APPENDIX G TRAFFIC AND TRANSPORT ASSESSMENT

Hills of Gold Wind Farm
Traffic and Transport Assessment

Prepared for:

Wind Energy Partners

12 November 2020

The Transport Planning Partnership

E: info@ttpp.net.au

Hills of Gold Wind Farm

Traffic and Transport Assessment

Client: Wind Energy Partners

Version: V07

Date: 12 November 2020

TTPP Reference: 18289

Quality Record

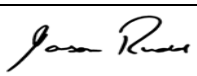
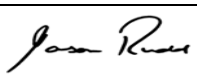
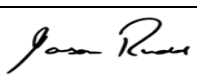
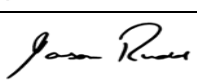
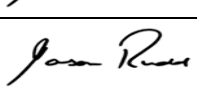
Version	Date	Prepared by	Reviewed by	Approved by	Signature
V01	21/08/20	S. Read	J. Rudd	J. Rudd	
V02	4/09/20	S. Read	J. Rudd	J. Rudd	
V03	22/09/20	S. Read	J. Rudd	J. Rudd	
V04	02/10/20	S. Read	J. Rudd	J. Rudd	
V05	16/10/20	S.Read	J.Rudd	J.Rudd	
V06	30/10/20	S.Read	J.Rudd	J.Rudd	
V07	12/11/20	S.Read	J.Rudd	J.Rudd	

Table of Contents

Tables

Figures

APPENDICES

1 Introduction

The Transport Planning Partnership (TTPP) has been commissioned by Wind Energy Partners (WEP) to undertake a traffic and transport assessment of the proposed Hills of Gold Wind Farm (the Project) south east of Nundle. The Project proposes the construction of up to 70 Wind Turbines and ancillary infrastructure on the site over a period of approximately two (2) years.

The purpose of this report is to present the findings of the traffic and transport assessment as part of the Environmental Impact Statement (EIS) prepared for the Project. Specifically, this assessment has addressed the State Environmental Assessment Requirements (SEARs) that relate to traffic and transport aspects of the of the EIS.

The report also addresses the outcomes of community feedback, consultation with Councils, preliminary concept design and input from biodiversity selection of the Devil's Elbow design.

1.1 Background

The Project involves the construction, operation, and commissioning of a wind farm with up to 70 wind turbine generators (WTG), together with associated and ancillary infrastructure.

The Project consists of the following key components:

- up to 70 WTGs, each with:
  - a maximum height of 230 m AGL (to the blade tip) with a generating capacity of approximately 6MW;
  - a 4-7 part tubular steel tower holding the nacelle;
  - three blades mounted to a rotor hub and the gearbox and generator assembly housed in the nacelle;
  - adjacent hardstands for use as crane pads and assembly / laydown areas;
- decommissioning of three current monitoring masts and installation of up to five additional monitoring masts for power testing. The five monitoring masts will be located close to a WTG location and will have the same WTG hub height. The exact number and location will be defined at the detailed design stage;
- a central 33kV/330kV electrical substation, including transformers, insulators, switchyard, and other ancillary equipment;
- an operations and maintenance facility;
- a battery energy storage system;
- an internal private access road network (up to a combined total length of approximately 48.5 km) connecting the WTGs and other Project infrastructure to the public road network;

- aboveground and underground 33kV electrical reticulation and fibre optic cabling connecting the WTGs to the onsite substation (following site access tracks where possible);
- a 330kV overhead transmission line to connect the onsite substation to the existing 330kV TransGrid Liddell to Tamworth overhead transmission line network, located approximately 21 km west of the substation. A switching station will be constructed to connect the Project to the 330kV TransGrid Liddell to Tamworth line; and
- upgrades to local roads and waterway crossings, as required for the delivery, installation and maintenance of WTG components and other associated materials and structures.

The following temporary elements will be required during construction of the Project:

- temporary site buildings and facilities for construction contractors / equipment, including site offices, car parking and amenities for the construction workforce;
- two temporary concrete batching plants to supply concrete for WTG footings and substation construction works;
- earthworks for access roads, WTG platforms and foundations, including blasting;
- potentially rock crushing facilities for the generation of suitable aggregates for concrete batching or sized rock for access road and hardstand construction;
- up to seven hardstand laydown areas for the temporary storage of construction materials, plant, and equipment construction;
- external water supply and aggregates / materials for concrete batching and construction activities; and
- the transport, storage and handling of fuels, oils and other hazardous materials for construction and operation of wind farm infrastructure.

1.2 Report Structure

This report is structured as follows:

- Section 2 Existing Conditions: This section describes the existing road network and traffic volumes.
- Section 3 Traffic Impacts: This section assesses the traffic impacts of the proposed development during construction and in the operational period. It also includes an assessment of the heavy vehicle routes and oversized and over mass transportation.
- Section 4 Mitigation Measures: this section recommends measures that should be adopted to minimise the impacts of the impacts of the construction and operational phases of the Project.
- Section 5 Conclusions: this section summarises the findings of the study and draws conclusions from the information presented in this report.

1.3 State Environmental Assessment Requirements

The State Environmental Assessment Requirements (SEARs) are a set of requirements that the Environmental Impact Statement (EIS) must address. The SEARs for the Project that relate to traffic and transport are set out in Table 1.1.

Table 1.1: Traffic and Transport SEARs

SEARs	Addressed in this Report
Assess the construction and operational traffic impacts of the development.	Refer to Section 4
Provide details of traffic volumes (both light and heavy vehicles) and transport routes during construction and operation, including traffic associated with sourcing raw materials (water, sand, and gravel).	Refer to Section 3.3
Assess the potential traffic impacts of the project on road network function including intersection performance and site access arrangements and road safety, including school bus routes.	Refer to Section 3.5
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) during construction and operation.	Refer to Section 3.5 and Section 3.6
Provide details of measures to mitigate and / or manage potential impacts including a schedule of all required road upgrades, road maintenance contributions, and any other traffic control measures, developed in consultation with the relevant road authority.	Refer to Section 4 of this report

1.4 Stakeholder Consultation

1.4.1 Stakeholder Consultation

Consultation was undertaken with key stakeholders including:

- Tamworth Regional Council
- Transport for NSW
- Forestry Corporation NSW
- Muswellbrook Shire Council
- Newcastle Council
- Cessnock City Council
- Upper Hunter Shire Council
- Liverpool Plains Shire Council

Written responses to this consultation are provided in Appendix C.

1.4.2 Community Engagement

From 2018 till 2020 consultation has occurred with residents along Morrisons Gap Road, Head of Peel Road and in Hanging Rock and Nundle. Among other things, the consultation aimed to understand concerns of increased traffic during construction and operation. Key concerns raised included:

- Dust and vibration along Head of Peel Road and Morrisons Gap Road
- Impact to existing business operations on Head of Peel Road
- Accumulated traffic build up on Barry Road and Morrisons Gap Road, in particular on Barry Road with the existing logging traffic
- The quality of Morrisons Gap Road surface and improving safety along this route
- Commuters from Morrisons Gap Road and Hanging Rock and oversized vehicle movement during peak morning and evening commuting times
- Safety of school children on school bus routes.

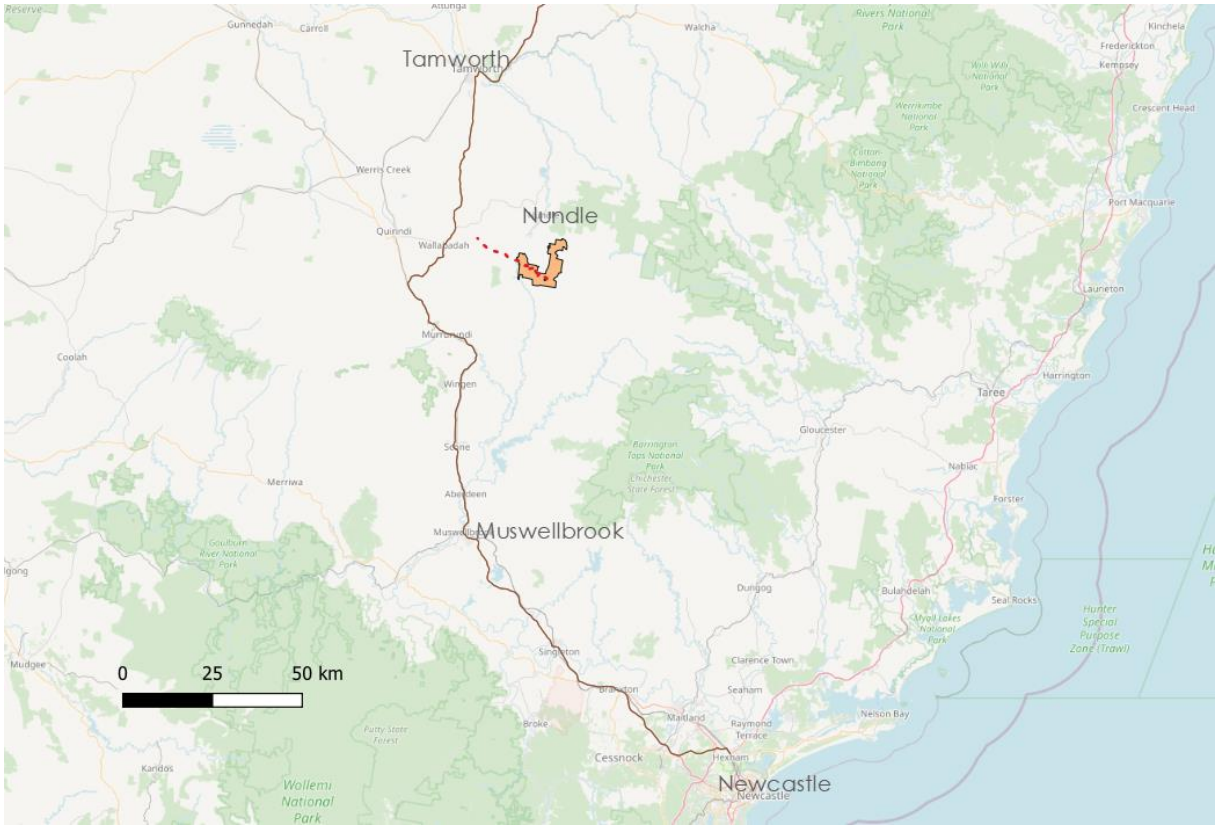
Two residents with pacemakers in Hanging Rock and Morrisons Gap Road raised concerns regarding being stuck behind oversized vehicles during emergency situations.

2 Existing Conditions

2.1 Site Location

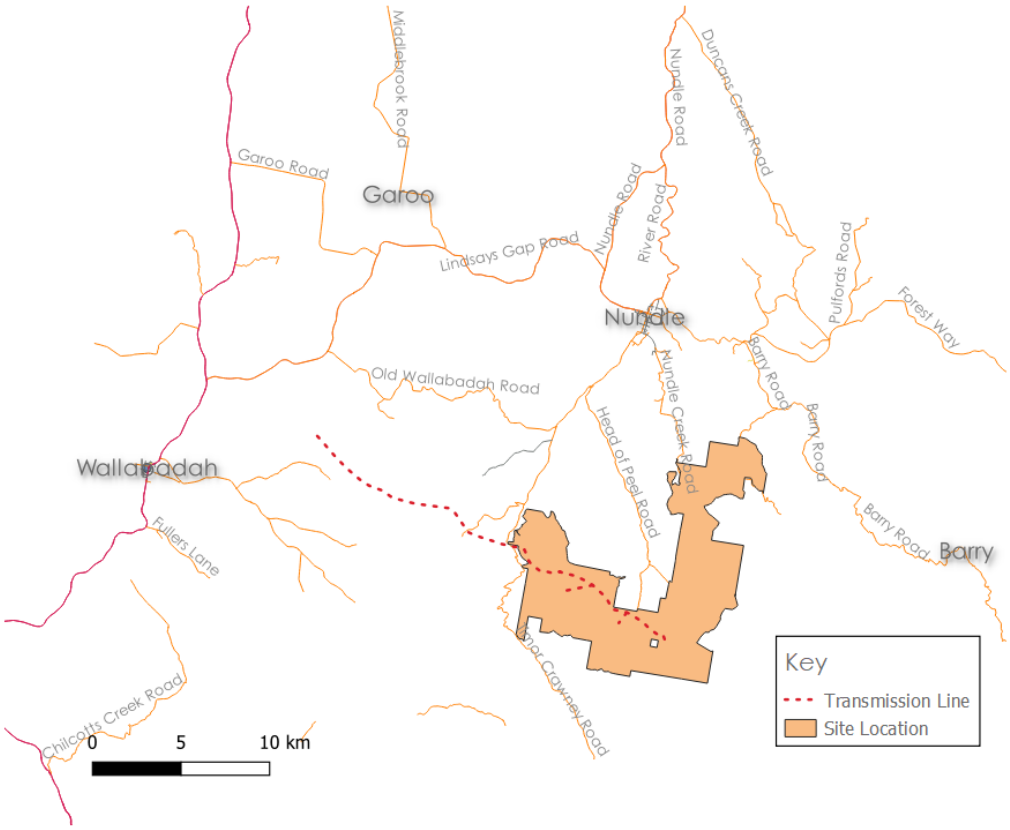
The proposed Hills of Gold Wind Farm is to be located south of the town of Nundle in NSW. Nundle is east of the New England Highway and 270km from Newcastle. The main regional route from Newcastle is along the New England Highway. The site context is shown in Figure 2.1.

Figure 2.1: Site Context



The site is located on a ridge line to the south east of the Nundle township in NSW as shown in Figure 2.2.

Figure 2.2: Site Location

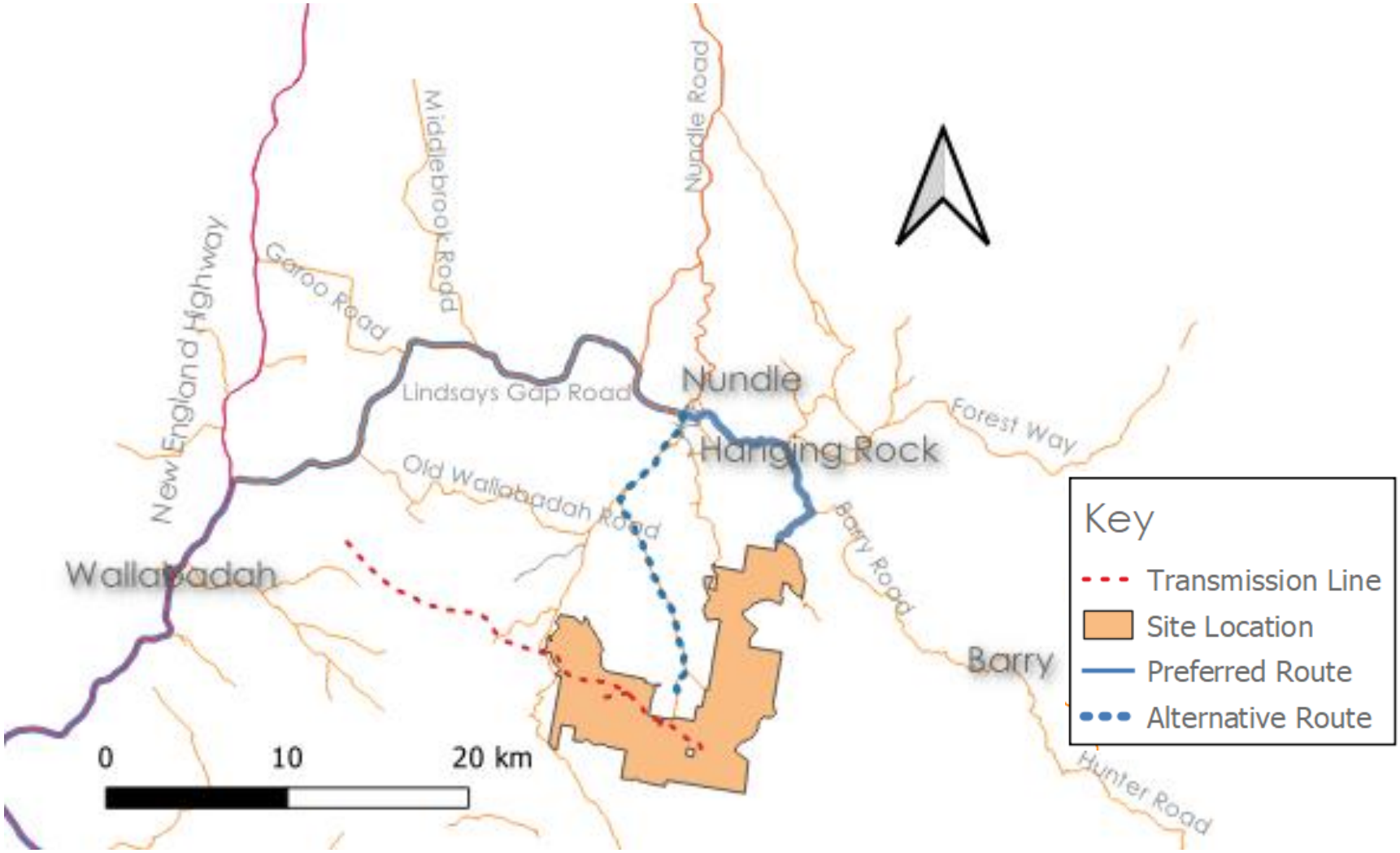


Source: Open Street Map

2.2 Road Network

The following section describes the local road network that would be used for access to the site. The preferred route and alternative route are shown in Figure 2.3.

Figure 2.3: Road Network



The key roads on the route are:

New England Highway – This is the Highway connecting Hexham (Newcastle) and Toowoomba in Queensland and is part of an inland route connecting Sydney to Brisbane. It is an important freight route as well as connecting inland towns such as Tamworth, Muswellbrook, and Armidale.

The section of highway between Wallabadah and Tamworth is single carriageway with sections of overtaking lanes (See Figure 2.4). The highway is of a higher standard road with centre line and lane markings as well as edge line marking. Horizontal curves generally have safety barriers.

The highway has been used for other wind turbine projects.

Figure 2.4: New England Highway (100m South of Lindsays Gap Road)

Lindsays Gap Road is the main route from the New England Highway to Nundle. It is a rural road that features two one-lane bridges at Goonoo Goonoo Creek and Middlebrook Creek (see Figure 2.3).

Figure 2.5: Lindsays Gap Road (10km east of New England Highway)

Nundle Road - Nundle Road connects Nundle to Tamworth. It is a two way rural road on an undivided carriageway. The road does not have a posted speed limit and therefore has the default 100km/h speed limit for a rural road (See Figure 2.6). Nundle Road is used as an alternative route to Tamworth.

The section of road between Nundle and Lindsays Gap Road is frequently used by forestry trucks on route to the intermodal terminal at Werris Creek.

Figure 2.6: Nundle Road (100m South of Lindsays Gap Road)

Barry Road – Barry Road is a rural road that connects Nundle with Hanging Rock and beyond. The road features sections of steep and winding sections of road (see Figure 2.7). This road is frequently used by forestry trucks travelling to and from the Werris Creek intermodal.

Figure 2.7: Barry Road (3km east of Happy Valley Road)

Morrisons Gap Road – Morisons Gap Road is an unsealed rural access road that runs from Barry Road and terminates in the Project Area. There is no posted speed limit, but drivers generally drive to the conditions (see Figure 2.8). The road features section of winding road through forested areas. The road is used a shared access to various rural properties and access to the Ben Halls Gap State Forest.

Figure 2.8: Morrisons Gap Road (2km west of Barry Road)

Crawney Road is a sealed rural road to the south of Nundle that runs in a north south direction. It has the default 100km/h speed limit (see Figure 2.9). The road has a single carriageway with limited line marking.

Figure 2.9: Crawney Road (3.5km south of Oakenville Street)

Head of Peel Road From Crawney Road, is an unsealed rural road that provides access to local farms. It is proposed to extend the road to meet the Project's internal access tracks providing a loop with the Morisons Gap Road at the top of the ridge. The Head of Peel Road features a bridge, and a number of causeway creek crossings and cattle grids (see Figure 2.10).

Figure 2.10: Head of Peel Road (600m south east of Crawney Road)

2.3 Land Use and Existing Activities

The land use surrounding the site is primarily rural land holdings. These properties share many of the access roads that are proposed to be used for the project including Head of Peel Road and Morrisons Gap Road. These roads are primarily used for personal transport but would also at times be used for transporting produce and livestock.

Barry Road is used by logging vehicles travelling to and from the main intermodal at Werris Creek where the logs are sent by rail to port. These trucks are generally B-doubles. Loaded vehicles travel from east to west through Nundle and operate at frequencies of approximately six trucks per hour.

The closest town is Nundle with a population of 496 (2016 Census). It includes a primary school, woollen mill, hotel, motels and accommodation, general store, places of worship and specialty shops.

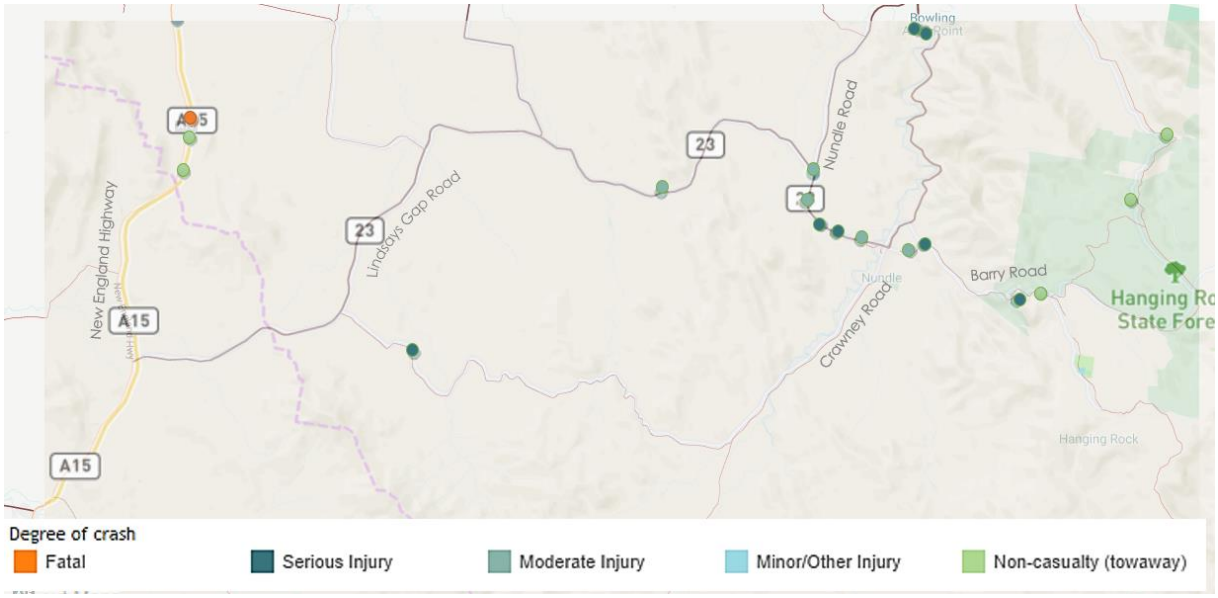
The nearest city is Tamworth with a population of 62,000 people and has a base hospital, airport, and major shopping centres. The project site is located on the boundary between the Tamworth Regional Council and the Upper Hunter Shire Council local government areas. Transmission lines, switching station as well as road access from Lindsays Gap Road lie within the Liverpool Plains LGA.

The New England Highway which is some 20km to the west of the site is part of the National Highways and major freight route between Sydney and Brisbane. Further west is the rail line which services both passenger and freight trips between northern NSW and Sydney.

2.4 Crash History

Crash data for the 5-year period from 2014 until 2018 has been sourced from Transport for NSW, Centre for Road Safety crash statistics and the location of crashes are shown in Figure 2.11. Crashes are recorded when reported to police and include crashes that involve vehicles being towed or a reported injury.

Figure 2.11: Crash History 2014 - 2018



Source: TfNSW, Centre for Road Safety Crash Statistics, https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats/lga_stats.html?tablga=4

The data shows that there was one fatal crash recorded in the area. That was on the New England Highway between Lindsays Gap Road and Garoo Road.

There is a cluster of seven (7) crashes on Nundle Road between Lindsays Gap Road and Nundle. Of these crashes:

- Five (5) involved single vehicle run off the road crashes.
- Two (2) were at the intersection of Nundle Road and Lindsays Gap Road involving vehicles turning right from Lindsays Gap Road and colliding with a vehicle travelling north on Nundle Road.
- All crashes resulted in injuries, with four (4) serious injuries and three (3) moderate injuries.

There were two (2) crashes recorded on Barry Road near the Devil's Elbow both were run off the road type crashes, one with moderate injury and the other with no injury.

There were two (2) crashes recorded on Old Hanging Road. Both were single vehicle run off the road type crashes.

In general, the number of crashes is consistent with a typical rural road. However, the 4.2km section of Nundle Road between Lindsays Gap Road and Nundle has had a significant number of crashes and should be given special consideration in the detailed traffic management plan.

The intersection of Lindsays Gap Road and Nundle Road where two crashes were recorded has adequate sight distance for the rural speed limit. However, Lindsays Gap Road intersects with Nundle Road at an angle. This may potentially have contributed to the recorded crashes as drivers are required to turn their heads over their shoulder to see traffic approaching on Nundle Road from the north.

2.5 Existing Traffic Volumes

Traffic volumes were provided by Tamworth Regional Council for Lindsays Gap Road from the 23 August 2018 and at other locations on 18 August 2019. These dates were before the current Covid-19 restrictions and associated reduction in traffic volumes generally across the road network.

The traffic volumes at key times are shown in Figure 2.12, Figure 2.13 and Figure 2.14 for the morning construction peak, morning peak and evening peak hours. The daily traffic volumes are shown in Figure 2.15.

Figure 2.12: Construction Morning Peak (7:00am – 8:00am)

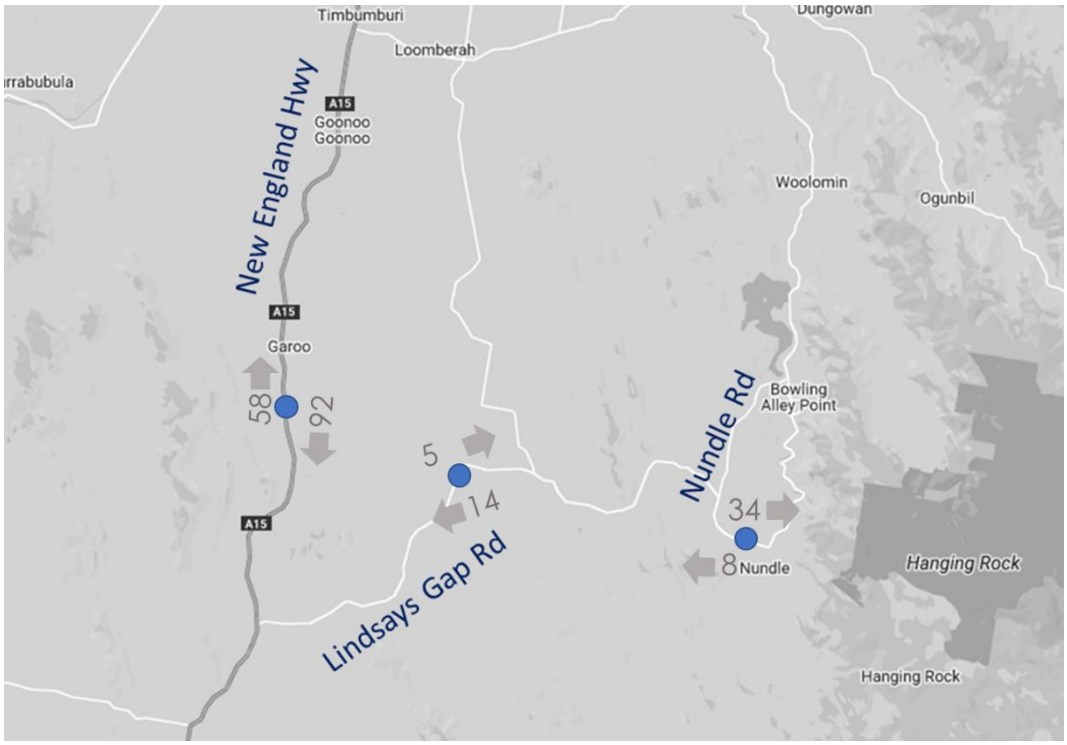


Figure 2.13: Morning Peak (8:00am – 9:00am)

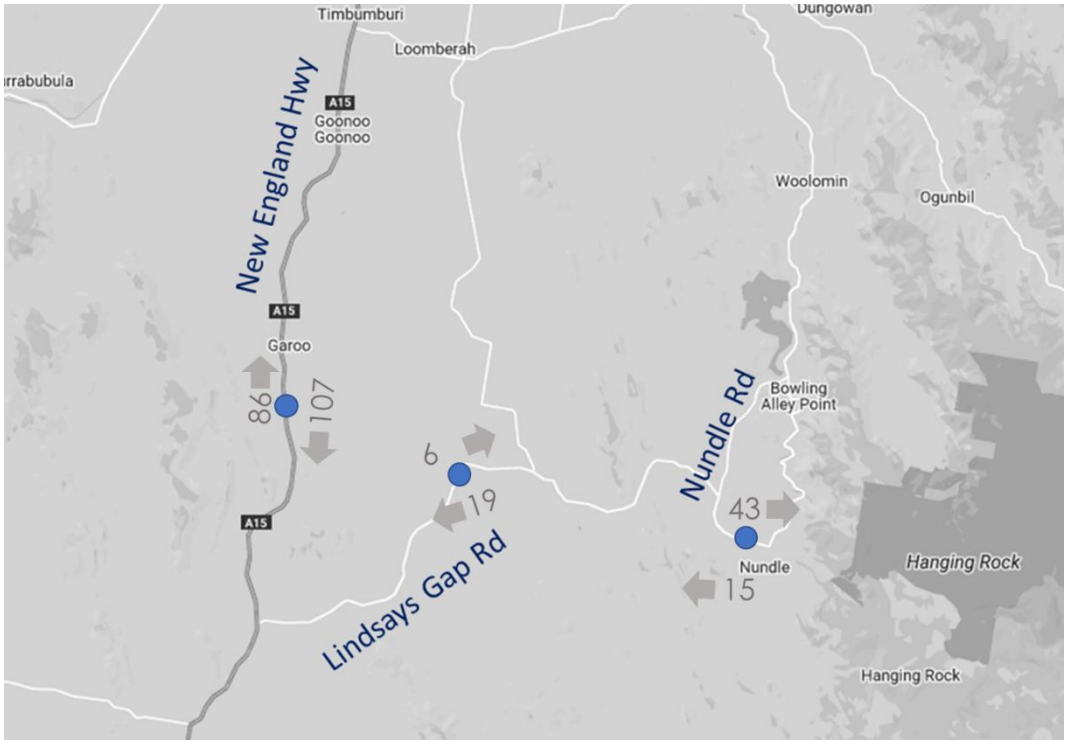


Figure 2.14: Evening Peak (5:00pm – 6:00pm)

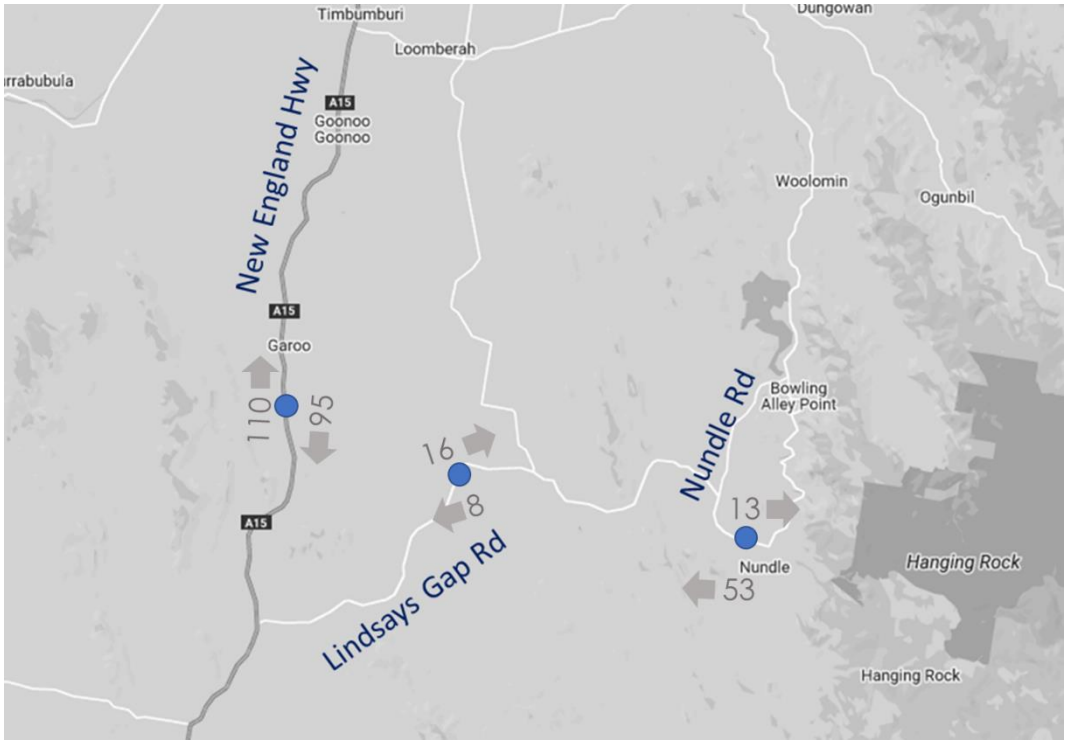
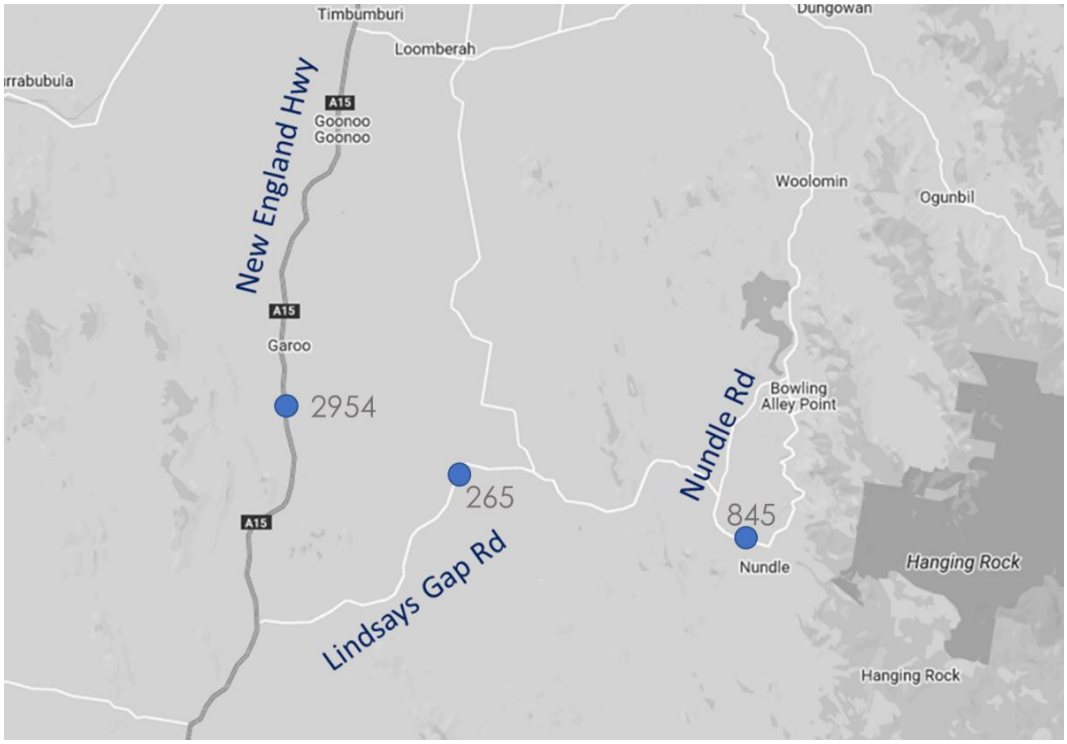


Figure 2.15: Daily Traffic Volumes (bi-directional)



Traffic volumes within the Nundle Township are shown in Figure 2.16, Figure 2.17 and Figure 2.18 for the construction peak, morning peak and evening peak respectively. The daily traffic volumes are shown in Figure 2.19.

Figure 2.16: Construction Morning Peak (7:00am – 8:00am)

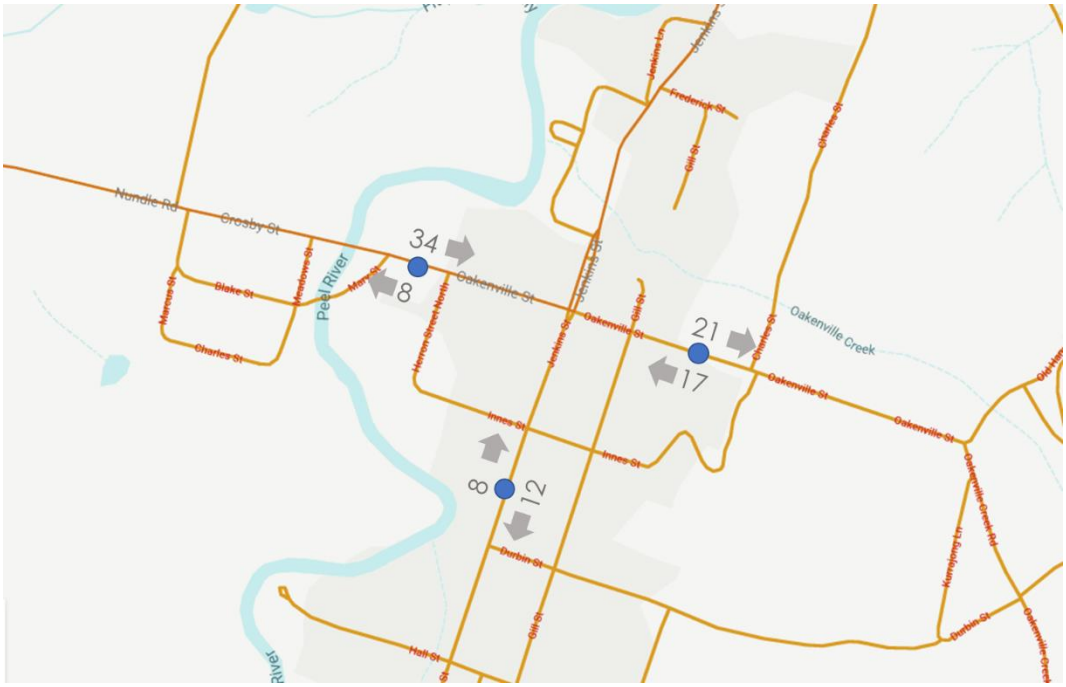


Figure 2.17: Morning Peak (8:00am – 9:00am)

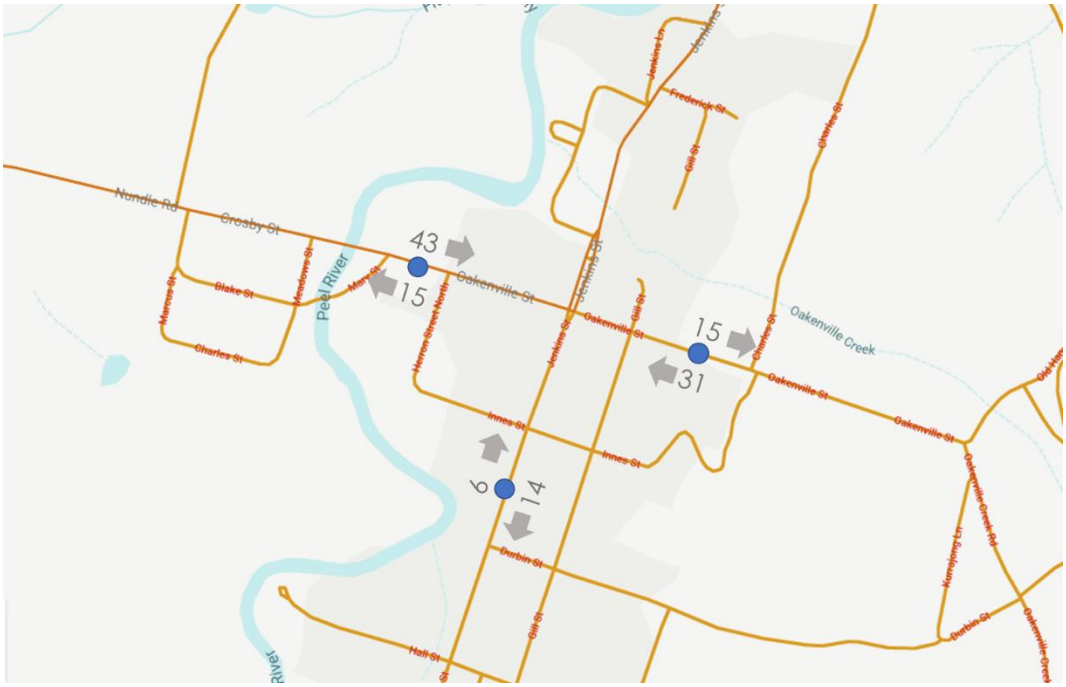


Figure 2.18: Evening Peak (5:00pm – 6:00pm)

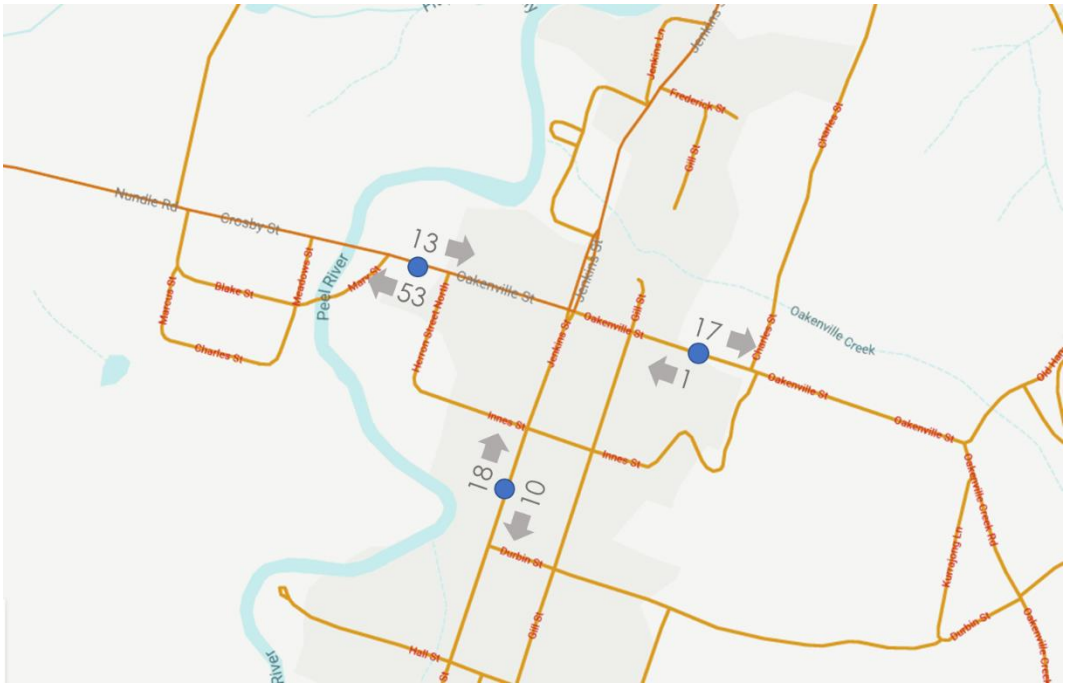
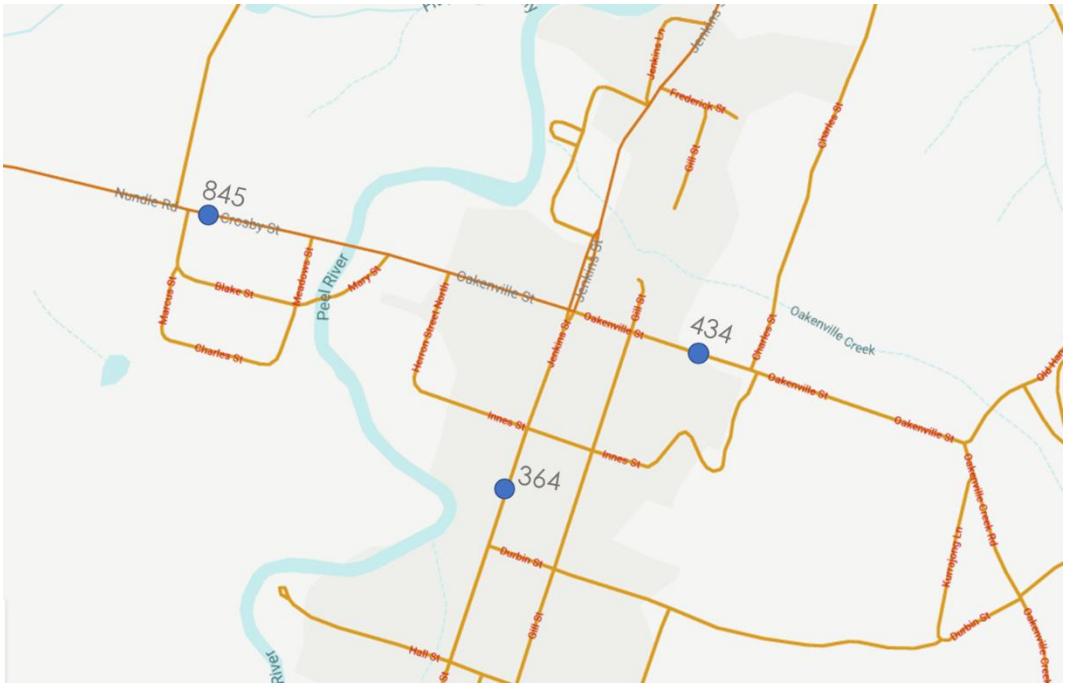


Figure 2.19: Daily Traffic Volumes (bi-directional)



The data shows that the traffic volumes in the area are relatively low. Observations on site indicate that most heavy vehicles travelling through Nundle are associated with the Forestry trucks carrying loaded westbound along Nundle Road and Lindsays Gap Road and returning empty eastbound. In the morning peak and evening peak volumes are in the order of six

laden (6) trucks per hour westbound and six (6) trucks per hour returning eastbound for a total of 12 trucks per hour.

2.6 Bus Routes

A bus service operates from Nundle to Tamworth on Thursdays only with services leaving Nundle at 9:00am and arrives in Tamworth at 10:00am the return trip departs Tamworth at 2:00pm and arrives in Nundle at 3:15pm.

There are also school bus services. These buses provide services to for High School students travelling to Tamworth as well as other services to Nundle Public School from outlying areas. They are generally provided on an ad hoc basis depending on demand for services.

School buses drop-off and pick up from outside the Nundle Public School located on Jenkins Street. The buses are usually mini-buses or 24 seater type buses. School buses operate in the mornings between 7:30am – 8:30am and in the evenings from 3:00pm – 4:00pm.

3 Traffic Impacts of the Proposed Project

3.1 Overview

The following section of this report describes the traffic generation and distribution for the construction and operation of the proposed wind farm. The assessment looks at the impacts of the proposal on road network in terms of capacity and impacts on amenity. The assessment has divided the Project in to three stages:

- Site establishment – construction of road upgrades and setting up of concrete batch plants and transporting of plant and equipment including cranes to site in order to begin construction.
- Construction stage – when most of the works will be undertaken including the construction of towers, blades and generators, foundations, hardstands and supporting infrastructure such as substation, battery storage and transmission infrastructure.
- Operational phase – on going maintenance of the site after the construction and includes short periods of higher activity such as replacement of blades or key components of a turbine.

The Project is expected to have a design life greater than 25 years and therefore it is assumed that decommissioning of the site if that were to occur is beyond the scope of this assessment. It is noted that decommissioning works are generally likely to involve lesser traffic impact than construction works as some infrastructure components will be retained on site (such as access roads required for ongoing use) and the fill required for the project will be vegetated rather than removed.

The assessment of traffic capacity has been based on the volume capacity ratio (V/C), rural road level of service and the Environmental Capacity for urban areas based on the RTA (2002) *Guide to Traffic Generating Development*.

The V/C ratio indicates the level of congestion by comparing the forecast traffic volumes to the theoretical lane capacity. For this assessment, the rural roads are assumed to have a capacity of 1000 vehicles / hour / lane. As V/C ratios approach 0.9 it should be expected that flow would become significantly interrupted.

To account for overtaking the level of service can be estimated based on the RTA Guide to Traffic Generating Developments table for the rural roads this is shown in Table 3.1. This is generally applicable for two-way two lane rural roads with a 100km/h speed limit.

Table 3.1: Rural Road Level of Service

Terrain	Level of Service	Percent of Heavy Vehicles			
		0	5	10	15
Level	B	630	590	560	530
	C	1030	970	920	870
	D	1630	1550	1480	1410
	E	2630	2500	2390	2290
Rolling	B	500	420	360	310
	C	920	760	650	570
	D	1370	1140	970	700
	E	2420	2000	1720	1510
Mountainous	B	340	230	180	150
	C	600	410	320	260
	D	1050	680	500	400
	E	2160	1400	1040	820

Source: RTA Guide to Traffic Generating Developments

The desirable Level of Service as recommended by the RTA Guide to Traffic Generating Developments is Level of Service C.

The environmental capacity is an assessment of the impact on the amenity of an environment. The environmental capacities are estimated by considering a range of differing perceptions of traffic impacts in a particular area. The assessment has used the tables provided in the RTA Guide to Traffic Generating Developments as shown in Table 3.2.

Table 3.2: Environmental Capacity

Road Class	Road Type	Maximum Speed (km/hr)	Maximum peak hour volume (veh/hr)
Local	Access way	25	100
	Street	40	200 environmental goal
			300 maximum
Collector	Street	50	300 environmental goal
			500 maximum

Source: RTA Guide to Traffic Generating Developments

For the purpose of this assessment a vehicle trip is defined in accordance the RTA Guide to Traffic Generating as a movement to or from the site. For example, a water truck arriving at site and then leaving is two trips (one arriving and one leaving). For each of the Project stages identified above the required vehicle trips have been conservatively estimated, based on the project elements, indicative construction program and assumptions outlined below. It is noted that this does not include oversized vehicles which are considered separately.

Construction hours are to be:

- 7:00am – 6:00pm Monday to Friday
- 8:00am – 1:00pm Saturdays
- No work on Sundays

It is assumed that the evening peak traffic generation is inverse of the morning peak.

3.2 Program

An indicative program for the construction period is shown in Figure 3.1. The construction of the Project is to be undertaken over an estimated period of 24 months. The construction activities on site would be more active between month 5 and month 19, with a lead up period before construction and a demobilisation, and testing and completion period following construction.

The potential for an early works contract to enable public road upgrades prior to the main construction could be considered.

Figure 3.1: Project Program

Activity	Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Conctract Signature																									
Notic to Proceed																									
Engineering Design																									
Precurement of Electrical and Civil BoP																									
Precurement and Manufacture Turbine Supply																									
Public Road Upgrades																									
Site Mobilisation and Establishment																									
Delivery of Turbines Components to Site																									
Substation Construction																									
Operation and Maintance Building Conctruction																									
WTG Installation																									
Internal Access Road and Hard Stand Construction																									
WTG Foundation Construction																									
Electrical Cabling																									
WTG Installation																									
Commissioning of WTG																									
Transmission Line Construction																									
Switching Station Construction																									
Demobilisation																									
Testing and Completion																									

3.3 Traffic Generation

The following provides an estimate of traffic generated by the Project during each of the stages. It sets out the assumptions that have been adopted. It describes the traffic generated by the site for construction on site. It does not include the transport to site of oversized and over mass vehicles that have been considered separately.

3.3.1 Types of Traffic

3.3.1.1 Workers

Majority of staff would be coming from Tamworth, and it is assumed that they would mostly use the Nundle Road (90%) and 10% using Lindsay Gap Road. It is assumed that up to half of staff would be transported by 24-seater buses the rest would arrive in light vehicles (private or company). The preferred option for access to site from Nundle is to be via Barry Road and Morrisons Gap Road. Alternatively, up to 20% of people could travel to site via the alternate access route via Head of Peel Road.

3.3.1.2 Plant Equipment and Materials

Travel to site from the New England Highway to site via Lindsays Gap Road, Nundle Road and then to Morrisons Gap Road via Barry Road. Alternatively, 20% to Head of Peel Road.

3.3.1.3 Water

It is assumed that water would be transported from Tamworth. This would represent the worst case for water transport. Options to source water have been investigated through local water permits holders, Tamworth Council and WaterNSW. It has been assumed that all trips to Morrisons Gap Road via Barry Road or alternatively 40% of trips travel to The Head of Peel Road.

3.3.1.4 Switching Station Access route

Access to the transmission line is proposed to use the Basin Creek Road to the switching station site and access to the sites along the proposed transmission line from Crawney Road via local access roads.

3.3.1.5 Bulk Earthworks

The Project will aim to create an access road and hardstand design aimed at balancing cut and fill to limit any demand for importation of fill material. There is potential for excess spoil and vegetative material unable to be reused onsite to be transported to an appropriately approved location. An allowance for such truck movements has been included in the peak

construction period traffic generation. The proponent will aim to schedule such truck movements outside the morning and afternoon peak hour periods.

3.3.1.6 Importation of Quarry Material

Construction materials including gravel, aggregate and sand will be required for the construction of hardstands to support the Project infrastructure, including internal access roads, wind turbine generators hardstands and laydown areas, for installation of electrical cabling and for concrete production. It is anticipated that material from the excavation of crane pad sites will be recycled into the construction of roads, however this will need to be confirmed upon geotechnical testing of the excavated material as the works commence. Otherwise gravel, aggregate and sand will be sourced externally and following consultation with stakeholders, will be sourced from existing operating quarries. There are a number of existing quarries located within approximately 80km of the Project, including quarries located at Tamworth, Willow Tree, Currabubula, Ardglen, Barry Road and Crawney Road. For Crawney Road, assume peak of 10 trips per day, maximum of 2 trips per hour. For the remainder, a combination of Nundle Road and Lindsay Gap Road would be utilised.

In addition, it is expected that some 30 – 50% would be sourced on site from excavations.

The Traffic Impact Assessment presented herein considered vehicle transport of aggregates from roads in these localities for the purposes of the traffic assessment. Construction materials will be transported to the Project site by trucks and stockpiled within the laydown areas. It is assumed trips will travel to site via Morrisons Gap Road and Barry Road. Alternatively, 50% of trips to Head of Peel Road.

3.3.2 Traffic Generation

The evening peak period is assumed to be inverse distribution of the morning peak. The morning peak period for this assessment is assumed to occur from 7:00am – 8:00am although trips are likely to start earlier. The evening peak period is assumed to occur between 5:00pm and 6:00pm.

3.3.2.1 *Site Establishment*

The estimated traffic generation during the site establishment phase is shown in Table 3.3. It is assumed that there are some construction workers coming and going from site throughout the day and that 50% of the workforce are provided a shuttle bus service to and from Tamworth.

Table 3.3: Site Establishment Traffic Generation

Vehicle type	Units	Morning Construction Peak (7:00am – 8:00am) (Vehicles per hour)			Daily Trips (Vehicles)
		To Site	From Site	Total	
Light vehicles	65 workers	65	0	65	130
Buses	60 workers	3	3	6	12
Water trucks	11 per day	2	2	4	22
Trucks	20 per day	3	2	5	40

3.3.2.2 *Construction Period*

The traffic generation for the peak construction period is shown in Table 3.4. This would occur over a period of 13 months.

Table 3.4: Peak Construction Period Traffic Generation

Vehicle type	Units	Morning Construction Peak (7:00am – 8:00am) (Vehicles per hour)			Daily (trips)
		To Site	From Site	Total	
Light vehicles	87 workers	87	15	102	210
Buses	87 workers	4	3	7	12
Water trucks	20 per day	3	3	4	40
Trucks	120 per day	14	14	28	240

3.3.2.3 *Operational Phase*

During the operational period of the Project it is estimated that there would usually be 31 workers on site to maintain the facility. The estimated traffic generation during a typical period is shown in Table 3.5.

Table 3.5: Typical Operational Period Traffic Generation

Vehicle type	Units	Morning Peak (7:00am – 8:00am) (Vehicles per hour)			Daily (trips)
		To Site	From Site	Total	
Light vehicles	31 workers	25	0	25	50
Heavy Vehicles	2 per day	2	1	-	4

At times additional workers may be required for specific tasks. The upper estimate for the number of staff on site is 33 workers during short one-week periods. The traffic generation during peak activity periods is shown in Table 3.6.

Table 3.6: Peak Operational Period Traffic Generation

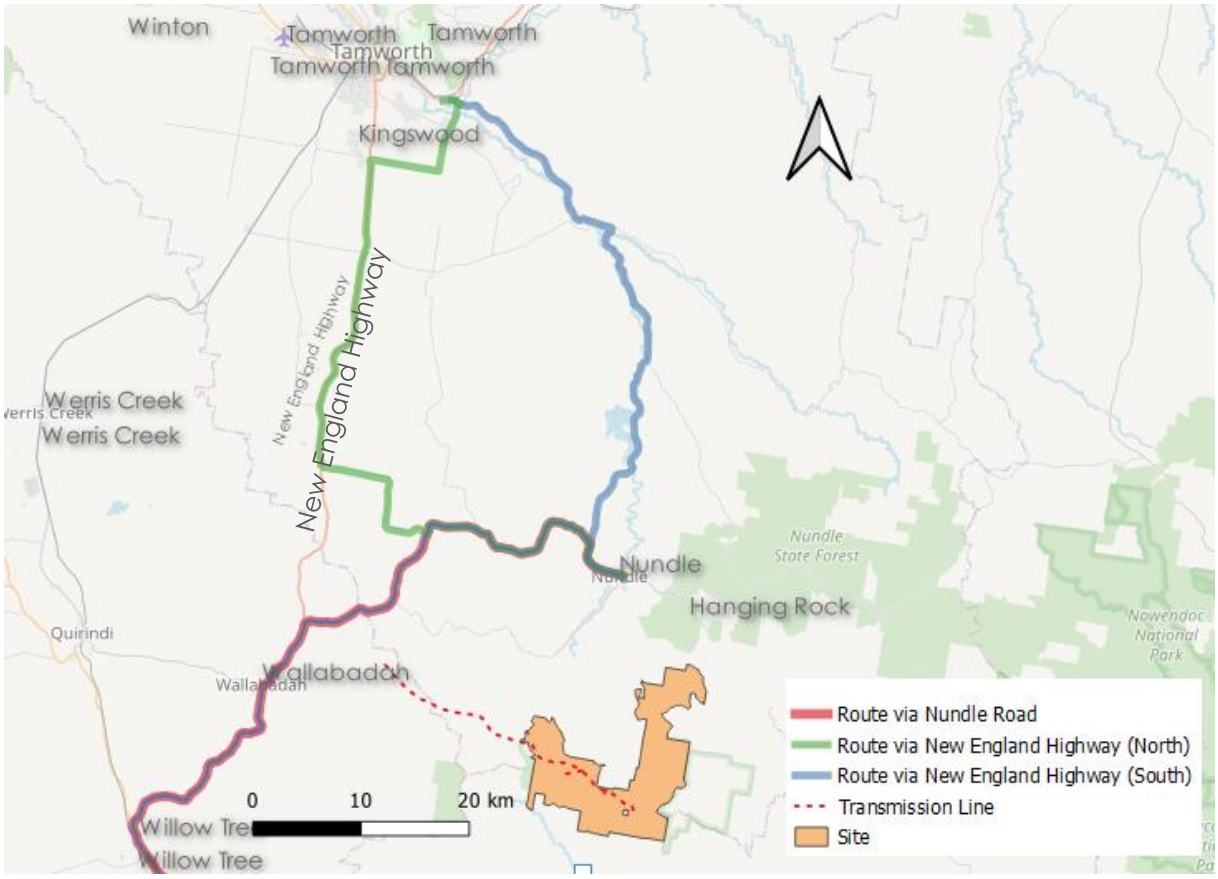
Vehicle type	Units	Morning Peak (7:00am – 8:00am) (Vehicles per hour)			Daily (trips)
		To Site	From Site	Total	
Light vehicles	33 workers	33	0	33	66
Heavy Vehicles	4 per day	2	1	-	8

3.4 Traffic Routes

The main routes to and from the site are shown on Figure 3.2. It is assumed that most of the light vehicles would use the route from Tamworth either via Nundle Road or the New England Highway / Garoo Road / Lindsays Gap Road.

Plant equipment and materials for construction is likely to travel from the New England to the south and then Lindsays Gap Road and Nundle Road.

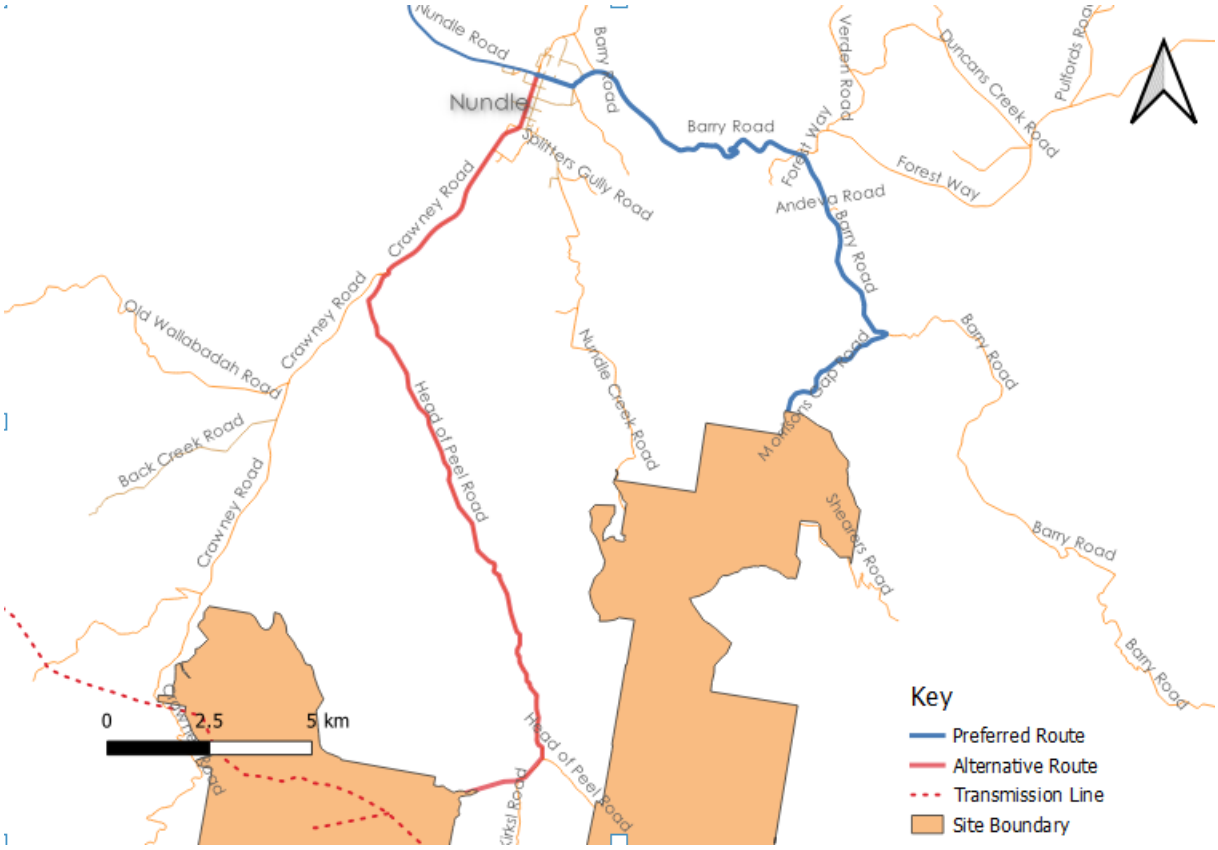
Figure 3.2: Traffic Routes



Once in Nundle traffic would either continue to Morrisons Gap Road via Barry Road or travel south on Crawney Road to Head of Peel Road. These routes are shown in Figure 3.3.

The Northern Route via Barry Road and Morrisons Gap Road is the preferred route. However, an alternative scenario has been considered that 80% of vehicles would travel via the preferred route and 20% via the alternative southern route via Crawney Road and Head of Peel Road.

Figure 3.3: Traffic Routes from Nundle



The southern alternative route would turn left from Oakenville Street to Jenkins Road to Crawney Road and Head of Peel Road. An additional variation to the alternative route would use Heron Street and Innes Road then turn right into Jenkins Street to avoid the centre of town this is shown in Figure 3.4.

Figure 3.4: Alternative Route Variation

3.5 Traffic Impacts

3.5.1 Construction Traffic Impacts

The traffic impacts during construction have been analysed. The results of the analysis are shown in Table 3.7. The table presents the existing traffic volumes and corresponding Volume Capacity (V/C) ratio and the forecast traffic volumes and V/C during the construction period. The V/C ratio is the comparison of the traffic volumes to the theoretical capacity. This assumes all traffic would go to Morrisons Gap Road. However, if some traffic goes to Head of Peel Road then this would add traffic to Jenkins Street as shown in the Table. Volumes on Oakenville Street can be assumed to be similar to the volumes on Barry Road. No traffic data was available for Morrisons Gap Road however it is expected that volumes would be very low less than 10 vehicles per hour.

Table 3.7: Peak Construction Period Generation and V/C Ratio

Road	Period	Direction	Existing Volumes		With Construction Volumes		
			Volume (vph)	V/C	Project Generated traffic (vph)	Total Volume (vph)	V/C
Lindsays Gap Road	Morning Peak	Northbound	5	0.005	23	28	0.028
		Southbound	14	0.014	16	30	0.030
	Evening Peak	Northbound	16	0.016	16	32	0.032
		Southbound	8	0.008	23	31	0.031
Nundle Road	Morning Peak	Westbound	8	0.008	35	43	0.043
		Eastbound	38	0.038	108	146	0.146
	Evening Peak	Westbound	53	0.053	108	161	0.161
		Eastbound	13	0.013	35	48	0.048
Oakenville Street (Barry Road)	Morning Peak	Westbound	9	0.009	38	47	0.047
		Eastbound	1	0.001	108	109	0.109
	Evening Peak	Westbound	21	0.021	108	129	0.129
		Eastbound	17	0.017	38	55	0.055
Jenkins Street*	Morning Peak	Southbound	12	0.012	22	34	0.034
		Northbound	8	0.008	10	18	0.018
	Evening Peak	Southbound	10	0.010	10	20	0.020
		Northbound	18	0.018	22	40	0.040

**Alternative arrangement with some traffic travelling to Head of Peel Road.*

The analysis indicates that the forecast volumes would not have a significant impact on the road network efficiency with V/C rations less than 0.2 on all roads that were assessed.

The Level of Service based on the criteria in Table 3.1 is shown in Table 3.8. This based on assuming 15% heavy vehicles, rolling terrain or mountainous for Oakenville Street (Barry Road).

Table 3.8: Peak Construction Period Rural Road Level of Service

Road	Period	Existing Volumes		With Construction Volumes	
		Volume (vph)	Level of Service	Total Volume (vph)	Level of Service
Lindsays Gap Road	Morning	19	A	57	A
	Evening	24	A	62	A
Nundle Road	Morning	46	A	189	A
	Evening	66	A	209	A
Oakenville Street (Barry Road)	Morning	10	A	156	B
	Evening	38	A	184	B
Jenkins Street	Morning	20	A	52	A
	Evening	28	A	60	A

The assessment shows that almost all the roads would operate at Level of Service A during the peak of construction. If we consider Oakenville Street as mountainous and includes Barry Road, then this would be revised to Level of Service B. In all cases the level of service is equal or better than the Level of Service B which is better than the recommended desirable Level of Service C.

In terms of environmental capacity, the forecast volumes would be less than the maximum 300 vehicles for collector roads and less than 200 vehicles per hour for local roads. Thus, the Project related traffic would operate within environmental capacity guidelines.

3.5.2 Operational Traffic Impacts

The traffic impacts during the operational period have also been analysed. The results of the analysis are shown in Table 3.9. The table presents the existing traffic volumes and corresponding Volume Capacity V/C ratio and the forecast traffic volumes. Jenkins Road has been considered for the alternative route via Crawney Road and Head of Peel Road.

Table 3.9: Operational Traffic Generation

Road	Period	Direction	Existing Volumes		Operational Volumes		
			Volume (vph)	V/C	Project Generated traffic (vph)	Total Volume (vph)	V/C
Lindsays Gap Road	Morning Peak	Northbound	5	0.005	3.3	8	0.008
		Southbound	14	0.014	0	14	0.014
	Evening Peak	Northbound	16	0.016	0	16	0.016
		Southbound	8	0.008	3	11	0.011
Nundle Road	Morning Peak	Westbound	8	0.008	0	8	0.008
		Eastbound	38	0.038	35	73	0.073
	Evening Peak	Westbound	53	0.053	35	88	0.088
		Eastbound	13	0.013	0	13	0.013
Oakenville Street (Barry Road)	Morning Peak	Westbound	9	0.009	2	11	0.011
		Eastbound	1	0.001	35	36	0.036
	Evening Peak	Westbound	21	0.021	35	56	0.056
		Eastbound	17	0.017	2	19	0.019
Jenkins Street*	Morning Peak	Southbound	12	0.012	7	19	0.019
		Northbound	8	0.008	1	9	0.009
	Evening Peak	Southbound	10	0.010	1	11	0.011
		Northbound	18	0.018	7	25	0.025

**Alternative arrangement with some traffic travelling to Head of Peel Road.*

The V/C on the subject roads are forecast to be less than 0.05 which indicates that there would be excellent levels of service and capacity on the road network.

Environmental capacity is based on the bi-directional traffic lows. The forecast bi-directional traffic flows are shown in Table 3.10.

Table 3.10: Bi-Directional Traffic Flows (vehicles per hour)

Road	Period	Existing Volumes		With Construction Volumes	
		Volume (vph)	Level of Service	Total Volume (vph)	Level of Service
Lindsays Gap Road	Morning	19	A	22	A
	Evening	24	A	27	A
Nundle Road	Morning	46	A	81	A
	Evening	66	A	101	A
Oakenville Street (Barry Road)	Morning	10	A	47	A
	Evening	38	A	75	A
Jenkins Street*	Morning	20	A	28	A
	Evening	28	A	36	A

**Alternative arrangement with some traffic travelling to Head of Peel Road.*

All roads analysed would be Level of Service A and have better performance than the minimum recommended.

The forecast traffic volumes would be less than the target environmental capacities for local streets.

3.5.3 Intersection Capacity

Observations on-site indicate that intersections in the area operate with minimal delay and spare capacity. The existing traffic volumes are low and the estimated future traffic volumes for both construction and operation are such that intersection traffic modelling was not warranted. It is expected that, given the V/C ratios indicate that there would be a generous amount of capacity in the road network, intersections would also continue to perform satisfactorily with a Level of Service of A during construction and in the operational period.

It is considered that a review of the environmental capacity of the roads is more appropriate for this project.

3.6 Oversized Loads Transportation

3.6.1 Overview

In additional to the daily traffic volumes that would be generated by the Project, the wind turbines components and electrical equipment will also be delivered to site and require oversized and over mass trucks. A summary of the estimated oversized and over mass trucks is shown in Table 3.11.

A detailed traffic management plan would be prepared for the transportation of individual items. The turbine models under consideration include single unit blades (up to 83.5m in length) and those that have the ability to be split (approximately 65.4m in length), hence reducing the overall vehicle length required to transport them.

The assessment has considered transporting the blades as a single unit. This would have the biggest impact on the footprint required to transport blades and require the most room to manoeuvre.

Splitting the blades would reduce the turning circle of the trucks transporting the blades but require additional truck movements to transport the tips. If split, three blade tips can be transported on a single truck while one truck would be required for each root section.

At this stage both blade lengths remain an option for the project.

Table 3.11: Oversized and Over Mass Vehicles

Component Type	Vehicle Types	No. of Trips to Site	Daily No. of Trips to site	Duration of Deliveries
Blades (root section)	Prime mover with 1x4 dolly with 4x4 extendable blade trailer	210	0.9 (2 WTGs/week)	35 weeks
Blades (tip section)*	Prime mover with 2x4-4x4 platform trailer	70	0.3	35 weeks
Nacelles	Prime mover with 8x8 Platform trailer	70	0.3	35 weeks
Drivetrain	Prime mover with 2x8-4x8 Platform Low loader	70	0.3	35 weeks
Hubs	Prime mover with 2x8 4x8 Low Loader	70	0.3	35 weeks
Tower Sections	Prime mover with 10x8 platform trailer (lower sections) Prime mover with 3x4-2x8 Dolly jinker (upper sections)	490 (7 section tower)	2.0	35 weeks
Other (2 x 40ft Shipping Container per WTG)	Prime mover with 1x4-3x4 platform trailer	140 (2 per WTG)	0.6	35 weeks
Sub station	Prime mover with 1x4-3x4 platform trailer	20	0.1	10-19 months
Switching Station	Prime mover with 1x4-3x4 platform trailer	20	0.1	10-19 months

Overhead cabling	Prime mover with 1x4-3x4 platform trailer	120	0.5	10-19 months
Underground cabling	Prime mover with 1x4-3x4 platform trailer	20	0.1	10-19 months
Battery System	Standard Semi – Trailer	158	2	35 weeks
Mobile concrete Batch Plant	Standard Semi – Trailer	2	1	1 Week
Transformers	2 x Low Loaders	2	1	2 Weeks

**Blade (tip section) - these movement would only occur if blades are split into two units. Note: Three tips can be transported on one truck.*

3.6.2 Vehicles

The typical vehicles to be associated with the transport of oversized and over mass materials to the site are provided in Appendix A of this report.

3.6.3 Oversized and Over Mass Vehicle Routes

It is understood that oversized and over mass loads will be transported from the Newcastle Port to the site. The following sections describe the proposed routes that would be used for the over mass and oversized vehicles.

3.6.3.1 Newcastle Port to Nundle

From the Port of Newcastle to Nundle, the traffic routes, depending on the oversize plant and equipment being transported, will be:

- Blade Route: via Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Golden Highway, Denman Road,(Muswellbrook bypass via Bengalla Road, Wybong Road, Kayuga Road, Ivermein Street, Dartbrook Mine Access Road), New England Highway, Lindsay's Gap Road, Nundle Road, Crosby Street, Oakenville Street.
- Tower Route: via Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Golden Highway, Denman Road, Thomas Mitchell Drive, New England Highway (Muswellbrook bypass via Bell Street, Victoria Street, Market Street), New England Highway to either:
- New England Highway, Lindsay's Gap Road, Nundle Road, Crosby Street, Oakenville Street; or alternatively
- Tamworth bypass (via Scott Street, Marius Street), New England Highway, Nundle Road, Crosby Street, Oakenville Street.

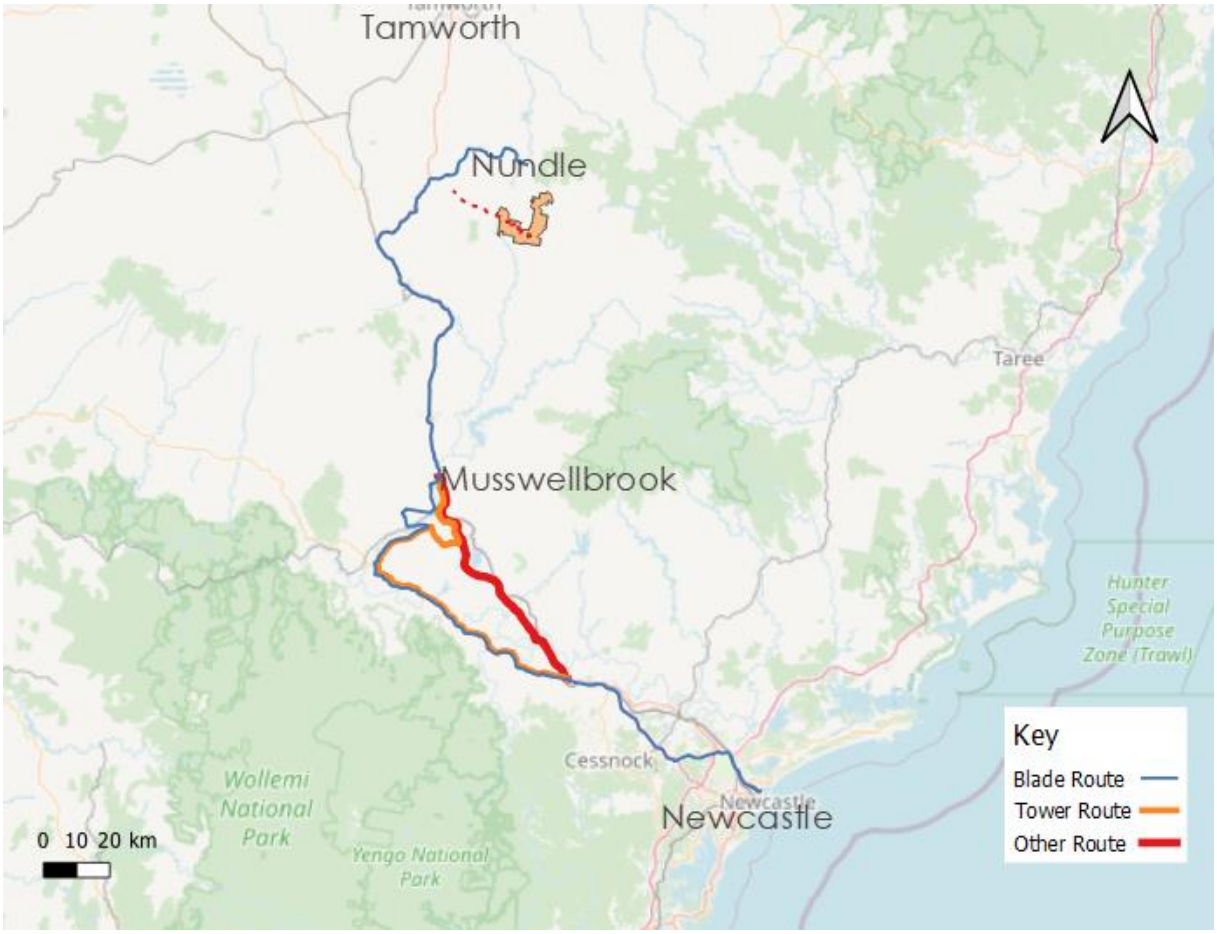
- Remaining components: via Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, (Muswellbrook bypass via Bell Street, Victoria Street, Market Street), New England Highway, Lindsay's Gap Road, Nundle Road, Crosby Street, Oakenville Street.

The nominated routes from the Newcastle Port to Nundle are shown in Figure 3.5.

A more detailed view of the alternate routes from Branxton to Aberdeen as shown in Figure 3.6.

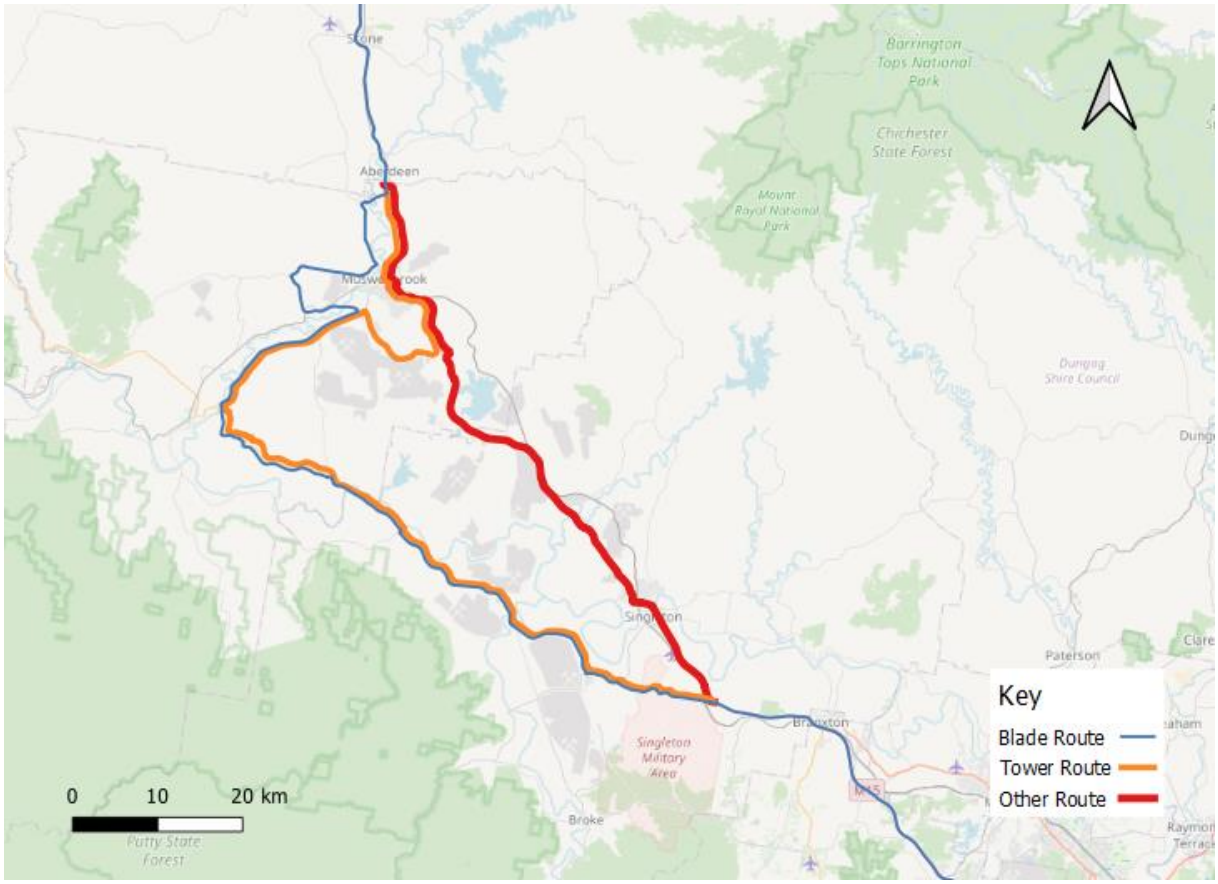
Layovers on route have been identified at Rixs Creek, Murrurundi, Murrurundi Hill, Willow Tree Township, Willow Tree Truck Stop and Wallabadah.

Figure 3.5: Travel Routes from Newcastle to Nundle



Source: Open Street Maps

Figure 3.6: Travel Routes Branxton to Aberdeen



3.6.3.2 Nundle to Site

Once in Nundle traffic would continue to Morrisons Gap Road via Barry Road as the primary access (northern route), or travel south on Jenkins Street, Crawney Road to Head of Peel Road (alternative access for Project vehicles) (southern route). These routes are shown in Figure 3.6.

Route 1 Preferred (northern) Route

The main route would be the northern route via is Oakenville Street, Old Hanging Rock Road, Barry Road and Morrisons Gap Road. Upgrades required at each intersection, construction of a layby and a deviation to bypass Devils Elbow on Barrys Road and the improvement and sealing of Morrisons Gap Road.

To negotiate the steeper sections of Barry Road may require multiple prime movers in a push pull arrangement. This may also require an area for staging the trucks or temporary closure of Barry Road to minimise impacts on existing traffic.

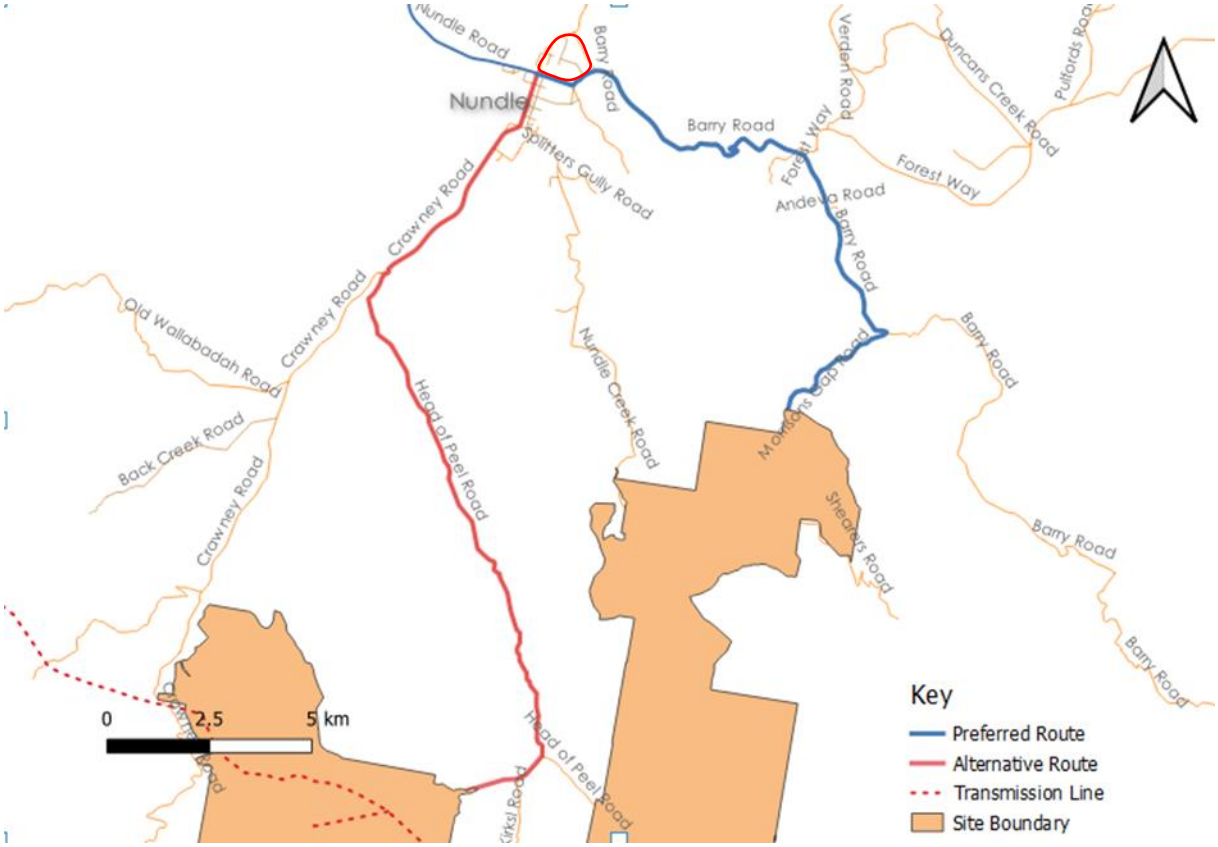
Route 2 Alternate (southern) Route

The southern route would use Head of Peel Road to access the site from below the ridge. This route is considered as an alternative and may not be used depending on the detailed assessment of the construction method. The route for blades and towers uses a route that travels through Nundle on Oakenville Street, Old Hanging Rock Road, Happy Valley Road, River Road, Jenkins Street, Crawney Road and Head of Peel Road (see Figure 3.39).

Smaller heavy vehicles would turn right directly onto Jenkins Street.

Alternative to this a further option is considered that would use Herring Street, Innes Street, Gill Street, Point Street then south on Crawney Road to Head of Peel Road (see Figure 3.45 and Figure 3.46).

Figure 3.7: Travel routes from Nundle to Site



Source: Open Street Maps

Shorter trucks would be able to bypass the centre of the town by turning into Herring Street and Innes Street then Jenkins Street to Crawney Road and Head of Peel Road. This route is shown in Figure 3.8.

Figure 3.8: Alternative Route to the South

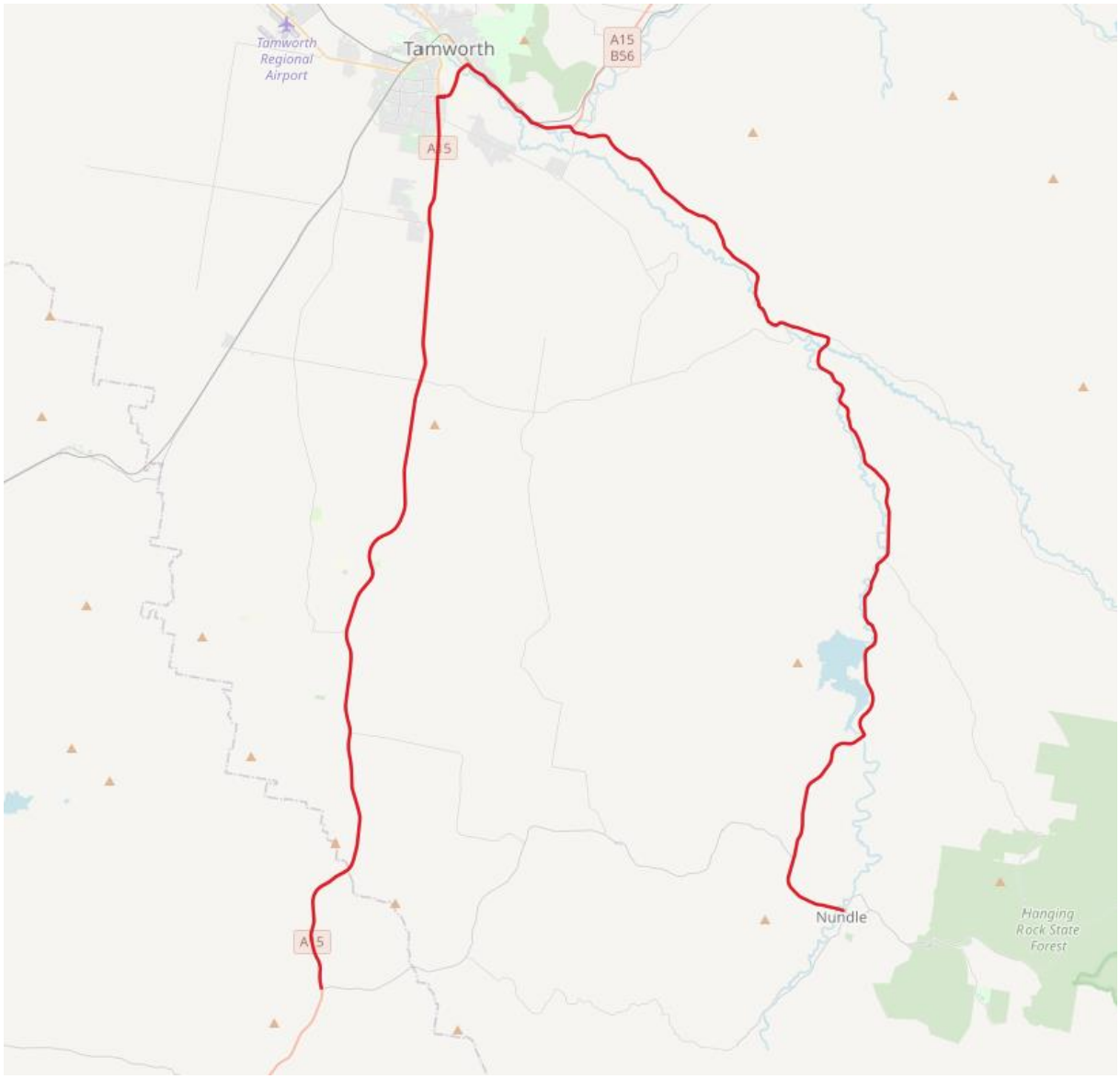
Source: Open Street Maps

3.6.4 Alternative Route via Tamworth

The route to Nundle on Lindsays Gap Road requires widening of bridges. An alternative route for wider axle loads has also been identified. The route is shown in Figure 3.9. The route would follow New England Highway, (Tamworth bypass via Scott Street, Marius Street), New England Highway, Nundle Road, Crosby Street, Oakenville Street. It is noted that the route through Tamworth was used for the construction of the White Rock and Sapphire wind farms.

This route can be avoided if both bridge upgrades are completed on Lindsays Gap Road.

Figure 3.9: Alternative Route to the South



Source: Open Street Maps

3.7 Road Upgrade Measures

The following outlines in detail the measures that would be required to upgrade roads between the New England Highway and the site.

3.7.1 Newcastle Port to Lindsays Gap Road

3.7.1.1 Mayfield Birth onto Selwyn Street

At this location additional hardstand is required and the fence will be relocated.

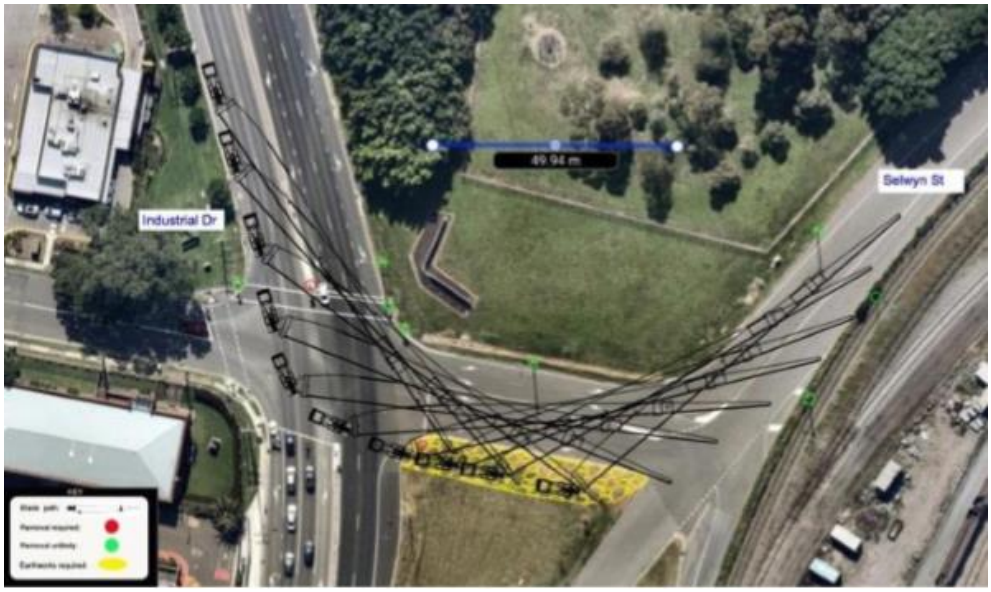
Figure 3.10: Mayfield Birth to Selwyn Street

Source: Rex J Andrews Appendix B

3.7.1.2 *Selwyn Street onto Industrial Drive*

At this location signs need to be converted to removable signs, traffic signals to be relocated and additional hardstand is required.

Figure 3.11: Selwyn Street to George Street



Source: Rex J Andrews Appendix B

3.7.1.3 *Industrial Drive onto Maitland Road*

At the Industrial Drive and Maitland Road intersection, minor alterations would be required to the median strip to accommodate the vehicle swept path.

Figure 3.12: Selwyn Street to George Street

Source: Rex J Andrews Appendix B

3.7.1.4 *John Renshaw Drive onto the Hunter Expressway*

Additional hardstand and an adjustment to the median on the Hunter Expressway would be required to accommodate the vehicle swept path at this intersection.

Figure 3.13: John Renshaw Drive onto the Hunter Expressway

Source: Rex J Andrews Appendix B

3.7.1.5 *New England Highway to Golden Highway*

Modifications to the centre island would be required at the New England Highway and Golden Highway Intersection to accommodate the vehicle swept paths. Additionally, removable signage would be required at the intersection.

Figure 3.14: New England Highway to Golden Highway

Source: Rex J Andrews Appendix B

3.7.1.6 Golden Highway intersection with Putty Road

Removable signage at the Golden Highway and Putty Road intersection would need to be installed to accommodate vehicle swept paths.

Figure 3.15: Golden Highway turn onto Putty Road

Source: Rex J Andrews Appendix B

3.7.1.7 *Golden Highway through Jerrys Plains village*

Removable signage along the Golden Highway through the village of Jerry Plains would need to be installed to accommodate vehicle swept paths. Additional hard stand will also be required.

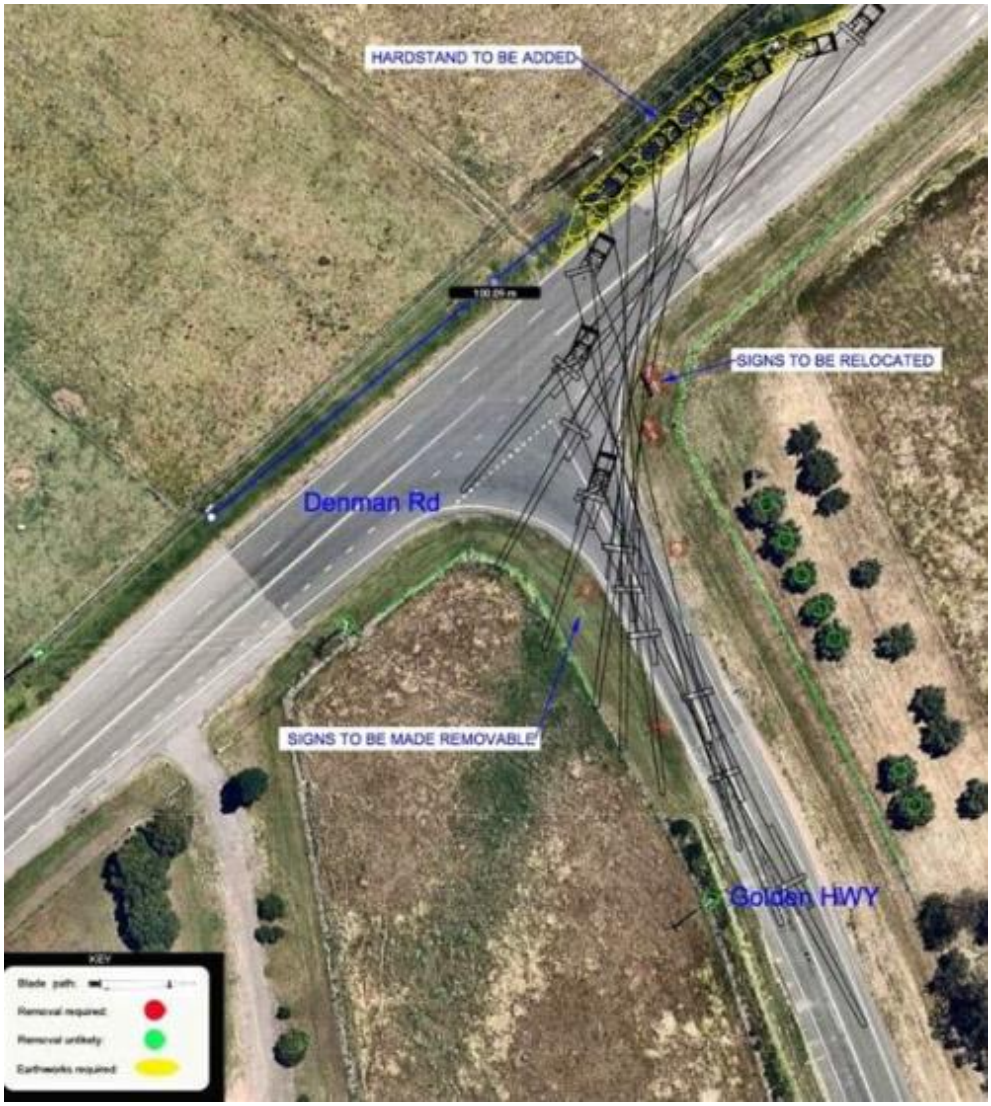
Figure 3.16: Through Jerrys Plains Village

Source: Rex J Andrews Appendix B

3.7.1.8 Golden Highway to Denman Road

Additional hardstand and removable signage will be required at the Golden Highway and Denman Road intersection to accommodate vehicle swept paths.

Figure 3.17: Golden Highway to Denman Road

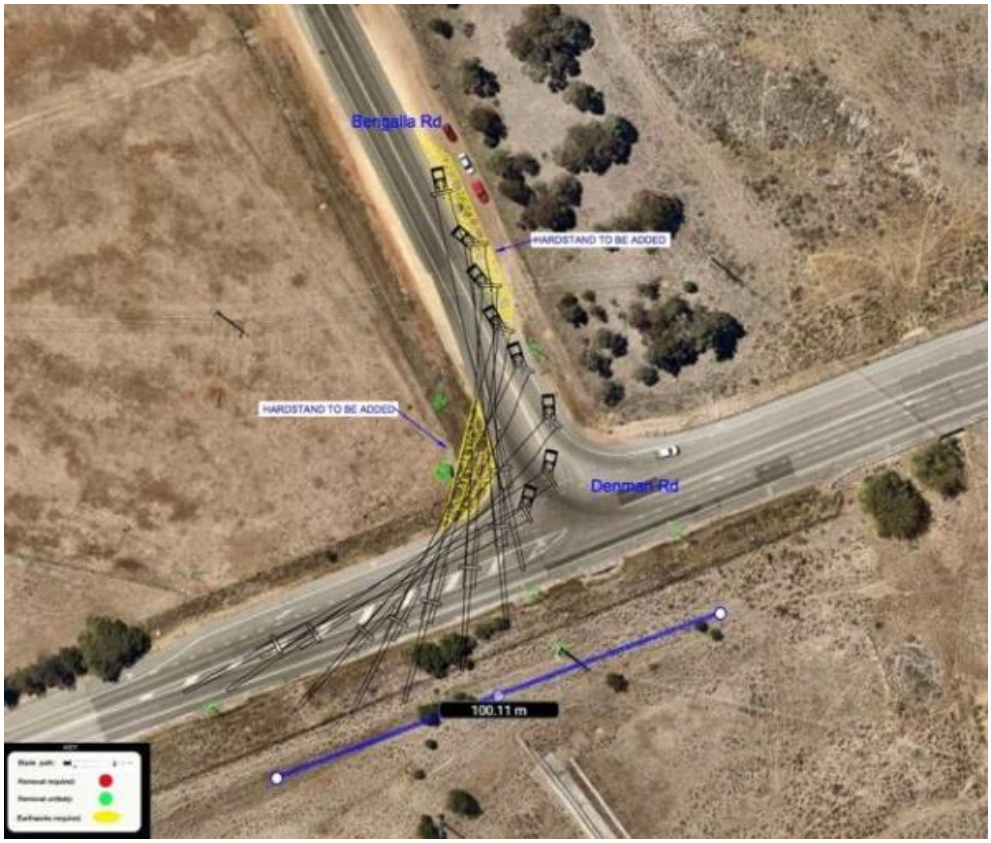


Source: Rex J Andrews Appendix B

3.7.1.9 *Denman Road onto Bengalla Road*

Additional hardstand will be required and signs need to be made removable at this intersection to accommodate vehicle swept paths.

Figure 3.18: Denman Road into Bengalla Road

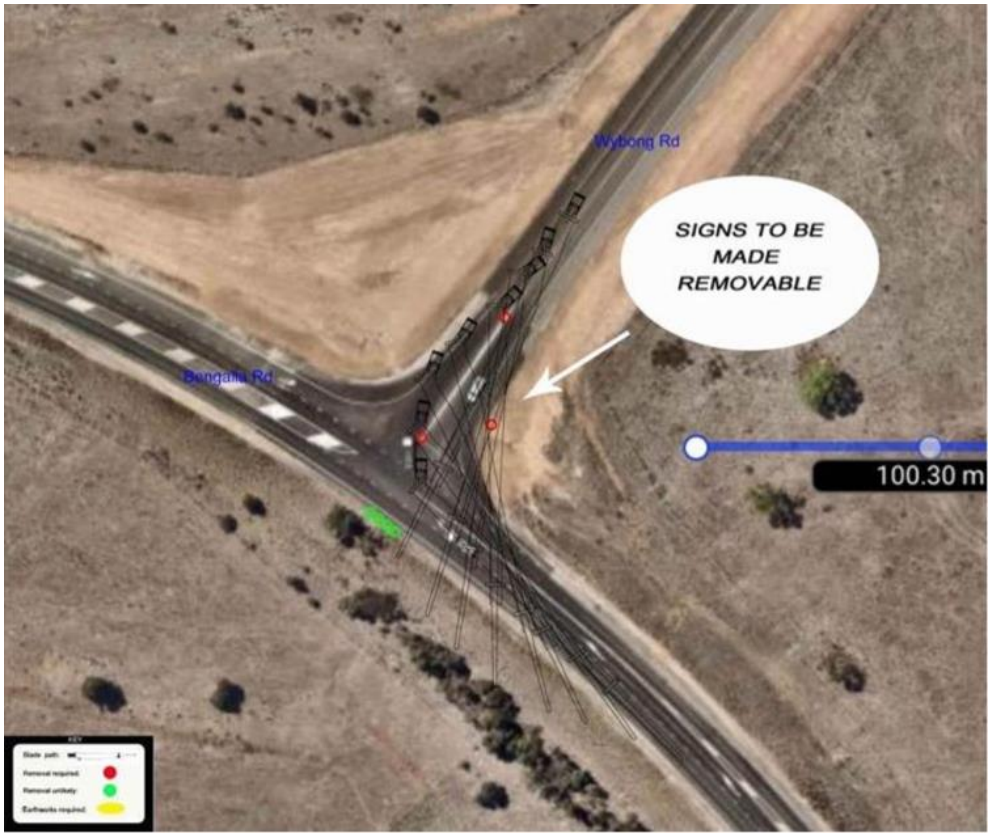


Source: Rex J Andrews Appendix B

3.7.1.10 *Bengalla Road onto Wybong Road*

Signage at the Bengalla Road and Wybong Road need to be made removable to accommodate vehicle swept paths.

Figure 3.19: Bengalla Road to Wybong Road

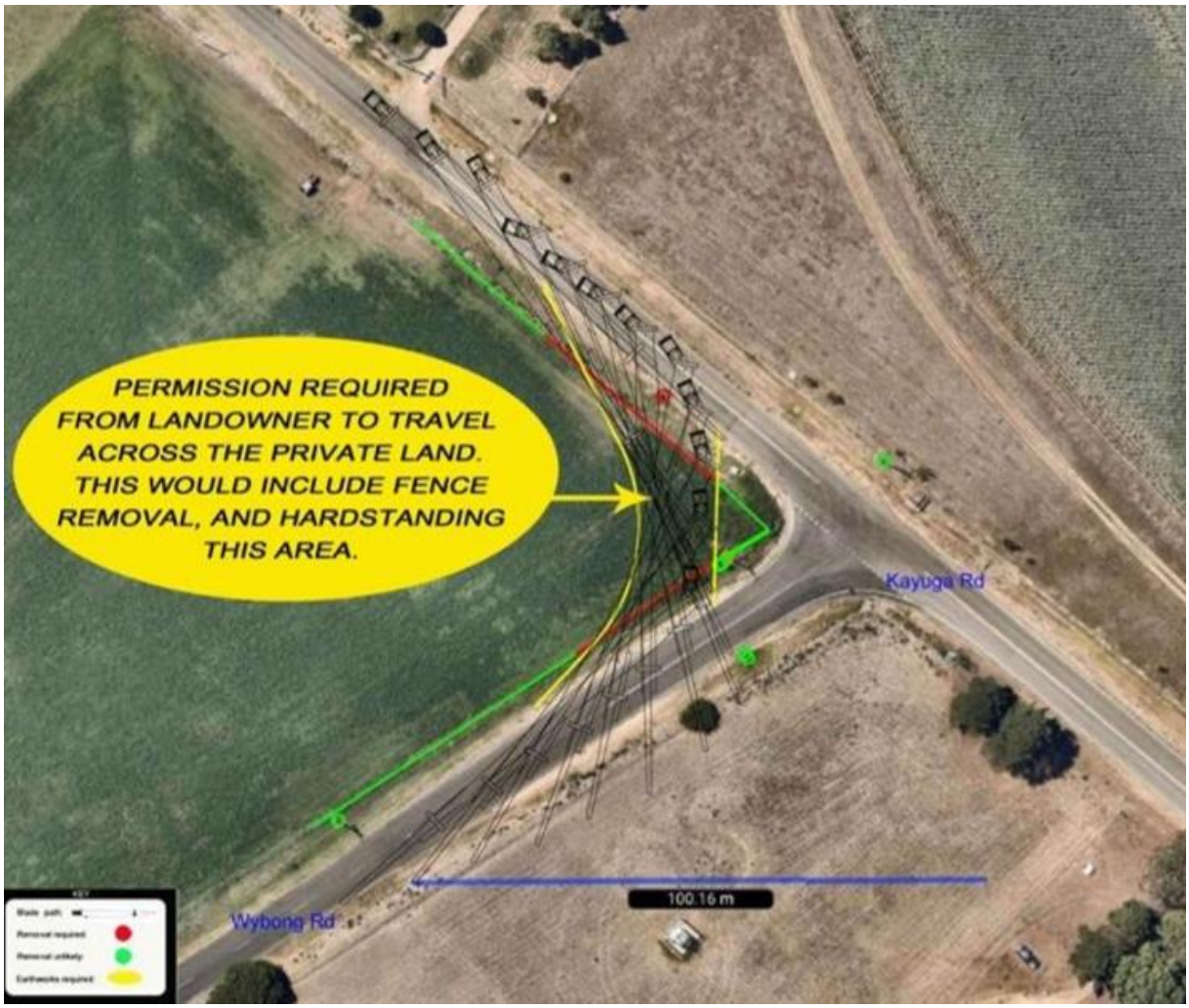


Source: Rex J Andrews Appendix B

3.7.1.11 Wybong Road onto Kayuga Road

At the Wybong Road and Kayuga Road intersection, signage will need to be made removable to accommodate vehicle swept paths. Additional hardstand and adjustment of existing fences on private land will also be required to accommodate vehicle swept paths at this intersection.

Figure 3.20: Wybong Road to Kayuga Road

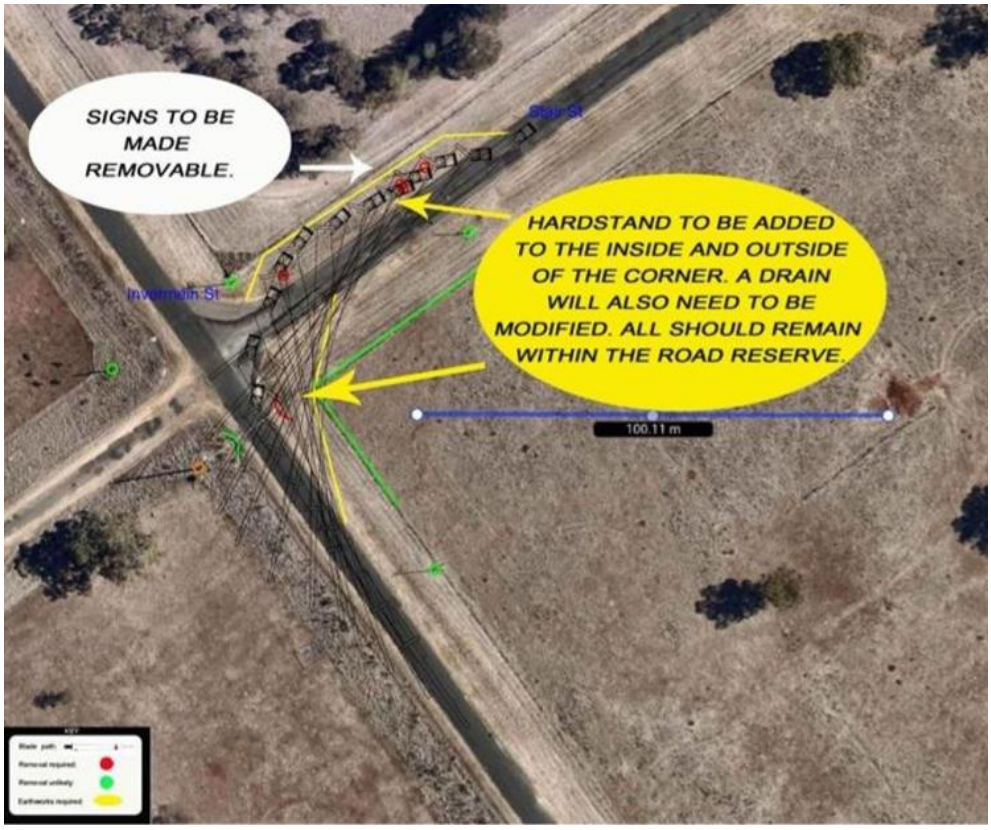


Source: Rex J Andrews Appendix B

3.7.1.12 *Ivenmein Street to Stair Street*

At the Ivenmein Street and Stair Street intersection, signage will need to be made removable and additional hardstand provided (including culvert extension) to accommodate the vehicle swept paths.

Figure 3.21: Ivermein Street to Stair Street



Source: Rex J Andrews Appendix B

3.7.1.13 Dartbrook Road

At the section of Dartbrook Road (see Figure 3.22) additional hardstand and conversion of signage to removable signs will be required to accommodate vehicle swept paths.

Figure 3.22: Dartbrook Road

Source: Rex J Andrews Appendix B

3.7.1.14 Dartbrook Road to New England Highway

At the Dartbrook Road and New England Highway intersection additional hardstand and conversion of signage to removable signs will be required to accommodate vehicle swept paths.

Figure 3.23: Dartbrook Road to New England Highway

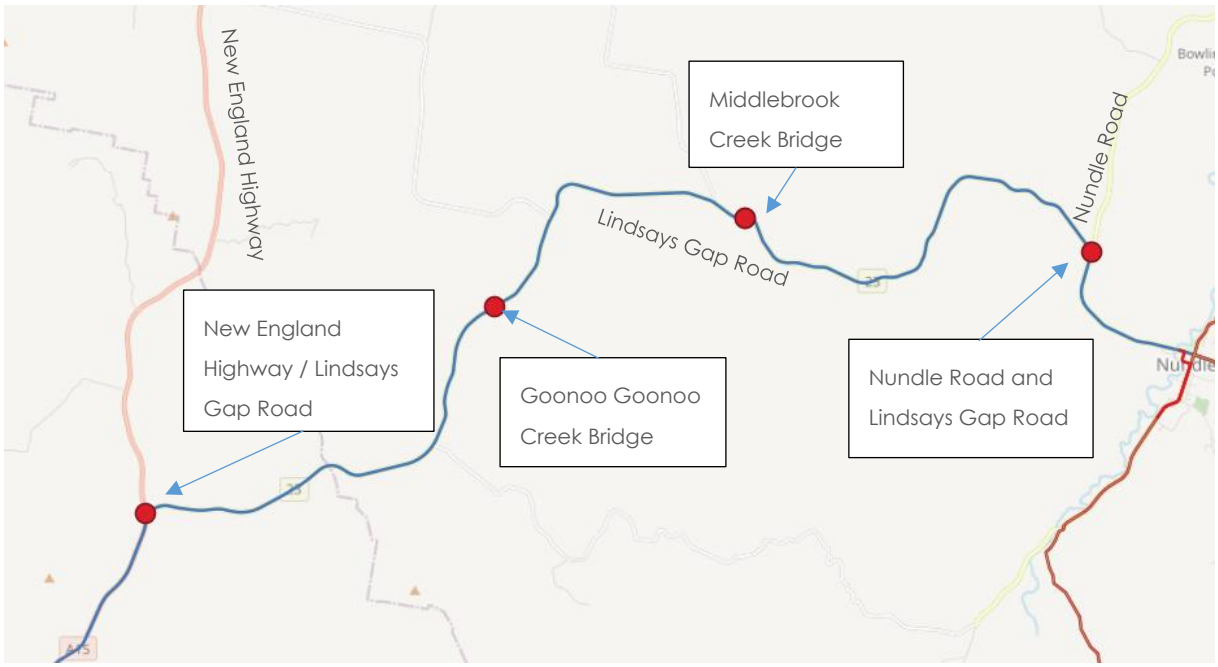
Source: Rex J Andrews Appendix B

3.7.2 New England Highway to Nundle via Lindsays Gap Road.

The proposed route along Lindsays Gap Road and Nundle Road is shown in Figure 3.24. The route travels from the New England Highway, Lindsays Gap Road, Nundle Road and Oakenville Street. The route would require upgrades to:

- Lindsays Gap Road and New England Highway Intersection
- Goonoo Goonoo Creek Bridge
- Middlebrook Creek Bridge
- Lindsays Gap Road and Nundle Road Intersection.

Figure 3.24: New England Highway to Nundle via Lindsays Gap Road



Source: Open Street Maps

3.7.2.1 *Lindsays Gap Road and New England Highway Intersection*

At the Lindsays Gap Road and New England Highway intersection, widening of the hardstand and installation of removable signage will be required to accommodate the vehicle swept path from the New England Highway to Lindsays Gap Road.

Figure 3.25: New England Highway and Lindsays Gap Road

Source: Rex J Andrews Appendix B

3.7.2.2 *Goonoo Goonoo Creek Bridge*

Blades would be able to negotiate this bridge however loads with axles wider than 3.6m would be required to use a different route. (Note Garoo Road was also investigated but also features a one lane bridge)

Widening and upgrading the bridge to allow wide axle loads, as this would avoid an 80km detour through Tamworth and reduce the traffic impacts of the Project. A photo of the bridge is shown in Figure 3.26. Consultation has been undertaken with Tamworth Regional Council about the upgrade of the bridge and they have not raised any objections to the upgrade of the bridge. See Section 3.8.1 of this report for further details.

Figure 3.26: Goonoo Goonoo Bridge

Source: Rex J Andrews

3.7.2.3 *Middlebrook Creek Bridge*

Currently there is a one lane bridge some 4.5m wide. This bridge is already on a Tamworth Regional Council program to be upgraded and the Project is in discussion with Council to facilitate the upgrade to accommodate the wide axle loads.

Figure 3.27: Middlebrook Creek Bridge

3.7.2.4 *Lindsays Gap Road and Nundle Road Intersection*

To accommodate the vehicle swept paths at the Lindsays Gap Road and Nundle Road intersection, intersection widening, additional hardstand, installation of removable signage and a power pole relocation will be required.

Figure 3.28: Lindsays Gap Road to Nundle Road

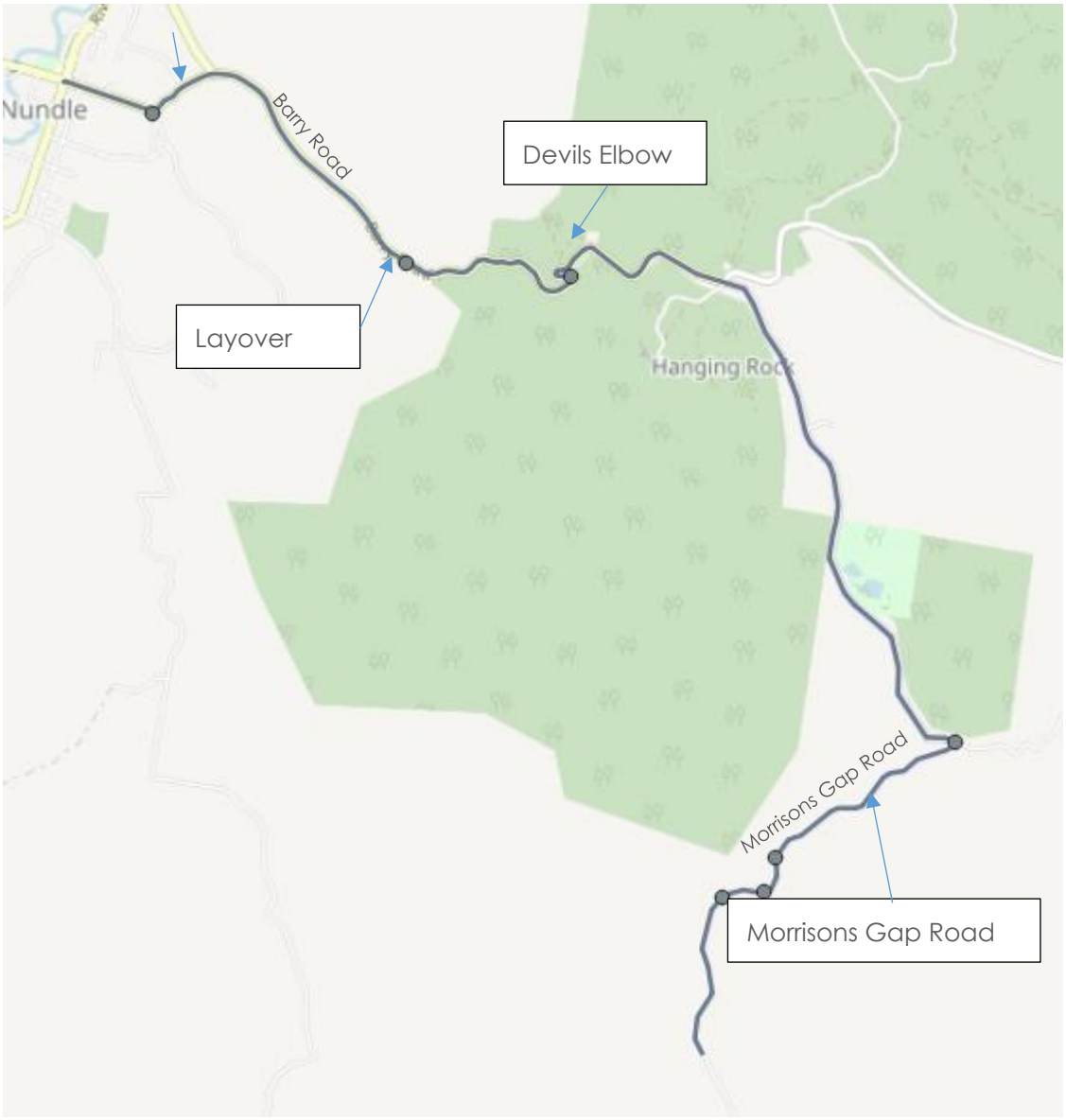
Source: Rex J Andrews Appendix B

3.7.3 Nundle to Site via Barry Road and Morrisons Gap Road

This route would follow Oakenville Street, Old Hanging Rock Road, Barry Road and Morrisons Gap Road. The route from Nundle to site via Barry Road and Morrisons Gap Road requires upgrades at:

- Oakenville Street and Old Hanging Rock Road Intersection
- Barry Road Layover
- Devils Elbow realignment
- Barry Road
- Barry Road and Morrisons Gap Road Intersection
- Morrisons Gap Road upgrade and sealing.

Figure 3.29: Barry Road



Source: Open Street Maps

3.7.3.1 *Oakenville Street and Old Hanging Rock Road Intersection*

To accommodate vehicle swept paths at the Oakenville Street and Old Hanging Rock intersection, road widening, additional hardstand and removable signage and street furniture will be required.

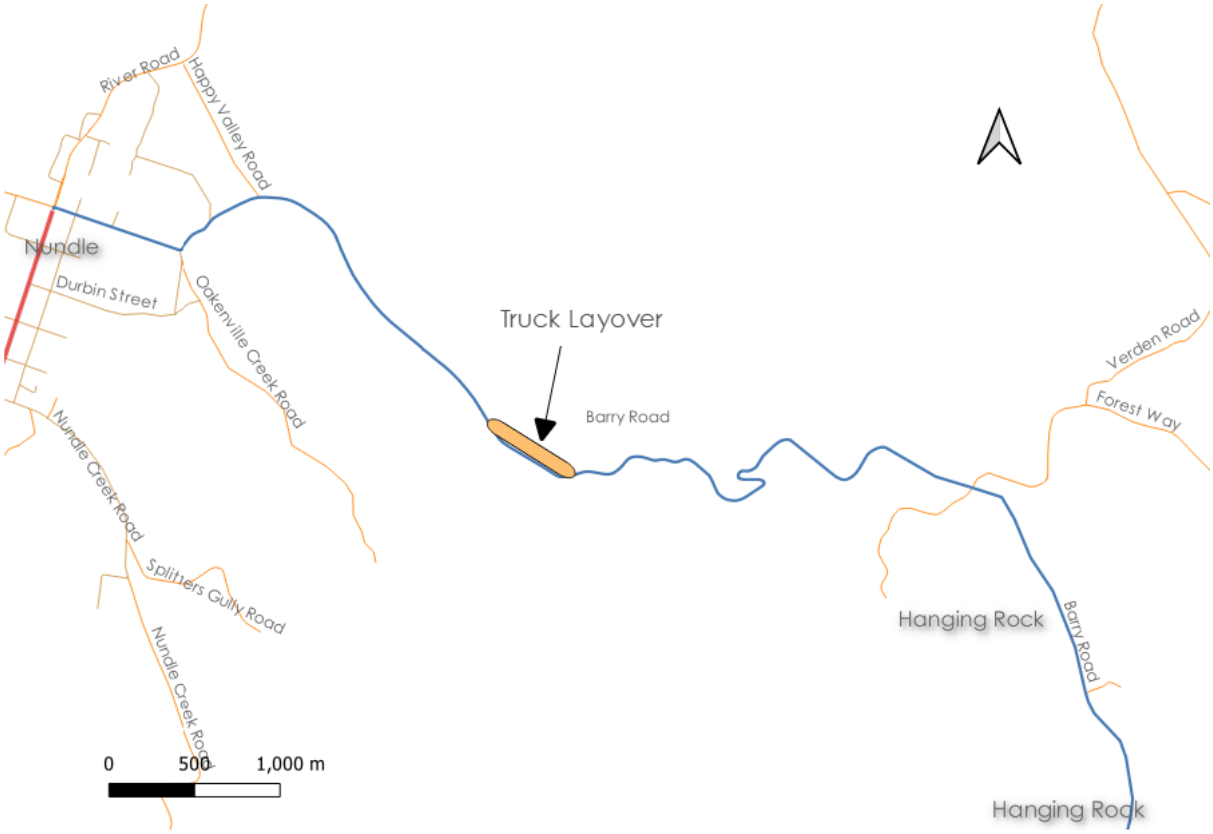
Figure 3.30: Oakenville Street and Old Hanging Rock Road

Source: Rex J Andrews Appendix B

3.7.3.2 *Barry Road Layover*

At the Barry Road Layover (see Figure 3.31) it has been identified that an area at the base of the hill an extension of the road shoulder may need to be constructed to provide a staging area for trucks about to negotiate the gradient up to Hanging Rock. This would be used if multiple prime movers are required.

Figure 3.31: Barry Road Truck Layover



3.7.3.3 Devils Elbow Realignment

It is proposed to provide a new private road that would straighten the curves on Barry Road to Hanging Rock. Three design options that were investigated and a preferred option selected on the basis of consultation with Forestry, Tamworth Regional Council and consideration of minimising biodiversity impacts

The preferred option would result in a significant gradient that may require combination of push pull truck arrangements to negotiate the slope. The swept path for the preferred option is shown in Figure 3.32.

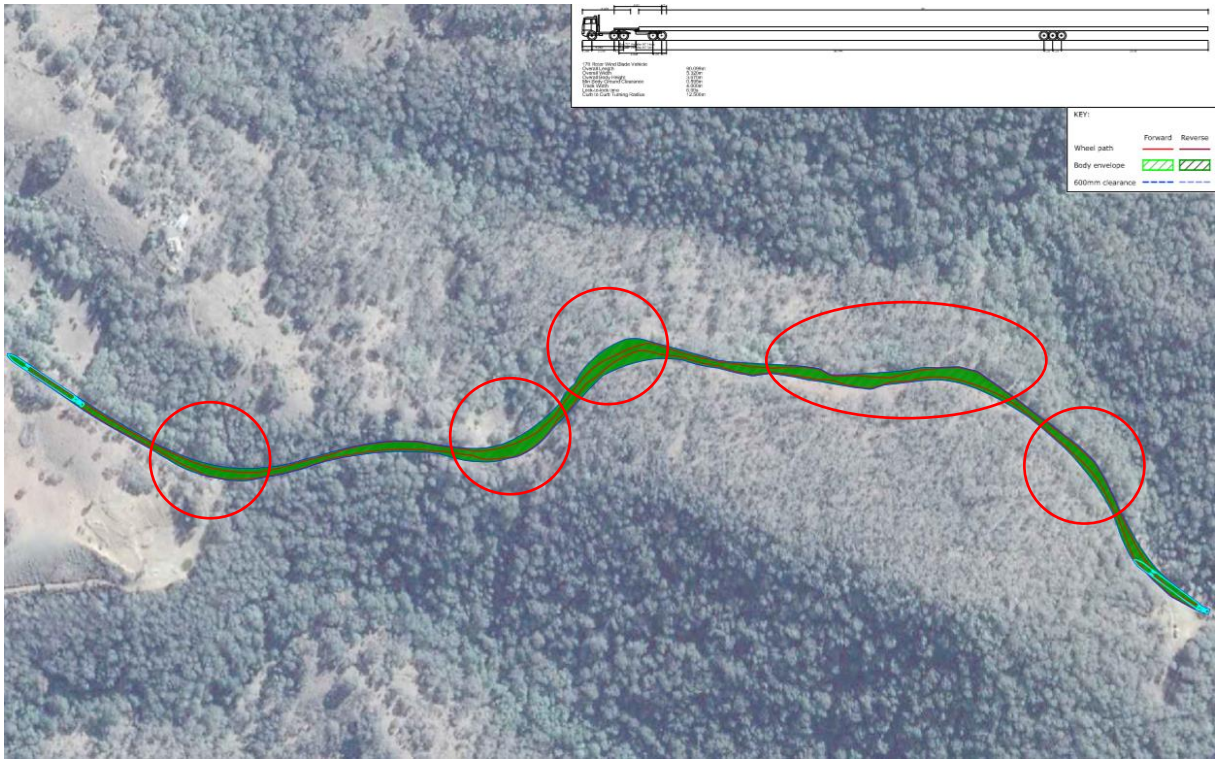
Figure 3.32: Devil's Elbow Realignment Preferred Option

Source: TTPP Swept path

3.7.3.4 Barry Road

Along Barry Road there would be a requirement to cut back of vegetation within the existing road reserve to allow the longest loads to negotiate the road. The key locations are shown in Figure 3.33.

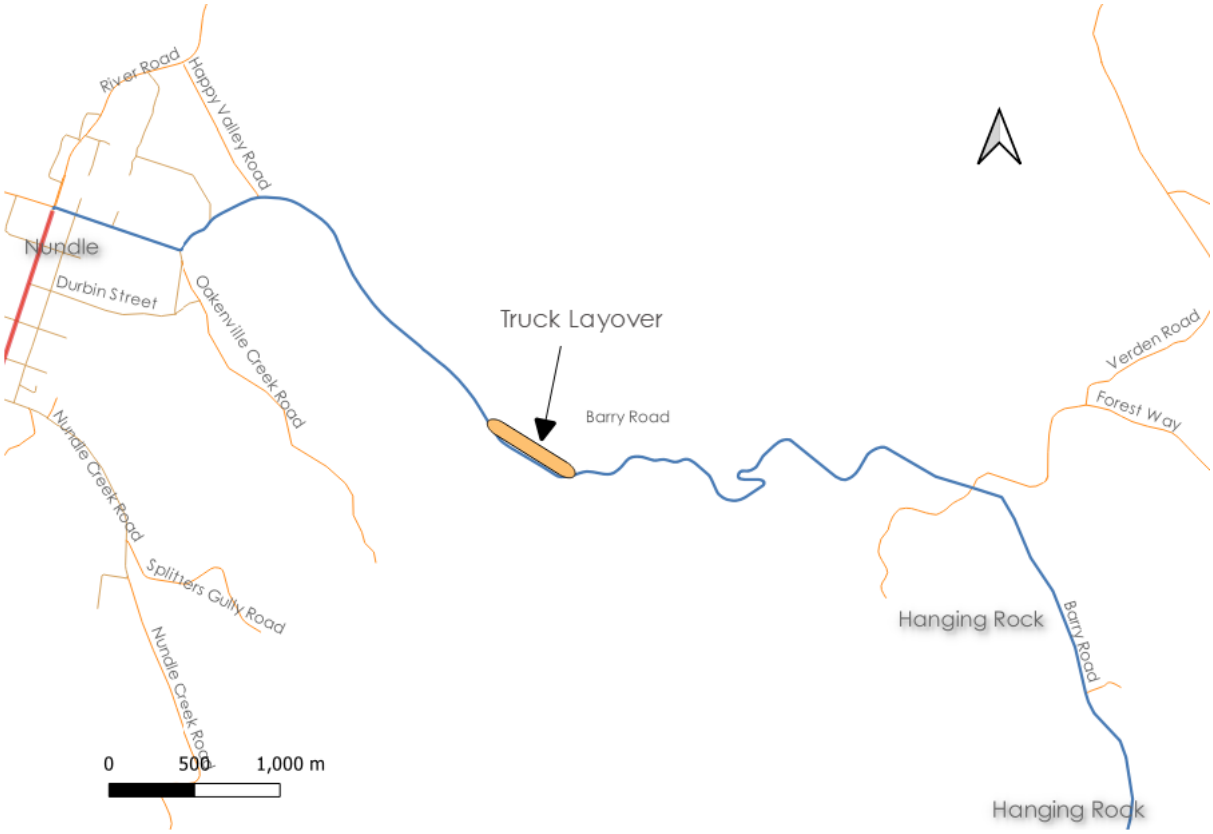
Figure 3.33: Barry Road Widening



Source: TTPP Swept path

In addition, an area has been identified for layover of vehicles while waiting to climb up Barry Road to Hanging Rock Road. This would comprise widening of the shoulder to be used as staging area. This location is shown in Figure 3.34.

Figure 3.34: Barry Road Truck Layover



3.7.3.5 *Barry Road and Morrisons Gap Road*

Requires additional widening and hardstand, fence relocation and removal of trees as shown in Figure 3.35.

Figure 3.35: Barry Road to Morrisons Gap Road

Source: Rex J Andrews Appendix B

3.7.3.6 *Morrisons Gap Road*

Morrisons Gap Road requires upgrade with widening 5.5m width and widening on bends, clearing vegetation on bends and sealing Morrisons Gap Road.

Figure 3.36: Morrisons Gap Road (part 1)

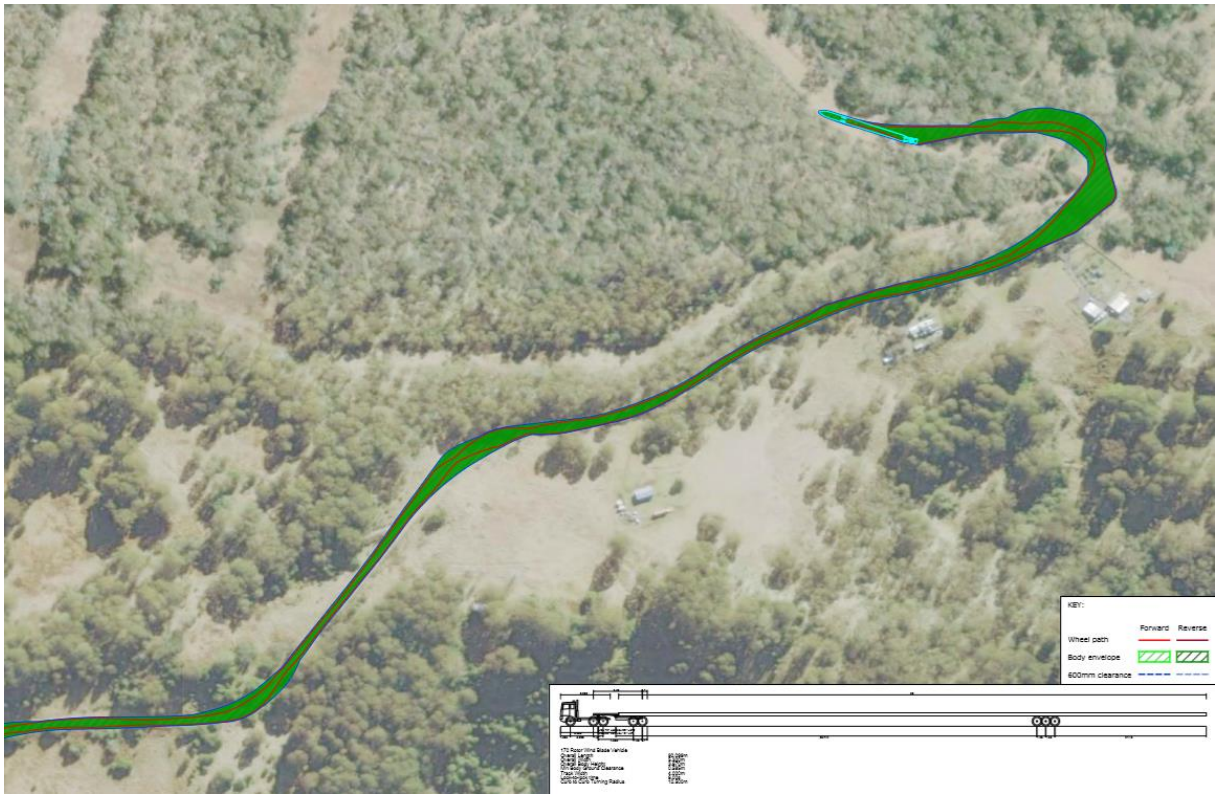


Figure 3.37: Morrisons Gap Road (part 2)

Figure 3.38: Morrisons Gap Road (part 3)

It has been identified that Morrisons Gap Road does not follow the road reserve on the cadastral map. In these locations, it is intended to work with Council and local landowners to resolve this existing issue.

Based on feedback from local community members, the project is proposing to seal Morrisons Gap Road to reduce the impacts of dust and vibrations on the local residents and provide an improved road for ongoing use by the community. The road would also be upgraded to provide additional warning signage, improved visibility, and sight distance.

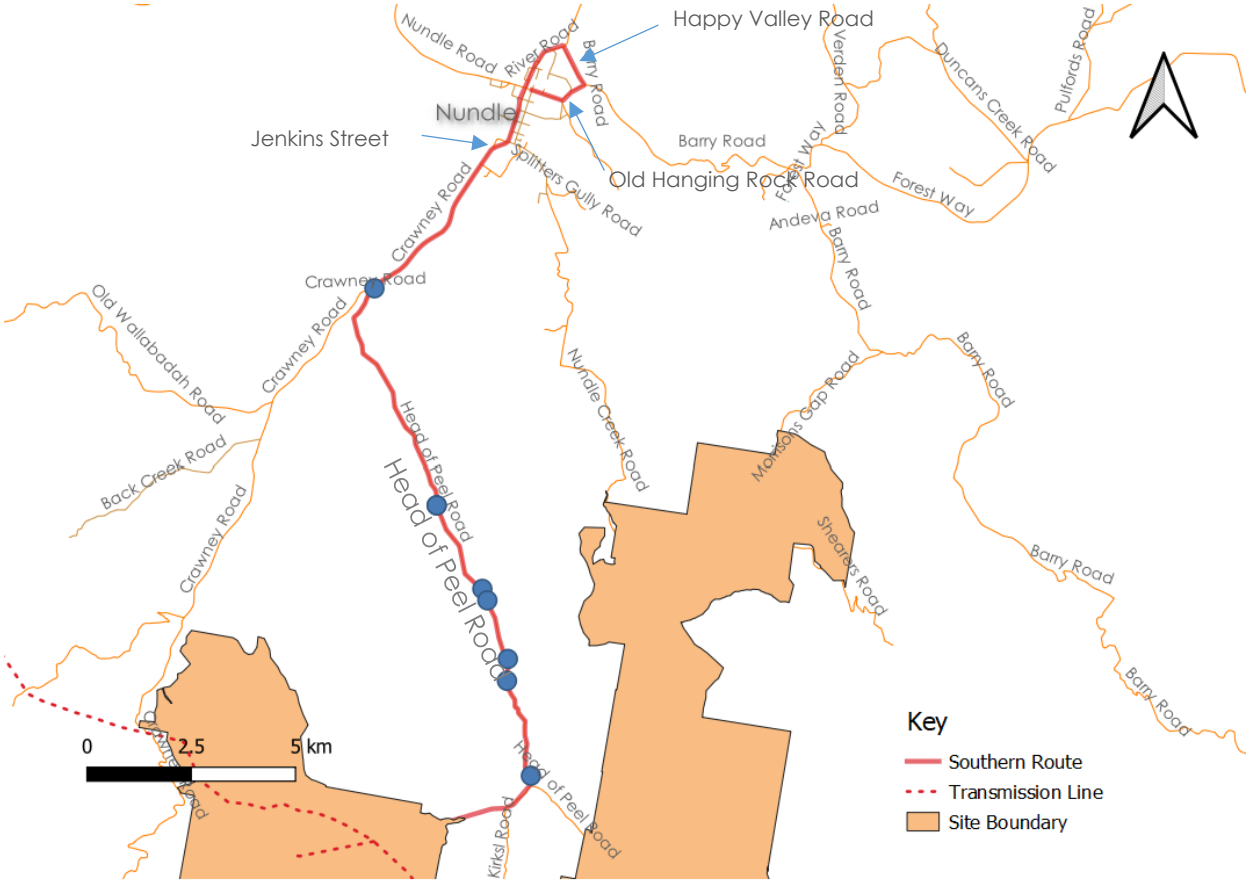
A detailed traffic management plan would be prepared to communicate the times when oversized and over massed vehicles would be using the road as well as an emergency plan to allow access for emergency vehicles.

3.7.4 Nundle to Site via Crawney Road and Head of Peel Road

The route alternative route to site via Crawney Road and Head of Peel Road would use Oakenville Street, Old Hanging Rock Road, Happy Valley Road, Jenkins Street, Crawney Road and Head of Peel Road. This route would be the main route for the turbine blades. The upgrades required on this route would be:

- Upgrade of the intersection of Old Hanging Rock Road and Oakenville Street
- Upgrade of Old Hanging Rock Road and Happy Valley Road
- Upgrade of the intersection of Happy Valley Road and Jenkins Street
- Upgrade of the intersection of Crawney Road and Head of Peel Road
- Upgrade of Head of Peel Road including causeways and duplication of a bridge.

Figure 3.39: Southern Route via Crawney Road and Head of Peel Road



Source: Open Street Maps

3.7.4.1 *Old Hanging Rock Road to Happy Valley Road*

At the Old Hanging Rock and Happy Road intersection, additional hardstand will be required to accommodate the vehicle swept path. Portions of the additional hardstand will be on private property and will also require fence relocation and vegetation trimming / clearing. Signs will also be converted to removable signage at this intersection.

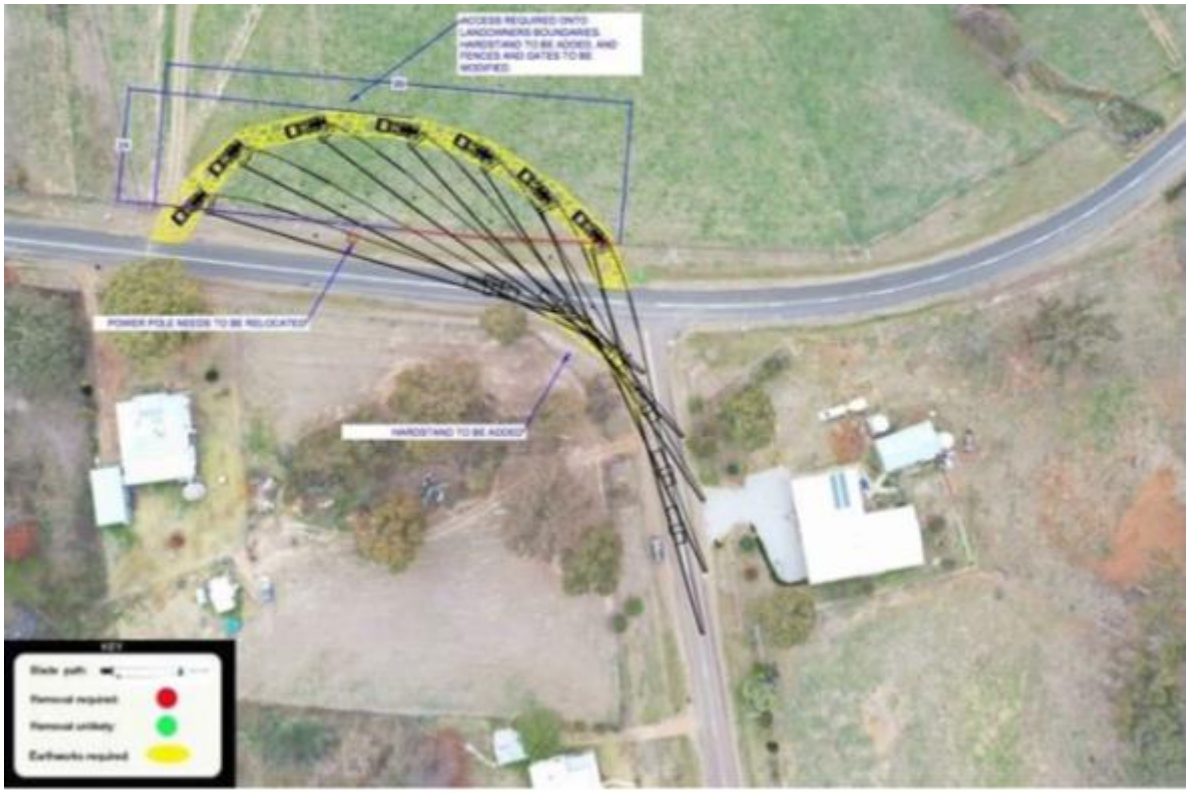
Figure 3.40: Old Hanging Rock Road to Happy Valley Road

Source: Rex J Andrews Appendix B

3.7.4.2 *Happy Valley Road to Jenkins Street*

Additional widening of the road and hard stand is required at the Happy Valley Road and Jenkins Street intersection to accommodate the vehicle swept path. Vehicle crossings into private land will occur and will require fence relocation as shown in Figure 3.41. Some trees will need to be trimmed/cleared and signs relocated to accommodate the vehicle swept paths.

Figure 3.41: Happy Valley Road to Jenkins Street



Source: Rex J Andrews Appendix B

3.7.4.3 Crawney Road to Head of Peel Road

Additional road widening and hardstand will be required at the Crawney Road and Head of Peel Road intersection to accommodate the vehicle swept paths. The extent of road works required are shown in Figure 3.42. This vehicle movement at this intersection would need to be undertaken under traffic control.

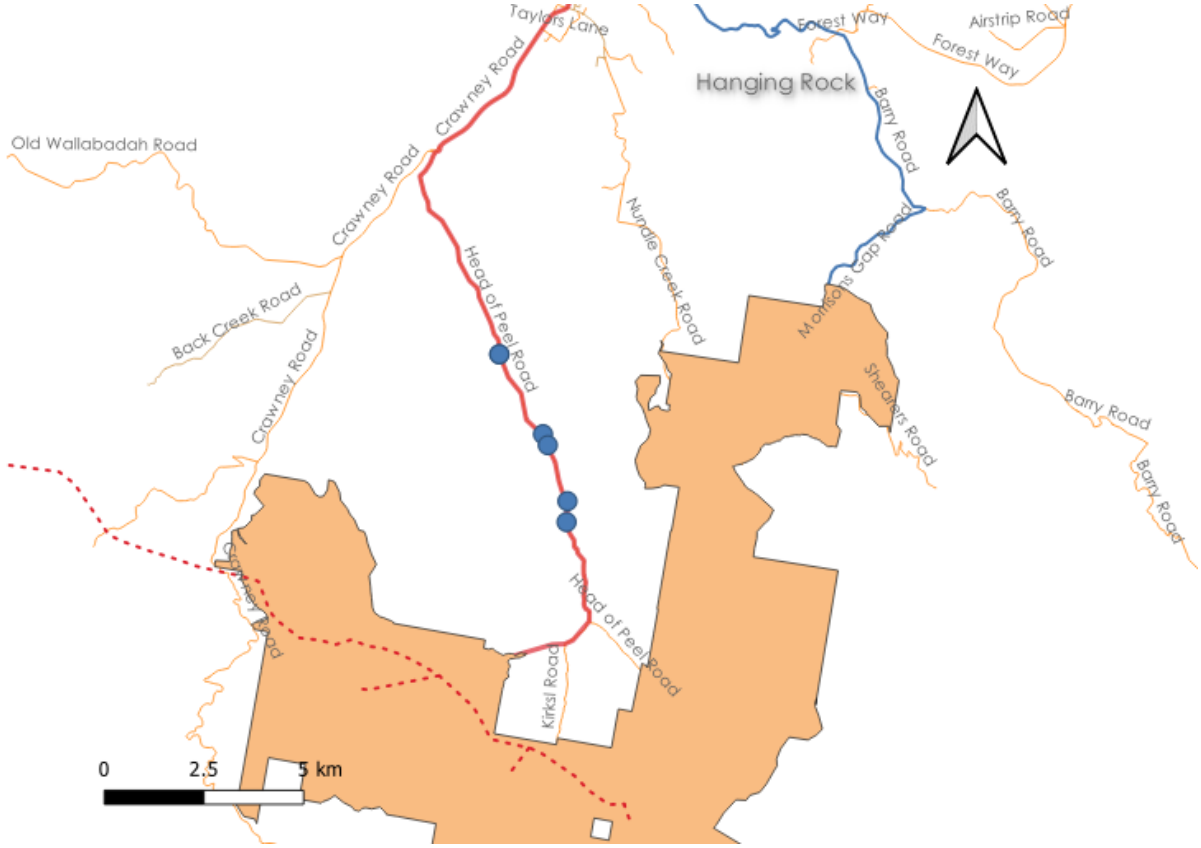
Figure 3.42: Crawney Road to Head of Peel Road

Source: Rex J Andrews Appendix B

3.7.4.4 Head of Peel Road Upgrade

General upgrades to the Head of Peel Road will be required including road widening to a width of 5.5m will be required to accommodate vehicle movements. Significant work on bridges, causeways and upgrading roads and horizontal and vertical curves will also need to be undertaken. It has been identified that Head of Peel Road does not follow the road reserve on the cadastral map. In these locations it is intended to work with Council and local landowners to resolve this existing issue.

Figure 3.43: Head of Peel Road Casueway



3.7.4.5 *Head of Peel Road – Bridge*

The existing bridge over the Peel River will need to be duplicated to accommodate the vehicle swept paths. The bridge currently has abutment for a second lane and could be easily widened to two lanes.

Figure 3.44: Head of Peel Road Bridge

Source: Rex J Andrews

3.7.5 Alternative Route Through Nundle to Jenkins Street

For Project related vehicle loads going to Head of Peel Road that do not include blades an alternative route via Herring Street and Innes Street is possible. This route would avoid travelling through the centre of the town (see Figure 3.8).

An alternative route for blades is being considered that would use Herring Street, Innes Street to Gill Street, Point Street and Crawney Road. This would require intersection up grades additional hard stand, modifications to drainage structures and use of private land. Swept paths for this route are shown in Figure 3.45 and Figure 3.46.

Figure 3.45: Wind Blades Swept Paths Alternative Route South (Part1)

Figure 3.46: Wind Blades Swept Paths Alternative Route South (Part 2)

There this would require the following upgrades:

3.7.5.1 Oakenville Street and Herring Street

This intersection would require additional hard stand, modification to the existing culverts and possible relocation of powerlines. The path would also require travelling through private land.

3.7.5.2 Herring Street and Innes Street

Additional hardstand required and crossing onto private land.

3.7.5.3 Innes Street to Gill Street

Requires additional hard stand and modification to road shoulder. It crosses private land and relocation of a power pole adjacent to the SES building.

3.7.5.4 Gill Street and Point Street

Requires additional hard stand and crossing into private property.

3.7.5.5 *Point Street and Crawney Road*

Significant modification to the existing culvert structure and widening of the intersection to accommodate the largest vehicles.

3.8 Consultation with Stakeholders

Key stakeholders were consulted as part of the study included:

- Tamworth Regional Council
- Transport for NSW (TfNSW)
- Forestry Corporation NSW
- Muswellbrook Shire Council.

In addition, we have contacted other local councils along the route:

- Liverpool Plains Shire Council
- Cessnock City Council
- Newcastle City Council
- Upper Hunter Council.

Responses from these stakeholders are attached in Appendix C. In addition, the Project has also consulted with residents on Head of Peel Road, Barry Road, Morrisons Gap Road and Shearers Road. A summary of the outcomes of that consultation is provided in Section 3.8.9.

3.8.1 Tamworth Regional Council

Tamworth Regional Council were consulted during the preparation of the EIS. TTPP met with a representative of Council on site in Nundle on 11 June 2020. A video conference was held on 26 August 2020 with the minutes provided in Appendix C.

A summary of comments from Council are provided below:

In line with Council's Development Control Plan and "Engineering Design Guidelines for SubDivisions and Developments" (both of which can be found on Council's web site), the following conditions are recommended by Council:

- *Road crossings are to use under-boring techniques only unless alternate method is approved by the roads authority (Council - Infrastructure and Works division);*
- *A Dial Before You Dig enquiry shall be lodged and any applicable services including TRC assets are to be potholed to ensure no clashes exist;*
- *All open trenches and pits within the footway shall be fenced off to prevent any unauthorised access by members of the public;*

- *A traffic control plan prepared by an NSW Worksafe accredited person in accordance with AS 1742 and the RMS Traffic Control at Worksites Manual will need to be provided for all works and submitted to Council prior to works commencing;*
- *All surrounds to new pits/valve covers shall be shaped to suit and should be situated outside of the clear zone where possible, in the event this is not possible consultation with Council shall be undertaken and installation of warning devices such as guideposts shall be installed to highlight any potential hazard;*
- *Signage shall be installed to highlight any areas where vibration rolling could be detrimental to any new infrastructure due to low cover or heightened loadings;*
- *An inspection of the Dungowan Dam Road pavement prior to and after works in conjunction with Council shall be undertaken to ascertain the condition of the road and establish whether any rectification works are required prior to leaving site or within the defects liability period of the works;*
- *Any driveways, footpaths or footways affected by the works shall be reinstated to existing;*
- *The footway/verge shall be left in a clean and tidy manner following works and seeded to reinstate existing ground coverage;*
- *Any damage to Council infrastructure caused by the works shall be rectified by the Contractor at their expense;*
- *Appropriate erosion and sediment control will require implementation during works;*
- *Evidence that Public liability insurance to the value of $20mill for the duration of the works shall be provided to Council prior to works commencing; and*
- *Council shall be informed of the respective contractor undertaking the works prior to works commencing;*
- *WAE documentation shall be provided to Council for any works within the road reserve*.

3.8.2 Transport for NSW

The following comments were provided in response to the report provided in the pre-lodgement enquiry, dated 17 August 2020.

> *TfNSW have no objections at this time, to the movements of the largest blade size, however it should be noted, that the largest blade movement for a wind farm project in NSW to date has been for 67m blades. These length blades have previously travelled along the proposed route out of Newcastle Port without incident.*
>
> *The report appears to be proposing to transport blades of two sizes, 65.4 metres and 82 metres. In that regard we expect that the final Environmental Impact Statement (EIS) will define the proposed blade length.*

With regard to blade lengths, both the 65.4 metre and 82 metre blades remain options for the Project. The assessment has considered the 82 metre as a worst case scenario for road upgrades.

3.8.3 Forestry NSW

The following issues were identified:

- *Road closures will impact on log trucks. However, closures of 10-15 minutes, a couple of times a day, will not have a significant impact on production*
- *Communication protocols currently in place with log trucks must be implemented by the trucks hauling the turbine components*
- *FCNSW require advanced notification of when haulage of components will begin so as to advise all parties involved with logging activities in the area of likely temporary road closures and the presence of oversized vehicles.*

3.8.4 Muswellbrook City Council

Muswellbrook City Council have responded that the route through Muswellbrook is currently under investigation as there are a number of issues with it including advice not to allow heavy vehicle movements over Rosebrook Bridge.

> *For this proposal to be considered, a comprehensive route analysis would have to be undertaken including all bridges and drainage structures to determine the impact involved on the road assets. The proposed road changes/upgrades would not nominally be funded by council and a design should be done and submitted to council for their consent.*

3.8.5 Liverpool Plains Shire Council

Liverpool Plains Shire Council provided a letter response. The points:

- The only local road is Lindsays Gap Road for 4.7 km.
- Any demand to LPSC road infrastructure as a result of construction-allied activity, both direct and indirect will need to be rectified at the proponent's expense.

3.8.6 Cessnock City Council

As the identified routes and any likely infrastructure impacts are confined to the state road network, and there will be no impact on the local road network, Council has no specific comments on the proposed routes other than to support the use of these routes as Councils preferred option for these vehicle movements.

3.8.7 Newcastle City Council

Comments provided by Newcastle City Council were:

- *The route will only impact Selwyn Street and part of George Street, Mayfield. The rest are Transport for NSW infrastructure.*
- *The EIS should consider the turning movements of the heavy vehicle plus the blade load that it will not hit our road infrastructures.*
- *The transport time should be during at night or early hours of the morning when there is less traffic.*
- *An NHVR application should be applied before the event take place.*

3.8.8 Upper Hunter Council

Upper Hunter Council have not responded however the routes through this local government area are on state roads and would not affect Council roads directly.

3.8.9 Outcomes from Consultation

Section 4 provides project commitments and mitigations opportunities to reduce the impact and specifically address the concerns of local residents. The project commitments or mitigations can be summarised for the concerns below:

Table 3.12: Oversized and Over Mass Vehicles

Issues Raised	Response
Dust and Vibration along Head of Peel Road and Morrisons Gap Road	Sealing of Morrisons Gap Road along where higher density of residential dwellings are.
Impact to existing business operations on Head of Peel Road	Communication with landowners around traffic management plan and working with landowners around stock movement plans. Further agreements with key landowners once final design and routes are selected.
Accumulated traffic build up on Barry Road and Morrisons Gap Road, in particular on Barry Road with the existing logging traffic	Laybys are proposed and an upgrade to the Devils Elbow to allow traffic to pass.
The quality of Morrisons Gap Road surface and improving safety along this route	Sealing of Morrisons Gap road and introduction of voluntary speed limits for construction related traffic. Improved signage on Morrisons Gap Road.
Commuters from Morrisons Gap Road and Hanging Rock and oversized vehicle movement during peak morning and evening commuting times	Recommendation to avoid Oversized deliveries during peak commuter times.
Safety of school children on school bus routes	Recommended avoid the transportation of oversized and over mass vehicles during school bus periods.
2 residents with pacemakers in Hanging Rock and Morrisons Gap Road with concerns regarding being stuck behind oversized vehicles during emergency situations	Traffic Management Plan to include communication strategy to include consideration for these landowners.

4 Mitigation Measures

The following outlines measures that are recommended to be implemented to reduce the impacts of the Project.

4.1 Oversized and Over Mass Vehicles

Oversized and over mass vehicles would be governed by a detailed traffic management plan that should be developed before approval for transport is granted. The traffic management plan will include:

- Procedures for escorts of oversized and over mass vehicles.
- Traffic control plans for temporary road closures to allow vehicles to cross to carriageway.
- Safe work methods and strategies for working on roadways.
- Dates and times for transporting loads.
- Location and use of rest stops and layovers along the journey.
- Communication strategy to affected communities.
- Notification and consultation of key stakeholders including:
  - Police and emergency services
  - Local Councils along the route
  - Public and School bus operators that may be affected
  - Advertising in local newspaper and media releases.
- Contact details of foreman or project manager throughout operations to be shared with emergency services and road authorities.
- Timing of operations and measures to avoid commuter peaks and school peaks through populated areas where practicable.
- Consideration of cumulative impacts of other projects along the route including mine and forestry related transport.
- Upgrading the two bridges along Lindsays Gap Road to avoid the need to use Tamworth route for towers and mitigate impact along the Nundle Road.
- Layby proposed to alleviate concern for being stuck behind oversized vehicles going up Barry Road just before Devils Elbow.
- Project commitment to seal Morrisons Gap Road and improve safety along this road.

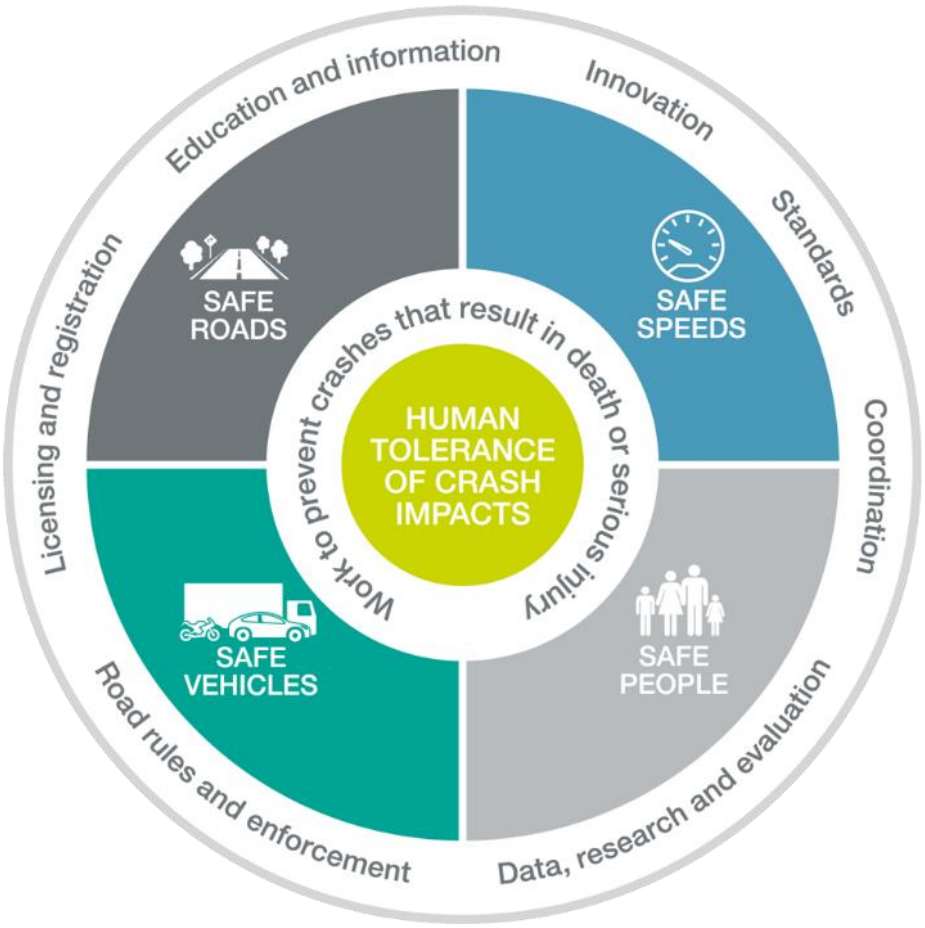
4.2 Reducing Traffic Volumes

To reduce the number of light vehicles generated by the Project, it is recommended that the use of shuttle bus services to and from key worker accommodation sites is implemented. This would significantly reduce the volume of light vehicles and reduce the impact on the road network. The assessment has assumed the use of 24-seater minibuses though higher capacity vehicles should be considered if feasible to reduce the amount of traffic.

4.3 Road Safety

Under the safe systems approach road safety is generally improved by focussing on Safe Roads, Safe Speeds, Safe People and Safe Vehicles. The safe systems approach is summarised in Figure 4.1.

Figure 4.1: Safe Systems Approach



Source: National Road Safety Strategy

4.3.1 Safe People

Safe people can be achieved by education of workers and policies of the work site. To this end worker site induction should include driver education of the local road conditions. This could include:

- Training on drivers respect private property and farm gates.
- Driving to the conditions on unsealed roads.
- Avoid speeding and other dangerous behaviour. Identification and communication of known road crash cluster locations. Also, identification and warning of when roads may be affected by black ice.
- A drug and alcohol policy to reduce incidents of drunk and drug driving.
- Additional caution when driving at dawn and dusk of kangaroos and other wildlife.
- Driving around livestock.
- Measures to reduce the risk of workers driving while tired.

In addition, the use of shuttle bus services would reduce the number of workers driving from the site while tired.

4.3.2 Safe Vehicles

Contractors are to ensure that all vehicles used are road worthy and in good working condition with lights, brakes, tire pressure etc.

4.3.3 Safe Roads

A number of road upgrades are proposed as part of the Project including the widening of two one-lane bridges. We recommend a road safety audit of the identified routes to site to identify any road safety deficiencies that could be corrected before the Project begins.

4.3.4 Safe Speeds

As part of managing the project the staff would be required to drive to the conditions and respect speed limits. Temporary construction speed limits may need to be implemented on Barry Road. Morrisons Gap Road and Head of Peel Road to reduce the risk and severity of potential crashes.

4.3.5 Sensitive Land Uses

It is recognised that the Project may have an impact on sensitive land uses such as schools and the township of Nundle. To minimise the impacts on schools it is recommended that temporary road closures should be avoided during school peaks. To this end vehicle layovers

have been identified so allow vehicles to wait until appropriate times also coordinating these times with the forestry trucks.

Likewise impacts on Nundle can be reduced by restricting heavy vehicle movements to daylight hours and avoiding dawn and dusk.

4.4 Enabling Works

As outlined in Section 3.7 a number of road upgrades are likely to be required to enable the oversize and over mass vehicles and loads required for the Project. The following summarises the location of known constraints and indicative works required to accommodate the delivery of blades, nacelles, and towers. This is described for the largest 170m rotor (ie. 83.5 metre blades) being considered. This rotor has the option of the tips being removed requiring a smaller truck but additional trucks to carry the tips.

The following works have been identified as being required for the Project. It is noted that if a smaller turbine model and blade configuration is utilised, then not all the works identified below would be required.

Newcastle Port to Lindsays Gap Road

- Mayfield Birth onto Selwyn Street – Additional hardstand required and fence relocated.
- Selwyn Street onto George Street - Sign need to be made removable.
- George Street onto Industrial Drive – Traffic Signals relocated and additional hardstand.
- Industrial Drive onto Maitland Road – Modification to concrete median strip.
- John Renshaw Drive onto the Hunter Expressway – May require additional hardstand.
- Golden Highway intersection with Putty Road – Signs to be made removable.
- Golden Highway through Jerrys Plains village – Signs need to be made removable and additional hardstand required.
- Golden Highway to Denman Road – Additional hardstand required and signs made removable.
- Denman Road onto Bengalla Road - Additional hardstand required and signs made removable.
- Bengalla Road onto Wybong Road – Signs to be made removable.
- Wybong Road onto Kayuga Road – Signs to be made removable, additional hardstand and adjustment of fences on private land.
- Ivenmein Street onto Dartbrook Mine Access Road – Signs made removable and additional hardstand including culvert extension required.
- Dartbrook Road – Additional hardstand required and signs made removable.

- New England Highway / Lindsays Gap Road – Signs to be made removable and some hardstand added.

Lindsays Gap Road to Nundle

- Goonoo Goonoo Creek Bridge – Bridge needs upgrading for loads with axles exceeding 3.5m.
- Middlebrook Creek Bridge – 4.5m clearance bridge may need upgrading.
- Lindsays Gap Road to Nundle Road – Additional hardstand required and signs made removable and power pole will also need to be relocated.

Nundle to Head of Peel Road

- Oakenville Street and Jenkins Street Intersection - Signs made removable.
- Oakenville Street and Old Hanging Rock Road – Blades crossing into private land requiring fence relocation and additional hardstand and bridge signs and guard rail require relocation.
- Old Hanging Rock Road onto Happy Valley Road - Blades crossing into private land requiring fence relocation and additional hardstand, and removal of some trees and relocation of signs.
- Happy Valley Road onto Jenkins Street - Blades crossing into private land requiring fence relocation, additional hardstand and relocation of a power pole, and removal of some trees and relocation of signs.
- Crawney Road onto Head of Peel Road – Blades crossing into private land requiring fence relocation, additional hardstand and relocation of a power pole, and removal of some trees and relocation of signs.
- Sections of Head of Peel Road would need to be made suitable for the vehicles. 5.5m minimum width and upgrade of a bridge and a number of causeways and removal of some trees.

Nundle to Morisons Gap Road

- Oakenville Street and Old Hanging Rock Road – Blades crossing into private land requiring fence relocation and additional hardstand and bridge signs and guard rail require relocation.
- Nundle to Hanging Road via Barrys Road. This section would require a layover site, some vegetation clearing on a number of curves and realignment works to overcome the 'Devil's Elbow' section of tight bends.
- Barrys Road onto Morrisons Gap Road - Blades crossing into private land requiring fence relocation, additional hardstand and removal of some trees and relocation of signs.
- Morrisons Gap Road – Widening of road surface and curves and removal of vegetation.

4.5 Dilapidation Surveys

Dilapidation reports covering the pavement, drainage, and bridge structures will be undertaken in consultation with Transport for NSW and local Councils for the proposed transport routes before and after construction. Regular inspections and consultation with local Councils and proponents would be developed. Any damage resulting from construction traffic, except normal wear and tear, will be repaired.

4.6 Communications with Forestry Corporation NSW

Communications protocols would be developed to allow communication between the Forestry NSW trucks and the Project trucks. The Project team would maintain communication with Forestry NSW to coordinate the movement of oversized and over mass vehicles.

4.7 Road Authority Approvals for Over-sized and Over-mass Vehicles

Over-mass and Over-sized vehicles would require permits from the National Heavy Vehicle Regulator. This replaces the approvals that were previously granted from Transport for NSW and Councils. Applications are to be submitted to the NHVR.

5 Conclusion

The Transport Planning Partnership (TTPP) has been commissioned to undertake a traffic and transport assessment for the proposed Hills of Gold Wind Farm. The purpose of the assessment to address the State Environmental Assessment Requirements (SEARs).

The Project proposes the construction of up to 70 wind turbines and associated infrastructure over a period of approximately two years.

5.1 Existing Conditions

The site is located to the south east of the township of Nundle. Access to the site from the New England Highway would be via Lindsays Gap Road and Nundle Road then divide into two routes. One route to the north is via Barry Road and Morrisons Gap Road and the second route to the south is via Crawney Road and Head of Peel Road.

Traffic count data was provided by Tamworth Regional Council. The daily traffic volumes are:

- New England Highway 2954 vpd
- Lindsays Gap Road 265 vpd
- Nundle Road 845 vpd
- Oakenville Road 434 vpd
- Jenkins Street 364 vpd

Crash data from 2014 to 2018 indicates that there have been seven crashes on Nundle Road between Lindsays Gap Road and Nundle mostly involving single car crashes.

5.2 Traffic Impacts

Estimates of Project related traffic generation were undertaken. During the peak construction period, the peak number of vehicles to be generated would be as shown in Table 5.1. This would occur over a period of about 13 months. The evening peak period would be the inverse of the morning peak.

Table 5.1: Peak Construction Period Traffic Generation

Table Heading	Units	Morning Peak Hour (7:00am – 8:00am) (Vehicle Trips per Hour)			Daily (Vehicles per day)
		To Site	From Site	Total	
Light vehicles	87 workers	87	15	102	210
Buses	87 workers	4	3	7	12
Water trucks	20 per day	3	3	4	40
Trucks	120 per day	14	14	28	240

The peak operational period traffic generation for the Project is shown in Table 5.2.

Table 5.2: Peak Operational Traffic Generation

Table Heading	Units	Morning Peak Hour (7:00am – 8:00am) (Vehicle Trips per Hour)			Daily (trips)
		To Site	From Site	Total	
Light vehicles	33 workers	33	0	33	66
Heavy Vehicles	4 per day	2	1	-	8

Analysis shows that when these traffic volumes are added to the existing traffic volumes that there would be adequate capacity in the road network with V/C ratio of less than 0.20 and Level of Service of B or better on all roads in the peak of the construction. During the operational period, the V/C ratios would be less than 0.09 on all roads.

The forecast traffic volumes are also expected to be less than the environmental capacity goals of 200 vehicles per hour on all roads during the peak of construction. During the operation of the site the traffic volumes would be even less.

5.3 Over-sized and Over-mass Loads

The turbine components would be transported from the Newcastle Port to Site via the New England Highway. Works have been identified that would be required including intersection widening, trimming and removal of vegetation, removable signs and infrastructure, relocation of overhead wires.

The route from the New England Highway to Nundle crosses two single lane bridges. These bridges would need to be upgraded to allow for the widest axle loads. The upgrade of both bridges would avoid the need to route towers via Tamworth.

A constraint on Barry Road has been identified that is known as Devil's elbow. Three options have been developed to realign the Devils Elbow section of Barrys Road. Even with these works the gradient would still provide limitations and it is expected that trucks carrying heavy

loads would require multiple prime movers in push-pull arrangements to allow them to negotiate the steeper slope.

5.4 Mitigation Measures

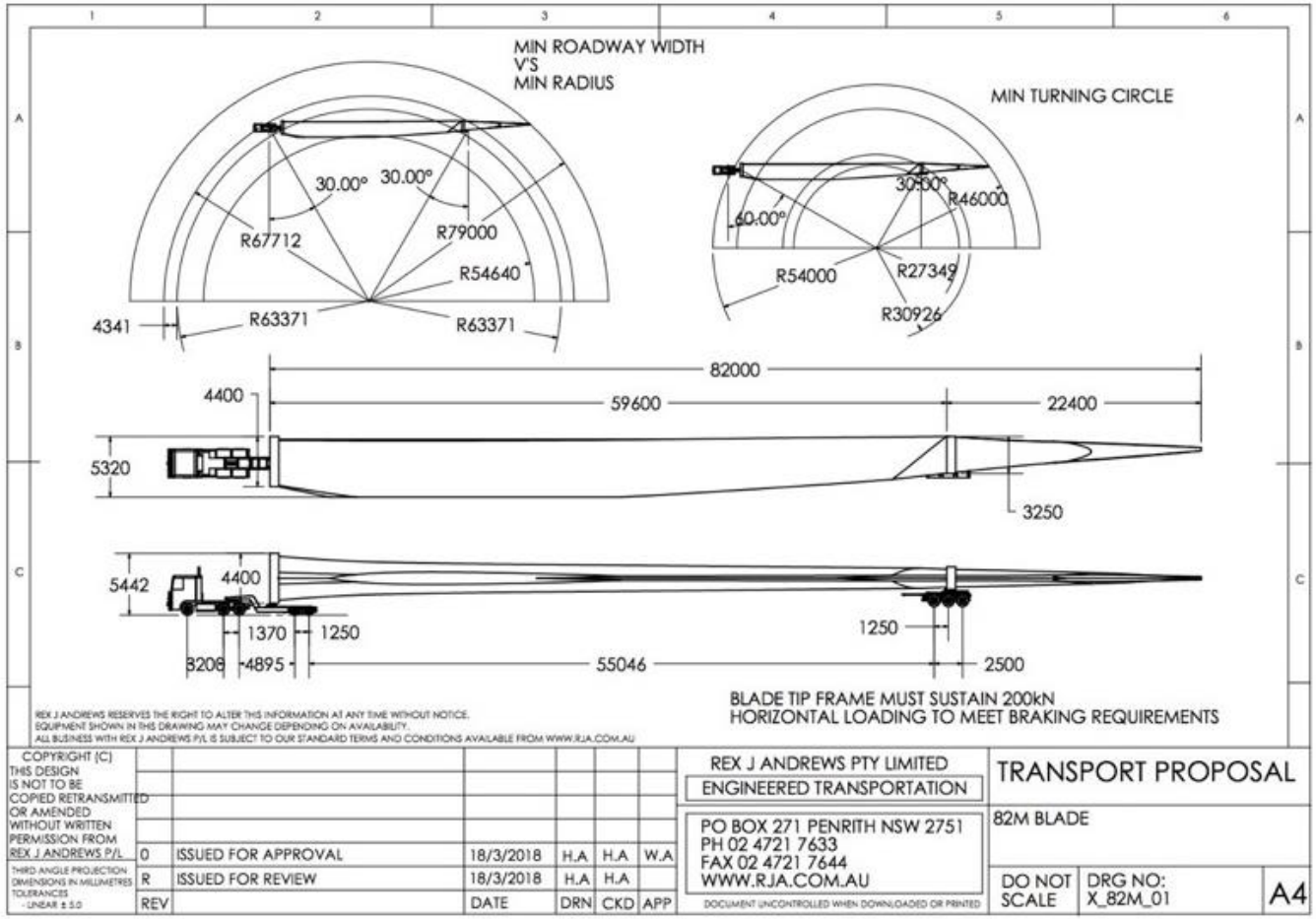
The following mitigation measures have been identified to minimise the impacts.

- The study has identified a number or road upgrades that would be required to enable the transport of over mass and oversized trucks. The required road upgrades form part of the Project and will create ongoing benefits to the local community in terms of improved road safety and amenity.
- Detailed traffic management plans and traffic control plans would be required for the transport of the oversized and over massed vehicles.
- Provision of shuttle bus services would be beneficial in reducing the number of private vehicles generated by the construction traffic.

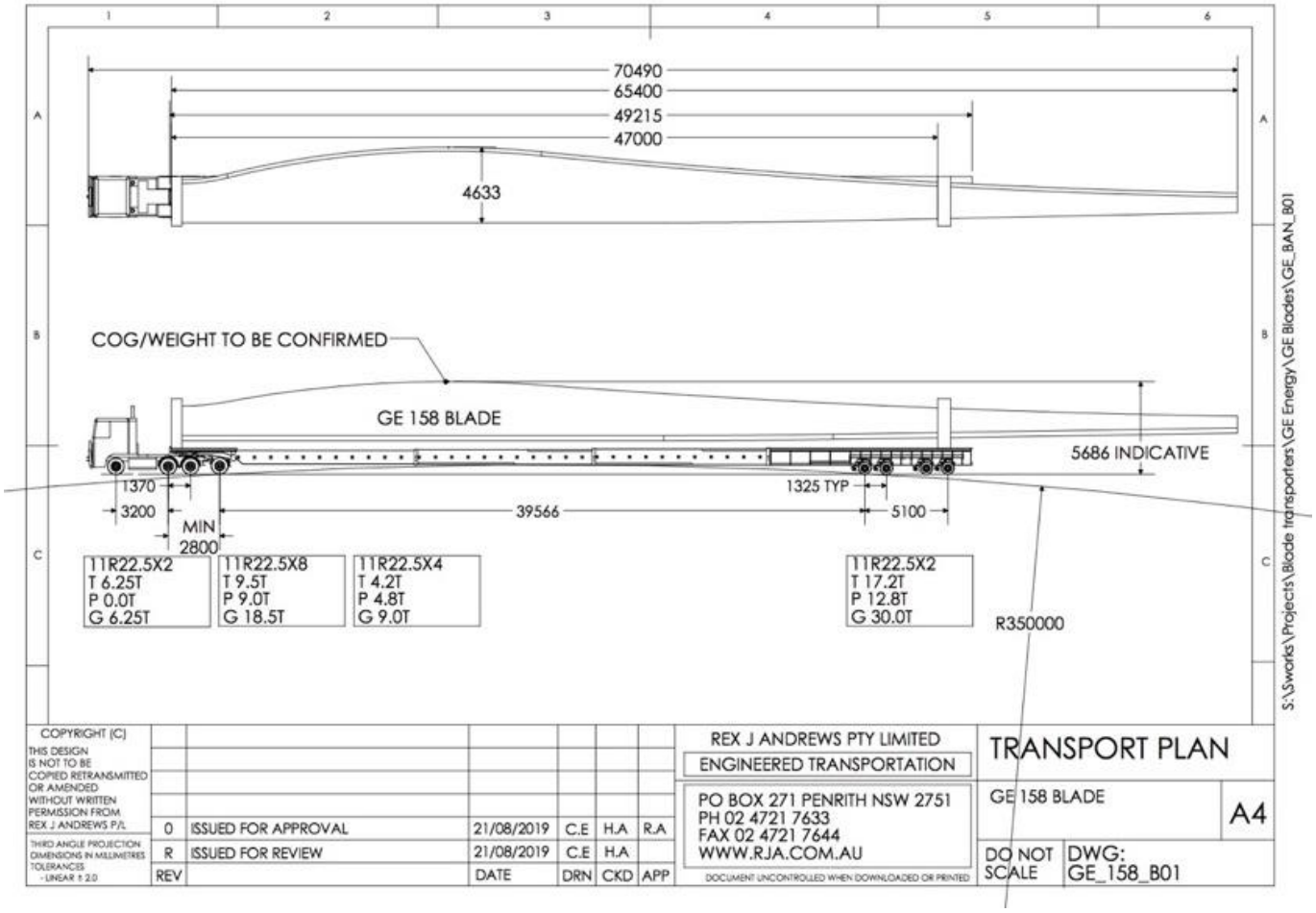
Appendix A

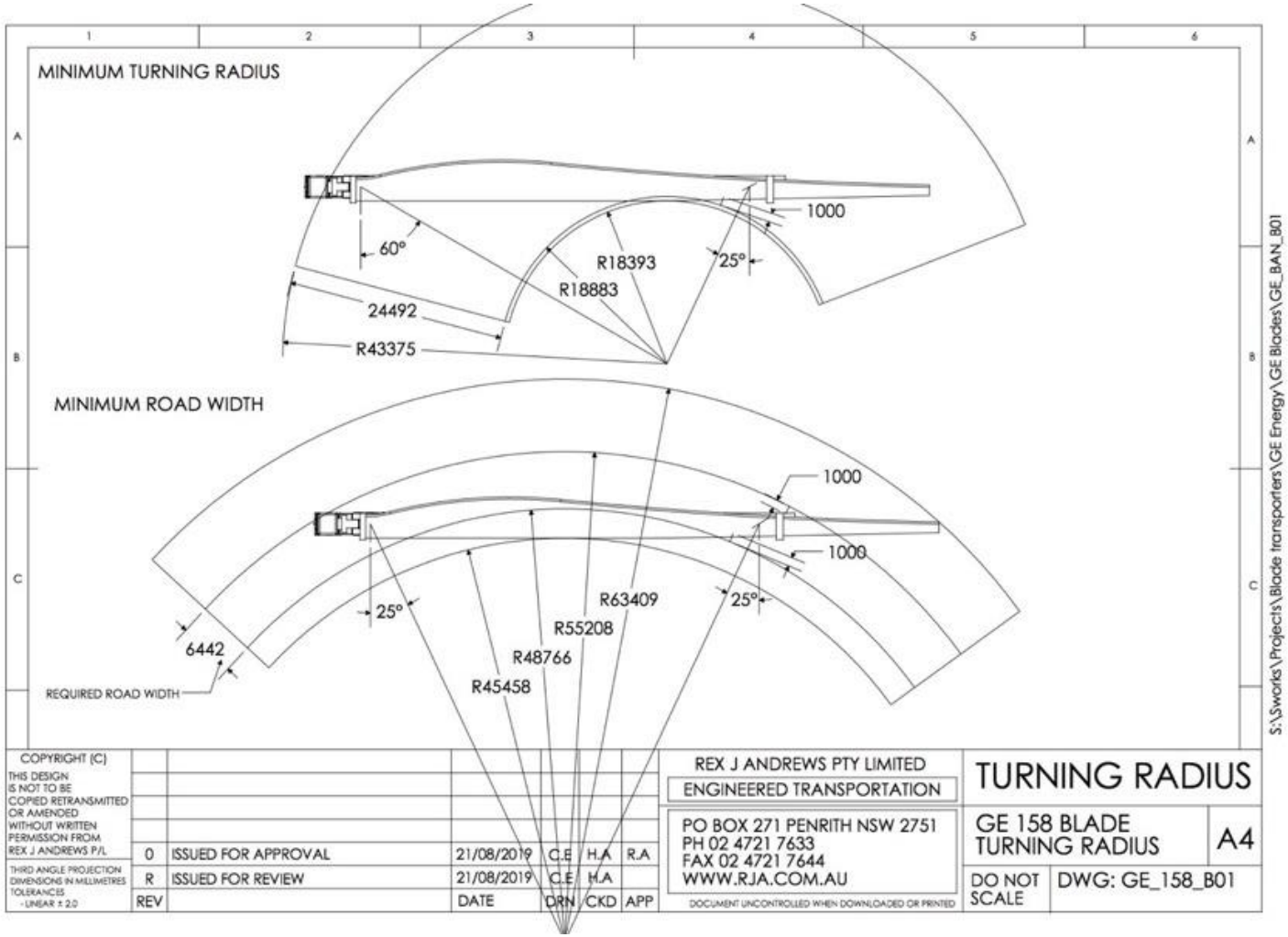
Design Vehicles

Blade diagram (170 rotor):

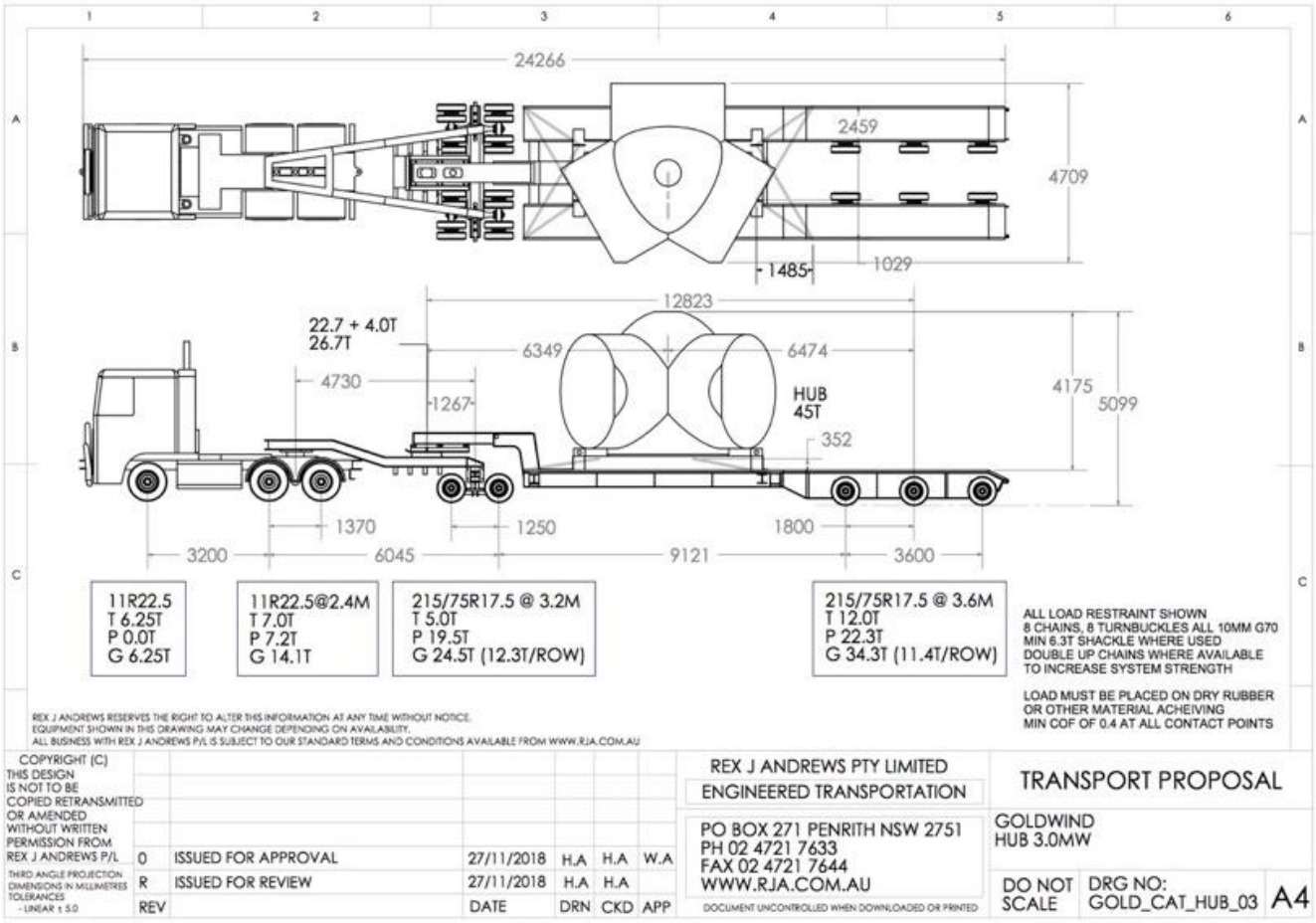


Blade diagram (158 rotor):

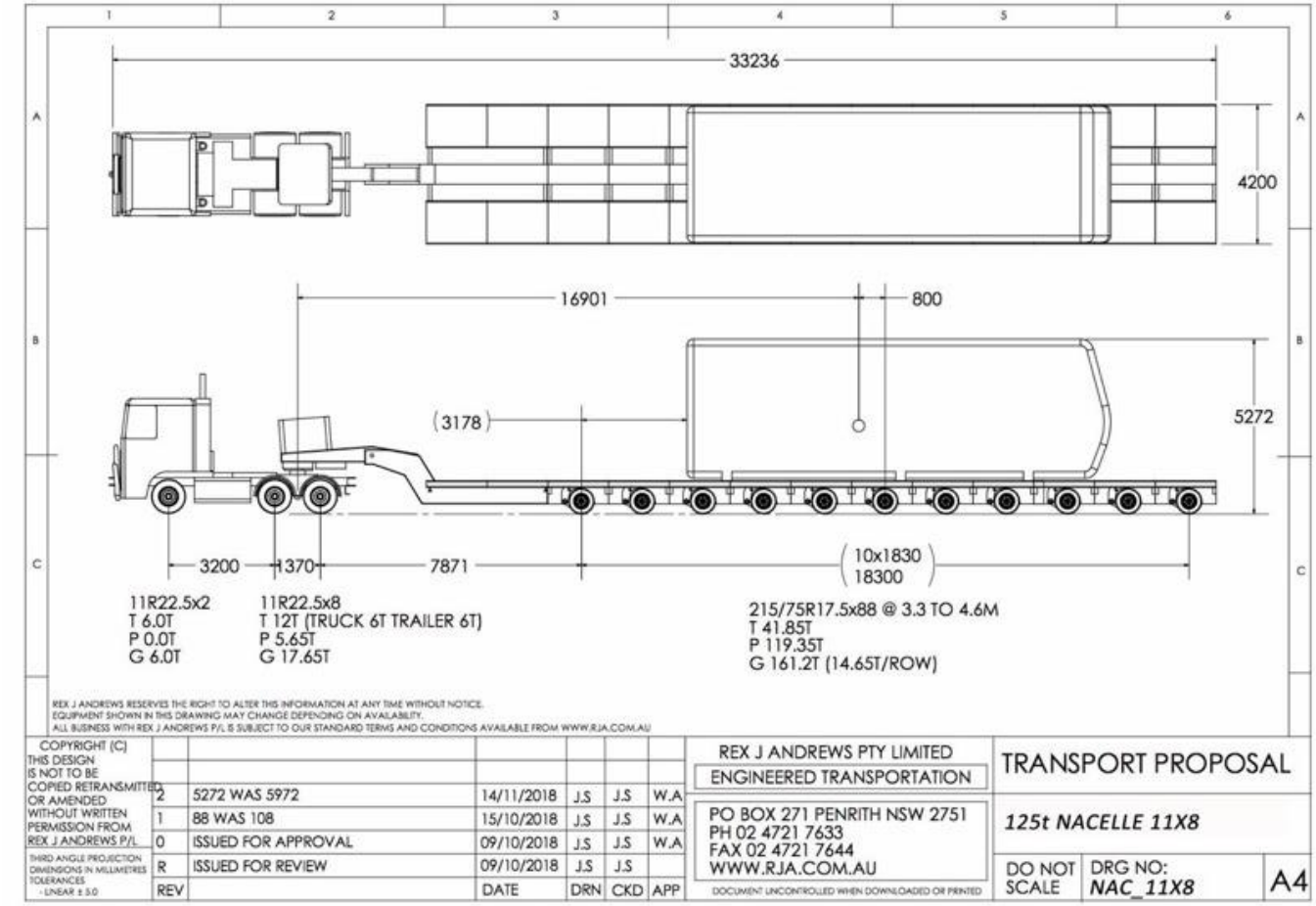



MINIMUM TURNING RADIUS
60°
R18393
R18883
25°
1000
24492
R43375
MINIMUM ROAD WIDTH
1000
1000
25°
25°
R63409
R55208
R48766
R45458
6442
REQUIRED ROAD WIDTH
S:\Sworks\Projects\Blade transporters\GE Energy\GE Blades\GE_BAN_B01
COPYRIGHT (C)
THIS DESIGN IS NOT TO BE COPIED RETRANSMITTED OR AMENDED WITHOUT WRITTEN PERMISSION FROM REX J ANDREWS P/L
THIRD ANGLE PROJECTION
DIMENSIONS IN MILLIMETRES
TOLERANCES - LINEAR ± 2.0
0 ISSUED FOR APPROVAL 21/08/2019 C.E H.A R.A
R ISSUED FOR REVIEW 21/08/2019 C.E H.A
REV DATE DRN CKD APP
REX J ANDREWS PTY LIMITED
ENGINEERED TRANSPORTATION
PO BOX 271 PENRITH NSW 2751
PH 02 4721 7633
FAX 02 4721 7644
WWW.RJA.COM.AU
DOCUMENT UNCONTROLLED WHEN DOWNLOADED OR PRINTED
TURNING RADIUS
GE 158 BLADE TURNING RADIUS
A4
DO NOT SCALE
DWG: GE_158_B01

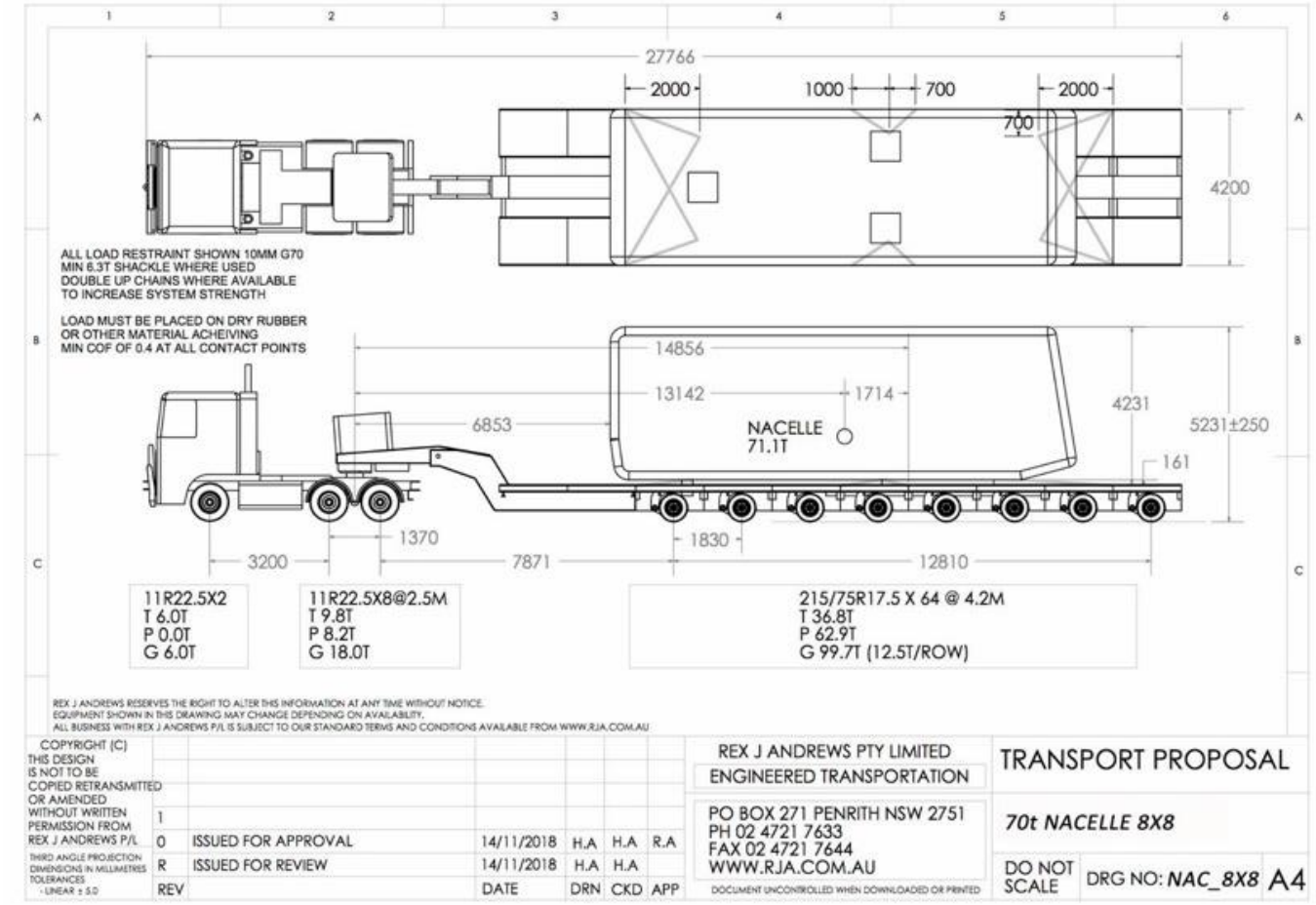
Hub trailer:


24266
2459
4709
1485
1029
12823
22.7 + 4.0T
26.7T
6349
6474
4730
1267
HUB
45T
4175
5099
352
1370
1250
1800
3200
6045
9121
3600
11R22.5
T 6.25T
P 0.0T
G 6.25T
11R22.5@2.4M
T 7.0T
P 7.2T
G 14.1T
215/75R17.5 @ 3.2M
T 5.0T
P 19.5T
G 24.5T (12.3T/ROW)
215/75R17.5 @ 3.6M
T 12.0T
P 22.3T
G 34.3T (11.4T/ROW)
ALL LOAD RESTRAINT SHOWN
8 CHAINS, 8 TURNBUCKLES ALL 10MM G70
MIN 6.3T SHACKLE WHERE USED
DOUBLE UP CHAINS WHERE AVAILABLE
TO INCREASE SYSTEM STRENGTH
LOAD MUST BE PLACED ON DRY RUBBER
OR OTHER MATERIAL ACHEIVING
MIN COF OF 0.4 AT ALL CONTACT POINTS
REX J ANDREWS RESERVES THE RIGHT TO ALTER THIS INFORMATION AT ANY TIME WITHOUT NOTICE.
EQUIPMENT SHOWN IN THIS DRAWING MAY CHANGE DEPENDING ON AVAILABILITY.
ALL BUSINESS WITH REX J ANDREWS P/L IS SUBJECT TO OUR STANDARD TERMS AND CONDITIONS AVAILABLE FROM WWW.RJA.COM.AU
COPYRIGHT (C)
THIS DESIGN
IS NOT TO BE
COPIED RETRANSMITTED
OR AMENDED
WITHOUT WRITTEN
PERMISSION FROM
REX J ANDREWS P/L
THIRD ANGLE PROJECTION
DIMENSIONS IN MILLIMETRES
TOLERANCES
- LINEAR ± 5.0
REV
DATE
DRN
CKD
APP
0
ISSUED FOR APPROVAL
27/11/2018
H.A
H.A
W.A
R
ISSUED FOR REVIEW
27/11/2018
H.A
H.A
REX J ANDREWS PTY LIMITED
ENGINEERED TRANSPORTATION
PO BOX 271 PENRITH NSW 2751
PH 02 4721 7633
FAX 02 4721 7644
WWW.RJA.COM.AU
DOCUMENT UNCONTROLLED WHEN DOWNLOADED OR PRINTED
TRANSPORT PROPOSAL
GOLDWIND
HUB 3.0MW
DO NOT SCALE
DRG NO:
GOLD_CAT_HUB_03
A4

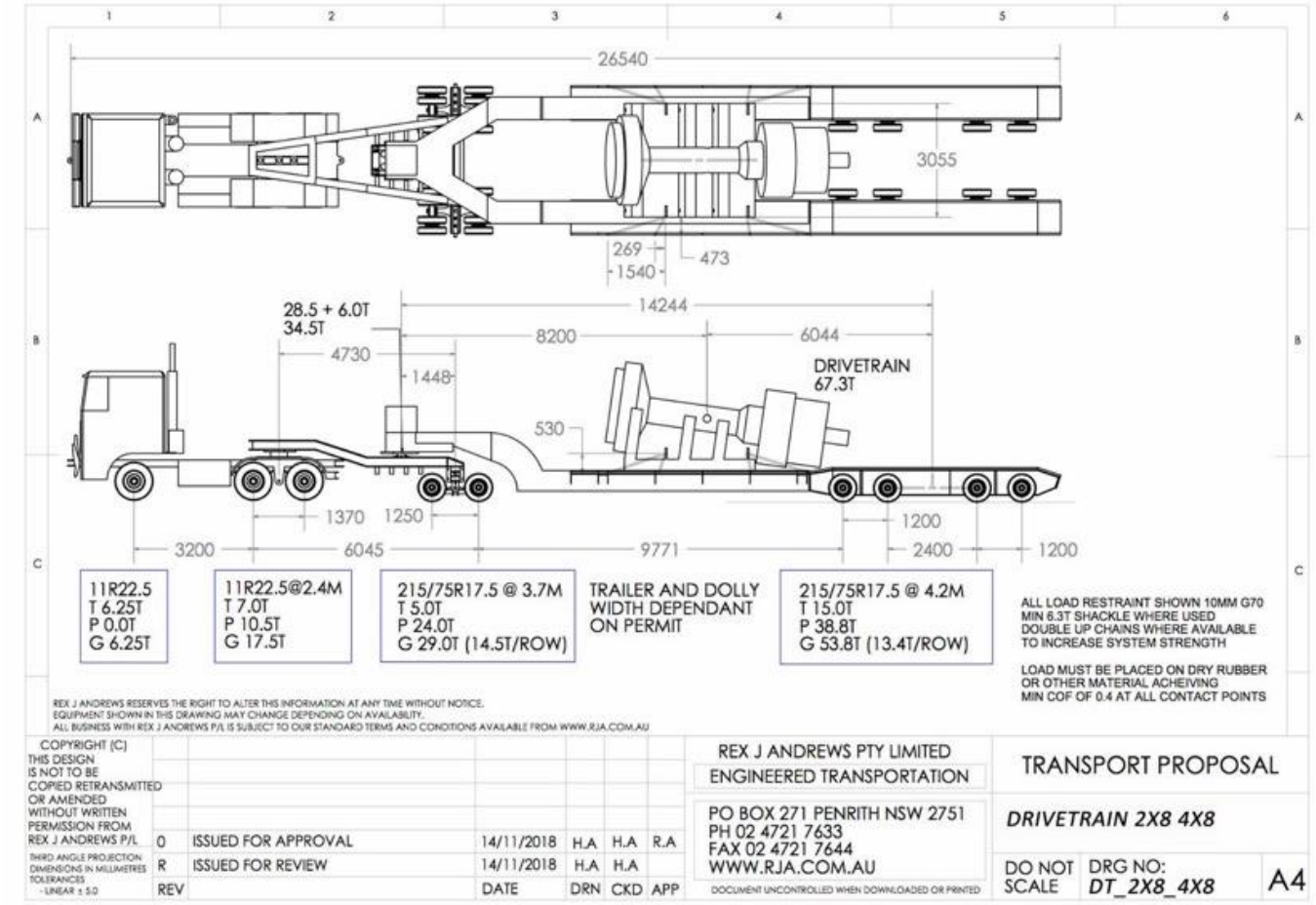
Nacelle with Drivetrain in (applicable weight differentiation):



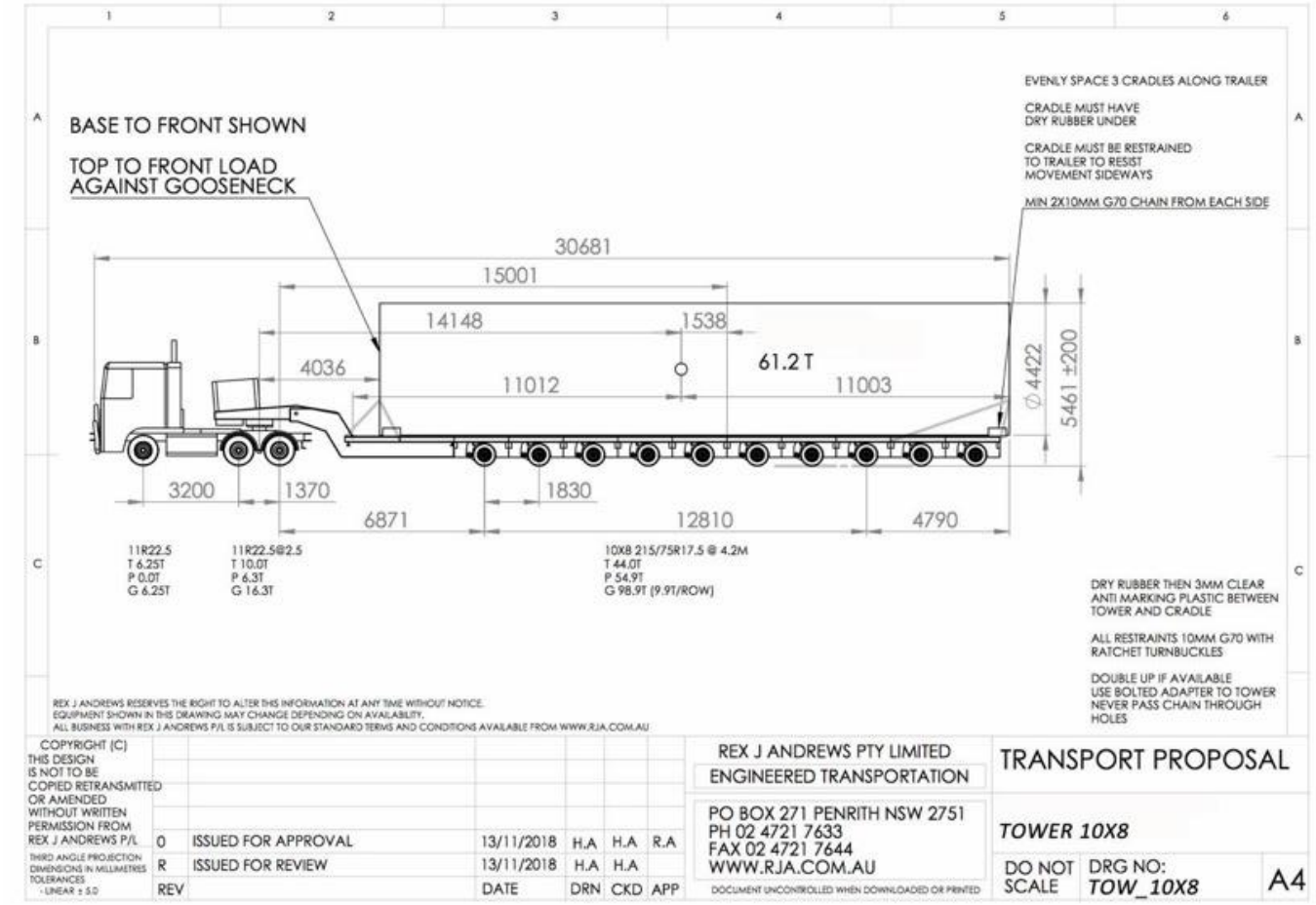
Nacelle with drivetrain out (applicable weight differentiation):



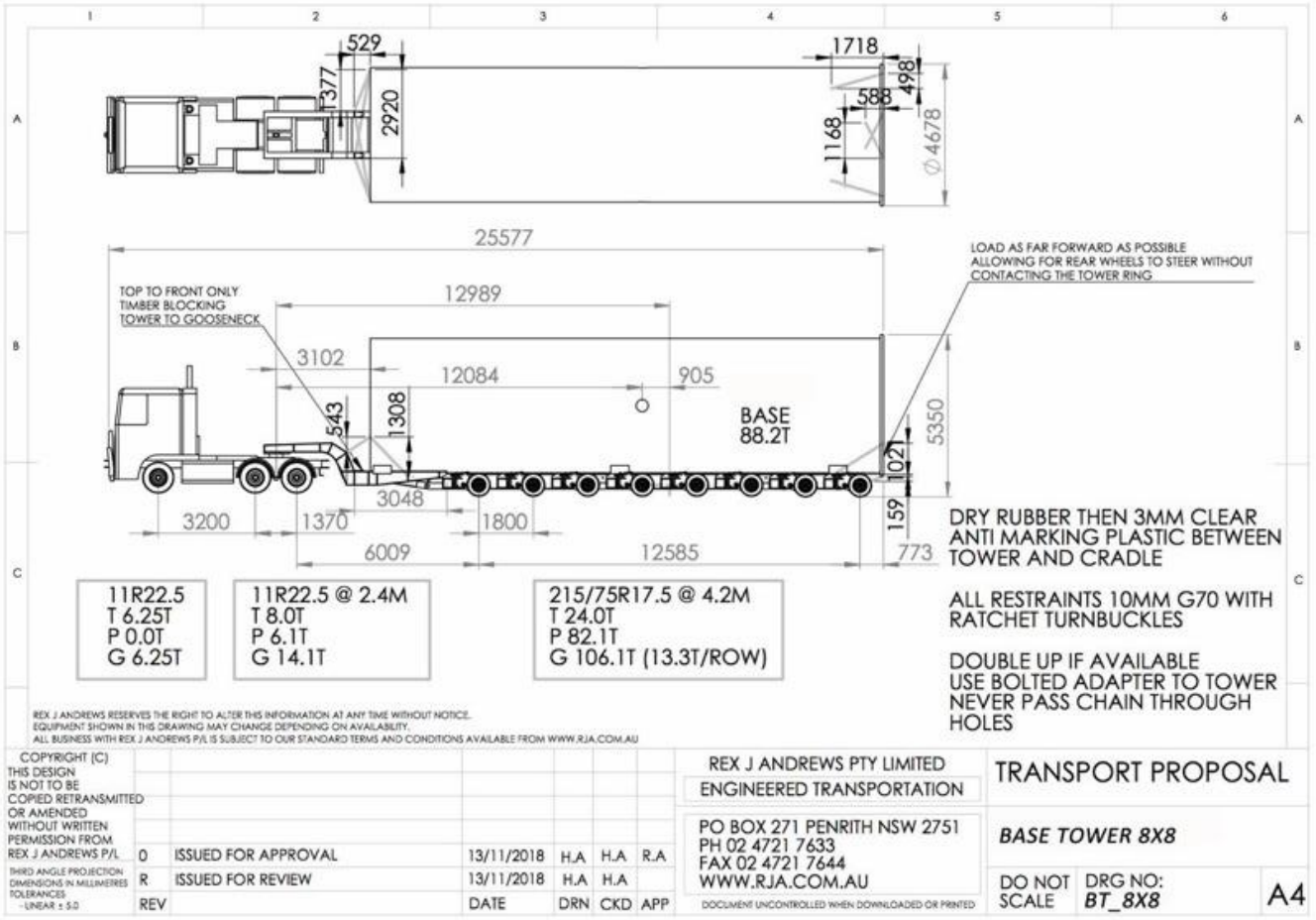
Drivetrain:


26540
3055
269
1540
473
28.5 + 6.0T
34.5T
14244
8200
6044
4730
1448
DRIVETRAIN
67.3T
530
1370
1250
1200
3200
6045
9771
2400
1200
11R22.5
T 6.25T
P 0.0T
G 6.25T
11R22.5@2.4M
T 7.0T
P 10.5T
G 17.5T
215/75R17.5 @ 3.7M
T 5.0T
P 24.0T
G 29.0T (14.5T/ROW)
TRAILER AND DOLLY
WIDTH DEPENDANT
ON PERMIT
215/75R17.5 @ 4.2M
T 15.0T
P 38.8T
G 53.8T (13.4T/ROW)
ALL LOAD RESTRAINT SHOWN 10MM G70
MIN 6.3T SHACKLE WHERE USED
DOUBLE UP CHAINS WHERE AVAILABLE
TO INCREASE SYSTEM STRENGTH
LOAD MUST BE PLACED ON DRY RUBBER
OR OTHER MATERIAL ACHEIVING
MIN COF OF 0.4 AT ALL CONTACT POINTS
REX J ANDREWS RESERVES THE RIGHT TO ALTER THIS INFORMATION AT ANY TIME WITHOUT NOTICE.
EQUIPMENT SHOWN IN THIS DRAWING MAY CHANGE DEPENDING ON AVAILABILITY.
ALL BUSINESS WITH REX J ANDREWS P/L IS SUBJECT TO OUR STANDARD TERMS AND CONDITIONS AVAILABLE FROM WWW.RJA.COM.AU
COPYRIGHT (C)
THIS DESIGN IS NOT TO BE COPIED RETRANSMITTED OR AMENDED WITHOUT WRITTEN PERMISSION FROM REX J ANDREWS P/L
THIRD ANGLE PROJECTION
DIMENSIONS IN MILLIMETRES
TOLERANCES - LINEAR ± 5.0
REV
0 ISSUED FOR APPROVAL 14/11/2018 H.A H.A R.A
R ISSUED FOR REVIEW 14/11/2018 H.A H.A
DATE DRN CKD APP
REX J ANDREWS PTY LIMITED
ENGINEERED TRANSPORTATION
PO BOX 271 PENRITH NSW 2751
PH 02 4721 7633
FAX 02 4721 7644
WWW.RJA.COM.AU
DOCUMENT UNCONTROLLED WHEN DOWNLOADED OR PRINTED
TRANSPORT PROPOSAL
DRIVETRAIN 2X8 4X8
DO NOT SCALE
DRG NO: DT_2X8_4X8
A4

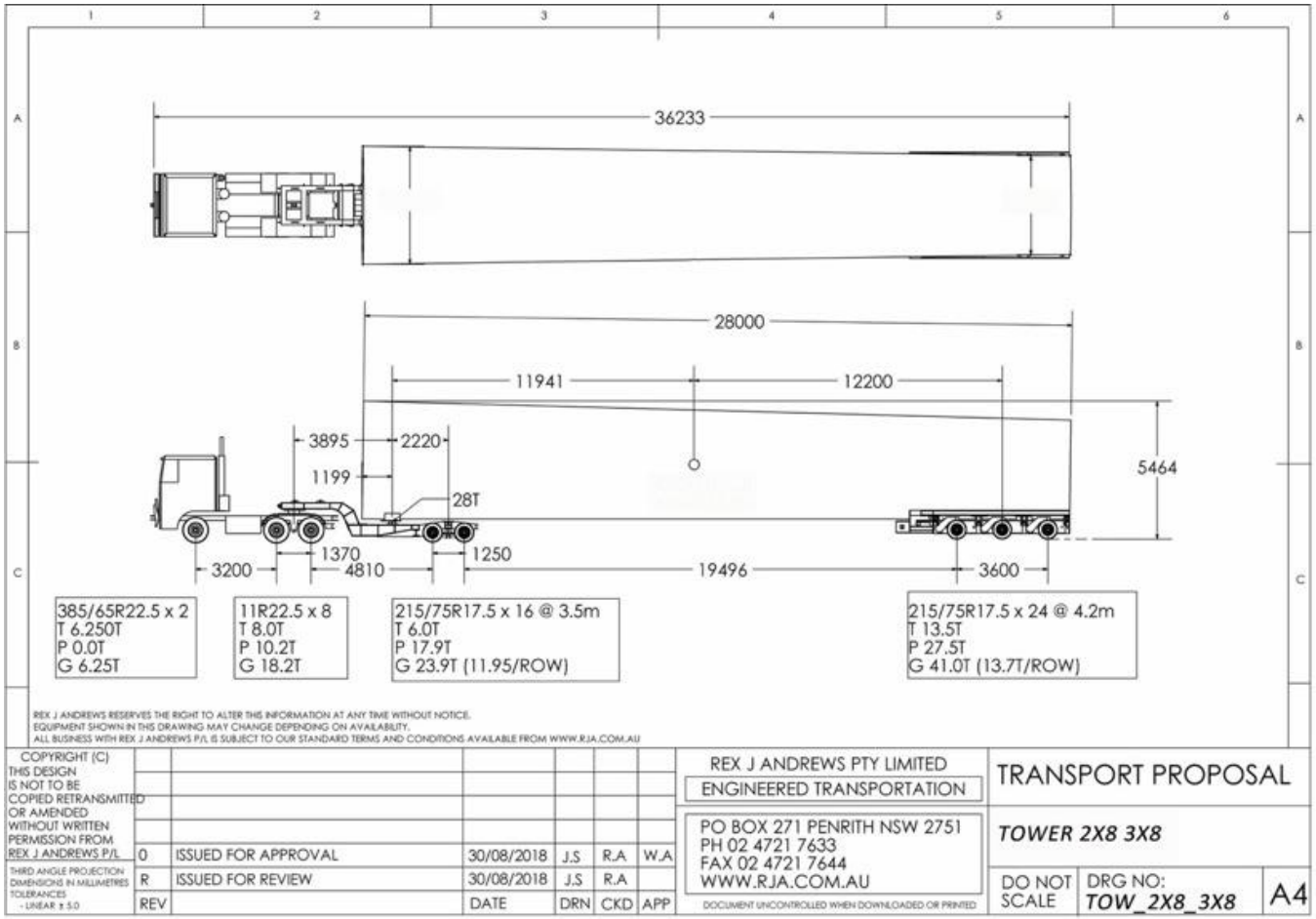
Tower trailer 10x8:



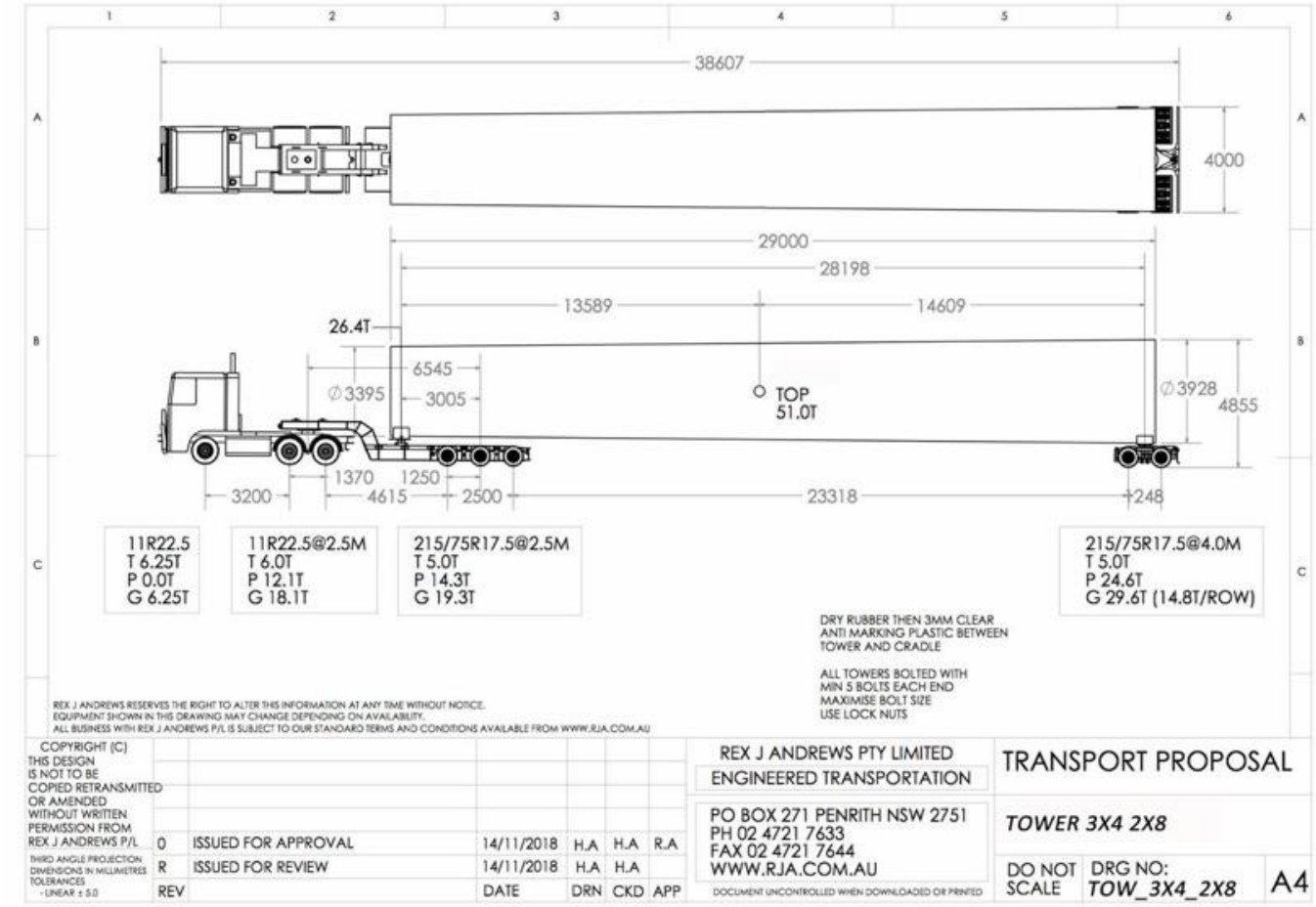
Tower trailer 8x8:



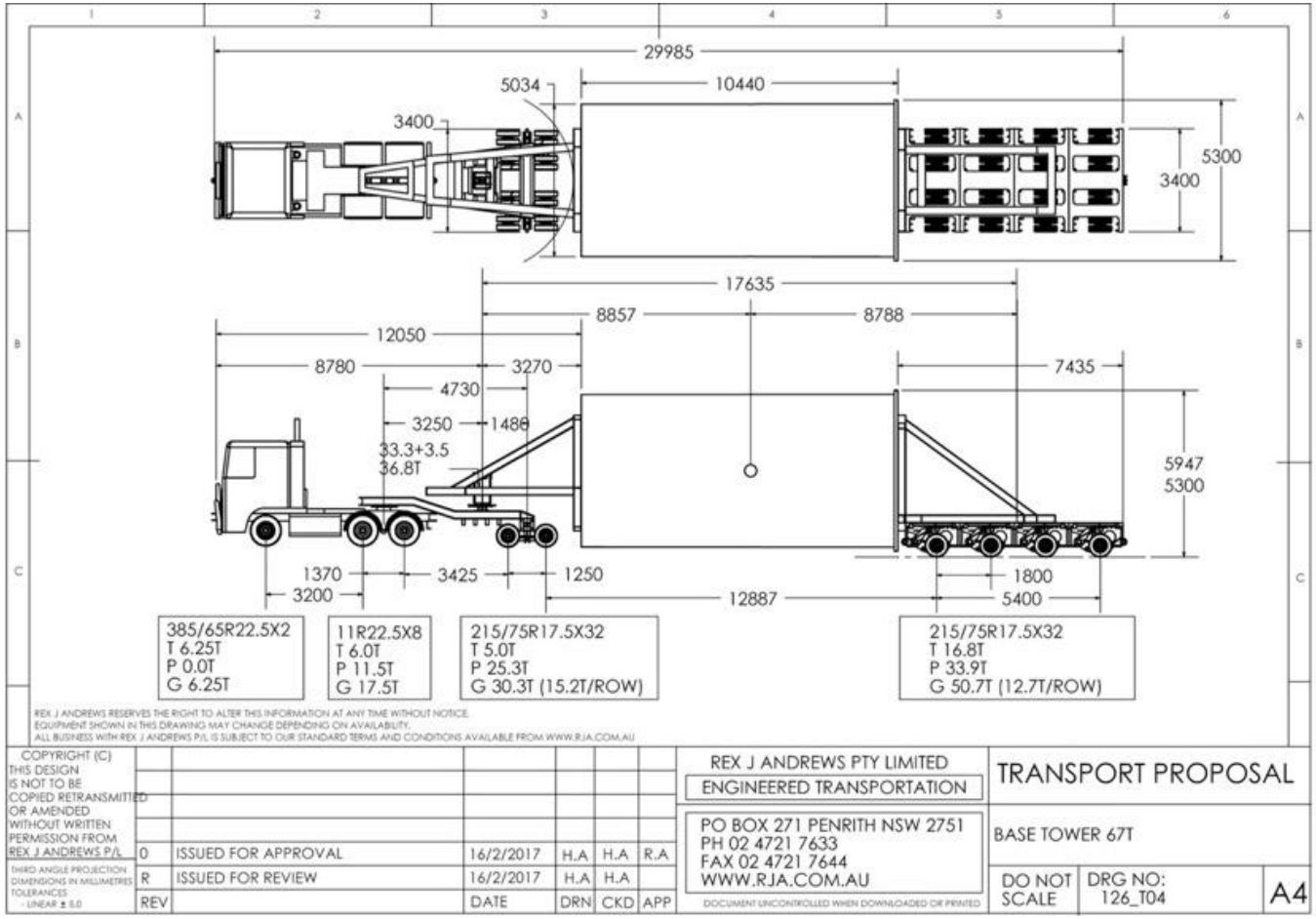
Mid tower trailer 10x8:



Top tower trailer:



Bookend tower trailer:



Appendix B

Rex J Andrews – Report

REX J ANDREWS
ENGINEERED TRANSPORTATION

TRANSPORT ROUTE ASSESSMENT: WIND ENERGY PARTNERS PTY LTD

PROJECT: HILLS OF GOLD WINDFARM PROJECT

EXPORT OF NEWCASTLE.

25/09/2019 REV 02

Rev.	Date	Change	Responsible	Checked
00	17/06/19	Route assessed	W Andrews	
00	03/07/19	Report compiled	W Andrews	
00	19/07/19	Report completed	W Andrews	
01	04/09/19	158m rotor blade added	W Andrews	✓
02	25/09/19	Address client comments	W Andrews	✓

Table of Contents

1.0 Introduction

This document provides an assessment of the route options for transport of major wind turbine components from the Port of Newcastle to the Hills of Gold Wind Farm Project. It provides information on observations made during the field survey component of the assessment and of previous experience in transporting similar wind turbine equipment along certain sections of the routes identified.

The field route survey component of this assessment took place on 17-06-2019.

2.0 Evaluation

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

Hills of Gold Transport Route Assessment – General Evaluation Summary

		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 Route Assessment. 17/06/2019

Survey undertaken by: (Rex J Andrews P/L)

Project Name: Hills of Gold Windfarm Project

Location: Newcastle port (NSW) to Nundle (NSW)

Wind turbine generator type design assumptions for the purpose of Transport Route Assessment:

Rotor size 170 metre with a hub height of up to 165 Metres.

Rotor size 158 metre with a hub height of up to 165 Metres.

4.0 Transport combination options.

Nacelle with drivetrain out (12l x 4.2w x 4.2h x 70T)
Possible transport configuration. Prime mover with 8x8 Platform trailer.
Overall length: 30.0l x 4.2w x 4.9h x 122.0T.

Drivetrain (7l x 3.5w x 3.5h x 68T)
Possible transport configuration. Prime mover with 2x8-4x8 Platform Low loader.
Overall length: 30.0l x 4.2w x 4.9h x 122.0T.

Nacelle with drivetrain in (12l x 4.2w x 4.2h x 125T)
Possible transport configuration. Prime mover with 11x8 Platform trailer.
Overall length: 49.0l x 4.2w x 5.2h x 195.0T.

Hubs (4.0l x 3.5w x 3.8h x 50.0T)
Possible transport configuration. Prime mover with 2x8 4x8 Low Loader.
Overall length: 28.0l x 5.1w x 5.9h x 92.5T.

Blade 170 rotor (82.0l x 4.5w x 4.0h x 35T)
Possible transport configuration. Prime mover with 2x8 dolly with 2x8 jinker.
Overall length: 92.0l x 5.6w x 5.3h x 86.5T.

Blade 158 rotor (65.4l x 4.7w x 3.4h x 24T)
Possible transport configuration. Prime mover with 1x4 dolly with 4x4 extendable blade trailer.
Overall length: 92.0l x 5.6w x 5.3h x 86.5T.

Bottom tower section (16.2l x 4.8 x 4.5 x 100T)
Possible transport configuration. Prime mover with 8x8 Platform trailer.
Overall length: 30.0l x 4.8w x 5.5h x 108.5T.

Mid-lower tower section (21.8l x 4.5 x 4.5 x 95.2T)
Possible transport configuration. Prime mover with 10x8 platform trailer.
Overall length: 32.0l x 4.5w x 5.5h x 157.5T.

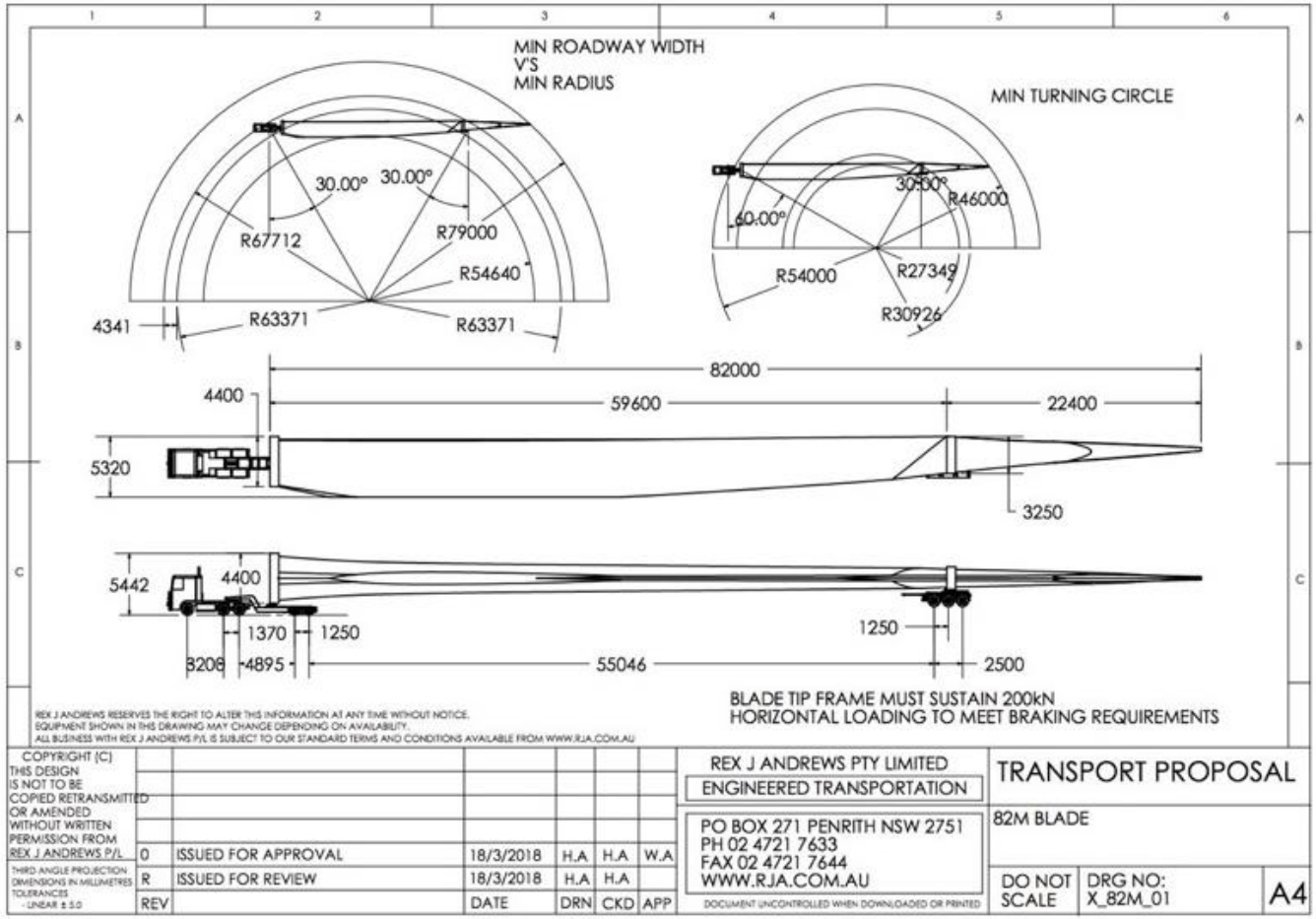
Mid-tower section (21.8l x 4.5 x 4.5 x 72.5T)
Possible transport configuration. Prime mover with 10x8 platform trailer.
Overall length: 32.0l x 4.5w x 5.5h x 137.5T.

Mid-upper tower section (28.8l x 4.5 x 4.5 x 52.3T)
Possible transport configuration. Prime mover with 3x4-2x8 Dolly jinker
Overall length: 40.0l x 4.5w x 5.5h x 92.5T.

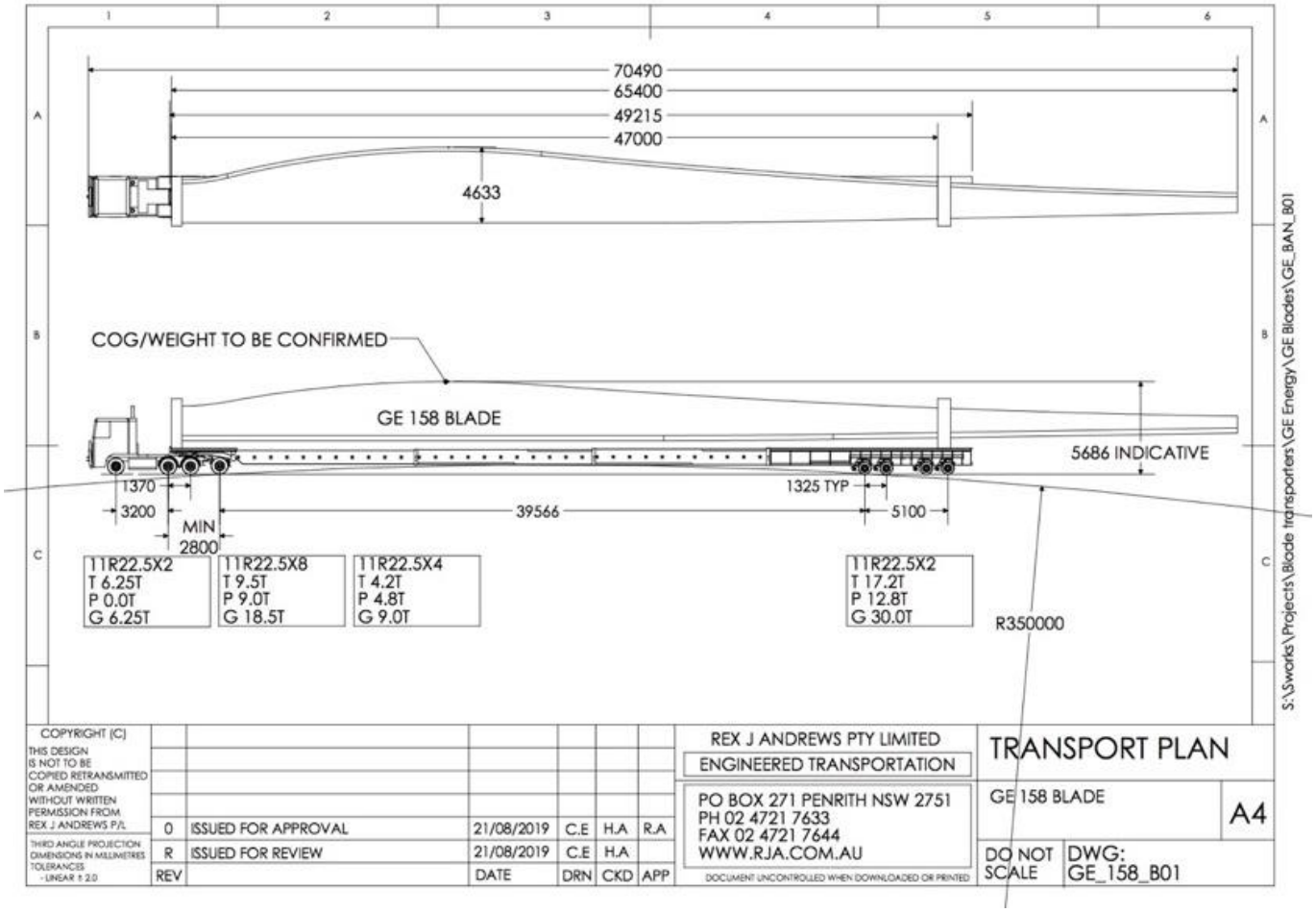
Top tower section (30.8l x 4.5 x 3.4h x 50.0T)
Possible transport configuration. Prime mover with 3x4-2x8 Dolly jinker
Overall length: 40.0l x 4.5w x 5.5h x 90.5T.

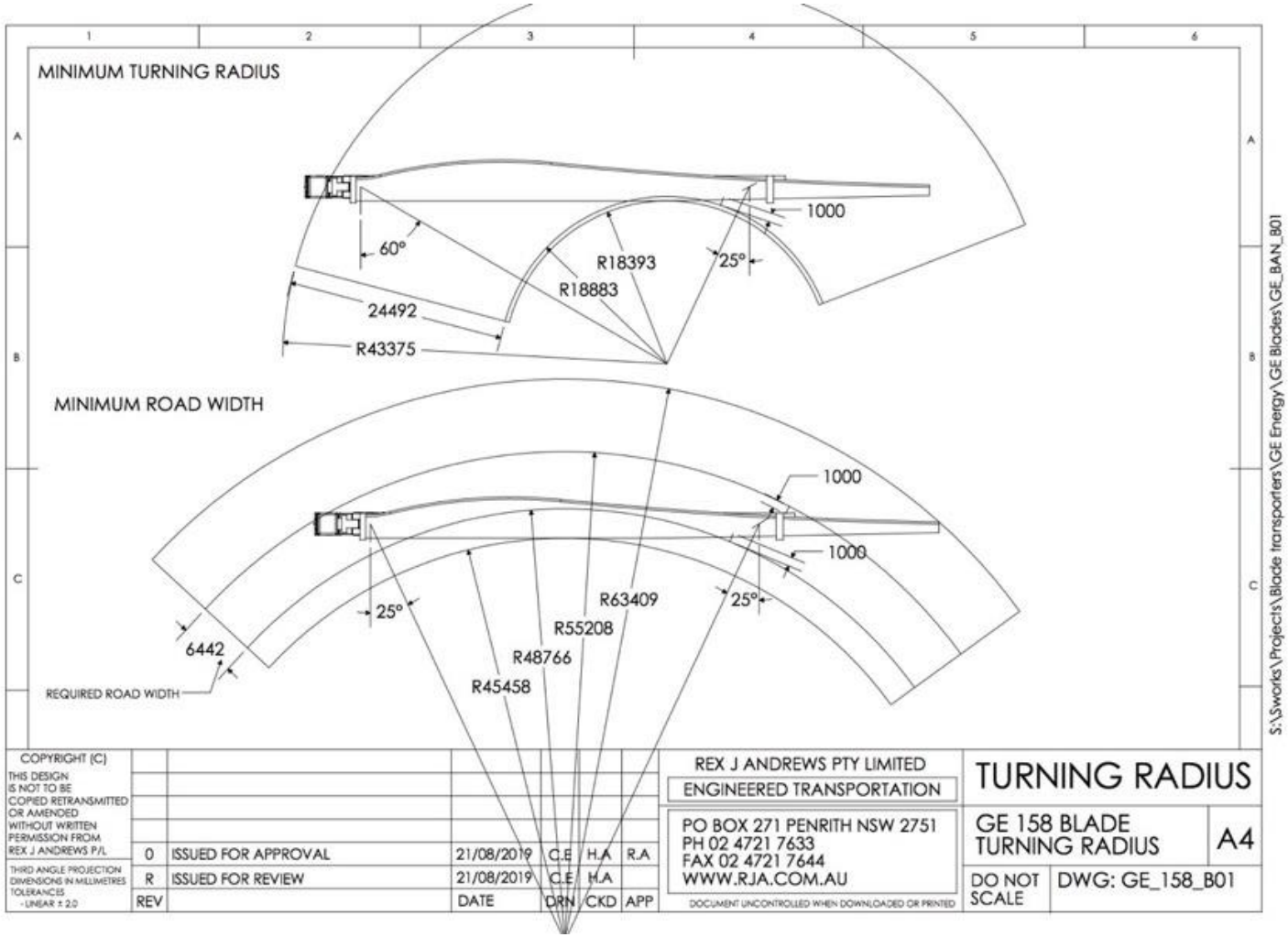
5.0 Transport schematics (possible combinations)

Blade diagram (170 rotor):

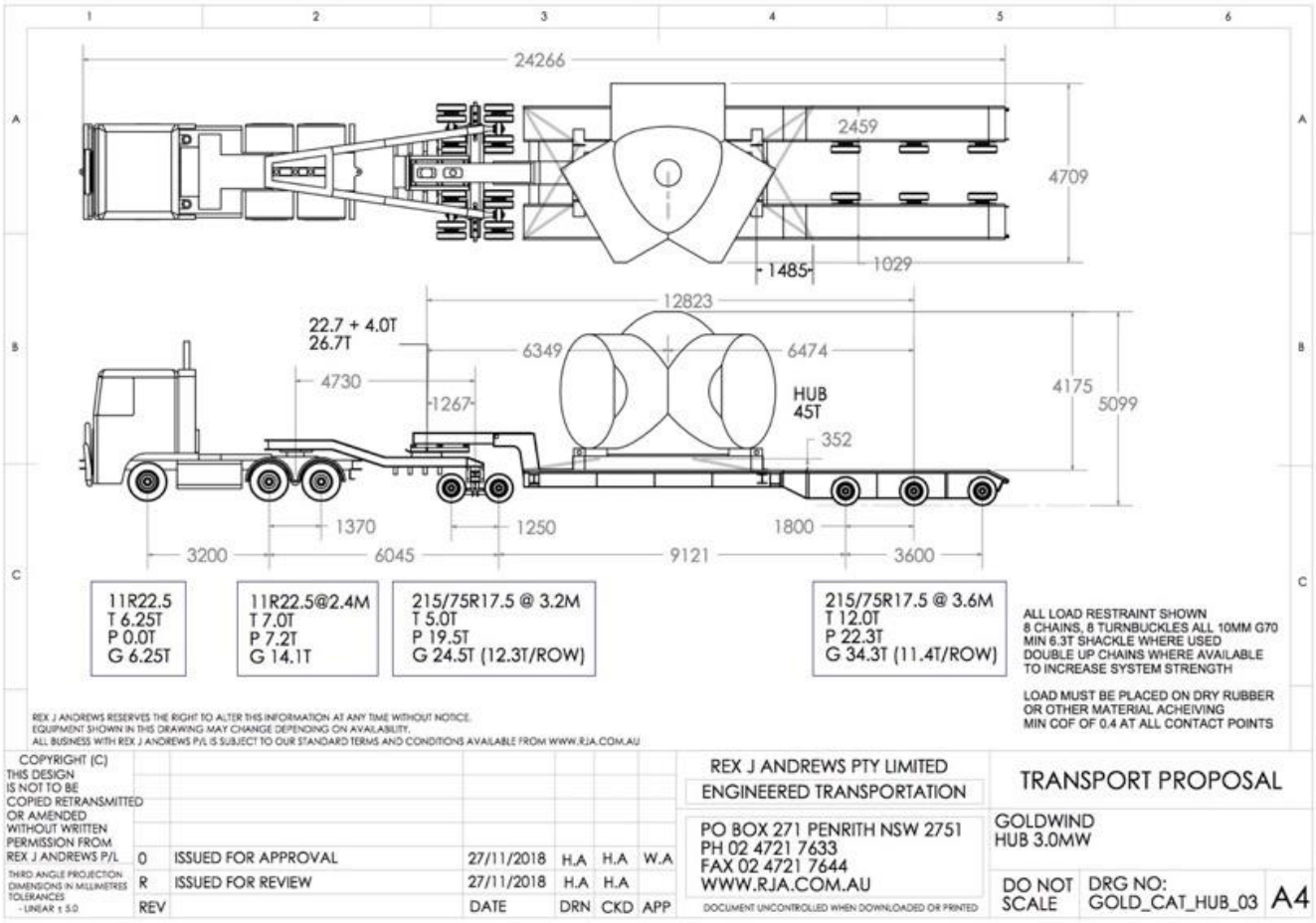


Blade diagram (158 rotor):

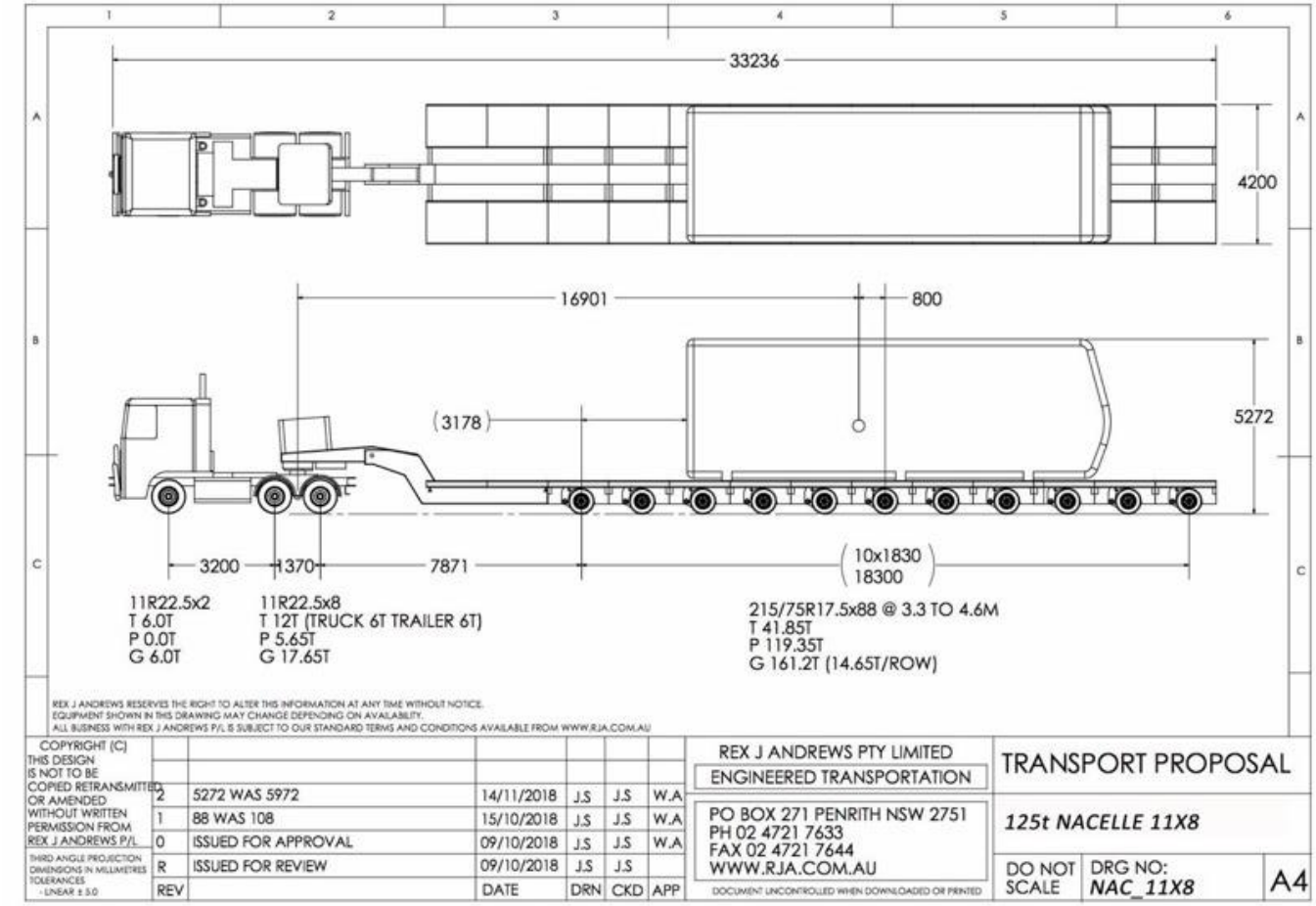



MINIMUM TURNING RADIUS
60°
R18393
R18883
25°
1000
24492
R43375
MINIMUM ROAD WIDTH
1000
1000
25°
25°
R63409
R55208
R48766
R45458
6442
REQUIRED ROAD WIDTH
S:\Sworks\Projects\Blade transporters\GE Energy\GE Blades\GE_BAN_B01
COPYRIGHT (C)
THIS DESIGN IS NOT TO BE COPIED RETRANSMITTED OR AMENDED WITHOUT WRITTEN PERMISSION FROM REX J ANDREWS P/L
THIRD ANGLE PROJECTION
DIMENSIONS IN MILLIMETRES
TOLERANCES - LINEAR ± 2.0
0 ISSUED FOR APPROVAL 21/08/2019 C.E H.A R.A
R ISSUED FOR REVIEW 21/08/2019 C.E H.A
REV DATE DRN CKD APP
REX J ANDREWS PTY LIMITED
ENGINEERED TRANSPORTATION
PO BOX 271 PENRITH NSW 2751
PH 02 4721 7633
FAX 02 4721 7644
WWW.RJA.COM.AU
DOCUMENT UNCONTROLLED WHEN DOWNLOADED OR PRINTED
TURNING RADIUS
GE 158 BLADE TURNING RADIUS
A4
DO NOT SCALE
DWG: GE_158_B01

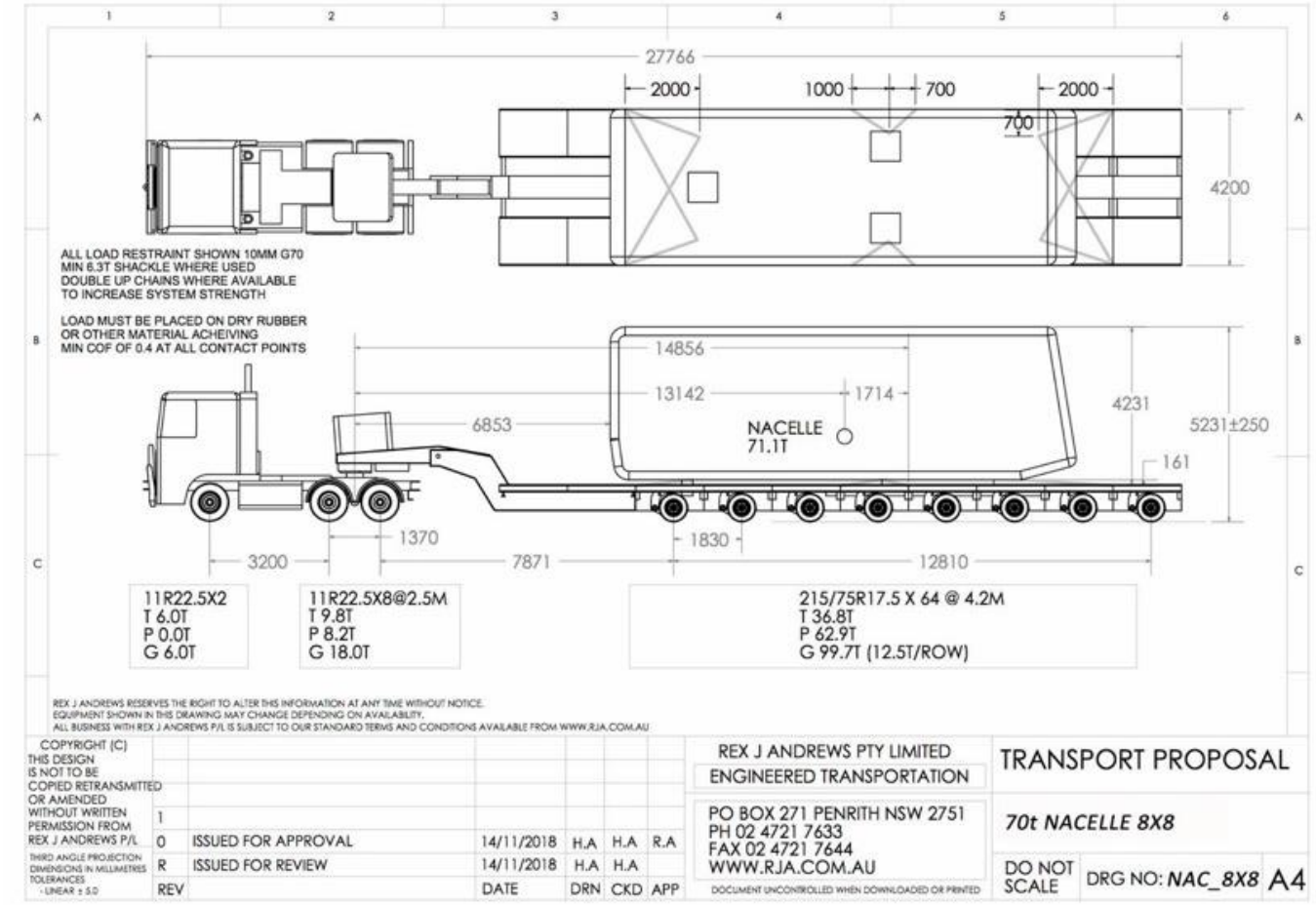
Hub trailer:


24266
2459
4709
1485
1029
12823
22.7 + 4.0T
26.7T
6349
6474
4730
1267
HUB
45T
4175
5099
352
1370
1250
1800
3200
6045
9121
3600
11R22.5
T 6.25T
P 0.0T
G 6.25T
11R22.5@2.4M
T 7.0T
P 7.2T
G 14.1T
215/75R17.5 @ 3.2M
T 5.0T
P 19.5T
G 24.5T (12.3T/ROW)
215/75R17.5 @ 3.6M
T 12.0T
P 22.3T
G 34.3T (11.4T/ROW)
ALL LOAD RESTRAINT SHOWN
8 CHAINS, 8 TURNBUCKLES ALL 10MM G70
MIN 6.3T SHACKLE WHERE USED
DOUBLE UP CHAINS WHERE AVAILABLE
TO INCREASE SYSTEM STRENGTH
LOAD MUST BE PLACED ON DRY RUBBER
OR OTHER MATERIAL ACHEIVING
MIN COF OF 0.4 AT ALL CONTACT POINTS
REX J ANDREWS RESERVES THE RIGHT TO ALTER THIS INFORMATION AT ANY TIME WITHOUT NOTICE.
EQUIPMENT SHOWN IN THIS DRAWING MAY CHANGE DEPENDING ON AVAILABILITY.
ALL BUSINESS WITH REX J ANDREWS P/L IS SUBJECT TO OUR STANDARD TERMS AND CONDITIONS AVAILABLE FROM WWW.RJA.COM.AU
COPYRIGHT (C)
THIS DESIGN
IS NOT TO BE
COPIED RETRANSMITTED
OR AMENDED
WITHOUT WRITTEN
PERMISSION FROM
REX J ANDREWS P/L
THIRD ANGLE PROJECTION
DIMENSIONS IN MILLIMETRES
TOLERANCES
- LINEAR ± 5.0
REV
DATE
DRN
CKD
APP
0
ISSUED FOR APPROVAL
27/11/2018
H.A
H.A
W.A
R
ISSUED FOR REVIEW
27/11/2018
H.A
H.A
REX J ANDREWS PTY LIMITED
ENGINEERED TRANSPORTATION
PO BOX 271 PENRITH NSW 2751
PH 02 4721 7633
FAX 02 4721 7644
WWW.RJA.COM.AU
DOCUMENT UNCONTROLLED WHEN DOWNLOADED OR PRINTED
TRANSPORT PROPOSAL
GOLDWIND
HUB 3.0MW
DO NOT SCALE
DRG NO:
GOLD_CAT_HUB_03
A4

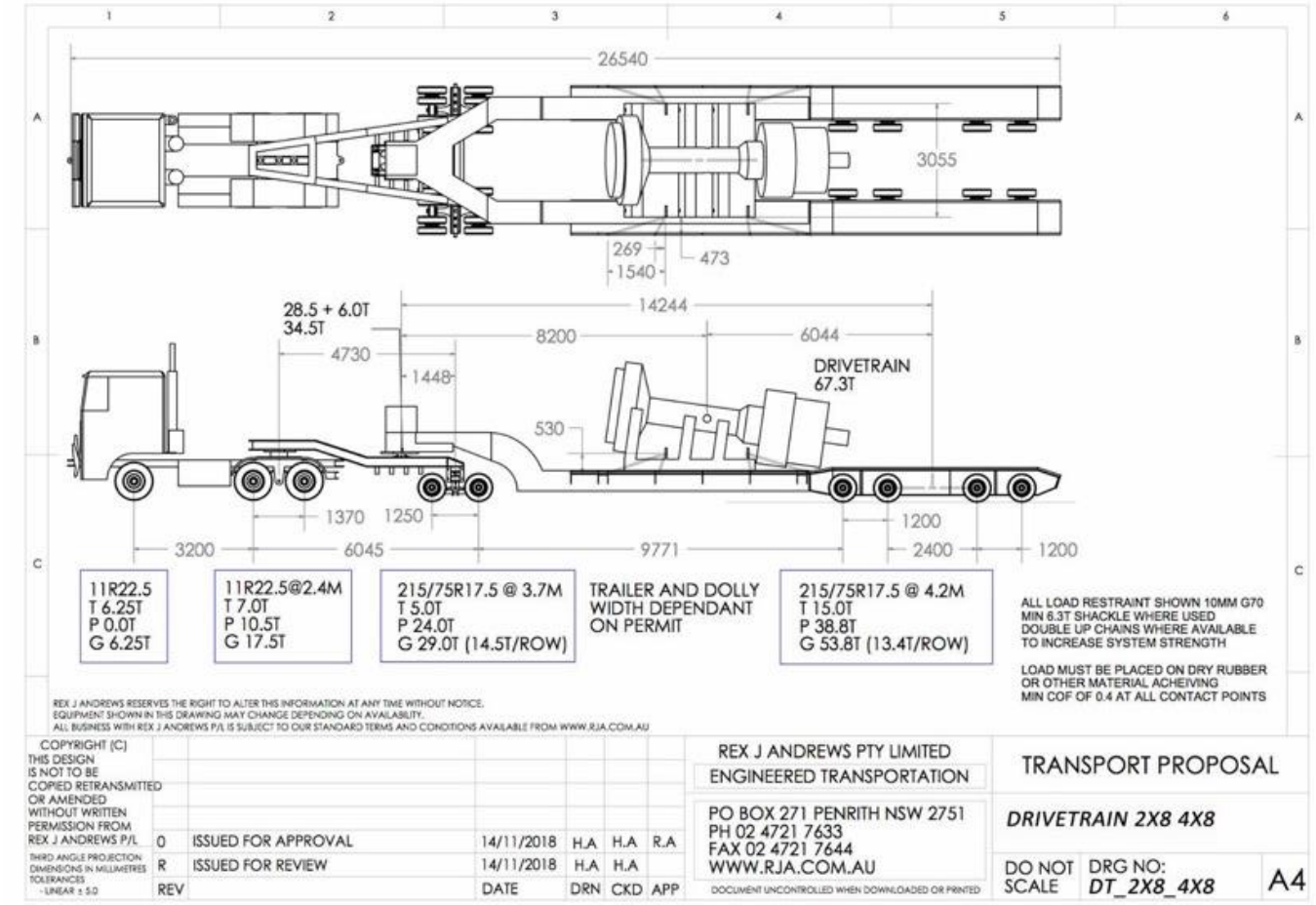
Nacelle with Drivetrain in (applicable weight differentiation):



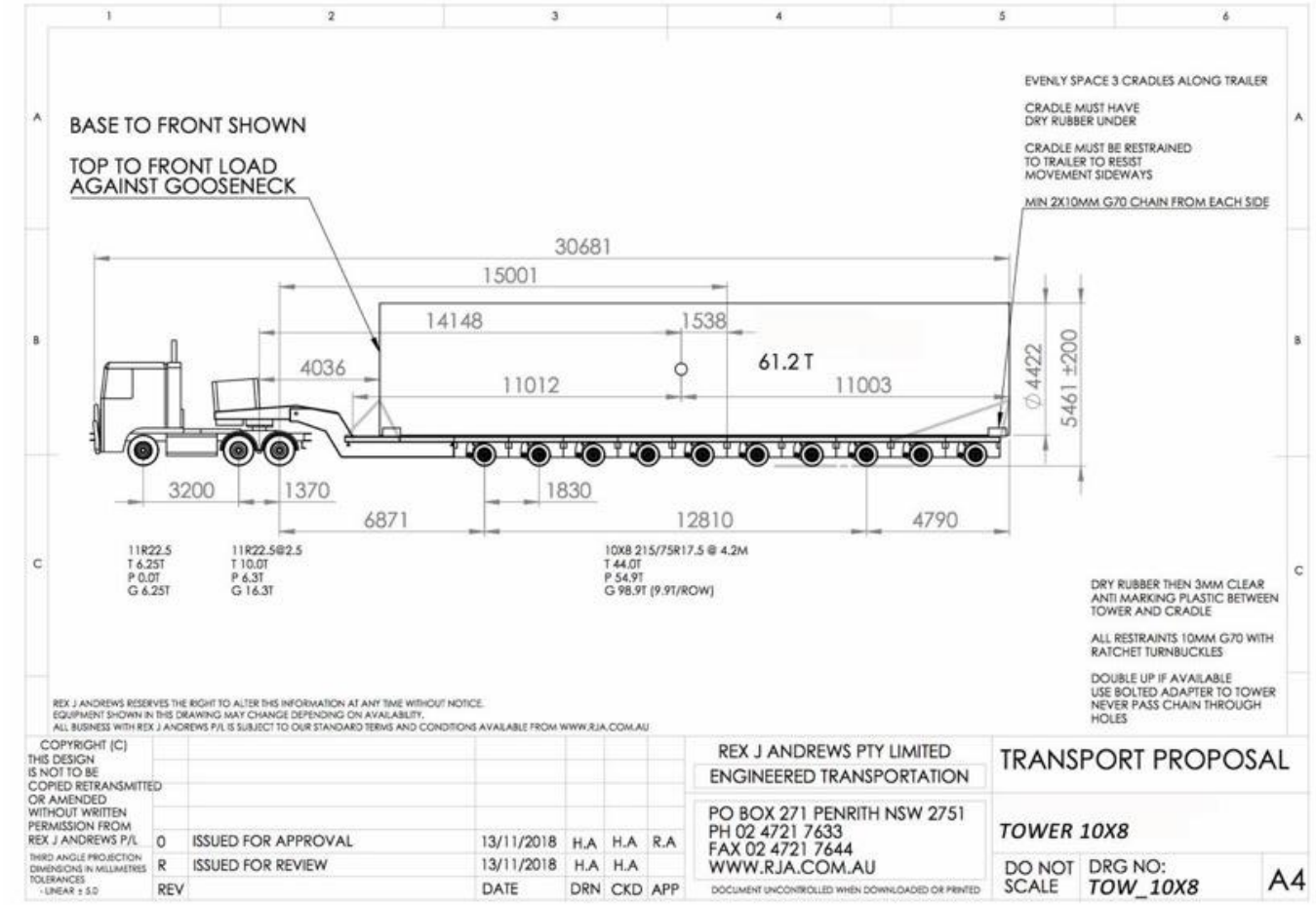
Nacelle with drivetrain out (applicable weight differentiation):



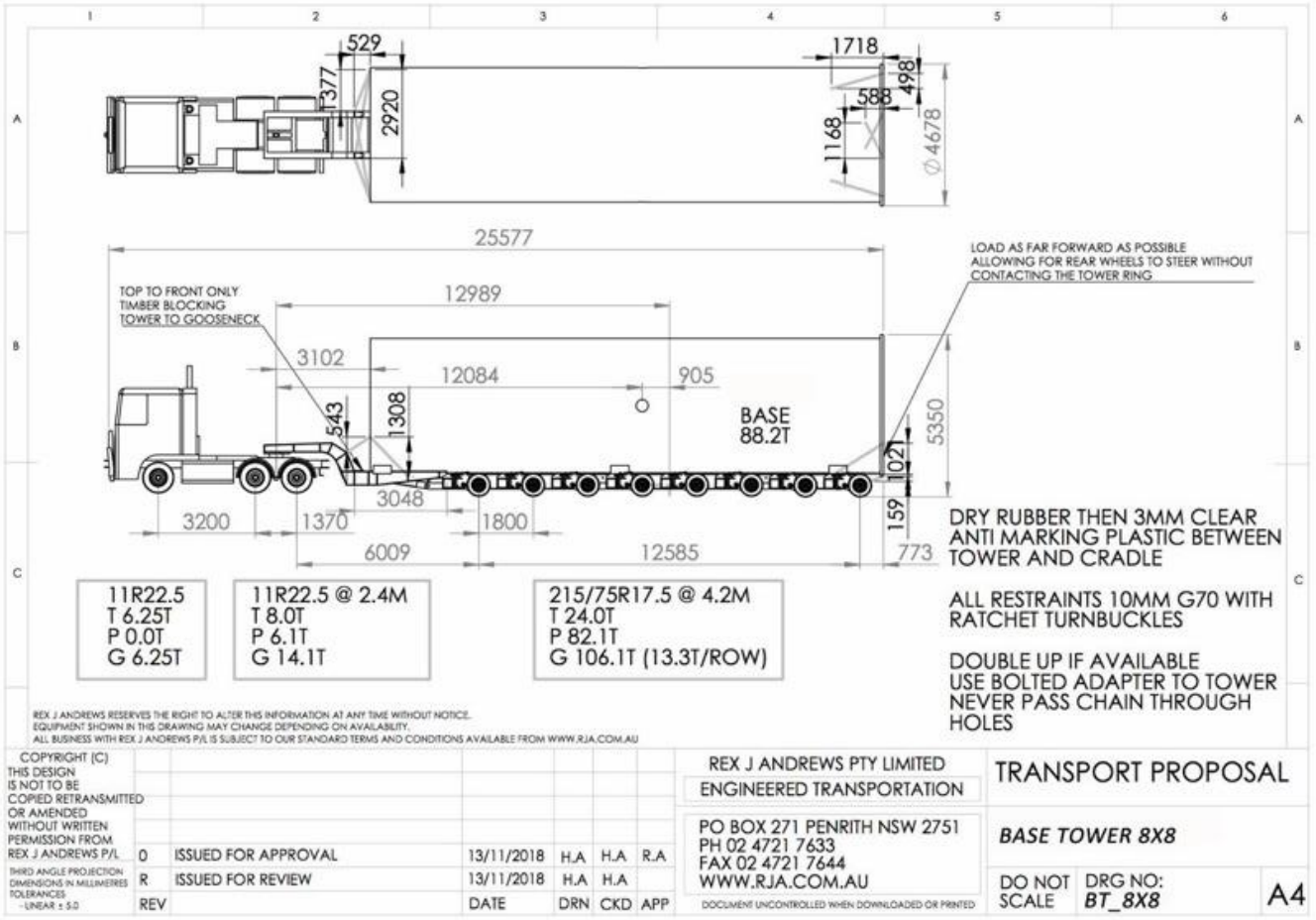
Drivetrain:


26540
3055
269
1540
473
28.5 + 6.0T
34.5T
14244
8200
6044
4730
1448
DRIVETRAIN
67.3T
530
1370
1250
1200
3200
6045
9771
2400
1200
11R22.5
T 6.25T
P 0.0T
G 6.25T
11R22.5@2.4M
T 7.0T
P 10.5T
G 17.5T
215/75R17.5 @ 3.7M
T 5.0T
P 24.0T
G 29.0T (14.5T/ROW)
TRAILER AND DOLLY
WIDTH DEPENDANT
ON PERMIT
215/75R17.5 @ 4.2M
T 15.0T
P 38.8T
G 53.8T (13.4T/ROW)
ALL LOAD RESTRAINT SHOWN 10MM G70
MIN 6.3T SHACKLE WHERE USED
DOUBLE UP CHAINS WHERE AVAILABLE
TO INCREASE SYSTEM STRENGTH
LOAD MUST BE PLACED ON DRY RUBBER
OR OTHER MATERIAL ACHEIVING
MIN COF OF 0.4 AT ALL CONTACT POINTS
REX J ANDREWS RESERVES THE RIGHT TO ALTER THIS INFORMATION AT ANY TIME WITHOUT NOTICE.
EQUIPMENT SHOWN IN THIS DRAWING MAY CHANGE DEPENDING ON AVAILABILITY.
ALL BUSINESS WITH REX J ANDREWS P/L IS SUBJECT TO OUR STANDARD TERMS AND CONDITIONS AVAILABLE FROM WWW.RJA.COM.AU
COPYRIGHT (C)
THIS DESIGN IS NOT TO BE COPIED RETRANSMITTED OR AMENDED WITHOUT WRITTEN PERMISSION FROM REX J ANDREWS P/L
THIRD ANGLE PROJECTION
DIMENSIONS IN MILLIMETRES
TOLERANCES - LINEAR ± 5.0
REV
0 ISSUED FOR APPROVAL 14/11/2018 H.A H.A R.A
R ISSUED FOR REVIEW 14/11/2018 H.A H.A
DATE DRN CKD APP
REX J ANDREWS PTY LIMITED
ENGINEERED TRANSPORTATION
PO BOX 271 PENRITH NSW 2751
PH 02 4721 7633
FAX 02 4721 7644
WWW.RJA.COM.AU
DOCUMENT UNCONTROLLED WHEN DOWNLOADED OR PRINTED
TRANSPORT PROPOSAL
DRIVETRAIN 2X8 4X8
DO NOT SCALE
DRG NO: DT_2X8_4X8
A4

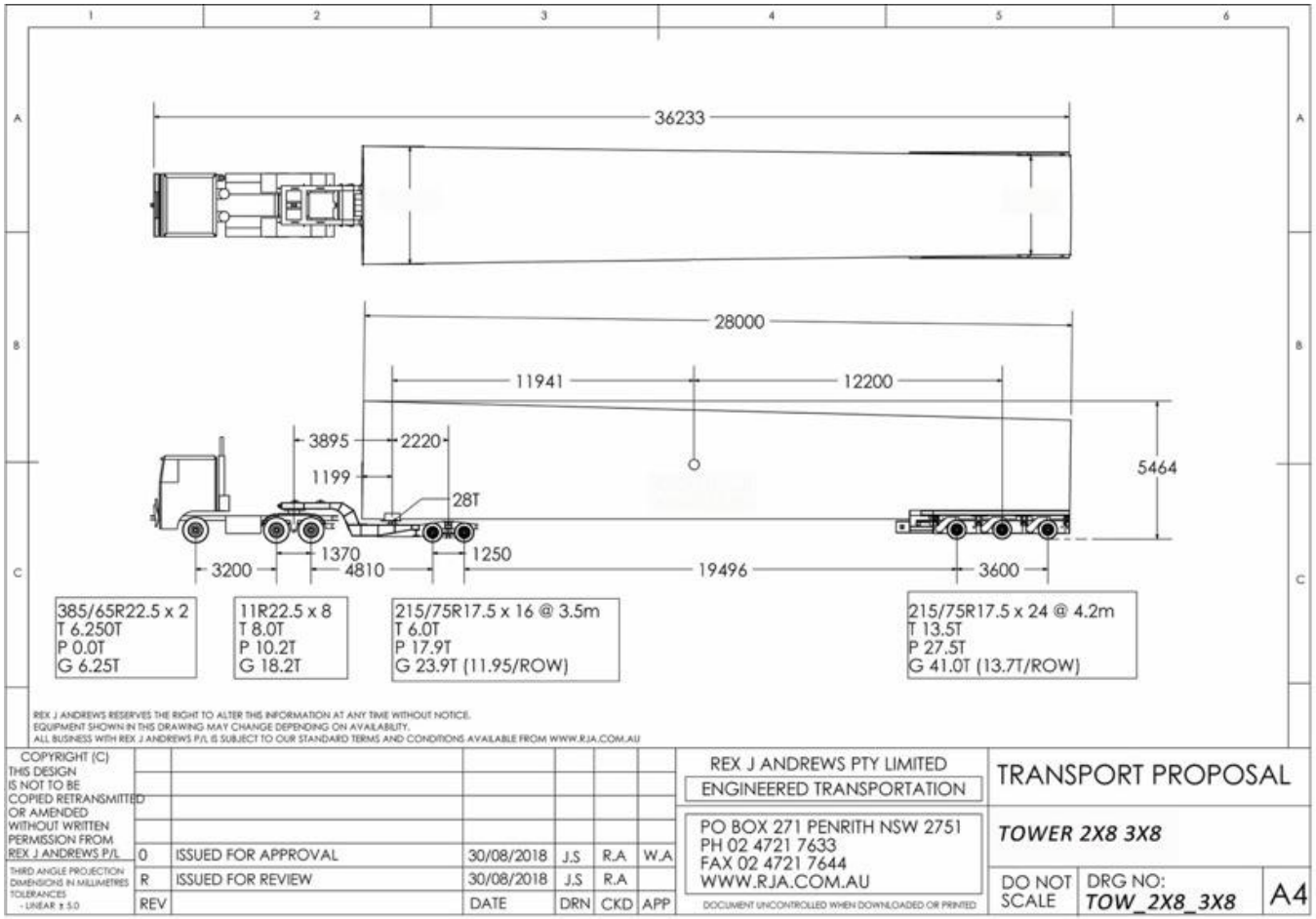
Tower trailer 10x8:



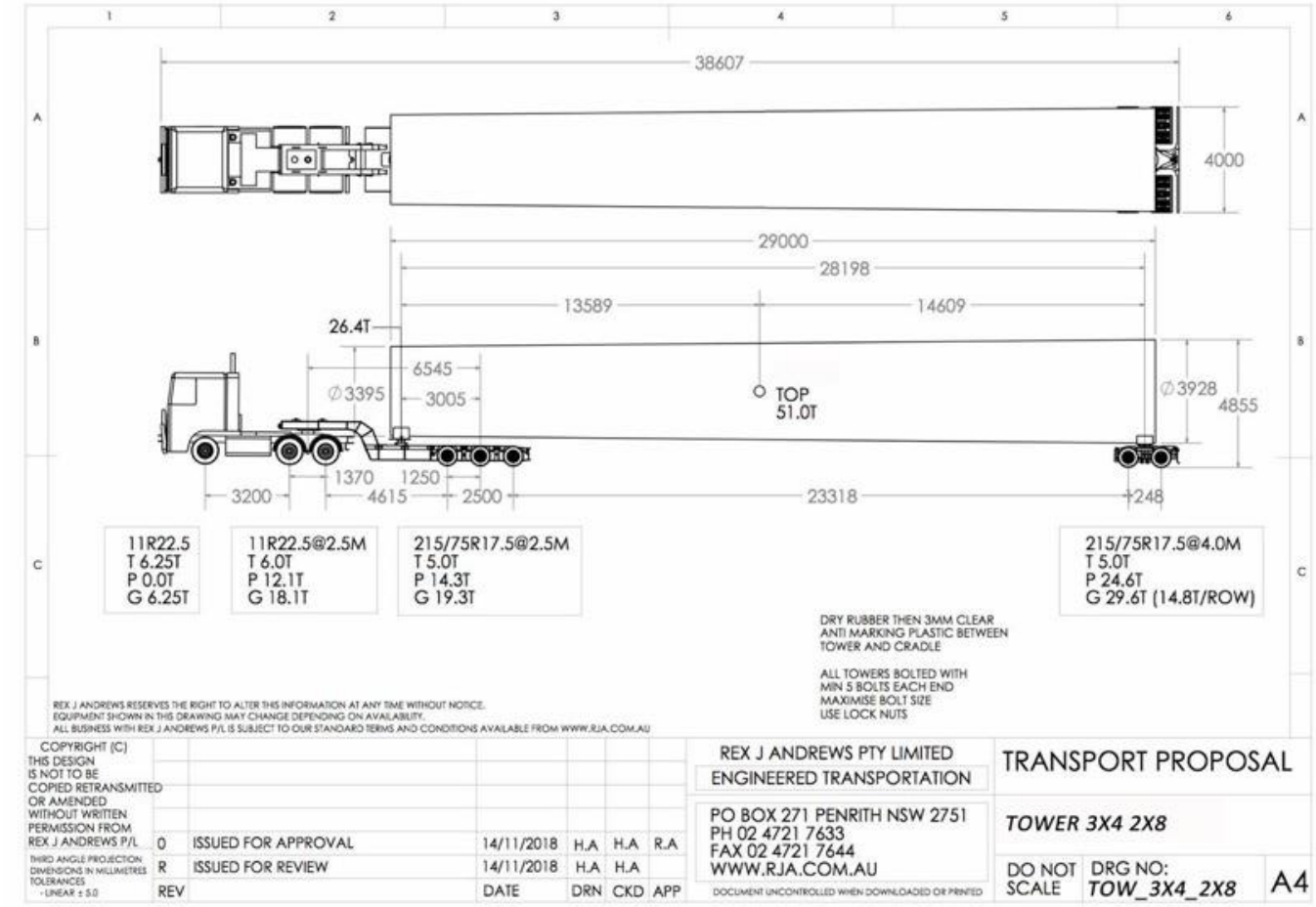
Tower trailer 8x8:



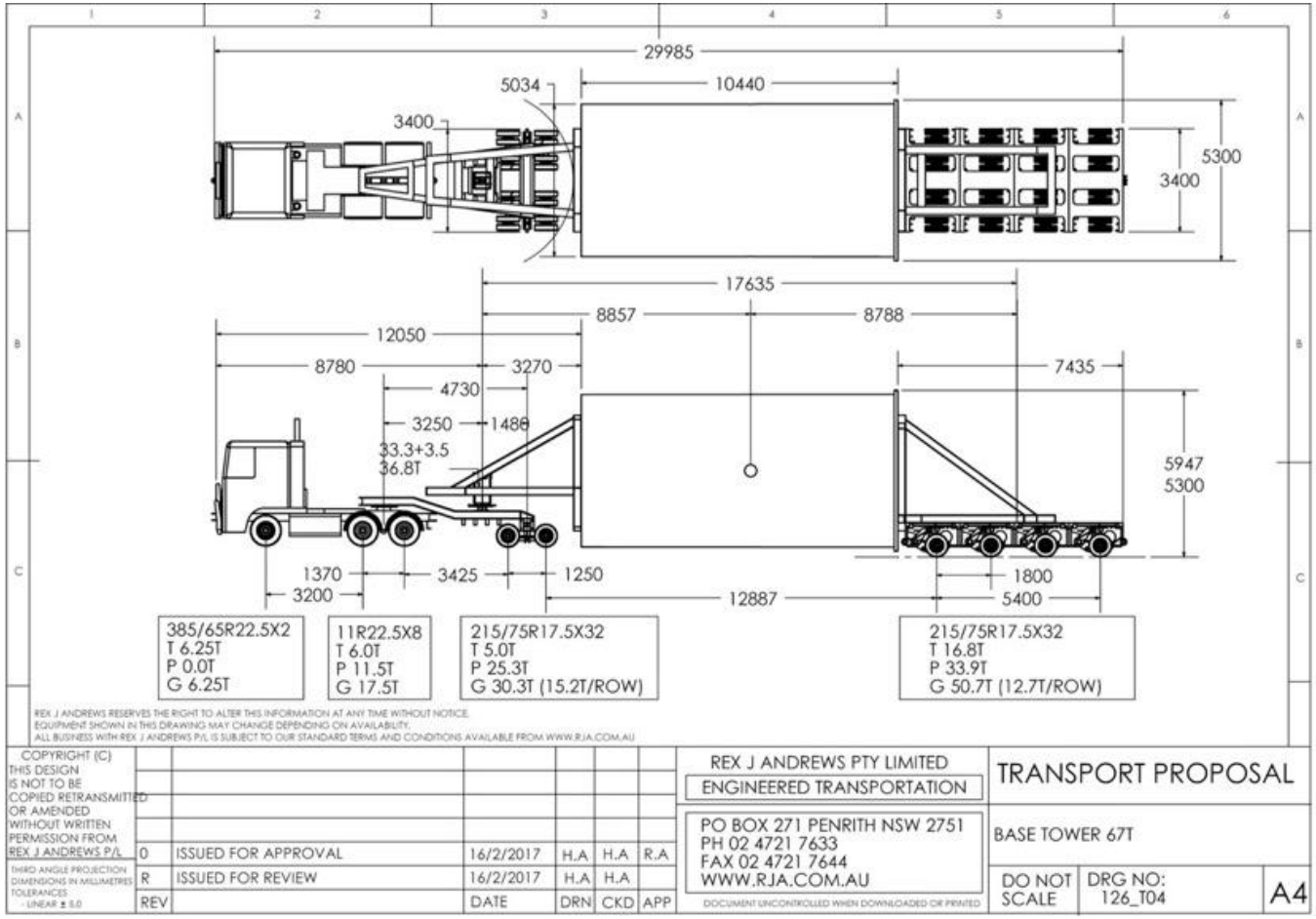
Mid tower trailer 10x8:



Top tower trailer:

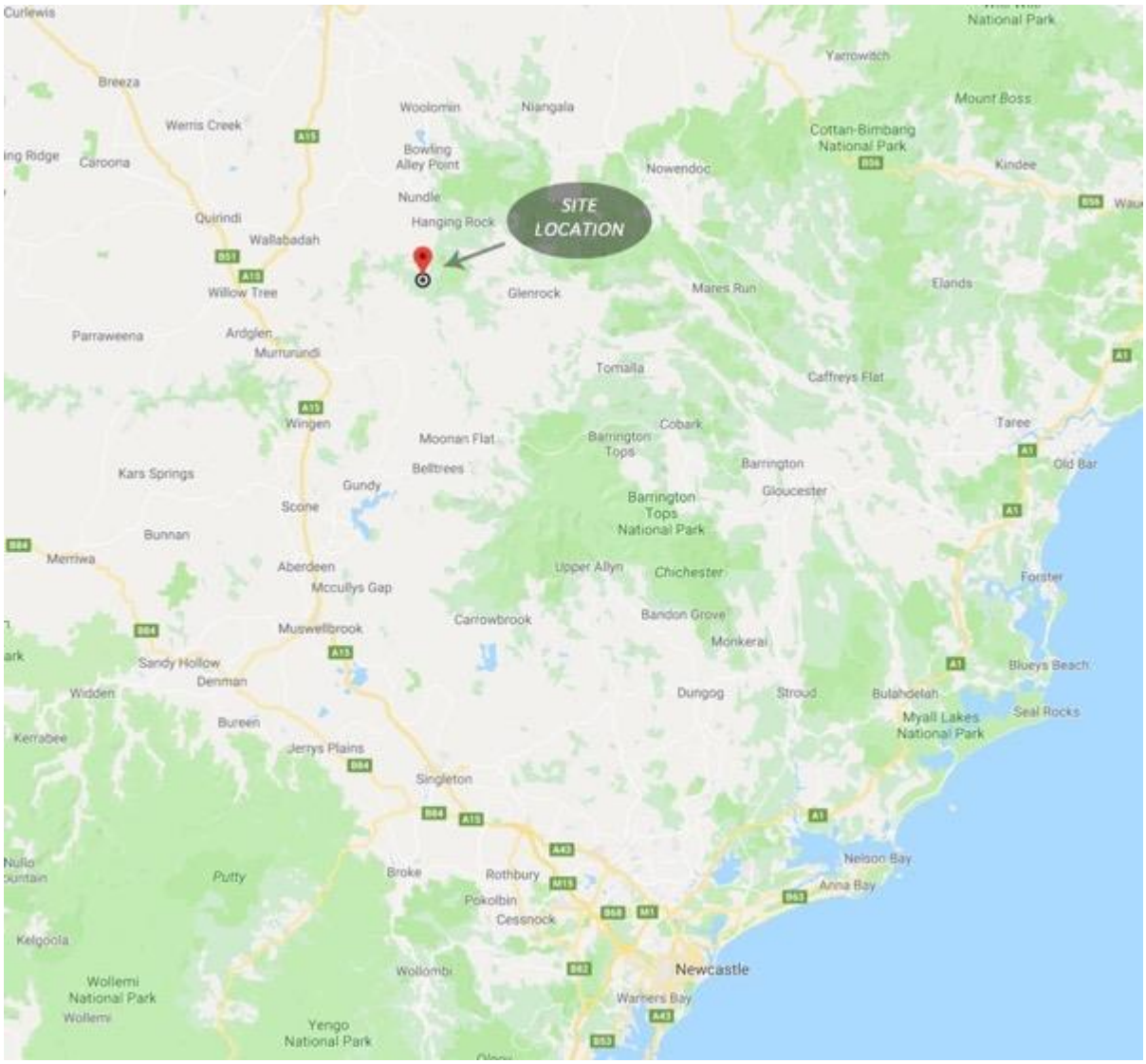


Bookend tower trailer:

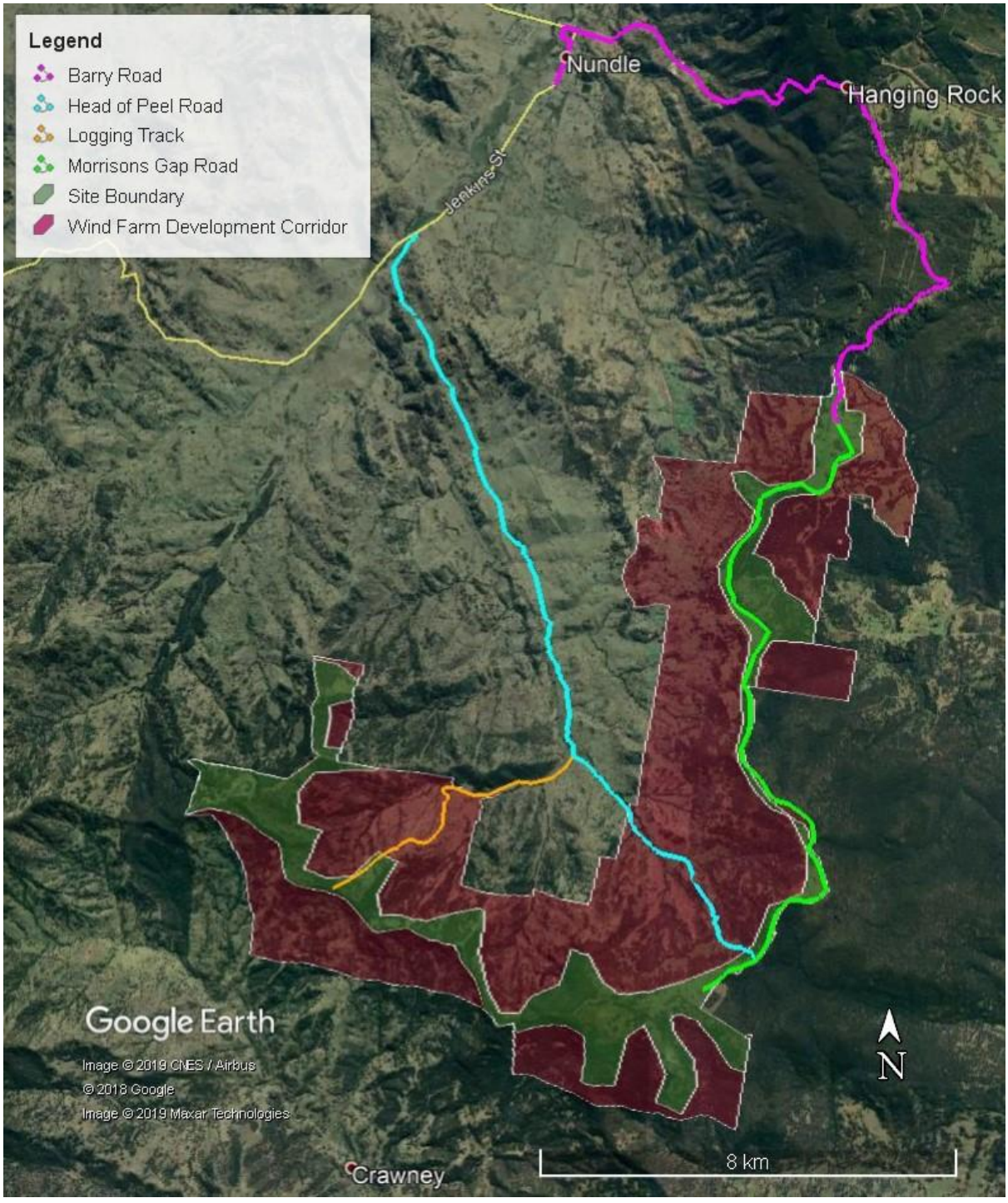


6.0 Site Location.

The Hill of Gold wind farm is located 8 km south of Nundle NSW and 300 Km by road from the Port of Newcastle.



7.0 Hills of Gold Wind Farm Project, Site Boundary's and Existing Access Roads & Tracks



8.0 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.

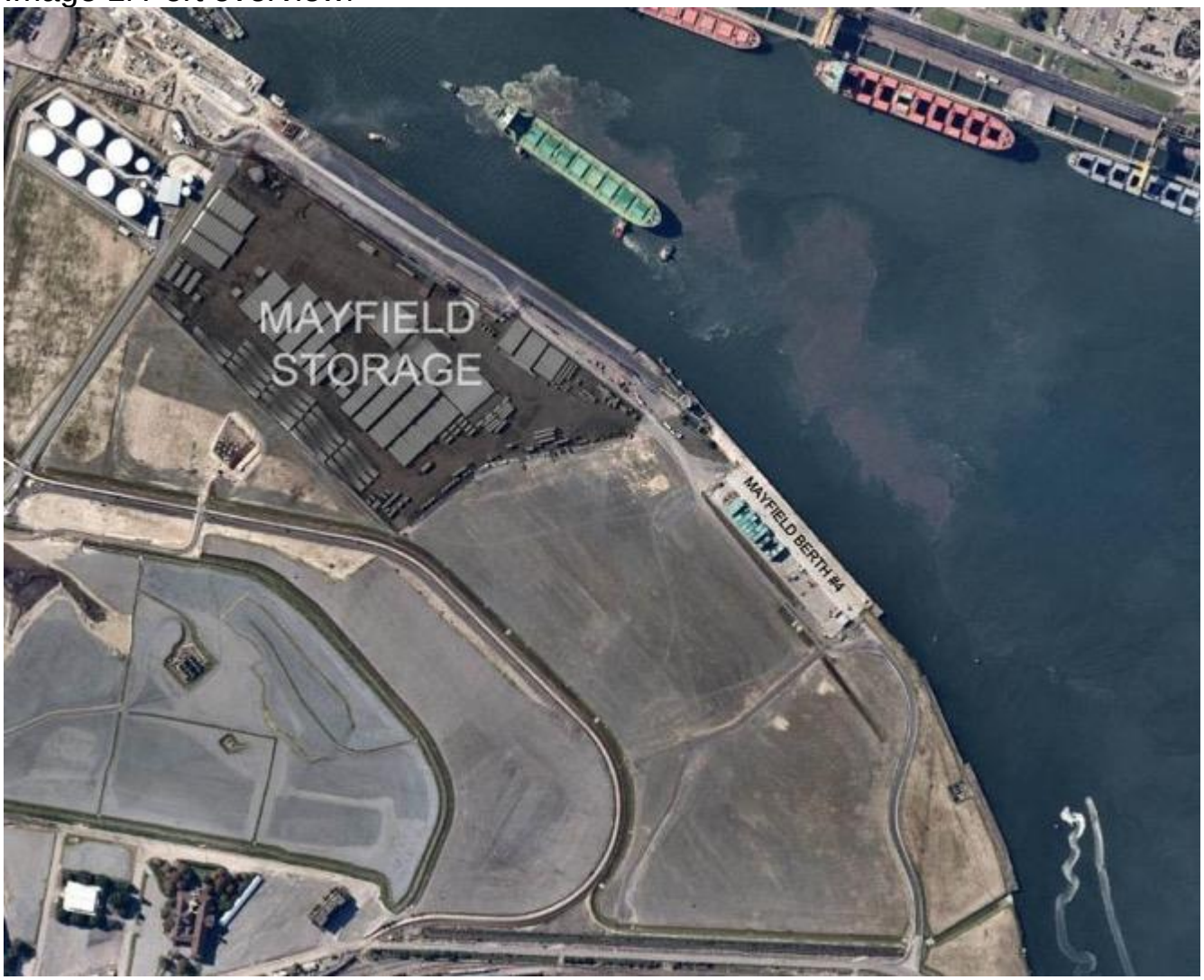


Image 2: Mayfield #4 Berth

Image 3: Mayfield #4 Port storage area.

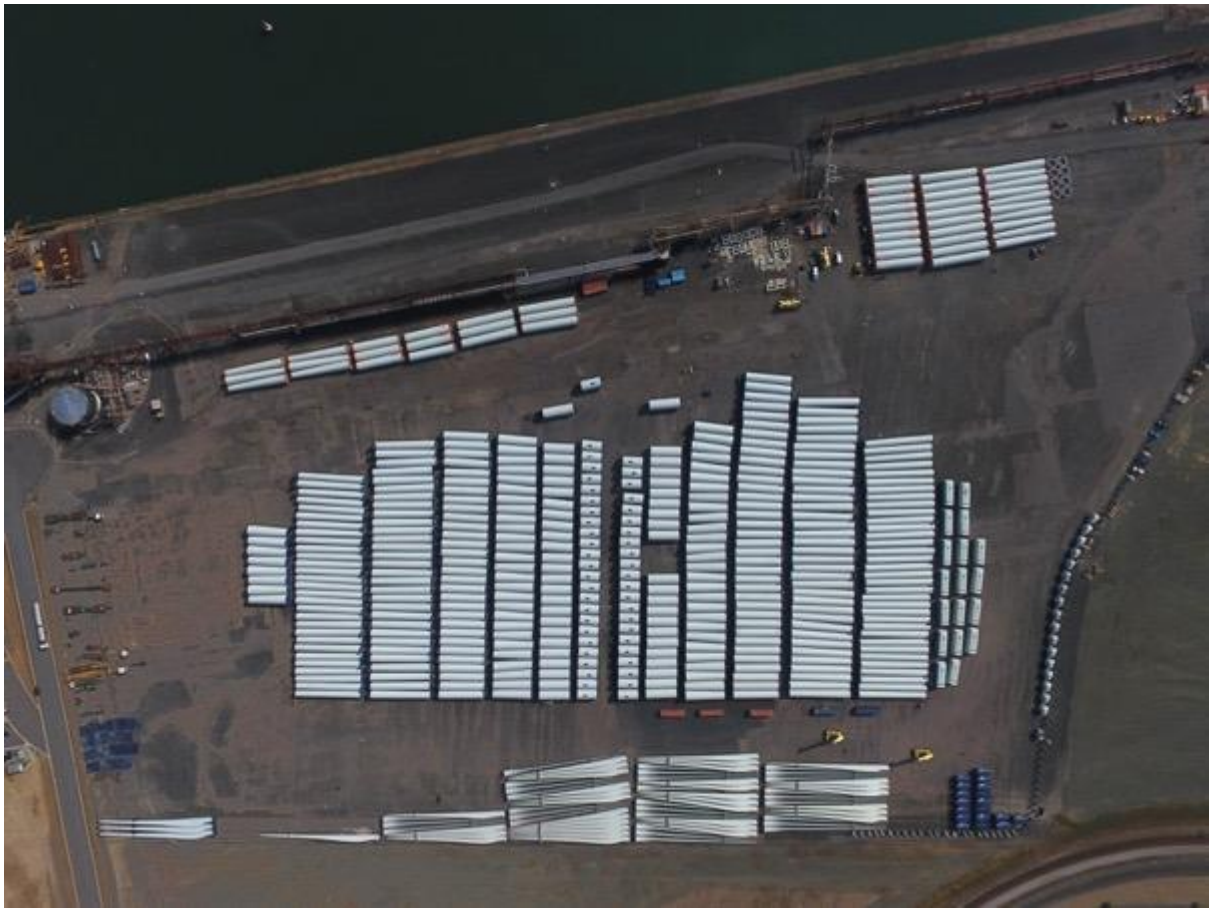


Image 4: Mayfield #4 Port storage area.

9.0 Transport Summary.

We have based this study on the turbine components, and towers entering Australia via the Port of Newcastle. The following shows the preferred route for the two different sized blades, and the main route for all other components. The transport routes will differ for some components. There will be 2 routes from the port through to Nundle, then 2 options to transport the goods through to either the South or North of the project.

MAIN ROUTES FROM PORT TO NUNDLE

BLADE ROUTE FROM PORT OF NEWCASTLE TO NUNDLE: (311.0 km): After completing this route survey and based on our technical experience, we recommend the following route is the most suitable option.

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, Denman Road,(Muswellbrook bypass via Bengalla Road, Wybong Road, Kayuga Road, Ivermein Street, Dartbrook mine access Road), New England Highway, Lindsay's Gap Road, Nundle Road, Crosby Street, Oakenville Street, Jenkins Street.

GPS Link: https://goo.gl/maps/ADDr39nRJZdYAgJY6

TOWER/LARGE MOTOR ROUTE FROM NEWCASTLE TO NUNDLE: (384.0 km): After completing this route survey and based on our technical experience, we recommend the following route is the most suitable option. (TO BE USED FOR TRAILERS OVER 3.5 METRES AXLE WIDTH AND EXCEEDING 5.2 METRES OVERALL HEIGHT).

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, Denman Road, Thomas Mitchell Drive, New England Highway (Muswellbrook bypass via Bell Street, Victoria Street, Market Street), New England Highway, (Tamworth bypass via Scott Street, Marius Street), New England Highway, Nundle Road, Crosby Street, Oakenville street.

GPS Link: https://goo.gl/maps/57BVbQXqjX9hBwbc6

REMAINING COMPONENTS ROUTE FROM PORT OF NEWCASTLE TO NUNDLE: (269.0 km): After completing this route survey and based on our technical experience, we recommend the following route is the most suitable option. (TO BE USED FOR TRAILERS UNDER 3.5 METRES AXLE WIDTH AND NOT EXCEEDING 5.2 METRES IN OVERALL HEIGHT).

This route took us via Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, (Muswellbrook bypass via Bell Street, Victoria Street, Market Street), New England Highway, Lindsay's Gap Road, Nundle Road, Crosby Street, Oakenville Street, Jenkins Street.

GPS Link: https://goo.gl/maps/ycTCnsatB4v3Bnvr6

ACCESS ROUTES FROM NUNDLE TO SITE ENTRANCES

OPTION 1: SOUTHERN ENTRANCES:

BLADE AND LARGE TOWER ROUTE FROM NUNDLE TO HEAD OF PEEL AND KIRKS ROAD: (20.3 km): After completing this route survey, we believe the following is the most suitable option.

This route took us via Jenkins Street Oakenville Street, Old Hanging Rock Road, Happy Valley Road, Jenkins Street, Crawney Road, Head of Peel Road, Jenkins Road.

GPS Link: https://goo.gl/maps/LD2xcpS5iEnkyeKWA

REMAINING COMPONENTS ROUTE FROM NUNDLE TO HEAD OF PEEL AND KIRKS ROAD: (16.8 km): After completing this route survey, we believe the following is the most suitable option.

This route took us via Jenkins Street, Crawney Road, Head of Peel Road, Jenkins Road.

GPS Link: https://goo.gl/maps/LzUCuK3H6SdkG4yV6

OPTION 2: NORTHERN ENTRANCES:

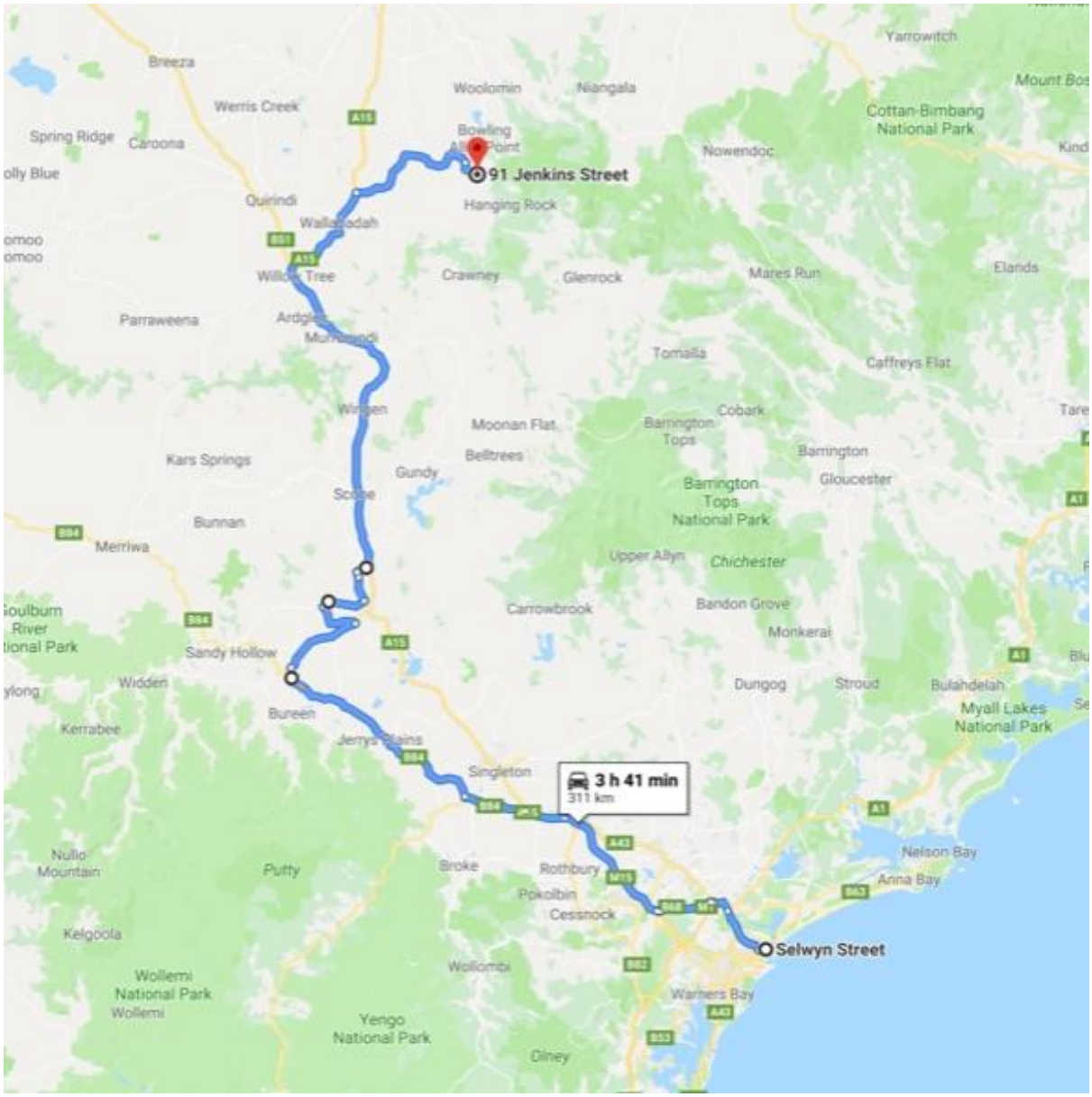
ALL COMPONENTS ROUTE FROM NUNDLE TO MORRISONS GAP ROAD: (14.6 km): After completing this route survey, we believe the following is the most suitable option.

This route took us via Jenkins Street Oakenville Street, Old Hanging Rock Road, Barry Road, Morrisons Gap Road.

GPS Link: https://goo.gl/maps/dCd9G3aZMYcvhbkp7

10.0 Route Survey: (Main route) – Newcastle port to Nundle for Blades.

Distance: (311.0 Km).
Via: Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Golden Highway, Denman Road,(Muswellbrook bypass via Bengalla Road, Wybong Road, Kayuga Road, Ivermein Street, Dartbrook mine access Road), New England Highway, Lindsay's Gap Road, Nundle Road, Crosby Street, Oakenville Street, Jenkins Street.
GPS Link: https://goo.gl/maps/ADDr39nRJZdYAgJY6



KEY	
MODIFICATIONS REQUIRED	
MINOR WORKS OR CAUTION	
PARKING	

Route Survey: (Main route) – Newcastle port to Nundle for Blades.

Km index	Location	Section of road	Critical Measurement	Procedure	Comments 170.0m rotor	Comments 158.0m rotor
0.0	Mayfield	Mayfield #4 berth onto Selwyn Street GPS link: https://goo.gl/maps/afLwPYKuNdm	Clearance: Length: 70.0 metres	Right hand turn	Both options will require the fence to be relocated on the left-hand side. Some hardstand will need to be added to the exit of the corner for both blades. Additionally, the 82-metre blade will require hardstand on the left-hand entry to the corner.	Fence may need to be modified.
0.4	Mayfield	Selwyn Street rail crossing GPS link: https://goo.gl/maps/AmohE54hKSz	Clearance: 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.	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 GPS link: https://goo.gl/maps/gXeHvBtCp4D2	Clearance: Length: 70.0 metres	Right hand turn	The sign on the inside of the corner will need to be made removable.	No problem with this section of road.
1.4	Mayfield	George Street onto Industrial Drive https://goo.gl/maps/s4ayrsuoAsD2	Clearance: Length: 70.0 metres	Moderate right hand turn	Load to travel across to the correct side to the correct side. The traffic signal in the middle of the intersection will need to be relocated. Additionally, hardstand will need to be placed on the south side of the intersection.	Load to travel across to the correct side to the correct side. Hardstand will need to be placed on the south side of the intersection.
4.9	Mayfield	Industrial Drive under traffic signals GPS link: https://goo.gl/maps/YmqhiS2iR582	Clearance: 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.	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.

Route Survey: (Main route) – Newcastle port to Nundle for Blades.						
Km index	**Location**	**Section of road**	**Critical Measurement**	**Procedure**	**Comments 170.0m rotor**	**Comments 158.0m rotor**
5.5	Mayfield West	Industrial Drive onto Maitland Road GPS link: https://goo.gl/maps/Kn49dhWG2qG2	Clearance: Length: 70.0 metres	Moderate 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. The concrete median strip will need to be reduced in height and have a gentle slope.	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. The concrete median strip will need to be reduced in height and have a gentle slope.
13.9	Hexham	New England Highway under gantry GPS link: https://goo.gl/maps/YTMoFe7Aick	Clearance: Height: 5.95 Metres	Travel directly ahead	This is the lowest structure on route. There is no bypass around the gantry. A maximum loaded height of 5.8 metres should not be exceeded.	This is the lowest structure on route. There is no bypass around the gantry. A maximum loaded height of 5.8 metres should not be exceeded.
17.4	Tarro	New England Highway onto John Renshaw Drive GPS link: https://goo.gl/maps/SRDr5JigkBp	Clearance: Width: 12.0 metres	Left hand merge	No problems with this section of road.	No problems with this section of road.
18.4	Beresfield	John Renshaw Drive through M1 intersection GPS link: https://goo.gl/maps/N19vJih1Fgr	Clearance: Width: 9.0 metres Height: 5.9 metres	Travel directly ahead	No problems with this section of road.	No problems with this section of road.
28.7	Buchanan	John Renshaw Drive onto the Hunter Expressway GPS link: https://goo.gl/maps/1STJ1PfQt9E2	Clearance: Length: 65.0 metres	Right hand turn	The blades will need to 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, this may require additional hardstand. Traffic control and or police will be required to perform this procedure.	Travel around the roundabout and take the third exit onto the Hunter Expressway onramp. A sign will need to be made removable. Spotter to guide load through this pinch point.
58.9	Branxton	The Hunter Expressway onto New England Highway	Clearance: Width: 9.0 metres	Travel directly ahead	No problems with this section of road.	No problems with this section of road.

Route Survey: (Main route) – Newcastle port to Nundle for Blades.						
Km index	**Location**	**Section of road**	**Critical Measurement**	**Procedure**	**Comments 170.0m rotor**	**Comments 158.0m rotor**
		GPS link: https://goo.gl/maps/7rauNuxzqjq				
67.3	Whittingham	The New England Highway onto the Golden Highway GPS link: https://goo.gl/maps/nAnfkYfeUn42	Clearance: Width: 12.0 metres	Left Hand turn	The NSW Government is currently upgrading this intersection. The intersection in its current form has several signs that would need to be made removable, but no modifications are required on the existing corner. At this stage the data that is available for the upgrades shows that the section of road that we would need to access does not change considerably. However, it is recommended that you monitor the progress of the upgrades, and that any changes are thoroughly looked at.	The NSW Government is currently upgrading this intersection. The intersection in its current form has several signs that would need to be made removable, but no modifications are required on the existing corner. At this stage the data that is available for the upgrades shows that the section of road that we would need to access does not change considerably. However, it is recommended that you monitor the progress of the upgrades, and that any changes are thoroughly looked at.
67.4	Whittingham	Golden Highway GPS link: https://goo.gl/maps/R86RFuPnmFU2	Clearance: 115.0 x 9.0 metres	Parking Bay	Suitable parking for Fatigue breaks.	Suitable parking for Fatigue breaks.
77.3	Whittingham	Golden Highway intersection with the Putty Road GPS link: https://goo.gl/maps/7hQdEmK1EgE2	Clearance: Length: 85.0 metres	Left hand turn	Blades to cross from the incorrect side to the incorrect side. Some signs will need to be made removable.	Blades to cross from the incorrect side to the incorrect side. Some signs will need to be made removable.
77.4	Mount Thorley	Golden Highway GPS link: https://goo.gl/maps/zGvdupDuixx	Clearance: 100.0 x 10.0 metres	Parking Bay	Suitable parking for Fatigue breaks.	Suitable parking for Fatigue breaks.
80.8	Mount Thorley	Golden Highway intersection with the Putty Road GPS link: https://goo.gl/maps/VyA42n1CqZx	Clearance: Length: 85.0 metres	Right hand turn	Blades to cross from the incorrect side and cross back to the correct side approx. 500 metres west of the intersection.	Blades to cross from the incorrect side and cross back to the correct side approx. 500 metres west of the intersection.

Route Survey: (Main route) – Newcastle port to Nundle for Blades.						
Km index	**Location**	**Section of road**	**Critical Measurement**	**Procedure**	**Comments 170.0m rotor**	**Comments 158.0m rotor**
98.0	Warkworth	Golden Highway GPS link: https://goo.gl/maps/Y6V6EXaCwxq	Clearance: 100.0 x 8.0 metres	Parking Bay	Suitable parking for Fatigue breaks.	Suitable parking for Fatigue breaks.
107.0	Jerrys Plains	Golden Highway through Jerrys Plains village GPS link: https://goo.gl/maps/WgSCRsJ9ZGt	Clearance: Length: 70.0 metres	Dogleg	Blades to cross from the incorrect side to the incorrect side. Some signs will need to be made removable and some hardstand added.	No problems with this section of road.
126.0	Ogilvy	Golden Highway GPS link: https://goo.gl/maps/58Tj9ojs7CC2	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.	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 GPS link: https://goo.gl/maps/sf4PNnycxB32	Clearance: Length: 60.0 metres	Right hand turn	The blades will travel around the corner from correct side onto the correct side. The existing corner will require hardstand to be added and signs made removable.	The blades will travel around the corner from correct side onto the correct side. The existing corner will require hardstand to be added and signs made removable.
149.0	Muswellbrook	Denman Road onto Bengalla Road GPS link: https://goo.gl/maps/CJYMtSMTttJ2	Clearance: Length: 65.0 metres	Left hand turn	Blades to cross from the incorrect side to the incorrect side. Some signs will need to be made removable and some hardstand added to the inside of the corner.	Blades to cross from the incorrect side to the incorrect side. No works required on this intersection.
158.5	Muswellbrook	Bengalla Road onto Wybong Road GPS link: https://goo.gl/maps/vibQtvHkxXE2	Clearance: Length: 70.0 metres	Right hand turn	Blades to cross from the correct side to the correct side. Some signs will need to be made removable.	Blades to cross from the correct side to the correct side. Some signs will need to be made removable.
168.1	Muswellbrook	Wybong Road onto Kayuga Road	Clearance:	Left hand turn	Blades to cross from the incorrect side to the incorrect side. Some signs will	Blades to cross from the incorrect side to the incorrect side. Some signs will

Route Survey: (Main route) – Newcastle port to Nundle for Blades.						
Km index	**Location**	**Section of road**	**Critical Measurement**	**Procedure**	**Comments 170.0m rotor**	**Comments 158.0m rotor**
		GPS link: https://goo.gl/maps/xVscKUT1isJ2	Length: 40.0 metres		need to be relocated or made removable. Permission will be required from the landowner to travel over the private land. This will require removal and realigning the fence and adding hardstand.	need to be relocated or made removable. Permission will be required from the landowner to travel over the private land. This will require removal and realigning the fence and adding hardstand.
173.3	Muswellbrook	Kayuga Road onto Ivermein Street GPS link: https://goo.gl/maps/JpTfmcsZ6Sk	Clearance: Length: 85.0 metres	Travel directly ahead	No problems with this section of road.	No problems with this section of road.
174.0	Muswellbrook	Ivermein Street onto Dartbrook mine access Road GPS link: https://goo.gl/maps/ddMHa4CmXK32	Clearance: Length: 50.0 metres	Right hand turn	Blades 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.	Blades 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	Dartbrook Road GPS link: https://goo.gl/maps/u9vSXiSV7Jt	Clearance: Length: 60.0 metres	Right hand turn	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 made removable and some hardstand added to the inside of the corner.	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 made removable and some hardstand added to the inside of the corner.
177.0	Muswellbrook	Dartbrook Road onto New England Highway GPS link: https://goo.gl/maps/twTsmUKaED82	Clearance: Length: 60.0 metres	Left hand turn	Blades to cross from the incorrect side to the incorrect side. Some signs will need to be made removable on the corner and some hardstand added.	Blades to cross from the incorrect side to the incorrect side. Some signs will need to be made removable on the corner and some hardstand added.
194.0	Scone	Rail crossing over the New England GPS link: https://goo.gl/maps/hQfQRRrmx5n	Clearance: Width: 7.0 metres	Drive directly ahead	Rail approval to be carried in vehicles that require this clearance. Likely to cross with caution, no escort required.	Rail approval to be carried in vehicles that require this clearance. Likely to cross with caution, no escort required.
240.8	Murrurundi	New England highway (Township) GPS link:	Clearance: 60.0 x 5.0 metres	Parking Bay	Suitable parking for Fatigue breaks.	Suitable parking for Fatigue breaks.

Route Survey: (Main route) – Newcastle port to Nundle for Blades.						
Km index	**Location**	**Section of road**	**Critical Measurement**	**Procedure**	**Comments 170.0m rotor**	**Comments 158.0m rotor**
		https://goo.gl/maps/Sj3ixAkhujt				
245.4	Murrurundi Hill	New England highway Nowlands Gap GPS link: https://goo.gl/maps/R5yufobPeMG2	Clearance: 120.0 x 12.0 metres	Parking Bay (small)	Emergency parking only.	Emergency parking only.
251.3	Willow Tree	New England highway GPS link: https://goo.gl/maps/XLTg7CRV7EU2	Clearance: 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.	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.
257.9	Willow Tree Township	New England highway GPS link: https://goo.gl/maps/qw38qmvVfTC2	Clearance: 60.0 x 5.0 metres	Parking Bay	Suitable parking for Fatigue breaks.	Suitable parking for Fatigue breaks.
259.5	Willow Tree Truck Stop N	New England highway GPS link: https://goo.gl/maps/RRdPVHupGCs	Clearance: 120.0 x 12.0 metres	Parking Bay (small)	Suitable parking for Fatigue breaks for small loads only.	Suitable parking for Fatigue breaks for small loads only.
269.0	Wallabadah	New England highway GPS link: https://goo.gl/maps/QWCyeHQSohS2	Clearance: 80.0 x 5.0 metres	Parking Bay (side of road)	Suitable parking for Fatigue breaks.	Suitable parking for Fatigue breaks.
276.0	Wallabadah	New England highway onto Lindsay's Gap Road GPS link: https://goo.gl/maps/ePbYctjJootkBZiM9	Clearance: Length: 50.0 metres	Right hand turn	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 made removable and some hardstand added to the inside of the corner.	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 made removable on the inside of the corner.
287.7	Garoo	Lindsay's Gap Road over Goonoo Goonoo Creek GPS link:	Clearance: Axle width: 3.60m	Travel directly ahead over bridge in the	Loads that are been carried on trailers with an axle width exceeding 3.5 meters will need to take an alternate route via Tamworth, or the bridge will need to be	Loads that are been carried on trailers with an axle width exceeding 3.5 meters will need to take an alternate route via Tamworth, or the bridge will need to be

Route Survey: (Main route) – Newcastle port to Nundle for Blades.						
Km index	**Location**	**Section of road**	**Critical Measurement**	**Procedure**	**Comments 170.0m rotor**	**Comments 158.0m rotor**
		https://goo.gl/maps/9ELSk5ZLRWnf14tm7	Overall width: 6.20m Guard rail height: 850mm	centre of the road.	widened. The blades will travel across this structure in its original form.	widened. The blades will travel across this structure in its original form.
295.7	Garoo	Lindsay's Gap Road over Middlebrook Creek GPS link: https://goo.gl/maps/DyxGUid9JucoAHhHA	Clearance: Axle width: 4.50m Overall width: 6.10m Guard rail height: 750mm	Travel directly ahead over bridge in the centre of the road.	Due to the bridge prior to this one, there will be no loads on this route that will exceed 3.5 metres in axle width so the heavier loads with wider axles will also detour this structure via Tamworth. The blades will travel across this structure in its original form.	Due to the bridge prior to this one, there will be no loads on this route that will exceed 3.5 metres in axle width so the heavier loads with wider axles will also detour this structure via Tamworth. The blades will travel across this structure in its original form.
301.2	Garoo	Lindsay's Gap Road through Lindsay's Gap GPS link: https://goo.gl/maps/GGKmKmKmqemziKdth8wH9	Clearance: Length: 90.0 metres	Travel directly ahead	Load to travel in the centre of the road, escorts to warn traffic 500 metres to the east of the gap.	Load to travel in the centre of the road, escorts to warn traffic 500 metres to the east of the gap.
306.8	Nundle	Lindsay's Gap Road onto Nundle Road GPS link: https://goo.gl/maps/FX4ZRx2YG9i2BsXMA	Clearance: Length: 50.0 metres	Right hand turn	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 made removable and some hardstand added to the inside of the corner. A power pole will also need to be relocated.	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 made removable.
310.3	Nundle	Nundle Road onto Crosby Street GPS link: https://goo.gl/maps/uVvcN9QkPyTDP1YR6	Clearance: Width: 8.0 metres	Travel directly ahead	No problems with this section of road.	No problems with this section of road.
310.6	Nundle	Crosby Street onto Oakenville Street GPS link: https://goo.gl/maps/aZNDKURdSBERedMr9	Clearance: Width: 8.0 metres	Travel directly ahead	No problems with this section of road.	No problems with this section of road.

Route Survey: (Main route) – Newcastle port to Nundle for Blades.						
Km index	**Location**	**Section of road**	**Critical Measurement**	**Procedure**	**Comments 170.0m rotor**	**Comments 158.0m rotor**
311.0	Nundle	Oakenville Street and Jenkins Street intersection GPS link: https://goo.gl/maps/7YM56hQq8bnCSoZy8	Clearance: Width: 5.0 metres		From this point the routes will either travel directly ahead or turn to the right, depending on which options are used.	From this point the routes will either travel directly ahead or turn to the right, depending on which options are used.

0.0 Km: Mayfield #4 onto Selwyn Street at Mayfield.

170 Metre rotor

PROCEDURE: Right hand turn.

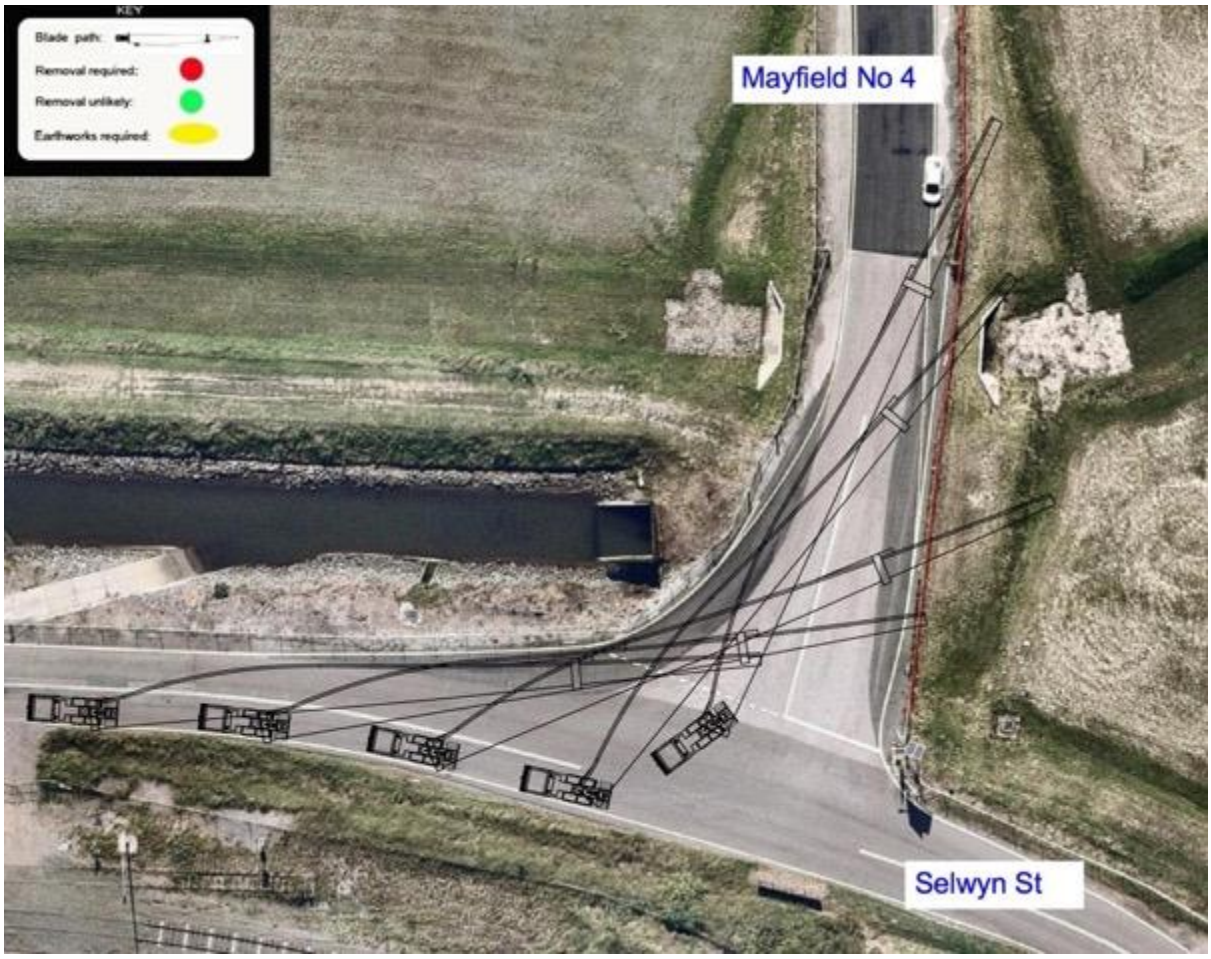
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/afLwPYKuNdm

COMMENTS: Some hardstand will need to be added to the left entry and exit of the corner. Some signs will need to be relocated and or made removable and some fence will 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: Yes, moderate amounts of work are required.

0.0 Km: Mayfield #4 onto Selwyn Street at Mayfield.
158 Metre rotor



PROCEDURE: Right hand turn.

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

COMMENTS: Fence may need to be modified.

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: Yes, small amounts of work are required.

0.4 Km: Rail crossing over Selwyn Street at Mayfield.

PROCEDURE: Travel directly ahead over the crossing.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/864FhMSaF9P2

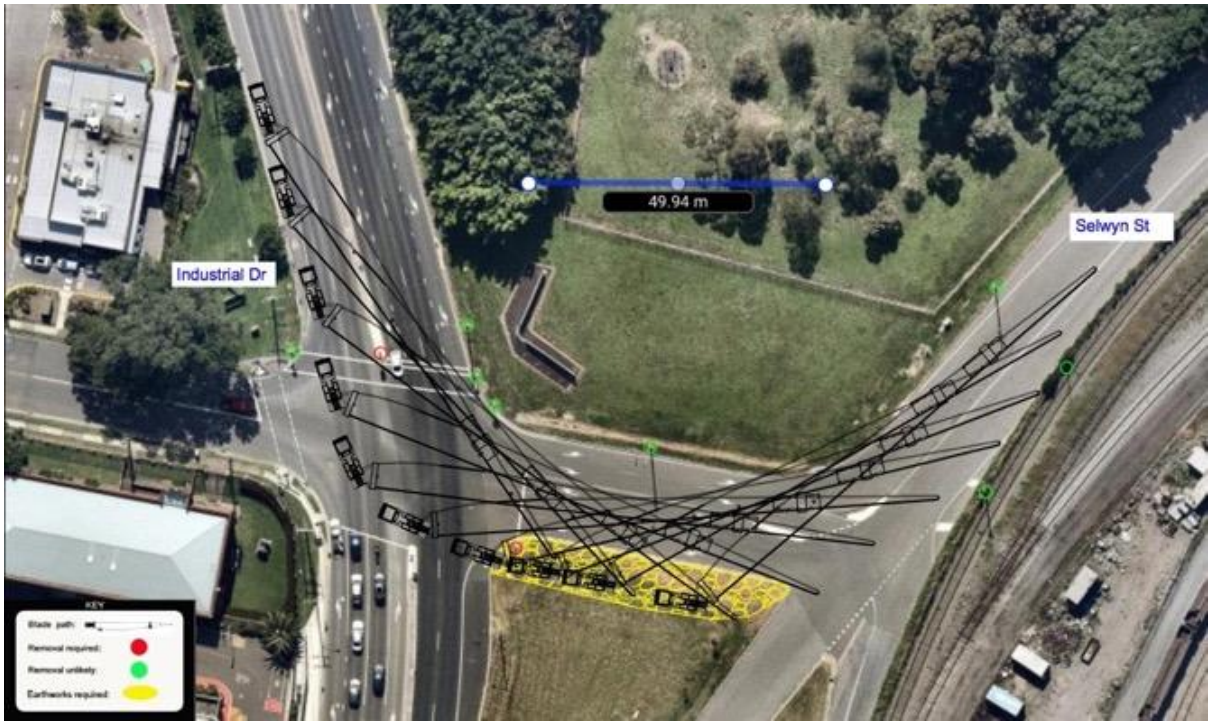
COMMENTS: Large width clearance and good ground clearance over this crossing.

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 required.

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

170 Metre rotor:



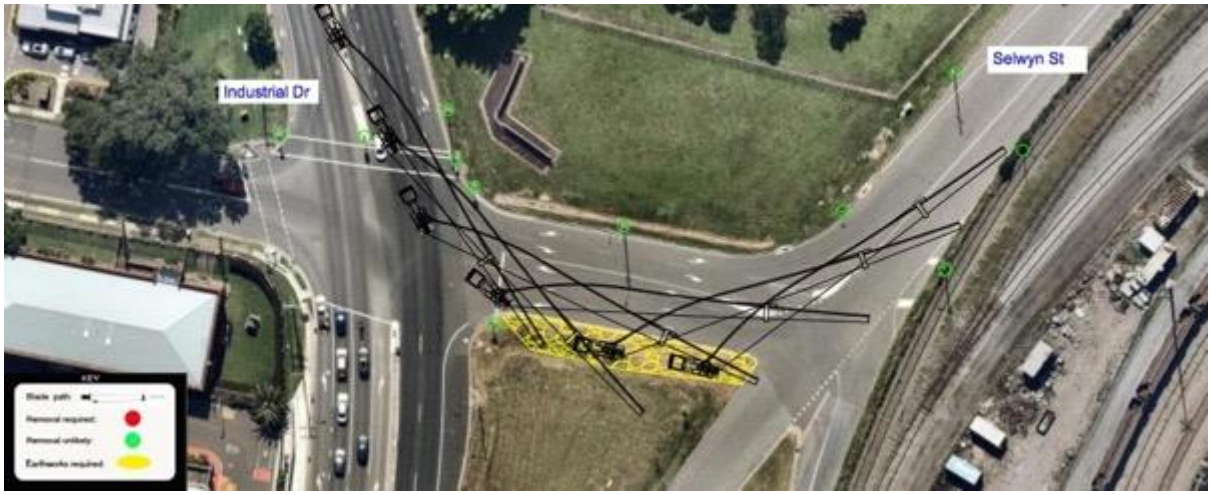
PROCEDURE: Right hand turn from Selwyn Street through George Street and onto Industrial Drive.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/brPRAckLr572

COMMENTS: The first right hand turn through George Street will need a sign made removable. Entering Industrial Drive, the loads will cross from the correct side to the correct side. The traffic signal in the centre median will need to be relocated. Some hardstand will need to be placed on the south side of the intersection. The traffic light to the south will likely be okay. A spotter would need to help the load through this intersection.

ROAD MODIFICATIONS: Yes, large amounts of works are required.

158 Metre rotor:



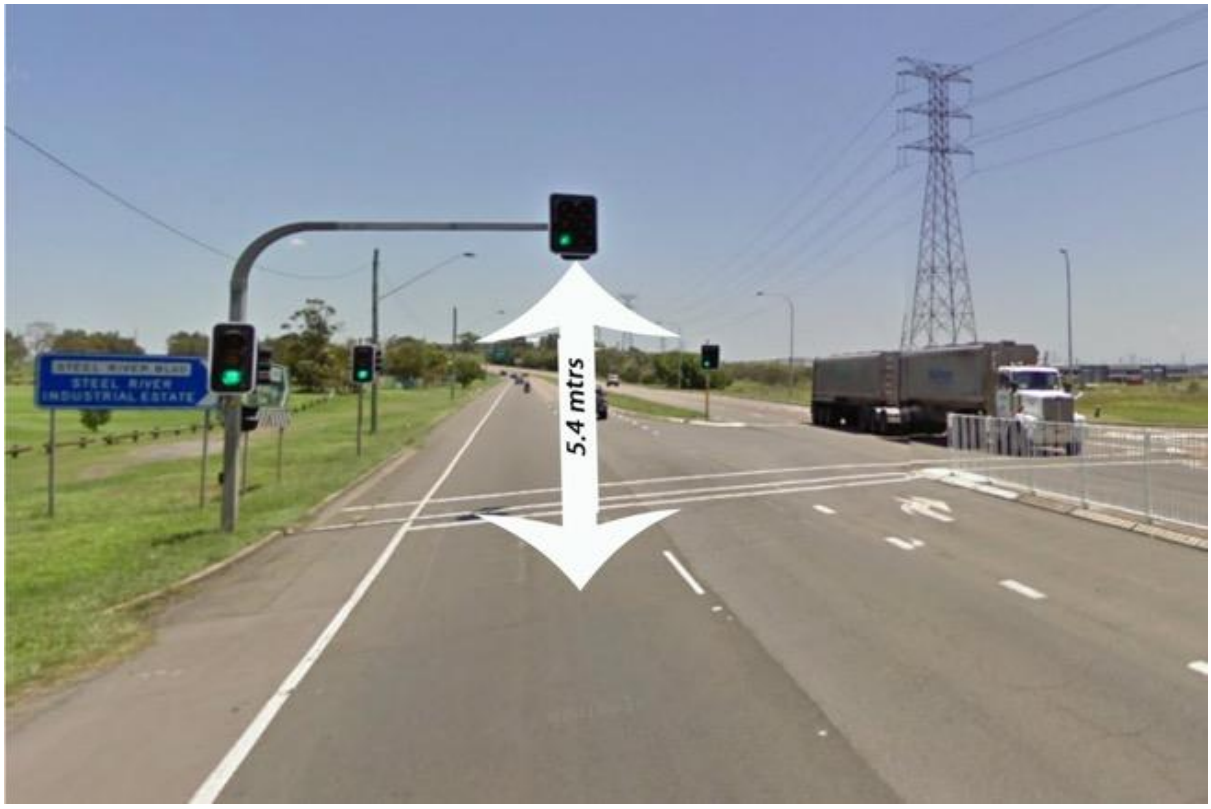
PROCEDURE: Right hand turn from Selwyn Street through George Street and onto Industrial Drive.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/brPRAckLr572

COMMENTS: Entering Industrial Drive the loads will cross from the correct side to the correct side. Some hardstand will need to be placed on the south side of the intersection. A spotter would need to help the load through this intersection.

ROAD MODIFICATIONS: Yes, moderate amounts of works are required.

4.9 Kms: Standard overhanging Traffic signals Mayfield to Hunter Expressway.



PROCEDURE: Overhanging signals while travelling through the intersection.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/5DpD3b7KnT72

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: Industrial Drive onto Maitland Road at Mayfield West. 170 Metre rotor:

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

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/Kn49dhWG2qG2

COMMENTS: The loads will need to cross to the incorrect side of the intersection, before crossing back over 200 metres to the north. The centre median strip will need to be modified so the trucks can cross over safely.

Spotter to keep the driver informed throughout the procedure.

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

ROAD MODIFICATIONS: Yes, moderate amounts of works are required.

158 Metre rotor:

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

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/Kn49dhWG2qG2

COMMENTS: The loads will need to cross to the incorrect side of the intersection, before crossing back over 200 metres to the north. The centre median strip will need to be modified so the trucks can cross over safely.

Spotter to keep the driver informed throughout the procedure.

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

ROAD MODIFICATIONS: Yes, moderate amounts of works are required.

13.9 Km's: Lowest structure (Bridge or Sign) between Mayfield and the Hunter Expressway.

Image 1:

PROCEDURE: Travel directly ahead in the centre lane.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/YTMoFe7Aick

COMMENTS: This is the lowest structure on route. There is no bypass around the gantry. A maximum loaded height of 5.8 metres should not be exceeded.

ROAD MODIFICATIONS: No works are required.

18.4 Km: Intersection of John Renshaw Drive and M1 at Beresfield.

170 Metre rotor and 158 Metre rotor:

PROCEDURE: Travel directly ahead in the centre lane.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/MYSBciVvcwB2

COMMENTS: The roundabout has been demolished. The new intersection has 2 lanes directly ahead with a width clearance of 9.0 metres.

ROAD MODIFICATIONS: No works are required.

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

170 Metre rotor:

170 Metre rotor:

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://goo.gl/maps/cEnuC5th1p52

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

ROAD MODIFICATIONS: No works required.

158 Metre rotor:

PROCEDURE: Travel around the roundabout and take the third exit onto the Hunter Expressway onramp.

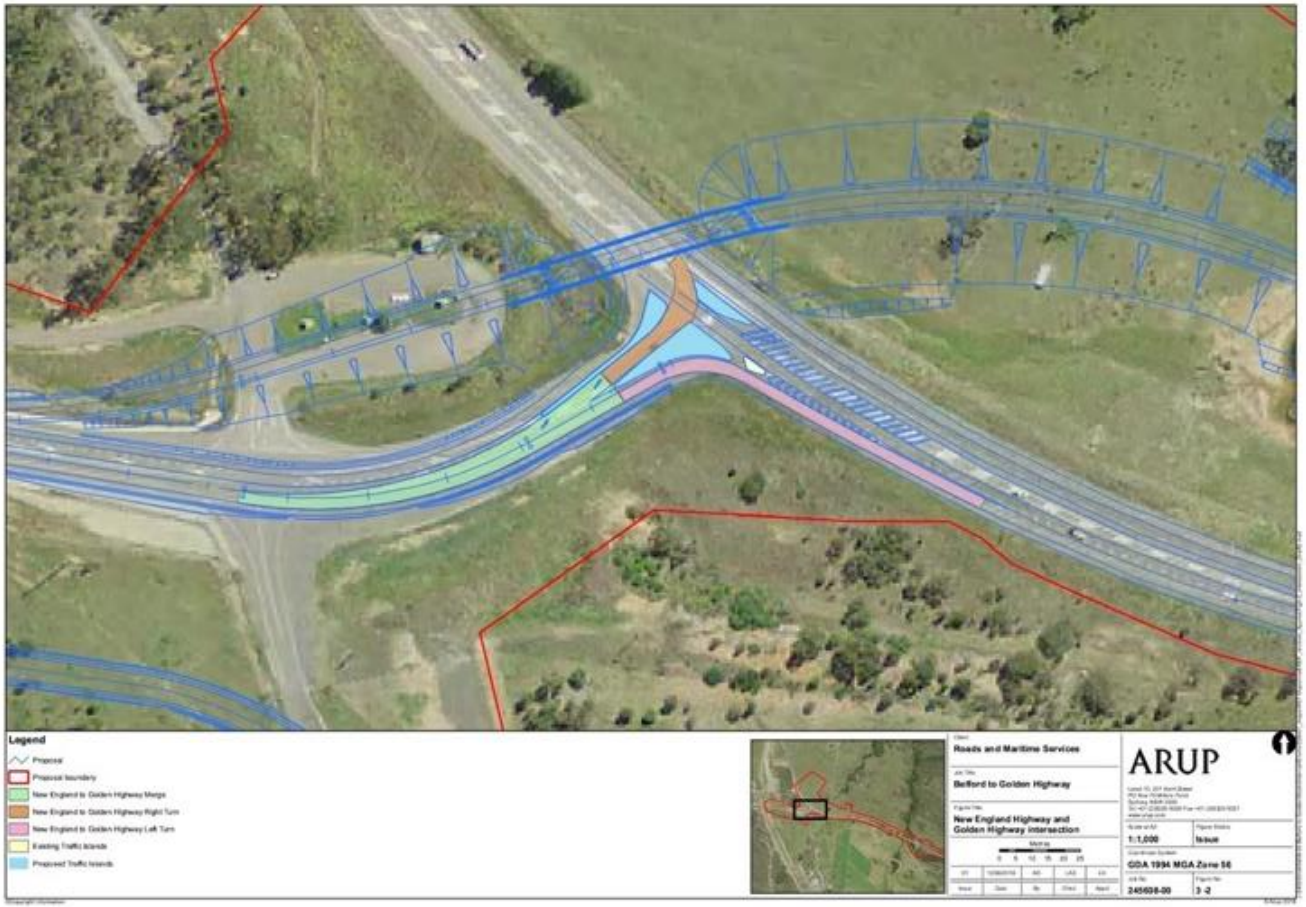
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/cEnuC5th1p52

COMMENTS: A sign will need to be made removable. Spotter to guide load through this pinch point.

ROAD MODIFICATIONS: No works required.

67.3 Km: New England Highway onto Golden Highway at Whittingham.

Image 1: Proposed upgrades



170 Metre rotor:

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

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/GZ3VbkLrKf42

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: NOTE: This intersection is currently in line to be upgraded. The details on image 1 shows that the changes should not affect the swept path, however it is recommended that this is monitored.

158 Metre rotor:

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

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/GZ3VbkLrKf42

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: NOTE: This intersection is currently in line to be upgraded. The details on image 1 shows that the changes should not affect the swept path, however it is recommended that this is monitored.

77.3 Km: Golden Highway intersection with Putty Road at Whittingham.

170 Metre rotor:

158 Metre rotor:

PROCEDURE: Left hand turn from the Golden Highway at the intersection of the Putty Road.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/esuS6TUUwQ92

COMMENTS: Loads to turn from the incorrect side to the incorrect side. Spotter 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.

80.8 Km: Golden Highway intersection with Putty Road at Mount Thorley.

170 Metre rotor:

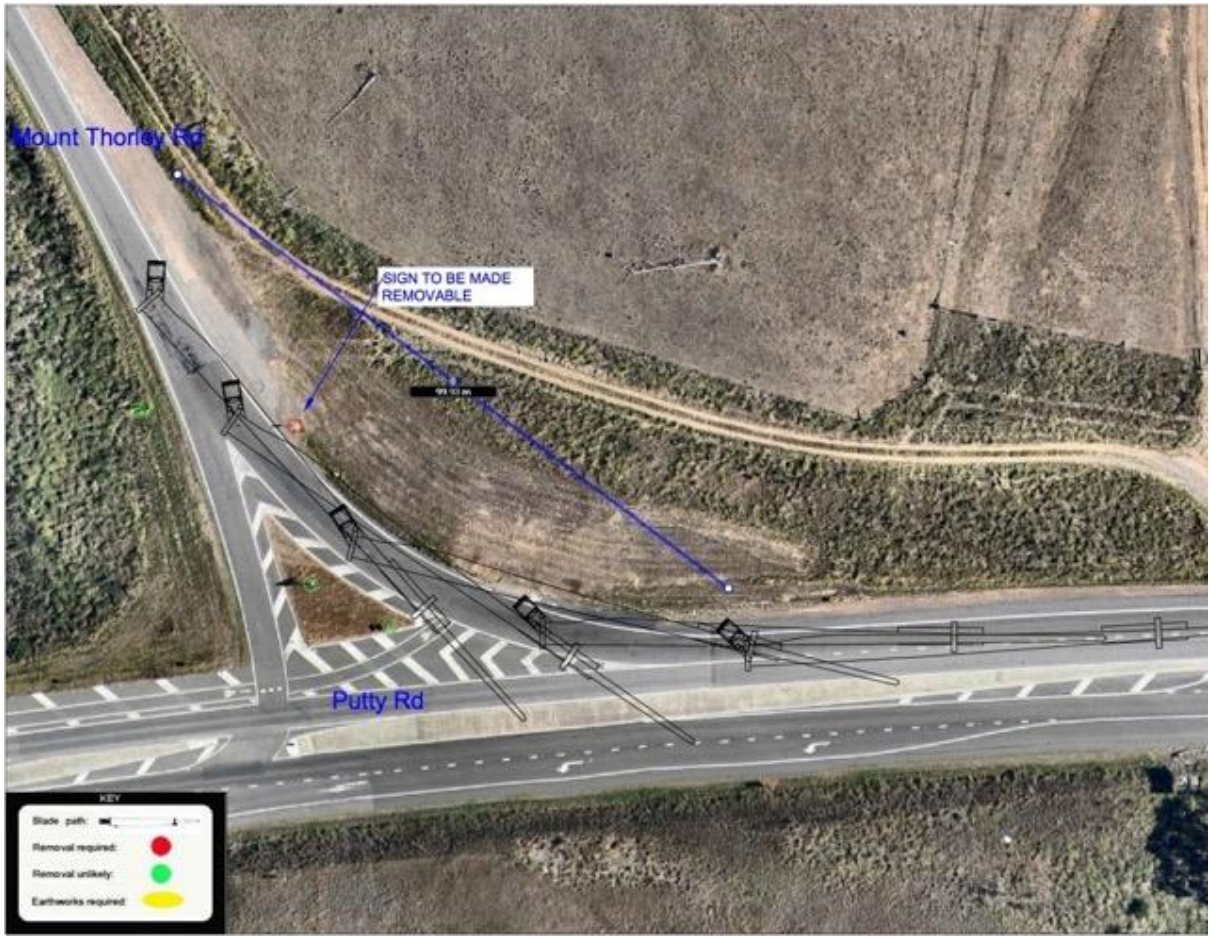
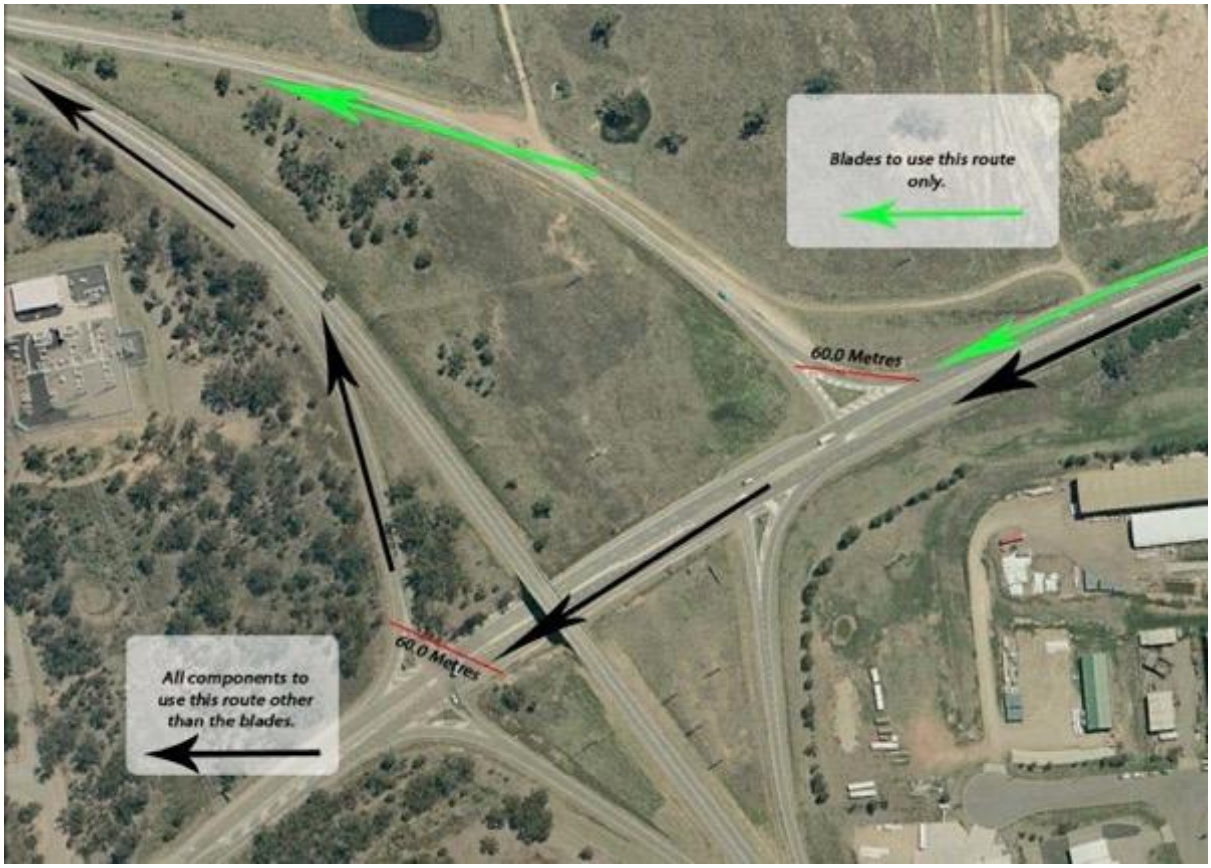


Image 2:



PROCEDURE: Right hand turn from the Putty Road onto the Golden Highway.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/Qj4tjSSjN932

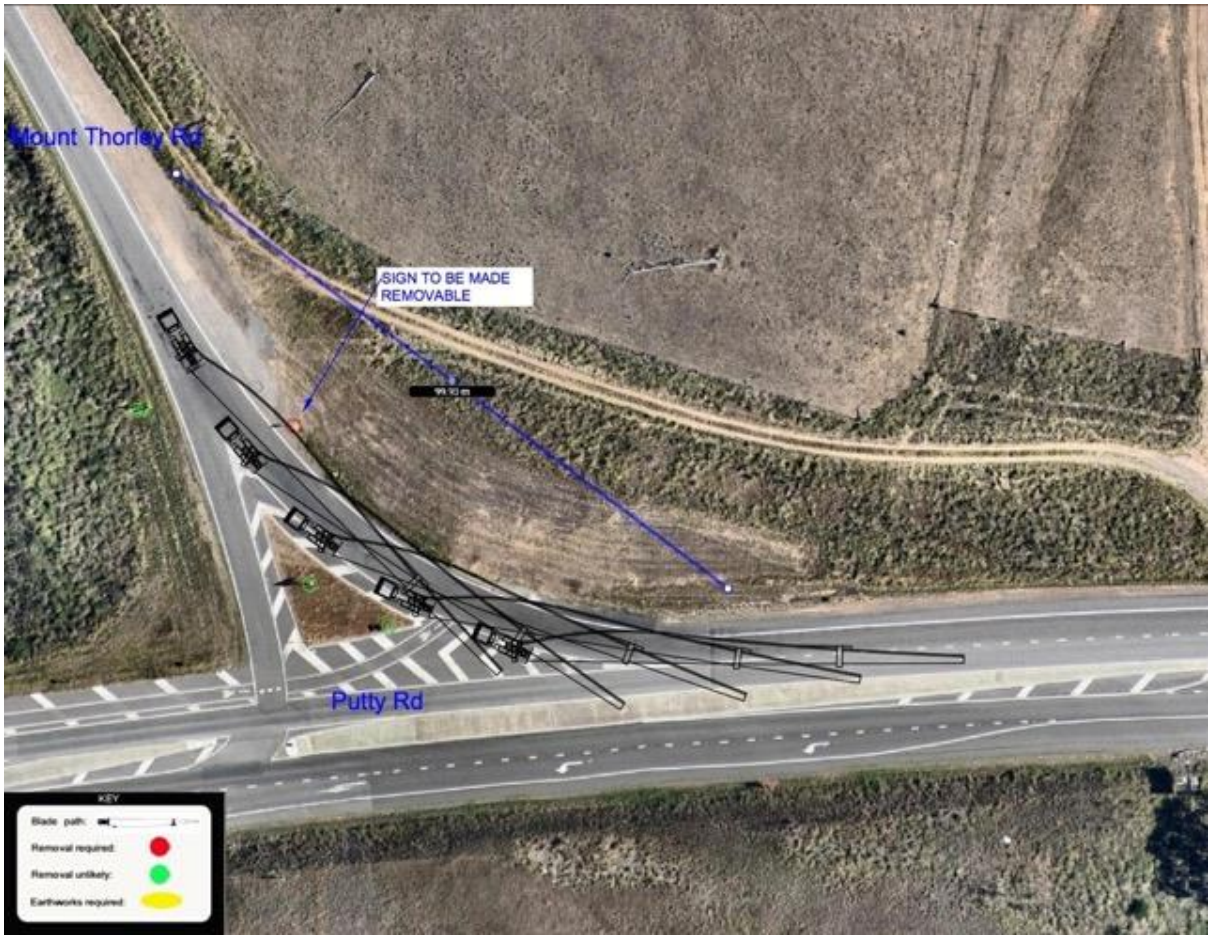
COMMENTS: Loads to turn from the incorrect side to the incorrect side. Blades to cross to the incorrect side prior to the intersection and return to the correct side when the lanes remerge. Spotter to keep the driver informed throughout the procedure.

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

NOTE: Towers and general loads will travel under the overpass and stay on the correct side of the road. The overpass is 5.6 in the center of the road. Loads that exceed 5.6 high will need to take the blade detour.

ROAD MODIFICATIONS: No works required.

158 Metre rotor



PROCEDURE: Right hand turn from the Putty Road onto the Golden Highway.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/Qj4tjSSjN932

COMMENTS: Loads to turn from the incorrect side to the incorrect side. Blades to cross to the incorrect side prior to the intersection and return to the correct side when the lanes remerge. Spotter to keep the driver informed throughout the procedure.

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

NOTE: Towers and general loads will travel under the overpass and stay on the correct side of the road. The overpass is 5.6 in the center of the road. Loads that exceed 5.6 high will need to take the blade detour.

ROAD MODIFICATIONS: No works required.

107.0 Km: Golden Highway through Jerrys Plains.
170 Metre rotor:

170 Metre rotor:

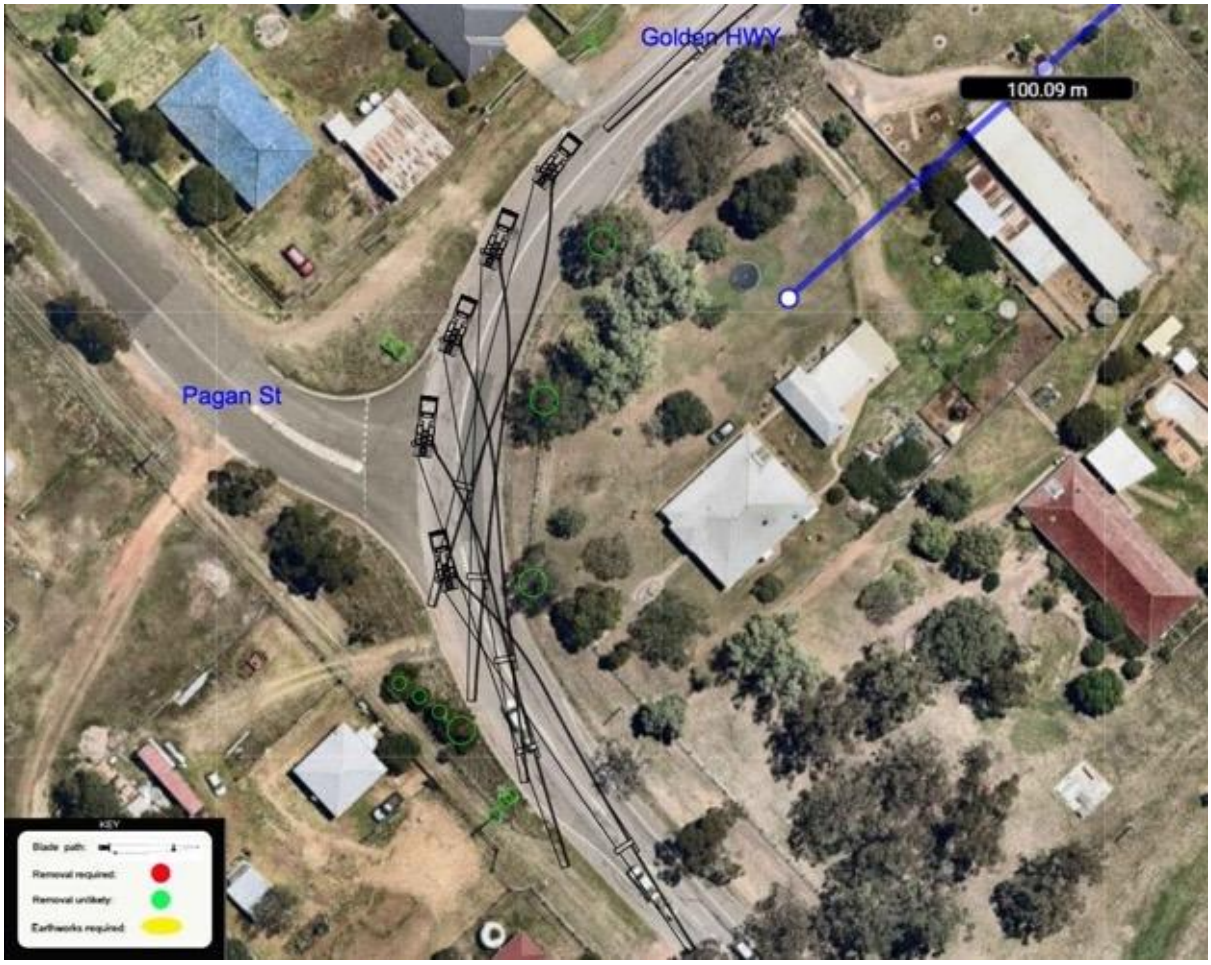
PROCEDURE: Right- and left-hand turn through the village.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/Ys3yKZ6vQs62

COMMENTS: Blades to cross from the incorrect side to the incorrect side. Some signs will need to be made removable and some hardstand added, additionally some trees will need to be trimmed/removed. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: Moderate amounts of work are required.

158 Metre rotor:



158 Metre rotor:

PROCEDURE: Right- and left-hand turn through the village.

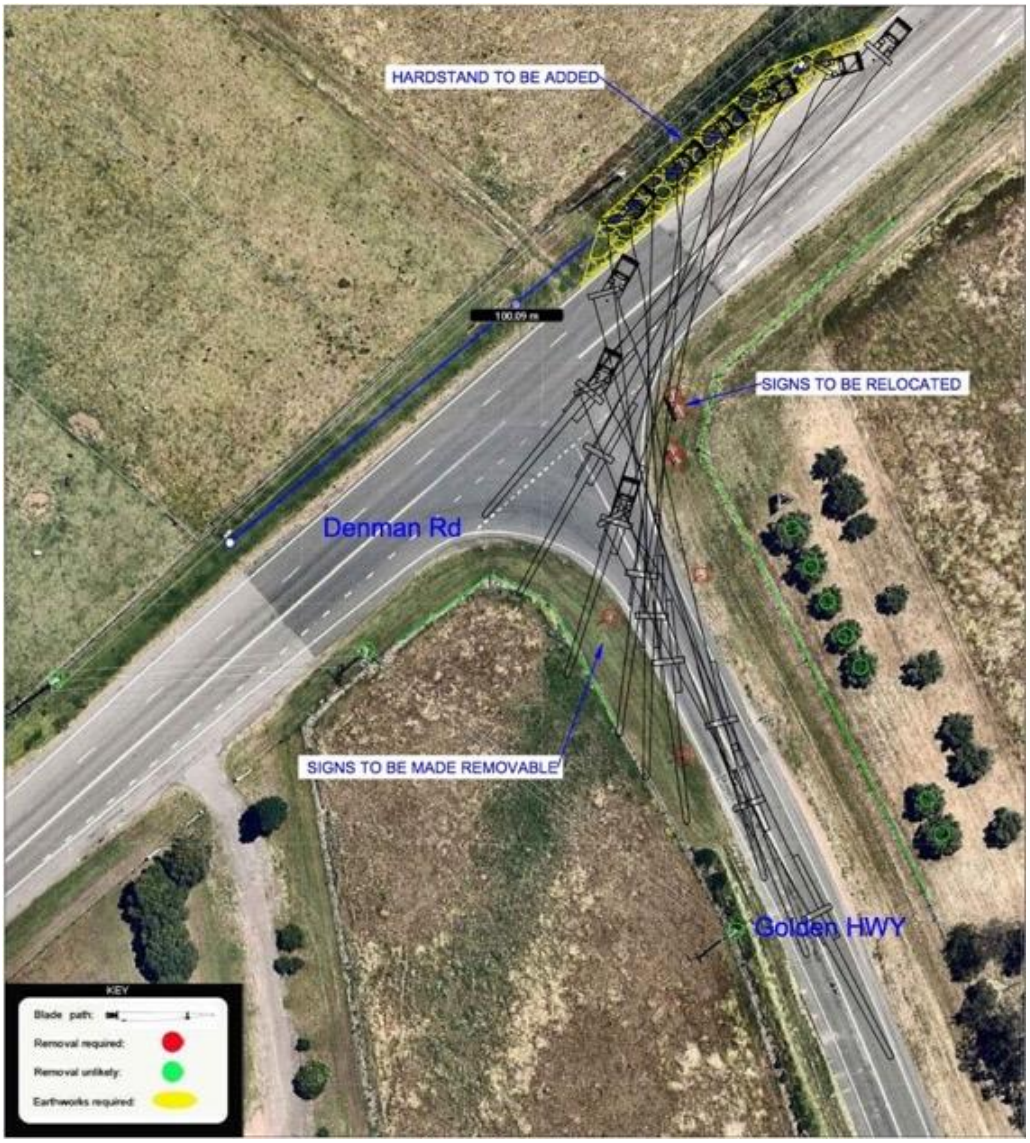
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/Ys3yKZ6vQs62

COMMENTS: Blades to cross from the incorrect side to the incorrect side. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: No works required.

141.9 Km: Golden Highway intersection with Denman Road at Denman.

170 Metre rotor:



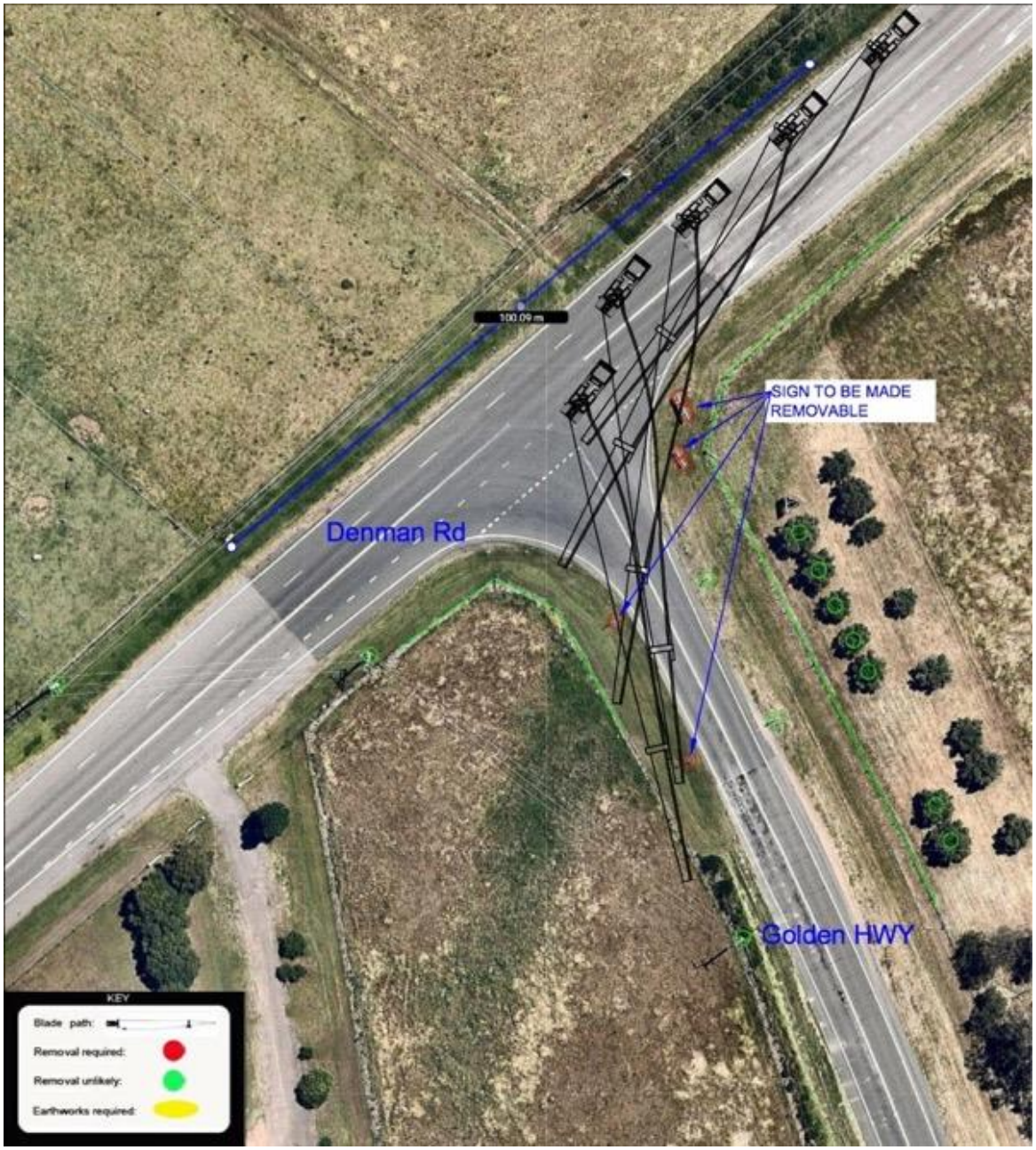
PROCEDURE: Right hand turn from the Golden Highway at the intersection of Denman Road.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/T4m46bBNuro

COMMENTS: Blades to cross from the correct side to the correct side. Some signs will need to be made removable and some hardstand added to the outside of both turns. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: Moderate amounts of work are required.

158 Metre rotor:



PROCEDURE: Right hand turn from the Golden Highway at the intersection of Denman Road.

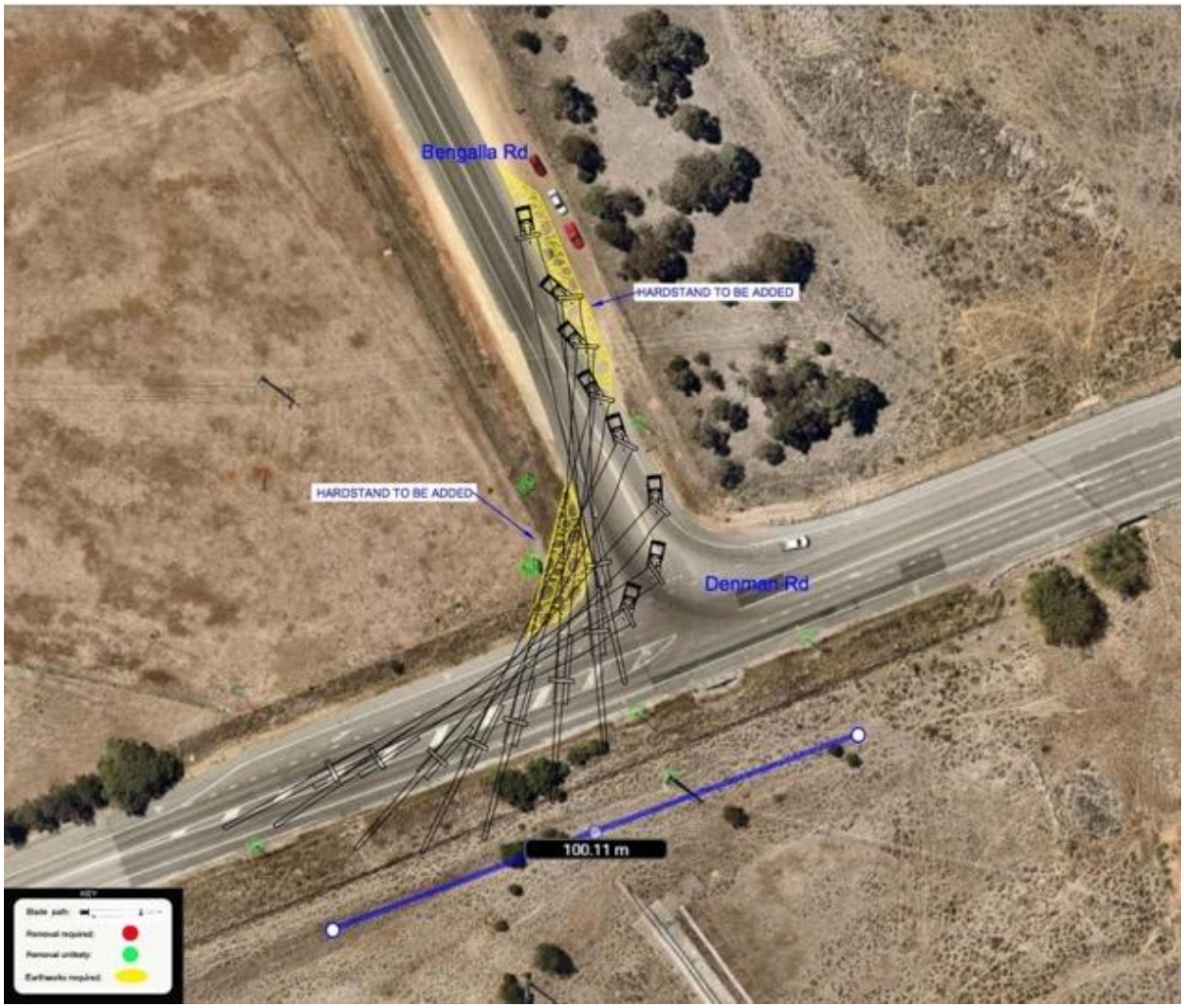
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/T4m46bBNuro

COMMENTS: Blades to cross 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: Small amounts of work are required.

149.0 Km: Denman Road onto Bengalla Road at Muswellbrook.

170 Metre rotor:



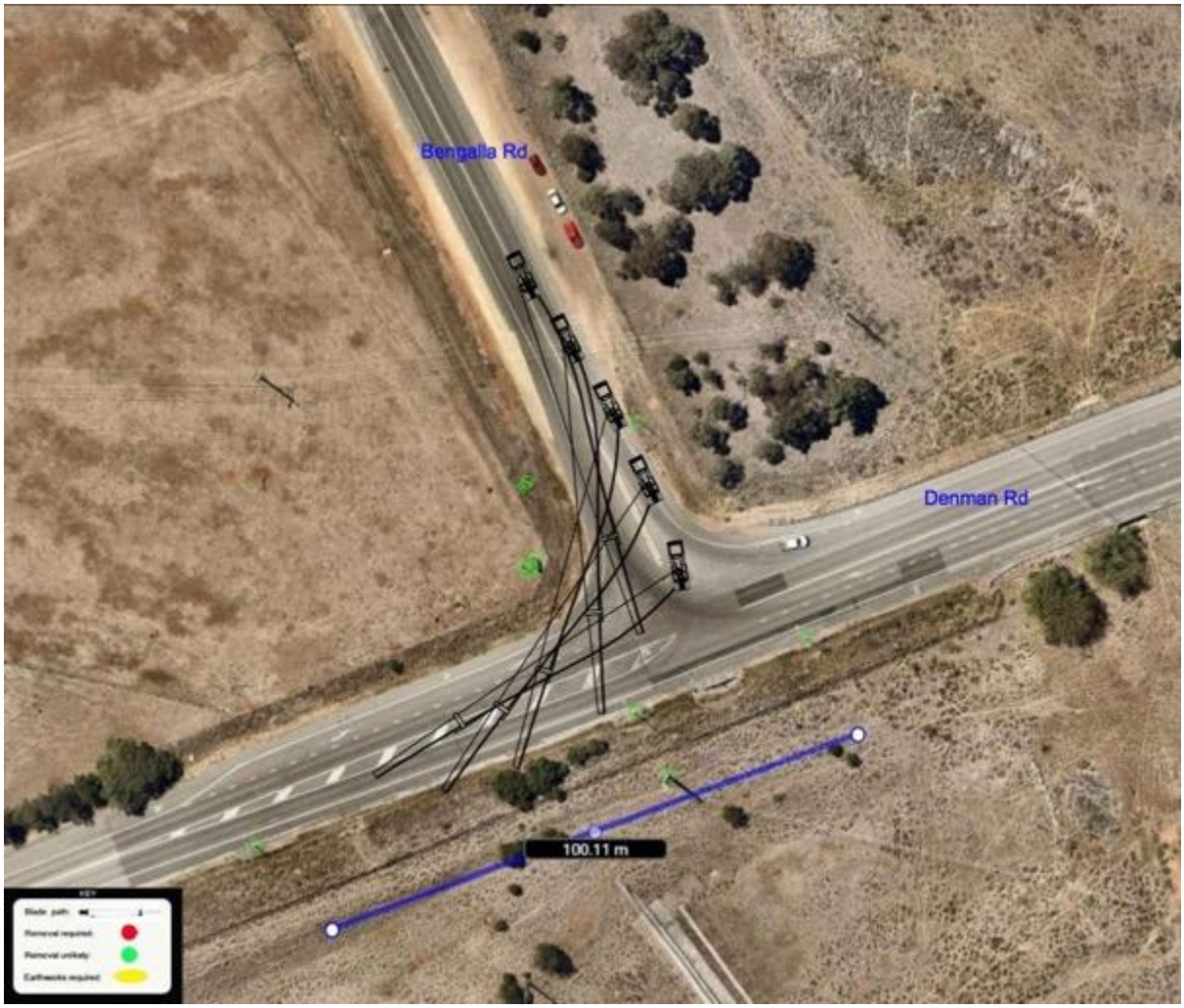
PROCEDURE: Left hand turn from Denman Road onto Bengalla Road.

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

COMMENTS: Blades to cross from the incorrect side to the incorrect side. Some signs will need to be 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: Moderate amounts of work are required.

158 Metre rotor:



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

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

COMMENTS: Blades to cross from the incorrect side to the incorrect side. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: No works required.

158.5 Km: Bengalla Road onto Wybong Road at Muswellbrook. 170 Metre rotor:

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

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

COMMENTS: Blades to cross 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: Small amounts of work are required.

158 Metre rotor:

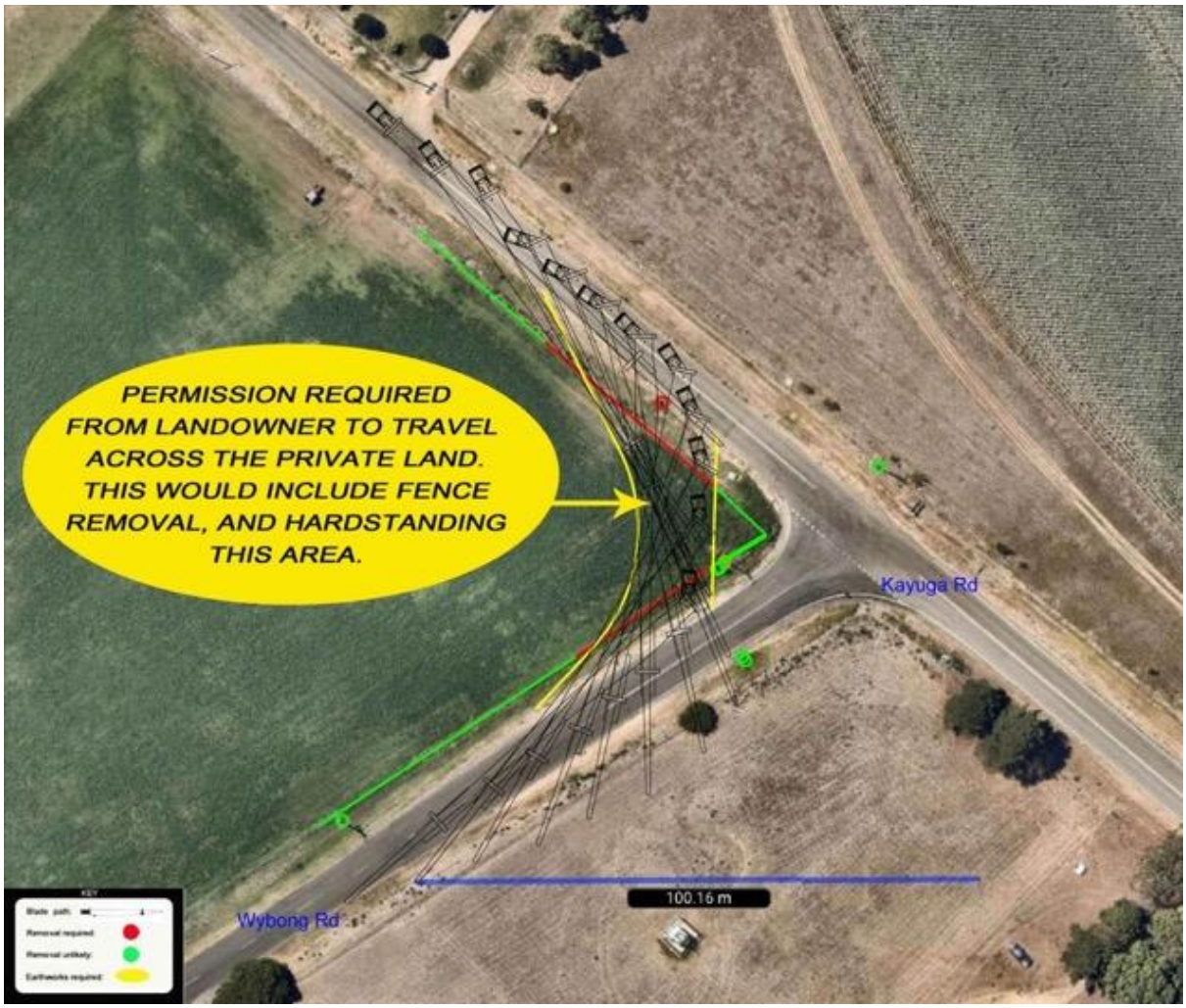
PROCEDURE: Right hand turn from Bengalla Road onto Wybong Road.

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

COMMENTS: Blades to cross 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: Small amounts of work are required.

168.1 Km: Wybong Road onto Kayuga Road at Muswellbrook.
170 Metre rotor:



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

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

COMMENTS: Blades to cross from the incorrect side to the incorrect side. Some signs will Permission will be required from the landowner to travel over the private land. This will require removal and realigning the fence and adding hardstand. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: Large amounts of work are required.

158 Metre rotor:

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

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

COMMENTS: Blades to cross from the incorrect side to the incorrect side. Some signs will Permission will be required from the landowner to travel over the private land. This will require removal and realigning the fence and adding hardstand. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: Large amounts of work are required.

174.0 Km: Ivermein Street onto Dartbrook access Road at Muswellbrook.

170 Metre rotor:

PROCEDURE: Right hand turn from Ivermein Street onto the Dartbrook mine access Road.

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

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

ROAD MODIFICATIONS: Moderate amounts of work are required.

158 Metre rotor:

PROCEDURE: Right hand turn from Ivermein Street onto the Dartbrook mine access Road.
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/ddMHa4CmXK32
COMMENTS: Blades 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. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: Moderate amounts of work are required.

174.8 Km: Dartbrook access Road at Muswellbrook.
170 Metre rotor:

PROCEDURE: Right hand turn on the Dartbrook mine access Road.

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

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 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: Moderate amounts of work are required.

158 Metre rotor:

PROCEDURE: Right hand turn on the Dartbrook mine access Road.

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

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 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: Small amounts of work are required.

177.0 Km: Dartbrook access Road onto the New England Highway at Muswellbrook.

170 Metre rotor:

PROCEDURE: Left hand turn from the Dartbrook mine access Road onto the New England Highway.

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

COMMENTS: Blades to cross from the incorrect side to the incorrect side. Some signs will need to be made removable on the corner and some hardstand added. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: Moderate amounts of work are required.

158 Metre rotor:

PROCEDURE: Left hand turn from the Dartbrook mine access Road onto the New England Highway.

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

COMMENTS: Blades to cross from the incorrect side to the incorrect side. Some signs will need to be made removable on the corner and some hardstand added. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: Moderate amounts of work are required.

276.0 Km: New England Highway onto Lindsay's Gap Road at Wallabadah.

170 Metre rotor:

PROCEDURE: Right hand turn from the New England Highway onto Lindsay's Gap Road.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/ePbYctjJootkBZiM9

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 made removable and some hardstand added to the inside of the corner.

ROAD MODIFICATIONS: Moderate amounts of work are required.

158 Metre rotor:

PROCEDURE: Right hand turn from the New England Highway onto Lindsay's Gap Road.
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/ePbYctjJootkBZiM9
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 made removable.
ROAD MODIFICATIONS: Small amounts of work are required.

287.7 Km: Lindsay's Gap Road over Goonoo Goonoo Creek at Garoo.

Image 1:

PROCEDURE: Travel directly ahead in the centre of the bridge.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/9ELSk5ZLRWnf14tm7

COMMENTS: Loads that are been carried on trailers with an axle width exceeding 3.5 meters will need to take an alternate route via Tamworth, or the bridge will need to be widened. The blades will travel across this structure in its original form.

ROAD MODIFICATIONS: Bridge will need to be assessed for axle loadings.

306.8 Km: Lindsay's Gap Road onto Nundle Road at Nundle.
170 Metre rotor:

PROCEDURE: Right hand turn from Lindsay's Gap Road onto Nundle Road.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/FX4ZRx2YG9i2BsXMA

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 made removable and some hardstand added to the inside of the corner. A power pole will also need to be relocated.

ROAD MODIFICATIONS: Large amounts of work are required.

158 Metre rotor:

PROCEDURE: Right hand turn from Lindsay's Gap Road onto Nundle Road.
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/FX4ZRx2YG9i2BsXMA
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 made removable.
ROAD MODIFICATIONS: Small amounts of work are required.

311.0 Km: Oakenville Street at Nundle.

170 Metre rotor and 158 Metre rotor:

PROCEDURE: Travel directly ahead on Oakenville Street.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/7YM56hQq8bnCSoZy8

COMMENTS: Blades to travel directly ahead on the correct side of the road. A no parking exclusion zone will need to be placed on the left-hand side while travelling through this intersection. Two signs will also need to be made removable.

ROAD MODIFICATIONS: Small amounts of work are required.

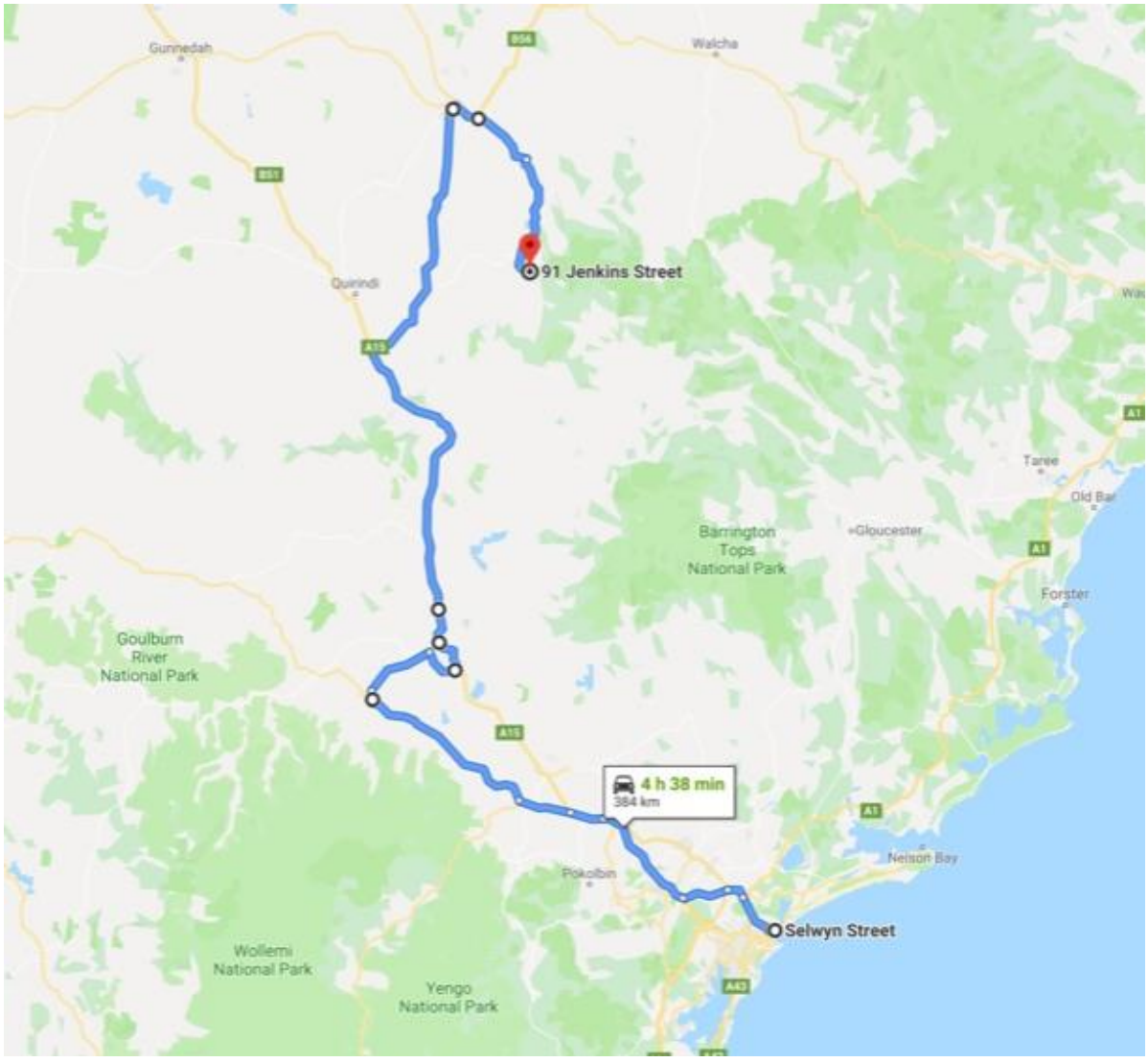
NOTE: From this point on the report will show 2 Options either to the South or North of the project.

11.0 Route Survey: (Main route) – Newcastle port to Nundle for Towers.

Distance: (384.0 Km).

Via: Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Golden Highway, Denman Road, Thomas Mitchell Drive, New England Highway (Muswellbrook bypass via Bell Street, Victoria Street, Market Street), New England Highway, (Tamworth bypass via Scott Street, Marius Street), New England Highway, Nundle Road, Crosby Street, Oakenville Street.

GPS Link: https://goo.gl/maps/57BVbQXqjX9hBwbc6



KEY	
MODIFICATIONS REQUIRED	
MINOR WORKS OR CAUTION	
PARKING	

Route Survey: (Main route) – Newcastle port to Nundle for Towers.

Km index	Location	Section of road	Critical Measurement	Procedure	Notes
0.0	Mayfield	Mayfield #4 berth onto Selwyn Street GPS link: https://goo.gl/maps/afLwPYKuNdm	Clearance: 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 GPS link: https://goo.gl/maps/AmohE54hKSz	Clearance: 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 GPS link: https://goo.gl/maps/qXeHvBtCp4D2	Clearance: 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://goo.gl/maps/s4ayrsuoAsD2	Clearance: Length: 70.0 metres Width: 8.0 metres	Moderate right hand turn	No problems with this section of road.
4.9	Mayfield	Industrial Drive under traffic signals GPS link: https://goo.gl/maps/YmqhiS2iR582	Clearance: 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 GPS link: https://goo.gl/maps/Kn49dhWG2qG2	Clearance: Length: 50.0 metres Width: 10.0 metres	Right hand turn	No problems with this section of road.
13.9	Hexham	New England Highway under gantry GPS link: https://goo.gl/maps/YTMoFe7Aick	Clearance: Height: 5.95 Metres	Travel directly ahead	This is the lowest structure on route. There is no bypass around the gantry. A maximum loaded height of 5.8 metres should not be exceeded.
17.4	Tarro	New England Highway onto John Renshaw Drive GPS link: https://goo.gl/maps/SRDr5JigkBp	Clearance: Width: 12.0 metres	Left hand merge	No problems with this section of road.
18.4	Beresfield	John Renshaw Drive GPS link: https://goo.gl/maps/N19vJih1Fgr	Clearance: Width: 9.0 metres Height: 5.9 metres	Travel directly ahead	No problems with this section of road.
28.7	Buchanan	John Renshaw Drive onto the Hunter Expressway GPS link: https://goo.gl/maps/1STJ1PfQt9E2	Clearance: Length: 65.0 metres Width: 7.0 metres	Right hand turn	No problems with this section of road.

Route Survey: (Main route) – Newcastle port to Nundle for Towers.					
Km index	**Location**	**Section of road**	**Critical Measurement**	**Procedure**	**Notes**
58.9	Branxton	The Hunter Expressway onto The New England Highway GPS link: https://goo.gl/maps/7rauNuxzqjq	Clearance: 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 GPS link: https://goo.gl/maps/nAnfkYfeUn42	Clearance: Width: 12.0 metres	Left Hand turn	No problems with this section of road.
67.4	Whittingham	Golden Highway GPS link: https://goo.gl/maps/R86RFuPnmFU2	Clearance: 115.0 x 9.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
77.3	Whittingham	Golden Highway intersection with the Putty Road GPS link: https://goo.gl/maps/7hQdEmK1EgE2	Clearance: Length: 85.0 metres Width: 12.0 metres	Left hand turn	No problems with this section of road.
77.4	Mount Thorley	Golden Highway GPS link: https://goo.gl/maps/zGvdupDuixx	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. GPS link: https://goo.gl/maps/VyA42n1CqZx	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 GPS link: https://goo.gl/maps/Y6V6EXaCwxq	Clearance: 100.0 x 8.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
107.0	Jerrys Plains	Golden Highway through Jerrys Plains village GPS link: https://goo.gl/maps/WgSCRsJ9ZGt	Clearance: Length: 70.0 metres Width: 9.0 metres	Dogleg	No problems with this section of road.
126.0	Ogilvy	Golden Highway GPS link: https://goo.gl/maps/58Tj9ojs7CC2	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 GPS link: https://goo.gl/maps/sf4PNnycxB32	Clearance: Length: 60.0 metres Width: 10.0 metres	Right hand turn	No problems with this section of road.

Route Survey: (Main route) – Newcastle port to Nundle for Towers.

Km index	Location	Section of road	Critical Measurement	Procedure	Notes
150.0	Muswellbrook	Denman Road onto Thomas Mitchell Drive GPS link: https://goo.gl/maps/XxZcg2MKqAgURuGu8	Clearance: Length: 65.0 metres Width: 12.0 metres	Right hand turn	No problems with this section of road.
160.6	Muswellbrook	Thomas Mitchell onto New England Highway GPS link: https://goo.gl/maps/3SyWufXF3gXqxaAt5	Clearance: Length: 70.0 metres Width: 10.0 metres	Left hand turn	No problems with this section of road.
169.5	Muswellbrook	New England Highway onto Bell Street GPS link: https://goo.gl/maps/H94bMYQMeSHay7918	Clearance: Length: 40.0 metres Width: 6.0 metres	Right hand turn	No problems with this section of road.
170.0	Muswellbrook	Bell Street onto Victoria Street GPS link: https://goo.gl/maps/aHhW27teZy9y3WNq9	Clearance: Length: 40.0 metres Width: 7.0 metres	Left hand corners	Tight left-hand bend over a rail bridge before another tight left-hand bend. Spotter to guide loads through this section of road, and approval from rail required to cross this structure.
170.5	Muswellbrook	Victoria Street onto Market Street GPS link: https://goo.gl/maps/pyiTUH25bANG3m9n9	Clearance: Width: 7.0 metres	Travel directly ahead	No problems with this section of road.
171.0	Muswellbrook	Market Street onto New England Highway GPS link: https://goo.gl/maps/3kpU6XdCBmCW75gM7	Clearance: Length: 30.0 metres Width: 7.0 metres	Right hand turn at roundabout	Loads may need to cross to the incorrect side of the roundabout if they exceed 30.0 meters in length, and do not exceed 42 meters in length.
197.0	Scone	Rail crossing over the New England GPS link: https://goo.gl/maps/hQfQRRrmx5n	Clearance: Width: 7.0 metres	Drive directly ahead	Rail approval to be carried in vehicles that require this clearance. Likely to cross with caution, no escort required.
243.8	Murrurundi	New England highway (Township) GPS link: https://goo.gl/maps/Sj3ixAkhujt	Clearance: 60.0 x 5.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
248.4	Murrurundi Hill	New England highway Nowlands Gap GPS link: https://goo.gl/maps/R5yufobPeMG2	Clearance: 120.0 x 12.0 metres	Parking Bay (small)	Emergency parking only.
254.3	Willow Tree	New England highway GPS link: https://goo.gl/maps/XLTq7CRV7EU2	Clearance: 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. We have engineered documentation showing correct weights for all loads.
260.9	Willow Tree Township	New England highway GPS link: https://goo.gl/maps/gw38qmvVfTC2	Clearance: 60.0 x 5.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
262.5	Willow Tree Truck Stop N	New England highway GPS link: https://goo.gl/maps/RRdPVHupGCs	Clearance: 120.0 x 12.0 metres	Parking Bay (small)	Suitable parking for Fatigue breaks for small loads only.

Route Survey: (Main route) – Newcastle port to Nundle for Towers.					
Km index	**Location**	**Section of road**	**Critical Measurement**	**Procedure**	**Notes**
272.0	Wallabadah	New England highway GPS link: https://goo.gl/maps/QWCyeHQSohS2	Clearance: 80.0 x 5.0 metres	Parking Bay (side of road)	Suitable parking for Fatigue breaks.
277.8	Goono Goono	New England highway GPS link: https://goo.gl/maps/im4QhUfW24D2	Clearance: 80.0 x 10.0 metres	Parking Bay	Emergency parking only. Incorrect side of the road
322.0	Tamworth	Standard roundabout on the New England GPS link: https://goo.gl/maps/3J9dCHxtYim	Clearance: Length: 60.0 metres Width: 6.0 metres	Drive directly ahead	The worst of the roundabouts have 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. Same for both blade types.
324.0	Tamworth	New England Highway onto the heavy vehicle bypass at Scott Road. GPS link: https://goo.gl/maps/BXdwaSiLSBw	Clearance: Length: 30.0 metres Width: 6.0 metres	Right hand turn	Loads over 30 metres in length will need to cross to the incorrect side of the roundabout.
325.7	Tamworth	Scott Road onto Murray Street GPS link: https://goo.gl/maps/nix2oREeh6H2	Clearance: Length: 60.0 metres Width: 6.0 metres	Drive directly ahead	No problems with this section of road.
326.0	Tamworth	Murray Street onto New England Highway GPS link: https://goo.gl/maps/45dffqHmUcs	Clearance: Length: 30.0 metres Width: 6.0 metres	Right hand turn	Loads over 30 metres in length will need to cross to the incorrect side of the roundabout.
331.6	East Tamworth	New England highway GPS link: https://goo.gl/maps/9cpBrT5qUAU2	Clearance: 120.0 x 6.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
333.0	Nemingha	New England Highway onto Nundle Road GPS link: https://goo.gl/maps/n5nUVXbqmUAv6CrC8	Clearance: Length: 60.0 metres Width: 8.0 metres	Right hand turn	No problems with this section of road.
350.8	Dungowan	Nundle Road intersection of Ogunbil Road GPS link: https://goo.gl/maps/PfmatRhEGy86fHsf9	Clearance: Length: 30.0 metres Width: 6.0 metres	Right hand turn	Loads over 30 metres in length will need to cross to the incorrect side of the roundabout.
372.5	Bowling Alley Point	Nundle Road intersection of River Road GPS link: https://goo.gl/maps/ALafPGfVZcuicLVz5	Clearance: Length: 40.0 metres Width: 6.0 metres	Right hand turn	No problems with this section of road.
383.2	Nundle	Nundle Road onto Crosby Street GPS link: https://goo.gl/maps/uVvcN9QkPyTDP1YR6	Clearance: Width: 8.0 metres	Travel directly ahead	No problems with this section of road.
383.5	Nundle	Crosby Street onto Oakenville Street GPS link: https://goo.gl/maps/aZNDKURdSBERedMr9	Clearance: Width: 8.0 metres	Travel directly ahead	No problems with this section of road.

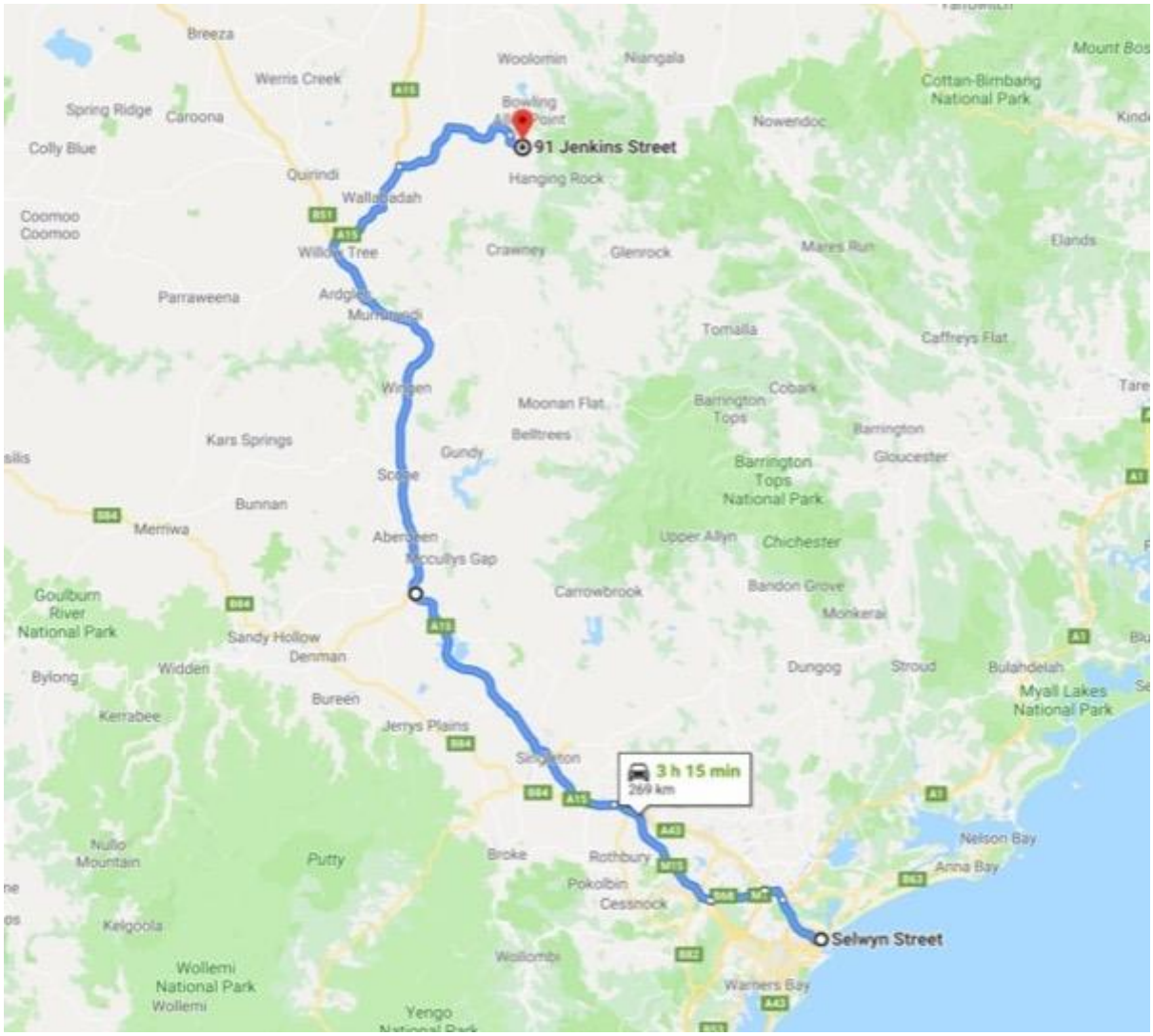
Route Survey: (Main route) – Newcastle port to Nundle for Towers.					
Km index	**Location**	**Section of road**	**Critical Measurement**	**Procedure**	**Notes**
384.0	Nundle	Oakenville Street and Jenkins Street intersection GPS link: https://goo.gl/maps/7YM56hQq8bnCSoZy8	Clearance: Width: 5.0 metres		From this point the routes will either travel directly ahead or turn to the right, depending on which options are used.

12.0 Route Survey: (Main route) – Newcastle port to Nundle for remaining components.

Distance: (269.0 Km).

Via: Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, (Muswellbrook bypass via Bell Street, Victoria Street, Market Street), New England Highway, Lindsay's Gap Road, Nundle Road, Crosby Street, Oakenville Street, Jenkins Street.

GPS Link: https://goo.gl/maps/ycTCnsatB4v3Bnvr6



KEY	
MODIFICATIONS REQUIRED	
MINOR WORKS OR CAUTION	
PARKING	

Route Survey: (Main route) – Newcastle port to Nundle for remaining components.

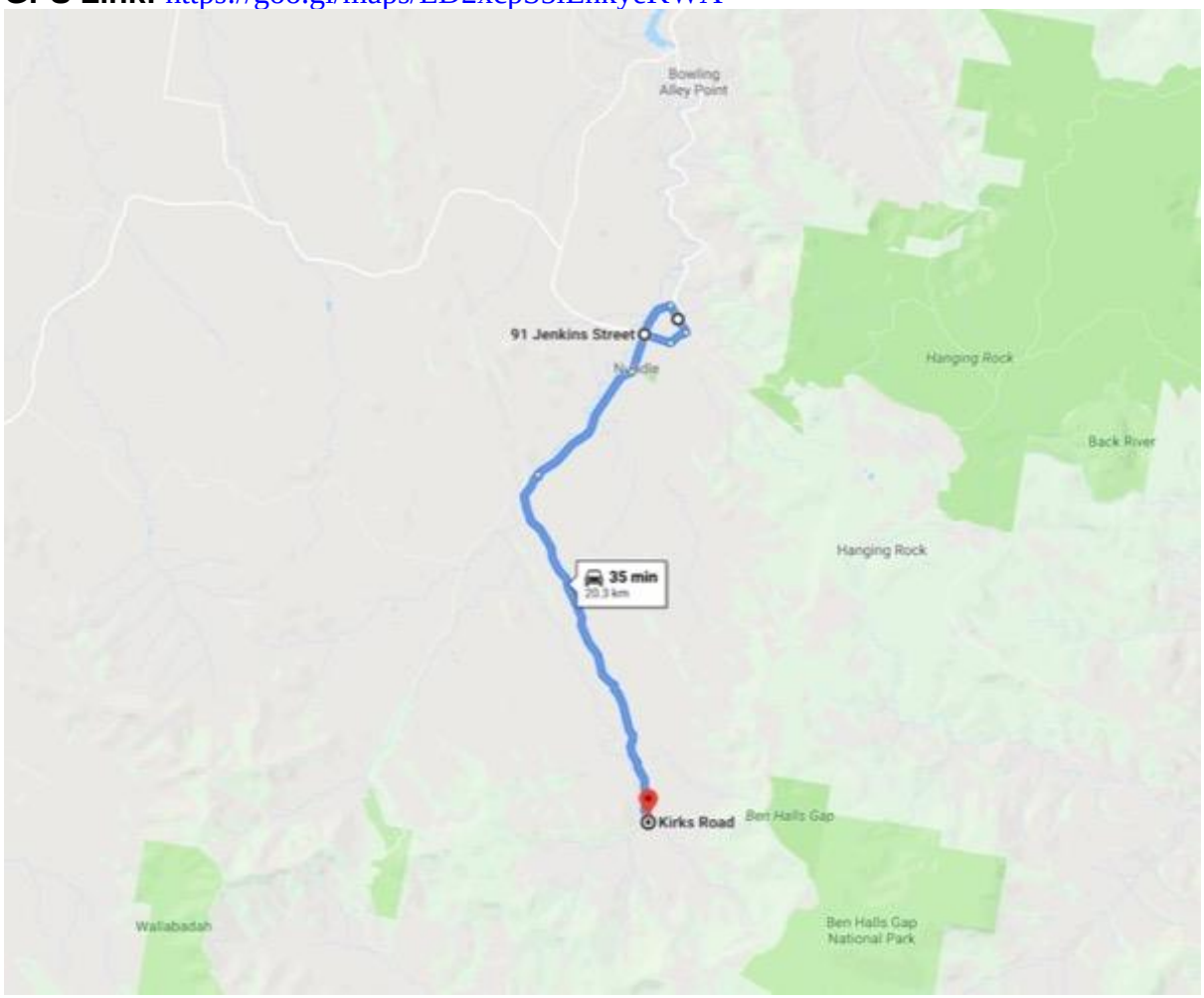
Km index	Location	Section of road	Critical Measurement	Procedure	Notes
0.0	Mayfield	Mayfield #4 berth onto Selwyn Street GPS link: https://goo.gl/maps/afLwPYKuNdm	Clearance: Length: 70.0 metres Width: 8.0 metres	Right hand turn	No problems with this section of road.
0.4	Mayfield	Selwyn Street rail crossing GPS link: https://goo.gl/maps/AmohE54hKSz	Clearance: 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 GPS link: https://goo.gl/maps/gXeHvBtCp4D2	Clearance: 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://goo.gl/maps/s4ayrsuoAsD2	Clearance: Length: 70.0 metres Width: 8.0 metres	Moderate right hand turn	No problems with this section of road.
4.9	Mayfield	Industrial Drive under traffic signals GPS link: https://goo.gl/maps/YmqhiS2iR582	Clearance: 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 GPS link: https://goo.gl/maps/Kn49dhWG2qG2	Clearance: Length: 50.0 metres Width: 10.0 metres	Right hand turn	No problems with this section of road.
13.9	Hexham	New England Highway under gantry GPS link: https://goo.gl/maps/YTMoFe7Aick	Clearance: Height: 5.95 Metres	Travel directly ahead	This is the lowest structure on route. There is no bypass around the gantry. A maximum loaded height of 5.8 metres should not be exceeded.
17.4	Tarro	New England Highway onto John Renshaw Drive GPS link: https://goo.gl/maps/SRDr5JiqkBp	Clearance: Width: 12.0 metres	Left hand merge	No problems with this section of road.
18.4	Beresfield	John Renshaw Drive GPS link: https://goo.gl/maps/N19vJih1Fgr	Clearance: Width: 9.0 metres Height: 5.9 metres	Travel directly ahead	No problems with this section of road.
28.7	Buchanan	John Renshaw Drive onto the Hunter Expressway GPS link: https://goo.gl/maps/1STJ1PfQt9E2	Clearance: Length: 65.0 metres Width: 7.0 metres	Right hand turn	No problems with this section of road.
58.9	Branxton	The Hunter Expressway onto The New England Highway GPS link: https://goo.gl/maps/7rauNuxzqjq	Clearance: Width: 9.0 metres	Travel directly ahead	No problems with this section of road.

Route Survey: (Main route) – Newcastle port to Nundle for remaining components.					
Km index	**Location**	**Section of road**	**Critical Measurement**	**Procedure**	**Notes**
80.3	Singleton	The New England Highway through Gowrie Gates rail overpass GPS link: https://goo.gl/maps/GSbCNH4S5XpPX316A	Clearance: Width: 10.0 metres Height: 5.7 metres	Travel directly ahead	Loads that exceed 5.6 metres in height are to detour this bridge via the Golden Highway.
83.0	Rixs Creek	New England Highway GPS link: https://goo.gl/maps/z4X45LYKppXxcjCo8	Clearance: 80.0 x 6.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
109.0	Liddell	The New England Highway under Liddell Power station access Road GPS link: https://goo.gl/maps/dhXHcoXXFQHb2gGX8	Clearance: Width: 10.0 metres Height: 5.7 metres	Travel directly ahead	Loads that exceed 5.3 metres in height are to detour this bridge via the Golden Highway. Loads that exceed 5.0 metres in height and under 5.3 metres in height are to travel under this structure in the far-right lane.
125.0	Muswellbrook	New England Highway onto Bell Street GPS link: https://goo.gl/maps/H94bMYQMeSHay7918	Clearance: Length: 40.0 metres Width: 6.0 metres	Right hand turn	No problems with this section of road.
125.5	Muswellbrook	Bell Street onto Victoria Street GPS link: https://goo.gl/maps/aHhW27teZy9y3WNq9	Clearance: Length: 40.0 metres Width: 7.0 metres	Left hand corners	Tight left-hand bend over a rail bridge before another tight left-hand bend. Spotter to guide loads through this section of road, and approval from rail required to cross this structure.
126.0	Muswellbrook	Victoria Street onto Market Street GPS link: https://goo.gl/maps/pyiTUH25bANG3m9n9	Clearance: Width: 7.0 metres	Travel directly ahead	No problems with this section of road.
126.5	Muswellbrook	Market Street onto New England Highway GPS link: https://goo.gl/maps/3kpU6XdCBmCW75gM7	Clearance: Length: 30.0 metres Width: 7.0 metres	Right hand turn at roundabout	Loads may need to cross to the incorrect side of the roundabout if they exceed 30.0 meters in length, and do not exceed 42 meters in length.
152.5	Scone	Rail crossing over the New England GPS link: https://goo.gl/maps/hQfQRRrmx5n	Clearance: Width: 7.0 metres	Drive directly ahead	Rail approval to be carried in vehicles that require this clearance. Likely to cross with caution, no escort required.
199.3	Murrurundi	New England highway (Township) GPS link: https://goo.gl/maps/Sj3ixAkhujt	Clearance: 60.0 x 5.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
203.9	Murrurundi Hill	New England highway Nowlands Gap GPS link: https://goo.gl/maps/R5yufobPeMG2	Clearance: 120.0 x 12.0 metres	Parking Bay (small)	Emergency parking only.
209.8	Willow Tree	New England highway GPS link: https://goo.gl/maps/XLTg7CRV7EU2	Clearance: 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. We have engineered documentation showing correct weights for all loads.
216.4	Willow Tree Township	New England highway GPS link: https://goo.gl/maps/gw38qmvVfTC2	Clearance: 60.0 x 5.0 metres	Parking Bay	Suitable parking for Fatigue breaks.

Route Survey: (Main route) – Newcastle port to Nundle for remaining components.					
Km index	**Location**	**Section of road**	**Critical Measurement**	**Procedure**	**Notes**
218.0	Willow Tree Truck Stop N	New England highway GPS link: https://goo.gl/maps/RRdPVHupGCs	Clearance: 120.0 x 12.0 metres	Parking Bay (small)	Suitable parking for Fatigue breaks for small loads only.
227.5	Wallabadah	New England highway GPS link: https://goo.gl/maps/QWCyeHQSohS2	Clearance: 80.0 x 5.0 metres	Parking Bay (side of road)	Suitable parking for Fatigue breaks.
235.0	Wallabadah	New England highway onto Lindsay's Gap Road GPS link: https://goo.gl/maps/ePbYctjJootkBZiM9	Clearance: Length: 50.0 metres Width: 7.0 Metres	Right hand turn	No problems with this section of road.
246.7	Garoo	Lindsay's Gap Road over Goonoo Goonoo Creek GPS link: https://goo.gl/maps/9ELSk5ZLRWnf14tm7	Clearance: Axle width: 3.60m Overall width: 6.20m Guard rail height: 850mm	Travel directly ahead over bridge in the centre of the road.	Loads that are been carried on trailers with an axle width exceeding 3.5 meters will need to take an alternate route via Tamworth, or the bridge will need to be widened. The blades will travel across this structure in its original form.
254.7	Garoo	Lindsay's Gap Road over Middlebrook Creek GPS link: https://goo.gl/maps/DyxGUid9JucoAHhHA	Clearance: Axle width: 4.50m Overall width: 6.10m Guard rail height: 750mm	Travel directly ahead over bridge in the centre of the road.	Due to the bridge prior to this one, there will be no loads on this route that will exceed 3.5 metres in axle width so the heavier loads with wider axles will also detour this structure via Tamworth. The blades will travel across this structure in its original form.
260.2	Garoo	Lindsay's Gap Road through Lindsay's Gap GPS link: https://goo.gl/maps/GGKmKmKmqemziKdth8wH9	Clearance: Length: 90.0 metres Width: 10.0 Metres	Travel directly ahead	Load to travel in the centre of the road, escorts to warn traffic 500 metres to the east of the gap.
265.8	Nundle	Lindsay's Gap Road onto Nundle Road GPS link: https://goo.gl/maps/FX4ZRx2YG9i2BsXMA	Clearance: Length: 50.0 metres Width: 8.0 Metres	Right hand turn	No problems with this section of road.
268.2	Nundle	Nundle Road onto Crosby Street GPS link: https://goo.gl/maps/uVvcN9QkPyTDP1YR6	Clearance: Width: 8.0 metres	Travel directly ahead	No problems with this section of road.
268.5	Nundle	Crosby Street onto Oakenville Street GPS link: https://goo.gl/maps/aZNDKURdSBERedMr9	Clearance: Width: 8.0 metres	Travel directly ahead	No problems with this section of road.
269.0	Nundle	Oakenville Street and Jenkins Street intersection GPS link: https://goo.gl/maps/7YM56hQq8bnCSoZy8	Clearance: Width: 5.0 metres		From this point the routes will either travel directly ahead or turn to the right, depending on which options are used.

13.0 Route Survey: (Access route Option 1) From Nundle to southern site entrance for Blades/Towers

Distance: (20.3 km).
Via: Jenkins Street Oakenville Street, Old Hanging Rock Road, Happy Valley Road, Jenkins Street, Crawney Road, Head of Peel Road, Jenkins Road
GPS Link: https://goo.gl/maps/LD2xcpS5iEnkyeKWA



KEY	
MODIFICATIONS REQUIRED	
MINOR WORKS OR CAUTION	
PARKING	

Route Survey: (Access route Option 1) From Nundle to southern site entrance for Blades/Towers

Km index	Location	Section of road	Critical Measurement	Procedure	Comments 170.0m rotor	Comments 158.0m rotor
0.0	Nundle	Oakenville Street and Jenkins Street intersection GPS link: https://goo.gl/maps/7YM56hQq8bnCSoZy8	5.0 metres width clearance		Blades to travel directly ahead on the correct side of the road. A no parking exclusion zone will need to be placed on the left-hand side while travelling through this intersection. Two signs will also need to be made removable.	Blades to travel directly ahead on the correct side of the road. A no parking exclusion zone will need to be placed on the left-hand side while travelling through this intersection. Two signs will also need to be made removable.
0.8	Nundle	Oakenville Street onto Old Hanging Rock GPS link: https://goo.gl/maps/1UMr2EwZetiE76Ey9	35.0 metres length clearance	Left hand turn	Blades to turn left from the incorrect side to the incorrect side of the road. The swept path will have the blades travel through a landowner's boundaries. This will require a fence to be relocated and hardstand added. Additionally, while travelling over the bridge some signs will need to be relocated and some sections of guardrail relocated.	Blades to turn left from the incorrect side to the incorrect side of the road. The swept path will have the blades travel through a landowner's boundaries. This will require a fence to be relocated and hardstand added. Additionally, while travelling over the bridge some signs will need to be relocated.
1.3	Nundle	Old Hanging Rock Road onto Happy Valley Road GPS link: https://goo.gl/maps/cfRnJ3BBQXEhq2AE8	40.0 metres clearance	Left hand turn	Blades to turn left from the incorrect side to the incorrect side of the road. The swept path will have the blades travel through a landowner's boundaries. This will require a fence to be relocated and hardstand added to the entrance and exit of the intersection. Additionally, some trees will need to be removed and several also trimmed as well as some signs been relocated.	Blades to turn left from the incorrect side to the incorrect side of the road. The swept path will have the blades stay within the road reserve. This will require hardstand added to the entrance and exit of the intersection. Additionally, some trees will need to be removed and several also trimmed as well as some signs been relocated.
2.2	Nundle	Happy Valley Road onto Jenkins Street https://goo.gl/maps/9bF75wcm6DrQk2Vj8	40.0 metres clearance	Left hand turn	Blades to turn left from the incorrect side to the incorrect side of the road. The swept path will have the blades travel through a landowner's boundaries. This will require a fence to be relocated,	Blades to turn left from the incorrect side to the incorrect side of the road. The swept path will have the blades stay within the road reserve. Some hardstand is required on the inside of the

Route Survey: (Access route Option 1) From Nundle to southern site entrance for Blades/Towers						
Km index	**Location**	**Section of road**	**Critical Measurement**	**Procedure**	**Comments 170.0m rotor**	**Comments 158.0m rotor**
					hardstand added and a power pole to be relocated. Additionally, some hardstand is required on the inside of the corner as well as a sign made removable. Additionally, some trees will need to be removed and several also trimmed as well as some signs been relocated.	corner as well as a sign made removable. Additionally, some trees will need to be removed and several also trimmed as well as some signs been relocated.
3.5	Nundle	Jenkins Street and Oakenville Street intersection GPS link: https://goo.gl/maps/YyGbrPmDguBFQT219	5.0 metres width clearance		Blades to travel directly ahead on the correct side of the road. A no parking exclusion zone will need to be placed on the left-hand side prior to and after Jenkins Street while travelling through this intersection.	Blades to travel directly ahead on the correct side of the road. A no parking exclusion zone will need to be placed on the left-hand side prior to and after Jenkins Street while travelling through this intersection.
4.7	Nundle	Jenkins Street onto Crawney Road GPS link: https://goo.gl/maps/ZxoU65FAZiA2gb816	8.0 metres width clearance	Travel directly ahead	No problems with this section of road.	No problems with this section of road.
8.9	Nundle	Crawney Road onto Head of Peel Road https://goo.gl/maps/veGrzZSTAsQGDMRT9	45.0 metres clearance	Left hand turn	Blades to turn left from the incorrect side to the incorrect side of the road. The swept path will have the blades travel through a landowner's boundaries. This will require a fence to be relocated, hardstand added and a power pole to be relocated. Additionally, some hardstand is required on the inside of the corner as well as a sign made removable. Additionally, some trees will need to be removed and several also trimmed as well as some signs been relocated.	Blades to turn left from the incorrect side to the incorrect side of the road. The swept path will have the blades stay within the road reserve. Some hardstand is required on the inside of both corners as well as a sign made removable. Additionally, some trees will need to be removed and several also trimmed as well as some signs been relocated.
8.9 to 20.3 Km	Nundle	Head of Peel Road https://goo.gl/maps/J2iLMPKvsWpQ6Amt8	45.0 metres clearance	Left hand turn	This section of road is gravel for the entirety. Multiple corners will need to be	This section of road is gravel for the entirety. Multiple corners will need to be

Route Survey: (Access route Option 1) From Nundle to southern site entrance for Blades/Towers						
Km index	**Location**	**Section of road**	**Critical Measurement**	**Procedure**	**Comments 170.0m rotor**	**Comments 158.0m rotor**
					made suitable for the swept path of all components. Typically, the road will need to be widened to 5.5 meters in all straight sections and made wider on the corners depending on the radius. Additionally, there will need to be trees removed and pruned and several causeways modified. The vertical curve will also need to be checked for the entirety of this road.	made suitable for the swept path of all components. Typically, the road will need to be widened to 5.5 meters in all straight sections and made wider on the corners depending on the radius. Additionally, there will need to be trees removed and pruned and several causeways modified. The vertical curve will also need to be checked for the entirety of this road.

0.0 : Oakenville Street at Nundle.
170 Metre rotor and 158 Metre rotor:

170 Metre rotor and 158 Metre rotor:

PROCEDURE: Travel directly ahead on Oakenville Street.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/7YM56hQq8bnCSoZy8

COMMENTS: Blades to travel directly ahead on the correct side of the road. A no parking exclusion zone will need to be placed on the left-hand side while travelling through this intersection. Two signs will also need to be made removable.

ROAD MODIFICATIONS: Small amounts of work are required.

0.8 Km: Oakenville Street onto Hanging Rock Road at Nundle.
170 Metre rotor:

170 Metre rotor:

PROCEDURE: Left hand turn from Oakenville Street onto Old Hanging Rock Road.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/1UMr2EwZetiE76Ey9

COMMENTS: Blades to turn left from the incorrect side to the incorrect side of the road. The swept path will have the blades travel through a landowner's boundaries. This will require a fence to be relocated and hardstand added. Additionally, while travelling over the bridge some signs will need to be relocated and some sections of guardrail relocated.

ROAD MODIFICATIONS: Large amounts of work are required.

158 Metre rotor:

PROCEDURE: Left hand turn from Oakenville Street onto Old Hanging Rock Road.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/1UMr2EwZetiE76Ey9

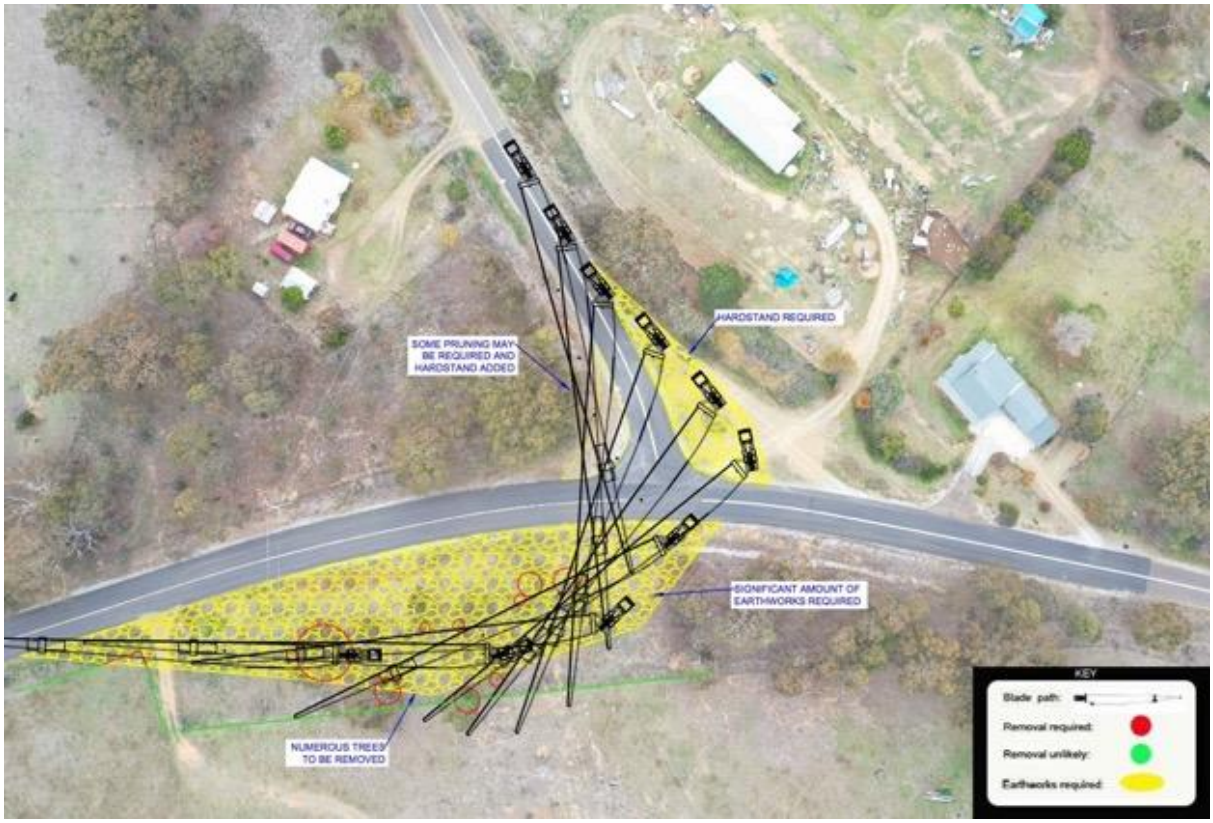
COMMENTS: Blades to turn left from the incorrect side to the incorrect side of the road. The swept path will have the blades travel through a landowner's boundaries. This will require a fence to be relocated and hardstand added. Additionally, while travelling over the bridge some signs will need to be relocated.

ROAD MODIFICATIONS: Large amounts of work are required.

1.3 Km: Hanging Rock Road onto Happy Valley Road at Nundle.

170 Metre rotor:

170 Metre rotor:



PROCEDURE: Left hand turn from Old Hanging Rock Road onto Happy Valley Road.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/cfRnJ3BBQXEhg2AE8

COMMENTS: Blades to turn left from the incorrect side to the incorrect side of the road. The swept path will have the blades travel through a landowner's boundaries. This will require a fence to be relocated and hardstand added to the entrance and exit of the intersection. Additionally, some trees will need to be removed and several also trimmed as well as some signs been relocated.

ROAD MODIFICATIONS: Large amounts of work are required.

158 Metre rotor:

PROCEDURE: Left hand turn from Old Hanging Rock Road onto Happy Valley Road.

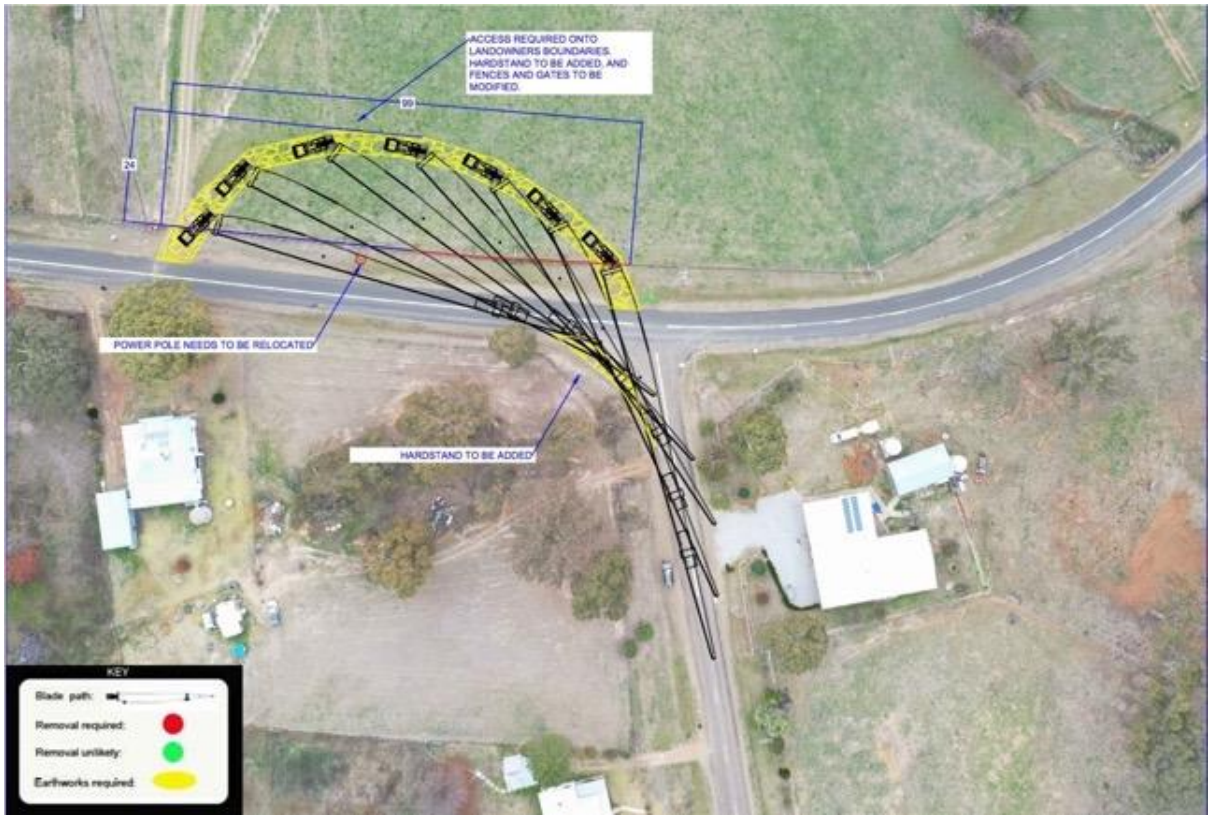
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/cfRnJ3BBQXEhg2AE8

COMMENTS: Blades to turn left from the incorrect side to the incorrect side of the road. The swept path should stay within the road reserve. This will hardstand added to the entrance and inside of the intersection. Additionally, some trees will need to be removed and several also trimmed as well as some signs been relocated.

ROAD MODIFICATIONS: Moderate amounts of work are required.

2.2 Km: Happy Valley Road onto Jenkins Street at Nundle.
170 Metre rotor:

170 Metre rotor:



PROCEDURE: Left hand turn from Happy Valley Road onto Jenkins Road.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/9bF75wcm6DrQk2Vj8

COMMENTS: Blades to turn left from the incorrect side to the incorrect side of the road. The swept path will have the blades travel through a landowner's boundaries. This will require a fence to be relocated, hardstand added and a power pole to be relocated. Additionally, some hardstand is required on the inside of the corner as well as a sign made removable. Additionally, some trees will need to be removed and several also trimmed as well as some signs been relocated.

ROAD MODIFICATIONS: Large amounts of work are required.

158 Metre rotor:

PROCEDURE: Left hand turn from Happy Valley Road onto Jenkins Road.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/9bF75wcm6DrQk2Vj8

COMMENTS: Blades to turn left from the incorrect side to the incorrect side of the road. The swept path should stay within the road reserve. Additionally, some hardstand is required on the inside and outside of the corner as well as a sign made removable. Additionally, some trees will need to be removed and several also trimmed as well as some signs been relocated.

ROAD MODIFICATIONS: Large amounts of work are required.

3.5 Km: Jenkins Street through Oakenville Street at Nundle.
170 Metre rotor and 158 Metre rotor:

PROCEDURE: Travel directly ahead on Jenkins Street.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/YyGbrPmDguBFQT219

COMMENTS: Blades to travel directly ahead on the correct side of the road. A no parking exclusion zone will need to be placed on the left-hand side prior to and after Jenkins Street while travelling through this intersection.

ROAD MODIFICATIONS: Small amounts of work are required.

8.9 Km: Crawney Road onto Head of Peel Road at Nundle.
170 Metre rotor:

170 Metre rotor:

PROCEDURE: Left hand turn from Crawney Road onto Head of Peel Road.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/veGrzZSTAsQGDMRT9

COMMENTS: Blades to turn left from the incorrect side to the incorrect side of the road. The swept path will have the blades travel through a landowner's boundaries. This will require a fence to be relocated, hardstand added, and some trees will need to be removed as well as some signs been relocated.

ROAD MODIFICATIONS: Large amounts of work are required.

158 Metre rotor:

PROCEDURE: Left hand turn from Crawney Road onto Head of Peel Road.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/veGrzZSTAsQGDMRT9

COMMENTS: Blades to turn left from the incorrect side to the incorrect side of the road. The swept path should stay within the road reserve. Some hardstand will need to be added, to the inside of both turns.

ROAD MODIFICATIONS: Moderate amounts of work are required.

8.9 to 20.3 Km: Head of Peel Road at Nundle.

170 Metre rotor:

Image 1:

Image 2:


AREA CLEAR FOR
TAIL-SWING
KEY
Blade path:
Removal required:
Removal unlikely:
Earthworks required:

Image 3:

Image 4:


AREA CLEAR FOR BLADE BODY
AREA CLEAR FOR TAIL-SWING
KEY
Blade path:
Removal required:
Removal unlikely:
Earthworks required:

Image 5:

Image 6:

Image 7:

Image 8:


AREA CLEAR FOR TAIL-SWING
SOME HARDSTAND REQUIRED
AREA CLEAR FOR BLADE BODY
KEY
Blade path:
Removal required:
Removal unlikely:
Earthworks required:

Image 9:

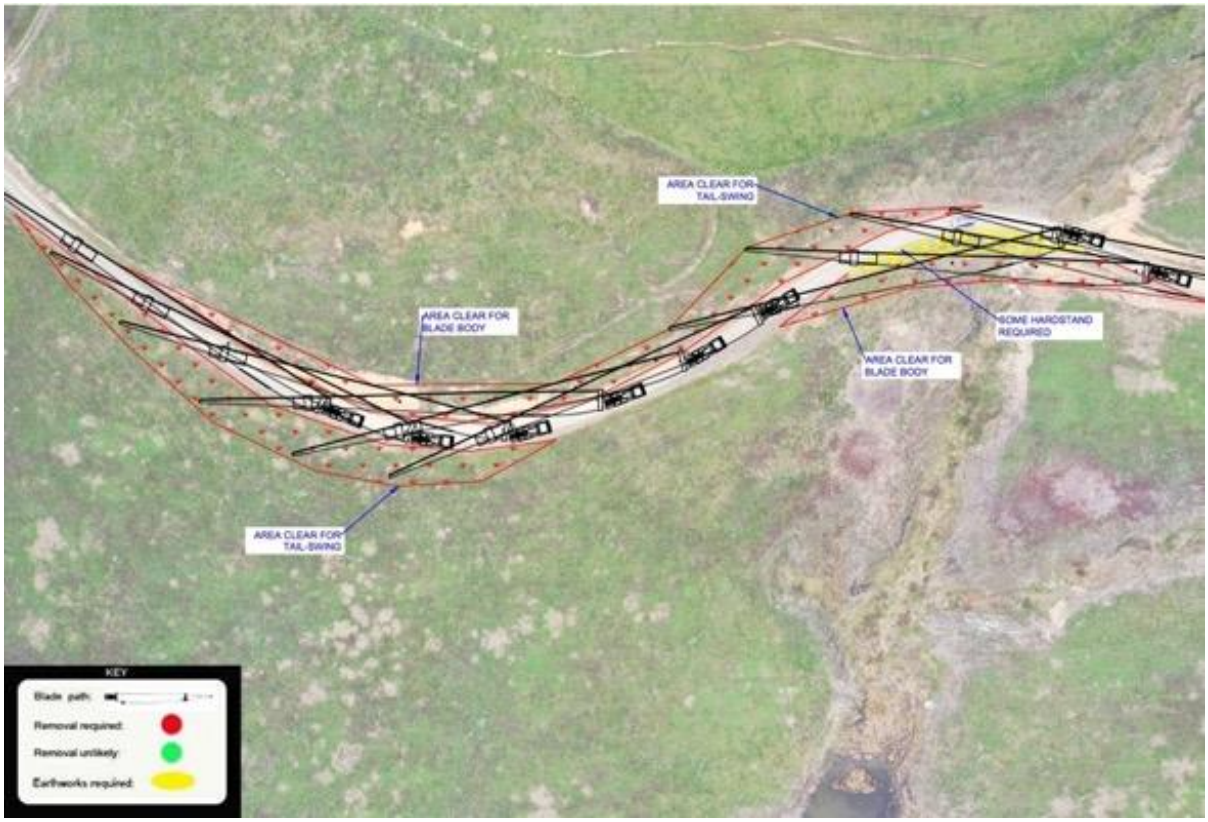

AREA CLEAR FOR TAIL-SWING
AREA CLEAR FOR BLADE BODY
SOME HARDSTAND REQUIRED
AREA CLEAR FOR BLADE BODY
AREA CLEAR FOR TAIL-SWING
KEY
Blade path:
Removal required:
Removal unlikely:
Earthworks required:

Image 10:


AREA CLEAR FOR TAIL-SWING
SOME HARDSTAND REQUIRED
KEY
Blade path:
Removal required:
Removal unlikely:
Earthworks required:

Image 11:

Image 12:


AREA CLEAR FOR TAIL-SWING
SIDE OF RAMP WOULD NEED REMOVING
AREA CLEAR FOR BLADE BODY
KEY
Blade path:
Removal required:
Removal unlikely:
Earthworks required:

Image 13:


KEY
Blade path:
Removal required:
Removal unlikely:
Earthworks required:
BRIDGE WIDENING REQUIRED

Image 14: (Head of Peel & Kirks Road intersection)

Image 15: (Head of Peel & Kirks Road intersection)

PROCEDURE: Travel directly ahead on Head of Peel Road.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/J2iLMPKvsWpQ6Amt8

COMMENTS: This section of road is gravel for the entirety. Multiple corners will need to be made suitable for the swept path of all components. Typically, the road will need to be widened to 5.5 meters in all straight sections and made wider on the corners depending on the radius. Additionally, there will need to be trees removed and pruned and several causeways modified. The vertical curve will also need to be checked for the entirety of this road.

ROAD MODIFICATIONS: Large amounts of work are required.

NOTE: From this point on all access roads through to final delivery points will need to be made suitable for the swept path of the largest items. These access roads will also need to be made with suitable gradients and vertical curves.

8.9 to 20.3 Km: Head of Peel Road at Nundle.

158 Metre rotor:

Image 1:

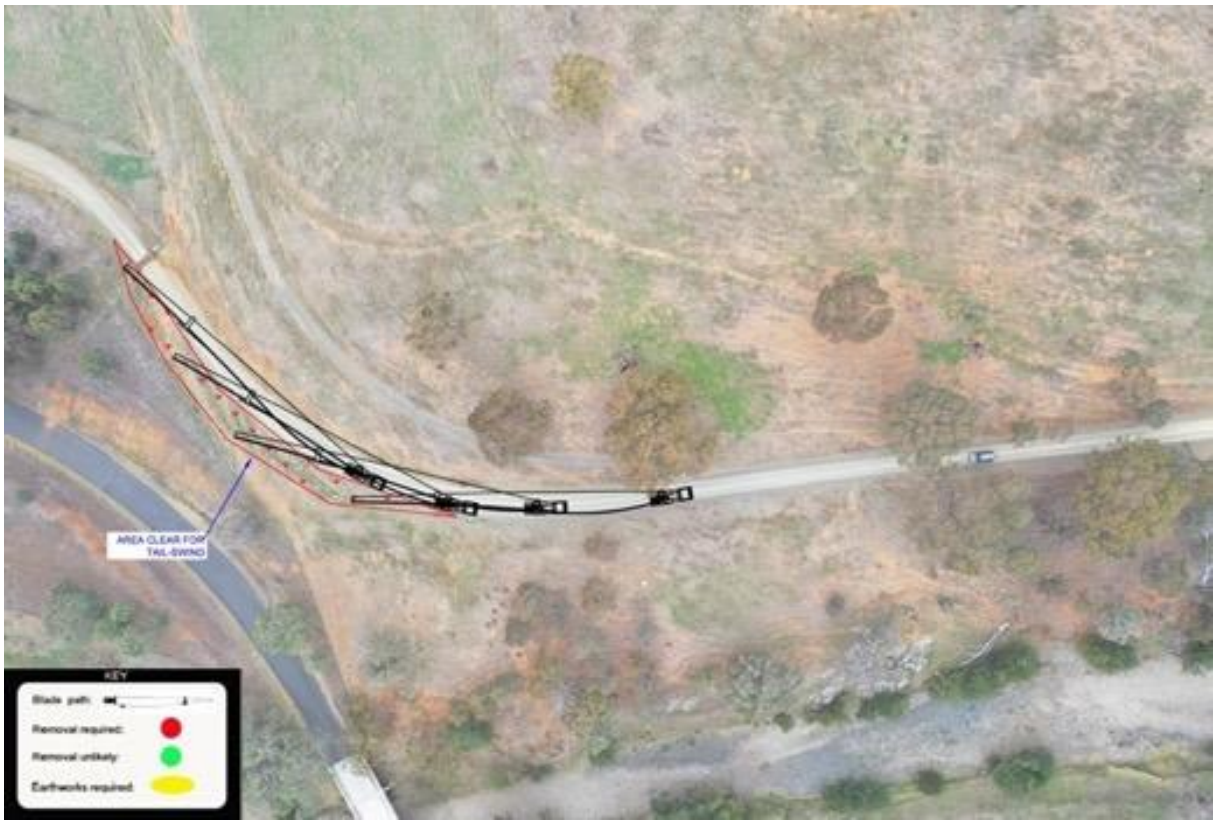


Image 2:


AREA CLEAR FOR BLADE BODY
AREA CLEAR FOR TAIL-SWING
KEY
Blade path
Removal required
Removal unlikely
Earthworks required

Image 3:


AREA CLEAR FOR TAIL-SWING
AREA CLEAR FOR BLADE BODY
SOME HARDSTAND REQUIRED
KEY
Blade path:
Removal required:
Removal unlikely:
Earthworks required:

Image 4:

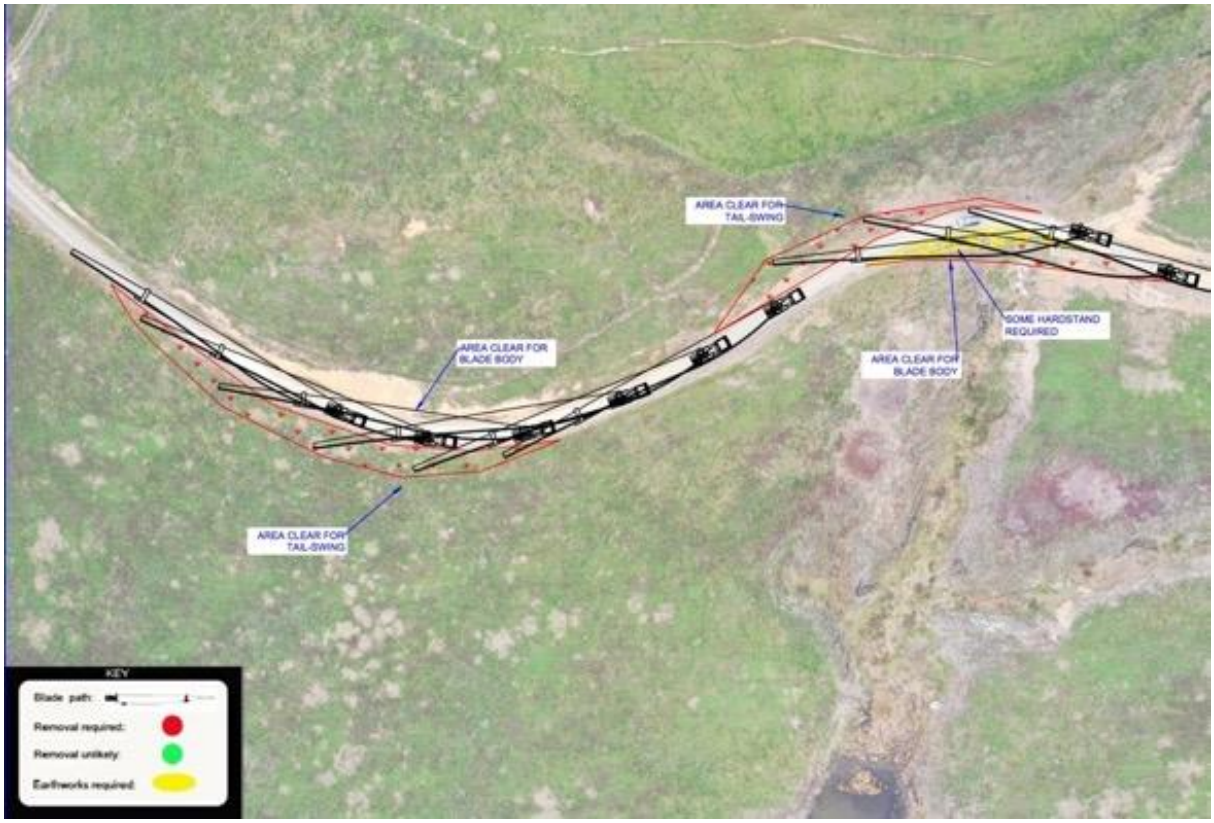

AREA CLEAR FOR TAIL-SWING
AREA CLEAR FOR BLADE BODY
SOME HARDSTAND REQUIRED
AREA CLEAR FOR BLADE BODY
AREA CLEAR FOR TAIL-SWING
KEY
Blade path:
Removal required:
Removal unlikely:
Earthworks required:

Image 5:


AREA CLEAR FOR TAIL SWING
SOME HARDSTAND REQUIRED
KEY
Blade path:
Removal required:
Removal unlikely:
Earthworks required:

Image 6:

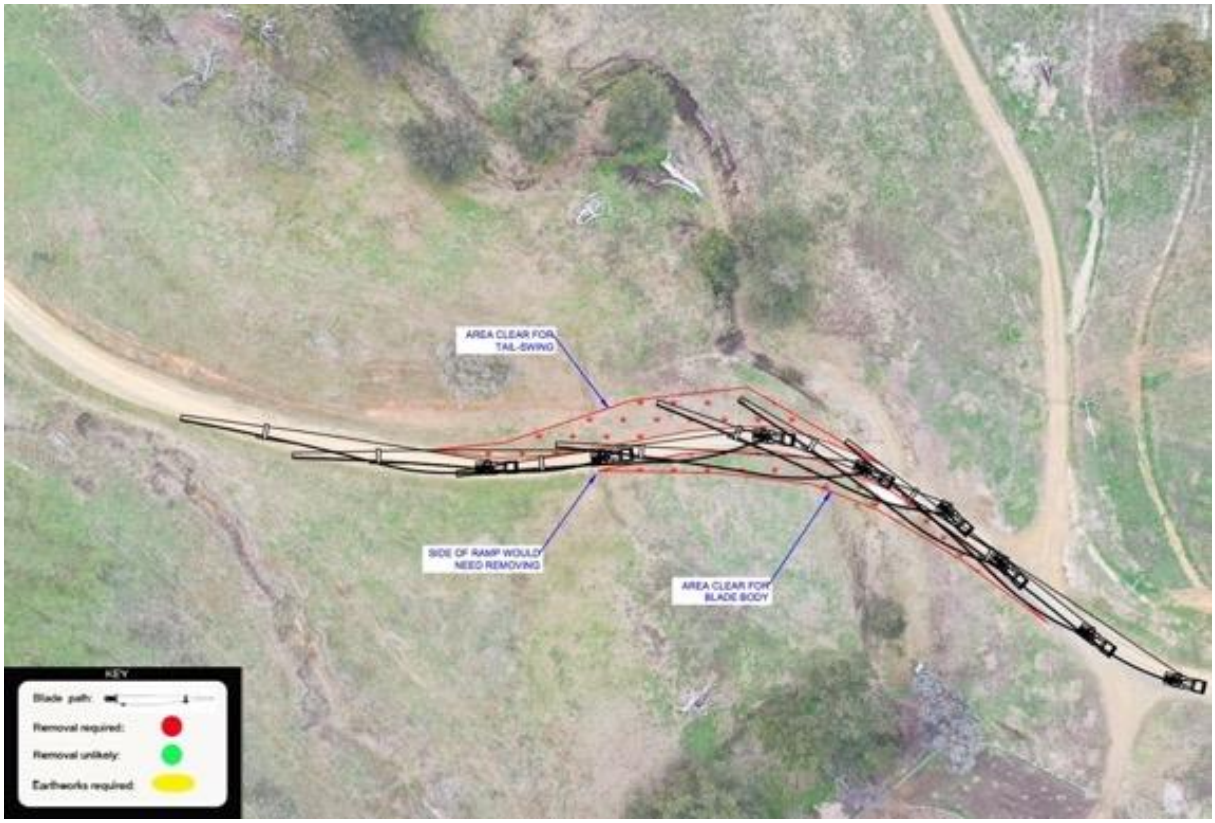

AREA CLEAR FOR TAIL-SWING
SIDE OF RAMP WOULD NEED REMOVING
AREA CLEAR FOR BLADE BODY
KEY
Blade path:
Removal required:
Removal unlikely:
Earthworks required:

Image 7:

Image 8:

PROCEDURE: Travel directly ahead on Head of Peel Road.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/J2iLMPKvsWpQ6Amt8

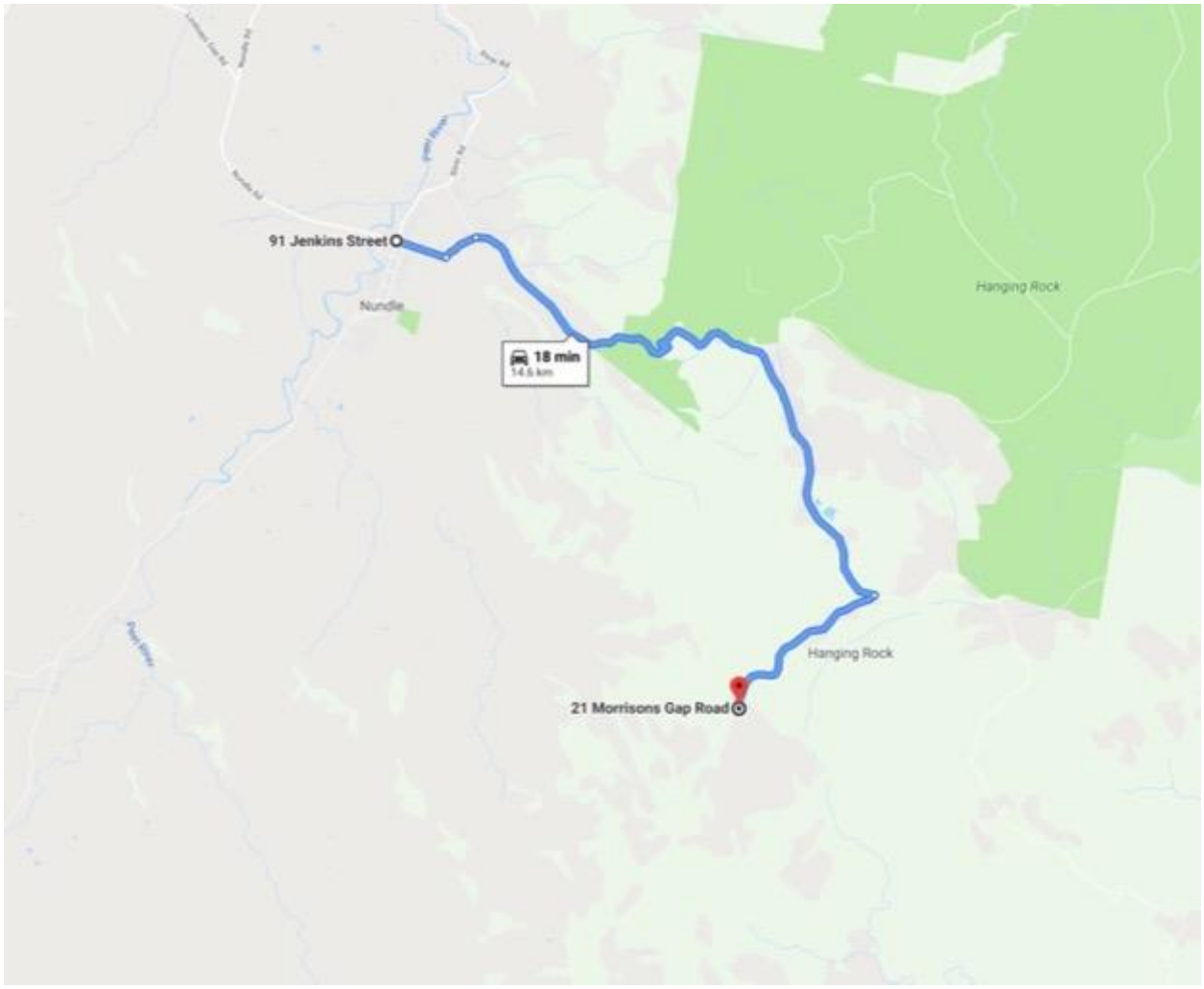
COMMENTS: This section of road is gravel for the entirety. Multiple corners will need to be made suitable for the swept path of all components. Typically, the road will need to be widened to 5.5 meters in all straight sections and made wider on the corners depending on the radius. Additionally, there will need to be trees removed and pruned and several causeways modified. The vertical curve will also need to be checked for the entirety of this road.

ROAD MODIFICATIONS: Large amounts of work are required.

NOTE: From this point on all access roads through to final delivery points will need to be made suitable for the swept path of the largest items. These access roads will also need to be made with suitable gradients and vertical curves.

14.0 Route Survey: (Access route option 2) from Nundle to northern site entrance for all components

Distance: (20.3 km).
Via: Jenkins Street Oakenville Street, Old Hanging Rock Road, Barry Road, Morrisons Gap Road.
GPS Link: https://goo.gl/maps/dCd9G3aZMYcvhbkp7



KEY	
MODIFICATIONS REQUIRED	
MINOR WORKS OR CAUTION	
PARKING	

Route Survey: (Access route option 2) from Nundle to northern site entrance for all components						
Km index	**Location**	**Section of road**	**Critical Measurement**	**Procedure**	**Comments 170.0m rotor**	**Comments 158.0m rotor**
0.0	Nundle	Oakenville Street and Jenkins Street intersection GPS link: https://goo.gl/maps/7YM56hQq8bnCSoZy8	5.0 metres width clearance		Blades to travel directly ahead on the correct side of the road. A no parking exclusion zone will need to be placed on the left-hand side while travelling through this intersection. Two signs will also need to be made removable.	Blades to travel directly ahead on the correct side of the road. A no parking exclusion zone will need to be placed on the left-hand side while travelling through this intersection. Two signs will also need to be made removable.
0.8	Nundle	Oakenville Street onto Old Hanging Rock GPS link: https://goo.gl/maps/1UMr2EwZetiE76Ey9	35.0 metres length clearance	Left hand turn	Blades to turn left from the incorrect side to the incorrect side of the road. The swept path will have the blades travel through a landowner's boundaries. This will require a fence to be relocated and hardstand added. Additionally, while travelling over the bridge some signs will need to be relocated and some sections of guardrail relocated.	Blades to turn left from the incorrect side to the incorrect side of the road. The swept path will have the blades travel through a landowner's boundaries. This will require a fence to be relocated and hardstand added. Additionally, while travelling over the bridge some signs will need to be relocated.
1.3	Nundle	Old Hanging Rock Road onto Barry Road GPS link: https://goo.gl/maps/ve9zvmdJnLBYtQSz5	90.0 metres clearance	Right hand bend	No problems with this section of road.	No problems with this section of road.
1.3 to 11.6 Km	Nundle to Hanging Rock	Barry's Road https://goo.gl/maps/BUBe2MCfoQ215qKE6	25.0 metres length clearance	Travel directly ahead through multiple tight turns and steep terrain	Barry's Road has a section of road known as the Devils Elbows. These hairpin corners are on a steep gradient and would not accommodate loads over 25 meters in length.	Barry's Road has a section of road known as the Devils Elbows. These hairpin corners are on a steep gradient and would not accommodate loads over 25 meters in length.

Route Survey: (Access route option 2) from Nundle to northern site entrance for all components						
Km index	**Location**	**Section of road**	**Critical Measurement**	**Procedure**	**Comments 170.0m rotor**	**Comments 158.0m rotor**
					There is a possibility that if the blades were placed in lifters at Nundle than transported up the range using this methodology, that they may negotiate this tight section of road, however these turns are on very tight corners with a gradient exceeding 10 %, this would make the procedure a very high risk. It is unlikely that the towers and the motors could pass through this section of road. To the west and east of the Devils Elbows the road will need to be widened on a few corners, this would include hardstand and tree removal.	There is a possibility that if the blades were placed in lifters at Nundle than transported up the range using this methodology, that they may negotiate this tight section of road, however these turns are on very tight corners with a gradient exceeding 10 %, this would make the procedure a very high risk. It is unlikely that the towers and the motors could pass through this section of road. To the west and east of the Devils Elbows the road will need to be widened on a few corners, this would include hardstand and tree removal.
11.6	Hanging Rock	Barry's Road onto Morrisons Gap Road GPS link: https://goo.gl/maps/CLZDJSjENx8rjfAq7	35.0 metres length clearance	Right hand turn	Blades to turn left from the correct side to the correct side of the road. The swept path will have the blades travel through a landowner's boundaries. This will require a fence to be relocated and hardstand added. Additionally, some trees will need to be removed.	Blades to turn left from the correct side to the correct side of the road. The swept path will have the blades travel through a landowner's boundaries. This will require a fence to be relocated and hardstand added. Additionally, some trees will need to be removed.
11.6 to 14.6 Km's	Hanging Rock	Morrisons Gap Road https://goo.gl/maps/kLtYYnmhTgvE6ZPFA	25.0 metres length clearance	Left hand turn	This section of road is gravel for the entirety. Several corners will need to be made suitable for the swept path of all components. Typically, the road will need to be widened to 5.5 meters in all straight sections and made wider on the corners depending on the radius. Additionally, there will need to be trees removed. The vertical curve will also need to be checked for the entirety of this road.	This section of road is gravel for the entirety. Several corners will need to be made suitable for the swept path of all components. Typically, the road will need to be widened to 5.5 meters in all straight sections and made wider on the corners depending on the radius. Additionally, there will need to be trees removed. The vertical curve will also need to be checked for the entirety of this road.

0.0 Km: Oakenville Street at Nundle.

170 Metre rotor and 158 Metre rotor:

PROCEDURE: Travel directly ahead on Oakenville Street.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/7YM56hQq8bnCSoZy8

COMMENTS: Blades to travel directly ahead on the correct side of the road. A no parking exclusion zone will need to be placed on the left-hand side while travelling through this intersection. Two signs will also need to be made removable.

ROAD MODIFICATIONS: Small amounts of work are required.

0.8 Km: Oakenville Street onto Hanging Rock Road at Nundle.
170 Metre rotor:

PROCEDURE: Left hand turn from Oakenville Street onto Old Hanging Rock Road.
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/dTVzsVzuaY1qvLHd7
COMMENTS: Blades to turn left from the incorrect side to the incorrect side of the road. The swept path will have the blades travel through a landowner's boundaries. This will require a fence to be relocated and hardstand added. Additionally, while travelling over the bridge some signs will need to be relocated and some sections of guardrail relocated.
ROAD MODIFICATIONS: Large amounts of work are required.

1.3 to 11.6 Km: Barry's Gap Road from Nundle to Hanging Rock.

170 Metre rotor:

Image 1:

Image 2:

Image 3:

Image 4:

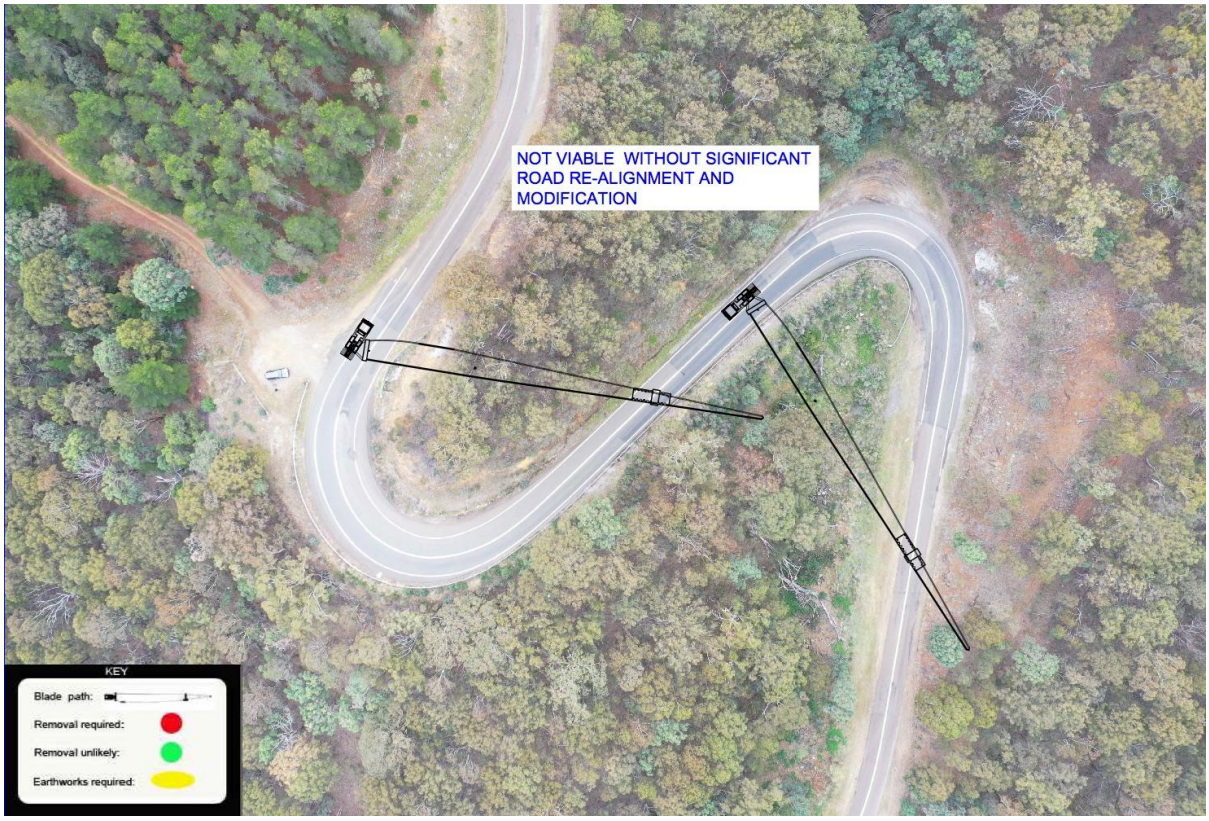

NOT VIABLE WITHOUT SIGNIFICANT ROAD RE-ALIGNMENT AND MODIFICATION
KEY
Blade path:
Removal required:
Removal unlikely:
Earthworks required:

Image 5:

Image 6:


KEY
Blade path
Removal required
Removal unlikely
Earthworks required

Image 7:

PROCEDURE: Travel directly ahead on Barry's Road.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/BUBe2MCfoQ215qKE6

COMMENTS: Barry's Road has a section of road known as the Devils Elbows. These hairpin corners are on a steep gradient and would not accommodate loads over 25 meters in length. There is a possibility that if the blades were placed in lifters at Nundle then transported up the range using this methodology, that they may negotiate this tight section of road, however these turns are on very tight corners with a gradient exceeding 10 %, this would make the procedure a very high risk. It is unlikely that the towers and the motors could pass through this section of road. To the west and east of the Devils Elbows the road will need to be widened on a few corners, this would include hardstand and tree removal.

ROAD MODIFICATIONS: Large amounts of work are required.

1.3 to 11.6 Km: Barry's Gap Road from Nundle to Hanging Rock.

158 Metre rotor:

Image 1:

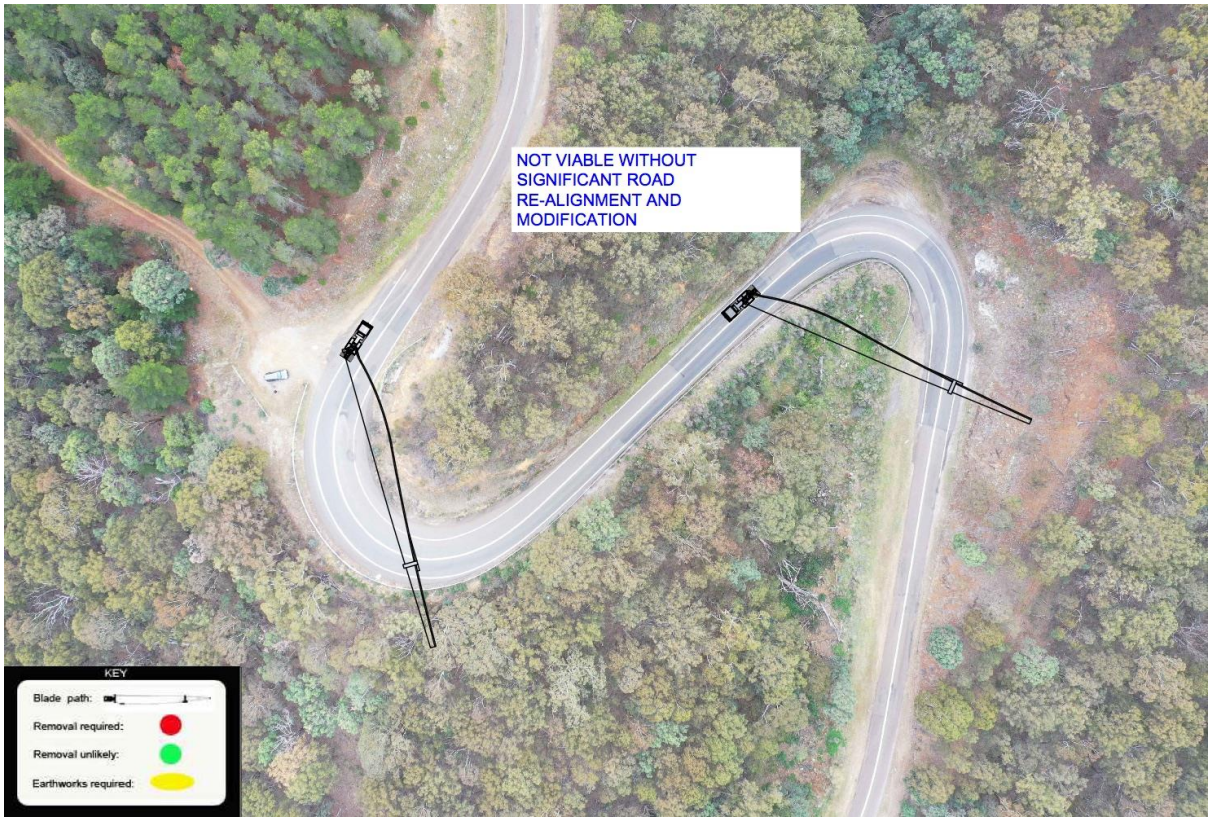


Image 2:


KEY
Blade path
Removal required:
Removal unlikely:
Earthworks required:

Image 3:

PROCEDURE: Travel directly ahead on Barry's Road.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/BUBe2MCfoQ215qKE6

COMMENTS: Barry's Road has a section of road known as the Devils Elbows. These hairpin corners are on a steep gradient and would not accommodate loads over 25 meters in length. There is a possibility that if the blades were placed in lifters at Nundle than transported up the range using this methodology, that they may negotiate this tight section of road, however these turns are on very tight corners with a gradient exceeding 10 %, this would make the procedure a very high risk.

It is unlikely that the towers and the motors could pass through this section of road. To the west and east of the Devils Elbows the road will need to be widened on a few corners, this would include hardstand and tree removal.

ROAD MODIFICATIONS: Large amounts of work are required.

11.6 Km: Barry's Road onto Morrisons Gap Road.

170 Metre rotor:

PROCEDURE: Right hand turn from Barry's Road onto Morrisons Gap Road.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/CLZDJSjENx8rjfAg7

COMMENTS: Blades to turn left from the correct side to the correct side of the road. The swept path will have the blades travel through a landowner's boundaries. This will require a fence to be relocated and hardstand added. Additionally, some trees will need to be removed.

ROAD MODIFICATIONS: Large amounts of work are required.

158 Metre rotor:

PROCEDURE: Right hand turn from Barry's Road onto Morrisons Gap Road.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/CLZDJSjENx8rjfAg7

COMMENTS: Blades to turn left from the correct side to the correct side of the road. The swept path will have the blades travel through a landowner's boundaries. This will require a fence to be relocated and hardstand added. Additionally, some trees will need to be removed.

ROAD MODIFICATIONS: Large amounts of work are required.

11.6 to 14.6 Km: Morrisons Gap Road at Hanging Rock.
170 Metre rotor and 158 Metre rotor:
Image 1:

Image 2:

Image 3:

PROCEDURE: Travel directly ahead on Morrisons Gap Road.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/kLtYYnmhTgvE6ZPFA

COMMENTS: This section of road is gravel for the entirety. Multiple corners will need to be made suitable for the swept path of all components. Typically, the road will need to be widened to 5.5 meters in all straight sections and made wider on the corners depending on the radius. Additionally, there will need to be trees removed and pruned. The vertical curve will also need to be checked for the entirety of this road.

ROAD MODIFICATIONS: Large amounts of work are required.

NOTE: From this point on all access roads through to final delivery points will need to be made suitable for the swept path of the largest items. These access roads will also need to be made with suitable gradients and vertical curves.

15.0 Conclusion:

MAIN ROUTES: (Newcastle port to Nundle)

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 Nundle as listed in the report.

NEWCASTLE:

The intersection of George Street and Industrial Drive at Mayfield looks to be the most difficult corner. Relocation of the traffic signal in the centre of the intersection would be necessary to allow the 83-metre blade to traverse the bend. The 65 Metre blade will not require traffic signals to be removed. However, both blades will require some hardstand to be added to the outside of the corner.

The corner from Industrial Drive onto Maitland Road will require the centre median strips to be lowered while the blades traverse the corner on the incorrect side of the road for both blade options.

HUNTER EXPRESSWAY:

The 83-metre blades will not make it around the roundabout from John Renshaw Drive onto the Hunter Expressway. The 65 Metre blade can travel around the roundabout.

For the 83-metre blade traffic control/Police would 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.

NEW ENGLAND HIGHWAY ONTO THE GOLDEN HIGHWAY:

This corner is currently in the design stage of modifications. The existing corner would need only a small amount of works to allow the blades a suitable swept path. It is recommended that the project keep a close eye on any potential changes that may affect the blades swept path around the corner.

THE GOLDEN HIGHWAY:

Several corners would need to have a moderate amount of modifications. Additionally, the blades will need to travel onto the incorrect side of the Golden Highway for approx. 400 metres. This will require the police escorts to hold all eastbound traffic on the Golden Highway. Roadwork's are programmed to take place on this route over the next year, so it is recommended that the client discuss any upcoming road projects with Transport NSW.

MUSWELLBROOK:

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

- BLADES 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 will require a large number of upgrades; these include large amounts of hard standing, relocating of power poles and approvals from Muswellbrook Shire Council, Private landowners and Dartbrook Mine. The 65-metre blade requires around 50% of the upgrades that the 83-metre blade would require.

- TOWERS AND HIGH COMPONENTS VIA: New England Highway, Golden Highway, Denman Road, Thomas Mitchell Drive, New England Highway, Bell Street, Victoria street, Market Street, 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 rail.

- REMAINING COMPONENTS VIA: New England Highway, Golden Highway, Denman Road, Thomas Mitchell Drive, New England Highway, Bell Street, Victoria street, Market Street, New England Highway.

  This route is suitable in its current form for loads up to 40 metres long and 5.3 metres in height. Approval required from Muswellbrook Shire Council and rail.

SCONE:

A town bypass is currently under construction and will be ready before the start of this project. The final design looks suitable for the swept path of the components.

LINDSAY'S GAP ROAD THROUGH TO NUNDLE:

Loads to turn right from the New England Highway onto Lindsay's Gap Road, travelling across to Nundle Road before entering Nundle via Crosby Street and Oakenville Road.

- The section of Lindsay's Gap Road between the New England Highway and Nundle Road has several bridges that will need to be checked for axle loadings.

  The bridge over Goonoo Goonoo creek has a maximum axle width of 3.5 metres. This will likely affect all towers and motors, depending on the weight. Basically, all loads over 50T will likely have a problem with this structure and will need to detour via Tamworth.

- The blades will travel on Lindsay's Gap Road, with upgrades required on the turn off from the New England Highway onto Lindsay's Gap Road, and from

Lindsay's Gap Road onto Nundle Road. Otherwise this section of road is adequate for the blades and smaller components. The 85-metre blade will require a large number of upgrades on this section of road, whereas the 65 metre blades only have a moderate amount of works.

- The loads will enter Nundle via Nundle Road, Crosby Street and Oakenville Street with this section of road having a suitable width and length clearance for the components. From the Intersection of Oakenville Street and Jenkins Road, the routes will differ depending on the Site access point and the component size. These routes which are listed in the report have varying difficulties, and a summary of each of these reports is listed below.

LINDSAY'S GAP ROAD DETOUR:

The loads that have an axle width exceeding 3.5 metres will need to travel through to Tamworth on the New England Highway, staying on the heavy vehicle Bypass via Scott Street. Once loads have returned to the New England Highway the loads will than turn onto Nundle Road at Nemingha, and travel on Nundle Road through to Nundle.

- The route through Tamworth has been used in the past for similar size components and would again be suitable for the towers and motors on this project.
- Nundle Road has a clear passage for dimension but will need to be checked for bridge capacity and overhead utilities.

ACCESS ROUTE OPTION 1: (Nundle to Southern site entrance)

Loads to continue directly ahead on Oakenville Road through Jenkins Street, travelling via Old Hanging Rock Road, Happy Valley Road, Jenkins Street, Crawney Road, Head of Peel Road and Kirks Road to the Southern entrance of the windfarm.

- Oakenville Street and Jenkins Road would require no parking areas put in place throughout the deliveries, these locations are listed in the survey.
- Oakenville Road onto Old Hanging Rock Road would require extensive modifications with the swept path currently entering a landowner's boundaries for both blade options.
- Old Hanging Rock Road onto Happy Valley Road would also require a large amount of modifications and tree removal for both blades, however the 65 metre blades would not be as extensive. These upgrades will likely stay within the road reserve.
- Happy Valley Road onto Jenkins Road would require extensive modifications with the swept path currently entering a landowner's boundaries for the 83-metre blade. The 65-metre blade would need some hardstand added but would stay within the road reserve.
- Head of Peel Road is gravel for the entirety and would need to be made suitable for all weather travel.
  The swept path of this road is generally good, but several sections of the road will need to be widened depending on the specifics of the trailer used for transportation.
- This section of road also has several Crests and dips and floodway's that would also need to be surveyed. This would allow us to determine if the largest trailers have adequate clearance to pass through them without the need for additional road works.
- Additionally, several trees on this route will need to be pruned and possibly removed.
- A full survey would need to be done on this road to determine the exact amount of works that would be required. The swept path of the 65-metre blade is far better than the 83 metre blade, and would save a large amount of work.
  Smaller components will turn right off Oakenville Street onto Jenkins Street. It would be possible to transport towers and motors around these corners if the centre median strips were temporarily removed or lowered.

ACCESS ROUTE OPTION 2: (Nundle to Northern site entrance)

Loads to continue directly ahead on Oakenville Road through Jenkins Street, travelling via Old Hanging Rock Road, Barry Road and Morrisons Gap Road.

- Oakenville Street would require no parking areas put in place throughout the deliveries, these locations are listed in the survey.
- Barry Road will not accommodate either size blade on a standard trailer. The section of road through the Devils elbows is too tight and the terrain too steep to modify. Blade lifters are a possibility but would be high risk due to the gradient through the Devil's Elbow. The larger towers would not make these turns, and again the gradient is too steep to make a suitable swept path for these loads. Either side of the Devil's Elbow the road has tight sections that would need upgrades, these would include tree removal and hardstand.
- Barry's Road onto Morrisons Gap Road would require extensive modifications with the swept path currently entering a landowner's boundaries.
- Morrisons Gap Road is gravel for the entirety and would need to be made suitable for all weather travel.
- The swept path of this road is tight in several sections, but several sections would need to be widened.
- This section of road also has several Crests that would also need to be surveyed. This would allow us to determine if the largest trailers have adequate clearance to pass through them without the need for additional road works.
- Additionally, several trees on this route will need to be pruned and possibly removed.

SUMMARY OF ROUTES:

After reviewing all Main routes and Site access options, we are under the opinion that the loads could be delivered through to Nundle with a number of upgrades.
The 83 metre and the 65 metre blades would require a new detour around Muswellbrook and approvals would still need to be sought to confirm that this is possible.
The 2 options to access the Hill of Gold windfarm once the loads arrive at Nundle both have considerable road modifications that would need to take place before they could become a reality for both blade types.
Out of both option, option 1 in our opinion is the only realistic route out of both.
Option 2 we deem as high risk and does not have the capacity to take the towers even if the blades could be transported in a lifter.
Option 1 still requires an extensive amount of work but is more realistic. The access from Kirks Road through to the site access roads would need to be made suitable for the largest loads.

GENERAL ROAD ACCESS:

BRIDGE CROSSINGS:

This route from Newcastle to Tamworth has been used in the past for items up to 100T. 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:

The lowest structure on this route 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 the bridge via the Golden Highway. A maximum height of 5.8 metres than would be the lowest structure that cannot be avoided. This structure is on the New England Highway at Hexham.

OVERHEAD WIRES:

This route would need to be assessed to handle a loaded height of up to 5.5 metres. It is likely that there are wires that will need to be raised.

RAIL ASSETS:

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

FLOODWAYS:

There are several floodways on the access roads that will need to be raised and widened. These floodways 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:

There are number of crests on Head of Peel Road and Morrisons Gap Road that will need to be surveyed. Hydraulic lift trailers could overcome these obstacles without the need for additional road works.

PAVEMENT:

The Pavement up to Head of Peel Road and Morrisons Gap Road is of suitable highway grade. Head of Peel Road and Morrisons Gap Road are both gravel and would need widening as well as upgrading to an all-weather surface.

ROADWORKS:

Roadworks 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
- NSW Police
- Ausgrid
- Essential Energy
- Telstra
- CRN JHG (Rail)
- ARTC (Rail)

16.0 References:

RMS 2008 Version 2: Operating Conditions: Specific permits for oversize and overmass vehicles and loads
Rex Andrews Engineered Transportation Pty. Ltd.
Goldwind Australia
Epuron
Route Survey LL273 REV01.
Google Earth/Maps
Nearmaps
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.

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 C

Stakeholder Consultation

Tamworth Regional Council

Memorandum

To: Circulated to attendees

From: Stephen Read

Date: 26 August 2020

TTPP REF: 18289

RE: HILLS OF GOLD WIND FARM
TAMWORTH REGIONAL COUNCIL BRIEFING

Date: Tuesday 18 August 2020

Location: Meeting via MS Teams

Attendees:

Stephen Read	The Transport Planning Partnership (TTPP)	**SR**
Amanda Antcliff	ERM	**AA**
Murray Curtis	ERM	**MC**
Robert Bell	Tamworth Regional Council (Council)	**RB**
Josh Granville	Tamworth Regional Council (Council)	**JG**
Jamie Chivers	Someva renewables (Someva)	**JC**

Apologies:

Jason Rudd	TTPP	**JR**

Table 1: Meeting Minutes

Item	Description	Action
1	**RB** noted that Warren Faulkner (Council) who was met on site was on secondment.	noted
2	Introduction to the Project by **AA**. Background on the Hills of Gold Wind Farm location and size of project including power lines. Traffic assessment undertaken by TTPP, ERM are undertaking the environmental assessment.	-
3	**SR** presented summary of briefing notes. Purpose of the briefing is to allow Council to respond to the project.	-
4	**SR** there is a constraint at the Goonoo Goonoo Creek Bridge that would require widening for vehicles with axle widths wider than 3.5m.	-
5	**RB** Council would generally support the road upgrades for a State Significant Development (SSD) and take over the asset after the project.	Noted
6	**SR** noted that Middlebrook Creek Bridge was due to be upgraded. **RB** was not aware of the details of the upgraded. Request for any information about the upgrade of the Middlebrook Creek Bridge.	**RB** to identify upgrades of bridges on Lindsays Gap Road.
7	Discussion of alternative route through Tamworth if the bridges on Lindsays Gap Road were not to be upgraded. **RB** noted that the proposed route through Tamworth was used by the Glen Innes wind farm project (White Rock & Sapphire Wind Farms).	Noted
8	**SR** presented the option and constraints for the Devils Elbow Barry Road section of the route. **RB** noted that there would be 'black ice' or snow issues in winter. **MC** noted that the proposed Devils Elbow realignment would be a private road and not open to the public, to only be used by construction vehicles. **RB** noted that council would not be opposed to the upgrade being a private road.	**SR** to note the black ice issue in the transport assessment.
9	**SR** noted the provision of a layover at on Barry Road to allow staging of the trucks and storage. **RB** raised the issue of school buses and forestry vehicles. **AA** noted that the Project team are currently liaising with Forestry Corporation about the project.	**SR** to note in the transport assessment the provision of the layover to avoid road closures at sensitive times such as school buses and Forestry.
10	**SR** raised the possibility of sealing and upgrading Morrisons Gap Road. **RB** indicated that Council would not be opposed to the sealing of Morrisons Gap Road.	Noted
11	**SR** raised the issue of formed roads of Morrisons Gap Road and Head of the Peal Road that do not follow the road reserve. **RB** indicated that Council would be able to assist in negotiating with the landowners to either relocate road or move the road reserve.	**RB** to provide advice on how council will assist in the process.
12	**RB** raised the issue of need to relocate power lines for the upgrades in Nundle. **SR** confirmed this was under consideration.	**SR** to confirm need for power line relations in route upgrade requirements.
13	**MC** requested that Council provide their standard terms for road upgrades including standard terms, maintenance issues, dilapidation inspections etc. and requirements for section 138 approvals.	**RB** to indicate Councils standard terms and conditions.
14	**MC** Requested that Council provide a written response on Council letterhead to the issues raised in the briefing note, pre-DA advice and in an in-principle agreement to the road infrastructure upgrades that are proposed.	**RB** to provide written response.

Mr Stephen Read
TTPP Transport Planning
Suite 402
22 Atchison Street
ST LEONARDS NSW 2065

Dear Stephen

HILLS OF GOLD WIND FARM TRANSPORT AND ROAD UPGRADES - NUNDLE

Ref: sk/SB/TTPP 18289

Please note the formal response as previously advised by email:-

Tamworth Regional Council agrees that the alignment proposed is capable of being upgraded to accommodate the proposed haulage, however final approval will be subject to the full Transport Impact Assessment.

This assessment will need to include environmental impacts, geometric feasibility and proposed traffic management for mitigation of impacts on existing users.

In response to the specific questions raised in the teleconference:-
4. Goonoo Goonoo Road Bridge will require widening. It will require a clear carriage way of 6.5 metres (as per your email dated 25/09/2020).
6. Middlebrook Creek Bridge replacement is not on Council's current Capital Works Program for upgrade. The bridge is sufficient for current HML loading.
11. While Morrisons Gap Road and Head of the Peel Road are outside the actual road reserve they function as a road and it would not be anticipated that any change would be required as part of this development.
13.General Section 138 conditions – Depending on the condition of Morrison Gap and Head of the Peel Roads a resheet/ bitumen seal may be required.

In line with Council's Development Control Plan and "Minimum Standards for Subdivisions and Developments" (both of which can be found on Council's web site), the following conditions are anticipated:-
1. Road crossings are to use underboring techniques only unless alternate method is approved by the roads authority (Council –Regional Services Directorate);
2. A Dial Before You Dig enquiry shall be lodged and any applicable services including TRC assets are to be potholed to ensure no clashes exist;
3. All open trenches and pits within the footway shall be fenced off to prevent any unauthorised access by members of the public;
4. A traffic control plan prepared by an NSW Worksafe accredited person in accordance with AS 1742 and the RMS Traffic Control at Worksites Manual will need to be provided for all works and submitted to Council prior to works commencing;
5. All surrounds to new pits/valve covers shall be shaped to suit and should be situated outside of the clear zone where possible, in the event this is not possible consultation with Council

shall be undertaken and installation of warning devices such as guideposts shall be installed to highlight any potential hazard;

6. Signage shall be installed to highlight any areas where vibration rolling could be detrimental to any new infrastructure due to low cover or heightened loadings.

7. An inspection of all the impacted road pavements prior to and after works in conjunction with Council shall be undertaken to ascertain the condition of the roads and establish whether any rectification works are required prior to leaving site or within the defects liability period of the works;

8. Any driveways, footpaths or footways affected by the works shall be reinstated to existing;

9. The footway/verge shall be left in a clean and tidy manner following works and seeded to reinstate existing ground coverage;

10. Any damage to Council infrastructure caused by the works shall be rectified by the Contractor at their expense;

11. Appropriate erosion and sediment control will require implementation during works;

12. Evidence that Public liability insurance to the value of $20mill for the duration of the works shall be provided to Council prior to works commencing; and

13. Council shall be informed of the respective contractor undertaking the works prior to works commencing.

14. WAE documentation shall be provided to Council for any works within the road reserve.

Please contact Council's Development Engineer, Robert Bell, should you wish to further discuss this matter.

Yours sincerely

Steve Brake
Manager, Development Engineering

Tamworth Regional Council
Ray Walsh House
437 Peel St, Tamworth, NSW, 2340
Ph: (02) 6767 5109

Stephen Read

From: Bell, Robert <r.bell@tamworth.nsw.gov.au>
Sent: Friday, 25 September 2020 9:00 AM
To: Stephen Read
Cc: Brake, Steve; Hazelwood, Michael
Subject: FW: Hills of Gold Wind Farm

Follow Up Flag: Follow up
Flag Status: Flagged

Morning Stephen,
Please find attached comments from Council's Regional Services.
They have requested advise on how much widening is required on Goonoo Goonoo Bridge?
Please advise if you have any further questions or require further information in relation to the Council Briefing.

Regards,

Robert Bell
Development Engineer
Planning & Compliance
Ph: (02) 6767 5288
M: 0434 244 774

Tamworth REGIONAL COUNCIL

From: Morrow, Jay
Sent: Tuesday, 22 September 2020 4:40 AM
To: Hazelwood, Michael
Subject: RE: Hills of Gold Wind Farm

Hey Mick,

Answers follow:

5: Yes
6: N/A bridge is sufficient for current HML loading.
11: Although these roads may lie outside of the actual road reserve they function as the road and it would not be anticipated any change would be required as part of the development.
13: General section 138 conditions follow: Depending on the condition of the (Morrison Gap and Head of Peel) roads a resheet/seal may be required……

In line with Council's Development Control Plan and "Engineering Design Guidelines for SubDivisions and Developments" (both of which can be found on Council's web site), the following conditions are imposed:

1. Road crossings are to use underboring techniques only unless alternate method is approved by the roads authority (Council - Infrastructure and Works division);
2. A Dial Before You Dig enquiry shall be lodged and any applicable services including TRC assets are to be potholed to ensure no clashes exist;

3. All open trenches and pits within the footway shall be fenced off to prevent any unauthorised access by members of the public;
4. A traffic control plan prepared by an NSW Worksafe accredited person in accordance with AS 1742 and the RMS Traffic Control at Worksites Manual will need to be provided for all works and submitted to Council prior to works commencing;
5. All surrounds to new pits/valve covers shall be shaped to suit and should be situated outside of the clear zone where possible, in the event this is not possible consultation with Council shall be undertaken and installation of warning devices such as guideposts shall be installed to highlight any potential hazard;
6. Signage shall be installed to highlight any areas where vibration rolling could be detrimental to any new infrastructure due to low cover or heightened loadings.
7. An inspection of the Dungowan Dam Road pavement prior to and after works in conjunction with Council shall be undertaken to ascertain the condition of the road and establish whether any rectification works are required prior to leaving site or within the defects liability period of the works;
8. Any driveways, footpaths or footways affected by the works shall be reinstated to existing;
9. The footway/verge shall be left in a clean and tidy manner following works and seeded to reinstate existing ground coverage;
10. Any damage to Council infrastructure caused by the works shall be rectified by the Contractor at their expense;
11. Appropriate erosion and sediment control will require implementation during works;
12. Evidence that Public liability insurance to the value of $20mill for the duration of the works shall be provided to Council prior to works commencing; and
13. Council shall be informed of the respective contractor undertaking the works prior to works commencing.
14. WAE documentation shall be provided to Council for any works within the road reserve.

14: N/A not our question to answer without notification of proposed upgrades…., either pre da minutes or RB to advise….

Regards,

Jay Morrow
Operations Works Manager - Infrastructure & Works, Regional Services
Tamworth Regional Council
Phone: 0267 675013

From: Hazelwood, Michael
Sent: Monday, 21 September 2020 11:52 AM
To: Morrow, Jay
Subject: FW: Hills of Gold Wind Farm

Jay,
Just shifting this one to the top of your email inbox.
Can you have a look and Items 5,6,11,13 and 14

Regards,

Michael Hazelwood
Operations Manager - Construction
Tamworth Regional Council
P: 02 6767 5065
M: 0417 288 094
E: m.hazelwood@tamworth.nsw.gov.au
Tamworth Regional Council - Website | Facebook | Instagram
Destination Tamworth - Website | Facebook | Instagram |#TamworthNSW

From: Bell, Robert [mailto:r.bell@tamworth.nsw.gov.au]
Sent: Monday, 14 September 2020 8:53 AM
To: Hazelwood, Michael
Subject: FW: Hills of Gold Wind Farm

Hi Michael.
fyi

Regards,

Robert Bell
Development Engineer
Planning & Compliance
Ph: (02) 6767 5288
M: 0434 244 774

From: Bell, Robert
Sent: Tuesday, 8 September 2020 11:41 AM
To: Russell, Murray
Cc: Brake, Steve; Glanville, Joshua
Subject: FW: Hills of Gold Wind Farm

Hi Murray,

I have attached the Minutes from a Zoom meeting held 18/08/2020.
Please note the following items:-
4. Goonoo Goonoo Bridge –will require widening (by developer)
5. Advise if okay.
6. Middlebrook Creek Bridge – will require upgrading. Developer advised they thought it was on an upgrade program If it is not on TRC's Capital Works Program for 2020/21 then it will be at Developers cost.

11. Barry Road and Head of the Peel Road not on correct alignment. I understand that while TRC would be supportive it is a matter for the Developer and the private property owners. TRC would have no urgency in rectifying the problem.
13. TRC to provide standard terms for maintenance issues, dilapidation inspections and requirements for Section 138 approval.
14. Request that TRC provide a written response to the issues raised in this briefing note and an in principle agreement to the road infrastructure upgrade that are proposed. I will prepare once I have your response.
Let me know if you have any questions.

Regards,

Robert Bell
Development Engineer
Planning & Compliance
Ph: (02) 6767 5288
M: 0434 244 774

Tamworth REGIONAL COUNCIL

From: Stephen Read [mailto:stephen.read@ttpp.net.au]
Sent: Monday, 7 September 2020 4:34 PM
To: Bell, Robert
Cc: Brake, Steve; Glanville, Joshua
Subject: RE: Hills of Gold Wind Farm

Hi Robert

Please find attached the meeting minutes.

Regards

Stephen

Stephen Read
Associate
p: +61 2 8437 7800 m: +61 437 657 952
a: Suite 402, 22 Atchison Street, St Leonards NSW 2065
w: www.ttpp.net.au e: Stephen.Read@ttpp.net.au

ttpp transport planning

Quality Management - ISO 9001 Global-Mark.com.au®
OHS Management - AS/NZS 4801 Global-Mark.com.au®
Environmental Management - ISO14001 Global-Mark.com.au®

From: Bell, Robert <r.bell@tamworth.nsw.gov.au>
Sent: Monday, 7 September 2020 9:16 AM
To: Stephen Read <stephen.read@ttpp.net.au>

Cc: Brake, Steve <s.brake@tamworth.nsw.gov.au>; Glanville, Joshua <j.glanville@tamworth.nsw.gov.au>
Subject: Hills of Gold Wind Farm

Morning Stephen,
Following our Zoom meeting 18th August I was hoping to have the record notes from this meeting to allow TRC to provide further information as discussed.

Regards,

Robert Bell
Development Engineer
Planning & Compliance
Ph: (02) 6767 5288
M: 0434 244 774

Stephen Read

From: Bell, Robert <r.bell@tamworth.nsw.gov.au>
Sent: Monday, 28 September 2020 10:18 AM
To: Stephen Read
Cc: Brake, Steve; Morrow, Jay; Glanville, Joshua
Subject: Hills of Gold Wind Farm

Hi Stephen,

In response to your email dated 25/09/2020 please note the following formal response:-

Tamworth Regional Council agrees that the alignment proposed is capable of being upgraded to accommodate the proposed haulage, however final approval will be subject to the full Transport Impact Assessment.
This assessment will need to include environmental impacts, geometric feasibility and proposed traffic management for mitigation of impacts on existing users.
Please contact me should you wish to further discuss this matter.

Regards,

Robert Bell
Development Engineer
Planning & Compliance
Ph: (02) 6767 5288
M: 0434 244 774

Tamworth REGIONAL COUNCIL

15	**RB** requested meeting minutes of this meeting to assist in Council's response and update to the briefing memo.	**SR** to write up meeting minutes and send to **AA** for review and then to Council.

Transport For NSW

25 September 2020

TfNSW Ref: NTH18/00147/02

The Transport Planning Partnership (TTPP)
Suite 402, 22 Atchison Street
ST LEONARDS NSW 2065

Attention: Stephen Read – Associate, TTPP

Dear Stephen,

Pre-lodgement Advice – SSD9679 – Proposed Hills of Gold Wind Farm
Morrisons Gap Road, Hanging Rock.

I refer to your email dated 17 August 2020 requesting pre-lodgement advice from Transport for NSW (TfNSW) regarding the proposed Transportation Route Assessment for the abovementioned development proposal.

Roles and Responsibilities

From 1 December 2019, all functions and responsibilities of Roads and Maritime Services will now be vested in an integrated Transport for NSW (TfNSW). Our key interests are for the safety and efficiency of the transport network, the integrity of State infrastructure and the integration of land use and transport in accordance with *Future Transport Strategy 2056.*

The proposed transportation route/s consist of the following classified (State) roads as defined under the *Roads Act 1993* (Roads Act), The New England Highway [HW9], Pacific Highway [HW10], Golden Highway [HW27], Denman Road [MR209], Industrial Drive [MR316], John Renshaw Drive [MR588] and the Hunter Expressway [M15]. The local Councils are the roads authorities for all public roads (other than freeways or Crown roads) in the respective local government areas pursuant to Section 7 of the Roads Act. TfNSW is the roads authority for freeways and can exercise roads authority functions for classified roads in accordance with the Roads Act. Any proposed works on a classified (State) road will require the consent of TfNSW. Consent is provided under the terms of a Works Authorisation Deed (WAD).

In addition to the above, it is noted that Nundle Road [MR105] and Lindsays Gap Road [MR106] are classified (Regional) roads. TfNSW's concurrence is required prior to Council's approval to works on these roads in accordance with S138 of the Roads Act.

In accordance with Clause 101 of the State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) the Consent Authority must have consideration for the safety, efficiency and ongoing operation of a classified road where development has frontage to a classified road. TfNSW is given the opportunity under Clause 104 to comment on traffic generating developments listed under Schedule 3.

The following comments are based on the information provided in your email enquiry, in particular with regards to the Transport Route Assessment (the report) produced by Rex J Andrews (RJA), and subsequent phone calls. These comments are not exhaustive. TfNSW will provide further

comment in response to any further request for pre-lodgement advice and/or any request from the Consent Authority to comment on the Development Application (DA).

Transport for NSW Response

The following comments are provided in response to the report provided in the pre-lodgement enquiry, dated 17 August 2020;

1. TfNSW have no objections at this time, to the movements of the largest blade size, however it should be noted, that the largest blade movement for a wind farm project in NSW to date has been for 67m blades. These length blades have previously travelled along the proposed route out of Newcastle Port without incident.

   The report appears to be proposing to transport blades of two sizes, 65.4 metres and 82 metres. In that regard we expect that the final Environmental Impact Statement (EIS) will define the proposed blade length.

2. Please refer to **Attachment A** for detailed comments and feedback on the report. It should be noted, that it is difficult for TfNSW to comment with certainty on the report due to gaps identified in the document. These comments and feedback should be used to further develop the Transport Management Plan (TMP), this TMP should inform the EIS. In addition to a TMP, we expect the EIS will include a Traffic Impact Assessment (TIA) addressing all other traffic related impacts.

If you have any further enquiries regarding the above comments please do not hesitate to contact Katrina Wade, Development Assessment Officer or the undersigned on (02) 6640 1362 or via email at: development.northern@rms.nsw.gov.au

Yours faithfully,

for Matt Adams
Manager Land Use Assessment Northern
Regional NSW and Outer Metropolitan
Transport for NSW

Enc. Attachment A - Preliminary technical comments relating to the Transport Route Assessment by RJA

ATTACHMENT A – Preliminary technical comments relating to the Transport Route Assessment by RJA

For context, this attachment must be read with TfNSW letter of 25 September 2020

The following comments have been sought from various TfNSW departments to assist you with the further development of the Hills of Gold Wind Farm (the Project) documentation, including but not limited to the Environmental Impact Statement (EIS), Traffic Impact Assessment (TIA), Transport Management Plan (TMP), and the Transport Route Assessment (the report).

GENERAL ADVICE

1. The route/s beyond the intersection of the New England Highway [HW9] and Nundle Road [MR105] and the intersection of the New England Highway [HW9] and Lindsays Gap Road [MR106] are under the care and control of Tamworth Regional Council, further advice should be sought from council in regards to the relevant classified (regional) and local roads in this location.
2. Any damage to the state road assets as a result of the project and the associated heavy vehicles will be required to be "made good" by the project (the twisting of the heavy vehicle at some of the intersections is likely to damage the spray seal). A dilapidation survey may be required prior to the commencement of the Project.
3. Vehicles identified in the report completely blocking the classified and local road/s during turning manoeuvres, will require police escorts, a Traffic Control Plan (TCP) and a Road Occupancy Licence (ROL), for these and other manoeuvres along the designated route/s, to prevent interactions with approaching vehicles. These processes will include further TfNSW reviews of the proposed manoeuvres.
4. The proposed movements appear possible with substantial pre-works. However it is noted that the proposal does not at this point address issues around load limits on bridges, or expand on potential options to widen bridge/s. This is something that will need to be clearly addressed in the Project submission.
5. The Transport Schematics diagrams, demonstrate the dimensions of the components being transported only, they do not demonstrate the dimensions of the design vehicles, in particular the axle widths.
6. Any removable signs installed for the project will require replacement with conventional signage posts at project completion.
7. Any modification to the state road assets will require the proponent to enter into a Works Authorisation Deed (WAD) with TfNSW for any roadwork deemed necessary on the classified (State) road. The developer will be responsible for all costs associated with the roadwork and administration for the WAD. It is recommended that developers familiarise themselves with the requirements of the WAD process. Further information can be obtained from the TfNSW website.
8. It is noted that the report indicates the use of Kelly Street in Scone via the rail level crossing. TfNSW recommends the project investigates the use of the Scone Bypass as an alternative.

SIGNALISED INTERSECTIONS

9. Signalised intersection of Industrial Drive [MR316] and George Street, Mayfield:
   - The larger 82 metre blades appear to be impacting the traffic signal posts at this intersection. There is potential for TfNSW undertaking future upgrades/reconstruction works on this signalised intersection to assist with Over Size Over Mass (OSOM) vehicles.

FURTHER INFORMATION REQUIRED

10. There are two existing bridges on Lindsays Gap Road [MR106] which have been identified to have axle width constraints (no larger than 3.5m wide) and potential for load weight issues. Although this has been acknowledged in the report by way of a detour route suggestion, very little detail has been provided in regards to the route of the proposed detour, or the vehicles and associated components which will require the use of that detour.

    TfNSW recommends this alternate detour route, be addressed in the report as an additional route. This route should clearly identify the design vehicles and relevant components which will need to be transported along the route and demonstrate that the proposed vehicles with their designated loads are able to traverse the route, or where applicable, propose appropriate mitigation measures to address any additional obstructions identified.

DETAILS TO BE UPDATED IN THE REPORT

11. It is understood from information supplied at the time of the Secretary's Environmental Assessment Requirements (SEARs) process, that the original construction commencement date was estimated to be during the 3rd quarter of 2020 (approximately now). However this information is now outdated. Through a further telephone conversation with Stephen Read, it is now understood an estimate of approximately 2022 is likely.

    If construction is not likely to commence until 2022, the Route Survey will need to be reassessed to cater for new road infrastructure / upgrades completed from 2019 to 2022 and also take into consideration any proposed works under construction during the project's new construction phase. Noting that projects may yet to be identified.

BLADE SIZE

12. The largest blade movement for a wind farm project in NSW to date has been for 67 metre long blades. These blade lengths have used the proposed route out of Newcastle Port without incident for several wind farms. The report has proposed the transportation of two different blade lengths of 65.4 metres and 82 metres. The information provided does not clearly indicate whether the Project consists of two different sized blades or whether the DA will be seeking approval to use the larger sized blades only. In that respect the final EIS, and TIA will need to clearly define the proposed blade length for the Project and be supported by a thorough *Transport Management Plan (TMP).*

    It should be noted that the longer blade creates a heightened level of risk to infrastructure, network efficiency and the safety of other road users. Considerable works will need to be funded and delivered by the Project prior to the transportation of components commencing.

13. The Project will need to work with TfNSW to develop plans for the OSOM operations. Any approval for access to the NSW road network would be subsequent to a thorough TMP that clearly explains how all risks will be mitigated.

14. The 82 metre blades would be an extreme load, however, the proposed movements appear possible with substantial pre-works.

15. Any approvals to carry out the pre-works would be subsequent to the approval to travel over private land at least two intersections.

TfNSW would like to highlight that these comments are preliminary and based on the information available to us at the time of review. TfNSW will conduct a full assessment and provide further response once the development application has been submitted to TfNSW by the Consent Authority.

End of document.

Forestry Corporation NSW

Forestry Corporation of NSW ABN 43 141 857 613
Hardwood Forests Division
Maher Street Wauchope NSW 2446
(PO Box 168 Wauchope NSW 2446)
T 02 6585 3744
F 02 6585 2392
www.forestrycorporation.com.au

11/09/2020
Ref No.: F2019/00440

Stephen Read
The Transport Planning Partnership
Suite 402, 22 Atchison Street
ST LEONARDS NSW
2065

stephen.read@ttpp.net.au

Dear Stephen,

Hills of Gold Wind Farm – Transport and Road Upgrades

Thank you for the brief dated 18th August 2020 detailing the likely works required to transport the various wind turbine components to the Hills of Gold Wind Farm, east of Nundle. I passed this report on to our operational staff and it was noted that the likely route will have an imact of Forestry Corporation of NSW (FCNSW) log haulage activities out of Nudle State Forest.

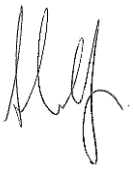
The following issues were identified:

- Road closures will impact on log trucks. However, closures of 10-15 minutes, a couple of times a day, will not have a significant impact on production
- Communication protocols currently in place with log trucks must be implemented by the trucks hauling the turbine components
- FCNSW require advanced notification of when haulage of components will begin so as to advise all parties involved with logging activities in the area of likely temporary road closures and the presence of oversized vehicles

It was also noted that any improvements in road width and alignment would be welcomed.

If you require any further information please do no hesitate to contact me on 0447 744 436 or scott.mallyon@fcnsw.com.au

Yours sincerely



Scott Mallyon
Manager, Forest Occupancy & Materials

Singleton Council

Stephen Read

From: Paul Smith <psmith@singleton.nsw.gov.au>
Sent: Thursday, 17 September 2020 8:45 AM
To: Stephen Read
Cc: Damian Morris; Sam Masoomi
Subject: RE: Hills of Gold Wind Farm - Traffic and Transport Assessment

Hi Stephen,

Thank you for sending through information regarding the transportation and road upgrades for the Hills of Gold Wind Farm.

I note that all of the traffic movements through Singleton LGA will take place on state roads and will not impact directly on Singleton Council's assets and as such Singleton Council does not have any objections, at this stage, with the proposed route.

Council's main area of concern is with regards to impacts and delays to motorists. I understand that the project is at an early stage, however Council requests that as the project progresses that we are kept fully updated.

Regards,
Paul

SINGLETON COUNCIL

PAUL SMITH
Traffic Engineering Officer

T 02 6578 7273
E psmith@singleton.nsw.gov.au
W singleton.nsw.gov.au

#WEAREHEREFORYOUNOMATTERWHAT
THANK YOU FOR YOUR UNDERSTANDING AS WE WORK HARD TO ASSIST YOU IN THESE CHALLENGING TIMES

From: Stephen Read <stephen.read@ttpp.net.au>
Sent: Friday, 11 September 2020 11:14 AM
To: Singleton, Council <council@singleton.nsw.gov.au>
Subject: Hills of Gold Wind Farm - Traffic and Transport Assessment

Hi

We are preparing a traffic and transport assessment for the Hills of Gold Wind Farm near Nundle NSW. Components of the Wind Farm will be travelling through Singleton Council area on state roads. As part of the EIS assessment we are seeking engagement from Council on the route for comment. Attached are some background briefing note that shows the route.

Stephen

Newcastle Council

Stephen Read

From: Jocelyn Cardona <jcardona@ncc.nsw.gov.au>
Sent: Friday, 11 September 2020 1:07 PM
To: Stephen Read
Subject: RE: TR2002/02432 - Turbine Blade to transport from Mayfield Port -EIS

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Stephen,
Thank you for your referral about the proposed transportation of the turbine blades in Newcastle.

My comments to your EIS are the following:

1) The route will only impact Selwyn Street and part of George Street, Mayfield. The rest are Transport for NSW infrastructure.
2) The EIS should consider the turning movements of the heavy vehicle plus the blade load that it will not hit our road infrastructures.
3) The transport time should be during at night or early hours of the morning when there is less traffic.
4) An NHVR application should be applied before the event take place.

Regard
Jocelyn

Jocelyn Cardona | Transport & Traffic Coordinator
City of Newcastle | Governance
Transport & Compliance | Traffic
T: +61249742666 | M: +61421612491 | E: jcardona@ncc.nsw.gov.au

Newcastle - a smart, liveable, sustainable global city.
Cooperation | Respect | Excellence | Wellbeing

From: Stephen Read <stephen.read@ttpp.net.au>
Sent: Tuesday, 8 September 2020 3:33 PM
To: Official Mail <officialmail@ncc.nsw.gov.au>
Subject: TR2002/02432

To the Traffic and transport team.

We are preparing a traffic and transport assessment for the Hills of Gold Wind Farm near Nundle NSW. Components of the Wind Farm will be travelling through City of Newcastle council area. As part of the EIS assessment we are seeking engagement from Council on the route for comment. Attached are some background briefing note that shows the route.

Stephen

Stephen Read
Associate

Cessnock Council

Stephen Read

From: Traffic and Transport <traffic@cessnock.nsw.gov.au>
Sent: Thursday, 10 September 2020 12:33 PM
To: Stephen Read
Subject: Traffic & Transport _ Various Roads Cessnock LGA _ Response CRM 17929/2020 - Hills of Gold Wind Farm _ The Transport Planning Parternship
Attachments: RJA Transport Route Survey Newcastle Port to Hills of Gold WF - FINAL.pdf; 18289 m08v02 Hills of Gold Breifing SR.pdf

Hi Stephen,

Thanks for the opportunity to provide feedback on the proposed routes.

As the identified routes and any likely infrastructure impacts are confined to the state road network, and there will be no impact on the local road network, Council has no specific comments on the proposed routes other than to support the use of these routes as Councils preferred option for these vehicle movements.

If you require any further information, please do not hesitate to contact Council's Customer Service on 4993 4100 or by email to council@cessnock.nsw.gov.au

Regards

Nathan Goodbun Traffic Engineering Officer
62-78 Vincent St | PO Box 152 | Cessnock NSW 2325
p 02 4993 4315
www.cessnock.nsw.gov.au

From: Stephen Read <stephen.read@ttpp.net.au>
Sent: Tuesday, 8 September 2020 2:44 PM
To: council <council@cessnock.nsw.gov.au>
Subject: Hills of Gold Wind Farm - traffic

Hi

We are preparing a traffic and transport assessment for the Hills of Gold Wind Farm near Nundle NSW. Components of the Wind Farm will be travelling through Cessnock Council area on state roads. As part of the EIS assessment we are seeking engagement from Council's on the route for comment. Attached are some background briefing note that shows the route.

Stephen

Stephen Read

Associate
p: +61 2 8437 7800 m: +61 437 657 952
a: Suite 402, 22 Atchison Street, St Leonards NSW 2065
w: www.ttpp.net.au e: Stephen.Read@ttpp.net.au

Muswellbrook Shire Council

Stephen Read

From: Elizabeth Curnow <Elizabeth.Curnow@muswellbrook.nsw.gov.au>
Sent: Thursday, 8 October 2020 11:22 AM
To: Stephen Read
Cc: Kellie Scholes; Peter Chambers
Subject: RE: Hills of Gold - Windfarm briefing note

Stephen
I apologise for the lack of response to your emails.
The route you are requesting through Muswellbrook is currently under investigation as we have a number of issues with it including advice not to allow heavy vehicle movements over Rosebrook Bridge.
For this proposal to be considered, a comprehensive route analysis would have to be undertaken including all bridges and drainage structures to determine the impact involved on the road assets.
The proposed road changes/upgrades would not nominally be funded by council and a design should be done and submitted to council for their consent.

Regards

Liz Curnow
Asset Inspector
Roads and Drainage
Muswellbrook Shire Council
Telephone 02 6549 3725
Mobile 0428 168 078
Elizabeth.curnow@muswellbrook.nsw.gov.au
muswellbrook shire council

From: Stephen Read <stephen.read@ttpp.net.au>
Sent: Wednesday, 7 October 2020 3:27 PM
To: Elizabeth Curnow <Elizabeth.Curnow@muswellbrook.nsw.gov.au>; Peter Chambers <Peter.Chambers@muswellbrook.nsw.gov.au>; Kellie Scholes <Kellie.Scholes@muswellbrook.nsw.gov.au>
Subject: RE: Hills of Gold - Windfarm briefing note

Hi Elizabeth

We are hoping to finish our transport assessment for the Hills of Gold Wind Farm and would like to include any feedback or comments from Muswellbrook Council. Are you to send us any comments?

Stephen

Stephen Read
Associate
p: +61 2 8437 7800 m: +61 437 657 952
a: Suite 402, 22 Atchison Street, St Leonards NSW 2065
w: www.ttpp.net.au e: Stephen.Read@ttpp.net.au

From: Elizabeth Curnow <Elizabeth.Curnow@muswellbrook.nsw.gov.au>
Sent: Thursday, 17 September 2020 1:57 PM
To: Peter Chambers <Peter.Chambers@muswellbrook.nsw.gov.au>; Kellie Scholes <Kellie.Scholes@muswellbrook.nsw.gov.au>
Cc: Stephen Read <stephen.read@ttpp.net.au>
Subject: FW: Hills of Gold - Windfarm briefing note

Good afternoon Peter and Kellie
Please see the attached request from TTPP Transport Planning for the preparation of an EIS traffic and transport report for the use of Muswellbrook Shire Council roads to transport wind turbines.
This company is chasing comments on their proposal.
Thank you for your assistance.

Regards

Liz Curnow
Asset Inspector
Roads and Drainage
Muswellbrook Shire Council
Telephone 02 6549 3725
Mobile 0428 168 078
Elizabeth.curnow@muswellbrook.nsw.gov.au
muswellbrook shire council

From: Stephen Read <stephen.read@ttpp.net.au>
Sent: Monday, 31 August 2020 11:27 AM
To: OverSized Permits <OverSizedPermits@muswellbrook.nsw.gov.au>; Muswellbrook Shire Council <council@muswellbrook.nsw.gov.au>
Cc: Elizabeth Curnow <Elizabeth.Curnow@muswellbrook.nsw.gov.au>
Subject: FW: Hills of Gold - Windfarm briefing note

Hi

I'm preparing an EIS traffic and transport report for the Hills of Gold Wind Farm near Nundle. As the proposed route for transporting the wind turbines will travel through Muswellbrook Shire Council we are seeking feedback on the proposal from Council. Attached is a briefing note that I have prepared. Please contact me if you would like further information.

Regards

Stephen

Stephen Read

Associate
p: +61 2 8437 7800 m: +61 437 657 952
a: Suite 402, 22 Atchison Street, St Leonards NSW 2065
w: www.ttpp.net.au e: Stephen.Read@ttpp.net.au

ttpp transport planning

Quality Management · ISO 9001 Global-Mark.com.au®
OHS Management · AS/NZS 4801 Global-Mark.com.au®
Environmental Management · ISO14001 Global-Mark.com.au®

Liverpool Plains Shire Council

LIVERPOOL PLAINS SHIRE COUNCIL

Reference: DLA:dla 20/0174; D20/17930

Contact: **Craig Orvad**

12 October 2020

Mr Stephen Read
TTPP Transport Planning

BY EMAIL: ***stephen.read@ttpp.net.au***

Dear Sir

TRAFFIC IMPACT ASSESSMENT FOR HILLS OF GOLD WIND FARM

Thank you for your recent correspondence regarding the preparation of a Traffic Impact Assessment for the Hills of Gold Wind Farm project. The following feedback is provided to inform this process:

1. It is noted that the only local road proposed to be impacted within the Liverpool Plains Shire Council LGA is Lindsay Gap Road (Regional Road 106), of which Council is responsible for is 4.7 kilometres in total. There is no objection to this proposed route.

2. The turn path to the east from the New England Highway (HW 9) into Lindsay Gap Road appears to be suitable (referencing the provided turn-path template as part of the preliminary Transport Route Assessment). It is acknowledged that the entire the T-intersection will be used. Notwithstanding, this manoeuvre would anecdotally be accompanied by a number of pilot and Police Highway Patrol vehicles to manage traffic on the New England Highway whilst the manoeuvre is undertaken.

3. In traversing Lindsay Gap Road – which is gazetted for Restricted Access Vehicles up to 4.6m high, some lower tree branches have been noted over the proposed route and in reference to the Transport Route Assessment, it appears some indivisible loads are up to 6 metres in height. At the appropriate time, further analysis will be required (including a site inspection) to ensure low hanging branches to 6 metres are removed. Any vegetation removal would also be subject to the recommendations of any corresponding ecological assessments and associated requirements for the project.

4. The maximum load width appears to be up to 5.3 metres wide which can be accommodated on the LPSC-controlled section of Lindsay Gap Road – with the appropriate pilot/Police vehicles, as the entire carriageway will need to be utilised. The maximum load length appears to be up to 92 metres appears able to be accommodated, with the appropriate escort/Police vehicles support.

5. It is foreshadowed that a condition assessment of the impacted local road network is required. Any damage to LPSC road infrastructure as a result of construction-allied activity, both direct and indirect, will need to be rectified at the proponent's expense.

Council trusts that the above information provides the necessary assistance. Should you require any additional information or clarification in this regard, you are invited to contact Council's Asset Management Officer Mr Craig Orvad on (02) 6746 1755 or by emailing lpsc@lpsc.nsw.gov.au.

Yours faithfully

Nathan Skelly
DIRECTOR – ENGINEERING SERVICES

LIVERPOOL PLAINS SHIRE COUNCIL
60 Station Street PO Box 152 QUIRINDI NSW 2343 TEL 02 6746 1755 FAX 02 6746 3255
EMAIL lpsc@lpsc.nsw.gov.au WEBSITE www.lpsc.nsw.gov.au ABN 97 810 717 370

The Transport Planning Partnership
Suite 402 Level 4, 22 Atchison Street
St Leonards NSW 2065

P.O. Box 237
St Leonards NSW 1590

02 8437 7800

info@ttpp.net.au

www.ttpp.net.au