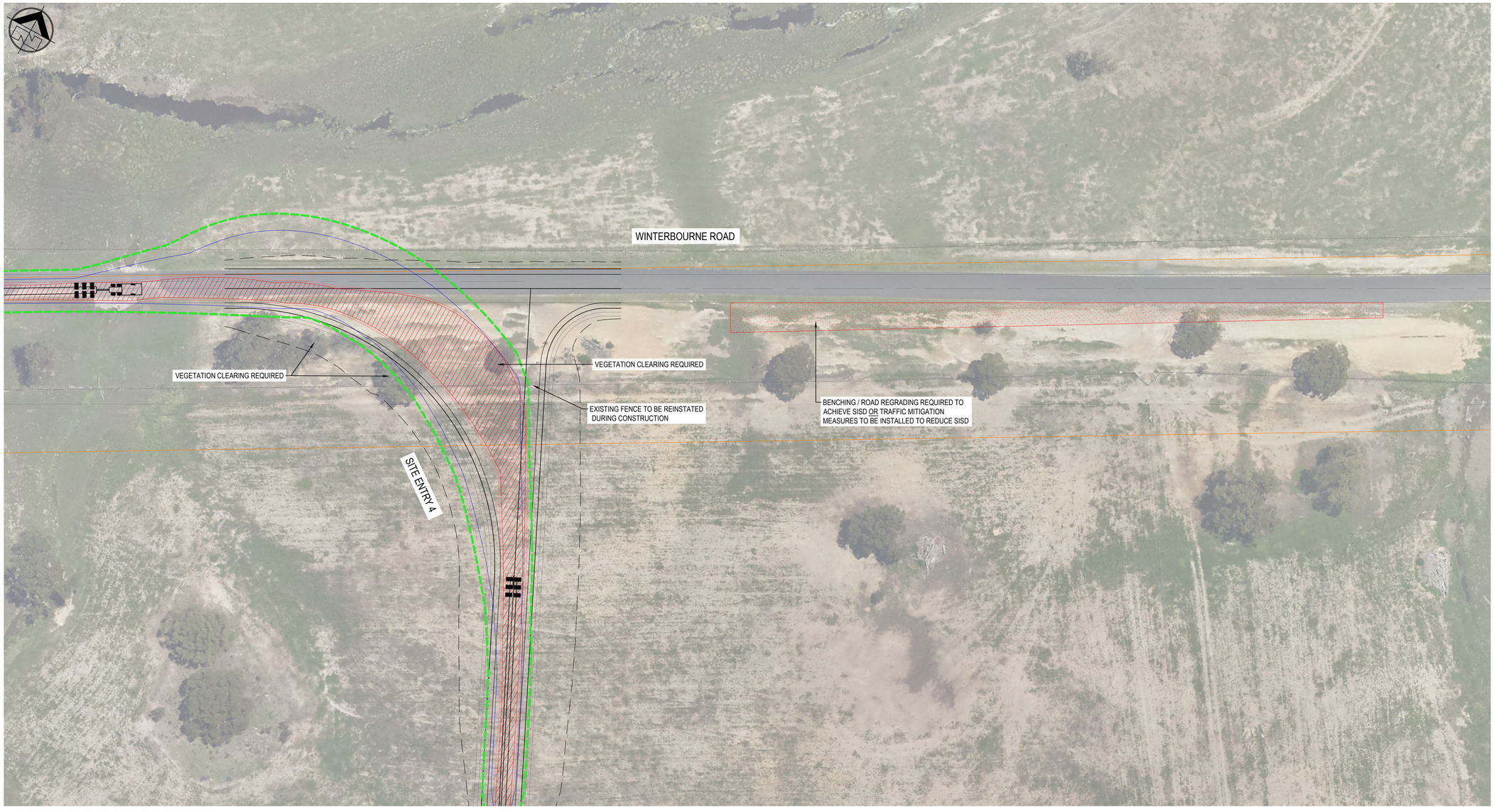
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Vestas

Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	WINTERBOURNE ROAD SITE ENTRY 3
DRAWING No.	22-094-WWF-EXT-0027-1
REV	B

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INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE
- ROAD VERGE CLEARING / BENCHING

TURNING PATH LEGEND

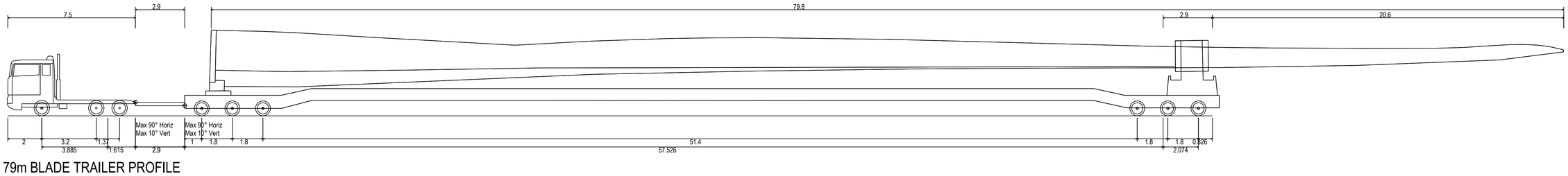
- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

WINTERBOURNE ROAD SITE ENTRY 4

SCALE 1:500



79m BLADE TRAILER PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	VERGE CLEARING / BENCHING AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	16.05.2024
A	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

REVISION HISTORY

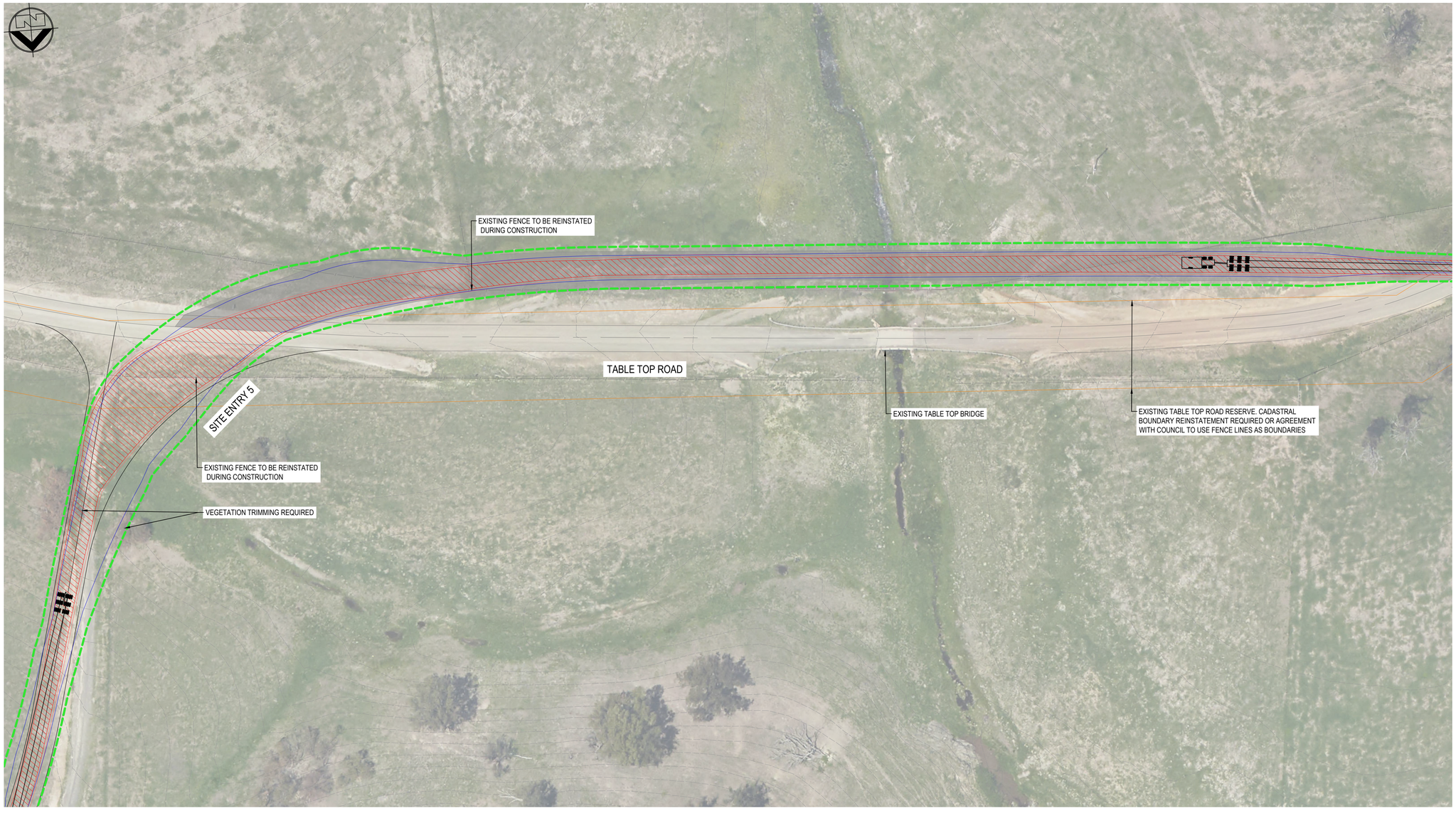
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Vestas

Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	WINTERBOURNE ROAD SITE ENTRY 4
DRAWING No.	22-094-WWF-EXT-0028-1
REV	B

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INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE
- TEMPORARY TRACK

TURNING PATH LEGEND

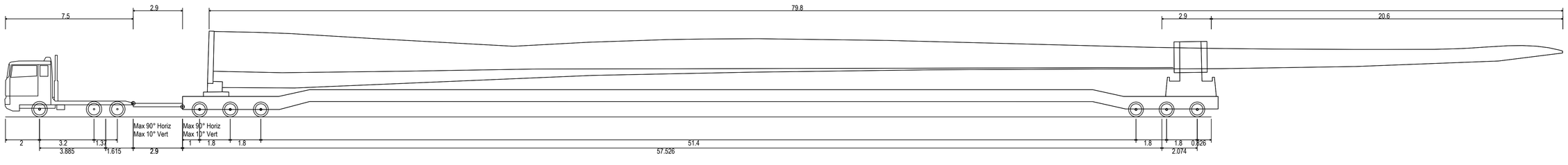
- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

TABLE TOP ROAD SITE ENTRY 5

SCALE 1:500



79m BLADE TRAILER PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

REVISION HISTORY

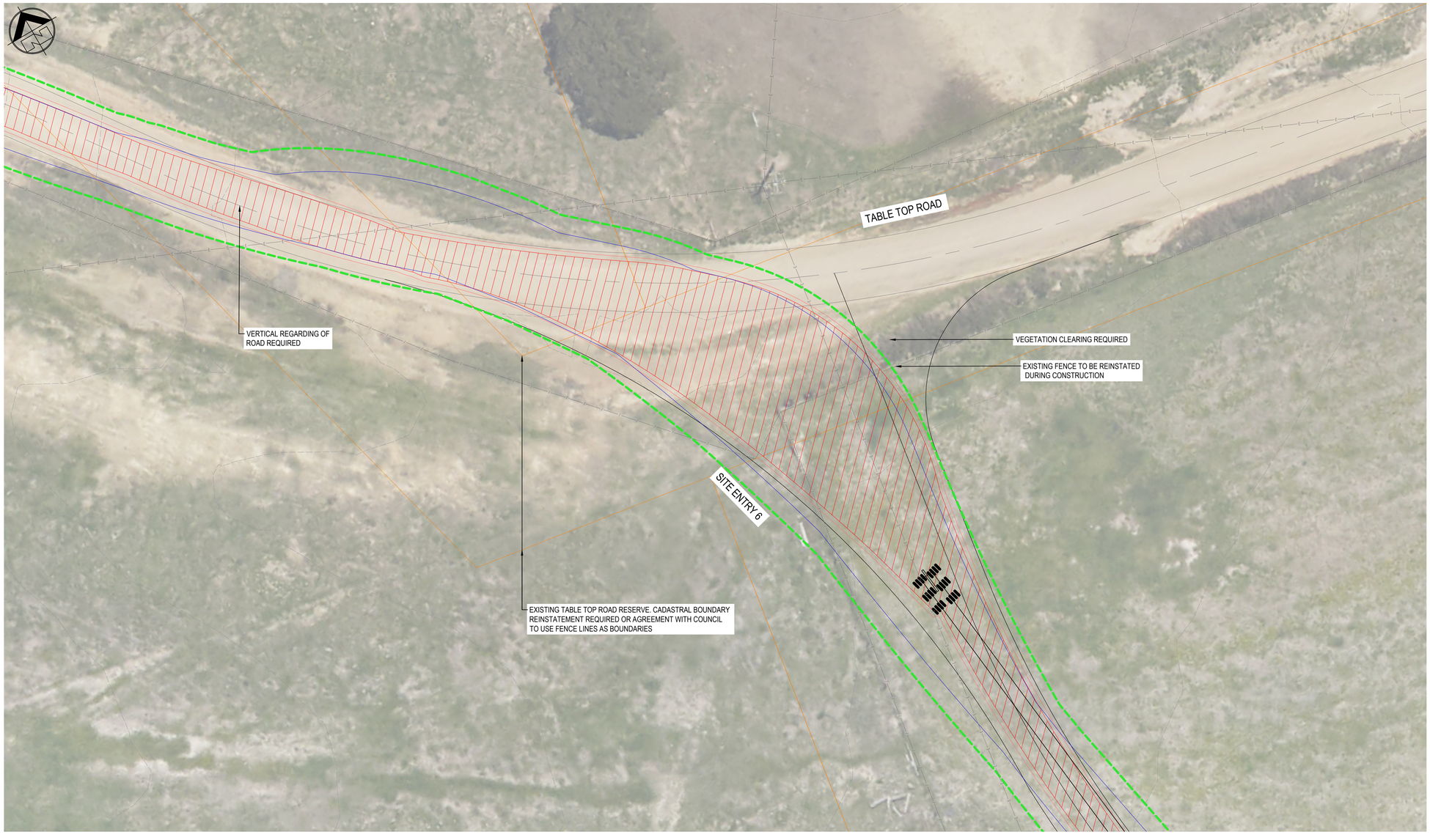
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Vestas

Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	TABLE TOP ROAD SITE ENTRY 5
DRAWING No.	22-094-WWF-EXT-0029-1
REV	A

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INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE
- EXISTING POWER LINE

TURNING PATH LEGEND

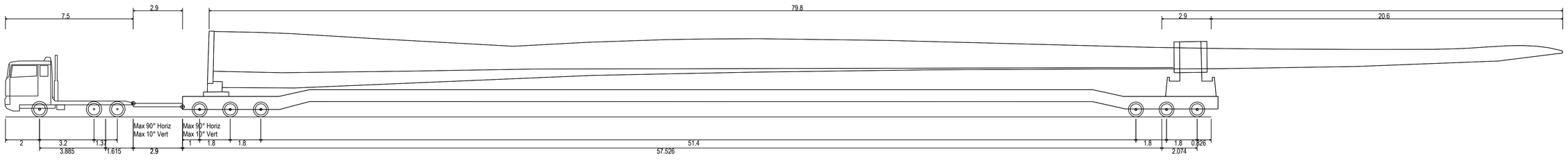
- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

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2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

TABLE TOP ROAD SITE ENTRY 6

SCALE 1:250



79m BLADE TRAILER PROFILE

NTS

No	DESCRIPTION	Ba.P.	Ba.P.	J.M.	N.C.	DATE
A	FOR REVIEW	DES	DRN	CHK	APP	07.02.2024

REVISION HISTORY

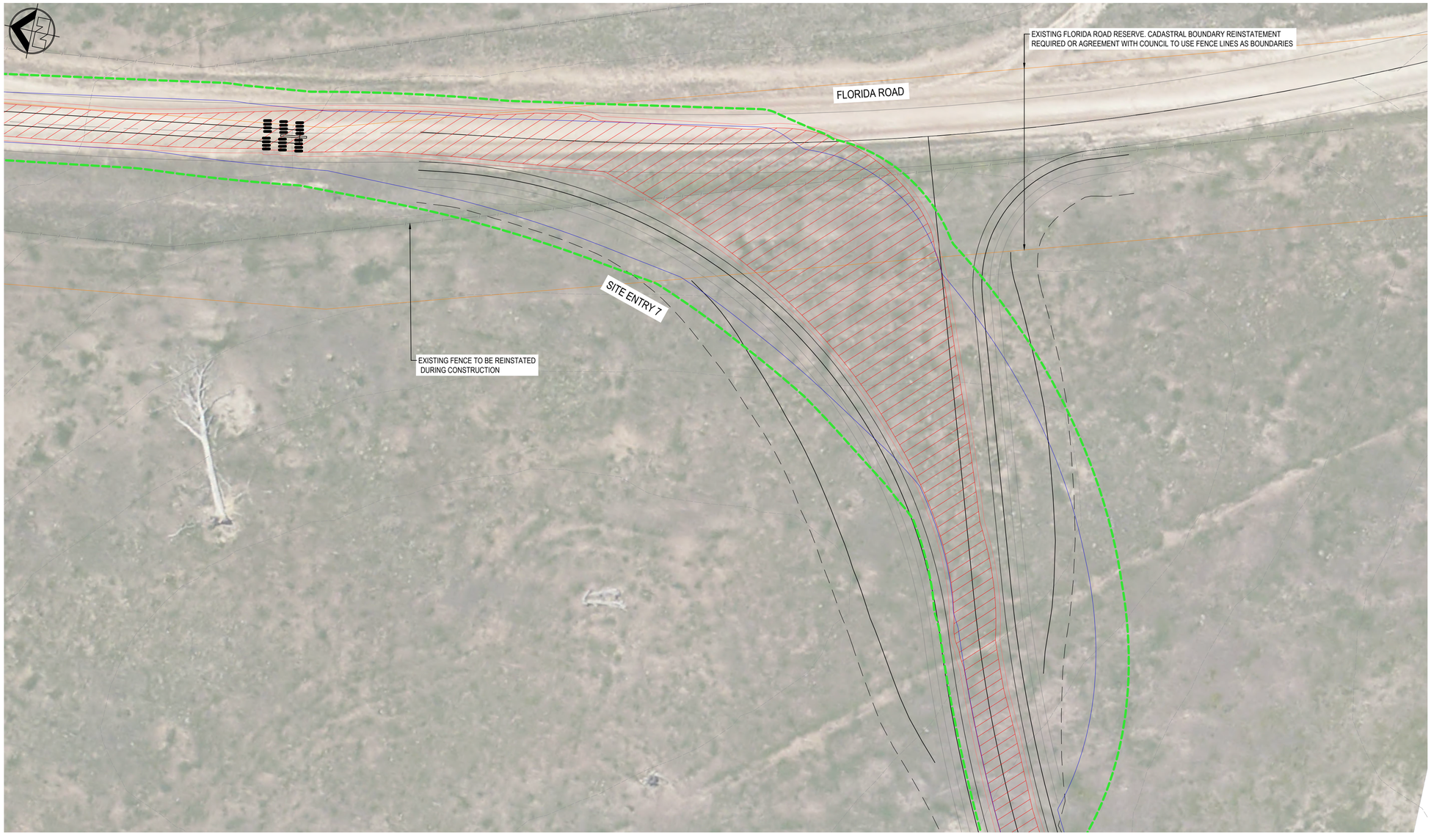
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Vestas

Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	TABLE TOP ROAD SITE ENTRY 6
DRAWING No.	22-094-WWF-EXT-0030-1
REV	A

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INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE

TURNING PATH LEGEND

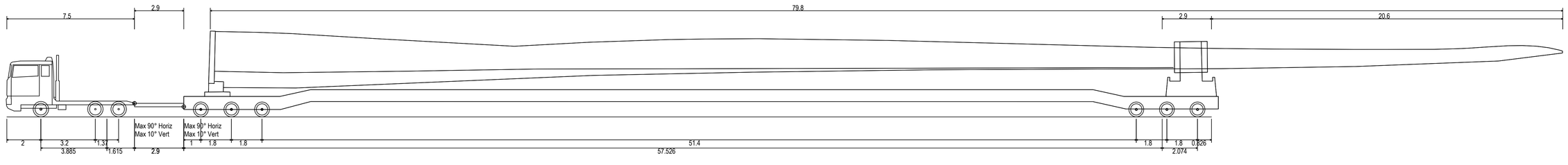
- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

FLORIDA ROAD SITE ENTRY 7

SCALE 1:250



79m BLADE TRAILER PROFILE

NTS

No	DESCRIPTION	Ba.P. DES	Ba.P. DRN	J.M. CHK	N.C. APP	DATE
A	FOR REVIEW					07.02.2024

REVISION HISTORY

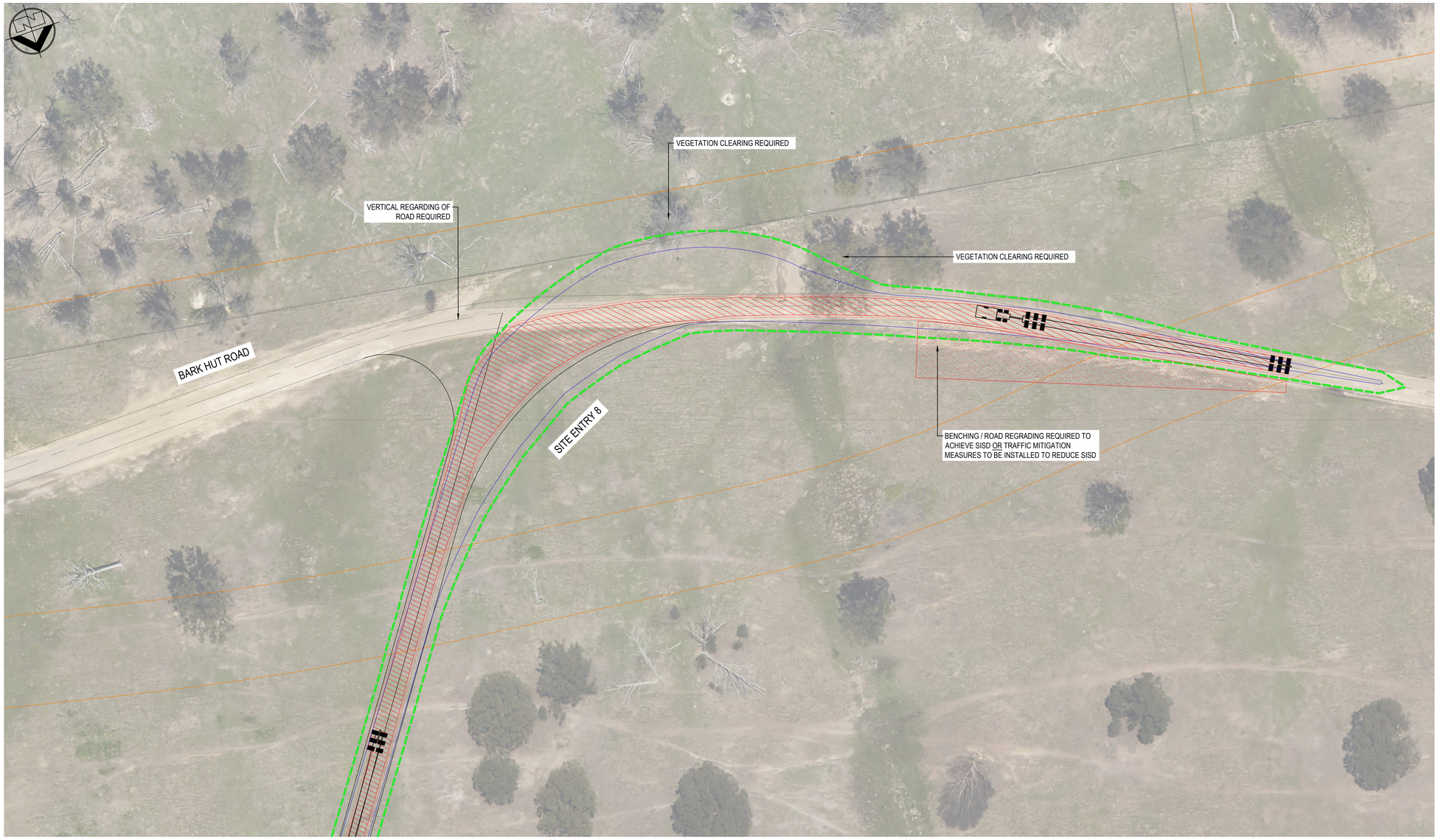
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Vestas

Winterbourne Wind

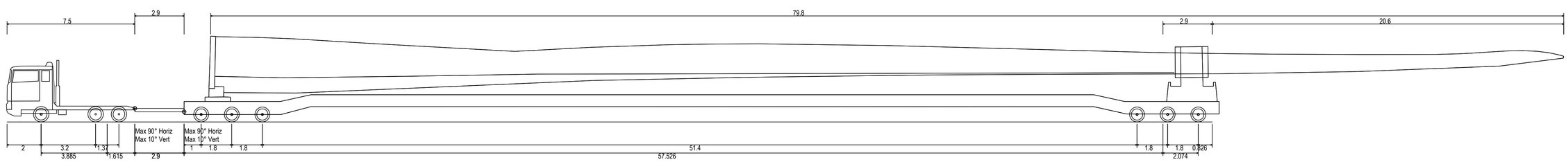
SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	FLORIDA ROAD SITE ENTRY 7
DRAWING No.	22-094-WWF-EXT-0031-1
REV	A

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BARK HUT ROAD SITE ENTRY 8

SCALE 1:500



79m BLADE TRAILER PROFILE

NTS

INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE
- ROAD VERGE CLEARING / BENCHING

TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	VERGE CLEARING / BENCHING AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	16.05.2024
A	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

REVISION HISTORY

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Vestas
Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	BARK HUT ROAD SITE ENTRY 8
DRAWING No.	22-094-WWF-EXT-0032-1
REV	B

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INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE

TURNING PATH LEGEND

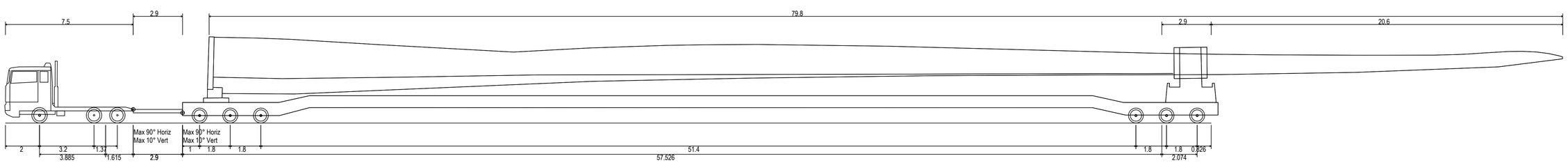
- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

BARK HUT ROAD SITE ENTRY 9

SCALE 1:250



79m BLADE TRAILER PROFILE

NTS

No	DESCRIPTION	Ba.P. DES	Ba.P. DRN	J.M. CHK	N.C. APP	DATE
A	FOR REVIEW					07.02.2024

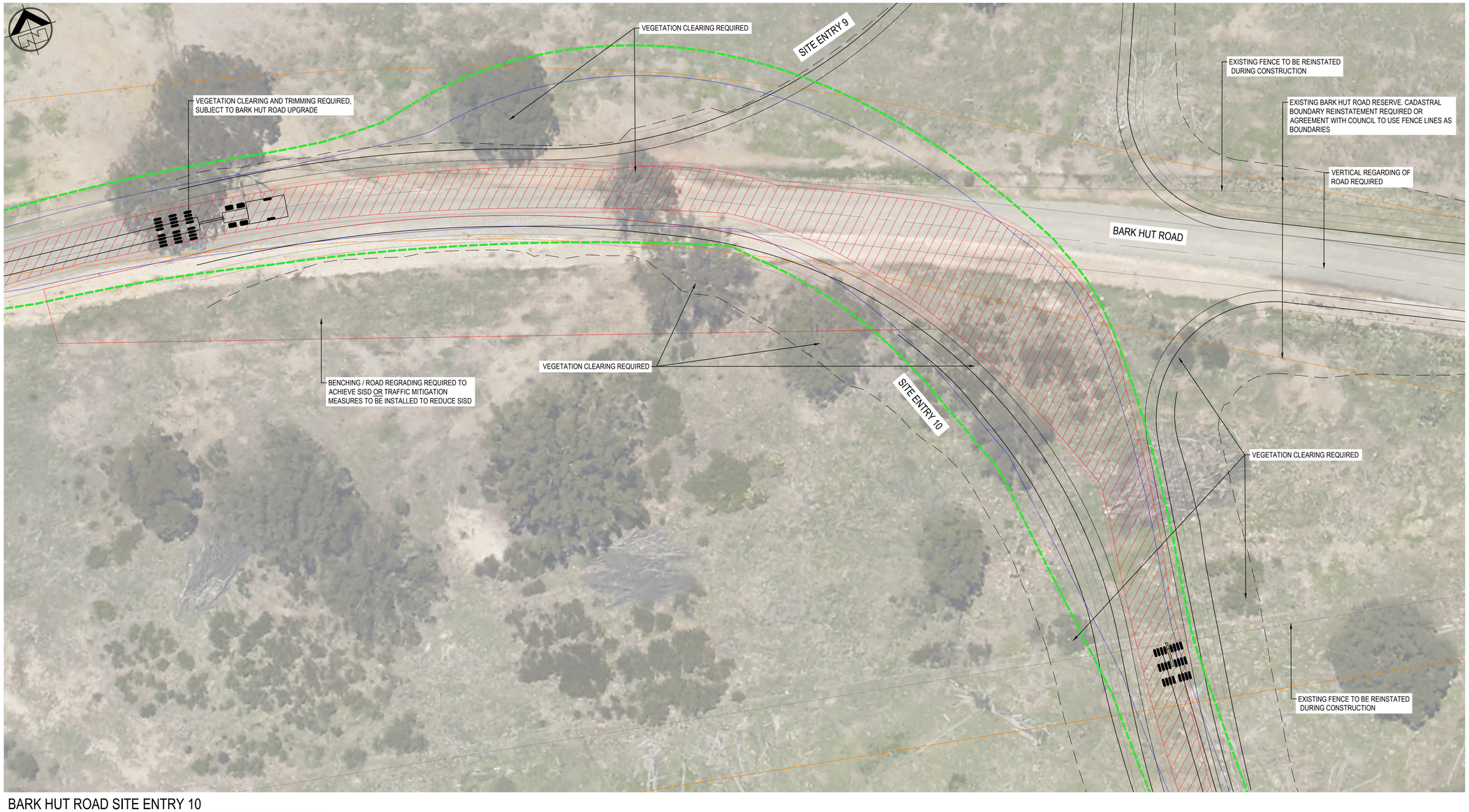
REVISION HISTORY

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Vestas
Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	BARK HUT ROAD SITE ENTRY 9
DRAWING No.	22-094-WWF-EXT-0033-1
REV	A

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BARK HUT ROAD SITE ENTRY 10

SCALE 1:250

INTERSECTION LEGEND

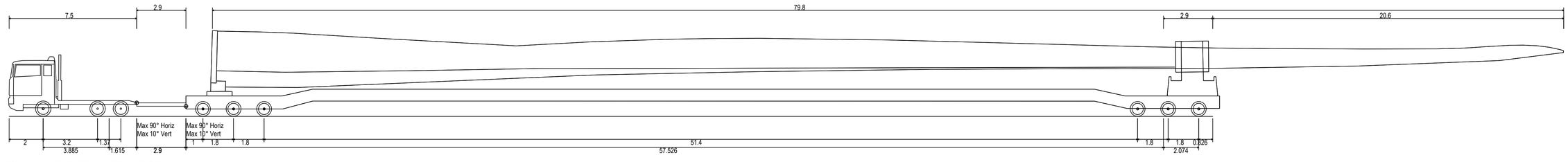
- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE
- ROAD VERGE CLEARING / BENCHING

TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.



79m BLADE TRAILER PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	VERGE CLEARING / BENCHING AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	16.05.2024
A	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

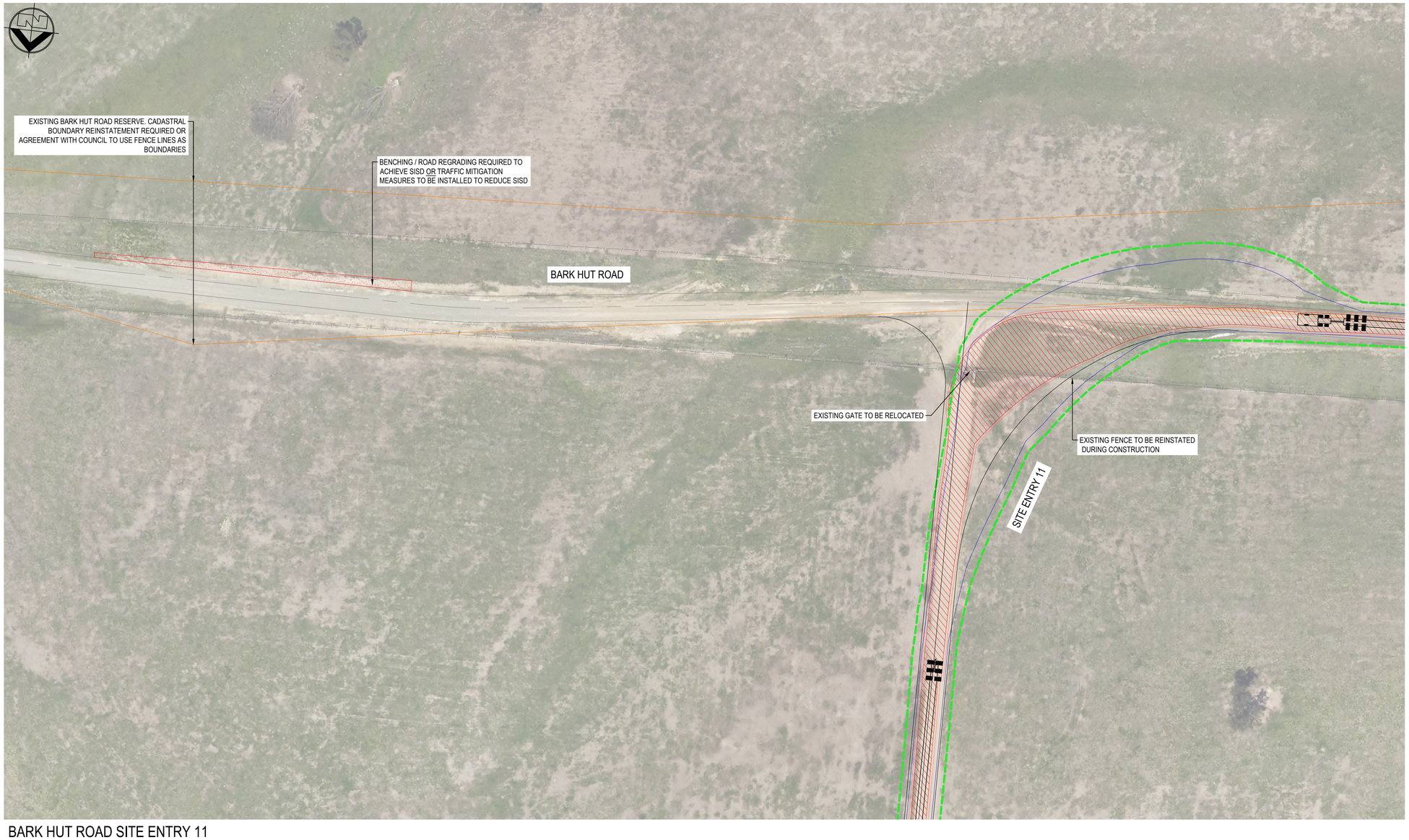
REVISION HISTORY

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Vestas
Winterbourne Wind

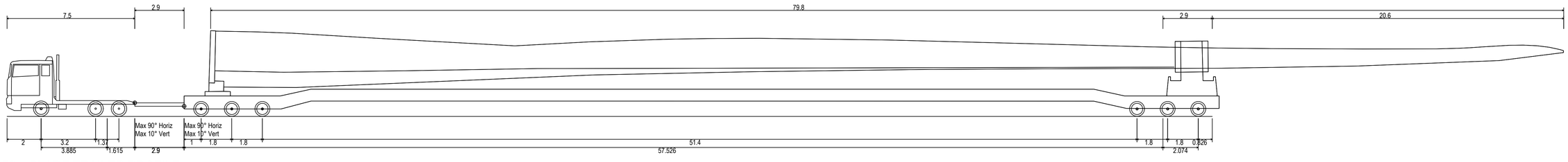
SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	BARK HUT ROAD SITE ENTRY 10
DRAWING No.	22-094-WWF-EXT-0034-1
REV	B

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BARK HUT ROAD SITE ENTRY 11

SCALE 1:500



79m BLADE TRAILER PROFILE

NTS

INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE
- ROAD VERGE CLEARING / BENCHING

TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	VERGE CLEARING / BENCHING AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	16.05.2024
A	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

REVISION HISTORY

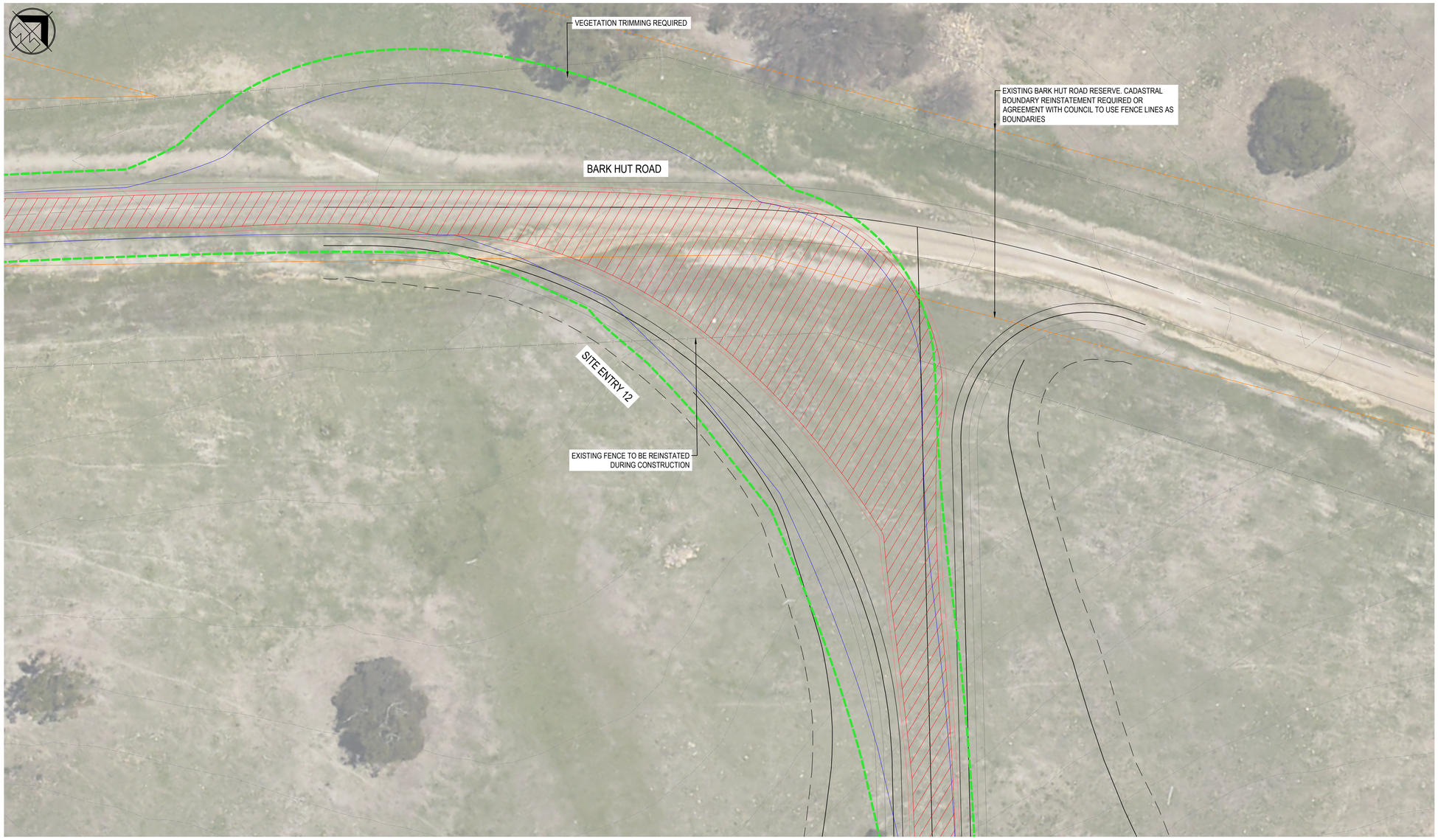
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Vestas

Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	BARK HUT ROAD SITE ENTRY 11
DRAWING No.	22-094-WWF-EXT-0035-1
REV	B

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INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE

TURNING PATH LEGEND

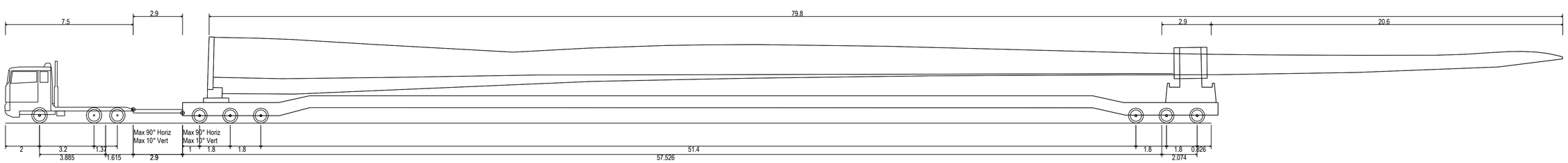
- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

BARK HUT ROAD SITE ENTRY 12

SCALE 1:250



79m BLADE TRAILER PROFILE

NTS

No	DESCRIPTION	Ba.P.	Ba.P.	J.M.	N.C.	DATE
A	FOR REVIEW	DES	DRN	CHK	APP	07.02.2024

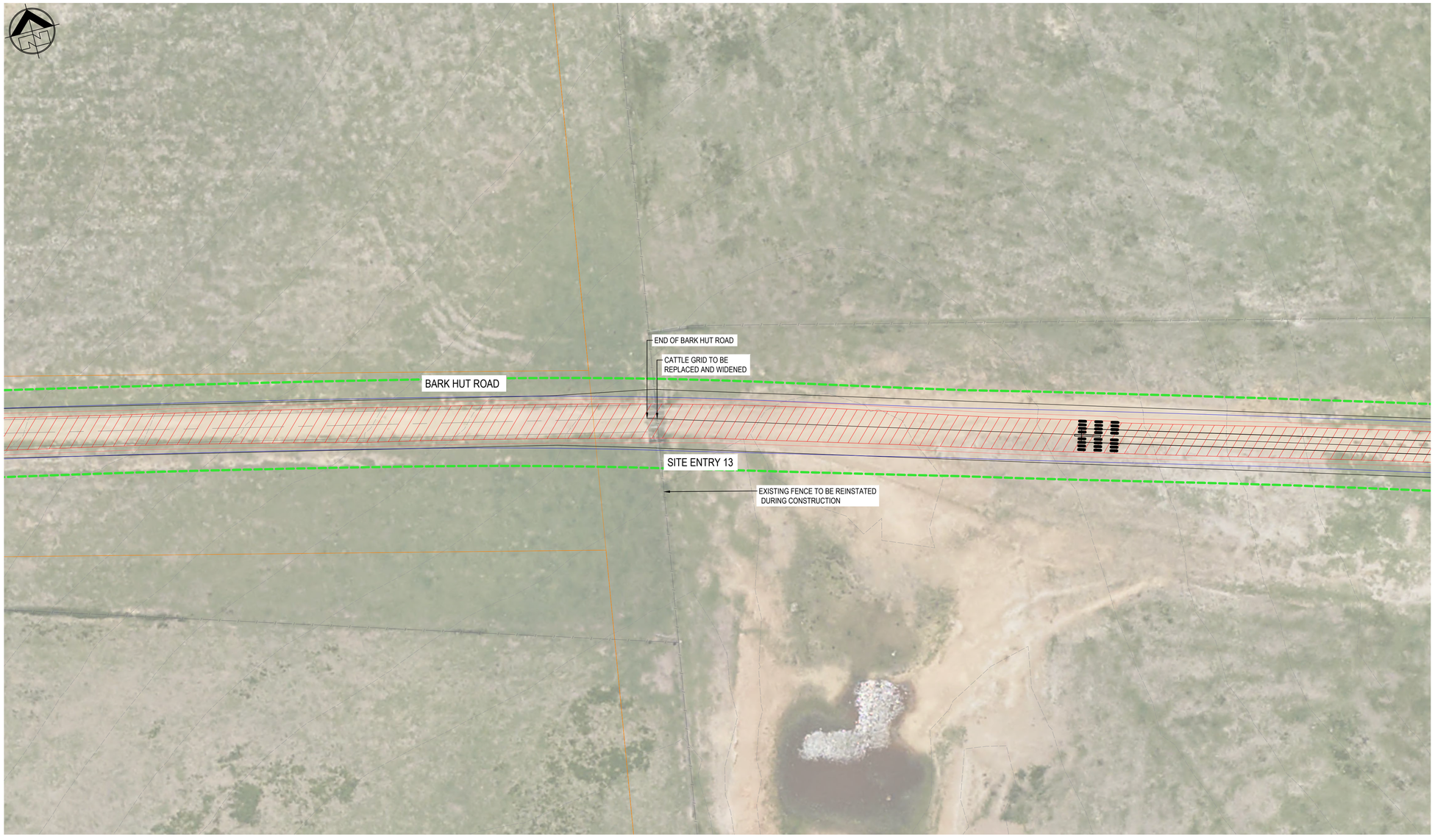
REVISION HISTORY

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Vestas
Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	BARK HUT ROAD SITE ENTRY 12
DRAWING No.	22-094-WWF-EXT-0036-1
REV	A

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INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE

TURNING PATH LEGEND

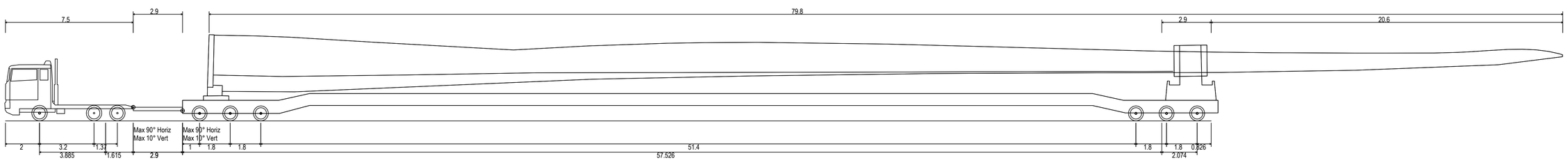
- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

BARK HUT ROAD SITE ENTRY 13

SCALE 1:250



79m BLADE TRAILER PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

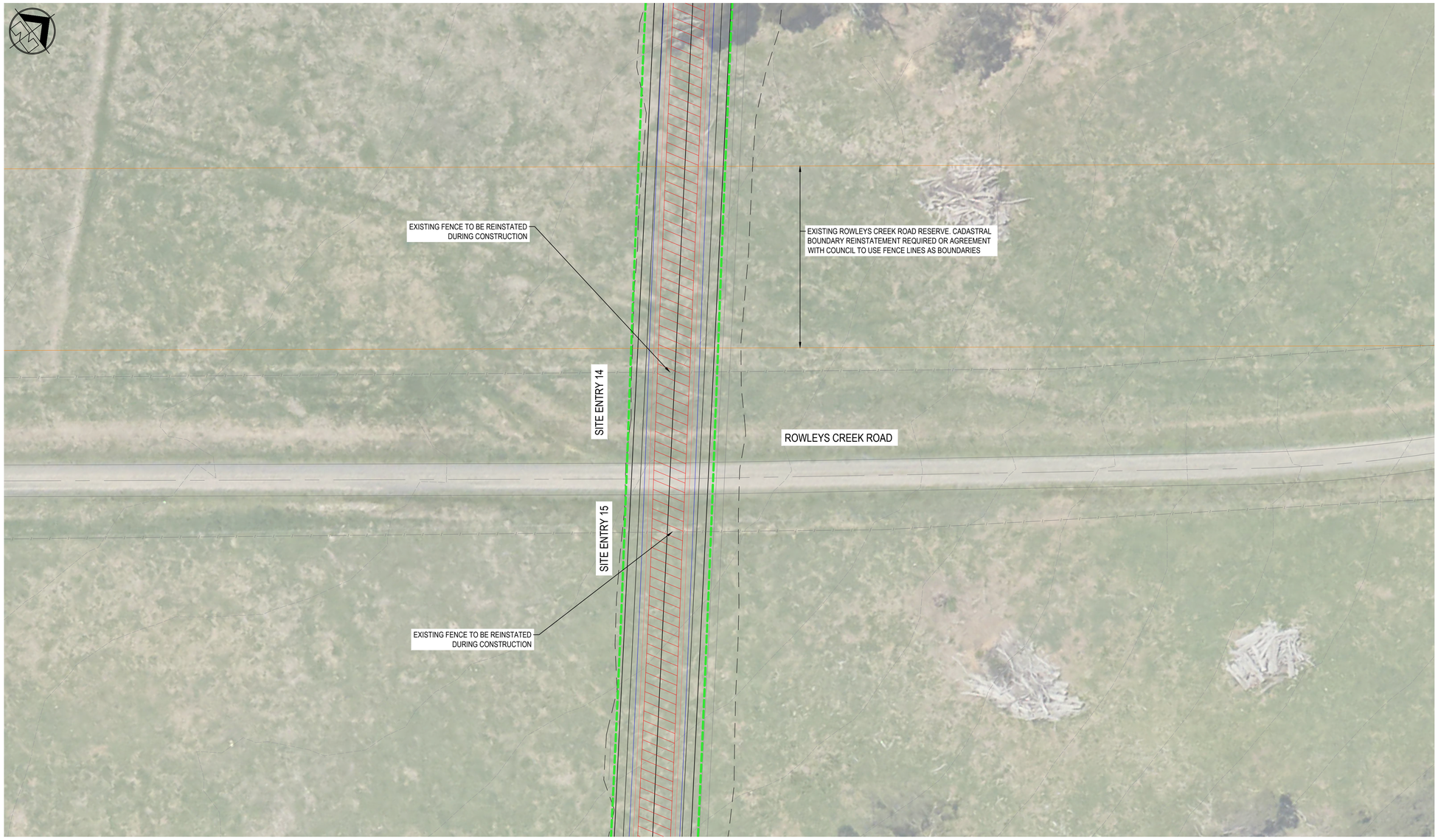
REVISION HISTORY

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Vestas
Winterbourne Wind

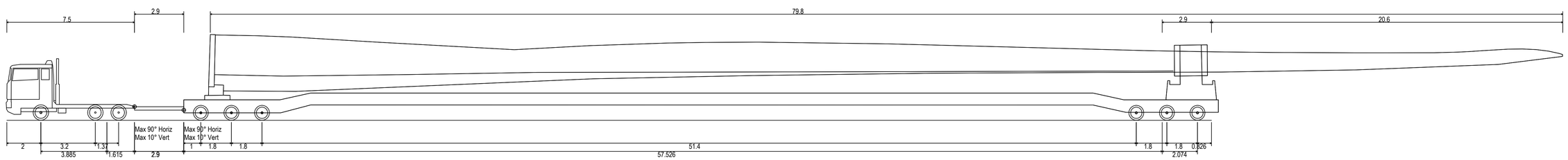
SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	BARK HUT ROAD SITE ENTRY 13
DRAWING No.	22-094-WWF-EXT-0037-1
REV	A

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ROWLEYS CREEK ROAD SITE ENTRY 14 & 15

SCALE 1:250



79m BLADE TRAILER PROFILE

NTS

INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE

TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

No	DESCRIPTION	Ba.P. DES	Ba.P. DRN	J.M. CHK	N.C. APP	DATE
A	FOR REVIEW					07.02.2024

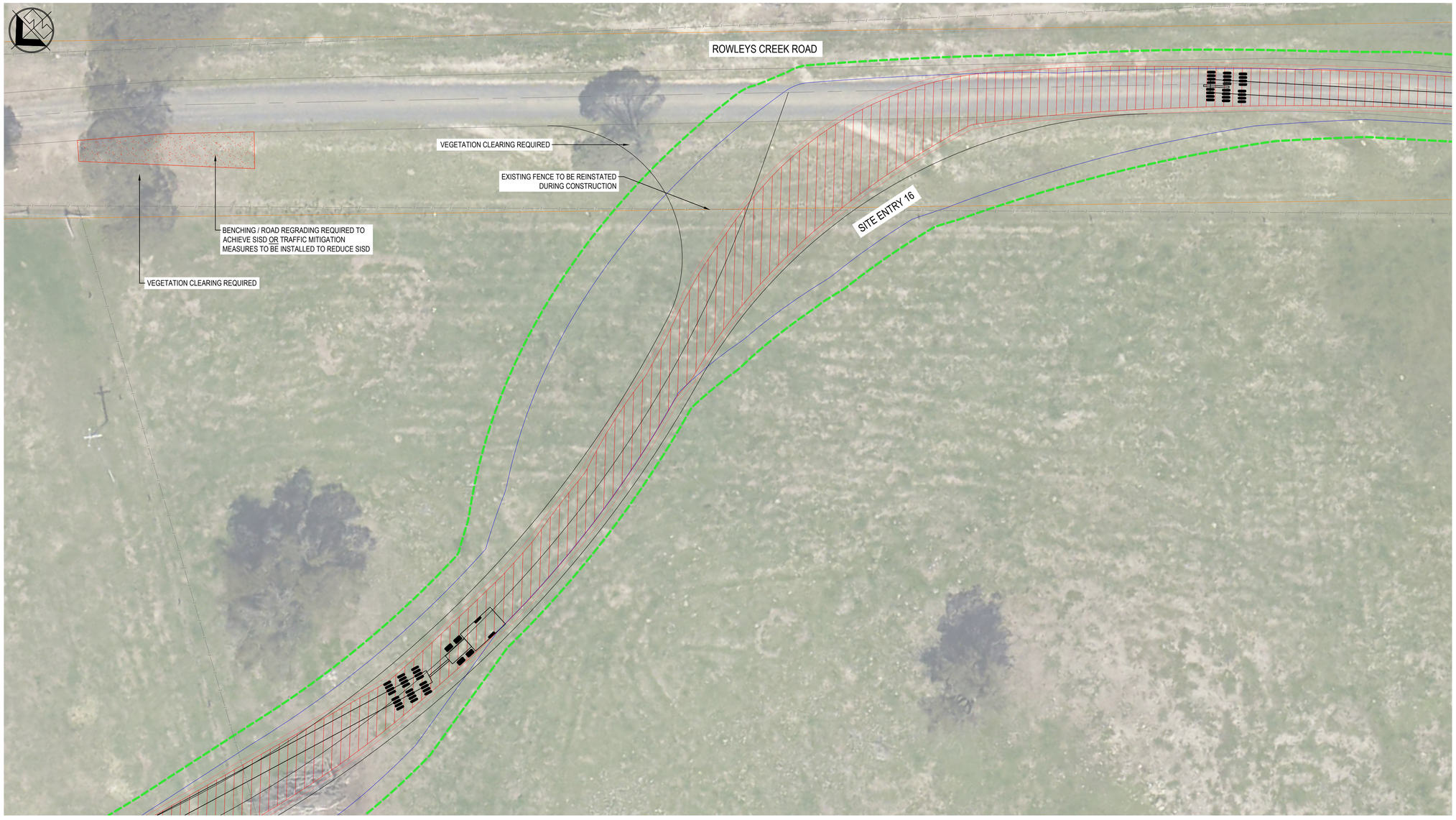
REVISION HISTORY

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Vestas
Winterbourne Wind

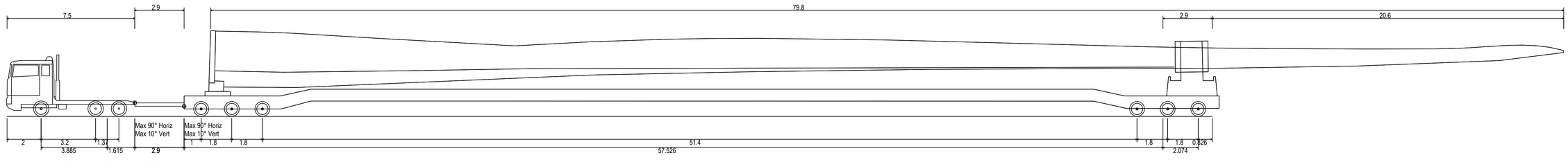
SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	ROWLEYS CREEK ROAD SITE ENTRY 14 & 15
DRAWING No.	22-094-WWF-EXT-0038-1
REV	A

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ROWLEYS CREEK ROAD SITE ENTRY 16

SCALE 1:250



79m BLADE TRAILER PROFILE

NTS

INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE
- ROAD VERGE CLEARING / BENCHING

TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

REVISION HISTORY

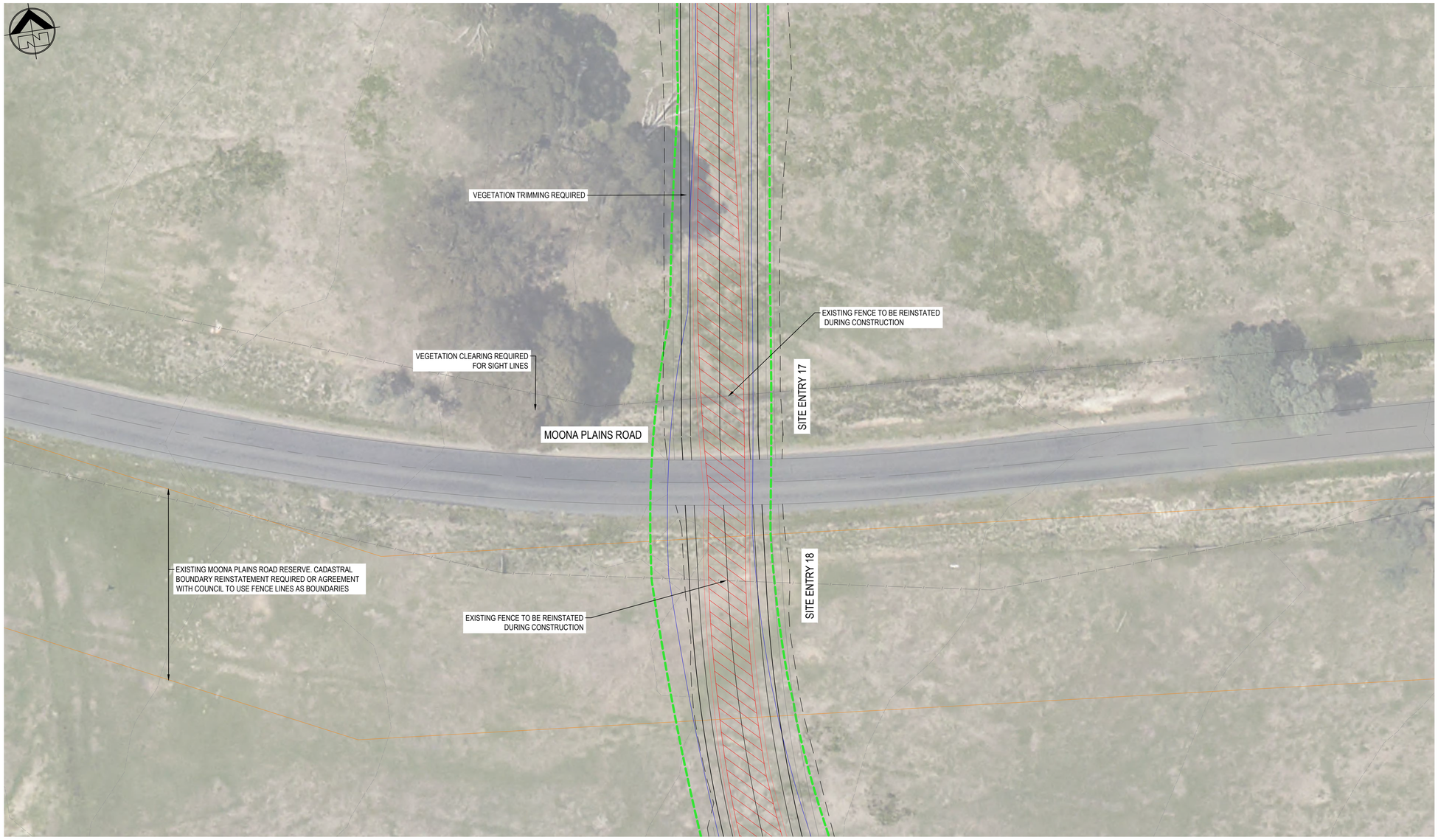
No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	VERGE CLEARING / BENCHING AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	16.05.2024
A	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

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Vestas
Winterbourne Wind

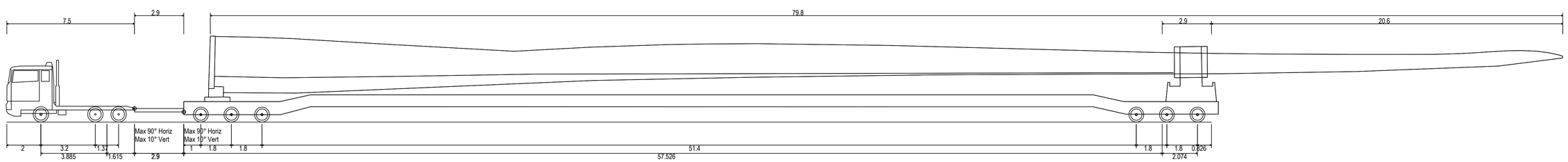
SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	ROWLEYS CREEK ROAD SITE ENTRY 16
DRAWING No.	22-094-WWF-EXT-0039-1
REV	B

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MOONA PLAINS ROAD SITE ENTRY 17 & 18

SCALE 1:250



79m BLADE TRAILER PROFILE

NTS

INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE

TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

REVISION HISTORY

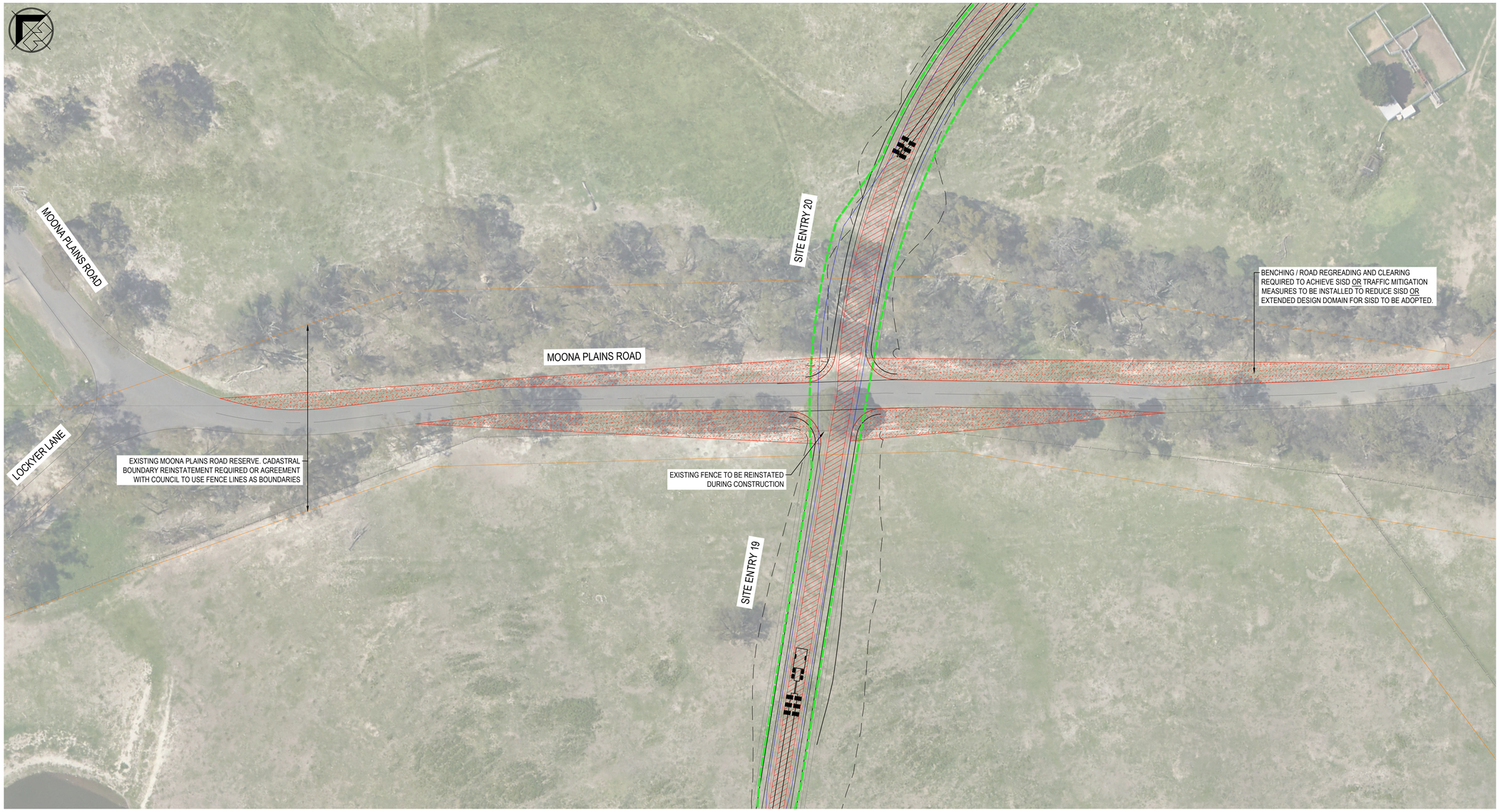
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Vestas

Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	MOONA PLAINS ROAD SITE ENTRY 17 & 18
DRAWING No.	22-094-WWF-EXT-0040-1
REV	A

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MOONA PLAINS ROAD SITE ENTRY 19 & 20

SCALE 1:500

INTERSECTION LEGEND

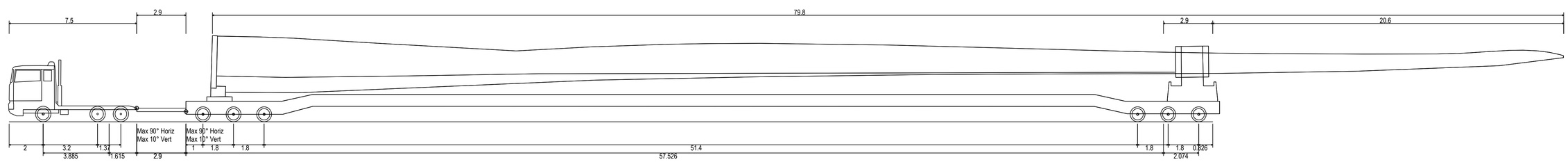
- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE
- ROAD VERGE CLEARING / BENCHING

TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.



79m BLADE TRAILER PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
C	VERGE CLEARING / BENCHING AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	16.05.2024
B	INTERSECTION LOCATION AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	17.04.2024
A	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

REVISION HISTORY

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Vestas

Winterbourne Wind

SIZE A1 | SCALE AS SHOWN

STATUS PRELIMINARY
NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM
GDA2020 MGA Z56

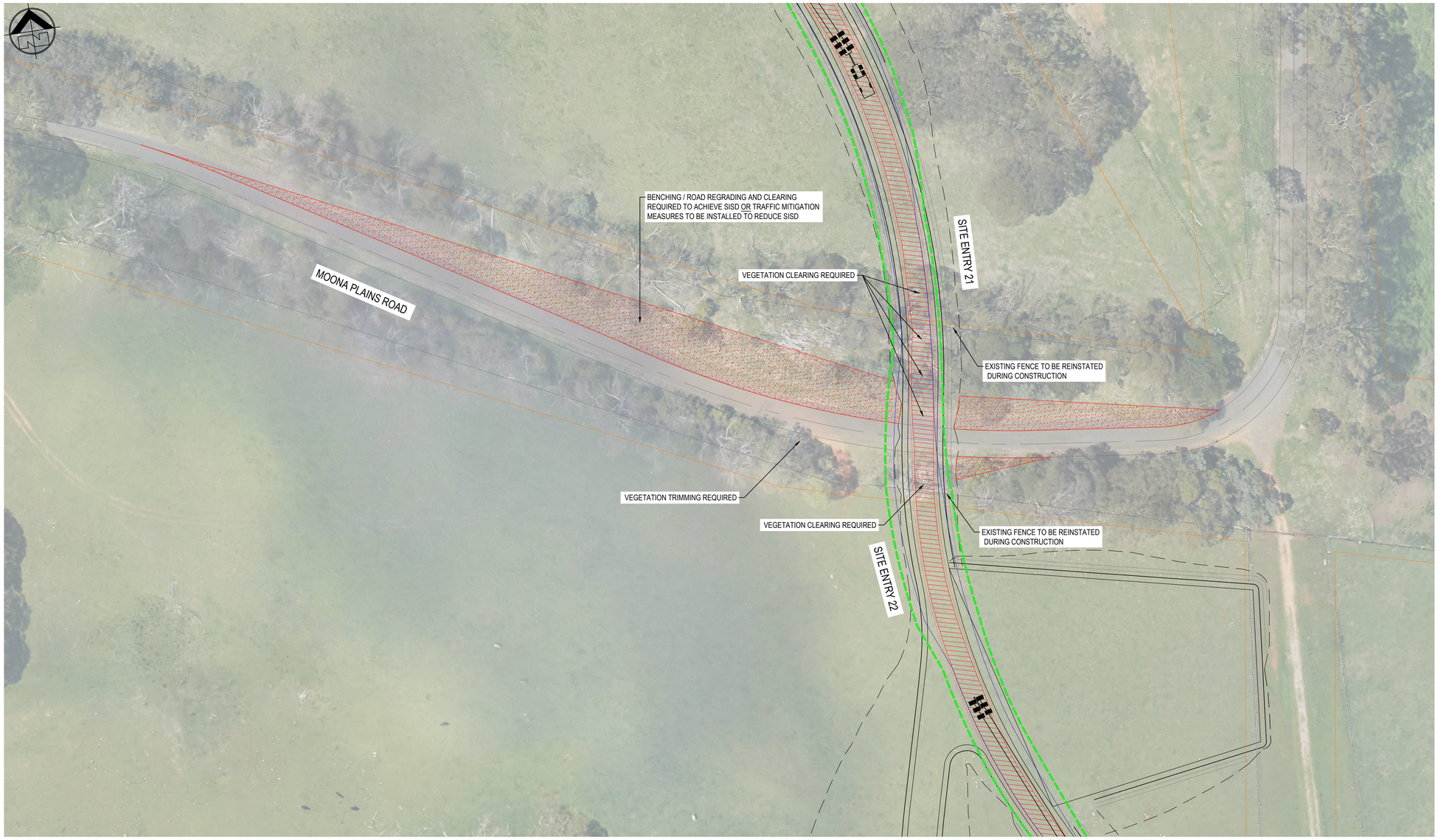
PROJECT WINTERBOURNE WIND FARM

TITLE MOONA PLAINS ROAD
SITE ENTRY 19 & 20

DRAWING No. 22-094-WWF-EXT-0041-1

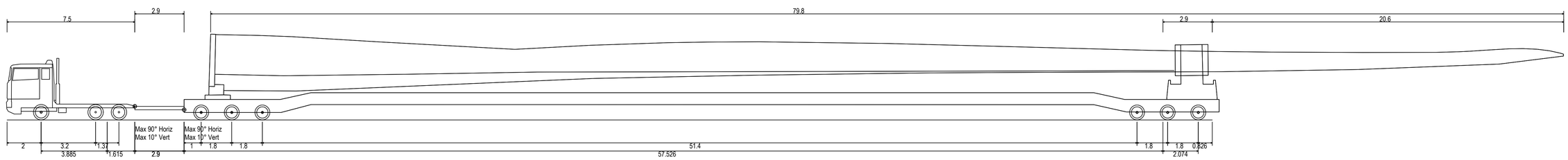
REV C

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MOONA PLAINS ROAD SITE ENTRY 21 & 22

SCALE 1:500



79m BLADE TRAILER PROFILE

NTS

INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE
- ROAD VERGE CLEARING / BENCHING

TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
C	VERGE CLEARING / BENCHING AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	16.05.2024
B	INTERSECTION AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	17.04.2024
A	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

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Vestas
Winterbourne Wind

SIZE A1 | SCALE AS SHOWN

STATUS PRELIMINARY
NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM
GDA2020 MGA Z56

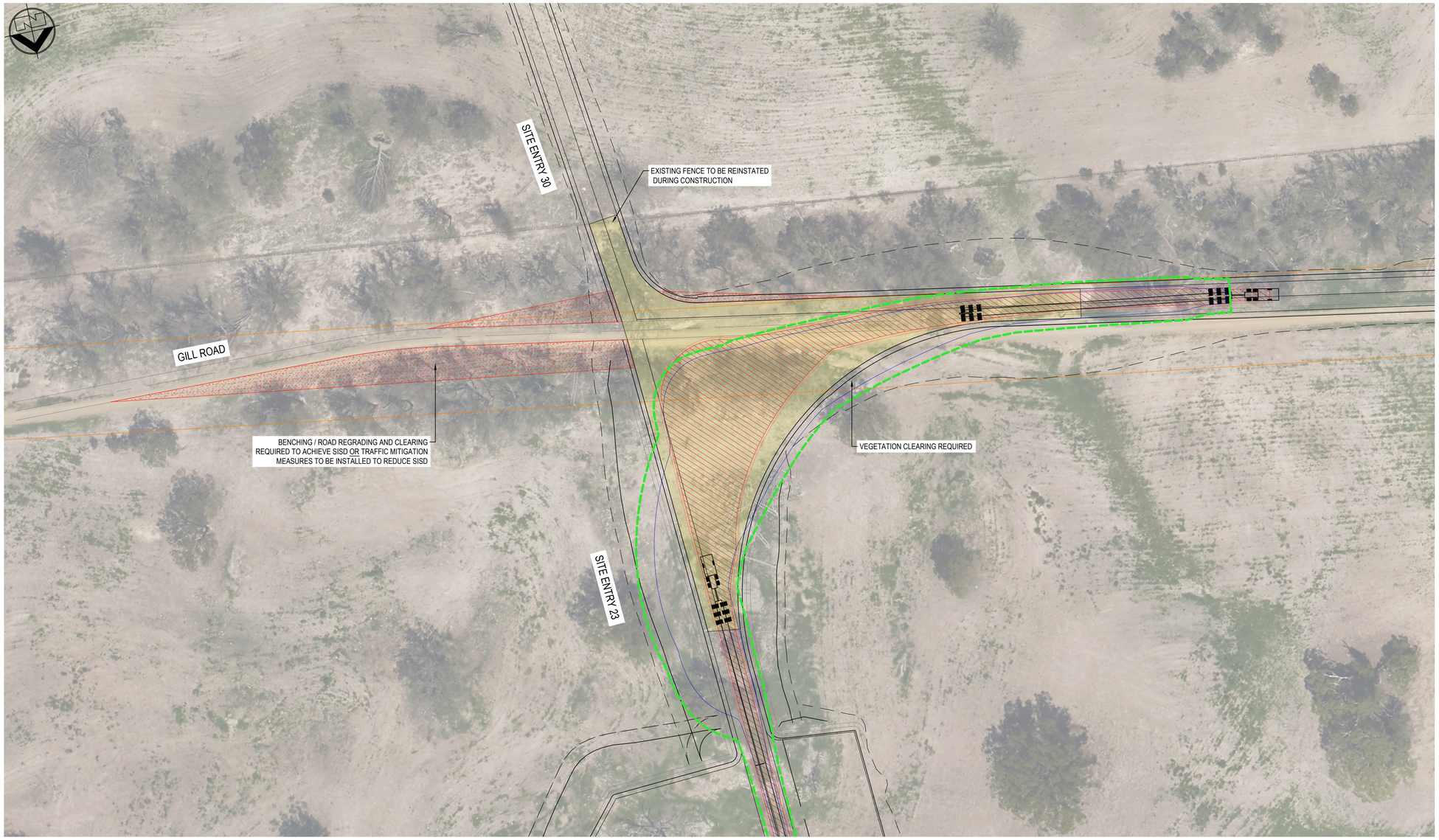
PROJECT WINTERBOURNE WIND FARM

TITLE MOONA PLAINS ROAD
SITE ENTRY 21 & 22

DRAWING No. 22-094-WWF-EXT-0042-1

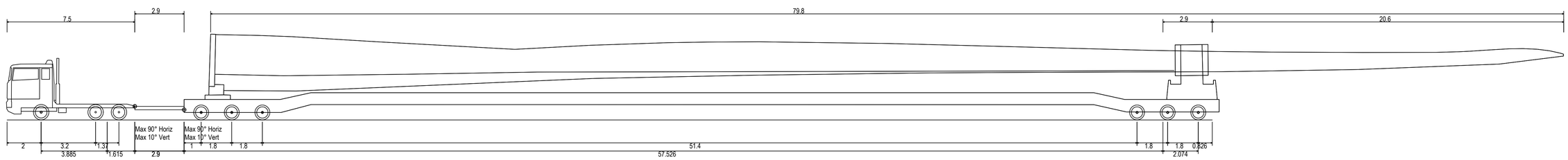
REV C

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GILL ROAD SITE ENTRY 23

SCALE 1:500



79m BLADE TRAILER PROFILE

NTS

INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE
- ROAD VERGE CLEARING / BENCHING
- VEGETATION CLEARING

TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
C	VERGE CLEARING / BENCHING AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	16.05.2024
B	VERGE CLEARING AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	17.04.2024
A	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

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Vestas
Winterbourne Wind

SIZE A1 | SCALE AS SHOWN

STATUS PRELIMINARY
NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM
GDA2020 MGA Z56

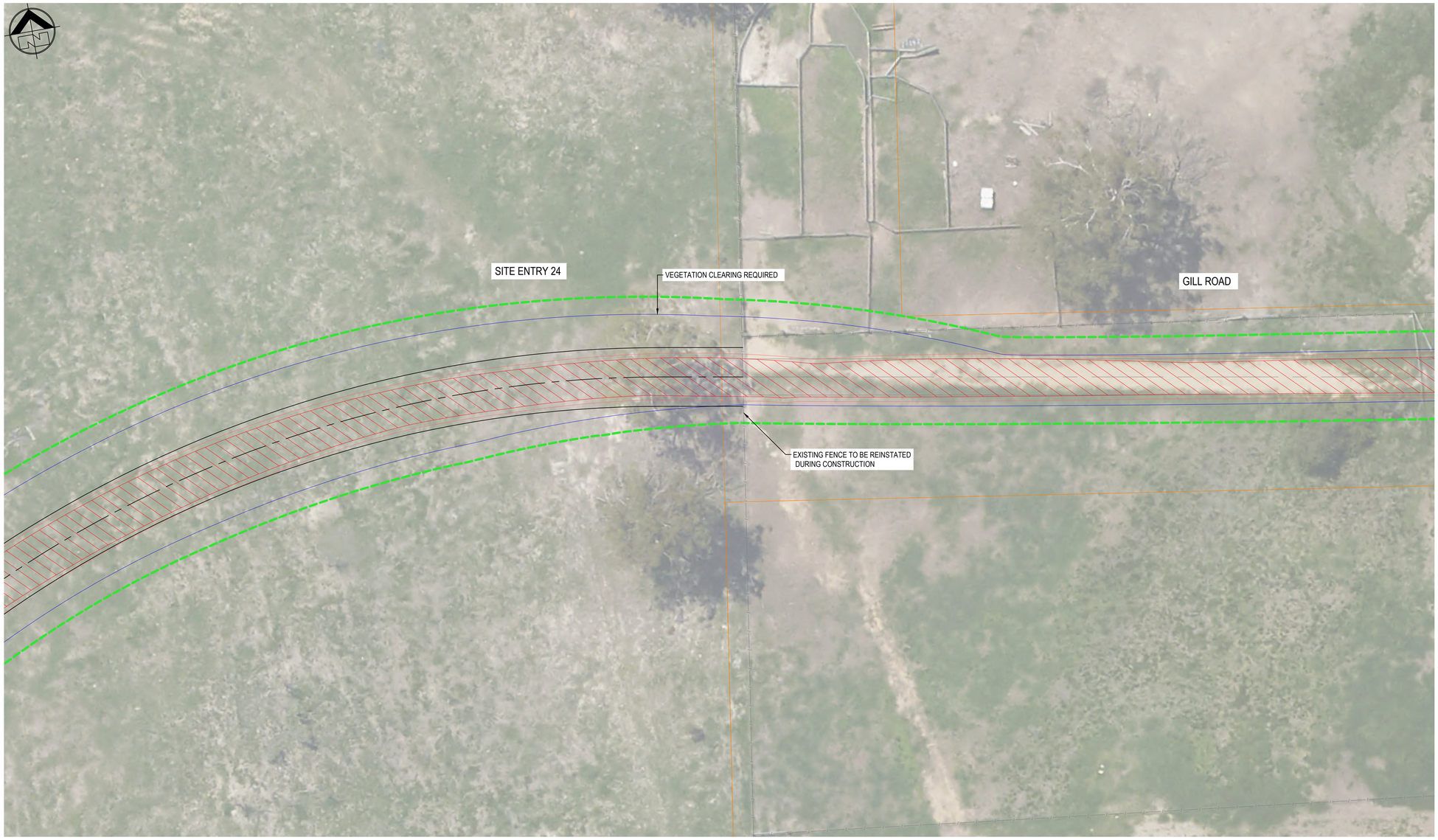
PROJECT WINTERBOURNE WIND FARM

TITLE GILL ROAD
SITE ENTRY 23

DRAWING No. 22-094-WWF-EXT-0043-1

REV C

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INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE

TURNING PATH LEGEND

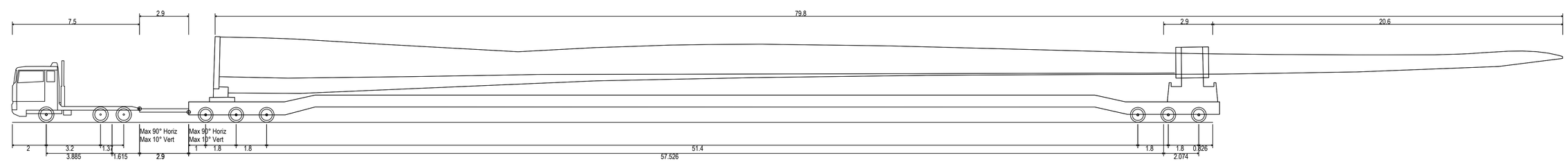
- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

GILL ROAD SITE ENTRY 24

SCALE 1:250



79m BLADE TRAILER PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

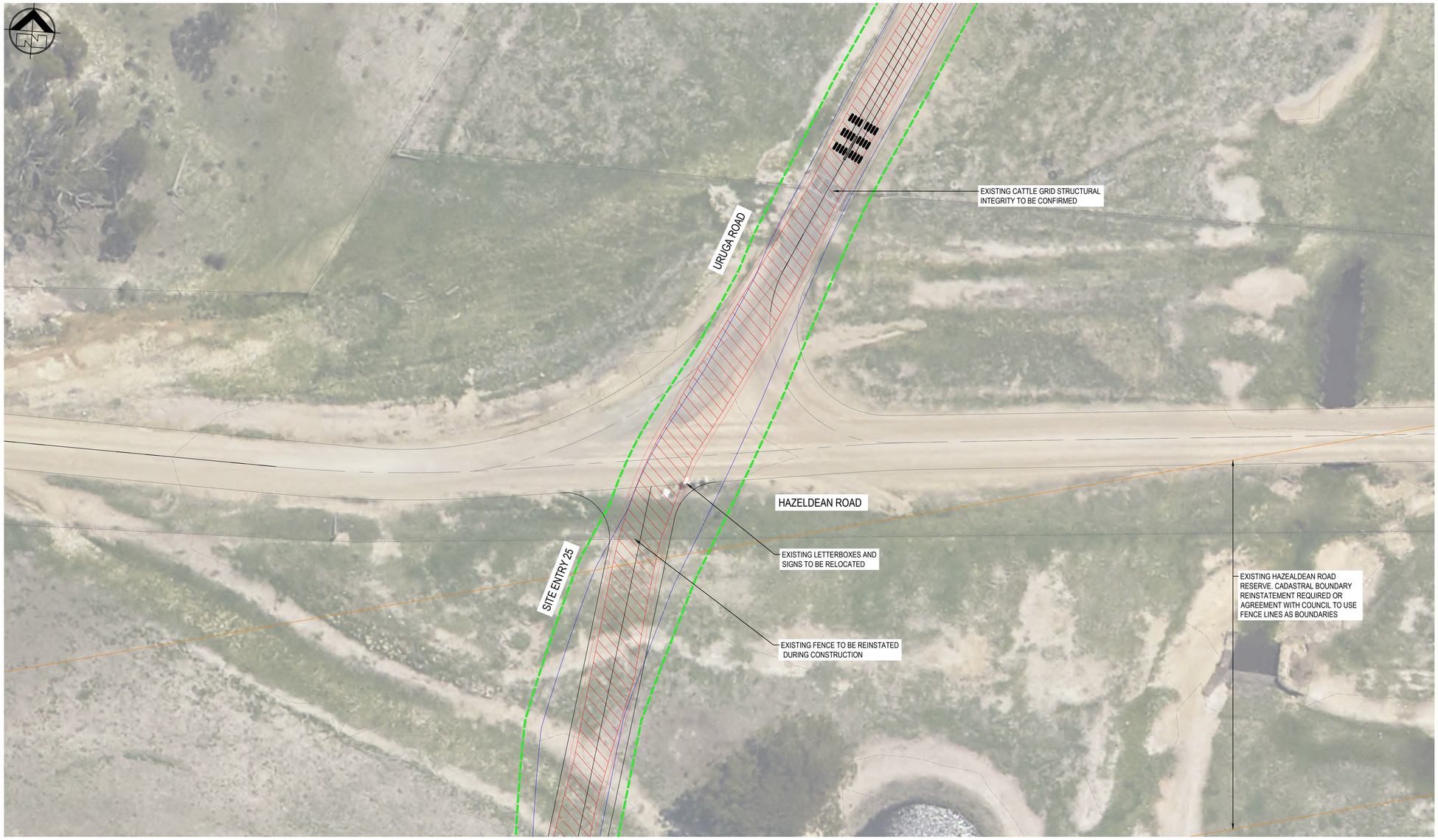
REVISION HISTORY

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Vestas
Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	GILL ROAD SITE ENTRY 24
DRAWING No.	22-094-WWF-EXT-0044-1
REV	A

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INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE

TURNING PATH LEGEND

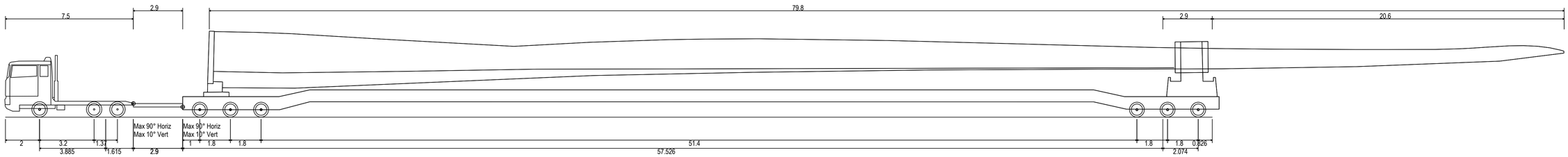
- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

HAZEALDEAN ROAD & URUGA ROAD SITE ENTRY 25

SCALE 1:250



79m BLADE TRAILER PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

REVISION HISTORY

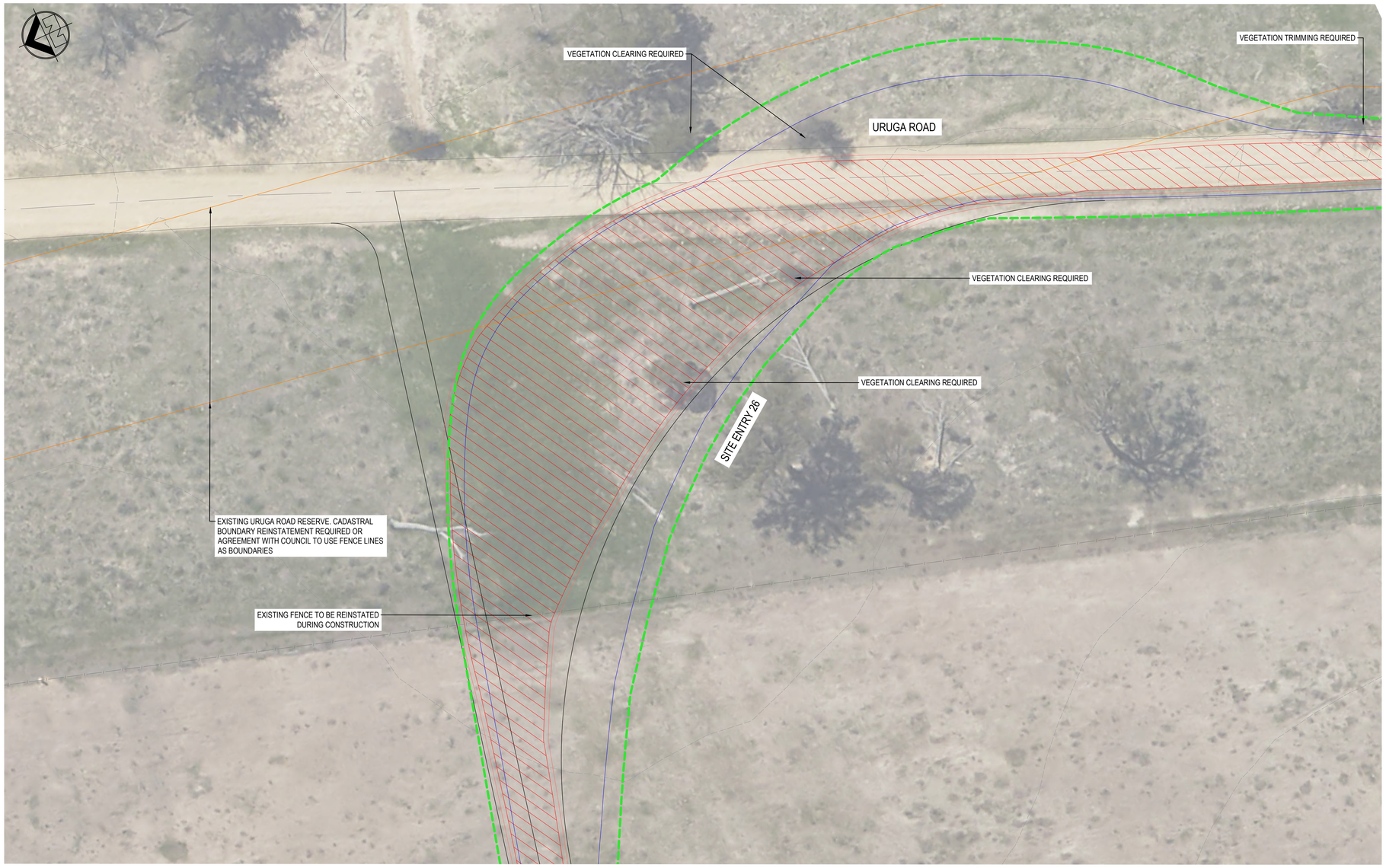
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Vestas

Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	HAZEALDEAN ROAD & URUGA ROAD SITE ENTRY 25
DRAWING No.	22-094-WWF-EXT-0045-1
REV	A

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INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE

TURNING PATH LEGEND

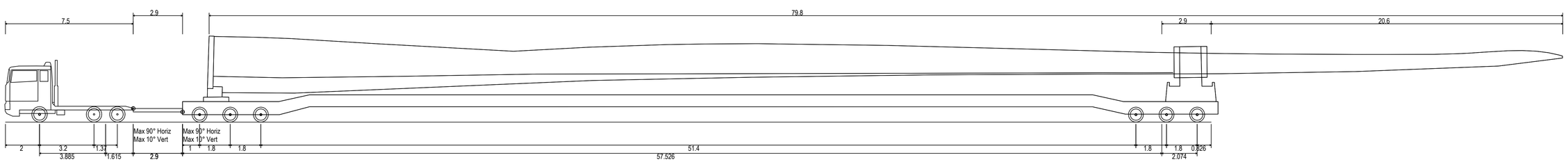
- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

URUGA ROAD SITE ENTRY 26

SCALE 1:250



79m BLADE TRAILER PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

REVISION HISTORY

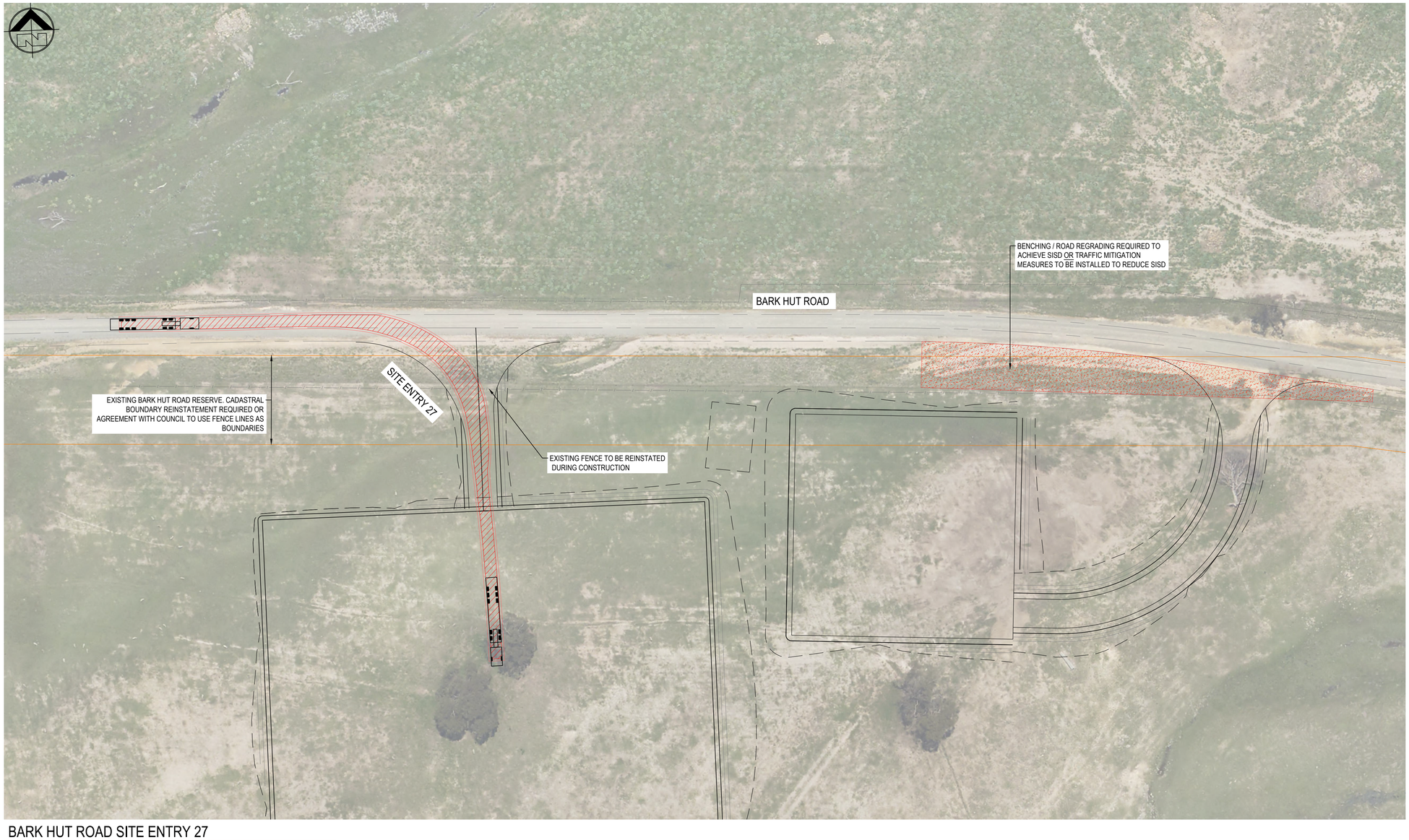
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Vestas

Winterbourne Wind

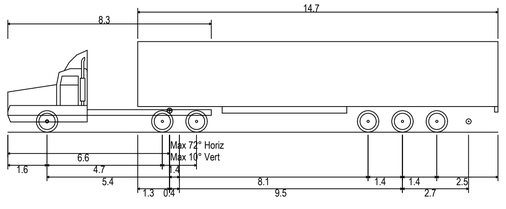
SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	URUGA ROAD SITE ENTRY 26
DRAWING No.	22-094-WWF-EXT-0046-1
REV	A

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BARK HUT ROAD SITE ENTRY 27

SCALE 1:500



20m PRIME MOVER & SEMI-TRAILER PROFILE

NTS

INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE
- ROAD VERGE CLEARING / BENCHING

TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
C	VERGE CLEARING / BENCHING AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	16.05.2024
B	MINOR AMENDMENTS	P.J.M.	P.J.M.	J.M.	J.M.	17.04.2024
A	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

REVISION HISTORY

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Vestas

Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	BARK HUT ROAD SITE ENTRY 27
DRAWING No.	22-094-WWF-EXT-0047-1
REV	C

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INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD

TURNING PATH LEGEND

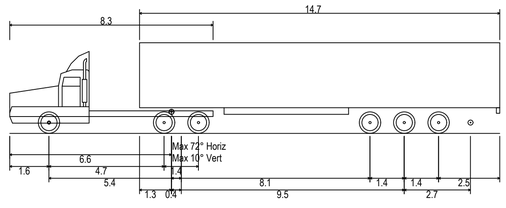
- WHEEL PATH
- WHEEL PATH 0.5m OFFSET

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

BARK HUT ROAD SITE ENTRY 28

SCALE 1:250



20m PRIME MOVER & SEMI-TRAILER PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

REVISION HISTORY

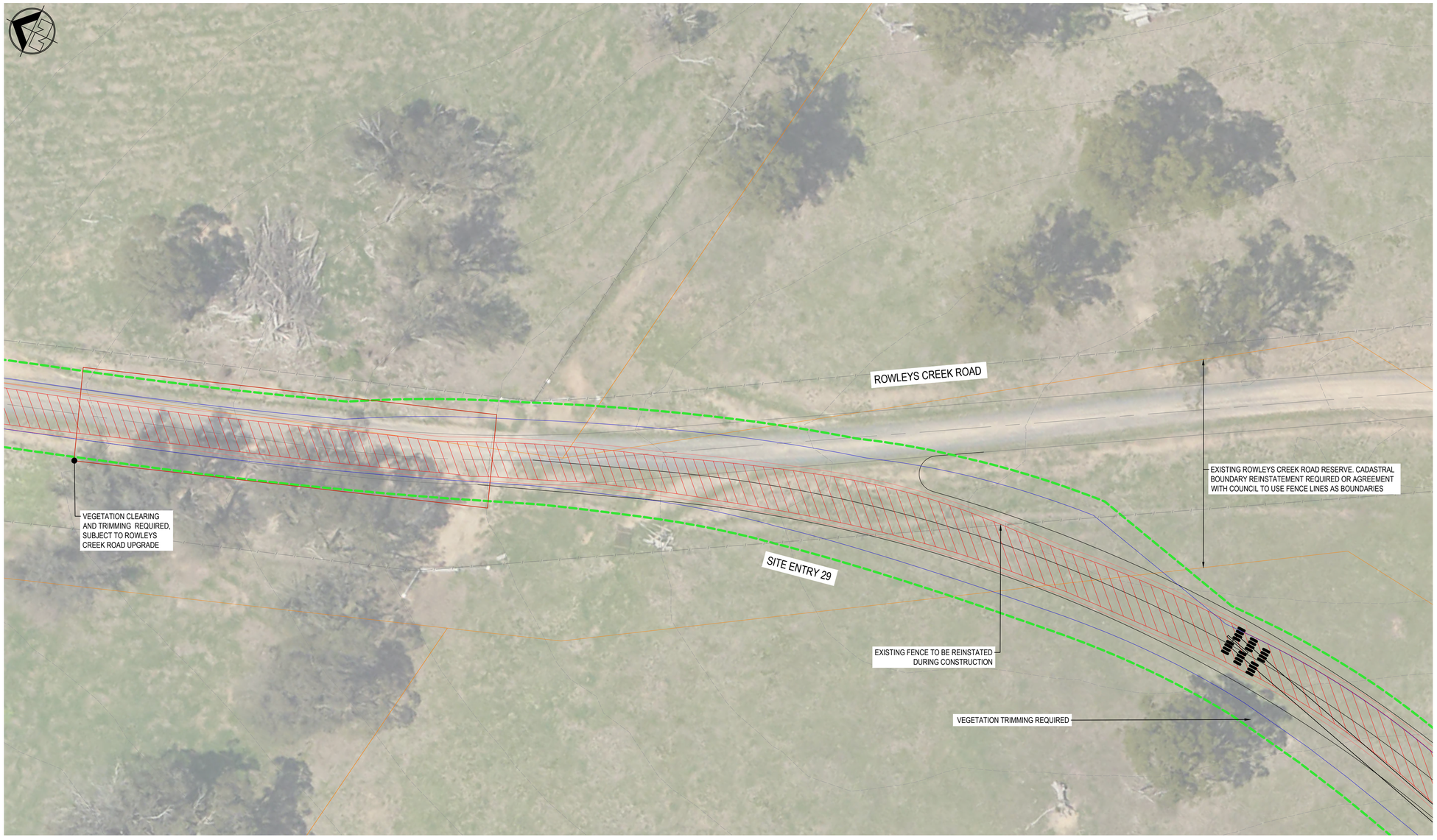
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Vestas

Winterbourne Wind

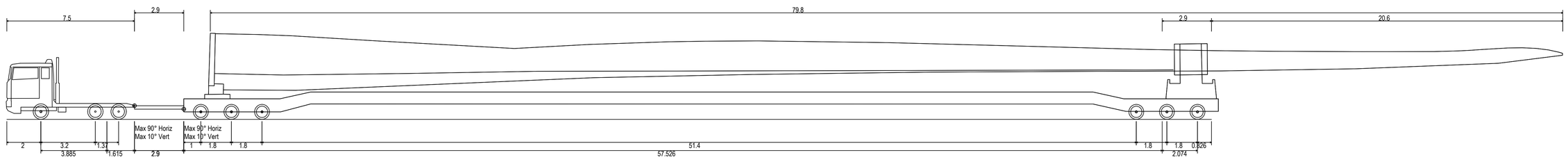
SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	BARK HUT ROAD SITE ENTRY 28
DRAWING No.	22-094-WWF-EXT-0048-1
REV	A

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ROWLEYS CREEK ROAD SITE ENTRY 29

SCALE 1:250



79m BLADE TRAILER PROFILE

NTS

INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE

TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

REVISION HISTORY

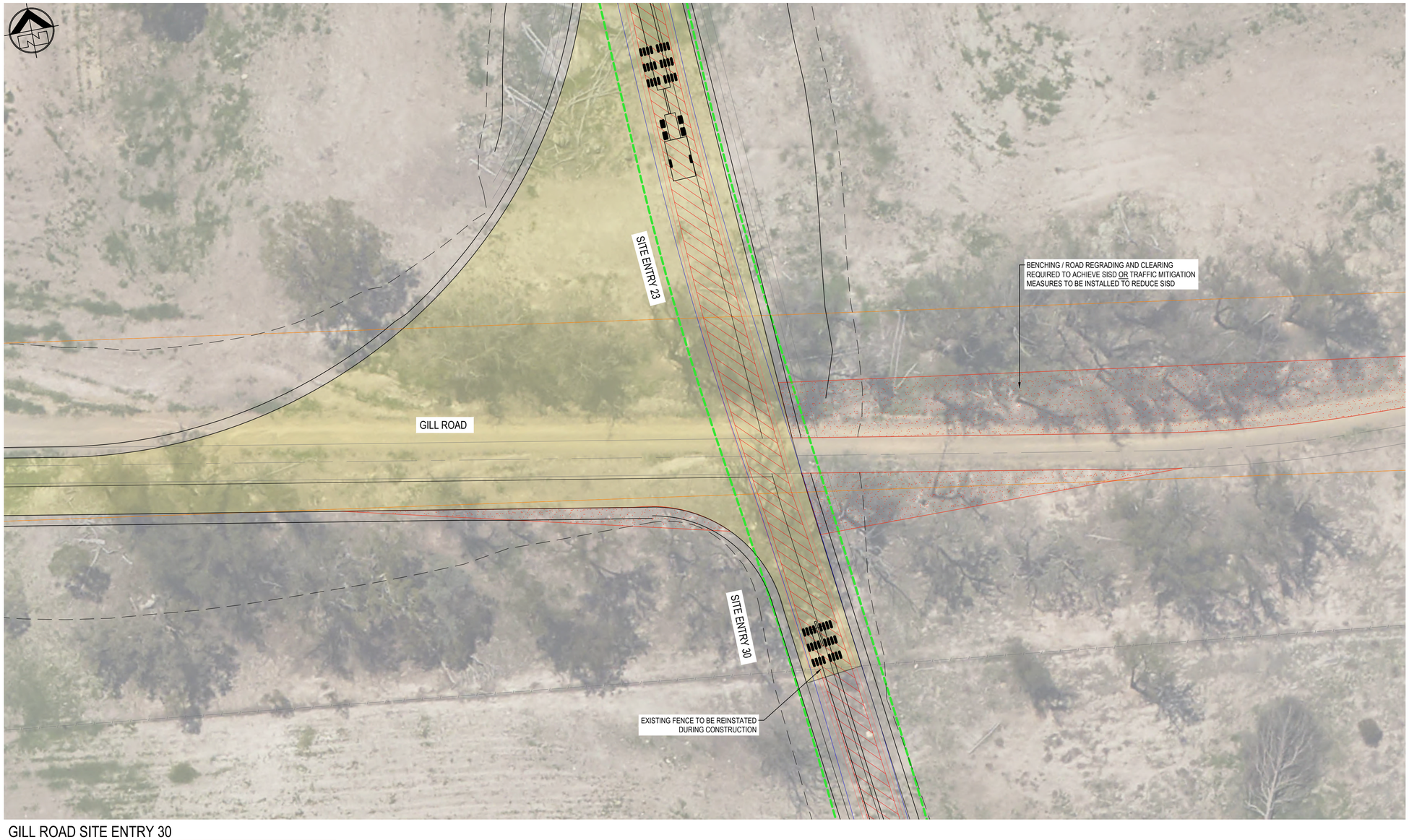
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Vestas

Winterbourne Wind

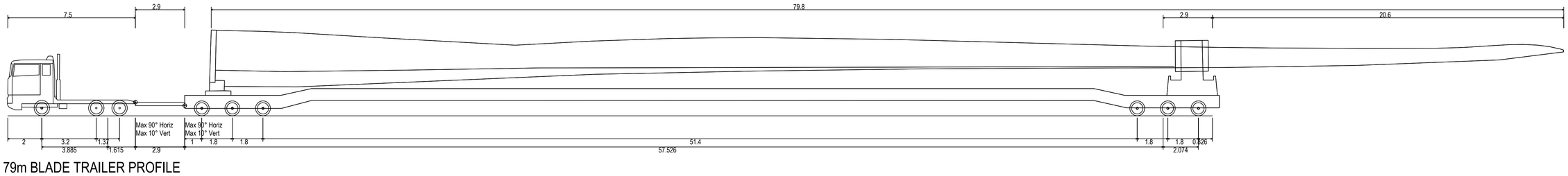
SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	ROWLEYS CREEK ROAD SITE ENTRY 29
DRAWING No.	22-094-WWF-EXT-0049-1
REV	A

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GILL ROAD SITE ENTRY 30

SCALE 1:250



79m BLADE TRAILER PROFILE

NTS

INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE
- ROAD VERGE CLEARING / BENCHING
- VEGETATION CLEARING

TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
C	VERGE CLEARING / BENCHING AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	16.05.2024
B	VERGE CLEARING AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	17.04.2024
A	FOR REVIEW	Ba.P.	Ba.P.	J.M.	N.C.	07.02.2024

REVISION HISTORY

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Vestas

Winterbourne Wind

SIZE	SCALE
A1	AS SHOWN

STATUS: PRELIMINARY
NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM: GDA2020 MGA Z56

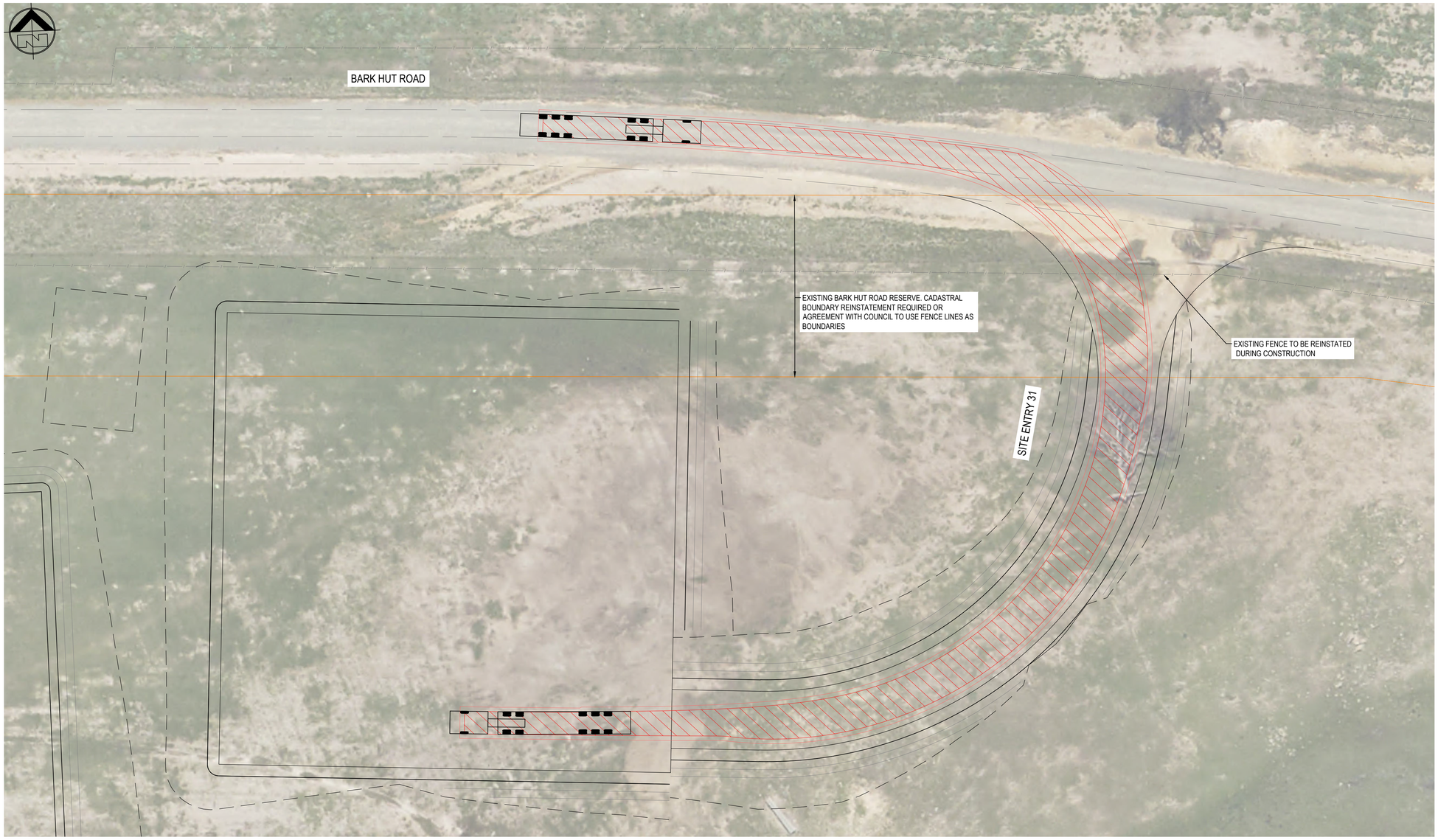
PROJECT: WINTERBOURNE WIND FARM

TITLE: GILL ROAD SITE ENTRY 30

DRAWING No.: 22-094-WWF-EXT-0055-1

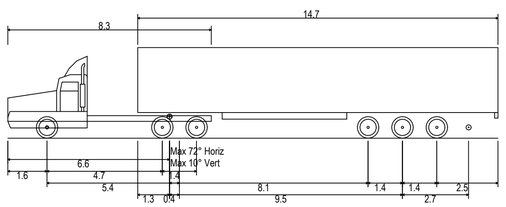
REV: C

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BARK HUT ROAD SITE ENTRY 31

SCALE 1:250



20m PRIME MOVER & SEMI-TRAILER PROFILE

NTS

INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS (1m INTERVAL)
- EXISTING ROAD
- EXISTING FENCE

TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	MINOR AMENDMENTS	P.J.M.	P.J.M.	J.M.	J.M.	16.05.2024
A	FOR REVIEW	P.J.M.	P.J.M.	J.M.	J.M.	17.04.2024

REVISION HISTORY

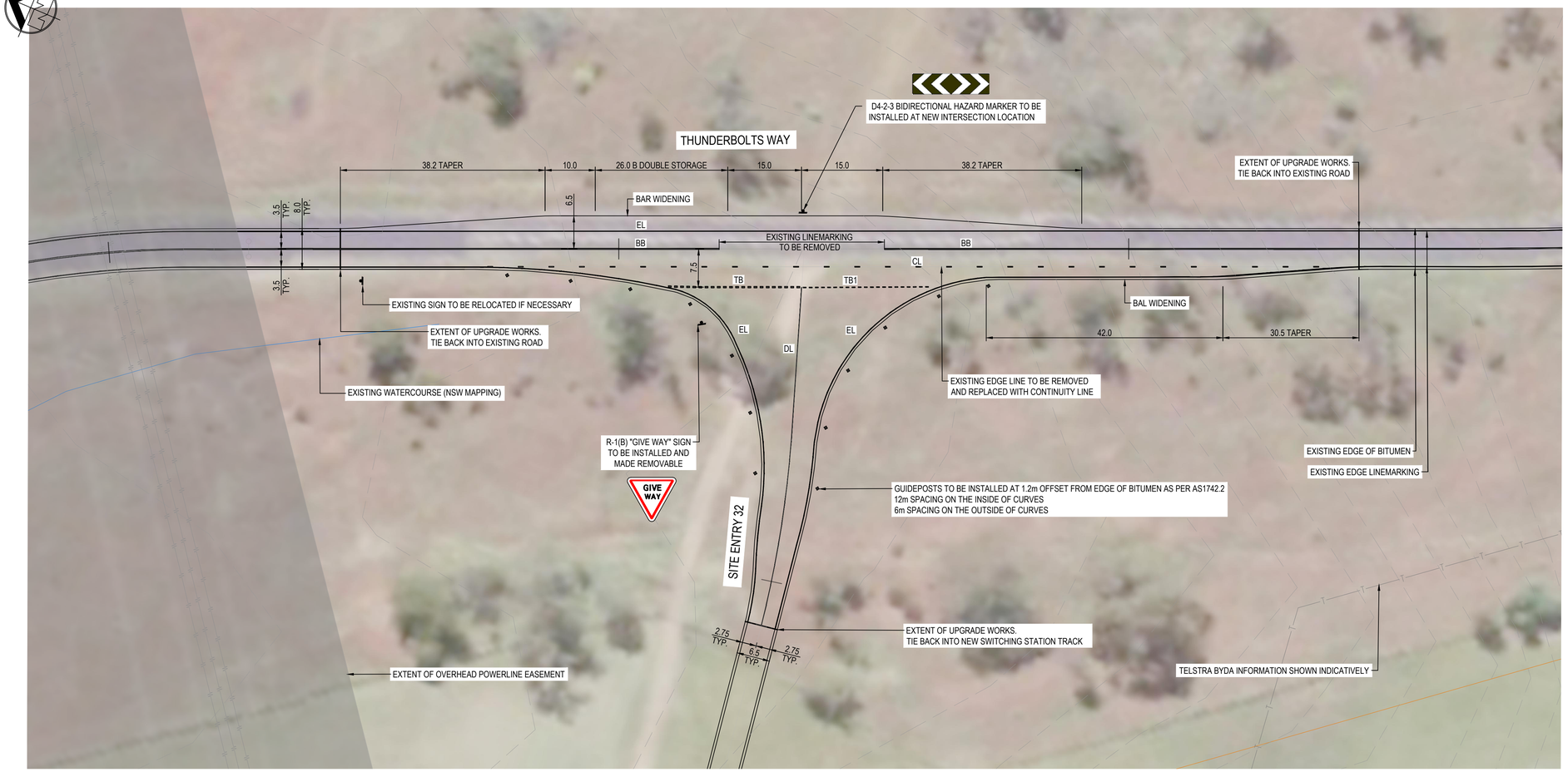
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Vestas

Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	BARK HUT ROAD SITE ENTRY 31
DRAWING No.	22-094-WWF-EXT-0056-1
REV	B

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SWITCHING STATION SITE ENTRY 32 - THUNDERBOLTS WAY INTERSECTION PLAN

SCALE 1:500

INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING CONTOURS
- EXISTING ROAD
- EXISTING TELECOMMUNICATIONS
- EXISTING OVERHEAD POWERLINE
- EXISTING WATERCOURSE (NSW MAPPING)
- SIGNPOST
- GUIDE POST
- EXISTING POWERLINE EASEMENT

NOTES

1. THUNDERBOLTS WAY IS OPERATED BY URALLA SHIRE COUNCIL. THE PROPOSED SITE ENTRY THAT INTERSECTS WITH THUNDERBOLTS WAY IS AN UNNAMED TRACK.
2. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, SIGNAGE, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
3. THUNDERBOLTS WAY ROAD FORMATION HAS BEEN EXTRACTED FROM THE UPDATED TRAFFIC IMPACT ASSESSMENT PROVIDED BY AMBER.

PAVEMENT MARKINGS

LINE	TYPE	PATTERN AND DIMENSIONS	LINE WIDTH
BARRIER LINES	BB		100 100 100
DIVIDING LINE	DL		100
GIVE WAY LINES	TB	600 STRIPE AND 600 GAP	300
GIVE WAY LINES	TB1	600 STRIPE AND 600 GAP	150
EDGE LINES	EL		150
CONTINUITY LINE	CL	1000 STRIPE AND 3000 GAP	150

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	PRELIMINARY DESIGN	A.G.	A.G.	J.M.	J.M.	16.08.2024

REVISION HISTORY

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Vestas

SIZE A1 | SCALE AS SHOWN

STATUS PRELIMINARY NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM GDA2020 MGA Z56

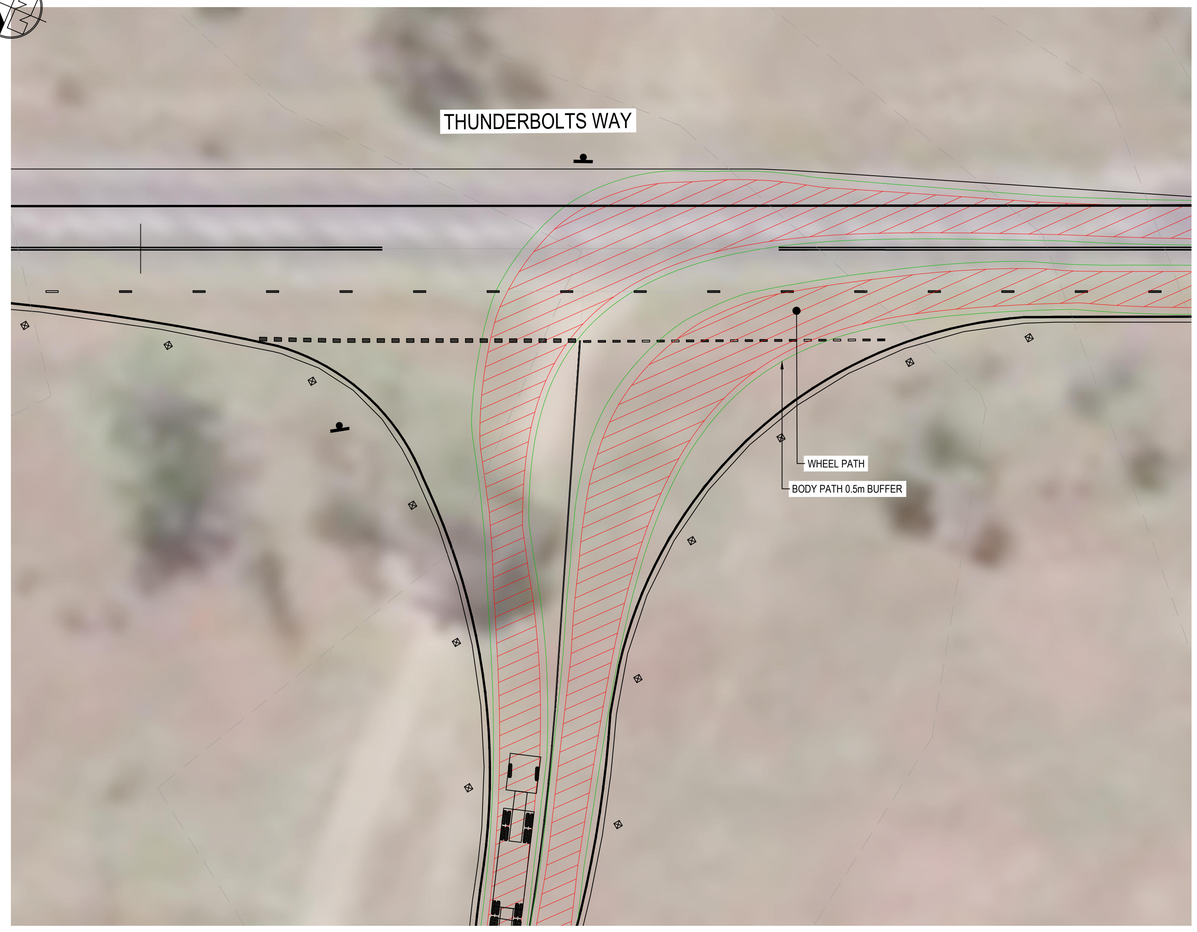
PROJECT WINTERBOURNE WIND FARM

TITLE SWITCHYARD ACCESS - THUNDERBOLTS WAY INTERSECTION PLAN SHEET 1 OF 4

DRAWING No. 22-094-WWF-EXT-0057-1

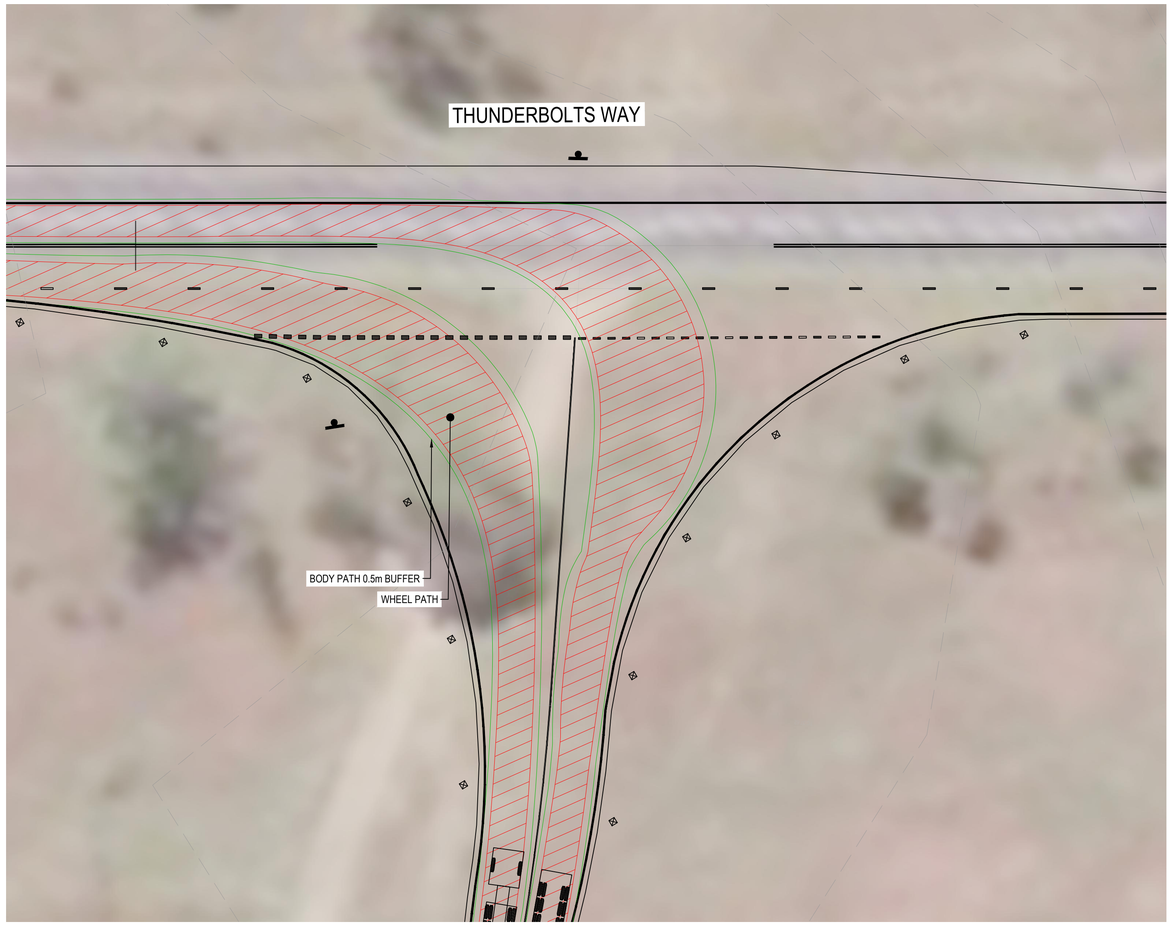
REV A

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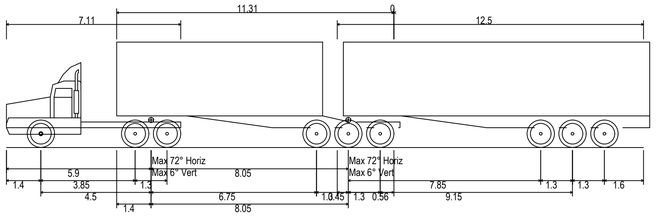
SWITCHYARD ACCESS - THUNDERBOLTS WAY TURNING PATH PLAN - 26m B DOUBLE

SCALE 1:250



SWITCHYARD ACCESS - THUNDERBOLTS WAY TURNING PATH PLAN - 26m B DOUBLE

SCALE 1:250



B-Double (26.0m)	
Overall Length	26.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m

26m B DOUBLE PROFILE

NTS

TURNING PATH LEGEND

WHEEL PATH

BODY PATH 0.5m OFFSET

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	PRELIMINARY DESIGN	A.G.	A.G.	J.M.	J.M.	16.08.2024

REVISION HISTORY

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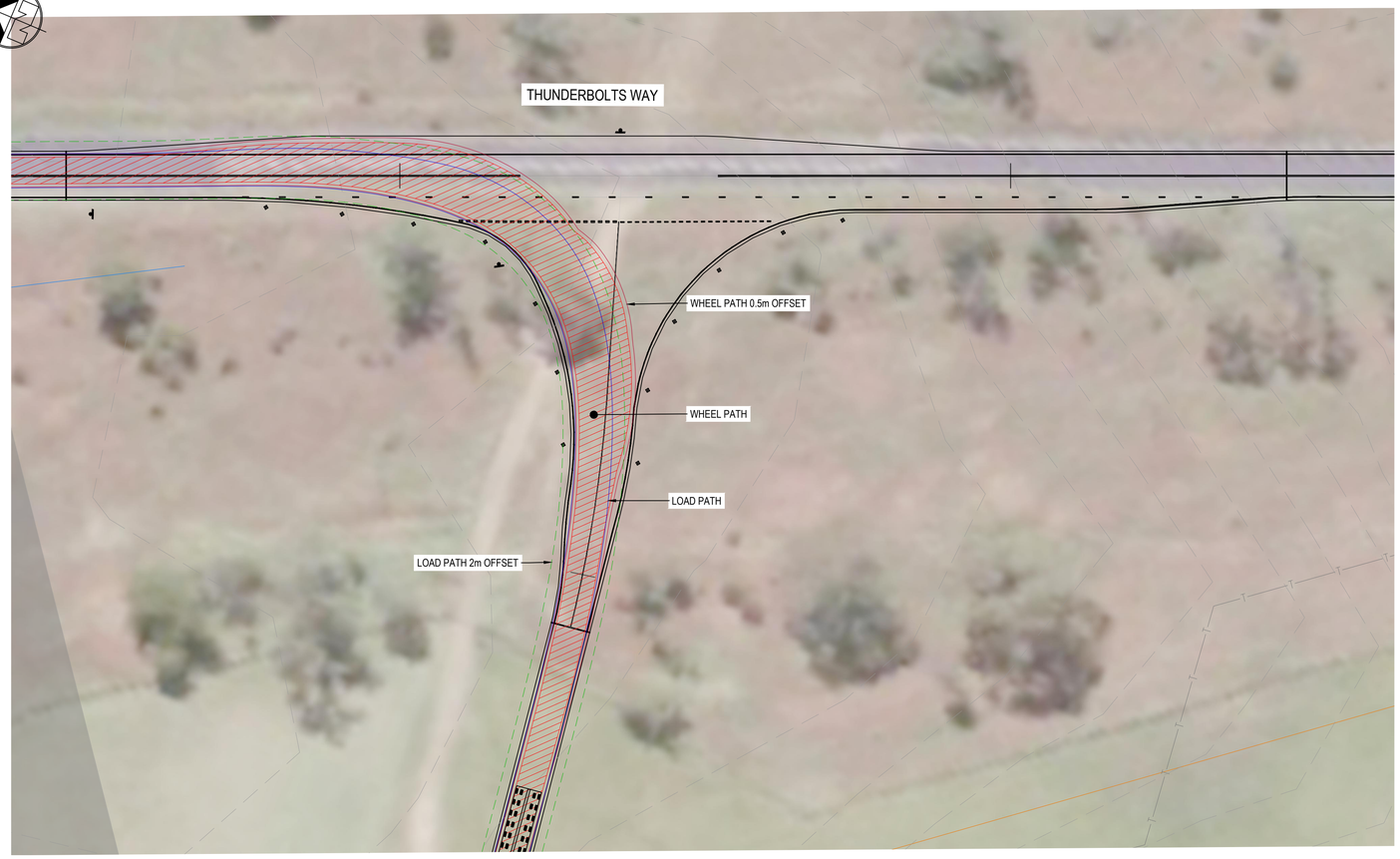
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Vestas

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	SWITCHYARD ACCESS - THUNDERBOLTS WAY TURNING PATH PLAN SHEET 2 OF 4
DRAWING No.	22-094-WWF-EXT-0057-2
REV	A

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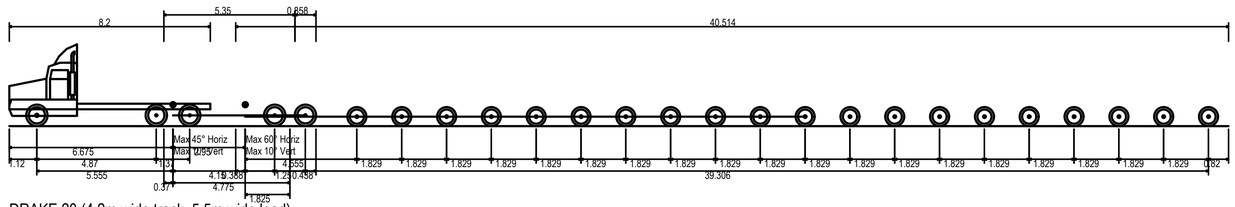


TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- LOAD PATH
- LOAD PATH 2m OFFSET

SWITCHYARD ACCESS - THUNDERBOLTS WAY TURNING PATH PLAN - 20 ROW FLOAT

SCALE 1:500



DRAKE 20 (4.2m wide track, 5.5m wide load)

Overall Length	49.751m
Overall Width	4.200m
Overall Body Height	3.341m
Min Body Ground Clearance	0.388m
Max Track Width	2.500m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	24.047m

20 ROW FLOAT PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	PRELIMINARY DESIGN	A.G.	A.G.	J.M.	J.M.	16.08.2024

REVISION HISTORY

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Vestas

SIZE A1 | SCALE AS SHOWN

STATUS PRELIMINARY
NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM
GDA2020 MGA Z56

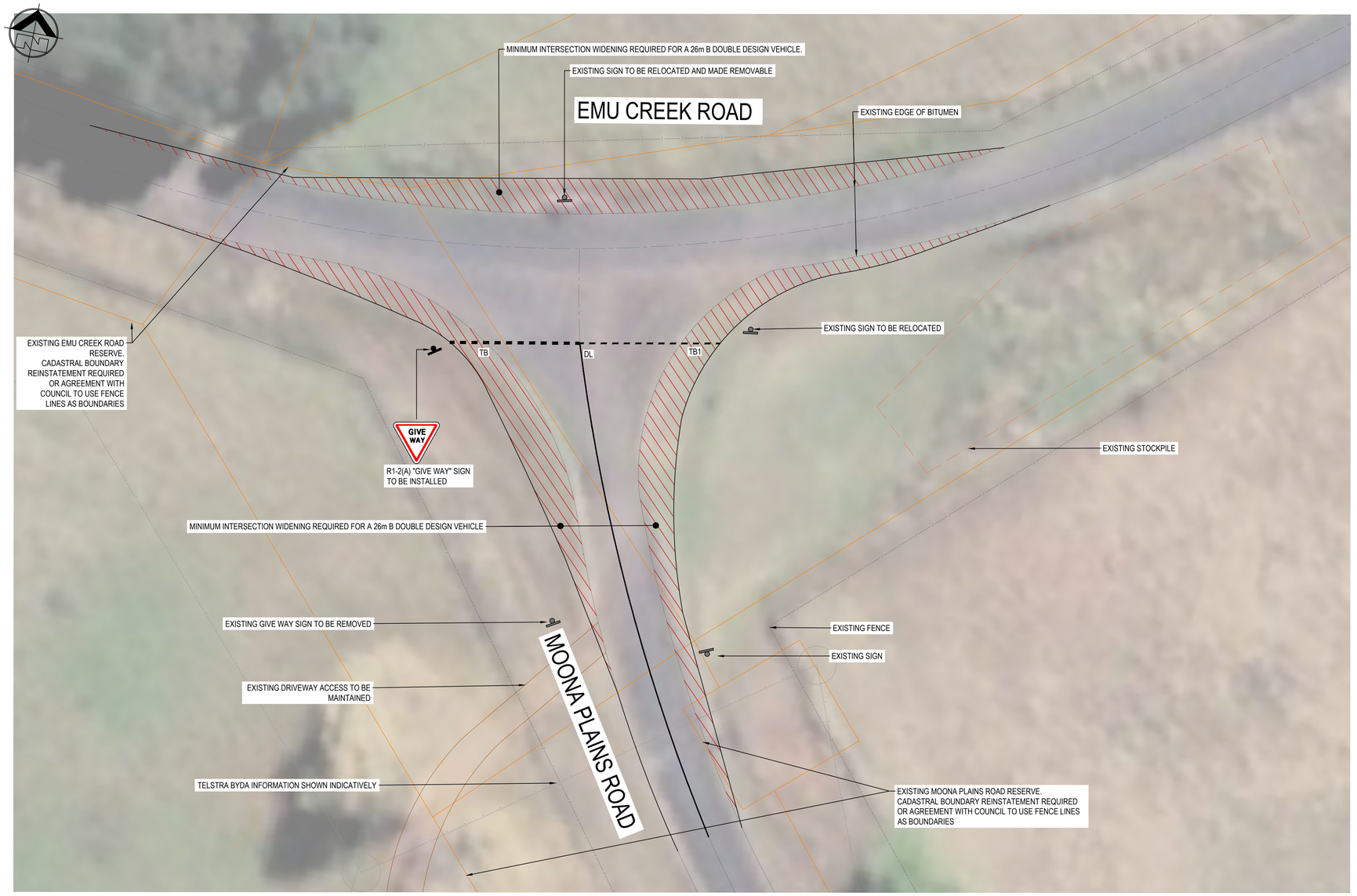
PROJECT WINTERBOURNE WIND FARM

TITLE SWITCHYARD ACCESS - THUNDERBOLTS WAY TURNING PATH PLAN SHEET 3 OF 4

DRAWING No. 22-094-WWF-EXT-0057-3

REV A

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INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING ROAD
- EXISTING TELECOMMUNICATIONS
- EXISTING OVERHEAD POWERLINE
- EXISTING GAS MAIN
- EXISTING FENCE
- EXISTING WATERCOURSE (NSW MAPPING)
- SIGNPOST
- GUIDE POST
- GUARD RAIL
- INTERSECTION WIDENING

PAVEMENT MARKINGS

LINE	TYPE	PATTERN AND DIMENSIONS	LINE WIDTH
BARRIER LINES	BB		100 100 100
BARRIER LINES	BS	3000 STRIPE AND 9000 GAP	100 100 100
GIVE WAY LINES	TB	600 STRIPE AND 600 GAP	300
GIVE WAY LINES	TB1	600 STRIPE AND 600 GAP	150
SEPERATION LINE	S1	3000 STRIPE AND 9000 GAP	100
EDGE LINES	EL		150
CONTINUITY LINE	CL	1000 STRIPE AND 3000 GAP	150
DIVIDING LINE	DL		100

NOTES

1. EMU CREEK ROAD AND MOONA PLAINS ROAD ARE OPERATED BY WALCHA COUNCIL.
2. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
3. THE EXTENT OF INTERSECTION WIDENING SHOWN FOR A 26m B DOUBLE DESIGN VEHICLE IS THE MINIMUM WIDENING REQUIRED TO FACILITATE THE VEHICLE TURNING PATH. THE PROJECT TRAFFIC IMPACT ASSESSMENT SHOULD COMPLETE A TURN WARRANT ASSESSMENT TO CONFIRM IF ADDITIONAL INTERSECTION TREATMENTS ARE REQUIRED.

EMU CREEK ROAD- MOONA PLAINS ROAD INTERSECTION PLAN

SCALE 1:250

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	BaP	BaP	JM	NC	29.08.2023

REVISION HISTORY

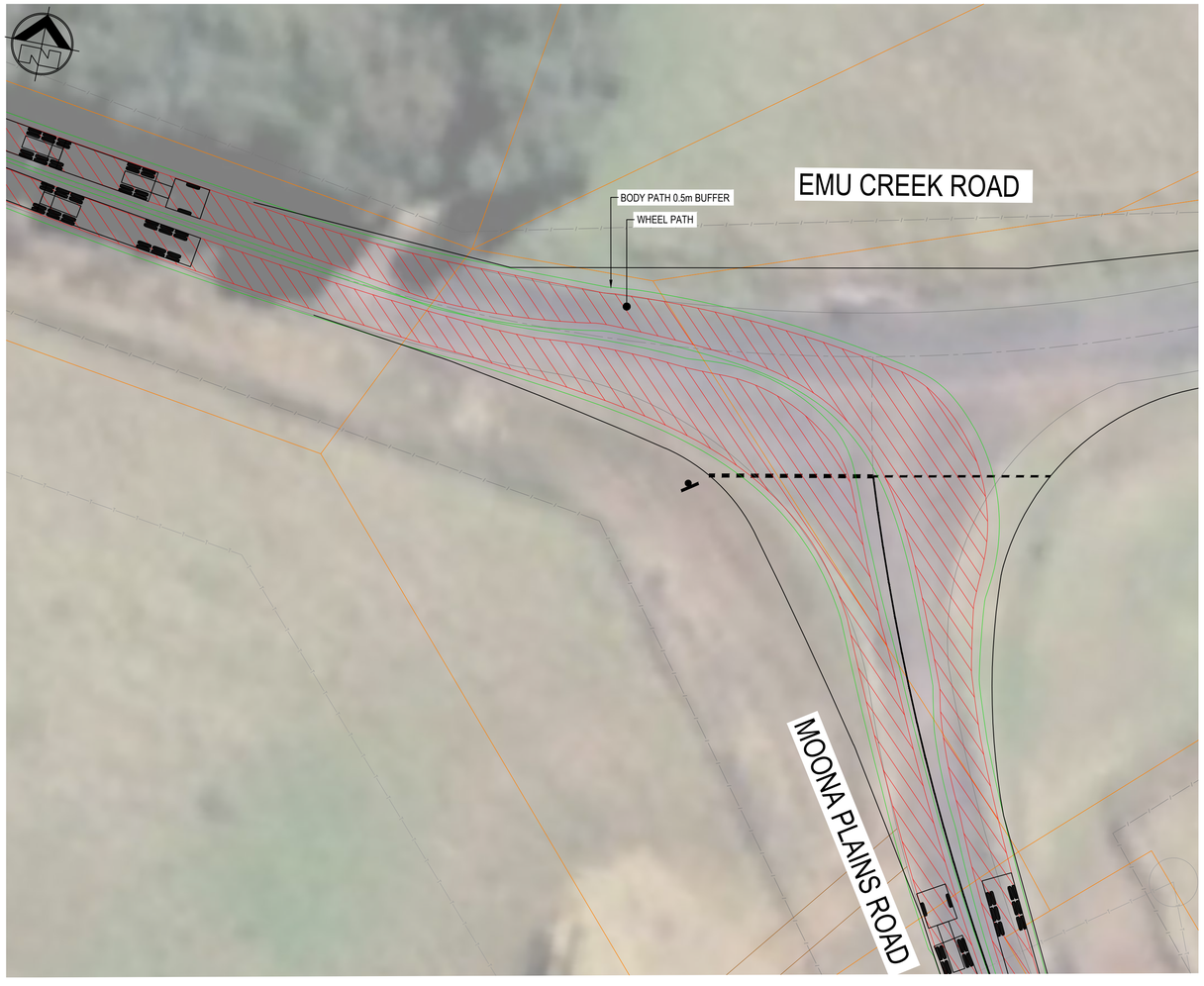
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Vestas

Winterbourne Wind

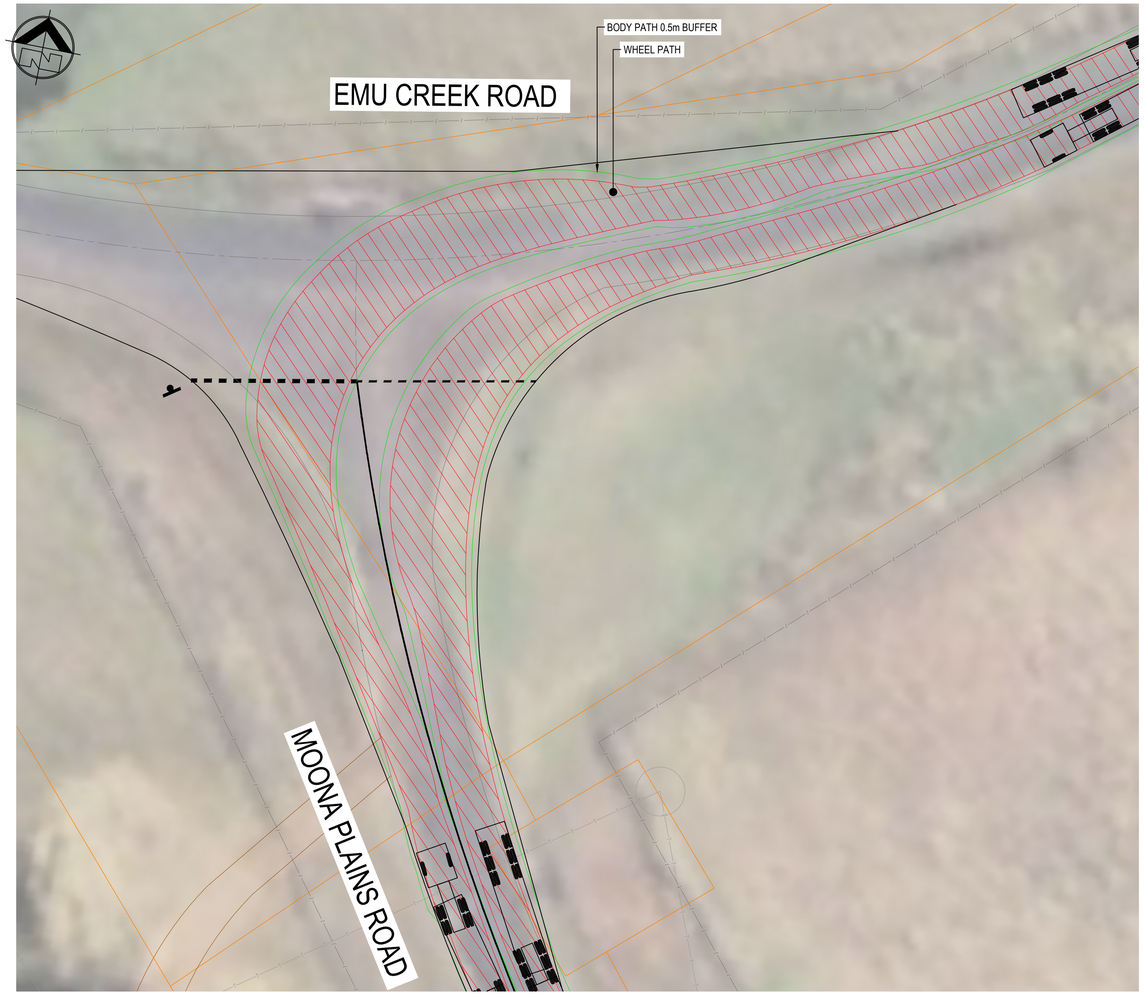
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SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA94 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	EMU CREEK ROAD / MOONA PLAINS ROAD INTERSECTION PLAN SHEET 1 OF 4
DRAWING No.	22-094-WWF-EXT-0014-1
REV	A

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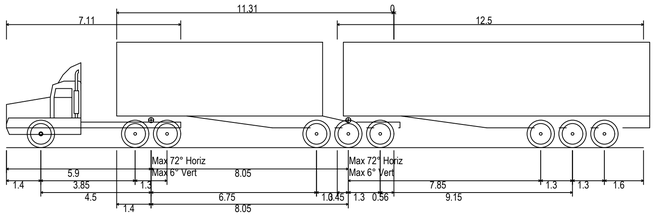
EMU CREEK ROAD- MOONA PLAINS ROAD TURNING PATH PLAN - 26m B DOUBLE

SCALE 1:250



EMU CREEK ROAD- MOONA PLAINS ROAD TURNING PATH PLAN - 26m B DOUBLE

SCALE 1:250



B-Double (26.0m)	
Overall Length	26.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m

26m B DOUBLE PROFILE

NTS

TURNING PATH LEGEND

WHEEL PATH

BODY PATH 0.5m OFFSET

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	BaP	BaP	JM	NC	29.08.2023

REVISION HISTORY

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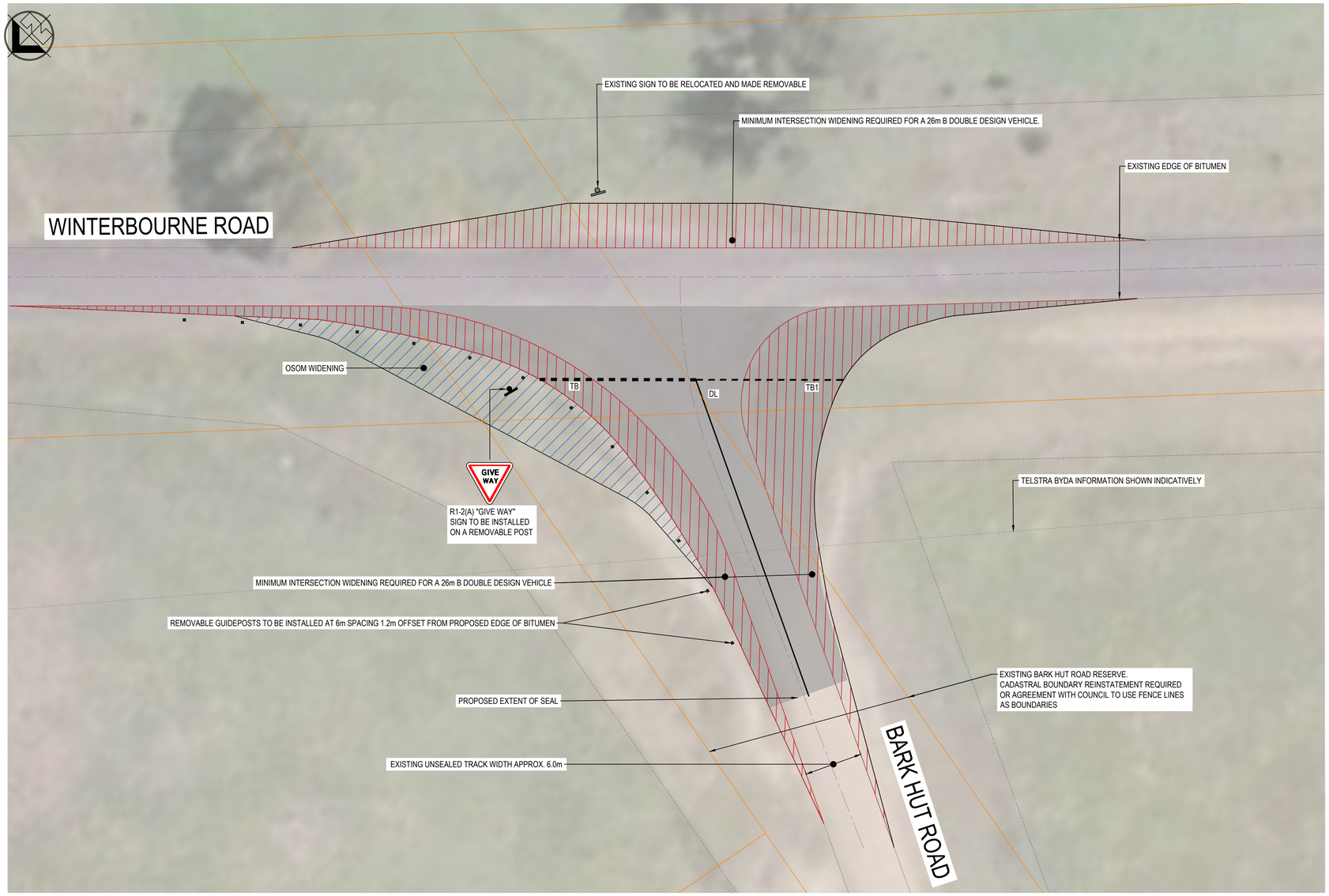
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Vestas

Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA94 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	EMU CREEK ROAD / MOONA PLAINS ROAD TURNING PATH PLAN SHEET 4 OF 4
DRAWING No.	22-094-WWF-EXT-0014-4
REV	A

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WINTERBOURNE ROAD- BARK HUT ROAD INTERSECTION PLAN

SCALE 1:250

INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING ROAD
- EXISTING TELECOMMUNICATIONS
- EXISTING OVERHEAD POWERLINE
- EXISTING GAS MAIN
- EXISTING FENCE
- EXISTING WATERCOURSE (NSW MAPPING)
- SIGNPOST
- GUIDE POST
- GUARD RAIL
- INTERSECTION WIDENING
- OSOM WIDENING
- PROPOSED EXTENTS OF SEAL

PAVEMENT MARKINGS

LINE	TYPE	PATTERN AND DIMENSIONS	LINE WIDTH
BARRIER LINES	BB		100 100 100
BARRIER LINES	BS	3000 STRIPE AND 9000 GAP	100 100 100
GIVE WAY LINES	TB	600 STRIPE AND 600 GAP	300
GIVE WAY LINES	TB1	600 STRIPE AND 600 GAP	150
SEPERATION LINE	S1	3000 STRIPE AND 9000 GAP	100
EDGE LINES	EL		150
CONTINUITY LINE	CL	1000 STRIPE AND 3000 GAP	150
DIVIDING LINE	DL		100

NOTES

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No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	OSOM WIDENING AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	17.04.2024
A	FOR REVIEW	BaP	BaP	MP	NC	29.08.2023

REVISION HISTORY

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Vestas

Winterbourne Wind

SIZE A1 | SCALE AS SHOWN

STATUS PRELIMINARY
NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM GDA94 MGA Z56

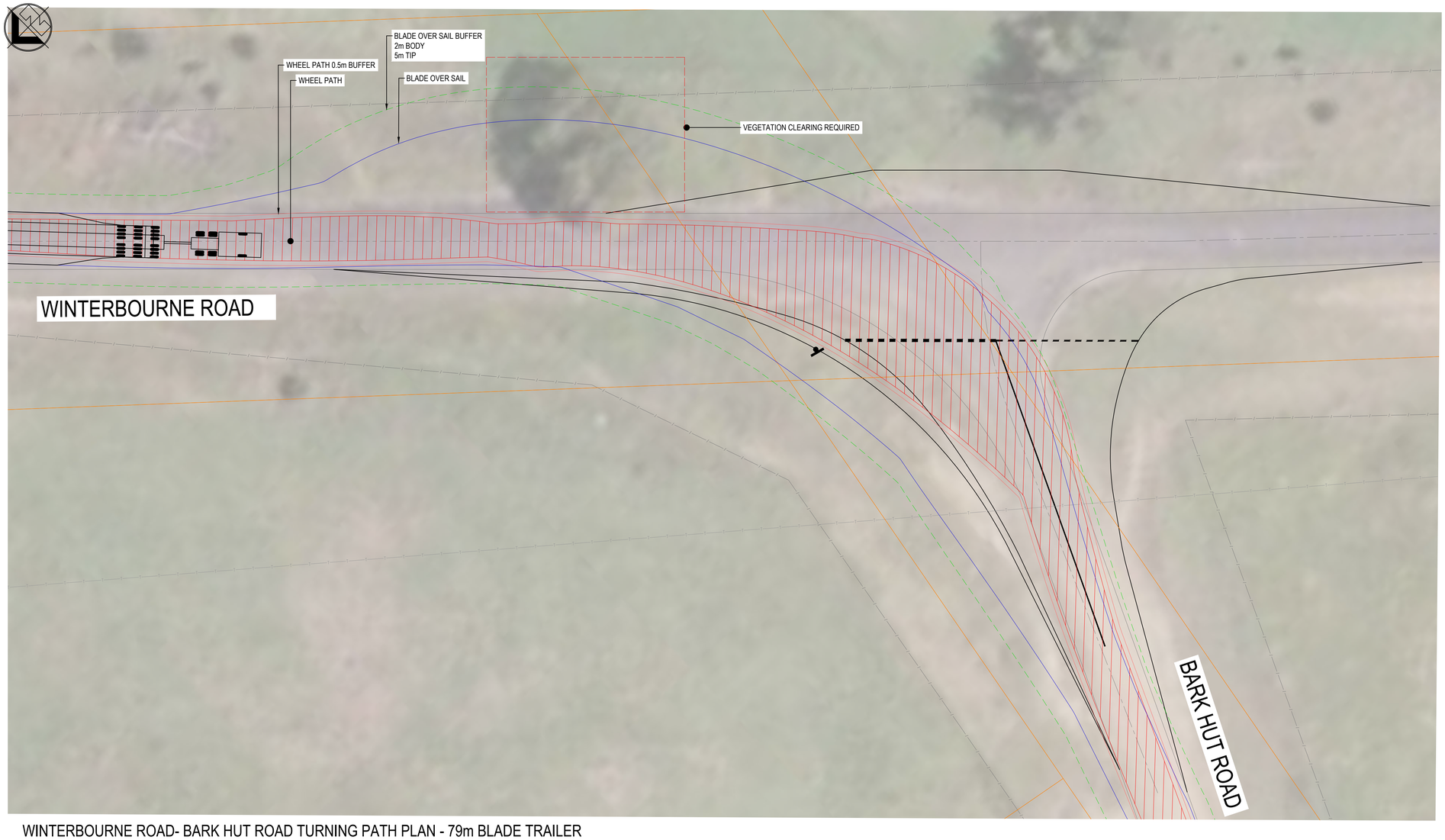
PROJECT WINTERBOURNE WIND FARM

TITLE WINTERBOURNE ROAD / BARK HUT ROAD TURNING PATH PLAN SHEET 1 OF 4

DRAWING No. 22-094-WWF-EXT-0016-1

REV B

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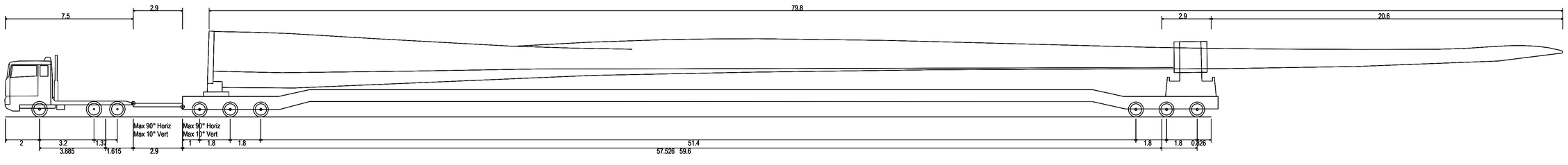


TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

WINTERBOURNE ROAD- BARK HUT ROAD TURNING PATH PLAN - 79m BLADE TRAILER

SCALE 1:250



79m BLADE TRAILER - TURNING PATH PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	BaP	BaP	JM	NC	29.08.2023

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Vestas

Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA94 MGA Z56

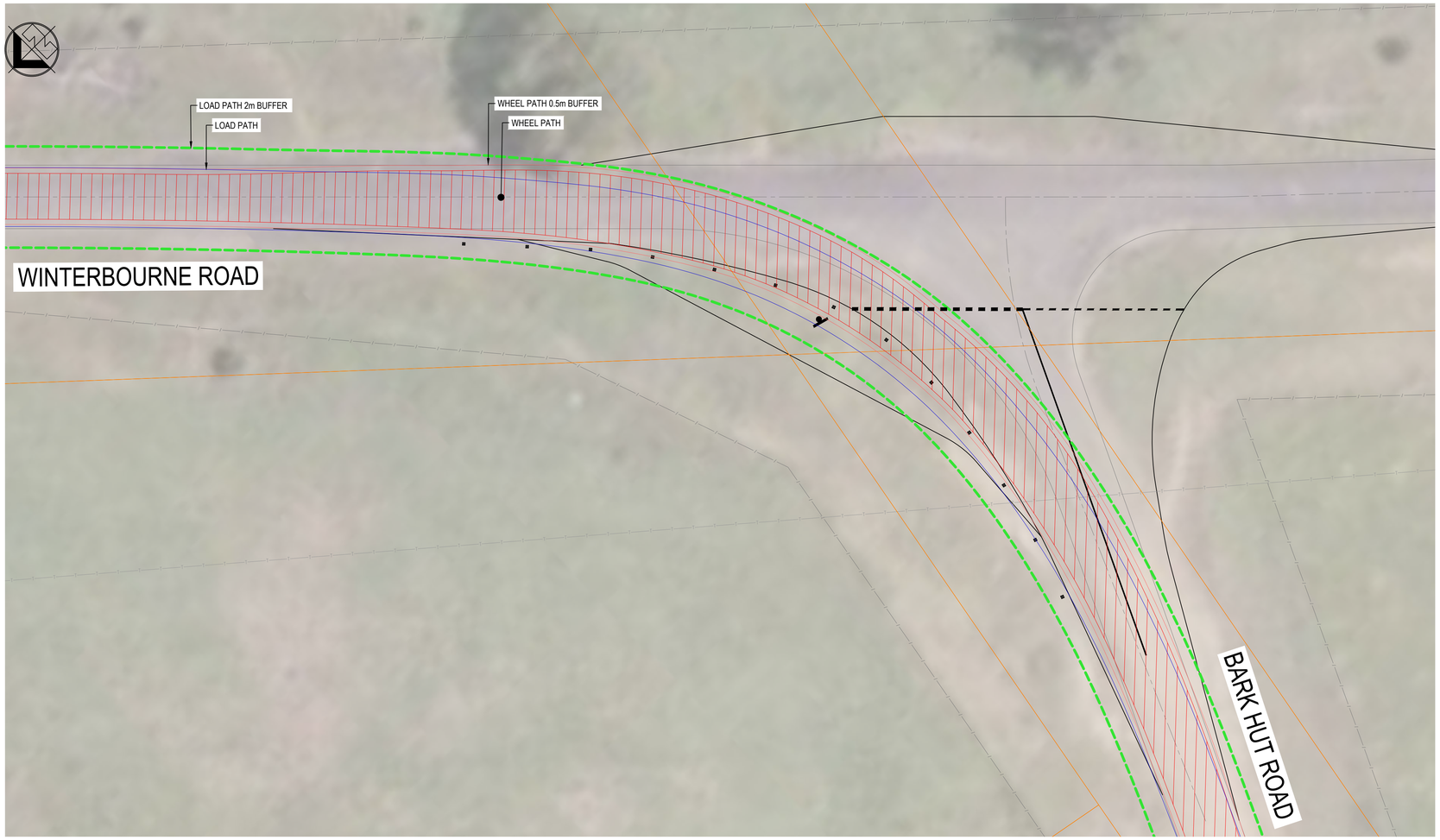
PROJECT: WINTERBOURNE WIND FARM

TITLE: WINTERBOURNE ROAD / BARK HUT ROAD TURNING PATH PLAN SHEET 2 OF 4

DRAWING No. 22-094-WWF-EXT-0016-2

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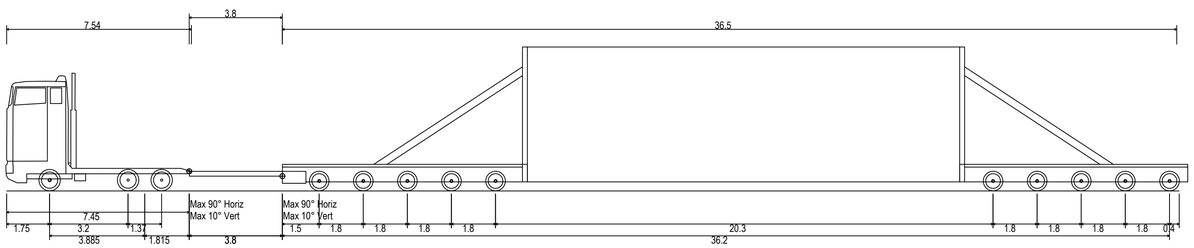


TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- LOAD PATH
- LOAD PATH 2m OFFSET

WINTERBOURNE ROAD-BARK HUT ROAD TURNING PATH PLAN - TOWER SECTION 3A

SCALE 1:250



TOWER SECTION 3A - TURNING PATH PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	OSOM WIDENING AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	17.04.2024
A	FOR REVIEW	BaP	BaP	JM	NC	29.08.2023

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Vestas

Winterbourne Wind

SIZE A1 | SCALE AS SHOWN

STATUS PRELIMINARY
NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM
GDA94 MGA Z56

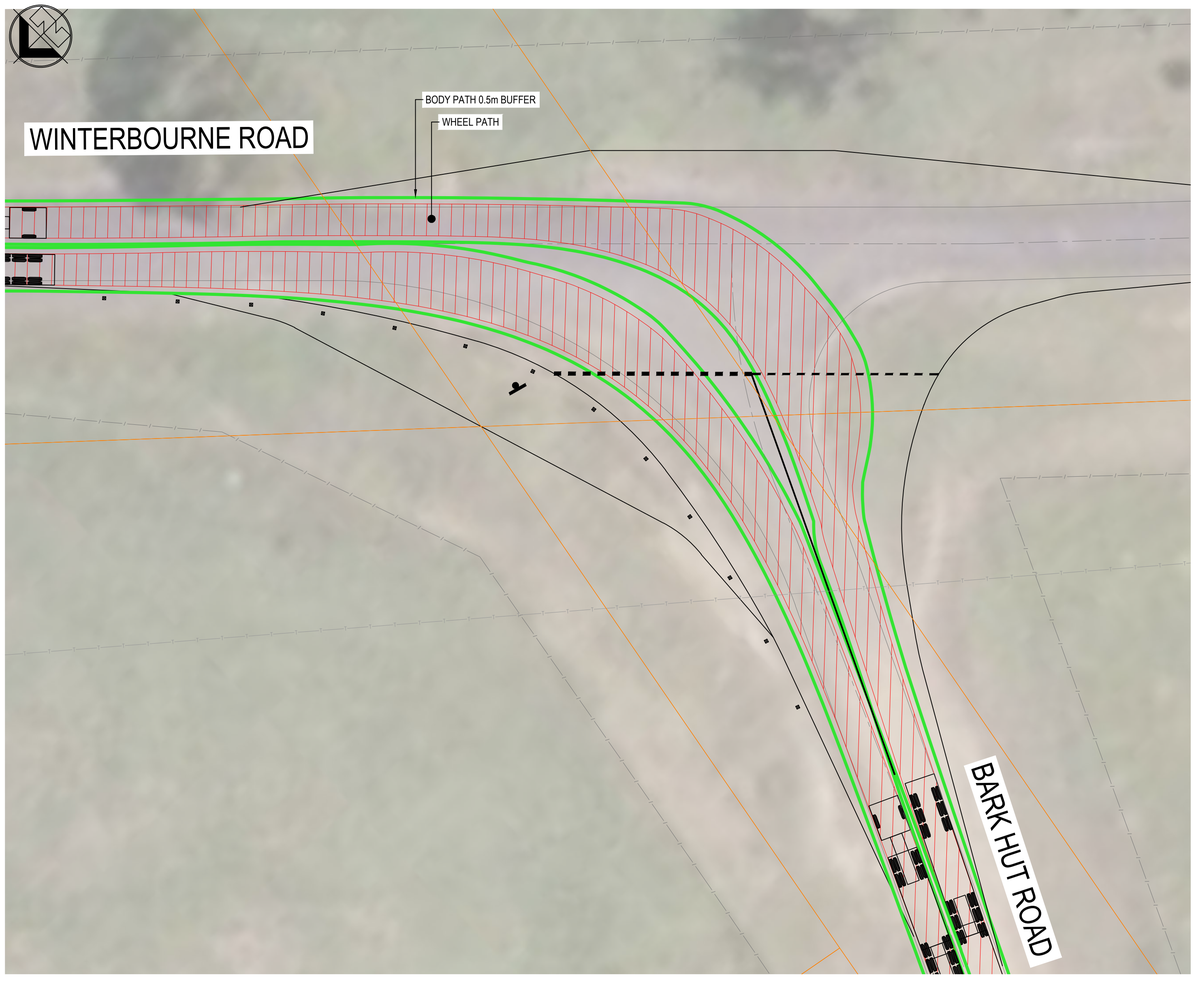
PROJECT WINTERBOURNE WIND FARM

TITLE WINTERBOURNE ROAD / BARK HUT ROAD TURNING PATH PLAN SHEET 3 OF 4

DRAWING No. 22-094-WWF-EXT-0016-3

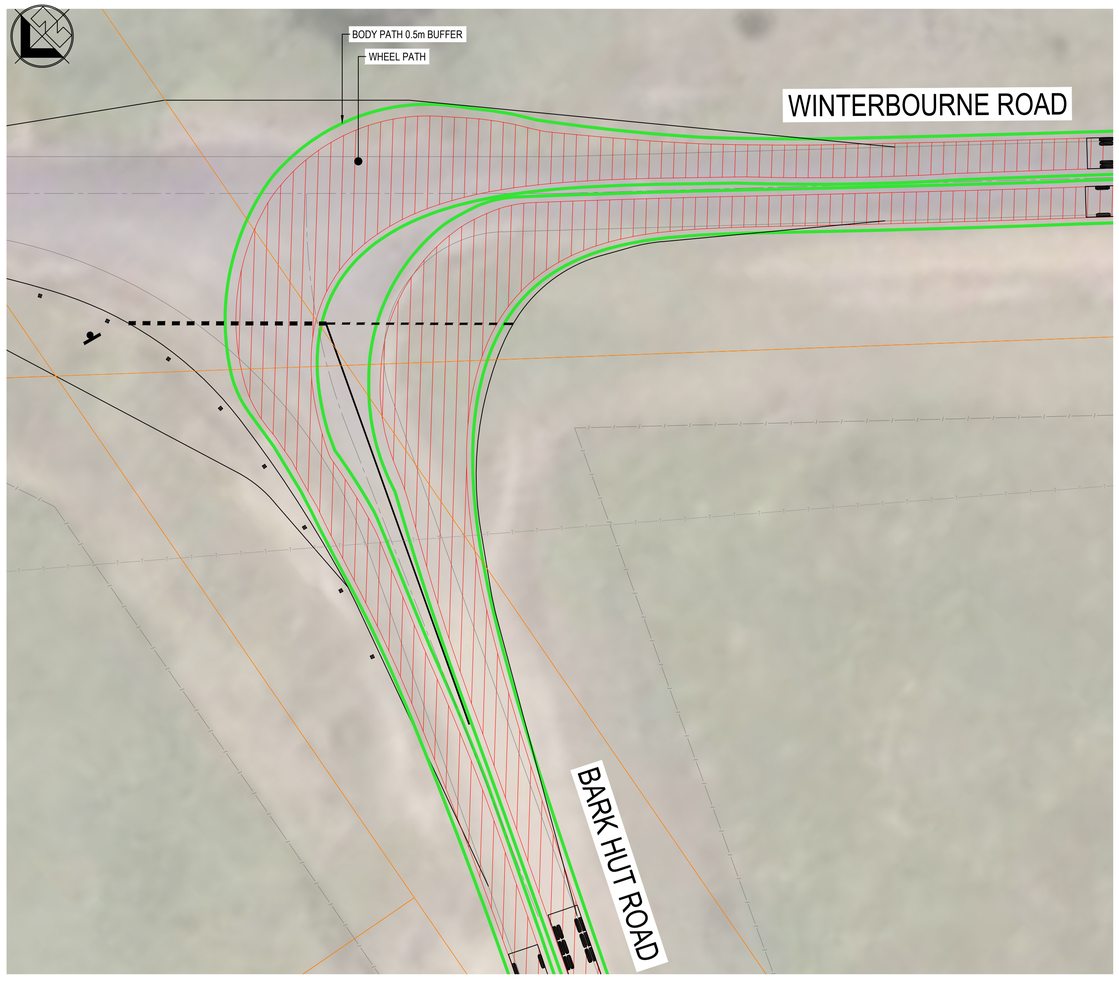
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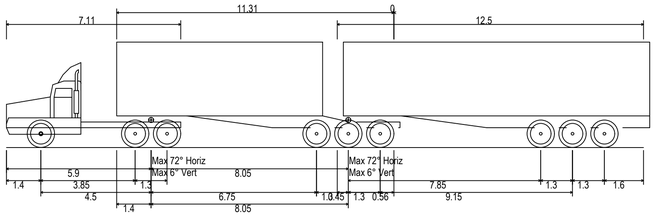
WINTERBOURNE ROAD- BARK HUT ROAD TURNING PATH PLAN - 26m B DOUBLE

SCALE 1:250



WINTERBOURNE ROAD- BARK HUT ROAD TURNING PATH PLAN - 26m B DOUBLE

SCALE 1:250



B-Double (26.0m)	
Overall Length	26.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m

26m B DOUBLE PROFILE

NTS

TURNING PATH LEGEND

WHEEL PATH

BODY PATH 0.5m OFFSET

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	OSOM WIDENING AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	17.04.2024
A	FOR REVIEW	BaP	BaP	JM	NC	29.08.2023

REVISION HISTORY

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Vestas

Winterbourne Wind

SIZE A1 | SCALE AS SHOWN

STATUS PRELIMINARY NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM GDA94 MGA Z56

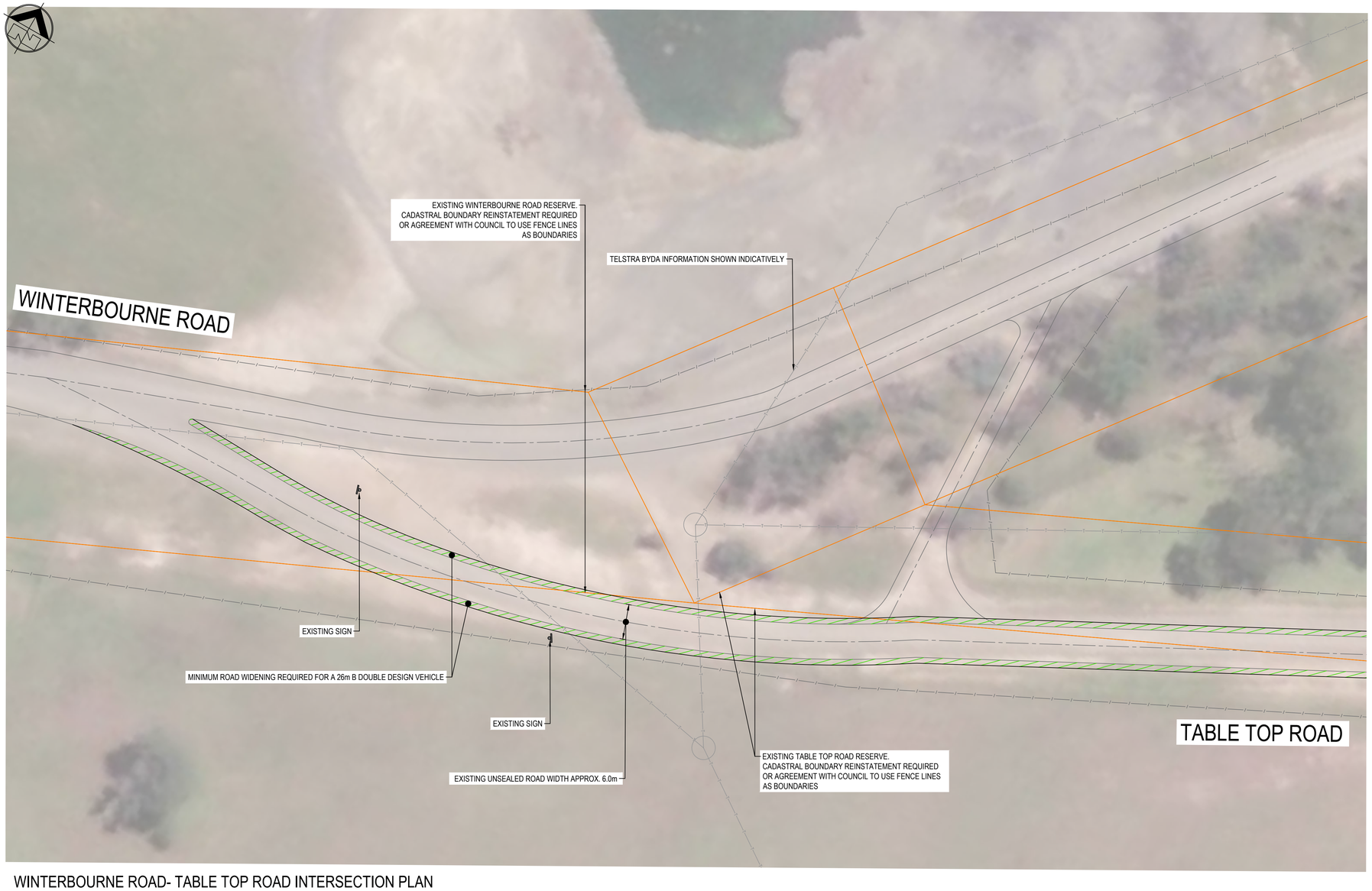
PROJECT WINTERBOURNE WIND FARM

TITLE WINTERBOURNE ROAD / BARK HUT ROAD TURNING PATH PLAN SHEET 4 OF 4

DRAWING No. 22-094-WWF-EXT-0016-4

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WINTERBOURNE ROAD- TABLE TOP ROAD INTERSECTION PLAN

SCALE 1:400

INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING ROAD
- EXISTING TELECOMMUNICATIONS
- EXISTING OVERHEAD POWERLINE
- EXISTING GAS MAIN
- EXISTING FENCE
- EXISTING WATERCOURSE (NSW MAPPING)
- SIGNPOST
- GUIDE POST
- GUARD RAIL
- ROAD WIDENING

PAVEMENT MARKINGS

LINE	TYPE	PATTERN AND DIMENSIONS	LINE WIDTH
BARRIER LINES	BB		100 100 100
BARRIER LINES	BS	3000 STRIPE AND 9000 GAP	100 100 100
GIVE WAY LINES	TB	600 STRIPE AND 600 GAP	300
GIVE WAY LINES	TB1	600 STRIPE AND 600 GAP	150
SEPERATION LINE	S1	3000 STRIPE AND 9000 GAP	100
EDGE LINES	EL		150
CONTINUITY LINE	CL	1000 STRIPE AND 3000 GAP	150
DIVIDING LINE	DL		100

NOTES

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No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	INTERSECTION AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	17.04.2024
A	FOR REVIEW	BaP	BaP	JM	NC	29.08.2023

REVISION HISTORY

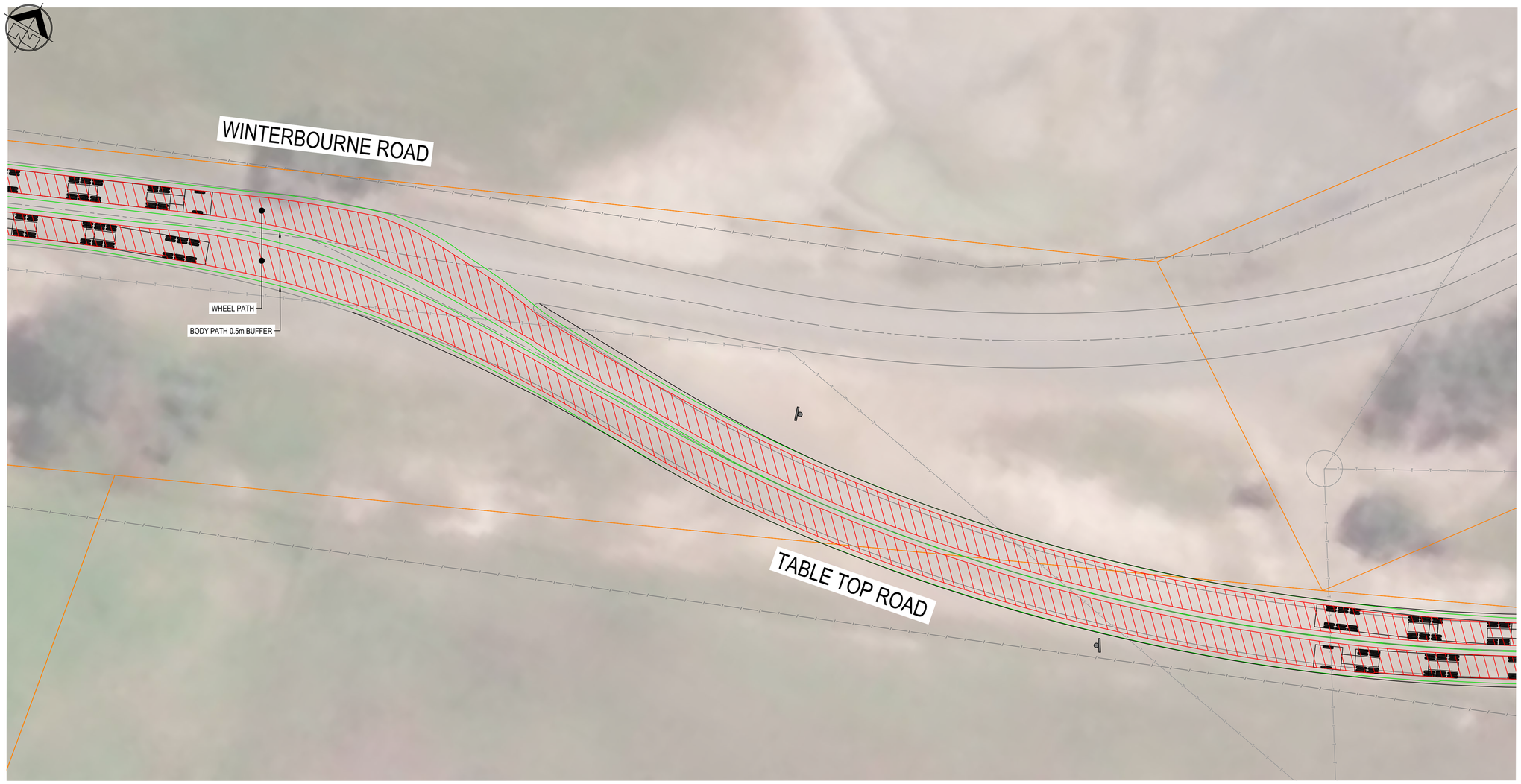
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Vestas
Winterbourne Wind

SIZE A1 | SCALE AS SHOWN
STATUS PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM GDA94 MGA Z56

PROJECT WINTERBOURNE WIND FARM
TITLE WINTERBOURNE ROAD / TABLE TOP ROAD INTERSECTION PLAN SHEET 1 OF 4
DRAWING No. 22-094-WWF-EXT-0017-1
REV B

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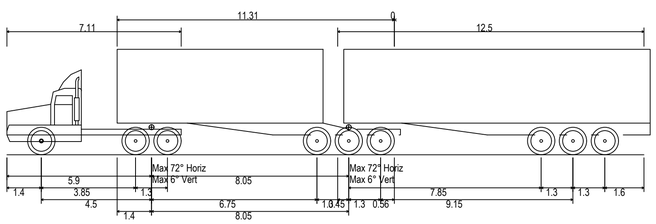


TURNING PATH LEGEND

- WHEEL PATH
- BODY PATH 0.5m OFFSET

WINTERBOURNE ROAD- TABLE TOP ROAD TURNING PATH PLAN - 26m B DOUBLE

SCALE 1:250



B-Double (26.0m)	
Overall Length	26.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m

26m B DOUBLE PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	INTERSECTION AMENDED	P.J.M.	P.J.M.	J.M.	J.M.	17.04.2024
A	FOR REVIEW	BaP	BaP	JM	NC	29.08.2023

REVISION HISTORY

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Vestas

Winterbourne Wind

SIZE A1 | SCALE AS SHOWN

STATUS PRELIMINARY
NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM
GDA94 MGA Z56

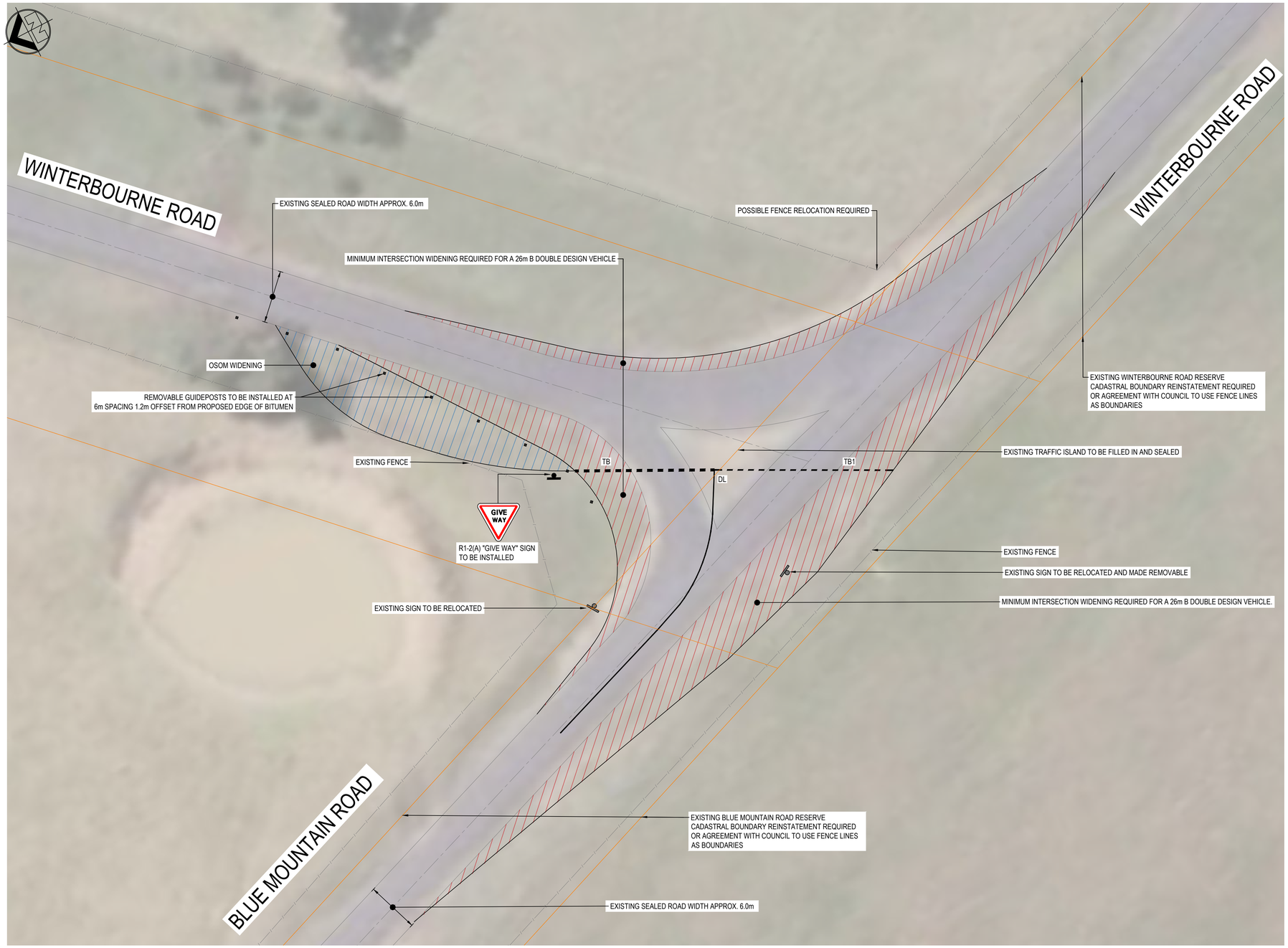
PROJECT
WINTERBOURNE WIND FARM

TITLE
WINTERBOURNE ROAD / TABLE TOP ROAD
TURNING PATH PLAN
SHEET 4 OF 4

DRAWING No. 22-094-WWF-EXT-0017-4

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WINTERBOURNE ROAD- BLUE MOUNTAIN ROAD INTERSECTION PLAN

SCALE 1:250

INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING ROAD
- EXISTING TELECOMMUNICATIONS
- EXISTING OVERHEAD POWERLINE
- EXISTING GAS MAIN
- EXISTING FENCE
- EXISTING WATERCOURSE (NSW MAPPING)
- SIGNPOST
- GUIDE POST
- GUARD RAIL
- INTERSECTION WIDENING
- OSOM WIDENING

PAVEMENT MARKINGS

LINE	TYPE	PATTERN AND DIMENSIONS	LINE WIDTH
BARRIER LINES	BB		100 100 100
BARRIER LINES	BS	3000 STRIPE AND 9000 GAP	100 100 100
GIVE WAY LINES	TB	600 STRIPE AND 600 GAP	300
GIVE WAY LINES	TB1	600 STRIPE AND 600 GAP	150
SEPERATION LINE	S1	3000 STRIPE AND 9000 GAP	100
EDGE LINES	EL		150
CONTINUITY LINE	CL	1000 STRIPE AND 3000 GAP	150
DIVIDING LINE	DL		100

NOTES

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No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	OSOM WIDENING ADDED	P.J.M.	P.J.M.	J.M.	J.M.	17.04.2024
A	FOR REVIEW	BaP	BaP	JM	NC	29.08.2023

REVISION HISTORY

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Vestas

Winterbourne Wind

SIZE A1 | SCALE AS SHOWN

STATUS PRELIMINARY
NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM
GDA94 MGA Z56

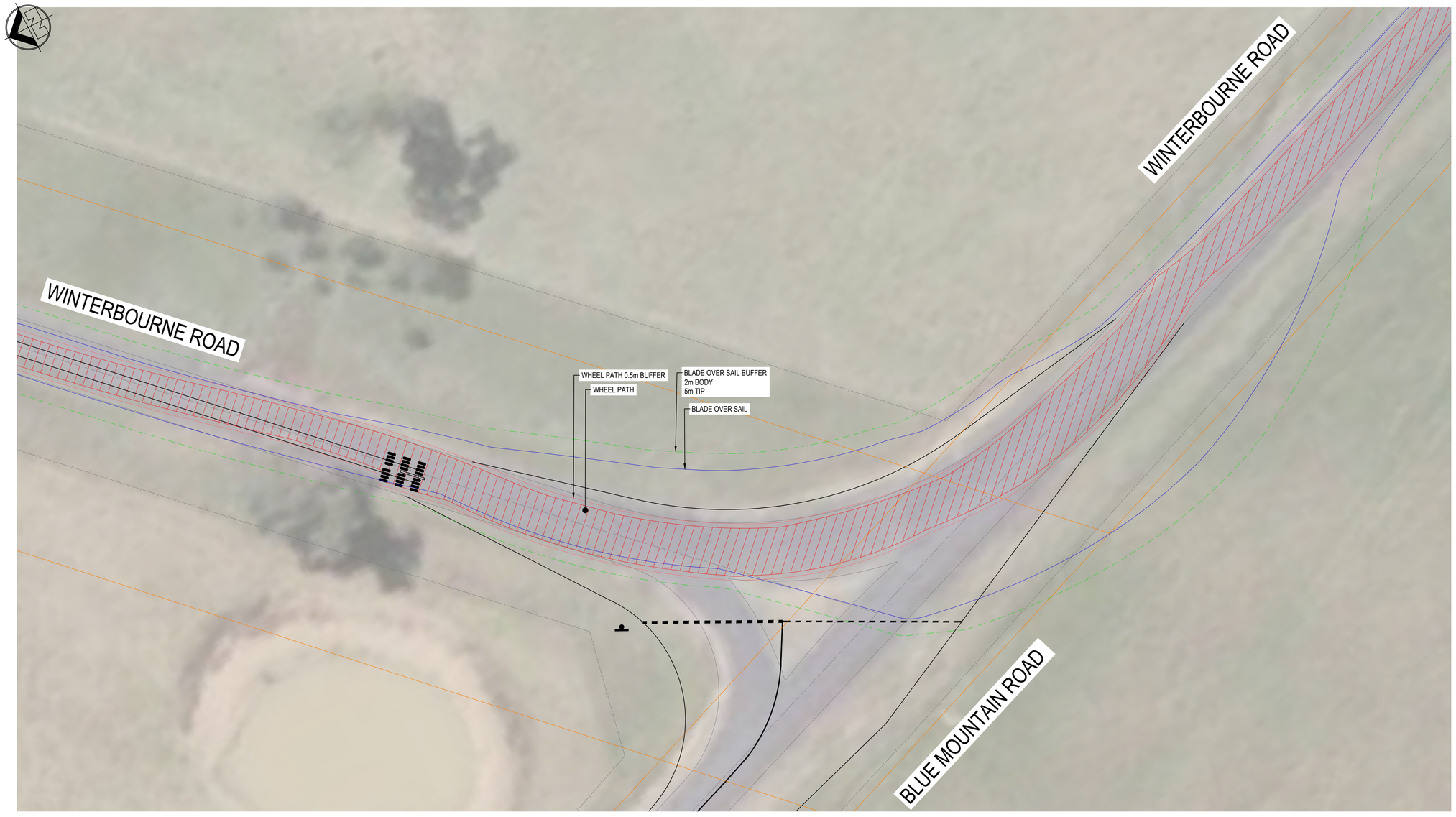
PROJECT WINTERBOURNE WIND FARM

TITLE WINTERBOURNE ROAD / BLUE MOUNTAIN ROAD INTERSECTION PLAN
SHEET 1 OF 4

DRAWING No. 22-094-WWF-EXT-0015-1

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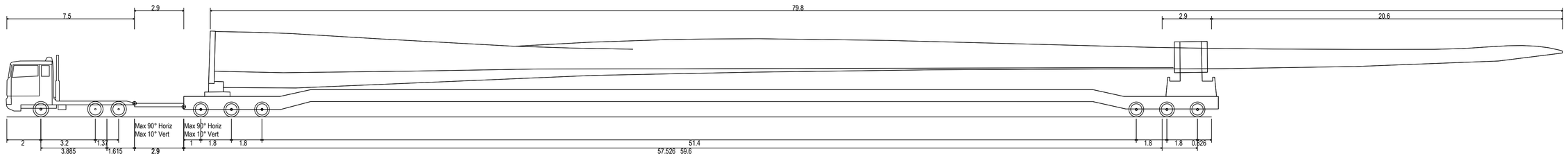


TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

WINTERBOURNE ROAD- BLUE MOUNTAIN ROAD TURNING PATH PLAN - 79m BLADE TRAILER

SCALE 1:250



79m BLADE TRAILER - TURNING PATH PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	BaP	BaP	JM	NC	29.08.2023

REVISION HISTORY

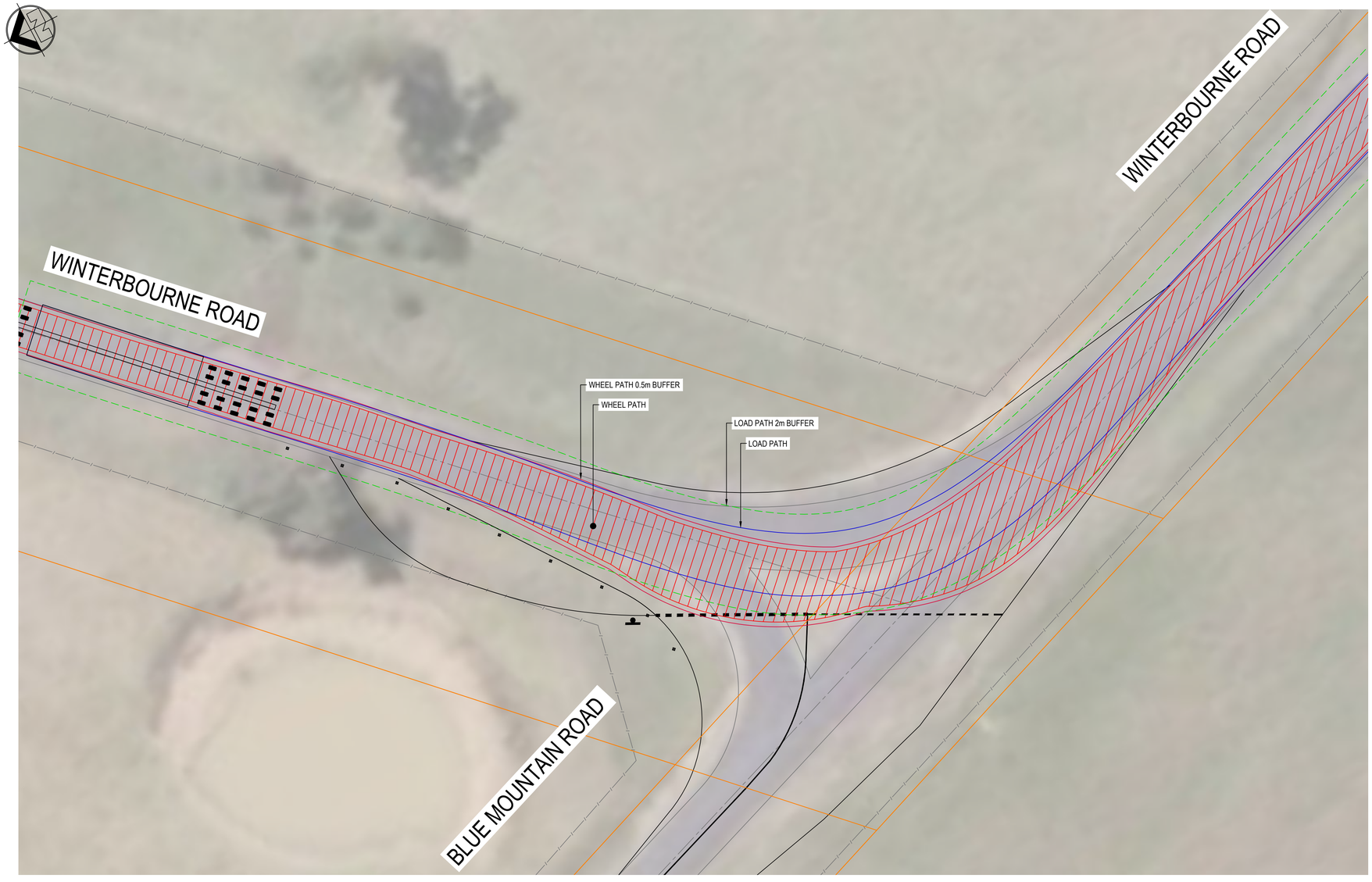
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Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA94 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	WINTERBOURNE ROAD / BLUE MOUNTAIN ROAD TURNING PATH PLAN SHEET 2 OF 4
DRAWING No.	22-094-WWF-EXT-0015-2
REV	A

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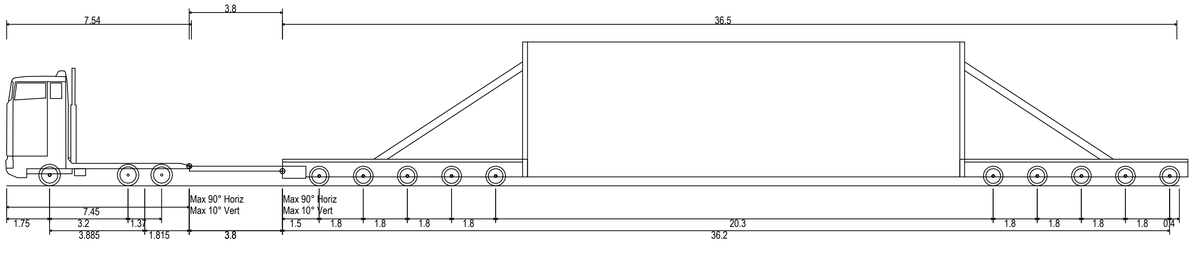


TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- LOAD PATH
- LOAD PATH 2m OFFSET

WINTERBOURNE ROAD- BLUE MOUNTAIN ROAD TURNING PATH PLAN - TOWER SECTION 3A

SCALE 1:250



TOWER SECTION 3A - TURNING PATH PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	OSOM WIDENING ADDED	P.J.M.	P.J.M.	J.M.	J.M.	17.04.2024
A	FOR REVIEW	BaP	BaP	JM	NC	29.08.2023

REVISION HISTORY

icubed consulting
innovation ingenuity inspiration
Development Services | Engineering | Project Delivery
www.icubed.com.au

Vestas
Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA94 MGA Z56

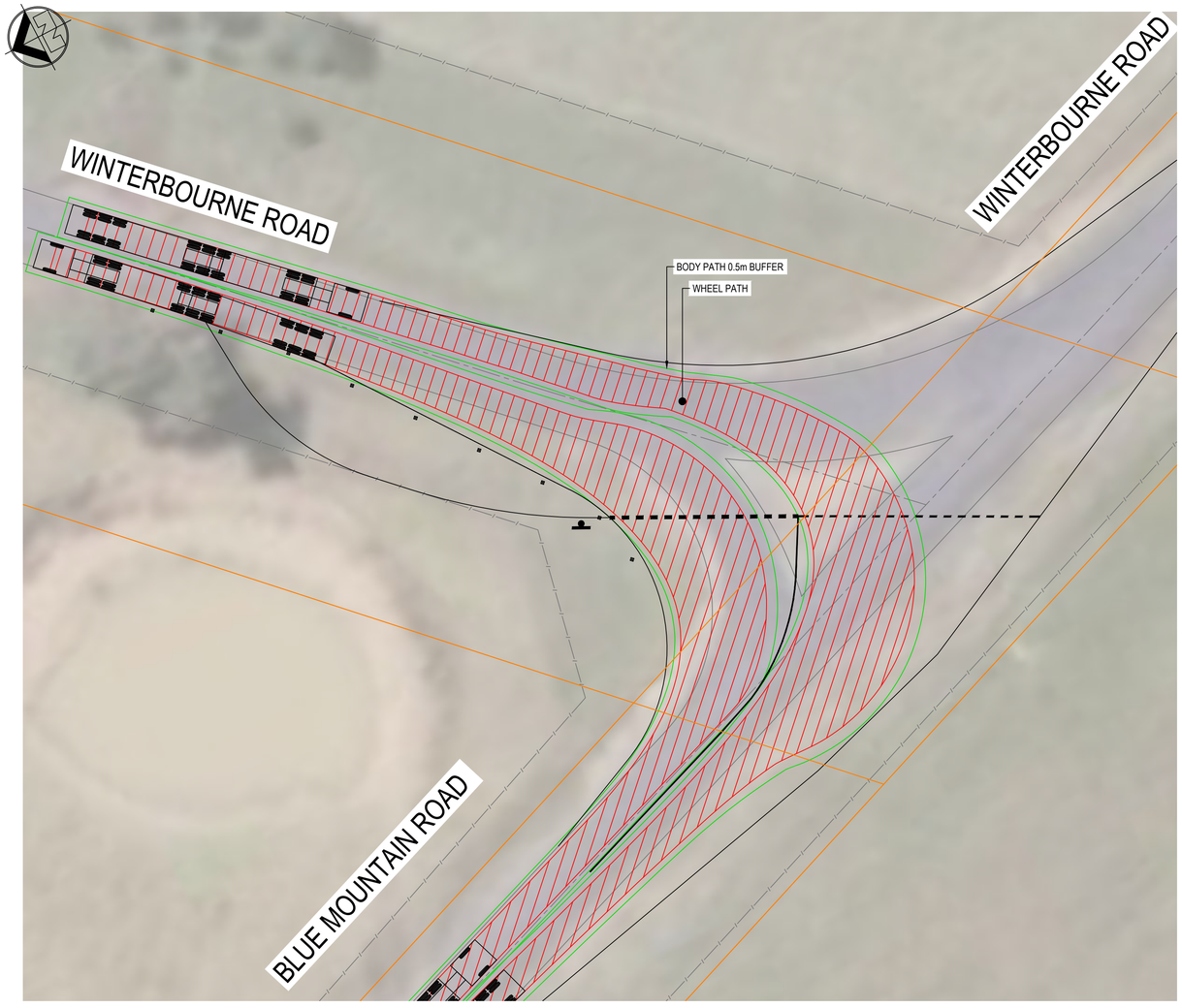
PROJECT: WINTERBOURNE WIND FARM

TITLE: WINTERBOURNE ROAD / BLUE MOUNTAIN ROAD TURNING PATH PLAN SHEET 3 OF 4

DRAWING No. 22-094-WWF-EXT-0015-3

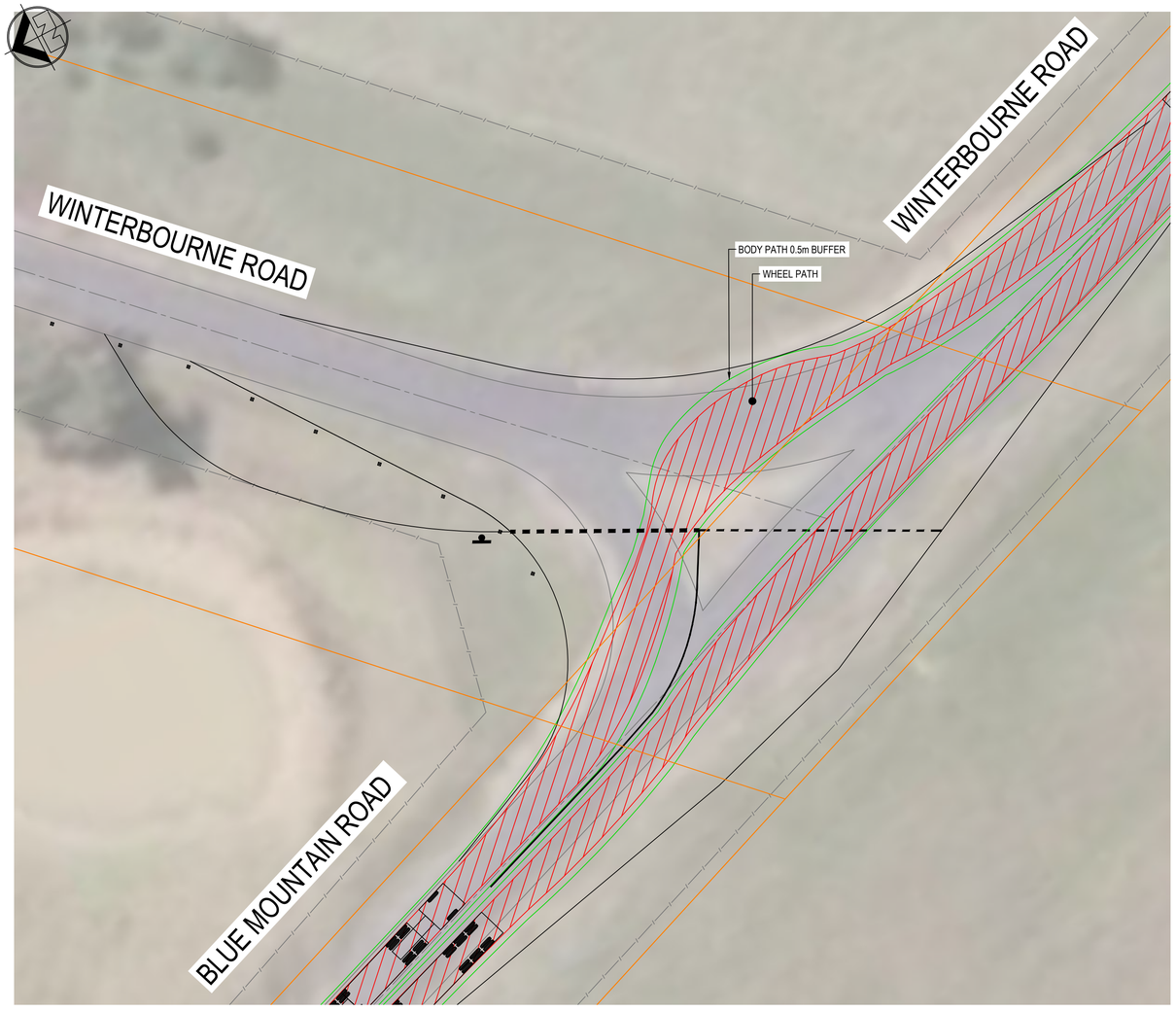
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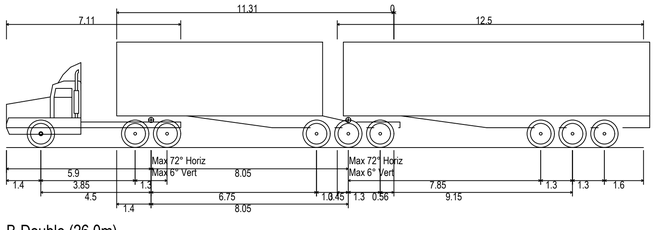
WINTERBOURNE ROAD- BLUE MOUNTAIN ROAD TURNING PATH PLAN - 26m B DOUBLE

SCALE 1:250



WINTERBOURNE ROAD- BLUE MOUNTAIN ROAD TURNING PATH PLAN - 26m B DOUBLE

SCALE 1:250



B-Double (26.0m)	
Overall Length	26.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m

26m B DOUBLE PROFILE

NTS

TURNING PATH LEGEND

WHEEL PATH

BODY PATH 0.5m OFFSET

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	OSOM WIDENING ADDED	P.J.M.	P.J.M.	J.M.	J.M.	17.04.2024
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Vestas

Winterbourne Wind

SIZE A1 | SCALE AS SHOWN

STATUS PRELIMINARY
NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM
GDA94 MGA Z56

PROJECT
WINTERBOURNE WIND FARM

TITLE
WINTERBOURNE ROAD / BLUE MOUNTAIN ROAD
TURNING PATH PLAN
SHEET 4 OF 4

DRAWING No. 22-094-WWF-EXT-0015-4

REV B

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Appendix C

Local Road Network Assessment (prepared by Constructive Solutions)

constructive solutions

Civil | Structural | Environmental

Winterbourne Wind Farm

Preliminary Road Upgrade Investigation

Prepared for

WinterbourneWind Pty Ltd

February 2024

Zenviron

Report prepared by Constructive Solutions Pty Ltd

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1	3*	S. Hillard	12/03/2024	R. Jeffcote	S. Hillard
1	4*	S. Hillard	12/03/2024	R. Jeffcote	S. Hillard

*Intersection section removed due to duplication of scope.

Author:	Claire Shultz
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Project Name:	Winterbourne Wind Farm
Project Number:	2023059
Name of Client:	WinterbourneWind Pty Ltd

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1 Introduction

1.1 Background

This Preliminary Road Upgrade Investigations Report has been prepared by Constructive Solutions Pty Ltd (CSPL) for WinterbourneWind Pty Ltd (the Proponent) to provide information on the proposed public road upgrades and treatments to ensure safe and secure access into the Winterbourne Wind Farm (WBWF) project (The Project) to accommodate the anticipated construction traffic in addition to the local vehicle movements.

The Project is located to the north and east of Walcha, with the centre of the Project approximately 20km northeast of the township. The Project is situated within the New England Renewable Energy Zone (NE REZ) declared under the *Electricity infrastructure Act 2020 (NSW)*. The Project involves the construction, operation, and maintenance of up to 118 wind turbines including associated road and electrical infrastructure to connect the wind farm to the electricity network.

Winterbourne Wind Farm will be seeking State Significant Development (SSD) consent under division 4.7 of the *Environmental Planning & Assessment Act 1979 (EP&A Act)* for The Project and requires a detailed Environmental Impact Statement (EIS) to be prepared in accordance with the NSW Government's Wind Energy Framework. The status of The Project is currently at the Response to Submissions stage.

1.2 Purpose and Scope of Report

The key purposes of this report are as follows:

- To identify the proposed public road upgrade and/or treatments along each of the access roads.
- To identify any structures (bridges, culverts, causeways, cattle grids) which may require upgrade or replacement.
- Identify any locations where required road upgrades may lead to encroachment into private property which would require landowner negotiations and/or land acquisition.
- To determine a high-level concept of the overall road works required as per the proposed upgrade and/or treatments needed to facilitate wind farm construction.

The key outcomes of the above scope of works aim to provide a preliminary overview of the required road upgrade and treatment works to inform on the viability of the proposed access routes, narrow down the options for road access and obtain agreement and further negotiations with the relevant road authorities and land holders.

Excluded from this scope are the access roads required to construct the overhead 330kV line from the Project area to the point of connection and all Transport for New South Wales (TfNSW) roads from Uralla leading up to the intersection of Thunderbolts Way and Darjeeling Road, Walcha.

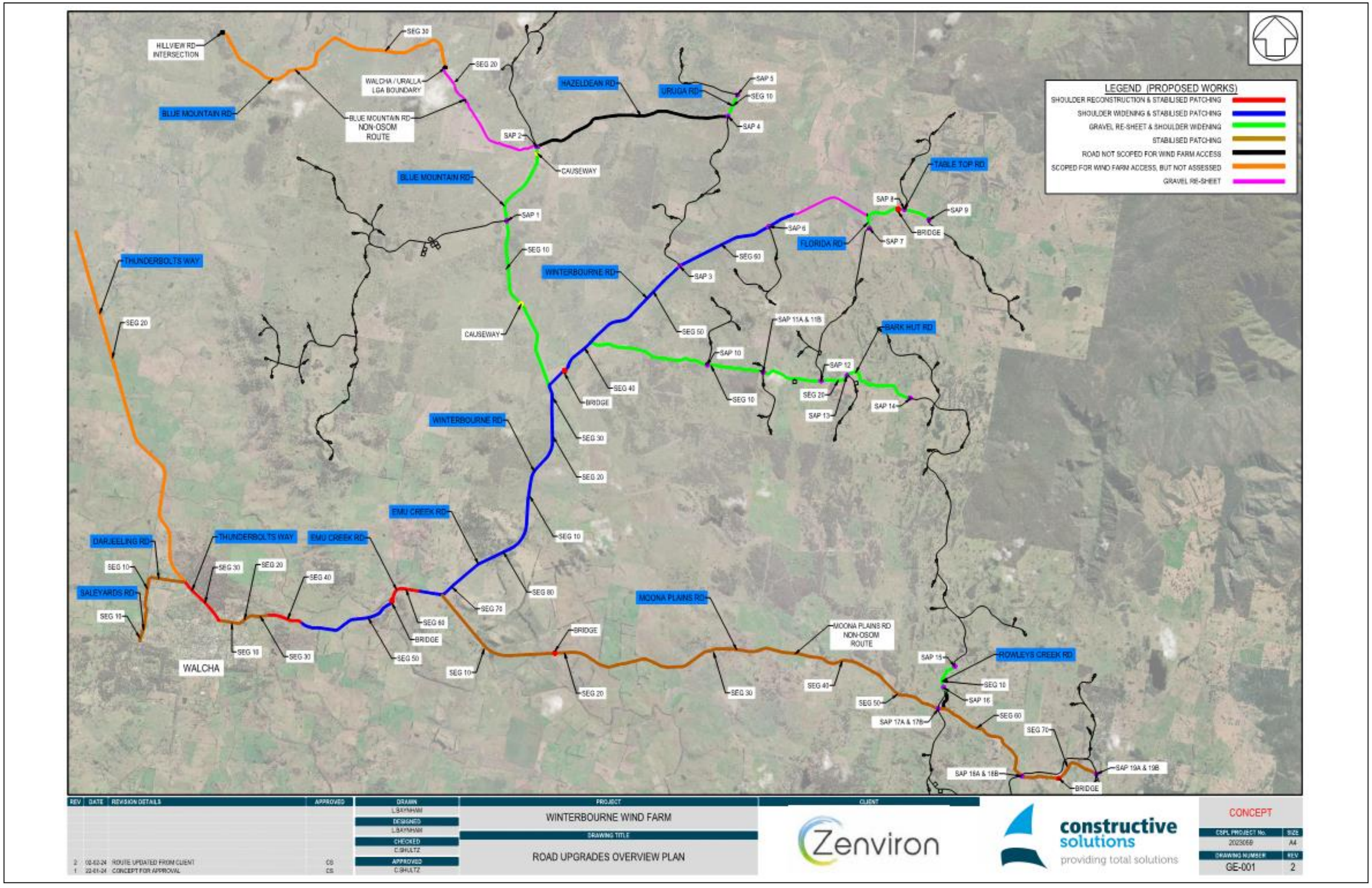
1.3 Wind Farm Layout and Access Route Development

Turbine components are anticipated to be transported from the Port of Newcastle to the Project site via the State Road network including the Hunter Expressway (M15), New England Highway (A15), Thunderbolts Way and the Local and Regional roads that provide direct access into the Project site.

As the preferred turbine has been identified, the anticipated OSOM vehicle numbers, types, dimensions, and weights required to construct the Project are known with more certainty and are used to determine the preliminary road upgrade and treatment scope of works. Currently the Project includes the construction of 118 turbines with a maximum blade tip height of 230m above ground level (AGL) with a combined capacity of around 700MW and in total is expected to generate approximately 2,100,000 megawatts hours (MWh)/year of energy.

A general overview of the proposed public roads to be used for access to the wind farm is shown in **Figure 1**.

Figure 1: Winterbourne Wind Farm Access Route Overview Map



2 Access Route Existing Conditions

This report is focused on the local and regional roads surrounding the proposed wind farm site on the outskirts of Walcha and the required public road and intersection upgrade and treatment works aimed at improving the existing road conditions as needed to provide reliable access for wind farm construction traffic into the site.

The approach taken was to survey the affected roads and segment them according to their existing conditions, road dimensions and failure types to produce sections of roads requiring targeted upgrade and treatment works. **Table 1** below provides a summary of the roads assessed in the route study.

Table 1: Proposed Access Route Roads (WSC)

Road Name	Description	LGA	Vehicle Types (Note 3)	Approx. Length (km)
Thunderbolts Way (Note 1)	Uralla (Salisbury Street, Duke Street) to LGA Boundary	USC	OSOM, HV, LV	25.5
Thunderbolts Way (Note 2)	LGA Boundary (Salisbury Plains) to Darjeeling Road	WSC	OSOM, HV, LV	13.1
Thunderbolts Way	Darjeeling Road to Jamieson Street (Emu Creek Road)	WSC	OSOM, HV, LV	1.5
Jamieson Street	Thunderbolts Way to Ohio Road (Emu Creek Road)	WSC	OSOM, HV, LV	0.6
Ohio Road	Jamieson Street to Emu Creek Road	WSC	OSOM, HV, LV	0.3
Emu Creek Road	Ohio Road to Winterbourne Road/Old Brookmount Road	WSC	OSOM, HV, LV	9.3
Winterbourne Road	Emu Creek Road to Blue Mountain Road	WSC	OSOM, HV, LV	5.0
Winterbourne Road	Blue Mountain Road to Table Top Road	WSC	OSOM, HV, LV	10.5
Moona Plains Road	Winterbourne Road to Chainage 22.2	WSC	HV, LV	22.2
Bark Hut Road	Winterbourne Road to Chainage 10.0	WSC	OSOM, HV, LV	10.0
Blue Mountain Road	Winterbourne Road to Hazeldean Road	WSC	OSOM, HV, LV	7.6
Blue Mountain Road	Hazeldean Road to Chainage 3.9	WSC	HV, LV	3.9
Blue Mountain Road	Chainage 3.9 to Hillview Road	USC	HV, LV	4.1
Uruga Road	Hazeldean Road to Chainage 1.0	WSC	OSOM, HV, LV	1.0
Table Top Road	Winterbourne Road to Florida Road	WSC	HV, LV	2.3
Table Top Road	Florida Road to Chainage 1.9	WSC	OSOM, HV, LV	1.9
Florida Road	Table Top Road to Chainage 0.5	WSC	OSOM, HV, LV	0.5
Rowleys Creek Road	Chainage 0.6 to Chainage 1.5	WSC	OSOM, HV, LV	0.9
Hillview Road	Thunderbolts Way to Blue Mountain Road	USC	HV, LV	12.1

Note 1: *This section of Thunderbolts Way forms part of Uralla Shire Council impacted roads and is included to provide context to the proposed wind farm access route and has not been assessed under this preliminary road upgrade investigation.*

Note 2: *This section of Thunderbolts Way forms part of the Walcha Shire Council impacted roads but has not been assessed at this time. Proposed treatments for this section are based on the general known condition and will need to be confirmed and verified through site inspections.*

Note 3: *Vehicle types include Light Vehicles (LV), Heavy Vehicles (HV), and Over-size and Over-mass (OSOM) vehicles which will be required during the construction and operational phases of the wind farm project.*

The inspected roads were generally found to be in fair condition and fit for purpose as rural roads with only short segments in poor condition showing severe pavement deformation, rutting, shoving, and cracking. The roads were segmented according to the defects identified as detailed in *Appendix A* of *Austroads Guide to Pavement Technology – Part 5 – Pavement Evaluation and Treatment Design, 2019* providing a targeted set of proposed road upgrades and treatments.

Taking into consideration that most local/rural roads are constructed using locally sourced gravels such as ridge gravel from Council owned quarries and borrow pits, in addition to the average remaining useful life of the pavements (roads were found to show the preliminary signs of aging/fatigued pavements) and assessed condition, strengthening of the existing pavements may be required by stabilisation and/or basecourse overlay to accommodate the increased loading.

Where geotechnical investigations identify sections with insufficient pavement depths or where lower than expected pavement strength required to carry heavily loaded trucks is found, a suitable treatment will be developed to cater specifically for the increased loading. Pavement strengthening may also be required after prolonged wet weather, to ensure the road pavements are sufficiently strong in saturated conditions to resist failure under heavy vehicle loading during wind farm construction.

2.1 Thunderbolts Way/Uralla Road – LGA Boundary to Jamieson Street

Thunderbolts Way is classified as a Regional Road traversing multiple local government areas including Uralla Shire Council and Walcha Shire Council, connecting the New England Highway (A15) to the Winterbourne Wind Farm for OSOM deliveries and construction traffic.

The first 38.6km section of Thunderbolts Way from Uralla was not assessed in this report.

A 1.5km section from Darjeeling Road intersection to Jamieson Street intersection was assessed and is considered to be in poor condition and will require shoulder improvement works to target edge-breaks, rutting, shoving and pavement deformation with other sections requiring pavement upgrade and road widening.

The 1.5km section of Thunderbolts Way is approximately 6.5-8.0m wide, sealed, and is the northern entry into Walcha from Uralla. Any road works along the Walcha section of Thunderbolts Way are to be completed in accordance with Transport for NSW (TfNSW) requirements.

2.2 Jamieson Street – Thunderbolts Way to Ohio Road

The section of Jamieson Street proposed for use as part of the access route (0.6km) runs between Thunderbolts Way and Ohio Road. Jamieson Street has a 13.5m wide seal with sections containing concrete kerb and gutter on both sides of the roadway. Jamieson Street is an urban street and intersects with Ohio Road on the top of a hill.

Jamieson Street shows signs of an aging pavement with cracking, flushing, raveling, potholes and is likely to have been constructed using local materials and would be unlikely to have sufficient pavement strength to cater for the increased heavy vehicle movements associated with the wind farm construction.

2.3 Ohio Road – Jamieson Street to Emu Creek Road

Ohio Road runs between Jamieson Street and Emu Creek Road with the section proposed for use in the wind farm project being 0.3km long and 13.5m wide containing a small section of concrete kerb and gutter on the north-western edge of the road only.

Ohio Road shows minor pavement failures including cracking and rutting and would also be unlikely to have sufficient pavement strength to cater for the increased heavy vehicle movements.

2.4 Emu Creek Road – Ohio Road to Winterbourne Road

Emu Creek Road runs between Ohio Road and transitions on alignment into Winterbourne Road at the Old Brookmount Road intersection. The section of Emu Creek Road proposed for use in the wind farm access route is 9.3km long and ranges between 5.5m and 7.5m wide. The narrow sections of Emu Creek Road will need widening for use by over-dimensional vehicles with shoulder improvement works required to provide adequate pavement strength in certain sections.

Drainage improvement works along the entire length of the road will benefit longevity of the pavement and reduce the rate of deterioration of existing failures.

2.5 Winterbourne Road – Emu Creek Road to Blue Mountain Road

This section of Winterbourne Road starts at Emu Creek Road and ends at Blue Mountain Road (5.0km in length). The road covers undulating terrain and is between 5.4m and 6.0m wide, in average condition and has sections containing moderate pavement failures.

The entire 5.0km section of the road will need to be widened to cater for the OSOM deliveries with drainage improvement works required along the entire length of the road to reduce the impacts of prevailing weather conditions on the road subgrade and pavements.

2.6 Winterbourne Road – Blue Mountain Road to Table Top Road

This section of Winterbourne Road runs between Blue Mountain Road and Table Top Road and is 10.5km in length. The pavement width ranges between 6.0-6.1m with cracking, edge-breaks, rutting and flushing as pavement failures observed.

Drainage improvement works along the majority of the road will benefit longevity of the pavement and reduce the rate of deterioration of existing failures.

2.7 Moona Plains Road – 22.07km Emu Creek Road to Moona Plains Station

Moona Plains Road is generally used for local rural property access and starts from Emu Creek Road with the first 22.2km proposed for use by the Project. Moona Plains Road will be used by HVs & LVs only to access the wind farm site during the construction and operational phases of the Project.

Stabilised pavement patching, drainage improvement works, centerline line marking, signage and routine maintenance is proposed for this road.

2.8 Bark Hut Road – Winterbourne Road to 10.04km East

Bark Hut Road is 10.04km in length and services a small number of rural properties and is a “No through” road. The road is unsealed and the pavement width ranges between 3.0-3.5m, covers undulating terrain and will require vertical and horizontal curve improvement works in numerous locations in addition to pavement widening to accommodate OSOM deliveries.

2.9 Blue Mountain Road – Winterbourne Road to Hazeldean Road

This 7.6km section of Blue Mountain Road is unsealed and ranges between 3.4-5.1m wide providing a link between Winterbourne Road and Hazeldean Road and will provide OSOM access to the western region of the wind farm site.

2.10 Blue Mountain Road – Hazeldean Road to Hillview Road

This section of Blue Mountain Road is 8.0km in length, unsealed and crosses into USC LGA from WSC at around 3.9km from the intersection of Hazeldean Road. This section of Blue Mountain Road has not been assessed under this investigation however it has been found that the majority of this section of road is not within the road reserve and that any upgrade and treatment works are to remain within the existing boundary fences where practicable. As this section of road will be used by HV & LVs only, it is anticipated that any upgrade or treatment works will have limited impacts on existing private property boundary fences.

2.11 Table Top Road – Florida Road Intersection to 1.9km East

Table Top Road provides access to local rural properties and ranges between 4.0-5.7m in width. A small section of this road will link internal wind farm access tracks starting from the intersection with Florida Road to chainage 1.9km.

Road widening, gravel resheet/pavement overlay and drainage improvement works are the proposed treatments for this section of road with the bridge at chainage 0.95km (from Florida Road intersection) to be widened and strengthened to meet OSOM requirements. Alternatively, it may be feasible to construct a new bridge to the north or to the south of the existing bridge outside of the road reserve, with the consent of the landowner. The new bridge can then be linked to the existing road to suit OSOM requirements.

The 2.3km section of Table Top Road between Winterbourne Road intersection and the Florida Road intersection will be used by HV & LVs only for wind farm access.

2.12 Uruga Road – Hazeldean Road to 1.0km North

Uruga Road is an unsealed local road servicing a small number of rural properties with the first 1.0km proposed for use as part of the access route. The existing pavement varies between 3.1m and 3.4m in width requiring widening to accommodate OSOM deliveries in addition to gravel overlay to provide adequate strength and improved drainage.

2.13 Rowleys Creek Road – Start Chainage 0.6 to End Chainage 1.5 (900m Section Located Approximately 2.4km North of Moona Plains Road)

This section of Rowleys Creek Road is approximately 4.0m wide and unsealed and is proposed to provide a link between two sections of wind farm internal access tracks. The 900m section crosses undulating country and is preliminarily deemed to require vertical and horizontal curve improvement works to provide adequate OSOM access including road widening, gravel resheet and drainage improvement works.

2.14 Saleyards Road and Darjeeling Road – Walcha Township Bypass

Saleyards Road and Darjeeling Road are local roads and have been included as part of the proposed Walcha township bypass route for HVs and LVs only.

3 Basis of Preliminary Design

The approach undertaken to determine the preliminary public road upgrade and treatments was to complete an assessment of the existing road standards of the WSC impacted roads against the *Austroads* Standards and the Critical Design Vehicles (weight and dimensional) to identify the required road upgrade and treatments to provide secure access.

3.1 Design Standards and Inputs

To determine the necessary road treatments, the expected Project construction traffic composition and vehicle movements were anticipated and used as design inputs to determine the road geometry requirements needed to cater for the increased traffic.

3.2 *Austroads* Requirements

The proposed public road upgrades and repair treatments were developed from site investigations completed, basic knowledge of the background (local) traffic and the anticipated wind farm construction traffic volumes based on experience from previous wind farm construction projects undertaken.

During the site investigations, an audit of the exiting road conditions identified deficiencies within the road network. The repair treatments developed focus on the general road conditions and compositions in addition to the types of failures, their attributes, and their locations generally in accordance with the following standards and further discussions and negotiations with Council:

- *Austroads Guide to Asset Management – Technical Information Part 15: Technical Supplements;*
- *Austroads Guide to Pavement Technology Part 2: Pavement Structural Design;*
- *Austroads Guide to Road Design Part 3: Geometric Design*; and
- *Austroads Guide to Pavement Technology Part 6.*

The background traffic and the safety of the general road users were taken into consideration with further refinement to be completed once traffic count data can be provided for inclusion as design inputs.

The summary of the anticipated public road upgrades and repair treatments for the relevant road authority can be found in the Preliminary Road Upgrade Schedule included in **Appendix 1**.

3.3 Design Vehicles

The physical and operating characteristics of the vehicles using a road influence the specific design elements used in the geometric design such as the swept path of large vehicles on small radius horizontal curves. With the preferred turbine identified, all vehicle types required for the turbine component delivery are therefore known.

A range of LV, HV, and OSOM vehicles will be required during the construction and operational phases of the wind farm project and have been included in the geometry design considerations for the proposed upgrades and treatments. For the roads considered within the WSC LGA, the roads listed in **Table 1** will be used for wind farm construction taking into account LV, HV and OSOM vehicle requirements, whereas Moona Plains Road, the first 2.3km of Table Top Road and 3.9km of Blue Mountain Road specifically will be used by HV & LVs only to access the site. A brief summary of the different vehicle types is provided below.

Light Vehicles (LV)

LVs such as 4WDs, utilities and vans will be required to transport workers and light materials to/from the work sites during the construction and operational phases.

Heavy Vehicles (HV)

A broad range of HVs will be required to construct the Project with the principal HVs to be used during the construction phase listed below:

- Flat-bed trucks to float large plant, machinery, and cranes.
- Truck and dogs to transport rock and gravel.
- Cement deliveries to concrete batch plants.
- Concrete trucks to deliver concrete to construction work fronts.
- Water truck deliveries for construction activities.
- Waste trucks for removal of unusable materials.
- Non OSOM crane vehicles.
- Fuel deliveries to sustain construction plant.

Wind Turbine - Over-size/over-mass (OSOM) Vehicles

OSOM loads are required to transport the large turbine components and electrical components such as substation power transformers, prefabricated buildings for substations, wind farm operation and maintenance facilities and for use in erection/construction of turbines to site. The combined load dimensions of the OSOM loads required for each turbine (based on the Vestas V162.149hh turbine) and the proposed road design widths for are summarised in **Table 2** below.

Table 2: Turbine-related OSOM Loads and Proposed Road Widths

Turbine Component	Combined OSOM Load Dimensions			Proposed Road Pavement Width (m) (Note 1)
	Length (m)	Width (m)	Height (m)	(Lane, Lane + Shoulder)
Blades	**90.0** (Note 2)	4.3	4.7	6.2-7.2
Nacelles	35.0	4.2	5.35	6.2-7.2
Drive Trains	35.0	4.2	5.35	6.2-7.2
Hubs	26.0	4.5	5.1	6.2-7.2
Base Towers	39.0	5.5	**5.5** (Note 4)	6.2-7.2
Section 2 Towers	44.0	5.0	5.3	6.2-7.2
Section 3 Towers	46.0	5.0	5.3	6.2-7.2
Section 4 Towers	35.0	5.0	5.3	6.2-7.2
Top Towers	54.0	5.1	4.9	6.2-7.2
Cooler Tops	19.0	2.5	4.3	6.2-7.2
Transformer	55.0	**6.3** (Note 3)	4.6	6.2-7.2

Note 1: The proposed road pavement width varies across the different road segments and includes the lanes and shoulders combined width with the verge providing additional width for OSOM vehicles to travel under escort and during the night. The OSOM vehicles will be able to use the entire carriageway width.

Note 2: Critical Size/Dimensional Assessment Vehicle was identified as the blade transport vehicle combination being 90.0m in length and has the critical swept path when turning.

Note 3: The Critical Weight Assessment Vehicle was identified as the transformer transport vehicle combination with a trailer wheel configuration consisting of 16 axles with 8 wheels per axle (16x8) and distributing around 170 tonnes of pressure through the wheels.

Note 4: The Critical Height Assessment Vehicle was identified as the base tower transport vehicle combination being 5.5m in height above the highest point of the road pavement.

The proposed road pavement widths take into account the swept path for the individual OSOM vehicles and is designed for the worst case (critical design vehicle), combining dimensional width and effective width on horizontal curves (bends in the road) with a radius larger than 120m.

Further analysis using the critical design vehicle is required to be completed to identify locations where the horizontal and vertical curves require improvement works to enable OSOM access into the wind farm site and is discussed in **Section 3.4** Vertical and Horizontal Standards – Vestas Road Requirements of this report.

The overall vehicle movements along the WSC impacted road segments are considered in the preliminary road geometry design for road user safety and associated traffic impacts. Road widening and roadside clearing treatments are proposed to accommodate HVs travelling in opposite directions to pass safely, and intersection turn treatments are designed to provide safe operations during times of peak vehicle movement.

3.4 Vertical and Horizontal Standards – Vestas Road Requirements

To ensure that the impacted public roads provide suitable access for the OSOM deliveries into the wind farm site, the existing vertical and longitudinal grades along the impacted roads have been preliminarily reviewed against the Vestas Road Requirements (VRR) as set out by Vestas Wind Systems A/S (Vestas).

Vestas is the manufacturer, supplier, and installer of the wind turbines for the Project and provide minimum road requirements to facilitate the transportation of turbine and electrical components to limit any potential damage from occurring during the delivery process. The VRR summarised in **Table 3** below provides a guide to be used in further assessments when finalising the designs.

Table 3: Vestas Road Requirements (VRRs)

Road Geometry	Parameters / Specifications for Design
Minimum Road Width	6.2 m on straight sections of road, this can include trafficable shoulders.
Bend Widening	A minimum radius of 120m is preferred.
Longitudinal Gradients	>6% preferred with additional widening for minimum 120m radius.
Longitudinal Slope	15% in the forward moving direction specific to the transformer delivery route.
	18% in the forward moving direction for all other wind farm routes.
Vertical Alignment of Roads	The vertical alignment of roads, in relation to minimum vertical curves, must be in accordance with the specified vertical radius parameter (Kv), as calculated for each wind turbine component.
Cross-fall	Crowned pavement crossfall of maximum 3% is preferred with road drainage to be designed to disperse runoff away from the pavement.
Road Overhead Clearance	6.3m for turbine component delivery. This is based on a maximum vehicle height of 5.5m plus clearance.

3.5 Existing Road Pavements

The existing road pavements for all public road segments and subsequent pavement upgrade, rehabilitation or strengthening works required to accommodate the wind farm construction traffic is to be informed by geotechnical pavement investigations and is not considered in the preliminary upgrades/repairs and treatments.

In sections where rain affected and deteriorated pavements have been identified, it is proposed to strengthen the road by stabilising the existing pavement and then overlaying with a suitable basecourse to achieve the required pavement strength capacity.

The pavement overlay is then followed by resurfacing with a bitumen seal to ensure that the rehabilitated pavement can sustain the heavy loading during wind farm construction without being

saturated when heavy rainfall is experienced. The extent of this type of upgrade work can only be assessed after detailed geotechnical investigations have been completed.

3.6 Public Roads - Council Standards

A meeting was held on 12/10/2023 with Walcha Sire Council Staff to discuss WSC's public road standards and specifications for the development of the required road upgrade and treatments that may be necessary to provide access for OSOM, HVs and LVs associated with the wind farm construction.

A brief overview of the preliminary road upgrade and treatments developed from *Austroads* and VRR was provided to WSC staff who advised the following:

- TfNSW specifications are preferred for any new or upgrade works along the Regional road network (Thunderbolts Way). Whilst this is Council's preference, further negotiations are recommended to progress and arrive at a mutually beneficial standard for any works required.
- Designs for any public road upgrades would need to be in accordance with the Austroads Guides as WSC does not have any engineering guidelines for developments.
- New seals would need to be a minimum of 7m wide. (3m lanes plus 0.5m shoulders on each side).
- Gravel resheeting would need to be undertaken in accordance with WSC specifications and that a copy of these specifications will be provided to the Proponent.
- Any gravel road upgrades would require a minimum width of 6.0m.
- Pavement marking is to be in accordance with the latest version of the Australian Standards and RMS Delineation Guides.
- The WSC cattle grid standard is the minimum standard to be adopted and a copy is to be forwarded to the Proponent.

4 Preliminary Design

The objectives for the public road upgrade and treatment scope of work for the wind farm access route are based on a framework that promotes efficiency in design and construction, economy and both consistency and safety for all road users during the different phases of the Project.

A brief description of the preliminary scope of work and draft design cross-sections of the public road and intersection upgrades/repair treatments proposed are included in **Appendix 1** and **Appendix 2** respectively and have been developed based on the following sub-sections below.

4.1 Road Upgrade and Treatment Works

The key conclusions derived from the detailed site inspections completed, the overall dimensions of the OSOM vehicles and *Austroads Guide to Road Design Part 3: Geometric Design* was used to determine the required road geometry (widths) based on the anticipated construction traffic volumes.

The following Annual Average Daily (wind farm construction) Traffic (AADT) is assumed and will be refined as the Project progresses:

- Local/Rural Roads AADT during peak construction to range from150-500 vehicles per day and to consist of a combination of windfarm construction traffic and local/residential traffic.
- Regional Roads AADT during peak construction to range from 500-1000 vehicles per day and to consist of a combination of windfarm construction traffic, local/residential traffic and through traffic connecting the New England Tablelands and the MidCoast regions.

Refer to **Figure 2** below from *Austroads Guide to Road Design Part 3: Geometric Design* showing the single carriageway rural road widths for the Design Average Annual Daily Traffic (Design AADT) used to determine the required road widths.

Figure 2: Austroads Rural Road Widths – Single Carriageway

Table 4.5: Single carriageway rural road widths (m)

Element	Design AADT				
	1–150	150–500	500–1000	1000–3000	> 3000
Traffic lanes(1)	3.7 (1 x 3.7)	6.2 (2 x 3.1)	6.2–7.0 (2 x 3.1/3.5)	7.0 (2 x 3.5)	7.0 (2 x 3.5)
Total shoulder	2.5	1.5	1.5	2.0	2.5
Minimum shoulder seal (2),(3),(4),(5),(6)	0	0.5	0.5	1.0	1.5
Total carriageway	8.7	9.2	9.2–10.0	11.0	12.0

1 *Traffic lane widths include centrelines but are exclusive of edge-lines.*
2 *Where significant numbers of cyclists use the roadway, consideration should be given to fully sealing the shoulders. Suggest use of a maximum size 10 mm seal within a 20 km radius of towns.*
3 *Wider shoulder seals may be appropriate depending on requirements for maintenance costs, soil and climatic conditions or to accommodate the tracked width requirements for Large Combination Vehicles.*
4 *Short lengths of wider shoulder seal or lay-bys to be provided at suitable locations to provide for discretionary stops.*
5 *Full width shoulder seals may be appropriate adjacent to safety barriers and on the high side of superelevation.*
6 *A minimum 7.0 m seal should be provided on designated heavy vehicle routes (or where the AADT contains more than 15% heavy vehicles).*

(Source: *Austroads*)

The desirable lane width on rural roads is 3.5m, which allows large vehicle to pass or overtake safely, with a minimum rural road width consisting of one lane of 3.7m wide. Taking into account the VRR, a minimum road pavement width of 6.2m and 0.5m wide shoulder is adopted on straight sections of road with additional shoulder widening proposed as per swept path requirements on curves. *Austroads Guide to Road Design Part 3: Geometric Design Table 7.13 – Curve widening per lane for current Austroads design vehicles*, will be a basis for implementing safety in design.

It should be noted that the basis of design for the road upgrades will be to enable OSOM deliveries to site and ensure the roads are safe and suitable to accommodate the traffic numbers expected during construction.

Upon completion of the wind farm construction, the road usage will reduce significantly back to the current volumes, this presents a unique design domain that needs to be discussed further between the relevant parties as it may not be economical or practical to upgrade these roads directly in accordance with Austroads for traffic volumes that will realistically only be on the roads for a far shorter period than the intended design life of the road.

Table 4 below summarises the proposed public road upgrades and repair treatments based on *Austroads Guides*, VRR and WSC requirements. Essential treatment for all impacted roads includes:

- Clear all road shoulders and extended clearing to cater for OSOM swept path widening/hardstands.
- Reinstate table drains, widen, and replenish road shoulders with gravel to the widths as per **Table 4** below and preliminary cross-sections.
- Minimum carriageway width to be achieved is 6.2m and minimum shoulder width is 0.5m (as per Vestas V162 requirements >7.2m overall width).

Table 4: Summary of Proposed Road Upgrades and Treatments.

Road Name	Description	Segment ID	Existing Conditions		Primary Treatment/Repair (Note 5)	Proposed Lane and Shoulder Width (m)
Thunderbolts Way (Note 2)	Uralla (Salisbury Street, Duke Street) to LGA Boundary	10	Not previously assessed	6.0-8.0	Road widening as required by further assessment.	7.0, 0.5 (Note 1)
Thunderbolts Way (Note 3)	LGA Boundary (Salisbury Plains) to Darjeeling Road	20	Not previously assessed	6.0-8.0	Road widening as required by further assessment.	7.0, 0.5 (Note 1)
Thunderbolts Way	Darjeeling Road to Jamieson Street (Emu Creek Road)	30	Moderate road failures	6.7	Shoulder reconstruction Stabilised pavement patching	7.0, 0.5 (Note 1)
Jamieson Street	Thunderbolts Way to Ohio Road (Emu Creek Road)	10	Moderate road failures	13.5	Stabilised pavement patching	13.5 (total width)
Ohio Road	Jamieson Street to Emu Creek Road	20	Moderate road failures	13.5	Stabilised pavement patching	13.5 (total width)
Emu Creek Road	Ohio Road to Winterbourne Road/Old Brookmount Road	30	Moderate road failures	6.6	Stabilised pavement patching Line marking	6.2. 0.5 (Note 1)
		40	Moderate road failures	7.2	Shoulder reconstruction Line marking	6.2, 0.5 (Note 1)
		50	Moderate road failures	5.6	Shoulder widening Line marking	6.2, 0.5 (Note 1)
		60	Moderate road failures	7.5	Shoulder reconstruction Line marking	6.2, 0.5 (Note 1)
		70-80	Minor to moderate road failures	5.6-5.9	Shoulder widening Line marking	6.2, 0.5 (Note 1)

Road Name	Description	Segment ID	Existing Conditions		Primary Treatment/Repair (Note 5)	Proposed Lane and Shoulder Width (m)
Winterbourne Road	Emu Creek Road to Blue Mountain Road	10-30	Minor road failures	5.4-6.0	Shoulder widening Stabilised pavement patching Line marking	6.2, 0.5 (Note 1)
	Blue Mountain Road to Table Top Road	40-70	Moderate road failures	6.0-6.1	Shoulder widening Stabilised pavement patching Line marking	6.2, 0.5 (Note 1)
Moona Plains Road (Note 4)	Winterbourne Road to Chainage 22.2	10-70	Minor to moderate road failures	5.3-6.0	Stabilised pavement patching Line marking	Maintain existing width
Bark Hut Road	Winterbourne Road to Chainage 10.0	10-20	Moderate road failures	3.0-3.5	Shoulder widening Gravel resheet	6.2, 0.5 (Note 1)
Blue Mountain Road (Note 4)	Winterbourne Road to Hazeldean Road	10	Minor road failures	3.4-5.1	Shoulder widening Gravel resheet	6.2, 0.5 (Note 1)
	Hazeldean Road to Chainage 3.9	20	Minor road failures	3.4-5.1	Gravel resheet	Maintain existing width
	Chainage 3.9 to Hillview Road	30	Not previously assessed	3.1-6.0	Gravel resheet	Maintain existing width
Uruga Road	Hazeldean Road to Chainage 1.0	10	Minor road failures	3.4-3.9	Shoulder widening Gravel resheet	6.2, 0.5 (Note 1)
Table Top Road	Winterbourne Road to Florida Road	10	Minor road failures	4.0-5.7	Gravel resheet	Maintain existing width
Table Top Road	Florida Road to Chainage 1.9	20	Minor road failures	4.0-5.7	Shoulder widening Gravel resheet	6.2, 0.5 (Note 1)
Florida Road	Table Top Road to Chainage 0.5	10	Minor road failures	3.1-6.0	Shoulder widening Gravel resheet	6.2, 0.5 (Note 1)
Rowleys Creek Road	Chainage 0.6 to Chainage 1.5	10	Minor road failures	3.1-3.2	Shoulder widening Gravel resheet	6.2, 0.5 (Note 1)
Hillview Road (Note 4)	Thunderbolts Way to Blue Mountain Road	10	Not previously assessed	3.1-6.0	Gravel resheet	Maintain existing width

Note 1: Lane and shoulder width (m) for single carriageway rural roads, respectively.

Note 2: *This section of Thunderbolts Way forms part of Uralla Shire Council impacted roads and is included to provide context to the proposed wind farm access route and has not been assessed under this preliminary road upgrade investigation.*

Note 3: *This section of Thunderbolts Way forms part of the Walcha Shire Council impacted roads but has not been assessed at this time. Proposed treatments for this section are based on the general known condition and will need to be confirmed and verified through site inspections.*

Note 4**:** *The existing road geometry will be maintained where HV & LV only access is required on Moona Plains Road, Blue Mountain Road and Hillview Road.*

Note 5: *Additional works may include upgrade to increase subgrade and pavement strength by stabilisation, overlay and reseal which may be required to resist damage during adverse weather conditions.*

Preliminary typical cross-sections have been developed to illustrate the extent of works required and are included in **Appendix 2.**

4.2 Site Access Points (SAPs)

There are twenty-three (23) site access points (SAPs) within the WSC LGA which provide access to the proposed wind farm access tracks. The basis for design of the site access points is the rural property access specifically designed for articulated vehicles. Further details of the site access points shall be explored in the Traffic Impact Assessment (TIA) for the project.

For wind farm construction, the largest construction related vehicles required for ingress and egress from SAPs consist of OSOM and B-double heavy vehicles. Whilst OSOM vehicle access is not required at all SAPs, it is proposed that the basis of design will be the typical rural property access with the following modifications only where required:

- Setback from the pavement edge to the grid or inward opening to increase from 19m to 28m.
- Driveway pavement width to be widened to accommodate the swept path of the relevant design vehicle:
    - Class 2 Heavy Vehicle (B-Double); or
    - Class 1 RAV Over-mass Vehicle (OSOM vehicles).

An initial review of the proposed SAP locations has identified some locations that may require further investigations such as survey to confirm the extent of SAP construction impacts relative to the road reserve and private property boundaries.

All SAP locations will be reviewed during the detailed design stages in consultation with Council and the relevant landholders to verify that the site entries accommodate OSOM access and ensure the safety of other road users. **Table 5** below summarises the SAP locations and potential impacts.

Table 5: SAP Locations and Potential Impacts

Road Name	SAP ID	SAP Potential Impacts
Blue Mountain Road	SAP 01	No potential impacts identified in preliminary investigations.
Intersection Blue Mountain Road and Hazeldean Road	SAP 02	Road reserve boundary and private property potential impact.
Winterbourne Road	SAP 03	No potential impacts identified in preliminary investigations.
Intersection Hazeldean Road and Uruga Road	SAP 04	Road reserve boundary and private property potential impact.
Uruga Road	SAP 05	Road reserve boundary and private property potential impact.
Winterbourne Road	SAP 06	No potential impacts identified in preliminary investigations.
Florida Road	SAP 07	Road reserve boundary and private property potential impact.
Table Top Road	SAP 08	Road reserve boundary and private property potential impact.
Table Top Road	SAP 09	Road reserve boundary and private property potential impact. Survey Permanent Marker (PM158307) nearby.
Bark Hut Road	SAP 10	Road reserve boundary and private property potential impact.

Bark Hut Road	SAP 11A and 11B	No potential impacts identified in preliminary investigations.
Bark Hut Road	SAP 12	Road reserve boundary and private property potential impact.
Bark Hut Road	SAP 13	Road reserve boundary and private property potential impact.
Bark Hut Road	SAP 14	No potential impacts identified in preliminary investigations.
Rowleys Creek Road	SAP 15	No potential impacts identified in preliminary investigations.
Rowleys Creek Road	SAP 16	Road reserve boundary and private property potential impact.
Moona Plains Road	SAP 17A and 17B	Road reserve boundary and private property potential impact.
Moona Plains Road	SAP 18A and 18B	No potential impacts identified in preliminary investigations.
Moona Plains Road	SAP 19A and 19B	No potential impacts identified in preliminary investigations.

4.3 Public Road Structures

In 2022, the Proponent engaged the Kelley Covey Group to complete a comprehensive Condition and Dilapidation Survey of the impacted roads associated with the Winterbourne Wind Farm construction. Subsequent site investigations were conducted to audit the road structures identified in the Kelley Covey Report (2022) as requiring work and all major structures which included four bridges, one large box culvert (spans exceeding 1200 mm), 80 minor culverts and two causeways to determine the scope of work required.

This high level review identified:

- The structures to be assessed against the critical design vehicle.
- The structures requiring further investigation and assessment.
- A preliminary scope of works.

Based on the results, the assessed bridges on Moona Plains Road, Winterbourne Road, and Table Top Road are likely to have adequate strength for the wind farm vehicles.

The width of the Winterbourne Road bridge should be reviewed due to the curvature of the approaches as it was noted that the abutments have adequate space on the northern side to accommodate an additional deck plank (approximately 600 mm), should the bridge need widening.

The width of the Table Top Road bridge is deemed inadequate. There is however adequate space to widen this bridge on either side with an existing side track located on the right hand side (travelling east), alternatively, a new temporary bridge could be constructed subject to further investigation and discussions with WSC and the relevant landowner.

Additional analysis is required for Emu Creek Road Bridge to determine if the substructure (headstock and piles) have adequate capacity for the transformer vehicle as the design actions from the assessment vehicle were found to be higher than the original design loading for the structure.

The audit of the culverts consisted of initial visual inspections on selected structures to ground truth the in-depth investigations completed by the Kelley Covey group, followed by Tier 1 assessments for large

and minor culverts where the theoretical capacity is assessed. The structural assessment process involved evaluating if a structure will be considered acceptable for the proposed vehicles (known as assessment vehicles) if it has adequate theoretical structural capacity and is assessed as fair to good condition.

All culverts were identified as having adequate theoretical capacity for OSOM vehicles (condition notwithstanding) if sufficient cover is provided. During detailed design it can be determined if the upgrade itself is enough to provide sufficient cover, alternatively if cover or capacity requirements cannot be achieved, then replacement of culverts may be required.

For minor culverts where structural deterioration was noted, it is recommended to replace the culvert due to the risk of failure considering the marginal variation in remediation versus replacement costs.

Refer to **Appendix 3** for the Phase 1 Structures Report detailing the basis of design used to determine the preliminary repair and upgrade treatments and additional investigations required.

4.4 Ancillary Road Infrastructure

Road Furniture and Lighting

Current road furniture in place includes guideposts and standard road signage (directional, information/tourist, regulatory and warning signage) which are to be retained or updated during the final design stages. The final designs will determine guardrail and other road furniture requirements when the pavement designs are considered, and extent of works are finalised.

Street lighting at the impacted intersections is not included in the proposed upgrade and turn treatments.

Utilities

Impacts to power and communications utilities by the works will be assessed through the detailed design stage.

Cattle Grids

The replacement of existing cattle grids will be in accordance with the WSC requirements as a minimum.

On OSOM routes the adjacent auxiliary gate will be utilised where possible due to the mass of the vehicles. The approaches to the auxiliary gates will be upgraded according to the route standard for OSOM delivery.

Where the auxiliary gate is not accessible, a cattle grid constructed to cater for the relevant width and strength requirements will be required.

4.5 Conflict Points (Vertical and/or Horizontal Curve Improvements)

To meet the VRR parameters for the OSOM deliveries as set out in **Section 3.4** Vertical and Horizontal Standards – Vestas Road Requirements, the existing road center line and surrounding terrain must be captured through survey to model the OSOM critical design/assessment vehicle as an input providing preliminary OSOM vehicle tracking (showing the assessment vehicle swept path and potential conflict points with the existing terrain).

The swept path review will be completed in the initial stages of design with suitable solutions developed targeting vertical or horizontal curve improvements as required. It is anticipated that Bark Hut Road and Rowleys Creek Road will require vertical and horizontal curve improvement works to provide suitable access to OSOM delivery vehicles. The initial review of Bark Hut Road identified thirty-two potential conflict points along the entire length of road to be used as part of the wind farm access route and are to be reviewed by the model to determine the extent of works required.

All public roads to form part of the OSOM delivery route will be modelled against the critical design vehicles to identify any vertical and/or horizontal curve improvement requirements. The conflict points identified will be scoped and included in the following stages of design for review and approval by the relevant road authorities.

4.6 Potential Property Boundary Impact Locations

The public roads proposed to be used by the Project were found to not always be located within the designated road reserve according to publicly available cadastral information. As a result, in line with contemporary cadastral surveying practices, the existing fence lines will preliminarily be used to define the road corridor for the purpose of road design extents. It is noted that some sections of the council roads have no fencing with cattle grids located at property boundaries with adjacent landowners to restrict the movement of livestock between these properties.

The proposed road upgrades and repair treatments predominantly include reinstatement of roadside drainage, road shoulder widening and road shoulder reconstruction with most sections of roads to be treated through stabilised pavement patching. Wherever possible, permanent road works will be designed to avoid encroachment into private property and are to remain within the existing boundary fences.

No new public dedicated roads are proposed for the Project within WSC, and the Project only proposes upgrades and repair treatments to existing council road infrastructure.

The preliminary scope of works is recommended to follow the existing alignment unless straightening is required for OSOM deliveries. OSOM vehicle swept path analyses, to be completed in the following stages, will refine the number and extent of impact locations and are subject to further discussions with council and the relevant landowners through detailed design.

In the event of encroachment, the Proponent aims to have the following in place:

- The Proponent aims to have access agreements in place with host landholders to ensure all access tracks that serve another property can be utilised throughout the operational life of the Project.
- Where widening of tight bends or intersections is required to facilitate OSOM movements, the Proponent aims to have access agreements in place with the relevant landholders to construct, maintain, and use the widened areas throughout the operational life of the Project.
- The anticipated public road upgrades and repair treatments are unlikely to require access into adjacent private property. Where required, appropriate property boundary surveys will be undertaken by a registered Land Surveyor to determine the legal extent of the public road reserve.

4.7 Additional Impacts

The Proponent has been informed by WSC that Council has received state government funding to construct a pedestrian footpath from Walcha township to the Summervale Village located approximately 5.5km along Emu Creek Road.

Council also informed the Proponent that government funding was granted to undertake urgent rehabilitation works in Derby Street with the wind farm construction having the potential to impact the critical rehabilitation works if construction was to be completed concurrently.

4.8 Environmental Assessment

Crown Land

At this stage of the investigation, one (1) parcel of Crown Land has been identified on Emu Creek Road at the Emu Creek Road bridge, located at chainage 5.3km.

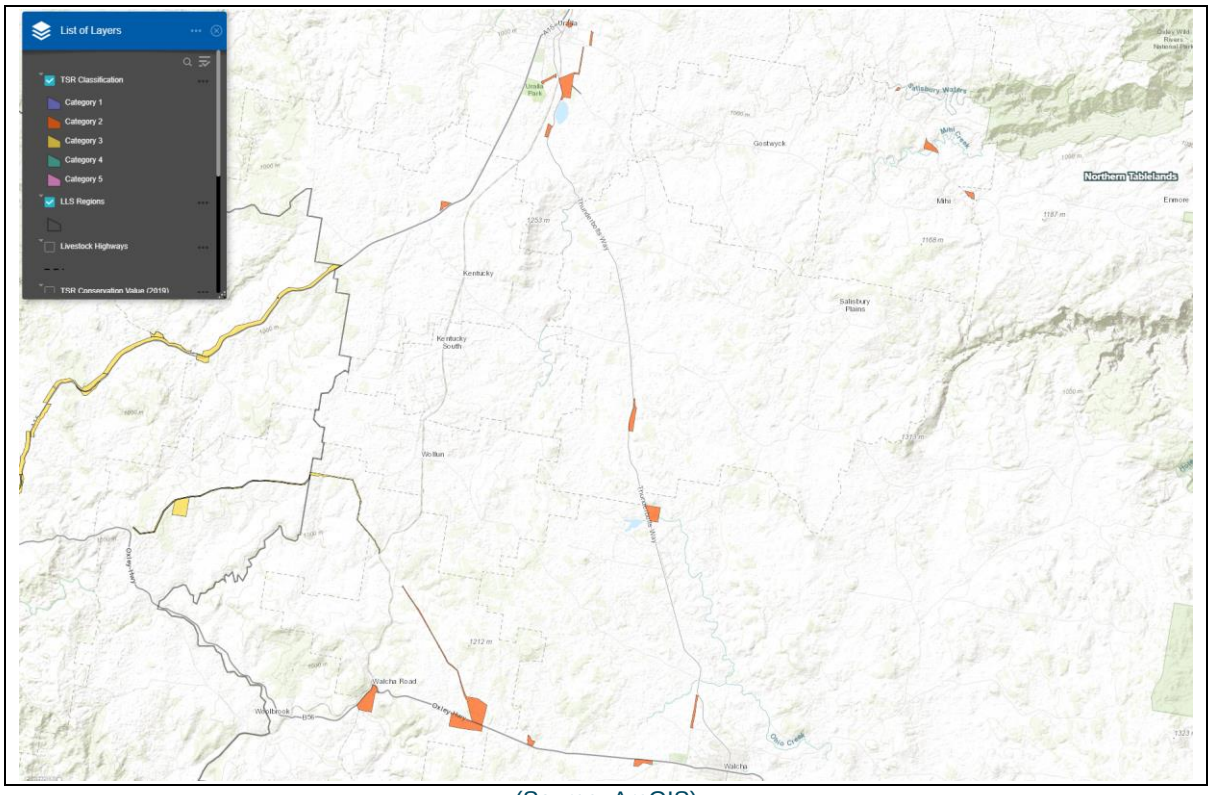
As part of the ongoing investigations and optimisation of the Project, should any Crown Land be affected by the Project, the Proponent shall consult with Crown Land and the relevant council regarding land dedication requirements.

Travelling Stock Route

Five (5) Travelling Stock Routes (TSR) have been identified in the preliminary scope of this investigation and are located between Uralla and Walcha along Thunderbolts Way as shown in **Figure 3** below. Impacts to the identified TSRs are deemed to be low risk with any upgrade or treatment works along Thunderbolts Way to remain within the existing boundary fences.

As part of the ongoing investigations and optimisation of the Project, should any of the identified TSRs be affected by the Project, the Proponent shall liaise with Local Land Services (LLS) and the relevant road authority regarding any consents and/or agreements that may be necessary.

Figure 3: Travelling stock routes identified along Thunderbolts Way



(Source: ArcGIS)

5 Conclusion

Upgrade Schedule

This report and upgrade schedule included in **Appendix 1** is intended to provide a preliminary overview of the required road upgrade and treatment works to inform on the viability of the proposed access routes, narrow down the options for road access and obtain agreement and further negotiations with the relevant road authorities and land holders.

The preliminary scope and high-level assessment of the proposed access route options identified aim to assist in the decision-making process and to form an agreed basis for design.

Assumptions

Structural Pavement Design

The structural pavement designs will be completed during the design process when undertaking geotechnical investigations and taking into account the refined Project construction traffic and construction program.

6 References

- Vestas – Winterbourne Wind Farm Road, Bridge and Culvert Condition and Dilapidation Survey, Walcha NSW. Report prepared by Kelly Covey Group Pty Ltd dated September 2022.
- RJA Transport Combinations – Newcastle to Winterbourne Wind Farm Route Study received January 2024.

Appendix 1: Preliminary Road Upgrade and Treatment Schedule

Project Name: **Winterbourne Wind Farm**

Project Number: **2023059**

Local Council Location: **Walcha Shire Council**

Road Upgrade / Treatment Schedule

Notes:

Blanket Treatment for all Roads - Clear Road Shoulders

- Reinstate Table Drains

Minimum Width on straight section of road is 6.2m as per Vestas V162 requirements (+1m sway = 7.2m)

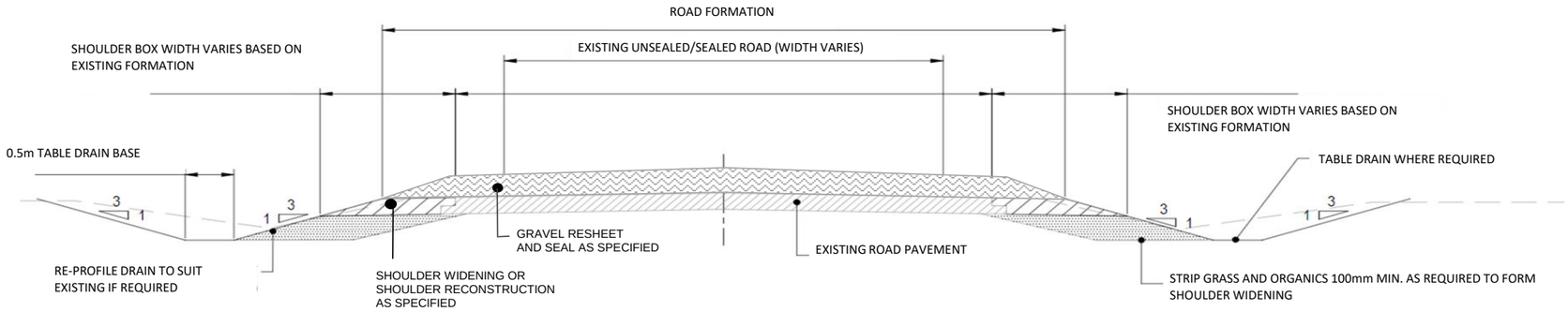
Intersection Treatments Subject to Intersection Analysis based on Design Traffic

Road/Intersection	Segment	Start Ch (km)	End Ch (km)	Length (km)	Seal Width (m)	Shoulder (m)	Vehicle Types	Existing Road Condition	Treatment / Upgrade Works	Operational Phase	Typical Cross-Section
Thunderbolts Way											
Thunderbolts Way - Uralla (Salisbury Street, Duke Street) to LGA Boundary	10	0	25.5	25.5	6.0-8.0	UKN	OSOM, HV, LV	Not previously assessed	* - Road widening - Stabilised patching as required - Linemarking	Reactive Maintenance - Sealed Road	-
Thunderbolts Way - LGA Boundary (Salisbury Plains) to Darjeerling Road	20	25.5	38.6	13.1	6.0-8.0	2.1-1.6	OSOM, HV, LV	Not previously assessed	* - Road widening - Stabilised patching as required - Linemarking	Reactive Maintenance - Sealed Road	-
Thunderbolts Way (Darjeerling Road Intersection)	30	38.6	40.1	1.5	6.7	3.0-1.8	OSOM, HV, LV	Moderate Failures - Rutting, flushing, cracking, potholes, shoving, pavement deformation, stripping	- Shoulder Reconstruction - Stabilised Patching - Moderate - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section B
Emu Creek Road											
Intersection - Derby St and Jamieson St	1						OSOM, HV, LV	Poor condition	**- BAL Turn Treatment (AUL(S) to satisfy TfNSW minimum requirements)** **- OSOM Swept Path Widening**	Reactive Maintenance - Sealed Road	-
Emu Creek Road - Jamieson St - Derby St Int	10	0	0.6	0.6	13.5	K&G	OSOM, HV, LV	Moderate Failures - Rutting, flushing, cracking, potholes	- Stabilised Patching - Minor - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section C
Emu Creek Road - Ohio Rd	20	0.6	0.9	0.3	13.5	0.5-0.5	OSOM, HV, LV	Moderate Failures - Rutting, flushing, crocodile-, logitudinal cracking, potholes, edgebreaks, pavement deformation	- Stabilised Patching - Minor - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section C
Intersection - Ohio Rd and Emu Creek Rd	21						OSOM, HV, LV		**No Intersection Turn Treatment (No OSOM turning movements)**	Reactive Maintenance - Sealed Road	
Emu Creek Road - Ohio Rd Intersection	30	0.9	1.52	0.62	6.6	1.5-0.5	OSOM, HV, LV	Moderate Failures - Rutting, flushing, cracking, potholes, edge breaks, pavement deformation	- Stabilised Patching - Minor - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section C
Emu Creek Road	40	1.52	2.5	0.98	7.2	1.0	OSOM, HV, LV	Moderate Failures - Rutting, cracking, shoving, ravelling, potholes, pavement failure, pavement deformation	- Shoulder Reconstruction - Stabilised Patching - Moderate - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section B
	50	2.5	5.5	3	5.6	0.5-1.0	OSOM, HV, LV	Moderate Failures - Rutting, cracking, shoving, ravelling, potholes, pavement failure, pavement deformation	- Shoulder Widening - Stabilised Patching - Moderate - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section B
	60	5.5	6.5	1	7.5	0.5-1.0	OSOM, HV, LV	Moderate Failures - Rutting, cracking, shoving, edgebreaks, potholes, pavement failure, pavement deformation	- Shoulder Reconstruction - Stabilised Patching - Moderate - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section B
	70	6.5	7.94	1.44	5.9	0.7-1.0	OSOM, HV, LV	Moderate Failures - Rutting, flushing, cracking, shoving, edge breaks, potholes, pavement failure, pavement deformation	- Shoulder Widening - Shoulder Reconstruction - Stabilised Patching - Moderate - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section B
	80	7.94	10.23	2.29	5.6	0.5-1.0	OSOM, HV, LV	Minor Failures - Rutting, edge breaks, cracking, pavement deformation	- Shoulder Widening - Stabilised Patching - Minor - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section B
Winterbourne Road											
Winterbourne Road - Emu Ck Rd Int (At Old Brookmount Rd)	10	0	2.5	2.5	5.8	0.5-1.0	OSOM, HV, LV	Minor Failures - Rutting, flushing, edge breaks, cracking, pavement deformation	- Shoulder Widening - Stabilised Patching - Minor - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section B
Winterbourne Road (Emu Creek Road to Blue Mountain Road)	20	2.5	3.5	1	5.4	0.5-1.0	OSOM, HV, LV	Minor Failures - Rutting, flushing, edge breaks, cracking, pavement deformation	- Shoulder Widening - Stabilised Patching - Minor - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section B
	30	3.5	5	1.5	6	0.5-1.0	OSOM, HV, LV	Minor Failures - Rutting, cracking, edge breaks, flushing, shoving, pavement deformation	- Shoulder Widening - Stabilised Patching - Minor - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section B
Winterbourne Road (Blue Mountain Road to Table Top Road)	40	5	7	2	6.1	0.5-1.0	OSOM, HV, LV	Minor Failures - Rutting, flushing, cracking, edge breaks, cracking, pavement deformation	- Shoulder Widening - Stabilised Patching - Minor - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section B
	50	7	9	2	6.1	0.5	OSOM, HV, LV	Moderate Failures - Rutting, cracking, shoving, ravelling, potholes, pavement failure, pavement deformation	- Shoulder Widening - Stabilised Patching - Moderate - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section B
	60	9	12.5	3.5	6	0.5-1.0	OSOM, HV, LV	Moderate Failures - Rutting, flushing, cracking, shoving, edge breaks, potholes, pavement failure, pavement deformation	- Shoulder Widening - Stabilised Patching - Moderate - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section B
	70	12.5	15.5	3	6	0.5-1.0	OSOM, HV, LV	Minor Failures - Rutting, flushing, edge breaks, cracking, pavement deformation	- Shoulder Widening - Stabilised Patching - Minor - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section B
Moona Plains Road											
Intersection - Emu Creek Road and Moona Plains Road	1						HV, LV		**- BAR Turn Treatment**	Reactive Maintenance - Sealed Road	-
Moona Plains Road - Emu Cr Rd Int	10	0	3	3	5.8	0.5-1.0	HV, LV	Moderate Failures - Rutting, cracking, shoving, seal delamination, pavement deformation, edge breaks, flushing, potholes	- Stabilised Patching - Moderate - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section C
Moona Plains Road	20	3	6	3	6	0.5-1.0	HV, LV	Minor Failures - Rutting, flushing, cracking, edge breaks, shoving, pavement deformation	- Stabilised Patching - Minor - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section C
	30	6	12.35	6.35	5.8	0.2-1.0	HV, LV	Minor Failures - Rutting, flushing, cracking, edge breaks, shoving, pavement deformation	- Stabilised Patching - Minor - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section C
	40	12.35	13.5	1.15	5.3	0.2-0.4	HV, LV	Moderate Failures - Rutting, cracking, shoving, seal delamination, pavement deformation, edge breaks, flushing, potholes	- Stabilised Patching - Moderate - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section C
Moona Plains Road (To Rowleys Creek Road)	50	13.5	16.2	2.7	5.6	0.0-0.5	HV, LV	Minor Failures - Rutting, flushing, cracking, potholes	- Stabilised Patching - Minor - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section C
Moona Plains Road (Lockyer Lane)	60	16.2	19.2	3	6	0.0-0.5	HV, LV	Minor Failures - Rutting, flushing, cracking, potholes	- Stabilised Patching - Minor - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section C
Moona Plains Road	70	19.2	22.07	2.87	5.5	0.0-0.2	HV, LV	Minor Failures - Rutting, flushing, cracking, edge breaks, shoving, edge breaks, pavement deformation	- Stabilised Patching - Minor - Linemarking (CL)	Reactive Maintenance - Sealed Road	Typical Cross-Section C

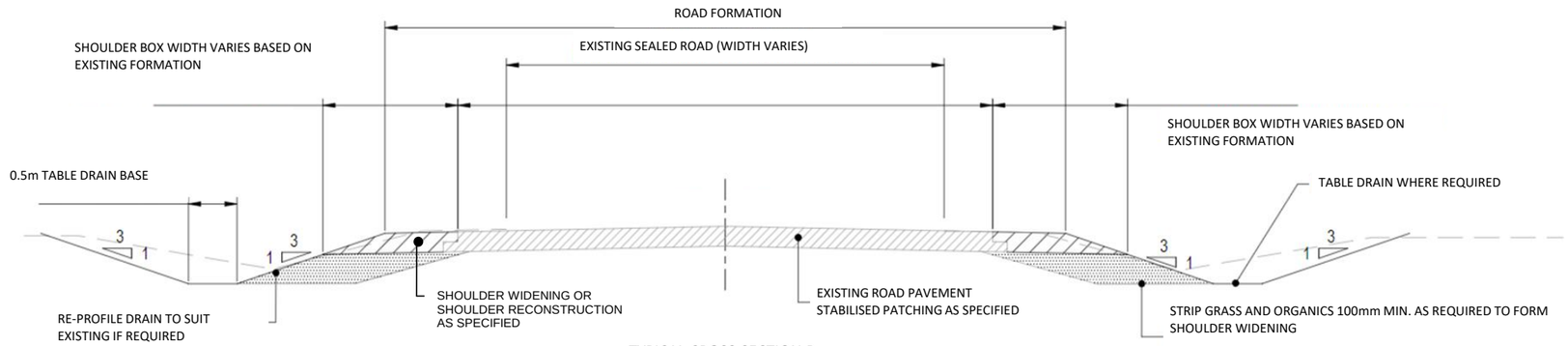
Road/Intersection	Segment	Start Ch (km)	End Ch (km)	Length (km)	Width (m)	Pavement	Vehicle Types	Existing Road Condition	Treatment / Upgrade Works	Operational Phase	Typical Cross-Section
Bark Hut Road											
Intersection - Winterbourne Road and Bark Hut Road	1					Unsealed	OSOM, HV, LV	Moderate Failures - Rutting, flushing, cracking	**- BAR Turn Treatment** **- OSOM Swept Path Widening**	Reactive Maintenance - Unsealed Road	-
Bark Hut Road	10	0	5.3	5.3	3.5	Unsealed	OSOM, HV, LV	Moderate Failures - Rutting, corrugations, pavement deformation, loss of gravel	- Vertical and Horizontal Curve Improvements - Shoulder Windening - Gravel resheet	Reactive Maintenance - Unsealed Road	Typical Cross-Section A
	20	5.3	10.04	4.74	3	Unsealed	OSOM, HV, LV	Moderate Failures - Rutting, corrugations, potholes, pavement deformation, loss of gravel	- Vertical and Horizontal Curve Improvements - Shoulder Windening - Gravel resheet	Reactive Maintenance - Unsealed Road	Typical Cross-Section A
Blue Mountain Road											
Intersection - Blue Mountain Road and Winterbourne Road	1					Sealed	OSOM, HV, LV	Minor Failures - Rutting, flushing, cracking, potholes	**- Clear the Clear Zone** **- OSOM Swept Path Widenning**	Reactive Maintenance - Sealed Road	-
Blue Mountain Road	10	0	9.84	9.84	3.4-5.1	Unsealed	OSOM, HV, LV	Minor to Moderate Failures - Rutting, potholes, pavement deformation, loss of gravel	- Shoulder Windening - Gravel resheet	Reactive Maintenance - Unsealed Road	Typical Cross-Section A
Intersection - Blue Mountain Road and Hazeldean Road	1					Unsealed	OSOM, HV, LV		**- Clear the Clear Zone** **- OSOM Swept Path Widenning**	Reactive Maintenance - Unsealed Road	-
Blue Mountain Road	20	9.84	13.74	3.9	3.4-5.1	Unsealed	HV, LV	Minor to Moderate Failures - Rutting, potholes, pavement deformation, loss of gravel	- Shoulder Windening - Gravel resheet	Reactive Maintenance - Unsealed Road	Typical Cross-Section A
Blue Mountain Road	30	13.74	17.84	4.1	-	Unsealed	HV, LV	Not previously assessed	- Shoulder Windening - Gravel resheet	Reactive Maintenance - Unsealed Road	Typical Cross-Section A
Hillview Road											
Intersection - Blue Mountain Road and Hillview Road	1					Unsealed	HV, LV	Not previously assessed	**- Clear the Clear Zone**	Reactive Maintenance - Unsealed Road	-
Hillview Road	10	0	12.1	12.1	3.4-5.1		HV, LV	Not previously assessed	- Maintain existing	Reactive Maintenance - Unsealed Road	-
Uruga Road											
Intersection - Hazeldean Road and Uruga Road	1					Unsealed	OSOM, HV, LV		**- OSOM Widening Swept Path/Intersection Realignment**	Reactive Maintenance - Unsealed Road	-
Uruga Road	10	0	1	1	3.4-3.9	Unsealed	OSOM, HV, LV	Minor Failures - Rutting, potholes, loss of gravel	- Shoulder Windening - Gravel resheet	Reactive Maintenance - Unsealed Road	Typical Cross-Section A
Table Top Road											
Intersection - Winterbourne Road and Table Top Road	1					Unsealed	OSOM, HV, LV	Minor Failures - Rutting, potholes, loss of gravel	**No Intersection Turn Treatment (No OSOM turning movements)**	Reactive Maintenance - Unsealed Road	-
Table Top Road	10	0	2.3	2.3	4-5.7	Unsealed	LV	Moderate Failures - Rutting, potholes, pavement deformation, loss of gravel	- Gravel resheet	Reactive Maintenance - Unsealed Road	Typical Cross-Section A
Table Top Road	20	2.3	4.2	1.9	4-5.7	Unsealed	OSOM, HV, LV	Moderate Failures - Rutting, potholes, pavement deformation, loss of gravel	- Shoulder Windening - Gravel resheet	Reactive Maintenance - Unsealed Road	Typical Cross-Section A
Rowleys Creek Road											
Intersection - Moona Plains Road and Rowleys Creek Road	1					Sealed		Minor Failures - Rutting, potholes, pavement deformation, loss of gravel	**No Intersection Turn Treatment (No OSOM turning movements)**	Reactive Maintenance - Sealed Road	
Rowleys Creek Road	10	2.4	3.1	0.7	3.1-3.2	Unsealed	OSOM, HV, LV	Minor Failures - Rutting, potholes, pavement deformation, loss of gravel	- Shoulder Windening - Gravel resheet	Reactive Maintenance - Unsealed Road	Typical Cross-Section A
Florida Road											
Intersection - Table Top Road and Florida Road	1					Unsealed		Minor Failures - Rutting, potholes, pavement deformation, loss of gravel	**No Intersection Turn Treatment (No OSOM turning movements)**	Reactive Maintenance - Sealed Road	
Florida Road	10	0	0.5	0.5	3.1-3.2	Unsealed	OSOM, HV, LV	Minor Failures - Rutting, potholes, pavement deformation, loss of gravel	- Shoulder Windening - Gravel resheet	Reactive Maintenance - Unsealed Road	Typical Cross-Section A

* This section of Thunderbolts Way forms part of Uralla Shire Council impacted roads and is included to provide context to the proposed wind farm access route and has not been assessed under this preliminary road upgrade investigation

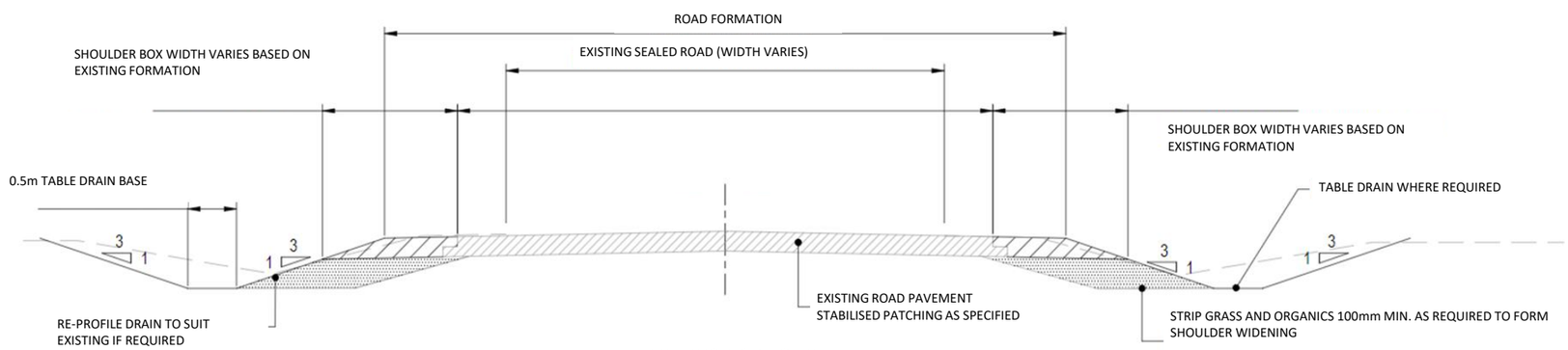
Appendix 2: Preliminary Typical Cross-Sections



TYPICAL CROSS-SECTION A



TYPICAL CROSS-SECTION B



TYPICAL CROSS-SECTION C

Appendix 3: Phase 1 Structures Report

constructive solutions

Civil | Structural | Environmental

Winterbourne Wind Farm

Preliminary Structures Investigation

Prepared for

WinterbourneWind Pty Ltd

February 2024

Zenviron

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1.2 Purpose and Scope of Report 1
2 Preliminary Bridge Assessments 1
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2.3 Results 4
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3.2 Results 5
Appendix 1: Assessment Vehicles ..... A

1 Introduction

1.1 Background

This Preliminary Road Structures Investigations Report has been prepared by Constructive Solutions Pty Ltd (CSPL) to provide information on the suitability of existing road structures within the Walcha Shire Council area for Over Size and Over Mass (OSOM) vehicle access into the Winterbourne Wind Farm (WBWF) development (the Project).

The Project is located to north and east of Walcha, with the centre of the project approximately 20km northeast of the township. The Project is located within the New England Renewable Energy Zone (NE REZ) declared under the *Electricity infrastructure Act 2020 (NSW)*. The Project involves the construction, operation and maintenance of up to 118 wind turbines including associated road and electrical infrastructure to connect the wind farm to the electricity network.

Winterbourne Wind Farm will be seeking State Significant Development (SSD) consent under division 4.7 of the *Environmental Planning & Assessment Act 1979 (EP&A Act)* for The Project and requires a detailed Environmental Impact Statement (EIS) to be prepared in accordance with the NSW Government's Wind Energy Framework. The status of The Project is currently at the Response to Submissions stage.

1.2 Purpose and Scope of Report

The purpose of this report is to summarise the findings of the Phase 1 assessment of structures on the proposed access routes.

- Undertake preliminary assessments of the capabilities of bridges along the proposed route to support OSOM vehicles;
- Determine the extent of work likely to be required on bridges; and
- Identify treatments for culvert and causeway structures along the proposed routes that had previously been identified as deficient.

2 Preliminary Bridge Assessments

2.1 Methodology

Austroads *Higher Order Bridge Assessment in Australia* (2018), outlines three tiers of assessments for heavy vehicle access to bridges:

- Tier 1: Access assessment based upon comparison of reference and assessment vehicles;
- Tier 2: Grillage or numerical model incorporating the capacity of the structure for an assessment vehicle; and
- Tier 3: Advanced numerical modelling or experimental testing / monitoring to provide access.

Tier 1 assessments are the simplest, cheapest method of assessment, and hence is the methodology adopted for this preliminary assessment. The methodology is further explained below.

A Tier 1 assessment involves comparing the effects (bending moment, shear and reaction forces) of the vehicle for assessment to those of a reference vehicle which has previously been verified as suitable for the structure. If the effects from the assessment vehicle are less than those from the reference vehicle, the assessment vehicle can be provided access. If not, then the vehicle can be denied access, higher tier assessments can be performed, or alternative management options could be undertaken depending upon the situation. The Tier 1 assessment process is illustrated in **Figure 1** below.

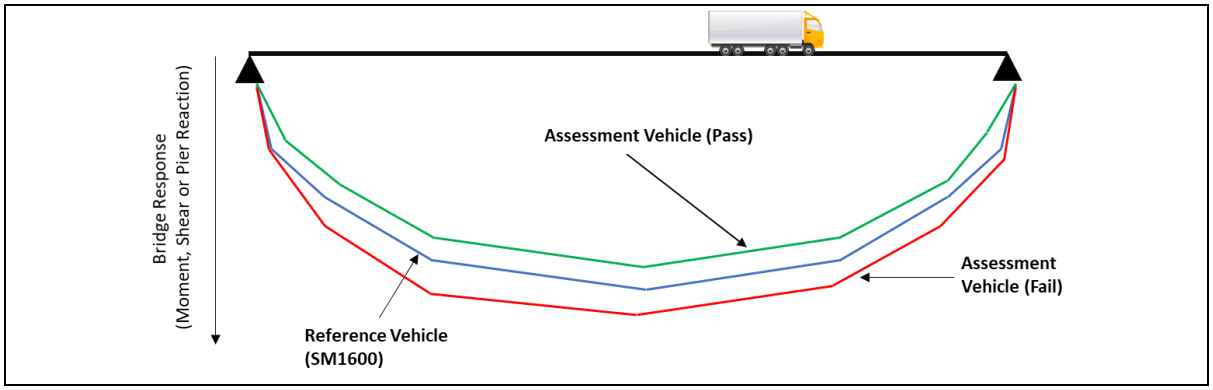


Figure 1:Tier 1 Vehicle Assessment

A Tier 1 assessment is only applicable if:

- The bridge was adequately designed for the reference vehicle in accordance with the Australian bridge design code applicable at the time of construction[1];
- The bridge is in the same structural condition as when it was constructed or assessed for the reference vehicle;
- The assessment vehicle has a similar axle footprint (ground contact width and number of wheels) as the reference vehicle; and
- The assessment vehicle is traveling along the same pathway as the reference vehicle (i.e. within the lane of traffic, straddling the centreline, etc.).

For this project, the wind farm vehicles have a different axle footprint and position (OSOM vehicles, straddling across two lanes) to the vehicles for which the bridges were originally designed (one semi-trailer in each lane). To compensate for this, 2D grillage models of each bridge were prepared to enable the comparison of bending, shear, and pier reactions between OSOM and in-lane vehicles. An example of one of the grillage models prepared is shown below in **Figure 2** below.

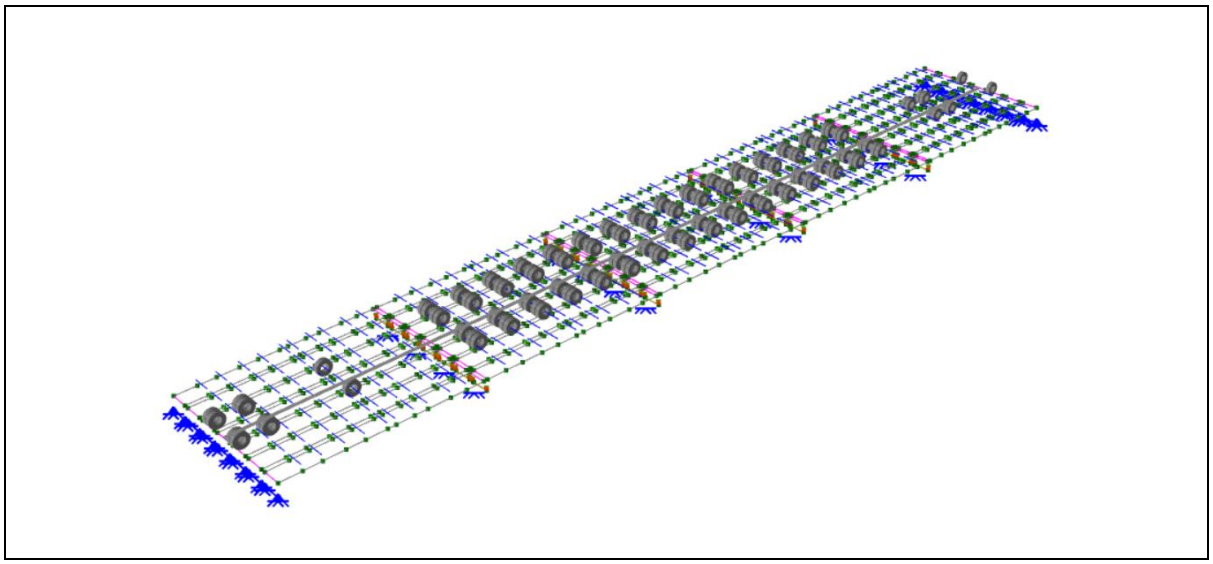


Figure 2: Grillage model of Emu Creek Bridge with OSOM Vehicle

[1] There is a risk that bridge codes may have changed between the time a bridge was designed, and when it was constructed. Council should ensure that the appropriate reference vehicle is being considered.

2.2 Bridges and Vehicles Assessed

The impacted bridges assessed under this preliminary investigation, their assumed reference vehicles (vehicle types used in the original design of the structure), Dynamic Load Allowance (DLA) and Live Load Factor (LLF) are listed below in **Table 1**.

The DLA is a quantitative measure of the dynamic effects exerted on the structure by moving vehicles in addition to static loading. Live load factors are defined for service and strength limit states and is used to determine the live load-carrying capacity of the bridge.

Table 1: Wind Farm Access Route Impacted Bridges

Bridge	No. Lanes	Carriageway Width (m)	Reference Vehicle	Reference Vehicle DLA	Reference Vehicle LLF
Emu Creek Road. Ch 5.5km from Derby St.	2	8.1	T44	0.3	2.0
Moona Plains Road. Ch 20.6km from Emu Creek Road.	2	7.1	T44	0.3	2.0
Winterbourne Road. Ch 5.1km from Old Brookmount Road	1	6.3	MS18	0.3	2.0
Table Top Road. Ch 3.3km from Winterbourne Road	1	4.6	T44	0.3	2.0

The bridges were assessed for the vehicles listed in **Table 2**. Further details of the assessment vehicles (including axle spacings and masses) are included in **Appendix 1**.

Table 2: Preliminary Assessment Vehicles

Vehicle	Reference Vehicle DLA	Reference Vehicle LLF
170 t transformer vehicle	0.1	1.5
V172 85 m blade vehicle	0.1	1.5
Hub 62.1 t vehicle	0.1	1.5
V172 PT 106 t vehicle	0.1	1.5
90 t bookend tower	0.1	1.5
90 t extending tower vehicle	0.1	1.5

The assessments assumed that the wind farm vehicles:

- Are restricted to a travel speed of 10 km/hr;
- Travel along the centreline of the bridge (±1 m);
- Axle loads are confirmed prior to transporting; and
- No other vehicles are permitted on the bridge at the same time as the assessment vehicle.

It is noted that vehicle selection has not been finalised, and that the assessments will need to be revisited at a later stage in the project. The purpose of these preliminary assessments is to identify the likely extent of detailed assessment and any strengthening works required to cater for the OSOM deliveries.

2.3 Results

The results are presented as an 'Equivalence Ratio for Bridges' (ERB) as per the QLD Department of Transport and Main Roads Tier 1 Bridge Heavy Load Assessment Criteria (2013). The ERB is the ratio of the effects from the reference vehicle divided by the actions from the assessment vehicle. ERB results over 1 indicate that the assessment vehicle imparts lower actions on the bridge than the design vehicle, and hence can be granted access without further assessment (unless condition issues are identified).

ERB ratings for key components of the bridges are presented below in **Table 3**.

Table 3: Tier 1-2D Bridge Assessment Results

Component	Emu Creek Rd. Ch 5.5km	Moona Plains Rd. Ch 20.6km	Winterbourne Rd. Ch 5.1km	Table Top Rd. Ch 3.3km
Deck	1.73	2.14	N/A	1.04
Inner Girders	1.06	1.48	1.91	1.07
Exterior Girders	1.80	1.28	1.41	N/A
Pier Column Reactions	0.96	N/A	N/A	N/A
Pier Headstocks	0.81	N/A	N/A	N/A
Abutment Reactions	1.31	1.39	1.67	0.98

Based on the results, the assessed bridges on Moona Plains Road, Winterbourne Road, and Table Top Road are likely to have adequate strength for the wind farm vehicles.

The width of the Winterbourne Road bridge should be reviewed due to the curvature of the approaches. It was noted that the abutments have adequate space on the northern side to accommodate an additional deck plank (approximately 600 mm) should the bridge need widening.

The width of the Table Top Road bridge may be inadequate. There is adequate space to widen this bridge on either side, and there is an existing side track on the right hand side.

Design actions from the transformer vehicle on the substructure of the Emu Creek Bridge were found to be higher than the design actions from the original design vehicle for the bridge. Hence, additional analysis is required to determine if the substructure (headstock and piles) have adequate capacity for the transformer vehicle.

2.4 Work Required for the next Phase

The following work is required for the next phase:

- Assess substructure capacity of the Emu Creek Road. bridge;
- Review widths and develop widening concepts for Table Top Road bridge and Winterbourne Road bridge (if required).

If drawings can be obtained from Walcha Council, this will be a simple exercise of calculating the design strength and comparing to the design actions obtained in this phase. If drawings are not available, a Level 3 inspection will be required including GPR scanning, breakouts, core samples and Schmitt Hammer Testing.

Strengthening of any bridge components, as required, will likely include attachment of carbon fibre wraps and laminates , along with associated works including scaffolding, surface preparation, and quality assurance testing.

The Tier 1 results should be reviewed once vehicle selection is finalised.

The Level 2 inspection results (in the 2022 Kelly Covey reports) are considered valid until 2025, or until a major event occurs that may cause the condition to change (such as a flood, earthquake, fire, or vehicle impact). It is likely that additional Level 2 inspections will be required at a later stage in the project.

3 Culverts and Causeways

3.1 Methodology

Culverts and causeways identified as requiring work in the Kelley Covey Dilapidation Survey Report (2022) were inspected to determine the scope of work required. The inspection included:

- Visual inspections of inlet, outlet, pavement and barrel condition;
- Measurement of cover over the barrel;
- Measurement of culvert and carriageway geometry.

The section of Thunderbolts Way between Darjeeling Road and Jamieson Street was inspected in addition to the assets listed in the Kelley Covey Dilapidation Survey Report (2022).

3.2 Results

The proposed treatments for each culvert/causeway inspected are presented in **Table 4**.

Table 4: Culvert and Causeway Recommendations

Road	Ch (km)	From	Lat	Long	Carriageway Width (m)	Cover (m)	Condition Notes	Proposed Actions
Emu Creek Road	0.932	Derby Street	-30.97589399	151.604166	6.5	0.20	-	Overlay to intersection.
Emu Creek Road	3.925	Derby Street	-30.978075	151.63344	5.7	0.20	Depression in carriageway on left hand side.	Replace culvert, increase cover.
Emu Creek Road	4.215	Derby Street	-30.97711	151.636447	5.7	0.15	Depression and patching of carriageway. New headwall right hand side.	Replace culvert, increase cover.
Emu Creek Road	4.515	Derby Street	-30.976782	151.639536	5.8	0.05	-	Replace culvert, widen, increase cover.
Emu Creek Road	6.595	Derby Street	-30.970169	151.657075	5.3	0.40	-	-
Emu Creek Road	6.9	Derby Street	-30.97086	151.662553	5.3	0.45	-	Clean out culvert.
Winterbourne Road	0.015	Blue Mountain Road	-30.91590985	151.6964701	5.8	0.35	-	Widen, increase cover.
Moona Plains Road	12.855	Emu Creek Road	-30.989418	151.784402	5.6	0.60	Minor longitudinal cracking of end units. Erosion of right hand side at wingwalls.	-
Moona Plains Road	18.125	Emu Creek Road	-31.011397	151.832695	6.4	0.45	-	-
Moona Plains Road	19.065	Emu Creek Road	-31.017111	151.836464		0.65	-	-
Bark Hut Road	0.796	Winterbourne Road	-30.906532	151.716748	4.2	0.31	Minor scour at outlet.	Widen, increase cover.
Bark Hut Road	2.728	Winterbourne Road	-30.910191	151.736143	2.4	0.25	-	Widen, increase cover.
Bark Hut Road	3.04	Winterbourne Road	-30.91026787	151.7391817		0.13	50% blockage.	Clean out culvert, increase cover.
Bark Hut Road	3.415	Winterbourne Road	-30.91123608	151.7429065	2.5	0.02	-	Widen, increase cover.
Bark Hut Road	3.867	Winterbourne Road	-30.91161206	151.747544	2.5	0.10	65% blockage right hand side. Exposed reo noted left hand side.	Clean out culvert, increase cover.
Bark Hut Road	4.154	Winterbourne Road	-30.91190873	151.7505042	2.6	0.13	-	Widen, increase cover.
Bark Hut Road	4.202	Winterbourne Road	-30.91201267	151.7509813		0.29	-	Widen, increase cover.
Bark Hut Road	4.627	Winterbourne Road	-30.91263016	151.755263	2.7	0.25	80% blockage of outlet.	Widen, clean out culvert, increase cover.

Road	Ch (km)	From	Lat	Long	Carriageway Width (m)	Cover (m)	Condition Notes	Proposed Actions
Bark Hut Road	5.692	Winterbourne Road	-30.9137677	151.7656989	2.6	0.25	Top of pipe broken off at inlet. 70% blockage at inlet and outlet.	Widen, clean out culvert, increase cover.
Bark Hut Road	7.018	Winterbourne Road	-30.91595966	151.7782512	2.9	0.50	80% blockage at outlet.	Widen, clean out culvert.
Blue Mountain Road	0.705	Winterbourne Road	-30.910451	151.693468	3.2	0.18	Hole in top of pipe at edge of carriageway. Urgent repair required.	Replace culvert, widen, increase cover
Blue Mountain Road	3.795	Winterbourne Road	-30.885035	151.683824	3.6	0.05	-	Widen, increase cover
Blue Mountain Road	4.165	Winterbourne Road	-30.881647	151.683586	4.2	0.05	-	Widen, increase cover
Blue Mountain Road	5.32	Winterbourne Road	-30.871369	151.683448	3.5	0.23	Cracking at right hand side, erosion around the pipe at right hand side.	Widen, increase cover .
Blue Mountain Road	6.135	Winterbourne Road	-30.865254	151.687449	4.3	0.08	-	Widen, increase cover.
Blue Mountain Road	6.665	Winterbourne Road	-30.86182	151.690832	4.1	0.13	-	Widen, increase cover.
Hazeldean Road	1.58	Winterbourne Road	-30.844673	151.763698		0.15	-	Replace culvert, widen, increase cover.
Hazeldean Road	1.925	Winterbourne Road	-30.844679	151.763746	3.7		-	Replace culvert, widen, increase cover.
Hazeldean Road	3.07	Winterbourne Road	-30.846375	151.751943	3.9	0.63	-	Widen.
Uruga Road	0.145	Hazeldean Road	-30.845433	151.751779		0.19	-	Widen, increase cover.
Uruga Road	0.665	Hazeldean Road	-30.840861	151.754153	3.1	0.05	Undermining of pipe at both sides.	Replace culvert, widen, increase cover.
Table Top Road	0.63	Winterbourne Road	-30.86995	151.777489	3.9	0.16	-	Increase cover.
Table Top Road	0.795	Winterbourne Road	-30.869377	151.778929	3.6	0.37	-	Increase cover.
Table Top Road	1.22	Winterbourne Road	-30.872001	151.791511		0.40	Left hand side of culvert starting to wash out.	Widen.
Table Top Road	2.545	Winterbourne Road	-30.872084	151.795256	5.3	0.55	-	-
Table Top Road	2.93	Winterbourne Road	-30.871291	151.801151	3.3	0.45	-	-
Table Top Road	3.14	Winterbourne Road	-30.871198	151.801095	3.1	0.10	Chipping of pipe. Outlet 50% blocked.	Widen, clean out culvert, increase cover.
Table Top Road	3.52	Winterbourne Road	-30.871505	151.805181	3.2	0.20	-	Widen, increase cover.

Road	Ch (km)	From	Lat	Long	Carriageway Width (m)	Cover (m)	Condition Notes	Proposed Actions
Table Top Road	3.8	Winterbourne Road	-30.872109	151.807872	2.9	0.10	95% blockage on right hand side.	Widen, increase cover, clear inlet and outlet.
Rowleys Creek Road	3.06	Moona Plains Road	-30.98171	151.829289		0.21	-	-
Blue Mountain Road	2.495	Winterbourne Road	-30.8956484	151.688354	5.5	0.18	Cracking in concrete causeway slab.	Widen.
Blue Mountain Road	7.475	Winterbourne Road	-30.856089	151.693215	5.5	0.45	Cracking in concrete causeway slab.	Widen.
Hazeldean Road	1.155	Winterbourne Road	-30.8485414	151.7694274	5.5	0.32	-	Widen, replace section around joint 5 and fix soft spot.
Saleyard Road	0.5	Hwy	-30.9768319	151.5723409	6.7	0.32	-	-
Darjeeling Road	1	Saleyards Road	-30.9656104	151.5750383	6.2	0.40	-	-
Darjeeling Road	1.8	Saleyards Road	-30.9666483	151.5829973	6.1	0.80	Pipe silted approx. 40%. Exposed reo on right hand side.	-
Thunderbolts Way	0.4	Darjeeling Road	-30.9698177	151.5877501	13.4	0.80	Damaged wingwall.	-
Thunderbolts Way	1.3	Darjeeling Road	-30.9751081	151.5934757	6.7	>1.5	Cracking of asphalt noted above culvert.	-
Emu Creek Road	1.08	Derby Street	-30.9759059	151.6054655	5.7	0.20	New headwall right hand side.	-
Emu Creek Road	7.1	Derby Street	-30.970919	151.6623869	6.6	0.32	Potholes	Increase cover.
Moona Plains Road	4.0	Emu Creek Road.	-30.986612	151.6968822	6.4		Major Culvert. Significant settlement cracking noted on downstream end. Minor settlement upstream end. Scour with possible undermining on downstream end.	No action – not on heavy vehicle route.
Winterbourne Road	0.04	Moona Plains Road	-30.9705891	151.6635209	7		Noted in KC report as Emu Ck Road 7.225. Minor separation of left hand side headwall.	-
Winterbourne Road	3.715	Blue Mountain Road	-30.8950831	151.7247982		0.23	-	Increase cover.
Winterbourne Road	0.4	Blue Mountain Road	-30.9138857	151.6989039	5.8	0.45	-	Widen.
Winterbourne Road	1.7	Blue Mountain Road	-30.905413	151.7085901		0.30	-	-

Road	Ch (km)	From	Lat	Long	Carriageway Width (m)	Cover (m)	Condition Notes	Proposed Actions
Winterbourne Road	1.775	Blue Mountain Road	-30.9051604	151.7088694		0.45	-	-
Winterbourne Road	2.06	Blue Mountain Road	-30.903399	151.7109601		0.60	-	-
Winterbourne Road	2.2	Blue Mountain Road	-30.9023367	151.7122263		0.30	-	-
Winterbourne Road	2.235	Blue Mountain Road	-30.9017846	151.7129037		0.30	-	-
Winterbourne Road	2.37	Blue Mountain Road	-30.9012152	151.7136513		0.25	Minor separation of headwall on right hand side. Chipping with exposed reo on cell 2.	-
Winterbourne Road	3.93	Blue Mountain Road	-30.8937741	151.7263537	6	0.21	-	Increase cover.
Winterbourne Road	4.625	Blue Mountain Road	-30.8892437	151.7313109		0.15	-	-
Winterbourne Road	5.365	Blue Mountain Road	-30.8849082	151.7373081		0.15	-	-
Winterbourne Road	5.585	Blue Mountain Road	-30.8840199	151.7393394		0.13	-	Increase cover.
Winterbourne Road	6.06	Blue Mountain Road	-30.8821362	151.7438113	6.2	0.25	-	Increase cover.
Winterbourne Road	6.22	Blue Mountain Road	-30.8815665	151.7453095	6	0.15	Minor scour.	Widen, increase cover.
Winterbourne Road	6.72	Blue Mountain Road	-30.8795542	151.7499961	5.8	0.38	Outlet blockage 40%.	Widen, clean out culvert, increase cover.
Winterbourne Road	6.955	Blue Mountain Road	-30.878674	151.7521749	5.8	0.40	-	Widen, increase cover.
Winterbourne Road	7.81	Blue Mountain Road	-30.8766198	151.7607521	5.8	0.35	-	Widen, increase cover.
Winterbourne Road	9.975	Blue Mountain Road	-30.8645095	151.7768681	4.5	0.00	Top of pipe exposed in carriageway.	Widen, increase cover.
Winterbourne Road	10.39	Blue Mountain Road	-30.8610448	151.7784295	3.2	0.25	-	Replace culvert, widen, increase cover.
Winterbourne Road	10.8	Blue Mountain Road	-30.8571674	151.778016		0.10	-	Widen, increase cover.
Uruga Road	0.3	Hazeldean Road	-30.8436796	151.7527271	3.1	0.05	-	Replace culvert, widen, increase cover.
Hazeldean Road	4.1	Winterbourne Road	-30.8466597	151.7411446	4	0.28	-	Replace culvert, widen, increase cover.
Hazeldean Road	2.25	Uruga Road	-30.8458152	151.7274382	5.5	0.27	Cracking and abrasion in causeway slab.	-

Road	Ch (km)	From	Lat	Long	Carriageway Width (m)	Cover (m)	Condition Notes	Proposed Actions
Table Top Road	2.125	Winterbourne Road	-30.8719965	151.7915144	2.8	0.40	Erosion on right hand side. Left hand side completely blocked.	Widen, increase cover, clean.
Bark Hut Road	0.4	Winterbourne Road	-30.906008	151.7127767		0.28	-	Increase cover.
Bark Hut Road	1.012	Winterbourne Road	-30.9068053	151.718969		0.05	Plastic pipe widening on right hand side.	Increase cover.
Bark Hut Road	5.902	Winterbourne Road	-30.9148296	151.7677208	2.4	0.25	Washout at left hand side. Minor blockage 20%. Erosion of roadway.	Widen, clean out culvert.
Bark Hut Road	6.013	Winterbourne Road	-30.9153391	151.7685197		0.09	Carriageway very close to inlet.	Widen, increase cover.
Bark Hut Road	6.078	Winterbourne Road	-30.9153555	151.7690718	2.6	0.08	100% blockage right hand side.	Clean out culvert, widen, increase cover.
Bark Hut Road	7.1	Winterbourne Road	-30.9160119	151.7790111		0.10	95% blockage.	Widen, clean out culvert, increase cover.
Bark Hut Road	3.7	Winterbourne Road	-30.9114707	151.7448356	3.5	0.00	Hole in top of pipe at edge of carriageway.	Replace culvert, widen, increase cover.
Bark Hut Road	1.8	Winterbourne Road	-30.9085734	151.7264546		0.10	60% blockage left hand side.	Widen, clean out culvert, increase cover.

Appendix 1: Assessment Vehicles

Constructive Solutions Pty Ltd

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Brisbane Office

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Paddington QLD 4064

Phone: 0427 011 143

Email: admin@constructivesolutions.com.au

4.0 Transport combinations (Examples)

Base Towers (15.6l x 5.4 x 4.95 x 85T)
Configuration. Prime mover with 3x8 4x8 Bookend
Overall dimension: 39.0l x 5.5w x 5.5h x 164.5T (+ Push truck)

Section 2 Towers (19.9l x 4.95 x 4.95 x 87T)
Configuration. Prime mover with 3x8 4x8 Bookend
Overall dimension: 44.0l x 5.0w x 5.3h x 164.5T (+ Push truck)

Section 3 Towers (26.9l x 4.95 x 4.65 x 98T)
Configuration. Prime mover with 5x8 5x8 Bookend
Overall dimension: 46.0l x 5.0w x 5.3h x 164.5T (+ Push truck)

Section 4 Towers (28.9l x 4.65 x 4.4 x 84T)
Configuration. Prime mover with 5x8 5x8 Bookend
Overall dimension: 35.0l x 5.0w x 5.3h x 154.5T (+ Push truck)

Top Towers (36.9l x 4.4w x 3.97h x 78T)
Configuration. Prime mover with 4x4 Dolly and 3x8 Jinker trailer
Overall dimension: 54.0l x 5.1w x 4.9h x 152.5T (+ Push truck)

Nacelles (18.1l x 4.2 w x 4.35h x 84.0T)
Configuration. Prime mover with 10x8 Platform
Overall dimensions: 35.0l x 4.2w x 5.35h x 164.5T (+ Push truck)

Drive trains (7.5l x 2.7 w x 3.0h x 97.0T)
Configuration. Prime mover with 10x8 Platform
Overall dimensions: 35.0l x 4.2w x 5.35h x 174.5T (+ Push truck)

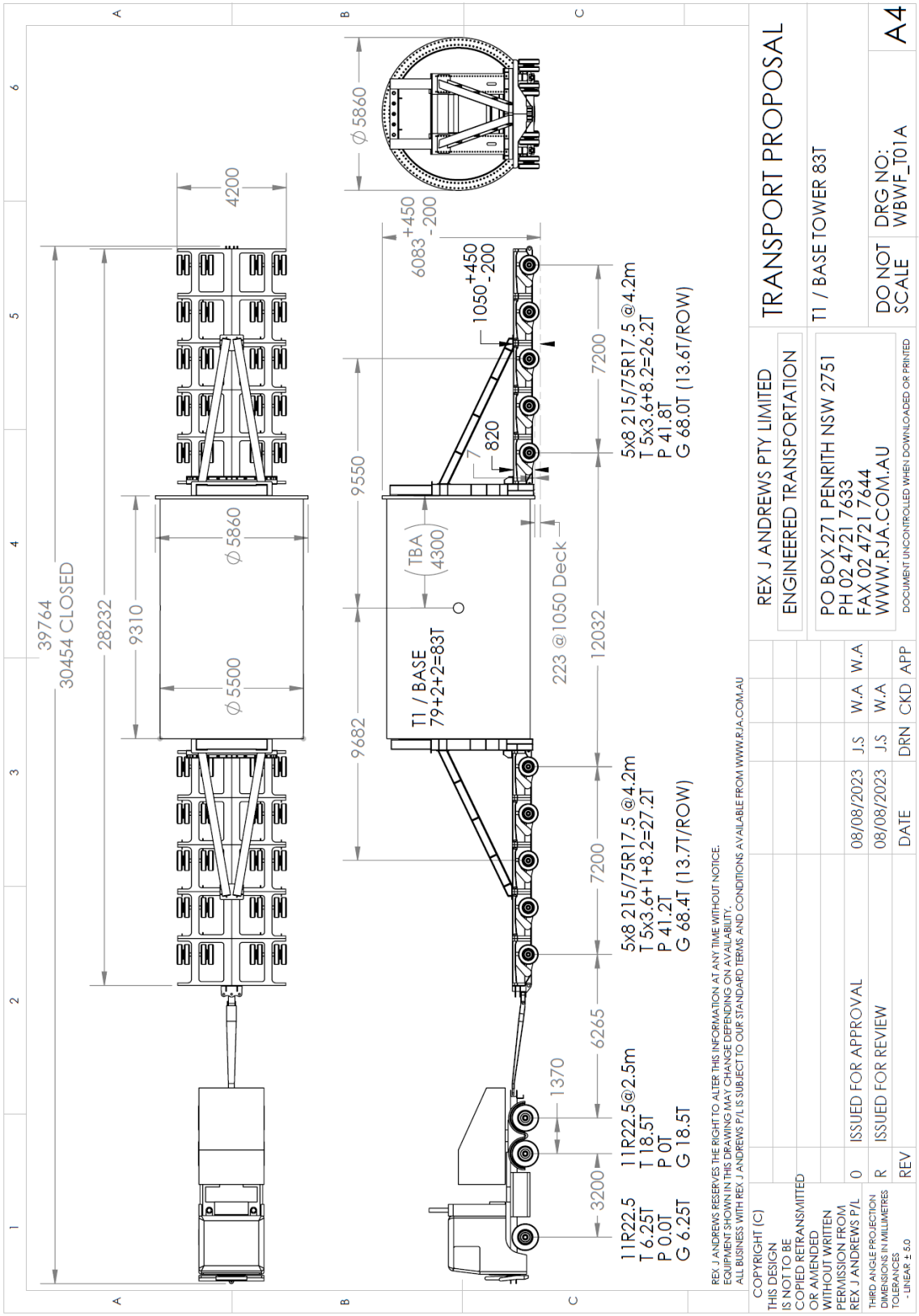
Hubs (5.0l x 4.4w x 4.0h x 64.0T)
Configuration. Prime mover with 6x8 Platform
Overall dimension: 26.0l x 4.5w x 5.1h x 108.5T

Cooler tops (5.2l x 2.3w x 3.0h x 2.3T)
Configuration. Prime mover with 3x4 Semi
Overall dimension: 19.0l x 2.5w x 4.3h x 42.5T

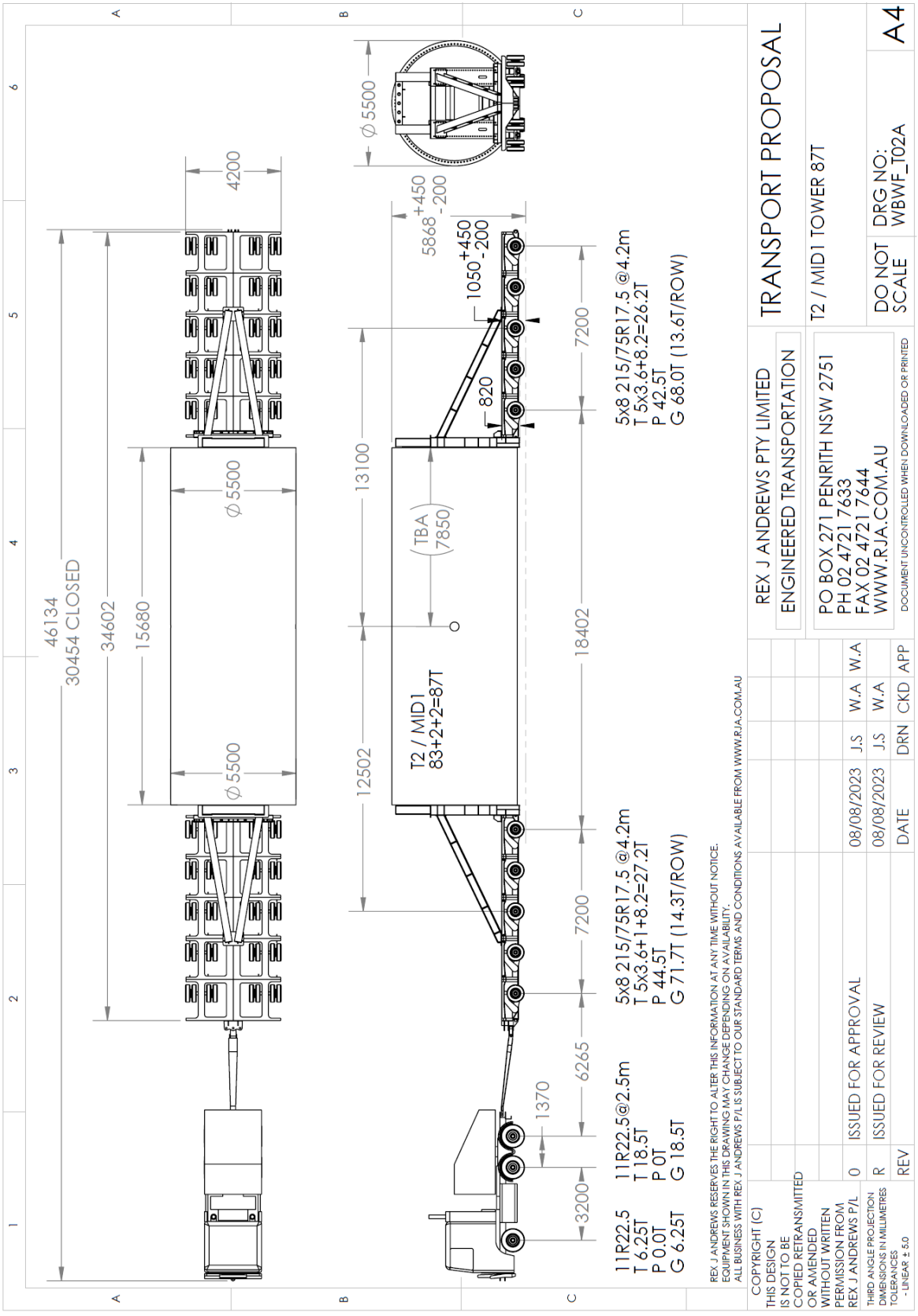
Blades (81.1l x 4.5w x 4.0h x 28.1T)
Configuration. Prime mover with 2x4 dolly 4x4 Jinker
Overall dimension: 90.0l x 4.3w x 4.7h x 67.5T

5.0 Transport drawings (Possible combinations)

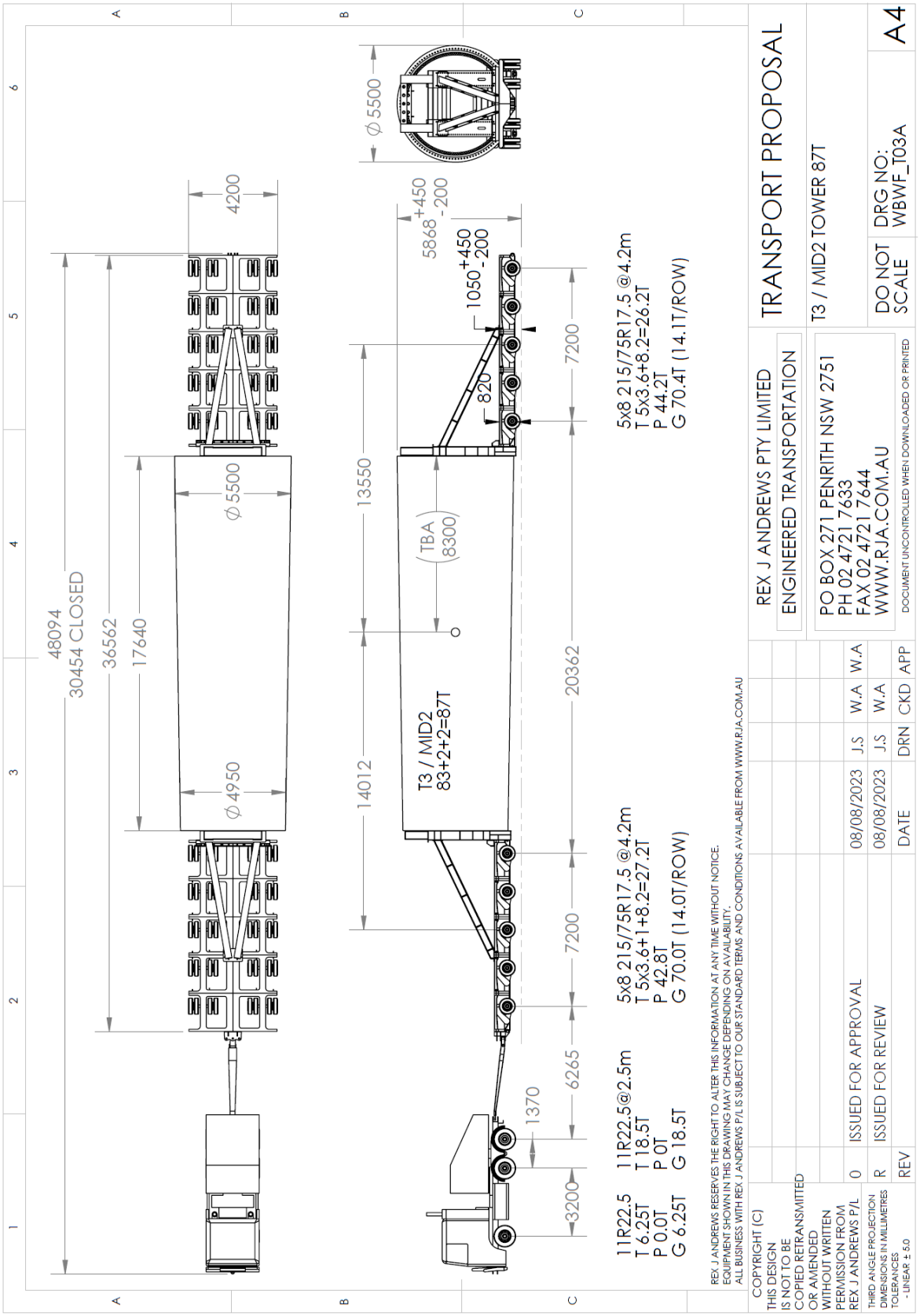
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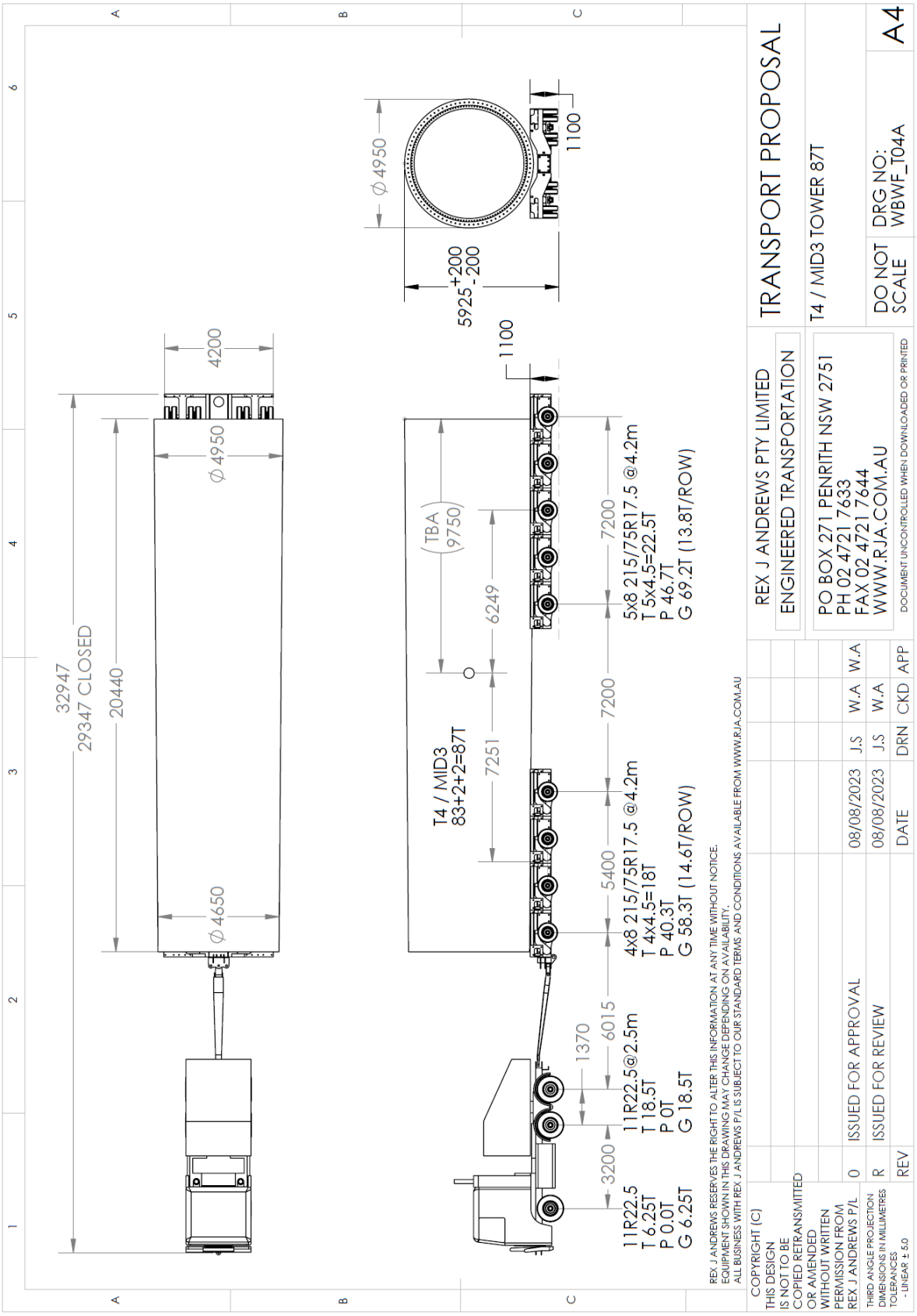
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46134
30454 CLOSED
34602
15680
4200
Ø 5500
Ø 5500
Ø 5500
13100
12502
T2 / MID1
83+2+2=87T
(TBA 7850)
5868 +450 -200
1050 +450 -200
820
7200
18402
7200
6265
1370
3200
11R22.5@2.5m
T 6.25T
P 0.0T
G 6.25T
11R22.5@2.5m
T 18.5T
P 0T
G 18.5T
5x8 215/75R17.5 @4.2m
T 5x3.6+1+8.2=27.2T
P 44.5T
G 71.7T (14.3T/ROW)
5x8 215/75R17.5 @4.2m
T 5x3.6+8.2=26.2T
P 42.5T
G 68.0T (13.6T/ROW)
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T2 / MID1 TOWER 87T
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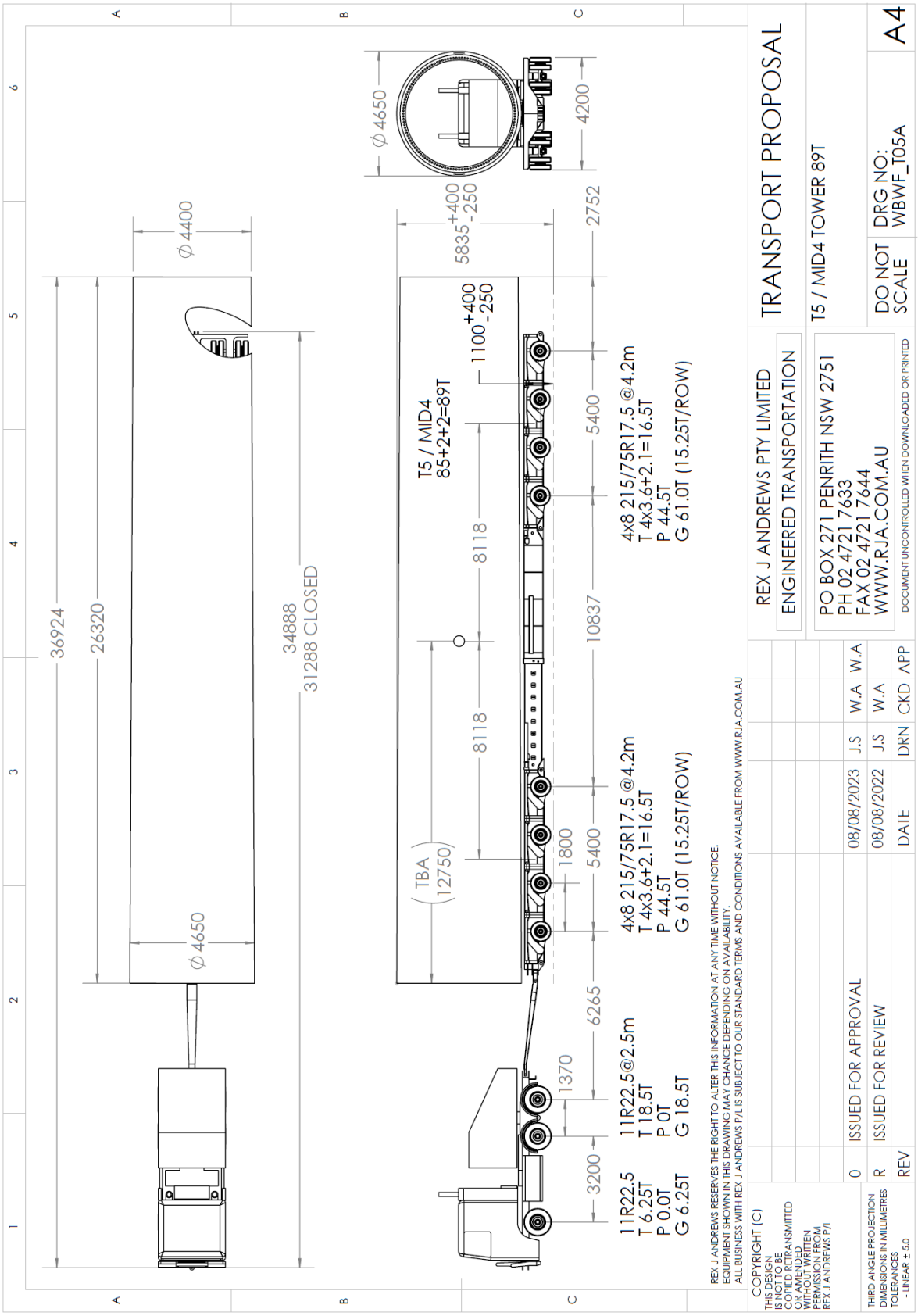
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36562
17640
4200
Ø5500
Ø4950
Ø5500
13550
14012
T3 / MID2
83+2+2=87T
(TBA)
(8300)
5868 +450 -200
1050 +450 -200
820
7200
20362
7200
6265
1370
3200
11R22.5 11R22.5@2.5m
T 6.25T T 18.5T
P 0.0T P 0T
G 6.25T G 18.5T
5x8 215/75R17.5 @4.2m
T 5x3.6+1+8.2=27.2T
P 42.8T
G 70.0T (14.0T/ROW)
5x8 215/75R17.5 @4.2m
T 5x3.6+8.2=26.2T
P 44.2T
G 70.4T (14.1T/ROW)
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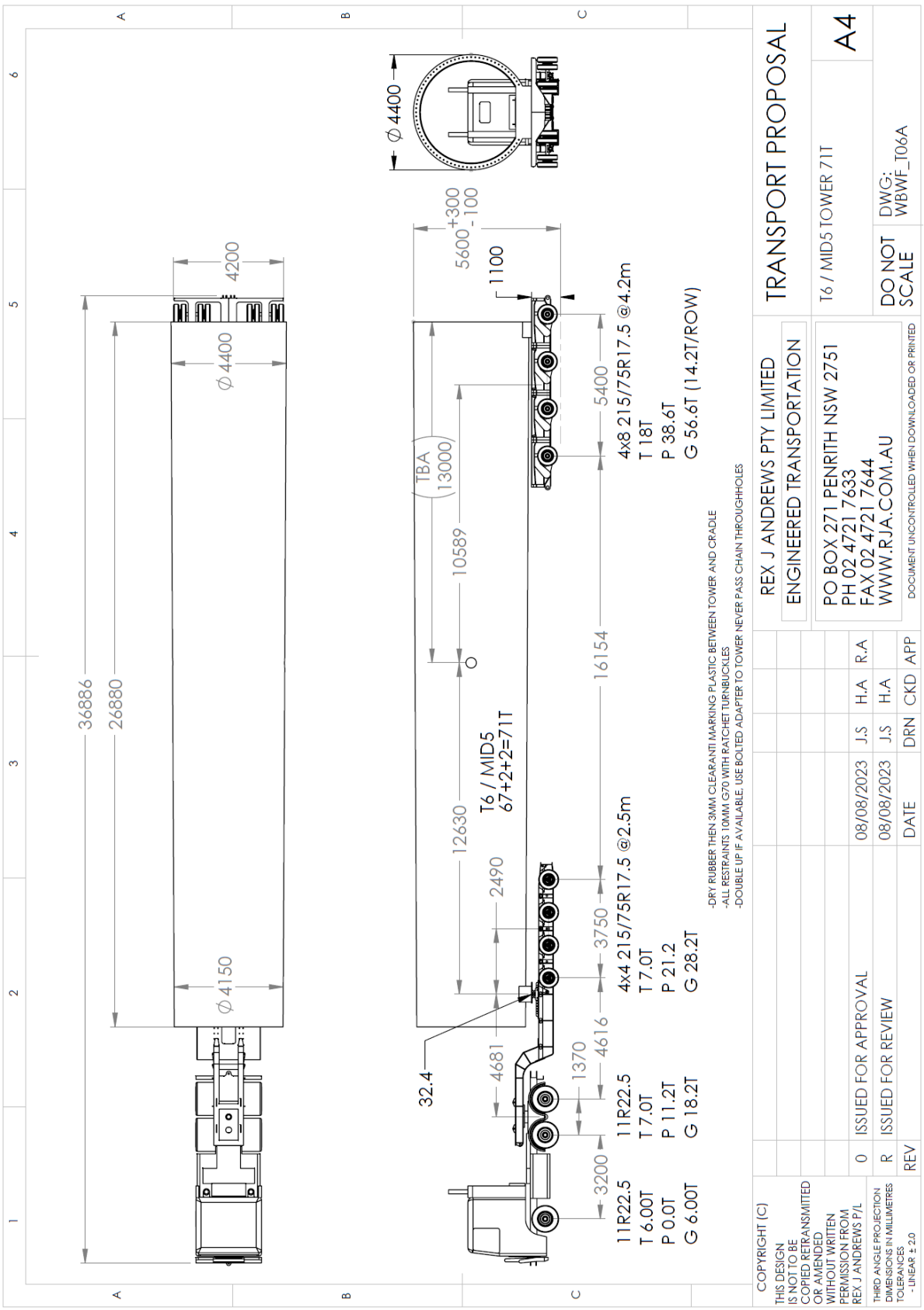
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4200
Ø4950
Ø4650
11R22.5
T 6.25T
P 0.0T
G 6.25T
3200
11R22.5@2.5m
T 18.5T
P 0T
G 18.5T
1370
6015
4x8 215/75R17.5 @4.2m
T 4x4.5=18T
P 40.3T
G 58.3T (14.6T/ROW)
5400
T4 / MID3
83+2+2=87T
7251
(TBA)
9750
6249
7200
5x8 215/75R17.5 @4.2m
T 5x4.5=22.5T
P 46.7T
G 69.2T (13.8T/ROW)
7200
1100
Ø4950
5925 +200 -200
1100
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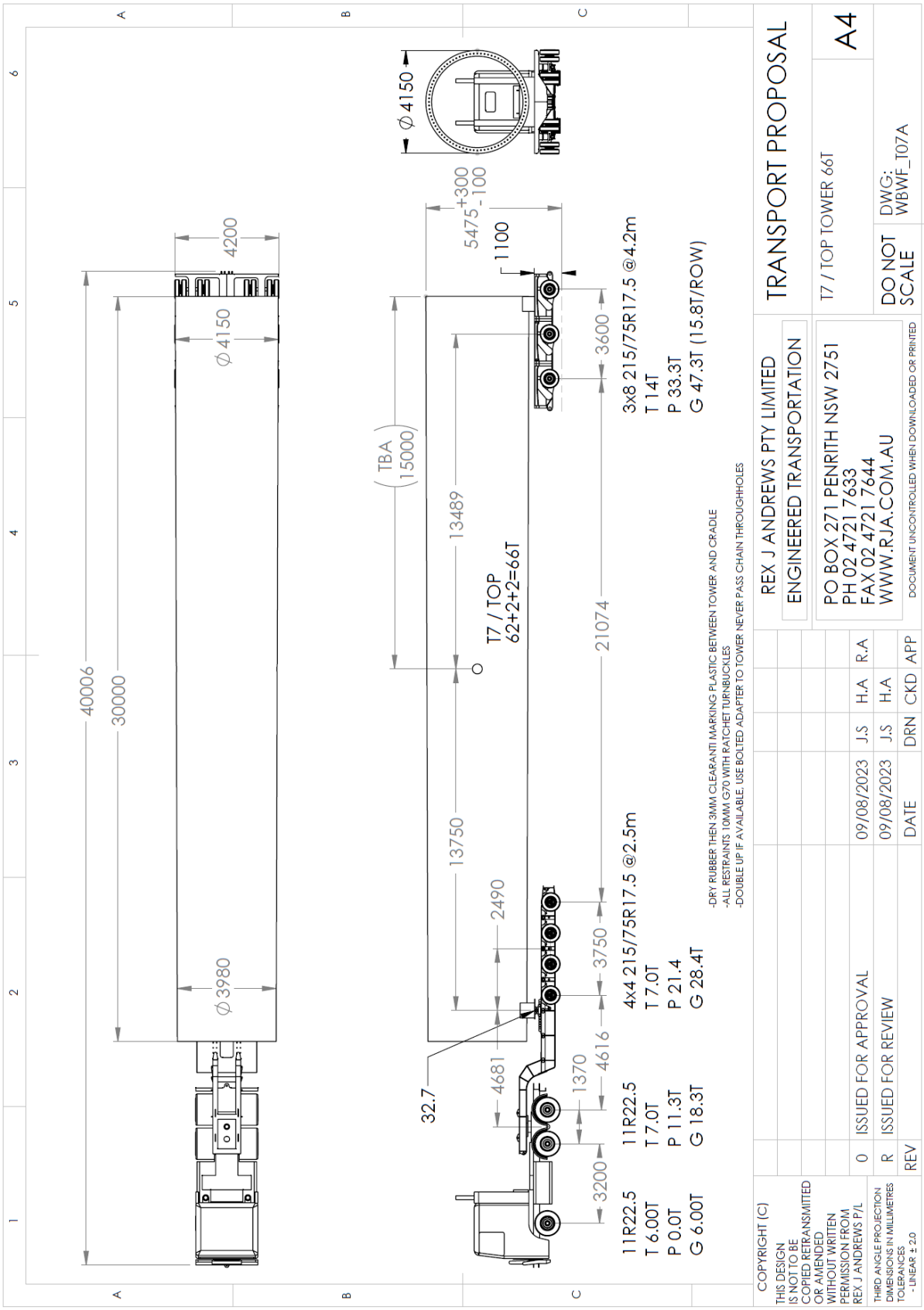
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T5 / MID4
85+2+2=89T
4x8 215/75R17.5 @4.2m
T 4x3.6+2.1=16.5T
P 44.5T
G 61.0T (15.25T/ROW)
11R22.5@2.5m
T 18.5T
P 0T
G 18.5T
11R22.5
T 6.25T
P 0.0T
G 6.25T
TBA
12750
8118
1800
5400
10837
6265
1370
3200
2752
4200
Ø4650
Ø4400
36924
26320
34888
31288 CLOSED
1100+400-250
5835+400-250
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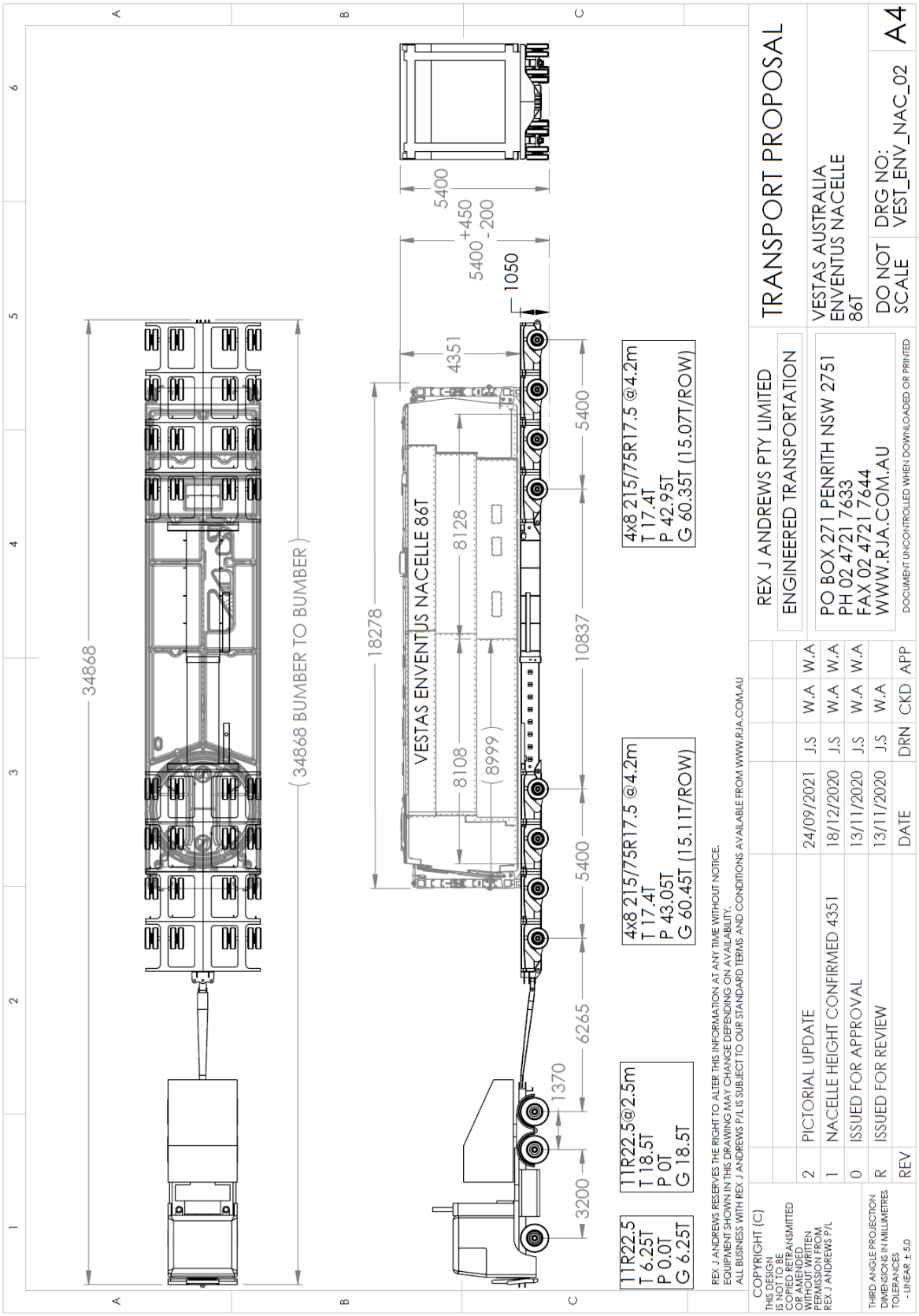
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TRANSPORT PROPOSAL
A4
T6 / MID5 TOWER 71T
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DATE
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-DRY RUBBER THEN 3MM CLEARANTI MARKING PLASTIC BETWEEN TOWER AND CRADLE
-ALL RESTRAINTS 10MM G70 WITH RATCHET TURNBUCKLES
-DOUBLE UP IF AVAILABLE. USE BOLTED ADAPTER TO TOWER NEVER PASS CHAIN THROUGHHOLES
T6 / MID5
67+2+2=71T
11R22.5 T 6.00T P 0.0T G 6.00T
11R22.5 T 7.0T P 11.2T G 18.2T
4x4 215/75R17.5 @2.5m T 7.0T P 21.2 G 28.2T
4x8 215/75R17.5 @4.2m T 18T P 38.6T G 56.6T (14.2T/ROW)
3200
4616
1370
4681
2490
12630
10589
TBA (13000)
3750
16154
5400
1100
5600 +300 -100
32.4
Ø 4400
Ø 4150
Ø 4400
4200
26880
36886

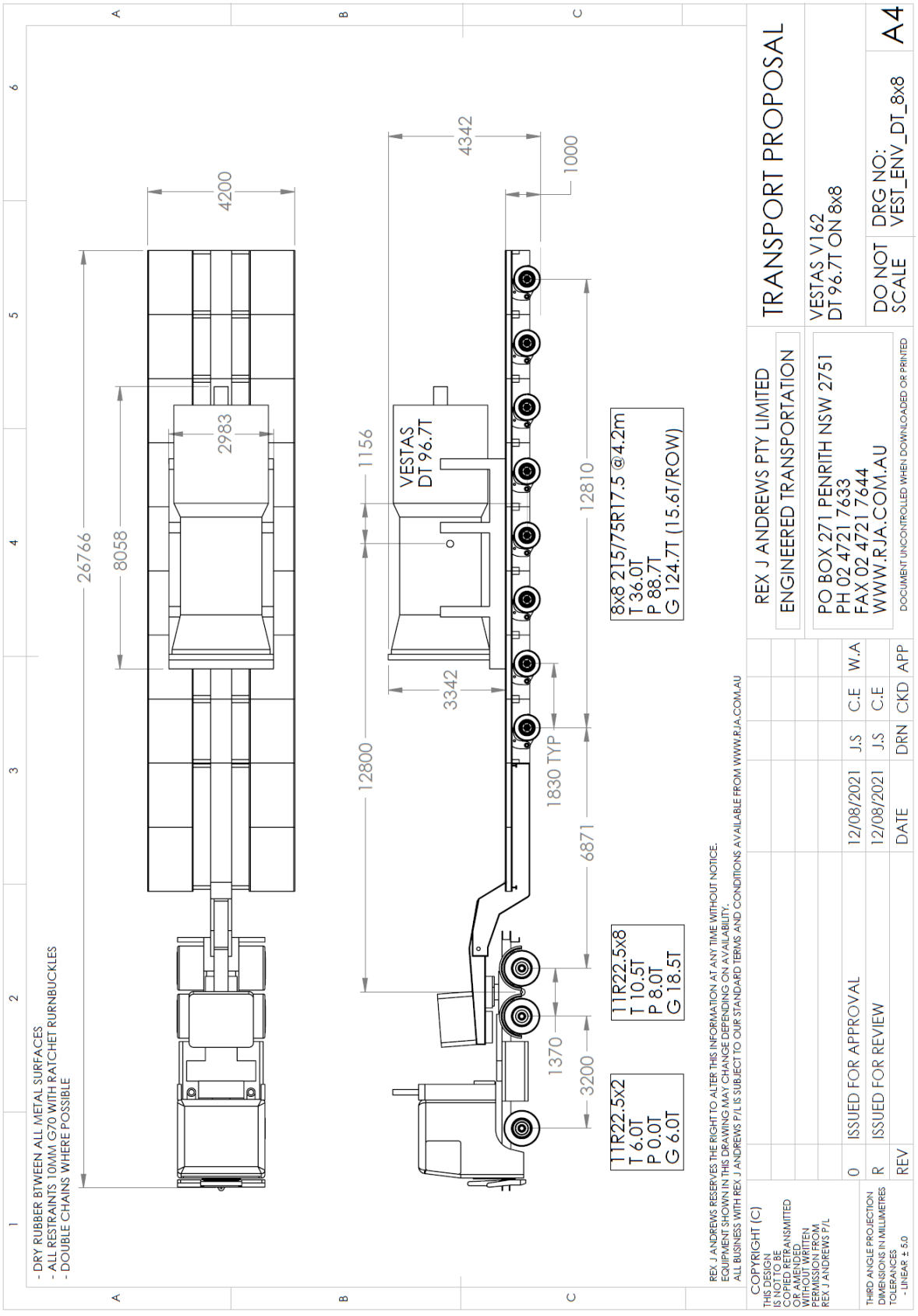
T7:


TRANSPORT PROPOSAL
T7 / TOP TOWER 66T
A4
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APP
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R ISSUED FOR REVIEW 09/08/2023 J.S H.A
-DRY RUBBER THEN 3MM CLEAR ANTI MARKING PLASTIC BETWEEN TOWER AND CRADLE
-ALL RESTRAINTS 10MM G70 WITH RATCHET TURNBUCKLES
-DOUBLE UP IF AVAILABLE. USE BOLTED ADAPTER TO TOWER NEVER PASS CHAIN THROUGHHOLES
T7 / TOP
62+2+2=66T
11R22.5 T 6.00T P 0.0T G 6.00T
11R22.5 T 7.0T P 11.3T G 18.3T
4x4 215/75R17.5 @2.5m T 7.0T P 21.4 G 28.4T
3x8 215/75R17.5 @4.2m T 14T P 33.3T G 47.3T (15.8T/ROW)
Ø4150
Ø3980
4200
40006
30000
5475 +300 -100
1100
(TBA) 15000
13489
13750
2490
3600
21074
3750
4616
1370
4681
3200
32.7

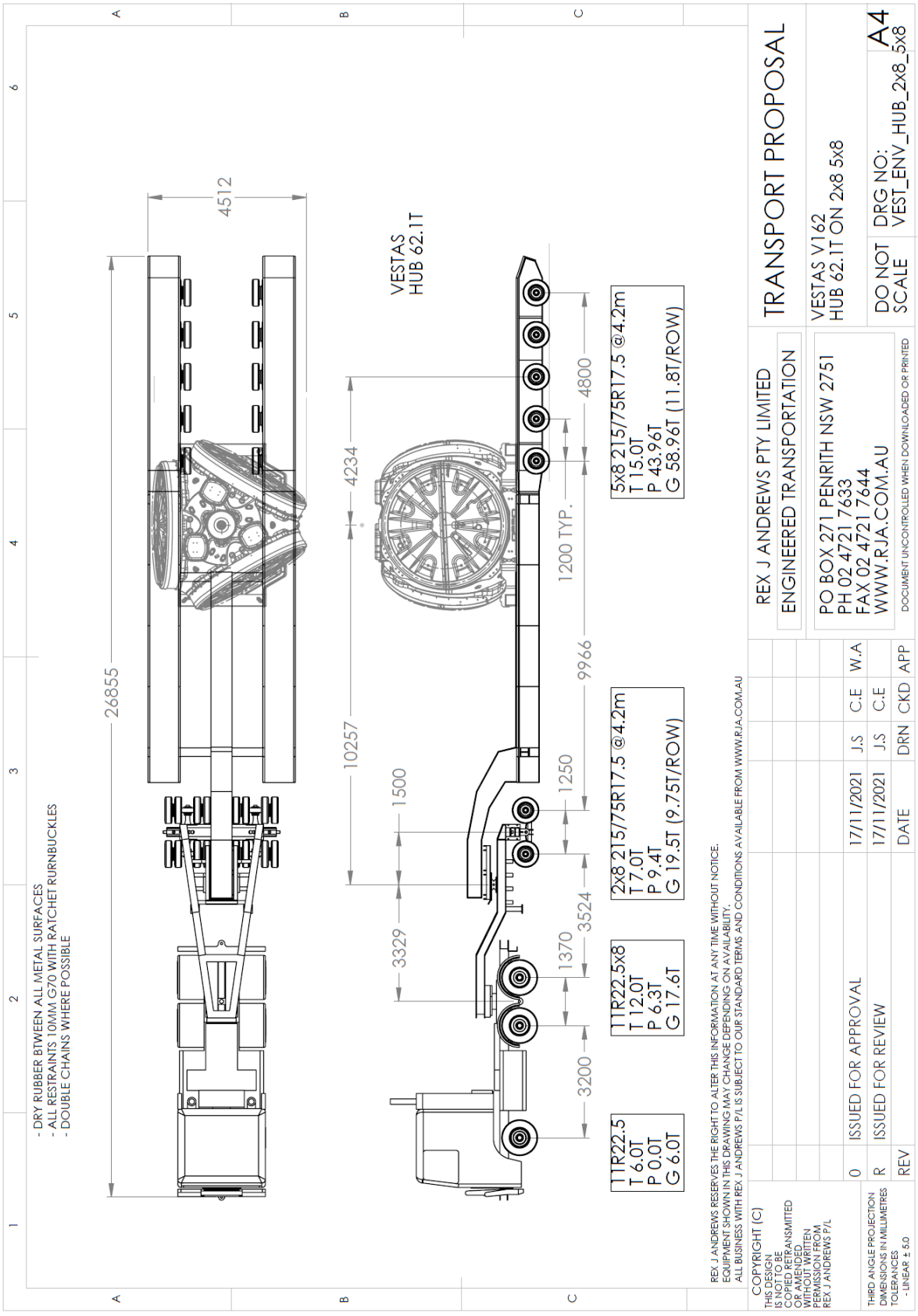
Nacelle:


34868
34868 BUMBER TO BUMBER
18278
VESTAS ENVENTUS NACELLE 86T
8108
8128
(8999)
4351
5400
+450
5400 -200
1050
5400
5400
10837
5400
6265
1370
3200
11R22.5
T 6.25T
P 0.0T
G 6.25T
11R22.5@2.5m
T 18.5T
P 0T
G 18.5T
4x8 215/75R17.5 @4.2m
T 17.4T
P 43.05T
G 60.45T (15.11T/ROW)
4x8 215/75R17.5 @4.2m
T 17.4T
P 42.95T
G 60.35T (15.07T/ROW)
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1 NACELLE HEIGHT CONFIRMED 4351 18/12/2020 J.S W.A W.A
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TOLERANCES
- LINEAR ± 5.0
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TRANSPORT PROPOSAL
VESTAS AUSTRALIA
ENVENTUS NACELLE
86T
DO NOT SCALE
DRG NO: VEST_ENV_NAC_02
A4

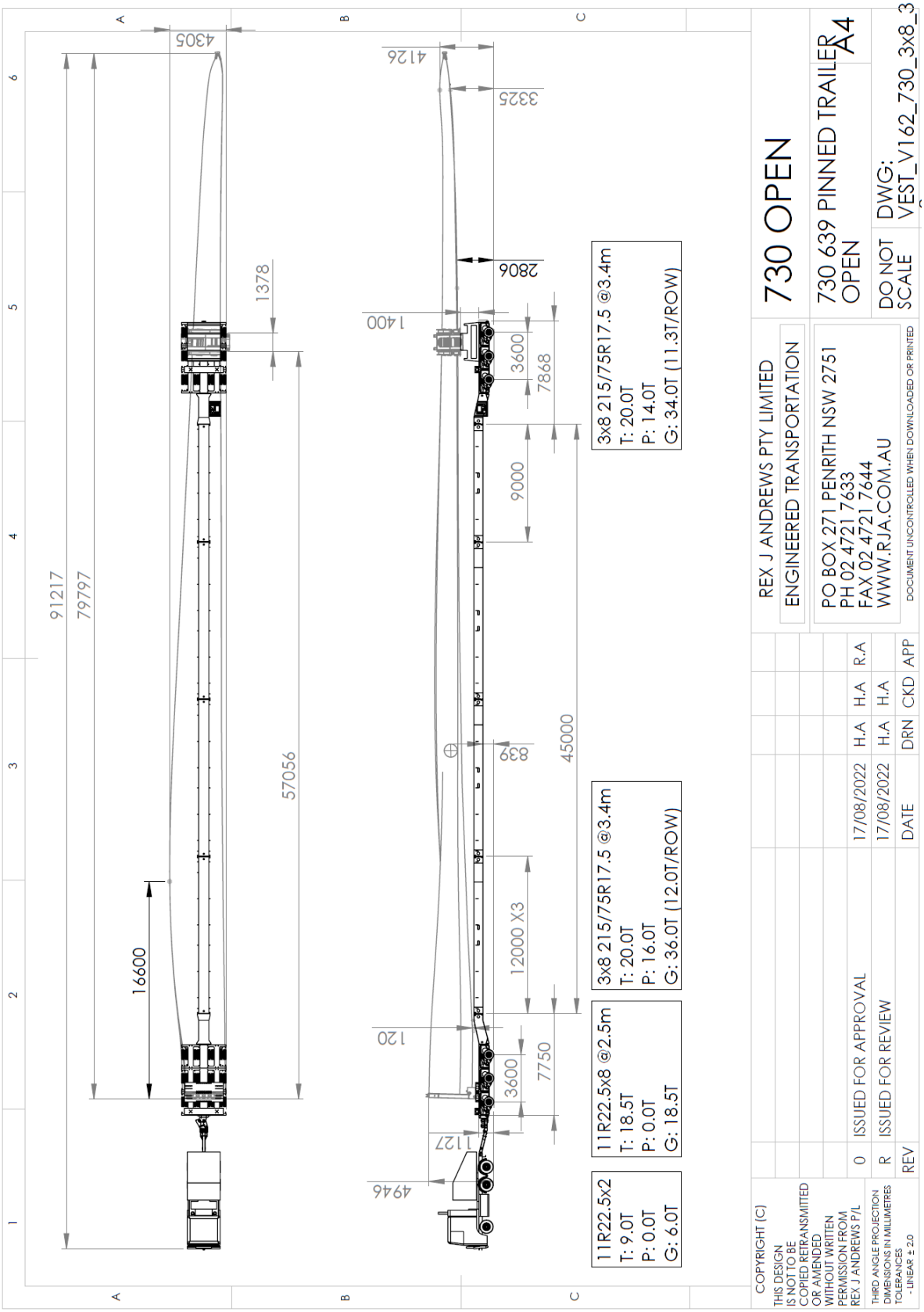
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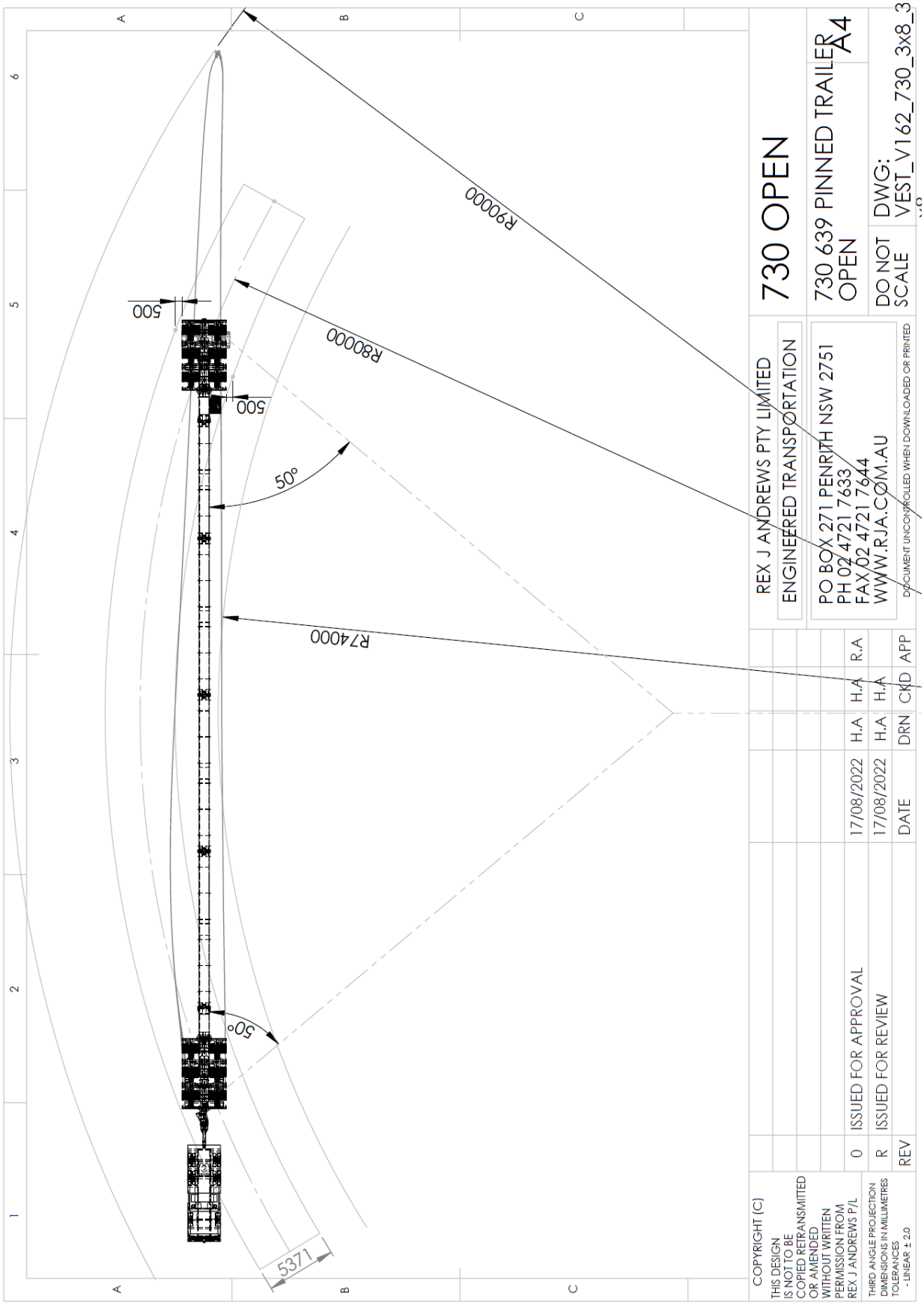

- DRY RUBBER BTWEEN ALL METAL SURFACES
- ALL RESTRAINTS 10MM G70 WITH RATCHET RURNBUCKLES
- DOUBLE CHAINS WHERE POSSIBLE
26766
8058
4200
2983
12800
1156
VESTAS
DT 96.7T
3342
4342
1000
12810
1830 TYP
6871
1370
3200
11R22.5x2
T 6.0T
P 0.0T
G 6.0T
11R22.5x8
T 10.5T
P 8.0T
G 18.5T
8x8 215/75R17.5 @4.2m
T 36.0T
P 88.7T
G 124.7T (15.6T/ROW)
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VESTAS V162
DT 96.7T ON 8x8
DO NOT SCALE
DRG NO: VEST_ENV_DT_8x8
A4

Hub:


- DRY RUBBER BTWEEN ALL METAL SURFACES
- ALL RESTRAINTS 10MM G70 WITH RATCHET RURNBUCKLES
- DOUBLE CHAINS WHERE POSSIBLE
VESTAS
HUB 62.1T
4512
26855
10257
4234
1500
3329
1200 TYP.
4800
9966
1250
1370
3524
3200
11R22.5
T 6.0T
P 0.0T
G 6.0T
11R22.5x8
T 12.0T
P 6.3T
G 17.6T
2x8 215/75R17.5 @4.2m
T 7.0T
P 9.4T
G 19.5T (9.75T/ROW)
5x8 215/75R17.5 @4.2m
T 15.0T
P 43.96T
G 58.96T (11.8T/ROW)
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TRANSPORT PROPOSAL
VESTAS V162
HUB 62.1T ON 2x8 5x8
DO NOT SCALE
DRG NO: VEST_ENV_HUB_2x8_5x8
A4

Blade


4305
1378
91217
79797
57056
16600
4126
3325
2806
1400
3600
7868
9000
45000
839
12000 X3
120
3600
7750
1127
4946
11R22.5x2
T: 9.0T
P: 0.0T
G: 6.0T
11R22.5x8 @2.5m
T: 18.5T
P: 0.0T
G: 18.5T
3x8 215/75R17.5 @3.4m
T: 20.0T
P: 16.0T
G: 36.0T (12.0T/ROW)
3x8 215/75R17.5 @3.4m
T: 20.0T
P: 14.0T
G: 34.0T (11.3T/ROW)
730 OPEN
730 639 PINNED TRAILER
OPEN
A4
DO NOT SCALE
DWG: VEST_V162_730_3x8_3
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DIMENSIONS IN MILLIMETRES
TOLERANCES - LINEAR ± 2.0


R90000
R80000
R74000
500
500
50°
50°
5371
730 OPEN
730 639 PINNED TRAILER OPEN
A4
DO NOT SCALE
DWG: VEST_V162_730_3x8_3
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Appendix D

Response to Agency Advice on EIS

Table 32: Response to TfNSW Agency Advice on EIS

TfNSW Comment	Response
1. Transport Routes	
The assessment focuses primarily on access to the site via the identified Preferred Access Route/s, for Over Size Over Mass (OSOM) and Heavy Vehicles, including access to site from the key intersection of Thunderbolts Way & Jamieson Street.	It is expected that the majority of Project traffic will access the Project Area via Thunderbolts Way which provides the nearest connection to the classified (Regional) road network. It is estimated that up to 24 vehicles per day (i.e. two-way trips) associated with the construction of the transmission line may periodically utilise Hillview Road to access the Project Area from Thunderbolts Way.
Not all rail related infrastructure has been identified along the proposed transportation route/s from the Port of Newcastle. In particular it is noted that a road over rail bridge along the Oxley Highway, west of Surveyors Creek Bridge is not mentioned in either Section 5.4.3 of the TIA, the Route Survey or the Transport Route Map in Figure F6 in the TIA. It is unclear whether any other rail related infrastructure is missing from the assessment, which may be impacted by construction traffic of the development.	It is no longer proposed to utilise Oxley Highway (including crossing Surveyors Creek Bridge) for the transport of OSOM components. An alternative route is proposed via New England Highway, Staces Road and Thunderbolts Way as outlined within this document and the RJA Report. An assessment of the rail and bridge infrastructure along the access routes is provided in Section 6.1.6.
• TfNSW notes, consultation was undertaken with TfNSW by the traffic consultants, Amber Organisation Pty Ltd in preparation for the EIS. In an email dated 24 June 2021, TfNSW highlighted the need for the development to undertake a formal review of the proposed transport route/s, in particular referring to the need to include bridge assessment/s. The email further advised that Rex J Andrews (RJA), OSOM transport consultants, were familiar with the process outlined for undertaking a formal review and assessment of the proposed transport route/s with TfNSW. However, this does not yet appear to have been undertaken as the (RJA) Route Survey notes that the capacity of each identified structure will need to be checked, and Section 5.4.1 of the TIA proposes use of an alternative route should the capacity of Surveyors Creek Bridge on the Oxley Highway be insufficient. (Refer below for further comments regarding alternative routes.) • The EIS, TIA and Route Survey all appear to rely solely on the OSOM route/s utilising the Oxley Highway to access the project site for OSOM loads, yet present uncertainty regarding the viability of the proposed route/s to accommodate the loads transported to the project site, furthermore not all relevant bridge / culvert structures along the proposed route/s have been identified. • TfNSW reiterates this assessment must be undertaken prior to determination to ensure the route/s are suitable to accommodate the proposed OSOM / HV loads being transported to site. Where the Preferred Access Route/s is found to be unsuitable, further assessment will be required for any alternative route/s.	It is no longer proposed to utilise Oxley Highway (including crossing Surveyors Creek Bridge) for the transport of OSOM components. An alternative route is proposed via New England Highway, Staces Road and Thunderbolts Way as outlined within this document and the RJA Report.

TfNSW Comment	Response
Figure F6 identifies Thunderbolts Way as a route between Walcha and the approximate location of the proposed switching yard, however does not show Thunderbolts Way as an access route to site for construction traffic coming from further north. This traffic is noted to include, approximately 50% of Light Vehicles transporting workers, 40% of the MRV/HRV and 30% of the Truck and Dog/AV/B-Doubles traveling to site from the Armidale and Uralla regions. Furthermore, no intersection assessment appears to have been undertaken at the key intersection of New England Highway & Thunderbolts Way. The TIA must be updated to clearly demonstrate ALL access routes to site, in particular from the key intersections of the classified (State & Regional) roads, further addressing traffic impacts at the key intersections along those route/s.	The expected distributions for Project traffic are outlined in Section 4.3. This report has been updated to include SIDRA intersection analysis for the following State and Regional Road intersections in Section 4.5.1: • New England Highway / Oxley Highway. • New England Highway (Bridge Street) / Thunderbolts Way (Salisbury Street). • Fitzroy Street / Derby Street. • Thunderbolts Way / Darjeeling Road. • Thunderbolts Way (Uralla Road & Derby Street) / Jamieson Street. It is estimated that up to 24 vehicles per day (i.e. two-way trips) associated with the construction of the transmission line may periodically utilise Hillview Road to access the Project Area from Thunderbolts Way. The vehicles would generally travel toward the site in the morning and away from the site in the afternoon. It is noted that Hillview Road is not proposed to accommodate regular construction traffic, and the majority of vehicles are expected to be light vehicles with only a small number of heavy vehicles (average of 1 movement per day). The traffic generated by the project would be limited to a shorter time period in the order of up to 12 months. It is noted that a small proportion of the project traffic would also access the switching station on the western side of Thunderbolts Way, however for the purposes of the assessment all vehicles are conservatively assumed to travel to/from the Project Area northeast of Walcha.
Although not directly proposed, TfNSW advise that any use of the Oxley Highway, East of Walcha will not be supported by TfNSW. This particular road corridor is prone to flooding, and hazards including land slips. It is currently undergoing significant rehabilitation works which may continue for several years, which may at times include single lane alternate flow, stop/slow, reduced lane / shoulder widths and the potential for road closures.	Noted. It is not proposed to utilise any section of Oxley Highway east of Walcha for Project traffic.

TfNSW Comment	Response
2. Alternative Transport Routes	
Alternative transport routes for OSOM and Heavy Vehicles via Kentucky and Uralla are mentioned in Sections 5.4.1 and 5.5 of the TIA, (bypassing the Oxley Highway). Each route is stated not to be the preferred route due to a variety of constraints, however none of these route/s are entirely discounted either. Furthermore, on occasion are used to suggest alternatives are available to the *Preferred Access Route/s*, if needed. These routes have not been sufficiently detailed in the TIA or Route Survey to be considered suitable viable alternatives, at this time. Further assessment is required if they are to be considered for this development.	An updated overview of the route options assessed for OSOM vehicles is provided in Section 6.1.10. Route 3 within the RJA Report provides an alternate bypass route for blade transport vehicles to avoid travelling through Tamworth which has been assessed and is considered feasible. All other routes are not proposed for OSOM vehicles and have been included to demonstrate the range of route options that have been considered, with the current proposed routes representing the most suitable options.
• A Tamworth Bypass route for Blade transportation, is detailed in both the TIA and Route Survey. This route is acknowledged to have a number of constraints, including being limited to a maximum of 25T. The proposed single piece 81m Blades are noted (in TIA Table 4) to have a mass of 28.1T, exceeding that maximum. It is unclear if this mass is for the blade component only or is inclusive of the specialist transportation vehicle's weight, also. • The proposal includes extensive traffic control & reversing manoeuvres to accommodate this route, in particular at the intersection of Whitehouse Lane & the New England Highway, south of Tamworth, and along Nundle Road between O'Brien's Lane & the intersection at the New England Highway, East of Tamworth at Nemingha. The Route Survey (11.0 Route Survey 3: Alternative Route through Tamworth), appears incomplete in addressing the relevant impacts, timeframes and distances of particular reversing movements. • Further to this, Section 6.6 of the TIA states that there is potential for the construction period to overlap with the Hills of Gold Wind Farm. Further information is required to directly address the cumulative impacts of both wind farm development's construction traffic occurring concurrently, in particular at the two identified intersections of the New England Highway and along Nundle Road. Further information is also required to further address any relevant pull over bays and / or procedures to enable the OSOM vehicles to wait, without blocking traffic, prior to traffic control processes being implemented to enable the proposed manoeuvres to occur. • TfNSW do not support the closing statement of Section 5.5, that the Tamworth Bypass will be further investigated prior to construction. Any route proposed to be included in any future consent, must address and identify any impacts on the classified road network, including the extent of works within the classified road reserve, which may require further consent and / or concurrence from TfNSW. Any associated environmental approvals are required to be identified & addressed prior to determination.	• The mass of each blade is 32.0T and overall mass including the transport vehicle is 96.5T as noted in the updated RJA Report. The report notes that this exceeds the current load limit along the bypass route. • The OSOM vehicles would operate with pilot vehicles and under police escort to guide the vehicles and manage traffic as required. A comprehensive TMP would be prepared prior to the construction phase in conjunction with the relevant road authorities to set out OSOM vehicle operating protocols and ensure adequate road safety and road network operations are maintained. • The Hills of Gold Wind Farm may generate traffic along New England Highway south of Tamworth, and along Nundle Road east of Tamworth. These road sections are not anticipated to be utilised by general traffic associated with the Winterbourne Wind Farm as outlined in Section 4.3. It is noted that OSOM vehicles may utilise these roads which would be carried out in accordance with the TMP and with pilot vehicles and police escort. Pull-over locations and procedures would be identified as part of the TMP. • The Tamworth Bypass is identified as Route 3 within the Route Study prepared by Rex J Andrews Pty Ltd (Appendix A). The Route Study provides swept paths for the OSOM delivery vehicles and identifies the required road upgrades for this option.

TfNSW Comment	Response
Uncertainty remains regarding the viability of the Preferred Access Route/s via the Oxley Highway (from the New England Highway), in particular regarding, impacts to relevant road and rail corridors, the need to undertake bridge and culvert assessments and further details required for the proposed works at Surveyors Creek Bridge. Until such details are provided to confirm the viability of the Preferred Access Route/s, TfNSW require further investigations be undertaken and details be provided regarding the alternative access route/s to site.	It is no longer proposed to utilise Oxley Highway for the transport of OSOM components. An alternative route is proposed via New England Highway, Staces Road and Thunderbolts Way as outlined within this document and the RJA Report.
3. Swept Paths	
Swept Paths demonstrated in Appendix I demonstrate the concurrent swept paths for a 19m Articulated Vehicle (AV) only, however, the project proposes to utilise a variety of Heavy Vehicles (HVs) including 19m Truck and Dog trailers and 26m B-Doubles. Swept paths must be updated to further demonstrate the concurrent inbound and outbound movements of both the largest design vehicle (B-Double) and the Truck and Dog (proposed to transport majority of materials to site) to identify any potential points of conflict at this intersection.	Swept paths have been prepared by icubed consulting and are provided within Appendix B. The swept paths have been prepared showing concurrent B-Double movements as these are the largest design vehicles proposed to access the Project Area. Truck and Dog vehicles are at least 7m shorter than the 26m B-Double design vehicles and would therefore have a suitable level of access at each intersection.
4. SIDRA	
Throughout the TIA, in particular the *Executive Summary, Appendix G* and *Appendix K*, reference is made to SIDRA Analysis being undertaken, however, no SIDRA Outputs have been provided. Furthermore, *Appendix K* states that SIDRA has been undertaken for the intersection of Thunderbolts Way / Jamieson Street, but does not state that any other key intersections have been analysed. SIDRA Outputs are required to enable an appropriate assessment of the traffic impacts of the development at key intersections.	This report has been updated to include SIDRA intersection analysis for the following State and Regional Road intersections in Section 4.5.1: • New England Highway / Oxley Highway. • New England Highway (Bridge Street) / Thunderbolts Way (Salisbury Street). • Fitzroy Street / Derby Street. • Thunderbolts Way / Darjeeling Road. • Thunderbolts Way (Uralla Road & Derby Street) / Jamieson Street. The SIDRA outputs for all intersections are provided in Appendix I.

TfNSW Comment	Response
5. Light Vehicle Trips & Carpooling	
• Table 9 in the TIA proposes 105 (one-way) peak hour Light Vehicle trips, with a further proposal to encourage carpooling among staff, at a rate of 4 people per car for a peak workforce of 400 workers. This rate although stated to be conservative, is rather high, and is without any evidence or strategies demonstrating how carpooling will be encouraged, implemented, mandated, or managed. Without this information, it is unclear how such rates would be maintained throughout the construction period of the project, to ensure the volume of light vehicle trips, complied with the proposal. The traffic impacts of the development have been demonstrated based on this high light vehicle passenger rate scenario, rather than "worst case" scenario. If they cannot be maintained, the traffic impacts on the state road and key intersections may be greater than demonstrated. • TfNSW recommends the development provide a Carpooling and Shuttle Buses Strategy further detailing how staff will be required to take up the option/s proposed. Where such a strategy cannot be provided to demonstrate processes and policies to comply with the proposal, further amendments to the TIA will be required to demonstrate the worst case scenario traffic impacts for light vehicle trips between their points of origin to/from site.	An updated assessment of the Project traffic generation is provided in Section 4.2. For the purposes of the assessment a revised vehicle occupancy of approximately 2.0 people per car has been adopted to calculate the staff traffic generation, with staff expected to be encouraged to carpool. In some instances, shuttle buses may be used by specific contractors where a group of people are working in the same area however at this stage it has conservatively been assumed that all staff would arrive by light vehicle. A carpooling program would be implemented for the workforce as outlined within the recommendations for the TMP in Section 9.2.
6. Rail Corridor Impacts	
• The proposed excavation works at the Surveyors Creek Bridge location along the Preferred Transport Route/s, has the potential to impact the adjacent rail corridor. The proposed switchyard and associated Transmission Line corridor appear to be within close proximity to the rail corridor. • Further information is required, which clearly identifies the relevant land parcels associated with the project and specifies the distance of any proposed works to the rail network corridor. Works may require further assessment under Section 2.99 of the Transport and Infrastructure SEPP (Excavation in, above, below or adjacent to rail corridors).	It is no longer proposed to utilise Oxley Highway (including cross Surveyors Creek Bridge) for the transport of OSOM components. An alternative route is proposed via New England Highway, Staces Road and Thunderbolts Way as outlined within this document and the RJA Report.
Consultation is stated to have commenced and be ongoing with ARTC, in particular with regard to the Selwyn Street level crossing, however no details regarding this consultation was provided. Further evidence is required of this consultation, to understand the impacts identified, any mitigation measures proposed or works required.	ARTC have been contacted and have indicated that the level crossing on Selwyn Street will require the attendance of an ARTC accredited Rail Protection Officer for every crossing due to the length of the load and the timings of the level crossing not being set for the longer loads. A copy of the relevant email correspondence is provided in Appendix L.
7. Additional Roads Act 1993 Concurrence	
The Transmission Line Corridor is proposed to cross over Thunderbolts Way. Works crossing a classified (regional) road reserve will require Council to seek concurrence from TfNSW under *Section 138* of the *Roads Act 1993.*	Noted.

TfNSW Comment	Response
8. Works Proposed at Surveyors Creek Bridge	
The development proposes undertaking significant works adjacent to Surveyors Creek Bridge, to accommodate the transportation of the proposed 81m Blades along the Oxley Highway. These include relocating fencing, removing armco (safety barriers), excavation into the roadside bank to allow for blade swing, and several signs to be relocated and /or made removable.	It is no longer proposed to utilise Oxley Highway (including cross Surveyors Creek Bridge) for the transport of OSOM components. An alternative route is proposed via New England Highway, Staces Road and Thunderbolts Way as outlined within this document and the RJA Report.

Table 33: Response to City of Newcastle Agency Advice on EIS

TfNSW Comment	Response
From a traffic safety perspective, the proposed measures are supported in principle subject to the following: • The proposed hardstands are not to involve any changes to the line marking on the road so that the existing arrangement of travel lanes remains the same. Where roads are significantly widened and do not possess edge lines, edge/centre lines are to be provided. • 'No Stopping' restrictions to be provided along the proposed hardstands to prevent vehicle parking on these areas for the duration of their required use. • For removable/sleeved signposts security head bolts are to be used to affix posts. • The 'oversized and over mass' routes are only to be used during the nighttime. More specific details in this regard will be provided by the NSW Police Force.	Noted.
The proposed modifications are to avoid vegetation removal. Any proposed removal of street trees will not be endorsed by City of Newcastle.	No vegetation removal is proposed within the City of Newcastle (including street trees) as outlined within the RJA Report.

Appendix E

Thunderbolts Way / Jamieson Street Intersection Design

WALCHA COUNCIL

DERBY STREET NORTH UPGRADE
APSLEY STREET TO JAMIESON STREET

INDEX

SHEET No.	DESCRIPTION
1	COVER SHEET
2	GENERAL ARRANGEMENT PLAN
3	TYPICAL CROSS SECTIONS
4	DERBY STREET PLAN AND LONGITUDINAL SECTION, SHEET 1 OF 3
5	DERBY STREET PLAN AND LONGITUDINAL SECTION, SHEET 2 OF 3
6	DERBY STREET PLAN AND LONGITUDINAL SECTION, SHEET 3 OF 3 AND JAMIESON STREET PLAN AND LONGITUDINAL SECTION
7	DERBY STREET KERB RETURNS 1 AND 2, PLAN AND LONGITUDINAL SECTIONS
8	DERBY STREET KERB RETURNS 3-5, PLAN AND LONGITUDINAL SECTIONS
9	DERBY STREET KERB RETURNS 6 AND 7, PLAN AND LONGITUDINAL SECTIONS
10	DERBY STREET CROSS SECTIONS, SHEET 1 OF 6
11	DERBY STREET CROSS SECTIONS, SHEET 2 OF 6
12	DERBY STREET CROSS SECTIONS, SHEET 3 OF 6
13	DERBY STREET CROSS SECTIONS, SHEET 4 OF 6
14	DERBY STREET CROSS SECTIONS, SHEET 5 OF 6
15	DERBY STREET CROSS SECTIONS, SHEET 6 OF 6
16	DERBY STREET LINEMARKING AND SIGNPOSTING PLAN
17	DERBY STREET PAVEMENT PLAN

LOCALITY MAP



GENERAL NOTES:

IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND LEVEL ALL SERVICES ADJACENT TO OR OTHERWISE AFFECTING THE WORKS PRIOR TO THE COMMENCEMENT OF WORKS, WHETHER OR NOT THEY ARE INDICATED ON THE DRAWINGS. WHERE SERVICES CONFLICT WITH PROJECT WORKS THEY ARE TO BE RELOCATED ON APPROVAL FROM THE 'PRINCIPAL'S AUTHORISED PERSONNEL' (P.A.P.). THE CONTRACTOR, ON APPROVAL FROM THE P.A.P., SHALL MAKE ALL NECESSARY ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST AS FOUND NECESSARY.

EXISTING SIGNS TO BE REUSED PROVIDED THEY ARE IN A GOOD AND SERVICEABLE CONDITION TO THE SATISFACTION OF THE P.A.P.. OTHERWISE, REPLACE WITH A NEW, EQUIVALENT SIGN.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO SUPPLY AND IMPLEMENT CONTEMPORARY SITE-SPECIFIC EROSION AND SEDIMENT CONTROL MEASURES AS PART OF THEIR ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROJECT. THE CONTROL MEASURES SHALL BE IN ACCORDANCE WITH COUNCIL SPECIFICATIONS AND 'THE BLUE BOOK'. THE CONTRACTOR SHALL , PRIOR TO COMMENCEMENT OF WORKS, PREPARE AND SUBMIT TO COUNCIL AN EROSION AND SEDIMENT CONTROL PLAN.

ALL DISTURBED AREAS ARE TO BE REGENERATED AND RESTORED TO PRE-EXISTING CONDITION.

THE CONTRACTOR SHALL NOT ENTER UPON OR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT PRIOR WRITTEN PERMISSION OF THE LAND OWNER AND COUNCIL.

THE CONTRACTOR SHALL AT ALL TIMES MAINTAIN IN A SAFE CONDITION AN ALL WEATHER ACCESS TO THE ROADWAYS AND PROPERTIES ADJACENT TO THE SITE TO THE SATISFACTION OF COUNCIL.

THE CONTRACTOR SHALL UNDERTAKE TRAFFIC CONTROL MEASURES IN ACCORDANCE WITH THE WORK HEALTH AND SAFETY ACT 2011.

ALL EXISTING CULVERTS ARE TO BE CLEANED AND VEGETATION TO BE REMOVED FROM INLET AND OUTLET TO RE-ESTABLISH A CLEAR WATERWAY.

ALL EXISTING CULVERTS ARE TO BE INSPECTED DURING CONSTRUCTION TO ENSURE THEY ARE STRUCTURALLY SOUND. DAMAGED SECTIONS OF CULVERTS MAY BE REPLACED UPON APPROVAL FROM THE P.A.P..

LEGS IN NO WAY CERTIFY THE STRUCTURAL INTEGRITY NOR STRUCTURAL CAPACITY OF EXISTING STRUCTURES WITHIN THE WORKS. IF THE CONTRACTOR DEEMS AN EXISTING STRUCTURE TO BE STRUCTURALLY UNSOUND, CONTACT THE PRINCIPAL'S REP. (P.A.P.)

SURVEY NOTES:

DETAIL SURVEY - DERBY ST - APSLEY STREET TO JAMIESON STREET, WALCHA - 21.01.19

THIS SURVEY PLAN/DATA HAS BEEN PREPARED FOR WALCHA COUNCIL FROM FIELD SURVEY FOR THE PURPOSE OF SHOWING THE PHYSICAL FEATURES, TOPOGRAPHY AND LEVELS FOR ROAD DESIGN. THE INFORMATION SHOWN HEREIN IS ONLY RELIABLE FOR THIS PURPOSE AND SHOULD NOT BE USED FOR OTHER PURPOSE OR AT A LATER DATE WITHOUT VERIFICATION.

SURVEY IS ON GROUND DISTANCES, MGA ZONE 56 ORIENTATION AND AHD.

ORIGIN OF COORDINATES PM 12947, E: 365809.591 N: 6571885.776 CLASS A ORDER 1 (SOURCE: SCIMS 19th NOV 2018). TO OBTAIN MGA GRID DISTANCES SCALE BY 0.999650 FROM ORIGIN.

ORIGIN OF LEVELS SSM 77587, RL 1046.884m AHD, CLASS LB ORDER L2.

A STATE SURVEY MARK (E.G. PM, SS ETC) OR BOUNDARY REFERENCE MARK MUST NOT BE DESTROYED OR DAMAGED UNLESS AUTHORISATION HAS BEEN GIVEN BY THE SURVEYOR GENERAL AND THE MARKS ARE ASSESSED BY A REGISTERED SURVEYOR OR PERSON AUTHORISED BY THE SURVEYOR GENERAL'S DEPARTMENT. ALL OTHER SURVEY MARKS ARE NOT TO BE DISTURBED OR DESTROYED UNTIL ASSESSED BY THE SITE SURVEYOR.

ANY STATE SURVEY MARK (E.G. PM, SS ETC.) THAT ARE DESTROYED ARE TO BE REPLACED WITH ANOTHER STATE SURVEY MARK AS PER THE SURVEYOR GENERALS'S DIRECTIONS NO. 11: PRESERVATION OF SURVEY INFRASTRUCTURE.

BOUNDARIES HAVE NOT BEEN SURVEYED. FENCELINES SHOWN ARE INDICATIVE OF POSITION ONLY AND DO NOT REFLECT CADASTRAL BOUNDARIES.

SERVICE LOCATIONS SHOWN ARE FROM SURFACE INVESTIGATIONS ONLY. WHERE SERVICE INFORMATION IS CRITICAL TO THE DESIGN PROPOSED, THE INFORMATION SHOULD BE VERIFIED PRIOR TO COMMENCEMENT OF CONSTRUCTION. ALL PARTIES SHOULD CARRY OUT THEIR OWN DIAL BEFORE YOU DIG SEARCH PRIOR TO COMMENCING ANY WORK ON SITE.

ALL SYMBOLS SHOWN ARE DIAGRAMMATIC ONLY AND NOT TO SCALE. TREE DIMENSIONS STIPULATED ARE DIAMETERS.

THIS NOTE FORMS PART OF THIS PLAN/DATA. REPRODUCTION OF THIS PLAN/DATA OR ANY PART OF IT WITHOUT THIS NOTE BEING INCLUDED IN FULL WILL RENDER THE INFORMATION SHOWN ON SUCH REPRODUCTION INVALID AND NOT SUITABLE FOR USE.

ISSUE	REVISION	AUTH	DATE
C	ISSUED FOR TENDER	J.C	17/10/19
B	ISSUED TO CLIENT FOR APPROVAL	L.W	09/10/19
A	ISSUED TO CLIENT FOR REVIEW	Z.C	24/07/19

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Email: john@legs.com.au
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17 Byron Street, Inverell NSW 2360
Ph: 02-67225110
Email: andrew@legs.com.au

CLIENT: WALCHA COUNCIL

PROJECT: DERBY STREET NORTH UPGRADE

COVER SHEET

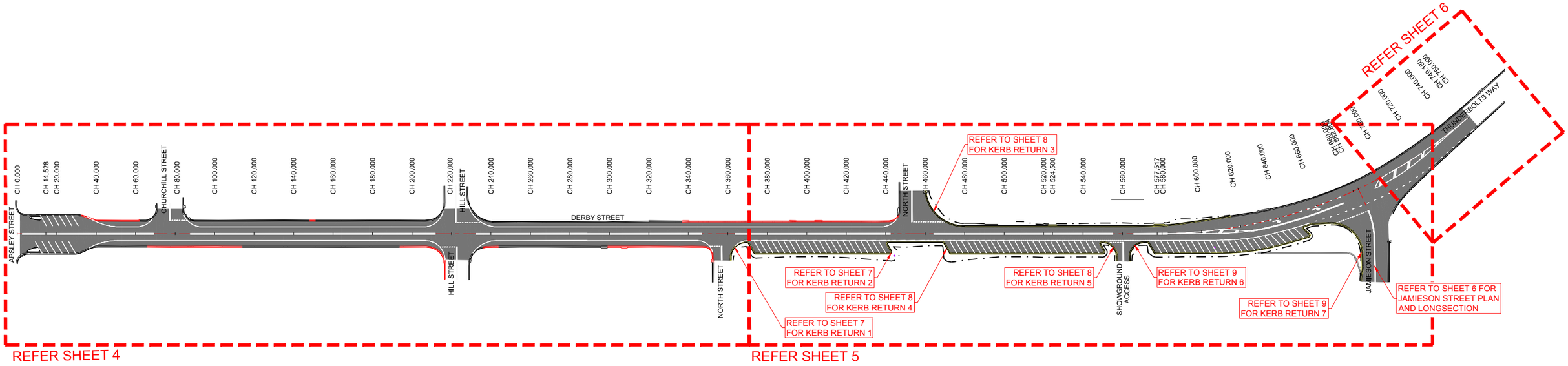
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FILE NAME: PM668_D.dwg

		DATE
DRAWN	Z.C	24/07/19
DESIGNED	L.W	24/07/19
APPROVED	J.C	24/07/19

DATUM: -

JOB No.: PM668
DOCUMENT No.: D01
ISSUE: C
SHEET No.: 1 OF 17
STATUS: TENDER
REG. No.: -



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WALCHA COUNCIL

CLIENT: WALCHA COUNCIL

PROJECT: DERBY STREET NORTH UPGRADE

GENERAL ARRANGEMENT

SCALES: A1 ORIGINAL
0 20 40 60 80 100m
SCALE 1:1000 @A1

FILE NAME: PM668_D.dwg

DRAWN	Z.C	DATE 24/07/19
DESIGNED	L.W	DATE 24/07/19
APPROVED	J.C	DATE 24/07/19
DATUM: -		

JOB No.: PM668
DOCUMENT No.: D02
ISSUE: C
SHEET No.: 2 OF 17
STATUS: TENDER
REG. No.: -

PAVEMENT NOTE

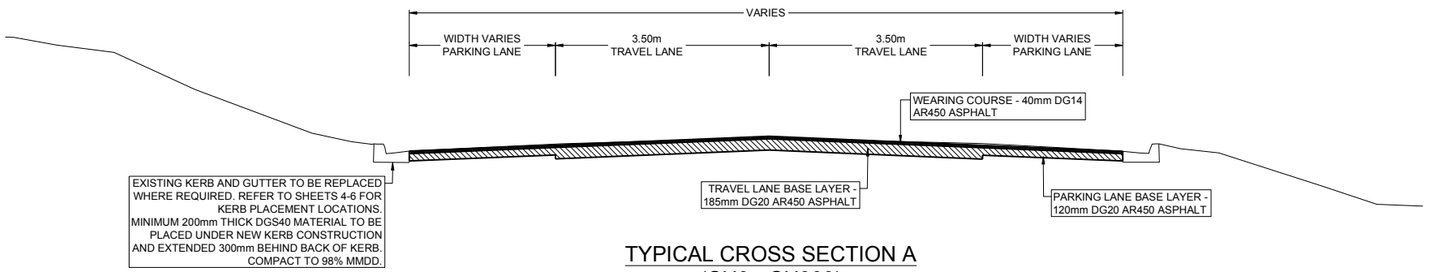
PAVEMENT DETAILS ARE TO BE READ IN CONJUNCTION WITH REGIONAL GEOTECH SOLUTIONS REPORT NUMBER RGS31755.1-AF DATED 04/05/2019

SURVEY CONTROL SCHEDULE

Station Name	Easting	Northing	RL	Description
PM 12947	365809.591	6571885.776	1056.824	Permanent Mark
PM 12948	365547.409	6571896.748	1067.624	Permanent Mark
PM 54300	365846.858	6572115.202	1059.871	Permanent Mark
SS 11212	365773.17	6571636.162	1065.17	State Survey Mark
SS 160133	365797.364	6572111.83	1059.774	State Survey Mark
SS 70904	365731.448	6572242.905	1066.509	State Survey Mark
SS 77587	365739.698	6571422.543	1046.884	State Survey Mark
SS 77594	365712.527	6571429.999	1048.075	State Survey Mark
STN1	365634.44	6572341.322	1069.496	Dumpy
STN2	365806.288	6572007.851	1057.505	Dumpy
STN3	365762.145	6571749.28	1064.019	Nail in Footpath
STN4	365730.175	6571523.959	1057.938	Dumpy

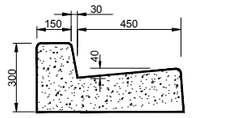
SUBSOIL TABLE

START CHAINAGE	END CHAINAGE	SIDE OF FORMATION
340	440	LEFT
460	610	LEFT
360	660	RIGHT



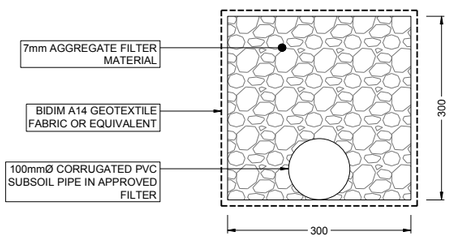
TYPICAL CROSS SECTION A (CH0 - CH300)

SCALE 1:50



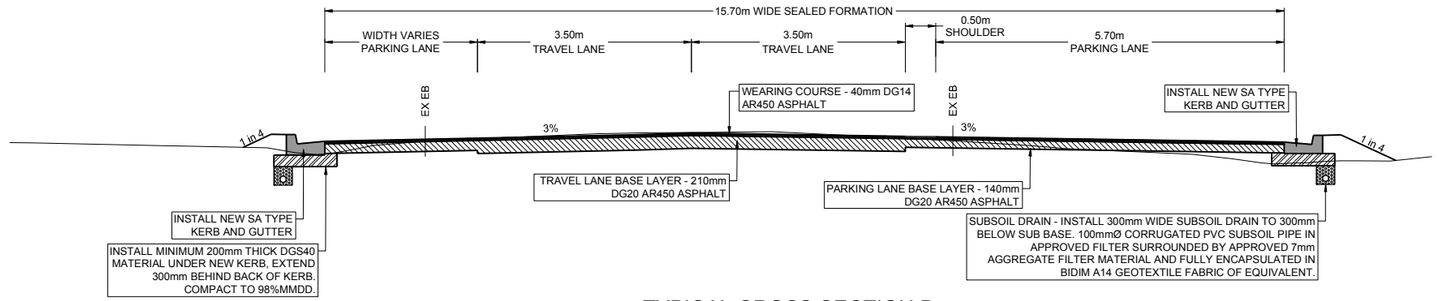
SA TYPE KERB & GUTTER DETAIL

NOT TO SCALE



SUBSOIL TRENCH DETAIL

NOT TO SCALE



TYPICAL CROSS SECTION B (CH300 - CH750)

SCALE 1:50

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Email: andrew@legs.com.au

CLIENT: WALCHA COUNCIL

PROJECT: DERBY STREET NORTH UPGRADE

TYPICAL CROSS SECTIONS

SCALES: A1 ORIGINAL — 0 1 2 3 4 5m — SCALE 1:50 @A1

FILE NAME: PM668_D.dwg

		DATE
DRAWN	Z.C	24/07/19
DESIGNED	L.W	24/07/19
APPROVED	J.C	24/07/19
DATUM:	-	

JOB No.: PM668
DOCUMENT No.: D03
ISSUE: C
SHEET No.: 3 OF 17
STATUS: TENDER
REG. No.: -

ALL SERVICES SHOWN ARE INDICATIVE ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND LEVEL ALL SERVICES ADJACENT TO OR OTHERWISE AFFECTING THE WORKS PRIOR TO THE COMMENCEMENT OF WORKS

WARNING EXISTING SEWER, WATERMAIN AND NBN WITHIN FORMATION. LOCATE PRIOR TO CONSTRUCTION.

WARNING EXISTING SEWER, WATERMAIN AND NBN WITHIN FORMATION. LOCATE PRIOR TO CONSTRUCTION.

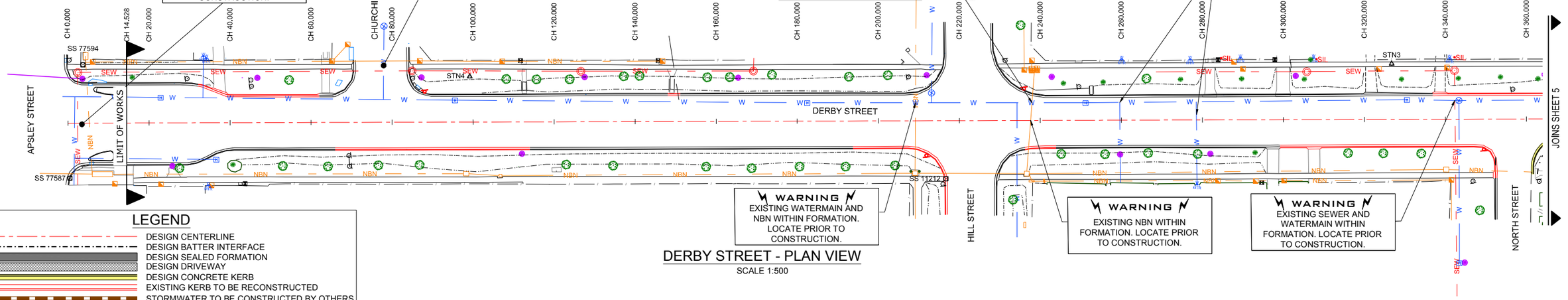
WARNING EXISTING WATERMAIN WITHIN FORMATION. LOCATE PRIOR TO CONSTRUCTION.

WARNING EXISTING WATERMAIN WITHIN FORMATION. LOCATE PRIOR TO CONSTRUCTION.

WARNING EXISTING WATERMAIN AND NBN WITHIN FORMATION. LOCATE PRIOR TO CONSTRUCTION.

WARNING EXISTING NBN WITHIN FORMATION. LOCATE PRIOR TO CONSTRUCTION.

WARNING EXISTING SEWER AND WATERMAIN WITHIN FORMATION. LOCATE PRIOR TO CONSTRUCTION.

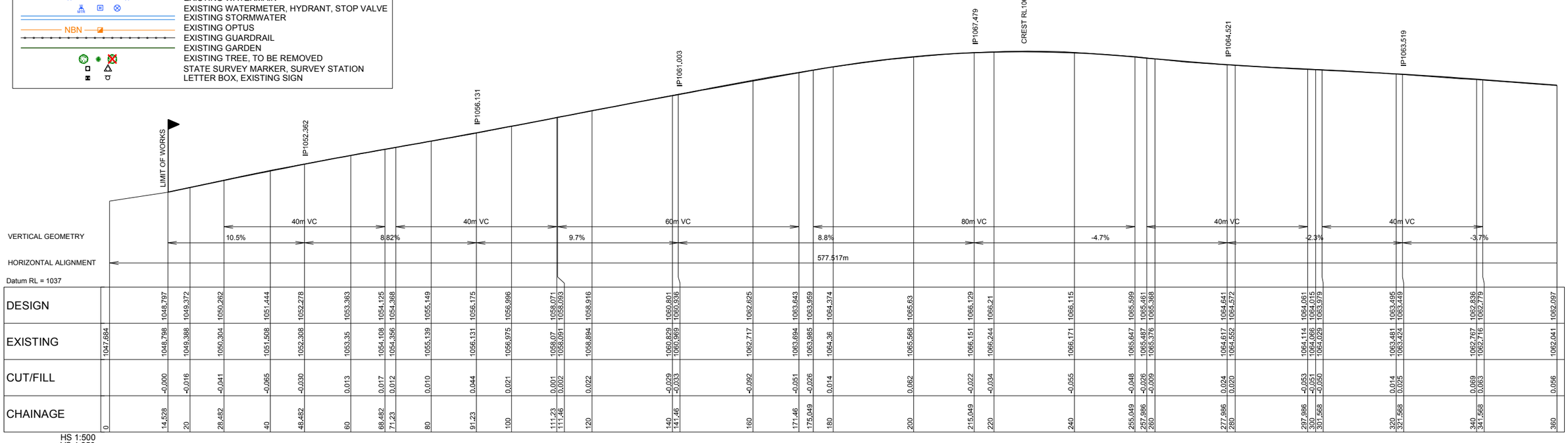


LEGEND

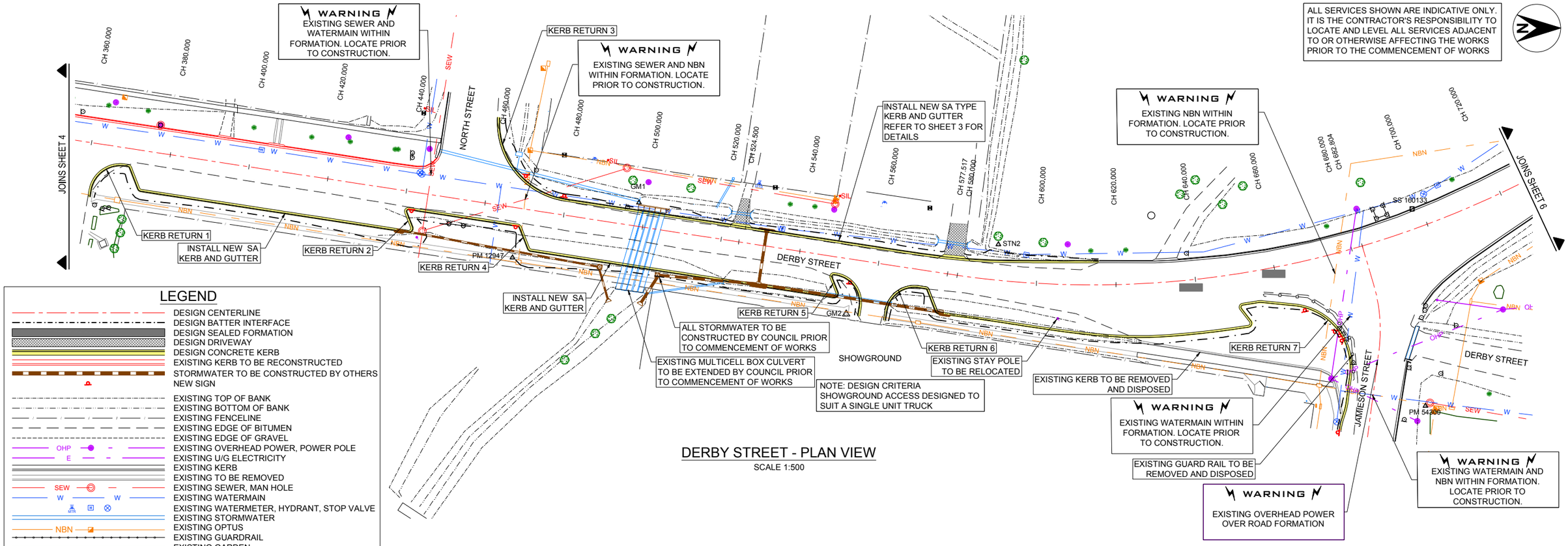
- DESIGN CENTERLINE
- DESIGN BATTER INTERFACE
- DESIGN SEALED FORMATION
- DESIGN DRIVEWAY
- DESIGN CONCRETE KERB
- EXISTING KERB TO BE RECONSTRUCTED
- STORMWATER TO BE CONSTRUCTED BY OTHERS
- NEW SIGN
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING FENCELINE
- EXISTING EDGE OF BITUMEN
- EXISTING EDGE OF GRAVEL
- EXISTING OVERHEAD POWER, POWER POLE
- EXISTING U/G ELECTRICITY
- EXISTING KERB
- EXISTING TO BE REMOVED
- EXISTING SEWER, MAN HOLE
- EXISTING WATERMAIN
- EXISTING WATERMETER, HYDRANT, STOP VALVE
- EXISTING STORMWATER
- EXISTING OPTUS
- EXISTING GUARDRAIL
- EXISTING GARDEN
- EXISTING TREE, TO BE REMOVED
- STATE SURVEY MARKER, SURVEY STATION
- LETTER BOX, EXISTING SIGN

DERBY STREET - PLAN VIEW

SCALE 1:500



| | | |

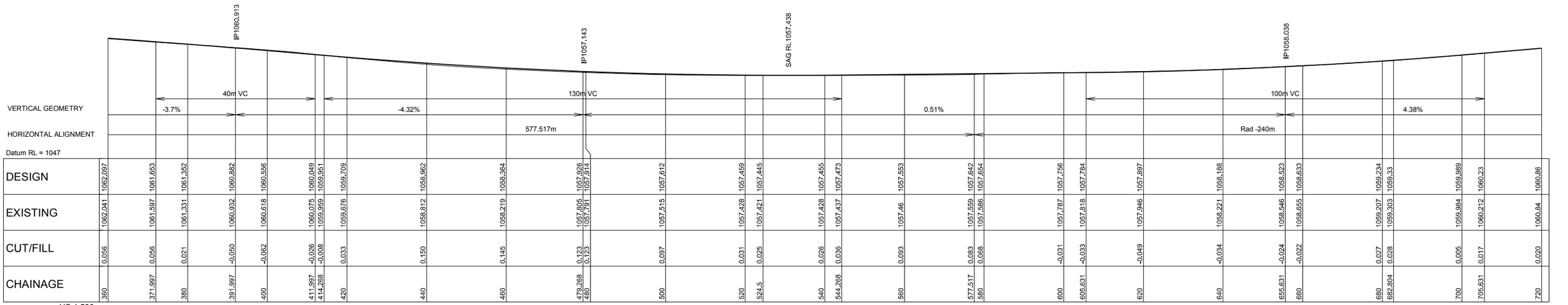


LEGEND

- DESIGN CENTERLINE
- DESIGN BATTER INTERFACE
- DESIGN SEALED FORMATION
- DESIGN DRIVEWAY
- DESIGN CONCRETE KERB
- EXISTING KERB TO BE RECONSTRUCTED
- STORMWATER TO BE CONSTRUCTED BY OTHERS
- NEW SIGN
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING FENCELINE
- EXISTING EDGE OF BITUMEN
- EXISTING EDGE OF GRAVEL
- EXISTING OVERHEAD POWER, POWER POLE
- EXISTING U/G ELECTRICITY
- EXISTING KERB
- EXISTING TO BE REMOVED
- EXISTING SEWER, MAN HOLE
- EXISTING WATERMAIN
- EXISTING WATERMETER, HYDRANT, STOP VALVE
- EXISTING STORMWATER
- EXISTING OPTUS
- EXISTING GUARDRAIL
- EXISTING GARDEN
- EXISTING TREE, TO BE REMOVED
- STATE SURVEY MARKER, SURVEY STATION
- LETTER BOX, EXISTING SIGN

DERBY STREET - PLAN VIEW

SCALE 1:500



DERBY STREET - LONGITUDINAL SECTION

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CLIENT: WALCHA COUNCIL

PROJECT: DERBY STREET NORTH UPGRADE

DERBY STREET PLAN AND LONGITUDINAL SECTION
SHEET 2 OF 3

SCALES — A1 ORIGINAL
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SCALE 1:250 @A1
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SCALE 1:500 @A1

FILE NAME: PM668_D.dwg

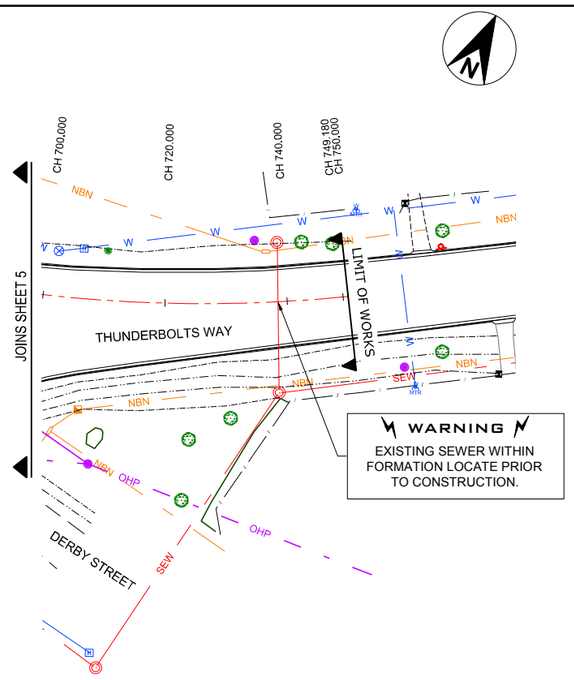
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DESIGNED	L.W	24/07/19
APPROVED	J.C	24/07/19
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DOCUMENT No.: D05
ISSUE: C
SHEET No.: 5 OF 17
STATUS: TENDER
REG. No.: -

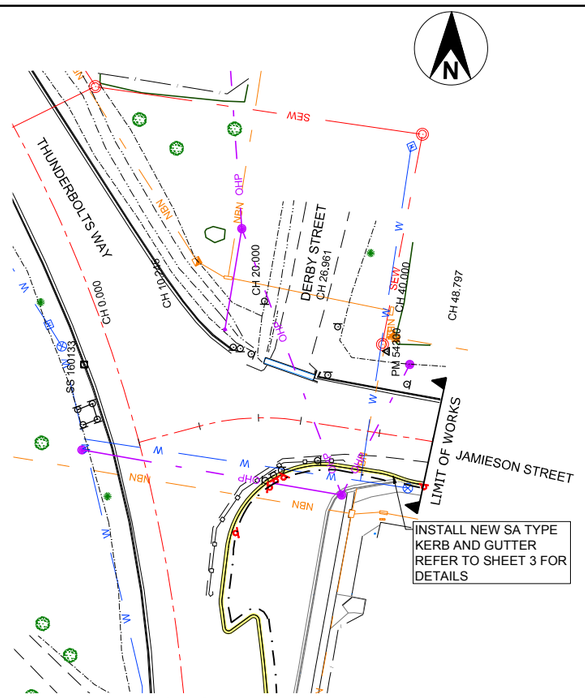
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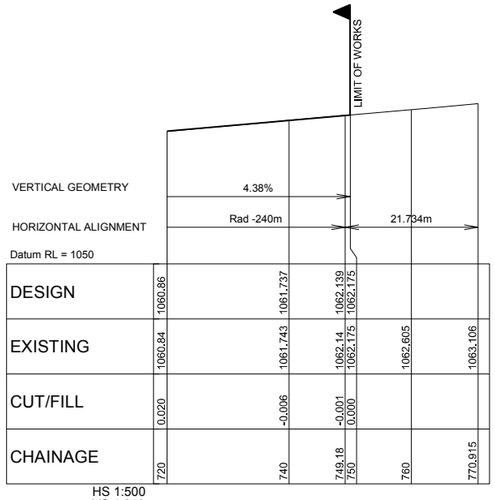
- DESIGN CENTERLINE
- DESIGN BATTER INTERFACE
- DESIGN SEALED FORMATION
- DESIGN DRIVEWAY
- DESIGN CONCRETE KERB
- EXISTING KERB TO BE RECONSTRUCTED
- STORMWATER TO BE CONSTRUCTED BY OTHERS
- NEW SIGN
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING FENCELINE
- EXISTING EDGE OF BITUMEN
- EXISTING EDGE OF GRAVEL
- OHP — EXISTING OVERHEAD POWER, POWER POLE
- E — EXISTING U/G ELECTRICITY
- EXISTING KERB
- EXISTING TO BE REMOVED
- SEW — EXISTING SEWER, MAN HOLE
- W — EXISTING WATERMAIN
- EXISTING WATERMETER, HYDRANT, STOP VALVE
- EXISTING STORMWATER
- NBN — EXISTING OPTUS
- EXISTING GUARDRAIL
- EXISTING GARDEN
- EXISTING TREE, TO BE REMOVED
- STATE SURVEY MARKER, SURVEY STATION
- LETTER BOX, EXISTING SIGN



DERBY STREET - PLAN VIEW
SCALE 1:500

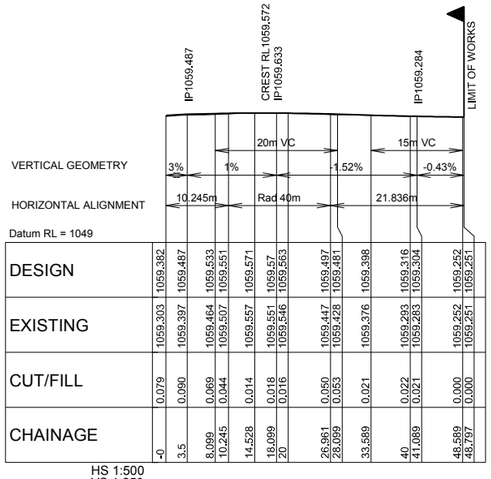


JAMIESON STREET - PLAN VIEW
SCALE 1:500



HS 1:500
VS 1:250

DERBY STREET - LONGITUDINAL SECTION



HS 1:500
VS 1:250

JAMIESON STREET - LONGITUDINAL SECTION

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WALCHA COUNCIL

CLIENT: WALCHA COUNCIL

PROJECT: DERBY STREET NORTH UPGRADE

DERBY STREET PLAN AND LONGITUDINAL SECTION
SHEET 3 OF 3
JAMIESON STREET PLAN AND LONGITUDINAL SECTION

SCALES — A1 ORIGINAL
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SCALE 1:250 @A1
0 10 20 30 40 50m
SCALE 1:500 @A1

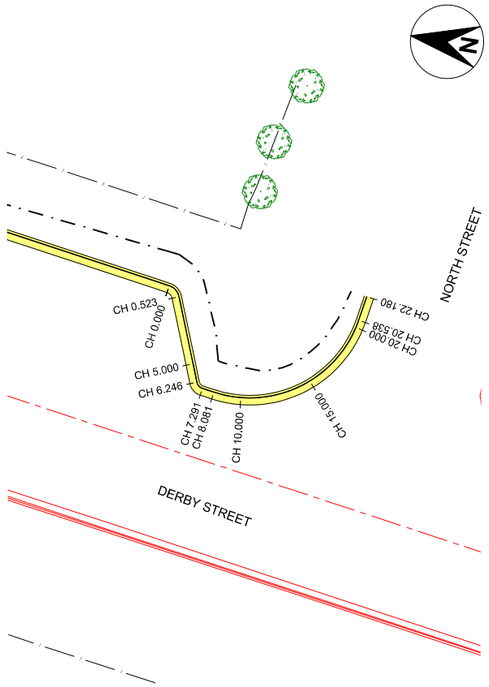
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DRAWN: Z.C	24/07/19
DESIGNED: L.W	24/07/19
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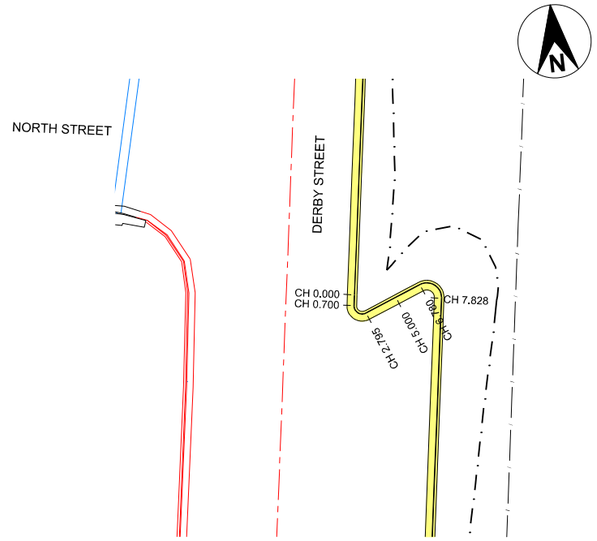
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REG. No.: -

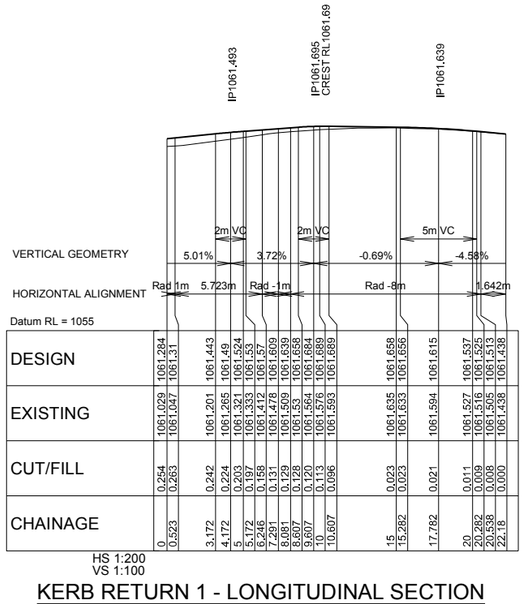
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KERB RETURN 1 - PLAN VIEW
SCALE 1:200

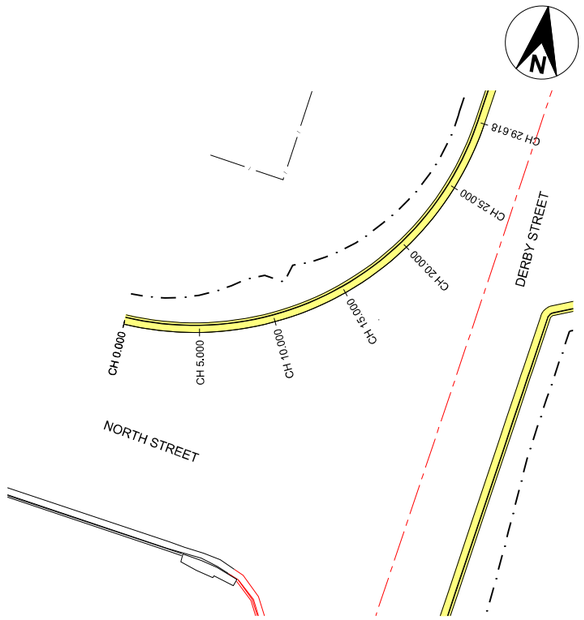


KERB RETURN 2 - PLAN VIEW
SCALE 1:200



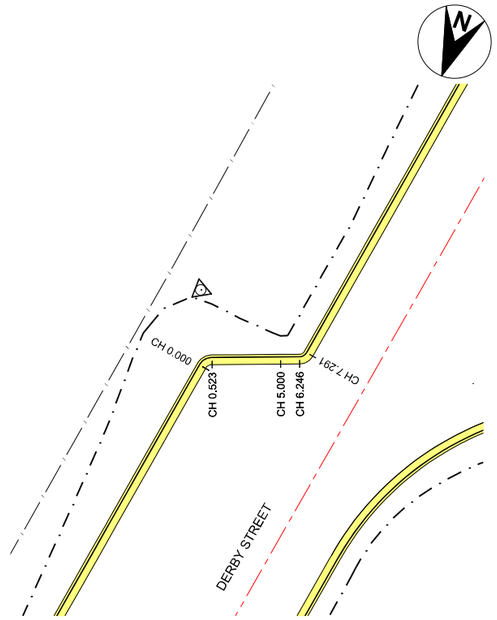
| | | |

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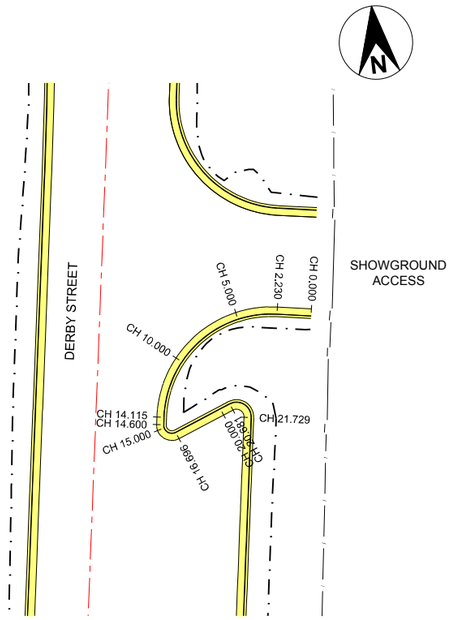
KERB RETURN 3 - PLAN VIEW

SCALE 1:200



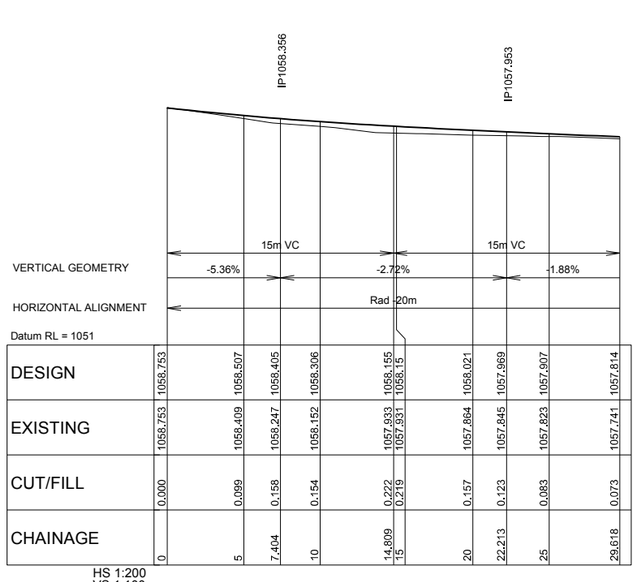
KERB RETURN 4 - PLAN VIEW

SCALE 1:200



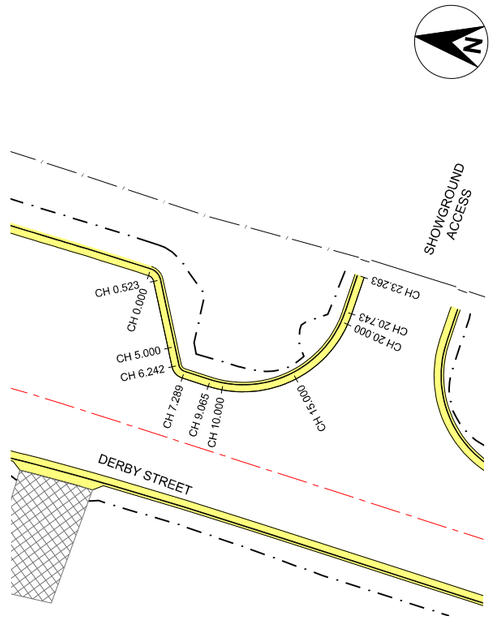
KERB RETURN 5 - PLAN VIEW

SCALE 1:200

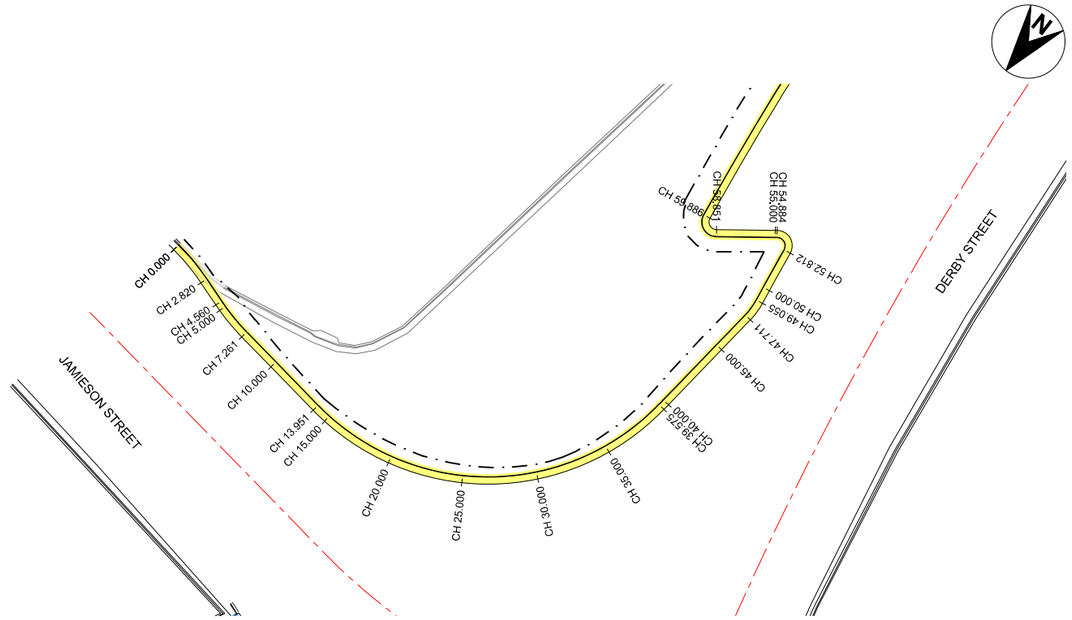


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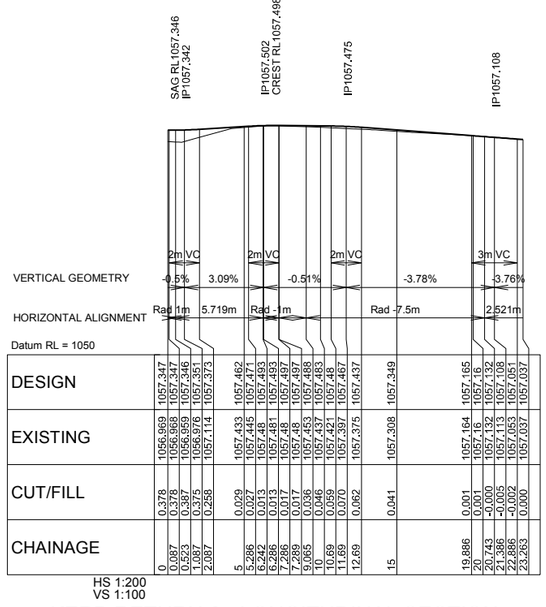
ALL SERVICES SHOWN ARE INDICATIVE ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND LEVEL ALL SERVICES ADJACENT TO OR OTHERWISE AFFECTING THE WORKS PRIOR TO THE COMMENCEMENT OF WORKS



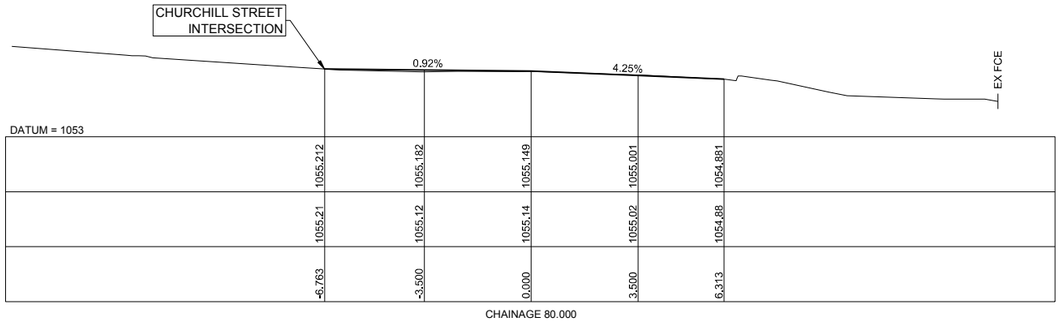
KERB RETURN 6 - PLAN VIEW
SCALE 1:200



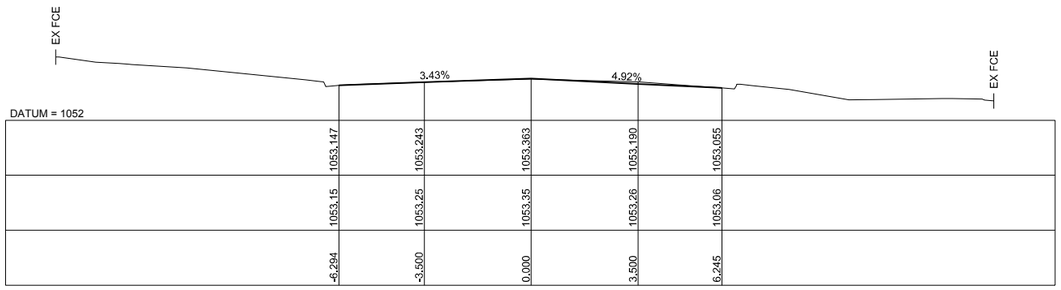
KERB RETURN 7 - PLAN VIEW
SCALE 1:200



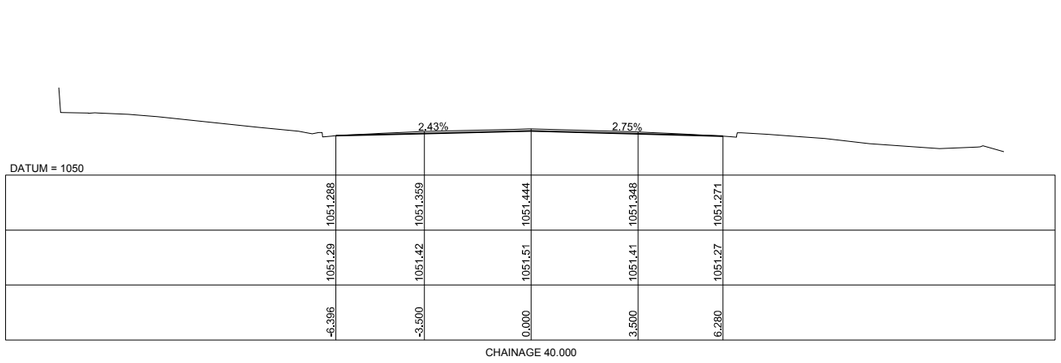
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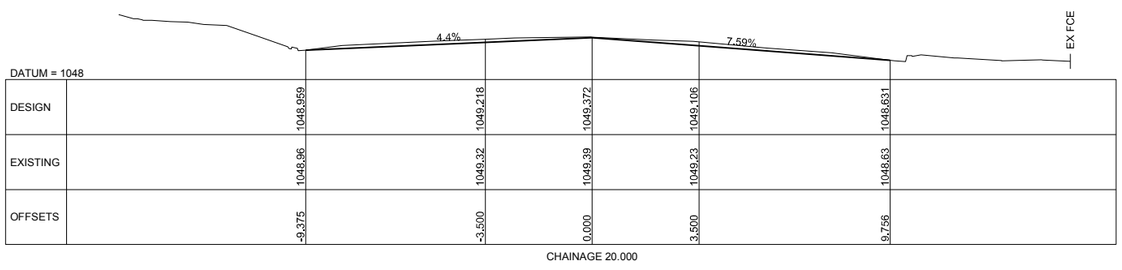
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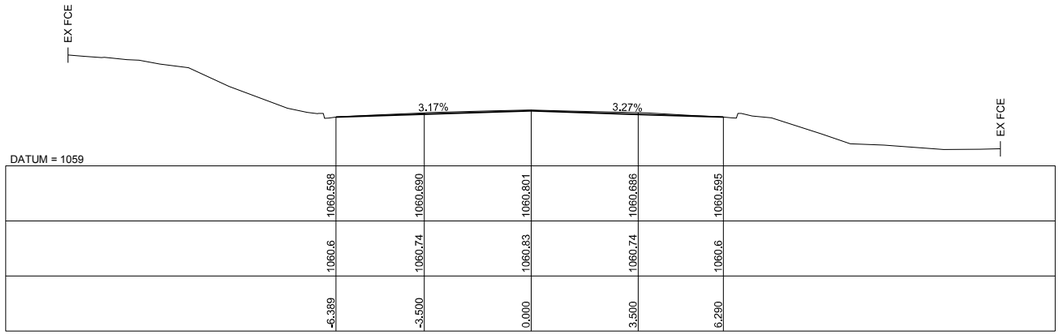
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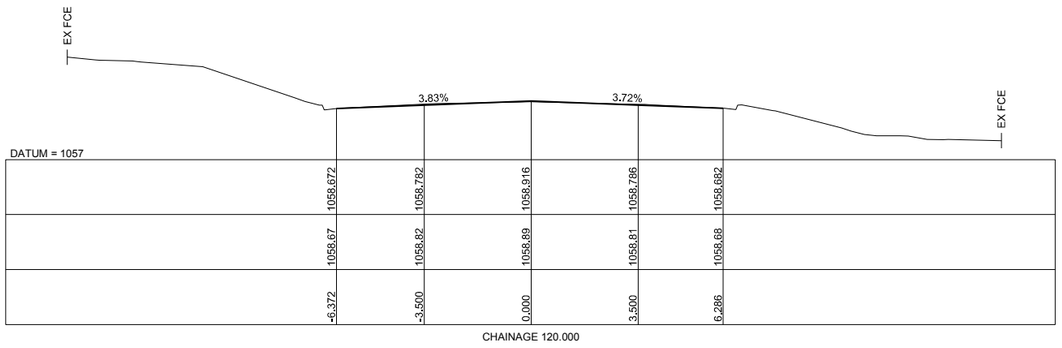
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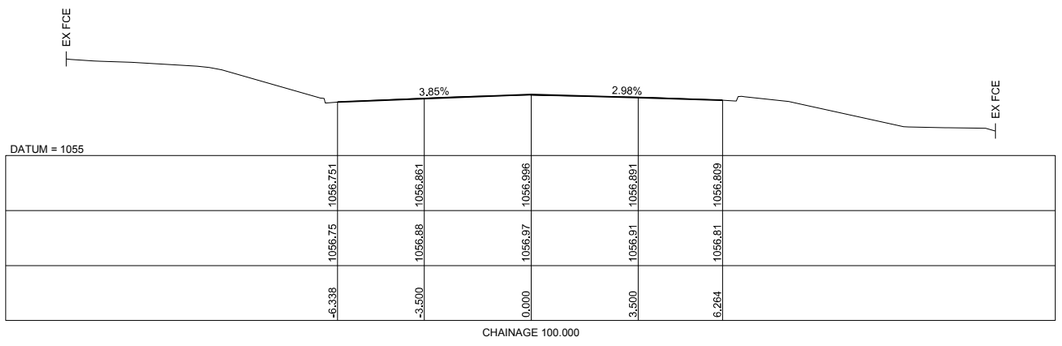
CHAINAGE 20.000



CHAINAGE 140.000



CHAINAGE 120.000



CHAINAGE 100.000

ISSUE	REVISION	AUTH	DATE
C	ISSUED FOR TENDER	J.C	17/10/19
B	ISSUED TO CLIENT FOR APPROVAL	L.W	09/10/19
A	ISSUED TO CLIENT FOR REVIEW	Z.C	24/07/19

LG ES LOCAL GOVERNMENT ENGINEERING SERVICES
Pty Ltd ABN 64 055 099 557
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Email: john@legs.com.au
Inverell
17 Byron Street, Inverell NSW 2360
Ph: 02-67225110
Email: andrew@legs.com.au

CLIENT: WALCHA COUNCIL

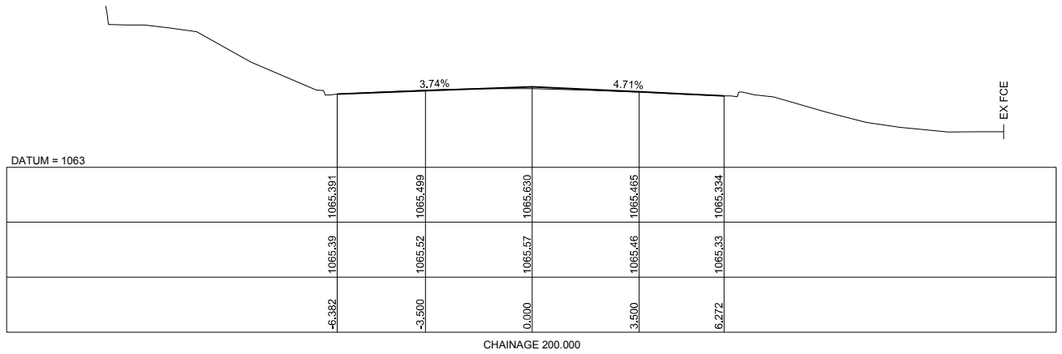
PROJECT: DERBY STREET NORTH UPGRADE

DERBY STREET CROSS SECTIONS
SHEET 1 OF 6

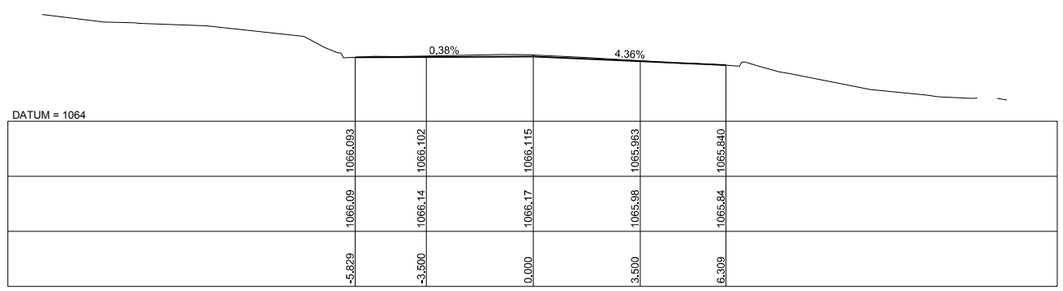
SCALES: A1 ORIGINAL
0 1 2 4 6 8 10m
SCALE 1:100 @A1

FILE NAME: PM668_D.dwg

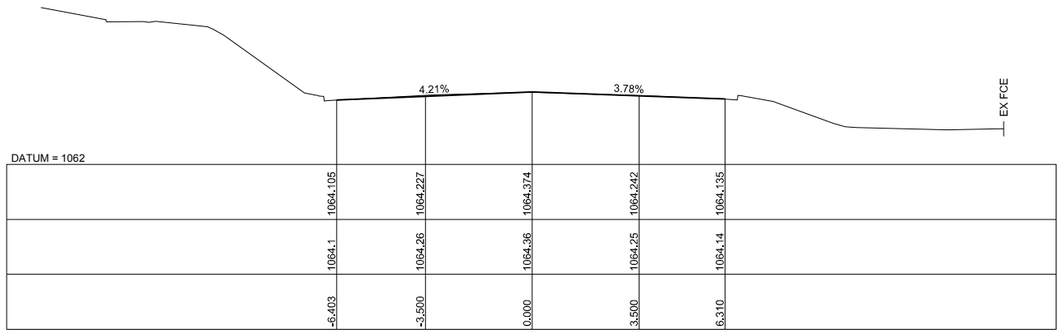
DRAWN	Z.C
DATE	24/07/19
DESIGNED	L.W
DATE	24/07/19
APPROVED	J.C
DATE	24/07/19
DATUM:	-
JOB No.:	PM668
DOCUMENT No.:	D10
ISSUE	C
SHEET No.	10 OF 17
STATUS:	TENDER
REG. No.:	-



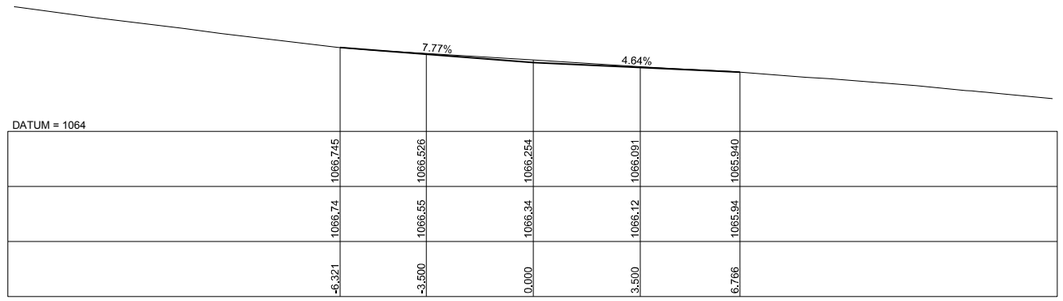
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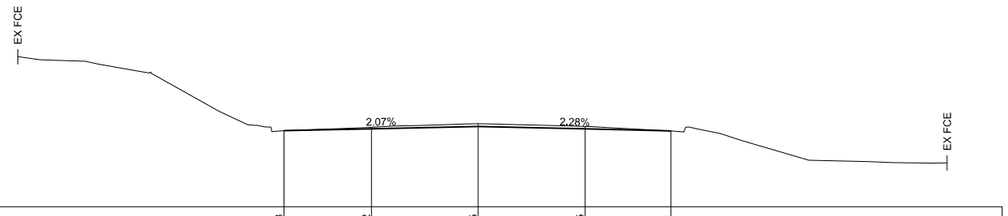
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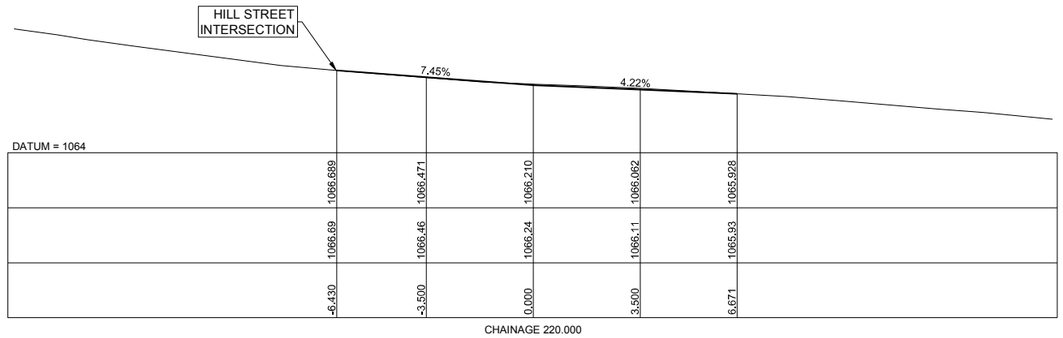
CHAINAGE 180.000



CHAINAGE 227.197



CHAINAGE 160.000



CHAINAGE 220.000

ISSUE	REVISION	AUTH	DATE
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Ph: 02-67225110
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CLIENT: WALCHA COUNCIL

PROJECT: DERBY STREET NORTH UPGRADE

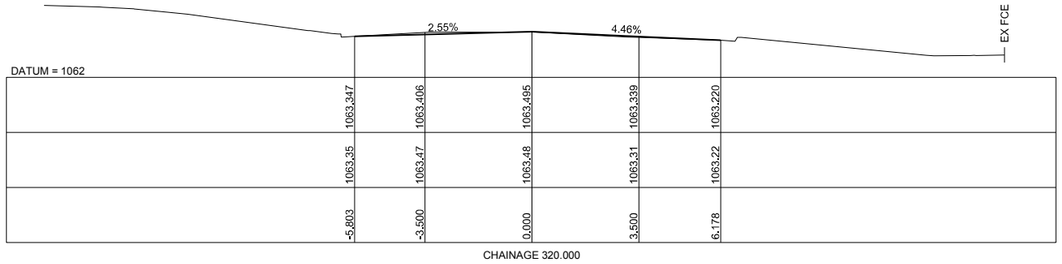
DERBY STREET CROSS SECTIONS
SHEET 2 OF 6

SCALES: A1 ORIGINAL
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SCALE 1:100 @A1

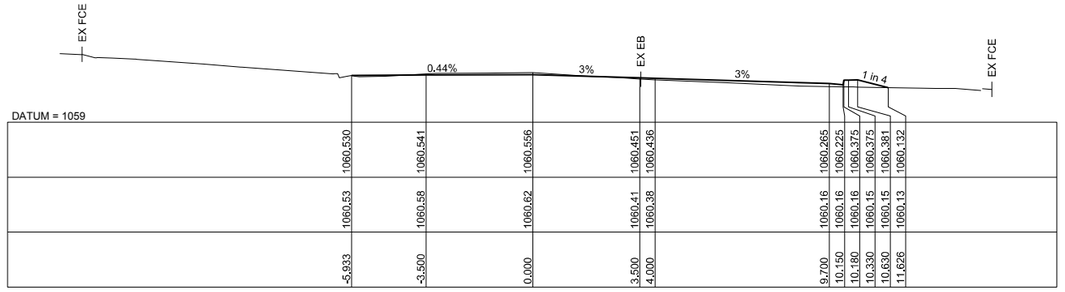
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DESIGNED	L.W	24/07/19
APPROVED	J.C	24/07/19
DATUM:	-	

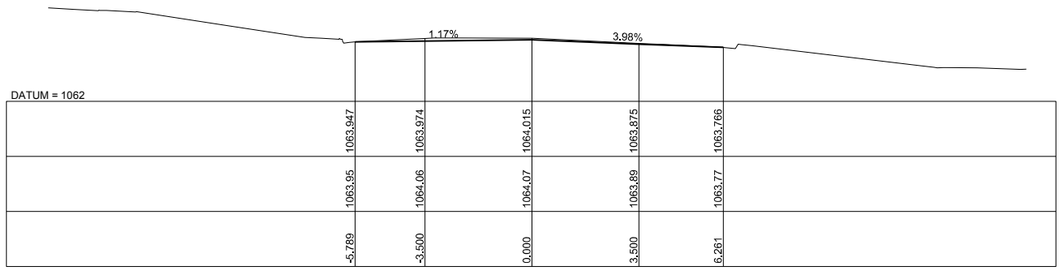
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DOCUMENT No.:	D11
ISSUE	C
SHEET No.	11 OF 17
STATUS:	TENDER
REG. No.:	-



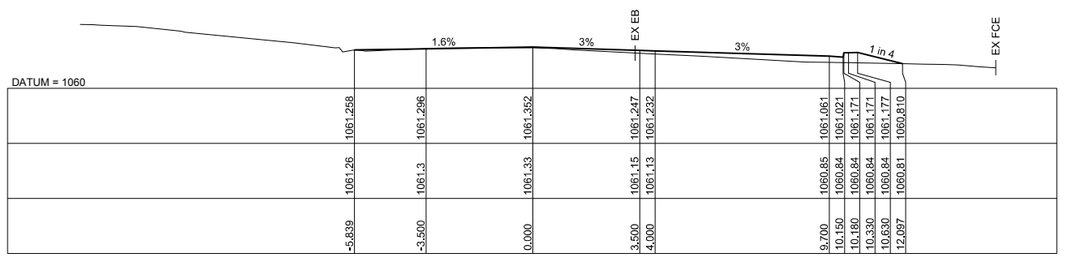
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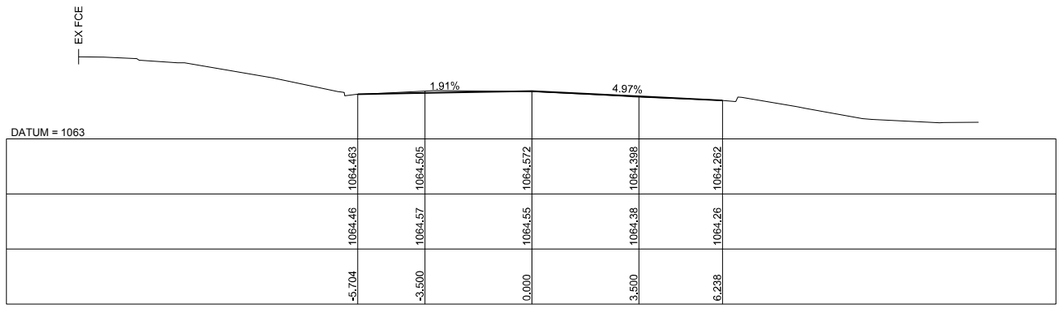
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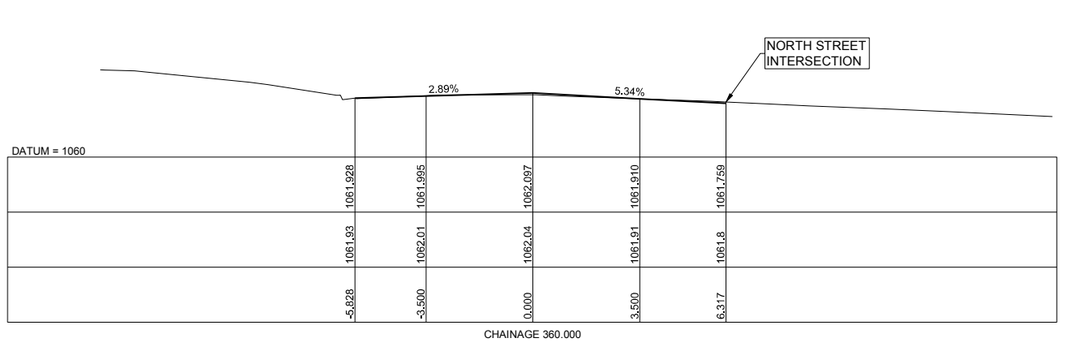
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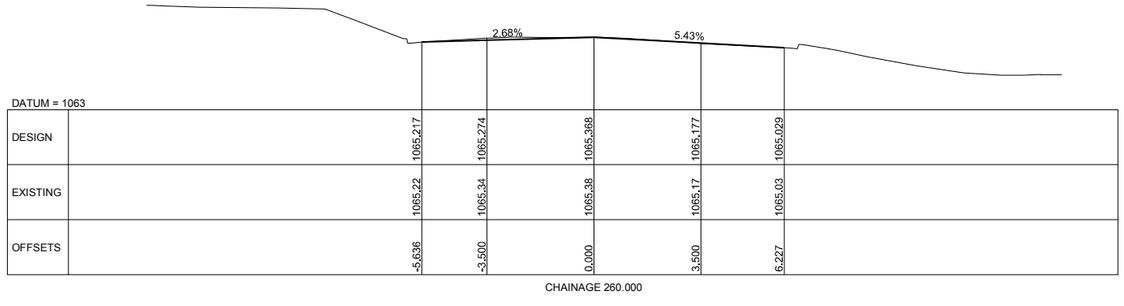
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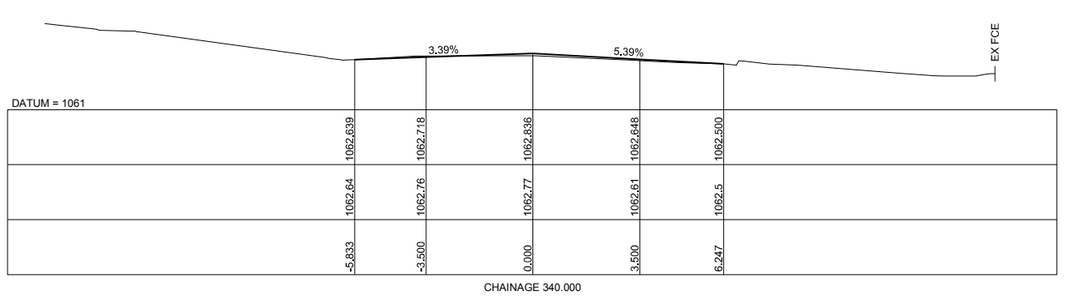
CHAINAGE 280.000



CHAINAGE 360.000



CHAINAGE 260.000



CHAINAGE 340.000

ISSUE	REVISION	AUTH	DATE
C	ISSUED FOR TENDER	J.C	17/10/19
B	ISSUED TO CLIENT FOR APPROVAL	L.W	09/10/19
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CLIENT: WALCHA COUNCIL

PROJECT: DERBY STREET NORTH UPGRADE
b

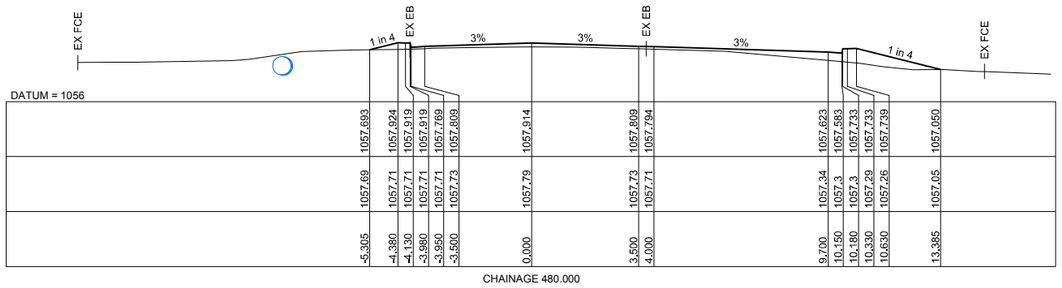
DERBY STREET CROSS SECTIONS
SHEET 3 OF 6

SCALES A1 ORIGINAL
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SCALE 1:100 @A1

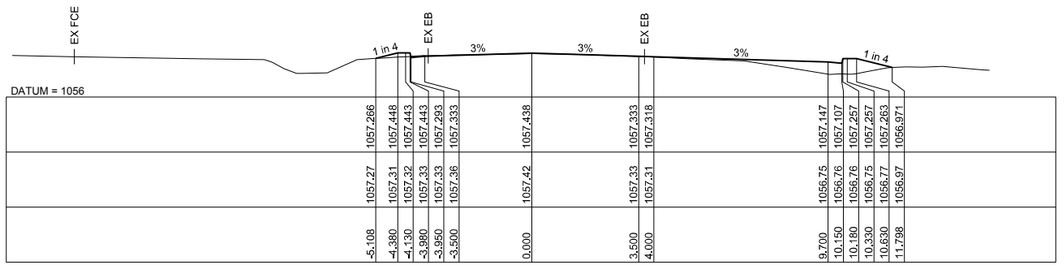
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DESIGNED	L.W	DATE	24/07/19
APPROVED	J.C	DATE	24/07/19
DATUM: -			

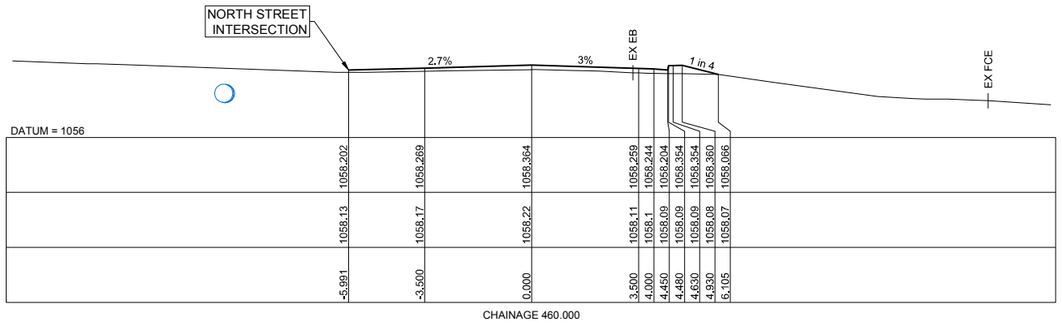
JOB No.: PM668
DOCUMENT No.: D12
ISSUE: C
SHEET No.: 12 OF 17
STATUS: TENDER
REG. No.: -



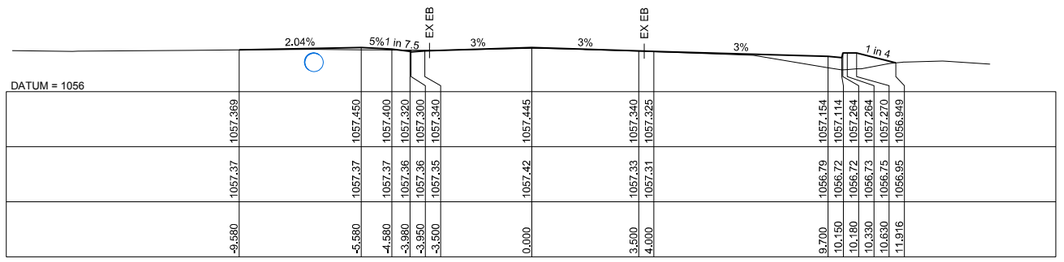
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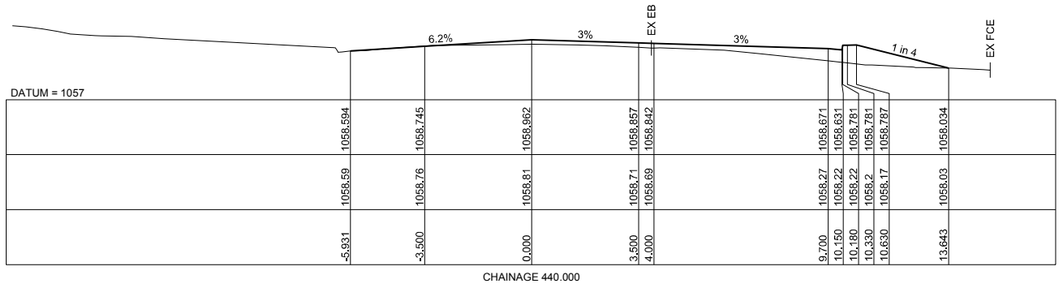
CHAINAGE 530.604



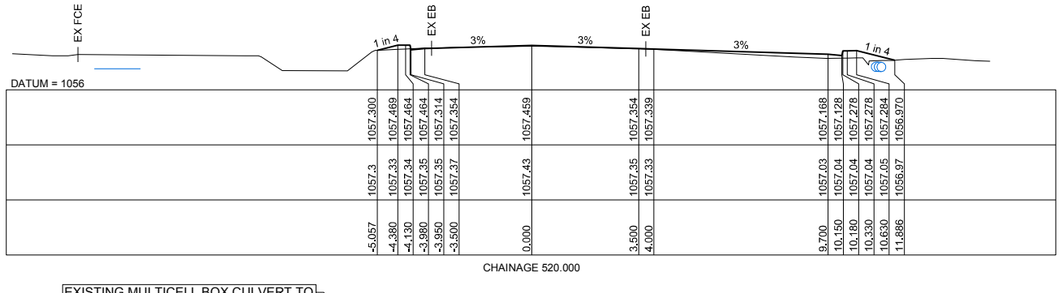
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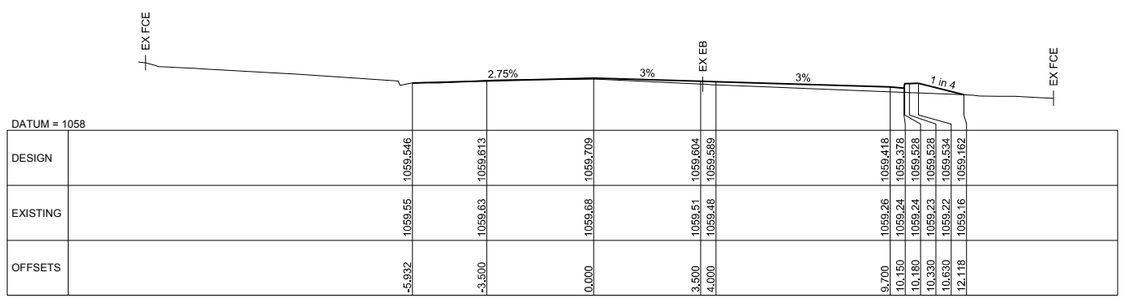
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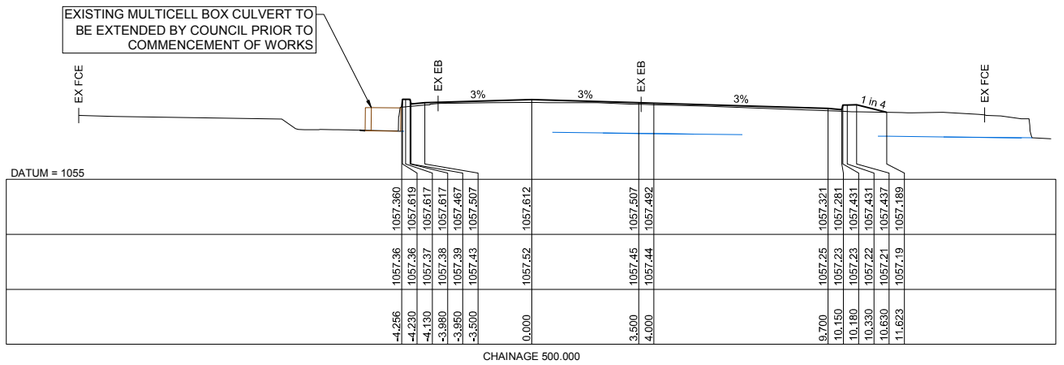
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CHAINAGE 520.000



CHAINAGE 420.000



CHAINAGE 500.000

ISSUE	REVISION	AUTH	DATE
C	ISSUED FOR TENDER	J.C	17/10/19
B	ISSUED TO CLIENT FOR APPROVAL	L.W	09/10/19
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WALCHA COUNCIL

CLIENT: WALCHA COUNCIL

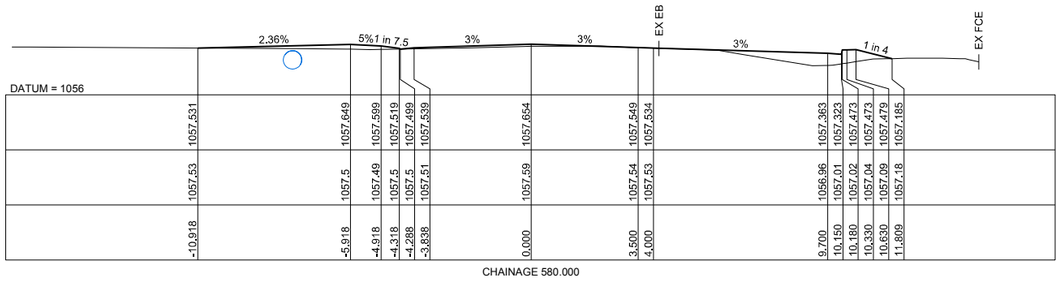
PROJECT: DERBY STREET NORTH UPGRADE

DERBY STREET CROSS SECTIONS
SHEET 4 OF 6

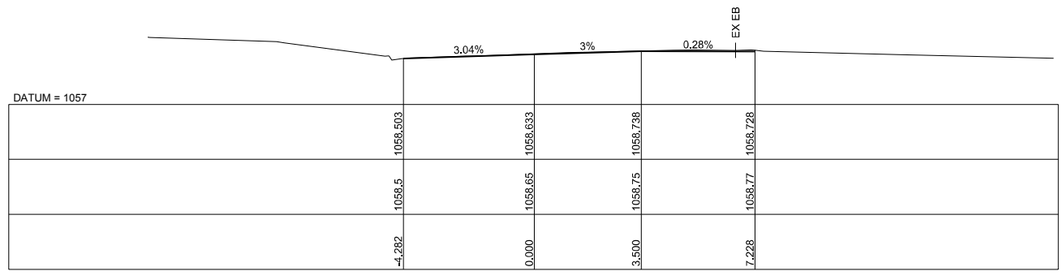
SCALES A1 ORIGINAL
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SCALE 1:100 @A1

FILE NAME: PM668_D.dwg

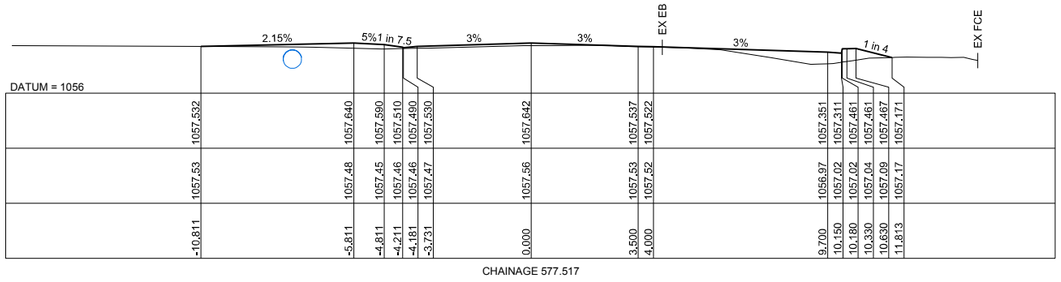
DRAWN	Z.C
DATE	24/07/19
DESIGNED	L.W
DATE	24/07/19
APPROVED	J.C
DATE	24/07/19
DATUM:	-
JOB No.:	PM668
DOCUMENT No.:	D13
ISSUE	C
SHEET No.	13 OF 17
STATUS:	TENDER
REG. No.:	-



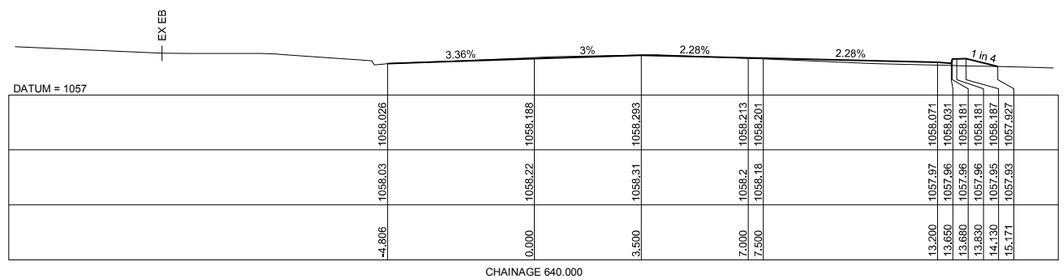
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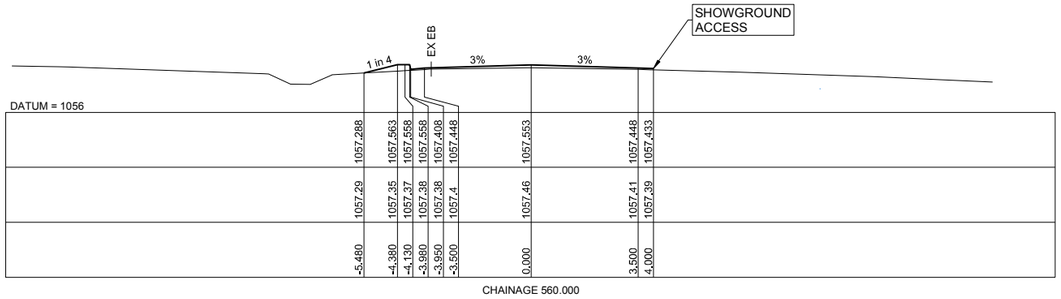
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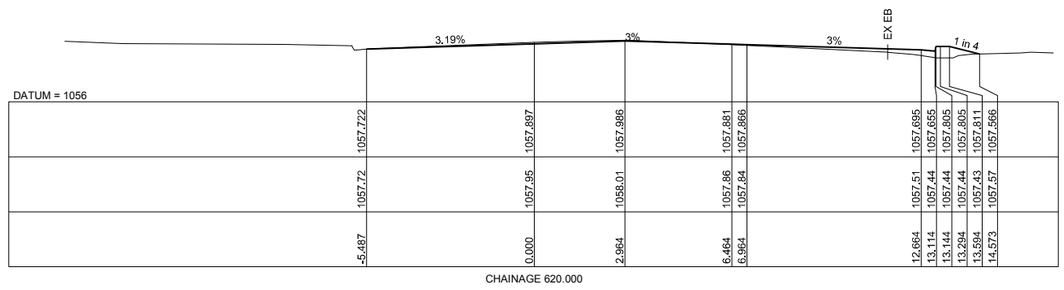
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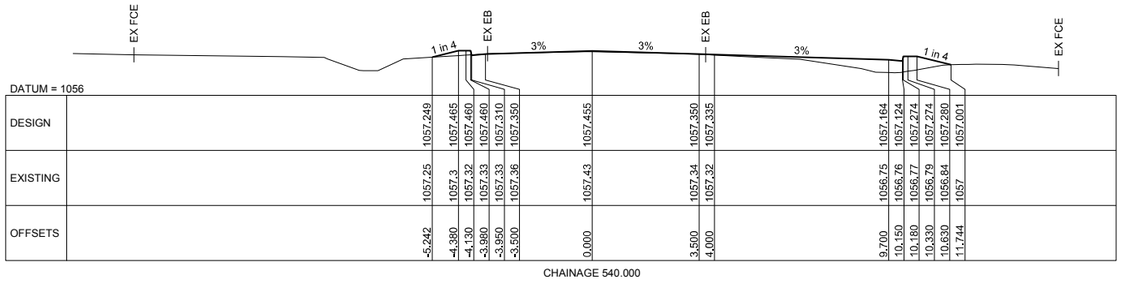
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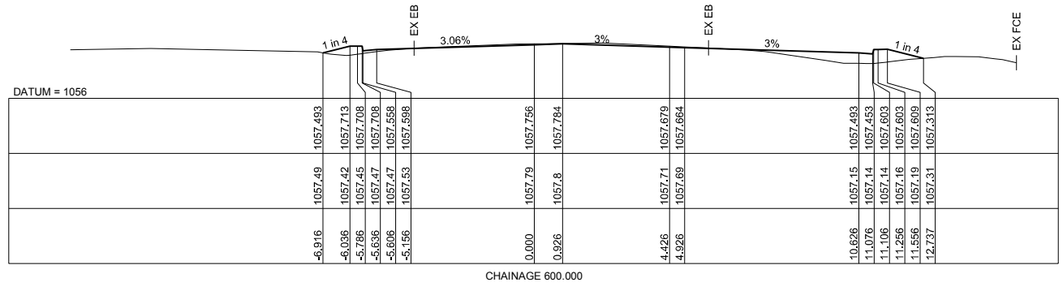
CHAINAGE 560.000



CHAINAGE 620.000



CHAINAGE 540.000



CHAINAGE 600.000

ISSUE	REVISION	AUTH	DATE
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CLIENT: WALCHA COUNCIL

PROJECT: DERBY STREET NORTH UPGRADE

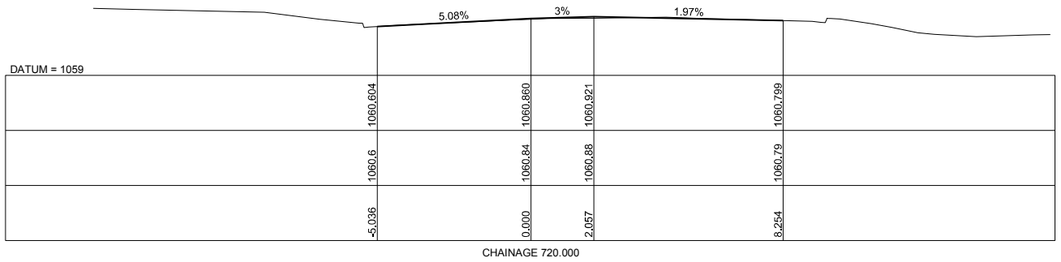
DERBY STREET CROSS SECTIONS
SHEET 5 OF 6

SCALES A1 ORIGINAL
0 1 2 4 6 8 10m
SCALE 1:100 @A1

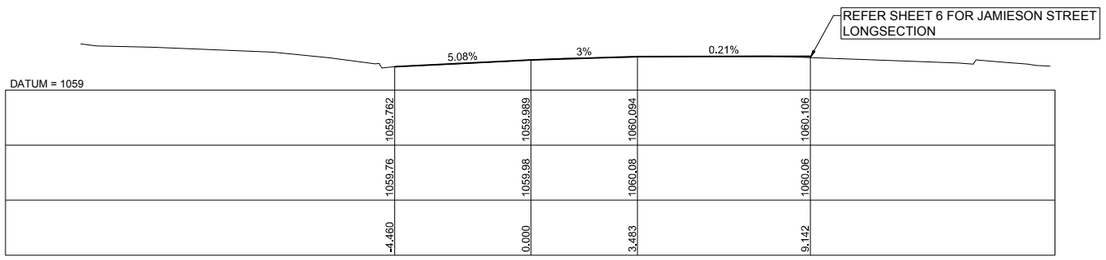
FILE NAME: PM668_D.dwg

DRAWN	Z.C	24/07/19
DESIGNED	L.W	24/07/19
APPROVED	J.C	24/07/19
DATUM:	-	

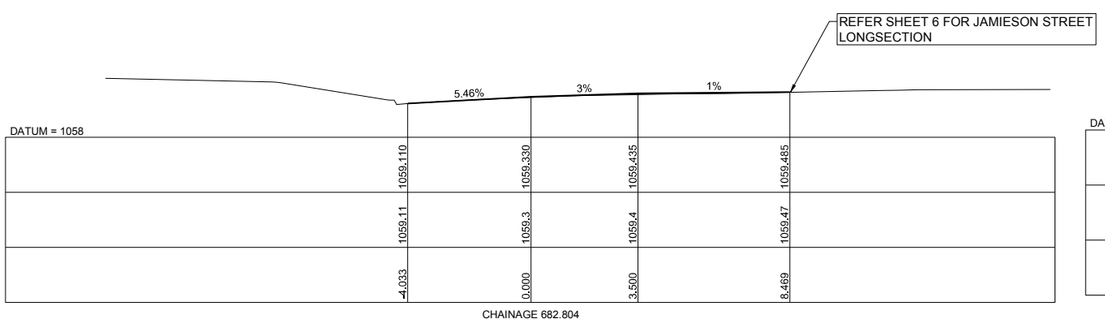
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DOCUMENT No.:	D14	
ISSUE	C	
SHEET No.	14	OF 17
STATUS:	TENDER	
REG. No.:	-	



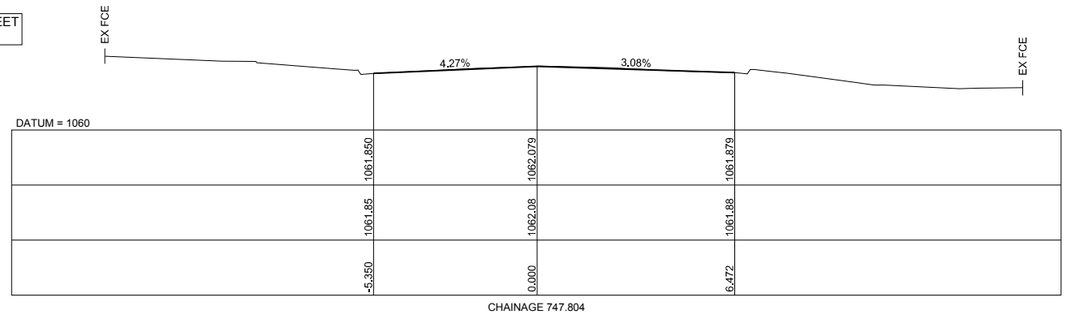
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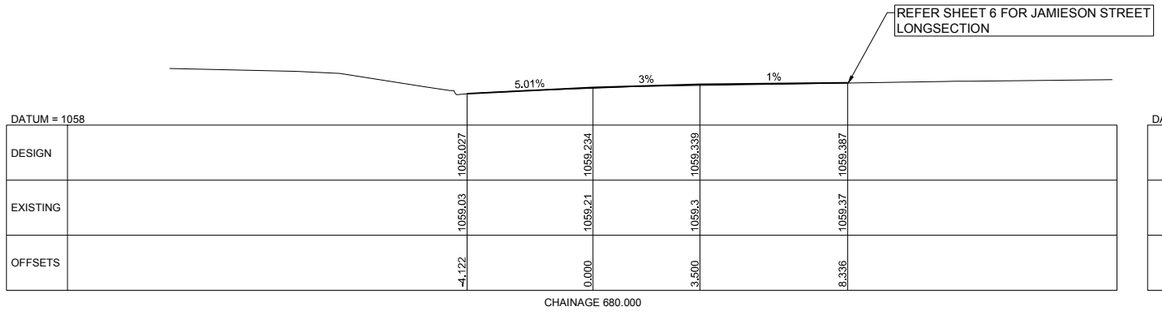
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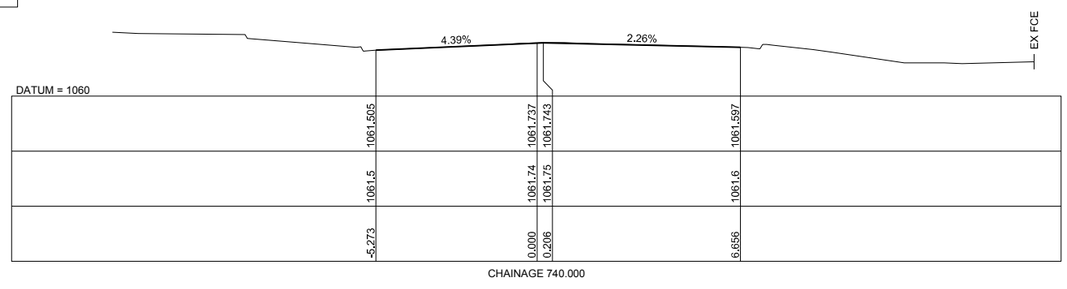
CHAINAGE 682.804



CHAINAGE 747.804



CHAINAGE 680.000



CHAINAGE 740.000

ISSUE	REVISION	AUTH	DATE
C	ISSUED FOR TENDER	J.C	17/10/19
B	ISSUED TO CLIENT FOR APPROVAL	L.W	09/10/19
A	ISSUED TO CLIENT FOR REVIEW	Z.C	24/07/19

LOCAL GOVERNMENT ENGINEERING SERVICES
Pty Ltd ABN 64 055 099 557
Web: www.legs.com.au
Port Macquarie
71 Lord St, Port Macquarie NSW 2444
Ph: 02-65843888
Email: john@legs.com.au
Inverell
17 Byron Street, Inverell NSW 2360
Ph: 02-67225110
Email: andrew@legs.com.au

CLIENT: WALCHA COUNCIL

PROJECT: DERBY STREET NORTH UPGRADE

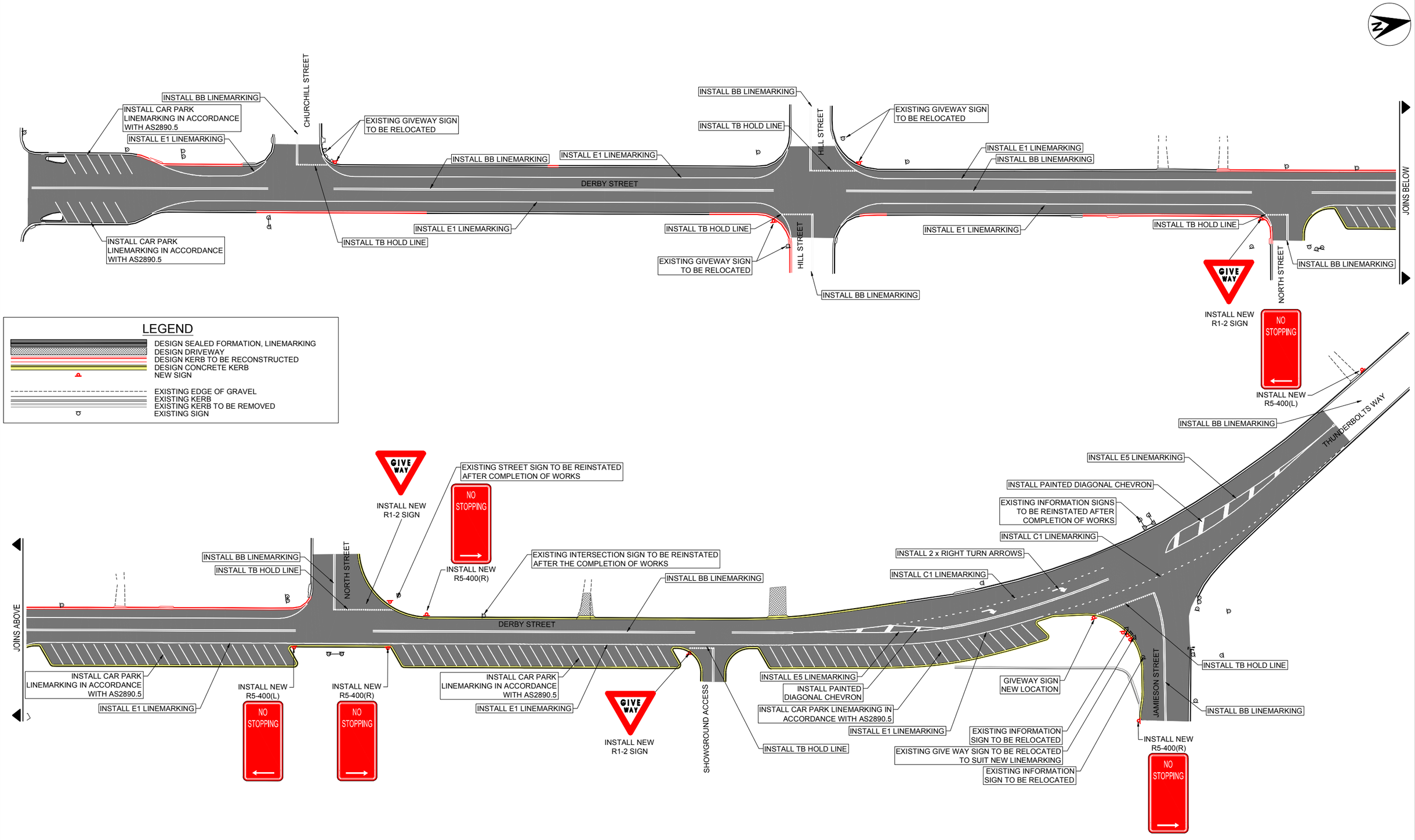
DERBY STREET CROSS SECTIONS
SHEET 6 OF 6

SCALES A1 ORIGINAL
0 1 2 4 6 8 10m
SCALE 1:100 @A1

FILE NAME: PM668_D.dwg

DRAWN	Z.C	DATE	24/07/19
DESIGNED	L.W	DATE	24/07/19
APPROVED	J.C	DATE	24/07/19
DATUM: -			

JOB No.:	PM668	ISSUE	C
DOCUMENT No.:	D15	SHEET No.	15 OF 17
STATUS:	TENDER		
REG. No.:	-		



LEGEND

- DESIGN SEALED FORMATION, LINEMARKING
- DESIGN DRIVEWAY
- DESIGN KERB TO BE RECONSTRUCTED
- DESIGN CONCRETE KERB
- NEW SIGN
- EXISTING EDGE OF GRAVEL
- EXISTING KERB
- EXISTING KERB TO BE REMOVED
- EXISTING SIGN

ISSUE	REVISION	AUTH	DATE
C	ISSUED FOR TENDER	J.C	17/10/19
B	ISSUED TO CLIENT FOR APPROVAL	L.W	09/10/19
A	ISSUED TO CLIENT FOR REVIEW	Z.C	24/07/19

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Ph: 02-67225110
Email: andrew@legs.com.au

CLIENT: WALCHA COUNCIL

PROJECT: DERBY STREET NORTH UPGRADE

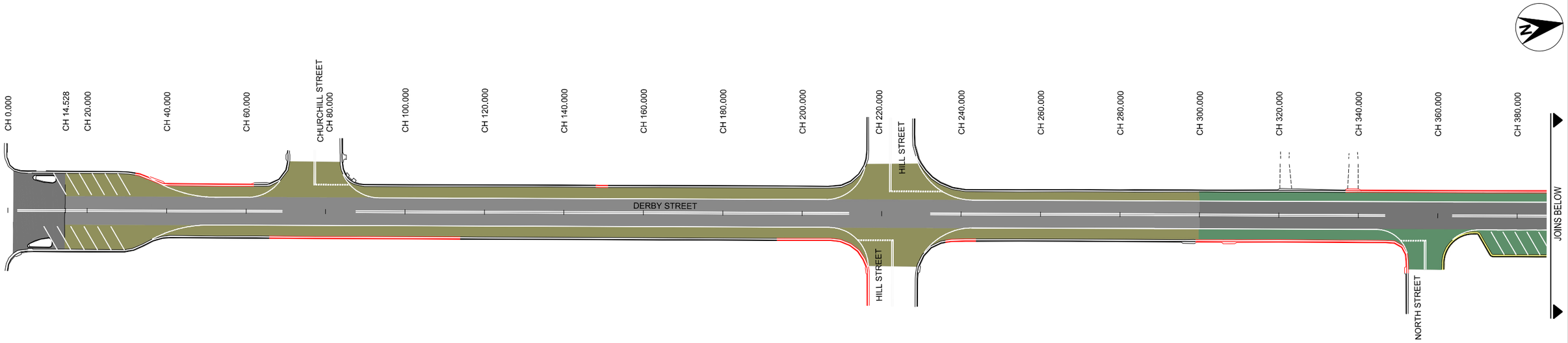
DERBY STREET
LINEMARKING AND SIGN POSTING PLAN

SCALES: A1 ORIGINAL
0 10 20 30 40 50m
SCALE 1:500 @A1

FILE NAME: PM668_D.dwg

DRAWN	Z.C	24/07/19
DESIGNED	L.W	24/07/19
APPROVED	J.C	24/07/19
DATUM: -		

JOB No.: PM668
DOCUMENT No.: D16
ISSUE: C
SHEET No.: 16 OF 17
STATUS: TENDER
REG. No.: -

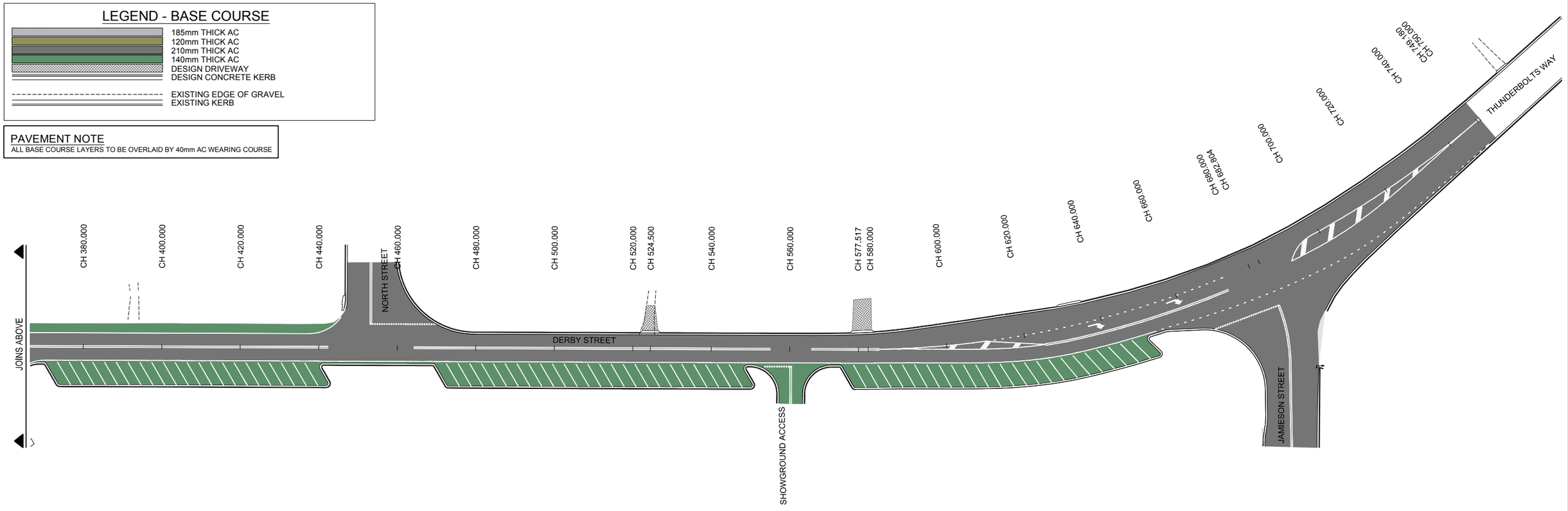


LEGEND - BASE COURSE

- 185mm THICK AC
- 120mm THICK AC
- 210mm THICK AC
- 140mm THICK AC
- DESIGN DRIVEWAY
- DESIGN CONCRETE KERB
- EXISTING EDGE OF GRAVEL
- EXISTING KERB

PAVEMENT NOTE

ALL BASE COURSE LAYERS TO BE OVERLAID BY 40mm AC WEARING COURSE



ISSUE	REVISION	AUTH	DATE
C	ISSUED FOR TENDER	J.C	17/10/19
B	ISSUED TO CLIENT FOR APPROVAL	Z.C	15/10/19

LOCAL GOVERNMENT ENGINEERING SERVICES
Pty Ltd ABN 64 055 099 557
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Ph: 02-67225110
Email: andrew@legs.com.au

CLIENT: WALCHA COUNCIL

PROJECT: DERBY STREET NORTH UPGRADE

DERBY STREET
PAVEMENT PLAN

SCALES: A1 ORIGINAL
0 10 20 30 40 50m
SCALE 1:500 @A1

FILE NAME: PM668_D.dwg

DRAWN	Z.C	DATE	15/10/19
DESIGNED	L.W	DATE	15/10/19
APPROVED	J.C	DATE	15/10/19
DATUM:	-		

JOB No.: PM668
DOCUMENT No.: D17
ISSUE: C
SHEET No.: 17 OF 17
STATUS: TENDER
REG. No.: -

Appendix F

Intersection Traffic Survey Data

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of New England Hwy and Oxley Hwy, Bendemeer

GPS *-30.878525, 151.159948*

Date:	Thu 16/02/23
Weather:	Fine
Suburban:	Bendemeer
Customer:	Amber

North:	New England Hwy
East:	Oxley Hwy
South:	New England Hwy
West:	N/A

Survey Period	AM:	6:00 AM-9:00 AM
	PM:	9:00 AM-1:00 PM
Traffic Peak	AM:	8:15 AM-9:15 AM
	PM:	4:45 PM-5:45 PM

All Vehicles

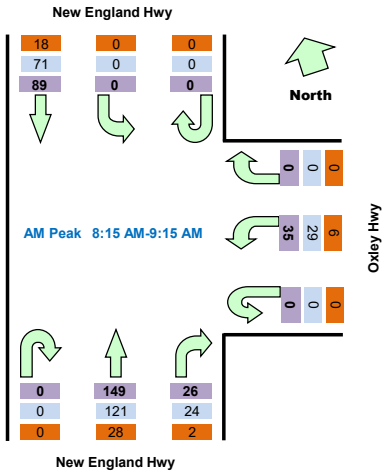
Time		North Approach New England Hwy			East Approach Oxley Hwy			South Approach New England Hwy			Hourly Total	
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	Hour	Peak
6:00	6:15	0	6	0	0	0	2	0	6	25	148	
6:15	6:30	0	6	0	0	0	3	0	5	21	156	
6:30	6:45	0	10	0	0	0	2	0	5	22	176	
6:45	7:00	0	9	1	0	0	0	0	5	20	200	
7:00	7:15	0	9	0	0	0	8	0	3	27	242	
7:15	7:30	0	20	2	0	1	6	0	2	24	254	
7:30	7:45	0	16	0	0	0	10	0	9	28	265	
7:45	8:00	0	26	1	0	0	7	0	7	36	284	
8:00	8:15	0	28	0	0	0	1	0	7	23	296	
8:15	8:30	0	15	0	0	0	12	0	4	35	299	Peak
8:30	8:45	0	20	0	0	0	6	0	10	46	291	
8:45	9:00	0	34	0	0	0	10	0	9	36		
9:00	9:15	0	20	0	0	0	7	0	3	32		
9:15	9:30	0	18	0	0	0	8	0	6	26		
15:00	15:15	0	21	0	0	0	10	0	11	38	300	
15:15	15:30	0	37	0	0	0	4	0	12	27	318	
15:30	15:45	0	25	0	0	1	4	0	4	30	325	
15:45	16:00	0	33	0	0	0	9	0	6	28	337	
16:00	16:15	0	50	0	0	0	4	0	3	41	340	
16:15	16:30	0	39	3	0	0	4	0	13	28	349	
16:30	16:45	0	41	1	0	1	7	0	3	23	345	
16:45	17:00	0	31	0	0	0	10	0	7	31	353	Peak
17:00	17:15	0	58	0	0	0	7	0	10	32	340	
17:15	17:30	0	35	0	0	1	11	0	3	33	285	
17:30	17:45	0	40	0	0	2	11	0	5	26	250	
17:45	18:00	0	23	0	0	0	7	0	12	24	211	
18:00	18:15	0	29	0	0	0	6	0	6	11	180	
18:15	18:30	0	26	0	0	0	1	0	8	13		
18:30	18:45	0	18	0	0	0	3	0	3	21		
18:45	19:00	0	15	0	0	0	4	0	3	13		

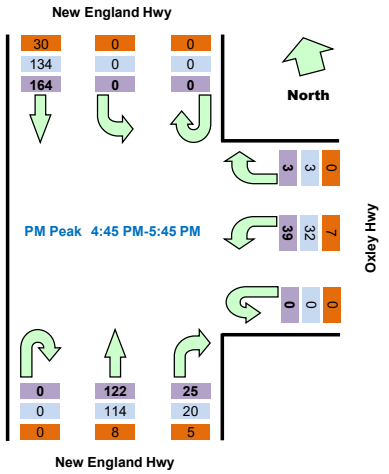
Peak Time		North Approach New England Hwy			East Approach Oxley Hwy			South Approach New England Hwy			Peak total
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	
8:15	9:15	0	89	0	0	0	35	0	26	149	299
16:45	17:45	0	164	0	0	3	39	0	25	122	353

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy





Light Vehicles

Time		North Approach New England Hwy			East Approach Oxley Hwy			South Approach New England Hwy		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
6:00	6:15	0	5	0	0	0	1	0	5	17
6:15	6:30	0	4	0	0	0	2	0	4	16
6:30	6:45	0	6	0	0	0	1	0	4	15
6:45	7:00	0	8	1	0	0	0	0	2	16
7:00	7:15	0	8	0	0	0	8	0	1	21
7:15	7:30	0	17	1	0	1	6	0	1	19
7:30	7:45	0	13	0	0	0	9	0	8	19
7:45	8:00	0	22	1	0	0	7	0	6	30
8:00	8:15	0	26	0	0	0	1	0	6	19
8:15	8:30	0	12	0	0	0	12	0	4	28
8:30	8:45	0	15	0	0	0	5	0	9	35
8:45	9:00	0	27	0	0	0	8	0	9	30
9:00	9:15	0	17	0	0	0	4	0	2	28
9:15	9:30	0	11	0	0	0	7	0	4	16
15:00	15:15	0	17	0	0	0	7	0	9	34
15:15	15:30	0	29	0	0	0	4	0	11	25
15:30	15:45	0	21	0	0	1	3	0	4	29
15:45	16:00	0	27	0	0	0	8	0	6	26
16:00	16:15	0	43	0	0	0	3	0	2	37
16:15	16:30	0	34	1	0	0	4	0	12	25
16:30	16:45	0	32	1	0	1	5	0	3	22
16:45	17:00	0	27	0	0	0	8	0	4	29
17:00	17:15	0	44	0	0	0	5	0	9	29
17:15	17:30	0	27	0	0	1	10	0	3	30
17:30	17:45	0	36	0	0	2	9	0	4	26
17:45	18:00	0	21	0	0	0	4	0	10	20
18:00	18:15	0	21	0	0	0	5	0	5	10
18:15	18:30	0	25	0	0	0	1	0	7	9
18:30	18:45	0	11	0	0	0	3	0	3	14
18:45	19:00	0	12	0	0	0	3	0	3	10

Peak Time		North Approach New England Hwy			East Approach Oxley Hwy			South Approach New England Hwy			Peak total
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	
8:15	9:15	0	71	0	0	0	29	0	24	121	245
16:45	17:45	0	134	0	0	3	32	0	20	114	303

Heavy Vehicles

Time		North Approach New England Hwy			East Approach Oxley Hwy			South Approach New England Hwy		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
6:00	6:15	0	1	0	0	0	1	0	1	8
6:15	6:30	0	2	0	0	0	1	0	1	5
6:30	6:45	0	4	0	0	0	1	0	1	7
6:45	7:00	0	1	0	0	0	0	0	3	4
7:00	7:15	0	1	0	0	0	0	0	2	6
7:15	7:30	0	3	1	0	0	0	0	1	5
7:30	7:45	0	3	0	0	0	1	0	1	9
7:45	8:00	0	4	0	0	0	0	0	1	6
8:00	8:15	0	2	0	0	0	0	0	1	4
8:15	8:30	0	3	0	0	0	0	0	0	7
8:30	8:45	0	5	0	0	0	1	0	1	11
8:45	9:00	0	7	0	0	0	2	0	0	6
9:00	9:15	0	3	0	0	0	3	0	1	4
9:15	9:30	0	7	0	0	0	1	0	2	10
15:00	15:15	0	4	0	0	0	3	0	2	4
15:15	15:30	0	8	0	0	0	0	0	1	2
15:30	15:45	0	4	0	0	0	1	0	0	1
15:45	16:00	0	6	0	0	0	1	0	0	2
16:00	16:15	0	7	0	0	0	1	0	1	4
16:15	16:30	0	5	2	0	0	0	0	1	3
16:30	16:45	0	9	0	0	0	2	0	0	1
16:45	17:00	0	4	0	0	0	2	0	3	2
17:00	17:15	0	14	0	0	0	2	0	1	3
17:15	17:30	0	8	0	0	0	1	0	0	3
17:30	17:45	0	4	0	0	0	2	0	1	0
17:45	18:00	0	2	0	0	0	3	0	2	4
18:00	18:15	0	8	0	0	0	1	0	1	1
18:15	18:30	0	1	0	0	0	0	0	1	4
18:30	18:45	0	7	0	0	0	0	0	0	7
18:45	19:00	0	3	0	0	0	1	0	0	3

Peak Time		North Approach New England Hwy			East Approach Oxley Hwy			South Approach New England Hwy			Peak total
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	
8:15	9:15	0	18	0	0	0	6	0	2	28	54
16:45	17:45	0	30	0	0	0	7	0	5	8	50

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of New England Hwy and Salisbury St, Uralla

GPS *-30.642339, 151.499169*

Date:	Thu 08/06/23
Weather:	Fine
Suburban:	Uralla
Customer:	Amber

North:	Salisbury St
East:	New England Hwy
South:	Salisbury St
West:	New England Hwy

Survey Period	AM:	6:00 AM-9:30 AM
	PM:	3:00 PM-7:00 PM
Traffic Peak	AM:	8:00 AM-9:00 AM
	PM:	3:30 PM-4:30 PM

All Vehicles

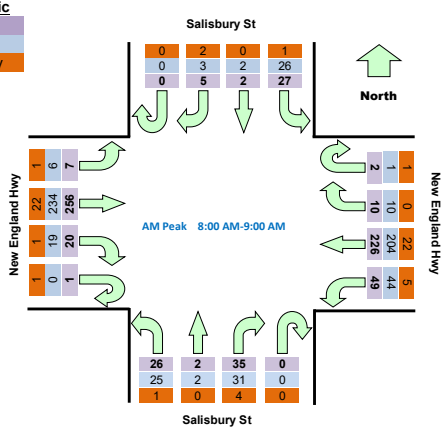
Time		North Approach Salisbury St				East Approach New England Hwy				South Approach Salisbury St				West Approach New England Hwy				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
6:00	6:15	0	0	1	2	0	2	19	6	0	5	0	0	0	2	20	0	254	
6:15	6:30	0	0	0	1	0	1	17	3	0	6	0	3	0	2	17	0	285	
6:30	6:45	0	0	0	1	0	0	21	9	0	4	0	1	0	0	29	0	340	
6:45	7:00	0	0	1	1	0	2	30	11	0	0	2	1	0	0	34	0	398	
7:00	7:15	0	0	1	3	0	1	35	8	0	4	1	1	0	1	33	0	457	
7:15	7:30	0	0	0	2	0	6	34	12	0	12	0	3	0	1	34	1	541	
7:30	7:45	0	1	0	6	1	2	45	9	0	8	0	2	1	2	46	0	594	
7:45	8:00	0	3	0	4	0	2	49	11	0	10	0	3	0	3	54	2	653	
8:00	8:15	0	0	0	6	1	0	60	15	0	12	0	9	1	1	66	1	668	Peak
8:15	8:30	0	1	1	3	1	3	50	11	0	3	0	4	0	3	75	3	663	
8:30	8:45	0	2	0	8	0	5	56	14	0	14	0	8	0	10	64	1	668	Peak
8:45	9:00	0	2	1	10	0	2	60	9	0	6	2	5	0	6	51	2		
9:00	9:15	0	0	2	10	2	4	57	17	0	9	2	4	0	9	51	0		
9:15	9:30	0	5	3	6	0	8	58	15	0	5	3	1	1	4	54	0		
15:00	15:15	0	1	2	6	0	10	76	17	0	17	1	9	2	4	70	1	802	
15:15	15:30	0	1	2	7	3	5	65	13	0	9	0	8	0	7	65	1	793	
15:30	15:45	1	0	2	7	1	6	62	22	0	24	2	3	2	10	58	4	806	Peak
15:45	16:00	0	2	0	6	0	9	71	23	0	7	3	3	1	2	67	2	781	
16:00	16:15	1	1	0	5	1	5	77	27	0	15	0	6	1	3	63	2	756	
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16:30	16:45	0	0	1	1	0	6	74	13	0	10	3	2	1	3	61	4	698	
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17:45	18:00	0	0	2	1	2	2	51	23	0	12	1	6	0	4	58	1	520	
18:00	18:15	0	0	0	5	1	6	44	15	0	11	1	4	0	2	69	3	428	
18:15	18:30	0	0	1	4	0	2	43	11	0	8	2	1	0	1	39	0		
18:30	18:45	1	0	0	0	0	0	37	9	0	12	1	0	0	1	23	0		
18:45	19:00	0	0	0	3	0	1	19	10	0	7	1	1	0	0	28	1		

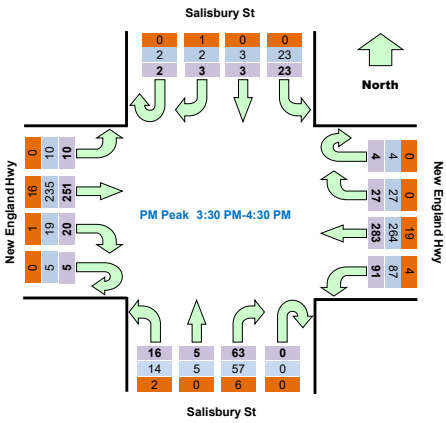
Peak Time		North Approach Salisbury St				East Approach New England Hwy				South Approach Salisbury St				West Approach New England Hwy				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00	9:00	0	5	2	27	2	10	226	49	0	35	2	26	1	20	256	7	668
15:30	16:30	2	3	3	23	4	27	283	91	0	63	5	16	5	20	251	10	806

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy





Light Vehicles

Time		North Approach Salisbury St				East Approach New England Hwy				South Approach Salisbury St				West Approach New England Hwy			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
6:00	6:15	0	0	1	2	0	2	17	4	0	4	0	0	0	2	15	0
6:15	6:30	0	0	0	1	0	1	16	2	0	6	0	3	0	2	15	0
6:30	6:45	0	0	0	1	0	0	19	8	0	3	0	1	0	0	25	0
6:45	7:00	0	0	1	1	0	2	28	9	0	0	2	0	0	0	30	0
7:00	7:15	0	0	1	2	0	1	31	7	0	4	0	1	0	1	27	0
7:15	7:30	0	0	0	2	0	5	27	11	0	10	0	2	0	1	28	1
7:30	7:45	0	0	0	6	1	2	39	8	0	7	0	2	1	2	43	0
7:45	8:00	0	3	0	3	0	2	44	10	0	8	0	2	0	2	47	2
8:00	8:15	0	0	0	5	1	0	50	14	0	9	0	9	0	1	61	1
8:15	8:30	0	1	1	3	0	3	48	11	0	3	0	4	0	3	71	3
8:30	8:45	0	2	0	8	0	5	51	13	0	14	0	8	0	10	59	1
8:45	9:00	0	0	1	10	0	2	55	6	0	5	2	4	0	5	43	1
9:00	9:15	0	0	1	10	2	4	52	12	0	8	2	4	0	8	42	0
9:15	9:30	0	4	3	6	0	8	54	15	0	3	3	1	1	4	52	0
15:00	15:15	0	1	2	6	0	10	71	17	0	17	1	9	2	4	63	0
15:15	15:30	0	1	2	6	3	5	62	12	0	9	0	8	0	7	63	1
15:30	15:45	1	0	2	7	1	6	57	20	0	20	2	3	2	10	51	4
15:45	16:00	0	2	0	6	0	9	67	22	0	7	3	2	1	2	63	2
16:00	16:15	1	0	0	5	1	5	71	26	0	13	0	5	1	3	61	2
16:15	16:30	0	0	1	5	2	7	69	19	0	17	0	4	1	4	60	2
16:30	16:45	0	0	0	1	0	6	71	13	0	10	3	2	1	3	55	4
16:45	17:00	0	1	0	5	2	9	55	24	0	8	0	1	0	3	47	2
17:00	17:15	0	0	1	3	1	4	55	16	0	11	1	5	1	4	50	1
17:15	17:30	1	0	0	2	2	3	56	21	0	15	3	3	0	3	65	1
17:30	17:45	0	0	0	5	1	1	40	24	0	10	0	5	0	2	50	2
17:45	18:00	0	0	2	1	2	2	48	23	0	12	1	6	0	4	56	0
18:00	18:15	0	0	0	5	1	6	40	15	0	11	1	4	0	2	66	3
18:15	18:30	0	0	1	4	0	2	39	11	0	8	2	1	0	1	39	0
18:30	18:45	1	0	0	0	0	0	34	7	0	12	1	0	0	1	22	0
18:45	19:00	0	0	0	3	0	1	18	10	0	6	1	1	0	0	25	1

Peak Time		North Approach Salisbury St				East Approach New England Hwy				South Approach Salisbury St				West Approach New England Hwy				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00	9:00	0	3	2	26	1	10	204	44	0	31	2	25	0	19	234	6	607
15:30	16:30	2	2	3	23	4	27	264	87	0	57	5	14	5	19	235	10	757

Heavy Vehicles

Time		North Approach Salisbury St				East Approach New England Hwy				South Approach Salisbury St				West Approach New England Hwy			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
6:00	6:15	0	0	0	0	0	0	2	2	0	1	0	0	0	0	5	0
6:15	6:30	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2	0
6:30	6:45	0	0	0	0	0	0	2	1	0	1	0	0	0	0	4	0
6:45	7:00	0	0	0	0	0	0	2	2	0	0	0	1	0	0	4	0
7:00	7:15	0	0	0	1	0	0	4	1	0	0	1	0	0	0	6	0
7:15	7:30	0	0	0	0	0	1	7	1	0	2	0	1	0	0	6	0
7:30	7:45	0	1	0	0	0	0	6	1	0	1	0	0	0	0	3	0
7:45	8:00	0	0	0	1	0	0	5	1	0	2	0	1	0	1	7	0
8:00	8:15	0	0	0	1	0	0	10	1	0	3	0	0	1	0	5	0
8:15	8:30	0	0	0	0	1	0	2	0	0	0	0	0	0	0	4	0
8:30	8:45	0	0	0	0	0	0	5	1	0	0	0	0	0	0	5	0
8:45	9:00	0	2	0	0	0	0	5	3	0	1	0	1	0	1	8	1
9:00	9:15	0	0	1	0	0	0	5	5	0	1	0	0	0	1	9	0
9:15	9:30	0	1	0	0	0	0	4	0	0	2	0	0	0	0	2	0
15:00	15:15	0	0	0	0	0	0	5	0	0	0	0	0	0	0	7	1
15:15	15:30	0	0	0	1	0	0	3	1	0	0	0	0	0	0	2	0
15:30	15:45	0	0	0	0	0	0	5	2	0	4	0	0	0	0	7	0
15:45	16:00	0	0	0	0	0	0	4	1	0	0	0	1	0	0	4	0
16:00	16:15	0	1	0	0	0	0	6	1	0	2	0	1	0	0	2	0
16:15	16:30	0	0	0	0	0	0	4	0	0	0	0	0	0	1	3	0
16:30	16:45	0	0	1	0	0	0	3	0	0	0	0	0	0	0	6	0

16:45	17:00	0	0	0	0	0	0	8	1	0	1	0	0	0	0	4	0
17:00	17:15	0	0	0	0	0	0	2	1	0	1	0	0	0	0	7	0
17:15	17:30	0	0	0	0	0	0	6	0	0	1	0	0	0	0	2	0
17:30	17:45	0	0	0	0	0	0	3	2	0	1	0	0	0	0	2	0
17:45	18:00	0	0	0	0	0	0	3	0	0	0	0	0	0	0	2	1
18:00	18:15	0	0	0	0	0	0	4	0	0	0	0	0	0	0	3	0
18:15	18:30	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
18:30	18:45	0	0	0	0	0	0	3	2	0	0	0	0	0	0	1	0
18:45	19:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	3	0

Peak Time		**North Approach Salisbury St**				**East Approach New England Hwy**				**South Approach Salisbury St**				**West Approach New England Hwy**				**Peak**
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	**total**
8:00	9:00	0	2	0	1	1	0	22	5	0	4	0	1	1	1	22	1	61
15:30	16:30	0	1	0	0	0	0	19	4	0	6	0	2	0	1	16	0	49

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Fitzroy St and Derby St, Walcha

GPS *-30.985212, 151.593390*

Date:	Thu 09/11/23
Weather:	Overcast
Suburban:	Walcha
Customer:	Amber

North:	Derby St
East:	Fitzroy St
South:	Derby St
West:	Fitzroy St

Survey Period	AM:	6:00 AM-10:00 AM
	PM:	3:00 PM-7:00 PM
Traffic Peak	AM:	8:45 AM-9:45 AM
	PM:	3:30 PM-4:30 PM

All Vehicles

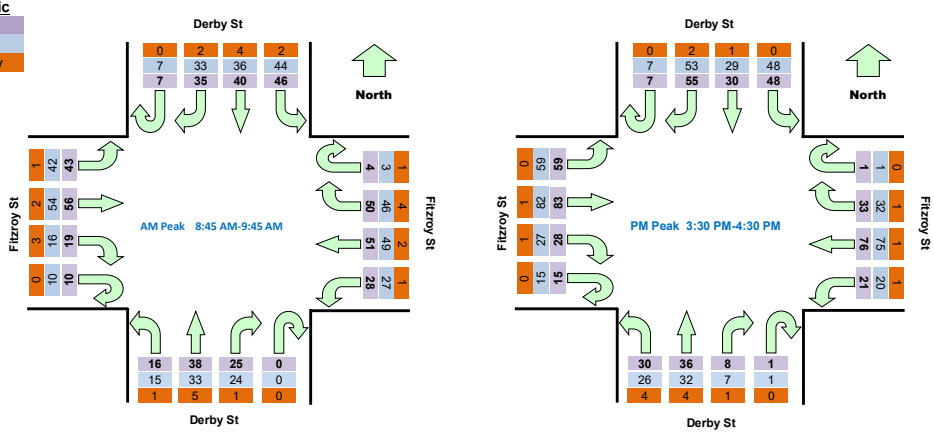
Time		North Approach Derby St				East Approach Fitzroy St				South Approach Derby St				West Approach Fitzroy St				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
6:00	6:15	0	3	0	5	0	5	2	2	0	1	3	0	0	0	1	3	164	
6:15	6:30	0	1	4	4	0	7	5	2	0	3	2	0	0	1	2	2	209	
6:30	6:45	0	3	4	4	0	2	13	5	0	2	6	1	0	1	5	3	231	
6:45	7:00	0	3	8	5	1	8	6	5	0	0	6	0	0	7	6	2	248	
7:00	7:15	0	2	5	9	0	7	10	3	1	4	6	3	2	3	9	6	274	
7:15	7:30	0	1	6	6	0	6	9	3	0	0	7	1	0	1	12	3	291	
7:30	7:45	0	2	10	5	3	9	10	5	0	1	10	1	0	1	3	6	331	
7:45	8:00	0	4	13	5	0	11	5	6	0	4	7	5	0	7	7	9	384	
8:00	8:15	0	3	5	7	1	6	11	7	0	4	11	9	1	2	15	5	427	
8:15	8:30	1	6	8	11	0	7	11	3	0	6	8	6	0	5	16	7	447	
8:30	8:45	1	6	6	12	0	10	17	5	0	9	18	7	3	3	14	8	464	
8:45	9:00	1	9	14	9	2	10	11	10	0	10	9	4	4	4	17	12	468	Peak
9:00	9:15	2	9	10	14	0	12	8	6	0	4	7	4	1	4	17	9	446	
9:15	9:30	0	7	9	13	1	14	12	7	0	5	11	5	2	5	9	12		
9:30	9:45	4	10	7	10	1	14	20	5	0	6	11	3	3	6	13	10		
9:45	10:00	1	12	6	13	1	9	12	5	0	3	11	3	1	3	12	12		
15:00	15:15	1	6	6	17	1	6	9	2	0	4	7	3	1	3	23	14	487	
15:15	15:30	0	15	9	12	0	7	18	8	0	2	10	5	2	7	11	5	519	
15:30	15:45	3	12	11	13	0	9	23	6	0	1	11	6	1	7	21	19	531	Peak
15:45	16:00	3	19	8	11	0	9	18	4	0	4	8	9	5	4	20	8	528	
16:00	16:15	0	17	4	12	1	7	22	6	0	1	8	9	7	8	16	17	522	
16:15	16:30	1	7	7	12	0	8	13	5	1	2	9	6	2	9	26	15	508	
16:30	16:45	0	17	6	10	0	5	24	4	0	10	10	9	4	2	26	13	503	
16:45	17:00	0	12	8	1	0	10	19	4	0	6	10	6	1	6	23	18	456	
17:00	17:15	0	18	6	10	2	8	14	4	0	5	13	4	1	8	16	12	416	
17:15	17:30	0	16	9	8	0	7	12	6	0	5	8	7	0	5	24	11	368	
17:30	17:45	0	9	6	3	0	4	19	6	0	4	7	5	0	4	19	7	342	
17:45	18:00	1	7	6	6	0	9	14	5	0	3	8	1	1	2	13	8	338	
18:00	18:15	0	6	9	8	1	8	9	3	0	3	5	3	0	2	11	5	333	
18:15	18:30	1	7	2	8	0	6	10	4	0	2	10	8	4	2	14	14		
18:30	18:45	1	10	4	14	0	7	17	1	0	2	7	2	3	3	9	9		
18:45	19:00	0	10	1	14	0	3	12	2	0	1	4	3	2	2	17	8		

Peak Time		North Approach Derby St				East Approach Fitzroy St				South Approach Derby St				West Approach Fitzroy St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:45	9:45	7	35	40	46	4	50	51	28	0	25	38	16	10	19	56	43	468
15:30	16:30	7	55	30	48	1	33	76	21	1	8	36	30	15	28	83	59	531

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



Light Vehicles

Time		North Approach Derby St				East Approach Fitzroy St				South Approach Derby St				West Approach Fitzroy St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
6:00	6:15	0	2	0	4	0	5	2	2	0	0	3	0	0	0	1	3
6:15	6:30	0	1	3	2	0	6	5	2	0	3	2	0	0	1	1	2
6:30	6:45	0	3	3	3	0	2	10	5	0	1	5	1	0	1	5	3
6:45	7:00	0	3	6	5	0	8	6	4	0	0	6	0	0	4	6	2
7:00	7:15	0	2	4	7	0	7	9	2	1	4	5	2	2	2	8	6
7:15	7:30	0	1	4	5	0	4	9	3	0	0	5	0	0	1	10	1
7:30	7:45	0	2	9	3	3	9	8	5	0	1	9	1	0	1	3	5
7:45	8:00	0	3	9	4	0	10	5	6	0	4	7	5	0	7	7	8
8:00	8:15	0	3	3	7	1	6	10	7	0	4	10	7	1	2	15	5
8:15	8:30	1	5	6	9	0	5	10	3	0	6	7	6	0	4	16	7
8:30	8:45	1	6	6	11	0	10	16	5	0	9	15	7	3	3	13	8
8:45	9:00	1	7	14	9	1	7	10	10	0	10	9	4	4	4	16	12
9:00	9:15	2	9	8	12	0	11	8	5	0	4	6	4	1	2	17	8
9:15	9:30	0	7	8	13	1	14	12	7	0	4	8	5	2	4	9	12
9:30	9:45	4	10	6	10	1	14	19	5	0	6	10	2	3	6	12	10
9:45	10:00	1	12	6	13	1	9	12	5	0	3	11	3	1	3	12	12
15:00	15:15	1	6	5	16	1	6	9	2	0	4	7	3	1	2	23	14
15:15	15:30	0	14	6	11	0	7	17	8	0	2	9	5	2	7	10	5
15:30	15:45	3	12	10	13	0	9	23	5	0	1	11	5	1	7	20	19
15:45	16:00	3	18	8	11	0	9	18	4	0	3	7	9	5	4	20	8
16:00	16:15	0	16	4	12	1	6	22	6	0	1	7	7	7	7	16	17
16:15	16:30	1	7	7	12	0	8	12	5	1	2	7	5	2	9	26	15
16:30	16:45	0	17	6	9	0	5	22	4	0	10	7	7	4	2	25	13
16:45	17:00	0	12	8	1	0	10	19	4	0	6	10	5	1	6	23	18
17:00	17:15	0	17	5	10	2	8	14	4	0	5	13	3	1	8	16	11
17:15	17:30	0	15	9	8	0	7	12	6	0	5	7	6	0	5	24	11
17:30	17:45	0	9	6	3	0	4	19	6	0	4	6	5	0	4	17	7
17:45	18:00	1	7	6	6	0	9	13	5	0	3	8	1	1	2	13	6
18:00	18:15	0	6	8	8	1	8	9	3	0	3	5	3	0	1	11	4
18:15	18:30	1	7	2	7	0	5	10	4	0	2	9	8	4	2	14	14
18:30	18:45	1	9	4	14	0	6	17	1	0	2	7	2	3	3	9	8
18:45	19:00	0	10	1	13	0	3	12	2	0	1	3	2	2	2	17	8

Peak Time		North Approach Derby St				East Approach Fitzroy St				South Approach Derby St				West Approach Fitzroy St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:45	9:45	7	33	36	44	3	46	49	27	0	24	33	15	10	16	54	42	439
15:30	16:30	7	53	29	48	1	32	75	20	1	7	32	26	15	27	82	59	514

Heavy Vehicles

Time		North Approach Derby St				East Approach Fitzroy St				South Approach Derby St				West Approach Fitzroy St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
6:00	6:15	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0
6:15	6:30	0	0	1	2	0	1	0	0	0	0	0	0	0	0	1	0
6:30	6:45	0	0	1	1	0	0	3	0	0	1	1	0	0	0	0	0
6:45	7:00	0	0	2	0	1	0	0	1	0	0	0	0	0	3	0	0
7:00	7:15	0	0	1	2	0	0	1	1	0	0	1	1	0	1	1	0
7:15	7:30	0	0	2	1	0	2	0	0	0	0	2	1	0	0	2	2
7:30	7:45	0	0	1	2	0	0	2	0	0	0	1	0	0	0	0	1
7:45	8:00	0	1	4	1	0	1	0	0	0	0	0	0	0	0	0	1
8:00	8:15	0	0	2	0	0	0	1	0	0	0	1	2	0	0	0	0
8:15	8:30	0	1	2	2	0	2	1	0	0	0	1	0	0	1	0	0
8:30	8:45	0	0	0	1	0	0	1	0	0	0	3	0	0	0	1	0
8:45	9:00	0	2	0	0	1	3	1	0	0	0	0	0	0	0	1	0
9:00	9:15	0	0	2	2	0	1	0	1	0	0	1	0	0	2	0	1
9:15	9:30	0	0	1	0	0	0	0	0	0	1	3	0	0	1	0	0
9:30	9:45	0	0	1	0	0	0	1	0	0	0	1	1	0	0	1	0
9:45	10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	15:15	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0
15:15	15:30	0	1	3	1	0	0	1	0	0	0	1	0	0	0	1	0
15:30	15:45	0	0	1	0	0	0	0	1	0	0	0	1	0	0	1	0

15:45	16:00	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0
16:00	16:15	0	1	0	0	0	1	0	0	0	0	1	2	0	1	0	0
16:15	16:30	0	0	0	0	0	0	1	0	0	0	2	1	0	0	0	0
16:30	16:45	0	0	0	1	0	0	2	0	0	0	3	2	0	0	1	0
16:45	17:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
17:00	17:15	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1
17:15	17:30	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0
17:45	18:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
18:00	18:15	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1
18:15	18:30	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0
18:30	18:45	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1
18:45	19:00	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0

Peak Time		**North Approach Derby St**				**East Approach Fitzroy St**				**South Approach Derby St**				**West Approach Fitzroy St**				**Peak**
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	**total**
8:45	9:45	0	2	4	2	1	4	2	1	0	1	5	1	0	3	2	1	29
15:30	16:30	0	2	1	0	0	1	1	1	0	1	4	4	0	1	1	0	17

TRANS TRAFFIC SURVEY

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TURNING MOVEMENT SURVEY

Intersection of Darjeeling Rd and Thunderbolts Way, Walcha

GPS *-30.966551, 151.584412*

Date:	Wed 22/11/23
Weather:	Overcast
Suburban:	Walcha
Customer:	Amber

North:	Thunderbolts Way
East:	N/A
South:	Thunderbolts Way
West:	Darjeeling Rd

Survey Period	AM:	6:00 AM-10:00 AM
	PM:	3:00 PM-7:00 PM
Traffic Peak	AM:	7:45 AM-8:45 AM
	PM:	3:15 PM-4:15 PM

All Vehicles

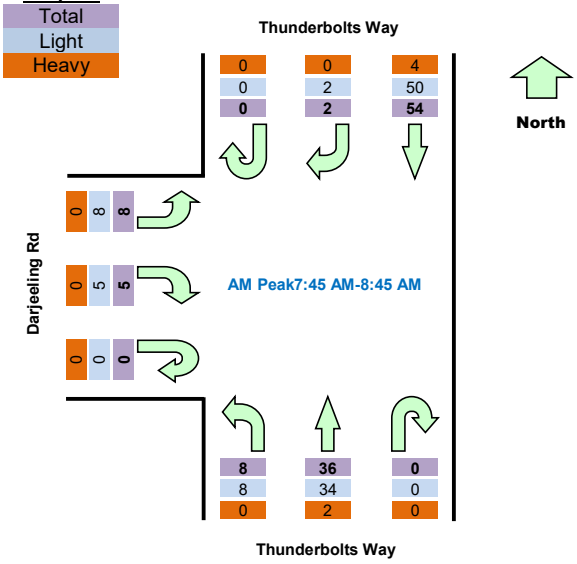
Time		North Approach Thunderbolts Way			South Approach Thunderbolts Way			West Approach Darjeeling Rd			Hourly Total	
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	Hour	Peak
6:00	6:15	0	0	4	0	2	0	0	0	3	51	
6:15	6:30	0	1	2	0	6	0	0	0	0	70	
6:30	6:45	0	1	6	0	3	1	0	2	2	77	
6:45	7:00	0	1	7	0	6	3	0	0	1	83	
7:00	7:15	0	1	9	0	16	1	0	0	1	94	
7:15	7:30	0	1	1	0	8	3	0	0	3	93	
7:30	7:45	0	1	6	0	10	3	0	1	0	101	
7:45	8:00	0	1	14	0	10	3	0	0	1	113	Peak
8:00	8:15	0	0	11	0	10	1	0	1	4	111	
8:15	8:30	0	1	11	0	7	3	0	2	0	113	Peak
8:30	8:45	0	0	18	0	9	1	0	2	3	112	
8:45	9:00	0	0	14	0	9	1	0	1	2	110	
9:00	9:15	0	0	7	0	14	6	0	1	1	107	
9:15	9:30	0	1	7	0	12	2	0	1	0		
9:30	9:45	0	3	13	0	9	2	0	4	0		
9:45	10:00	0	1	8	1	11	0	0	2	1		
15:00	15:15	0	0	10	0	9	1	0	2	5	127	
15:15	15:30	0	1	21	0	17	2	0	0	0	128	Peak
15:30	15:45	0	2	16	0	9	0	0	2	0	107	
15:45	16:00	0	1	9	0	13	5	0	1	1	106	
16:00	16:15	0	3	7	0	12	3	0	3	0	105	
16:15	16:30	0	0	8	0	9	1	0	2	0	101	
16:30	16:45	0	1	7	0	13	2	0	5	0	103	
16:45	17:00	0	1	9	0	8	4	0	6	1	103	
17:00	17:15	0	0	15	0	9	0	0	0	0	89	
17:15	17:30	0	1	10	1	4	3	0	2	1	80	
17:30	17:45	0	1	12	0	3	2	0	10	0	68	
17:45	18:00	0	0	7	0	3	1	0	3	1	56	
18:00	18:15	0	1	6	0	4	4	0	0	0	53	
18:15	18:30	0	1	6	0	3	0	0	0	0		
18:30	18:45	0	1	10	0	4	0	0	0	1		
18:45	19:00	0	0	2	0	6	2	0	2	0		

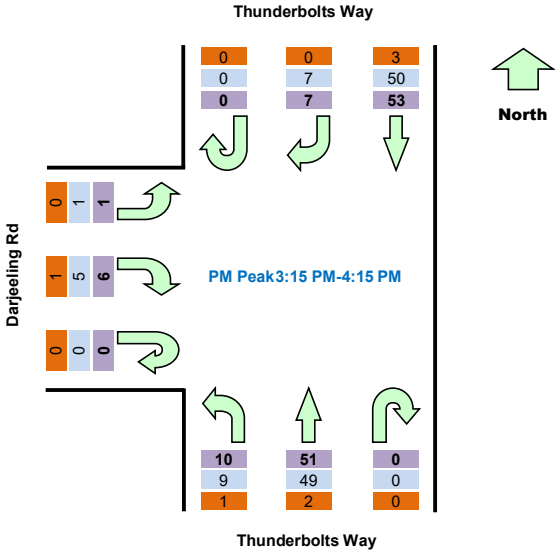
Peak Time		North Approach Thunderbolts Way			South Approach Thunderbolts Way			West Approach Darjeeling Rd			Peak
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	total
7:45	8:45	0	2	54	0	36	8	0	5	8	113
15:15	16:15	0	7	53	0	51	10	0	6	1	128

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy





Light Vehicles

Time		North Approach Thunderbolts Way			South Approach Thunderbolts Way			West Approach Darjeeling Rd		
Period Start	**Period End**	U	R	SB	U	NB	L	U	R	L
6:00	6:15	0	0	4	0	2	0	0	0	2
6:15	6:30	0	1	2	0	6	0	0	0	0
6:30	6:45	0	1	4	0	3	1	0	1	2
6:45	7:00	0	1	5	0	5	3	0	0	1
7:00	7:15	0	1	9	0	16	1	0	0	1
7:15	7:30	0	1	1	0	7	3	0	0	3
7:30	7:45	0	1	6	0	10	3	0	1	0
7:45	8:00	0	1	14	0	9	3	0	0	1
8:00	8:15	0	0	11	0	10	1	0	1	4
8:15	8:30	0	1	10	0	6	3	0	2	0
8:30	8:45	0	0	15	0	9	1	0	2	3
8:45	9:00	0	0	13	0	9	0	0	1	2
9:00	9:15	0	0	6	0	13	3	0	1	1
9:15	9:30	0	0	6	0	11	2	0	0	0
9:30	9:45	0	3	13	0	8	2	0	3	0
9:45	10:00	0	1	8	1	11	0	0	2	1
15:00	15:15	0	0	10	0	8	1	0	2	4
15:15	15:30	0	1	20	0	17	2	0	0	0
15:30	15:45	0	2	16	0	9	0	0	2	0
15:45	16:00	0	1	8	0	12	4	0	1	1
16:00	16:15	0	3	6	0	11	3	0	2	0
16:15	16:30	0	0	7	0	9	1	0	2	0
16:30	16:45	0	1	7	0	13	1	0	4	0
16:45	17:00	0	1	8	0	8	3	0	6	1
17:00	17:15	0	0	15	0	8	0	0	0	0
17:15	17:30	0	1	10	1	4	3	0	2	1

17:30	17:45	0	1	12	0	2	2	0	9	0
17:45	18:00	0	0	7	0	3	0	0	3	1
18:00	18:15	0	1	5	0	4	4	0	0	0
18:15	18:30	0	1	6	0	3	0	0	0	0
18:30	18:45	0	1	10	0	3	0	0	0	1
18:45	19:00	0	0	2	0	6	0	0	2	0

Peak Time		North Approach Thunderbolts Way			South Approach Thunderbolts Way			West Approach Darjeeling Rd			Peak
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	total
7:45	8:45	0	2	50	0	34	8	0	5	8	107
15:15	16:15	0	7	50	0	49	9	0	5	1	121

Heavy Vehicles

Time		North Approach Thunderbolts Way			South Approach Thunderbolts Way			West Approach Darjeeling Rd		
Period Start	Period End	U	R	SB	U	NB	L	U	R	L
6:00	6:15	0	0	0	0	0	0	0	0	1
6:15	6:30	0	0	0	0	0	0	0	0	0
6:30	6:45	0	0	2	0	0	0	0	1	0
6:45	7:00	0	0	2	0	1	0	0	0	0
7:00	7:15	0	0	0	0	0	0	0	0	0
7:15	7:30	0	0	0	0	1	0	0	0	0
7:30	7:45	0	0	0	0	0	0	0	0	0
7:45	8:00	0	0	0	0	1	0	0	0	0
8:00	8:15	0	0	0	0	0	0	0	0	0
8:15	8:30	0	0	1	0	1	0	0	0	0
8:30	8:45	0	0	3	0	0	0	0	0	0
8:45	9:00	0	0	1	0	0	1	0	0	0
9:00	9:15	0	0	1	0	1	3	0	0	0
9:15	9:30	0	1	1	0	1	0	0	1	0
9:30	9:45	0	0	0	0	1	0	0	1	0
9:45	10:00	0	0	0	0	0	0	0	0	0
15:00	15:15	0	0	0	0	1	0	0	0	1
15:15	15:30	0	0	1	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0	0	0
15:45	16:00	0	0	1	0	1	1	0	0	0
16:00	16:15	0	0	1	0	1	0	0	1	0
16:15	16:30	0	0	1	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	1	0	1	0
16:45	17:00	0	0	1	0	0	1	0	0	0
17:00	17:15	0	0	0	0	1	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	1	0	0	1	0
17:45	18:00	0	0	0	0	0	1	0	0	0
18:00	18:15	0	0	1	0	0	0	0	0	0
18:15	18:30	0	0	0	0	0	0	0	0	0
18:30	18:45	0	0	0	0	1	0	0	0	0
18:45	19:00	0	0	0	0	0	2	0	0	0

Peak Time		North Approach Thunderbolts Way			South Approach Thunderbolts Way			West Approach Darjeeling Rd			Peak total
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	
7:45	8:45	0	0	4	0	2	0	0	0	0	6
15:15	16:15	0	0	3	0	2	1	0	1	0	7

TRANS TRAFFIC SURVEY

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TURNING MOVEMENT SURVEY

Intersection of Jamieson St and Derby St, Walcha

GPS -30.976936, 151.594846

Date:	Thu 09/11/23
Weather:	Overcast
Suburban:	Walcha
Customer:	Amber

North:	Derby St
East:	Jamieson St
South:	Derby St
West:	Uralla Rd

Survey Period	AM:	6:00 AM-10:00 AM
	PM:	3:00 PM-7:00 PM
Traffic Peak	AM:	8:30 AM-9:30 AM
	PM:	4:30 PM-5:30 PM

All Vehicles

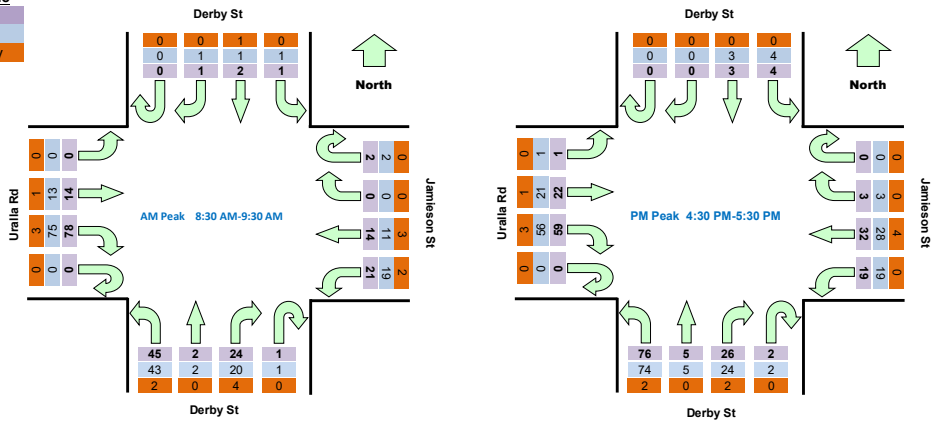
Time		North Approach Derby St				East Approach Jamieson St				South Approach Derby St				West Approach Uralla Rd				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
6:00	6:15	0	0	0	0	0	0	1	1	0	3	0	4	0	3	0	0	89	
6:15	6:30	0	0	0	0	0	0	2	3	0	3	0	2	0	5	2	0	118	
6:30	6:45	0	0	0	0	0	0	3	3	0	2	0	8	0	7	0	0	127	
6:45	7:00	0	0	0	0	0	0	2	7	0	4	0	12	0	9	3	0	135	
7:00	7:15	0	0	0	0	0	0	12	2	0	1	0	14	0	10	2	0	133	
7:15	7:30	0	0	0	0	0	0	6	0	1	1	0	9	0	8	1	0	131	
7:30	7:45	0	0	0	0	0	0	2	2	0	1	0	10	0	14	2	0	150	
7:45	8:00	0	0	1	0	0	0	3	4	0	3	0	8	0	13	3	0	175	
8:00	8:15	0	0	1	1	0	0	2	2	0	2	0	17	0	12	2	0	200	
8:15	8:30	0	0	1	1	0	0	2	5	0	3	1	11	0	18	3	0	201	
8:30	8:45	0	1	2	0	1	0	5	3	1	5	1	11	0	21	5	0	205	Peak
8:45	9:00	0	0	0	1	1	0	7	4	0	5	0	13	0	25	4	0	188	
9:00	9:15	0	0	0	0	0	0	0	8	0	4	0	11	0	15	2	0	175	
9:15	9:30	0	0	0	0	0	0	2	6	0	10	1	10	0	17	3	0		
9:30	9:45	0	0	1	0	0	0	3	5	0	5	0	6	0	14	5	0		
9:45	10:00	0	0	1	0	0	1	5	8	0	4	1	11	0	13	3	0		
15:00	15:15	0	0	1	2	0	0	5	6	0	5	3	18	0	13	5	0	218	
15:15	15:30	0	0	0	0	0	0	7	6	0	5	0	10	0	15	4	0	211	
15:30	15:45	0	0	2	0	0	0	5	12	0	2	1	14	0	20	3	0	213	
15:45	16:00	0	0	2	0	0	0	5	8	0	4	0	12	0	19	4	0	204	
16:00	16:15	0	0	1	1	0	0	7	3	0	10	2	9	0	14	4	0	211	
16:15	16:30	0	0	0	0	0	0	2	8	0	5	1	18	0	11	4	0	228	
16:30	16:45	0	0	0	2	0	0	5	5	1	6	2	12	0	11	5	1	252	Peak
16:45	17:00	0	0	0	0	0	1	8	4	1	9	2	18	0	14	4	0	237	
17:00	17:15	0	0	1	1	0	1	10	8	0	4	0	21	0	17	5	0	235	
17:15	17:30	0	0	2	1	0	1	9	2	0	7	1	25	0	17	8	0	226	
17:30	17:45	0	0	0	0	0	0	7	4	0	1	0	10	0	9	4	0	196	
17:45	18:00	0	0	0	0	0	0	12	4	0	3	2	21	0	14	3	0	208	
18:00	18:15	0	0	1	0	0	1	2	4	0	1	0	18	0	25	7	0	190	
18:15	18:30	0	0	0	0	0	1	4	1	0	3	0	22	0	10	2	0		
18:30	18:45	0	0	1	0	0	0	4	5	0	2	1	8	0	23	3	0		
18:45	19:00	0	0	0	1	0	1	1	4	0	1	0	8	0	19	6	0		

Peak Time		North Approach Derby St				East Approach Jamieson St				South Approach Derby St				West Approach Uralla Rd				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:30	9:30	0	1	2	1	2	0	14	21	1	24	2	45	0	78	14	0	205
16:30	17:30	0	0	3	4	0	3	32	19	2	26	5	76	0	59	22	1	252

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



Light Vehicles

Time		North Approach Derby St				East Approach Jamieson St				South Approach Derby St				West Approach Uralla Rd			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
6:00	6:15	0	0	0	0	0	0	1	1	0	3	0	4	0	2	0	0
6:15	6:30	0	0	0	0	0	0	2	2	0	3	0	1	0	4	0	0
6:30	6:45	0	0	0	0	0	0	3	3	0	1	0	6	0	7	0	0
6:45	7:00	0	0	0	0	0	0	2	6	0	4	0	12	0	7	2	0
7:00	7:15	0	0	0	0	0	0	12	2	0	1	0	13	0	8	2	0
7:15	7:30	0	0	0	0	0	0	5	0	1	0	0	8	0	6	1	0
7:30	7:45	0	0	0	0	0	0	2	1	0	1	0	9	0	12	2	0
7:45	8:00	0	0	1	0	0	0	3	4	0	3	0	7	0	11	3	0
8:00	8:15	0	0	1	1	0	0	0	2	0	2	0	15	0	11	2	0
8:15	8:30	0	0	1	1	0	0	2	5	0	3	1	8	0	14	2	0
8:30	8:45	0	1	1	0	1	0	4	3	1	5	1	11	0	20	5	0
8:45	9:00	0	0	0	1	1	0	5	3	0	5	0	12	0	23	4	0
9:00	9:15	0	0	0	0	0	0	0	7	0	4	0	10	0	15	2	0
9:15	9:30	0	0	0	0	0	0	2	6	0	6	1	10	0	17	2	0
9:30	9:45	0	0	1	0	0	0	2	5	0	5	0	5	0	12	4	0
9:45	10:00	0	0	1	0	0	1	3	8	0	4	1	11	0	12	3	0
15:00	15:15	0	0	1	2	0	0	5	5	0	5	3	18	0	13	5	0
15:15	15:30	0	0	0	0	0	0	5	6	0	4	0	10	0	13	3	0
15:30	15:45	0	0	2	0	0	0	5	12	0	2	1	14	0	18	2	0
15:45	16:00	0	0	2	0	0	0	5	8	0	4	0	12	0	19	3	0
16:00	16:15	0	0	1	1	0	0	5	2	0	10	1	9	0	13	4	0
16:15	16:30	0	0	0	0	0	0	2	8	0	4	1	17	0	11	4	0
16:30	16:45	0	0	0	2	0	0	5	5	1	5	2	11	0	10	4	1
16:45	17:00	0	0	0	0	0	1	7	4	1	9	2	18	0	14	4	0
17:00	17:15	0	0	1	1	0	1	8	8	0	3	0	21	0	15	5	0
17:15	17:30	0	0	2	1	0	1	8	2	0	7	1	24	0	17	8	0
17:30	17:45	0	0	0	0	0	0	6	4	0	1	0	9	0	9	4	0
17:45	18:00	0	0	0	0	0	0	12	3	0	2	2	21	0	14	3	0
18:00	18:15	0	0	1	0	0	1	2	4	0	1	0	18	0	24	7	0
18:15	18:30	0	0	0	0	0	1	4	1	0	2	0	21	0	10	2	0
18:30	18:45	0	0	1	0	0	0	4	5	0	1	1	8	0	23	2	0
18:45	19:00	0	0	0	1	0	1	1	4	0	1	0	7	0	18	6	0

Peak Time		North Approach Derby St				East Approach Jamieson St				South Approach Derby St				West Approach Uralla Rd				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:30	9:30	0	1	1	1	2	0	11	19	1	20	2	43	0	75	13	0	189
16:30	17:30	0	0	3	4	0	3	28	19	2	24	5	74	0	56	21	1	240

Heavy Vehicles

Time		North Approach Derby St				East Approach Jamieson St				South Approach Derby St				West Approach Uralla Rd			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
6:00	6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
6:15	6:30	0	0	0	0	0	0	0	1	0	0	0	1	0	1	2	0
6:30	6:45	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0
6:45	7:00	0	0	0	0	0	0	0	1	0	0	0	0	0	2	1	0
7:00	7:15	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0
7:15	7:30	0	0	0	0	0	0	1	0	0	1	0	1	0	2	0	0
7:30	7:45	0	0	0	0	0	0	0	1	0	0	0	1	0	2	0	0
7:45	8:00	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0
8:00	8:15	0	0	0	0	0	0	2	0	0	0	0	2	0	1	0	0
8:15	8:30	0	0	0	0	0	0	0	0	0	0	0	3	0	4	1	0
8:30	8:45	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0
8:45	9:00	0	0	0	0	0	0	2	1	0	0	0	1	0	2	0	0
9:00	9:15	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
9:15	9:30	0	0	0	0	0	0	0	0	0	4	0	0	0	0	1	0
9:30	9:45	0	0	0	0	0	0	1	0	0	0	0	1	0	2	1	0
9:45	10:00	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0
15:00	15:15	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	2	0	0	1	0	0	0	2	1	0
15:30	15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0

15:45	16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
16:00	16:15	0	0	0	0	0	0	2	1	0	0	1	0	0	1	0	0
16:15	16:30	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0	0	0	1	0	1	0	1	1	0
16:45	17:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	2	0	0	1	0	0	0	2	0	0
17:15	17:30	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0
17:30	17:45	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
18:00	18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
18:15	18:30	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
18:30	18:45	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
18:45	19:00	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0

Peak Time		**North Approach Derby St**				**East Approach Jamieson St**				**South Approach Derby St**				**West Approach Uralla Rd**				**Peak**
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	**total**
8:30	9:30	0	0	1	0	0	0	3	2	0	4	0	2	0	3	1	0	16
16:30	17:30	0	0	0	0	0	0	4	0	0	2	0	2	0	3	1	0	12

Appendix G

School Bus Schedule and Route

MOONA BUS RUN DIRECTIONS 2020

Of a morning:

START AT

1889 The Retreat

Right onto Moona Plains Road

Left at Emu Creek Road

Left at Angle Street

Left to Walcha Central School

On to North Street

Left at Middle Street

Right at Hill Street

Across Derby Street (Thunderbolts way)

Left at Meridian Street

Left at Apsley Street to St Patricks School

Left at Derby Street

Right onto Jamieson Street

Onto Emu Creek Road

Right at Moona Plains Road

1889 The Retreat

Of an Afternoon:

START AT

1889 The Retreat

Right onto Moona Plains Road

Left at Emu Creek Road

Onto Jamieson Street

Left onto Derby Street (Thunderbolts Way)

Right at Roundabout onto Fitzroy Street

Through next roundabout

Right at Towers Street

Right at Apsley Street to St Patricks School

Left at Derby Street

Right at Hill Street

Left at Middle Street

Right at North Street to Walcha Central School

Right at Angle Street

Right onto Emu Creek Road

Right onto Moona Plains Road

Left to 1889 Moona Plains Road

MOONA BUS TIMETABLE 2020

AM	Bus Stop/ Property Name	KM on Moona Road
8:00	The Retreat	1889
	Chinooks Road Turnoff	
8:05	East Lynne	1802
	Romavilla	1426
8:15	Elswick	677
8:25	Bangalla	0.1
8:30	Walcha Central School	
8:35	St Patricks Scool	
PM		
3:05	St Patricks School	
3:15	Walcha Central School	
3:25	Bangalla	
3:30	Elswick	
	Romavilla	
3:35	East Lynne	
	Chinooks Road Turnoff	
3:40	The Retreat	

**Indicates pending additions in the future years

Appendix H

Project Traffic Volumes

HEAVY VEHICLES

Operation	Purpose	Delivery Vehicle	Vehicle Type	Vehicle Class	HV Movements One Way	Comments
General						
Site Set Up and Compound	Water delivery	Truck Tanker	AV	Class 6-11	96	Potable drinking water for running of site amenities, approx 2 deliveries per month
	Shed and Offices	Flat Bed	AV	Class 6-11	60	Sirte offices, generally a 12x3 shed per truck for 2x compounds with approx 25 sheds plus furniture then concrete, timber, colorbond for awnings
	Fuel delivery	Truck Tanker	AV	Class 6-11	800	Assumes 4 per week (this includes running of site amenities and re-fueling of construction plant and equipment)
	Skip delivery	Flat Bed	MRV/HRV	Class 3 - 5	200	1-2 / week (nominal assumption)
	Portaloo Deliveries and cleaning	Flat Bed	MRV/HRV	Class 3 - 5	200	1-2 / week (nominal assumption)
Bulk Earthworks						
Mobilisation	Earthmoving Equipment	Low loader	AV	Class 6 - 9	250	Peak bulk earthworks machinery based on projects of similar scale
	Containers, Fuel Tanks, Servicing	Flat Bed	MRV/HRV	Class 3 - 5	400	2x misc deliveries for earthworks per week for 200 weeks
Road Pavement	Cement and Lime Stablisation	Truck Tanker	AV	Class 6-11	100	Cement and lime requirements to strengthen unsuitable material on site
	Track and Hardstand Pavement Material	Truck and Dog	AV	Class 6-11	500	Assumed Site Won Gravel, with 15,000t of imported material only for establishment works.
	Track and Hardstand Pavement Material (on site crushing)	Low Loader	AV	Class 6-11	50	Crushing Equipment for on site crushing works
	Construction Water	Truck Tanker	AV	Class 6-11	50	Assumed site won construction water (earthworks material conditioning and dust suppression) plus small allowance for drilling and establishment of bores across site
Pipes and Drainage	Bedding Sand	Truck and Dog	AV	Class 6-11	150	Bedding sand for drainage pipe installation
	Pipe and Headwalls	Flat Bed	AV	Class 6-11	100	
Civil - Concrete and Foundations						
Mobilisation	Establishment of batch plant, agitator fleet etc.	Flat Bed	MRV/HRV	Class 3 - 5	1,800	Allows for agitators and concrete pump to leave site on non-pour days and return
Sand Deliveries	Concrete raw materials	Truck and Dog	AV	Class 6-11	2,400	Assumes 118 turbines with 800m3 per foundation concrete and 100m3 of blinding conrete (900m3 total per turbine) with 30% of that concrete volume comprising of sand plus allowance for misc concrete
Cement Deliveries	Concrete raw materials	Truck Tanker	AV	Class 6-11	2,600	Assumes 118 turbines with 800m3 per foundation concrete and 100m3 of blinding conrete (900m3 total per turbine) with 20% of that concrete volume comprising of sand plus allowance for misc concrete
Aggregate Deliveries	Concrete raw materials	Truck and Dog	AV	Class 6-11	4,550	Assumes 100% Import of Aggregates which make up 50% of the concrete volumes above
Water Deliveries	Concrete raw materials	Truck Tanker	AV	Class 6-11	900	Assumes 100% import for potable concrete water (if bore quality is sufficient, this can be removed)
Steel Reinforcement Deliveries	foundation reinforcement for turbine foundations, substation, overhead line	Flat Bed	MRV/HRV	Class 3 - 5	650	Includes reinforcement and hold down bolts
Substation and O&M Construction						
Mobilisation	Plant etc	Flat Bed	MRV/HRV	Class 3 - 5	60	Assumes that earthworks included within site earthworks scope.
Bulk materials	Pavement & blue metal	Flat Bed	MRV/HRV	Class 3 - 4	900	Assumes that concrete is sourced internally
	Misc electrical equipment	Flat Bed	MRV/HRV	Class 3 - 5	225	
	Operations building	Flat Bed	MRV/HRV	Class 3 - 5	30	
Overhead Line Construction						
Mobilisation	Machines and Equipment	Flat Bed	MRV	Class 6	30	
Pole Deliveries	Overhead line Poles	Flat Bed	MRV	Class 6	400	
Conductor and Accessories		Flat Bed	MRV	Class 6	150	
MV Cable Installation						
Mobilisation	Machines and Equipment	Flat Bed	AV	Class 6-11	50	
Cable Deliveries	MV Cable Drums	Flat Bed	AV	Class 6-11	50	
Bedding Sand Deliveries	Bedding sand for HV cable installation	Truck and Dog	AV	Class 6-11	3,000	Assumes 118km of MV cable with a usage rate of sand of 0.4m3 per lineal metre and 100% import of bedding sand
Turbine Deliveries (Supply and Installation Works)						
Mobilisation	Includes cranes	Low Loader	AV	Class 6-11	75	
Operations	Site estabishment and Operations (containers, sheds, fuel etc.)	Flat Bed	MRV/HRV	Class 3 - 5	350	
		TOTAL HV MOVEMENTS			**21,176**	

OSOM

Turbine Deliveries (Supply and Installation Works)						
Turbine Components	Tower Sections	OSOM	OSOM	OSOM	826	Assumes a 7 section tower
	Nacelle	OSOM	OSOM	OSOM	118	
	Power Train	OSOM	OSOM	OSOM	118	
	Hub	OSOM	OSOM	OSOM	118	
	Blades	OSOM	OSOM	OSOM	354	
	Switchgear	Flat Bed	OSOM	OSOM	118	
Substation and O&M Construction						
Substation Electrical	Transformer delivery - substation	Low loader	OSOM	OSOM	4	
	Switchroom Buildings	Low Loader	OSOM	OSOM	4	
		TOTAL OSOM MOVEMENTS			**1,660**	

LIGHT VEHICLES

Light Vehicles						
BoP	Site establishment	LV	LV	Class 1	1,050	Months 1-6 approx
	BoP Works	LV	LV	Class 1	90,050	Months 7-39 approx
	Supply and Install Works	LV	LV	Class 1	49,950	Months 18 - 52 approx
		TOTAL LV MOVEMENTS			**141,050**	

Classification: Confidential

Appendix I

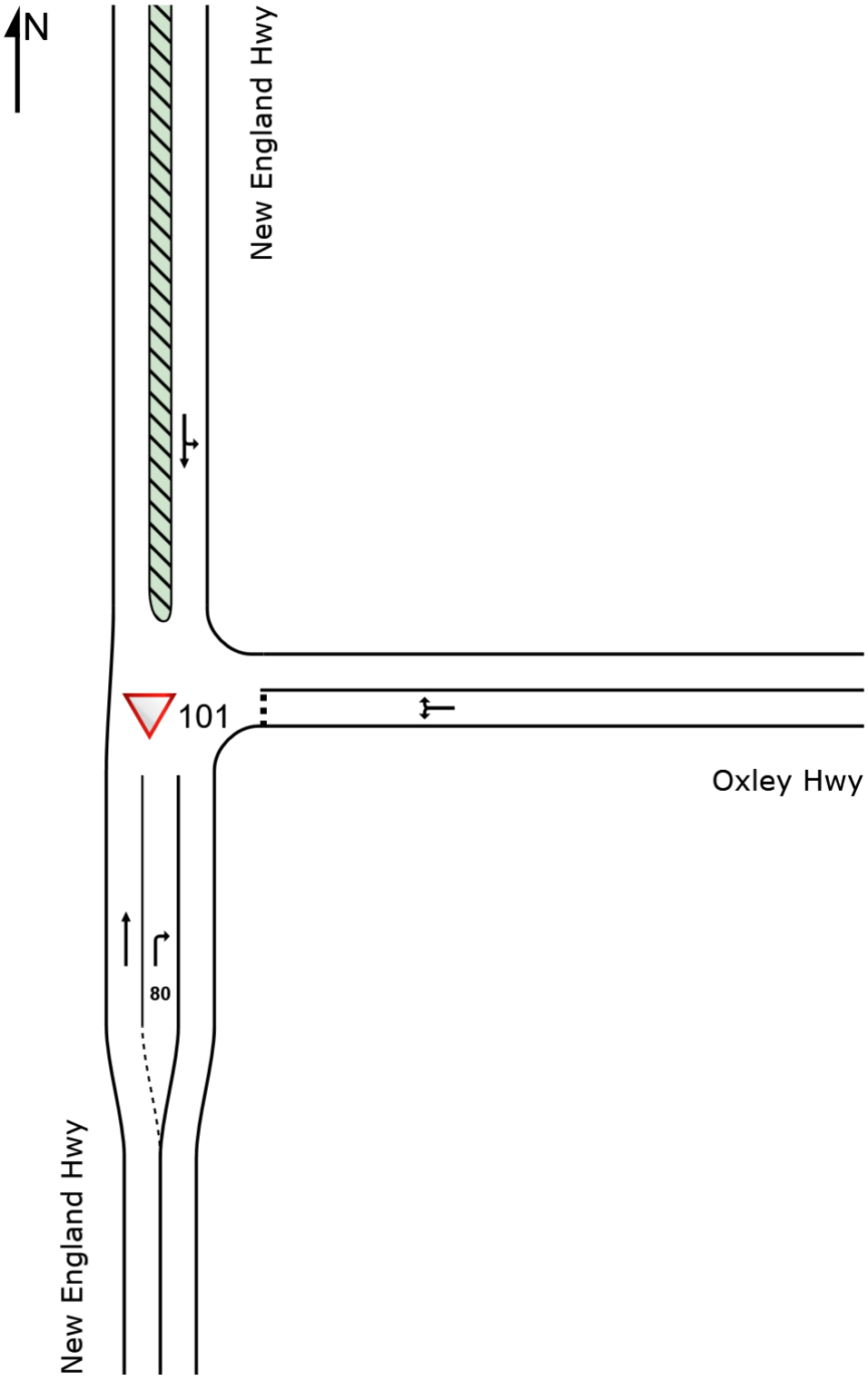
SIDRA Results

SITE LAYOUT

Site: 101 [New England Hwy and Oxley Hwy Intersection (AM peak) (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [New England Hwy and Oxley Hwy Intersection (AM peak) (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: New England Hwy															
2	T1	All MCs	143	28.7	143	28.7	0.087	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
3	R2	All MCs	159	32.5	159	32.5	0.111	8.6	LOS A	0.5	4.8	0.20	0.63	0.20	62.3
Approach			302	30.7	302	30.7	0.111	4.5	NA	0.5	4.8	0.11	0.33	0.11	75.8
East: Oxley Hwy															
4	L2	All MCs	7	42.9	7	42.9	0.007	9.2	LOS A	0.0	0.3	0.16	0.60	0.16	60.0
6	R2	All MCs	1	0.0	1	0.0	0.007	9.9	LOS A	0.0	0.3	0.16	0.60	0.16	72.8
Approach			8	37.5	8	37.5	0.007	9.3	LOS A	0.0	0.3	0.16	0.60	0.16	61.3
North: New England Hwy															
7	L2	All MCs	21	40.0	21	40.0	0.042	8.9	LOS A	0.0	0.0	0.00	0.22	0.00	67.4
8	T1	All MCs	44	33.3	44	33.3	0.042	0.0	LOS A	0.0	0.0	0.00	0.22	0.00	93.9
Approach			65	35.5	65	35.5	0.042	2.9	NA	0.0	0.0	0.00	0.22	0.00	83.3
All Vehicles			376	31.7	376	31.7	0.111	4.4	NA	0.5	4.8	0.09	0.32	0.09	76.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 101 [New England Hwy and Oxley Hwy Intersection (PM peak) (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: New England Hwy															
2	T1	All MCs	76	30.6	76	30.6	0.047	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
3	R2	All MCs	23	9.1	23	9.1	0.016	8.2	LOS A	0.1	0.5	0.27	0.61	0.27	69.4
Approach			99	25.5	99	25.5	0.047	1.9	NA	0.1	0.5	0.06	0.14	0.06	90.6
East: Oxley Hwy															
4	L2	All MCs	151	31.5	151	31.5	0.156	9.4	LOS A	0.7	6.0	0.32	0.64	0.32	62.2
6	R2	All MCs	20	42.1	20	42.1	0.156	11.5	LOS A	0.7	6.0	0.32	0.64	0.32	59.1
Approach			171	32.7	171	32.7	0.156	9.7	LOS A	0.7	6.0	0.32	0.64	0.32	61.8
North: New England Hwy															
7	L2	All MCs	1	0.0	1	0.0	0.086	7.8	LOS A	0.0	0.0	0.00	0.01	0.00	87.2
8	T1	All MCs	143	24.3	143	24.3	0.086	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	99.8
Approach			144	24.1	144	24.1	0.086	0.1	NA	0.0	0.0	0.00	0.01	0.00	99.6
All Vehicles			414	28.0	414	28.0	0.156	4.5	NA	0.7	6.0	0.15	0.30	0.15	78.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

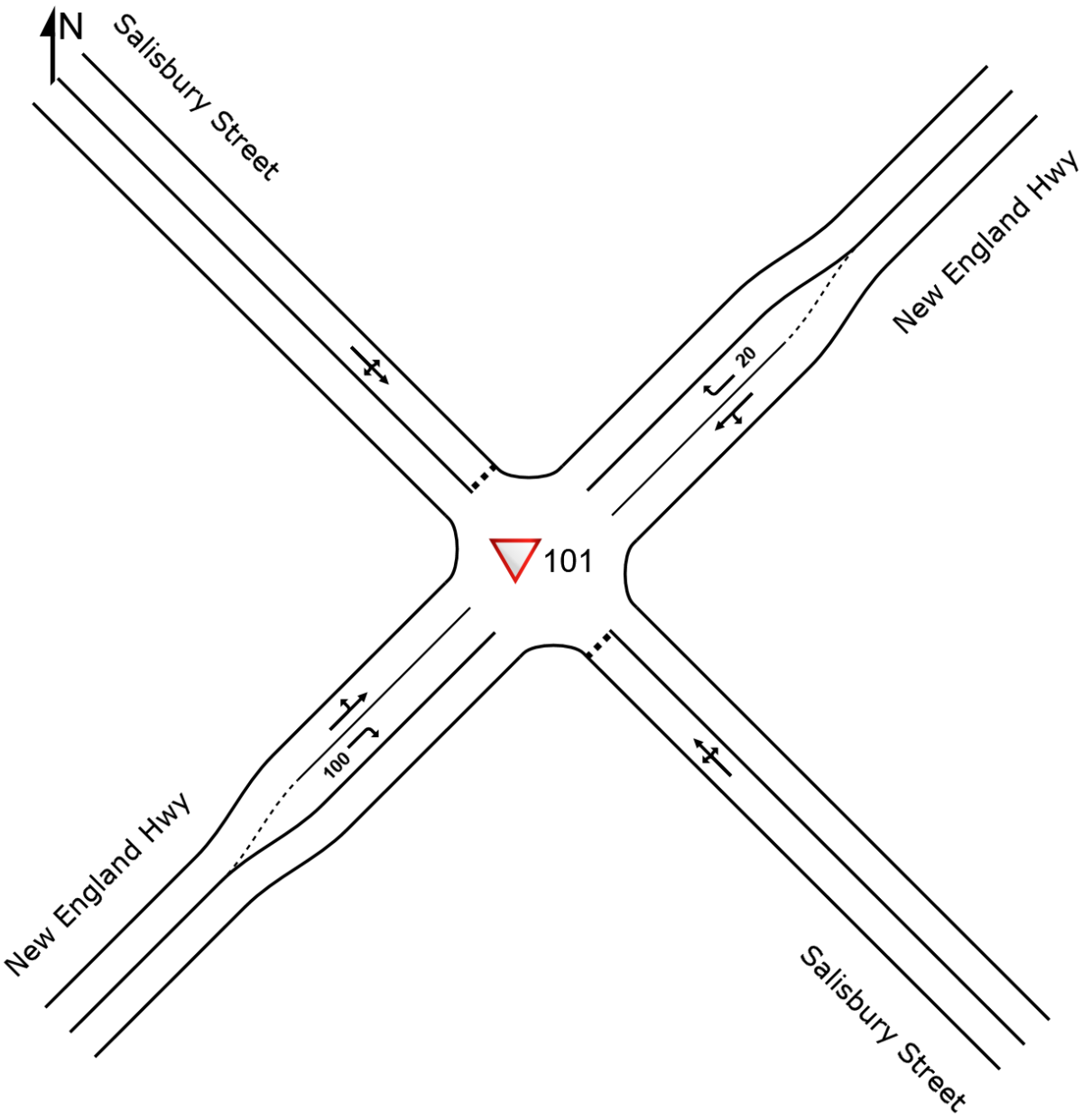
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SITE LAYOUT

Site: 101 [New England Hwy and Salisbury St Intersection (AM peak) (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

Site: 101 [New England Hwy and Salisbury St Intersection (AM peak) (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Salisbury Street															
21	L2	All MCs	5	20.0	5	20.0	0.035	5.2	LOS A	0.1	1.0	0.37	0.56	0.37	44.5
22	T1	All MCs	2	0.0	2	0.0	0.035	5.3	LOS A	0.1	1.0	0.37	0.56	0.37	45.1
23	R2	All MCs	17	12.5	17	12.5	0.035	7.4	LOS A	0.1	1.0	0.37	0.56	0.37	44.5
Approach			24	13.0	24	13.0	0.035	6.8	LOS A	0.1	1.0	0.37	0.56	0.37	44.6
NorthEast: New England Hwy															
24	L2	All MCs	35	21.2	35	21.2	0.077	4.8	LOS A	0.0	0.0	0.00	0.14	0.00	47.7
25	T1	All MCs	102	8.2	102	8.2	0.077	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	49.3
26	R2	All MCs	6	0.0	6	0.0	0.004	4.9	LOS A	0.0	0.1	0.23	0.51	0.23	45.3
Approach			143	11.0	143	11.0	0.077	1.4	NA	0.0	0.1	0.01	0.15	0.01	48.7
NorthWest: Salisbury Street															
27	L2	All MCs	6	0.0	6	0.0	0.010	5.0	LOS A	0.0	0.2	0.27	0.50	0.27	45.5
28	T1	All MCs	2	0.0	2	0.0	0.010	5.4	LOS A	0.0	0.2	0.27	0.50	0.27	45.8
29	R2	All MCs	1	0.0	1	0.0	0.010	6.6	LOS A	0.0	0.2	0.27	0.50	0.27	45.4
Approach			9	0.0	9	0.0	0.010	5.3	LOS A	0.0	0.2	0.27	0.50	0.27	45.5
SouthWest: New England Hwy															
30	L2	All MCs	1	0.0	1	0.0	0.066	4.6	LOS A	0.0	0.0	0.00	0.00	0.00	48.7
31	T1	All MCs	117	15.3	117	15.3	0.066	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
32	R2	All MCs	4	0.0	4	0.0	0.003	4.9	LOS A	0.0	0.1	0.24	0.50	0.24	45.3
Approach			122	14.7	122	14.7	0.066	0.2	NA	0.0	0.1	0.01	0.02	0.01	49.8
All Vehicles			299	12.3	299	12.3	0.077	1.5	NA	0.1	1.0	0.05	0.14	0.05	48.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
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Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [New England Hwy and Salisbury St Intersection (PM peak) (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Salisbury Street															
21	L2	All MCs	7	0.0	7	0.0	0.102	5.3	LOS A	0.4	2.7	0.51	0.68	0.51	43.8
22	T1	All MCs	6	0.0	6	0.0	0.102	6.9	LOS A	0.4	2.7	0.51	0.68	0.51	44.1
23	R2	All MCs	44	2.4	44	2.4	0.102	9.2	LOS A	0.4	2.7	0.51	0.68	0.51	43.7
Approach			58	1.8	58	1.8	0.102	8.4	LOS A	0.4	2.7	0.51	0.68	0.51	43.8
NorthEast: New England Hwy															
24	L2	All MCs	53	4.0	53	4.0	0.119	4.6	LOS A	0.0	0.0	0.00	0.13	0.00	47.9
25	T1	All MCs	166	8.2	166	8.2	0.119	0.0	LOS A	0.0	0.0	0.00	0.13	0.00	49.2
26	R2	All MCs	11	0.0	11	0.0	0.007	5.1	LOS A	0.0	0.2	0.29	0.52	0.29	45.2
Approach			229	6.9	229	6.9	0.119	1.3	NA	0.0	0.2	0.01	0.15	0.01	48.7
NorthWest: Salisbury Street															
27	L2	All MCs	14	0.0	14	0.0	0.016	5.3	LOS A	0.1	0.4	0.31	0.52	0.31	45.3
28	T1	All MCs	1	0.0	1	0.0	0.016	6.9	LOS A	0.1	0.4	0.31	0.52	0.31	45.6
29	R2	All MCs	1	0.0	1	0.0	0.016	8.3	LOS A	0.1	0.4	0.31	0.52	0.31	45.2
Approach			16	0.0	16	0.0	0.016	5.6	LOS A	0.1	0.4	0.31	0.52	0.31	45.3
SouthWest: New England Hwy															
30	L2	All MCs	4	0.0	4	0.0	0.101	4.6	LOS A	0.0	0.0	0.00	0.01	0.00	48.7
31	T1	All MCs	186	4.5	186	4.5	0.101	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	49.9
32	R2	All MCs	4	0.0	4	0.0	0.003	5.2	LOS A	0.0	0.1	0.32	0.51	0.32	45.1
Approach			195	4.3	195	4.3	0.101	0.2	NA	0.0	0.1	0.01	0.02	0.01	49.7
All Vehicles			498	5.1	498	5.1	0.119	1.9	NA	0.4	2.7	0.08	0.17	0.08	48.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

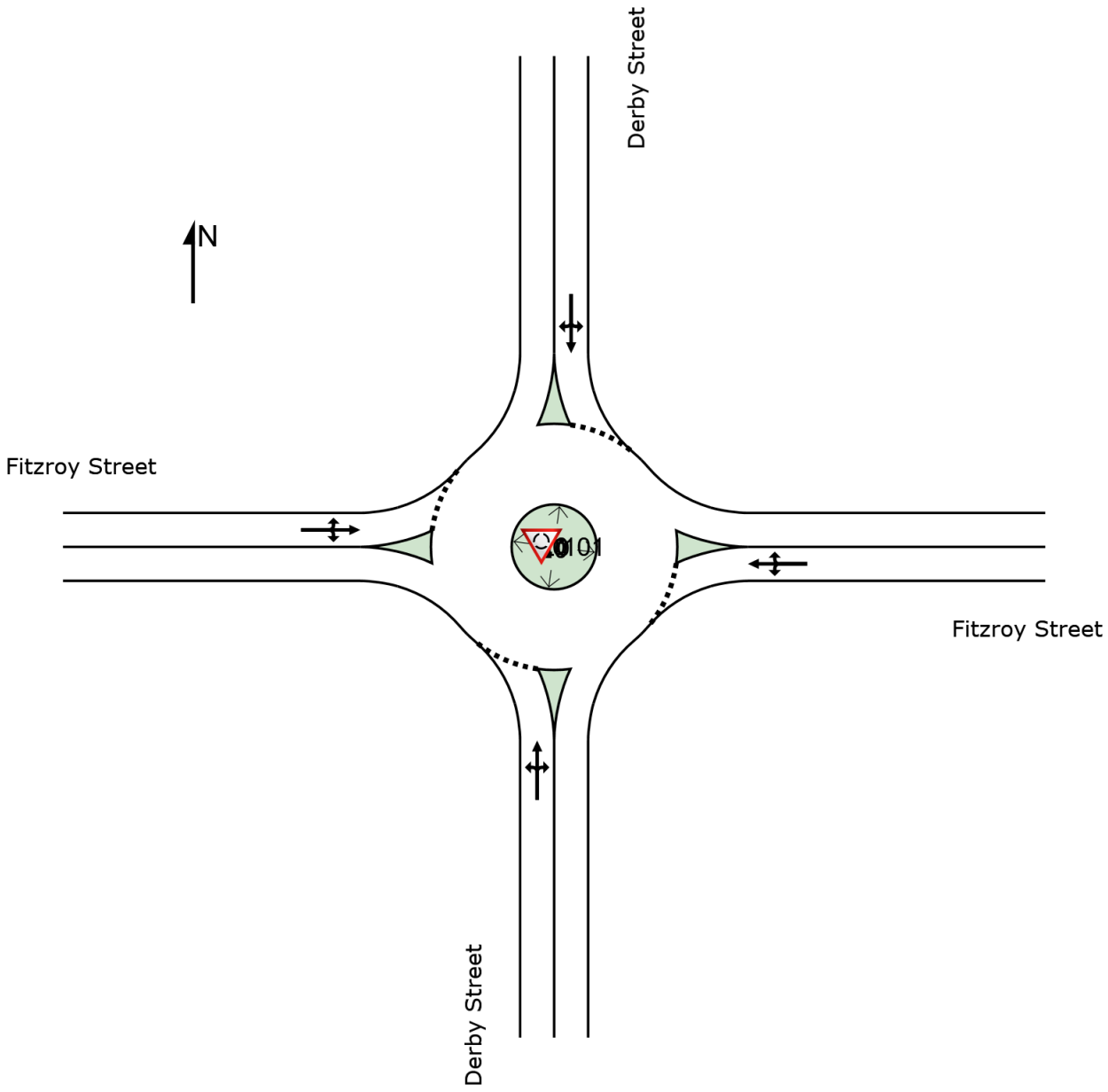
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SITE LAYOUT

Site: 101 [Fitzroy St and Derby St Intersection (AM peak) (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

Site: 101 [Fitzroy St and Derby St Intersection (AM peak) (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Derby Street															
1	L2	All MCs	1	0.0	1	0.0	0.023	2.8	LOS A	0.1	0.8	0.20	0.37	0.20	38.1
2	T1	All MCs	20	5.3	20	5.3	0.023	2.5	LOS A	0.1	0.8	0.20	0.37	0.20	38.3
3	R2	All MCs	6	33.3	6	33.3	0.023	6.1	LOS A	0.1	0.8	0.20	0.37	0.20	37.9
Approach			27	11.5	27	11.5	0.023	3.4	LOS A	0.1	0.8	0.20	0.37	0.20	38.2
East: Fitzroy Street															
4	L2	All MCs	16	6.7	16	6.7	0.057	2.7	LOS A	0.3	2.0	0.16	0.42	0.16	38.0
5	T1	All MCs	31	10.3	31	10.3	0.057	2.4	LOS A	0.3	2.0	0.16	0.42	0.16	38.1
6	R2	All MCs	25	4.2	25	4.2	0.057	5.7	LOS A	0.3	2.0	0.16	0.42	0.16	37.8
Approach			72	7.4	72	7.4	0.057	3.6	LOS A	0.3	2.0	0.16	0.42	0.16	38.0
North: Derby Street															
7	L2	All MCs	21	20.0	21	20.0	0.042	2.8	LOS A	0.2	1.6	0.14	0.39	0.14	38.1
8	T1	All MCs	18	23.5	18	23.5	0.042	2.5	LOS A	0.2	1.6	0.14	0.39	0.14	38.2
9	R2	All MCs	12	9.1	12	9.1	0.042	5.7	LOS A	0.2	1.6	0.14	0.39	0.14	37.9
Approach			51	18.8	51	18.8	0.042	3.3	LOS A	0.2	1.6	0.14	0.39	0.14	38.1
West: Fitzroy Street															
10	L2	All MCs	73	0.0	73	0.0	0.077	2.7	LOS A	0.4	2.7	0.18	0.39	0.18	38.3
11	T1	All MCs	16	6.7	16	6.7	0.077	2.5	LOS A	0.4	2.7	0.18	0.39	0.18	38.4
12	R2	All MCs	11	30.0	11	30.0	0.077	6.0	LOS A	0.4	2.7	0.18	0.39	0.18	38.0
Approach			99	4.3	99	4.3	0.077	3.0	LOS A	0.4	2.7	0.18	0.39	0.18	38.3
All Vehicles			248	8.9	248	8.9	0.077	3.3	LOS A	0.4	2.7	0.17	0.40	0.17	38.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Fitzroy St and Derby St Intersection (PM peak) (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Derby Street															
1	L2	All MCs	19	5.6	19	5.6	0.054	3.4	LOS A	0.3	1.9	0.35	0.44	0.35	37.9
2	T1	All MCs	31	6.9	31	6.9	0.054	3.2	LOS A	0.3	1.9	0.35	0.44	0.35	38.0
3	R2	All MCs	9	0.0	9	0.0	0.054	6.4	LOS A	0.3	1.9	0.35	0.44	0.35	37.7
Approach			59	5.4	59	5.4	0.054	3.8	LOS A	0.3	1.9	0.35	0.44	0.35	37.9
East: Fitzroy Street															
4	L2	All MCs	12	0.0	12	0.0	0.083	3.2	LOS A	0.4	3.0	0.31	0.44	0.31	37.8
5	T1	All MCs	56	0.0	56	0.0	0.083	2.9	LOS A	0.4	3.0	0.31	0.44	0.31	38.0
6	R2	All MCs	29	7.1	29	7.1	0.083	6.3	LOS A	0.4	3.0	0.31	0.44	0.31	37.6
Approach			97	2.2	97	2.2	0.083	3.9	LOS A	0.4	3.0	0.31	0.44	0.31	37.8
North: Derby Street															
7	L2	All MCs	52	4.1	52	4.1	0.138	3.0	LOS A	0.7	5.2	0.25	0.49	0.25	37.6
8	T1	All MCs	19	5.6	19	5.6	0.138	2.7	LOS A	0.7	5.2	0.25	0.49	0.25	37.7
9	R2	All MCs	102	1.0	102	1.0	0.138	5.9	LOS A	0.7	5.2	0.25	0.49	0.25	37.4
Approach			173	2.4	173	2.4	0.138	4.7	LOS A	0.7	5.2	0.25	0.49	0.25	37.5
West: Fitzroy Street															
10	L2	All MCs	42	5.0	42	5.0	0.097	2.8	LOS A	0.5	3.5	0.22	0.39	0.22	38.1
11	T1	All MCs	60	0.0	60	0.0	0.097	2.5	LOS A	0.5	3.5	0.22	0.39	0.22	38.3
12	R2	All MCs	21	5.0	21	5.0	0.097	5.9	LOS A	0.5	3.5	0.22	0.39	0.22	37.9
Approach			123	2.6	123	2.6	0.097	3.2	LOS A	0.5	3.5	0.22	0.39	0.22	38.2
All Vehicles			452	2.8	452	2.8	0.138	4.0	LOS A	0.7	5.2	0.27	0.44	0.27	37.8

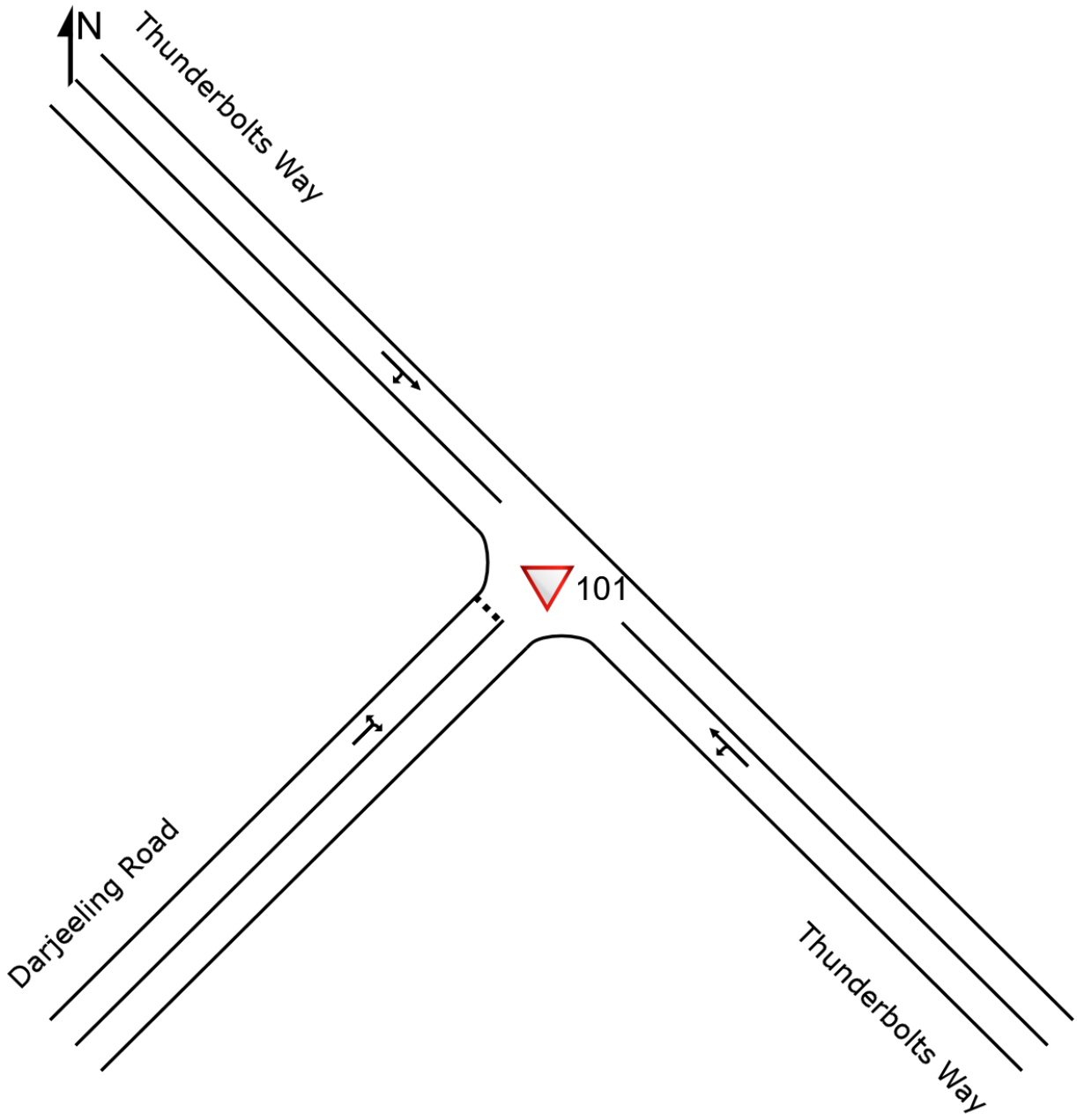
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 101 [Thunderbolts Way and Darjeeling Rd Intersection (AM peak) (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [Thunderbolts Way and Darjeeling Rd Intersection (AM peak) (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Thunderbolts Way															
21	L2	All MCs	4	0.0	4	0.0	0.013	7.8	LOS A	0.0	0.0	0.00	0.12	0.00	84.5
22	T1	All MCs	20	5.3	20	5.3	0.013	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	96.2
Approach			24	4.3	24	4.3	0.013	1.4	NA	0.0	0.0	0.00	0.12	0.00	94.0
NorthWest: Thunderbolts Way															
28	T1	All MCs	133	10.3	133	10.3	0.074	0.0	LOS A	0.0	0.1	0.00	0.02	0.00	99.4
29	R2	All MCs	3	0.0	3	0.0	0.074	7.4	LOS A	0.0	0.1	0.00	0.02	0.00	70.5
Approach			136	10.1	136	10.1	0.074	0.2	NA	0.0	0.1	0.00	0.02	0.00	98.5
SouthWest: Darjeeling Road															
30	L2	All MCs	7	14.3	7	14.3	0.036	5.8	LOS A	0.1	1.4	0.17	0.56	0.17	56.9
32	R2	All MCs	22	95.2	22	95.2	0.036	7.9	LOS A	0.1	1.4	0.17	0.56	0.17	42.5
Approach			29	75.0	29	75.0	0.036	7.4	LOS A	0.1	1.4	0.17	0.56	0.17	45.3
All Vehicles			189	19.4	189	19.4	0.074	1.4	NA	0.1	1.4	0.03	0.11	0.03	82.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 101 [Thunderbolts Way and Darjeeling Rd Intersection (PM peak) (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Thunderbolts Way															
21	L2	All MCs	27	84.6	27	84.6	0.095	10.0	LOS A	0.0	0.0	0.00	0.12	0.00	57.6
22	T1	All MCs	132	8.0	132	8.0	0.095	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	99.2
Approach			159	21.2	159	21.2	0.095	1.7	NA	0.0	0.0	0.00	0.12	0.00	88.3
NorthWest: Thunderbolts Way															
28	T1	All MCs	28	3.7	28	3.7	0.017	0.1	LOS A	0.0	0.1	0.06	0.09	0.06	97.1
29	R2	All MCs	3	0.0	3	0.0	0.017	7.9	LOS A	0.0	0.1	0.06	0.09	0.06	69.3
Approach			32	3.3	32	3.3	0.017	0.9	NA	0.0	0.1	0.06	0.09	0.06	93.3
SouthWest: Darjeeling Road															
30	L2	All MCs	1	0.0	1	0.0	0.003	5.9	LOS A	0.0	0.1	0.23	0.55	0.23	60.9
32	R2	All MCs	2	0.0	2	0.0	0.003	6.0	LOS A	0.0	0.1	0.23	0.55	0.23	60.8
Approach			3	0.0	3	0.0	0.003	6.0	LOS A	0.0	0.1	0.23	0.55	0.23	60.8
All Vehicles			194	17.9	194	17.9	0.095	1.7	NA	0.0	0.1	0.01	0.12	0.01	88.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

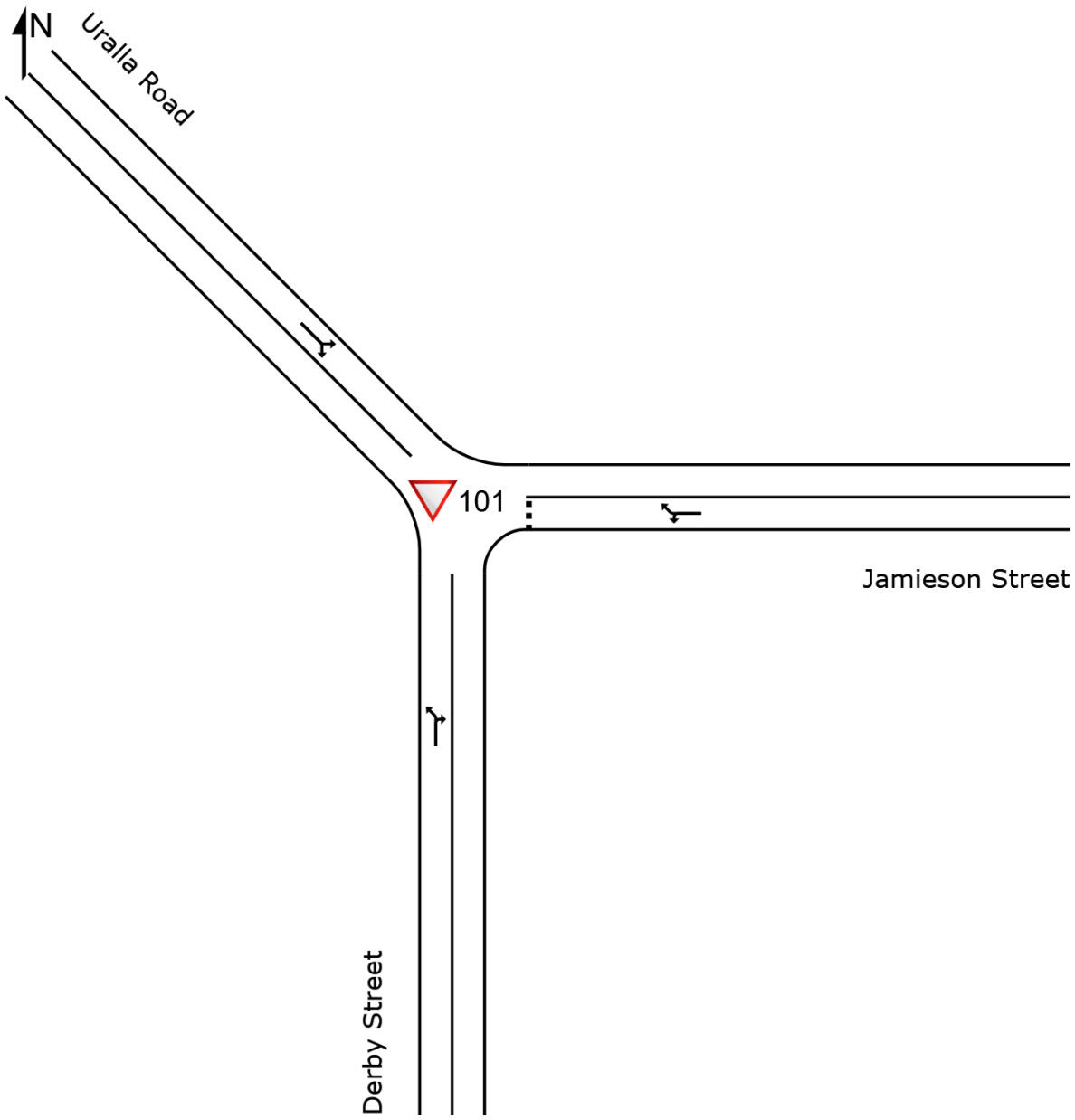
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SITE LAYOUT

Site: 101 [Jamieson St and Derby St Intersection (AM peak) (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

Site: 101 [Jamieson St and Derby St Intersection (AM peak) (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Derby Street															
1a	L1	All MCs	31	10.3	31	10.3	0.091	5.0	LOS A	0.4	3.1	0.27	0.54	0.27	45.1
3	R2	All MCs	116	0.9	116	0.9	0.091	5.1	LOS A	0.4	3.1	0.27	0.54	0.27	45.2
Approach			146	2.9	146	2.9	0.091	5.1	NA	0.4	3.1	0.27	0.54	0.27	45.2
East: Jamieson Street															
4	L2	All MCs	16	13.3	16	13.3	0.020	4.8	LOS A	0.1	0.5	0.12	0.49	0.12	45.6
6a	R1	All MCs	9	0.0	9	0.0	0.020	4.9	LOS A	0.1	0.5	0.12	0.49	0.12	45.8
Approach			25	8.3	25	8.3	0.020	4.8	LOS A	0.1	0.5	0.12	0.49	0.12	45.7
NorthWest: Uralla Road															
27a	L1	All MCs	138	24.4	138	24.4	0.102	4.8	LOS A	0.2	1.6	0.09	0.54	0.09	45.3
29a	R1	All MCs	27	15.4	27	15.4	0.102	4.6	LOS A	0.2	1.6	0.09	0.54	0.09	45.6
Approach			165	22.9	165	22.9	0.102	4.7	NA	0.2	1.6	0.09	0.54	0.09	45.4
All Vehicles			337	13.1	337	13.1	0.102	4.9	NA	0.4	3.1	0.17	0.54	0.17	45.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 101 [Jamieson St and Derby St Intersection (PM peak) (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Derby Street															
1a	L1	All MCs	65	3.2	65	3.2	0.041	4.5	LOS A	0.1	0.4	0.02	0.54	0.02	45.7
3	R2	All MCs	8	25.0	8	25.0	0.041	4.8	LOS A	0.1	0.4	0.02	0.54	0.02	45.4
Approach			74	5.7	74	5.7	0.041	4.5	NA	0.1	0.4	0.02	0.54	0.02	45.7
East: Jamieson Street															
4	L2	All MCs	118	0.0	118	0.0	0.225	4.9	LOS A	0.9	7.1	0.25	0.53	0.25	45.5
6a	R1	All MCs	144	20.4	144	20.4	0.225	5.2	LOS A	0.9	7.1	0.25	0.53	0.25	45.2
Approach			262	11.2	262	11.2	0.225	5.1	LOS A	0.9	7.1	0.25	0.53	0.25	45.4
NorthWest: Uralla Road															
27a	L1	All MCs	21	5.0	21	5.0	0.062	4.5	LOS A	0.3	2.1	0.05	0.51	0.05	45.8
29a	R1	All MCs	89	2.4	89	2.4	0.062	4.1	LOS A	0.3	2.1	0.05	0.51	0.05	46.0
Approach			111	2.9	111	2.9	0.062	4.2	NA	0.3	2.1	0.05	0.51	0.05	46.0
All Vehicles			446	8.3	446	8.3	0.225	4.8	NA	0.9	7.1	0.16	0.52	0.16	45.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

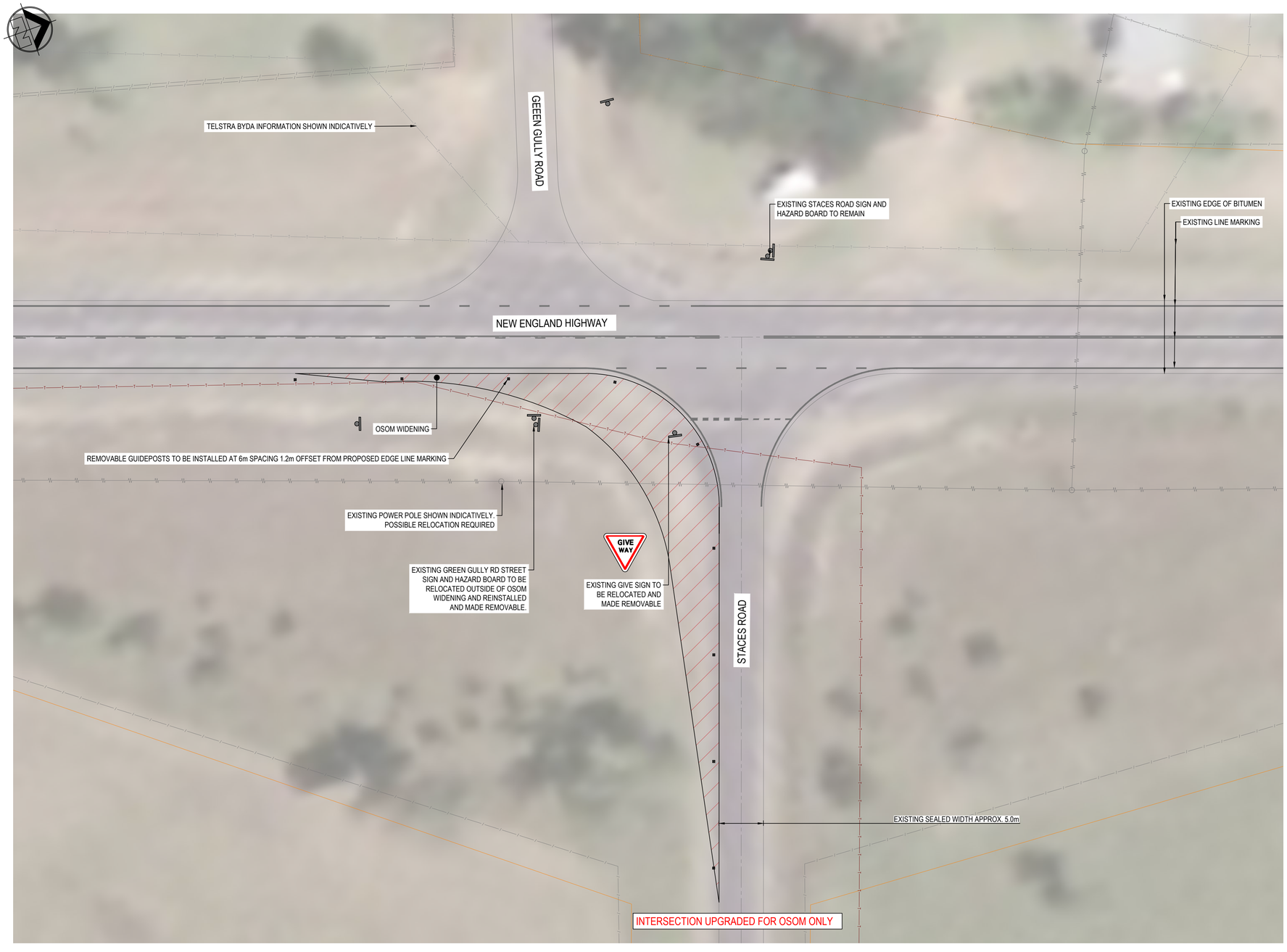
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Appendix J

Uralla Bypass Design
(prepared by icubed consulting)



INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING ROAD
- EXISTING TELECOMMUNICATIONS
- EXISTING OVERHEAD POWERLINE
- EXISTING GAS MAIN
- EXISTING FENCE
- EXISTING WATERCOURSE (NSW MAPPING)
- SIGNPOST
- GUIDE POST
- GUARD RAIL
- INTERSECTION WIDENING
- EXISTING AARNET FIBRE OPTIC CABLE

NOTES

1. THE NEW ENGLAND HIGHWAY IS OPERATED BY TRANSPORT FOR NEW SOUTH WALES (TfNSW) AND STACES ROAD IS OPERATED BY URALLA SHIRE COUNCIL.
2. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
3. THE INTERSECTION UPGRADE IS SHOWN FOR OSOM VEHICLES ONLY. NO PROJECT CONSTRUCTION HEAVY OR LIGHT VEHICLES ARE TO UTILIZE THIS INTERSECTION.
4. EXISTING LINEMARKING IS TO BE RETAINED.

NEW ENGLAND HIGHWAY- STACES ROAD INTERSECTION PLAN

SCALE 1:250

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	INTERSECTION UPDATED	J.M.	J.M.	J.M.	N.C.	07.02.2024
A	FOR REVIEW	Ba.P.	Ba.P.	M.W.	N.C.	06.09.2023

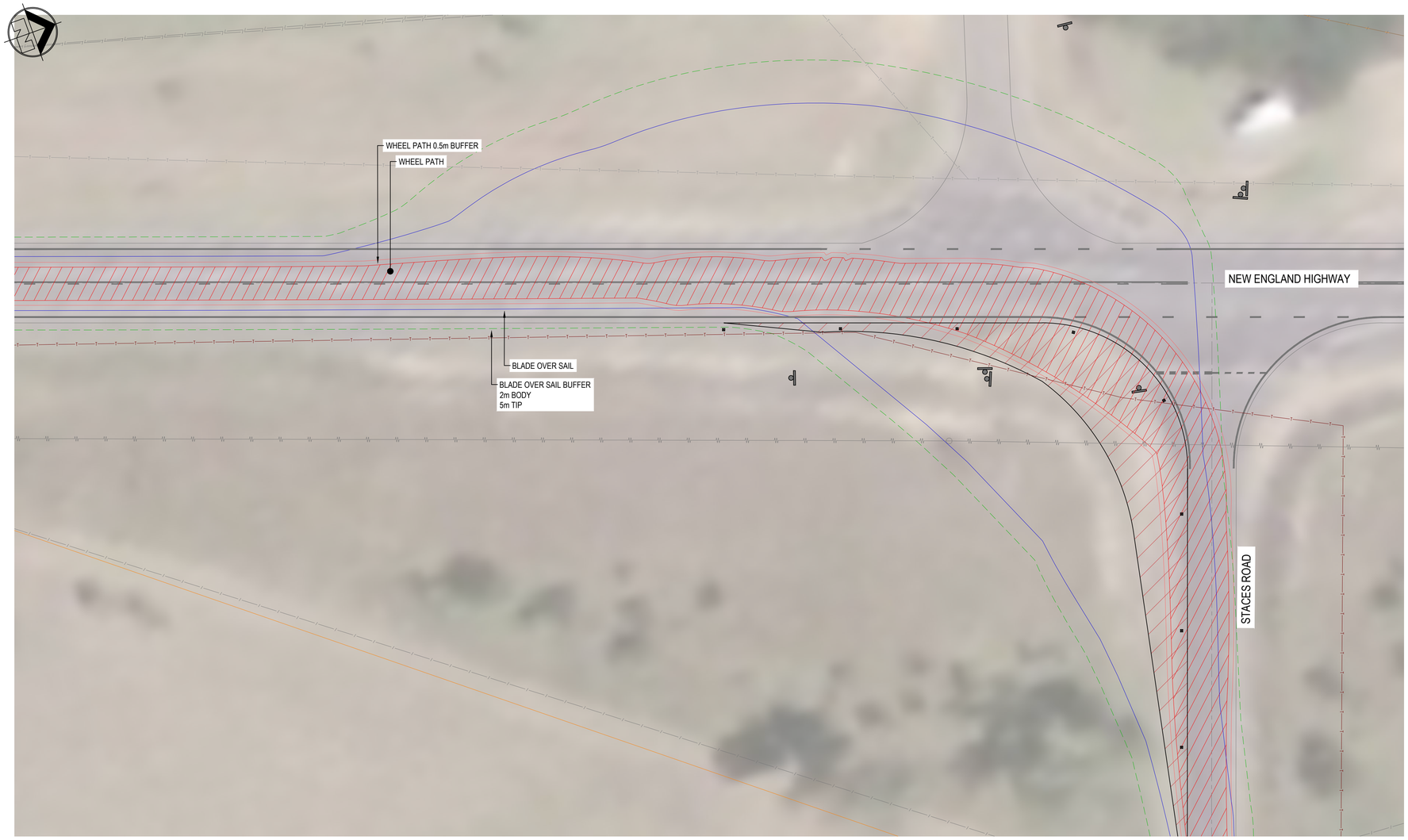
REVISION HISTORY

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Vestas
Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	NEW ENGLAND HIGHWAY / STACES ROAD INTERSECTION PLAN SHEET 1 OF 4
DRAWING No.	22-094-WWF-EXT-0021-1
REV	B

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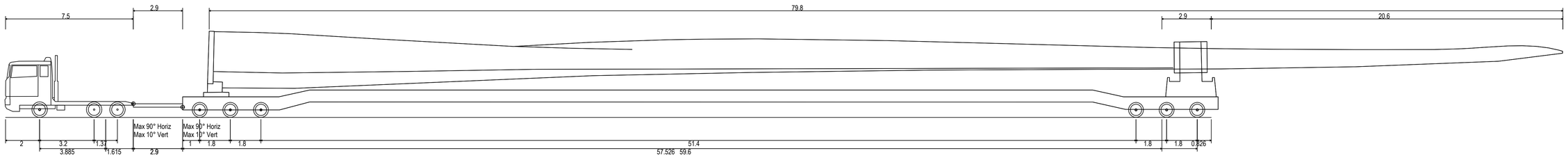


TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

NEW ENGLAND HIGHWAY- STACES ROAD TURNING PATH PLAN - 79m BLADE TRAILER

SCALE 1:250



79m BLADE TRAILER PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	INTERSECTION UPDATED	J.M.	J.M.	J.M.	N.C.	07.02.2024
A	FOR REVIEW	Ba.P.	Ba.P.	M.W.	N.C.	06.09.2023

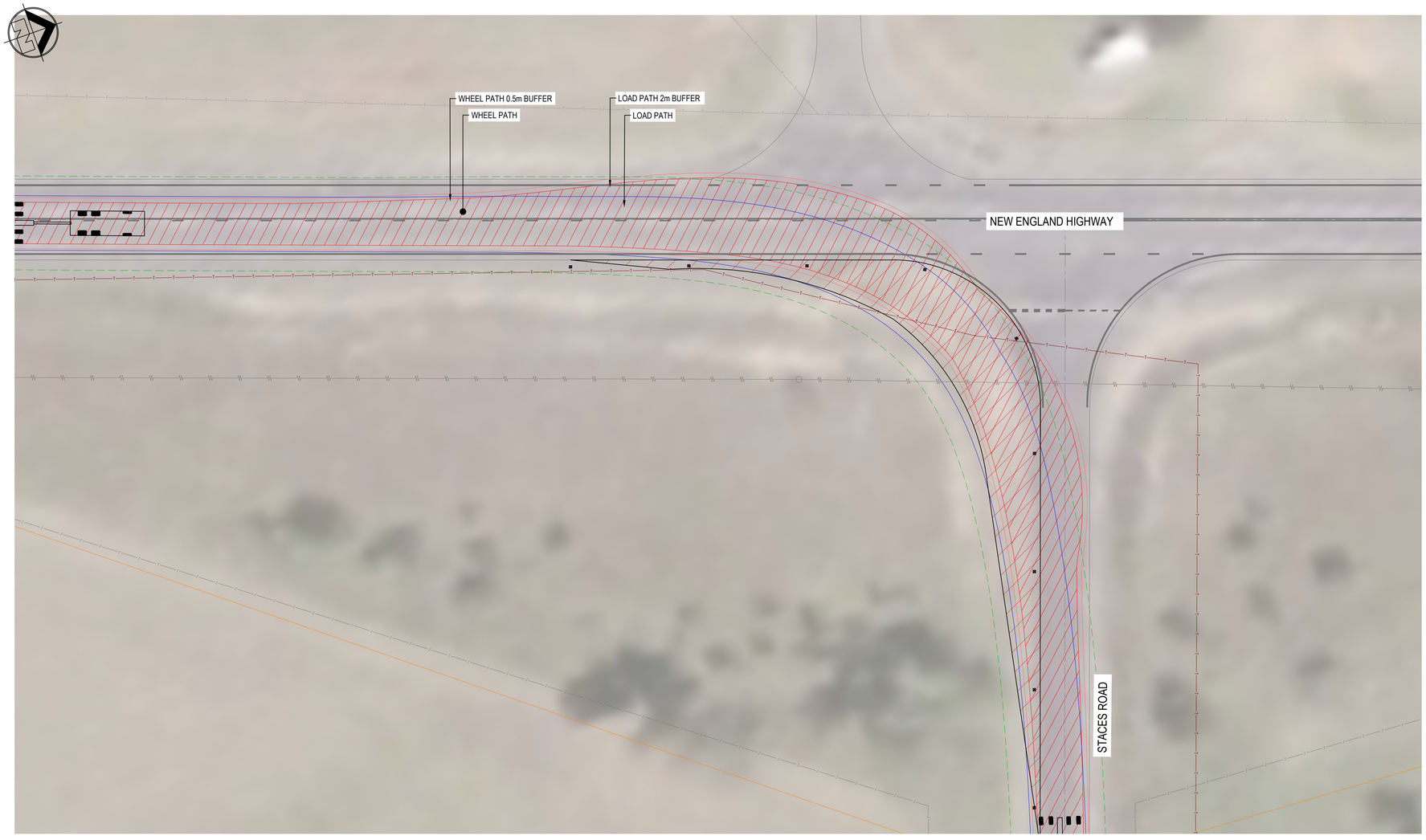
REVISION HISTORY

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Vestas
Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	NEW ENGLAND HIGHWAY / STACES ROAD TURNING PATH PLAN SHEET 2 OF 4
DRAWING No.	22-094-WWF-EXT-0021-2
REV	B

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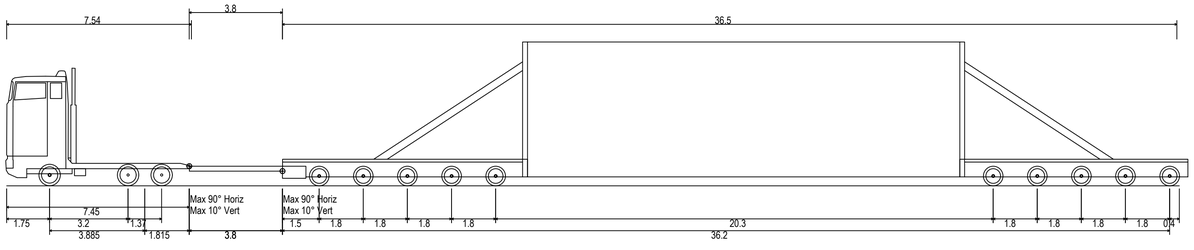


TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- LOAD PATH
- LOAD PATH 2m OFFSET

NEW ENGLAND HIGHWAY- STACES ROAD TURNING PATH PLAN - TOWER SECTION 3A

SCALE 1:250



TOWER SECTION 3A - TURNING PATH PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	INTERSECTION UPDATED	J.M.	J.M.	J.M.	N.C.	07.02.2024
A	FOR REVIEW	Ba.P.	Ba.P.	M.W.	N.C.	06.09.2023

REVISION HISTORY

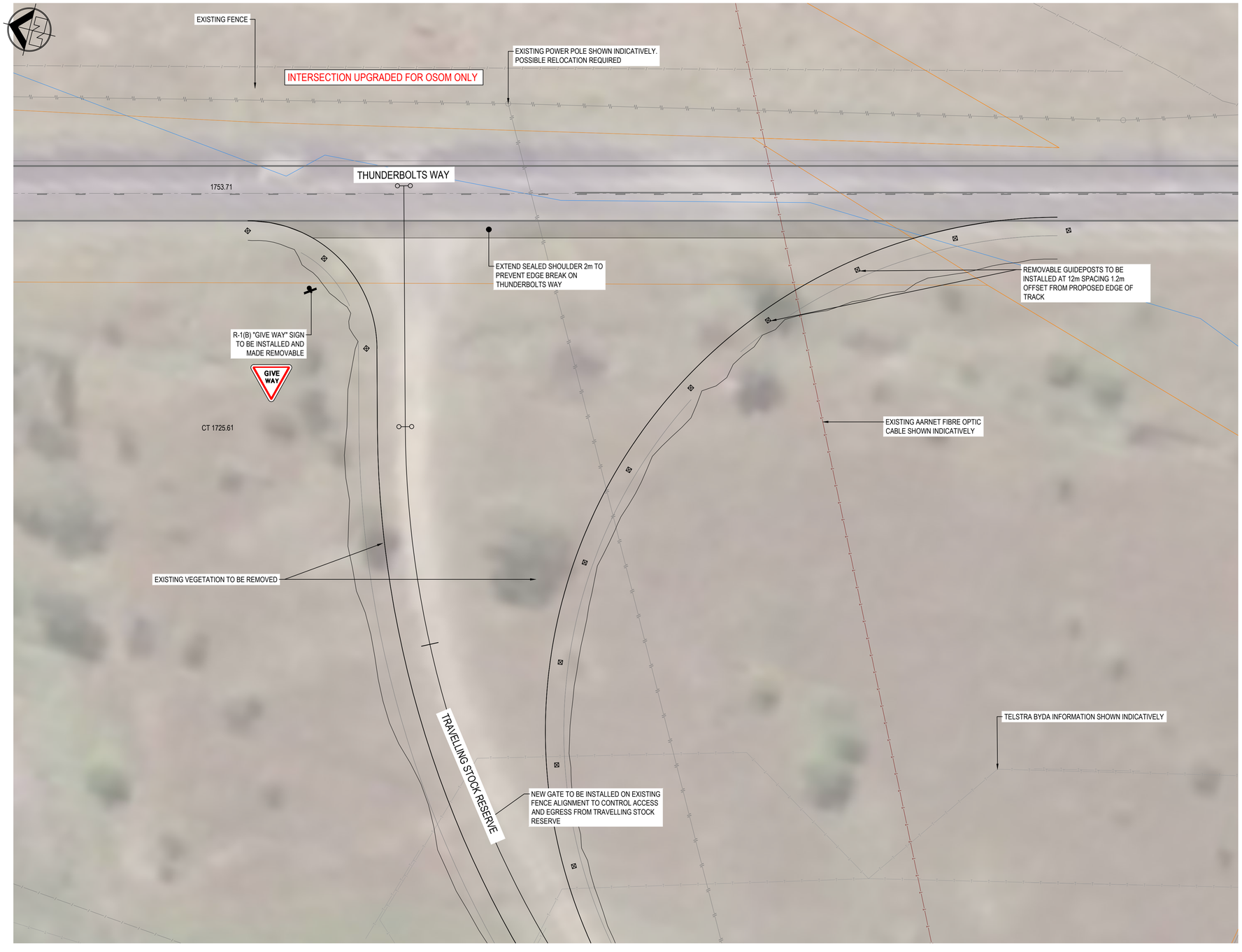
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Vestas

Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	NEW ENGLAND HIGHWAY / STACES ROAD TURNING PATH PLAN SHEET 3 OF 4
DRAWING No.	22-094-WWF-EXT-0021-3
REV	B

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INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING ROAD
- EXISTING TELECOMMUNICATIONS
- EXISTING OVERHEAD POWERLINE
- EXISTING GAS MAIN
- EXISTING FENCE
- EXISTING WATERCOURSE (NSW MAPPING)
- SIGNPOST
- GUIDE POST
- PROPOSED EXTENTS OF SEAL
- EXISTING AARNET FIBRE OPTIC CABLE

NOTES

1. THUNDERBOLTS WAY IS OPERATED BY URALLA SHIRE COUNCIL. THE EXISTING TRACK STOCK RESERVE THAT INTERSECTS WITH THUNDERBOLTS WAY IS AN UNNAMED ROAD WITHIN A CROWN LAND ROAD RESERVE.
2. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
3. THE EXTENT OF INTERSECTION WIDENING SHOWN FOR OSOM VEHICLES ONLY. INTERSECTION ACCESS IS TO BE RESTRICTED, PUBLIC ROAD USERS AND CONSTRUCTION HEAVY OR LIGHT VEHICLES WILL NOT BE ABLE TO UTILISE THE TRAVELLING STOCK RESERVE.

THUNDERBOLTS WAY- STACES ROAD INTERSECTION PLAN

SCALE 1:250

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	INTERSECTION UPDATED	J.M.	J.M.	J.M.	N.C.	08.02.2024
A	FOR REVIEW	Ba.P.	Ba.P.	M.W.	N.C.	06.09.2023

REVISION HISTORY

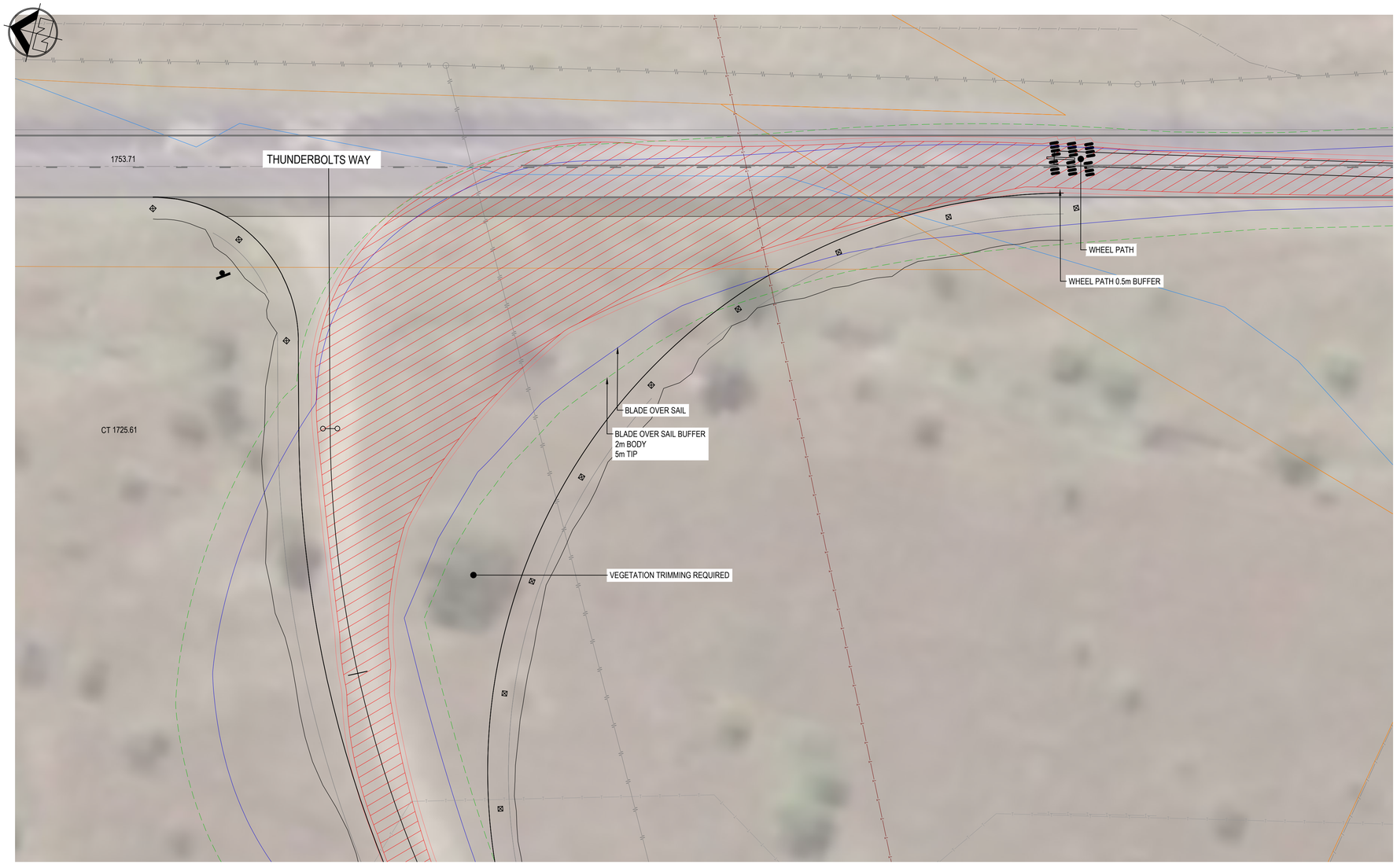
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Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	THUNDERBOLTS WAY / STACES ROAD INTERSECTION PLAN SHEET 1 OF 4
DRAWING No.	22-094-WWF-EXT-0022-1
REV	B

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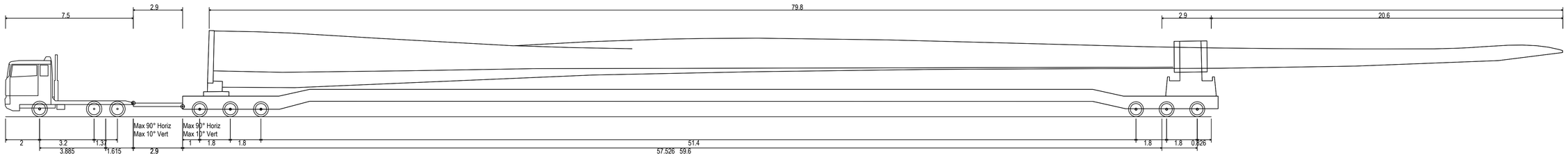


TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)

THUNDERBOLTS WAY- STACES ROAD TURNING PATH PLAN - 79m BLADE TRAILER

SCALE 1:250



79m BLADE TRAILER PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	INTERSECTION UPDATED	J.M.	J.M.	J.M.	N.C.	08.02.2024
A	FOR REVIEW	Ba.P.	Ba.P.	M.W.	N.C.	06.09.2023

REVISION HISTORY

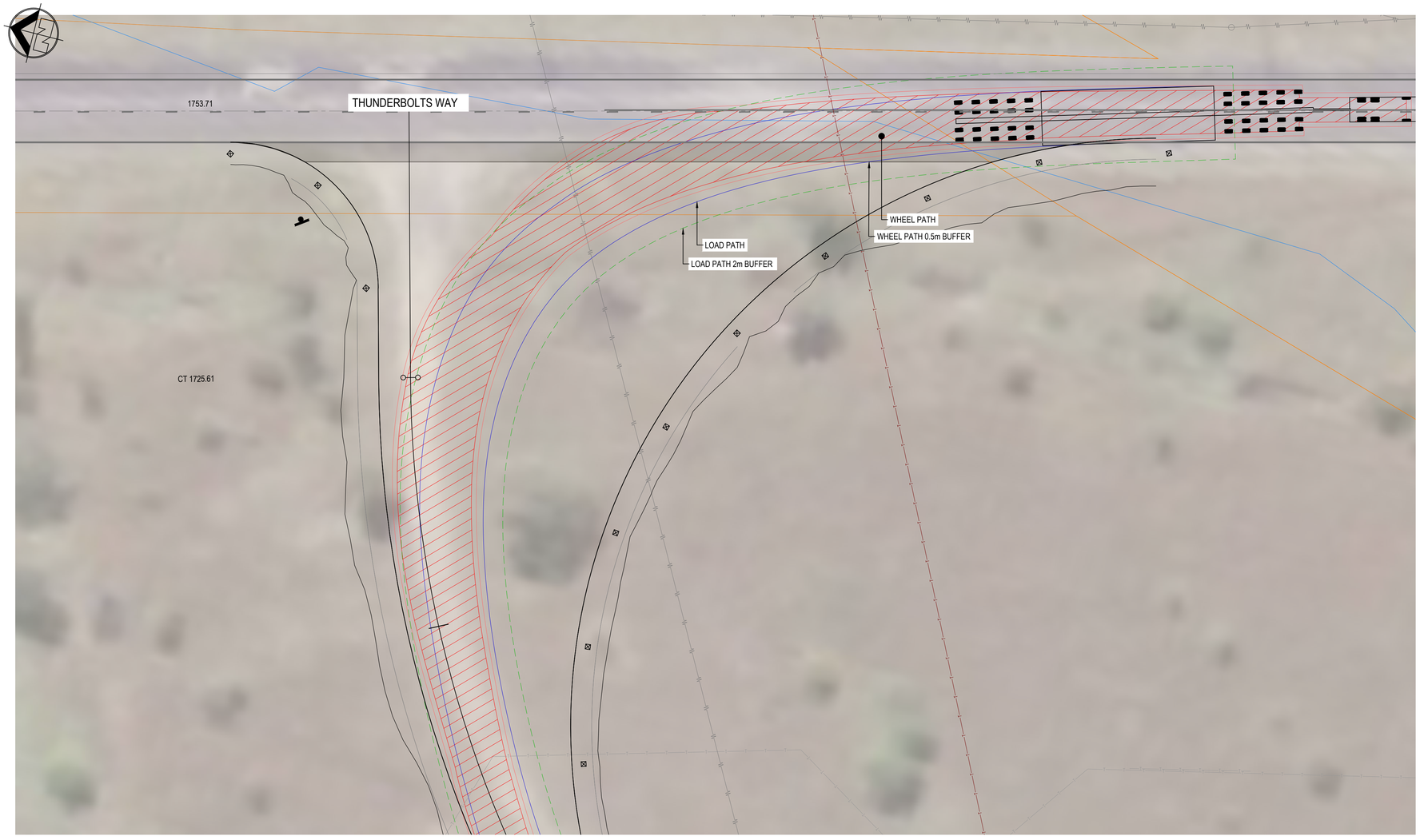
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Vestas

Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	THUNDERBOLTS WAY / STACES ROAD TURNING PATH PLAN SHEET 2 OF 4
DRAWING No.	22-094-WWF-EXT-0022-2
REV	B

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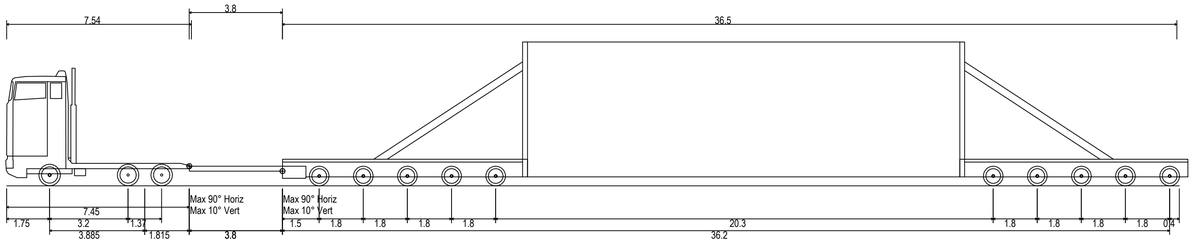


TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- LOAD PATH
- LOAD PATH 2m OFFSET

THUNDERBOLTS WAY- STACES ROAD TURNING PATH PLAN - TOWER SECTION 3A

SCALE 1:250



TOWER SECTION 3A - TURNING PATH PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	INTERSECTION UPDATED	J.M.	J.M.	J.M.	N.C.	08.02.2024
A	FOR REVIEW	Ba.P.	Ba.P.	M.W.	N.C.	06.09.2023

REVISION HISTORY

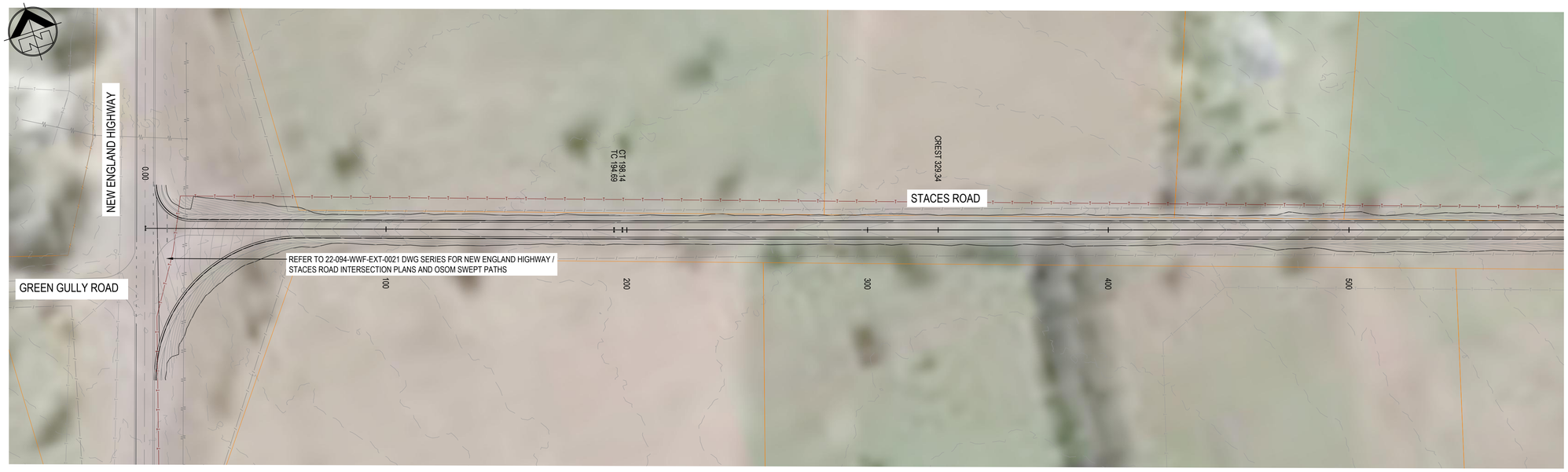
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Vestas

Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	THUNDERBOLTS WAY / STACES ROAD TURNING PATH PLAN SHEET 3 OF 4
DRAWING No.	22-094-WWF-EXT-0022-3
REV	B

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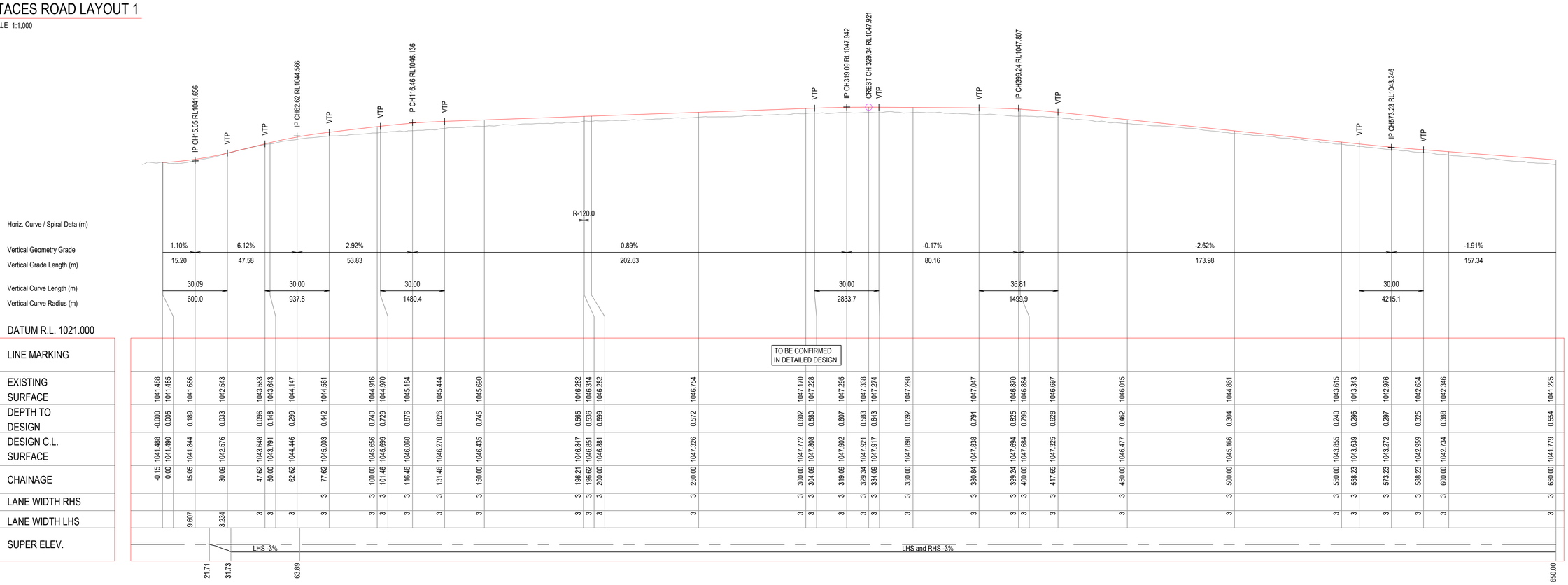
- LOT BOUNDARY (NSW MAPPING)
- EXISTING ROAD
- DESIGN ROAD
- EXISTING CONTOURS (1m)
- DESIGN CONTOURS (0.25m)
- EXISTING TELECOMMUNICATIONS
- EXISTING OVERHEAD POWERLINE
- EXISTING FENCE
- EXISTING AARNET FIBRE OPTIC CABLE

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.

STACES ROAD LAYOUT 1

SCALE 1:1,000



STACES ROAD LONGITUDINAL SECTION 1

HORIZ. SCALE 1:1,000
VERT. SCALE 1:250

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	M.W.	A.G.	J.M.	N.C.	23.01.2024

REVISION HISTORY

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Vestas

Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	WINTERBOURNE WIND FARM - STACES ROAD PLAN AND LONGITUDINAL SECTION SHEET 1 OF 3
DRAWING No.	22-094-WWF-EXT-0050-1
REV	A

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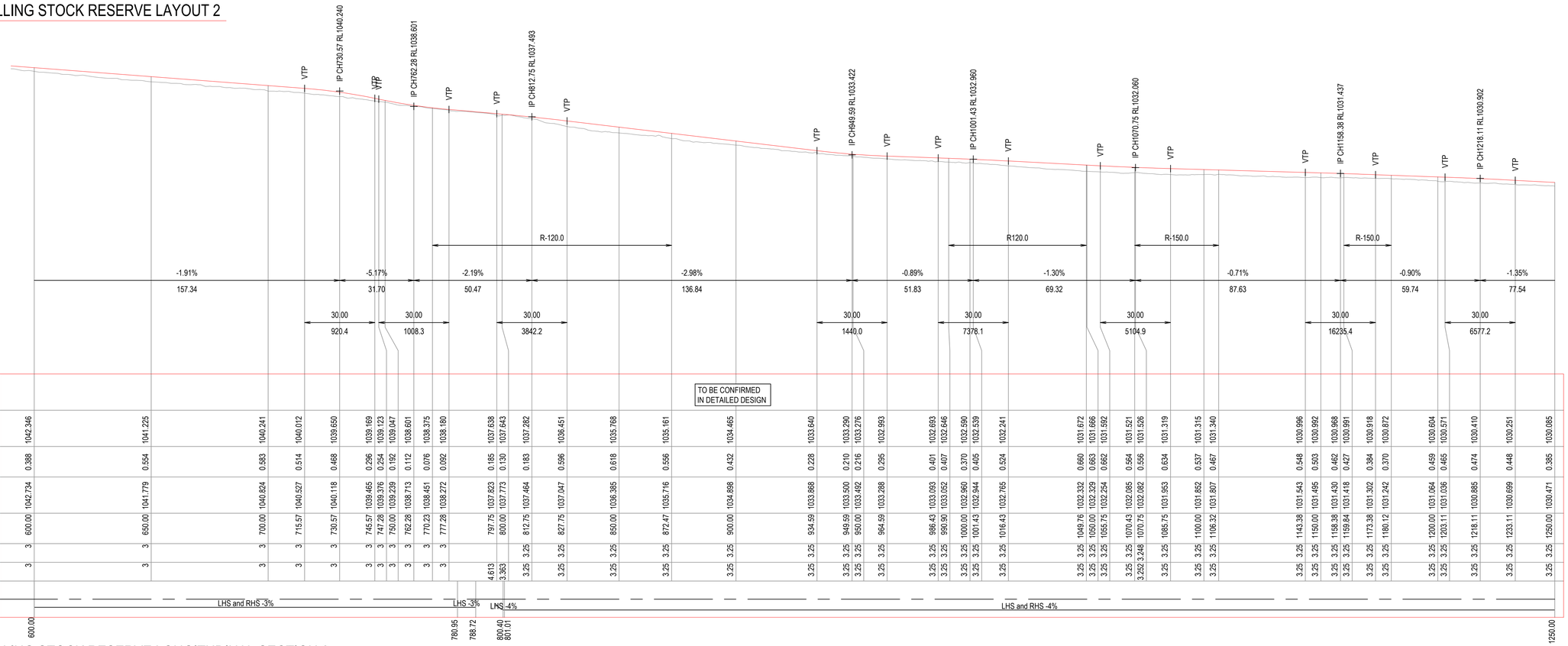
- LOT BOUNDARY (NSW MAPPING)
- EXISTING ROAD
- DESIGN ROAD
- EXISTING CONTOURS (1m)
- DESIGN CONTOURS (0.25m)
- EXISTING TELECOMMUNICATIONS
- EXISTING OVERHEAD POWERLINE
- EXISTING GAS MAIN
- EXISTING FENCE
- EXISTING AARNET FIBRE OPTIC CABLE
- EXISTING WATERCOURSE (NSW MAPPING)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.

STACES ROAD / TRAVELLING STOCK RESERVE LAYOUT 2

SCALE 1:1,000



STACES ROAD / TRAVELLING STOCK RESERVE LONGITUDINAL SECTION 2

HORIZ. SCALE 1:1,000
VERT. SCALE 1:250

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	M.W.	A.G.	J.M.	N.C.	23.01.2024

REVISION HISTORY

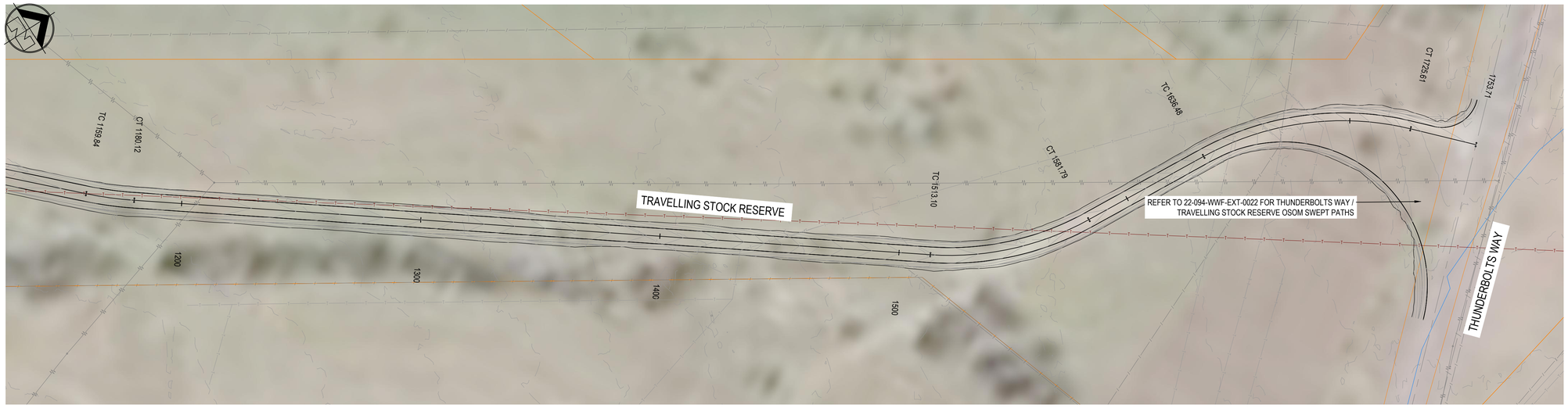
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Vestas

Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	WINTERBOURNE WIND FARM - STACES ROAD PLAN AND LONGITUDINAL SECTION SHEET 2 OF 3
DRAWING No.	22-094-WWF-EXT-0050-2
REV	A

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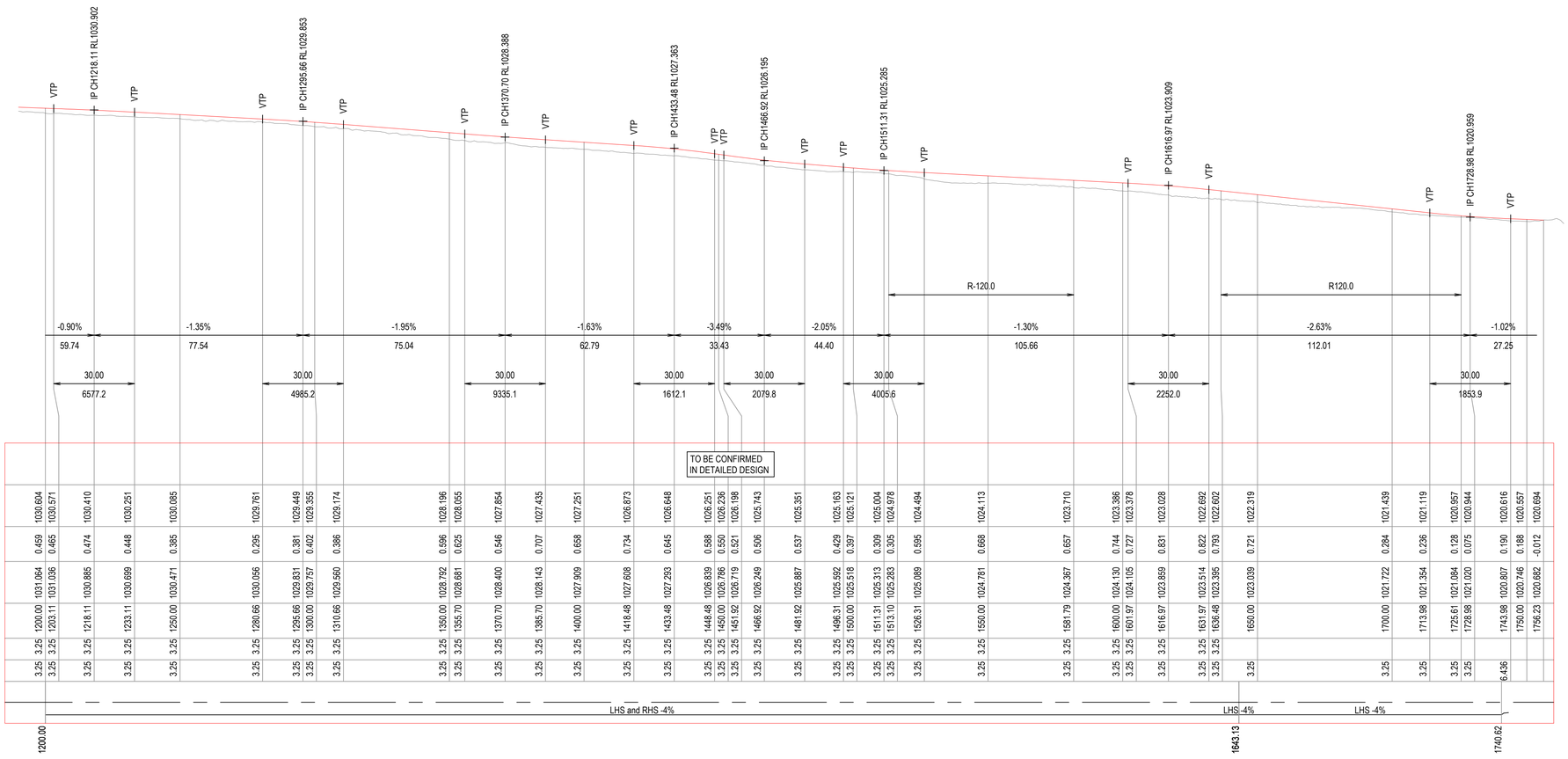
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- EXISTING ROAD
- DESIGN ROAD
- EXISTING CONTOURS (1m)
- DESIGN CONTOURS (0.25m)
- EXISTING TELECOMMUNICATIONS
- EXISTING OVERHEAD POWERLINE
- EXISTING FENCE
- EXISTING AARNET FIBRE OPTIC CABLE
- EXISTING WATERCOURSE (NSW MAPPING)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.

TRAVELLING STOCK RESERVE LAYOUT 3

SCALE 1:1,000



TRAVELLING STOCK RESERVE LONGITUDINAL SECTION 3

HORIZ. SCALE 1:1,000
VERT. SCALE 1:250

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	M.W.	A.G.	J.M.	N.C.	23.01.2024

REVISION HISTORY

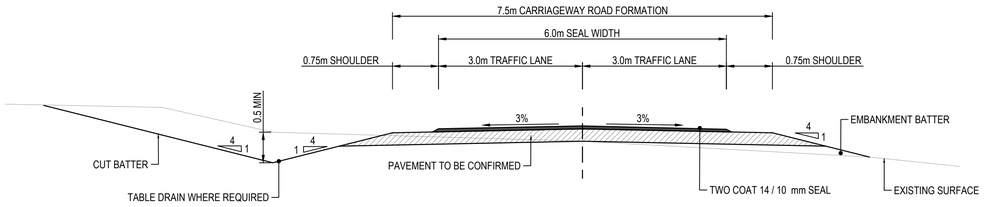
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Vestas

Winterbourne Wind

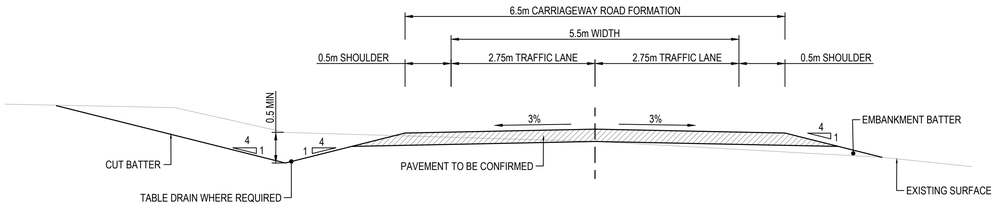
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COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	WINTERBOURNE WIND FARM - STACES ROAD PLAN AND LONGITUDINAL SECTION SHEET 3 OF 3
DRAWING No.	22-094-WWF-EXT-0050-3
REV	A

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TYPICAL STACES ROAD SECTION - RURAL ACCESS MINOR

SCALE NTS



TYPICAL TRAVELLING STOCK RESERVE SECTION - RURAL ACCESS MINOR

SCALE NTS

NOTES

1. DRAINAGE STRUCTURES TO BE DESIGNED IN ACCORDANCE WITH AUSTROADS STANDARDS AND AUSTRALIAN RAINFALL AND RUNOFF. REFER TO ARMIDALE REGIONAL COUNCIL FOR ARI REQUIREMENTS FOR SAID STRUCTURES.
2. TABLE DRAIN INVERTS TO BE THE LOWER OF PAVEMENT SUBGRADE OR 500mm BELOW FINISHED ROAD SURFACE.
3. PRIOR TO ROAD CONSTRUCTION COMMENCING, ROAD PLANS MUST BE SUBMITTED TO AND APPROVED BY COUNCIL.
4. ROAD BATTERS ARE TYPICALLY 1:4 FOR EASE OF MAINTENANCE AND TO REDUCE SAFETY RISKS AND EROSION. BATTERS GREATER THAN 1:4 ARE PERMITTED WHERE TERRAIN OR BOUNDARY CONSTRAINTS ARE PRESENT.

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	M.W.	A.G.	J.M.	N.C.	23.01.2024

REVISION HISTORY

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Vestas
Winterbourne Wind

SIZE A1 | SCALE AS SHOWN

STATUS PRELIMINARY
NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM
GDA2020 MGA Z56

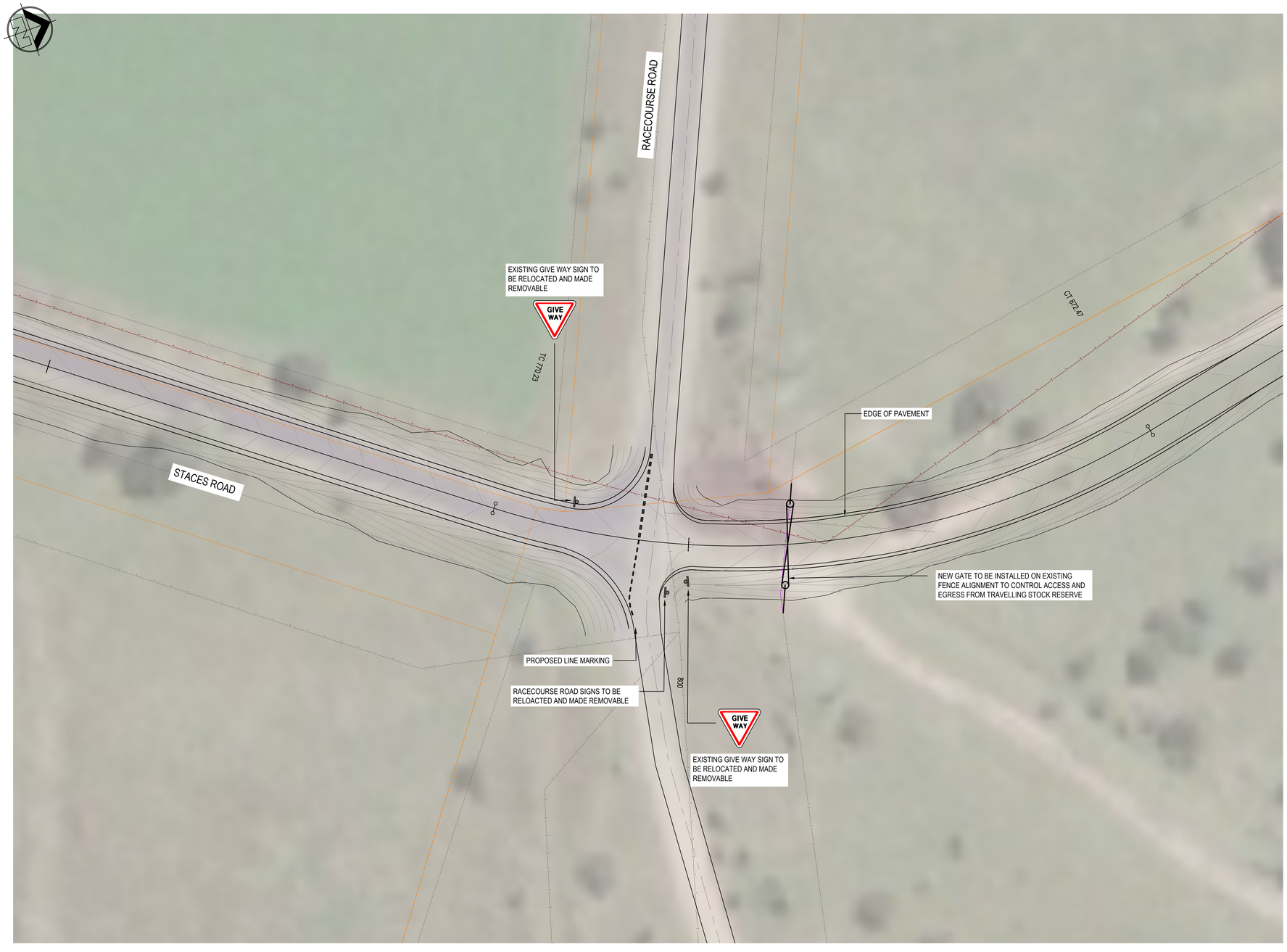
PROJECT
WINTERBOURNE WIND FARM

TITLE
WINTERBOURNE WIND FARM - STACES ROAD
TYPICAL RURAL ACCESS ROAD CROSS SECTION PLAN

DRAWING No. 22-094-WWF-EXT-0050-4

REV A

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INTERSECTION LEGEND

- LOT BOUNDARY (NSW MAPPING)
- EXISTING ROAD
- EXISTING TELECOMMUNICATIONS
- EXISTING FENCE
- FENCE TO BE REMOVED
- EXISTING AARNET FIBRE OPTIC CABLE
- SIGNPOST
- PROPOSED GATE

NOTES

1. STACES ROAD AND RACECOURSE ROAD IS MANAGED BY URALLA SHIRE COUNCIL.
2. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.

RACECOURSE ROAD - STACES ROAD INTERSECTION PLAN

SCALE 1:250

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	A.G.	A.G.	J.M.	N.C.	23.01.2024

REVISION HISTORY

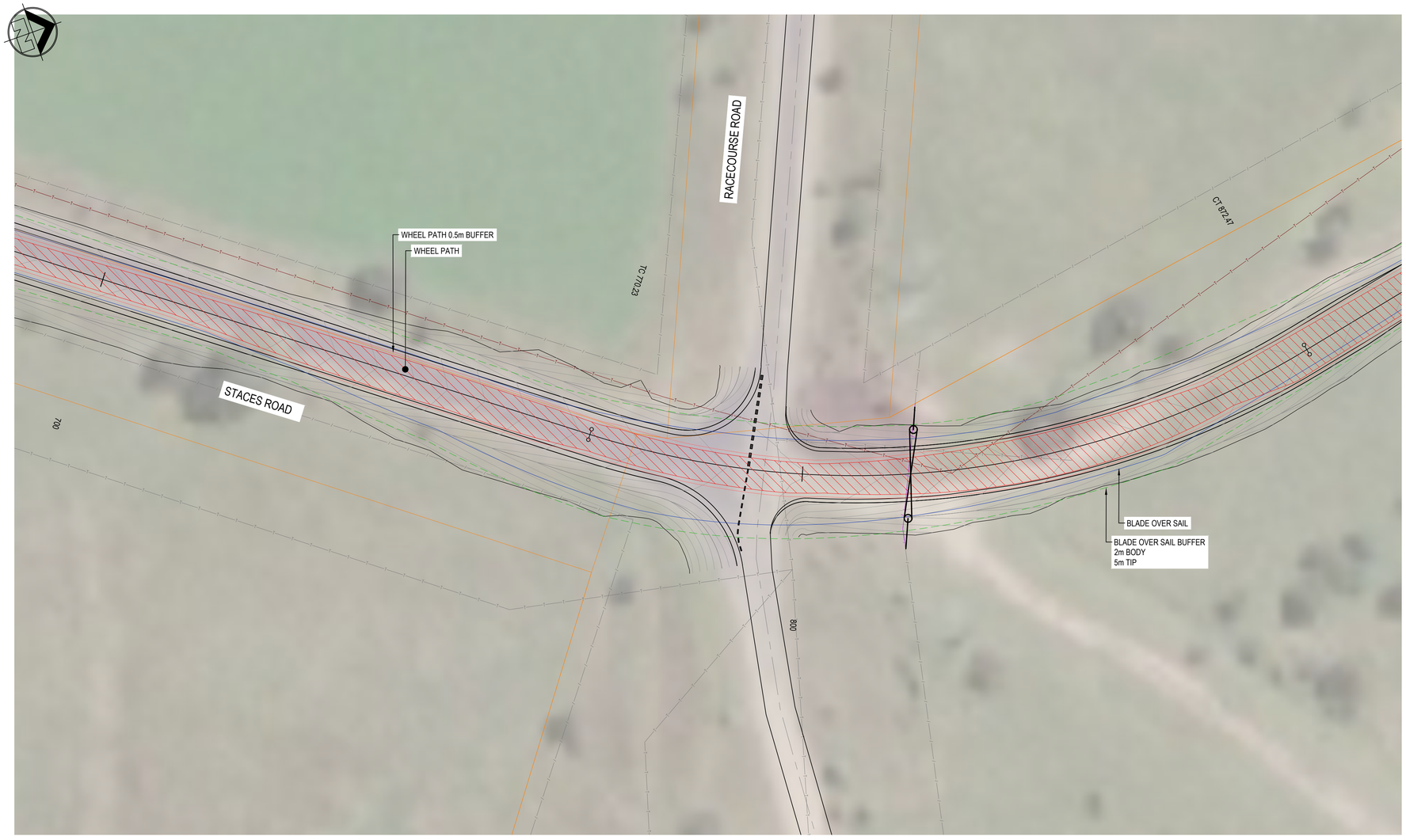
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Vestas

Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	STACES ROAD / RACECOURSE ROAD INTERSECTION PLAN SHEET 1 OF 3
DRAWING No.	22-094-WWF-EXT-0051-1
REV	A

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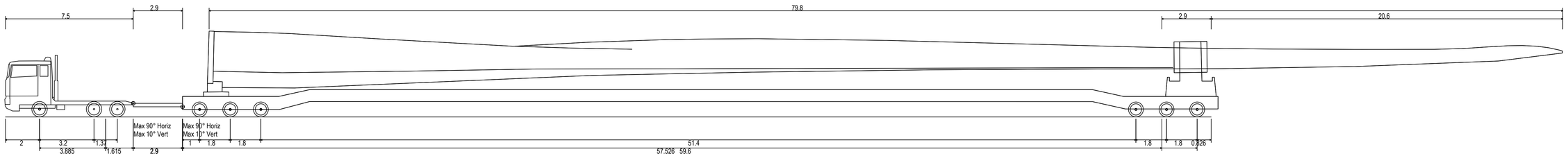


TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- BLADE OVER SAIL
- BLADE OVER SAIL OFFSET (2m BODY, 5m TIP)
- EXISTING CONTOURS (1m INTERVAL)
- LOT BOUNDARY (NSW MAPPING)
- EXISTING ROAD
- EXISTING FENCE
- EXISTING POWER LINE
- EXISTING AARNET FIBRE OPTIC CABLE

RACECOURSE ROAD - STACES ROAD TURNING PATH PLAN - 79m BLADE TRAILER

SCALE 1:250



79m BLADE TRAILER PROFILE

NTS

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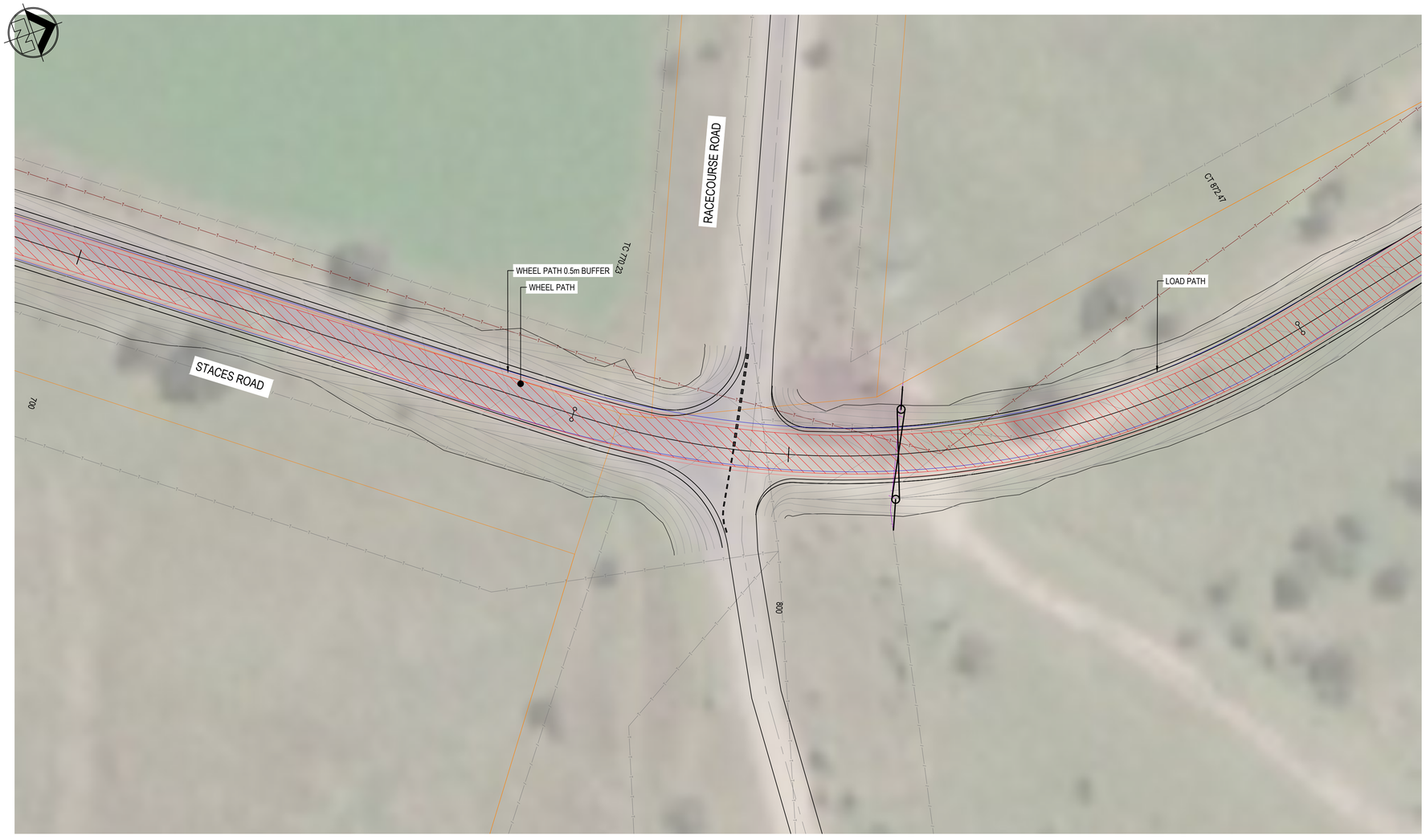
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Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	STACES ROAD / RACECOURSE ROAD TURNING PATH PLAN SHEET 2 OF 3
DRAWING No.	22-094-WWF-EXT-0051-2
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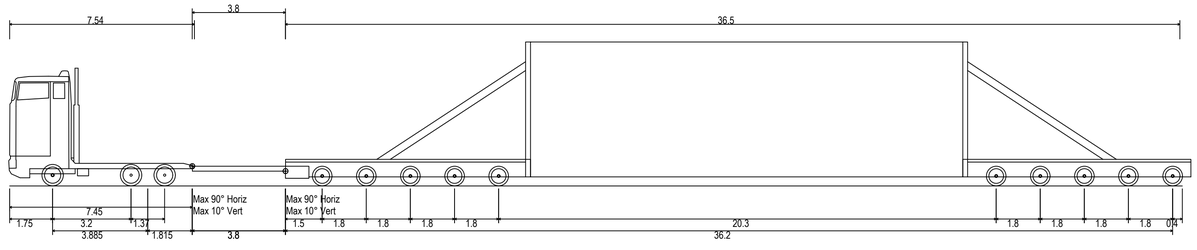


TURNING PATH LEGEND

- WHEEL PATH
- WHEEL PATH 0.5m OFFSET
- LOAD PATH

RACECOURSE ROAD - STACES ROAD TURNING PATH PLAN - TOWER SECTION 3A

SCALE 1:250



TOWER SECTION 3A - TURNING PATH PROFILE

NTS

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
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Winterbourne Wind

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PROJECT	WINTERBOURNE WIND FARM
TITLE	STACES ROAD / RACECOURSE ROAD TURNING PATH PLAN SHEET 3 OF 3
DRAWING No.	22-094-WWF-EXT-0051-3
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Appendix K

Review of OSOM Route Study (prepared by icubed consulting)

Port to Site – EIS Assessment Advisory

Winterbourne Wind Farm



Prepared for:

Winterbourne Wind

Vestas®

Prepared By	Dannie O'Brien
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Released By	Nick Canto
Job Number	22-094
Date	**21/08/2024**
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STATEMENT OF LIMITATION
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Abbreviations and Definitions

"Amber" means Amber Organisation Pty Ltd

"ARTC" means the Australian Rail Track Corporation

"CN" means the City of Newcastle

"EIS" means Environmental Impact Statement as defined under the State Significant Development Guidelines

"*EnergyCo*" means Energy Corporation of NSW

"GGBFS" means Ground Granulated Blast Furnace Slag

"HML" means a Higher Mass Limit

"HV" means Heavy Vehicle

"HVR" means Heavy Vehicle Road

"LV" means Light Vehicle

"NEH" means the New England Highway

"NHVR" means the National Heavy Vehicle Regulator

"NSW" means the state of New South Wales in Australia

"O&M" means Operations and Maintenance

"Original Equipment Manufacturer (OEM)" means the turbine provider.

"OSOM" means over size over mass.

"Project" means the Winterbourne Wind Farm.

"REZ" means a Renewable Energy Zone

"ROL" means Road Occupancy Licence

"RJA" means Rex J Andrews

"SSD" means a State Significant Development as defined by the NSW Department of Planning

"SWOT" means Strengths/Weaknesses/Opportunities/Threats

"*TfNSW*" means Transport for New South Wales and refers to the NSW Governments transport and road agency

"TIA" means a Traffic Impact Assessment

"Vestas" means Vestas Development Australia Pty Ltd

"WAD" means a Works Authorisation Deed

"*WTG*" means Wind Turbine Generator

1. Introduction

icubed consulting has been engaged by Vestas Development Australia Pty Ltd (Vestas), on behalf of Winterbourne Wind Pty Ltd to provide advisory services to support the Environmental Impact Statement (EIS) approval process for the State Significant Development (SSD) Application for Winterbourne Wind Farm (The Project).

As part of this review, icubed consulting conducted a review of the proposed Port to Site route and logistics for the Project, including investigating key pinch points, proposing alternative route options, and providing recommendations. This will aid Vestas in providing a clear message of intent to respond to the concerns/queries raised by Transport for New South Wales (TfNSW) and relevant Councils (e.g., Walcha Council, Muswellbrook Shire Council and Uralla Shire Council) as part of the EIS Response to Submission phase for the Project.

1.1 Vehicle Fleet

There are a number of vehicle configurations applicable to the construction of a windfarm and should be further considered as part of the Port to Site EIS strategy including:

- Police Escorted & Piloted Oversize Overmass (OSOM) vehicles – Typically Blades and Tower Sections, Inbound Only
- Piloted OSOM Vehicles – Larger Construction plant, In & Out Bound, Transformer, inbound, some Compacted WTG Component deliveries e.g., book end trailers, outbound only.
- Heavy Vehicles (HVs), including, Body and Dog / B-Double combinations operating Higher Mass Limits (HMLs) – Sand, Concrete Binder, Steel reinforcement, Electrical Conductor, Containerised Goods
- HV, Heavy Vehicle Road Class (HVRC) – Sand, fuel, waste, plant mobilisation, (cranes, concrete agitators etc.)
- Light Vehicles, Workforce transit

1.2 Background

As part of the SSD Application for the Project, a Traffic Impact Assessment (TIA) prepared by Amber Organisation Pty Ltd (Amber), and a detailed Route Assessment Survey by Rex J Andrews (RJA) was completed.

As part of these assessments, two (2) proposed OSOM transportation routes from the Port of Newcastle to the Project were outlined including one route for components including blades, generators and other small components under 5.2 metres in overall height; and another route for components including towers, generators and other components over 5.2 metres in overall height; refer to **Table 1**.

Table 1 – Proposed OSOM Transport Routes for Winterbourne Wind Farm

Blade OSOM Transportation Route		Tower Section Transportation Route	
Constituting Roads	**Local Authority**	**Constituting Roads**	**Local Authority**
1. Selwyn Street 2. George Street 3. Industrial Drive 4. Maitland Road 5. New England Highway (NEH) 6. John Renshaw Drive	1. Port Authority 2. City of Newcastle 3. TfNSW 4. TfNSW 5. TfNSW 6. TfNSW 7. TfNSW 8. TfNSW	1. Selwyn Street 2. George Street 3. Industrial Drive 4. Maitland Road 5. New England Highway (NEH) 6. John Renshaw Drive	1. Port Authority 2. City of Newcastle 3. TfNSW 4. TfNSW 5. TfNSW 6. TfNSW 7. TfNSW 8. TfNSW 9. TfNSW

7. Hunter Expressway 8. New England Highway (NEH) **9. Thomas Mitchell Drive** 10. Denman Road 11. Bengalla Road 12. Wybong Road 13. Kayuga Road 14. Ivermein Street 15. Stair Street 16. Dartbrook mine access Road 17. New England Highway (NEH) 18. Scott Road 19. Murray Street 20. Marius Street 21. Armidale Road 22. New England Highway (NEH) 23. Oxley Highway 24. Saleyards Road 25. Darjeeling Road 26. Thunderbolts Way 27. Jamieson Street	9. Muswellbrook Shire 10. TfNSW 11. Muswellbrook Shire / Private 12. Muswellbrook Shire 13. Muswellbrook Shire 14. Muswellbrook Shire 15. Muswellbrook Shire / Private 16. Muswellbrook Shire / Private 17. TfNSW 18. TfNSW 19. TfNSW 20. TfNSW 21. TfNSW 22. TfNSW 23. TfNSW 24. Walcha Council 25. Walcha Council 26. Walcha Council 27. Walcha Council	7. Hunter Expressway 8. New England Highway (NEH) **9. Golden Highway** 10. Denman Road 11. Bengalla Road 12. Wybong Road 13. Kayuga Road 14. Invermein Street 15. Stair Street 16. Dartbrook Mine access Road 17. New England Highway (NEH) 18. Scott Road 19. Murray Street 20. Marius Street 21. Armidale Road 22. New England Highway (NEH) 23. Oxley Highway 24. Saleyards Road 25. Darjeeling Road 26. Thunderbolts Way 27. Jamieson Street	10. TfNSW 11. Muswellbrook Shire / Private 12. Muswellbrook Shire 13. Muswellbrook Shire 14. Muswellbrook Shire 15. Muswellbrook Shire / Private 16. Muswellbrook Shire / Private 17. TfNSW 18. TfNSW 19. TfNSW 20. TfNSW 21. TfNSW 22. TfNSW 23. TfNSW 24. Walcha Council 25. Walcha Council 26. Walcha Council 27. Walcha Council

1.3 Pinch Points

icubed consulting has outlined key constrained sections along the proposed transport routes which require further investigation to inform the EIS Response to Submissions including (refer to **Figure 1**):

1. Port of Newcastle
2. Muswellbrook Bypass
    - Golden Highway onto Denman Road
    - Denman Road onto Bengalla Road
    - Bengalla Road onto Wybong Road
    - Wybong Road onto Kayuga Road
    - Invermein Street onto Stair Street
    - Stair Street onto Dartbrook Access Road
3. South Tamworth Bypass
    - Goonoo Goonoo Road/Scotts Road vs alternative Tamworth Bypass options including:
        - Whitehouse Lane/Marsden Park Road/ O'Briens Lane/Nundle Road option
        - Whitehouse Lane/Marsden Park Road/ O'Briens Lane/ Back Kootingal Road/Dorothy Avenue option
4. Oxley Highway (Surveyors Creek Bridge) vs Uralla Bypass (Staces Road)
5. Hillview Road/Blue Mountain Road vs Jamieson Street/Ohio Road/Emu Creek Road/Winterbourne Road/Blue Mountain Road

TfNSW and all relevant Councils have highlighted the need for any route proposed to address and identify the extent of works within the road reserve and obtain further consent/land agreement in private land prior

to determination. As part of this assessment, icubed have indicated the likely extend of road upgrade works required and any likely consent/land agreement requirements.

A clear concern for both the TfNSW and Muswellbrook Council submissions, was the need for further identification of all rail, bridge, and culvert infrastructure along all proposed transport routes (OSOM, Non-OSOM). icubed has performed a desktop assessment to identify rail and bridge infrastructure along the tower and blade routes, which has been provided in **Section 6**.

Portions of the proposed OSOM route from Port to Site are proposed for other Wind Farm projects in the New England and surrounding REZ's as per the State Significant Projects portal including but not limited to: the Hills of Gold Wind Farm and the Thunderbolt Wind Farm .

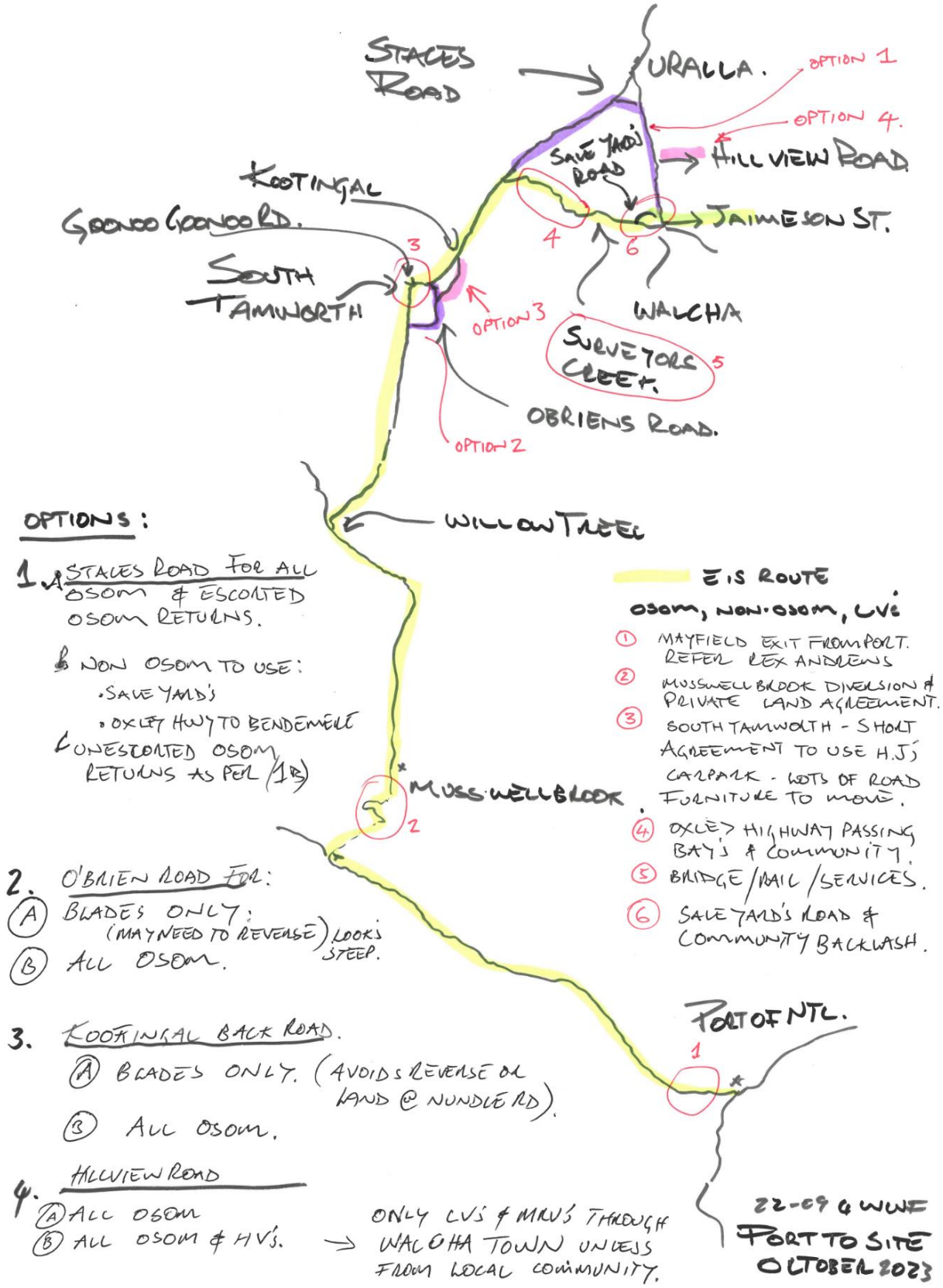


Figure 1 – Pinch Points and Alternative Options to be Investigated
Source: icubed consulting, 2023

2. Port of Newcastle

As described in the RJA Route Assessment, at the Port of Newcastle there are three (3) key manoeuvres that all OSOM vehicles will need to perform, these manoeuvres will require the following upgrade/modification works:

- Mayfield #4 berth access road exit onto Selwyn Street
- Selwyn Street onto George Street intersection
- George Street onto Industrial Drive intersection

Horizontally the route out of the Port of Newcastle is constrained at these key intersections for OSOM blade vehicles, resulting in road widening and hardstand conditioning works, as well as fence removal and signage relocation. This will require consultation and Approval from the City of Newcastle (CN), TfNSW and Australian Rail Track Corporation (ARTC); refer to **Figure 2**. It is understood from discussions that Vestas are in the process of consulting the relevant authorities. Noting as part of a condition to approval, the following approval/licences may also need to be obtained including:

- Section 138 Approval pursuant to the Roads Act 1993 for all works within the road reserve under the CN;
- Road Occupancy Licence (ROL) from TfNSW including where impacting travel lanes or the operation of traffic signals on a State Road; and
- Works Authorisation Deed (WAD) from TfNSW including where impacting travel lanes or the operation of traffic signals on a State Road

Attachment A- Responsible Regulatory Authorities

Location	Road upgrades/traffic management measures
Corner of Selwyn Street and Industrial Road, Mayfield North	• Hardstand works on traffic island within road reserve – CN Selwyn St, TfNSW-Industrial Drive • Removal/relocation/re-design of existing utility poles (Utility Authority) and traffic lights-TFNSW • Mount existing medians - TFNSW • Encroach road verges – CN • Removal of existing trees – CN or private
Industrial Road and Pacific Highway, Mayfield West	• Use left-turn slip lane for right turn maneuver onto Pacific Highway-TFNSW • Traverse in opposite direction (contra-flow) along Pacific Highway for approximately 130 m.- TFNSW • Mount existing medians-TFNSW

Figure 2 – City of Newcastle (CN) Advice relating to Responsible Regulatory Authorities for Upgrades
Source: City of Newcastle, 2023

A key concern raised by CN was the impact to their stormwater infrastructure as part of the hardstand works proposed at Selwyn Street/Mayfield #4 berth access road intersection and George Street and Industrial Drive intersection. If required by CN, a structural capacity check can be performed on these stormwater pipes after development consent to ensure they can support the loads and volumes from the OSOM vehicles.

3. Muswellbrook Bypass

The proposed OSOM routes utilise State Controlled and higher order roads from the Port of Newcastle to the New England Highway, (NEH), however it is understood in Belford that OSOM tower component vehicles will utilise the Golden Highway while OSOM blade vehicles will remain on the NEH, turning at Thomas Mitchell Drive before Muswellbrook. All OSOM vehicles routes will then converge again at the intersection of Denman Road and Bengalla Road and bypass the township of Muswellbrook through a range of lower order roads including Bengalla Road, Wybong Road, Kayuga Road, Invermein Street, Stair Street and Dartbrook Mine access Road; refer to **Figure 3**.

The proposed bypass routes are known to be due to the constraints caused by the Denman Road bridge crossings of the Hunter River (height limit restricted) and the Muswellbrook rail underpass on the New England Highway.

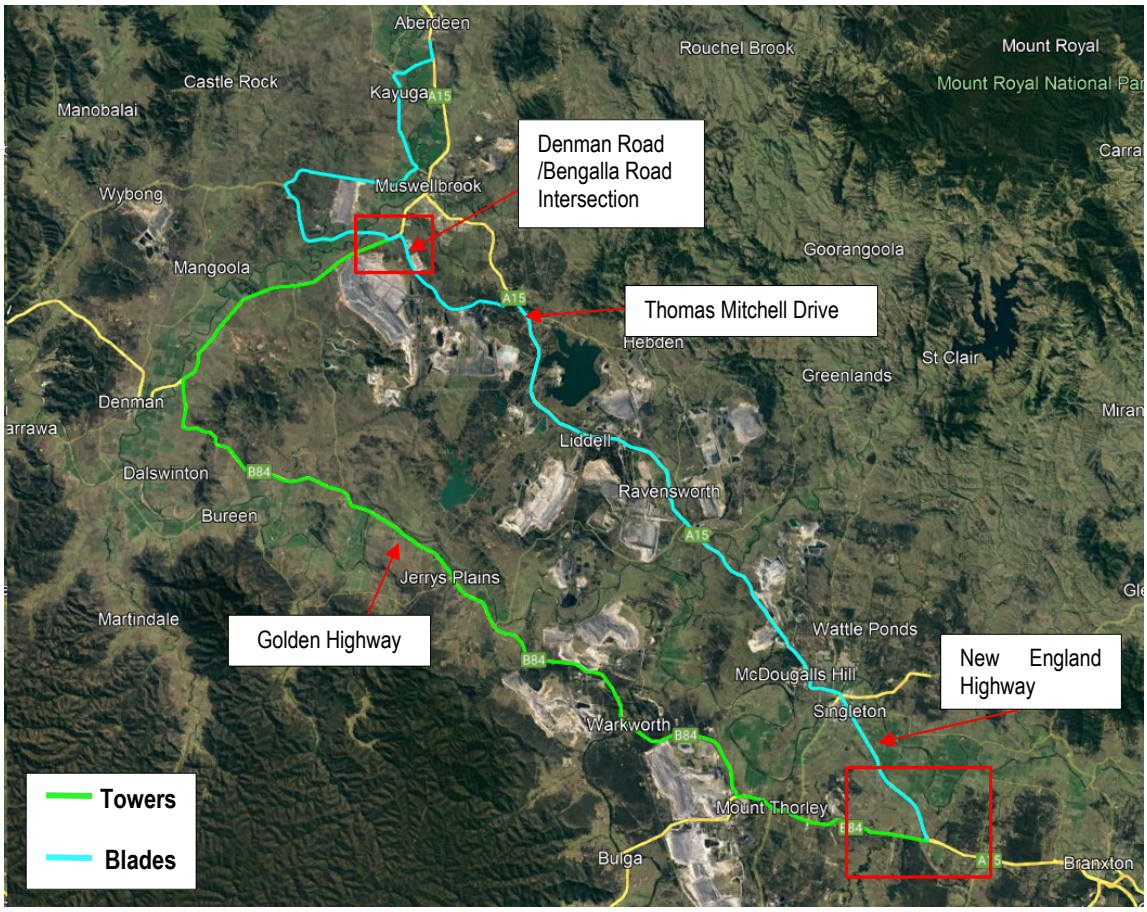


Figure 3 – Proposed Blade and Tower Bypass Routes through Muswellbrook Local Government Area (LGA)
Source: Google Earth, 2023; Amber Consulting, 2022

According to the NSW OSOM Load Carrying Vehicles Network, Thomas Mitchell Drive, Bengalla Road, Wybong Road, Kayuga Road, Invermein Street, Stair Street and Dartbrook Mine Access Road are not approved roads, and therefore an access permit from the National Heavy Vehicle Regulator is required.

To understand the local load limits further along Wybong Road and Kayuga Road, icubed reached out to Muswellbrook Shire Council and they noted that as per Council direction, they are authorised to "*object to all State Significant Development (SSD) that nominates the use of local roads in the Shire for transport of components to another LGA, until EnergyCo, Transport for NSW and Department of Planning Industry and Environment find a more strategic solution to managing transport issues that is acceptable to Council*".

3.1 Swept Path Analysis

icubed completed a Blade Trailer Swept Path Assessment package for a 90m, (it is noted that this blade length is greater than what is being proposed for the Project) blade trailer and tower component vehicle at five (5) sections/intersections of road along the OSOM route to inform private land agreements and the extent of likely road upgrades including:

1. Reverse Curve, Golden Highway, Jerrys Plains
2. Golden Highway/ Denman Road
3. Denman Road/ Bengalla Road
4. Bengalla Road/ Wybong Road
5. Wybong Road/Kyuga Road

The swept path assessment has shown that upgrades are required at all intersections, typically comprising of additional pavement widening, the relocation of existing services and road furniture and minor vegetation clearing. Consultation and further agreements will be required with the relevant impacted landowners.

3.2 Dartbrook Mine

As noted in the Muswellbrook Shire Council objection, *"mining companies own a significant amount of land on the transport route*", in particular near Dartbrook Mine, and therefore, consultations and approvals with these entities will be required. According to NSW Spatial Viewer, a section of Stair Street and Dartbrook Access Road is not in the road reserve; refer to Figure 4. It is understood that other wind farm developers within the surrounding REZ are consulting with the relevant mining companies.

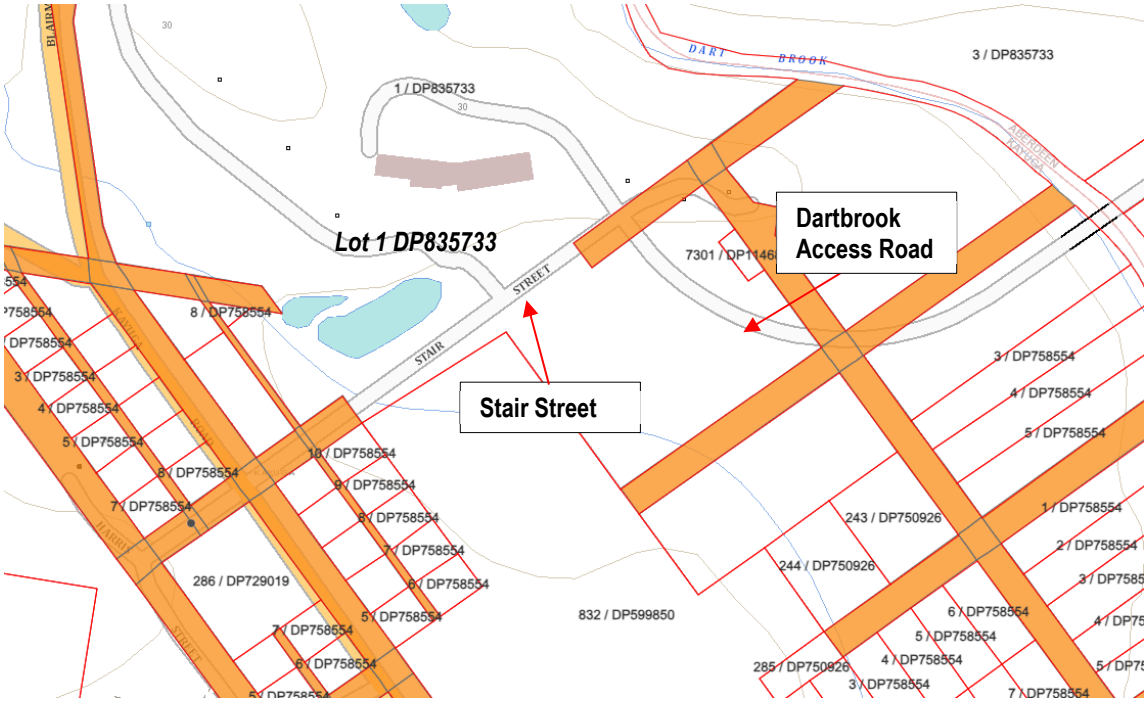


Figure 4 – Invermein/Stair Street Intersection & Stair Street/Dartbrook Access Road Intersection (Road Reserve shown in orange)
Source: NSW Spatial Viewer, 2023

3.3 Likely Road Upgrades

As raised in Muswellbrook Council's objection, many of the roads are described as "*country road standard, with narrow lane widths, unformed shoulders, poor pavement depths, aged-sealed surfaces, drainage structures that will not support heavy loads/turning movements and road/weight limits and road gradients*

unsuitable for transport of long loads". In addition, "*it is Council's* (Muswellbrook Shire Council) *preference that if local roads are used, that roads are upgraded to "purpose built" to minimise maintenance costs over the long term*".

Muswellbrook Council has not proposed a formal design standard; however, the commentary suggests that a full geometric, pavement and drainage rebuild is required. Geometrically it is presumed that lane widening, and the provision of formalised shoulders is required, it is also presumed that batter flattening will be required. It is unclear if horizontal and vertical geometric upgrades will form part of the upgrade, typically horizontal and vertical upgrades are more challenging to provide as land acquisition is required to facilitate the proposed design. Upgrade standards will need to be confirmed with Muswellbrook Council in the Secondary Consent Phase.

3.4 Planned TfNSW Muswellbrook Bypass

As detailed in Muswellbrook Shire Council's objection as part of the EIS submissions:

- "*Council's preference is also for single route option utilising a limited number of roads for all blade and tower components rather than impacting a greater number of roads:*
    a. *To the north via the planned Muswellbrook Bypass. Until this is constructed, Council Officers would prefer Golden Highway, Denman Road, Bengalla Link Road, Wybong Road East and Kayuga Road.*
    b. *To the west via the Golden Highway"*

The planned Muswellbrook Bypass is a proposed New England Bypass by TfNSW to reduce the volume of heavy freight vehicles travelling through Muswellbrook; refer to **Figure 5** (TfNSW, 2023). The Muswellbrook TfNSW bypass is proposed approximately 4.0km past the current WWF OSOM blade bypass route at Thomas Mitchell Drive along the New England Highway.

The TfNSW bypass project is currently obtaining project approval before proceeding to a detailed design phase (TfNSW, 2023). It is currently planned to be constructed by 2027, which is indicatively after the proposed Winterbourne Wind Farm construction phase where the wind farm construction is planned to begin in 2025. The wind farm may be able to use the Muswellbrook ypass for the operational and maintenance period.

There are several road and rail underpasses from Belford to the proposed Muswellbrook TfNSW Bypass entrance which are constraints to the tower section vehicles; refer to Appendix A. A further assessment of the heights along each road and rail bypass is required to confirm their restrictions.



Figure 5 – Proposed Muswellbrook Bypass Route
Source: TfNSW, 2023

Muswellbrook is a constrained section for other renewable projects in the New England Renewable Energy Zone (REZ) and the Central West Orana REZ when using Newcastle as the Port of Entry. This constraint should be an objective for Energy Co and TfNSW to resolve the land acquisition and road upgrade requirements, to enable the critical OSOM component delivery to both REZ's. As outlined in Muswellbrook Shire Council's objection as part of the EIS submission, consultation has occurred between EnergyCo and TfNSW with a preference from Muswellbrook Council for a reclassification of these local Council roads which are proposed to be used for the REZ Projects to TfNSW managed roads.

A Media Release (attached in Appendix B) from EnergyCo last year on the 5th September 2023 highlighted:

> *"the Energy Corporation of NSW (EnergyCo) has finalised a Memorandum of Understanding (MOU) with Transport for NSW (TfNSW) to facilitate the rollout of REZs with road improvements*".

Noting however this MOU only "*relates to coordinating and facilitating necessary upgrades to State road infrastructure where TfNSW is the roads authority*". Therefore, developers are still responsible to implement necessary measures to ensure OSOM vehicle movements on the load road networks where Council is the road authority.

As further stated in a recent Media Release (attached in Appendix B) from the Minister for Energy and Climate Change for the NSW Budget on the 18th June 2024 outlined that,

> *"NSW regions from Newcastle to Dubbo and surrounds will benefit from a $128.5 million investment to upgrade roads for drivers and allow for the transportation of components for renewable energy projects… Road upgrades will enable transportation of critical components required for the construction of new renewable infrastructure from Newcastle to the Renewable Energy Zones via the existing road network… Individual developers will need to ensure vehicle movements can be accommodated on any additional local roads to their project sites".*

3.5 Pros and Cons Analysis

For Muswellbrook, there are three (3) possible bypass routes for the Project:

1. Proposed Blade OSOM Route - NEH, Thomas Mitchell Drive, Denman Road, Bengalla Road, Wybong Road, Kayuga Road, Ivermein Street, Stair Street, Dartbrook mine access Road, NEH
2. Proposed Tower Section OSOM Route – NEH, Golden Highway, Denman Road, Bengalla Road, Wybong Road, Kayuga Road, Invermein Street, Stair Street, Dartbrook Mine access Road, NEH
3. Proposed TfNSW Muswellbrook Bypass Route

A Pros vs Cons Analysis was completed on each of these routes for inbound and outbound OSOM blade and tower component traffic, to understand the potential costs, opportunities, and associated risks for the external route campaign for the project; refer to Table 2.

Table 2 – Pros vs. Cons Analysis for Muswellbrook Transport Routes for OSOM Components

Options	INBOUND/OUTBOUND	
	Pros	Cons
OSOM		
1. Current Proposed Blade Route	- Avoids the township of Muswellbrook - Potential to be used by other wind farm projects – agreement to share costs associated with upgrades	- Seven (7) bridges, eleven (11) road underpasses/overpasses, and three (3) railway overpasses which require further assessment of load capacity and clearance for OSOM vehicles; refer to Section 6 - Need to acquire in principle agreements with the mining operations on their road and infrastructure segments - Route is not an approved OSOM route - Land agreements required - Use of Council Roads as opposed to State Roads - Impacts to mining operations - Not fit for purpose route for Operational phase - Awaiting for EnergyCo and TfNSW to upgrade the roads
2. Current Proposed Tower Component Route	- Avoids the township of Muswellbrook & Singleton - Potential to be used by other wind farm projects – agreement to share costs associated with upgrades	- Seven (7) bridges, six (6) bridge/culverts, two (2) road underpasses and five (5) railway overpasses which require further assessment of load capacity and clearance for OSOM vehicles; refer to Section 6 - Need to acquire in principle agreements with the mining operations on their road and infrastructure segments - Route is not an approved OSOM route - Land agreements required - Use of Council Roads as opposed to State Roads - Impacts to mining operations - Not fit for purpose route for Operational phase - Awaiting for EnergyCo and TfNSW to upgrade the roads
3. Muswellbrook Bypass	- Quickest route to site - Avoid the use of the local road networks and therefore associated upgrades on lower order roads - Avoids disturbing the operations of the mines around Muswellbrook - Avoids the need to deal with approvals from the Muswellbrook Shire Council as it's a TfNSW asset - No known land agreements required	- Not built in time for current perceived construction timeframe - Height constraints along the route including several road and rail underpasses prior that need to be assessed for clearance

4. South Tamworth Bypass

This section explores the three (3) possible routes for OSOM loads to bypass the township of Tamworth.

4.1 Option 1 - Goonoo Goonoo Road and Scott Road Roundabout

At South Tamworth, all vehicles are currently proposed in the EIS to use the New England Highway via the Goonoo Goonoo Road and Scott Road roundabout. As discussed in correspondence, icubed have performed various swept path drawings for the blade trailer and tower sections 7 and 3a at this roundabout in Tamworth, with various options investigated:

Option 1a – Use of Hungry Jacks Allotments

- Land license with the proposed Hungry Jacks allotments from Village Hub Projects (Lot 5A, DP38704, Lot 52 DP517948, Lot 4 DP38280) required
- Parking exclusion zone required for northbound traffic on the NEH
- Future traffic signals impacted on a few legs

Option 1b – Purchasing of Three SE Allotments

- Three (3) allotments (Lot 3 DP505051, Lot 2 DP505051, Lot 1 DP505051) are required to be purchased on SE corner of roundabout
- Parking exclusion required for northbound and southbound traffic on NEH
- Future traffic signals not affected
- Arguably the least amount of services impacted

Option 1c – Purchasing of One (1) Allotment

- One (1) lot (Lot 2 DP505051) to be purchased on SE corner of roundabout
- Parking exclusion required for northbound and southbound traffic on the New England Highway
- Future traffic signals impacted on a few legs
- Blade trailer to travel in opposing direction northbound on the NEH

As detailed in the provided plans, the encroachment areas will need to be free of landscaping, road furniture (e.g., poles, signs) or any other vertical protrusion and therefore during the wind farm freight task, access will need to be secured against access to pedestrians and parked vehicles. The street frontage at the proposed Hungry Jacks will need to comprise of a concrete foot path for the full width between the boundary and kerb. The surface shall be paved to prevent damage against OSOM Vehicle Axle Loads of up to 16.5t per row. Any access covers or grates shall be Class D and ideally the kerb should be altered to a 125mm tall Semi Mountable profile. A meeting is required with TfNSW and Tamworth Regional Council (TRC) to confirm their desire for these proposed options.

4.2 Tamworth Bypass Options

4.2.1 Option 2 – Whitehouse Lane/Marsden Park Rd/ O'Briens Lane/ Nundle Road

An alternative Tamworth bypass route (Option 2) on Whitehouse Lane, Marsden Park Road, O'Briens Lane and Nundle Road was further explored by icubed consulting for blade transport vehicles; refer to Figure 6. This option involves a reversing manoeuvre on the final segment of Nundle Road and was noted by Rex J Andrews (RJA).

Initial dialogue with TRC indicates that there should not be any impediments to using these gravel roads, subject to regular network upgrades for safety and dust, landowner agreements and consideration of upgrade width, pavement and seal.

Two (2) visits by icubed consulting on 11th October 2023 and the 7-8th May 2024 on Option 1 and Option 2 confirmed that geometrically (horizontally and vertically) these roads will likely be suitable for the OSOM freight task. There are some challenges however with these routes including:

- Existing pavement is of variable quality with some sections of road with noticeable defects (crocodile cracking, edge break, potholes, rutting, shoving). Pavement maintenance is notable on sealed road in segments;
- Road reserves and fence to fence widths are narrow
- Intersection upgrades required;
- Powerline crossings will need to be surveyed to ensure there is suitable clearance for the OSOM vehicles;
- Road verges at intersections have multiple services (telecommunications, water, stormwater);
- Private land encroachment required at intersections;
- Vegetation clearing required; and
- Intermittent flooding issues that will need to be assessed.



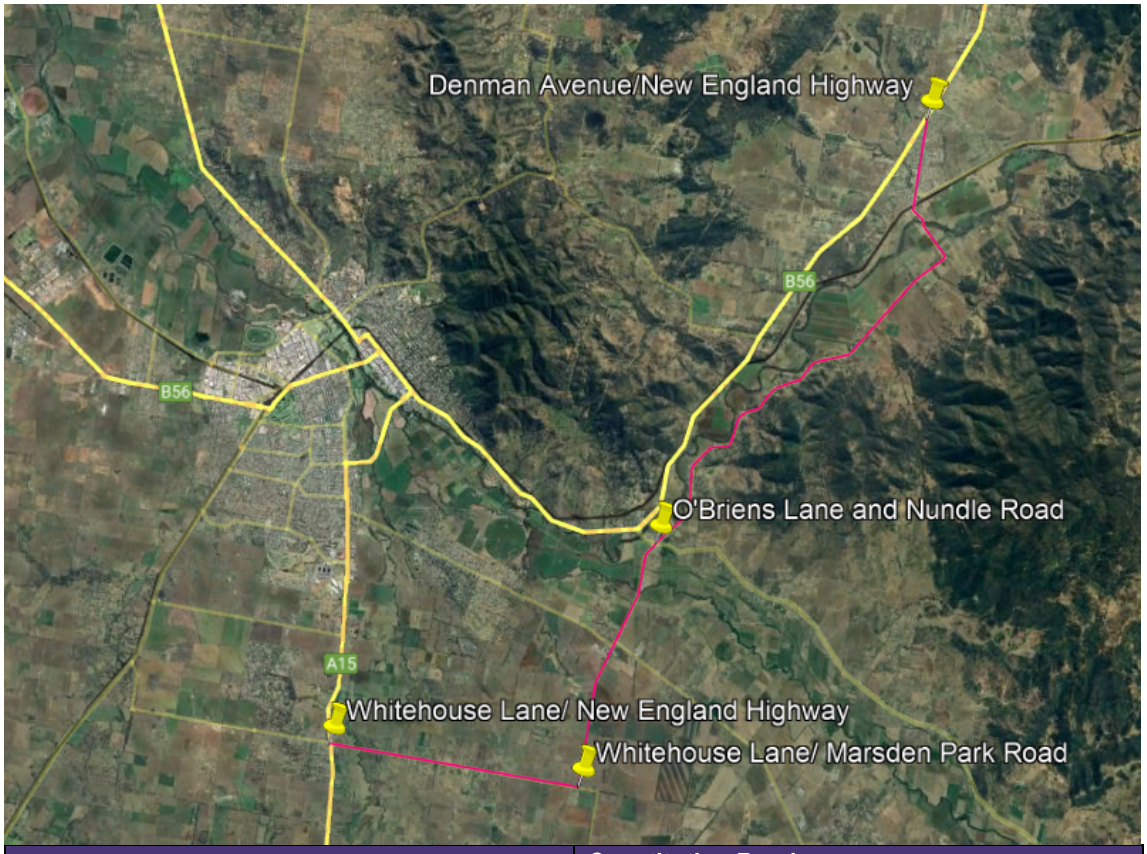
	Constituting Roads
Option 2 – Approx. 11.7km in length	*From the NEH outside Tamworth* Whitehouse Lane Marsden Park Road O'Briens Lane Nundle Road *Back on the NEH at Nemingha*

Figure 6 – Option 2 – Proposed Tamworth Bypass
Source: Google Earth, 2023

4.2.2 Option 3 – Kootingal Road

Through icubed's site visits, a further Tamworth Bypass Option (Option 3) was explored which extends beyond Nundle Road/O'Briens Lane intersection through Back Kootingal Road and Denman Avenue onto

the New England Highway; refer to Figure 7. TRC did indicate potential community backlash travelling through Kootingal.



	Constituting Roads
Option 3 – Approx. 24km in length	*From the NEH outside Tamworth* Whitehouse Lane Marsden Park Road O'Briens Lane Back Kootingal Road Denman Avenue/ Dorothy Avenue *Back on the NEH at Kootingal*

Figure 7 – Option 3 – Proposed Tamworth Bypass
Source: Google Earth, 2023

4.2.3 Swept Path Assessment

As part of a larger consortium with another REZ wind farm developer and Vestas, icubed consulting completed a functional external road package with a 79m, 85m and 90m blader trailer vehicle at these intersections along Option 2 and Option 3 to understand the extent of upgrades and potential land agreements that need to be obtained to facilitate the design vehicle turning paths. Surveyed lot boundaries were provided to inform this assessment.

The swept path assessment has shown that upgrades are required at all intersections, typically comprising of additional pavement widening, the relocation of existing services and road furniture and potential private land agreements. A brief description of the upgrades required at each intersection is provided below:

4.2.3.1 NEH / Whitehouse Lane Intersection

For Option 2 and Option 3, a three (3) point manoeuvre at this intersection from the NEH to Whitehouse Lane is required; refer to Figure 8. This will require the vehicle to cross onto the incorrect side of the NEH to reverse into Spains Lane to straighten up and travel onto Whitehouse Lane. Pavement widening will required on the north-eastern and north-western side of the intersection to facilitate this manoeuvre noting there is an extensive existing table drain and/or culverts on either side. A private land acquisition will be required with the north-western corner allotment (Lot 6101 DP1059416). Minor vegetation clearing, the removal of an existing fence and the reinstatement of existing signage onto removable signposts will also be required; refer to Figure 8.

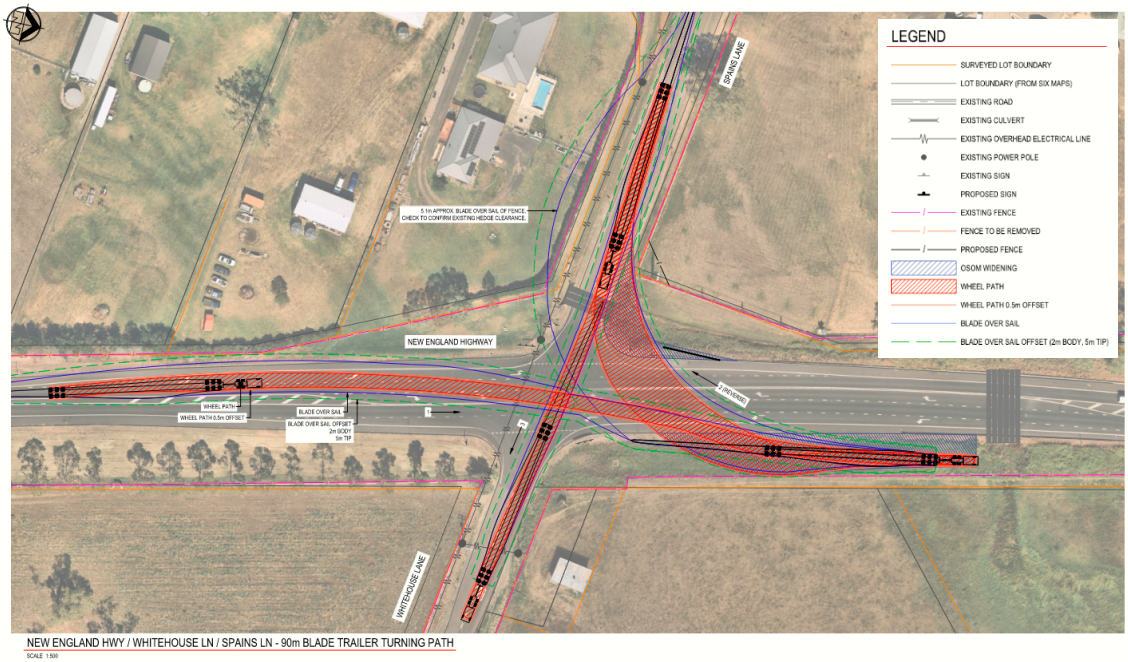


Figure 8 – Option 2 & 3 – Intersection of NEH and Whitehouse Lane
Source: icubed consulting, 2024

4.2.3.2 Whitehouse Lane/Marsden Park Road Intersection

For Option 2 and Option 3, at the Whitehouse Lane and Marsden Park Road intersection, to facilitate the left turn manoeuvre, pavement widening will be required on the north-east and north-west sections of the intersection; refer to Figure 9. A landholder agreement will be required with the north-east allotment (Lot 21 DP1077811); refer to Figure 9. Blade oversail will occur on the southern allotment resulting in the relocation of an existing fence and vegetation clearing. The relocation of an existing power pole is also required on the inside north-western corner; refer to Figure 9.

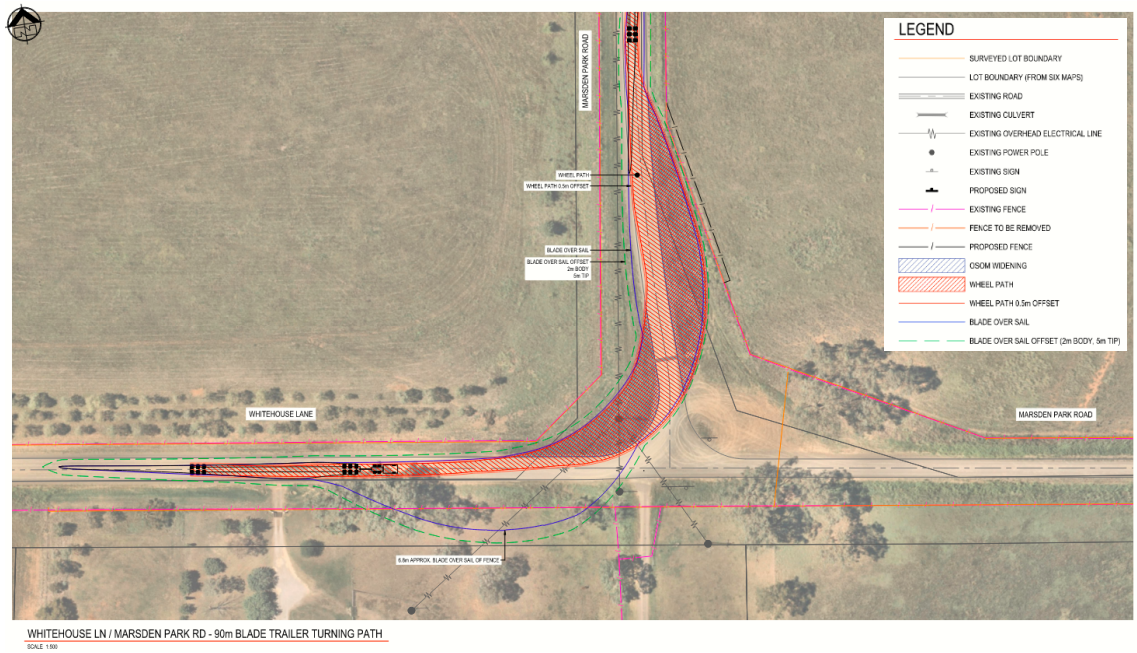


Figure 9 – Option 2 & 3 – Intersection of Whitehouse Lane and Marsden Park Road
Source: icubed consulting, 2024

4.2.3.3 Marsden Park Road/Catala Lane/O'Briens Lane Intersection

Along both Option 2 and Option 3, there is a right-hand turning manoeuvre required on Marsden Park Road and Calala Lane/O'Briens Lane; refer to Figure 11. icubed recommends a straight through manoeuvre given the extensive road corridor alignment in this section; refer to Figure 11. Pavement widening and vertical regrading is potentially required to facilitate the inside right-hand turn onto O'Briens Lane. In addition, due to blade oversail the south-western corner will require the removal of street signs and the clearing of vegetation.

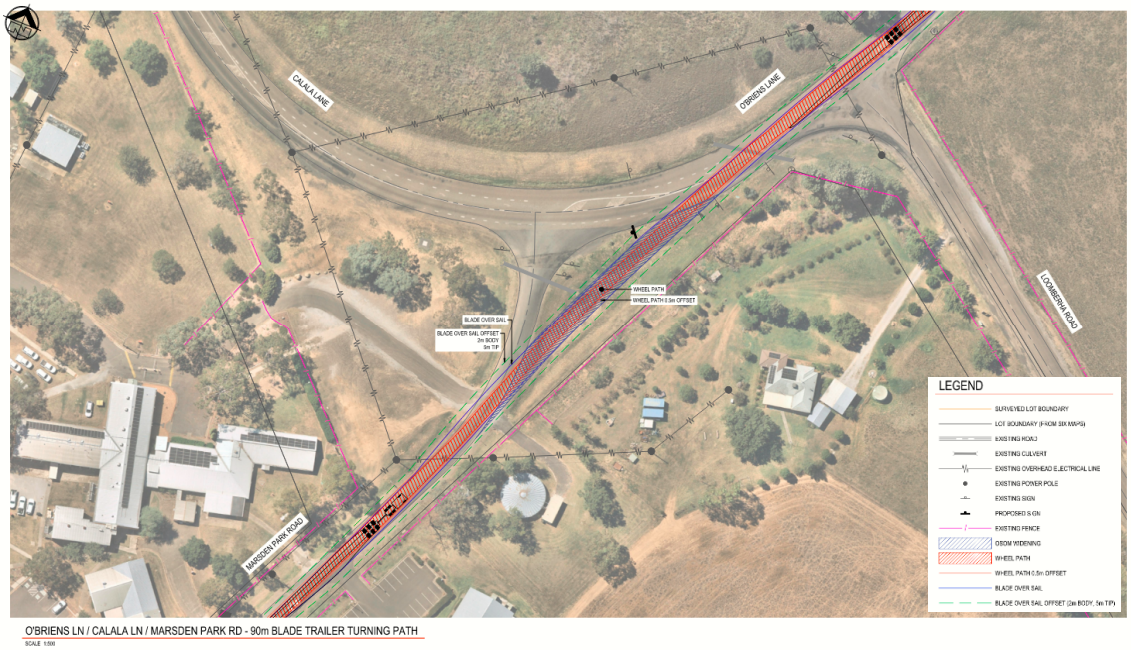


Figure 10 – Option 2 & 3 – Intersection of Marsden Park Road, Catala Lane and O'Briens Lane
Source: icubed consulting, 2024



Figure 11 – Option 2 & 3 – Intersection of Marsden Park Road and O'Briens Lane/Catala Lane (orange outlines the road corridor whilst the purple line is the proposed OSOM route)
Source: SixMaps, 2023

4.2.3.1 O'Briens Lane/ Nundle Road/ Back Kootingal Road Intersection

As shown in Figure 12, for Option 2 at the O'Briens Lane, Nundle Road and Back Kootingal Road intersection, a three (3) point manoeuvre is required with a considering reversing operation; refer to Figure 12. This avoids extensive landholder agreements at the roundabout and impacts to the petrol station at the New England Highway and Nundle Road Intersection. The practicality and time required to affect this manoeuvre should be considered as it will require considerable disruption to through traffic on both Nundle Road, but more critically the New England Highway; refer to Figure 12. A minor private land acquisition will be required with the south-western allotment (Lot 1 DP317654), in addition to pavement widening and cable stay pole and street sign relocations; refer to Figure 12.

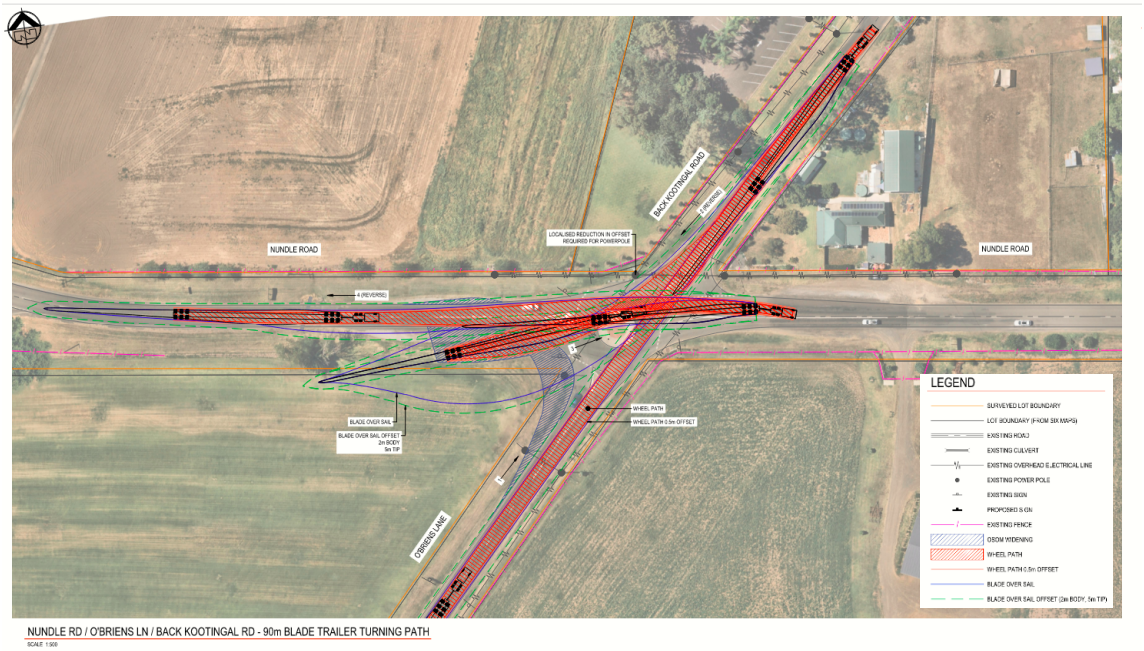


Figure 12 – Option 2 – Intersection of O'Briens Lane, Nundle Road and Kootingal Road Intersection
Source: icubed consulting, 2024

4.2.3.1 Nundle Road, Railway Street and NEH Intersection

For Option 2 at Nemingha, a two-point reversing manoeuvre is required from Nundle Road onto the NEH; refer to Figure 13. This intersection will not require any land agreements with the surrounding allotments but as the NEH is operated by TfNSW, their approval will need to be sought when upgrading this intersection. It appears that the business operations of the Petrol Station extend in the TfNSW road corridor, which will need to be a point of discussion with TfNSW and the respective business owner; refer to Figure 13. This manoeuvre will require OSOM intersection and pavement widening on the inside corner, the relocation of existing services (e.g. power poles/lines, telecoms), vegetation clearing and the reinstatement of street furniture; refer to Figure 13.

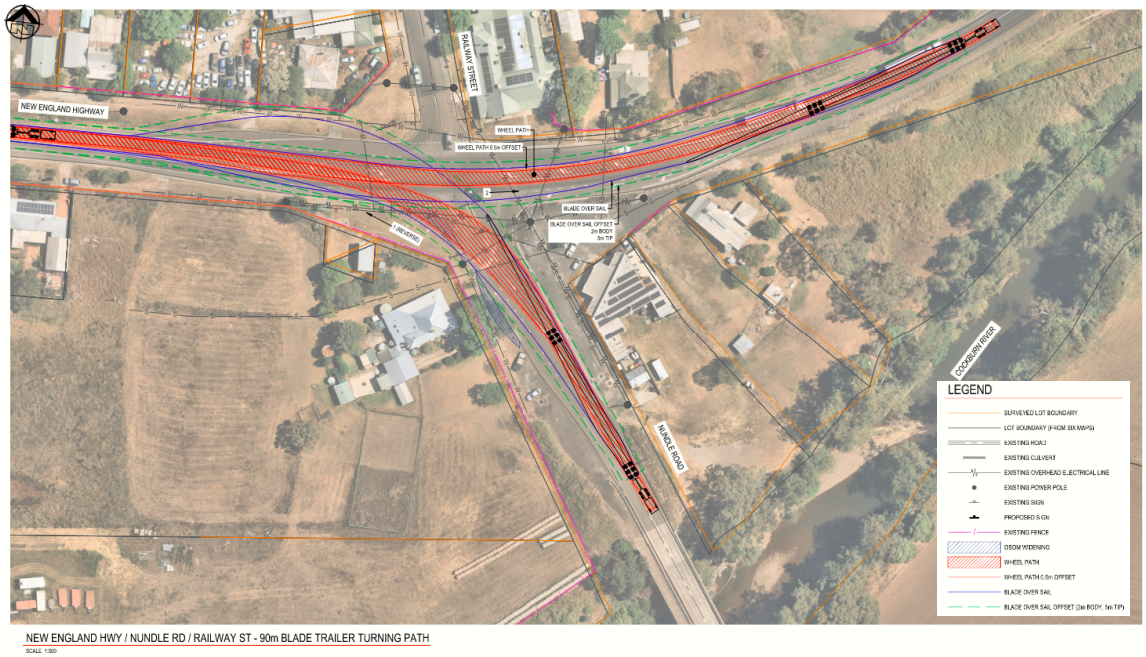


Figure 13 – Option 2 – Intersection of O'Briens Lane and Nundle Road
Source: icubed consulting, 2024

4.2.3.1 Ormans Avenue/ Denman Avenue/Dorothy Avenue/ NEH Intersections

For Option 3, OSOM vehicles will remain on the Back Kootingal Road for 12.8km through the township of Kootingal through the intersection of Ormans Lane/Kootingal Road and the intersection of Denman Avenue/NEH. At the first intersection, no major upgrades are required, except possible relocation of existing signage; refer to Figure 14. At the Denman Avenue and NEH intersection, no land agreements will be required but as the NEH is operated by TfNSW, their approval will need to be obtained when upgrading the NEH intersection; refer to Figure 15. In terms of upgrading works, there will need to be localised verge widening to facilitate the OSOM manoeuvres, in addition to vegetation, and the relocation of an existing power pole and signage on the NEH is required; refer to Figure 15. There is a potential alternative straight through temporary manoeuvre into area within the existing road corridor alignment including vertical regrading and pavement widening is required; refer to Figure 15.

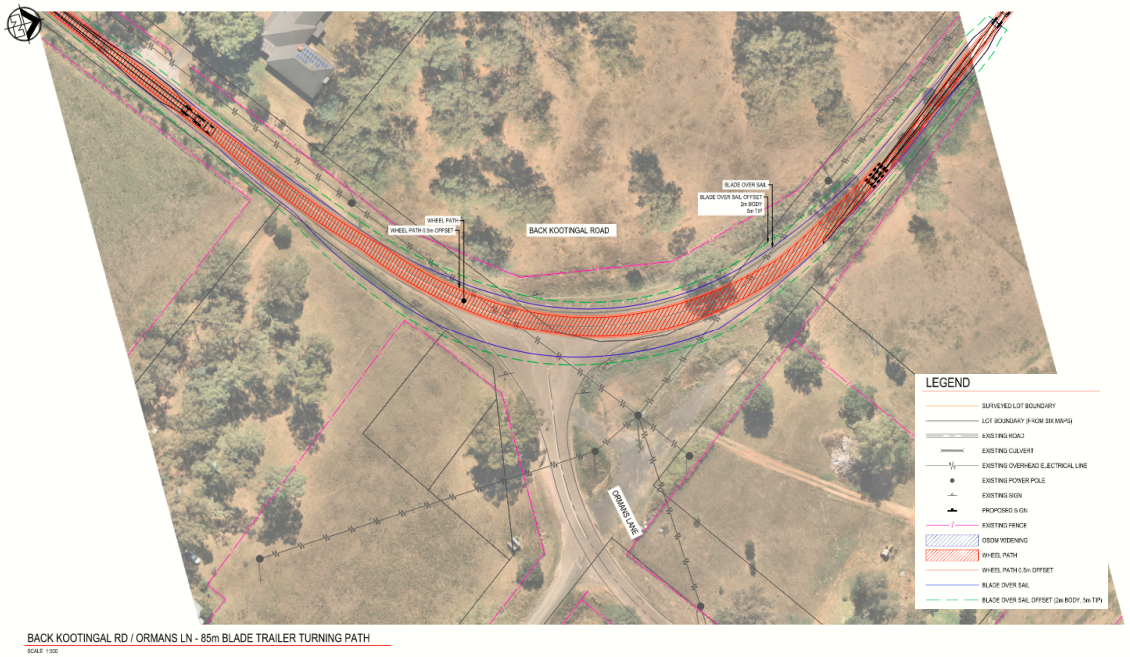


Figure 14 – Option 3 – Intersection of Ormans Avenue and Kootingal Road
Source: icubed consulting, 2024

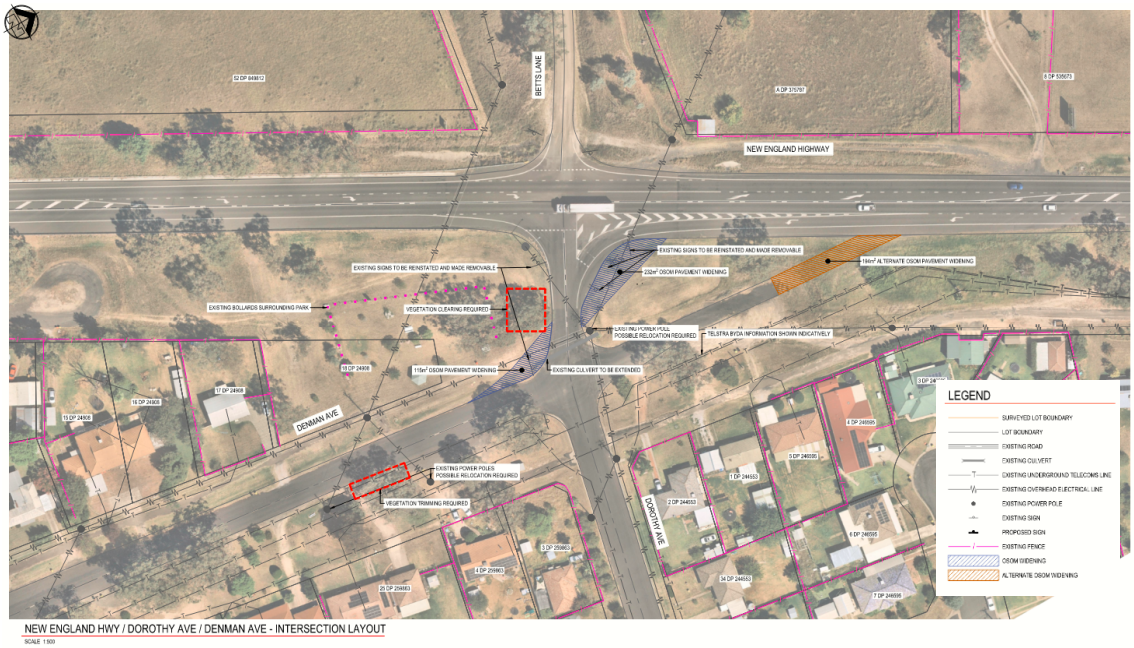


Figure 15 – Option 3 – Intersection of Denman Avenue and NEH Intersection
Source: icubed consulting, 2024

4.2.4 Road Upgrades

icubed has reviewed the TRC Engineering Design Minimum Standards, Version 2 (2023) in conjunction with the TRC Zoning Mapping in the NSW Planning Portal, to outline the minimum upgrade standards required by TRC; refer to Figure 16.

Formation widening is likely expected on Whitehouse Lane, O'Briens Lane, and Back Kootingal Road if road upgrades are going to be required to Council Standard. This may be challenging noting the slim existing road reserves and existing services.

Table 2-C - Road Classifications, Formation Widths and Design Traffic

Road Classification	Indicative Design Traffic[2]	RU1, RU4 Primary Production, Rural Small Holdings	RU5 Village	R1 General Residential	R2 Low Density Residential RSD1/RDS2	R2 Low Density Residential RSD3-RDS5	R5 Large Lot Residential	B1-B7, IN1, IN3 Business, Industrial
Arterial	As determined per pavement design.	30m Road Reserve 2 x Travel Lanes, 3.5m wide 2 x Shoulder, 2.5m wide[1]	30m Road Reserve 2 x Travel Lanes, 3.5m wide 2 x Parking Lanes, 2.5m wide[1]	34m Road Reserve 4 x Travel Lanes, 3.5m wide 2 x Parking Lanes, 3.0m wide[1]	34m Road Reserve 4 x Travel Lanes, 3.5m wide 2 x Parking Lanes, 3.0m wide[1]	30m Road Reserve 2 x Travel Lanes, 3.5m wide 2 x Shoulder, 1.5m wide[1]	30m Road Reserve 2 x Travel Lanes, 3.5m wide 2 x Shoulder, 1.5m wide[1]	32m Road Reserve 4 x Travel Lanes, 3.5m wide 2 x Parking Lanes, 4.0m wide[1]
Sub-Arterial	As determined per pavement design.	30m Road Reserve 2 x Travel Lanes, 3.5m wide 2 x Shoulder, 2.0m wide[1]	30m Road Reserve 2 x Travel Lanes, 3.5m wide 2 x Shoulder, 1.5m wide[1]	32m Road Reserve 4 x Travel Lanes, 3.5m wide 2 x Parking Lanes, 3.0m wide[1]	32m Road Reserve 4 x Travel Lanes, 3.5m wide 2 x Parking Lanes, 3.0m wide[1]	30m Road Reserve 2 x Travel Lanes, 3.5m wide 2 x Shoulder, 1.5m wide[1]	30m Road Reserve 2 x Travel Lanes, 3.5m wide 2 x Shoulder, 1.5m wide[1]	30m Road Reserve 4 x Travel Lanes; 3.5m wide 2 x Parking Lanes; 3.0m wide[1]
Collector	Min 2 x 10^6 ESA	25m Road Reserve 2 x Travel Lanes, 3.5m wide 2 x Shoulder, 1.5m wide[1]	30m Road Reserve 2 x Travel Lanes, 3.5m wide 2 x Shoulder, 1.0m wide[1]	25m Road Reserve 2 x Travel Lanes; 3.5m wide 2 x Parking Lanes, 3.0m wide[1]	25m Road Reserve 2 x Travel Lanes; 3.5m wide 2 x Parking Lanes, 3.0m wide[1]	25m Road Reserve 2 x Travel Lanes; 3.5m wide 2 x Shoulder, 1.0m wide[1]	25m Road Reserve 2 x Travel Lanes; 3.5m wide 2 x Shoulder, 1.0m wide[1]	28m Road Reserve 2 x Travel Lanes; 3.5m wide 2 x Parking Lanes; 5.5m wide[1]
Local	Min 3 x 10^5 ESA	24m Road Reserve 2 x Travel Lanes, 3.5m wide 2 x Shoulder, 1.0m wide[1]	30m Road Reserve 2 x Travel Lanes; 3.5m wide 2 x Shoulder; 0.5m wide[1]	20m Road Reserve 2 x Travel Lanes; 3.5m wide 2 x Parking Lanes, 2.0m wide[1]	20m Road Reserve 2 x Travel Lanes; 3.5m wide 2 x Parking Lanes, 2.0m wide[1]	25m Road Reserve 2 x Travel Lanes; 3.5m wide 2 x Shoulder, 0.5m wide[1]	25m Road Reserve 2 x Travel Lanes; 3.5m wide 2 x Shoulder, 0.5m wide[1]	25m Road Reserve 2 x Travel Lanes; 3.5m wide 2 x Parking Lanes; 4.5m wide[1]
Access	Min 8 x 10^3 ESA	22m Road Reserve 2 x Travel Lanes, 3.0m wide 2 x Shoulder, 0.5m wide[1]	30m Road Reserve 2 x Travel Lanes, 3.0m wide 2 x Shoulder, 0.5m wide[1]	17m Road Reserve 2 x Travel Lanes; 3.0m wide 1 x Parking Lane, 2.0m wide[1]	17m Road Reserve 2 x Travel Lanes; 3.0m wide 1 x Parking Lane, 2.0m wide[1]	22m Road Reserve 2 x Travel Lanes; 3.0m wide 2 x Shoulder; 0.5m wide[1]	22m Road Reserve 2 x Travel Lanes; 3.0m wide 2 x Shoulder; 0.5m wide[1]	

Note 1: Shoulders and parking lanes are to be constructed to the same standard as travel lanes.

Note 2: The Indicative Design Traffic is based on those specified in Austroads Guide to Pavement Design. The Design Traffic to be adopted in the pavement design should be consistent with traffic counts on similar roads within the neighbourhood or development where appropriate.

Figure 16 – Road Classifications and Upgrade Standards (TRC Engineering Design Minimum Standards)
Source: TRC, 2023

Table 3 – Assessment of Road Upgrades

Whitehouse Lane	
Zoning	RU4 – Primary Production Small Lots
Road Classification	Local road (has more than 15 dwellings and more than one entry/exit point).
Existing road reserve width	21m
Existing road formation	7m approx. existing seal width, transitioning to a 9m unsealed formation at intersection with Ascot-Calala Road.
Likely Road Upgrade	Upgrading to the TRC standard for an RU4 local road would require a 9m formation (2 x 3.5m traffic lanes + 2 x 1.0m shoulders).
O'Briens Lane	
Zoning	RU4 – Primary Production Small Lots
Road Classification	Local road (has more than 15 dwellings and more than one entry/exit point)
Existing road reserve width	21m
Existing road formation	9m unsealed formation transitioning to a 7m approx. sealed road at intersection with Calala Lane.
Likely Road Upgrade	Upgrading to the TRC standard for an RU4 local road would require a 9m formation (2 x 3.5m traffic lanes + 2 x 1.0m shoulders).
Nundle Road	
Zoning	RU4 – Primary Production Small Lots & R1 – General Residential

Road Classification	Collector
Existing road reserve width	30m existing road reserve, 20m in built up area
Existing road formation	9m sealed road formation, transitioning to an 11m sealed road in the built-up area.
Likely Road Upgrade	Upgrading to the TRC standard for a RU4 collector road would require a 10m formation (2 x 3.5m traffic lanes + 1 x 1.5m shoulders) Upgrading to the TRC standard for a R1 collector road would require a 13m formation (2 x 3.5m traffic lanes + 2 x 3.0m parking lanes)
Back Kootingal Road	
Zoning	RU4 – Primary Production Small Lots, R1 – General Residential, R5 – Large Lot Residential
Road Classification	Collector
Existing road reserve width	21m existing road reserve
Existing road formation	7m sealed road formation
Likely Road Upgrade	Upgrading to the TRC standard for an RU1, RU4 collector would require a 10m formation (2 x 3.5m traffic lanes + 2 x 1.5m shoulders). Upgrading to the TRC standard for an R5 collector would require a 9m formation (2 x 3.5m traffic lanes + 2 x 1.0m shoulders).
Denman Avenue	
Zoning	RE1 – Public Recreation, MU1 – Mixed Use, R1 – General Residential
Road Classification	Collector
Existing road reserve width	40m existing road reserve
Existing road formation	9m sealed road formation, widening out to 17m in the RE1 and MU1 zones.
Likely Road Upgrade	Upgrading to the TRC standard for a R1 collector road would require a 13m formation (2 x 3.5m traffic lanes + 2 x 3.0m parking lanes)

4.2.5 SWOT

A Strengths/Weaknesses/Opportunities/Threats (SWOT) analysis has been completed on the three (3) proposed OSOM route options to bypass the township of Tamworth; refer to Table 4, Table 5 and Table **6**. Based on our analysis, Option 2 it is the preferred route for all blade and tower OSOM components. Further investigation however is required, including an initial discussion with Tamworth Regional Council.

Table 4 – Option 1 SWOT Analysis (Goonoo Goonoo Rd/ Scott Rd Roundabout – Hungry Jacks)

STRENGTHS - Most direct route to the New England Highway - Reduces time to WWF	**WEAKNESSES** - Parking exclusion areas required to avoid vehicles parking overnight and access to pedestrians during OSOM deliveries - Approval required of TfNSW – need to understand their requirements for upgrading works - Licence required with the Hungry Jacks allotments. Alternatively, acquisition of private allotments is required - Additional traffic control required in a urban environment.
OPPORTUNITIES	**THREATS** - Urban intersection resulting in extensive disruptions to Tamworth traffic and impacts to services, signage, vegetation in the road verges - Between one (1) to three (3) potential land agreements required including the removal of possibly three residential properties - Not the most sustainable route for the O&M phase if a replacement blade is required

Table 5 – Option 2 SWOT Analysis (Whitehouse Lane/Marsden Park Road/O'Briens Lane/Nundle Road)

STRENGTHS	WEAKNESSES
- Bypasses the township of Tamworth - Shorter distance than Option 3 at 11.7km	- Extensive unsealed road sections requiring upgrades - Minor vegetation clearing likely - Route crosses three (3) bridges (O'Briens Bridge, Unnamed Bridge and Johnstone Bridge) - Maintenance of gravel roads
OPPORTUNITIES	**THREATS**
- Can accommodate the long term operational & maintenance period of the wind farm	- 25- tonne limit from Nundle Road to Loomberah Road on O'Briens Lane - Intermittent Flooding issues requiring further investigation - Four (4) land agreements and potential land acquisition at O'Briens Lane/ Nundle Road Intersection (Turf Farm) - Extensive upgrade and negotiation works with TfNSW required at Nundle Road/NEH Intersection

Table 6 – Option 3 SWOT Analysis (Whitehouse Lane/Marsden Park Road/ O'Briens Lane/ Back Kootingal Road/ Denman Avenue/ Dorothy Avenue)

STRENGTHS	WEAKNESSES
- Bypasses the township of Tamworth	- Longer distance than Option 2 (24km) - Route crosses three (3) bridges (O'Briens Bridge, Unnamed Bridge and Cockburn River Bridge) - Extensive unsealed road sections requiring upgrades - Minor vegetation clearing likely - Maintenance of gravel roads
OPPORTUNITIES	**THREATS**
- Less land agreements required in comparison to Option 1 and Option 2 - Can accommodate the long term operational & maintenance period of the wind farm	- 25- tonne limit from Nundle Road to Loomberah Road on O'Briens Lane - Intermittent Flooding issues requiring further investigation - Community backlash through Kootingal

5. Local Road Network

5.1 Oxley Highway

As part of the EIS, the OSOM blade and tower vehicles are proposed to utilise the NEH to Bendemeer where they would perform a right turn manoeuvre onto the Oxley Highway, however as identified through earlier discussions a key constraint along this route is the Surveyors Creek Bridge.

icubed has completed a functional layout and a series of swept path turning plans at Surveyors Creek Bridge using vehicle parameters from RJA. The swept path analysis confirmed that significant works (bridge and pavement widening, batter/retaining works) and/or land acquisition and approval (e.g., rail corridor) will be required for the OSOM transport fleet to cross Surveyors Creek Bridge.

Due to these constraints, several options were proposed including:

1. Widening Surveyors Creek Bridge and completing minor pavement widening, and batter works at the bridge approach on the western side of the Oxley Highway.
2. Maintaining the existing width of Surveyors Creek Bridge and completing major pavement widening at the bridge approach on the western side of the Oxley Highway. This will require a retaining structure and either land acquisition of the Main Northern Rail Corridor (unlikely) or note that the Project will require a "Works within a rail corridor" permit.
3. Find an alternative OSOM route.

At a workshop with RJA, Vestas and icubed consulting on the 25th August 2023, it was discussed that these constraints could be bypassed for OSOM deliveries by continuing along the New England Highway to Uralla.

It is reasonable that the Oxley Highway be used for any unpiloted, lawfully loaded vehicles, such as return travel for the unladen and compacted component delivery vehicles, or to facilitate deliveries from resources located southwest of Walcha. Further discussion will be required with TfNSW. icubed has completed a Pros vs Cons assessment of all the local network route options; refer to Section 5.6.3.

5.2 Uralla Bypass

A proposed alternative OSOM route was identified during the above-mentioned workshop between Vestas, RJA and icubed consulting, that continued along the NEH towards Uralla and connected to Thunderbolt Way via Staces Road and an unnamed Crown land parcel; refer to Figure 17. As shown in Figure 18, a landholder agreement will be required with the Crown Land allotment used as a travelling stock reserve (Lot 7300 DP1157667). It is understood that Vestas has begun consultations with Crown Land on the bypass route to progress the permitting process.



Figure 17 – Uralla Bypass – Staces Road and Un-named Crown Road (Purple outline depicts proposed OSOM route)
Source: SIXmaps, 2023



Figure 18 – Uralla Bypass – Crown Land Allotments
Source: Planning Portal NSW, 2023

To progress consultations with the relevant authorities, icubed provided longitudinal sections and functional layout drawings at the New England Highway/Staces Road intersection and the Crown Track/Thunderbolts

Way intersection. These intersections were prepared on the basis of the minimum requirements for OSOM delivery rather than the LGA or Austroads requirements for geometric design as the roads shall be used by OSOM traffic only. We note that RJA has also completed swept path assessments at the three (3) intersections.

As shown in the provided plans and Figure 19 at the New England/Staces Road intersection, localised intersection widening will be required as well as the relocation of existing signage and an existing power pole.

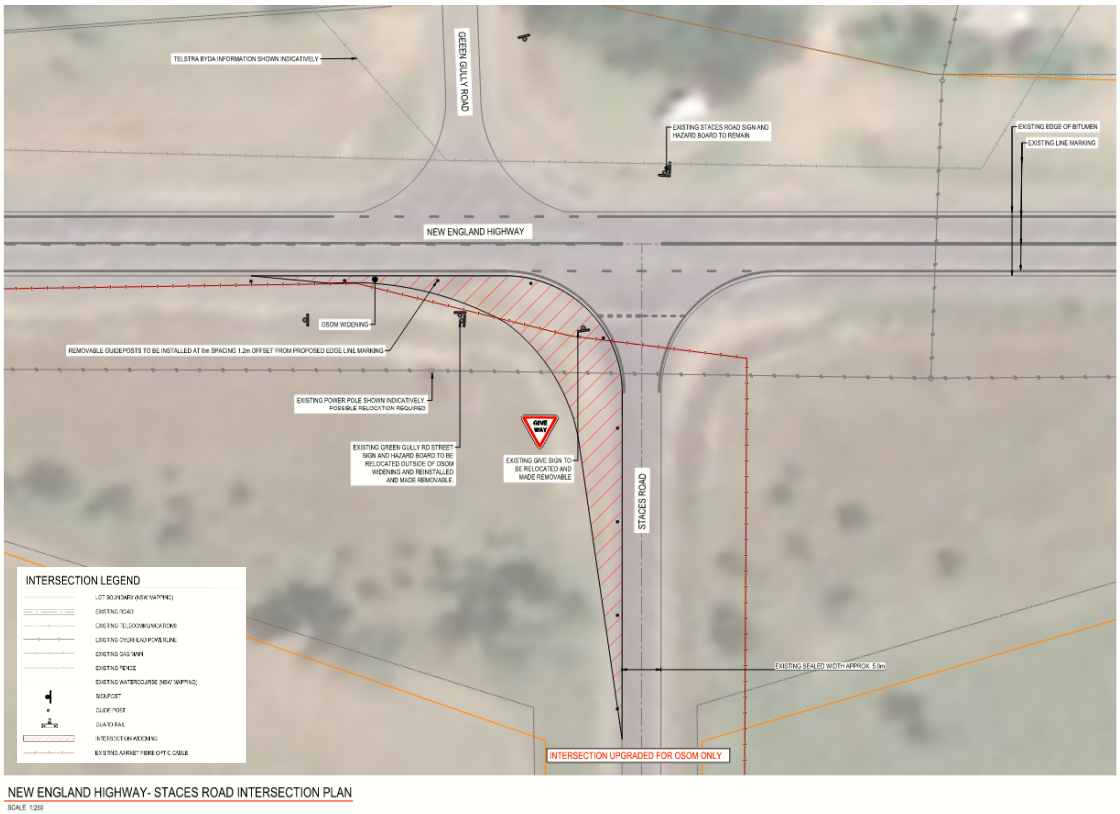


Figure 19 – Intersection from New England Highway onto Staces Road in Uralla
Source: icubed consulting, 2023

At the Unnamed Crown Road/Thunderbolt Way intersection, intersection widening as well as vegetation clearing is required to facilitate the OSOM design vehicles, and an existing power pole will possibly need to be relocated; refer to Figure 20.

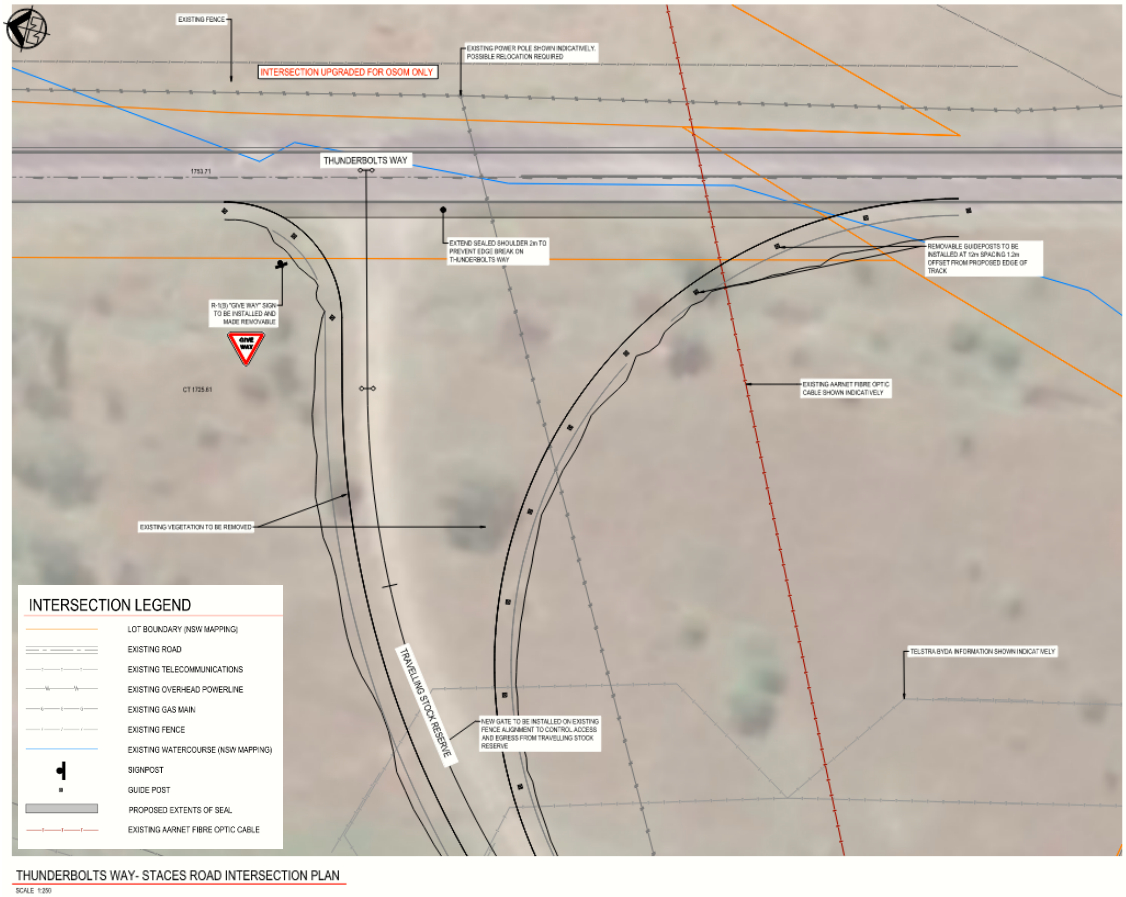


Figure 20 – Intersection from the Crown Road onto Thunderbolts Way
Source: icubed consulting, 2023

Vestas had an initial meeting with the General Manager at Uralla Shire Council in 2023, who verbally provided in-principle approval for this proposal, and therefore are willing to issue a Section 175 notice subject to further negotiations. A further meeting was held with Uralla Shire Council on the 27th February 2024 who approved the Armidale Regional Council Typical Rural cross section methodology and the conceptual drawings produced by icubed consulting to further inform the EIS Response to Submissions and Crown Road negotiations.

5.3 Hillview Road

From the Uralla Bypass route along Thunderbolts Way, icubed proposed through earlier correspondence the potential to use Hillview Road/Blue Mountain Road as a possible OSOM route to site. As part of the EIS submissions, several concerns were raised from local residents, businesses and the Walcha Council on the impacts imposed by the construction traffic through the township of Walcha.

The proposed Walcha bypass route at Hillview Road is approximately 15km from the proposed Uralla Bypass at the intersection of Unnamed Crown Road and Thunderbolts Way and 22km from the township of Walcha; refer to Figure 21. Details of this proposed route is provided in Table 7.

A site inspection by icubed consulting confirmed the road is in reasonable condition however there are several crests and tight horizontal curves requiring realignment and formation widening, as well as pavement strengthening to facilitate wind farm OSOM deliveries and wind farm construction traffic. The route is generally cleared of natural vegetation however minor vegetation clearing would be required on sections to facilitate OSOM deliveries.

Table 7 – Details of Hillview Road/Blue Mountain Road Bypass Route

Road Name	Length of Road (Approximate)	Current Standard	Managing Authority
Hillview Road	12km	Narrow Unsealed	Uralla Shire Council
Blue Mountain Road	10.5km	Narrow Unsealed	Walcha Council / Uralla Shire Council
TOTAL	22.5km of likely total upgrades		

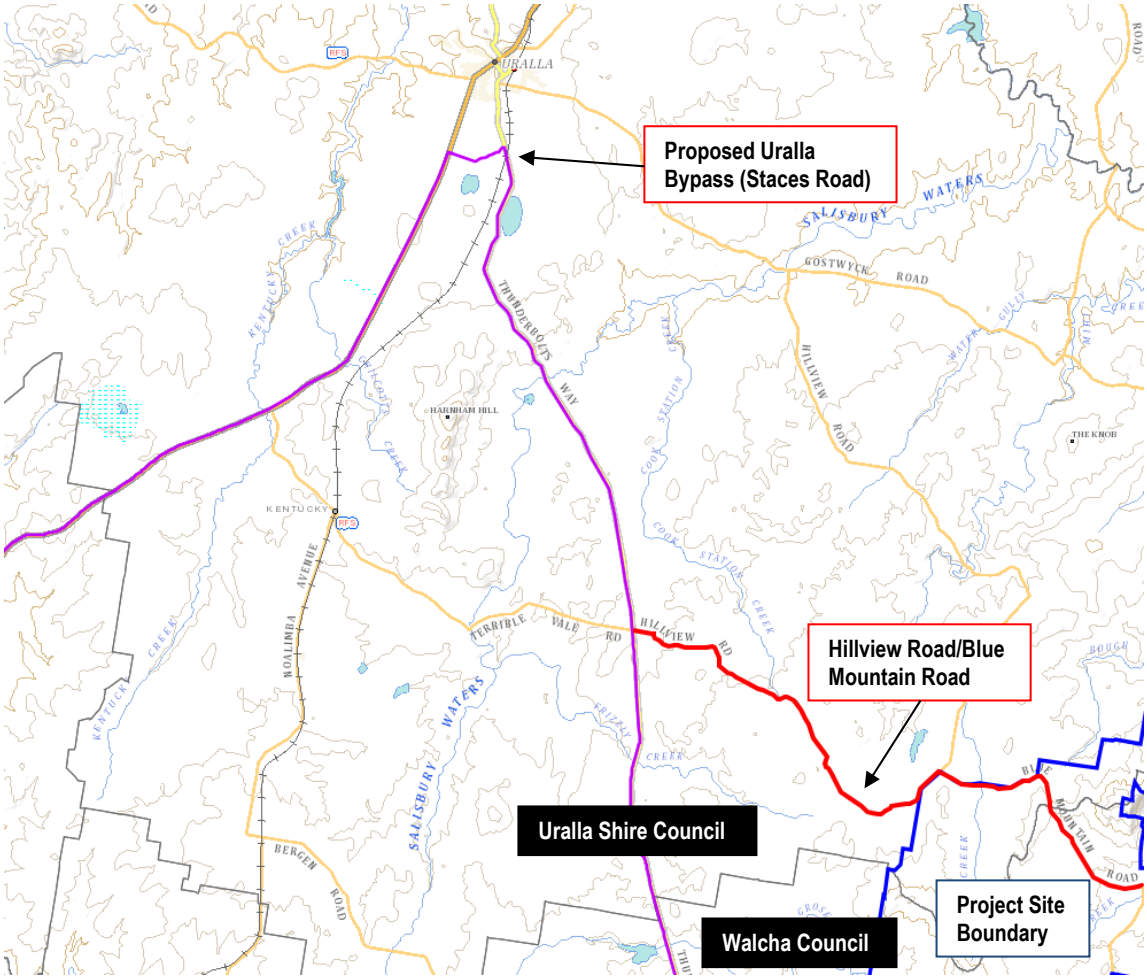


Figure 21 – Proposed Hillview Road/Blue Mountain Road in context to Local Road Network
Source: Spatial NSW Mapping, 2023

In subsequent reviews, Hillview Road is being pursued for use by LV to reduce travel times for works from the north rather than an alternative site entrance route for OSOM.

5.4 Thunderbolts Way

From the Uralla Bypass to the township of Walcha at the intersection with Jamieson Street, Thunderbolts Way is approximately 22.3km in length. Thunderbolts Way is a regional road designated as a 26m B-double route and is a responsibility of the Uralla and Walcha Councils to manage the roads, TfNSW will contribute to any maintenance activities. It should be noted that according to the NHVR Portal, a majority of Thunderbolts Way is not approved for OSOM load carrying vehicles travel; refer to Figure 22.

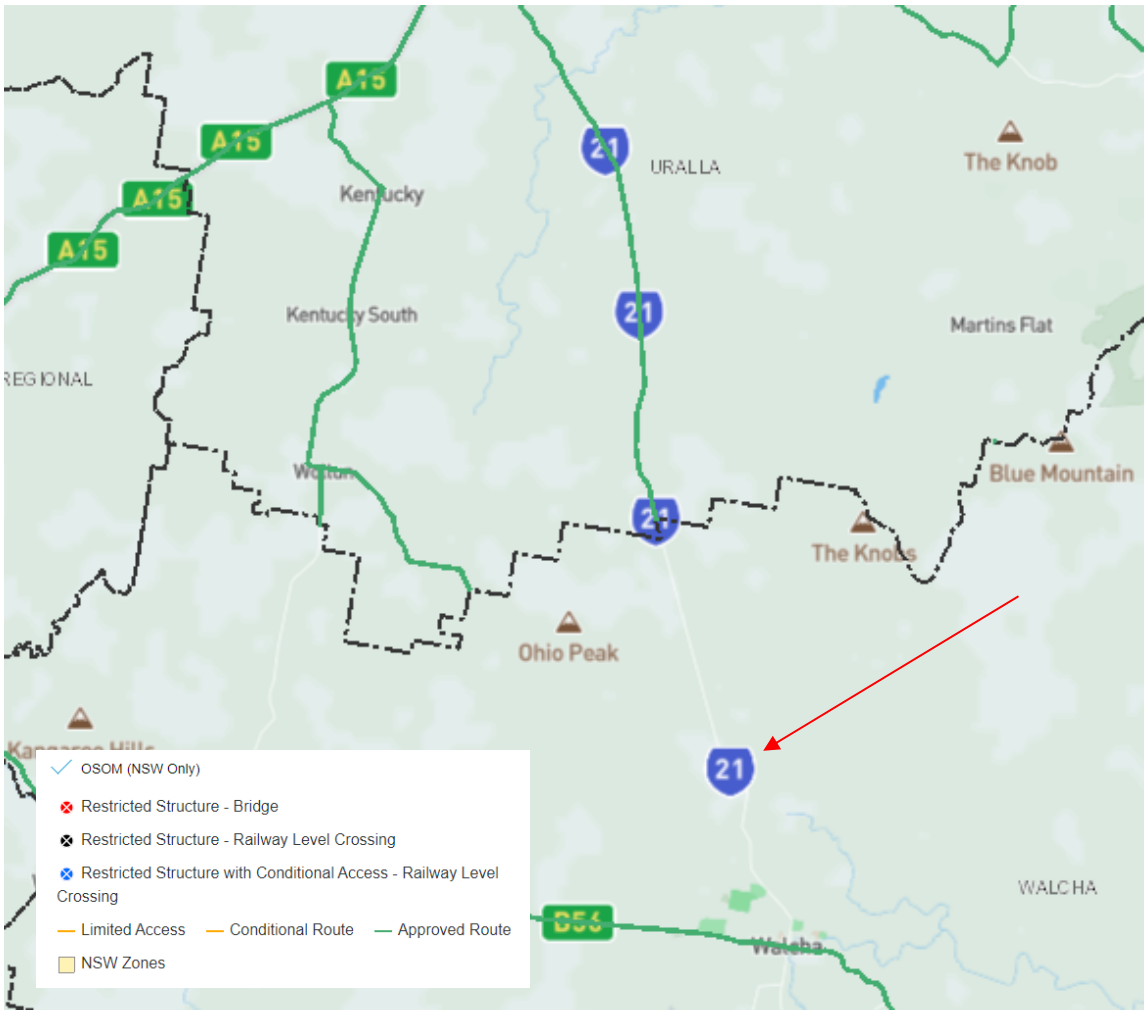


Figure 22 – Unapproved OSOM Route – Portion of Thunderbolts Way
Source: NHVR Portal, 2023

A site visit by icubed consulting confirmed that Thunderbolts Way is a bitumen sealed road with good horizontal and vertical geometric alignment, edge line marking and sealed shoulders. There are clear deteriorated pavement sections located within segments of road and limited safety barriers in place for constrained segments; refer to Figure 23. Engagement has been undertaken by icubed consulting, Vestas and Zenviron with Walcha Shire Council on Thunderbolts Way,



Figure 23 – Example of Deteriorated pavements along Thunderbolts Way
Source: icubed consulting, 2023

5.5 Walcha – Local Roads

As part of the previous EIS submission, it is proposed that all vehicles including OSOM, HV and LVs will enter the Project Site from the Oxley Highway via a range of sealed and unsealed local rural roads leading to the main entrance.

icubed completed functional layouts and swept path plans for ten (10) intersections along the proposed transport route for a 26m B Double design vehicle and the proposed 79m blade trailer and tower section 3A trailer. The functional layout and swept path plans outlined the minimum upgrades and pavement widening required to facilitate the design vehicle turning paths. From this assessment, it was clear that upgrades are required at all local intersections required for HV/OSOM use in the Walcha Council. Upgrades would likely comprise of additional pavement widening and the relocation of existing services and road furniture.

As per the meeting minutes between Zenviron and Constructive Solutions with Walcha Shire Council on the 12th October 2023, it is Council's expectation that all road upgrades to the public road network are to be completed in accordance with TfNSW specifications and Austroads Guidelines. In addition, road widths for sealed roads would need to be a minimum of 7m wide (3m plus 0.5m shoulders on each side) and gravel road upgrades would require a minimum width of 6m. In regard to site access points, Swept path assessments have been completed by icubed and referenced in the TIA

Detailed assessment of the existing local road geometry, pavements or drainage is beyond the scope of this assessment. Given their present condition, it is reasonable to expect that despite seals looking to be in reasonable condition at the time of writing this report, once the non OSOM freight task commences in all weather conditions, it is reasonably foreseeable that the pavement and seal condition will deteriorate considerably. The decision to execute upgrades pre-emptively or through a 'watch and act' maintenance program should be carefully considered.

5.6 Local Road Options for OSOM, HV, LV

From Bendemeer to Walcha, there are three (3) possible OSOM routes, five (5) possible HV (incl. unescorted empty OSOM) routes and five (5) possible LV routes as described further in Figure 24.

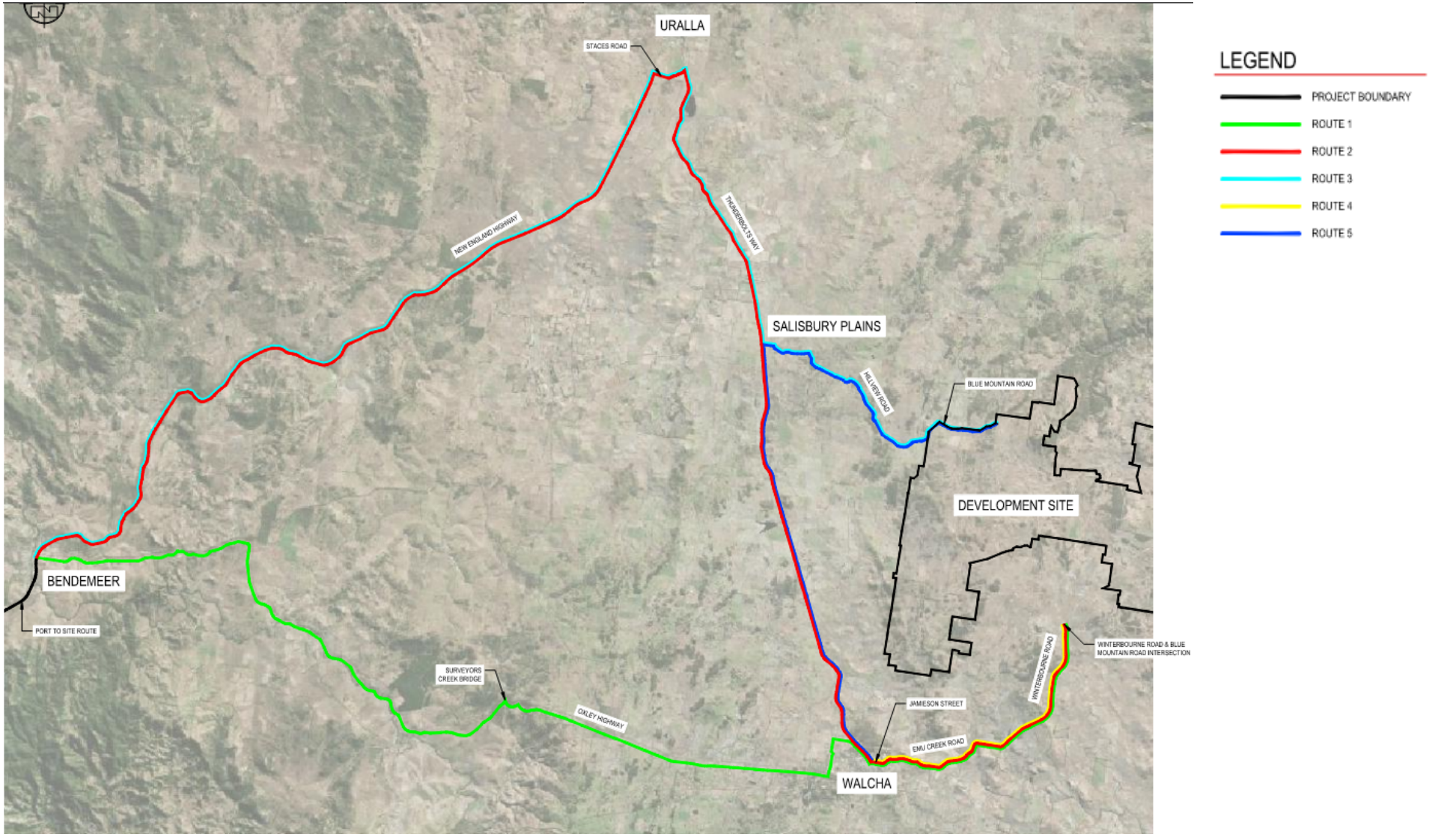


Figure 24 – Local Road Network – Proposed OSOM, HV and LV Routes

Source: icubed consulting, 2023

5.6.1 Material Sourcing

It is important as part of the EIS Response, that there is a greater understanding of where raw materials for the Project will be sourced including but not limited to, concrete aggregates, fly ash, bedding sand for cables, water and reinforcing steel. These materials are associated with the balance of plant elements including, access roads, installation hardstands, footings, substations, and electrical reticulation. The delivery of aggregate material sourcing should be factored into the choice of delivery route of OSOM components as these routes used for aggregate material delivery will likely require upgrades and maintenance.

Early consultation is always recommended with possible suppliers to understand if they can supply the quantity and quality of material. This will also aid in ongoing discussions with TfNSW and local councils and may further increase community sentiment to the Project as the potential impacts to surrounding Council and TfNSW roads are mitigated where possible.

Where reasonably possible, materials should be primarily sourced locally from regional centres or regional quarry operations via the New England Highway/ Thunderbolts way. The TIA as part of the EIS does not acknowledge that there is a potential that materials will be sourced from the north of the Project Site including in Queensland.

A concern raised by the Walcha and Uralla Shire Council which they require more detail on is whether water for the construction project will be sourced external to the Walcha LGA to ascertain additional vehicle movements. icubed recommends that a water resource strategy be confirmed and included with any response to submissions. Any proposal to source concrete mixing water locally should include some screening tests to ensure required quality standards is achievable.

5.6.1.1 On-site Aggregates and Pavement Material

A recent site walkover by an associate geotechnical engineer from FSG confirmed that the geological nature of the weathered meta-sedimentary rock across the site including at onsite gravel pits are likely to provide a satisfactory source of general fill for embankment construction. In addition, based on their observations from the rock outcrops and quarries in and near the site, there is potential viability for the geology to support concrete aggregates and pavement material. Noting the existing quarry to the north of the Project site accessed by Thunderbolts Way may be a suitable source for inferred crushed rock products for pavement material for the local roads.

FSG performed an initial petrographic analysis on the meta-sedimentary and volcanic rock from outcrops to assist in understanding the rock structure and determining the viability of the local materials. Additional boreholes at borrow pit sites and hauling of spoil and test crushing/grading and associated aggregate laboratory testing is recommended to understand if the material could provide a suitable sources of rock pavements, sediment and erosion control material and possibly concrete aggregates to supply the needs of the Project.

If high quality aggregates associated with concrete production cannot be obtained on site to supply the needs of the Project, the likely local source for importation is potentially from the Brooklyn Quarry Pty Ltd located along the Oxley Highway (as the closest source). A hybrid option with onsite aggregates (if possible) may be required given the significant quantity of material demand for the Project.

5.6.1.2 Fly Ash

Fly ash is a key material required in the WTG footing construction and icubed believe the likely source for this is from the north of the Project via South-East QLD sources, including for example from Independent Flyash Brokers Pty Ltd in Millmerran. To Walcha using Thunderbolts Way, this source is approximately 402km north (4 hours, 32 minutes approximately). Other options include resources at Eraring (Morriset), and Mt Piper, (Lithgow) power

stations which are located some 400 and 500km from Walcha by road. Both these sources though will likely have variability in quality and supply.

5.6.1.3 Bedding Sand

Cable trench bedding sand is utilised in underground electrical reticulation installation and some degree of testing needs to be conducted to ensure it is of a suitable standard to meet the electrical and thermal performance criteria requirements. icubed envision this material to be sourced from local quarries south of Bendemeer near Tamworth or north of Uralla near Armidale along the New England Highway. Potential sources for instance may include Boral Concrete or Hanson Australia in Armidale or Tamworth.

5.6.1.4 Cement & Ground Granulated Blast Furnace Slag

Significant quantities of cement and GGBFS (Ground Granulated Blast Furnace Slag), will be required to be delivered for footing construction. Key production, grinding or import facilities for these products are located at Ports of Brisbane, Newcastle, Kembla and the Boral facility and Berrima, (cement only). Whilst there are rail opportunities for bulk and containerised product into Tamworth, it is not uncommon for these products to be transported by road on specialised powder vessels, mounted on a B-Double Configuration.

5.6.1.5 Steel Reinforcement

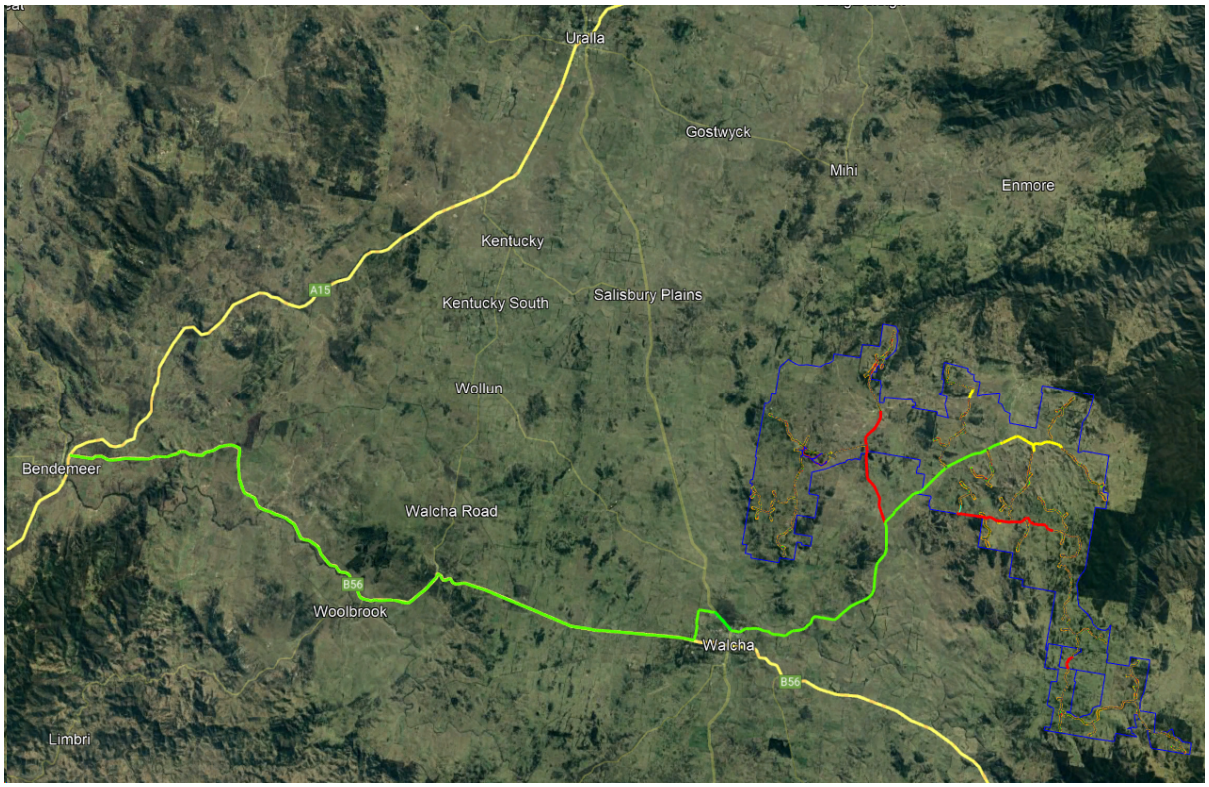
Large quantities of steel reinforcement material is required for the wind turbine generator footings and substations, transmission lines and O&M facilities. Key import locations for the raw product is likely to be Ports of Brisbane, Newcastle, and Kembla. Processing for this quantity of reinforcement is likely to be completed in Brisbane or Western Sydney, where lines are largely automated. Regional opportunities are likely to provide some limited support in areas such as Newcastle, Tamworth, or Toowoomba, which are all considered to be viable options in the project supply chain.

5.6.2 Upgrades Strategy Comparison

icubed performed a brief comparison between Route Options 1, 2 and 3 to compare likely local external road upgrades based on the current layout prepared to date if these were used as the only OSOM or HV routes for the projects; refer to Figure 25, Figure 26, and Figure 27**Error! Reference source not found.**. Noting the colours represent the current standard of the road where red = narrow and unsealed, yellow = wide and unsealed and/or wide and sealed and green = wide sealed and narrow sealed.

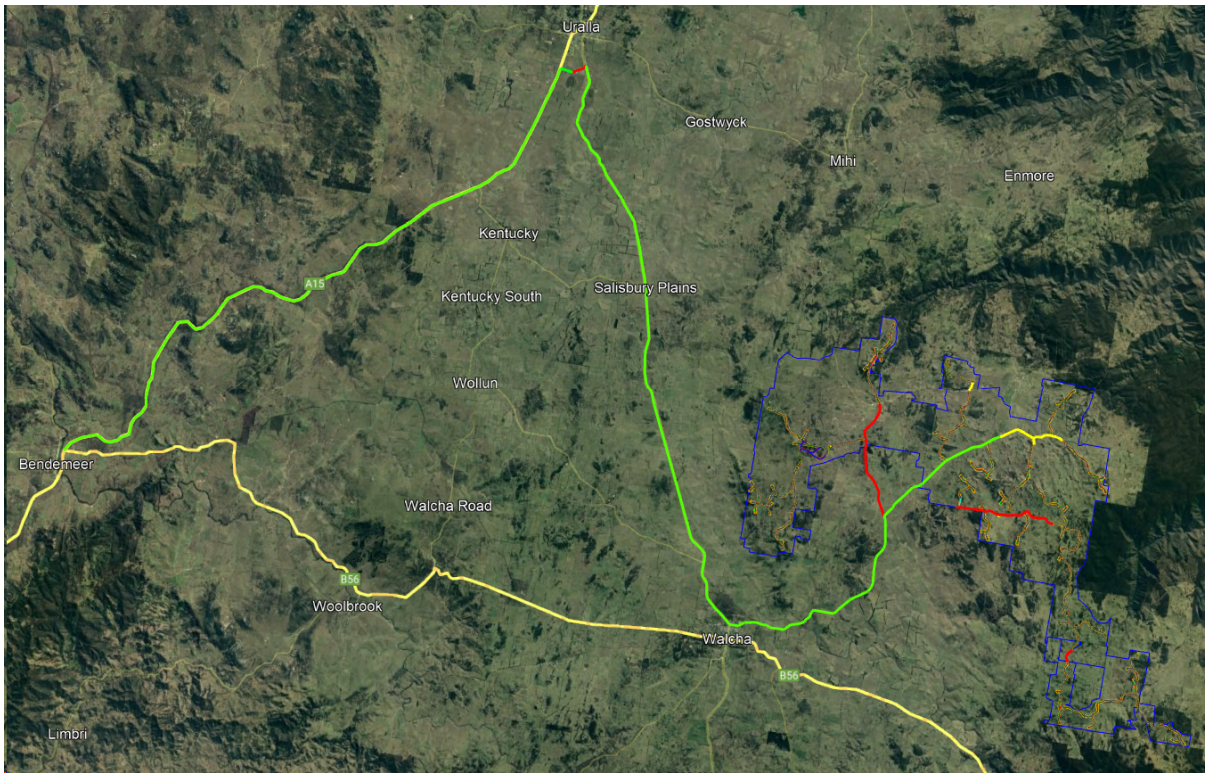
As shown, the site access point for OSOM and HVs will play a part in total external road upgrades central to the project site. Route 1 is the shortest route for potential total upgrades, followed by Route 3 then Route 2.

The large increase in the number of OSOM and HVs using the minor roads in and surrounding Walcha will likely generate impacts to the road pavement (e.g. loss of pavement materials, deterioration and potholes) as in their current state they will be inadequate to cater for the increase in pavement loadings from the freight task. Generally, the state controlled and higher order LGA roads (e.g. New England Highway, Thunderbolts Way), should have adequate pavement strength and formation widening to facilitate the OSOM and HV movements, however a pre-construction dilapidation inspection may be required on the sections of road used by the Project to identify and document the current condition and establish the required maintenance or rehabilitation works.



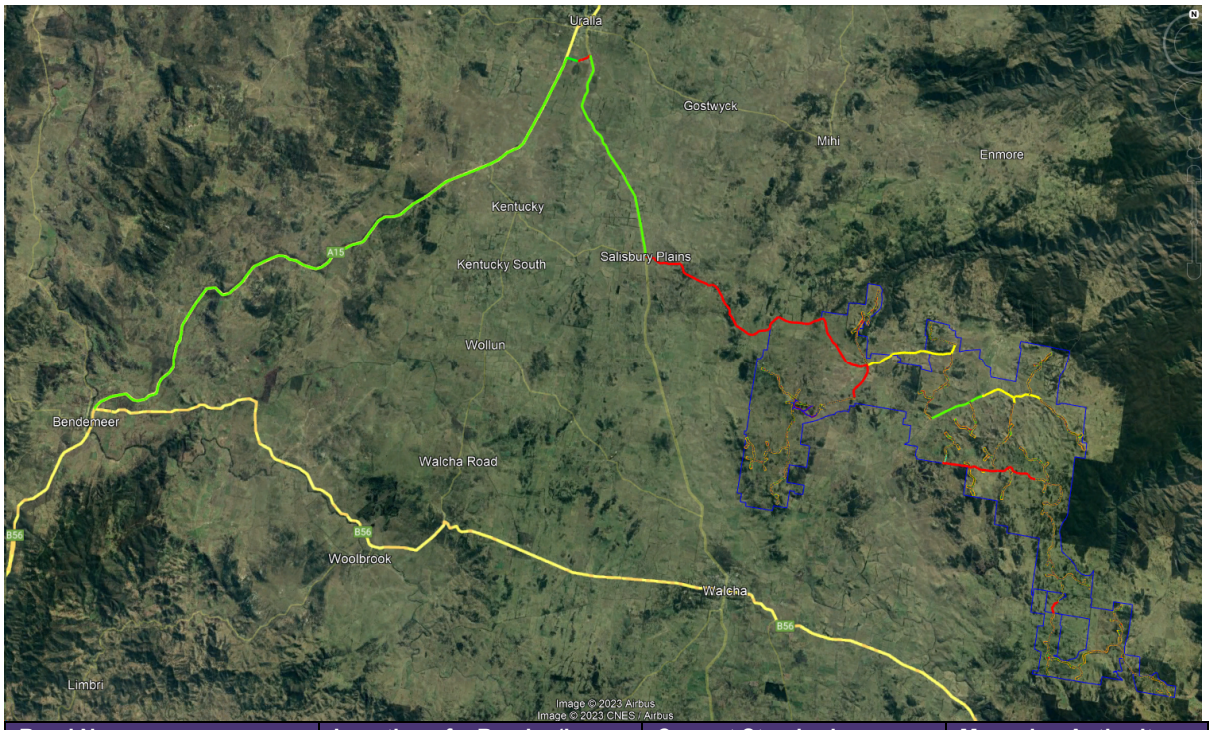
Road Name	Length of Road (km - Approximate)	Current Standard	Managing Authority
New England Highway (*from Bendemeer at Intersection with Oxley Highway)*	44.4km	Sealed	TfNSW
Saleyards Road	1.0km	Sealed - Narrow	Walcha Council
Darjeeling Road	1.95km	Sealed – Narrow	Uralla Shire Council
Thunderbolts Way	1.52km	Sealed	Walcha Council
Jamieson Street	0.58km	Sealed	Walcha Council
Ohio Road	0.98km	Sealed	Walcha Council
Emu Creek Road	9.28km	Sealed – Narrow	Walcha Council
Winterbourne Road	13.4km	Sealed – Narrow	Walcha Council
Blue Mountain Road	9.63km	Unsealed – Narrow	Walcha Council
Uruga Road	0.68km	Unsealed – Wide	Walcha Council
Bark Hut Road	6.61km	Sealed – Narrow	Walcha Council
Table Top Road	4.25km	Sealed – Narrow	Walcha Council
Florida Road	0.40km	Unsealed – Wide	Walcha Council
Rowleys Creek Road	0.93km	Unsealed – Narrow	Walcha Council
TOTAL	95.61km		

Figure 25 - Route 1 Potential Road Upgrades
Source: icubed consulting, 2023



Road Name	Length of Road (km - Approximate)	Current Standard	Managing Authority
New England Highway *(from Bendemeer at Intersection with Oxley Highway)*	44.4km	Sealed	TfNSW
Staces Road	0.80km	Sealed – Narrow	Uralla Shire Council
Unnamed Crown Land/Road	0.96km	Unsealed – Narrow	Uralla Shire Council
Thunderbolts Way	37.3km	Sealed	Uralla Shire Council/ Walcha Council
Jamieson Street	0.58km	Sealed	Walcha Council
Ohio Road	0.98km	Sealed	Walcha Council
Emu Creek Road	9.28km	Sealed – Narrow	Walcha Council
Winterbourne Road	13.4km	Sealed – Narrow	Walcha Council
Blue Mountain Road	9.63km	Unsealed – Narrow	Walcha Council
Uruga Road	0.68km	Unsealed – Wide	Walcha Council
Bark Hut Road	6.61km	Sealed – Narrow	Walcha Council
Table Top Road	4.25km	Sealed – Narrow	Walcha Council
Florida Road	0.40km	Unsealed – Wide	Walcha Council
Rowleys Creek Road	0.93km	Unsealed – Narrow	Walcha Council
TOTAL	130.2km		

Figure 26 - Route 2 Potential Road Upgrades
Source: icubed consulting, 2023



Road Name	Length of Road (km - Approximate)	Current Standard	Managing Authority
New England Highway *(from Bendemeer at Intersection with Oxley Highway)*	44.4km	Sealed	TfNSW
Staces Road	0.80km	Sealed – Narrow in sections	Uralla Shire Council
Unnamed Crown Land/Road	0.96km	Unsealed – Narrow	Uralla Shire Council
Thunderbolts Way	15km	Sealed	Uralla Shire Council
Hillsview Road	12km	Unsealed – Narrow	Uralla Shire Council
Blue Mountain Road	10.46km	Unsealed – Narrow	Uralla Shire Council / Walcha Council
Hazeldean Road	5.83km	Unsealed – Wide	Walcha Council
Uruga Road	0.68km	Unsealed – Wide	Walcha Council
Winterbourne Road	3.80km	Sealed – Narrow	Walcha Council
Table Top Road	4.25km	Sealed (narrow in sections)	Walcha Council
Florida Road	0.40km	Unsealed – Wide	Walcha Council
Bark Hut Road	6.61km	Unsealed – Narrow	Walcha Council
Rowleys Creek Road	0.93km	Unsealed – Narrow	Walcha Council
TOTAL	106.12km		

Figure 27 - Route 3 Potential Road Upgrades
Source: icubed consulting, 2023

5.6.3 A Pro vs. Cons Analysis

A Pros vs Cons Analysis was completed on each of these routes for inbound and outbound OSOM, HV and LV traffic, to understand the potential costs, opportunities, and associated risks for the external route campaign for the project; refer to Table 8. Note the colour coding of the route options is in line with Figure 24.

Table 8 – Pros and Cons Analysis – Local Road Network

Options	INBOUND		OUTBOUND	
	Pros	Cons	Pros	Cons
OSOM				
1. Oxley Highway-Walcha	• Quickest OSOM route to site from Bendemeer • More construction fronts are opened up through south access	• Land agreements with road and rail authorities and private landowners, as well as significant upgrade works at Surveyors Creek Bridge • Community backlash – safety, noise and amenity impacts • Austroads requirements stipulated from Walcha Shire Council for local road upgrades • Vegetation clearing required • Need for pull over bays along Oxley Highway • Construction activities will need to be managed to avoid peak times in Walcha (e.g. school bus times)	• Possible to support return travel for the for the unloaded OSOM vehicles narrower than 3.5m wide without major road upgrade improvements or agreements. • Shortest route back to the new England Highway	• Need for pull over bays along Oxley Highway if vehicles wider than 3.5m utilise this route.

Options	INBOUND		OUTBOUND	
	Pros	Cons	Pros	Cons
2. Uralla Bypass, Thunderbolts, Walcha	• Avoids OSOM loads in Walcha	• Traffic volumes from wind farm construction period causing damage to local roads in Walcha • Community backlash – safety, noise and amenity impacts • Austroads requirements stipulated from Walcha Shire Council for local road upgrades – most local roads impacted • Longest route to site from Bendemeer via Uralla bypass • Vegetation clearing required • Potential for upgrade works required on part of Thunderbolts Way as it isn't an OSOM loaded road • Need to consult both Uralla Shire and Walcha Council • Construction activities will need to be managed to avoid peak times in Walcha (e.g. school bus times) • Intersection Upgrades required at Uralla Bypass		• Longest route back to the New England Highway
3. Uralla Bypass, Hillview Road, north entrance	• Less disturbance to Walcha and local roads within and surrounding the site • Avoids the need for likely local road upgrades for Emu Creek Road, Winterbourne Road, Moona Plains Road, Salesyard Road, Darjeeling Road, Ohio Road, Jamieson Street • Less local council roads used • Hillview Road bypass potential to just be a fit for purpose project road	• Significant realignment and upgrade works required on Hillview Road Bypass • Minor land clearing required on Hillview Road bypass route • Vegetation clearing required • Need to consult both Uralla Shire and Walcha Council • Intersection upgrades required at Uralla Bypass		• Not as convenient as using the Oxley Highway – more time consuming to access site
Heavy Vehicles (HVs) – incl. unescorted empty OSOM				
1. Oxley Highway-Walcha	• If Walcha is the accommodation hub for the Project, this route provides ease of access to the site	• Community backlash from HVs in Walcha		• Community backlash from HVs in Walcha

Options	INBOUND		OUTBOUND	
	Pros	Cons	Pros	Cons
	• Ease of access for raw materials coming from Tamworth			
2. Uralla Bypass, Thunderbolts, Walcha	• Ease of access for raw materials coming from Uralla way	• Community backlash from HVs in Walcha		• Community backlash from HVs in Walcha
3. Uralla Bypass, Hillview Road, north entrance	• Avoids HVs in Walcha • Ease of access for raw materials coming from Uralla way • Avoids the need for likely local road upgrades for Emu Creek Road, Winterbourne Road, Moona Plains Road, Salesyard Road, Darjeeling Road, Ohio Road, Jamieson Street	• Management of vehicles to not access south roads and still use the Hillview Road access point	• Avoids HVs in Walcha	
4. Walcha to South	• If Walcha is the accommodation hub for the Project, this route provides ease of access to the site	• Community backlash from HVs in Walcha		
5. Walcha to North	• If Walcha is the accommodation hub for the Project, this route provides ease of access to the site • Avoids the need for likely local road upgrades for Emu Creek Road, Winterbourne Road, Moona Plains Road, Salesyard Road, Darjeeling Road, Ohio Road, Jamieson Street	• Community backlash from HVs in Walcha		
Light Vehicles (LVs)				
1. Oxley Highway-Walcha				

Options	INBOUND		OUTBOUND	
	Pros	Cons	Pros	Cons
2. Uralla Bypass, Thunderbolts, Walcha)		• Inconvenient for LVs as this is the longest route to site		
3.Uralla Bypass, Hillview Road, north entrance		• Management of LVs to not access south roads and still use the Hillview Road access point		
4. Walcha to South	• If Walcha is the accommodation hub for the Project, this route provides ease of access to the site			
5. Walcha to North	• If Walcha is the accommodation hub for the Project, this route provides ease of access to the site			

6. Identification of Bridge, Road, and Rail Infrastructure

icubed has performed a desktop identification of all rail and bridge infrastructure obstacles along the tower and blade routes including the possible option routes at Tamworth and Uralla; refer to Appendix A. Overall, the port to site route will encounter approximately 133 obstacles, as briefly described in Table 9. A further breakdown for authority is provided in Table 10. Note structures typically controlled by local authorities.

Table 9 – Bridge, Road, Rail Infrastructure Obstacles

Road Obstacle Type	Count
Bridges	55
Potential Bridges/Large Scale Box Culverts	28
Railway Crossings	3
Railway Overpasses	12
Railway Underpasses	4
Road Overpass	9
Road Underpasses	22
TOTAL BRIDGE, ROAD, RAIL OBSTACLES	**133**

Table 10 – Bridge, Road, Rail Infrastructure Obstacles

Local Government Area	Count
Bridges	
TfNSW	34
Muswellbrook Shire Council	4
Tamworth Regional Council	5
Uralla Shire Council	2
Walcha Council	9
Potential Bridges/Large Scale Box Culverts	
TfNSW	6
Muswellbrook Shire Council	2
Tamworth Regional Council	9
Uralla Shire Council	1
Walcha Council	11
Railway Infrastructure	
ARTC/Port	1
ARTC/TfNSW	12
ARTC/Council	
Muswellbrook Shire Council	4
Tamworth Regional	1
Uralla Shire Council	1
Road Infrastructure	
Muswellbrook Shire Council	1
TfNSW	30
TOTAL BRIDGE, ROAD, RAIL OBSTACLES	**133**

A route inspection is recommended to be undertaken along the proposed OSOM route to ensure the identification of all bridge, rail, and culvert structures along these routes. icubed recommends that as part of next steps, liaison occurs with the respective infrastructure owners including TfNSW, ARTC, Councils etc.to advise on height and load limitations and if further formal structural assessment is required. It is recommended that details of these discussions and findings are highlighted in the EIS Response.

Of particular concern, as raised in the Muswellbrook Shire EIS submission, are the rail and bridge infrastructure not identified along the bypass routes which needs further assessment as well the concern that these are not fit for purpose. In particular, the railway overpasses and bridges which may be owned by the respective mining companies in the area. From our assessment as shown in Appendix A, there are seven (7) bridges, five (5) possible bridge/culvert structures, two (2) railway overpasses, three (3) railway underpasses, two (2) road underpasses, and three (3) road underpasses.

6.1 Bridges

Of the bridges crossed by along the OSOM component transport route, fifty-four (54) bridges have been identified which are crossing a river or creek; refer to Appendix A. The other twenty-eight are unnamed from a desktop analysis and of a smaller size with some potentially being box culverts. A site inspection will need to be undertaken to understand if any of the identified bridges/culverts are smaller box-culverts. icubed recommends further liaison with TfNSW/respective councils is undertaken on the identified bridges to confirm their load strength to accommodate OSOM vehicles.

6.2 Rail

Along the Port to site OSOM route, there are three (3) railway crossings, twelve (12) railway overpasses, and four (4) railway underpasses; refer to Appendix A. For the railway overpasses and underpasses, height markings were unable to be identified through a desktop analysis, and thus further consultation is required with each respective authority/council to confirm railway overpass heights and load strengths.

Of particular concern, are the four (4) railway overpasses/underpasses in the Muswellbrook bypass routes that appear to be utilised by the respective mining companies. A consultation with the applicable infrastructure owners and assessment of their respective strengths to accommodate the OSOM loads is required. It can reasonably be assumed that if OSOM mining vehicles use these proposed railway crossings and they are located on HML routes that they should be suffice for wind farm OSOM, however further consultation is recommended to confirm.

7. Next Steps

icubed has conducted a review of the Port to Site route to assist with responding to the EIS Response to Submission as part of the EIS approval process for the Project.

For each constrained section, the following next steps are recommended:

1. **Port of Newcastle**
    - Further consultation and approval from CN, TfNSW and ARTC required. Process to be managed by RJA & Vestas
2. **Muswellbrook Bypass**
    - A preferred strategy for construction and operation/maintenance of the wind farm needs to be further outlined in the EIS
    - Consultation with the respective infrastructure owners for the road, rail and bridge infrastructure including TfNSW, ARTC, Councils to understand if these are fit for purpose and could support the loads and heights of OSOM vehicles – assessment may be required on structures not listed on HML routes
    - Where land acquisition or agreements are required, particularly at intersections, consultation is required with Muswellbrook Council, relevant mining companies and associated landowners – understanding other developers may have progressed discussions.
    - Validation of cadastral data and completing swept path assessments at intersections along bypass route to ascertain if landholder agreements/land acquisition is required.
3. **South Tamworth Bypass**
    - Understand preferred strategy to bypass South Tamworth
    - Active dialogue with Tamworth Regional Council and TfNSW
        - Understand load limit and upgrade requirements to approve as OSOM route
    - Validation of cadastral data and completing swept path assessments at intersections along bypass route to ascertain if landholder agreements/ land acquisition is required.
4. **Oxley Highway (Surveyors Creek Bridge) vs. Uralla Bypass (Staces Road)**

Preferred strategy is as follows in Table 11.

Table 11 – Vehicle Fleet Strategy from Bendemeer to Site

Vehicle Fleet 0.0	Strategy
Police Escorted & Piloted Oversize Overmass (OSOM) vehicles from Port of Newcastle (Blades and Tower Sections, Inbound only)	Use Uralla Bypass (Staces Road) and Thunderbolts Way
Piloted OSOM vehicles – in & out bound, larger Construction plant, transformer inbound, some compacted WTG Component deliveries (e.g., book end trailers, outbound only)	Piloted uncompacted OSOM – use Uralla Bypass (Staces Road) and Thunderbolts Way Unpiloted compacted OSOM – use Oxley Highway (e.g. outbound)
HVs, including Body and Dog / B-Double combinations operating HMLs (e.g. sand, Concrete Binder, Steel reinforcement, Electrical Conductor, Containerised Goods)	From Bendemeer, those originating north or west, use Staces Road and Thunderbolts Way From Bendemeer, those originating south, use Oxley Highway

HV, HVR class vehicles (e.g. sand, fuel, waste, plant mobilisation, cranes, concrete agitators etc.)	From Bendemeer, those originating north or west, use Staces Road and Thunderbolts Way From Bendemeer, those originating south, use Oxley Highway
Light Vehicles, Workforce transit	Use Oxley Highway and Thunderbolts Way – no proposed upgrades

- Uralla Bypass
  - Vestas to understand preferred strategy to site
  - If Hillview Road is further explored;
    - a swept path assessment required on the intersection with Thunderbolts Way
    - a discussion with Uralla Shire Council to ascertain design standard and requirements for the upgrade along this route
  - A design package to be completed on Uralla bypass including swept path analysis and a discussion with Council on design standard

5. Local Road Network

- Understand preferred strategy to site – icubed recommends Jamieson Street
  - Pull over bays may be required on Thunderbolts way – icubed can perform an assessment along Thunderbolts Way to identify potential areas for pull over bays and provide a typical drawing to demonstrate pull-out bays adjacent to Thunderbolts Way for submission to TfNSW
- Zenviron currently managing local road upgrades with Walcha Council
- Landholder agreements with associated impacted allotments may also be required.

6. Bridge, Road and Rail Infrastructure

- A route inspection is recommended to be undertaken along the proposed OSOM route to ensure the identification of all bridge, rail, and culvert structures.
- Liaison recommended with respective infrastructure owners including TfNSW, ARTC, Councils to advise on height and load limitations and if further formal structural assessment is required.

APPENDIX A

Obstacle No.	Location Description	Latitude (°)	Longitude (°)	Council	Authority
1	Railway Crossing	-32.89855	151.75991	Newcastle City	ARTC/Port
2	Railway Overpass	-32.87640	151.71365	Newcastle City	ARTC/TfNSW
3	Bridge (Ironbark Creek Bridge)	-32.85452	151.70289	Newcastle City	TfNSW
4	Road Underpass	-32.82445	151.68385	Newcastle City	TfNSW
5	Railway Overpass	-32.81060	151.67143	Newcastle City	ARTC/TfNSW
6	Road Underpass	-32.81200	151.66578	Newcastle City	TfNSW
7	Road Overpass	-32.83000	151.53152	Cessnock City	TfNSW
8	Road Overpass	-32.82879	151.52844	Cessnock City	TfNSW
9	Bridge (Wallis Creek Bridge)	-32.82764	151.52555	Cessnock City	TfNSW
10	Road Underpass	-32.82513	151.51465	Cessnock City	TfNSW
11	Road Underpass	-32.80994	151.49990	Cessnock City	TfNSW
12	Road Underpass	-32.80896	151.49938	Cessnock City	TfNSW
13	Road Underpass	-32.80198	151.49041	Cessnock City	TfNSW
14	Railway Underpass	-32.80074	151.48331	Cessnock City	ARTC/TfNSW
15	Road Underpass	-32.79727	151.47531	Cessnock City	TfNSW
16	Road Underpass	-32.76291	151.44078	Cessnock City	TfNSW
17	Road Underpass	-32.72399	151.40365	Cessnock City	TfNSW
18	Road Overpass	-32.70795	151.38348	Cessnock City	TfNSW
19	Road Underpass	-32.69256	151.38027	Cessnock City	TfNSW
20	Road Underpass	-32.66853	151.36250	Cessnock City	TfNSW
21	Road Underpass	-32.66817	151.36131	Cessnock City	TfNSW
22	Road Underpass	-32.66557	151.35079	Cessnock City	TfNSW
23	Railway Overpass	-32.66079	151.34077	Cessnock City	ARTC/TfNSW
24	Bridge (Black Creek Bridge)	-32.65592	151.32863	Singleton	TfNSW
25	Bridge (Jump Up Creek Bridge)	-32.65336	151.27267	Singleton	TfNSW
Tower Section OSOM Route					
26	Railway Overpass	-32.64240	151.22730	Singleton	**ARTC/TfNSW**
27	Railway Overpass	-32.62554	151.13561	Singleton	**ARTC/TfNSW**
28	Bridge	-32.62099	151.12177	Singleton	**TfNSW**
29	Railway Overpass	-32.61737	151.10805	Singleton	**ARTC/TfNSW**
30	Road Underpass	-32.61767	151.10239	Singleton	**TfNSW**
31	Bridge/Culverts	-32.60446	151.09808	Singleton	**TfNSW**
32	Bridge	-32.58252	151.07401	Singleton	**TfNSW**
33	Bridge (Cockbridge Bridge)	-32.56638	151.02164	Musselbrook Shire	**TfNSW**
34	Bridge/Culverts	-32.50821	150.92834	Musselbrook Shire	**TfNSW**
35	Bridge (Bowmans Crossing Bridge)	-32.45344	150.84968	Musselbrook Shire	**TfNSW**

36	Bridge/Culverts	-32.43410	150.78771	Musselbrook Shire	**TfNSW**
37	Bridge	-32.35584	150.73579	Musselbrook Shire	**TfNSW**
38	Bridge/Culverts	-32.34430	150.74605	Musselbrook Shire	**TfNSW**
39	Bridge (Keys Bridge)	-32.29050	150.84651	Musselbrook Shire	**Council**
40	Bridge/Culverts	-32.29434	150.82344	Musselbrook Shire	**Council**
41	Railway Overpass	-32.29427	150.81883	Musselbrook Shire	**ARTC/Council**
42	Bridge/Culverts	-32.28849	150.80185	Musselbrook Shire	**Council**
43	Railway Overpass	-32.28637	150.80127	Musselbrook Shire	**ARTC/Council**
44	Road Underpass	-32.26121	150.85218	Musselbrook Shire	**Council**
45	Bridge (Rosebrook Bridge)	-32.26291	150.86307	Musselbrook Shire	**Council**
Blade Route Muswellbrook					
46	Road Underpass	-32.64255	151.23351	Singleton	**TfNSW**
47	Bridge	-32.61537	151.21450	Singleton	**TfNSW**
48	Bridge (Singleton Crossing)	-32.55809	151.17271	Singleton	**TfNSW**
49	Road Underpass	-32.55501	151.15515	Singleton	**TfNSW**
50	Road Underpass	-32.52647	151.13501	Singleton	**TfNSW**
51	Road Overpass	-32.51968	151.12862	Singleton	**TfNSW**
52	Bridge	-32.47502	151.08590	Singleton	**TfNSW**
53	Bridge	-32.46201	151.06981	Singleton	**TfNSW**
54	Road Overpass	-32.41586	151.03274	Singleton	**TfNSW**
55	Road Underpass	-32.41113	151.02061	Singleton	**TfNSW**
56	Road Underpass	-32.40808	150.99611	Singleton	**TfNSW**
57	Road Overpass	-32.40485	150.98920	Singleton	**TfNSW**
58	Road Overpass	-32.39314	150.96826	Musselbrook Shire	**TfNSW**
59	Road Underpass	-32.38149	150.95951	Musselbrook Shire	**TfNSW**
60	Road Overpass	-32.37379	150.96141	Musselbrook Shire	**TfNSW**
61	Road Underpass	-32.35880	150.96506	Musselbrook Shire	**TfNSW**
62	Railway Underpass	-32.33643	150.95384	Musselbrook Shire	**ARTC/TfNSW**
63	Railway Underpass	-32.33158	150.92157	Musselbrook Shire	**ARTC/Council**
64	Railway Underpass	-32.33467	150.90334	Musselbrook Shire	**ARTC/Council**
65	Bridge	-32.19672	150.87324	Musselbrook Shire	**Council**
66	Bridge	-32.19487	150.87638	Musselbrook Shire	**Council**
67	Bridge (Fitzgerald Bridge)	-32.15676	150.88519	Upper Hunter Shire	**TfNSW**
End of bypass					
68	Railway Overpass	-32.13593	150.87689	Upper Hunter Shire	**ARTC/TfNSW**

69	Overpass	-32.05806	150.86833	Upper Hunter Shire	**TfNSW**
70	Railway Overpass	-32.05762	150.86699	Upper Hunter Shire	**ARTC/TfNSW**
71	Bridge	-32.05159	150.85856	Upper Hunter Shire	**TfNSW**
72	Railway Overpass	-31.85563	150.89639	Upper Hunter Shire	**ARTC/TfNSW**
73	Bridge (Blandford Bridge)	-31.78791	150.89801	Upper Hunter Shire	**TfNSW**
74	Bridge (Benhams Bridge)	-31.77230	150.86914	Upper Hunter Shire	**TfNSW**
75	Bridge (Arnolds Bridge)	-31.76468	150.83728	Upper Hunter Shire	**TfNSW**
76	Bridge/Culverts	-31.65864	150.73397	Liverpool Plains Shire	**TfNSW**
77	Bridge	-31.57342	150.81135	Liverpool Plains Shire	**TfNSW**
78	Bridge	-31.54552	150.82920	Liverpool Plains Shire	**TfNSW**
79	Bridge	-31.31391	150.89031	Tamworth Regional	**TfNSW**
80	Bridge	-31.28788	150.90671	Tamworth Regional	**TfNSW**
81	Bridge	-31.11011	150.92938	Tamworth Regional	**TfNSW**
82	Bridge (George Fielder Bridge)	-31.09878	150.93542	Tamworth Regional	**TfNSW**
Tamworth Options					
83	Bridge/Culverts	-31.16697	150.92696	Tamworth Regional	**Council**
84	Bridge/Culverts	-31.16880	150.93941	Tamworth Regional	**Council**
85	Bridge/Culverts	-31.15947	150.97945	Tamworth Regional	**Council**
86	Bridge/Culverts	-31.13796	150.98960	Tamworth Regional	**Council**
87	Bridge (O'Briens Bridge)	-31.13624	150.99041	Tamworth Regional	**Council**
88	Bridge	-31.13117	150.99150	Tamworth Regional	**Council**
89	Bridge (Johnston Bridge)	-31.12491	150.99103	Tamworth Regional	**Council**
90	Bridge/Culverts	-31.08949	151.03865	Tamworth Regional	**Council**
91	Bridge/Culverts	-31.08304	151.04548	Tamworth Regional	**Council**
92	Bridge/Culverts	-31.07938	151.04929	Tamworth Regional	**Council**
93	Bridge/Culverts	-31.07250	151.05780	Tamworth Regional	**Council**
94	Bridge	-31.06368	151.05567	Tamworth Regional	**Council**
95	Bridge/Culverts	-31.06216	151.05438	Tamworth Regional	**Council**
96	Railway Crossing	-31.06005	151.05346	Tamworth Regional	**ARTC/Council**
97	Bridge	-31.05810	151.05390	Tamworth Regional	**Council**
End of Tamworth Options					

98	Bridge	-31.09417	151.01103	Tamworth Regional	**TfNSW**
99	Railway Overpass	-31.09137	151.01431	Tamworth Regional	**ARTC/TfNSW**
100	Bridge	-31.05129	151.05095	Tamworth Regional	**TfNSW**
101	Bridge	-31.02471	151.06907	Tamworth Regional	**TfNSW**
102	Bridge	-30.91404	151.13526	Tamworth Regional	**TfNSW**
103	Bridge	-30.90174	151.14557	Tamworth Regional	**TfNSW**
104	Bridge (Ta Perry Bridge)	-30.89238	151.15655	Tamworth Regional	**TfNSW**
Uralla Bypass					
105	Bridge (Perrys Pond Bridge)	-30.87530	151.16274	Tamworth Regional	**TfNSW**
106	Bridge	-30.82073	151.22411	Tamworth Regional	**TfNSW**
107	Bridge	-30.79410	151.30814	Tamworth Regional	**TfNSW**
108	Bridge	-30.73174	151.43123	Uralla Shire	**TfNSW**
109	Bridge/Culverts	-30.72053	151.45295	Uralla Shire	**TfNSW**
110	Railway Crossing	-30.66610	151.50274	Uralla Shire	**ARTC/Council**
111	Bridge	-30.72325	151.51438	Uralla Shire	**Council**
112	Bridge	-30.82185	151.54123	Uralla Shire	**Council**
113	Bridge/Culverts	-30.83198	151.54020	Uralla Shire	**Council**
114	Bridge	-30.86892	151.55095	Walcha	**Council**
115	Bridge/Culverts	-30.90920	151.56389	Walcha	**Council**
116	Bridge/Culverts	-30.91983	151.56722	Walcha	**Council**
117	Bridge/Culverts	-30.92282	151.56814	Walcha	**Council**
118	Bridge/Culverts	-30.93032	151.57115	Walcha	**Council**
119	Bridge	-30.94314	151.57807	Walcha	**Council**
Oxley Highway					
120	Bridge/Culverts	-30.88099	151.18845	Walcha	**Council**
121	Bridge/Culverts	-30.88052	151.19590	Walcha	**Council**
122	Bridge/Culverts	-30.88037	151.21493	Walcha	**Council**
123	Bridge	-30.90931	151.28744	Walcha	**Council**
124	Bridge/Culverts	-30.96016	151.35792	Walcha	**Council**
125	Bridge/Culverts	-30.96008	151.36185	Walcha	**Council**
126	Bridge	-30.94522	151.40257	Walcha	**Council**
Walcha to Site					
127	Bridge	-30.97177	151.64839	Walcha	**Council**
128	Bridge	-30.91250	151.70072	Walcha	**Council**
129	Bridge	-30.87122	151.80258	Walcha	**Council**
130	Bridge	-30.98663	151.69682	Walcha	Council
131	Bridge	-31.02094	151.84916	Walcha	Council
132	Causeway	-30.89536	151.68814	Walcha	Council
133	Culverts	-30.98412	151.67491	Walcha	Council

APPENDIX B

EnergyCo

Media Release

Tuesday, 5 September 2023

‘PORT TO REZ’ AGREEMENT PAVES THE WAY FOR SMOOTH ENERGY TRANSITION

The NSW Government will upgrade the State’s road network to help accelerate the transition to renewables.

The upgrades will be undertaken in consultation with communities, councils and road users during construction of Renewable Energy Zones (REZs).

Components for renewable energy projects and supporting transmission infrastructure will need to be transported from ports to the REZs along the existing road network. These include wind turbines, towers and transformers.

To support this, the Energy Corporation of NSW (EnergyCo) has finalised a Memorandum of Understanding (MOU) with Transport for NSW (TfNSW) to facilitate the rollout of REZs with road improvements.

The ‘Port to REZ’ MOU ensures TfNSW can assist EnergyCo to:

- identify appropriate corridors for transportation of over-sized and over-mass (OSOM) components to REZs and priority transmission network infrastructure projects
- plan, consult and undertake necessary works to ensure the identified roads can support the anticipated transportation requirements
- develop a strategy and framework to efficiently and safely manage transportation of OSOM loads along these routes.

The agreement relates to coordinating and facilitating necessary upgrades to State road infrastructure where TfNSW is the roads authority.

EnergyCo chief executive James Hay said EnergyCo will lead consultation with renewable generators, landowners and councils around relevant roadworks.

“The Port to REZ MOU between EnergyCo and TfNSW is another example of how we are taking a whole-of-government and community-focussed approach to delivering a clean, reliable and affordable energy system for the State,” Mr Hay said.

“It complements EnergyCo’s agreement with the Department of Planning to establish dedicated resources for assessment of major energy projects in NSW REZs, and EnergyCo’s partnership with the Port of Newcastle to understand the logistics required to support renewable energy development in NSW.”

Anthony Hayes, Transport for NSW Executive Director, Regional Community and Places, said the Transport task associated with these projects is substantial, and the new agreement will aid efficient and collaborative planning with government, local councils and communities.

“For many of these projects, hundreds of massive components will need to be safely and efficiently moved across our road network,” Mr Hayes said.

“By working together, we will ensure the best routes are identified and ready to enable the manoeuvring of these key components to their destinations in the Renewable Energy Zones, with minimal impact to the community.”

Individual developers will still be responsible for addressing their respective road haulage requirements and will need to plan for and implement any necessary measures to ensure OSOM vehicle movements can be accommodated on local road networks to their project sites.

ENDS

Penny Sharpe
Minister for Climate Change, Minister for Energy
Minister for the Environment, Minister for Heritage
Leader of the Government in the Legislative Council

Yasmin Catley
Minister for the Hunter, Minister for Police and Counter-terrorism

Jenny Aitchison
Minister for Regional Transport and Roads

Media Release

NSW Budget delivers road upgrades to support renewables boom

Tuesday, 18 June 2024

NSW regions from Newcastle to Dubbo and surrounds will benefit from a $128.5 million investment to upgrade roads for drivers and allow for the transportation of components for renewable energy projects.

In addition to a series of state road upgrades, the funding will support preliminary planning for a logistics precinct at the Port of Newcastle, where large and heavy components will be stored and then loaded for delivery to project construction sites.

This 2024-25 Budget investment by the Minns Labor Government will build better communities for NSW, by ensuring we have the roads, infrastructure and affordable renewable energy we need.

Road upgrades will enable transportation of critical components required for the construction of new renewable infrastructure from Newcastle to the Renewable Energy Zones via the existing road network. The components will include wind turbine blades, batteries and transformers.

The initial road upgrades will prioritise the route from the Port of Newcastle to the Central-West Orana Renewable Energy Zone near Dubbo. A portion of the route will also be used for transportation to the New England Renewable Energy Zone.

Individual developers will need to ensure vehicle movements can be accommodated on any additional local roads to their project sites.

Quote attributable to NSW Minister for Climate Change and Energy Penny Sharpe:

“This investment is a win-win. $128.5 million in the 2024-25 Budget to not only improve the roads we drive on, but also ensure the construction of more renewable energy projects which will drive down power bills.

“To build solar and wind farms and our new transmission network we’ll need trucks to carry their components to sites. Upgrading the roads ensures deliver can happen quickly and safely.”

Quote attributable to NSW Minister for the Hunter Yasmin Catley:

“The Hunter is central to the transformation of our energy system and investments like these will ensure our region continues to prosper into the future.

“Port to Project will upgrade our road network, making it safer for all drivers, and create a logistics hub at Newcastle Port.

“Transforming our energy market is a challenge but it’s one the NSW Government takes seriously. We are investing in significant infrastructure and programs to ensure the Hunter remains an energy

powerhouse."

Quote attributable to NSW Minister for Regional Transport and Roads Jenny Aitchison:

"Regional roads connect our local communities and this must be a vital consideration for all major infrastructure projects, including renewable energy projects.

"Making this investment in the Port to Project transport route ensures they remain safe and secure for all road users."

MEDIA:

Natalie Peters | Minister Sharpe | 0403 177 343

Ashley Wick | Minister Catley | 0484 762 351

Wendy Fitzgibbon | Minister Aitchison | 0408 427 540

Appendix L

Rail Authority Correspondence

Oliver Mihaila

From: Michelle Caldwell-Shaw <MCaldwell-Shaw@ARTC.com.au>
Sent: Wednesday, 16 December 2020 11:10 AM
To: Michael Willson
Cc: ODL Permits
Subject: FW: Wind Farm Route Assessment - Selwyn Street level crossing
Attachments: DBY - Draft RJA Route Survey Newcastle Port to Doughboy WF REV01 (reduced).pdf; RJA Route Survey Newcastle Port to Winterbourne WF REV01 reduced.pdf

Hi Michael

Thank you for contacting ARTC regarding the proposed movements of windfarm components from the Newcastle Port to Doughboy and Winterbourne.

I have quickly reviewed the load sizes and advise that the majority if not all will require management of the movement across every ARTC level crossing. This will require the attendance of an ARTC accredited Rail Protection Officer for every movement across every ARTC level crossing, due to the length of the load. The timings on level crossings are not set for these long loads.

Noting that ARTC is to be notified of the proposed Protection officers in advance of any movement taking place.

There may be 2 loads to Winterbourne ie the 26m long and the 19m long, that **may** not require management of the crossings. Timing on each level crossing will need to be checked to ensure that the timing is adequate for these 2 length loads only.

Hubs (5.0l x 4.4w x 4.0h x 64.0T) Configuration. Prime mover with 6x8 Platform Overall dimension: 26.0l x 4.5w x 5.1h x 108.5T

Cooler tops (5.2l x 2.3w x 3.0h x 2.3T) Configuration. Prime mover with 3x4 Semi Overall dimension: 19.0l x 2.5w x 4.3h x 42.5T

If you require additional information please contact me.

Regards

Michelle

Michelle Caldwell-Shaw
Third Party Projects. Portfolio Manager
Third Party Projects

ARTC

P.
M. 0403 387 057
E. MCaldwell-Shaw@ARTC.com.au

Australian Rail Track Corporation
97-99 Bakehouse Road
Kensington VIC 3031

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From: Michael Willson <mike@amber.org.au>
Sent: Tuesday, 15 December 2020 12:45
To: Michelle Caldwell-Shaw <MCaldwell-Shaw@ARTC.com.au>
Subject: [EXT] Wind Farm Route Assessment - Selwyn Street level crossing

Hi Michelle,

Thanks for your time on the phone earlier.

As discussed, we have been engaged as the traffic engineers for the Doughboy and Winterbourne Wind Farms and are currently preparing Traffic Impact Assessments for the projects which are to be included within the Environmental Impact Statement. A Route Assessment has been undertaken for both projects which has been prepared by Rex J Andrews (see attached).

Both projects are very similar in that the plant is almost identical. All plant is to be imported to the Port of Newcastle and then delivered to the site to the north-west which would require the OSOM vehicles to pass over the level crossing on Selwyn Street.

As we are only preparing the Traffic Impact Assessment we are not after a permit at this stage but what we are seeking is some initial comment from ARTC as to whether there would be any issues with these vehicles passing over the level crossing. A permit would be sought by the appointed contractor at a later date.

If you could please provide a response or put us in touch with the correct person to liaise with that would be much appreciated.

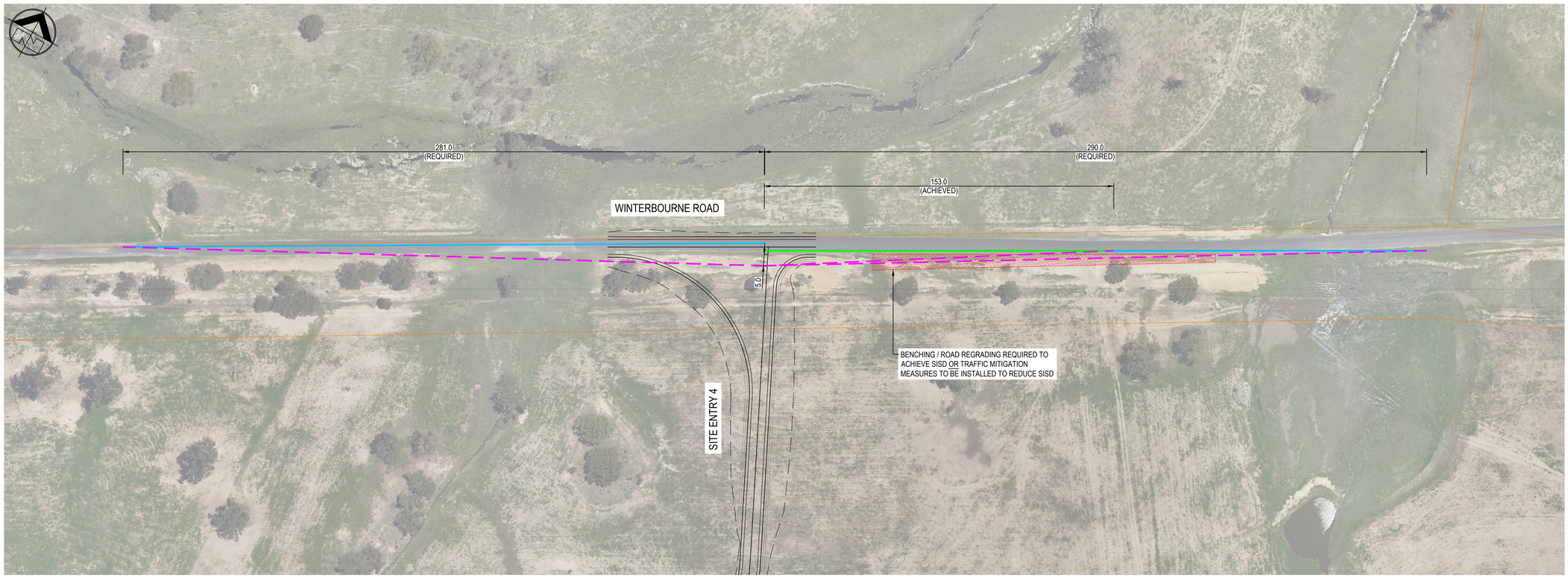
Kind Regards

Mike Willson
BE (Hons) CPEng RPEQ
Director - Traffic Engineering

Ph: +61 432 022 363

Appendix M

Sight Distance Plans
(prepared by icubed consulting)



SISD LEGEND

- LINE OF SIGHT
- REQUIRED SISD
- ACHIEVED SISD (IF LESS THAN REQUIRED)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

WINTERBOURNE ROAD SITE ENTRY 4 - SISD

SCALE 1:1000

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	P.J.M.	P.J.M.	J.M.	J.M.	07.06.2024

REVISION HISTORY

icubed consulting
innovation ingenuity inspiration
Development Services | Engineering | Project Delivery
www.icubed.com.au

Vestas
Winterbourne Wind

SIZE A1 | SCALE AS SHOWN

STATUS
PRELIMINARY
NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM
GDA2020 MGA Z56

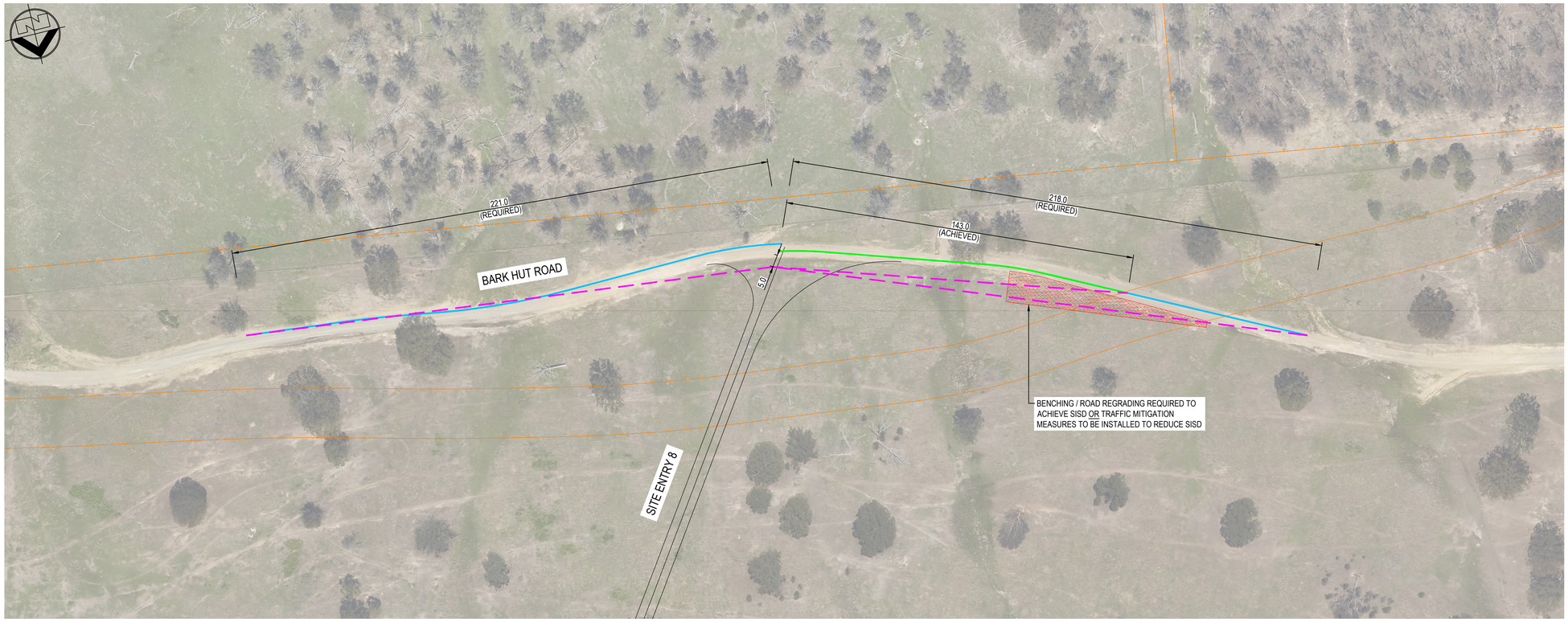
PROJECT
WINTERBOURNE WIND FARM

TITLE
WINTERBOURNE ROAD
SITE ENTRY 4
SISD PLAN

DRAWING No. 22-094-WWF-EXT-0028-2

REV A

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SISD LEGEND

- LINE OF SIGHT
- REQUIRED SISD
- ACHIEVED SISD (IF LESS THAN REQUIRED)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

BARK HUT ROAD SITE ENTRY 8 - SISD

SCALE 1:1000

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	P.J.M.	P.J.M.	J.M.	J.M.	07.06.2024

REVISION HISTORY

icubed consulting
innovation ingenuity inspiration
Development Services | Engineering | Project Delivery
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Vestas
Winterbourne Wind

SIZE A1 | SCALE AS SHOWN

STATUS PRELIMINARY
NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM
GDA2020 MGA Z56

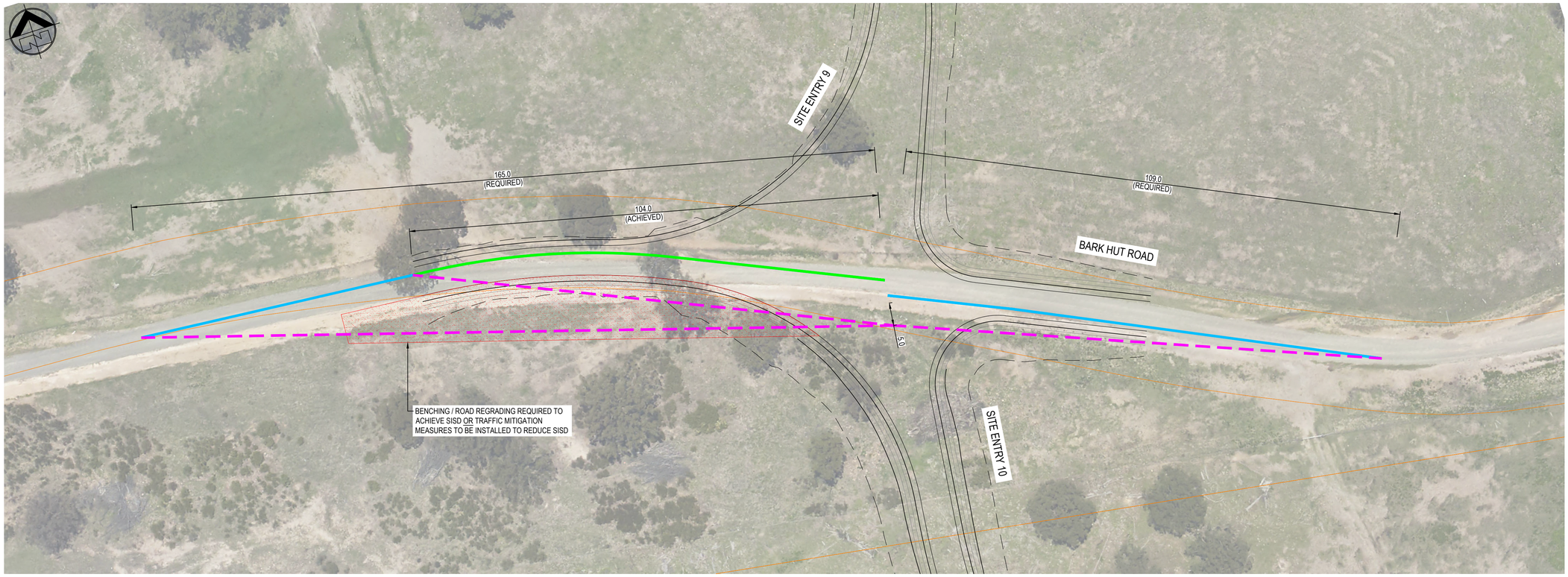
PROJECT WINTERBOURNE WIND FARM

TITLE BARK HUT ROAD
SITE ENTRY 8
SISD PLAN

DRAWING No. 22-094-WWF-EXT-0032-2

REV A

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BARK HUT ROAD SITE ENTRY 10 - SISD

SCALE 1:500

SISD LEGEND

- LINE OF SIGHT
- REQUIRED SISD
- ACHIEVED SISD (IF LESS THAN REQUIRED)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	P.J.M.	P.J.M.	J.M.	J.M.	07.06.2024

REVISION HISTORY

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Vestas
Winterbourne Wind

SIZE A1 | SCALE AS SHOWN

STATUS PRELIMINARY
NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM
GDA2020 MGA Z56

PROJECT
WINTERBOURNE WIND FARM

TITLE
BARK HUT ROAD
SITE ENTRY 10
SISD PLAN

DRAWING No. 22-094-WWF-EXT-0034-2

REV A

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BARK HUT ROAD SITE ENTRY 11 - SISD

SCALE 1:1000

SISD LEGEND

- LINE OF SIGHT
- REQUIRED SISD
- ACHIEVED SISD (IF LESS THAN REQUIRED)

NOTES

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No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	P.J.M.	P.J.M.	J.M.	J.M.	07.06.2024

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Vestas
Winterbourne Wind

SIZE A1 | SCALE AS SHOWN

STATUS PRELIMINARY
NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM
GDA2020 MGA Z56

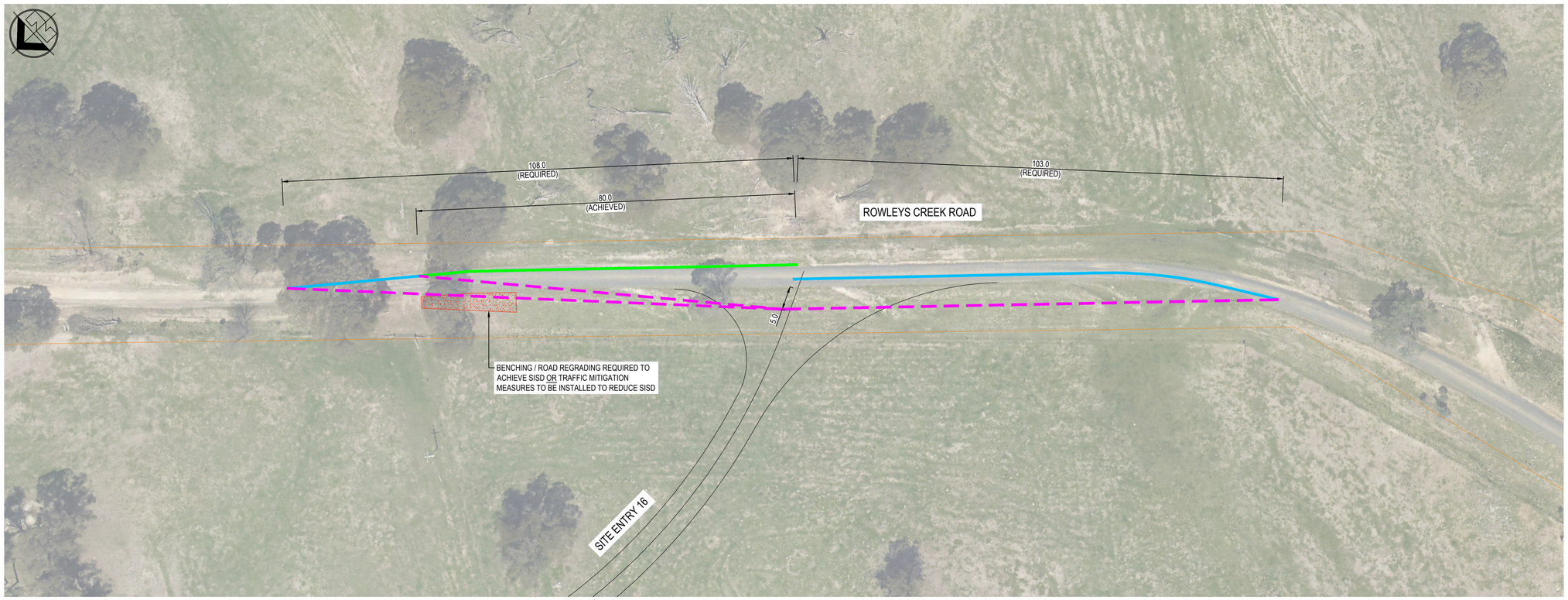
PROJECT WINTERBOURNE WIND FARM

TITLE BARK HUT ROAD
SITE ENTRY 11
SISD PLAN

DRAWING No. 22-094-WWF-EXT-0035-2

REV A

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ROWLEYS CREEK ROAD SITE ENTRY 16 - SISD

SCALE 1:250

SISD LEGEND

- LINE OF SIGHT
- REQUIRED SISD
- ACHIEVED SISD (IF LESS THAN REQUIRED)

NOTES

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No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	P.J.M.	P.J.M.	J.M.	J.M.	07.06.2024

REVISION HISTORY

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Vestas
Winterbourne Wind

SIZE A1 | SCALE AS SHOWN

STATUS PRELIMINARY
NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM
GDA2020 MGA Z56

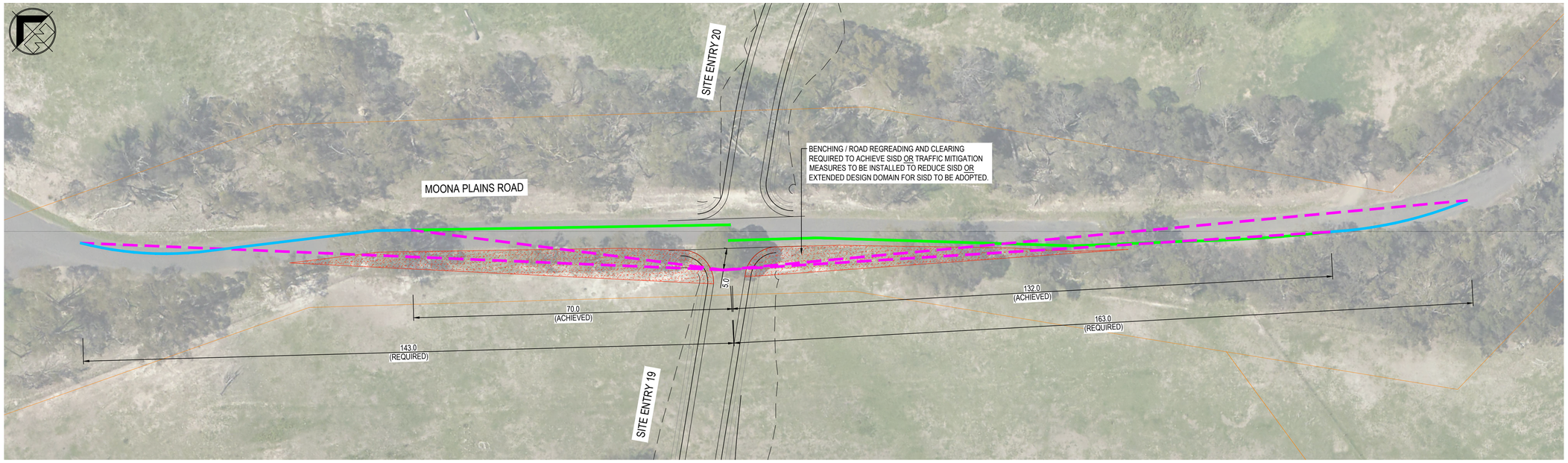
PROJECT WINTERBOURNE WIND FARM

TITLE ROWLEYS CREEK ROAD
SITE ENTRY 16
SISD PLAN

DRAWING No. 22-094-WWF-EXT-0039-2

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MOONA PLAINS ROAD SITE ENTRY 19 - SISD

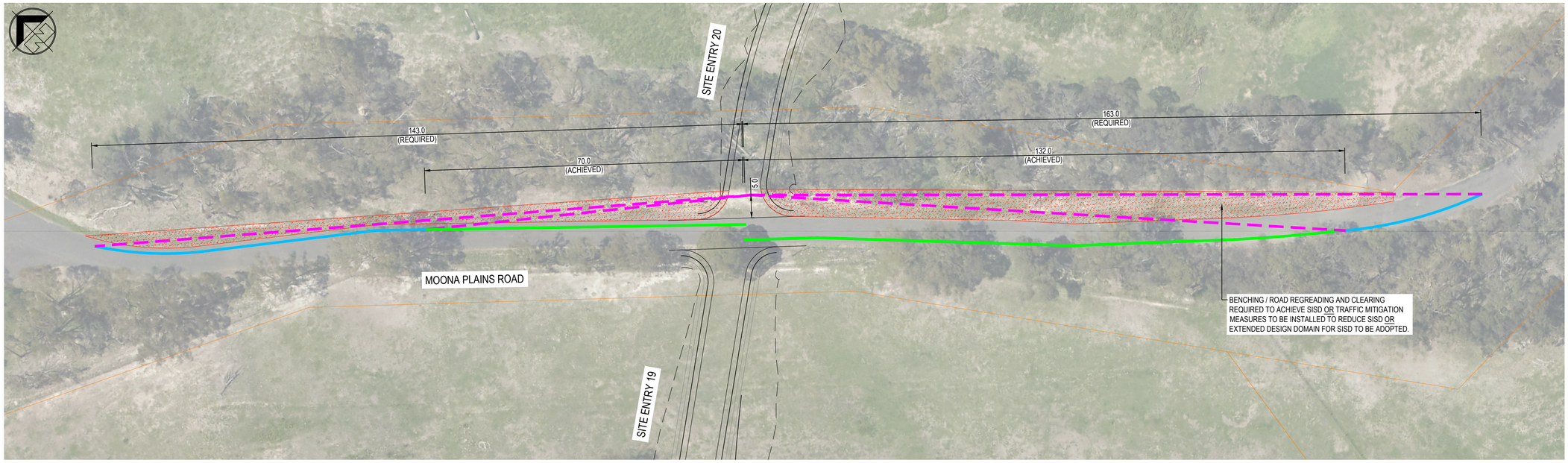
SCALE 1:500

SISD LEGEND

- LINE OF SIGHT
- REQUIRED SISD
- ACHIEVED SISD (IF LESS THAN REQUIRED)

NOTES

1. NO TOPOGRAPHICAL, FEATURE OR CADASTRAL SURVEY HAS BEEN UNDERTAKEN. EXISTING ROADS, SERVICES, FENCE LINES, BOUNDARIES ETC. HAVE BEEN SOURCED FROM THE NSW SPATIAL DATA PORTAL OR TRACED FROM AN AERIAL IMAGE AND ARE SHOWN INDICATIVELY ONLY.
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MOONA PLAINS ROAD SITE ENTRY 20 - SISD

SCALE 1:500

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	P.J.M.	P.J.M.	J.M.	J.M.	07.06.2024

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Vestas

Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	MOONA PLAINS ROAD SITE ENTRY 19 & 20 SISD PLAN
DRAWING No.	22-094-WWF-EXT-0041-2
REV	A

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MOONA PLAINS ROAD SITE ENTRY 21 - SISD

SCALE 1:500



MOONA PLAINS ROAD SITE ENTRY 22 - SISD

SCALE 1:500

SISD LEGEND

- LINE OF SIGHT
- REQUIRED SISD
- ACHIEVED SISD (IF LESS THAN REQUIRED)

NOTES

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No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	P.J.M.	P.J.M.	J.M.	J.M.	07.06.2024

REVISION HISTORY

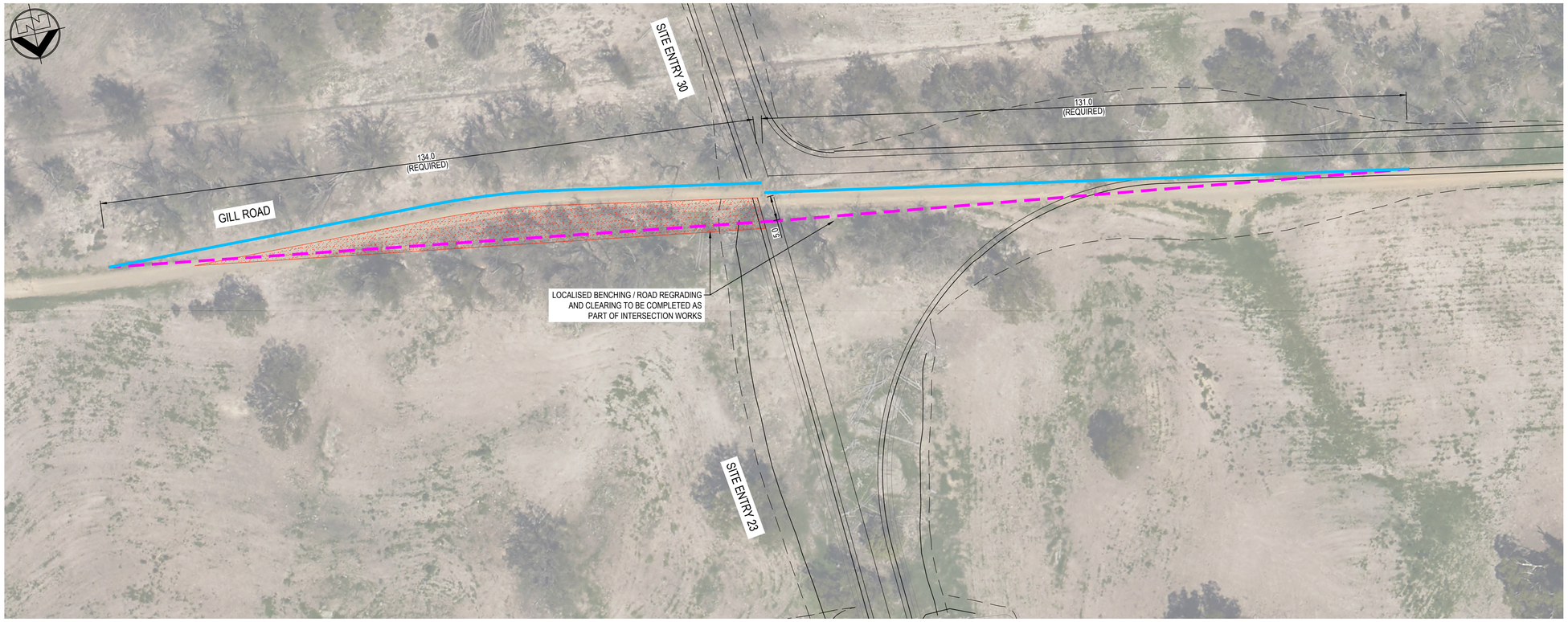
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Vestas

Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	MOONA PLAINS ROAD SITE ENTRY 21 & 22 SISD PLAN
DRAWING No.	22-094-WWF-EXT-0042-2
REV	A

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GILL ROAD SITE ENTRY 23 - SISD

SCALE 1:500

SISD LEGEND

- LINE OF SIGHT
- REQUIRED SISD
- ACHIEVED SISD (IF LESS THAN REQUIRED)

NOTES

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2. INTERSECTION PLAN DESIGN, SIGNAGE AND GRADING TO BE CONFIRMED IN SUBSEQUENT STAGES OF DESIGN.

REVISION HISTORY

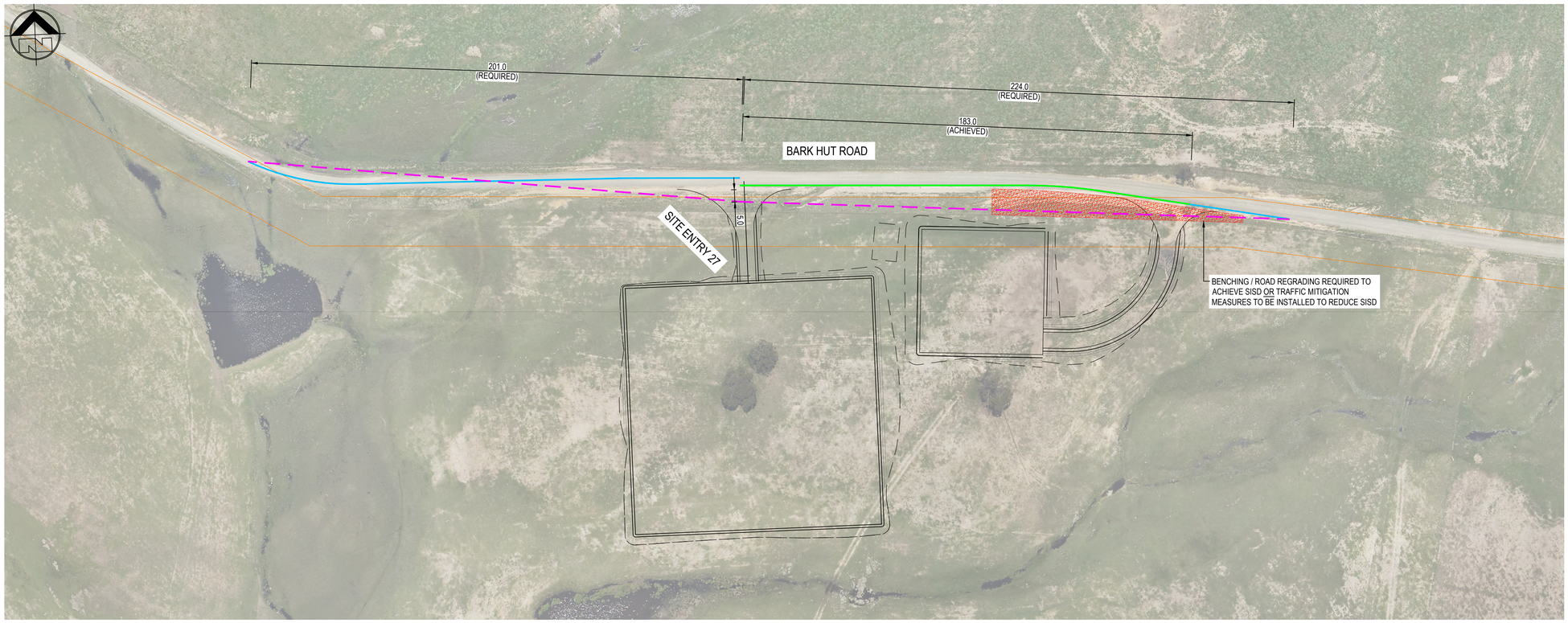
No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	P.J.M.	P.J.M.	J.M.	J.M.	07.06.2024

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Vestas
Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	GILL ROAD SITE ENTRY 23 SISD PLAN
DRAWING No.	22-094-WWF-EXT-0043-2
REV	A

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SISD LEGEND

- LINE OF SIGHT
- REQUIRED SISD
- ACHIEVED SISD (IF LESS THAN REQUIRED)

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BARK HUT ROAD SITE ENTRY 27 - SISD

SCALE 1:1000

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	P.J.M.	P.J.M.	J.M.	J.M.	07.06.2024

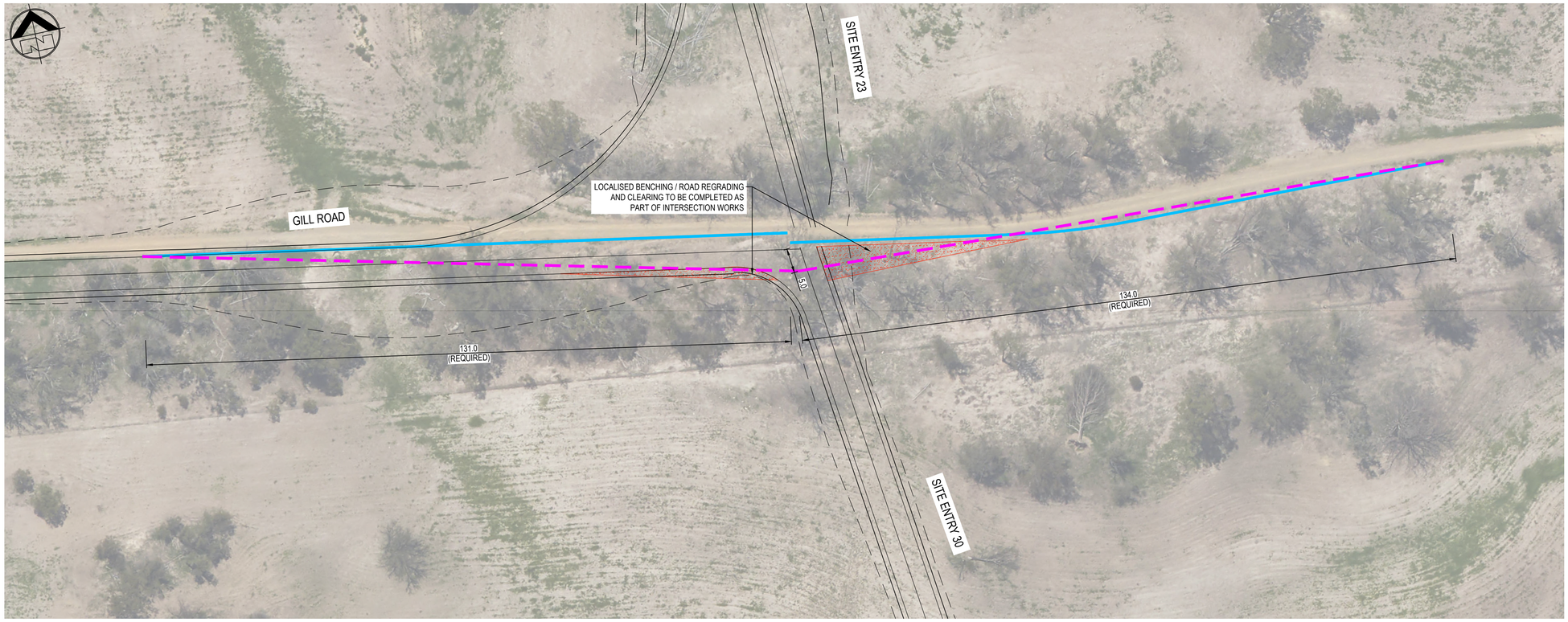
REVISION HISTORY

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Vestas
Winterbourne Wind

SIZE	A1
SCALE	AS SHOWN
STATUS	PRELIMINARY NOT FOR CONSTRUCTION
COORDINATE REFERENCE SYSTEM	GDA2020 MGA Z56
PROJECT	WINTERBOURNE WIND FARM
TITLE	BARK HUT ROAD SITE ENTRY 27 SISD PLAN
DRAWING No.	22-094-WWF-EXT-0047-2
REV	A

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SISD LEGEND

- LINE OF SIGHT
- REQUIRED SISD
- ACHIEVED SISD (IF LESS THAN REQUIRED)

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GILL ROAD SITE ENTRY 30 - SISD

SCALE 1:500

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
A	FOR REVIEW	P.J.M.	P.J.M.	J.M.	J.M.	07.06.2024

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Vestas
Winterbourne Wind

SIZE A1 | SCALE AS SHOWN

STATUS PRELIMINARY
NOT FOR CONSTRUCTION

COORDINATE REFERENCE SYSTEM
GDA2020 MGA Z56

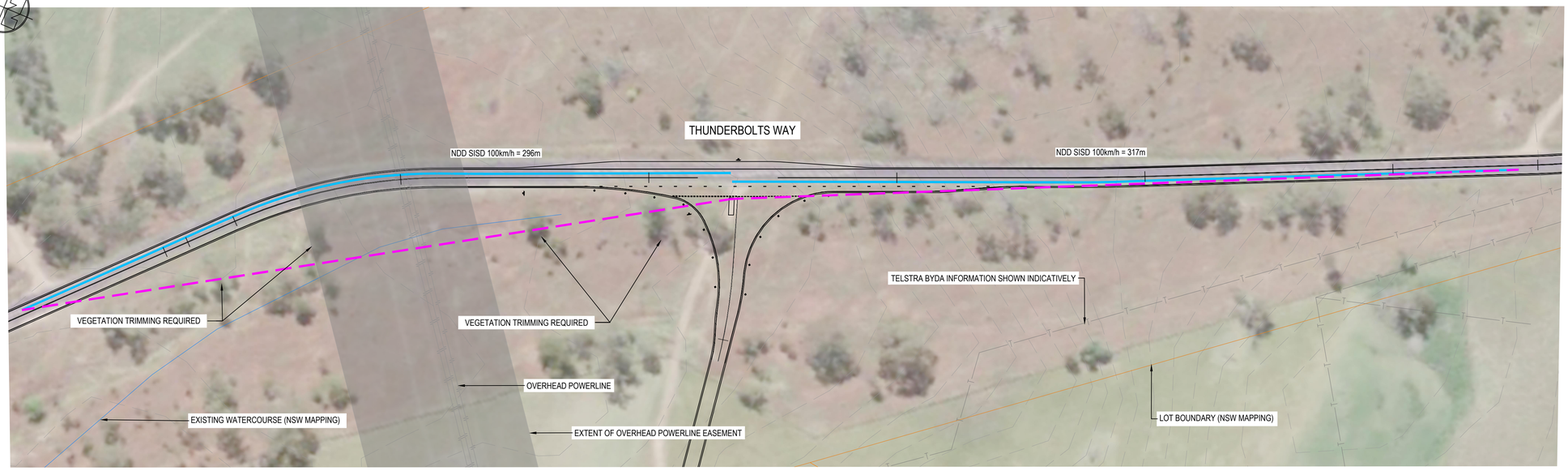
PROJECT
WINTERBOURNE WIND FARM

TITLE
GILL ROAD
SITE ENTRY 30
SISD PLAN

DRAWING No. 22-094-WWF-EXT-0055-2

REV A

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SWITCHYARD ACCESS - THUNDERBOLTS WAY INTERSECTION SISD PLAN

SCALE 1:1,000

SISD LEGEND

- LINE OF SIGHT
- REQUIRED SISD

INTERSECTION SIGHT DISTANCES

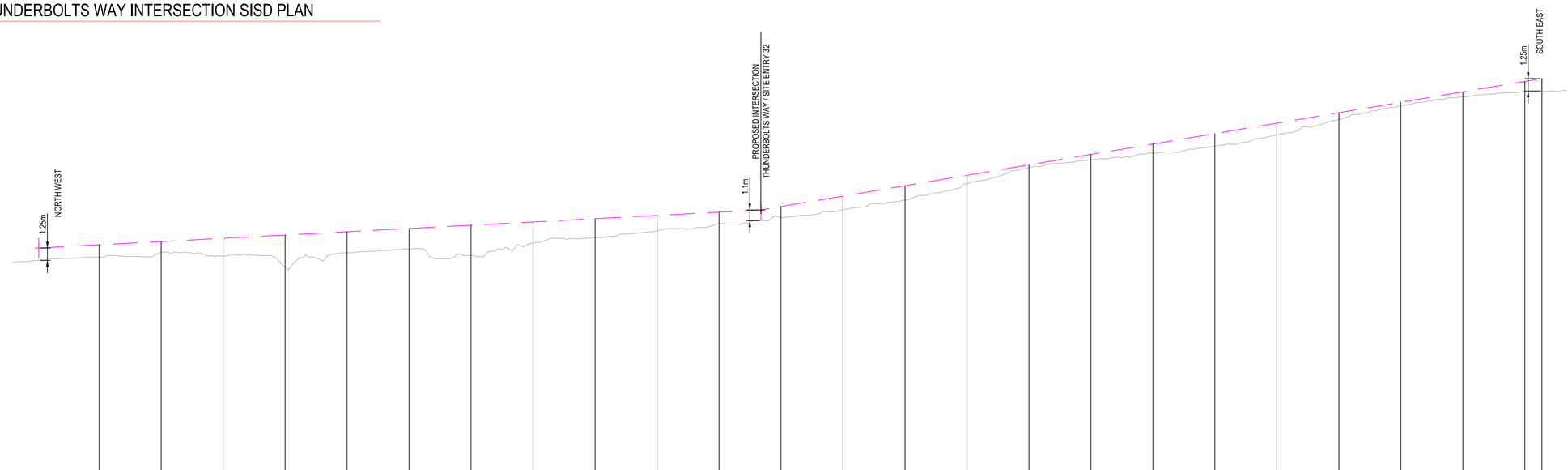
AUSTROADS - GUIDE TO ROAD DESIGN PARTS 3 & 4a

SISD - SAFE INTERSECTION SIGHT DISTANCE

THUNDERBOLTS WAY

1.1m	DRIVERS EYE HEIGHT
1.25m	OBJECT HEIGHT
3.0s	OBSERVATION TIME
2.5s	REACTION TIME
d=0.36	DECELERATION VALUE
V=110km/h	OPERATING (85th PERCENTILE) SPEED

CALCULATED SIGHT DISTANCES (INCLUDING CORRECTION FOR GRADES)	
ROAD	SISD (m)
THUNDERBOLTS WAY NORTHWEST	296
THUNDERBOLTS WAY SOUTHEAST	317



DATUM R.L. 1034.000

LINE OF SIGHT		1058.703	1059.032	1059.361	1059.689	1060.018	1060.347	1060.676	1061.004	1061.333	1061.662	1061.991	1062.554	1063.604	1064.654	1065.705	1066.755	1067.805	1068.856	1069.906	1070.956	1072.007	1073.057	1074.107	1075.157	1075.448	
EXISTING SURFACE	1057.131	1057.476	1057.941	1057.558	1056.449	1057.894	1058.270	1057.621	1058.887	1059.422	1060.124	1060.827	1061.445	1062.223	1063.212	1064.845	1066.474	1067.244	1067.943	1068.635	1069.780	1071.315	1072.729	1073.605	1074.189	1074.198	
CHAINAGE	0.000	25.000	50.000	75.000	100.000	125.000	150.000	175.000	200.000	225.000	250.000	275.000	300.000	325.000	350.000	375.000	400.000	425.000	450.000	475.000	500.000	525.000	550.000	575.000	600.000	606.909	

SWITCHYARD ACCESS - THUNDERBOLTS WAY SISD LONGITUDINAL SECTION

HORIZ. SCALE 1:1,000
VERT. SCALE 1:250

No	DESCRIPTION	DES	DRN	CHK	APP	DATE
B	CHANGE IN REACTION TIME	A.G.	A.G.	J.M.	J.M.	22.08.2024
A	PRELIMINARY DESIGN	A.G.	A.G.	J.M.	J.M.	19.08.2024

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Vestas

SIZE A1 | SCALE AS SHOWN

STATUS PRELIMINARY
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COORDINATE REFERENCE SYSTEM
GDA2020 MGA Z56

PROJECT WINTERBOURNE WIND FARM

TITLE SWITCHYARD ACCESS - THUNDERBOLTS WAY SISD PLAN SHEET 4 OF 4

DRAWING No. 22-094-WWF-EXT-0057-4

REV B

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