GTAconsultants

Biala Wind Farm Oversize and Overmass Transportation Traffic Management Plan

Client // Goldwind Australia

Office // NSW

Reference // N142521

Date // 11/02/202020

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Oversize and Overmass Transportation

Traffic Management Plan

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Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	19/12/18	Final	Okka Maw	Dora Choi	Dora Choi	Dora Choi
B	9/12/19	Final - amended	Raymond Zhang	Dora Choi	Dora Choi	Dora Choi
C	7/01/20	Final - amended	Raymond Zhang	Dora Choi	Dora Choi	Dora Choi
D	11/02/2020	Final - amended	Raymond Zhang	Dora Choi	Dora Choi	

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1. Introduction

1.1 Background

A State Significant Development Application (SSDA 6039) has been approved by the Department of Planning and Environment (DPE) for the proposed Biala Wind Farm (BWF). The proposed BWF is located approximately 15 kilometres southwest of the town of Crookwell near the township of Grabben Gullen. The project area is 1,936 hectares in size, which encompasses 32 individual lots. It will accommodate a total of 31 wind turbine generators with a maximum height of 185 metres.

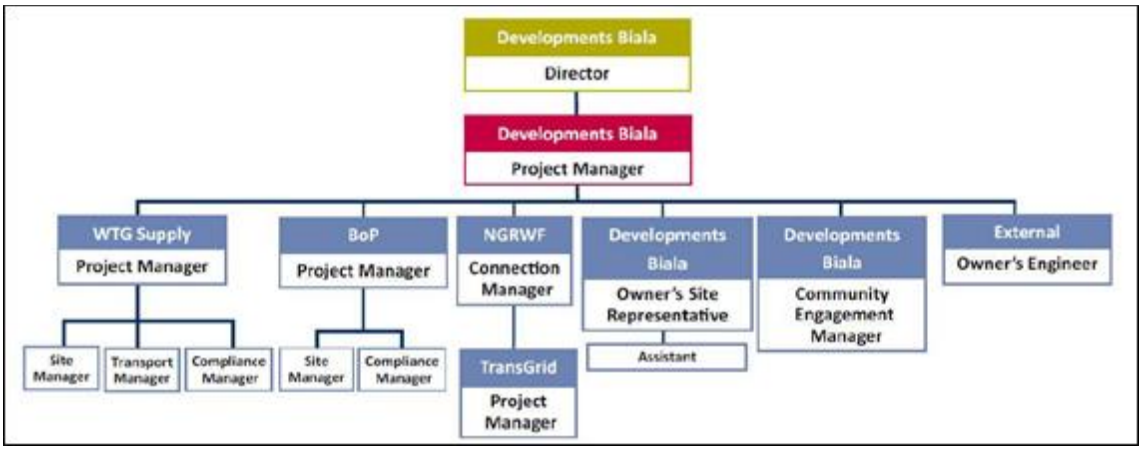
The construction of BWF is expected to be undertaken in two different works streams with different traffic generating characteristics:

- Stage 1: Balance of Plant (BoP) works consists of civil and electrical cabling, substation and operations/ maintenance buildings
- Stage 2: Wind turbine generator (WTG) supply and installation.

It is expected that the supply and install of the wind turbines and associated equipment will require the use of oversize and overmass (OSOM) transportation. A Construction Traffic Management Plan (CTMP) has been previously prepared and issued for the BoP by GTA. This included route analysis and assessment of traffic impacts associated with construction traffic.

The organisation of the BWF project is such that two different contractors will be appointed for the two different work streams (BoP and WTG supply). The overall project organisation chart is shown in Figure 1.1

Figure 1.1: BWF project organisation chart



Goldwind Australia have commissioned GTA Consultants (GTA) to prepare a Transport Management Plan (TMP) that identifies the transport implications associated with OSOM transportation of the 31 wind turbines and associated power control systems from Port Kembla to BWF. This plan, along with the attached route survey by Rex J Andrews, has been prepared in accordance with the requirements of Roads and Maritime Services' *Transport Management Plan for oversize and/ or over-mass movements in NSW* with specific details relating to the following:

- vehicle and load specifications
- obstacles and pinch points identified along the vehicle routes
- traffic management arrangements required during the OSOM movement
- stakeholder consultation and community notifications.

At the time of preparation of this OSOM Traffic Management Plan, a transport contractor has not been appointed for the OSOM transportation. The appointed transport contractor will be required to undertake all OSOM deliveries in accordance with this TMP.

This TMP addresses the OSOM transport related requirements set out in *Development Consent Section 89E of the Environment Planning & Assessment Act 1979*for SSD 6039 issued by the Department of Planning and Environment. The relevant consent conditions relating to traffic and transport are reproduced in Table 1.1. It should be noted that the CTMP for the BoP (GTA Consultants, 2018) has been prepared to address Consent Conditions 24, 25, 26 and 28.

Table 1.1: Conditions of Consent for SSDA 6039 – transport requirements

Consent Condition No.	Consent Condition Description	Relevant Section of this Report
24	*The Applicant must ensure that:* *a) all over-dimensional vehicle access to and from the site is via Hume Highway southern interchange through Goulburn, north along Crookwell-Goulburn Road and then bypassing Crookwell Township via Grange Road, Cullen Street, Kialla Road and Range Road connecting to Grabben Gullen Road* *b) all heavy vehicles access to and from the site is via the Hume Highway to Gunning then north along Grabben Gullen Road' and* *c) development related heavy vehicles must not travel on Hume Street and Yass Street in Gunning (south of Collector Road).* *Notes:* ○ *The Applicant is required to obtain relevant permits under the Heavy Vehicle National Law (NSW)for the use of over-dimensional vehicles on the road network.* ○ *The identified over-dimensional and heavy vehicle access routes are shown in the figure in Appendix 8.*	Section 2
25	*Prior to any over-dimensional vehicles accessing the site, the Applicant must carry out the road upgrades in the schedule of works in Appendix 7 to the satisfaction of Council.*	

Consent Condition No.	Consent Condition Description	Relevant Section of this Report
26	*The Applicant must:* *a) prepare a dilapidation survey of:* *o the designated heavy vehicle route:* *- prior to the commencement of any construction of decommissioning works other than pre-construction minor works; and* *- within 1 month of the completion of any construction of decommissioning works other than pre-construction minor works;* *o the designated over-dimensional vehicle route:* *- prior to the use of the route by any over-dimensional vehicles for the construction or decommissioning of the development; and* *- within 1 month of the completion of the use of the route by over-dimensional vehicles for the construction or decommission of the development;* *b) rehabilitate and/ or make good any development-related damage:* *o identified during the carrying out of the relevant construction and/ or decommissioning works if it could endanger road safety, as soon as possible after the damage is identified but within 7 days at the latest; and* *o identified during any dilapidation survey carried out following the completion of the relevant construction and/ or decommissioning works within 2 months of the completion of the survey unless the relevant roads authority agrees otherwise.* *to the satisfaction of the relevant roads authority.* *If the construction and/ or decommissioning of the development is to be staged, the obligations in this condition apply to each stage of construction and/ or decommissioning.* *If there is a dispute about the scope of any remedial works or the implementation of these works, then either party may refer the matter to the Secretary for resolution.*	Section 3
28	*Prior to the commencement of construction, the Contractor must prepare a Traffic Management Plan for the development in consultation with Roads and Maritime and Council, and to the satisfaction of the Secretary. This plan must:* *a) detail the measures that would be implemented to:* *o minimise the traffic safety impacts of the development and disruptions to local road users during the construction and decommissioning of the development, including:* *- temporary traffic controls, including detours and signage;*	Sections 4.9 and 7, Table 4.2
	- notifying the local community about development-related traffic impacts;	Section 6.4 and Table 4.2

Consent Condition No.	Consent Condition Description	Relevant Section of this Report
	- *avoiding potential conflicts between development-related traffic and the stock movements of the owner of Residence H07 by implementing measures such as:* *i. consulting with the landowner to confirm likely stock movement frequency, timing and duration;* *ii. notification protocols for stock movements, including a dedicated phone number; and* *iii. temporary traffic controls on Grabben Gullen Road such as traffic flags or signals;*	Section 2.8, Table 4.2 and Appendix B
	- *avoiding potential conflict between development-related traffic and school buses in consultation with school bus operators by implementing measures such as avoiding traffic movements during school bus service times or providing an escort for school buses;*	Sections 2.6, 5.1.2, 5.1.3 and 6.4, Table 4.2
	- *ensuring development-related traffic does not track dirt onto the public road network;*	Section 4.7
	- *ensuring loaded vehicles entering or leaving the site have their loads covered or contained;*	Section 5.1.3 and Table 4.2
	- *there is sufficient parking on site for all development-related traffic;*	Section 4.10 and Table 4.2
	- *responding to any emergency repair requirements or maintenance during construction and/ or decommissioning; and*	Section 4.8.2
	- *a traffic management system for managing over-dimensional vehicles;*	Section 4
	o *comply with the traffic conditions in this consent;* *b) include a driver's code of conduct that addresses:* o *travelling speeds;* o *procedures to ensure that drivers adhere to the designated heavy and OSOM vehicle routes; and* o *procedures to ensure that drivers implement safe driving practices;*	Section 5 and Table 4.2
	c) include a detailed program to monitor and report on the effectiveness of these measures and the code of conduct.	Section 7
	Following the Secretary's approval, the Applicant must implement the Traffic Management Plan.	Section 1.1

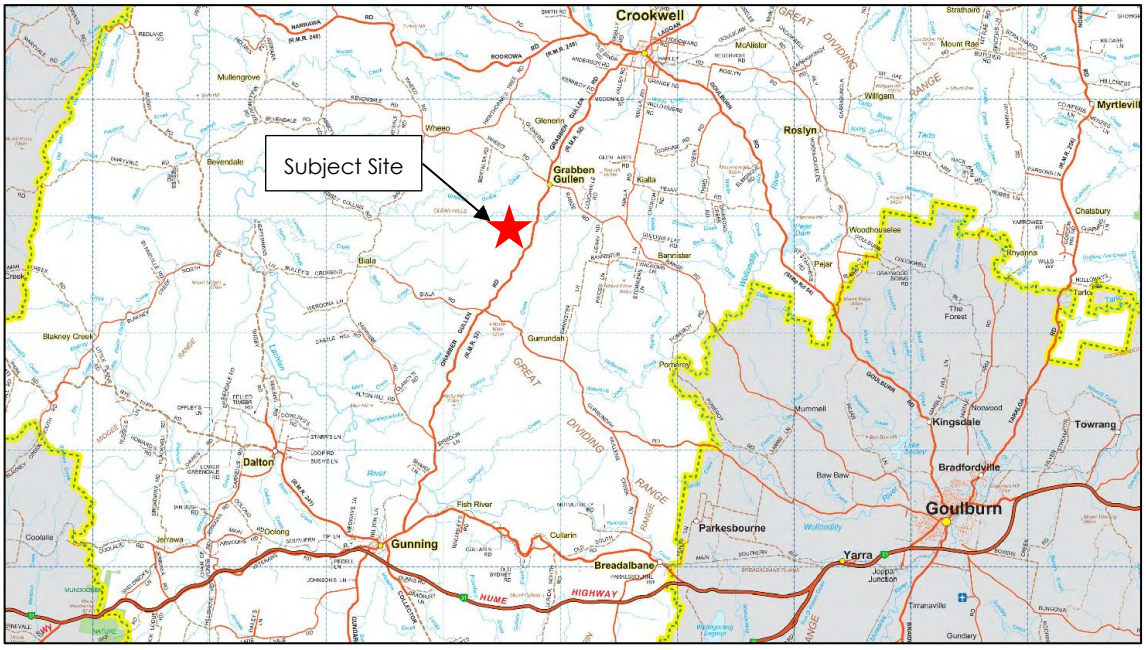
2. Overview of OSOM Movement and Existing Circumstances

2

2.1 Subject Site

The proposed wind farm is located approximately 12 kilometres southeast of Crookwell in southern New South Wales (NSW), approximately 45 kilometres northwest of Goulburn. The proposed development covers an area of 1,936 hectares and is within the Upper Lachlan Shire Local Government Area. The surrounding properties are predominantly used for agriculture and grazing. The location of the project area is shown in Figure 2.1.

Figure 2.1: Project area



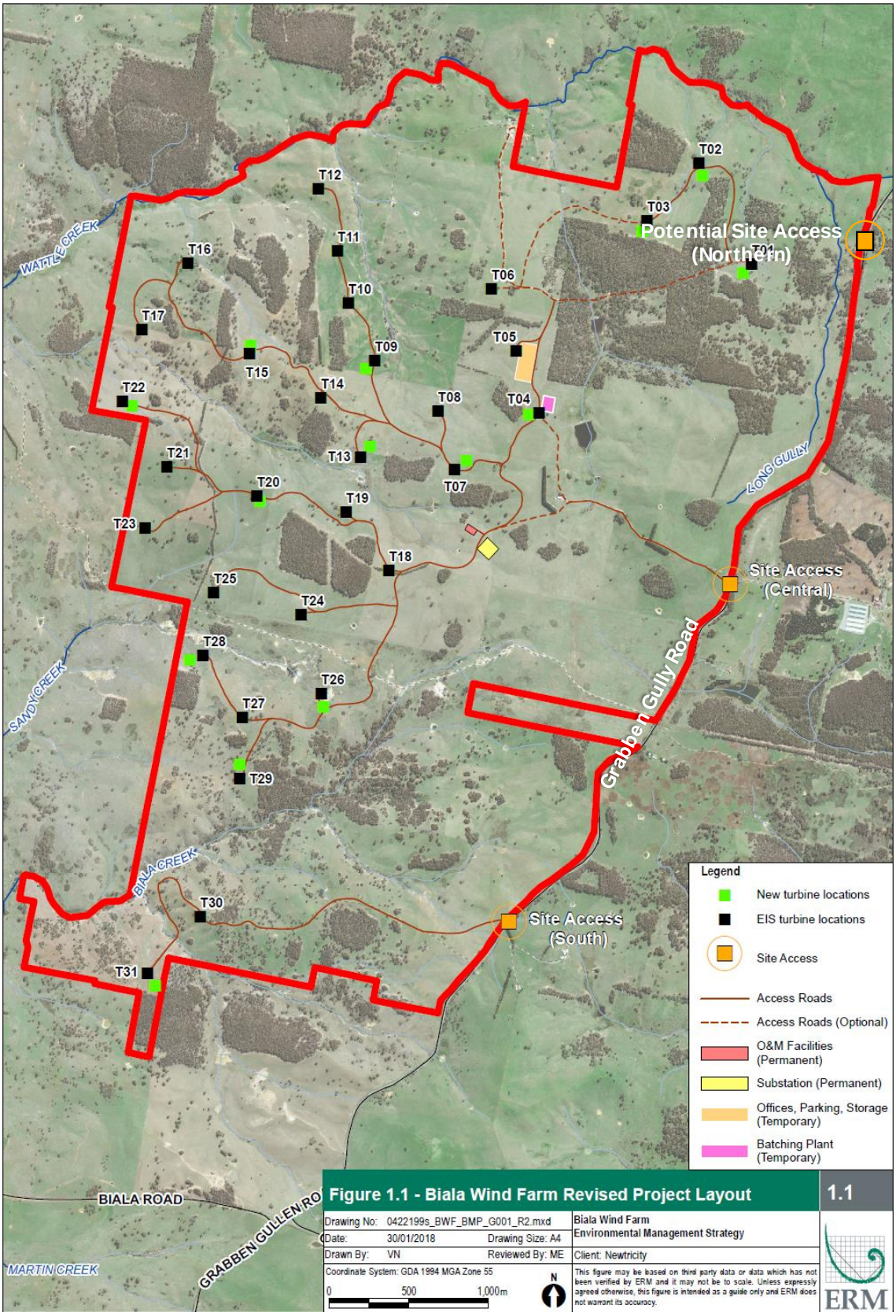
Basemap source: https:/ / www.upperlachlan.nsw.gov.au, accessed 11/01/18

The wind turbines will be serviced by a network of access roads within the project area and will be connected to the existing road network via potentially three new stop-controlled (unsignalised) access points, located along Grabben Gullen Road, as follows and illustrated in Figure 2.2:

- Northern (Potential): Private Access to Grabben Gullen Road
- Central : Private Access to Grabben Gullen Road
- Southern : Private Access to Grabben Gullen Road.

The proposed vehicle access points will be used for the construction and operational phases.

Figure 2.2: Project area layout and vehicle access locations



Source: Development Consent, Section 89E of the Environmental Planning and Assessment Act 1979, dated 12 April 2017

2.2 Vehicle and Load Details

The wind farm components required to be transport from Port Kembla to the BWF site will consist of 31 wind turbines with a specified maximum of GW140-3S wind turbines with a hub height of 109.4 metres and 68.7-metre-long blades. The breakdown of maximum wind turbine component load and vehicle details are as follows:

Table 2.1: Maximum load and type summary

Load type	Length	Width	Height	Weight
Load only				
Nacelle Bodies	10.1m	5.2m	4.2m	42.5T
Generators	5.3m	5.3m	3.2m	83.5t
Hubs	5.4m	4.7m	4.1m	43.7T
Blades	68.7m	4.8m	3.45m	22T
Bottom section	16.7m	4.8m	4.5m	109T
Mid-lower section	22.5m	4.5m	4.5m	98.1T
Mid-section	22.5m	4.5m	4.5m	77.1T
Mid-upper section	22.5m	4.5m	4.5m	55.3T
Top section	25.5m	4.5m	3.4m	53T
Vehicle and Load Combined				
Nacelle Bodies	25.0m	5.2m	5.2m	77.5T
Generators	30.0m	5.3m	4.9m	143.5T
Hubs	25.0m	4.8m	5.2m	77.5T
Blades	78.0m	4.8m	5.2m	77.5T
Bottom section	35.0m	4.8m	5.3m	189.5T
Mid-lower section	35.0m	4.8m	5.3m	179.5T
Mid-section	38.0m	4.5m	5.3m	144.5T
Mid-upper section	38.0m	4.5m	5.3m	126.5T
Top section	39.0m	4.5m	5.3m	86.5T

Based on the above, the combined load and vehicle dimensions for the blades will form the largest and physically most restrictive vehicle.

The axle loading from each truck load will be in the order of 12-16 tonnes per axle with a maximum gross truck weight of approximately 145 tonnes.

In addition to the above, it is expected that cranes will be required to move onto the BWF site to erect the wind turbines. A number of these are expected to be undertaken using OSOM vehicles.

2.3 Duration of Deliveries

The wind farm components are expected to be transported from Port Kembla to the BWF site over a 20-week period. The delivery schedule is provided in Table 2.2, and is subject to obtaining OSOM approvals and weather conditions.

It is proposed that each delivery will occur from 2:00am, with the OSOM vehicle required to be outside of Goulburn Town Centre before 7:30am to limit any impact on peak period traffic, school bus services and school operating hours.

Rex J Andrews has advised that the OSOM vehicle would layover before entering Goulburn town centre until sufficient daylight is available, then proceed to navigate through the town centre before 7:30am.

Table 2.2: OSOM movement delivery schedule

Component	Quantity	Period
Nacelle Bodies	31	20 weeks
Generators	31	20 weeks
Hubs	31	20 weeks
Blades	93	20 weeks
Tower Sections (Base, Mid-lower, Mid, Mid-upper, Top)	155	20 weeks

Source: Goldwind Australia

2.4 Traffic Generation

The overall traffic generation per wind turbine is expected to be between 15 to 20 trucks. Out of this, it is expected that a maximum of 11 trucks will be OSOM trucks with the remainder general construction heavy vehicles (e.g. flatbed trucks and articulated vehicles). Overall, the expected number of OSOM deliveries to BWF from Port Kembla is expected to be approximately 350 deliveries over a period of five months with up to five deliveries per night. At least two pilot vehicles will accompany each OSOM vehicle to guide the OSOM vehicle and manage traffic under the direction of police where required. Police vehicles will provide traffic management at 'pinch points' as identified in this study.

The OSOM vehicles will leave at specific intervals, and regroup at specific 'pinch points' to allow police to implement the required traffic management, such as road closures.

It is noted that heavy access route will traverse via the approved heavy route and OSOM vehicles are to follow the approved OSOM route.

2.5 Proposed Route

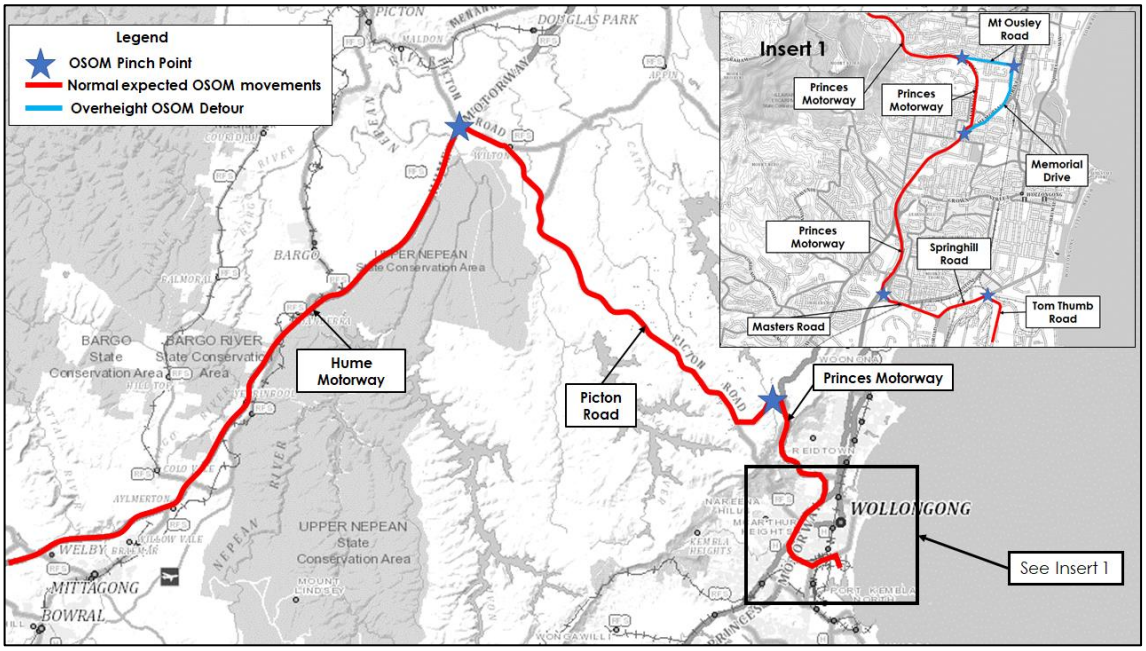
The proposed OSOM route from Port Kembla to the BWF site will encompass two transportation routes. This is a result of the 4.9 metre height restriction under the University Avenue footbridge on the Princes Motorway, Keiraville, of which some OSOM vehicles and components will be too high to clear. To bypass this height restriction, a secondary route has been identified through the Wollongong area.

The proposed route from Port Kembla to the BWF site is shown in Figure 2.3 and Figure 2.4 with a distance of approximately 233 kilometres.

The proposed OSOM routes does not traverse on Hume Street and Yass Street in Gunning, which satisfies Condition of Consent Schedule 3, Condition 24 (c). It should be noted that some of the WTG delivery vehicles will be heavy vehicles and the heavy vehicle route shall be applied.

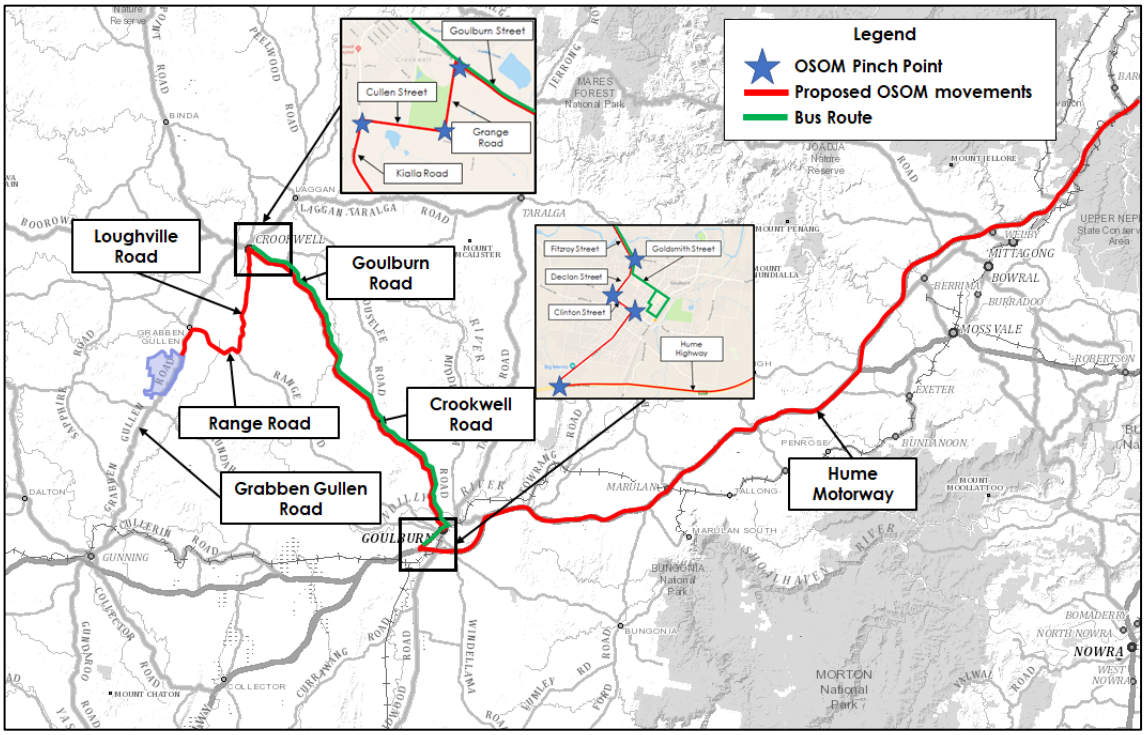
It is noted that OSOM vehicles are to follow the proposed OSOM route, while the heavy access route will traverse via the approved heavy route.

Figure 2.3: Port Kembla to Hume Motorway M31 primary and secondary detour routes



Basemap Source: NSW SIX Maps

Figure 2.4: Hume Highway to BWF site



Basemap source: NSW SIX Maps

Primary transportation route (vehicle and load heights less than 5.0 metres)

The primary route will be used by OSOM vehicles transporting components with combined vehicle load heights of less than 5.0 metres.

The primary transportation route will use the following roads from Port Kembla to the BWF site:

- Tom Thumb Road, Springhill Road, Masters Road, Princes Motorway, Mt Ousley Road, Picton-Wilton Road, Hume Highway, Hume Street, Clinton Street, Deccan Street, Fitzroy Street, Crookwell Road, Grange Road, Cullen Street, Kialla Road, Range Road and Grabben Gullen Road.

The total length of the primary OSOM transportation route is approximately 233 kilometres.

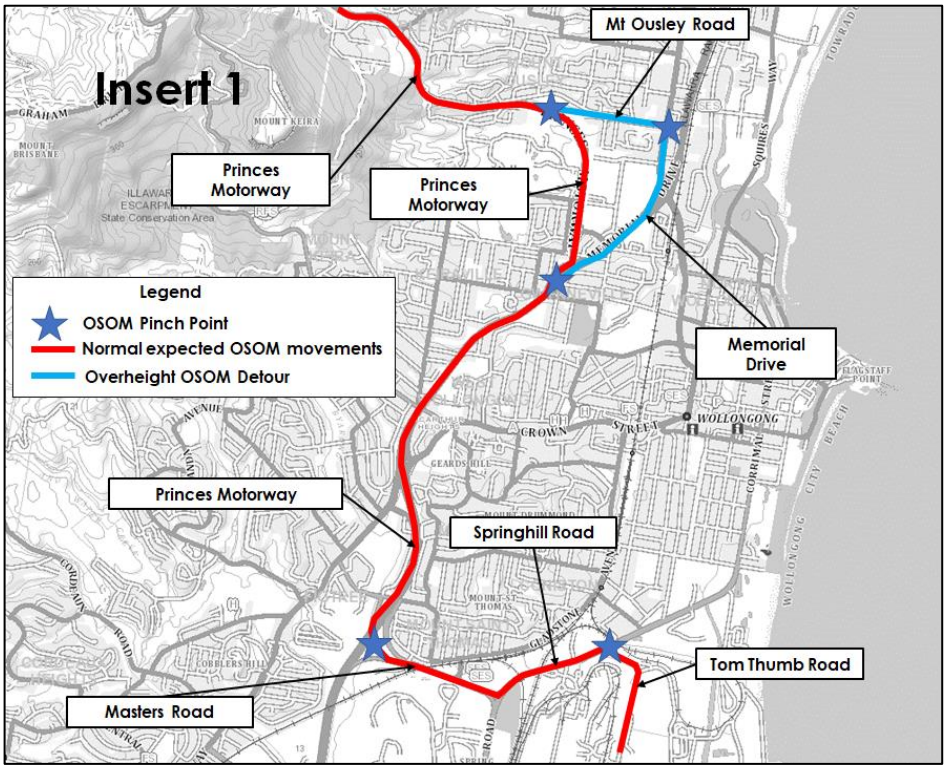
It is noted that whilst the height of the blade and vehicle load combinations has been listed as 5.3 metres, this does not include consideration of special vehicle trailers that are able to lower. As a result of this and slow vehicle movements, it is expected that the blades will be able to use the primary transport route underneath the University Avenue bridge.

Secondary detour route (vehicles higher than 4.8 metres)

The detour route at Mount Ousley will be used by OSOM vehicles transporting loads with a combined height (trailer and load) of more than 5.0 metres. Examples of loads combinations exceeding this height include tower sections with maximum heights of 5.3 metres. Approximate maximum required trailer widths and heights specified for the wind turbine loads for BWF are summarised in Table 2.1.

The detour route will require the affected OSOM vehicles to exit Princes Motorway onto Memorial Drive, Gwynneville. These vehicles will then use Princes Highway and Mount Ousley Road to return to Princes Motorway and re-join the primary transportation route. The detour route increases the travel distance by approximately 1.1 kilometres with no railway crossings. The detour route is shown in detail in Figure 2.5.

Figure 2.5: Proposed detour route through Keiraville for over height OSOM vehicles



Basemap source: NSW SIX Maps

Potential Conflicts Along Route

A review of the transportation route indicates that there is a single livestock crossing area along the route that would be impacted by the OSOM movement. The owner of the livestock and properties (owner H07) is located to the north of the wind farm site entrances, with H07's farm straddling both sides of Grabben Gullen Road.

Owner H07 has been consulted with discussions including frequency, timing and duration of livestock movements. The following mitigation measures will be implemented to avoid conflict between livestock and OSOM transportation movements:

- Developments Biala will provide the landowner with enhanced temporary signage. This will assist the landowner in their stock crossing operations with both wind farm and non-wind farm traffic at all hours on all days.
- OSOM trucks approaching the site will also adhere to these signs and the proposed speed restrictions of 40km/h. OSOM truck drivers will be informed of the signage and possibility of stock movement operations prior to arrival at site. RAVs will slow or queue with other traffic as required while the stock movements are occurring.

Developments Biala will provide a dedicated phone number for the owner of H07 to contact in the case of stock movements. During consultation with the owner of H07, it was determined that it is not possible for the owner of H07 to reliably provide prior notice of stock movements. This is due to the unpredictability of farming. As such, the measures above have been designed to mitigate risk with or without such notification.

Temporary traffic controls were not seen as appropriate by Developments Biala or the owners of H07 as it will result in delays to all traffic, not just traffic associated with the BWF.

2.6 Public Transport/ School Bus Routes

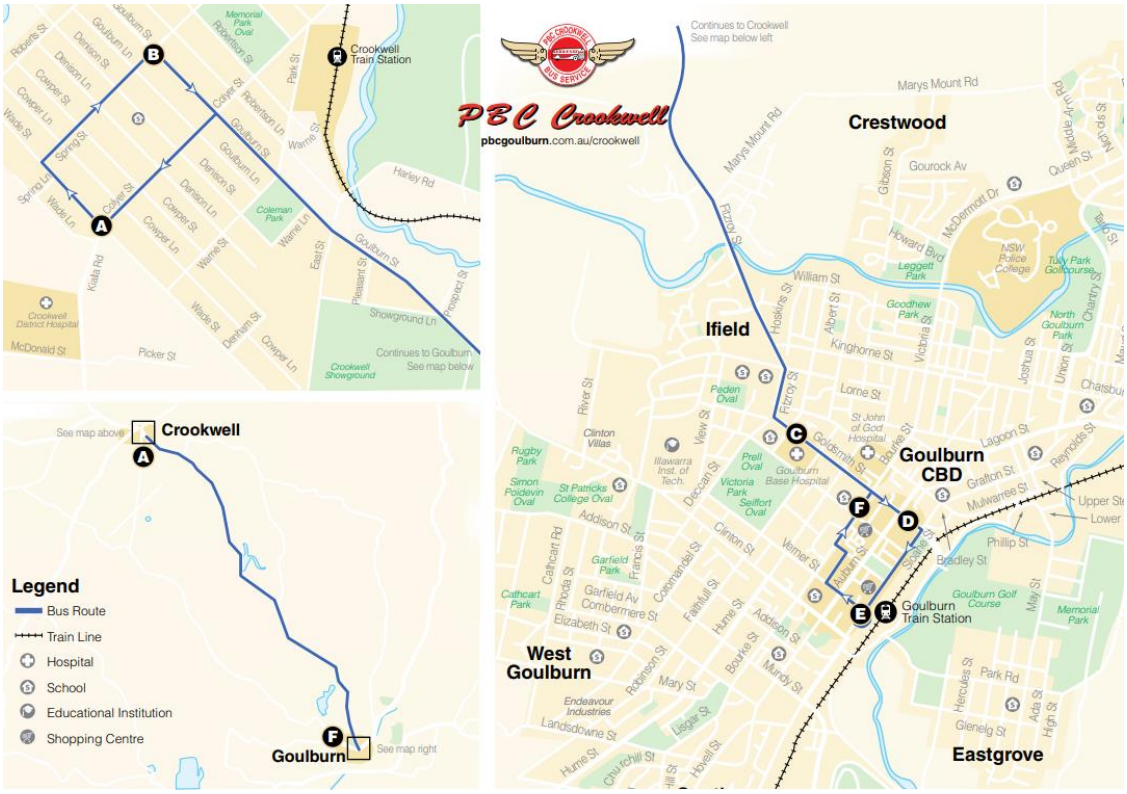
A review of the public transport available near the site indicates that public bus services run along Crookwell-Goulburn Road. The 818 service coincides with school times, and effectively serves as a school bus. A summary of this service is shown in Table 2.3.

Table 2.3: Public transport/ school bus routes

Service	Monday to Friday (school term)	Monday to Friday (school holidays)
818 – Goulburn to Crookwell	9:15am, 1:30pm and 3:15pm	9:15am, 12:00pm and 3:15pm
818 – Crookwell to Goulburn	7:32am, 9:51am and 2:06pm	8:26am, 10:56am and 2:13pm

The 818 bus service routes are shown in Figure 2.6 and the schedules are detailed in Figure 2.7.

Figure 2.6: Bus route 818 network map



Source: http://www.pbcgoulburn.com.au/crookwell/files/818%20-Crookwell%20to%20Goulburn.pdf, accessed 16 January 2018

Figure 2.7: Bus route 818 schedule

	Monday to Friday						
map ref	Route	818	818	818	818	818	818
		am	am	am	am	pm	pm
A	Colyer St at Wade St (access to Hospital)	S7:32	H8:26	S9:51	H10:56	S14:06	H14:13
B	Spring St at Goulburn St.	S7:35	H8:30	S10:00	H11:00	S14:15	H14:15
	Roslyn Rd	S7:37	H8:35	S10:05	H11:05	S14:20	H14:20
	Third Creek Rd	S7:39	H8:36	S10:06	H11:06	S14:21	H14:21
	Wind Farm	S7:43	H8:39	S10:09	H11:09	S14:24	H14:24
	Pejar Rd	S7:45	H8:41	S10:11	H11:12	S14:26	H14:26
	Pejar Rest Area	S7:48	H8:44	S10:14	H11:15	S14:29	H14:29
	St Stephens Rd	S7:52	H8:46	S10:16	H11:17	S14:31	H14:31
	Woodhouselee Rd	S7:55	H8:47	S10:17	H11:18	S14:32	H14:32
	Fenwick Creek Rd	S7:59	H8:51	S10:20	H11:22	S14:36	H14:36
	Marble Hill Rd	S8:04	H8:54	S10:23	H11:25	S14:39	H14:39
C	Goulburn Hospital, Goldsmith St	S8:10	H8:59	S10:28	H11:30	S14:44	H14:44
D	Centro, Goldsmith St	S8:11	H9:00	S10:29	H11:31	S14:46	H14:46
E	Goulburn Railway Station, Sloane St	S8:13	H9:02	S10:31	H11:33	S14:48	H14:48
	West Goulburn, Knox St	S8:25	...	...	...	...	...
	Cnr Deccan & Verner St (access to TAFE)	S8:30	OR	...	OR	...	OR
	Mulwaree High School, McDermott Dr	S8:37	...	...	...	...	...
F	Cartright Pl, Goulburn	S8:45	H9:04	S10:35	H11:35	S14:58	H14:50

	Monday to Friday						
map ref	Route	818	818	818	818	818	818
		am	am	pm	pm	pm	pm
F	Cartright Pl, Goulburn	S9:15	H9:15	H12:00	S13:30	S15:15	H15:15
	Mulwaree High School, McDermott Dr	...	...	...	...	S15:20	...
	West Goulburn, Knox St	...	...	...	...	S15:40	...
	Cnr Deccan & Verner St (access to TAFE)	...	OR	OR	...	S15:40	OR
C	Goulburn Hospital, Goldsmith St	S9:17	H9:17	H12:02	S13:32	S15:41	H15:17
	Marble Hill Rd	S9:23	H9:23	H12:08	S13:37	S15:49	H15:21
	Fenwick Creek Rd	S9:25	H9:25	H12:10	S13:40	S15:53	H15:24
	Woodhouselee Rd	S9:30	H9:30	H12:15	S13:45	S16:02	H15:29
	St Stephens Rd	S9:31	H9:31	H12:16	S13:46	S16:06	H15:30
	Pejar Rest Area	S9:34	H9:34	H12:19	S13:49	S16:10	H15:33
	Pejar Rd	S9:36	H9:36	H12:21	S13:51	S16:15	H15:35
	Wind Farm	S9:39	H9:39	H12:24	S13:54	S16:19	H15:38
	Third Creek Rd	S9:42	H9:42	H12:27	S13:57	S16:21	H15:41
	Roslyn Rd	S9:43	H9:43	H12:28	S13:58	S16:22	H15:42
A	Colyer St at Wade St (access to Hospital)	S9:48	H9:48	H12:33	S14:03	S16:35	H15:47
B	Spring St at Goulburn St.	S9:50	H9:50	H12:35	S14:05	S16:40	H15:50

Source: https:/ / www.visitupperlachlan.com.au/ 2015BusTimetable.pdf accessed 16 January 2018
S – Times for the service during the School Term
H – Times for the service during the School Holidays (including school development days)

In addition, Valmar Community Transport also offers a Thursday fortnightly service from Crookwell to Goulburn. A fortnightly community bus runs twice a day from Grabben Gullen to Crookwell/ Goulburn and Gunning via Grabben Gullen Road with departure in the morning and return in the afternoon.

There are other school bus services that operate in and around the area.

Based on Developments Biala and GTA consultation with the bus operators, a summary of the contact details for all school bus operators and whether the routes are relevant to the construction related traffic routes are summarised in Table 2.4.

Table 2.4: Other school bus services

Company	Contact details	Affected by construction routes	Comments provided by school bus operator contact
John Laverty	John Laverty Phone: 02 4821 2320 jlaverty@skymesh.com.au	Yes	o Bus runs along Kialla Road to Range Road. o Will need to communicate times and dates when the trucks will be moving along Kialla Road.
Col Pitt	Col Pitt 0417 295 598 col11pitt@bigpond.com	Yes	o Bus service runs from Grabben Gullen township along Range Road and continues past Kialla Road towards Goulburn. Bus runs between 8:10am and 8:30am and between 3:30pm and 4pm.
A little bus Bailey's garage, Gunning	Craig Southwell 02 4845 1224 cdsouthwell@bigpond.com	Yes	o 14-seater bus with 12 to 13 students on the bus. o Morning run leaves Gunning at 7:10am. o Drops four to five children to Goulburn bus at Clean Hills, Gurrundah Road at 7:35am. o Crookwell bus drop meeting Col Pitt bus at Grabben Gullen, then back to Gunning via Sapphire road 9am at 8:15am. o Operator concerned with heavy vehicle traffic during transfers between Crookwell bus and Goulburn bus at Grabben Gullen Road. o Afternoon run leaves Gunning at 3:30pm Crookwell Road to Sapphire Road and onto Grabben Gullen departs at 4:10pm to Gunning along Grabben Gullen Road.
PBC Goulburn	Greg Taylor 02 4821 2320 greg@pbcgoulburn.com.au	Yes	o Runs one service between Gunning and Goulburn along Grabben Gullen Road, with an expected arrival in Goulburn at 8:30am. o Similarly, a service runs between 3pm and 4pm.
Road coach Goulburn	Joe Cymet 040 981 9543 joekmet@roadcoach.com.au	No	o No routes along the intended route in Goulburn or Gunning.
Neil/ Carol Skelly	Neil and Carol Skelly 02 4832 1910 kimboneil@bigpond.com.au	No	o Runs one service out along Boorowa Road, heading into Goulburn.

Consultation will continue with all bus operators throughout the construction period.

Given the low volume of over-sized, over-mass vehicles deliveries of the wind turbine components, it is not anticipated that the OSOM deliveries will cause adverse impacts to school bus services. Nonetheless, during the OSOM deliveries, the following mitigation measures shall be implemented to avoid impact on school buses.

i The information collected on bus routes and times will be included in the induction for Developments Biala and form part of the Drivers Code of Conduct.

ii Regular drivers will be instructed to be aware of the potential for passengers waiting at bus stops and buses stopping to pick up passengers during these times.

iii If complaints are received from bus operators or passengers then the procedures in section 5.1.6 will be implemented, including reviewing vehicle tracking information for vehicles in the vicinity at the time of the complaint. Additional traffic management controls may be implemented where required, such as providing escorts for buses.

2.7 Surrounding Wind Farm Developments

Due to excellent wind resources by international standards, the Southern Tablelands is a popular region for wind farms. Currently, a number of wind farms are either operational, under construction or proposed for the region. Wind farms in the same region as BWF, which are at a similar stage include Crookwell 2 and Crookwell 3. Crookwell 2 is under construction and due to be completed before BWF construction begins. Crookwell 3 has not been granted approval and therefore has no firm timeline for construction.

2.8 Livestock Movements

Condition of Consent Schedule 3, Condition 28(a) (iii), requires this TMP to detail the measures to be implemented to avoid potential conflicts between development related traffic and the stock movements of the owner of residence H07.

In preparing this TMP, Developments Biala has consulted with the owner of H07 regarding this requirement. Details of the consultation is included in Appendix B and includes frequency, timing and duration of stock movements.

H07's farm is located on both sides of Grabben Gullen Road, to the north of the wind farm's site entrances. This means that it is on the route defined for use by oversize and over mass vehicles including RAVs. Light vehicles generated by the project may also use this route. It is not on the route for other deliveries including heavy vehicles, such as trucks carrying stone for tracks or concrete aggregate.

Currently, the owner of H07 erects temporary signage when their stock will be crossing Grabben Gullen Road.

Developments Biala will implement the following mitigation measures to avoid conflicts with H07's stock movements. These measures have been developed after consultation with construction contractors and the owners of H07. The measures are focused on the traffic that Developments Biala has direct control of, being the traffic associated with the wind farm.

- Developments Biala will provide the landowner with enhanced temporary signage. This will assist the landowner in their stock crossing operations with both wind farm and non-wind farm traffic at all hours on all days.
- Developments Biala will ensure every worker on the site is informed of the operations of H07 and the need to be aware of the warning signage that H07 will put in place should stock be crossing the road (as part of the site induction). Each worker will be instructed to slow down to 40 km/h and be ready to stop as required when the signage is in place.
- Vehicle monitoring systems will be used to log the behaviour of all regular wind farm traffic. In the case that H07 believes vehicles have not slowed appropriately, Developments Biala will assess the recorded data available to determine whether this TMP has not been followed. In such instances, workers will be given one warning and if there is a repeat offence they will be removed from site.
- RAVs approaching the site will also adhere to these signs and the proposed speed restrictions. RAV drivers will be informed of the signage and possibility of stock movement operations prior to arrival at site. RAVs will slow or queue with other traffic as required while the stock movements are occurring. Turbine delivery traffic will be covered in an addendum to this plan.

Developments Biala will provide a dedicated phone number for the owner of H07 to contact in the case of stock movements. During consultation with the owner of H07, it was determined that it is not possible for the owner of H07 to reliably provide prior notice of stock movements. This is due to the unpredictability of farming. As such, the measures above have been designed to mitigate risk with or without such notification.

Temporary traffic controls were not seen as appropriate by Developments Biala or the owners of H07 as it will result in delays to all traffic, not just traffic associated with the BWF.

3. Existing Conditions Assessment

3

3.1 Dilapidation Survey

A dilapidation survey of the existing roads along the transportation route will be completed by using an ARRB 'laser car' survey (or other method agreed with relevant authorities) before and after the OSOM deliveries, with any roadworks required at the completion of the deliveries agreed with the relevant authorities.

3.2 Route Survey

Rex J Andrews has completed a route survey along the transportation route from Port Kembla to the BWF site. This includes a swept path analysis for the transportation of the 68.7 metre-long blades at locations identified as 'pinch points', which are listed in Table 3.1.

Table 3.1: Key pinch point locations

Location	Chainage (from Port Kembla)
Exiting Port Kembla	0.0km
Tom Thumbs Road/ Springhill Road, Port Kembla	0.2km
Springhill Road/ Master Road, Port Kembla	1.4km
Master Road onto Southern Freeway, Figtree	2.6km
Southern Freeway onto Mount Ousley Road, Keiraville	6.4km
University overbridge on Southern Freeway, Keiraville	6.5km
Mount Ousley Road/ Picton Road, Mount Ousley	13.1km
Picton Road/ Hume Motorway M31, Wilton	40.2km
Hume Highway M31 off-ramp onto Hume Street interchange, Goulburn	161km
Hume Street/ Ducks Lane roundabout, Goulburn	161.9km
Cowper Street/ Clinton Street, Goulburn	164.4km
Clinton Street/ Deccan Street, Goulburn	165.2km
Deccan Street/ Fitzroy Street, Goulburn	166.0km
Fitzroy Street/ Newton Street, Goulburn	167.0km
Crookwell Road/ Grange Road, Crookwell	207.0km
Grange Road/ Cullen Street, Crookwell	208.0km
Cullen Street/ Kialla Road, Crookwell	209.0km
Kialla Road/ Range Road, Bannister	223.0km
Range Road/ Grabben Gullen Road, Grabben Gullen	228.0km
Grabben Gullen Road/ North BWF Site Access, Biala	231.0km
Grabben Gullen Road/ Alternative North BWF Site Access, Biala	233.0km
Grabben Gullen Road/ South BWF Site Access, Biala	236.0km

As part of the 'pinch point' identification Rex J Andrews have also identified a number of infrastructure upgrades to facilitate the proposed OSOM movements and are presented as Appendix A. These identified 'pinch points' have also been used to form the required traffic management arrangements including under bridges and through road narrowing (i.e. pedestrian crossing facilities and road bridges/ culverts) which are presented in Section 4.

3.3 Trial Run

Once a transport contractor and manager has been appointed, it is proposed that the contractor complete a trial run of a blade delivery prior to the commencement of any OSOM deliveries. The trial would include the trailer to be used for the 68.7-metre-long turbine blade, a mock turbine black to simulate the overhang and height clearance, escort vehicles and all required permits.

The trial run would confirm the requirement for infrastructure modifications detailed in studies and identify any additional modifications required.

3.4 Current Roadworks

The Live Traffic NSW provides live updates for NSW roads[1]. The live Traffic NSW website notes the following roadworks planned along the proposed OSOM delivery route:

- Road works at M1 Princes Motorway between Masters Road and Princes Highway – 28/10/18 to 02/11/18
- Road works at M1 Princes Motorway between Memorial Drive and Masters Road – 12/11/18 to 14/11/18
- Road works at M1 Princes Motorway below University Avenue 21/10/18 to 16/11/18
- Both direction road closure of Picton Road between Mount Ousley Road and Mount Keira Road 11/11/18 to 12/11/18
- Lane closure affecting OSOM vehicles of Picton Road at Cataract 15/10/18 to 19/12/18.

As noted above, pilot vehicles will accompany all OSOM vehicles for the transportation of the wind turbine components, with police to provide traffic management at 'pinch points' as required.

The Live Traffic NSW website will also be monitored prior to the days of the movements, especially in relation to any planned upcoming works along the transportation route.

[1] https://www.livetraffic.com/desktop.html

4. Traffic Management Arrangements

4.1 Roles and Responsibilities

Pilot and police arrangements are required for each OSOM vehicle movement. The roles and responsibilities of the parties involved during the movements are as follows:

- Pilot vehicles – driven by an appropriately trained and accredited driver to guide the OSOM vehicle from the front and rear, manage vehicle queuing behind the convoy and assist police with traffic management at pinch points as required.
- Police vehicle(s) – to hold traffic at intersections or intersection approaches to allow OSOM vehicles to navigate through, as required.

As previously mentioned, each OSOM vehicle will require at least two pilot vehicles as part of the convoy, depending on the size and traffic control required. The pilot vehicles will have at least two personnel, with the passenger to guide the OSOM vehicle on foot and/ or temporarily remove and replace signposts before and after manoeuvres are complete.

In addition, locations have been identified within Wollongong and Goulburn where police will be required to temporarily control traffic at intersections whilst the OSOM vehicles navigates through.

4.2 Emergency Procedures

In the event of an emergency such as truck breakdown, the OSOM vehicle will be moved to the left lane and/ or shoulder to ensure traffic flow adjacent can be maintained with minimal disruption. Police and pilot vehicles will manage traffic around the OSOM vehicle as necessary. Pilot vehicles accompanying the movements will be required to follow the direction of police at all times. In such instances, the Transport Management Centre will be promptly advised so that necessary warnings can be provided to the surrounding traffic.

In the event of poor weather such as heavy rain, the appointed OSOM transport contractor will make a decision the afternoon prior to the OSOM movements. All relevant parties will be notified at this time and a suitable alternative date for the movements will be set. This will require further consultation with relevant authorities.

In the event of a communications failure between any of the vehicles within the convoy, the OSOM movement is to cease at a suitable location until communications can be re-established.

4.3 Communication Protocol

A pre-departure meeting will be held at least 15 minutes prior to the commencement of any OSOM movement. Communication between parties involved in the movements will occur on a UHF radio channel chosen on the day (in addition to mobile phones as required). All parties will be informed of the chosen UHF channel in the pre-departure meeting along with all relevant procedures and schedules required for the OSOM movements.

4.4 Rest and Fatigue Break Locations

The appointed contractor will confirm the departure times from Port Kembla.

Historical experience with wind farm OSOM deliveries generally have trucks departing Port Kembla at 2:00am with an expected arrival time of 5:30am at the Governors Hill truck parking area on the Hume Highway for a fatigue break. This primary rest stop is located approximately 153 kilometres from the origin. The trucks will then depart the site at sunrise and travel through Goulburn and Crookwell. No other breaks are generally expected between Port Kembla and Goulburn.

Notwithstanding the above, pull over locations have also been identified based on past experiences suitable for OSOM vehicles, and which can realistically be used as rest locations:

- stopping bay on Mount Ousley Road (approximately 10.7 kilometres from origin)
- parking bay on Picton Road (approximately 40.9 kilometres from origin)
- parking bay on Hume Motorway (approximately 67.2 kilometres from origin)
- parking bay on Hume Motorway (approximately 104.4 kilometres from origin)
- parking bay on Hume Motorway (approximately 124.6 kilometres from origin).

4.5 "Pull over" Activation

It is expected that there will be two instances were a 'pull over' may be activated. These are:

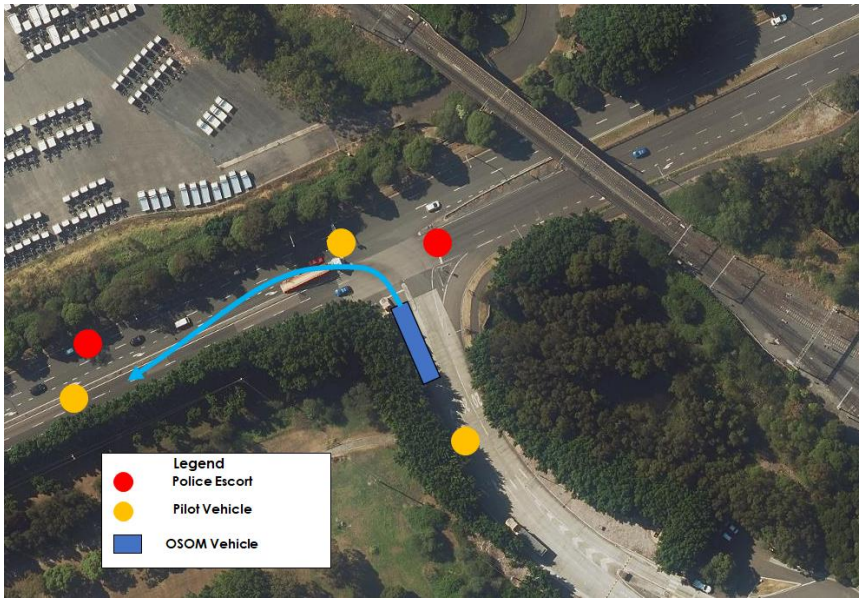
- when queuing behind the convoy requires clearing
- approaching a pinch point and awaiting advice from police that temporary closures have been implemented and the OSOM vehicle is safe to proceed.

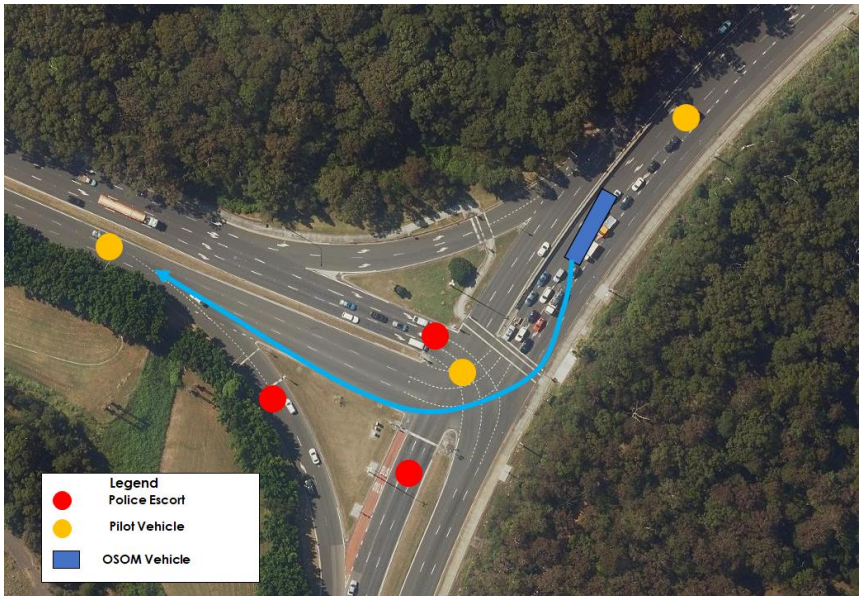
When a 'pull over' is activated the lead pilot vehicle for each OSOM vehicle is to determine a safe location for the convoy to stop and provide sufficient road width to allow one lane of traffic to pass. The 'pull over' locations could be using either the left lane and/ or road shoulder of a carriageway. Pull over locations have been identified in Section 4.4

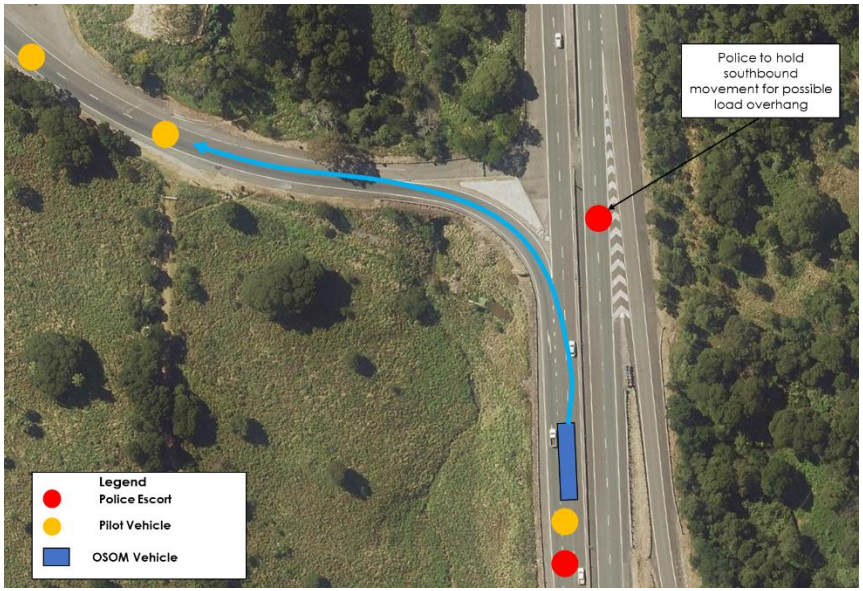
4.6 Temporary Road Network Modifications

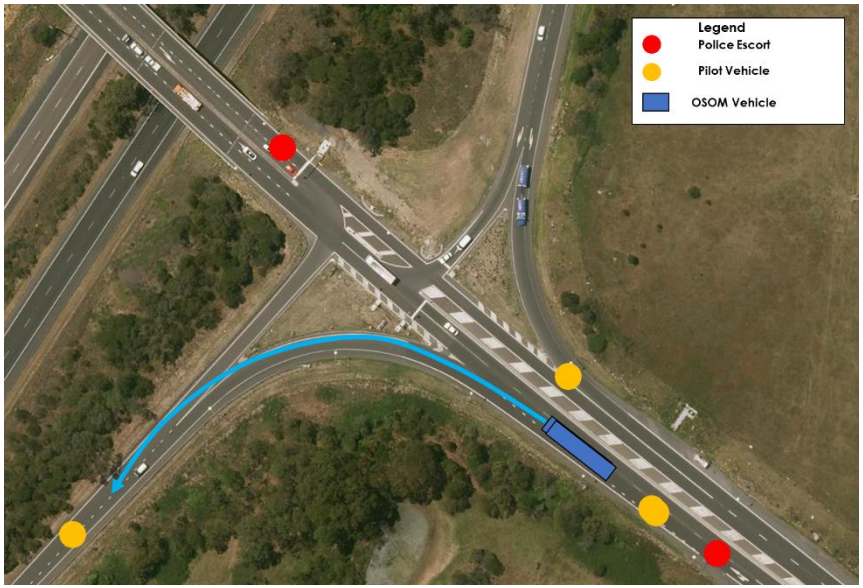
A summary of the anticipated road and intersection upgrade or modification works identified as part of the route survey and swept path analysis are provided within the Rex J Andrews Route Survey (Appendix A). Traffic management requirements at 'pinch points' are presented in Table 4.1.

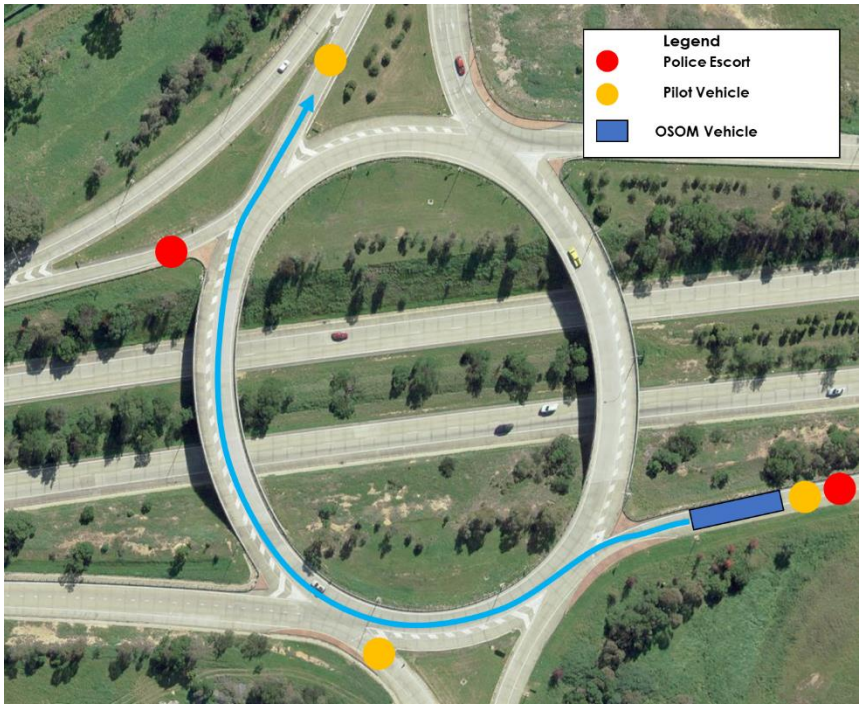
Table 4.1: Required traffic management

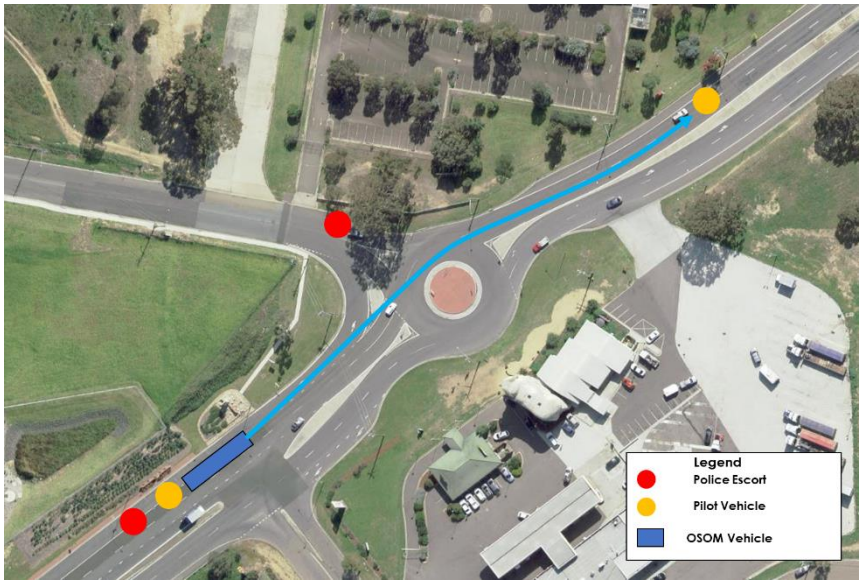
Location	Chainage (from Port Kembla)	Image	Traffic Management Requirements
Tom Thumbs Road/ Springhill Road, Port Kembla	0.2km		○ Police escorts to stop eastbound and westbound traffic along Springhill Road. ○ Lead police and pilot vehicles will move ahead to inform traffic of OSOM movement. ○ Rear police and pilot will drop back to inform following traffic of delay while the intersection is being cleared. ○ Third pilot to guide OSOM vehicle through intersection.

Location	Chainage (from Port Kembla)	Image	Traffic Management Requirements
Springhill Road/ Masters Road, Port Kembla	1.4km		○ Lead police and pilot vehicles to move ahead and warn oncoming vehicles. ○ Police escorts to stop traffic from Masters Road eastbound right turn and Springhill Road northbound. ○ Rear pilot vehicle to inform following traffic of delays.
Master Road onto Southern Freeway, Figtree	2.6km		○ Refer to Route Study Report (Rex J Andrews, 2018) in Appendix A.
Southern Freeway onto Mount Ousley Road, Keiraville	6.4km		○ Refer to Route Study Report (Rex J Andrews, 2018) in Appendix A.

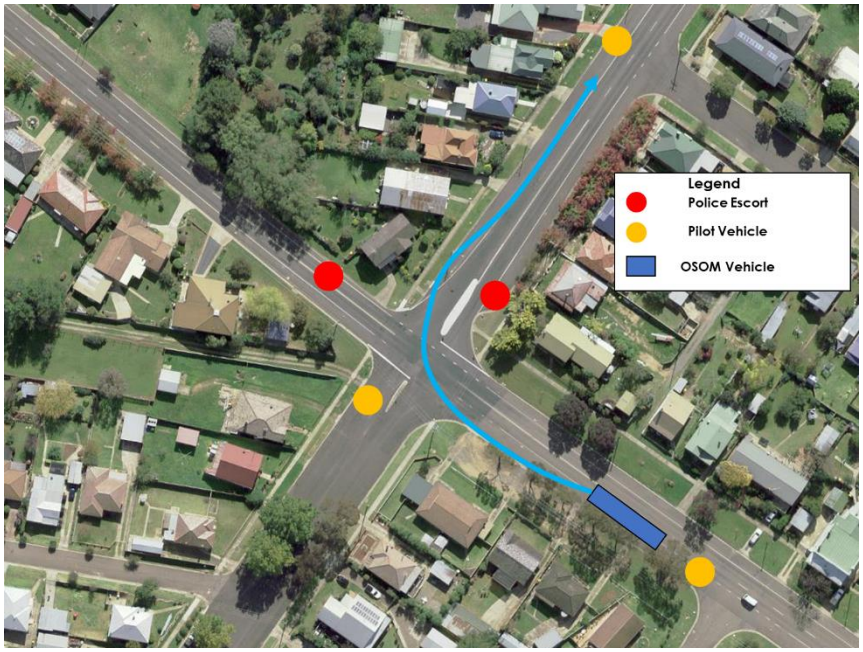
Location	Chainage (from Port Kembla)	Image	Traffic Management Requirements
University overbridge on Southern Freeway, Keiraville	6.5km		○ Refer to Route Study Report (Rex J Andrews, 2018) in Appendix A.
Mount Ousley Road/ Picton Road, Mount Ousley	13.1km		○ Lead police and pilot vehicles to move ahead and warn oncoming vehicles. ○ Police escorts to stop southbound traffic along Southern Freeway for possible load overhang. ○ Rear pilot and escort vehicles to inform following traffic of delays.

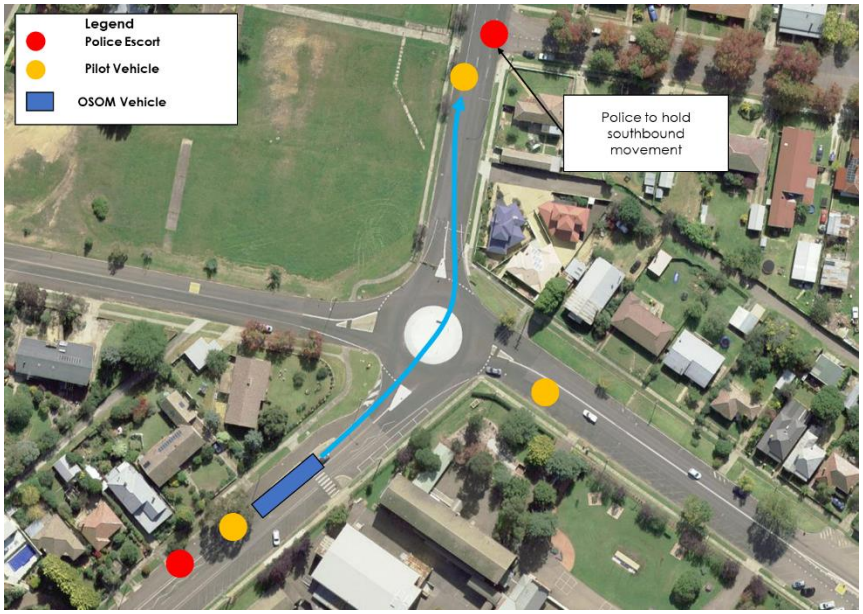
Location	Chainage (from Port Kembla)	Image	Traffic Management Requirements
Picton Road/ Hume Motorway M31, Wilton	40.2km		○ Lead pilot vehicle to move ahead and warn oncoming vehicles along Hume Motorway. ○ Police escort to hold traffic along Picton Road eastbound. ○ Pilot vehicle to hold vehicles from off-ramp travelling eastbound for possible load overhang. ○ Rear pilot and escort vehicles to inform following traffic of delays.

Location	Chainage (from Port Kembla)	Image	Traffic Management Requirements
Hume Highway M31 off-ramp onto Hume Street interchange, Goulburn	161km		○ Pilot and escort vehicles to hold oncoming traffic from south and east roundabout approaches. ○ Pilot vehicle to warn oncoming traffic of OSOM movement moving through roundabout. ○ Rear pilot and escort vehicles to inform following traffic of delays.

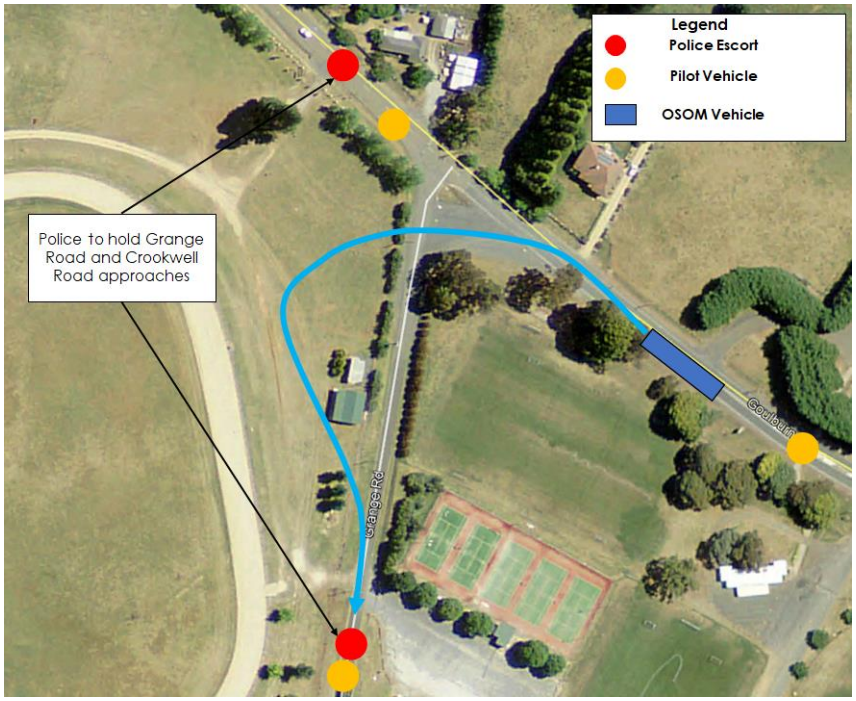
Location	Chainage (from Port Kembla)	Image	Traffic Management Requirements
Hume Street/ Ducks Lane roundabout, Goulburn	161.9km		○ Police escort to hold traffic from Ducks Lane approach. ○ Lead pilot vehicle to warn oncoming traffic of OSOM movement. ○ Rear pilot and escort vehicles to inform following traffic of delays.

Location	Chainage (from Port Kembla)	Image	Traffic Management Requirements
Cowper Street/ Clinton Street, Goulburn	164.4km		○ Police escorts to hold traffic along Clinton Street from both approaches. ○ Lead pilot vehicle to hold traffic from Cowper Street north approach in case of possible load overhang. ○ Rear pilot vehicles will need to warn and hold drivers as the OSOM vehicle crosses onto southbound side of Cowper Street to navigate turn.

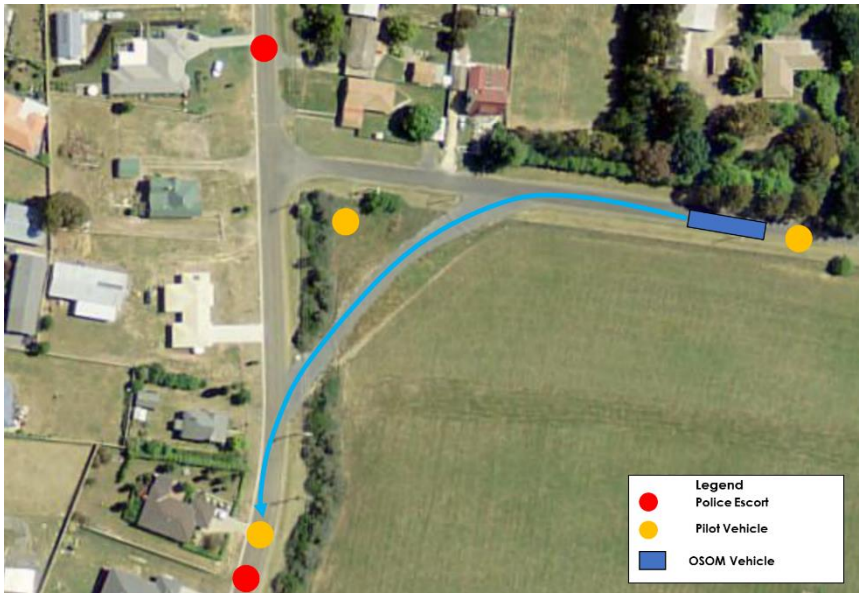
Location	Chainage (from Port Kembla)	Image	Traffic Management Requirements
Clinton Street/ Deccan Street, Goulburn	165.2km		○ Pilot and police escorts to hold oncoming traffic from north, south and west approaches. ○ Lead pilot vehicle to warn oncoming traffic of delays. ○ Rear pilot vehicle to inform following traffic of delays.

Location	Chainage (from Port Kembla)	Image	Traffic Management Requirements
Deccan Street/ Fitzroy Street, Goulburn	166.0km		○ ○ Lead police escort to hold southbound traffic along Fitzroy Street as OSOM movement will likely travel through opposite lane. ○ Pilot vehicle to hold traffic from Goldsmith Street. ○ Lead pilot warn oncoming traffic of delays and guide OSOM vehicle. ○ Rear pilot and escort vehicles to inform following traffic of delays.

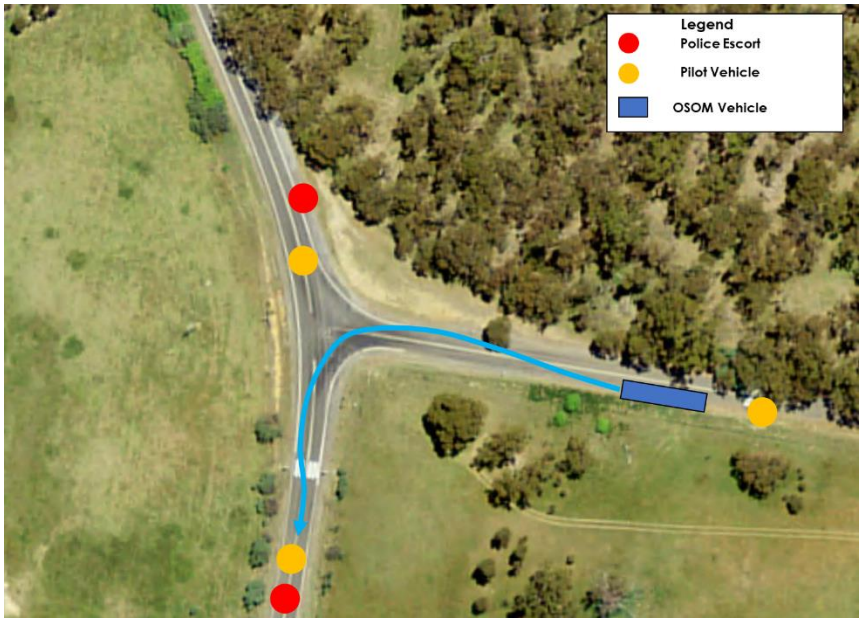
Location	Chainage (from Port Kembla)	Image	Traffic Management Requirements
Fitzroy Street/ Newton Street, Goulburn	167.0km		○ Police escort to hold southbound traffic along Fitzroy Street as OSOM vehicle is likely to overhang and travel into opposite lane. ○ Pilot vehicle to assist and guide OSOM vehicle through intersection. ○ Rear pilot and escort vehicles to inform following traffic of delays.

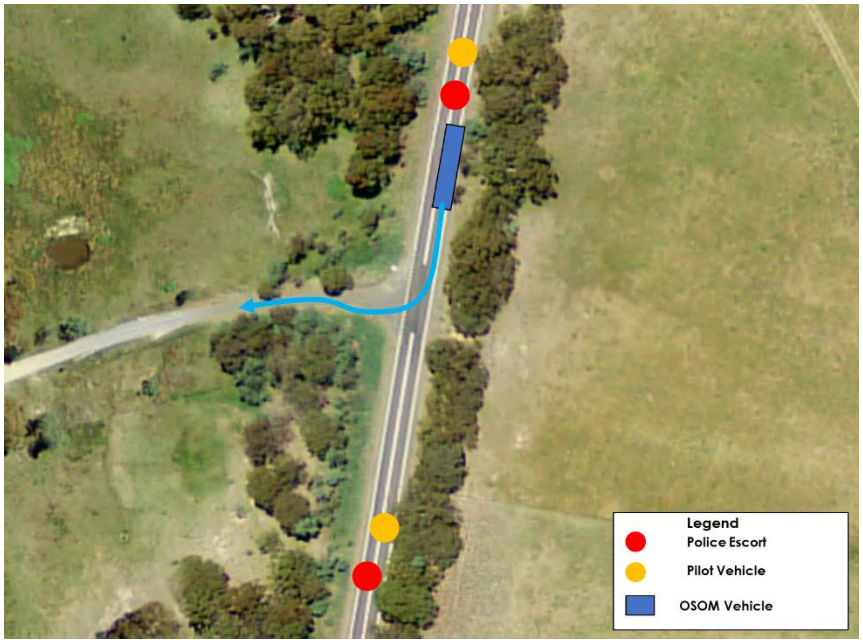
Location	Chainage (from Port Kembla)	Image	Traffic Management Requirements
Crookwell Road/ Grange Road, Crookwell	207.0km		○ Lead pilot, and police escorts to hold Grange Road (eastbound) and Crookwell Road approaches as the travel path of the OSOM vehicle travels into the Crookwell Showground and out of it. ○ Pilot vehicle to assist OSOM vehicle in navigating into and out of Crookwell Showground ○ Rear pilot vehicle to inform following traffic of delays.

Location	Chainage (from Port Kembla)	Image	Traffic Management Requirements
Grange Road/ Cullen Street, Crookwell	208.0km		○ Lead police escort to hold eastbound traffic along Cullen Street as OSOM vehicle will cross over into the inside corner of bend. ○ Police escort to hold traffic on Grange Road south approach. ○ Lead pilot vehicle to warn oncoming traffic of delays. ○ Pilot vehicle to stay on Grange Road south approach to guide OSOM vehicle through bend. ○ Rear pilot vehicle to inform following vehicles of delays.

Location	Chainage (from Port Kembla)	Image	Traffic Management Requirements
Cullen Street/ Kialla Road, Crookwell	209.0km		○ Police escort to hold traffic on Kialla Street north and south approaches as OSOM vehicle and load overhang likely to take up entire road width of Cullen Street and Kialla Road. ○ Lead pilot vehicle on Kialla Road to inform oncoming vehicles of delays. ○ Rear pilot vehicle to inform following vehicles of delay as OSOM vehicle navigates through intersection.

Location	Chainage (from Port Kembla)	Image	Traffic Management Requirements
Kialla Road/ Range Road, Bannister	223.0km		○ Police escort to hold oncoming traffic from Kialla Road (northbound) and Range Road (southbound) as OSOM and load likely to take up entire width of intersection. ○ Lead pilot vehicle to inform oncoming drivers of delay as OSOM vehicle navigates through intersection. ○ Pilot vehicle to stay on south approach (Range Road) to guide OSOM vehicle through intersection. ○ Rear pilot vehicle to inform following vehicles of delay as OSOM vehicle navigates through intersection.

Location	Chainage (from Port Kembla)	Image	Traffic Management Requirements
Range Road/ Grabben Gullen Road, Grabben Gullen	228.0km		○ Police escort to hold north and south approaches of Grabben Gullen Road as the OSOM vehicle and load is likely to take up entire width of intersection. ○ Lead pilot vehicle to inform northbound vehicles on Grabben Gullen Road of oncoming OSOM vehicle delays. ○ Pilot vehicle to guide OSOM vehicle through intersection from north approach. ○ Rear pilot vehicle to inform following drivers of delays as OSOM vehicle navigates through intersection.

Location	Chainage (from Port Kembla)	Image	Traffic Management Requirements
Grabben Gullen Road/ North BWF Site Access, Biala	231.0km		○ Lead escort and pilot vehicles to hold oncoming traffic along Grabben Gullen Road while OSOM vehicle enters the site. ○ Rear pilot and escort vehicles to inform following vehicles of delay as OSOM vehicle enters site.

Location	Chainage (from Port Kembla)	Image	Traffic Management Requirements
Grabben Gullen Road/ Alternative North BWF Site Access, Biala	233.0km		○ Lead escort and pilot vehicles to hold oncoming traffic along Grabben Gullen Road while OSOM vehicle enters the site. ○ Police escort to hold vehicles from east approach while OSOM vehicle navigates turn into site access. ○ Rear pilot vehicle to inform following vehicles of delay as OSOM vehicle enters site.

Grabben Gullen Road/ South BWF Site Access, Biala	236.0km		○ Lead escort and pilot vehicles to hold oncoming traffic along Grabben Gullen Road while OSOM vehicle enters the site. ○ Rear pilot and escort vehicles to inform following vehicles of delay as OSOM vehicle enters site.

4.7 Upgrades to Site Access Pavement

The internal access roads will be generally made up of unsealed carriageways. To limit loose gravel and dirt being transferred to the Grabben Gullen Road carriageway, the first 20 metres of the site access carriageway will be sealed as part of the BoP works. Developments Biala will monitor the public road and if excessive loose gravel and dirt is evident additional measures such as tyre cleaning grids will be implemented.

It is also recommended that "Stop" line marking and signage be provided on each of the vehicle access points to reinforce the priority of Grabben Gullen Road. Developments Biala confirms that this will be put in place, and completed prior to the Oversize and Overmass Transportation commence.

4.8 Monitoring and Maintenance of Roads

4.8.1 Monitoring

To ensure that the roads used by traffic associated with the OSOM deliveries of the BWF site are maintained to a suitable standard commensurate with their function, Developments Biala has been conditioned as part of the Conditions of Consent to provide pre- and post-construction road dilapidation report surveys (see Schedule 3 - Condition 26).

During construction the condition of the road surfaces will be monitored by Development Biala monthly and following any complaint or incident, as per the approved BoP Construction Traffic Management Plan.

4.8.2 Maintenance and Emergency Repair

Any emergency repair requirements or maintenance during construction and/ or decommissioning would be completed by Development Biala as required, in consultation with ULSC. This arrangement is as per the approved BoP Construction Traffic Management Plan.

4.9 Mitigation and Management Measures

Table 4.2 summarises all mitigation measures committed to throughout this TMP. For each measure, the responsible party and stage of project is listed.

Table 4.2: Mitigation and management measures

Factor	Management of control measure	Responsibility	When does this apply?
Permits/ Consent/ Licences	○ Contractors will abide by this TMP once approved by the Secretary. ○ The OSOM transportation contractor will obtain a Road Occupancy Licence from Roads and Maritime Traffic Operations Unit prior to commencing work within the classified road reserve or within 100 metres of traffic signals. ○ The OSOM transportation contractor will ensure that all traffic management approvals for works / traffic management arrangement along Local Roads are obtained from ULSC prior to any work commencing on the stipulated roads.	OSOM Transportation Contractor (Developments Biala to ensure compliance)	Throughout construction
Haulage	○ The OSOM transportation will use an appropriately licensed haulage contractor for haulage of any items to site. The contractor will have experience in transporting similar loads and be responsible for obtaining all required approvals and permits from Roads and Maritime or National Heavy Vehicle Regulator and Councils and for complying with conditions specified in the approvals. ○ All loaded vehicles entering or leaving site will have their loads covered or contained.	OSOM Transportation Contractor (Developments Biala to ensure compliance)	During construction
Road condition and dilapidation	○ Developments Biala will undertake dilapidation surveys in accordance with Schedule 3 condition 26 of the Project Approval. ○ Development Biala will ensure monthly monitoring occurs of the road conditions on the heavy vehicle route.	Developments Biala in conjunction with OSOM transportation contractor	Prior to, throughout and post construction

Consultation	○ Effective on-going consultation will be undertaken with relevant stakeholders as per Section 6.3.
	○ Liaison activities will include a combination of the following:
	  ○ Text message alerts
	  ○ One on one meetings
	  ○ Newspaper articles or advertisements
	  ○ Monthly project newsletter distributed via email
	  ○ Email and Phone discussions
	  ○ Follow through of complaints as per procedure
	  ○ An up to date website
	  ○ Operating a Community Consultative Committee.
		Developments Biala in conjunction with OSOM transportation contractor	Prior to, throughout and post construction

Delays to traffic	○ Construction trucks are to follow approved routes at all times. ○ Light vehicles to always drive responsibility and consider other road users. This will be incorporated in the site induction. ○ As the loading on the road network will remain below a LOS of C no substantial delays to traffic are expected. ○ Sufficient dedicated onsite personnel car parking will be provided. ○ Construction trucks' arrival and departure are to be planned with consideration to minimising effect to other road users during peak traffic periods.	OSOM transportation contractor (Developments Biala to ensure compliance	During construction

Factor	Management of control measure	Responsibility	When does this apply?

Driver's code of conduct	○ The drivers code of conduct has been developed in consultation with balance of plant, transport contractor(s) and reviewed by Developments Biala. The TMP it will be implemented by Development Biala and the appointed BoP contractor for all traffic and transport construction activities associated with the balance of plant construction. A Code of Conduct is included in Section 7.
	○ Training records will be kept for all inductions and the Transport code of conduct.
	○ Controls in the code include:
	  ○ Travelling speeds
	  ○ Haulage routes
	  ○ Details on school zones and school bus routes including times
	  ○ Details on stock crossing locations
	  ○ Safe driving practices
	  ○ All traffic will be courteous to other users
	  ○ Heavy vehicle driver fatigue policies
	  ○ Vehicle maintenance requirements
	  ○ Complaints resolution
	  ○ Disciplinary procedure.
		OSOM transportation contractor	During construction

Stock Movements	○ Enhanced temporary signage will be provided by Developments Biala to the owners of Residence H07. ○ Every worker onsite will be informed of the potential for stock movements through the site induction. ○ Slowing at the temporary stock signs is part of the driver's code of conduct. ○ If complaints are received that traffic is not behaving appropriately, vehicle tracking information will be reviewed, and disciplinary action taken where appropriate. ○ Developments Biala will provide a dedicated phone number to the owners of Residence H07 to discuss traffic and stock movements on Grabben Gullen Road throughout construction.	Developments Biala in conjunction with OSOM transportation contractor	During construction
School Bus Routes	○ Details and times of school bus routes will form part of the site induction, so all drivers will be aware. ○ Consultation is to be ongoing with bus operators. ○ If deemed necessary, an escort vehicle may be provided.	Developments Biala in conjunction with OSOM transportation contractor	During construction

4.10 Project Personnel Car Parking

Sufficient dedicated on-site worker car parking will be provided by Biala Development. No development related vehicles are permitted to park on public roads at any time. A drop-off and storage facility will be provided on-site for larger tools and equipment. As such, the car parking impact of construction workers will be negligible on Grabben Gullen Road.

5. Driver's Code of Conduct

The following code of conduct will be revised by Developments Biala in conjunction with the OSOM contractor prior to commencement of on-site works for the project. After Developments Biala's approval it will be implemented for all traffic and transport construction activities associated with the OSOM transportation.
The following code of conduct will form part of Development Biala's requirements of the OSOM transportation contractor, where the OSOM transportation contractor is expected to comply with the code of conduct in full. It is Development Biala's expectation that the Code of Conduct will be implemented for all traffic and transport construction activities associated with the OSOM transportation.

5.1 Driver's Code of Conduct

This code of conduct will be communicated to all site workers during the site induction process. Workers will be reminded of the requirements of the code of conduct regularly in toolbox meetings.

The code of conduct will be revised prior to commencement of on-site works and when required during construction works.

5.1.1 Travelling Speeds

All vehicles associated with the BWF site are required to travel within the posted speed limits on public roads. In situations where driver's visibility and traffic safety on public roads is affected by weather related conditions such as heavy rainfall or fog, construction vehicles should reduce their speed limit until visibility and traffic safety has improved.

Vehicle tracking management systems will be used for all site-based vehicles during construction.

5.1.2 Haulage Routes and Timing of Transport

All large vehicles associated with the BWF site will follow the designated heavy and oversized/ over mass vehicle routes in the surrounding area. A map of the haulage routes highlighting critical locations is attached to the transport code of conduct. Any school zones and school bus routes corresponding to the transport routes will be marked on the route maps. The route maps identified for OSOM and HV routes are detailed in Figure 5.1, 5.2 and 5.3.

Figure 5.1: OSOM Route – Wollongong to Mittagong

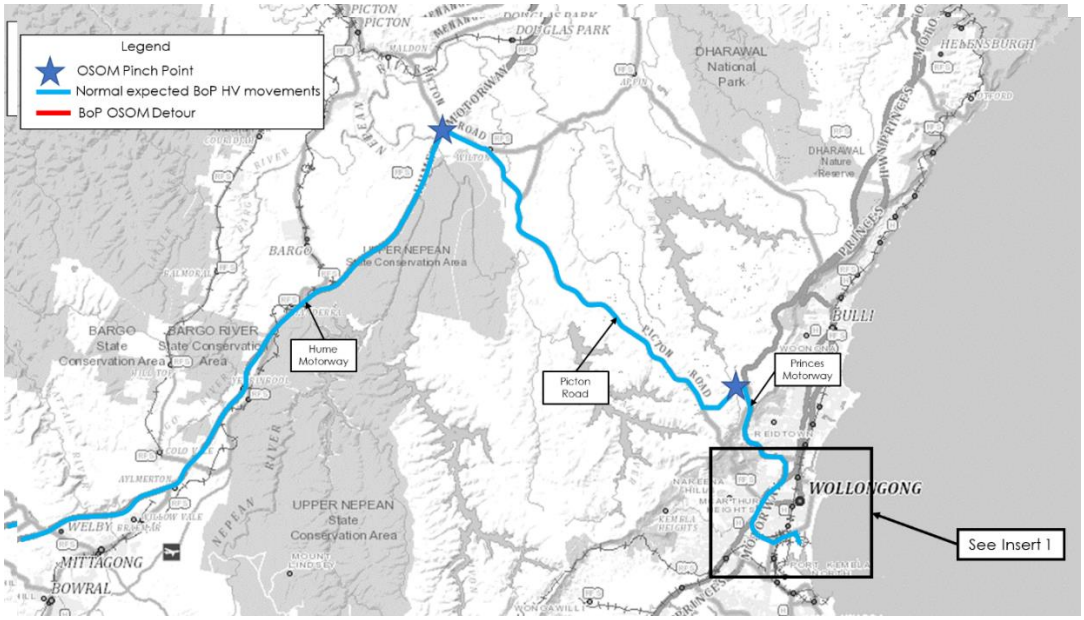


Figure 5.2: OSOM Route - Wollongong

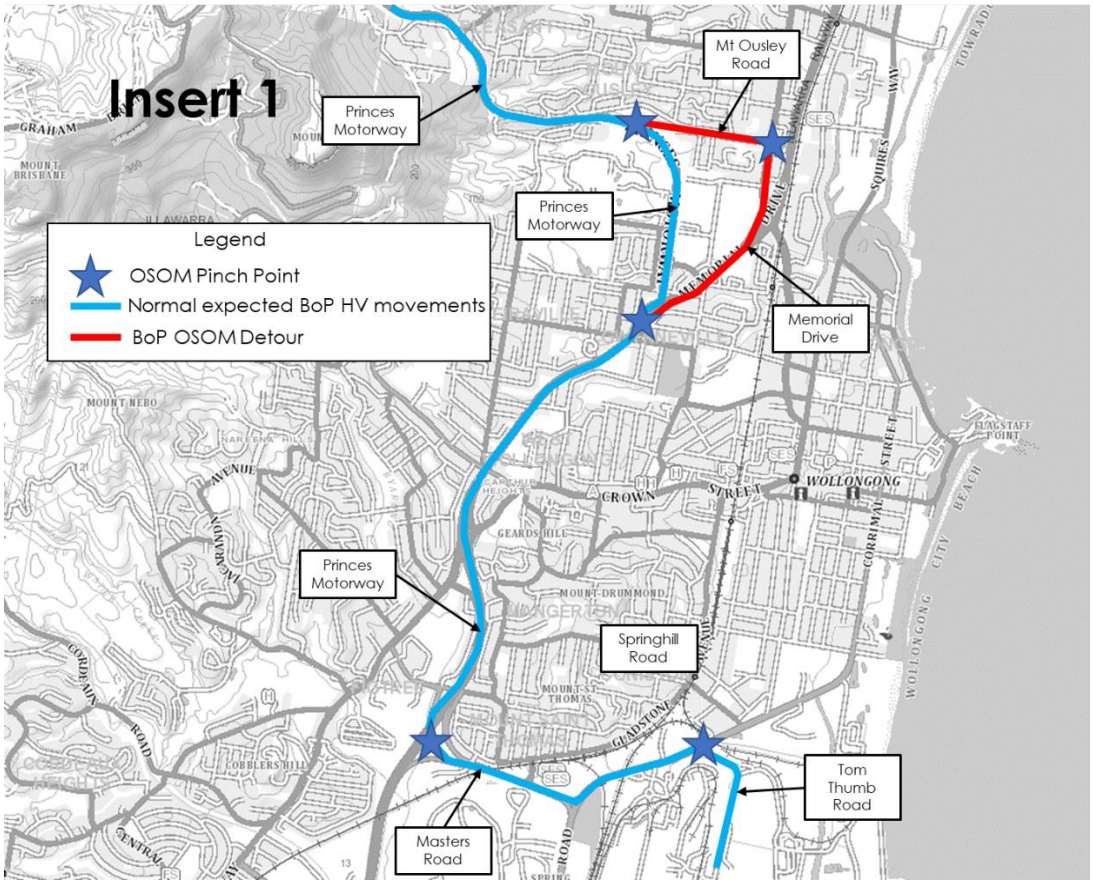
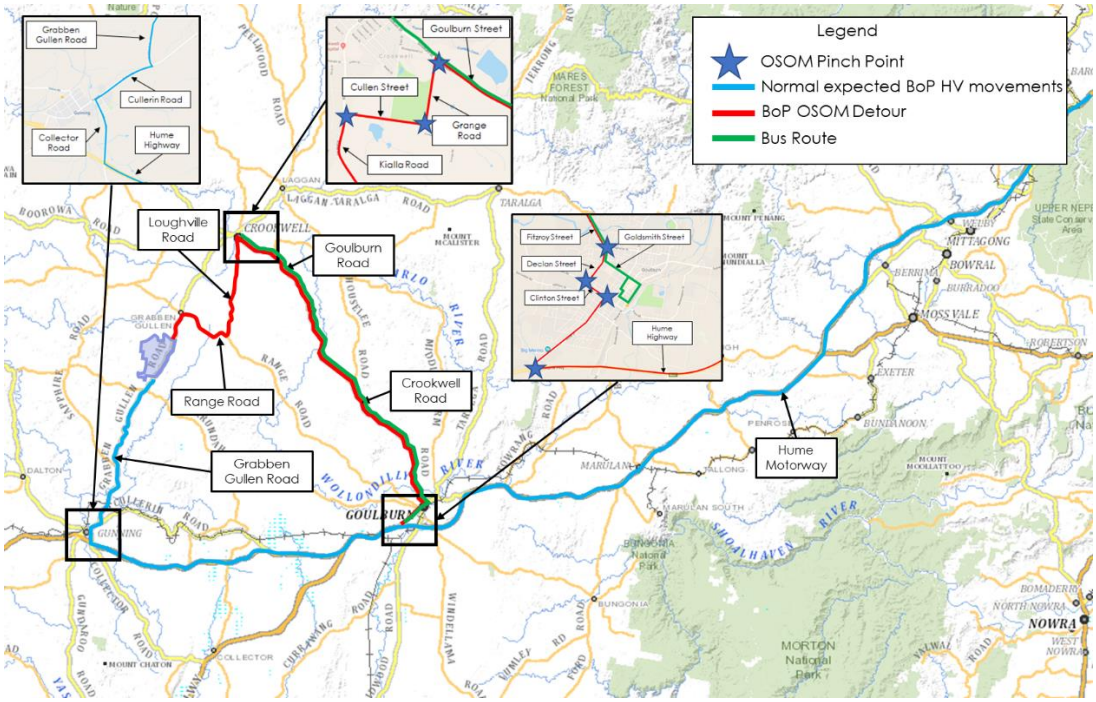


Figure 5.3: OSOM Route and HV movements – Mittagonog – Crookwell



When Gunning Road is being used for transporting the components, all drivers of heavy vehicles associated with the development shall be required to use the grade separated intersection of the Hume Highway and Gunning-Collector Road for all movement onto the Hume Highway eastbound.

The OSOM transportation contractor will complete the following measures to minimise impact on school bus routes:

- Details and times of school bus routes will form part of the site induction.
- Consultation will be ongoing with bus operators.
- If deemed necessary, an escort vehicle for the school bus will be provided.
- Over dimensioned and over mass deliveries are subject to the OSOM transportation contractor obtaining relevant approvals from RMS, with such deliveries typically escorted outside school bus operation hours. Refer to Appendix C for the RMS letter outlining the OSOM approval process.

5.1.3 Safe Driving Practices

The operators of all vehicles associated with the BWF site would maintain a high level of awareness and respect for all other road users. All on-site staff will receive a site induction, which will include details regarding the TMP and this code of conduct. Regular toolbox meetings will be held to maintain awareness of required controls. Details of the traffic and access training and induction will focus on:

- objectives of the TMP
- performance goals
- mitigation measures required to be implemented
- traffic and access monitoring and reporting requirements
- incident investigation and response protocols.

Training is to be provided prior to start-up of any traffic and access related management tasks and updated if task, equipment or procedures are expected to, or have changed.

The following requirements would be adhered to at all times:

- Obey all laws and regulations.
- Do not drive whilst under the influence of alcohol, drugs, nor any medication which may affect ability to drive.
- Be medically fit to drive at all times and must inform site coordinators if they have any medical condition which may affect their ability to drive.
- Drive in a considerate manner at all times and respect the rights of others to use and share the road space.
- Report all vehicle defects to their employer. Serious defects must be corrected immediately, or an alternative vehicle supplied.
- Any vehicle crash or incident resulting in injury or significant damage to property must be reported to the police.
- Report any near misses.
- Always adhere to the site working hours.
- Only drive the construction vehicle when conducting works related to the project.
- Securely fasten and cover loads, as appropriate.
- Keep their vehicle clean and in good mechanical condition to reduce the environmental impact.
- Extra care should be taken when driving at dawn or dusk, being particularly watchful for wildlife and/ or livestock.
- Vehicles must give way to pedestrians, cranes, forklifts, mobile plant, emergency vehicles and livestock.
- Drivers must reduce speed to below 40 km/h and be prepared to stop when the temporary signs for stock movement are erected, on Grabben Gullen Road, north of the Central Access and south of Range Road.

The transport OSOM contractor is to develop and implement a maintenance program for the heavy transport vehicles that is consistent with these safety requirements.

5.1.4 Heavy Vehicle Driver Fatigue

Fatigue is one of the biggest causes of crashes for heavy vehicle drivers. The Heavy Vehicle Driver Fatigue Reform was therefore developed by the National Transport Commission and approved by Ministers from all States and Territories in February 2007. The heavy vehicle driver fatigue law commenced in NSW on 28 September 2008 and applies to trucks and truck combinations over 12 tonne gross vehicle mass (however there are Ministerial Exemption Notices that can apply). Under the law, industry has the choice of operating under three fatigue management schemes:

- standard hours of operation
- basic fatigue management
- advanced fatigue management.

Developments Biala will be responsible to ensure all heavy vehicle drivers operating out of the BWF site are to be aware of and understand the adopted fatigue management scheme and operate within its requirements, as included in Appendix D.

5.1.5 Maintenance Requirements

The operators of all vehicles associated with the BWF site would maintain a high level of maintenance. The following requirements would be adhered to at all times:

- ensure their vehicle complies with relevant State legislation in relation to roadworthiness and modifications
- undergo regular vehicle checks and maintenance and
- ensure their vehicles have correctly fitted mufflers to minimise noise disturbance.

5.1.6 Complaint Resolution and Disciplinary Procedure

All traffic related complaints will be managed in accordance with the BWF Complaints Handling Procedure included in the annexure section of the Environmental Management Strategy.

A brief overview is described as follows, and all complaints will be collated via the following means and be responded within two business days:

- Toll Free Phone: 1800 370045
- Email: info@bialawindfarm.com
- Write: Biala wind farm, Suite 3, Level 21, 1 York Street, Sydney, NSW 2000
- Feedback Form: http://bialawindfarm.com/contact-us/.

Failure to comply with these procedures for safe transport may result in disciplinary action. Vehicle tracking will be used to follow-up on any complaints lodged. If a complaint occurs on Grabben Gullen Road north of the Central access and South of Range Road, one warning to the involved driver will be issued. If a second complaint against the involved driver occurs that driver will be removed from site.

6. Consultation

6.1 Stakeholder Engagement

GTA and Goldwind have informed and consulted the following stakeholders in developing the OSOM applications and this TMP, as well as obtaining relevant permits and resources:

- Roads and Maritime Services Special Permits Unit
- Upper Lachlan Shire Council.

6.2 Roads and Maritime

A draft copy of the OSOM TMP was submitted to Roads and Maritime for comment on the 1 October 2019 for comment. On the 23 October 2019 Roads and Maritime provided formal comments and required no amendments on the draft OSOM TMP. Refer to Appendix E for a copy of the letter.

6.3 Council

The local council of the project area and surrounding road network is the Upper Lachlan Shire Council (ULSC). On 21 November 2019 ULSC provided comments on the OSOM TMP and these comments have been addressed by Beijing Jingneng Clean Energy on 22 November 2019. Refer to Appendix F for a copy of the correspondence.

6.4 Community Notifications

Information regarding the construction traffic disruption associated with the OSOM deliveries will be provided to the local community as part of Biala Wind Farm's responsibilities. This will be done through letterbox drops that will include information on such planned activities, progress of schedule, traffic routes and flows, enquiry and complaint contact information, as well as any changes to delivery activities.

The letters will be distributed monthly or as appropriate to coincide with key delivery milestones. Letters will be distributed to property owners within five kilometres of the site entrances. Letters will be distributed to property owners within five kilometres of the site entrances,

6.5 Complaints Management

All complaints will initially be received by the on-site Principal Contractor. On receipt of a complaint, the Principal Contractor will:

- Contact the complainant.
- Complete a Community Complaints form to record:
  - date/ time
  - means of complaint (i.e. telephone, mail, email)
  - personal details
  - nature of complaint.
- Coordinate with the Site Manager, appointed transport contractor and/or relevant contractors on potential corrective actions.
- Advise the complainant of the corrective actions and record these on the Community Complaints form.
- Complete the Community Complaints Register.

- If corrective actions cannot be implemented immediately, an incident report will be raised to manage the process.
- If appropriate, follow up with the complainant to review outcome of the implemented corrective actions.

Members of the community will be able to notify Biala Development Pty Ltd or its principal contractor as shown in Table 6.1, with any complaints they may have.

Table 6.1: Complaints contact details

Contact/ Company	Telephone	Email	Mail
Biala Wind Farm	1800 370 045 (toll free)	info@bialawindfarm.com	Suite 3, Level 21, York Street, Sydney, NSW 2000
OSOM Transport Contractor	TBC	TBC	TBC
Principal Project Manager	TBC	TBC	TBC

7. Monitoring, Reporting and Compliance

Monitoring and reporting of the effectiveness of the measures outlined in this TMP will occur in accordance with Table 7.1.

Table 7.1: Monitoring and reporting of TMP measures

Action	Frequency
Review of Traffic Management Plan and Transport Code of Conduct	Review every 6 months or after a complaint or incident requires amendment.
Review of Site Induction to ensure it includes relevant traffic related information	Monthly during construction.
Review training records to ensure all site staff have completed the site induction and the transport code of conduct	Monthly during construction.
Review that driver behaviour is in accordance with this TMP and the Drivers Code of Conduct	Developments Biala will remain vigilant to any non-compliance by any site staff during construction. Developments Biala will undertake monthly safety audits including spot checks on compliance with the TMP, evidence of truck and trailer safety inspections and the Drivers Code of Conduct.
Review of complaints relating to traffic	Any complaints will be handled in accordance with BWF's Complaints Handling Procedure. An updated (anonymised) complaints register will be placed on the project website at monthly intervals. Any traffic related complaints will be discussed immediately with any relevant contractors. During monthly project meetings, traffic related complaints will be discussed as an agenda item.
Traffic Incident follow-up	Monthly review of incident reports on register to ensure actions are closed out and all follow-ups are completed.
Monitor conditions of access roads to site	Monthly.
Monitor loose material on public road at site entrances	Daily.

Appendix A

Rex J Andrews Route Survey Report

REX J ANDREWS
ENGINEERED TRANSPORTATION

ROUTE STUDY: GOLDWIND AUSTRALIA

BIALA WIND FARM:

EX PORT KEMBLA.

26/11/2018 REV 02

Rev.	Date	Change	Responsible	Checked
00	04/08/17	Route Assessed	W Andrews	✓
00	09/08/17	Report compiled	W Andrews	✓
00	16/08/17	Report completed	W Andrews	✓
01	19/08/17	Revisions	W Andrews	✓
02	26/11/18	Revisions	W Andrews	✓

Index:

1.0 Introduction

This document describes observations and previous experience on sections of this route and explains the Transport of Wind turbine equipment from Port Kembla to Biala wind farm.

This Route survey took place on 04-08-17.

2.0 Evaluation

1	No Cost
2	Some Work
3	Urgent Modification
4	Extreme Amount of Work

(Mark below boxes with an X)

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

3.0 Project data.

Date of latest Route Assessment. 04/08/2017
Survey undertaken by. (Rex J Andrews P/L)
Project name. Biala Windfarm
Location. Port Kembla (NSW) to Biala (NSW)
Turbine type.
31 x GW140, 110 metre H/H

4.0 Transport combinations 3.4MW.

Nacelle bodies (10.1l x 5.2w x 4.2h x 42.5T)
Possible transport configuration. Prime mover with 2x4 dolly 4x4 Low loader.
Overall length: 25.0l x 5.2w x 5.2h x 77.5T.

Generators (5.3 x 5.3 x 3.2h x 83.5T)
Possible transport configuration. Prime mover with 2x8 dolly & 6x8 Platform trailer.
Overall length: 30.0l x 5.3w x 4.9h x 143.5T.

Hubs (5.4l x 4.7w x 4.1h x 43.7T)
Possible transport configuration. Prime mover with 2x4 dolly 4x4 Low loader.
Overall length: 25.0l x 4.8w x 5.2h x 77.5T.

Blades (68.7l x 4.8w x 3.45h x 22T)
Possible transport configuration. Prime mover with 2x4 low dolly- 3x4 -Blade trailer.
Overall length: 78.0l x 4.8w x 5.2h x 77.5T.

Bottom section (16.7l x 4.8 x 4.5 x 109T)
Possible transport configuration. Prime mover with 11x8 Platform trailer with low centre chassis.
Overall length: 35.0l x 4.8w x 5.3h x 189.5T.

Mid lower section (22.5l x 4.5 x 4.5 x 98.1T)
Possible transport configuration. Prime mover with 11x8 Platform trailer with low centre chassis.
Overall length: 35.0l x 4.8w x 5.3h x 179.5T.

Mid section (22.5l x 4.5 x 4.5 x 77.1T)
Possible transport configuration. Prime mover with 4x8-4x8 Platform trailer.
Overall length: 38.0l x 4.5w x 5.3h x 144.5T.

Mid upper section (22.5l x 4.5 x 4.5 x 55.3T)
Possible transport configuration. Prime mover with 4x8-4x8 Platform trailer.
Overall length: 38.0l x 4.5w x 5.3h x 126.5T.

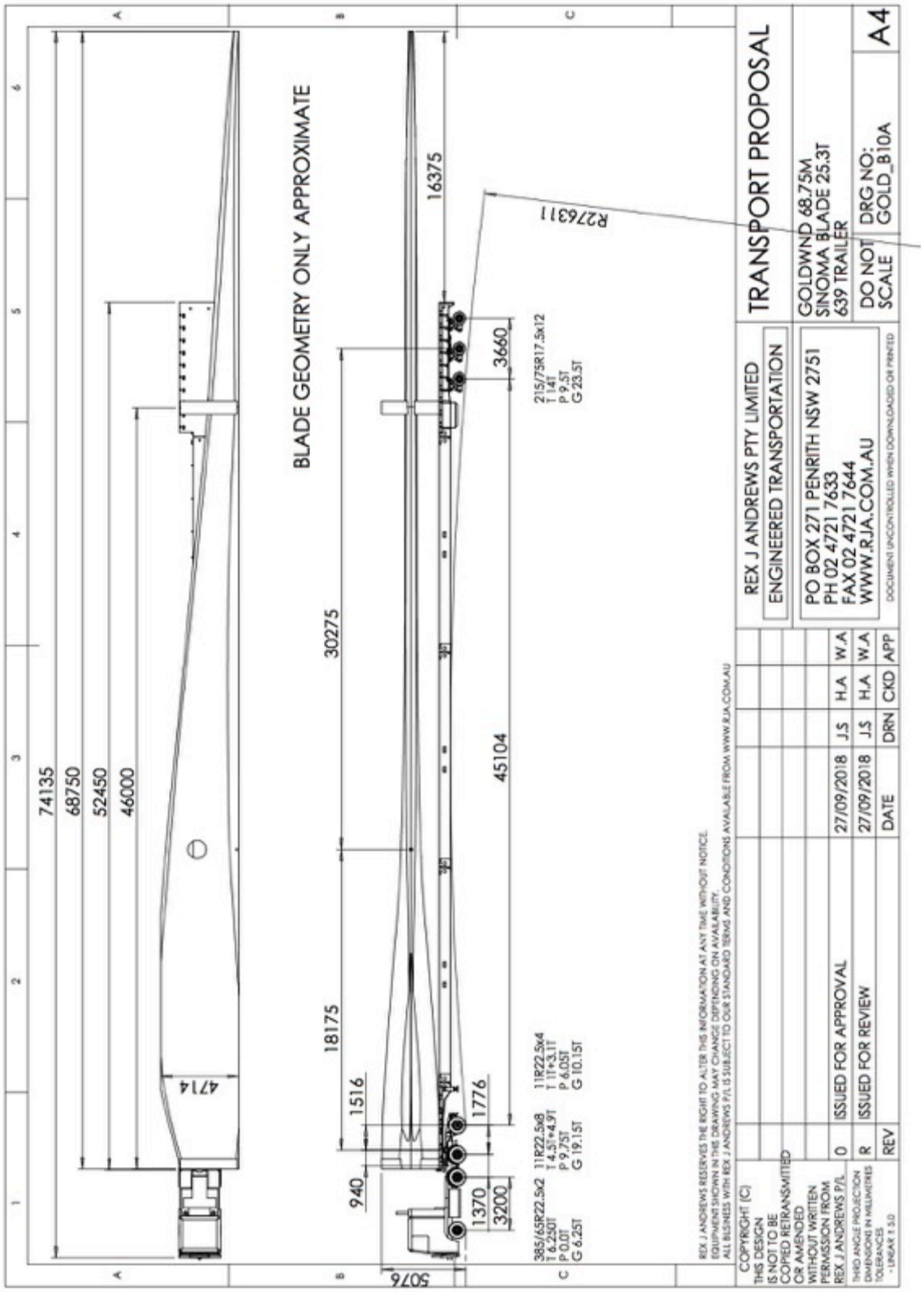
Top section (25.5l x 4.5 x 3.4 x 53.0T)
Possible transport configuration. Prime mover with 2x8 3x8 dolly-jinker.
Overall length: 39.0l x 4.5w x 5.3h x 86.5T.

5.0 Site Location.

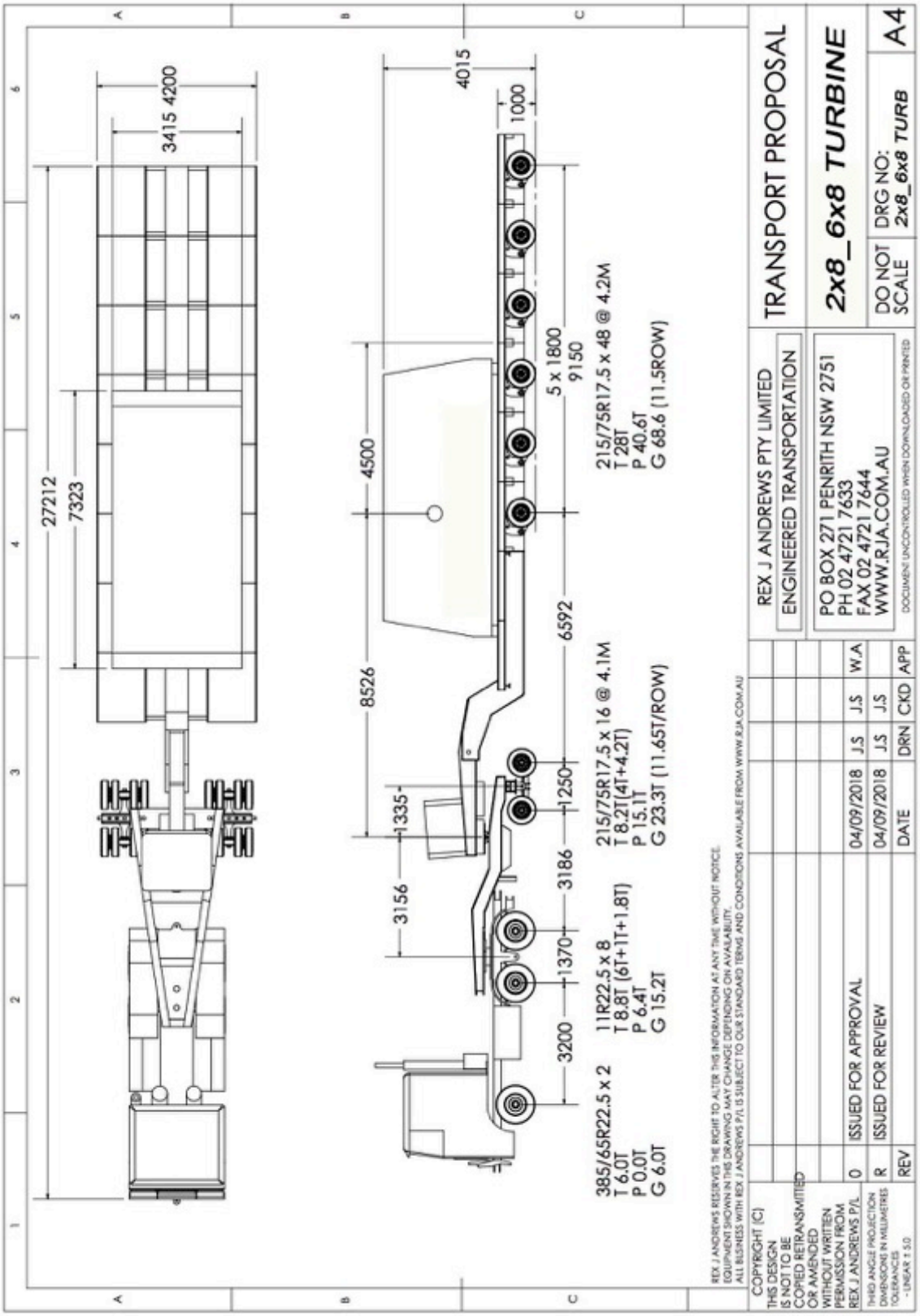
The Biala Wind farm is located approx. 200 Kilometers south west of Port Kembla, and approx. 20 Kilometers south of Crookwell.

6.0 Transport drawings (Examples).

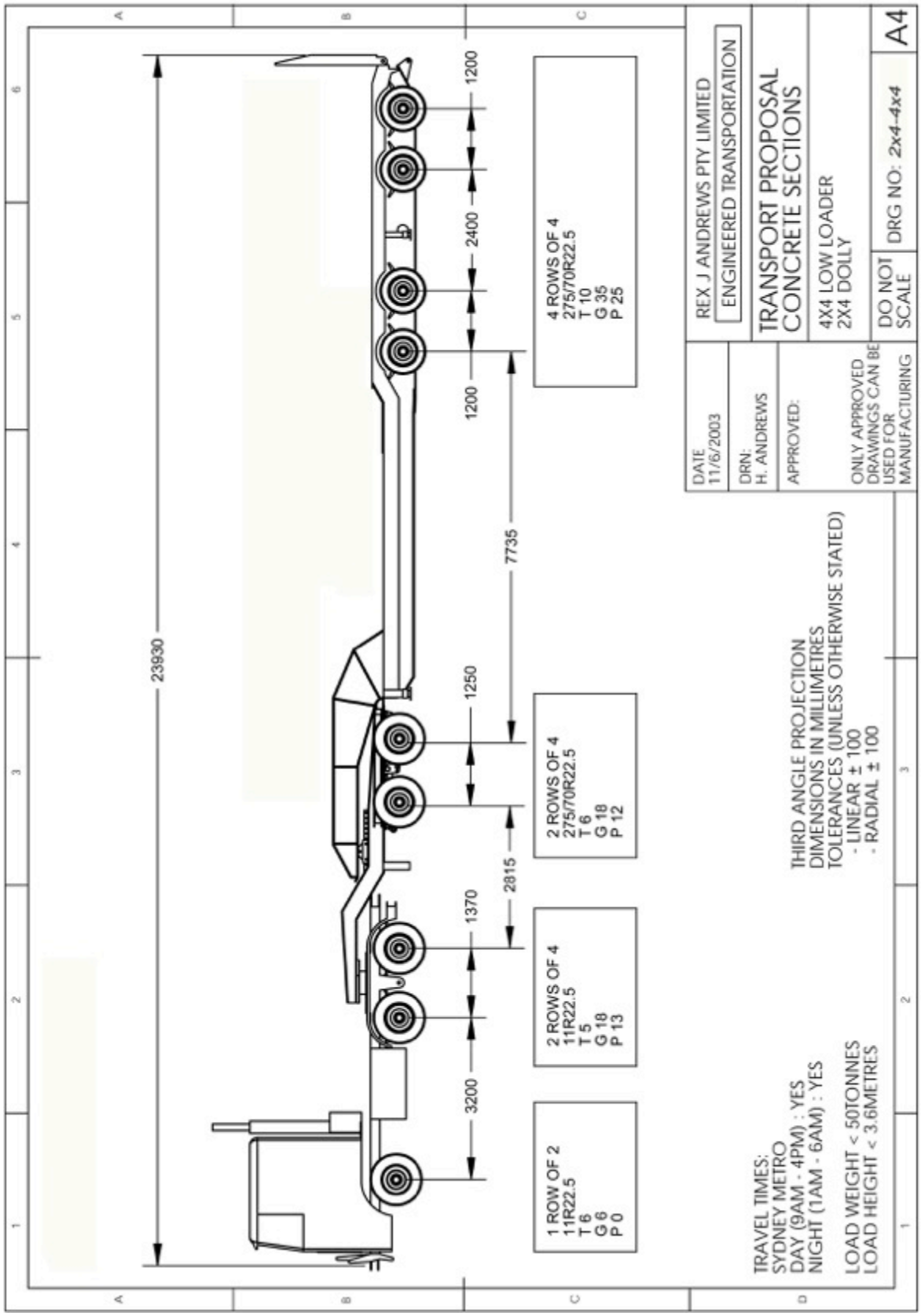
Blade example:



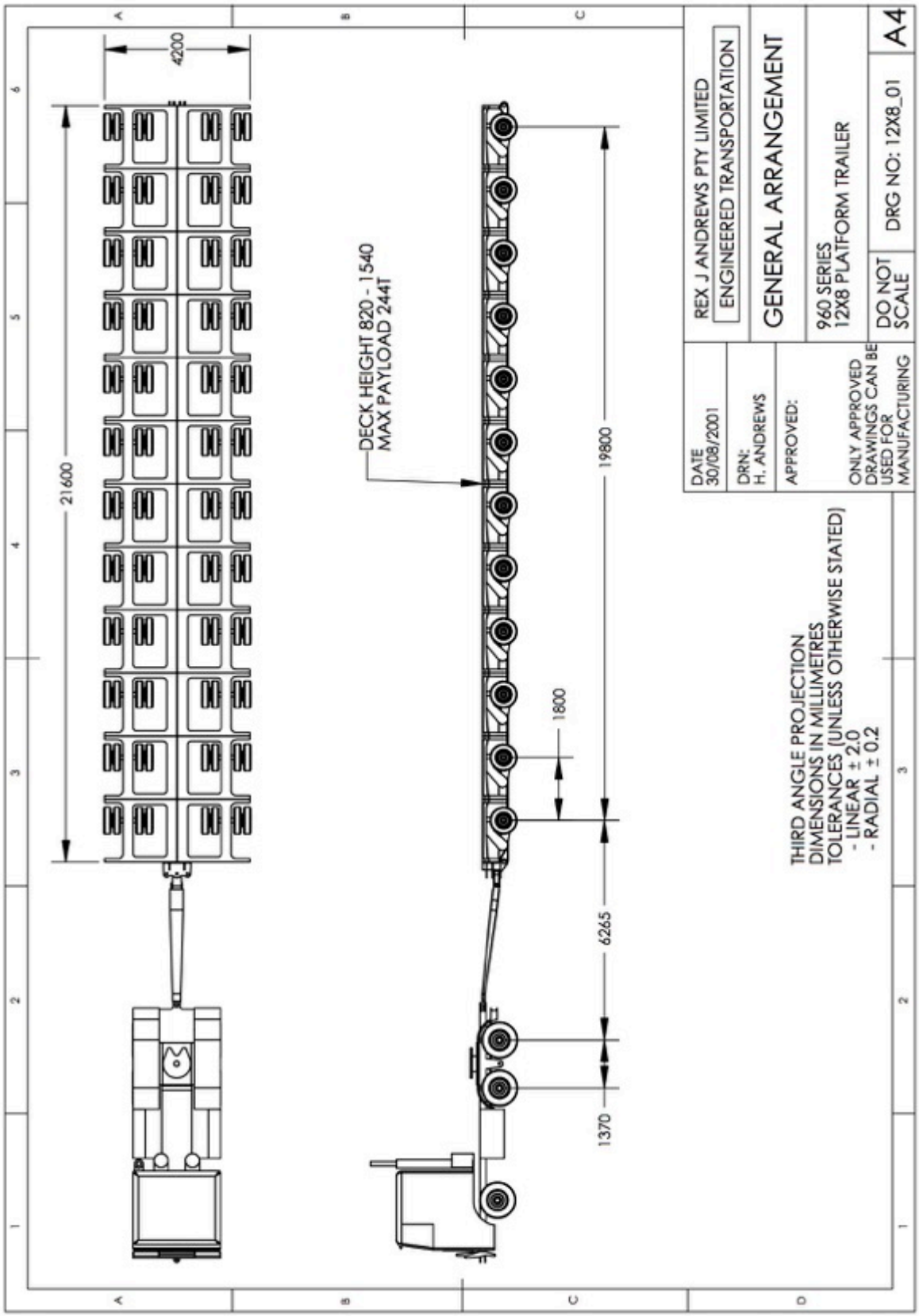
Generator example:

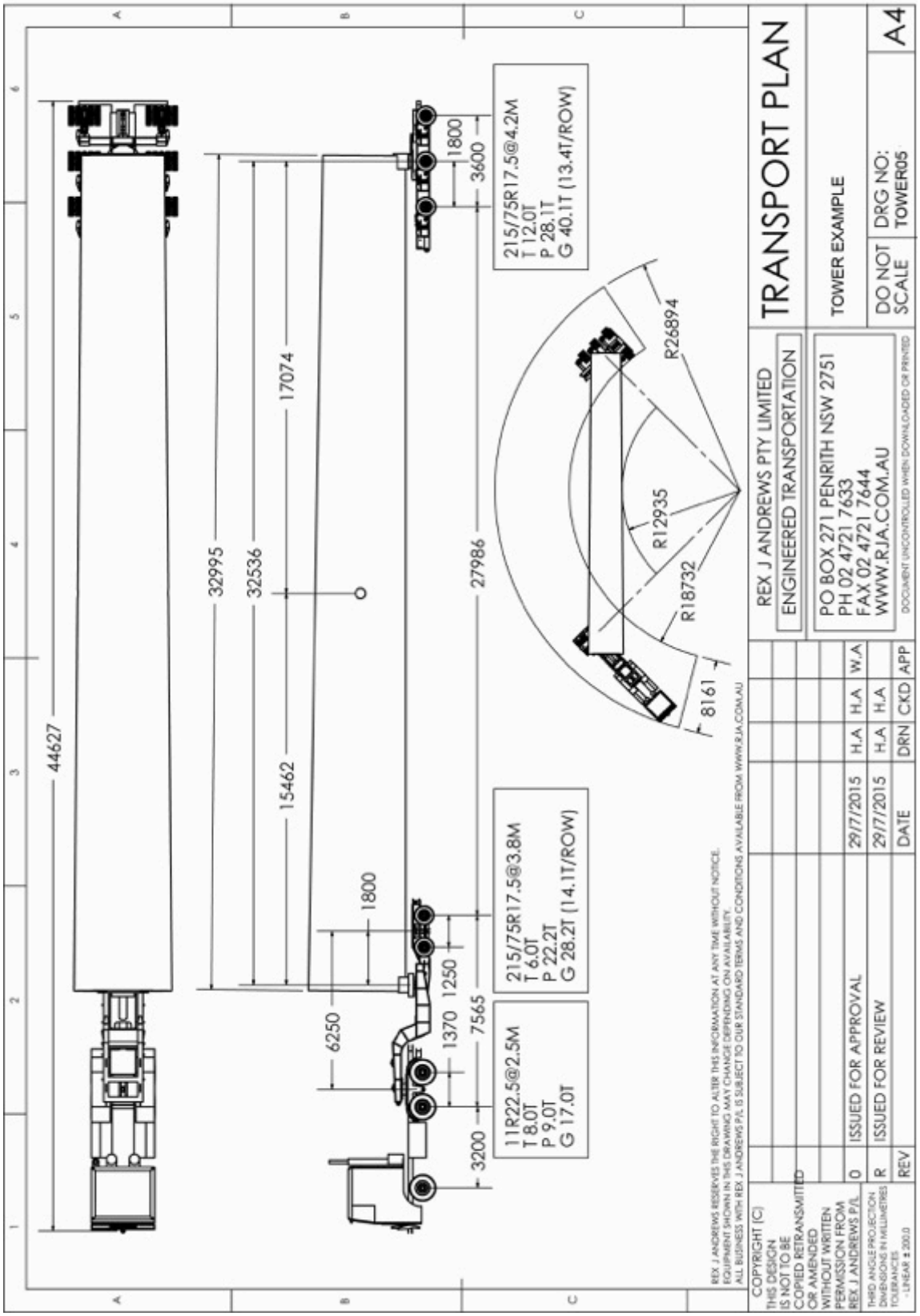


Hub/Nacelle example:



Tower examples:




44627
32995
32536
17074
15462
27986
1800
3600
1800
6250
1370
1250
7565
3200
215/75R17.5@4.2M
T 12.0T
P 28.1T
G 40.1T (13.4T/ROW)
215/75R17.5@3.8M
T 6.0T
P 22.2T
G 28.2T (14.1T/ROW)
11R22.5@2.5M
T 8.0T
P 9.0T
G 17.0T
R26894
R12935
R18732
8161
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7.0 Port of Import.

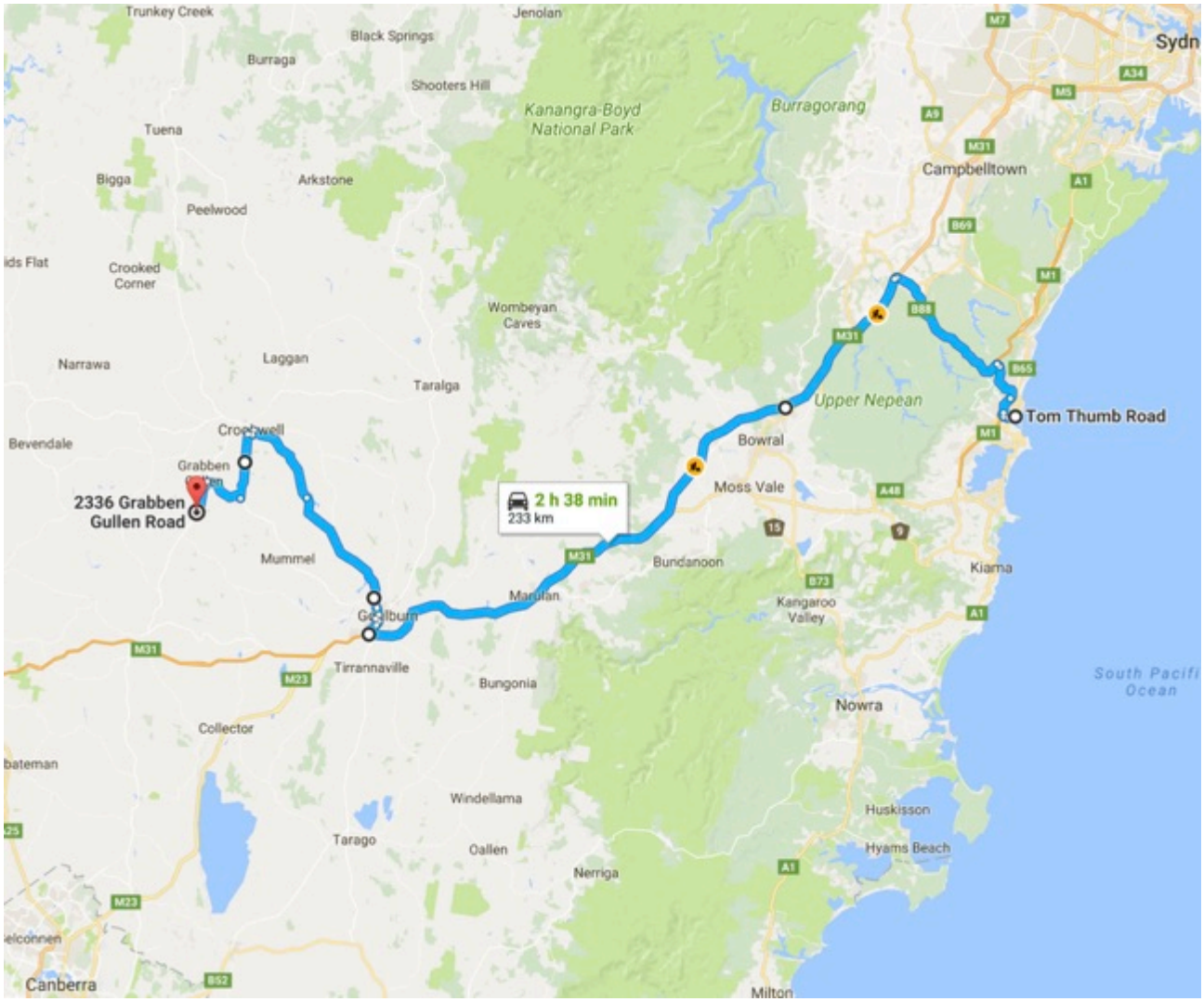
The wind turbine equipment will be imported from various countries, and will arrive on ships into Port Kembla. The client may also source local towers. The ideal berth for these shipments is the AAT terminal. The facility has a hardstand storage area of roughly 40,000 s/q metres.

8.0 Route study: Port Kembla to Biala.

We have based this study on the turbine components, and all imported towers entering Australia via the AAT terminal at Port Kembla. After accessing a number of options, the following was selected as the most likely route.

ROUTE: Port Kembla to Biala 233.0 kilometres:

This route took us via Tom Thumb Road, Springhill Road, Masters Road, Southern Freeway, Mt Ousley Road, Picton-Wilton Road, Hume Highway, Hume Street, Clinton Street, Deccan Street, Fitzroy Street, Crookwell Road, Grange Road, Cullen Street, Kialla Road, Range Road, Grabben Gullen Road.



Route Index

KEY	
CRITICAL	
CAUTION	
EMERGENCY PARKING	

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
Route: Port Kembla to Biala wind farm					
0.0	Port Kembla	Exit port onto Tom Thumb Road	5.5 Metres width	Travel directly ahead	No problems with this section of road
0.2	Port Kembla	Tom Thumb Road onto Springhill Road	A clearance of 70 metres in length is required	Left hand turn	The light pole on the right hand side will need to be relocated to accommodate the tail swing. Some removal and trimming of trees will also be required.
1.4	Port Kembla	Springhill Road onto Masters Road	A clearance of 70 metres in length is required	Right hand turn	Some hardstand will need to be added on the exit of the corner.
2.6	Figtree	Masters Road onto Southern Freeway	70.0 Metres clearance	Right hand sweeping bend	No problems with this section of road
2.7	Figtree	Southern Freeway under The Avenue	5.4 Metres clearance	Travel directly ahead	Loads that exceed 5.3 metres will not be able to use this section of road.
6.4	Keiraville	Southern Freeway onto Mount Ousley Road	5.4 Metres clearance	Travel directly ahead	Loads that exceed 5.3 metres will not be able to use this section of road.
6.5	Keiraville	Mount Ousley Road under the University Bridge	5.0 Metres clearance	Travel directly ahead	Loads that exceed 5.0 metres will not be able to use this section of road. Detour for up to 5.3 metres high via the Princes Highway.
13.0	Mount Ousley	Mount Ousley Road onto Picton-Wilton Road	70.0 Metres clearance	Tight left hand turn	Care to be taken with this procedure. The guardrail on the left hand side will come close to the trailer. The prime mover will need to mount the existing median strip. Police will need to hold southbound traffic so the overhang can pass over the southbound lanes.
40.0	Wilton	Picton-Wilton Road onto the Hume Highway	70.0 Metres clearance	Long Sweeping left Hand Turn	Care to be taken with this procedure. The pole on the inside of the corner will come close to the trailer. The overhang should pass over the signs on the outside of the turn.
104.0	Sutton Forest	Hume Highway	150.0 long x 10.0 wide	Merge to left	Large parking area
153.0	Goulburn	Hume Highway	180.0 long x 15.0 wide	Merge to left	Large parking area

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
161.0	Goulburn	Hume Highway onto Hume Street	70.0 Metres clearance	Travel around to the right and take the 3rd exit onto Hume Street	As well as guardrail, a spotter will need to watch the poles on the rear overhang. The overhang should also pass over any of the warning signs.
161.9	Goulburn	Hume Street roundabout	70.0 Metres clearance	Travel directly ahead and take the 2nd exit to remain on Hume Street	The blades will stay on the correct side for this procedure. The blade overhang will pass over any of the traffic signs.
164.4	Goulburn	Cowper Street onto Clinton Street	70.0 Metres clearance	Tight left hand turn	The signs on the inside of the corner and center median strips will need to be removed.
164.7	Goulburn	Clinton Street roundabout	70.0 Metres clearance	Travel directly ahead and take the 2nd exit to remain on Clinton Street	The blades will stay on the correct side for this procedure. The blade overhang will pass over any of the traffic signs.
165.2	Goulburn	Clinton Street onto Deccan Street	60.0 Metres clearance	Tight right hand turn	OPTION 1: The signs will need to be removed from the inside of the corner, and on the centre median strip, The trees on the tail swing may also be a problem. It will be very tight. OPTION 2: A large amount of hardstand would need to be added to the inside of the corner. The signs will need to be removed from the inside of the corner, and on the centre median strip. This option will allow the trees to stay in place. 2 sections of road will require no parking exclusion zones.
166.0	Goulburn	Deccan Street onto Fitzroy Street	65.0 Metres	Slight veer to the left	The overhang will tighten up on the crossing sign outside the school. This sign may need to be made removable, as well as signs prior and after the roundabout. A no parking exclusion zone to be placed on the exit of the roundabout on the left hand side.
167.0	Goulburn	Fitzroy Street	65.0 Metres	Slight veer to the left	The overhang will tighten up on the crossing signs on the center median strip. These sign may need to be made removable.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
207.0	Crookwell	Crookwell Road onto Grange Road	55.0 Metres	Tight left hand turn	Blades are to travel directly across the corner and enter the showground. Blades will than sweep around to the left before reentering Grange Road to the south of the intersection. Discussions to take place between GWA and Upper Lachlan Shire council.
208.0	Crookwell	Grange Road onto Cullen Street	60.0 Metres	Tight right hand turn	Some fill will need to be added to the outside of the turn, as well as the removal of a tree on the left hand side prior to the corner. The blades overhang should clear the exsisting embankment.
209.0	Crookwell	Cullen Street onto Kialla Road	60.0 Metres	Moderate left hand turn	The exsisting access road through the private property would require the widening of the exsisiting gates, as well as the removal of 3 bushes within the tailswing of the blade.
212.0	Crookwell	Kialla Road	1.0 metre deep	Floodways	Kialla Road has a number of floodways. It is advisable that all loads slow to a minimum of 10 kilometres per hour while travelling through them.
223.0	Bannister	Kialla Road onto Range Road		Moderate right hand turn	This intersection has been upgraded for the Gullen range project. However the existing corner will still require a large amount of hardstand to be added to the inside of the corner.
228.0	Grabben Gullen	Range Road onto Grabben Gullen Road		Tight left hand turn	This corner would require a moderate amount of hardstand added to the inside of the turn, and on the outside of the turn. The blade may overhang the property owner's boundary, but should not make contact with the landowner's property. Some trees will require trimming. And the removal of the tree on the entrance to the corner will also need to be removed.
231.0	Biala	Grabben Gullen Road into North Access gate		Right hand turn	The exsisting option to turn into the access gate via the exsisting gravel road would require extensive works. The option of placing the site entrance 100 metres north looks to be the best option. Both options however would require a large amount of works.
233.0	Biala	Grabben Gullen Road into Alternative North Access gate		Right hand turn	A suitable site entrance would be required to accommodate the swept path of the blades. The proposed location of this access points is in a good position with flat ground and good line of site.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
236.0	Biala	Grabben Gullen Road into South Access gate		Right hand turn	A suitable site entrance would be required to accommodate the swept path of the blades. The proposed location of this access points is in a good position with flat ground and good line of site.

0.0 Km's: Exiting Port Kembla.

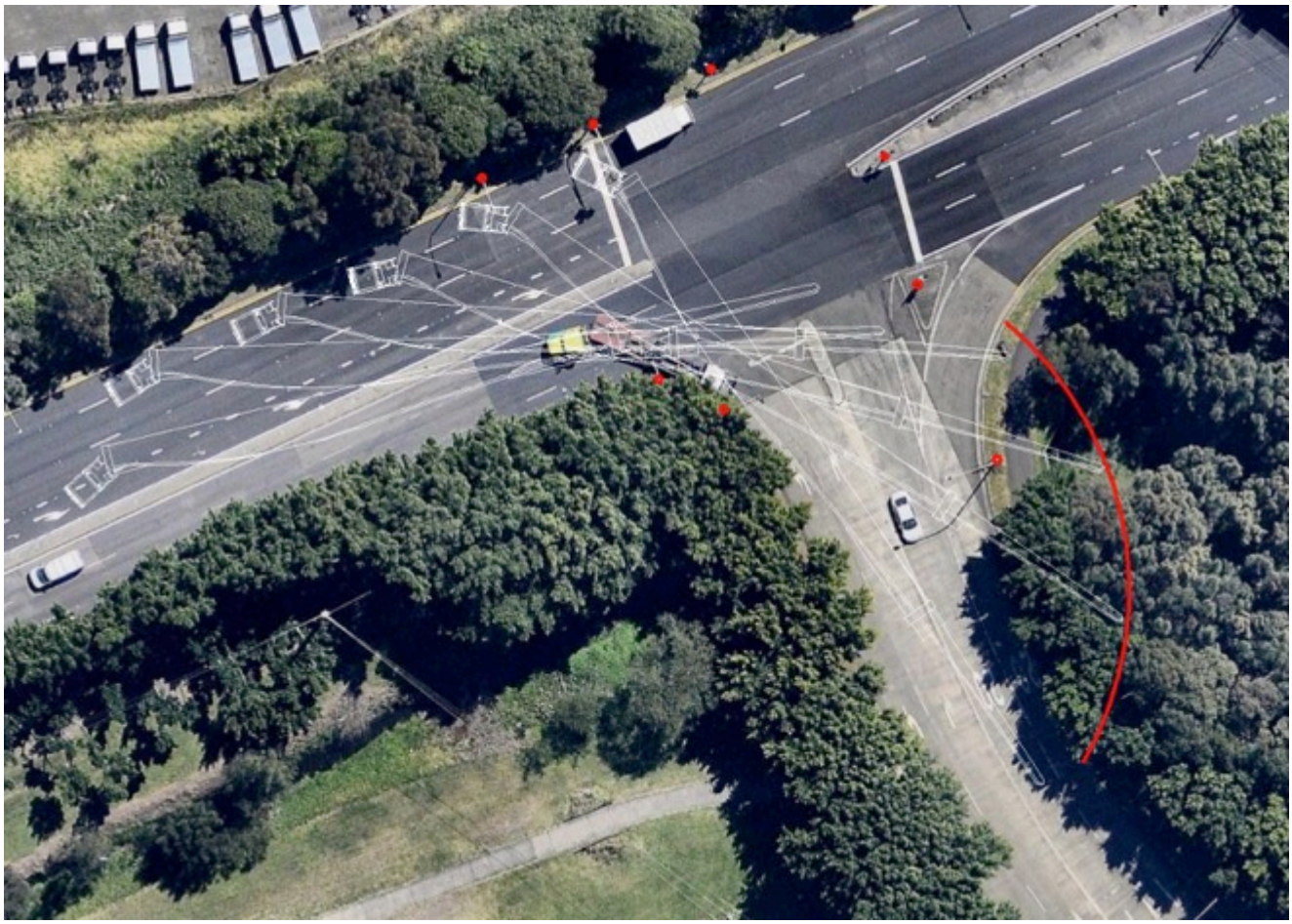
PROCEDURE: Exit port heading north through the security gate.

COMMENTS: Straight ahead. Contact must be made with security guard top ensure the boom remains open until the loads have passed through.

CONCLUSION: No problems with this section of road.

ROAD MODIFICATIONS: No works required.

0.2 Km's: Left turn from Tom Thumb Road onto Springhill Road at Port Kembla.



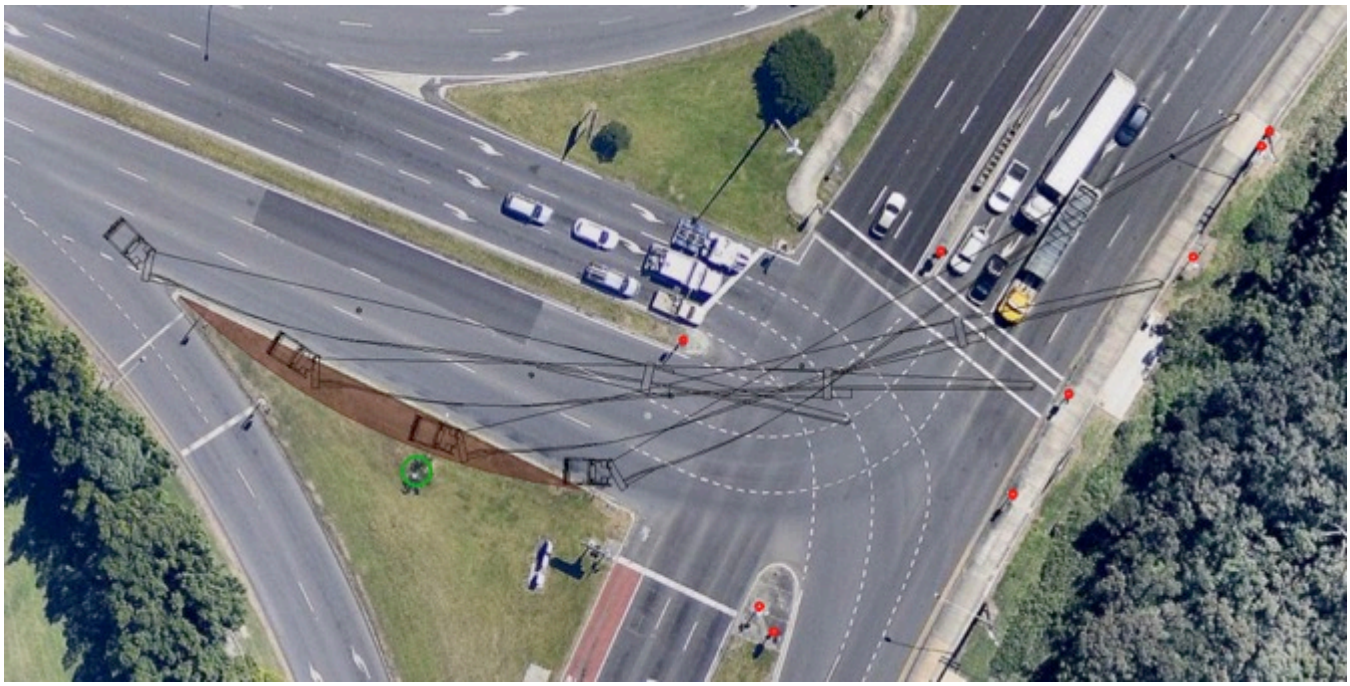
PROCEDURE: Tight left hand turn from Tom Thumb Road onto Springhill Road.

COMMENTS: The blades will need to cross from the incorrect side of Tom Thumb Road onto the incorrect side of Springhill Road, before returning to the correct side approx. 100 metres west of the intersection.

CONCLUSION: The light pole on the right hand side will need to be relocated to accommodate the tail swing. Some removal and trimming of trees will also be required.

ROAD MODIFICATIONS: Yes large amounts of works are required.

1.4 Km's: Springhill Road onto Masters Road at Port Kembla.



PROCEDURE: Sweeping right hand corner.

COMMENTS: The blades will need to cross from the far left hand lane while entering the corner, and cross onto the verge while exiting the turn.

CONCLUSION: Some hardstand will need to be added to the exit of the corner.

ROAD MODIFICATIONS: Small amounts of works are required on this section of road.

2.6 Km's: Masters Road onto the Southern Freeway at Figtree.

PROCEDURE: Gentle right hand merge onto the Southern Freeway.

COMMENTS: This is a large turn with very little problems. The overhead bridge is 5.35 metres high at the lowest point.

CONCLUSION: No problems with this section of road.

ROAD MODIFICATIONS: No works required on this section of road.

6.4 Km's: The Southern Freeway onto Mount Ousley Road at Keiraville.

PROCEDURE: Gentle left hand sweeping bend.

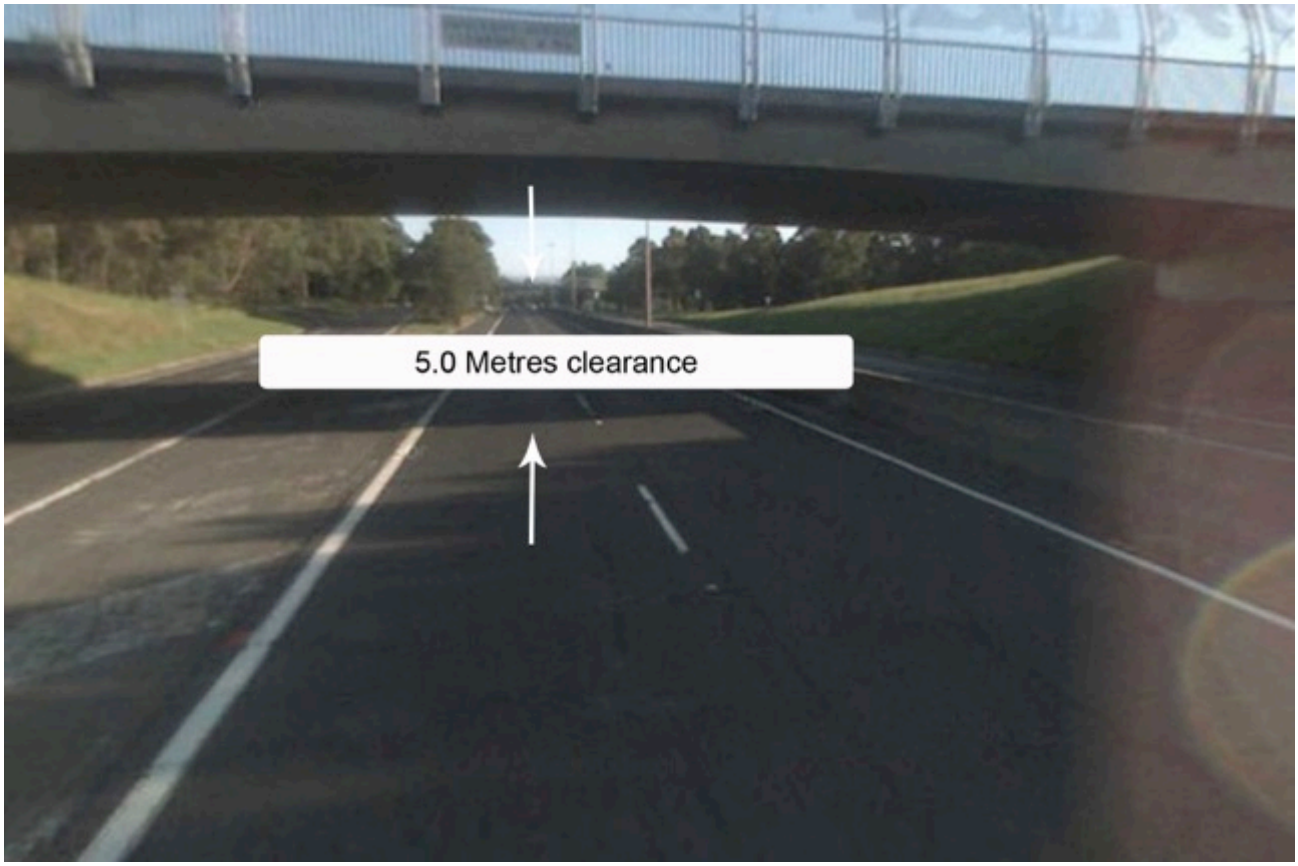
COMMENTS: Large section of road with plenty of room. However the lowest structure on route is on this section of road.

CONCLUSION: Loads over 5.0 metres high will need to take the high load detour.

ROAD MODIFICATIONS: No works required on this section of road.

6.5 Km's: University Overbridge on the Southern Freeway at Keiraville.

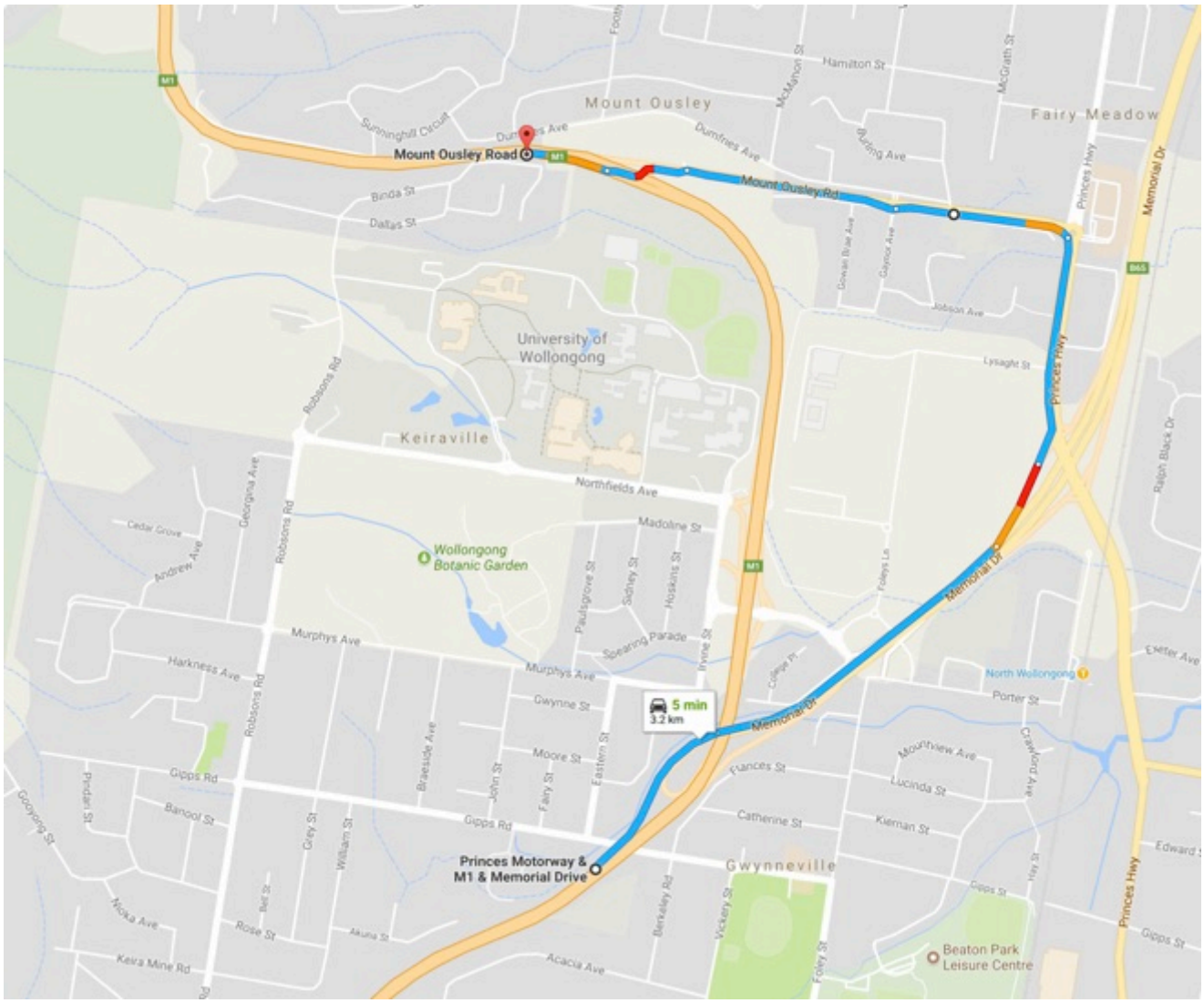
Image 1:



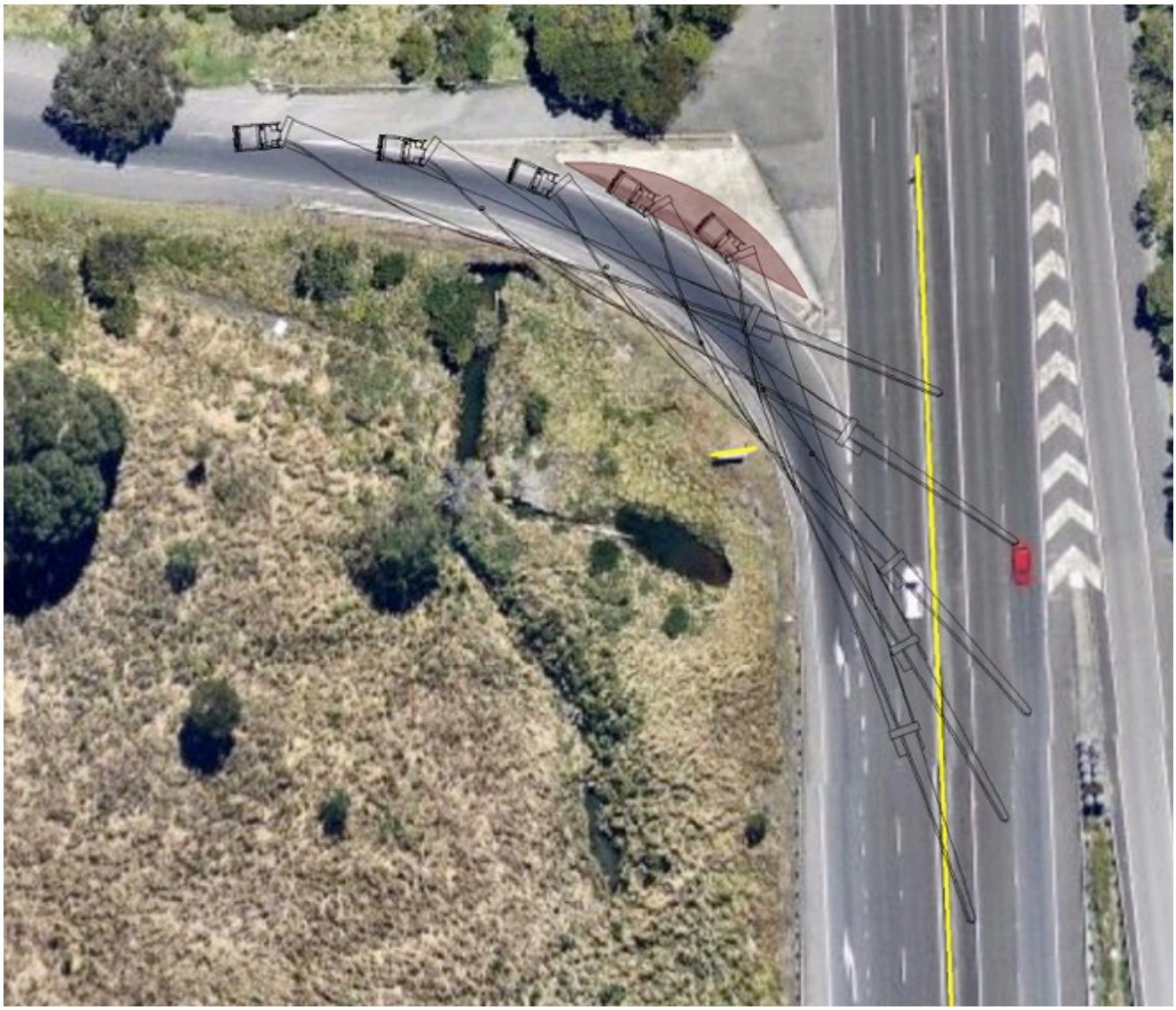
PROCEDURE: Travel under bridge in the left hand lane.
COMMENTS: No loads that exceed 5.0 metres to pass under this structure.
CONCLUSION: Loads that exceed 5.0 metres high will need to use the following detour.
ROAD MODIFICATIONS: No works required on this section of road.

Image 2: (High load detour)

VIA: Southern Freeway, Memorial Drive, Princes Highway, Mount Ousley Road.



13.1 Km's: Mt Ousley Road onto Picton-Wilton Road at Mt Ousley.



PROCEDURE: Tight left hand turn from Mt Ousley Road onto Picton-Wilton Road.

COMMENTS: The truck will need to stay as far to the right while exiting this turn.

CONCLUSION: Care to be taken with this procedure. The guardrail on the left hand side will come close to the trailer. The prime mover will also need to mount the existing median strip. Police may need to hold southbound traffic so the overhang can pass over the southbound lanes.

ROAD MODIFICATIONS: No works required on this section of road.

40.2 Km's: Picton-Wilton Road onto the Hume Highway at Wilton.

PROCEDURE: Tight left hand turn from Picton-Wilton Road onto Hume Highway onramp.

COMMENTS: The truck will need to stay as far to the right while exiting this turn.

CONCLUSION: Care to be taken with this procedure. The pole on the inside of the corner will come close to the trailer. The overhang should pass over the signs on the outside of the turn.

ROAD MODIFICATIONS: No works required on this section of road.

161.0 Km's: Hume Highway onto Hume Street at Goulburn.
Image 1:

Image 2:

Image 3:

PROCEDURE: Gentle right hand turn through the roundabout.

COMMENTS: This is a large turn, however care is to be taken with the inside guardrail.

CONCLUSION: As well as guardrail, a spotter will need to watch the poles on the rear overhang. The overhang should also pass over any of the warning signs.

ROAD MODIFICATIONS: No works required on this section of road.

161.9 Km's: Hume Street roundabout at Goulburn.

PROCEDURE: Travel directly ahead at the roundabout.

COMMENTS: The blades will stay on the correct side for this procedure. The blade overhang will pass over any of the traffic signs.

CONCLUSION: No problems with this section of road.

ROAD MODIFICATIONS: No works required on this section of road.

164.4 Km's: Cowper Street onto Clinton Street at Goulburn.
Image 1:

Image 2:

PROCEDURE: Tight left hand turn.

COMMENTS: The blades will need to cross from the incorrect side of Hume Street onto the incorrect side of Clinton Street, before returning to the correct side approx. 100 metres west of the intersection.

CONCLUSION: The signs on the inside of the corner and centre median strips will need to be removed.

ROAD MODIFICATIONS: A small amount of works required on this section of road.

164.7 Km's: Roundabout on Clinton Street at Goulburn

PROCEDURE: Straight ahead.
COMMENTS: The trailers will need to pass over the roundabout on the correct side.
CONCLUSION: No problems with this section of road.
ROAD MODIFICATIONS: No works required on this section of road.

165.2 Km's: Clinton Street onto Deccan Street at Goulburn (Option 1)

Image 1:

Image 2:

PROCEDURE: Tight right hand turn.

COMMENTS: The blades will need to cross from the correct side to the correct side for this corner.

CONCLUSION: The signs will need to be removed from the inside of the corner, and on the centre median strip, The trees on the tail swing may also be a problem. It will be very tight.

ROAD MODIFICATIONS: Moderate amounts of works are required on this section of road.

165.2 Km's: Clinton Street onto Deccan Street at Goulburn (Option 2)

PROCEDURE: Tight right hand turn.

COMMENTS: The blades will need to cross from the correct side to the correct side for this corner.

CONCLUSION: A large amount of hardstand would need to be added to the inside of the corner. The signs will need to be removed from the inside of the corner, and on the center median strip. 2 sections of road will require no parking exclusion zones.

ROAD MODIFICATIONS: Moderate amounts of works are required on this section of road.

166.0 Km's: Deccan Street onto Fitzroy Street in Goulburn.
Image 1:

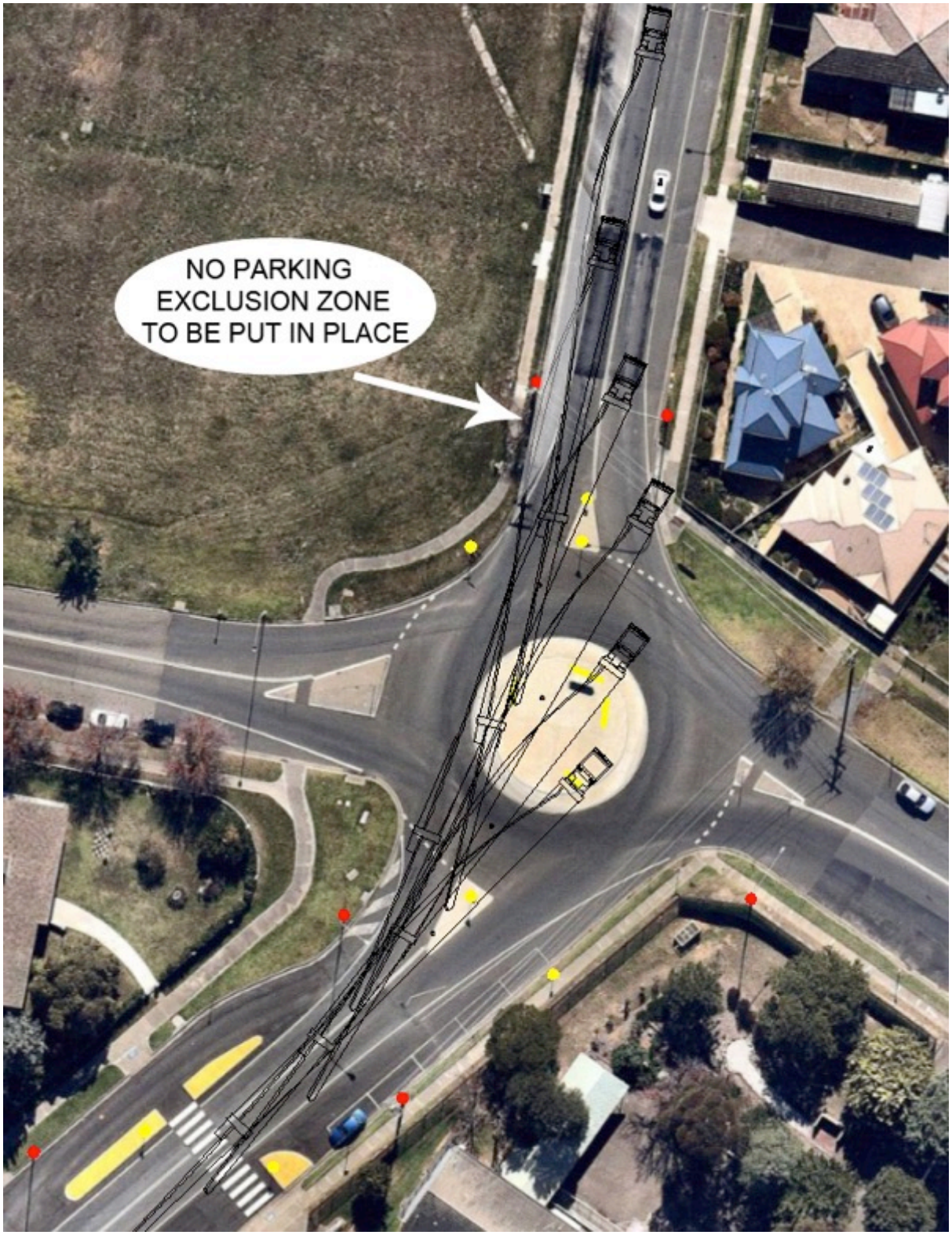


Image 2:

PROCEDURE: Gentle left hand turn.

COMMENTS: Loads to pass over the centre of the roundabout before crossing back to the correct side.

CONCLUSION: The overhang will tighten up on the crossing sign outside the school. This sign may need to be made removable. The signs prior and after the roundabout will need to be made removable. A no parking exclusion zone to be put in place on the left while exiting the roundabout.

ROAD MODIFICATIONS: Small amounts of works are required on this section of road.

167.0 Km's: Fitzroy Street in Goulburn.

Image 1:

Image 2:

PROCEDURE: Gentle left hand turn.

COMMENTS: Loads to stay on the correct side through this corner.

CONCLUSION: The overhang will tighten up on the crossing signs on the centre median strip. These sign may need to be made removable.

ROAD MODIFICATIONS: Small amounts of works are required on this section of road.

207.0 Km's: Crookwell Road onto Grange Road at Crookwell.
Image 1:

Image 2:

PROCEDURE: Tight left hand turn from Crookwell Road onto Grange Road.

COMMENTS: This corner can currently handle 55 metre blades. The 70 metre blades will require a greater amount of works to make this turn unrestricted.

CONCLUSION: Blades are to travel directly across the corner and enter the showground. Blades will than sweep around to the left before re-entering Grange Road to the south of the intersection. Discussions to take place between GWA and Upper Lachlan Shire council.

ROAD MODIFICATIONS: Large amounts of works are required on this section of road.

208.0 Km's: Grange Road onto Cullen Street at Crookwell.
Image 1:

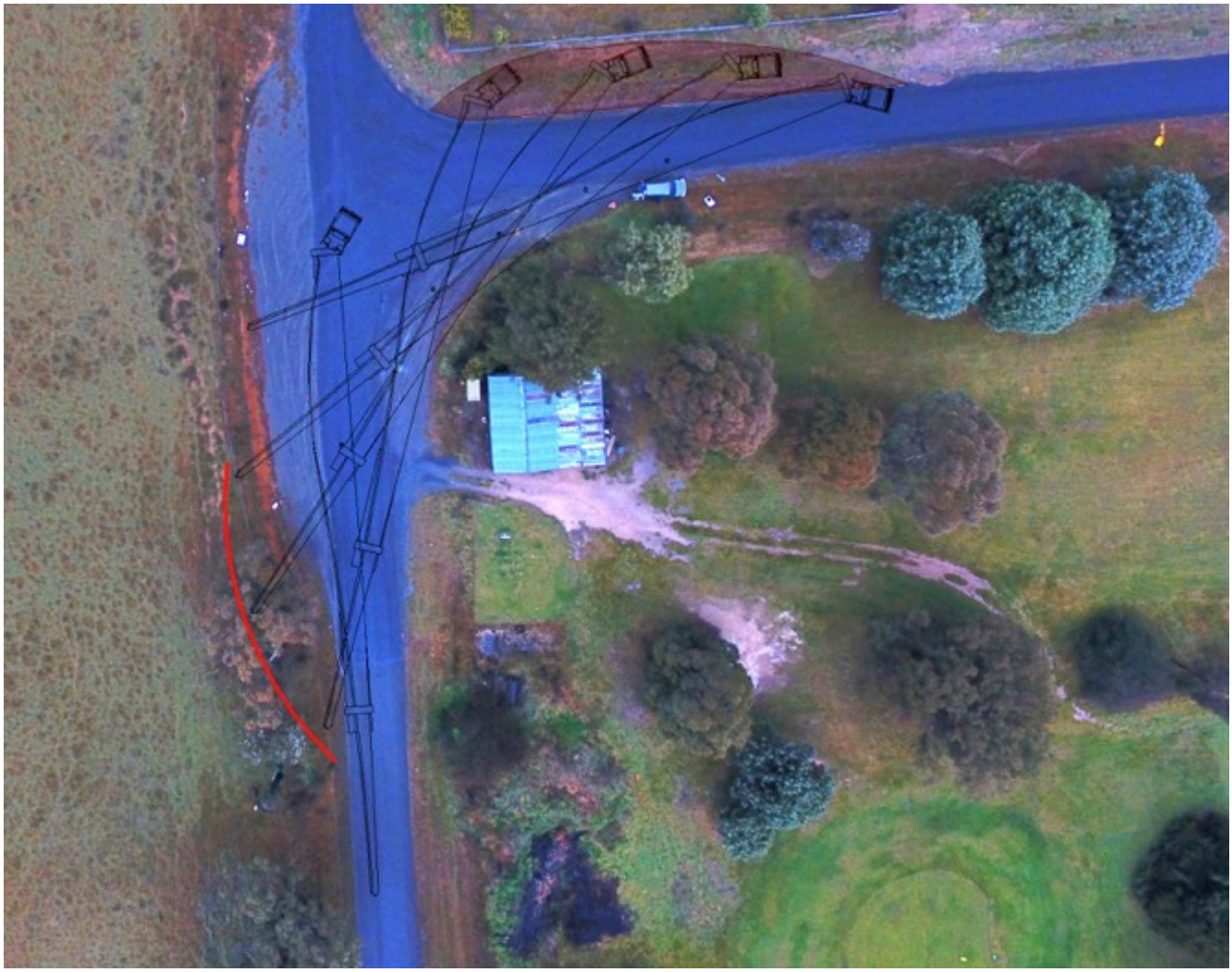


Image 2:

PROCEDURE: Tight right hand turn from Grange Road onto Cullen Street.

COMMENTS: This corner can currently handle 60 metre blades. The 70 metre blades will require a moderate amount of works to make this turn unrestricted.

CONCLUSION: Some fill will need to be added to the outside of the turn, as well as the removal of a tree on the left hand side prior to the corner. The blades overhang should clear the existing embankment.

ROAD MODIFICATIONS: Moderate amounts of work are required on this section of road.

209.0 Km's: Cullen Street onto Kialla Road at Crookwell.
Image 1:

Image 2:

PROCEDURE: Moderate left hand turn from Cullen Street onto Kialla Road.

COMMENTS: This corner can currently handle 60 metre blades. The 70 metre blades will require a moderate amount of works to make this turn unrestricted.

CONCLUSION: The existing access road through the private property would require the widening of the existing gates, as well as the removal of 3 bushes within the tail swing of the blade.

ROAD MODIFICATIONS: Moderate amounts of work are required on this section of road.

223.0 Km's: Kialla Road onto Range Road at Bannister.

Image 1:

Image 2:

PROCEDURE: Tight right hand turn from Kialla Road onto Range Road.

COMMENTS: This corner can currently handle 60 metre blades. The 70 metre blades will require a large amount of works to make this turn unrestricted.

CONCLUSION: This intersection has been upgraded for the Gullen range project. However the existing corner will still require a large amount of hardstand to be added to the inside of the corner.

ROAD MODIFICATIONS: Large amounts of work are required on this section of road.

228.0 Km's: Range Road onto Grabben Gullen Road at Grabben Gullen.

Image 1:

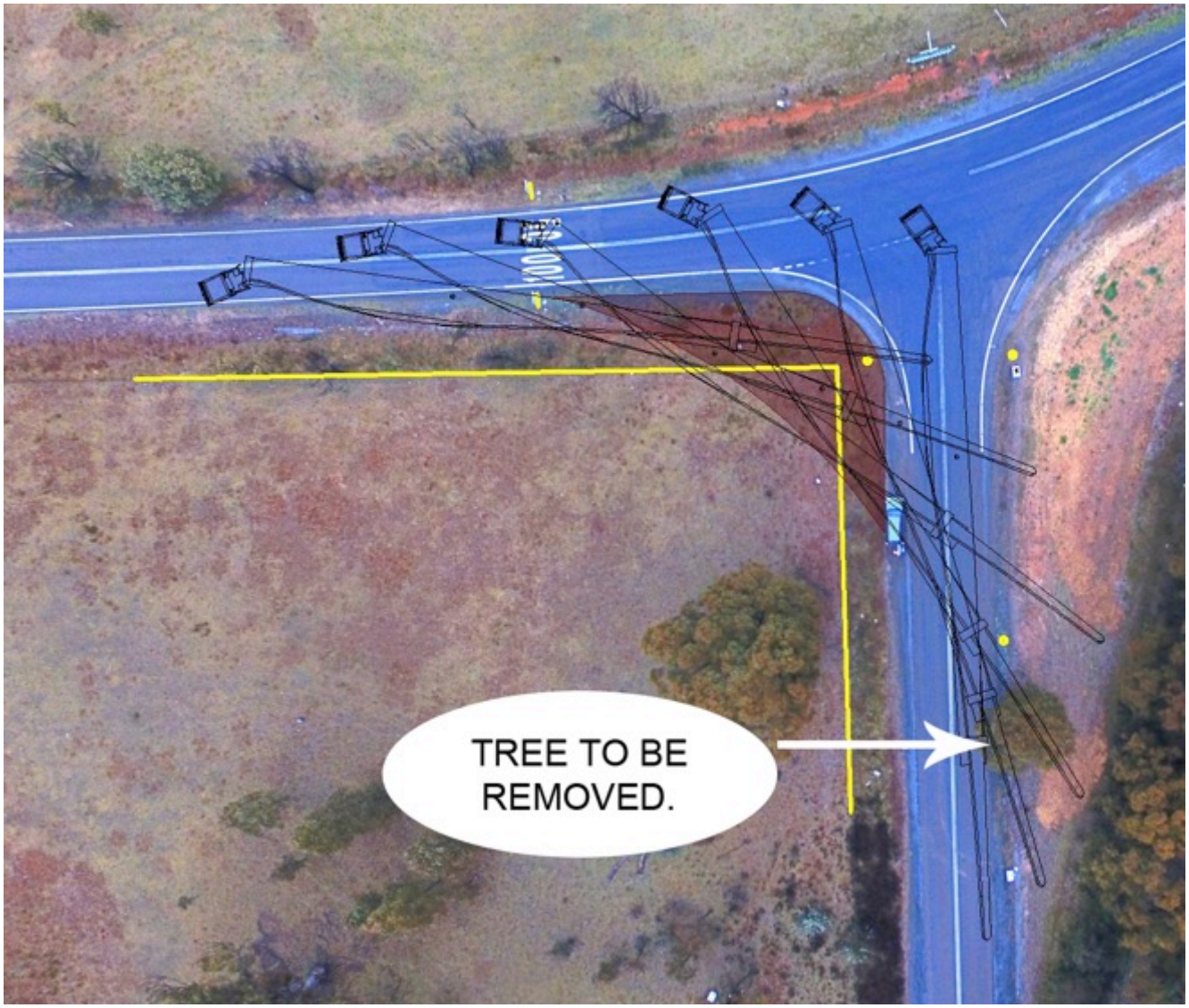


Image 2:

PROCEDURE: Tight left hand turn from Range Road onto Grabben Gullen Road.

COMMENTS: This is a tight corner that will require upgrades.

CONCLUSION: This corner would require a moderate amount of hardstand added to the inside of the turn, and on the outside of the turn. The blade may overhang the property owner's boundary, but should not make contact with the landowner's property. Some trees will need to be trimmed for the overhang And the tree on the right verge while entering the corner will need to be removed.

ROAD MODIFICATIONS: Large amounts of work are required on this section of road.

231.0 Km's: Grabben Gullen Road into North Access Gate at Biala.

Image 1:

Image 2:

PROCEDURE: Right hand turn from Grabben Gullen Road into North Access gate.

COMMENTS: Upgrades required on this section of road.

CONCLUSION: The existing option to turn into the access gate via the existing gravel road would require extensive works. The option of placing the site entrance 100 metres north looks to be the best option. Both options however would require a large amount of works to allow the swept path of the 70 metre blades.

ROAD MODIFICATIONS: Large amounts of work are required on this section of road.

233.0 Km's: Grabben Gullen Road into Alternative North Access Gate at Biala.

Image 1:

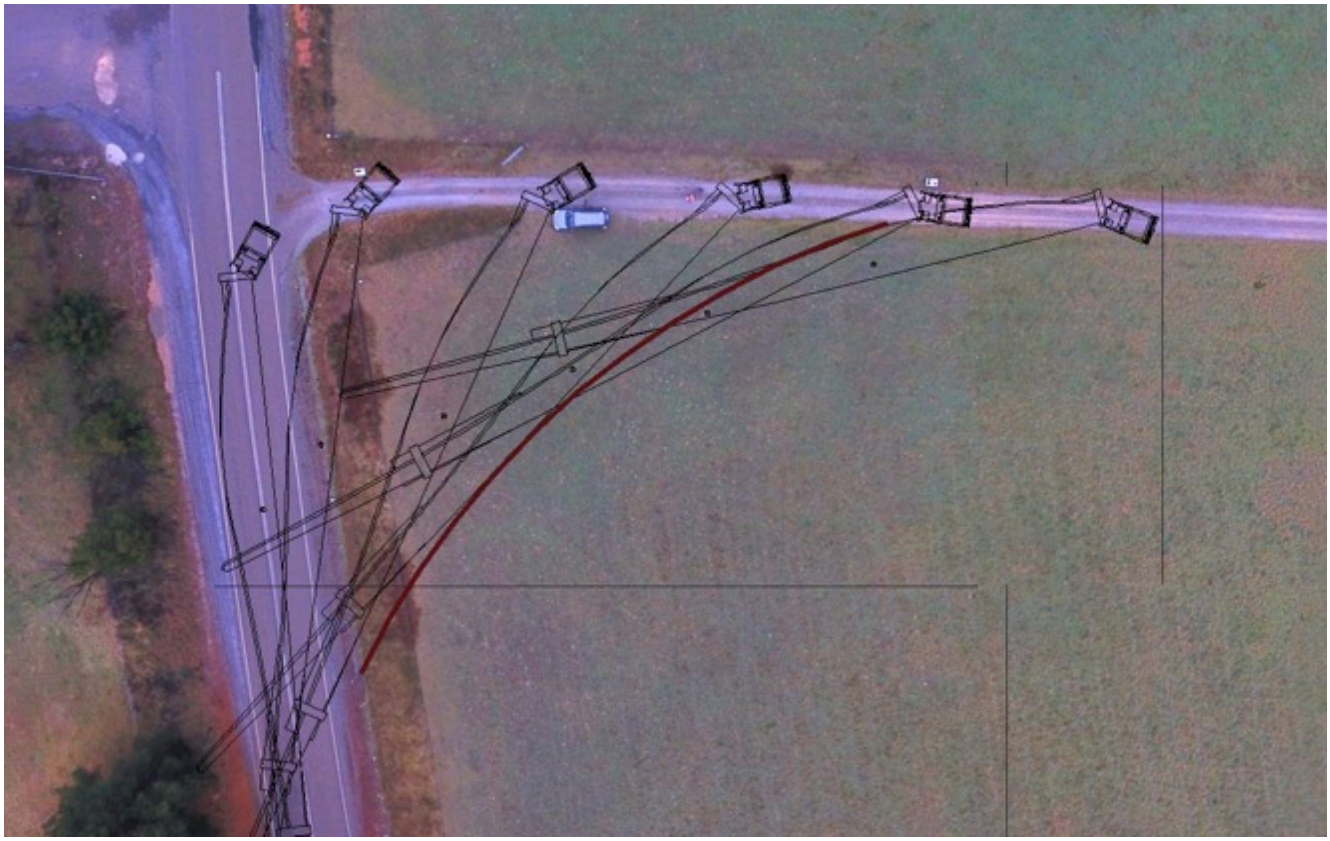


Image 2:

PROCEDURE: Right hand turn from Grabben Gullen Road into Alternative North Access gate.

COMMENTS: Upgrades required on this section of road.

CONCLUSION: A suitable site entrance would be required to accommodate the swept path of the blades. The proposed location of this access points is in a good position with flat ground and good line of site.

ROAD MODIFICATIONS: Large amounts of work are required on this section of road.

236.0 Km's: Grabben Gullen Road into South Access Gate at Biala.

Image 1:

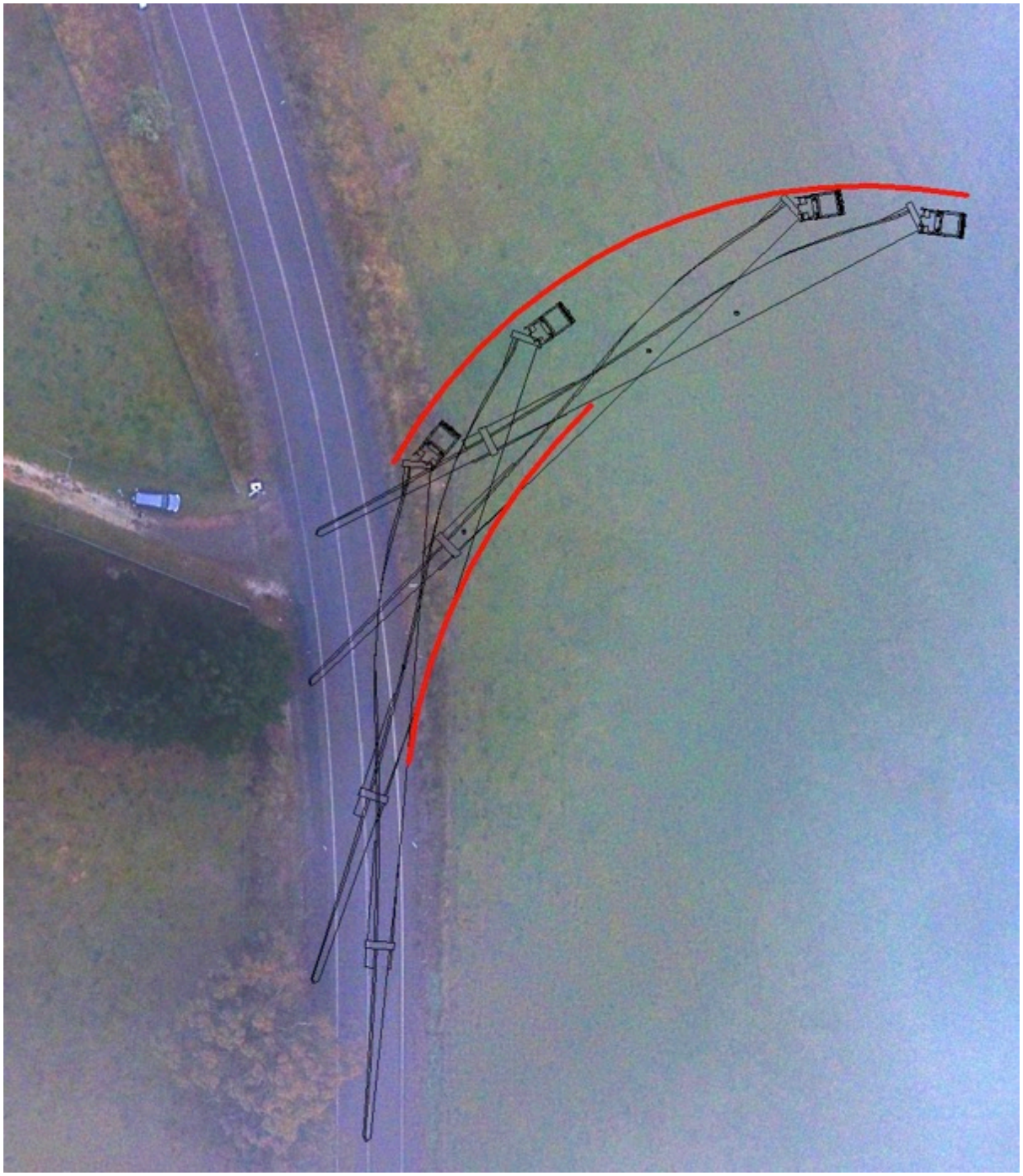


Image 2:

PROCEDURE: Right hand turn from Grabben Gullen Road into South Access gate.

COMMENTS: Upgrades required on this section of road.

CONCLUSION: A suitable site entrance would be required to accommodate the swept path of the blades. The proposed location of this access points is in a good position with flat ground and good line of site.

ROAD MODIFICATIONS: Large amounts of work are required on this section of road.

9.0 Conclusion:

After studying all options and undertaking a route survey, this route in its current condition will require a large amount of upgrades before it could be deemed suitable for transporting the proposed components.

The following are the key points that need to be taken into consideration, if the project moves forward with this route.

BRIDGES:

- There are a number of bridges on route that will require bridge assessments. However the route up till Grange Road has had similar axle weights in the past. We expect a study of Grabben Gullen Road to be the only outstanding bridges requiring inspection.

OVERHEAD STRUCTURES: (5.3 Maximum loaded height)

- There are a large number of overhead structures between Port Kembla and Crookwell. The lowest of these structures is the University Bridge at Keiraville. This bridge has a maximum safe clearance of 5.0 metres. All loads over 5.0 metres will need to take the high load detour via the Princes Highway. The high load detour will allow loads of up to 5.3 metres in height.
- NOTE: The blades will need to be placed onto a suitable trailer than can reduce the overall height down under 5.0 metres, as they cannot be delivered to site without passing under the University bridge.

OVERHEAD UTILITIES:

- This route will need to be checked by an authorised scoping company. It is likely that a route of at least 5.3 metres is required for this project.

OVERHEAD TREES:

- This route will need to be checked for a clear passage of at least 5.3 metres for overhead branches. Some trimming is likely on this route.

PAVEMENT:

- The route up until Grange Road road is highway grade asphalt and will be adequate for all loads. The pavement from Grange Road through to site is generally okay, but may need to be monitored for wear throughout the project.

PORT KEMBLA:

- The light pole exiting the port and the removal of a number of trees are required. This is likely to be a large job. We would recommend discussions with the authorities take place at least 6 month prior to the start of transport.

GOULBURN:

- The majority of the signs are already removable, however some swill need to be sleeved.
- Both of the options turning onto Deccan Street need to be reviewed by Goulburn council to allow them to make the best decision on this corner.

CROOKWELL ROAD ONTO GRANGE ROAD:

- Blades to travel through the intersection and into the showground. Blades to than sweep around to the left before re-entering Grange Road.
- NOTE: Discussions to take place between GWA and Upper Lachlan Shire council.

GRANGE ROAD ONTO CULLEN STREET

- Fill required on the outside of the corner.
- Tree to be moved to allow the swept path of the blade, and the tailswing.
- NOTE: To avoid removing the tree, the road would need to be extended into the landowner's property on Cullen Street. Discussions with council may be required to come up with the best option.

CULLEN STREET ONTO KIALLA ROAD

- Gates to be widened at each end of the access road
- Hardstand to be added to existing track.
- Shrubs to be removed for overhang.

KIALLA ROAD ONTO RANGE ROAD

- Hardstand to be added to the inside of the corner.

RANGE ROAD ONTO GRABBEN GULLEN ROAD

- Hardstand to be added to the inside of the corner and outside of the corner.
- Signs to be made removable.
- Trees to be trimmed

GRABBEN GULLEN ROAD INTO SITE ENTRANCES

- All access points to be made suitable for the swept path of the blades.

10.0 References:

Australian Load Restraint Guide
Rex J Andrews P/L Drawings
Rex J Andrews route survey # 202
Google Earth/Maps
Nearmaps
NHVR (OSOM)
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 these listed routes. No information on bridge crossings are included in the study, only swept paths. The developer should engage with local and state governments and other stakeholders to check the adequacies of these bridge structures.

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

Appendix B

Consultation records with the owner of H07 relating to stock movements

Consultation with the owner of the residence H07 and Developments Biala commenced in December 2017. Up until May 2018 this has included four face to face meetings as well as phone calls and email exchanges. Developments Biala will continue to consult with the owner of this residence until construction has been completed. The consultation that has occurred to date has informed the drafting of this Traffic Management Plan.

Note that this consultation record has been provided to the owner of H07 but has not been agreed as an accurate record of consultation.

Background for Stock Movements

H07 owns land on both sides of Grabben Gullen road. 750 ewes and 30 rams normally reside on the portion of the property which falls on the western side of Grabben Gullen Road with the main yards and shearing shed on the portion of property on the eastern side. The stock is moved across the road as required for farming operations. Due to the layout of gates and paddocks, in many situations stock is required to move along the road for a distance in order that it can be moved across.

- Movements usually occur early in the morning, when the owner of H07 expects traffic volumes along Grabben Gullen Road to be low. The owner also expects that stock is calmer during early morning movements.
- The stock movements occur up to seven times per year per sheep. Four paddocks of ewes and one of rams have to be moved across and then back, resulting in expected stock movements of up to 96 times per year.
- The sheep are moved in groups of 200 to 400 depending on the quantity of sheep in the paddock and the reason for the stock movement. Each paddock is always moved individually to avoid mixing sheep from different paddocks.
- The sheep normally reside on the western side of Grabben Gullen Road within five paddocks, which can be accessed via two gates.
- The stock travel a worst-case distance of approximately 500 metres along Grabben Gullen Road between gates to cross the road.

Consultations

The following details were discussed with the owner of H07:

- The traffic loading due to the wind farm will be minimal during the operational phase, so emphasis should be placed on mitigation of traffic impact during construction. The mitigation measures will be incorporated into the Traffic Management Plan required under Schedule 3 Condition 28 of the Project Approval.
- Under the Project Approval, all heavy vehicles that are not OSOM load must travel to the site from the south via Gunning and will not pass along the section of Grabben Gullen Road near residence H07 as it is located north of the site.
- Under the Project Approval, all OSOM load vehicles must approach the site from the north via Crookwell and will therefore pass by residence H07.
- The construction of the project is expected to take 12 months. The first 5 months will involve civil and electrical works. There will be few heavy vehicles required for these works, which will predominantly involve transporting of rock for tracks, sand for cable bedding and materials for concrete batching. All of these materials will be transported by heavy vehicles and must approach from the south via Gunning.
- After approximately 5 months, it is planned that wind turbine component deliveries to the site will commence. These will involve OSOM vehicles and must approach site from the north via Crookwell. These deliveries will be subject to a second submission of the

TMP. The deliveries will be undertaken by specialist delivery drivers at agreed times. Special permits will be required for these deliveries.

- During the entire construction period, light vehicles may access the site from the north or the south. Therefore, a portion of light vehicles will pass by the residence H07. These light vehicles would appear to have the greatest potential to impact the Hewitt's stock crossing activities.
- Light vehicle traffic to and from the wind farm will be at its highest frequency in the morning when workers travel to the site and in the afternoon when they leave the site. The times when these peaks will occur will correlate with the beginning and end of the working hours specified in the Project Approval. Stock movements during first daylight and just prior to sunset will not correlate with these times for the majority of the year but will during the winter period.

Details of Stock movements

During Developments Biala's initial two meetings with the owners of H07, the following information was collected.
The stock movements and associated timing and quantity include:

- Culling ewes – February = 8 movements
- Shearing - December = 10 movements
- Weaning lambs – February, March = 8 movements
- Crutching- August = 10 movements
- Drenching - five times a year = 50 movements
- Culling hoggets and moving rams in and out of the flock = 10 movements.

Additional husbandry movements which can occur at any time due to seasonal conditions may include but are not limited to:

- Flystrike
- Worms
- Pink eye
- Foot trimming.

Current traffic management implemented

The owner of Residence H07 have obtained a permit from Council to allow for stock movements along and across Grabben Gullen Road. Local Land Services issue Annual Stock movement permits which are paid annually.

- The stock movements can only occur between sunrise and sunset. However, it is noted that the actual time within sunrise and sunset that the stock is moved varies with the seasons.
- "Stock on Road" signs are placed 250 metres in each direction of Grabben Gullen Road from the crossing location.
- Dedicated persons stand by the side of Grabben Gullen Road to wave at and slow traffic while another person musters the stock onto and along the road.
- Cars react to seeing the stock and don't slow down at the signs, meaning cars are travelling fast while passing stock.
- Stock becomes skittish due to the speed of the traffic, lambs can separate which causes panic within the stock.

Gate Locations

The gate locations along Grabben Gullen Road are summarised as follows and shown in Figure C11:

- Western side of Grabben Gullen Road: Ram Paddock and Red Hill gates
- Eastern side of Grabben Gullen Road: Lucerne Western, Laneway, Wattle Creek and Creek gates.

Figure C1: Stock gates along Grabben Gullen Road

Basemap source: Google Maps

Mitigation Measures Discussed

During consultation with the owners of residence H07, several proposals have been made by Developments Biala to assist in avoiding potential conflicts during construction between development related traffic and stock movements. These include:

- Installing permanent signs for all potential gates (subject to obtaining necessary approvals).
- Installing 'Stock crossing' signs at 300m, potentially with flashing lights that could be triggered by remote control for when the stock are on the road (subject to obtaining necessary approvals).
- Installing a stop sign which could be folded up 20m from the gate and unfolded when stock are on the road (subject to obtaining necessary approvals).
- Providing additional support from the wind farm which may include a person to unfold signs and a car positioned on the side of the road with flashing lights to warn drivers, of crossing stock during wind farm construction hours.
- Installing holding paddocks beside the main gates used.
- Installing parallel fences to allow the stock to travel within the paddock beside the road instead of inside the road corridor. This would allow the stock to cross directly over the road instead of having to walk along it.
- Ensuring all on-site workers are aware of the potential for stock movements by including details in the site induction. This would include requiring all workers to slow to 40km/h when stock crossing signs are on display and be prepared to stop. Adherence to this protocol would be monitored using Vehicle Tracking Management Systems for all on-site vehicles. Such education of on-site workers may help to slow other road users who would normally not slow down for the stock crossing signs.

The owners of H07 have expressed the following in relation to these proposals:

- They do not wish to rely on a wind farm staff person when moving their stock (in relation to the wind farm providing a vehicle with flashing lights to assist with stock movement).
- They do not want to be responsible for road accidents involving permanent signage.
- Stop signs may result in people in the community becoming displeased.
- Parallel fencing would not be possible due to the wetness of the land at certain times of the year.
- Farming is dependent on many external factors, such as the weather, and it is therefore difficult to schedule stock movements accurately.

Mitigation Measures to Implement

After undertaking this consultation with the owners of H07, Developments Biala has developed the mitigation measures detailed in section 2.8 of this report. These measures have been discussed with the owners of H07.

Appendix C

Roads and Maritime Services Letter outlining OSOM approval process

Our ref: STH13/00123/09
Contact: Melissa Steep 4221 2771
Your ref: Biala Wind Farm TMP

17 September 2018

Dora Choi
GTA Consultants
Dora.choi@gta.com.au

Cc: information@planning.nsw.gov.au

BIALA WIND FARM TRAFFIC MANAGEMENT PLAN

Dear Dora,

Roads and Maritime Services (RMS) refers to your correspondence dated 5 September 2018 regarding the subject Traffic Management Plan. RMS notes that the requirement to prepare a Traffic Management Plan, in consultation with RMS and Council, is a condition of consent for the Biala Wind Farm development.

RMS has reviewed and the subject Traffic Management Plan and has no further comment to provide, except to reiterate the following requirements:

- The developer must apply for, and obtain a Road Occupancy Licence (ROL) from the RMS Traffic Operations Unit (TOU) prior to commencing roadworks on a State Road or any other works that impact a travel lane of a State Road or impact the operation of traffic signals on any road. The application will require a Traffic Management Plan (TMP) to be prepared by a person who is certified to prepare Traffic Control Plans. Should the TMP require a reduction of the speed limit, a Speed Zone Authorisation will also be required from the TOU. The developer must submit the ROL application 10 business days prior to commencing work. It should be noted that receiving an approval for the ROL within this 10 business day period is dependant upon RMS receiving an accurate and compliant TMP.
  Notes: An approved ROL does not constitute an approval to commence works until an authorisation letter for the works has been issued by RMS Project Manager.

- Prior to transporting any oversized or over mass loads, the applicant shall obtain a permit for an oversized and over mass load from the RMS Special Permits Unit in Glen Innes. The contact number is 1300 656 371.

  It should be noted that the issue of a Special Permit may be subject to route and bridge assessment/s if deemed necessary by the RMS Special Permits Unit. While the TIS has considered the length, width, height and turning radius requirements for over dimensional loads/vehicles, no

details have been given as to the expected weight of loads or axle loadings for the over dimensional movements. The maximum weight of loads associated with the subject development to be moved should be specified in the TIS.

If you have any questions please contact Melissa Steep on 4221 2771.

Please ensure that any further email correspondence is sent to development.southern@rms.nsw.gov.au.

Yours faithfully,

Chris Millet
Manager Land Use
Southern Region

Appendix D

Driver Fatigue Management Policy

DRAFT

DRIVER FATIGUE AND READINESS FOR DUTY POLICY

Newtricity Developments Biala Pty Ltd (Developments Biala) is committed to the safety of its drivers and all other road users. Developments Biala will ensure all drivers comply with this Developments Biala Driver Fatigue and Readiness for Duty Policy.

- Developments Biala will ensure that all driver rosters and schedules are in accordance with the limits prescribed in legislation and incorporate fatigue management measures.
- The Developments Biala Fatigue Management system is in accordance with the National Transport Commission (NTC) Australia - Guidelines for Managing Heavy Vehicle Driver Fatigue (August 2007) (See Attachment 1): https://www.ntc.gov.au/Media/Reports/(276E6278-7517-1B69-9EF0-85C2CA2B91DE).pdf
- The Developments Biala Fatigue Management system is designed to ensure that drivers are not required to drive unreasonable distances within a specified period and without sufficient notice or adequate rest.
- All trip schedules and driver rosters are planned and assigned by the Transport Manager with driving/ rest limits and accounting for the time of day, road conditions, forward planning and time to complete the task safely.
- At no time will the delivery of a load be placed before a driver's safety or health.
- Rosters and workloads will be developed to maximise the opportunity for a driver to recover from the effects or onset of fatigue.
- Scheduling and rostering practices will consider the driver's recent work history, driving ability, welfare and work preferences (where appropriate) as well as the time of day for the transport task to be completed safely.

Readiness for Duty

- Developments Biala will ensure that drivers are in a fit state for work and can perform their work duties safely.
- Developments Biala and its Management team have a legal, moral and social responsibility to ensure that employees do not undertake driving work whilst fatigued.
- Developments Biala will ensure that time off is provided for drivers to recover from or prepare for the fatigue effects of work.
- Drivers will ensure that they consider the impact of activities such as social and recreational activities and personal life on their wellbeing and capacity to work safely.
- Drivers will use their time off responsibly to prepare for, or to recover from, the fatigue effects of work.
- Drivers will complete the National Heavy Vehicle Regulator (NHVR) - Driver Fatigue Management Plan as part of the overall fatigue-management system (see Attachment 2): https://www.nhvr.gov.au/files/20150701-0211-ltfms-form-1-safe-driving-plan.doc

Yours sincerely

Tim Mead
Project Manager
Newtricity Developments Biala Pty Ltd 27 July 2018

encl.
Attachment 1 – Guidelines for Managing Heavy Vehicle Driver Fatigue (August 2007)
Attachment 2 – National Heavy Vehicle Regulator (NHVR) - Driver Fatigue Management Plan

Attachment 1

Guidelines for Managing Heavy Vehicle Driver Fatigue (August 2007)

AUGUST 2007

Guidelines For Managing Heavy Vehicle Driver **Fatigue**

These guidelines have been prepared to assist you to comply with the new road transport heavy vehicle driver fatigue laws that are likely to be implemented around Australia from 2008. They also promote compliance with general obligations to manage driver fatigue under current Occupational Health and Safety laws.

Following public consultation in the third quarter 2006 the draft guidelines and new laws were amended in response to feedback and the final documents were approved by Ministers of the Australian Transport Council (ATC) in February 2007.

NTC AUSTRALIA
National Transport Commission

Acknowledgments

The *Guidelines for Managing Heavy Vehicle Driver Fatigue* are based on the draft Fatigue Code of Practice for Heavy Vehicle Drivers prepared for the National Transport Commission (NTC) between 2003 and 2004. The draft Code of Practice was prepared through extensive consultation and the NTC thanks the many people and organisations from both government and non-government sectors for their efforts in progressing this important initiative.

The NTC wishes to acknowledge the key role of the Australian Trucking Association, Department of Industrial Relations Qld, WorkCover NSW, WorkSafe Victoria, WorkSafe SA, Roads and Traffic Authority NSW, Queensland Transport and VicRoads in the preparation of this edition of the Guidelines for Managing Heavy Vehicle Driver Fatigue.

The NTC also gratefully acknowledges the use of much of the material in Part 2 taken from *Staying Alert at the Wheel,* published by the Government of Western Australia.

Design and editing: Adcore Creative 03 9662 3248

Disclaimer

This document describes the legal obligations of parties in general terms. The reader is advised to read this document in conjunction with the relevant legislation and, if necessary, take legal advice.

Guidelines for Managing Heavy Vehicle Driver Fatigue

Date: August 2007

ISBN: 1 921168 11 0

Title: Guidelines for Managing Heavy Vehicle Driver Fatigue

Address: National Transport Commission
Level 15/628 Bourke Street
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E-mail: ntc@ntc.gov.au
Website: www.ntc.gov.au

Type of report: Final report

Objectives: To provide guidance to all parties in the supply chain on the effective management of heavy vehicle driver fatigue.

NTC Programs: Fitness for duty, heavy vehicle driver fatigue

Key Milestones: Following public comment, the draft guidelines were revised as necessary, then considered by transport agencies in each State and Territory and the Commonwealth. This final version of these guidelines was approved by Australian transport ministers in February 2007.

Abstract: Heavy vehicle driver fatigue is a safety issue and is to be addressed by the national heavy vehicle driver fatigue reform which seeks to achieve consistency with current occupational health and safety legislation. The Guidelines provide guidance to all parties in the supply chain on the effective management of heavy vehicle driver fatigue

Purpose: Final report

Key words: Heavy vehicles, fatigue guidelines, fatigue, road safety, driver fatigue and fitness for duty

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Overview

Fatigue can affect a person's health, reduce performance and productivity, and can increase the chance of a workplace accident or road crash. Evidence also suggests that fatigued people are more likely to engage in risk-taking behaviour.

Importantly, fatigue may affect a person's judgment of his or her own state of fatigue. This means the effective management of fatigue should not be the responsibility of the driver alone. Employers, employees and all parties in the supply chain have a role in ensuring that any risks associated with fatigue are eliminated, minimised or controlled through the creation of an effective fatigue-management system. This can comprise a collation of associated fatigue management policies and procedures and may include a driver fatigue-management plan.

These guidelines are intended to assist drivers, employers, operators and schedulers, as well as users and customers of road transport to manage heavy vehicle driver fatigue through the creation of a fatigue-management system.

This will assist parties to meet their general duty to manage heavy vehicle driver fatigue under Occupational Health and Safety (OH&S) laws and the new road transport heavy vehicle driver fatigue laws. These new laws were developed by the National Transport Commission (NTC) in consultation with transport agencies and the road transport industry and unions.

Ministers of the Australian Transport Council (ATC) approved the development of the new laws in 2004. The final laws were approved by the ATC in February 2007, with implementation likely to occur from 2008.

The new laws will apply to trucks of greater than 12 tonnes gross vehicle mass and buses with 12 or more seats (9 seats in NSW) and will be implemented in New South Wales, Northern Territory, Queensland, South Australia, Tasmania and Victoria. This will enable a level of consistency with Western Australia, which already regulates fatigue management under OH&S law.

The new laws will include:

- a general duty in road transport law to manage fatigue, consistent with current OH&S laws;
- Chain of Responsibility provisions extending to parties in the supply chain whose actions, inactions or demands influence conduct on the road including drivers, operators, employers, directors and senior managers, loaders, schedulers, consignors and consignees (receivers), as well as agents of any of these parties;
- a much greater emphasis on opportunities for sleep and rest;
- strengthened record-keeping provisions, including replacement of log books with a new driver work diary;
- risk-based categorisation of offences and a revised range of sanctions;
- enhanced enforcement powers; and
- three fatigue-management options providing alternative drive, work and rest hour requirements with variable levels of flexibility in return for increased fatigue management and compliance responsibilities on operators and drivers.

These guidelines have been drafted to assist all parties to prepare for, and meet, the general duties to manage fatigue both under the new laws and in existing OH&S laws.

These guidelines explain the common factors that lead to fatigue and provide guidance for managing driver fatigue including some risk-management tools for use by different parties in the supply chain. Useful check lists for drivers to manage their fatigue are also provided and these can be used by other parties in the supply chain to meet their obligations.

Under existing OH&S laws, employers and employees are required to take all reasonably practicable steps to ensure safety in the workplace – including managing driver fatigue for employees and contractors. Similarly, the new laws will require all parties in the supply chain to take all 'reasonable steps' to ensure safety on the road by managing heavy vehicle driver fatigue.

Under this approach it will not be enough to just rely on the driver to comply with the law if there are other suitable steps that could be taken. Due to the many different modes of operation in the heavy vehicle industry and the many different factors that can influence how transport tasks are undertaken, it is very difficult to define 'reasonable steps' as it will depend on the options reasonably available to a particular business.

OH&S laws provide a framework for creating a fatigue-management system to assist all employers to meet their obligations for a safe workplace, and includes:

- implementation of a systematic process of hazard identification, risk assessment, risk control and review in the workplace;
- appropriate training, instruction and supervision, including induction and ongoing training for employees (including managers and contractors);
- consultation with employees and their OH&S representatives; and
- adequate record-keeping in relation to OH&S.

This framework is also suitable for use by all parties in the supply chain in order to meet their general duty to manage fatigue under the new laws.

While compliance with these guidelines is voluntary, all parties must take appropriate action to manage the risks of heavy vehicle driver fatigue in order to meet their obligations under both road transport and OH&S laws.

Businesses may use any reasonable method to manage driver fatigue, however, transport and OH&S regulators recommend that the suggestions for managing fatigue in these guidelines be followed by businesses unless better or equally effective methods of managing fatigue are used.

These guidelines may also be used by enforcement agencies and courts in determining whether reasonable steps have been taken to manage heavy vehicle driver fatigue under both the new laws and OH&S laws.

Further information will be available from transport agencies to assist various parties to understand their obligations to manage heavy vehicle driver fatigue. A range of Fact Sheets and Information Bulletins will also be available from the NTC website at www.ntc.gov.au

Industries are encouraged to develop more specific guidance through developing an Industry Codes of Practice tailored to the risks of that industry, in order to further promote compliance with fatigue and other safety-related laws.

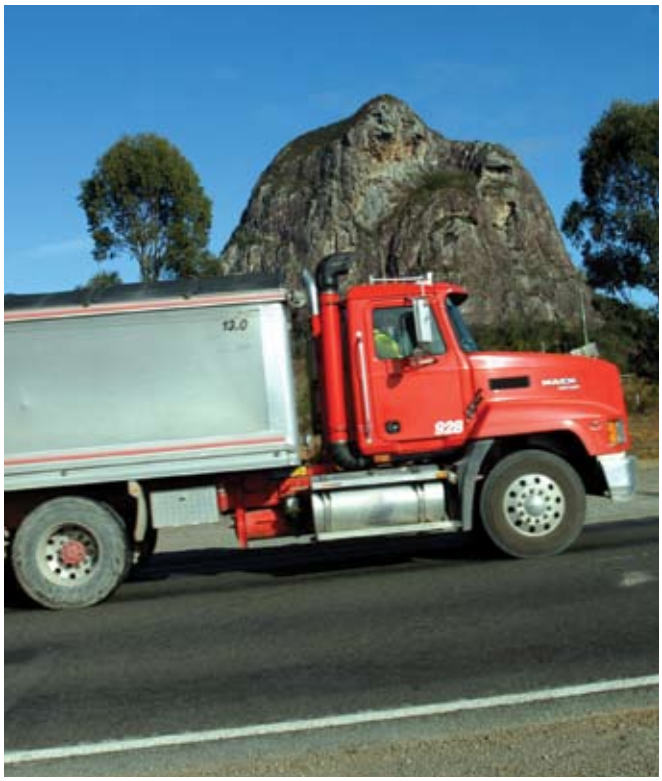


Table of contents

Part One Introduction

1.1 PURPOSE OF THESE GUIDELINES

The effective management of fatigue relies on more than just the driver. As such, these guidelines have been prepared to provide guidance to employers, employees and all parties in the supply chain to manage heavy vehicle driver fatigue – and in so doing, to achieve compliance with their specific and general duties in the new road transport heavy vehicle driver fatigue laws and Occupational Health and Safety (OH&S) laws.

Fatigue is a major cause of crashes involving heavy vehicle drivers, and the impact on families and the community is significant.

The new road transport heavy vehicle driver fatigue laws introduce revised drive, work and rest hours and introduce a new 'Chain of Responsibility' in road transport law to require all parties in the supply chain and their agents take all reasonable steps to manage the fatigue of heavy vehicle drivers. These changes will complement the general duty that already exists under OH&S law on all employers, employees and contractors to ensure safety in the workplace by managing fatigue.

Merely adhering to prescribed drive, work and rest hours and completing work diaries/logbooks may not be enough to comply with the general duties under OH&S laws and the new laws. Good fatigue-management practices encompassing a fatigue-management system with a systematic risk-management approach is also essential.

The fatigue-management measures suggested in these guidelines provide a foundation for complying with the general duties, but the steps that need to be taken will depend on the nature of the specific business operations and the level of fatigue risk involved.

The measures may need to be modified in relation to specific circumstances, as these guidelines cannot anticipate all possible situations in which fatigue has to be managed. For example, what a short-haul operator may do to effectively address a certain type and level of risk may not be the most appropriate or effective course of action for a long-haul operator facing similar risks.

1.2 SCOPE OF THESE GUIDELINES

These guidelines provide important information and guidance on:

- fatigue – its effect, its causes, and ways to reduce it;
- creating a fatigue-management system to manage risks – steps and factors to consider;
- meeting Chain of Responsibility obligations under new heavy vehicle driver fatigue laws on all parties in the supply chain whose actions, inactions or demands influence conduct on the road including drivers, operators, prime contractors, employers, directors and senior managers, loaders, schedulers, consignors and consignees (receivers); and
- current obligations under OH&S laws.

These guidelines are designed to assist all parties in the supply chain, including their agents, to create a fatigue-management system to help them comply with their obligations to manage heavy vehicle driver fatigue when using trucks greater than 12 tonnes gross vehicle mass and buses with 12 or more seats (9 seats in NSW).

By managing fatigue you help to protect the safety of workers and all other road users – and ensure compliance with your obligations under road transport and OH&S laws. There are also other major productivity and efficiency benefits that may be achieved by effectively managing fatigue.

It is important to recognise that fatigue may arise because of the actions or inactions of anyone in the supply chain. Figure 1 illustrates some of the points at which actions along the chain can have 'knock-on' effects for other parties.

Further information will be available from transport agencies to assist various parties to understand their obligations to manage heavy vehicle driver fatigue. A range of Fact Sheets and Information Bulletins will also be available from the NTC website at www.ntc.gov.au

Industries are encouraged to develop more specific guidance through developing Industry Codes of Practice, tailored to the risks of that industry, in order to further promote compliance with fatigue and other safety-related laws.

Figure 1: Examples of weak links in the supply chain

Consignor Weak Links
Inflexible pick up and delivery times
Commercial pressures more important than fatigue consequences for specific trips

Consignors need to be aware of their obligations not to make unreasonable or unrealistic demands on operators or drivers.

Operator Weak Links
Poor scheduling/rostering
Poor management practices
Inadequate training
Inappropriate vehicle for the job

Operators need to plan the transport task to minimise fatigue through a regular risk-assessment process.

Driver Weak Links
Not following Fatigue Management Procedures or Trip Plans
Family demands
Use of alcohol and other drugs
Poor fitness for duty

Drivers need to follow fatigue management and trip procedures that have been designed to reduce safety risk associated with fatigue.

Receiver Weak Links
Delays resulting from loading and unloading arrangements
Poor queuing of heavy vehicles
Lack of amenities for waiting drivers

Receivers need to ensure their operations do not create additional fatigue risks by delaying drivers or setting unrealistic delivery times.

This diagram illustrates some examples of weak links in the Chain of Responsibility. All parties in the supply chain should review their role to ensure they are not the 'weak link'.

1.3 STATUS OF THESE GUIDELINES

These guidelines apply to all parties in the supply chain, including their agents, and provide guidance on how these parties can meet their general duty to manage fatigue under current OH&S laws and under the new road transport heavy vehicle driver fatigue laws.

These guidelines explain common hazards and set out a range of processes and practices for managing fatigue. These include methods of identifying, assessing and controlling fatigue risks, and steps to develop and maintain an effective fatigue-management system.

These processes and practices provide a basis for all parties in the supply chain to work out how they might manage fatigue in their business, although the exact measures will depend on their specific situation, as a 'one-size-fits-all' approach is not suitable. Parties should refer to these guidelines unless a better or equally effective method of minimising fatigue can be demonstrated.

While compliance with these guidelines is voluntary, all parties in the Chain of Responsibility must take all reasonable steps to manage the risks of driver fatigue.

These guidelines provide guidance to parties on how to meet their obligations under OH&S laws and the new road transport laws to take all reasonable steps. These guidelines may also be used to assist enforcement agencies and courts in determining whether OH&S and road transport duties have been satisfied.

Ministers of the Australian Transport Council (ATC) approved the new laws in February 2007 and these are likely to be implemented from 2008 in NSW, NT, QLD, SA, TAS and VIC. Western Australia already regulates driver fatigue management, consistent with many of the new laws, under OH&S law. While there may be some minor differences from State to State, anyone seeking to ascertain their legal position should contact their local transport agency for information.

By following these guidelines, parties can prepare for the new laws and in so doing, will meet their duties under OH&S and insurance laws as explained in Section 1.4.

1.4 LEGISLATION

1.4.1 New road transport heavy vehicle driver fatigue laws

The new road transport heavy vehicle driver fatigue laws have four key components outlined below.

(i) A general duty on all parties in the supply chain under the Chain of Responsibility laws to take all reasonable steps to manage driver fatigue, complementing the general duty already in OH&S laws.

(ii) Changes to driving hours place a greater emphasis on opportunities for sleep and rest, the 'body-clock' influences, and the cumulative nature of fatigue.

There are three components:

- a Standard Hours option – a default option prescribing minimum rest and maximum working hours;
- a Basic Fatigue Management option (BFM) – allowing additional working hours while imposing increased fatigue management and compliance responsibilities on operators; and
- an Advanced Fatigue Management option (AFM) – allowing more flexible working hours based on risk management, alternative compliance and quality assurance approaches. Operators will need to adhere to agreed standards and operating limits in return for more flexible working arrangements defined by the regulatory agency according to the operator's specific fatigue risks and fatigue-management system.

(iii) Strengthened record-keeping provisions and replacing logbooks with a new driver work diary.

(iv) Risk-based categorisation of offences, revised range of sanctions, and enforcement powers.

Contact your local road transport agency or your industry association for further details.

1.4.2 New obligations under the Chain of Responsibility

The Chain of Responsibility concept recognises that fatigue may happen because of the actions or inactions of members of the supply chain. These parties include drivers, operators, schedulers, loaders, unloaders, loading managers, prime contractors and consigners including any agents of these parties. Under this concept, parties share responsibility to manage driver fatigue and cooperate and consult with each other to address fatigue risks.

Under the Chain of Responsibility parties in the supply chain must take all reasonable steps to check:

- the fatigue-management option under which the driver is operating;
- the accreditation details of the operator, if applicable;
- that the driver is complying with relevant work, rest and speed limit requirements; and
- that the driver is not impaired, or likely to become impaired by fatigue.

In addition, if a driver breaches their work and rest requirements, under the Chain of Responsibility all other parties in the supply chain can also be held liable unless they can show that they have taken all reasonable steps to prevent the offence. It is irrelevant whether or not they knew about the offence or intended that it occur. Drivers will continue to be held liable even if another party in the supply chain is found guilty.

Under the general duty to manage driver fatigue, all parties must also ensure they do not breach the general duty by their demands, actions or inactions. This includes for example:

- drivers properly managing their work and rest and not driving if fatigued;
- ensuring trip schedules have sufficient flexibility and are reasonable;
- maintaining effective loading practices; and
- ensuring that commercial requirements do not require a driver to break the law (e.g. driving excessive hours or speeding to meet a deadline).

The new law also makes it illegal for any person to make a reckless or negligent demand that they know, or reasonably ought to know, will lead to breach of the law.

Many influences on schedules and rosters flow from the decisions and requirements of other parties in the supply chain. It is unlikely to be enough to simply require in contracts that operators and drivers meet their legal obligations in order to prove that all reasonable steps have been taken where other steps are reasonably available.

All parties in the supply chain should work together to manage fatigue. Parties may adopt practices such as:

- implementing ongoing consultative mechanisms to identify and effectively control fatigue risks;
- developing clear contractual obligations that do not contribute to fatigue;
- providing training and implementing procedures to empower drivers to refuse unreasonable requests; and
- implementing ongoing operational reviews to identify practices that contribute to fatigue, develop improved practices and ensure that relevant parties are advised if existing practices are contributing to fatigue, such as:
  - inflexible delivery times and unloading times;
  - poor management of truck queues; and
  - inadequate equipment and/or resources to load/unload trucks.

1.4.3 Existing obligations under Occupational Health and Safety Law

OH&S laws in all Australian jurisdictions place a general duty on employers to provide a workplace and systems of work that are safe and healthy. OH&S laws require employers to:

1. implement a systematic process of hazard identification, risk assessment, risk control and review in all systems of work (references to "health" includes risks to psychological health)
2. monitor the health of employees
3. ensure that employees, including managers and contractors, receive appropriate training, instruction and supervision, including induction and ongoing training
4. obtain appropriate information to manage risks
5. consult with employees whose work is directly affected by decisions or changes in the workplace, and their OH&S representatives
6. implement and review control measures over time
7. keep adequate records in relation to OH&S.

Under these duties, parties must take all reasonably practicable steps to manage fatigue.

Maintaining a safe workplace is a shared responsibility of employers and employees. For example, heavy vehicle drivers have a legal duty to take reasonable care for their safety at work and cooperate with their employers in meeting their obligations. Employers owe a duty to protect the safety of all employees, including contractors.

These guidelines represent part of the 'state of knowledge' in OH&S law for managing heavy vehicle driver fatigue – assisting parties to comply with their obligations to manage fatigue under OH&S laws as well as road transport laws.

1.4.4 Other obligations and benefits

Effectively managing heavy vehicle driver fatigue may also provide other benefits in addition to compliance with road transport and OH&S laws, including:

- minimising the risk of negligence claims, for example, resulting from unintentional safety breaches that cause a vehicle crash;
- satisfying insurance obligations, for example, the obligation under the *Insurance Contracts Act 1984* that requires disclosure to the insurer of all reasonably foreseeable risks;
- productivity gains, for example, through minimising avoidable losses that may result from driver fatigue; and
- generating commercial opportunities, for example, by showing the ability to manage compliance, thereby reducing exposure of customers and suppliers under the Chain of Responsibility.

Part Two Understanding Fatigue

Fatigue is an acute or ongoing state of tiredness that affects employee performance, safety and health, and requires rest or sleep for recovery.

Key risks resulting in fatigue are poor understanding about the factors leading to fatigue including poor communication and consultation between parties in the supply chain. Managing fatigue is the shared responsibility of all parties in the supply chain and requires commitment from all parties to manage the risks. This requires genuine and open consultation and communication and increased understanding by all parties.

This section (Part 2) provides guidance on what constitutes fatigue, common contributing factors, and details on methods that may be used to control fatigue. This material should be consulted when using the risk-management approach described in Part 3.

2.1 EFFECTS OF FATIGUE

Fatigue is more than falling asleep at the wheel. Fatigue describes the feeling of being tired, drained or exhausted. It causes poor judgment, impaired coordination and slower reactions, and impacts on how well you work. It builds up, leading to a progressive loss of alertness that ultimately ends in sleep and is a major contributing factor in many road crashes. The effects of fatigue include:

- **Loss of Alertness** – when you respond more slowly to things as they arise. Loss of alertness is an early sign of fatigue and may result in less efficient vehicle control (e.g. changing gears, finding it hard to drive inside the lanes, or finding it hard to maintain a constant speed).
- **Poor Judgment** – before drowsiness sets in, fatigue affects the ability to think clearly, which is vital when making safety-related decisions and judgments. Someone who is very fatigued may not realise how fatigued they really are. As a result, fatigued people are unaware that they are not functioning as well or as safely as they would if they were not fatigued.
- **Drowsy Driving** – drowsiness means feeling sleepy, but not actually being asleep. When drowsy, a driver may actually drift in and out of sleep occasionally without knowing it (micro sleep). Drivers have been studied when drowsy and found to be asleep for 3 to 5 seconds – or as long as 15 seconds. Travelling at 100 kilometres per hour can mean 100-300 metres of travel and plenty of time to run off the road.
- **Falling Asleep at the Wheel** – this happens in a number of crashes, typically very severe single vehicle crashes where there has been no attempt by the driver to control the vehicle. Often the driver was completely unaware of events before the crash.
- **Poor Memory** – being fatigued will also affect your memory. For example, drivers may have travelled a significant distance without knowing it. This is directly related to loss of alertness.
- **Mood Change** – being fatigued can also make you irritable, agitated, aggressive and poor company. You start to overreact to things including those that wouldn't normally upset you.

> Driving is a complex mental and physical task requiring sustained levels of concentration and skill to maintain maximum performance. No driver can afford to be fatigued nor can anyone else afford a driver to be fatigued.

2.2 CAUSES OF FATIGUE

2.2.1 Time of day – body-clock factors

The body has natural rhythms that are repeated approximately every 24 hours – this is called the 'body clock' or the circadian rhythm. The body clock regulates sleeping patterns, body temperature, hormone levels, digestion and many other functions, and helps conserve resources. When the body clock is out of 'synch', effects such as jet lag result.

The body clock programs a person to sleep at night and stay awake during the day. Body temperature drops during the night resulting in sleepiness and rises during the day to assist in feeling alert. At night the digestive system slows (because individuals are less likely to be eating) and hormone production rises to repair the body.

The body clock is controlled partly by light and dark and partly by what activities are undertaken. When working normally from 9 am to 5 pm, things that happen as a result of your body clock include:

- morning light tells the body clock to be more alert;
- after lunch (siesta time) the body clock will turn alertness down for a couple of hours;
- alertness is heightened in the late afternoon and early evening;
- darkness at night tells the body clock to turn alertness down again to get ready to sleep; and
- after midnight, body temperature and alertness decrease to their lowest level.

2.2.2 Sleep factors

The optimum amount of required sleep varies. The average daily sleep required for an adult generally varies between 6 to 8 hours. People who have less sleep than necessary will incur a sleep debt. This 'sleep debt' builds up for each day you don't have enough sleep.

The best time for good quality sleep is in the early morning hours (midnight to 6 am). Unless a driver is on night shift, it is best to try to sleep during this period. It is important that all parties in the supply chain recognise that drivers working irregular hours or shift work are routinely exposed to conditions that reduce the amount and quality of their sleep.

It is not necessary to repay every hour of sleep debt immediately. However, if a sleep debt is not properly managed, driving performance could be as poor as if the legal alcohol limit was exceeded.

> Sleep debt is like a bank loan – you have to pay it back.

Every day that sleep is insufficient, a driver is more fatigued and therefore more dangerous. Fatigue will also build if sleep is lost over consecutive days as the effects of fatigue are cumulative.

It is not possible to just sleep and drive, and drive and sleep. Sleep time should not be shortened to fit in daily living activities such as washing, eating and domestic tasks. Drivers and schedulers must take this into account and include adequate time for sleep as well as other domestic and recreational activities.

> Time is needed both for sleep and other domestic activities.

Short-term measures such as taking naps can help compensate for lack of sleep but remember that naps are not a substitute for continuous sleep and that after a nap it can take some time to wake-up completely and get over the sleep inertia.

2.2.3 Health factors

There are some general health tips and lifestyle choices that will ensure safer driving – with many other benefits. However, the following are a number of health factors that can prevent a driver from getting a good long sleep.

Although most people over 50 years snore at night sometimes, for a few it is a serious problem. Sleep apnoea occurs when the windpipe collapses during sleep so that too little air reaches the lungs, resulting in frequent waking due to oxygen starvation. The condition is treatable.

A further problem is falling asleep during the day with no obvious sleep problem at night. This condition is called narcolepsy, and can be treated.

Some people also suffer from restlessness at night that keeps them awake. They find their legs keep moving or twitching. This too is treatable.

Some illnesses such as diabetes, if not controlled, can also result in fatigue. Again, this can be treated.

Being overweight or obese is not usually regarded as an illness. However, obesity can cause sleep problems and strongly contributes to sleep-disordered breathing (apnoea). Also, being overweight does cause other problems including medical sleep problems.

Tiredness and drowsiness after sufficient sleep may indicate a medical problem. It is recommended you seek medical advice.

Ongoing fatigue and stress can also contribute to serious long-term health effects such as cardiovascular disease. It makes sense to have regular health checks so these illnesses and medical problems can be diagnosed before they make drivers unsafe, unable to do their job or worse.

- Effect of alcohol, other drugs and stimulants

The effect of alcohol on people is very similar to fatigue. After consuming alcohol the only way to reduce its effect is to allow time. Large amounts of alcohol before bedtime will reduce the quality and amount of sleep a person can have.

Many drivers smoke cigarettes in the belief that it helps keep them alert, however this increases the risk of many diseases such as heart disease and lung problems.

There is a temptation to take stimulant drugs to manage fatigue but this is not recommended. These drugs have many side effects resulting in increased fatigue and can cause long-term effects on health including problems such as high blood pressure and other cardiac problems.

Caffeine and other related stimulants can have the effect of perking up an individual for a short amount of time. If you have caffeine all the time your body adapts to it so it has less effect. Whether it is coffee, tea, chocolate, cola drinks or perhaps something stronger, caffeine is a stimulant. But too much can be a problem.

Too much caffeine can stop a person from sleeping when they want to, as well as reducing the quality of their sleep. It can also cause digestive, cardiac and other problems, including headaches. Caffeine dehydrates the body, which is a serious problem when driving. And, if you are very fatigued, caffeine won't help you – only sleep will.

- Benefit of diet and exercise

Good health and fitness will assist in addressing issues associated with fatigue.

Exercise and a good diet will help drivers to be fit for work, assisting in alertness and better sleep. Exercising for 30 minutes a day, even in three 10 minute periods, can significantly improve health and reduce weight. Just walking or jogging instead of using the car for short trips is beneficial.

During a break from driving, walking is good exercise. As a driver, the health of your back is vital to your livelihood, so look after it by stretching, flexing regularly and lifting properly.

Unlike some other types of work, driving requires drivers to be alert and attentive all of the time. This depends on the work being done but also on what drivers have done on the days prior to driving. Drivers need to be ready to drive/work at all times when at work. This is commonly called 'fitness for duty'. Drivers need to be aware of the impact some types of activities may have on their fitness for duty such as a second job, recreational activities, sport, insufficient sleep and any stress-related situation.

Employers and all parties in the supply chain also have duties to ensure that drivers are fit for work – and drivers have a similar obligation.

A healthy diet and regular exercise will reduce weight and improve your fitness. Nutritionists recommend the following:

- breads and cereals: (4-5 servings daily) such as rice, pasta, bread and cereals;
- vegetables and fruit: (at least 4-5 servings daily) of fresh, frozen or canned fruits and vegetables;
- meat and meat substitutes: (1-2 servings daily) of lean beef, lamb, veal, chicken or pork (grilled rather than fried)
- milk or dairy products: (3-4 servings daily) of milk, cheese or yoghurt;
- fats: butter and margarine: (maximum of 1 tablespoon daily) of butter or table margarine; and
- fish: (preferably 1 serving daily) minimum of 2 servings per week.

The quantity of food consumed can also affect sleep. It is bad practice to eat a heavy meal before going to bed. Plan to eat no less than 3 hours before going to sleep.

Further detailed guidance on Fitness for Duty matters including sleep disorders can be found in *Assessing Fitness to Drive*, Austroads 2003 available at **www.ntc.gov.au**.

2.2.4 Work factors

In addition to those matters that can be controlled by a driver, actions or inactions by other parties in the supply chain can contribute to driver fatigue. In a recent survey of drivers[1], the key factors that contribute to fatigue are:

- long or excessive hours;
- unreasonable transit times or deadlines; and
- inflexible time slots, problematic loading and distribution.

Long working hours have been cited in driver surveys and in research as a major fatigue risk. While some drivers still drive hours in excess of legal limits, fatigue can still be a problem even within the legal limits, and the risk of long working hours must be properly managed.

Table 1: Check list of warning signs

Most people who have a sleep debt don't realise they are tired, so drowsiness can creep up on them. It is time to pull over for a nap or a break if any of the following is experienced.
trouble keeping your head up
wandering, disconnected thoughts – day dreaming
eyes close for a moment or go out of focus
eyelids droop
inability to stop yawning
inability to remember driving the last few kilometres
drifting over the centre line or onto the gravel at the side of the road
not noticing signs and hazards early enough
missing your exit
missing gear changes
starting to see things that are not there
approaching corners too fast
poor steering or braking too late
changing speed without noticing

1: SA WorkCover, Fitness for Work in the SA Heavy Vehicle Transport Industry, November 2004.

Unreasonable schedules increase the risk of fatigue by failing to allow drivers to take necessary rest breaks or failing to provide for reasonably expected delays. Actions of heavy vehicle customers, such as those regarding delivery deadlines, can place unreasonable demands on drivers and increase driver fatigue. In turn, delays in loading or unloading further increase fatigue risk.

Unsafe and unsuitable workplace conditions are a contributing factor to fatigue. Good vehicle design and depot facilities will assist drivers in reducing the effects of fatigue. Vehicles must comply with Australian Design Rules covering such things as ventilation, seating suspension and sleeper berths. Another factor that can contribute to driver fatigue is the time necessary for a driver to travel to and from work.

It is important that all factors are identified and that parties in the supply chain are reminded of their responsibilities.

2.2.5 Two-up driving

Two-up driving, when managed properly, can be an effective form of driving in long-haul operations. This is because a driver is able to rest when fatigued while the vehicle is still moving.

The safety of two-up driving depends though on whether a driver is able to work well with their driving partner and gain restorative rest.

Issues to consider when scheduling two-up driving include:

- drivers need to be capable of sleeping in a moving vehicle;
- drivers must be confident in the ability of the co-driver or the quality of rest may be lower;
- the sleeper berth needs to be compliant with the standard in the new laws;
- whether a sleeper berth requires better insulation and if it should be fitted with independent air-conditioning;
- allowing drivers to volunteer for two-up driving with the capacity to select their driving partner;
- drivers should share the driving to best fit each other's body clock e.g. is particularly important at night;
- if possible try not to have drivers participate in loading/ unloading if they are undertaking ultra long trips; and
- match new two-up drivers with a more experienced driver for a probationary period involving a number of trips as a team. The experienced driver should provide feedback on the new drivers' skills, attitude and 'behaviours' and if the new driver is able to sleep well in a moving vehicle.

2.3 WAYS TO REDUCE FATIGUE

2.3.1 Listen to and plan around the body clock

No matter whether adequate sleep is achieved or not, there are high points of alertness and low points when one feels drowsy, or wants to sleep. Consider the body clock in scheduling breaks for rest or naps. Also explain to families and friends how important sleep is and avoid parties, etc. if occurring at times when you need sleep.

Employers must provide the opportunity for necessary sleep and ensure that drivers get off the road when feeling drowsy. Drivers should ensure they have enough sleep to cancel the debt and don't drive if feeling drowsy.

Most passenger and freight schedules will hinge on pick up and delivery times and dates. All parties in the supply chain equally share the responsibility for trip planning. Plans should include time for sleep, food and rest, including time for naps if needed and take into account possible delays. The driver must have the flexibility to adjust the schedule if circumstances change.

The likelihood of falling asleep when the body clock is set to 'sleep' is very much higher than at other times in the day and the associated risks must be considered by employers and other parties in the supply chain when setting schedules and agreeing to contracts. The risk also increases as sleep debt increases, so schedules need to take this into account.

Develop and maintain a regular routine that provides for sleep, meals, daily living and time off. This will improve sleep quality and alertness when awake.

Learn, plan and use counter-measures to better manage driver fatigue:

- set schedules so that wherever possible, drivers can take a power nap if starting to feel tired;
- take a nap before the start of a shift to help prevent fatigue;
- use rest breaks to maximise the quality of rest;
- combine short rest breaks with exercise;
- drink plenty of water and eat sufficient fresh food including fruit and vegetables; and
- even with adequate sleep, a monotonous trip can make us less alert – mental games and habits can be developed to help keep alert.

If early signs of drowsiness are ignored, micro sleeps may be experienced, resulting in loss of control of the vehicle leading to the vehicle running off the road or into an oncoming vehicle. Once fatigue sets in, the best counter-measure is sleep.

2.3.2 Obtaining good sleep and taking naps

The actual amount of sleep needed by each person varies and this needs to be considered by drivers and all members of the supply chain. Similarly, how to have a good sleep is an important consideration. Avoid stimulants – they are not the answer to fatigue as they only delay sleep.

To obtain good quality sleep and manage the risks associated with the quality of sleep…

- at home, a motel or driver quarters:
  - find the best room temperature to fall asleep (it will probably be between 18 & 22°C);
  - turn down your phone volume (or turn it off); wear earplugs; ask the family to be quiet;
  - if using a motel room, select one away from the road;
  - hang extra thick curtains; wear eye shades; and
  - have sufficient sleep before commencing driving/ working.
- on the road:
  - find a quiet truck bay and use dark curtains and liners to keep out light;
  - make sure your sleeping berth is well-ventilated;
  - take eye shades and earplugs with you;
  - turn off your mobile phone and radios;
  - take time to change out of your work clothes as you would at home; and
  - drink plenty of water.

If you are having trouble sleeping seek medical advice and remember regular health checks are important. It is important that drivers are aware of any sleep disorder or other medical condition that could affect their ability to drive safely.

> The best time to sleep is when you feel the onset of tiredness.

Short breaks are an important means of addressing driver fatigue and in addition to the short breaks specified in the new laws; additional breaks should also be taken when necessary. Naps should not be seen as a weakness as it is good fatigue management. Naps can be very effective in providing short-term relief, but they are only a temporary measure and not a substitute for continuous sleep. When driving, remember to:

- be prepared to take breaks when most needed;
- avoid extreme temperature and take breaks where relief from temperature is available;
- use short breaks to stretch and walk; and
- try and maintain some simple exercise routines between driving shifts.

Naps are a short-term answer to fatigue if it occurs, so those in the supply chain should plan the work and rest so that naps are not usually needed. If fatigue does occur however, a nap can help decrease fatigue.

The effectiveness of naps will depend on the time of day they are taken and how fatigued the driver is. Naps are most effective if taken before a driver is fatigued. However, if experiencing overwhelming sleepiness, stop and obtain adequate sleep as soon as practical. Naps should only be taken as a last resort in these circumstances. Consider the following points when napping;

- a minimum of a 10-minute up to 30-minute nap should be adequate to reduce the effects of fatigue;
- if a longer nap is needed, allow up to 80-90 minutes so that waking should occur during a shallower sleep;
- consider taking a nap before a long drive to help prevent fatigue developing during the drive;

- plan and schedule naps and ideally take advantage of facilities to coincide with natural drowsiness in the afternoon (2-4 pm) or during the hours of midnight to dawn if a night driver;
- sleep occurring when we are designed to be awake (e.g. late morning and the middle of the day) tends to be shorter and more fragmented and therefore less restorative;
- after naps taken during normal sleep hours, particularly the period between midnight and around 6 am, it can be hard to get going again. It may be better to have a nap slightly earlier in the evening; and
- build in a 'wake-up' period to get going again.

For more information on naps you can download the *Guidelines for Using Napping to Prevent Commercial Vehicle Driver Fatigue (2006)* from the NTC website at **www.ntc.gov.au.**

2.3.3 Managing fatigue at work

It is important that all parties in the supply chain cooperate to better manage driver fatigue. Simply adhering to prescribed driving hours and relying on work diaries/logbooks may not be enough to address the risks of driver fatigue. Good fatigue-management practice is also essential.

Part 2 of these guidelines highlights many of the common factors that contribute to driver fatigue. Part 3 sets out a suggested risk-management process, consistent with OH&S requirements, which can be used by all parties in the supply chain to manage the risk of their actions or inactions contributing to driver fatigue.

Managing fatigue requires a systematic fatigue-management system. Central to this is a risk-management approach and this is discussed in Part 3. Also necessary are associated policies and procedures to manage the risks associated with that business and that engenders an organisational commitment to the ongoing management of fatigue. An example of this might include a system involving use of Driver Fatigue Management Plans (DFMP).

See table 2, page 13

Share this information with your family so they can provide support and understand the importance of adequate sleep.

If in doubt – seek medical advice.

Factors to consider when developing policies and procedures include:

- methods to generate a culture of understanding and management of fatigue including good communication and consultation;
- the type of work to be performed and body-clock risks that can contribute to fatigue;
- scheduling and rostering drivers, including length of shift and allowing for necessary rest and recovery during and between shifts;
- availability of rest areas and amenities for drivers;
- consultation on fatigue risks with drivers, their representatives, and other parties in the supply chain;
- reviewing loading and unloading times and delays at pick up and delivery points;
- establishing drivers' capacity and fitness for work;
- contingency planning including providing for reasonably expected delays;
- training and education in fatigue management;
- managing incidents and near misses; and
- establishing and maintaining appropriate workplace conditions and audits.

Some or all of the policies and procedures may exist already in other corporate documents. Fitness for work policies and procedures may be in human resource management manuals and relevant information on training may be in general safety induction manuals. It is not necessary to create documents especially for a fatigue management system, providing that issues can be identified and referenced within existing policies and procedures.

Some policies and procedures that are used for fatigue management, such as policies on drugs and alcohol in the workplace or hazard and incident reporting procedures, may apply to a wide range of circumstances within the one organisation. Where relevant policies and procedures exist, which have been developed in consultation with employees and OH&S representatives, they could be used for fatigue management.

Table 2: Check list for managing fatigue

Here are some tips to help keep alert at the wheel:

Planning:

- Plan trips to provide adequate time for sleep, rest and food, taking into account appropriate places to stop
- Plan rosters so there is enough time to adjust to a change between day and night shift
- Talk to the family well in advance of departure time so that sufficient rest is achieved
- Be realistic about how much sleep is needed to be a safe driver and make sure it is acquired
- Start the journey without sleep debt
- Understand the body clock and be aware of low point of alertness
- Share this information with the family so they can provide support and understand the importance of adequate sleep
- Make sure there are no health problems. If in doubt – seek medical advice.

On the road:

- Take regular power naps (20 to 30 minutes)
- Keep the cab at a comfortable temperature, but not too warm
- Get fresh air into the cab. Smoke and stale air can contribute to drowsiness
- Eat sensibly and exercise regularly
- Drink plenty of water and never drink alcohol when working
- Use caffeine only when needed – it is only a short-term solution to mild fatigue if you don't usually have a lot of caffeine
- Learn to recognise the signs of sleepiness and pull over as soon as possible for a short nap
- Do not take drugs to manage fatigue.

To help manage boredom:

- Listen to music, talkback radio or talking books or chat on the CB radio
- Play mental games, such as calculating distances
- Take regular breaks to stretch, walk and check the vehicle
- Learn to recognise the signs of sleepiness and pull over as soon as possible for a short nap.

Table 3: Guidance on schedules and rosters to minimise fatigue

Here are some tips on designing schedules and rosters to manage driver fatigue:

1	Give a driver sufficient notice to prepare for a working period of 14 hours or more, or if this is not practical, ensure the driver's fitness for duty is assessed.
2	A solo driver needs the opportunity for at least 7 hours of continuous sleep in a 24 hour period.
3	Minimise irregular or unfamiliar work rosters.
4	Operate flexible schedules to allow for Short Break Time or discretionary sleep.
5	Minimise very early departures to give drivers the maximum opportunity to sleep in preparation for the trip.
6	When drivers return from leave, minimise night-time schedules and rosters to give drivers time to adapt to working long hours, especially at night.
7	Give sufficient notice of a change between night and day shift, with enough time to change sleep patterns.

Part Three Managing Fatigue — Risk-Management Approach

A suggested process to create a fatigue-management system that can be used by all parties in the supply chain to eliminate, minimise or control the risk of their contribution to driver fatigue, includes the following steps:

1. **Risk Identification**
2. **Risk Assessment**
3. **Risk Control**
4. **Monitor and Review**

No two operations are the same. Every member of the supply chain should assess the specific factors resulting from their operations and use the risk-management process to manage all resulting risks. Keep records of this process as evidence of the steps that have been considered and taken to manage the risks of driver fatigue. Parties in the supply chain should consult with other parties in the supply chain, and in particular with operators and drivers, in order to control risks of driver fatigue.

A detailed approach to risk management is already required under OH&S law and is the key to effectively managing the risks of heavy vehicle driver fatigue. This section (Part 3) provides guidance on applying the risk-management process. Further guidance is provided in Part 4 in highlighting questions to assist all parties in the supply chain identify, assess and develop controls in order to manage fatigue risks.

For more information on how to use the risk-management approach to meet workplace health and safety obligations, please refer to Australian Standard ASNZ4360 on Risk Management.

STEP ONE: RISK IDENTIFICATION

The first step is to identify factors that may contribute to driver fatigue. Employers and all other parties in the supply chain should develop a list and keep records of all the factors in their business that have the potential to contribute to driver fatigue.

There are many ways to identify workplace factors that contribute to fatigue, including:

- inspecting workplace rosters and work-time records;
- consulting with drivers – ask them about schedules and rosters. Also, ask about any problems they have encountered, or any near misses or unreported injuries;
- consulting with workplace OH&S representatives and committees;
- reviewing loading and unloading times and delays at pick up and delivery points;
- conducting safety audits;
- analysing injury and incident reports;
- undertaking driver surveys;
- reviewing loading and unloading times and delays at pick up and delivery points;
- conducting safety audits;
- keeping records and details of all workplace incidences and near misses;
- recording frequency – how often the situation occurs; and
- recording number of people exposed and duration.

Records should be kept of this process and of decisions made. This information can be useful as a starting point when undertaking regular reviews of risks in the future.

Factors to be considered include:

- length of shifts worked – the length of shifts worked can contribute to fatigue;
- previous hours and days worked – the effects of fatigue are cumulative (drivers may have sleep debt due to the previous hours and days worked, which can contribute to fatigue);
- type of work performed – pay attention to the level of physical and/or mental effort required;
- time of the day when the work is being performed – remember that disrupting the body clock can cause fatigue and also impact on task performance;
- delays loading or unloading at consignors or consignees;
- roster design & scheduling – allow for rest and recovery between shifts;
- work premises – layout and condition;
- work environment – vibration, noise, climate/temperature, etc;
- human factors – capability, skill, experience, age, physical fitness and health status; and
- driver's fitness for duty.

STEP TWO: RISK ASSESSMENT

The second step involves assessing each of the risks identified. That is, assessing the likelihood of the event occurring (e.g. two long shifts, two days in a row) and the expected consequences (loss of alertness). For each of the risks you have identified, assess and record:

- the likelihood of the incident occurring, bearing in mind the existing control measures;
- the consequences of an incident occurring, bearing in mind the existing control measures; and
- the combination of the likelihood and consequences to estimate the rate of risk.

Part 2 of these guidelines provides guidance about common fatigue hazards. Further guidance may be gained by all members of the supply chain by considering the various questions contained in Part 4. This further explains the nature of risks and contains examples of questions that further highlight various risks and consequences.

Example of a Risk Assessment Matrix

Instructions:

A Determine the most likely fatigue consequence of an incident (e.g. falling asleep, drowsiness)

B Select the phrase that best describes the likelihood of the event occurring (e.g. highly likely that a driver will work three night shifts in a row)

C Line up the consequence and likelihood to determine the risk score

All risks should be managed as soon as reasonably practicable. However, if this is not possible, a plan should be put in place to manage the risks as soon as reasonably possible. In this case, greatest priority should be given to risks in the dark blue zone that indicate high-level risks requiring priority action, the mid blue zone indicates medium-level risks that may be given lower priority, and the white zone indicates low-level risks. Remember, however, that this is just a guide.

When assessing the risks, refer to Table 5 that may help you determine what type of activities increase fatigue risks the most.

Records should be kept of this process including details of the assessment process undertaken, who is allocated responsibility to manage each risk and the relevant timeliness for action. Where necessary, this will demonstrate that matters are progressed appropriately and in a timely and efficient manner according to the order of priority.

Step 3 (page 19) provides further guidance on the types of controls that should be used to control risks.

Table 4. Risk Assessment Matrix

MOST LIKELY FATIGUE CONSEQUENCE	LIKELIHOOD			
	Definitely will occur	Likely to occur	Unlikely to occur	Won't occur
High levels of fatigue (e.g. drowsiness, micro sleeps)				
Medium levels of fatigue (e.g. loss of alertness, slowed reactions)				
Low levels of fatigue (e.g. slight tiredness)				
No fatigue				

Table 5. Risk Assessment Guide

Here are some tips on some risks and the seriousness they might have in your business

Lower Fatigue Risk	Some Fatigue Risk	Higher Fatigue Risk
Regular short shifts with little night work	Regular shifts	Unpredictable or long shifts with lots of night work
Schedules build in time for typical delays	Schedules allow some flexibility for delays	Schedules do not allow any time for delays
All trips avoid driving at low alertness periods (i.e. night, early morning)	Some trips during low alertness periods	Most trips during low alertness periods
Rosters ensure at least a week's notice to prepare for upcoming schedules	Rosters allow a few days notice for upcoming schedules	Notice for schedule changes do not allow an opportunity for good quality rest
Short breaks are taken frequently and from early in the shift	Short breaks taken only at end of allowed maximum driving period	Short breaks not always taken
Drivers are able to sleep at night in own bed	Drivers sometimes sleep at night and usually in own bed, or always at night but in vehicle/motel	Drivers rarely sleep at night and usually in vehicle
Drivers almost always get 7-8 hours continuous sleep per night	Drivers sometimes get 7-8 hours sleep	Drivers rarely get 7-8 hours sleep

STEP THREE: RISK CONTROL

The third step involves deciding on control measures to manage exposure to each fatigue risk identified and implementing the controls in a timely manner. Employers and other parties in the supply chain should implement control measures that adequately control exposure to fatigue in their business.

The hierarchy of control outlined in Table 6 provides a method of assessing control measures. Under the hierarchy, the ideal solution when managing fatigue is to completely eliminate factors contributing to fatigue. If this is not reasonably possible there are a number of control options that may be used alone, or in combination, to reduce the risk so far as is reasonably practicable. Measures should be supported by policies, procedures, information and training. Because fatigue is caused by a combination of factors, the most effective way to manage it is by using a combination of risk-control measures.

Table 6: Order of control measures to eliminate or reduce the risk of injury or harm (in some instances a combination if control measures may be appropriate).

Most effective control measure

1. **Elimination**
   removing the hazard or hazardous work practice from the workplace. *For example, eliminating schedules that result in undue pressure on drivers or through using effective policies and fatigue-monitoring equipment that ensure a driver stops driving before becoming impaired by fatigue.*
2. **Substitution**
   substituting or replacing a hazard or hazardous work practice with a less hazardous one. *For example, substituting an onerous schedule or through providing a changeover driver rather than requiring the one driver to complete a long shift.*
3. **Isolation**
   isolating or separating the hazard or hazardous work practice from people involved in the work or people in the general work area. *For example, providing drivers with accommodation for quiet sleep away from the heavy vehicle and from noisy traffic.*
4. **Engineering controls**
   if the hazard cannot be eliminated, substituted or isolated, an engineering control is the next preferred measure. *For example, re-engineering a queuing system in order to minimise queuing of heavy vehicles for loading/unloading.*
5. **Administrative controls**
   this includes introducing work practices that reduce the risk, such as providing procedures, instruction and training. *For example, providing training to employees on combating fatigue and through supervising and assessing drivers' fitness for duty through a shift.*
6. **Personal protective clothing and equipment**
   these should be considered only when other control measures are not practicable or to increase protection. While essential for some work procedures, these should be last in the list of priorities. *For example, through fitting heavy vehicles with safety equipment such as airbags or implementing policies and supervision to ensure drivers wear their seat belt.*

Least effective control measure

Control measures

It is important that once controls are developed they are implemented in a timely manner. This includes keeping records of decisions and of who is responsible for implementing the measures and, where appropriate, setting milestones for progress and providing necessary resources in order to complete the task. Further guidance on developing appropriate controls is provided below by referring to the questions contained in Part 4.

Control measures need to be specific to the risks identified and to the particular business. The types of measures may include:

- developing work procedures and/or policies;
- communicating control measures;
- providing training and instruction; and
- supervision.

Table 6 shows the order of priority in seeking to control risk. By following the order of controls, parties will be able to identify what types of controls are best suited to a specific risk. For example, if eliminating a risk is not reasonably possible, consider substituting the risk instead. A lower order control should only be used if the higher order control is not reasonably practicable. When assessing the type of control measure, consider options for their applicability and the interaction between combinations of hazard factors that could influence the level of risk. The order of controls can be used by any party in the supply chain and examples are given to highlight controls that various parties can use for their business.

Specific industries or industry sectors may also wish to consider developing their own tailored Industry Codes of Practice as a further guide to effectively managing driver fatigue.

Developing work policies and procedures

Work policies and procedures need to be developed and implemented to ensure that all reasonable fatigue control measures are in place and effective. This might include developing a driver fatigue-management plan as part of the overall fatigue-management system. A fatigue-management system can consist of a collation of policies and procedures to manage driver fatigue and may include a Driver Fatigue Management Plan (DFMP).

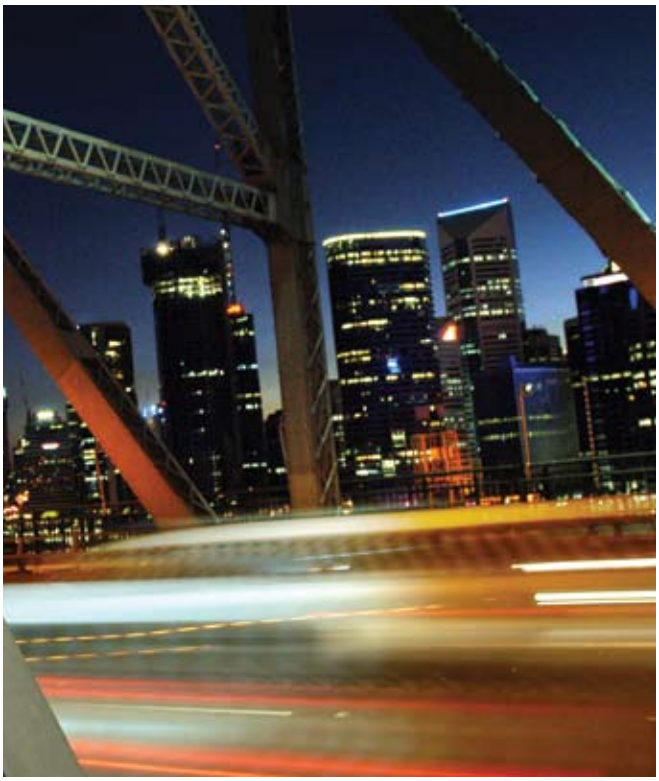
Effective fatigue-control measures should define and communicate responsibilities. For example, employers and persons conducting a business are responsible for providing a roster system that provides staff with sufficient opportunity for rest and recovery. It is a good idea to document and keep records of procedures and the reasons behind them, detailing when and how they must be implemented and who is accountable.

Communicating control measures

Employers and persons conducting a business should consult with drivers about the control measures, both in their development and when they are to be implemented. It is important to clearly communicate that the control measures are being introduced to effectively manage fatigue. When communicating control measures to drivers, it is important to remember that drivers (through their workplace health and safety representatives) are entitled to be consulted about any changes in the workplace that affect, or could affect, their safety.

Consultation may be achieved through the workplace OH&S representatives and should include:

- the possible health and safety impact of changes;
- the benefits and problems associated with the changes;
- measures needed to eliminate or control any adverse impact on health and safety;
- procedures for drivers to notify supervisors of any impairment or potential impairment that may place any person at risk before starting work; and
- clear definition and communication of responsibilities.



Providing training and instruction

Employers and persons conducting a business should provide training and instruction on fatigue for drivers, supervisors, schedulers and any other person whose actions may affect road safety. Specific training requirements are included in the requirements for participation in both the Basic and Advanced Fatigue Management schemes. Minimum information should include:

- common causes of fatigue including shift work, extended working hours, roster patterns, demands placed on drivers and delays in loading and unloading;
- tips to identify signs of fatigue;
- potential health and safety impacts of fatigue;
- how drivers are responsible for making appropriate use of their rest days, and for ensuring they are fit for duty; and
- policies and procedures.

Consideration should be given to the appropriate information and training to be provided to members of the chain, including all drivers. Drivers attending training outside their normal shift should be considered at work and rosters adjusted accordingly.

Supervision

Employers and persons conducting a business should also provide adequate supervision to ensure that control measures are being used correctly. This can include activities such as monitoring fatigue levels of drivers or ensuring compliance with safety procedures. Induction is also relevant to new employees or when new activities are undertaken. For drivers working alone, employers should consider providing a means of communication and a procedure for regular contact.

STEP FOUR: MONITORING AND REVIEW

The fourth step is to monitor and review the effectiveness of fatigue control measures, and revise if necessary. When working through this step it is useful for members of the supply chain to consider:

- have the chosen control measures been implemented as planned?
- are the chosen control measures working?
- are there any new problems that may, for example, have been caused by the control measures?

When answering these questions, employers and persons conducting a business can:

- consult with drivers, supervisors, OH&S representatives, OH&S officers, and safety committees;
- consult with other parties in the supply chain;
- measure exposure to fatigue – are drivers still getting fatigued?; and
- monitor incident reports and assess the likelihood for fatigue contributing to incidents.

If any new hazards have been identified, it is necessary to refer back to Step One and identify and manage risks as part of the ongoing risk-management process. Employers and persons conducting a business should ensure that there is a process for ongoing monitoring and evaluation of workplace fatigue using the risk-management process as this process should be regularly undertaken and reviewed. Once again, records should be kept of this process including steps undertaken and decisions reached.

Part Four Developing A Road Transport Risk-Management System

IMPLEMENTING FATIGUE RISK MANAGEMENT SYSTEMS

This attachment has been prepared for the information of all parties in the supply chain including:

- road transport operators;
- owner/drivers;
- employee drivers;
- other influencing parties (for example, consignors, consignees and loaders); and
- agents of any of the above parties.

It is very important to note that given the diversity of road transport operations, it is very difficult to prescribe exactly what each duty holder should be doing in terms of fatigue counter-measures. That is, what may be effective for one party may be ineffective for another.

Instead of prescribing exactly what parties should do to address these common fatigue risk factors, questions or prompts that parties should consider are provided against a number of common fatigue risks to assist you in undertaking the risk-management process and formulation of your fatigue-management plan.

The questions provided will have varying degrees of relevance according to individual operating circumstances. Further, the questions should be considered against a background of whether you, or the business, do them 'adequately'.

Remember, it is not necessary to address every risk, but all reasonable risks that are appropriate to your circumstance.

Key points

- All personnel in your business who have an influence on driver fatigue levels should read these guidelines to gain an understanding of fatigue and risk-management theory.
- Using the questions below as prompts, systematically analyse your operations through genuine consultation and communication and begin to work out where the fatigue risks are, how serious they are, and what's the best way to address them. You should accurately record your discussions and steps that you take.
- Begin a process of monitoring and reviewing what you do.

Examples of fatigue risk factors	Why is this factor a fatigue risk?	Questions that should be considered by parties to assist when determining what specific controls are appropriate and when/how should they be implemented
Poor understanding, communication, commitment, consultation and review	• Can lead to ineffective fatigue-management practices and systems	**Heavy vehicle operators, including owner/drivers – does my business:** • understand each party's legal obligations in relation to fatigue management? (see Part One) • understand the causes of fatigue and how/where my work systems may create fatigue risks? (see Part Two) • understand how the risk-management process can be used as a means to implement effective fatigue management? (see Part Three) • adequately communicate with all relevant parties in the supply chain including drivers of the importance of effective fatigue management and engender commitment from all parties to improved day-to-day practices? • keep abreast of ongoing fatigue and risk-management information and developments from sources such as industry associations, transport or OH&S agencies? • demonstrate a commitment to effective fatigue management that is supported by management and employees/contractors and backed up by appropriate training resources? • review written and/or verbal instructions from customers to ensure that they are not leading to breaches of fatigue regulations and/or creating unnecessary risks? • assess which customers are likely to promote effective fatigue management and give preference to them? • continually review its risk-management and fatigue management processes and plans to assess their effectiveness via mechanisms such as accreditation and auditing processes? **Consignors, consignees or loaders – does my business:** • understand each party's legal obligations to manage driver fatigue? (see Part One) • understand the causes of fatigue and how/where my work systems may create fatigue risks? (see Part Two) • understand how the risk-management process can be used as a means to implement effective fatigue management? (see Part Three) • keep abreast of ongoing fatigue and risk-management information and developments from sources such as industry associations, transport or OH&S agencies? • adequately consult with all supply chain parties to plan and implement effective fatigue-management practices? • provide adequate training to all relevant staff? • continually review the effectiveness of its risk-management and fatigue-management plans and processes? **Employee drivers – do I:** • understand my legal obligations in relation to fatigue management? (see Part One) • understand the factors that lead to fatigue? (see Part Two) • assist my employer to implement effective fatigue risk-management systems? (see Part Three) • comply with the company's other related policies such as drugs, alcohol and medications? • inform my employer or supervisor when I believe I may be affected by fatigue?

Examples of Fatigue Risk Factors	Why is this factor a fatigue risk?	Questions that should be considered by parties to assist when determining what specific controls are appropriate and when/how should they be implemented
Long work shifts	• Long shifts without adequate breaks can contribute to fatigue – especially if there is a high amount of physical and/or mental exhaustion • Fatigue-related incidents are more likely in circadian low points (e.g. midnight to 6 am) • The effects of fatigue are cumulative so fatigue is more likely to occur towards the end of a shift and the end of the working week • Sleep at night is the most effective way of fixing accumulated sleep debt.	**Heavy vehicle operators – does my business:** • provide adequate information to drivers on short-term measures such as naps and breaks and do all parties understand the limitations of these temporary measures? **Employee drivers, or owner/drivers – do I:** • take the necessary breaks as legally obliged and seek to minimise fatigue by sleeping, where possible, in dark, quiet and comfortable places and preferably at night? • plan shifts and lifestyle generally so that the highest quality breaks and rest periods can be utilised? • utilise check lists such as those in Part Two to keep alert and detect fatigue warning signs? • inform relatives and friends of work schedules and sleep times to avoid unwanted disruptions? • minimise disruptions? (e.g. use an answering machine or turn phone down?) • develop ways of 'unwinding' after a long shift? (e.g. take a walk or watch some television?) • use breaks to stretch and exercise? **Consignors, consignees or loaders – does my business:** • adequately assist drivers in the latter stages of their shift by, where possible, introducing controls and procedures? • consider making allowances in the latter half of shifts or working periods to address the possible heightened fatigue levels of drivers?
Cumulation of a high number of previous hours and days worked without adequate sleep	• 'Sleep debt' accumulated over a period of time can contribute to fatigue • Broken sleep and day sleep may not be as restorative as night time sleep and must be considered.	**Heavy vehicle operators – does my business:** • have adequate flexibility in its work systems and processes to respond to busy times and/or unexpected delays? • consider how work systems such as work flexibility could be implemented? • consider how controls and procedures to assist staff performing hazardous work during high fatigue periods could be implemented? • monitor records such as logbooks, driver diaries, pay slips and output from electronic monitoring devices and other records to confirm that drivers are compliant with regulatory limits? • maintain an awareness of drivers having other employment responsibilities such as a second job? **Employee drivers, or owner/drivers – do I:** • take active steps to assess my fatigue levels and respond accordingly? **Consignors, consignees or loaders – does my business:** • check its work systems to ensure that drivers are compliant with regulatory limits?

Examples of Fatigue Risk Factors	Why is this factor a fatigue risk?	Questions that should be considered by parties to assist when determining what specific controls are appropriate and when/how should they be implemented
High level of exertion	• Work that is mentally and/or physically demanding can contribute to fatigue • Fatigue can be exacerbated if work completed at circadian low points (e.g. midnight to 6 am).	**Heavy vehicle operators – does my business:** • design and redesign work practices so that levels of physical and/or mental exhaustion are taken into account? **Employee drivers, or owner/drivers – do I:** • understand that high levels of exertion can exacerbate fatigue and make the necessary allowances? • ensure I use my rest times to recuperate as much as possible? **Consignors, consignees or loaders – does my business:** • check its work systems to ensure that they minimise the amount of highly mental and/or physical work that is undertaken by drivers? • communicate to drivers and operators before the task is undertaken of the likely demands involved?
Time of the day when the work is being performed	• Work performed at circadian low points (e.g. midnight to 6 am) can result in fatigue.	**Heavy vehicle operators – does my business:** • design schedules to be as flexible as possible? • provide adequate opportunities to recover from night-time work? **Employee drivers, or owner/drivers – do I:** • understand that working at different times of the day and night can exacerbate fatigue levels? • take adequate steps to minimise these risks? **Consignors, consignees or loaders – does my business:** • provide systems that promote effective and efficient queuing and loading/unloading of heavy vehicles? • provide rest facilities for drivers?
Delays loading or unloading at consignors and consignees	• Delays can extend the length of shifts and can be physically and/or mentally exhausting which can contribute to sleep debt and fatigue.	**Heavy vehicle operators – does my business:** • promote flexibility in its work systems to be able to reschedule pick up and delivery times where possible? • promote flexibility in its work systems to be able to replace a fatigued driver prior to driving hours being in excess of regulations, where possible? • promote a work system to allow drivers to report delays and incidents that in turn allows the investigation of fatigue problems? • consider how contractual obligations with consignors and consignees and other influencing parties could be utilised to encourage effective and efficient loading and unloading practices? **Employee drivers, or owner/drivers – do I:** • have the ability to amend schedules? • communicate with 'base' to amend schedules? • balance longer working time with longer breaks or a longer sleep in the subsequent period? • record delays and all fatigue-related problems so they can be addressed?

Examples of Fatigue Risk Factors	Why is this factor a fatigue risk?	Questions that should be considered by parties to assist when determining what specific controls are appropriate and when/how should they be implemented
		Consignors, consignees or loaders – does my business: • promote flexibility in its work systems to be able to reschedule pick up and delivery times and/or have greater loading and unloading capacity during busy times or following general delays? • promote a work system to allow all in the supply chain to report incidents? • promote a work system to allow the reporting and investigation of fatigue problems? • promote a work system to allow the implementation, monitoring and review of effective fatigue-management practices and policies?
Poor roster design and scheduling	• Rosters and schedules that do not allow for rest and recovery between and during shifts can contribute to fatigue • Swapping from day to night shifts and vice versa without adequate transition assistance can contribute to fatigue • Drivers may feel fatigued during the latter half of their working week (or working period) • Drivers may feel fatigued at the start of a working week (or working period).	**Heavy vehicle operators – does my business:** • assess fitness for duty of drivers? • take into account the effect of likely non-driving activities (e.g. bus driver attending to passenger needs) and delays when calculating maximum work hours permitted? • take into account drivers' commuting hours as a factor that may contribute to fatigue levels? • plan trips to allow as much sleep at night when operational requirements permit this? • consult with individual drivers where work will require regular and significant changes to work periods? • build in time to assist drivers adjust when returning from a break or from day to night (or night to day) driving where possible? • schedule trips to allow for appropriate rest breaks? • schedule trips allowing also for the impact of likely delays? • have contingencies in place? **Employee drivers, or owner/drivers – do I:** • report any fatigue problems within or between schedules so they can be fixed? • maintain logbooks, driver diaries or other paperwork required for fatigue purposes? • provide input to improve schedules and rosters? • advise when not fit for work? • advise any conditions that may affect my ability to perform tasks legally and safely? **Consignors, consignees or loaders – does my business:** • check contracts to ensure no undue pressure? • seek other forms of assurance that systems are not placing undue demands on parties? • audit its processes regularly to ensure safe work systems? • manage the flow-on effects to operators and drivers if changes to work systems occur? • when awarding work, consider factors other than financial?

Examples of Fatigue Risk Factors	Why is this factor a fatigue risk?	Questions that should be considered by parties to assist when determining what specific controls are appropriate and when/how should they be implemented
Poor work environment	• Excessive vibration, noise, climate/ temperature, etc. can contribute to mental and/or physical exertion that can contribute to fatigue • Work premises – poor layout and condition • Poor ergonomics and poor facilities can contribute to mental and/or physical exertion that can contribute to fatigue.	**Heavy vehicle operators – does my business:** • provide amenities to assist drivers take high-quality rest (possibly including lunch rooms, sleeping accommodation, sleeper cabs, etc.) that are appropriate to the operation? • monitor the quality of amenities? • maintain vehicles to meet roadworthiness standards and fatigue-related standards (e.g. ADR 42 on sleeper berths and 42.18 on ventilation)? • consider cabin comfort, including vibration characteristics, particularly of vehicles used in long-haul operations? • make scheduling allowances for adverse weather and road conditions (e.g. heat, snow, roads under repair, etc.)? **Employee driver, or owner/driver – do I:** • advise managers where the work premises may be poor in terms of encouraging high-quality rest? • keep the cab well-ventilated and at a comfortable temperature? • adhere to equipment maintenance schedules? • report equipment faults? • undertake timely and accurate pre-trip, during trip and post-trip inspections? **Consignor, consignee or loader – does my business:** • provide amenities to assist drivers take high-quality rest? • monitor the quality of amenities? • design loading/unloading and queuing areas and monitor practices to minimise working hours as much as reasonably practicable? • accommodation for full vehicle combinations i.e. B-double, B-triple, etc.? • provide a working environment that will not exacerbate a driver's fatigue levels? **Other parties/governments – do we:** • provide appropriately maintained roads, rest areas and traffic systems? • provide amenities to assist drivers take appropriate rest? • monitor the quality of amenities?

Examples of Fatigue Risk Factors	Why is this factor a fatigue risk?	Questions that should be considered by parties to assist when determining what specific controls are appropriate and when/how should they be implemented
Inadequate/Poor human factors	• Capability, skill, experience, age, physical fitness and health status all influence a driver's ability to mange his or her own fatigue	**Heavy vehicle operators – does my business:** • encourage regular medical assessments? • assist drivers undertake their medical assessments when required and are the driver's medical certificates current? • assess the ability of drivers to safely perform the tasks requested of them? **Employee driver, or owner/driver – do I:** • disclose any matter that may affect my fitness for duty? • take active steps to ensure that I am fit for duty? (see Part One) **Consignor, consignee or loader – does my business:** • observe the wellbeing of drivers and actively intervene if behaviour and appearance of the driver is not normal?

Common terms used in these Guidelines

Minimum continuous break in a 24 hour period for a solo driver	*7 hours in the Standard Hours option, 7 hour continuous break or 8 hours in 2 parts (is limited) in the Basic Fatigue Management option, 6 hour continuous break or 8 hours in 2 parts (subject to conditions).*
Night sleep	*At least seven hours continuous rest between 10pm and 8am.*
Shift	*The period of driving and work time between two periods of continuous sleep opportunity. A shift is deemed to have started at the end of the last continuous sleep opportunity and finishes at the beginning of the next continuous sleep opportunity.*
Short rest break	*Any rest break that is 15 minutes or more in duration, but less than seven hours. Means time at work provided for rest and meals after a continuous period of active work and does not include non-driving work time or time not working. Short rest is recorded in minimum 15 minute periods (i.e. any non-work less than 15 minutes does not count towards rest, any period of non-work of 15 minutes but less than 30 minutes is counted as 15 minutes rest etc.).*
Night work	*Any driving or work undertaken between midnight and 6 am.*
Hazard	*A source or situation with a potential to cause injury, illness or disease.*
Hazard identification	*Process of recognising that a hazard exists.*
Risk	*The likelihood of an injury, illness or disease occurring and the severity of any injury, illness or disease that results from exposure to a hazard.*
Risk assessment	*Process of working out how big a risk is present and what risk factors are causing the problem.*
Risk control	*The process of applying appropriate prevention measures to eliminate or minimise any risks.*
Circadian rhythm	*Circadian rhythms or the body clock regulates physiological and behavioural functions on a 24 hour basis. Sleep and wakefulness are programmed and sleepiness is greatest between midnight to 6 a.m. and to a lesser extent between 2-4 p.m.*
ADR	*Australian Design Rules.*
Fatigue	*Fatigue can be described as a progressive loss of alertness that ultimately ends in sleep*
Sleep debt	*Failure to have a normal sleep results in sleep debt that accumulates and can only be paid back by undisturbed, restorative sleep.*
Schedule	*The pattern of driving and work covering one or more trips. For operators with rostered drivers a schedule might operate over a week or a month. For less regular or predictable situations a schedule may refer to a single trip.*

NTC AUSTRALIA
National Transport Commission

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Attachment 2

National Heavy Vehicle Regulator (NHVR) - Driver Fatigue Management Plan

Form 1 – Safe Driving Plan

Use this document as a template for your fatigue risk management system.

This form can be replaced with one from your current system if it is equivalent in the key areas and meets the standards and outcomes.

The key areas in this model document are:

- Section 4 Questions 1-4

Instructions

To be completed by the Scheduler at least once a day (prior to driver's being allocated a task) with reference to Form 2.

1. Retrieve the relevant Form 2 for the driver from [file location 3].
2. Complete all sections of the form in blue/black ink.
3. Advise the customer of the proposed plan.
4. Advise the driver of the proposed plan.
5. Have the Driver sign the form.
6. Sign the form.
7. Copy the form and hand it to the Driver.
8. Place the completed form in [file location 2]

Form 1 – Safe Driving Plan (complete as per instructions overleaf)

Section 1 – Company and Supply Chain Details

Name	Address	Role
[Transport Company Name]		**Transport Operator**
		Freight Customer

Section 2 – Driver/Vehicle Details

Date:		Driver Name:	
Person completing form:			
Rego. Number/s:			
Tick vehicle type:	Truck / Trailer: ☐	B-Double: ☐	Road Train: ☐
Tick Driving Hours Scheme:	STDH: ☐	BFM: ☐	AFM: ☐

Section 3 – Proposed Trip Plan

From	To	Estimated Start Time	Working Time	Rest Time	Total Time

NOTE: The driver is to use discretion and rest where or when required provided that regulated driving hours are not exceeded.

Section 4 – Fitness for Duty / Fatigue Checklist (Completed by Scheduler)

1. Has the driver had a reset rest break in the preceding 14 days		Yes / No
2. If the driver has worked in the preceding 24 hours: • Does the shift keep a similar work pattern? (night / day work) • Has a minimum of 7 hours continuous rest?		 Yes / No Yes / No
3. Does the driver have sufficient work hours remaining to comply with legal limits?		Yes / No
4. Does the plan provide opportunity for the minimum required rest breaks?		Yes / No
Changes to driving plan made by:	Scheduler (Initials)	
	Customer (Initials)	
	Driver (Initials)	
Driver notified of relevant scheduled changes if any?	Yes / No	Date: _____ Time: _____

Section 5 – General Risk Assessment

Are there any other risks associated with this trip?

1. Vehicle issues:	Yes / No
2. Speed issues or restrictions:	Yes / No
3. Communication or remoteness:	Yes / No
4. Fauna or vegetation:	Yes / No
5. Weather or visibility:	Yes / No
6. Other (Specify):	Yes / No

Section 6 – Special Instructions/Contingencies

DRIVERS MUST NOT DRIVE WHILST IMPAIRED BY FATIGUE

Drivers may modify this **Safe Driving Plan** providing work hour / rest requirements are met and notification of any changes is provided to the Scheduler as soon as possible by telephone.

Specific fatigue management instructions for this trip are:

Section 7 - Declarations

Driver acknowledgement

I understand that I am working under [Transport Company Name]'s AFM accreditation and have had the necessary training to do so.

I agree with the work and rest times allowed for this trip and agree to advise the Scheduler of any changes to this trip plan.

I have inspected the named vehicle/s and have rectified any defects likely to affect its safe operation.

Driver's Signature: _____

Scheduler acknowledgement

I certify that this plan has been discussed with the driver and customer.

Scheduler's Signature: _____

Appendix E

Roads and Maritime Services Letter

Our ref: STH13/00123/14
Contact: Hayley Sarvanandan 4221 2423
Your ref: Biala Wind Farm TMP

23 October 2019

Tim Mead
Beijing Jingneng Clean Energy (Australia)
BY EMAIL: tim.mead@bjceaustralia.com
CC: information@planning.nsw.gov.au
council@upperlachlan.nsw.gov.au

BIALA WIND FARM TRAFFIC MANAGEMENT PLAN – OVERSIZED AND OVER MASS (OSOM) TRANSPORTATION

Dear Tim,

Roads and Maritime Services (RMS) refers to your correspondence dated 1st October 2019 regarding an oversize over mass vehicle specific traffic management plan (TMP) for the subject development application.

RMS has completed an assessment of the development, based on the information provided and focussing on the impact to the state road network. For this development, the key state road is Hume Highway.

RMS notes the following:

- Traffic will be generated by the development from transportation of 31 wind turbines and associated power control systems which will be transported from Port Kembla to Biala Wind Farm. Delivery routes and load details are provided in Section 2 of the TMP dated 19th December 2018 (Attachment 1).
- Appendix 1 of the TMP (Attachment 1) provides a route survey report which identifies the required road works along the proposed routes to allow OSOM vehicles to transport wind turbine components.

RMS has reviewed the oversize over mass vehicle specific TMP and has no further comment to provide, except to reiterate the following requirements:

- RMS recognises that road works are required to allow OSOM vehicles to transport wind turbine components along the proposed routes. The RMS Special Permits Unit in Glen Innes will need to be consulted for further assessment and to obtain a permit prior to transporting any oversized or over mass loads. The contact number is 1300 656 371.

- As part of the requirements for overized or over mass roads, the developer must apply for, and obtain a Road Occupancy Licence (ROL) from the RMS Traffic Operations Unit (TOU) prior to commencing roadworks on a State Road or any other works that impact a travel lane of a State Road or impact the operation of traffic signals on any road. The developer must submit the ROL application 10 business days prior to commencing work.

If you have any questions please contact Hayley Sarvanandan on 4221 2423.

Please ensure that any further email correspondence is sent to development.southern@rms.nsw.gov.au.

Yours faithfully

Chris Millet
Manager Land Use
Southern Region

Appendix F

Council Correspondence

Raymond Zhang

From: Tim Mead <tim.mead@bjceaustralia.com>
Sent: Friday, 22 November 2019 9:37 AM
To: Chai Xiong (Charlie)
Cc: Craig Smart; Atheer AL-Saoudi; John Levien
Subject: RE: Biala Wind Farm TMP; Stage 2 turbine delivery

Hi Charlie,

Please find responses to your questions below. Can you please confirm Council have no further comments in relation to this TMP by today? It will then be submitted to DPIE for approval.

On Page 2 of Table 1.1, when are the road upgrades in Appendix 7 to be completed (Consent Condition 25)
Section I and II under Appendix 7 (Kialla and Range Rd) are complete. Section III (intersections) is address below.
On Page 6 of Section 2.3, the OSOM to be at Goulburn by 7:30am then still has about 30 minutes to get to Crookwell. By 8am, school buses and peak traffic are already on the roads in Crookwell vicinity, has these been addressed?
Further liaison to occur between the transport contractor, Goldwind (turbine supplier) and NSW Police to confirm departure time from Port Kembla. Where possible, earlier departure may be necessary to address the concern raised by Council.
On Pages 17 & 18, when will the works on these listed locations be starting and completing? Are the specifications for these works available for Council to assess?
Divalls acting on behalf of Goldwind has already submitted S138 application to Council for proposed road works on below intersections 1 and 2:

- Goulburn Rd/Grange Rd intersection, and;
- Grange Rd/Cullen St intersection.

Application also includes:

- Detailed design - including pavement design, plan views, swept paths, long sections and cross sections (intersections 1 & 2);
- Site surveys (intersections 1 & 2);
- Traffic Control Plans (intersections 1 & 2);
- Draft REF (entire project);
- Traffic Management Plan (entire project), and;
- Environmental Management Plan (entire project).
- ROL and Geotech will be submitted as an addendum

We are planning to submit the application for remaining three intersections by next week which includes:

- Cullen St/Kialla Rd intersection;
- Kialla Rd/Range Rd intersection, and;
- Range Rd/Grabben Gullen Rd;

Upon approval we plan to start construction on 6 Dec 2019. The construction works is estimated to take 5 to 6 weeks total for all intersections.

On Page 60, the route study is only at a conceptual stage (guide only) so we do Council expect to see the final decision on the chosen route?
We confirm that the route presented in the RJA Route study is the final route to be utilised (as per the project Development Consent). We acknowledge that the route presented more than one potential entry point to site. The OSOM vehicles will only utilise the already established site access points which are both located along Grabben Gullen Rd. No additional road works/modifications are required to enter the site via these site entry locations.

As mentioned, only swept paths have been investigated on this route study, there are other variables (factors) such as pavement structure, bridges, culverts, etc that have not been assessed. When does Council expect to get these assessed?
The route up until Grange Rd is highway grade asphalt and will be adequate for all loads. The pavement from Grange Rd through to site is generally okay and Kialla/Range Rd has been upgraded with causeway replacement and pavement rehabilitation (Appendix 7 Sections I and II). OSOM vehicles will have similar axle weights on similar route that were utilised on previous projects in the surrounding area, such as Gullen Range Wind Farm and Crookwell 2 Wind Farm. Route assessment is the responsibility of the logistics company, and they will obtain all relevant permits under the Heavy Vehicle National Law (NSW). We do not consider a bridge assessment is required.

Lastly, when does Council expect to see the Traffic Control Plans (if any)? The whole event is to be police escorted for the safety of the travelling public.
TCPs are being submitted to support the s.138 applications for the 5 intersection modifications around Crookwell. Further TCPs will be provided by the OSOM transport logistics contractor, as necessary, prior to deliveries commencing. This is covered off in the overarching TMP.

Regards,
Tim

Beijing Jingneng Clean Energy (Australia)
Suite 3, Level 21, 1 York Street, Sydney NSW 2000 Australia
Mobile : 0429 290 673
Email: tim.mead@bjceaustralia.com
www.jncec.com

From: Tim Mead
Sent: Thursday, 21 November 2019 12:46 PM
To: Chai Xiong (Charlie) <CXiong@upperlachlan.nsw.gov.au>
Cc: Craig Smart <CSmart@upperlachlan.nsw.gov.au>; Atheer AL-Saoudi <AAL-Saoudi@upperlachlan.nsw.gov.au>; 'John Levien' <JLevien@upperlachlan.nsw.gov.au>
Subject: RE: Biala Wind Farm TMP; Stage 2 turbine delivery

Hi Charlie,

As requested, see attached approved BOP TMP for the project. I will follow up with answers to your questions below to close this out.

Regards,
Tim

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Email: tim.mead@bjceaustralia.com

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From: John Levien <JLevien@upperlachlan.nsw.gov.au>
Sent: Thursday, 21 November 2019 11:30 AM
To: Tim Mead <tim.mead@bjceaustralia.com>
Cc: Craig Smart <CSmart@upperlachlan.nsw.gov.au>; Atheer AL-Saoudi <AAL-Saoudi@upperlachlan.nsw.gov.au>; Chai Xiong (Charlie) <CXiong@upperlachlan.nsw.gov.au>
Subject: RE: Biala Wind Farm TMP; Stage 2 turbine delivery

Tim,

The TMP Document is GTA Consultants – Biala Wind farm Oversize and Over mass transportation – Reference: N142521 - dated: 19/12/18

An email for Charlie Williamson of Goldwind Australian to-day indicates the Traffic Management plan is approved by Council, as he has submit for Crown land temporary licence?

See question from Council's Road Safety, traffic and Asset Officer

On Page 2 of Table 1.1, when are the road upgrades in Appendix 7 to be completed (Consent Condition 25)

On Page 6 of Section 2.3, the OSOM to be at Goulburn by 7:30am then still has about 30 minutes to get to Crookwell. By 8am, school buses and peak traffic are already on the roads in Crookwell vicinity, has these been addressed?

On Pages 17 & 18, when will the works on these listed locations be starting and completing? Are the specifications for these works available for Council to assess?

On Page 60, the route study is only at a conceptual stage (guide only) so we do Council expect to see the final decision on the chosen route? As mentioned, only swept paths have been investigated on this route study, there are other variables (factors) such as pavement structure, bridges, culverts, etc that have not been assessed. When does Council expect to get these assessed?

Lastly, when does Council expect to see the Traffic Control Plans (if any)? The whole event is to be police escorted for the safety of the travelling public.

Regards

John Levien

Asset & Risk Coordinator
Works & Operations
Upper Lachlan Shire Council
M: PO Box 42, Gunning, NSW, 2581
P: (02) 4830 1014
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E: jlevien@upperlachlan.nsw.gov.au
www.upperlachlan.nsw.gov.au

You are requested to send your email correspondence to Council's email address council@upperlachlan.nsw.gov.au instead of individual Council staff. Community members are encouraged to use Council's email address for appropriate record keeping, and timely responses.

From: Tim Mead [mailto:tim.mead@bjceaustralia.com]
Sent: Wednesday, 20 November 2019 10:15 AM
To: John Levien <JLevien@upperlachlan.nsw.gov.au>
Subject: RE: Biala Wind Farm TMP; Stage 2 turbine delivery

Hi John,

That is correct, a short term licence application has been submitted to CL for that corner. Do you have any further comments on the TMP? I would like to submit to DPIE today, so please let me know if I should wait for any further comments from Council.

Thank you,
Tim

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From: John Levien <JLevien@upperlachlan.nsw.gov.au>
Sent: Wednesday, 20 November 2019 10:11 AM
To: Tim Mead <tim.mead@bjceaustralia.com>
Subject: RE: Biala Wind Farm TMP; Stage 2 turbine delivery

Tim,

We need to understand what arrangements will be in place for use of Crown Reserve at Goulburn Road and Granger road intersection at Crookwell

I have received and email for Goldwind, Medard Boutry that a short term licence will be lodged with Crown land.

Regards

John Levien

Asset & Risk Coordinator
Works & Operations
Upper Lachlan Shire Council

M: PO Box 42, Gunning, NSW, 2581
P: (02) 4830 1014
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E: jlevien@upperlachlan.nsw.gov.au
www.upperlachlan.nsw.gov.au

From: Tim Mead [mailto:tim.mead@bjceaustralia.com]
Sent: Friday, 15 November 2019 10:18 AM
To: John Levien <JLevien@upperlachlan.nsw.gov.au>
Cc: Rozali, Angela <Angela.Rozali@aecom.com>; Robbie Williamson <robbie.williamson@bjceaustralia.com>; Mursaleen Shah <MShah@upperlachlan.nsw.gov.au>; Upper Lachlan Shire Council <council@upperlachlan.nsw.gov.au>; Craig Smart <CSmart@upperlachlan.nsw.gov.au>
Subject: RE: Biala Wind Farm TMP; Stage 2 turbine delivery

Hi John,

Does Council have any comment on this turbine delivery TMP for Biala Wind Farm? RMS have responded with no further comments, and it is now urgent for us to send it into the Department for review and approval.

Regards,
Tim

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www.jncec.com

From: Tim Mead
Sent: Thursday, 24 October 2019 2:01 PM
To: John Levien <JLevien@upperlachlan.nsw.gov.au>
Cc: Rozali, Angela <Angela.Rozali@aecom.com>; Robbie Williamson <robbie.williamson@bjceaustralia.com>; Mursaleen Shah <MShah@upperlachlan.nsw.gov.au>; council@upperlachlan.nsw.gov.au; Craig Smart <CSmart@upperlachlan.nsw.gov.au>
Subject: RE: Biala Wind Farm TMP; Stage 2 turbine delivery

Hi John,

Can you please confirm whether Council has any comments on the attached TMP? To be clear, this TMP is for the turbine delivery to Biala WF. It is required under the WF development approval, which is separate from the TMP submitted by CPP under the transmission line DA.

Thanks,
Tim

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Suite 3, Level 21, 1 York Street, Sydney NSW 2000 Australia
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Email: tim.mead@bjceaustralia.com
www.jncec.com

From: Tim Mead
Sent: Tuesday, 1 October 2019 3:37 PM
To: Mursaleen Shah <MShah@upperlachlan.nsw.gov.au>; council@upperlachlan.nsw.gov.au; Craig Smart <CSmart@upperlachlan.nsw.gov.au>
Cc: Rozali, Angela <Angela.Rozali@aecom.com>; Robbie Williamson <robbie.williamson@bjceaustralia.com>
Subject: Biala Wind Farm TMP; Stage 2 turbine delivery

Hi Mursaleen, Craig,

Please find attached the Stage 2 Traffic Management Plan for wind turbine delivery, for Council's review. This TMP is intended to be an addendum to the already approved Stage 1 TMP (Balance of Plant). Can you please advise an estimated time for response on this review? I have also provided the plan to RMS for their review.

Please don't hesitate to contact me if you would like to discuss further.

Regards,
Tim

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