RYE PARK WIND FARM

Request for Additional Information

(Development Consent State Significant Development: 6693)

October 2020

Rye Park Renewable Energy Pty Ltd

Rye Park Wind Farm

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Purpose of Document

The purpose of this document is to provide a response to the Request for Additional Information from the Department of Planning Industry and Environment (the Department) dated 30th September 2020 in relation to the Rye Park Wind Farm Modification 1 (SSD-6693-Mod-1).

The Applicant was requested to submit additional information to address the following issues:

Traffic and Transport:

- *confirm the maximum blade length proposed;*
- *detail the number of heavy vehicles using each haulage route;*
- *document the consultation undertaken with relevant road authorities along the proposed*
- *haulage routes, and how matters raised during consultation have been addressed;*
- *consolidate a list of any intersection upgrades or intersection treatment types required and road infrastructure that would be impacted along each of the proposed haulage routes;*
- *detail the assumptions made for sourcing raw material and their transportation to site.*

Visual:

- *provide an assessment of the visual impacts associated with the realigned transmission line design; and*
- *clarify the status of neighbour agreements referred to in the Revised Visual Impact Assessment.*

Biodiversity:

- *provide further justification regarding the proposed locations of the permanent meteorological monitoring masts or consider relocating them to areas of lower quality vegetation; and*
- *provide further justification for the removal of Speckled Warbler and Brown Treecreeper from the calculation of ecosystem credit species calculation in the Biodiversity Assessment Method Calculator (BAMC) or revise to include them in BAMC.*

The following sections address each of the issues requiring additional information as requested by the Department. This response has been prepared with technical assistance from Green Bean Design in relation to visual issues and Umwelt in relation to biodiversity issues.

1.0 Traffic and Transport

1.1 Maximum blade length

The maximum blade length being considered is 83.5m.

1.2 Heavy Vehicles using each haulage route

Final haulage route will be selected with the preferred tenderer. The Applicant is currently in the tendering process with multiple turbine suppliers and construction contractors. The preferred suppliers for the engineering, procurement, construction and commissioning of the wind farm will be selected in the next few months and these preferred suppliers will work with the Applicant to further finalise the details of haulage route in accordance with the Development Consent including preparation of the Traffic Management Plan.

In the tables below the three turbine suppliers currently being considered are denoted as Supplier A, Supplier B and Supplier C. Note that Supplier C will transport the turbine components and the tower components via different routes (see Table 3 and Table 4 for further details).

Table 1, Table 2, Table 3 and Table 4 show various oversize overmass (OSOM) vehicles for transportation of the turbine components, their purpose and approximate trips per vehicle type.

Table 1: Supplier A – OSOM movements from Newcastle to Rye Park (all components)

Purpose/ Turbine Component	Anticipated Delivery Vehicle	Approximate Trips	Comments
Tool container delivery	L Low Loader	15	Various equipment for turbine install crew HV - nominal amount estimated
WTG container delivery	Flat bed	80	Nacelle sit packs
Tower container delivery	Flat bed	80	Anchor cages and tower site packs
Top section delivery	Low loader - Towers	80	5 section tower
Middle Section	Low loader - Towers	80	5 section tower
Middle Section	Low loader - Towers	80	5 section tower
Middle Section	Low loader - Towers	80	5 section tower
Bottom Section Delivery	Low loader - Towers	80	5 section tower
Blades delivery - single blade transport	Low loader - Blade	240	3 blade turbine - assume non reticulated blades OD
Nacelle and Transformer	Low loader - Nacelle	80	1 OD delivery per turbine
Drive Train	Low loader - Drive Train	80	1 OD delivery per turbine
Hubs + Spinner	L Low Loader	80	1 OD delivery per turbine
Power module	H Low Loader	80	1 OD delivery per turbine
Escort Vehicles	Light Cars	1,920	2 small vehicles per OD delivery assumed
	Total for Supplier A	**3,055**	

Table 2: Supplier B– OSOM movements from Port Kembla to Rye Park (all components)

Purpose /Turbine Component	Anticipated Delivery Vehicle	Approximate Trips	Comments
Tool container delivery	L Low Loader	15	Various equipment for turbine install crew HV - nominal amount estimated
WTG container delivery	Flat bed	80	Nacelle sit packs
Tower container delivery	Flat bed	80	Anchor cages and tower site packs
Top section delivery	Low loader - Towers	80	5 section tower
Middle Section	Low loader - Towers	80	5 section tower
Middle Section	Low loader - Towers	80	5 section tower
Middle Section	Low loader - Towers	80	5 section tower

Purpose /Turbine Component	Anticipated Delivery Vehicle	Approximate Trips	Comments
Bottom Section Delivery	Low loader - Towers	80	5 section tower
Blades delivery - single blade transport	Low loader - Blade	240	3 blade turbine - assume non reticulated blades OD
Nacelle and Transformer	Low loader - Nacelle	80	1 OD delivery per turbine
Drive Train	Low loader - Drive Train	80	1 OD delivery per turbine
Hubs + Spinner	L Low Loader	80	1 OD delivery per turbine
Power module	H Low Loader	80	1 OD delivery per turbine
Escort Vehicles	Light Cars	1,920	2 small vehicles per OD delivery assumed
	Total for Supplier B	**3,055**	

Table 3: Supplier C – OSOM movements from Newcastle to Rye Park via Dubbo (all components except bottom tower sections)

Purpose/ Turbine Component	Anticipated Delivery Vehicle	Approximate Trips	Comments
Tool container delivery	L Low Loader	15	Various equipment for turbine install crew HV - nominal amount estimated
WTG container delivery	Flat bed	80	Nacelle sit packs
Tower container delivery	Flat bed	80	Anchor cages and tower site packs
Top section delivery	Low loader - Towers	80	5 section tower
Middle Section	Low loader - Towers	80	5 section tower
Middle Section	Low loader - Towers	80	5 section tower
Middle Section	Low loader - Towers	80	5 section tower
Blades delivery - single blade transport	Low loader - Blade	240	3 blade turbine - assume non reticulated blades OD
Nacelle and Transformer	Low loader - Nacelle	80	1 OD delivery per turbine
Drive Train	Low loader - Drive Train	80	1 OD delivery per turbine
Hubs + Spinner	L Low Loader	80	1 OD delivery per turbine
Power module	H Low Loader	80	1 OD delivery per turbine
Escort Vehicles	Light Cars	1,760	2 small vehicles per OD delivery assumed
	Sub-total for Supplier C	2,815	

Table 4: Supplier C – OSOM movements from Newcastle to Rye Park via Dubbo (bottom tower sections only)

Purpose/ Turbine Component	Anticipated Delivery Vehicle	Approximate Trips	Comments
Bottom Section Delivery	Low loader - Towers	80	5 section tower
Escort Vehicles	Light Cars	160	2 small vehicles per OD delivery assumed
	Sub-total for Supplier C	240	
	Total for Supplier C	3,055	

1.3 Consultation with relevant road authorities along the proposed haulage routes

The Applicant commissioned GTA Consulting to prepare Stakeholder Approvals Plan for the proposed transport routes for the Project. A copy of the Stakeholder Approvals Plan is contained in Appendix A.

The report provides an overview of the process of stakeholder approvals and identifies:

- the route, by section and accountable authority
- the class of vehicles that applications need to be made for
- the permit application process and recommendations associated with the approvals process with the relevant road authority
- Local roads that will be used, local council identification and the specific application process
- Arterial roads that will be used within Metropolitan Sydney and the specific application process associated with OSOM movements

The Stakeholder Approvals Plan also details the consultation undertaken with relevant road authorities along the proposed haulage routes.

The Applicant is committed to following the recommendations of the Stakeholder Approvals Plan and will work with the preferred tenderer to ensure the recommendations are implemented.

1.4 Intersection upgrades or treatment types and road infrastructure impacted along each of the proposed haulage routes

The following tables provide a consolidated list of the intersection upgrades and/ or treatment types and road infrastructure impacted along each of the haulage routes. The lists have extracted from the full route assessments undertaken by Rex J Andrews and Ares Transport Group (contained in Appendices B-D). The Rex J Andrews for Newcastle to Rye Park report and the Ares Transport Group Port Kembla to Rye Park report are also contained in Appendix G7 Traffic Impact Assessment of the Modification Application. A peer review of the three transport routes was undertaken by GTA Consulting and was provided in Appendix D of the Response to Submissions Report (Transport Route Assessment Peer Review).

Newcastle to Rye Park

Table 5, Table 6 and Table 7 provide a consolidated list of the intersection upgrades and treatment types for the route from Newcastle to Rye Park. Appendix B contains the full route assessment report undertaken by Rex J Andrews.

KEY	
MODIFICATIONS REQUIRED	
PINCH POINT	
EMERGENCY PARKING	

Table 5: Stage 1 Newcastle to Rye Park township

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
0.0	Mayfield	Mayfield #4 berth onto Selwyn Street GPS link: https://goo.gl/maps/afLwPYKuNdm	70.0 metres clearance	Moderate right hand turn	Some hardstand will need to be added on the left entrance and exit of the corner. The fence on both sides of the road and the gate will need to be relocated.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
0.4	Mayfield	Selwyn Street rail crossing GPS link: https://goo.gl/maps/AmohE54hKSz	9.0 Metres wide	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
1.3	Mayfield	Selwyn Street onto Industrial Drive via George Street GPS link: https://goo.gl/maps/gXeHvBtCp4D2	70.0 metres clearance	Right hand turn	Truck will need to travel over the hardstand area than return to the correct side of Industrial Drive. The trailer will need to cross over to the incorrect side before travelling over the centre median and returning to the correct side of Industrial Drive. The traffic signal in the centre of the intersection will need to be relocated. A sign will also need to be relocated on the inside of the corner and a pole removed on the outside of the corner. A hardstand area will need to be constructed on the south side of the intersection.
5.5	Mayfield West	Industrial Drive onto Maitland Road GPS link: https://goo.gl/maps/Kn49dhWG2qG2	70.0 metres clearance	Right hand turn	The blades will need to cross to the incorrect side metres prior to the intersection, then return to the correct side 120 metres past the intersection. The centre median strip will need to be lowered, or the trucks are to cross to the incorrect side of Industrial drive further to the east of the intersection.
17.4	Tarro	New England Highway onto John Renshaw Drive GPS link: https://goo.gl/maps/SRDr5JigkBp	100.0 metres clearance	Left hand merge	No problems with this section of road.
18.5	Beresfield	John Renshaw Drive onto the M1 GPS link: https://goo.gl/maps/A34ihxCjM5wfRDdq6	100.0 metres clearance	Left hand bend	No problems with this section of road.
113.0	Mt White	M1 Motorway under Mt White overpass GPS link: https://goo.gl/maps/K3fPPe4fNx63xB3j7	Left Lane: 5.2 mtrs Centre Lane: 5.3 mtrs Right Lane: 5.4 mtrs	Travel directly ahead	Loads that exceed 5.3 metres high are not to travel under this structure. Loads over 5.2 metres high are to travel under the bridge in the far-right lane, and at a speed of no more than 5 km's per hour. Spotter to guide load through this section of road.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
122.0	Hawkesbury River	M1 Motorway GPS link: https://goo.gl/maps/yDzjirEKLAbREE8B6	100.0 long x 6.0 wide	Merge to left	Large parking area
146.0	Wahroonga	M1 onto Pennant Hills Rd GPS link: https://goo.gl/maps/bskC8kD4CdW9xmwYA	75.0 metres clearance	Left hand turn	It is recommended that the centre median strip be modified to allow a suitable clearance for the truck to travel over. Blade loads are to turn from the correct side to the incorrect side of the road. The prime mover will need to turn from the far- right lane and cross onto the incorrect side of Pennant Hills Road, before returning to the correct side once the trailer has cleared the corner.
147.0	Normanhurst	Pennant Hills Road under Pedestrian overpass GPS link: https://goo.gl/maps/nYbjkf5AJ9D2xvUt7	Left Lane: 5.15 mtrs Centre Lane: 5.2 mtrs Right Lane: 5.3 mtrs	Travel directly ahead	Loads that exceed 5.3 metres high are not to travel under this structure. Loads over 5.2 metres high are to travel under the bridge in the far-right lane, and at a speed of no more than 5 km's per hour. Spotter to guide load through this section of road.
151.0	Beecroft	Pennant Hills Road under Pedestrian overpass GPS link: https://goo.gl/maps/sjnLQqYRudUSKqTQ8	Left Lane: 5.3 mtrs Centre Lane: 5.4 mtrs Right Lane: 5.5 mtrs	Travel directly ahead	Loads that exceed 5.3 metres high are not to travel under this structure. Loads over 5.2 metres high are to travel under the bridge in the centre lane, and at a speed of no more than 5 km's per hour. Spotter to guide load through this section of road.
154.0	West Pennant Hills	Pennant Hills Rd onto M2 Motorway GPS link: https://goo.gl/maps/cCsJwSt1NsRi5cSs6	75.0 metres clearance	Right hand turn	A traffic signal will need to be relocated, and a section of fence removed on the inside of the corner. A barrier will also need to be relocated on the outside of the corner. Trucks are to turn from the correct side to the correct side of the road. The prime mover will need to turn from the far left lane on Pennant Hills Road and enter the on ramp as wide as possible. Spotter to guide the load through the corner.
163.0	Winston Hills	M2 Motorway onto M7 Motorway GPS link: https://goo.gl/maps/PC96cBq2xqtW85vG7	75.0 metres clearance	Travel directly ahead	No problems with this section of road.
167.0	Kings Park	M7 Motorway GPS link: https://goo.gl/maps/T8WcbR9T84Zs7WpF7	100.0 long x 6.0 wide	Merge to left	Large parking area

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
201.0	Prestons	M7 Motorway onto M5 Motorway GPS link: https://goo.gl/maps/FA2mF7PxZkxrRDTR9	75.0 metres clearance	Travel directly ahead	No problems with this section of road.
229.0	Menangle	Hume Highway https://goo.gl/maps/KPMdLS1XuRWHrcyb6	200.0 long x 8.0 wide	Merge to left	Large parking area for towers and motors, no blades to enter this parking bay.
238.0	Wilton	Hume Highway under Farm access overpass GPS link: https://goo.gl/maps/2ZsVqYJ9j9gPTGqa9	Left Lane: 5.5 mtrs Centre Lane: 5.4 mtrs Right Lane: 5.3 mtrs	Travel directly ahead	Loads that exceed 5.3 metres high are not to travel under this structure. Loads over 5.2 metres high are to travel under the bridge in the left lane, and at a speed of no more than 5 km's per hour. Spotter to guide load through this section of road.
303.0	Sutton Forest	Hume Highway https://goo.gl/maps/uT1ubtSuawS2	150.0 long x 10.0 wide	Merge to left	Large parking area
352.0	Goulburn	Hume Highway https://goo.gl/maps/7HywRcjZiJy	180.0 long x 15.0 wide	Merge to left	Large parking area
375.0	Breadalbane	Hume Highway https://goo.gl/maps/PmpDm5ymjjnK7ciW8	140.0 long x 12.0 wide	Merge to left	Large parking area
388.0	Cullerin ridge	Hume Highway https://goo.gl/maps/3r7x8uzs9Fy7pVmp8	100.0 long x 10.0 wide	Merge to left	Large parking area
409.0	Oolong	Hume Highway https://goo.gl/maps/EVyT3US6dgcapAWWA	130.0 long x 15.0 wide	Merge to left	Large parking area
444.0	Bowning	Hume Highway onto Lachlan Valley Way GPS link: https://goo.gl/maps/j1Nvy5sXDonei1K99	75.0 metres clearance	Right hand turn	Some signs in the centre median strip will need to be relocated. Truck to turn from the far left lane and enter the corner as wide as possible.
486.0	Boorowa	Lachlan Valley Way onto Trucking Yard Road GPS link: https://goo.gl/maps/qCR2CX4EADMGK3WR8	75.0 metres clearance	Right hand turn	Some signs in the inside of the corner will need to be relocated.
487.0	Boorowa	Trucking Yard Road GPS link: https://goo.gl/maps/HTJCwCnUerjtgc5z9	50.0 metres clearance	Right hand bend	The causeway will need to be widened, and hardstand added to the inside of the corner.
487.2	Boorowa	Trucking Yard Road onto Dillon Street GPS link: https://goo.gl/maps/sQFVtnE3CPvhVibS8	90.0 metres clearance	Travel directly ahead.	No Problems with this section of road.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
488.0	Boorowa	Dillon Street onto Long Street GPS link: https://goo.gl/maps/mnV8spf8JGG6LsT99	50.0 metres clearance	Left hand turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the inside of the corner, and a fence relocated within the landowner's boundaries. Additionally, some vegetation needs to be removed.
489.5	Boorowa	Long Street onto Rye Park Road GPS link: https://goo.gl/maps/Ry5s7svgx1BDzRAMA	50.0 metres clearance	Right hand turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the inside of the corner, and a fence relocated within the landowner's boundaries. Additionally, some vegetation needs to be removed.
509.0	Boorowa to Rye Park township	Rye Park Road GPS link: https://goo.gl/maps/LGgWeQKDCERMsHQy7	90.0 metres clearance	Travel directly ahead	No problems with this section of road.

Pages 26 to 40 of Appendix B provide detailed comments and photos of each of the intersections that require modifications.

Table 6 Stage 2 Route survey (Rye Park Township to Rye Park North)

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
0.0	Rye park	Rye Park Road onto Grassy Creek Road GPS link: https://goo.gl/maps/LGgWeQKDCERMsHQy7	Length: 30 Metres	Left hand turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the landowner's property and some trees and fence will need to be removed.
0.0 to 6.6	Rye Park	Grassy Creek Road GPS link: https://goo.gl/maps/NC1AQuTTZPJHDDfk9	Width: 4.5 metres	Travel directly ahead	Grassy Creek road is generally 4.5 metres of width with no shoulder. The pavement is in fair condition but may show wear with the volume of heavy traffic. Some trees will need to be trimmed and removed on sections of this road. The floodway has an adequate swept path.
5.4	Rye park	Grassy Creek Road into site entrance # 2 https://goo.gl/maps/5LwRX2EKMkNAFYsT8		Left turn	Site entrance to be made suitable for the swept path of the largest loads.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
6.6	Rye park	Grassy Creek Road into site entrance # 1 https://goo.gl/maps/B2bjRMNjVvvbbfZt6		Right turn	Site entrance to be made suitable for the swept path of the largest loads.

Pages 43 to 48 of Appendix B provide detailed comments and photos of each of the intersections that require modifications.

Table 7 Stage 3 Route survey (Rye Park Township to Rye Park South)

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
0.0	Rye park	Rye Park Road onto Yass Street Road GPS link: https://goo.gl/maps/LGqWeQKDCERMsHQy7	Length: 30 Metres	Right turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the landowner's property and some trees and fence will need to be removed.
0.0 to 26.4	Rye Park	Yass street through to Site entrance #13 https://goo.gl/maps/DV4fputJ45k6HGvD7	4.5 Metres width clearance	Travel directly ahead	This section of road will need to be checked for swept path and vertical curve of the largest loads. Some sections of this road will require upgrades. Sections of this road have trees that would need to be trimmed/removed.
1.0	Rye Park	Yass Street onto Gunning Road https://goo.gl/maps/LLydmFC4TMxwjSzH7	5.5 Metres width clearance	Travel directly ahead	No problem with this section of road.
2.0	Rye Park	Gunning Road onto Dalton Road https://goo.gl/maps/zC4FNES8z1B1iJYk7	5.5 Metres width clearance	Travel directly ahead	No problems with this section of road.
12.0	Rye Park	Dalton Road onto Flakney Creek Road. (Site entrance #4) GPS link: https://goo.gl/maps/SWaaW7LWhcnekCJc7	30.0 metres clearance	Left turn	This corner and through to site will need to be made suitable for the swept path of the largest loads.
16.7	Rye Park	Dalton Road onto Rye Park Road https://goo.gl/maps/ah3wGy1QP5BrZzoU6	5.5 Metres width clearance	Travel directly ahead	No problems with this section of road.
24.7	Blakney Creek	Rye Park Road intersection of Blakney Creek South Road GPS link: https://goo.gl/maps/CGWNqgq3i9ANQbMx8	30.0 metres clearance	Left turn	

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
26.4	Blakney Creek	Rye Park windfarm (Site entrance # 13) onto Rye Park Road GPS link: https://goo.gl/maps/saww6PjtwotzvKB36	0.0 metres clearance	Left turn	Site to supply adequate access for the swept path of the largest loads.

Pages 51 to 57 of Appendix B provide detailed comments and photos of each of the intersections that require modifications.

Port Kembla to Rye Park

Table 8 and Table 9 provide a consolidated list of the intersection upgrades and treatment types for the route from Port Kembla to Rye Park. Appendix C contains the full route assessment report undertaken by Ares Transport Group.

LEGEND

●	Take Caution
●	Medium Maneuver
●	Difficult Maneuver

Table 8 Route 1: Port Kembla to Rye Park Wind Farm (excl. high loads)

Action	Location	KM	Obstruction	Height			Rating	Comment
				L	M	R		
LHT	Exit Tom Thumb Road	0.0	**intersection**				●	Light and trees to be removed
RHT	Masters Road	1.2	**intersection**				●	Slow travel
STR	M1	4.6	**Bridge**	5.05	5.18	5.31	●	Slow travel
STR	M1	6.7	**Bridge**	5.43	5.35	5.28	●	Slow travel
LHT	Picton Road	13.8	**intersection**				●	Oncoming traffic to be stopped by police
STR	Picton Road	31.0	**Road works**				●	Take caution- slow travel
LHT	Hume Highway	40.9	**intersection**				●	Steering required. Light pole to be moved
STR	Hume Highway	126.2	**HVIS**				●	slow travel
RHT	Lachlan Valley Way	244.4	**intersection**				●	Take Caution
RHT	Trucking Yard Rd	287.5	**intersection**				●	Take Caution
LHT	Long Rd	289.2	**Intersection**				●	Trees and fences obstruct turn. Requires modification of corner.
RHT	Rye Park Rd	290.3	**Intersection**				●	Sharp corner requires modification.
LHT	Grassy Creek Rd	309.7	**intersection**				●	Power pole and Telstra box obstruct turn. Requires modification of corner.

Action	Location	KM	Obstruction	Height			Rating	Comment
				L	M	R		
RHT	Maryvale Rd	319.5	**Roundabout**				●	Take Caution

Section 2.2.1 to 2.2.11 of Appendix C provide detailed comments and photos of each of the intersections.

Table 9 Route 2: Port Kembla to Rye Park Wind Farm (high load detour)

Action	Location	KM	Obstruction	Height			Rating	Comment
				L	M	R		
LHT	Exit Tom Thumb Road	0.0	**intersection**				●	Light and trees to be removed
RHT	Masters Road	1.2	**intersection**				●	Slow travel
STR	Memorial drive	7.5	**Bridge**	5.21	5.40	5.61	●	Take caution
LHT	Princes Highway	7.9	**intersection**				●	Slow travel
LHT	Mt Ousley Road	8.5	**Roundabout**				●	Take caution- slow travel
STR	Mt Ousley Road	8.9	**Roundabout**				●	Slow travel
RHT	Mt Ousley Road	9.3	**intersection**				●	slow travel
LHT	Picton Road	13.8	**intersection**				●	Oncoming traffic to be stopped by police
STR	Picton Road	31.0	**Road works**				●	Take caution- slow travel
LHT	Hume Highway	40.9	**intersection**				●	Steering required. Light pole to be moved

Section 2.3.1 to 2.3.5 of Appendix C provide detailed comments and photos of each of the intersections.

Newcastle to Rye Park (via Dubbo)

Table 10, Table 11, Table 12 and Table 13 provide a consolidated list of the intersection upgrades and treatment types for the route from Newcastle to Rye Park (via Dubbo). Appendix D contains the full route assessment report undertaken by Rex J Andrews.

Table 10 Stage 1 Route: Newcastle to Rye Park township (all components other than towers)

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
0.0	Mayfield	Mayfield #4 berth onto Selwyn Street GPS link: https://goo.gl/maps/afLwPYKuNdm	70.0 metres clearance	Moderate right hand turn	Some hardstand will need to be added on the left entrance and exit of the corner. The fence on both sides of the road and the gate will need to be relocated.
0.4	Mayfield	Selwyn Street rail crossing GPS link: https://goo.gl/maps/AmohE54hKSz	9.0 Metres wide	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
1.3	Mayfield	Selwyn Street onto Industrial Drive via George Street GPS link: https://goo.gl/maps/gXeHvBtCp4D2	70.0 metres clearance	Right hand turn	Truck will need to travel over the hardstand area than return to the correct side of Industrial Drive. The trailer will need to cross over to the incorrect side before travelling over the centre median and returning to the correct side of Industrial Drive. The traffic signal in the centre of the intersection will need to be relocated. A sign will also need to be relocated on the inside of the corner and a pole removed on the outside of the corner. A hardstand area will need to be constructed on the south side of the intersection.
5.5	Mayfield West	Industrial Drive onto Maitland Road GPS link: https://goo.gl/maps/Kn49dhWG2qG2	70.0 metres clearance	Right hand turn	The blades will need to cross to the incorrect side metres prior to the intersection, then return to the correct side 120 metres past the intersection. The centre median strip will need to be lowered, or the trucks are to cross to the incorrect side of Industrial drive further to the east of the intersection.
17.4	Tarro	New England Highway onto John Renshaw Drive GPS link: https://goo.gl/maps/SRDr5JigkBp	100.0 metres clearance	Left hand merge	No problems with this section of road.
18.5	Beresfield	John Renshaw Drive onto the M1 GPS link: https://goo.gl/maps/A34ihxCjM5wfRDdq6	100.0 metres clearance	Left hand bend	No problems with this section of road.
113.0	Mt White	M1 Motorway under Mt White overpass GPS link: https://goo.gl/maps/K3fPPe4fNx63xB3j7	Left Lane: 5.2 mtrs Centre Lane: 5.3 mtrs Right Lane: 5.4 mtrs	Travel directly ahead	Loads that exceed 5.3 metres high are not to travel under this structure. Loads over 5.2 metres high are to travel under the bridge in the far-right lane, and at a speed of no more than 5 km's per hour. Spotter to guide load through this section of road.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
122.0	Hawkesbury River	M1 Motorway GPS link: https://goo.gl/maps/yDzjirEKLAbREE8B6	100.0 long x 6.0 wide	Merge to left	Large parking area
146.0	Wahroonga	M1 onto Pennant Hills Rd GPS link: https://goo.gl/maps/bskC8kD4CdW9xmwYA	75.0 metres clearance	Left hand turn	It is recommended that the centre median strip be modified to allow a suitable clearance for the truck to travel over. Blade loads are to turn from the correct side to the incorrect side of the road. The prime mover will need to turn from the far- right lane and cross onto the incorrect side of Pennant Hills Road, before returning to the correct side once the trailer has cleared the corner.
147.0	Normanhurst	Pennant Hills Road under Pedestrian overpass GPS link: https://goo.gl/maps/nYbjkf5AJ9D2xvUt7	Left Lane: 5.15 mtrs Centre Lane: 5.2 mtrs Right Lane: 5.3 mtrs	Travel directly ahead	Loads that exceed 5.3 metres high are not to travel under this structure. Loads over 5.2 metres high are to travel under the bridge in the far-right lane, and at a speed of no more than 5 km's per hour. Spotter to guide load through this section of road.
151.0	Beecroft	Pennant Hills Road under Pedestrian overpass GPS link: https://goo.gl/maps/sjnLQqYRudUSKgTQ8	Left Lane: 5.3 mtrs Centre Lane: 5.4 mtrs Right Lane: 5.5 mtrs	Travel directly ahead	Loads that exceed 5.3 metres high are not to travel under this structure. Loads over 5.2 metres high are to travel under the bridge in the centre lane, and at a speed of no more than 5 km's per hour. Spotter to guide load through this section of road.
154.0	West Pennant Hills	Pennant Hills Rd onto M2 Motorway GPS link: https://goo.gl/maps/cCsJwSt1NsRi5cSs6	75.0 metres clearance	Right hand turn	A traffic signal will need to be relocated, and a section of fence removed on the inside of the corner. A barrier will also need to be relocated on the outside of the corner. Trucks are to turn from the correct side to the correct side of the road. The prime mover will need to turn from the far left lane on Pennant Hills Road and enter the on ramp as wide as possible. Spotter to guide the load through the corner.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
163.0	Winston Hills	M2 Motorway onto M7 Motorway GPS link: https://goo.gl/maps/PC96cBq2xqtW85vG7	75.0 metres clearance	Travel directly ahead	No problems with this section of road.
167.0	Kings Park	M7Motorway GPS link: https://goo.gl/maps/T8WcbR9T84Zs7WpF7	100.0 long x 6.0 wide	Merge to left	Large parking area
201.0	Prestons	M7 Motorway onto M5 Motorway GPS link: https://goo.gl/maps/FA2mF7PxZkxrRDTR9	75.0 metres clearance	Travel directly ahead	No problems with this section of road.
229.0	Menangle	Hume Highway https://goo.gl/maps/KPMdLS1XuRWHrcyb6	200.0 long x 8.0 wide	Merge to left	Large parking area for towers and motors, no blades to enter this parking bay.
238.0	Wilton	Hume Highway under Farm access overpass GPS link: https://goo.gl/maps/2ZsVqYJ9j9qPTGqa9	Left Lane: 5.5 mtrs Centre Lane: 5.4 mtrs Right Lane: 5.3 mtrs	Travel directly ahead	Loads that exceed 5.3 metres high are not to travel under this structure. Loads over 5.2 metres high are to travel under the bridge in the left lane, and at a speed of no more than 5 km's per hour. Spotter to guide load through this section of road.
303.0	Sutton Forest	Hume Highway https://goo.gl/maps/uT1ubtSuawS2	150.0 long x 10.0 wide	Merge to left	Large parking area
352.0	Goulburn	Hume Highway https://goo.gl/maps/7HywRcjZiJy	180.0 long x 15.0 wide	Merge to left	Large parking area
375.0	Breadalbane	Hume Highway https://goo.gl/maps/PmpDm5ymjjnK7ciW8	140.0 long x 12.0 wide	Merge to left	Large parking area
388.0	Cullerin ridge	Hume Highway https://goo.gl/maps/3r7x8uzs9Fy7pVmp8	100.0 long x 10.0 wide	Merge to left	Large parking area
409.0	Oolong	Hume Highway https://goo.gl/maps/EVyT3US6dgcapAWWA	130.0 long x 15.0 wide	Merge to left	Large parking area
444.0	Bowning	Hume Highway onto Lachlan Valley Way GPS link: https://goo.gl/maps/j1Nvy5sXDonei1K99	75.0 metres clearance	Right hand turn	Some signs in the centre median strip will need to be relocated. Truck to turn from the far left lane and enter the corner as wide as possible.
486.0	Boorowa	Lachlan Valley Way onto Trucking Yard Road GPS link: https://goo.gl/maps/qCR2CX4EADMGK3WR8	75.0 metres clearance	Right hand turn	Some signs in the inside of the corner will need to be relocated.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
487.0	Boorowa	Trucking Yard Road GPS link: https://goo.gl/maps/HTJCwCnUerjtgc5z9	50.0 metres clearance	Right hand bend	The causeway will need to be widened, and hardstand added to the inside of the corner.
487.2	Boorowa	Trucking Yard Road onto Dillon Street GPS link: https://goo.gl/maps/sQFVtnE3CPvhVibS8	90.0 metres clearance	Travel directly ahead.	No Problems with this section of road.
488.0	Boorowa	Dillon Street onto Long Street GPS link: https://goo.gl/maps/mnV8spf8JGG6LsT99	50.0 metres clearance	Left hand turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the inside of the corner, and a fence relocated within the landowner's boundaries. Additionally, some vegetation needs to be removed.
489.5	Boorowa	Long Street onto Rye Park Road GPS link: https://goo.gl/maps/Ry5s7svgx1BDzRAMA	50.0 metres clearance	Right hand turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the inside of the corner, and a fence relocated within the landowner's boundaries. Additionally, some vegetation needs to be removed.
509.0	Boorowa to Rye Park township	Rye Park Road GPS link: https://goo.gl/maps/LGqWeQKDCERMsHQy7	90.0 metres clearance	Travel directly ahead	No problems with this section of road.

Page 24 to 38 of Appendix D provide detailed comments and photos of each of the intersections that require modifications.

Table 11 Stage 2 Route: Rye Park Township to Rye Park Windfarm North (all components)

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
0.0	Rye park	Rye Park Road onto Grassy Creek Road GPS link: https://goo.gl/maps/LGqWeQKDCERMsHQy7	Length: 30 Metres	Left hand turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the landowner's property and some trees and fence will need to be removed.

0.0 to 6.6	Rye Park	Grassy Creek Road GPS link: https://goo.gl/maps/NC1AQuTTZPJHDDfk9	Width: 4.5 metres	Travel directly ahead	Grassy Creek road is generally 4.5 metres of width with no shoulder. The pavement is in fair condition but may show wear with the volume of heavy traffic. Some trees will need to be trimmed and removed on sections of this road. The floodway has an adequate swept path.
5.4	Rye park	Grassy Creek Road into site entrance # 2 https://goo.gl/maps/5LwRX2EKMkNAFYsT8		Left turn	Site entrance to be made suitable for the swept path of the largest loads.
6.6	Rye park	Grassy Creek Road into site entrance # 1 https://goo.gl/maps/B2bjRMNjVvvbbfZt6		Right turn	Site entrance to be made suitable for the swept path of the largest loads.

Page 41 to 46 of Appendix D provide detailed comments and photos of each of the intersections that require modifications.

Table 12 Stage 3 Route: Rye Park Township to Rye Park Windfarm North (all components)

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
0.0	Rye park	Rye Park Road onto Yass Street Road GPS link: https://goo.gl/maps/LGqWeQKDCERMsHQy7	Length: 30 Metres	Right turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the landowner's property and some trees and fence will need to be removed.
0.0 to 26.4	Rye Park	Yass street through to Site entrance #13 https://goo.gl/maps/DV4fputJ45k6HGvD7	4.5 Metres width clearance	Travel directly ahead	This section of road will need to be checked for swept path and vertical curve of the largest loads. Some sections of this road will require upgrades. Sections of this road have trees that would need to be trimmed/removed.
1.0	Rye Park	Yass Street onto Gunning Road https://goo.gl/maps/LLydmFC4TMxwjSzH7	5.5 Metres width clearance	Travel directly ahead	No problem with this section of road.
2.0	Rye Park	Gunning Road onto Dalton Road https://goo.gl/maps/zC4FNES8z1B1iJYk7	5.5 Metres width clearance	Travel directly ahead	No problems with this section of road.
12.0	Rye Park	Dalton Road onto Flakney Creek Road. (Site entrance #4) GPS link: https://goo.gl/maps/SWaaW7LWhcnekCJc7	30.0 metres clearance	Left turn	This corner and through to site will need to be made suitable for the swept path of the largest loads.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
16.7	Rye Park	Dalton Road onto Rye Park Road https://goo.gl/maps/ah3wGy1QP5BrZzoU6	5.5 Metres width clearance	Travel directly ahead	No problems with this section of road.
24.7	Blakney Creek	Rye Park Road intersection of Blakney Creek South Road GPS link: https://goo.gl/maps/CGWNggq3i9ANQbMx8	30.0 metres clearance	Left turn	
26.4	Blakney Creek	Rye Park windfarm (Site entrance # 13) onto Rye Park Road GPS link: https://goo.gl/maps/saww6PjtwotzvKB36	0.0 metres clearance	Left turn	Site to supply adequate access for the swept path of the largest loads.

Page 49 to 55 of Appendix D provide detailed comments and photos of each of the intersections that require modifications.

Table 13 High Tower Route: Newcastle to Rye Park township (towers components)

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
0.0	Mayfield	Mayfield #4 berth onto Selwyn Street GPS link: https://goo.gl/maps/afLwPYKuNdm	Length: 70.0 Mtrs Width: 8.0 Mtrs	Moderate right hand turn	No problems with the towers on this section of road.
0.4	Mayfield	Selwyn Street over rail crossing GPS link: https://goo.gl/maps/AmohE54hKSz	Length: 90 metres Width: 9.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
1.3	Mayfield	Selwyn Street onto George Street GPS link: https://goo.gl/maps/gXeHvBtCp4D2	Length: 40.0 Mtrs Width: 8.0 Mtrs	Right hand turn	No problems with the towers on this section of road.
1.4	Mayfield	George Street onto Industrial Drive https://goo.gl/maps/s4ayrsuoAsD2	Length: 40.0 Mtrs Width: 8.0 Mtrs	Right hand turn	No problems with the towers on this section of road.
4.9	Mayfield	Industrial Drive under traffic signals GPS link: https://goo.gl/maps/YmqhiS2iR582	Height: 5.4 metres	Travel directly ahead in the far right lane.	The lowest traffic signal on route is at the intersection of Steel River Blvd. Trucks that exceed 5.3 metres will need to travel in the right-hand lane. Clearance in the right end lane is 6.0 metres.
5.5	Mayfield West	Industrial Drive onto Maitland Road GPS link: https://goo.gl/maps/K	Length: 40.0 Mtrs Width: 7.0 Mtrs	Right hand turn	No problems with the towers on this section of road.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
		n49dhWG2qG2			
6.4	Sandgate	Maitland Road over rail bridge GPS link: https://goo.gl/maps/W2JWWjhfqv5UMviB7	Length: 90 metres Width: 9.0 Metres	Travel directly ahead in the right- hand lane	Approval from Rail company required to cross this structure. Travel over this structure may have specific conditions.
13.9	Hexham	New England Highway under gantry GPS link: https://goo.gl/maps/YTMoFe7Aick	Height: 5.9 metres	Travel directly ahead	This is the lowest structure on route. There is no bypass around the gantry. A maximum loaded height of 5.9 metres should not be exceeded.
15.1	Tarro	New England Highway over rail bridge GPS link: https://goo.gl/maps/tTnWLwQC2hzSPhAp6	Length: 90 metres Width: 7.0 Metres	Travel directly ahead in the right- hand lane	Approval from Rail company required to cross this structure. Travel over this structure may have specific conditions.
17.4	Tarro	New England Highway onto John Renshaw Drive GPS link: https://goo.gl/maps/SRDr5JigkBp	Length: 100.0 Mtrs Width: 12.0 Mtrs	Left hand merge	No problems with the towers on this section of road.
18.4	Beresfield	John Rensh aw Drive GPS link: https://goo.gl/maps/N19vJih1Fgr	Length: 100.0 Mtrs Width: 10.0 Mtrs	Travel directly ahead	The roundabout has been removed. A set of dual lanes now takes traffic directly across the intersection.
28.7	Buchanan	John Renshaw Drive onto the Hunter Expressway GPS link: https://goo.gl/maps/1STJ1PfQt9E2	Length: 65.0 Mtrs Width: 7.0 Mtrs	Right hand turn	No problems with the towers on this section of road.
58.9	Branxton	The Hunter Expressway onto The New England Highway GPS link: https://goo.gl/maps/7rauNuxzqjq	Length: 100.0 Mtrs Width: 12.0 Mtrs	Travel directly ahead	No problems with this section of road.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
67.3	Whittingham	The New England Highway onto the Golden Highway GPS link: https://goo.gl/maps/nAnfkYfeUn42	Length: 70.0 Mtrs Width: 8.0 Mtrs	Left Hand turn	The NSW Government is currently upgrading this intersection. At this stage the data that is available for the upgrades shows that the section of road that we would need to access does not change considerably. However, it is recommended that you monitor the progress of the upgrades, and that any changes are thoroughly looked at.
67.4	Whittingham	Golden Highway GPS link: https://goo.gl/maps/R86RFuPnmFU2	115.0 x 9.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
68.0	Whittingham	Golden Highway over rail bridge GPS link: https://goo.gl/maps/5NwDQofandvvMKfY9	Length: 90 metres Width: 9.0 Metres	Travel directly ahead in the centre of the road.	Approval from Rail company required to cross this structure. Travel over this structure may have specific conditions.
77.3	Mount Thorley	Golden Highway over rail bridge GPS link: https://goo.gl/maps/qTxSbkxPu87L5hx4A	Length: 90 metres Width: 9.0 Metres	Travel directly ahead in the centre of the road.	Approval from Rail company required to cross this structure. Travel over this structure may have specific conditions.
77.4	Whittingham	Golden Highway intersection with the Putty Road GPS link: https://goo.gl/maps/7hQdEmK1EgE2	Length: 65 metres Width: 6.0 Metres	Left hand turn	No problems with this section of road.
77.5	Mount Thorley	Golden Highway GPS link: https://goo.gl/maps/zGvdupDuixx	100.0 x 10.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
80.6	Mount Thorley	Golden Highway over rail bridge GPS link: https://goo.gl/maps/ipGU4USXmWZ8GkJs6	Length: 90 metres Width: 9.0 Metres Height: 5.2 metres	Travel directly ahead in the centre of the road.	Approval from Rail company required to cross this structure. Travel over this structure may have specific conditions.
80.8	Mount Thorley	Putty Road under Mt Thorley Road GPS link: https://goo.gl/maps/SMzSLP1kvQYDMqa86	Heights: Left: 6.6 metres Centre: 6.3 Metres Right: 6.3 metres	Travel under the bridge in the left lane	Mt Thorley underpass is 6.3 metres in the centre of the road. Towers to pass under this structure on the correct side.
80.8	Mount Thorley	Golden Highway intersection with the Putty Road GPS link: https://goo.gl/maps/QS9quvSyHYWaFHoX9	Length: 45 metres Width: 6.0 Metres	Right hand turn	No problems with this section of road.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
98.0	Warkworth	Golden Highway GPS link: https://goo.gl/maps/Y6V6EXaCwxq	100.0 x 8.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
107.0	Jerrys Plains	Golden Highway through Jerrys Plains village GPS link: https://goo.gl/maps/WgSCRsJ9ZGt	Length: 60 metres Width: 6.0 Metres	Left hand than right hand turn	No problems with this section of road.
126.0	Ogilvy	Golden Highway GPS link: https://goo.gl/maps/58Tj9ojs7CC2	6% gradient	Travel directly ahead	This section of road has a steep mountain range that will require additional pull trucks to assists loads that exceed 80T gross weight. Additionally, the NSW Government is currently upgrading this section of road. It is recommended that you monitor the progress of the upgrades, and that any changes are thoroughly looked at.
131.9	Denman	Golden Highway onto Denman Road GPS link: https://goo.gl/maps/sf4PNnycxB32	Length: 55 metres Width: 6.0 Metres	Right hand turn	No problems with this section of road.
137.9	Muswellbrook	Denman Road onto Bengalla Road GPS link: https://goo.gl/maps/3sK4m6YSHNHqkqn68	Length: 60 metres Width: 8.0 Metres	Left hand turn	No problems with this section of road.
149.0	Bengalla	Bengalla Road onto Wybong Road GPS link: https://goo.gl/maps/zfDyG4GQq6G37imB9	Length: 90 metres Width: 8.0 Metres	Left hand bend	No problems with this section of road.
158.0 to 183.0	Bengalla	Wybong Road GPS link: https://goo.gl/maps/ekGZA5wFFK55Mvmc7	Length: 60 metres Width: 8.0 Metres	Travel directly ahead	This road is maintained by Muswellbrook Council. Approval will be required to travel on this section of Road.
183.0	Sandy Hollow	Wybong Road onto Golden Highway GPS link: https://goo.gl/maps/5ft3VnWpnPhpeN4u7	Length: 60 metres Width: 8.0 Metres	Right hand turn	No problems with this section of road.
190.1	Sandy Hollow	Golden highway GPS link: https://goo.gl/maps/2THBuV165xx	50.0 x 4.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
193.0	Sandy Hollow	Golden Highway under safety Cam GPS link: https://goo.gl/maps/b7t9zH2ankJcvWpT6	Height: Left: 6.3 metres	Travel directly ahead on the correct side	No problems with this section of road.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
201.0	Gungal	Golden highway GPS link: https://goo.gl/maps/WDoL2LfeCoP2	70.0 x 6.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
221.0	Merriwa	Golden Highway under safety Cam GPS link: https://goo.gl/maps/D92rzQ8vnUcYsqj56	Height: Right: 6.4 metres	Travel directly ahead on the correct side	No problems with this section of road.
224.0	Merriwa	Golden highway GPS link: https://goo.gl/maps/NqrWzTsRmnt	100.0 x 5.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
274.0	Cassilis	Golden highway GPS link: https://goo.gl/maps/vs6YMT6TxCA2	200.0 x 8.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
305.0	Leadville	Golden highway GPS link: https://goo.gl/maps/ujxMGukhopeFWRhb8	200.0 x 8.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
331.0	Dunedoo	Golden Highway over rail crossing GPS link: https://goo.gl/maps/wsyNKfcoAij3SosY9	Length: 90 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
331.1	Dunedoo	Golden Highway intersection with Wargundy Street GPS link: https://goo.gl/maps/WzACUHey3jYadj1K7	Length: 60 metres Width: 6.0 Metres	Right hand bend	No problems with this section of road.
384.0	Ballimore	Golden Highway GPS link: https://goo.gl/maps/RuKKrfHarw1Mjy5E9	150.0 x 8.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
392.0	Ballimore	Golden Highway over rail crossing GPS link: https://goo.gl/maps/yb15Kz6R2r3E69fj6	Length: 90 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
400.0	Dubbo	Golden Highway onto Boothenba Road GPS link: https://goo.gl/maps/TJLi5W4ir11ejgtb6	Length: 50 metres Width: 6.5 Metres	Right hand turn	No problems with this section of road.
411.0	Dubbo	Boothenba Road over rail crossing GPS link: https://goo.gl/maps/72ageimPLqPWYY7M9	Length: 90 metres Width: 6.5 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
411.1	Dubbo	Boothenba Road onto Troy Bridge Road GPS link: https://goo.gl/maps/2u5uRf2ByKxseoFm9	Length: 90 metres Width: 6.5 Metres	Travel directly ahead	No problems with this section of road.
414.0	Dubbo	Troy Bridge Road onto Bunglegumbie road GPS link: https://goo.gl/maps/6Uke9jwPypNYVPux5	Length: 90 metres Width: 6.5 Metres	Travel directly ahead	No problems with this section of road.
420.0	Dubbo	Bunglegumbie road onto the Mitchell Highway GPS link: https://goo.gl/maps/jCWqmaQsd3fChp837	Length: 50 metres Width: 6.5 Metres	Right hand turn	No problems with this section of road.
450.0	Narromine	Mitchell Highway onto Manildra Street GPS link: https://goo.gl/maps/hFG648tcSMUHxJ8h6	Length: 40 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
450.1	Narromine	Manildra Street over rail crossing GPS link: https://goo.gl/maps/4s2HYJJfJQ5pGbKg7	Length: 60 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
450.2	Narromine	Manildra Street onto Derribong Avenue GPS link: https://goo.gl/maps/776aPaxqsFTWi6qL6	Length: 40 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
450.5	Narromine	Derribong Avenue onto Algalah Street GPS link: https://goo.gl/maps/9s8cb8G4T2c75t1V8	Length: 40 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
452.0	Narromine	Algalah Street onto Tomingley Road GPS link: https://goo.gl/maps/EWfZYo3Xos6T3J8A8	Length: 60 metres Width: 7.0 Metres	Travel directly ahead	No problems with this section of road.
487.5	Tomingley	Tomingley Road onto the Newell Highway GPS link: https://goo.gl/maps/NJtXmHCFHxaiMaq39	Length: 60 metres Width: 7.0 Metres	Travel directly ahead	No problems with this section of road.
488.0	Tomingley	Newell Highway GPS link: https://goo.gl/maps/ADMke5At2A1Uy1z4A	200.0 x 15.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
489.0	Tomingley	Newell Highway under safety Cam GPS link: https://goo.gl/maps/9Vqu9xXxRwhHt4Uk6	Height: Right: 6.8 metres	Travel directly ahead on the correct side	No problems with this section of road.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
490.0	South Tomingley	Newell Highway GPS link: https://goo.gl/maps/1q8f6HJ2zsZSxup66	150.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
502.0	Peak Hill	Newell Highway GPS link: https://goo.gl/maps/orKTBB8wobK6exsc6	90.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
503.0	Peak Hill	Newell Highway under safety Cam GPS link: https://goo.gl/maps/sAbh8zwZzZVMriD2A	Height: Right: 6.3 metres	Travel directly ahead on the correct side	No problems with this section of road.
526.0	Alectown	Newell Highway GPS link: https://goo.gl/maps/GMGbEJHAEkeWuRyz5	90.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
552.0	Parkes	Newell Highway onto Thomas Street GPS link: https://goo.gl/maps/fSnFVWPr78RePSTz9	Length: 55 metres Width: 6.5 Metres	Right hand turn	No problems with this section of road.
554.0	Parkes	Thomas Street onto Moulden Street GPS link: https://goo.gl/maps/HpYrcwcx8BHrUmfc8	Length: 55 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
554.8	Parkes	Moulden Street onto Henry Parkes Way GPS link: https://goo.gl/maps/atnNtdtyi21wK4PF9	Length: 55 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
555.0	Parkes	Henry Parkes Way onto Westlime Road GPS link: https://goo.gl/maps/Uk2nuLS7xvfnv5dt6	Length: 55 metres Width: 6.5 Metres	Right hand turn	No problems with this section of road.
556.0	Parkes	Westlime Road onto Hartigan Ave GPS link: https://goo.gl/maps/XtKqPrWcZHY3im65A	Length: 55 metres Width: 6.5 Metres	Travel directly ahead	No problems with this section of road.
557.0	Parkes	Hartigan Avenue under traffic signal GPS link: https://goo.gl/maps/sQxVxzZivbDX7E3j6	Height: Left: 5.5 metres	Travel around the traffic signal on the incorrect side of the road.	Traffic signal is too low. Pass on right hand side.
558.0	Parkes	Hartigan Ave onto the Newell Highway GPS link: https://goo.gl/maps/y3rabftt4HGreX9e6	Length: 55 metres Width: 6.5 Metres	Travel directly ahead	No problems with this section of road.
558.1	Parkes	Newell Highway over rail crossing GPS link: https://goo.gl/maps/7tSoLfFManXyKV3T9	Length: 60 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
562.0	Parkes	Newell Highway over rail crossing GPS link: https://goo.gl/maps/Kxa3shUCMiuKe2sX7	Length: 60 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
569.0	Tichborne	Newell Highway over rail crossing GPS link: https://goo.gl/maps/gxYUZLLe3jsCEJgD7	Length: 60 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
576.0	Daroobalgie rest area	Newell Highway GPS link: https://goo.gl/maps/swec16PWh1N8ZbUR7	200.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
590.0	Forbes	Newell Highway intersection with Dowling Street GPS link: https://goo.gl/maps/DqkvxH4gtWnXvLJ26	Length: 45 metres Width: 6.0 Metres	Left hand turn	No problems with this section of road.
590.2	Forbes	Newell Highway GPS link: https://goo.gl/maps/Hsmjs9pqvZ5UYFAH7	100.0 x 6.5 metres	Parking Bay	Suitable parking for Fatigue breaks.
595.5	Forbes	Newell Highway under safety Cam GPS link: https://goo.gl/maps/hUdv6YJunC9yfoxF7	Height: Right: 6.4 metres	Travel directly ahead on the correct side	No problems with this section of road.
658.0	Marsden	Newell Highway under safety Cam GPS link: https://goo.gl/maps/fRpjbRoXfup29Swx6	Height: Right: 6.9 metres	Travel directly ahead on the correct side	No problems with this section of road.
659.0	Marsden rest area	Newell Highway GPS link: https://goo.gl/maps/AfAfr2wuNTjQMdKT8	200.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
689.0	Wyalong	Newell Highway under safety Cam GPS link: https://goo.gl/maps/sudP4qYXPWbDB6sL6	Height: Centre: 6.2 metres	Travel directly ahead on the correct side	No problems with this section of road.
690.0	Wyalong	Newell Highway onto Goldfields Way GPS link: https://goo.gl/maps/T719JaaurSGKqLFG8	Length: 55 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
703.0	Yiddah	Goldfields Way GPS link: https://goo.gl/maps/xZq9CdyFsA6xCMtj8	200.0 x 6.5 metres	Parking Bay	Suitable parking for Fatigue breaks.
717.0	Barmedman	Goldfields Way intersection of Nobby's Road GPS link: https://goo.gl/maps/NQ1CJ8Vd4hrpNn5e9	Length: 50 metres Width: 6.5 Metres	Right hand turn	No problems with this section of road.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
753.0	Temora	Goldfields Way onto Kitchener Road GPS link: https://goo.gl/maps/4nu8hpHqVwrZaRqu9	Length: 40 metres Width: 6.0 Metres	Left hand turn	No problems with this section of road.
753.0 to 754.5	Temora	Kitchener Road GPS link: https://goo.gl/maps/ZvsdgQ2ztSgn2XCa8	Height: Left: 4.8 Metres	Travel directly ahead	There are several low trees on Kitchener road. The load will need to travel around these trees on the incorrect side of the road.
754.5	Temora	Kitchener Road onto Bundawarrah Road GPS link: https://goo.gl/maps/HgS5zfdDxndXy4kXA	Length: 40 metres Width: 6.0 Metres	Right hand turn	No problems with this section of road.
754.8	Temora	Bundawarrah Road onto Milvale road GPS link: https://goo.gl/maps/fGde9dUjotP27gzj8	Length: 40 metres Width: 6.0 Metres	Left hand turn	No problems with this section of road.
755.4	Temora	Milvale road onto Waratah Street GPS link: https://goo.gl/maps/xaDowcuSLeaNrMui8	Length: 40 metres Width: 6.0 Metres	Right hand turn	No problems with this section of road.
756.3	Temora	Waratah Street onto Burley Griffin Way GPS link: https://goo.gl/maps/n14EJJnv22o8qL7R9	Length: 40 metres Width: 6.0 Metres	Left hand turn	No problems with this section of road.
772.0	Springdale	Burley Griffin Way GPS link: https://goo.gl/maps/EFsSZqGeVRxP3HDs7	100.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
816.0	Wallendbeen	Burley Griffin Way roundabout at Olympic Highway GPS link: https://goo.gl/maps/KbDXmF2JLCHUMsVc6	Length: 40 metres Width: 6.0 Metres	Travel directly ahead through the roundabout	Spotter to guide load through this pinchpoint.
827.0	Murrumburrah	Burley Griffin Way GPS link: https://goo.gl/maps/gExxjqjtMgpJLMtH9	200.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
834.0 to 836.5	Harden	Burley Griffin Way through 3 pedestrian median strips GPS link: https://goo.gl/maps/8XwWsmwgezQrjGzu6	Width: 5.5 Metres Axle width: 3.8 Metres	Travel directly ahead on the correct side	Spotter to guide load through this pinchpoint. Possible works on these pedestrian islands
837.3	Harden	Burley Griffin Way under Town Banner GPS link: https://goo.gl/maps/5ubTjzHsm3ELTPJN7	Height?	Travel directly ahead on the correct side	Will need to talk to the shire on when the banner is hung, and at what height it would be strung at.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
864.6	Binnalong	Burley Griffin Way intersection of Queen Street & Manning Street GPS link: https://goo.gl/maps/nz3TaNzD2LpRxq398	Length: 45 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
865.0	Binnalong	Burley Griffin Way intersection of Queen & Stephens St GPS link: https://goo.gl/maps/WpKLMpFS72QPPQ7L6	Length: 45 metres Width: 6.5 Metres	Right hand turn	No problems with this section of road.
870.0	Binnalong	Burley Griffin Way GPS link: https://goo.gl/maps/F1do76VRh7sMjWcHA	200.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
883.0	Bowning	Burley Griffin Way onto Hume Highway GPS link: https://goo.gl/maps/1dc42UtNeBsZNi7s8	Length: 60 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
894.0	Bowning	Hume Highway onto Lachlan Valley Way GPS link: https://goo.gl/maps/j1Nvy5sXDonei1K99	75.0 metres clearance	Left hand turn	No problems with this section of road.
936.0	Boorowa	Lachlan Valley Way onto Trucking Yard Road GPS link: https://goo.gl/maps/qCR2CX4EADMGK3WR8	75.0 metres clearance	Right hand turn	No problems with this section of road.
937.0	Boorowa	Trucking Yard Road GPS link: https://goo.gl/maps/HTJCwCnUerjtgc5z9	50.0 metres clearance	Right hand bend	The causeway will need to be widened, and hardstand added to the inside of the corner.
937.2	Boorowa	Trucking Yard Road onto Dillon Street GPS link: https://goo.gl/maps/sQFVtnE3CPvhVibS8	90.0 metres clearance	Travel directly ahead.	No Problems with this section of road.
938.0	Boorowa	Dillon Street onto Long Street GPS link: https://goo.gl/maps/mnV8spf8JGG6LsT99	50.0 metres clearance	Left hand turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the inside of the corner, and a fence relocated within the landowner's boundaries. Additionally, some vegetation needs to be removed.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
939.5	Boorowa	Long Street onto Rye Park Road GPS link: https://goo.gl/maps/Ry5s7svgx1BDzRAMA	50.0 metres clearance	Right hand turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the inside of the corner, and a fence relocated within the landowner's boundaries. Additionally, some vegetation needs to be removed.
939.0 to 959.0	Boorowa to Rye Park township	Rye Park Road GPS link: https://goo.gl/maps/LGgWeQKDCERMsHQy7	90.0 metres clearance	Travel directly ahead	Some sections of this road will need tree trimming.

Page 68 to 69 of Appendix D provide conclusions regarding the high tower route.

1.5 Sourcing raw material and their transportation to site

Section 5.1 Construction Traffic of the Traffic Impact Assessment submitted as part of the Modification Application included the following statement in relation to sourcing materials:

It has been assumed in this analysis that there will not be an on-site quarry present to source materials. Should an onsite quarry be proposed this would likely reduce the number of traffic movements. Construction traffic generated will use RMS roads, local council roads and roads within the site.

Off-site quarrying has been assumed as a worst-case scenario in terms of the number of vehicle movements. The Applicant is currently reviewing options for on-site quarries to reduce the number of heavy vehicle movements and will continue to work with the preferred supplier and relevant contractors.

2.0 Visual

2.1 Visual impacts associated with the realigned transmission line design

Green Bean Design has undertaken an additional assessment of the realigned transmission line. The full assessment is provided in Appendix E.

In summary, the assessment found that most non-associated dwellings within 2km of the amended transmission line will not experience a visual impact any greater than the impact determined for the consented 33kV and 330kV transmission lines. Amendments to the 33kV and 330kV transmission lines in the north and south portions of the project site will not result in any additional landscape or visual impacts.

A small number of non-associated dwellings in the mid-southern section, including R47, R48 and R50, are likely to experience an increase in visual impact where the amended 330kV transmission line is located closer to the dwellings than the consented transmission line. Transmission line visibility from these dwellings may be mitigated to some degree through planting works within and beyond the dwelling curtilage in accordance with the Development Consent.

2.2 Status of neighbour agreements referred to in the Revised Visual Impact Assessment

A Revised Visual Impact Assessment was prepared as part of the Response to Submissions report (Appendix C of the RTS). The Revised Visual Impact Assessment referred to neighbour agreements that had been offered to residences within proximity to the wind farm. Table 14 shows the current status of the neighbour agreements referred to in this report.

Table 14 Status of neighbour agreements referred to in the Revised Visual Impact Assessment

Residence	Status of Agreement
R01	Associated neighbour (accepted neighbour agreement)
R02	Associated host landowner
R06	A neighbour agreement has been offered to the property owner. No response has been received from the property owner and the offer will remain in place for the life of the wind farm.
R08	A neighbour agreement has been offered to the property owner. No response has been received from the property owner and the offer will remain in place for the life of the wind farm.
R11	A neighbour agreement has been offered to the property owner. The offer is currently being discussed with the landowner. the offer will remain in place for the life of the wind farm.
R14	Associated host landowner
R15	Associated neighbour (accepted neighbour agreement)
R16	Associated neighbour (accepted neighbour agreement)
R10	A neighbour agreement has been offered to the property owner.
R18	A neighbour agreement has been offered to the property owner. The offer was declined (due to potential conflict of interest).
R22	A neighbour agreement has been offered to the property owner. No response has been received from the property owner and the offer will remain in place for the life of the wind farm.
R38	A neighbour agreement has been offered to the property owner. The offer is currently being discussed with the landowner. The offer will remain in place for the life of the wind farm. As per Condition 1 of Schedule 3 of the Development Consent, the property owner may request the Applicant to acquire their land.
R45	A neighbour agreement has been offered to the property owner. The offer was declined, however will remain in place for the life of the wind farm should the landowner reconsider.
R63	A neighbour agreement has been offered to the property owner. No response has been

Residence	Status of Agreement
	received from the property owner and the offer will remain in place for the life of the wind farm.
R64	Associated host landowner
R128	Associated host landowner
R131	Associated neighbour (accepted neighbour agreement)
R132	Associated neighbour (accepted neighbour agreement)

3.0 Biodiversity

3.1 Proposed locations of the permanent meteorological monitoring masts

The proposed locations for the six permanent meteorological masts for the Project were selected following analysis of technical, landowner and ecological constraints.

As evident from the Biodiversity Development Assessment Report (BDAR) (Umwelt 2020), the Project occurs in a landscape with patches of remnant forests (non-threatened ecological communities) providing habitat for squirrel glider, remnant patches of woodlands and grasslands of the valley floor and lower slopes aligning with state and federal Critically Endangered Ecological Communities (CEEC), and specific grassland habitats supporting habitat for striped legless lizard and/or golden sun moth.

The Final Modified Project clarifies the locations and disturbance areas (within the met mast development corridor) of the approved six permanent met masts. Appropriate locations for the permanent met masts have been selected, given the technical requirements, the proposed Project design and the abovementioned ecological constraints. Permanent met masts are required to provide ongoing wake-free measurements of wind speeds as well as for testing the performance levels of installed turbines. The indicative locations proposed for the permanent masts have been selected to minimise environmental impacts whilst also ensuring that applicable international technical standards for wind measurement are met. To meet required technical standards it is necessary to locate met masts between two and four rotor diameters upwind from turbines that will be tested. The met masts also need to provide coverage over the full extent of the Project site. The Applicant sought advice from a technical expert (DNV GL) in selecting appropriate locations for the permanent met masts.

The proposed six permanent meteorological masts avoid impacts to PCTs 289, 335 and 350, impacting PCT 351 solely. Of the total 9.17 hectares of impact associated with the Indicative Development Footprint – Permanent Masts, just 0.47 hectares is within the remnant forest of PCT 351 (Vegetation Zone 5). The majority of impact occurs within the disturbed condition zones of PCT 351, being derived native grassland (Vegetation Zone 6), acacia shrubland (Vegetation Zone 7) and sifton shrublands (Vegetation Zone 7). A further 1.35 hectares occur within non-native vegetation (Vegetation Zone 10). The Vegetation Zones are relatively consistent across the met mast development corridor and therefore it is expected that the area of impact will be similar even if micro-siting of the met mast location is undertaken.

Considering the technical constraints that require consideration in determining the location of the permanent meteorological masts, the Applicant has chosen suitable locations to minimise impacts to remnant forests, squirrel glider habitat and golden sun moth habitat. It is not possible for these meteorological masts to be positioned so as to avoid all ecological values.

The indicative location of the proposed six permanent meteorological masts avoid impacting the following significant ecological features:

- White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act),
- White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grasslands CEEC (EPBC Act),
- Southern myotis habitat, and
- Striped legless lizard habitat.

3.2 Calculation of the Speckled Warbler and Brown Treecreeper Biodiversity Assessment Method Calculator

The Applicant requested further clarification in relation to the removal of speckled warbler and brown treecreeper from the Biodiversity Assessment Method Calculator (BAM-C) assessment for the Project. The

following clarification was provided by Biodiversity and Conservation Division (BCD) (via email from the Department):

BAMC – deselection of ecosystem credit species

BCD does not agree with the deselection of the following species:

- ***Speckled Warbler*** *–the description in the TBDC states that typical habitat includes scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Isolated paddock trees found in DNG can be important for this species as they can link remnant foraging habitat. Most foraging takes place on the ground around tussocks and under bushes and trees.*
- ***Brown Treecreeper*** *– the comments in the TBDC (above the habitat constraints) state that suitable foraging habitat includes areas within 100 m of moderate to good condition vegetation of suitable type. Therefore, any DNG within 100 m suitable of suitable foraging habitat should be included within the ecosystem credit calculation.*

Deselection of both species is significant because they have a high sensitivity to potential gain and, therefore, disproportionality impact the ecosystem credit output.

The information referenced by BCD from the Threatened Biodiversity Data Collection (TBDC) (BioNet 2020) is relevant, however, there is also other key information listed in the 'Habitat and Ecology' information tab of the TBDC – Descriptive Text for speckled warbler and brown treecreeper that support the justification for their deselection.

It is important to note that the biodiversity consultant engaged on this Project, Umwelt did not deselect these two species entirely from the online BAM-C assessment for the Project. They remain selected in relation to the vegetation zones (being 1, 2, 3, 5, 6 – 9) recorded for the Project that support habitat for both the species. These habitats include the remnant woodlands and forests as well as the two shrubland variants.

Umwelt reviewed the 'Habitat and Ecology' information tab of the TBDC – Descriptive Text which states "The Speckled Warbler lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies" (BioNet 2020); and the brown treecreeper is "Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest…" (BioNet 2020).

While it is not suggested that these species would never use derived native grasslands, based on the whole profile of these species within the TBDC (BioNet 2020) those vegetation zones would not form 'regular habitat' for the species.

BCD correctly pointed out that both of these species are classed as 'High Sensitivity to Gain' species; however it is contended that the deselection of these species will not disproportionally impact the ecosystem credit for the Project.

The calculation of ecosystem credits within BAM is determined based on the highest sensitivity to gain class for the PCT (OEH 2017). Umwelt have reviewed the BAM-C, which is currently locked (not able to be edited) through the assessment process, and there are at least two other species that are in the same 'High Sensitivity to Gain' class, being the spotted-tailed quoll and the yellow-bellied sheathtail bat. Both species are selected as applicable for the derived native grasslands (Vegetation Zones 4 and 6) which have been deselected for brown treecreeper and speckled warbler.

As there are species with a higher sensitivity to gain class than brown treecreeper and speckled warbler selected as applicable for Vegetation Zones 4 and 6, Umwelt do not believe the ecosystem credit generation has been 'disproportionally impacted' and, in fact, the ecosystem credit generation is unlikely to be affected at all by their selection or deselection.

Umwelt has not been able to test this in the BAMC for the project as the two assessments are currently locked, given they have been submitted. The text in the BAM that supports the position above is in Sections 6.6.1.4 and 11.2.3.3 as well as Equation 1 (OEH 2017).

Irrespective of this position, and to ensure no confusion, Umwelt will update the BAMC to select brown treecreeper and speckled warbler for Vegetation Zones 4 and 6 for the Project. This will be completed in the BDAR for the final Project.

Appendix A: Stakeholder Approval Plan

Stakeholder Approvals Plan

Rye Park Wind Farm
Final Report

Prepared by: GTA Consultants (NSW) Pty Ltd for Rye Park Renewable Energy
on 14/09/2020
Reference: N189120
Issue #: A

GTAconsultants

Stakeholder Approvals Plan

Rye Park Wind Farm
Final Report

Client: Rye Park Renewable Energy

on 14/09/2020

Reference: N189120

Issue #: A

Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	10/09/2020	Final, compiling stakeholder responses received to-date	Zara Abbasi	Brett Maynard	Brett Maynard	

GTAconsultants

Melbourne | Sydney | Brisbane
Adelaide | Perth

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Appendices

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Tables

1. INTRODUCTION

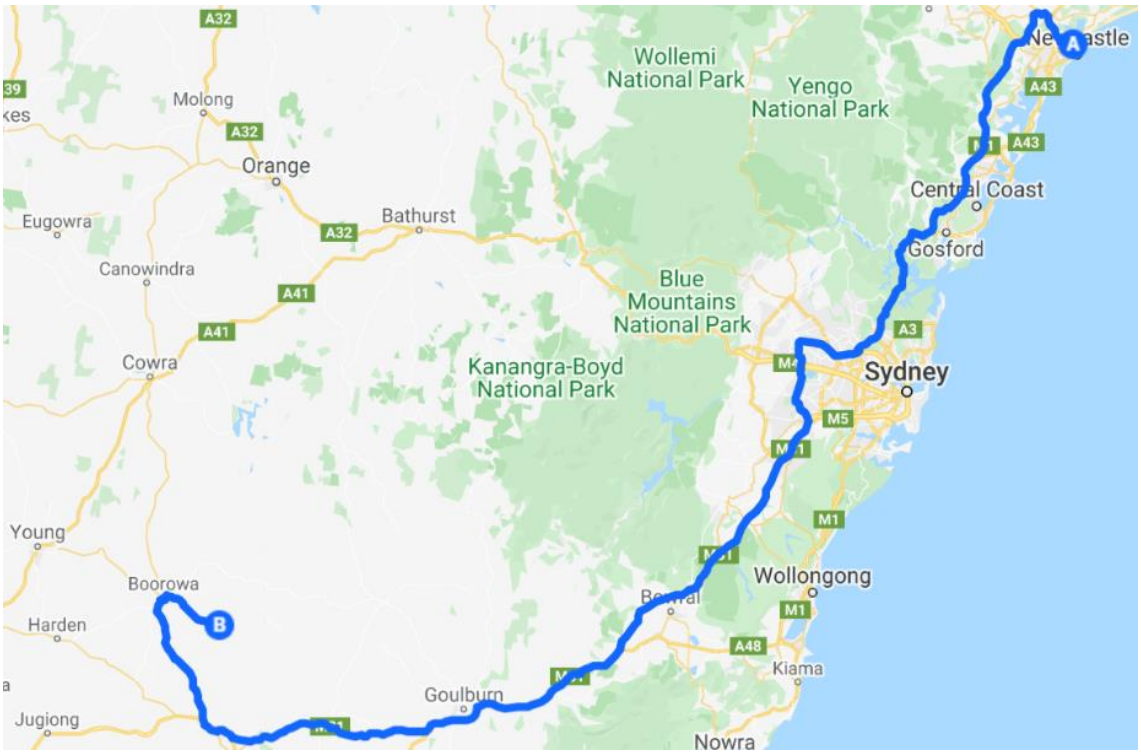
1.1. Background

The Rye Park Wind Farm is an approved $700 million development north of Yass and east of Boorowa near the village of Rye Park. The Rye Park Wind Farm received development consent in May 2017. Since this time, there have been advancements in wind turbine technology and the proponents are intending to submit an application to modify the current development consent to incorporate the use of the latest, most efficient wind turbines on the project.

GTA Consultants (GTA) has been commissioned by Rye Park Renewable Energy, a wholly owned subsidiary of Tilt Renewables to review the three potential over-dimensional (OD) transport routes from a desktop perspective, pinch point analysis and site inspection to inform project planning for the Rye Park Wind Farm project. An important part of the study is to map a stakeholder approval plan, including identification of the different stakeholders and approval processes for each section of the proposed access routes. The three routes are shown Figure 1.1 to Figure 1.3 and comprise the following:

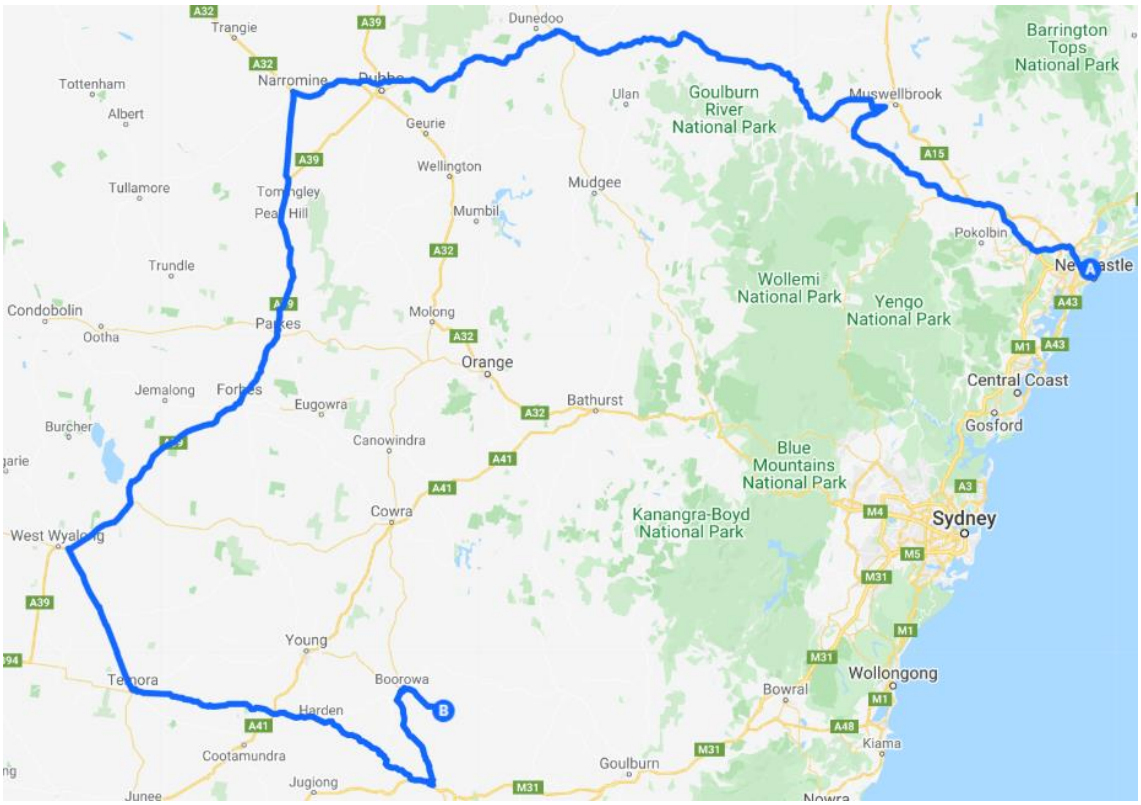
- Newcastle to Rye Park via Sydney for wind blade transport, should the Port of Newcastle be used to receive the wind turbine components
- Newcastle to Rye Park via Muswellbrook for transport of tower sections and other components from the Port of Newcastle, avoiding Sydney and spreading heavy vehicle trips across two routes
- Port Kembla to Rye Park via Goulburn for all OD components, should Port Kembla be used to receive the wind turbine components

Figure 1.1: Route One - Port of Newcastle to Rye Park via Sydney



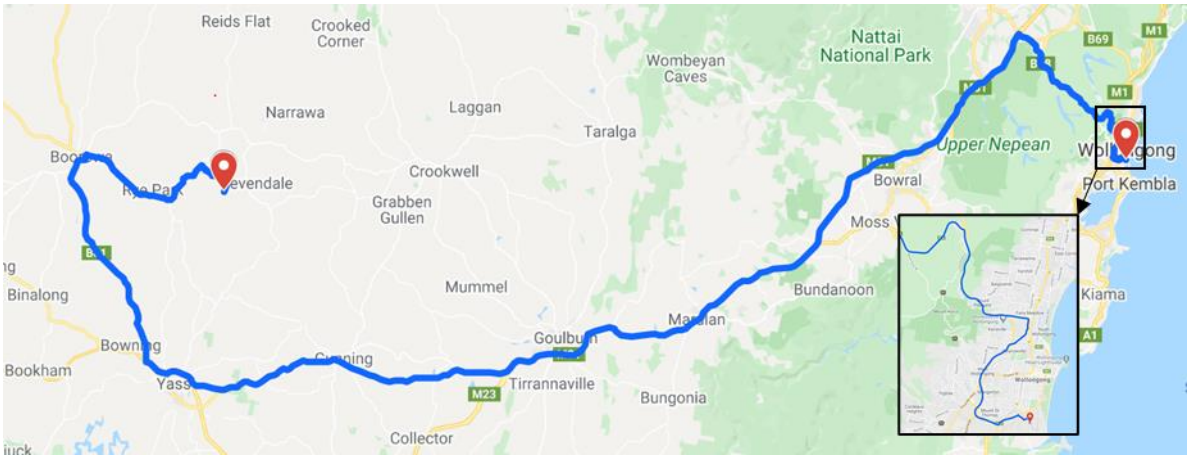
Base map source: Google maps

Figure 1.2: Route Two - Port of Newcastle to Rye Park via Muswellbrook



Base map source: Google maps

Figure 1.3: Route Three - Port Kembla to Rye Park via Goulburn



Base map source: Google maps

1.2. Scope

This report will map out the process of stakeholder approvals and identifies:

- the route, by section and accountable authority
- the class of vehicles that applications need to be made for
- the permit application process and recommendations associated with the approvals process with the relevant road authority
- Local roads that will be used, local council identification and the specific application process
- Arterial roads that will be used within Metropolitan Sydney and the specific application process associated with oversize over mass movements (OSOM)
  recommended submission dates for the relevant permits/ licenses in order to achieve timely approvals.

1.3. Summary

The process of obtaining permission to transport large wind turbine components for Rye Park Wind Farm involves getting approval to access the TfNSW and Council road networks, as well as getting the required permits for road works to facilitate the manoeuvring of OD vehicles and their respective loads. These temporary or permanent road works include the relocation poles or street lighting, temporary or permanent modification of traffic signals, temporary removal of traffic safety barriers and signage, and tree pruning or removal.

The process of gaining approval for oversize and/or overmass vehicles to access the road network is facilitated through the National Heavy Vehicle Regulator (NHVR), for which the permit application process takes up at least 28 days based on NHVR advice. The detail of the process is discussed in 2.4, noting that:

- If there is an issue with the proposed route, the application is refused and needs to be resubmitted
- Early consultation and programming of works with road authorities may allow integration with our road works and/or maintenance activities. Works may also be able to be undertaken by the road authority if appropriate lead time is available, simplifying approval processes and requirements for inspection of completed works.
- Any route modifications that have associated environmental impacts (e.g. new road pavement and tree pruning) need to be addressed through an SSDA Modification. Consultation indicates that such issues have held up previous projects.

The generic process of getting permissions for doing the road works, the approximate required lead times and relevant stakeholders are provided in Section 3, noting that the routes to be used have not yet been agreed yet.

All information has been obtained though telephone and email correspondence with the different stakeholders for each route section, as well as GTA's experience. However, to provide the detailed process and better estimates of lead time for each road modifications are required preparation of a Traffic Management Plan with close collaboration with stakeholders. The plan should define following information:

- Final agreed routes
- Assigned Transport Operator
- Number and duration of trips per routes
- Duration of all trips and timeframe
- Assigned Traffic Management Consultancy

2. ROUTES AND RELEVANT AUTHORITY

2.1. Overview

In this section, each route option is divided into different segments based on road authority via Route Planner suggested by The National Heavy Vehicle Regulator (NHVR).[1]

The following table shows all stakeholders which might be required to be contacted regardless of using which routes. Involvement of each of the utility providers is dependent on the final agreed routes and infrastructure modifications, and will be identified via Council or TfNSW for each route section.

Table 2.1: General stakeholders

Stakeholder	Contact information
ActewAGL	Phone: 13 14 93 Website: www.actewagl.com.au Ebo Energy: 62935770
Telstra	Email: high.loads.Telstra@team.telstra.com Phone: 1800 047 909 Website: www.telstra.com.au Overhead lines
Ausgrid Energy	phone: 13 13 65 Website: www.ausgrid.com.au Sydney, Central Coast and Hunter NSW regions
Endeavour Energy	Phone: 13 10 81 Website: www.endeavourenergy.com.au Northern, Central, Southern NSW
Essential Energy	Email: high.load.permit@essentialenergy.com.au Phone: (02) 6933 5823 Website: www.essentialenergy.com.au Open the 'Quick Links' drop down on the right hand side and click on "High Load Permits" to Apply for a High Load Approval online.
Grain and Oilseed Supply Chain Australia Cargill	Ron Game phone: 02 4920 0175 office: 02 4920 0100 mobile: 0407 215 633 fax: 02 4928 4081 Address: 51 Raven Street, Kooragang Island NSW 2304 Email: Ron_game@cargill.com

[1] https://www.nhvr.gov.au/road-access/route-planner

Stakeholder	Contact information
New South Wales Police	NSW Police Traffic and Highway Patrol Command Email: trafficosom@police.nsw.gov.au Phone: (02) 8882 1436 Website: www.police.nsw.gov.au In the search bar type "transport escort service" A minimum of 5 working days is required for police notification and/or organisation of police resources.
TransGrid	Metropolitan: (02) 9620 0777 Orange: (02) 6360 8711 Newcastle: (02) 4967 8678 Tamworth: (02) 6765 1666 Wagga: (02) 6922 0222 Yass: (02) 6226 9666 Website: www.transgrid.com.au
V/Line Corporation	Email: Rupert.Capper@vline.com.au Phone: (03) 9619 5015 Mobile: 0407 300 210 Website: www.vline.com.au

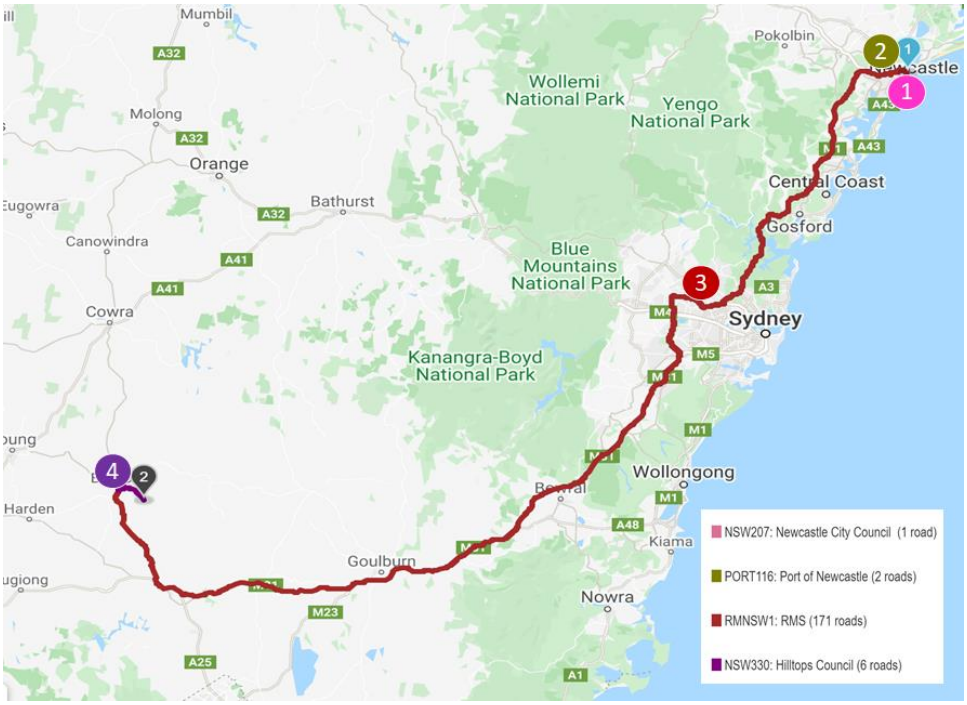
2.2. Route Section and Accountable Authorities

This section steps through each route and outlines the relevant road authorities and contact details. Affected private landowners have not been include as these will be addressed separately by Tilt Renewables.

2.2.1. Route One - Port of Newcastle to Rye Park via Sydney

Figure 2.1 shows the relevant road authorities along the route, with relevant contact details provided in Table 2.1.

Figure 2.1: Route One - 488 km or 5 h 26 min



Source: https://www.nhvr.gov.au/road-access/route-planner

ROUTES AND RELEVANT AUTHORITY

Table 2.1: Route One sections and the accountable authority

Route section	Stakeholder	Contact person	Contact information
1	Newcastle City Council	Traffic Team	+61 4974 2000 mail@ncc.nsw.gov.au
2	Port of Newcastle	Rebecca Jones Christine Hanckel	+61 49088209 induction@portofnewcastle.com.au
		Daniel Miles	+61 427 959 965 daniel.miles@portofnewcastle.com.au
3	TfNSW (Roads and Maritime Services)	Maurice Morgan	maurice.morgan@transport.nsw.gov.au
4	Hilltops Council	Iain Rice	iain.rice@hilltops.nsw.gov.au
M7	Westlink M7	Westlink M7	access@m7.com.au

For loads with the following specifications, the following process is required for access to the M7 Motorway:

- Height > 5.2m and/or
- Width >= 4.3m and/or
- Total Mass > 150t

Step 1: Transport companies are to register with Westlink M7 (one time only) by emailing the following information to access@m7.com.au to obtain a username and password for use in the Permitted website:

- Company/ entity name
- Company ABN

Step 2: Once Transport company details (above) are received, M7 will issue an email back confirming the update into the Permitted access system; with company username and password for accessing the system.

Step 3: Transport company to log into the Permitted portal (www.permitted.com.au/main.php) and use the 'Heavy Vehicle' TAB to apply for an Access Request.

Step 4: Details to include in the Permitted Access Request:

- start and end date of travel on M7 (including estimated times on M7)
- route on M7 (on and off)
- dimensions of load (height/ width/ mass)
- contact details

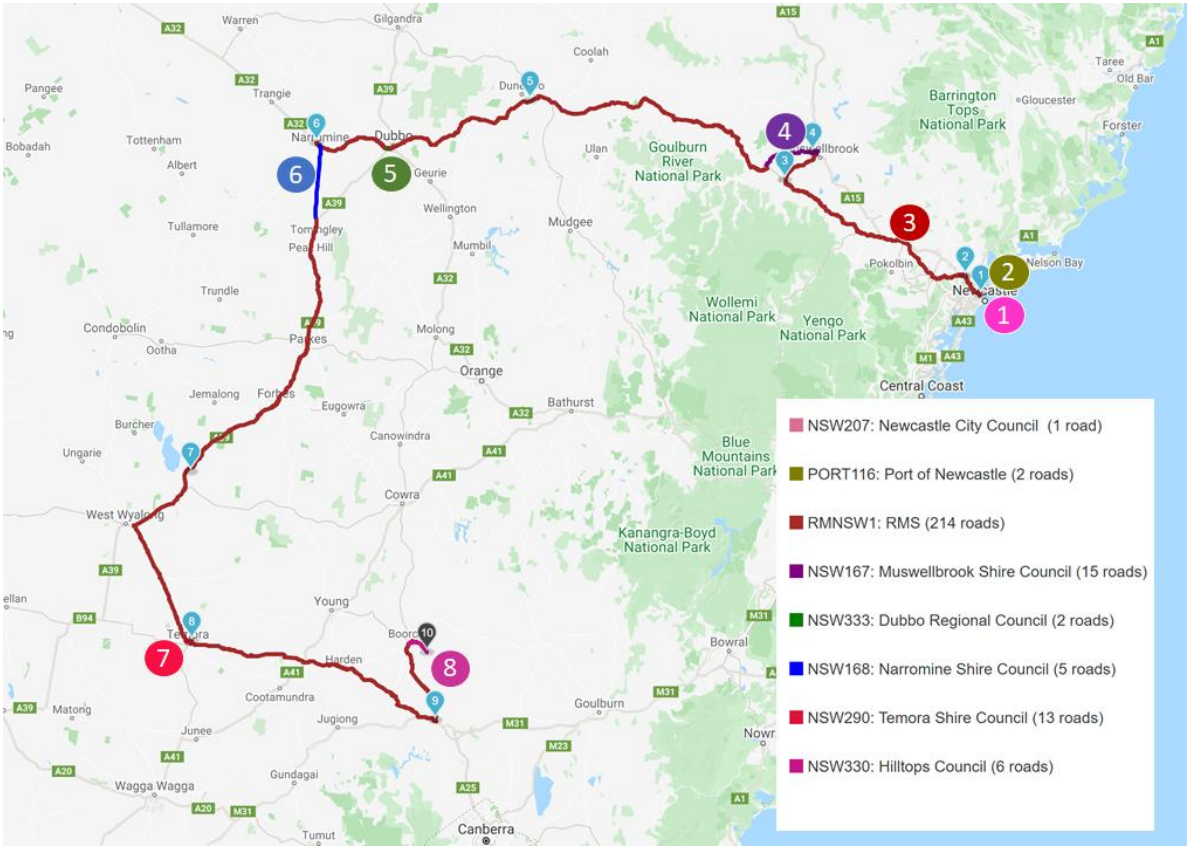
Westlink M7 will then contact the nominated contact person to coordinate the movement on the Motorway. The process takes 5 business days for reviewing the documentation and issuing the permit.

2.2.2. Route Two - Port of Newcastle to Rye Park via Muswellbrook

Figure 2.2 shows the relevant road authorities along the route, with relevant contact details provided in Table 2.2.

Consultation with Narromine Shire Council indicates that Tomingley Road within the Narromine LGA (section 6) is not appropriate as an OSOM route. Therefore, Route 2 will require modification of this basis. Council has recommended that OD transport is undertaken via the Newell Highway.

Figure 2.2: Route Two - 965 km or 13 h 30 min



Source: https://www.nhvr.gov.au/road-access/route-planner

Table 2.2: Route Two sections and the accountable authority

Route section	Stakeholder	Contact person	Contact information
1	Newcastle City Council	Traffic Team	(02) 4974 2000 mail@ncc.nsw.gov.au
2	Port of Newcastle	Rebecca Jones Christine Hanckel	(02) 49088209 induction@portofnewcastle.com.au
8	Hilltops Council	Iain Rice Development and Traffic Officer	iain.rice@hilltops.nsw.gov.au
3	TfNSW (Roads and Maritime Services)	Maurice Morgan	maurice.morgan@transport.nsw.gov.au
4	Muswellbrook Shire Council	Elizabeth Curnow	(02) 428 168 078 elizabeth.curnow@muswellbrook.nsw.gov.au
6	Narromine Shire Council	Jordan Richardson	(02) 6889 9999 mail@narromine.nsw.gov.au
5	Dubbo Regional Council	Traffic Team	council@dubbo.nsw.gov.au
7	Temora Shire Council	Rob Fisher	0418 510 119 rfisher@temora.nsw.gov.au

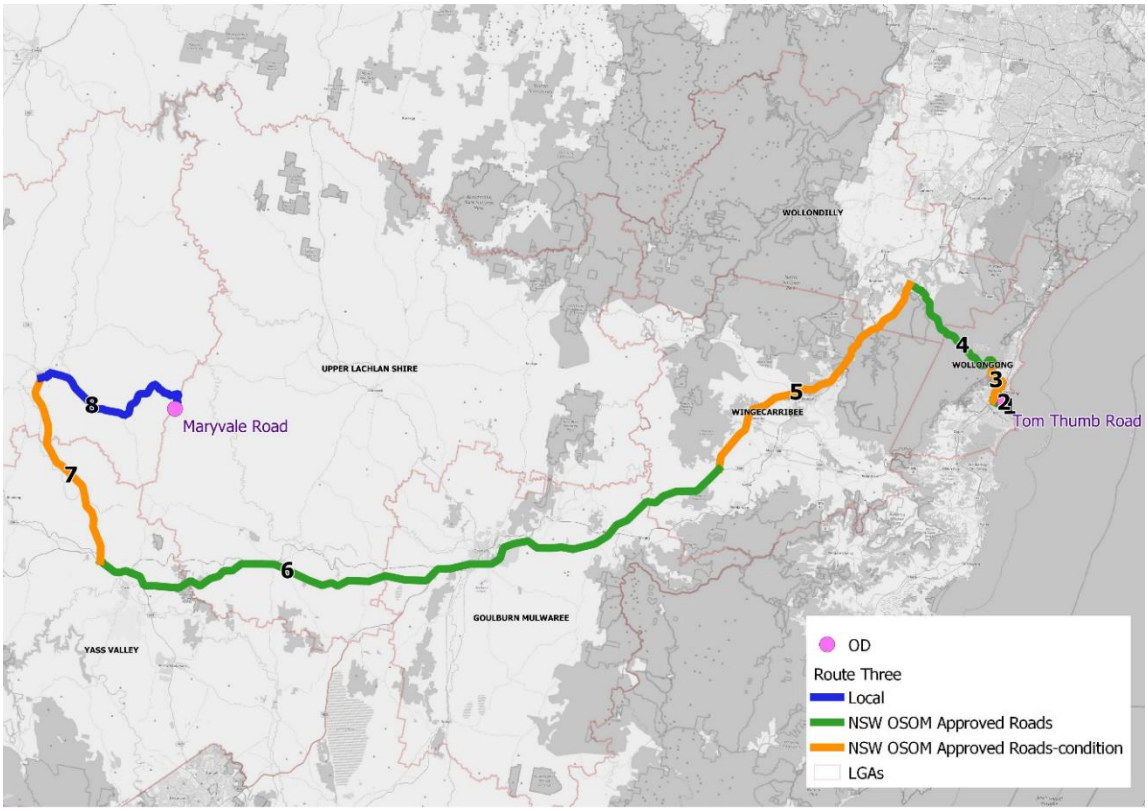
Muswellbrook Shire Council has special conditions for travelling on Wybong Road. Access to this route for OSOM vehicles requires a separate specific permission from Council, known as a Road Use Approval Application, which is included in Appendix B. The special conditions are as follows:

- *Inform the exact time of the transport to Council's Technical Officer Roads & Drainage, on the morning of the proposed date of the transport who will arrange somebody to observe the load as it travels Wybong Road.*
- *Loads travel no more than 10km/h over bridge structures.*
- *The load travels outside of school bus times 7:30 to 9:00 AM and 3:00 to 5 PM on Wybong Road.*
- *The applicant takes full responsibility for all damage to Council assets and will repair such damage within an agreed time frame. Note: Council reserves the right to repair the damage itself if necessary for public safety and charge costs to the applicant.*
- *This approval is not valid without your return agreement to the above conditions and permit issued.*
- *Maximum axle mass limits and the total mass limits in this permit shall be automatically suspended or decreased in the event of heavy or prolonged rain affecting the route used, as directed by the road authority (Muswellbrook Shire Council).*

2.2.3. Route Three - Port Kembla to Rye Park via Goulburn

Figure 2.3 compiles the different sections of Route Three based on the NSW Over Size Over Mass Load Carrying Vehicles Network map[2]. Section 1 and 8 are local roads. Sections 4 and 6 are approved TfNSW roads, along with Routes 5 and 6 for which travel conditions exist. Sections 1, 8 and 9 required approval from Wollongong City Council, Hilltops Council and Upper Lachlan Shire Council respectively. The relevant contact details provided in Table 2.3.

Figure 2.3: Route Three - 331 km or 4 h 13 min



Source: GTA

Table 2.3: Route Three sections and the accountable authority

Route section	Stakeholder	Contact person	Contact information
1	Wollongong City Council/ Port Kembla	Lindsay Dunstan Wayne Ashton	(02) 4908 8209 ldunstan @wollongong.nsw.gov.au 0417 217 274 wayne.ashton@nswports.com
8	Hilltops Council	Iain Rice Development and Traffic Officer	iain.rice@hilltops.nsw.gov.au
2,3,4,5,6,7	TfNSW (Roads and Maritime Services)	Maurice Morgan	maurice.morgan@transport.nsw.gov.au

[2] https://www.rms.nsw.gov.au/business-industry/heavy-vehicles/maps/nsw-load-carrying-network/map/index.html

2.3. Class of Vehicle

The heaviest component is a nacelle with dimensions 14.7l x 4.7w x 3.5h x 98.0T. When adding the weight of the prime mover with 10 x 8 platform trailer and back up prime mover, the total dimensions become the following: Vehicle + Nacelles: 40.0l x 4.7w x 5.0h x 164.5T

The dimensions and weight for each component are as follows:

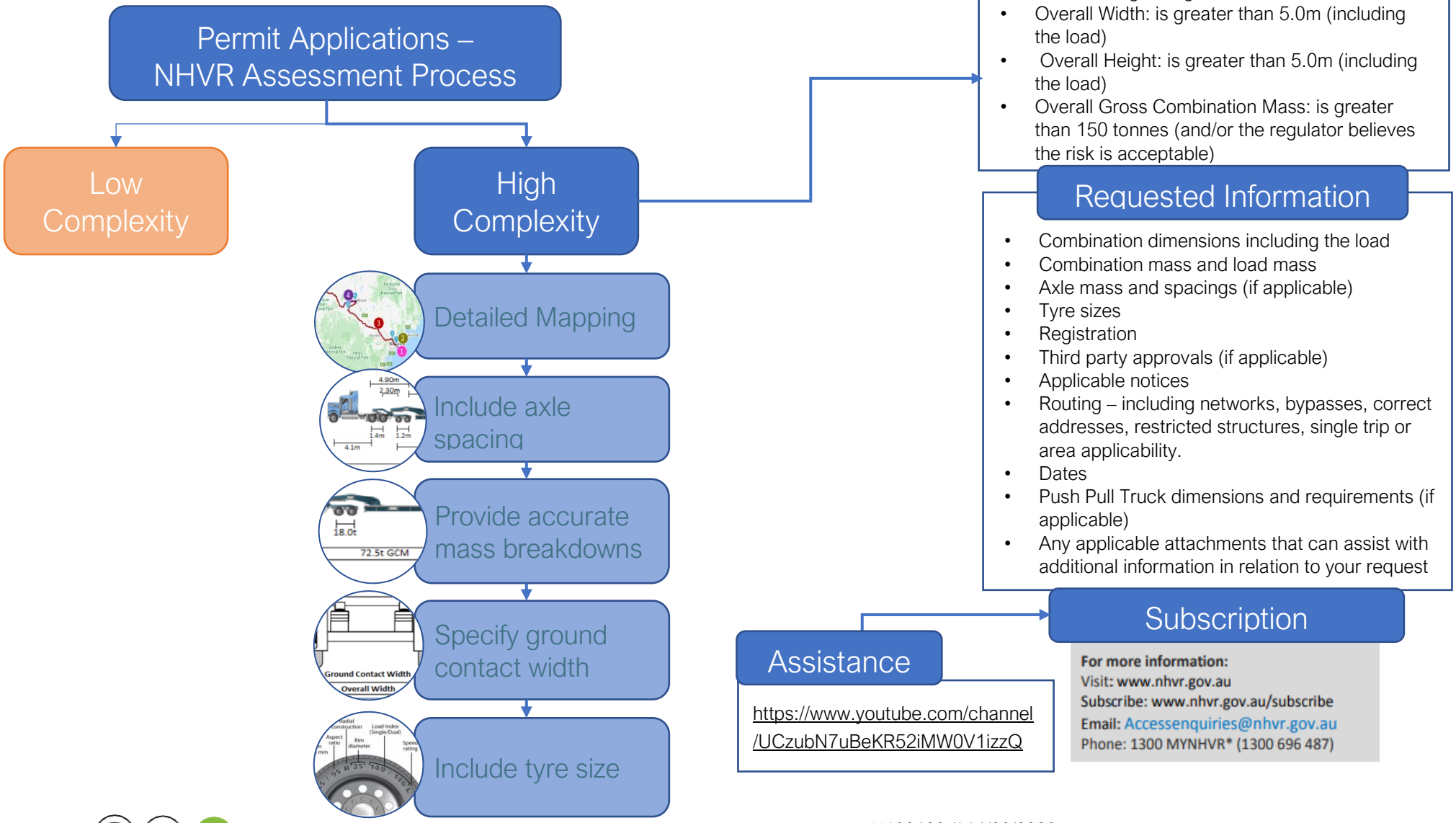
- Nacelles: 14.7l x 4.7w x 3.5h x 98.0T
- Drive trains: 6.7l x 3.2w x 2.3h x 76.3T
- Hubs: 4.6l x 4.2w x 4.0h x 54.9T
- Wind blades: 83.5l x 4.78w x 3.5h x 30.5T
- Wind blade towers (the tower is broken into five sections):
    - Section 1 – 13.5l x 4.7w x 4.7h x 85T
    - Section 2 – 18.2l x 4.7w x 4.4h x 85T
    - Section 3 – 23.7l x 4.45w x 4.45h x 85T
    - Section 4 – 27.0l x 4.45w x 3.6h x 75T
    - Section 5 – 29.9l x 3.6w x 3.4h x 66T.

2.4. Access Permit Application Process

The permit application process is outlined in Figure 2.4. The National Heavy Vehicle Regulator will facilitate permit applications with Road Managers across TfNSW Special Permits Unit, Local Councils and Toll Road Operators.

The National Heavy Vehicle Regulator has advised that the process will take at least 28 days for the permit process. NHVR will contact all relevant stakeholders to review the submission materials and provide any comments and contents are required within 28 days. It should be noted that if any stakeholders require further reviews and/or time, the stakeholder can request an extension of the initial 28-day period to a maximum 6 months.

Figure 2.4: Permit Application Process



3. ROAD WORKS PERMIT PROCESS

3.1. Overview

Any temporary or permanent road works, modification to road furniture or work within the road reserve are required to be discussed, approved and organised with the relevant road authority prior to implementation. Approvals for both the design and implementation of these works generally fall under Section 138 (Works and Structures) of the Roads Act 1993; the key part of which is reproduced below:

> *(1) A person must not:*
>
> *(a) erect a structure or carry out a work in, on or over a public road, or*
>
> *(b) dig up or disturb the surface of a public road, or*
>
> *(c) remove or interfere with a structure, work or tree on a public road, or*
>
> *(d) pump water into a public road from any land adjoining the road, or*
>
> *(e) connect a road (whether public or private) to a classified road,*
>
> *otherwise than with the consent of the appropriate roads authority.*

As such, whether the information from councils as detailed in the remainder of this section specifically refers to a Section 138 application/ permit/ approval or not, this is the basis upon which such approvals must be sought.

The relevant road authority and key contact person(s) for each OD route section has been identified, and permit process for each general type of modification discussed with the relevant contact person. The following tables show the contact details of each stakeholder, type of modifications required for the stakeholder, permit process and the approximate lead time for review and approval. These lead times do not include construction/ implementation timeframes.

City of Newcastle (Route 1 and 2)

Table 3.1: City of Newcastle contact details

Name and position	Contact details
Akshay Mahager Traffic Engineer- Asset Management Team	02 4974 2660 traffic@ncc.nsw.gov.au

Table 3.2: Type of modifications and permit process

Type of modification	Permit type	Lead time	Note
Encroachment onto road verge and lot boundary	The evidence of approval from private landowner is required to be submitted by Tilt Renewables	One week maximum to review the evidence as part of traffic management plan	Any encroachment on private property requires consent from the respective landowners
Temporary removal of traffic sign(s)	an NHVR application with the traffic management plan	At least 28 days to get the approval for the NHVR permit and traffic management plan	All road works should be done via a qualified contractor or by Council via chargeable rates. A supervisor from Council is required to check the implementation.
Removal/ replacement of light and utility pole(s)	Lighting plan and back-up plan are required	At least one month including one week contingency. If any detailed lighting/ cabling design is required, recommend allowing 3 months (GTA comment)	

Hilltops Council (Route 1 and 2)

Table 3.3: Hilltops Council contact details

Name and position	Contact details
Iain Rice Development and Traffic Manager	02 6384 2503 Iain.rice@hilltops.nsw.gov.au

Table 3.4: Type of modifications and permit process

Type of modification	Permit type	Lead time	Note
Tree removal	Biodiversity impacts report required. This report will be part of State Significant Development which is required to be approved by Department of Environment, Planning and Industry	Will be assessed by Council town planning team during the 28-day NHVR request period and consent provided if required.	The 28 days might be requested by Council to be extended to up to 6 months
Encroachment onto road verge or lot boundary	All road works and road upgrades will be identified and agreed during the 28 days framework and Tilt Renewables is required to complete Works Within Road Reserve Application (Section 138 Council form) which will be companied with an Engineering Design Plan for Council to review and approve.	Minimum 3 weeks following NHVR permit approval, longer if comments and re-submission of plans etc. required. All works to be managed by Tilt Renewables.	As the project is SSD, the Traffic Committee will not be involved for approval of road upgrades

Muswellbrook Shire Council (Route 2)

Table 3.5: Muswellbrook Shire Council contact details

Name and position	Contact details
Elizabeth Curnow Asset Inspector Roads and Drainage	+61 6549 3725 elizabeth.curnow@muswellbrook.nsw.gov.au

Table 3.6: Type of modifications and permit process

Type of modification	Permit type	Lead time	Note
Use of Wybong Road	Road Use Approval Application	At least 10 days for approval	These conditions have to be agreed prior to any permits for travel being approved. A copy of the conditions is attached in Appendix B for consideration and action. Fee: Observation fee $343 plus $335 Overtime fee (if applicable).
Pruning of tree(s)	Section 138 (available on Council's website)	At least 10 days for approval	Council does the tree trimming on an as needed basis or as Service Request. A request can be submitted to Council to inspect and undertake the trimming. However, depending on how quickly the works are required, Tilt Renewables may need to engage a contractor to do the work. In order to do the work, the contractor would need to submit to Council: • A S138 application detailing specifically the activity Tilt Renewables is proposing to undertake e.g. if it is tree trimming location of tree, clearance to be trimmed etc. • As this activity would involve the disturbance of vegetation it will need to be supported by a Review of Environmental Factors and Traffic Management Plan • The contractor is required to have Current Public Liability Insurance for no less than $20,000,000 • Works cannot be undertaken until the permit is approved and issued.

Narromine Shire Council (Route 2)

Table 3.7: Narromine Shire Council contact details

Name and position	Contact details
Jordan Richardson Manager Engineering Services	02 6889 9999 jrichardson@narromine.nsw.gov.au

Table 3.8: Type of modifications and permit process

Type of modification	Permit type	Lead time	Note
Temporary removal of existing sign along Tomingley Road	Request via the NHVR permit process	Depends on the type of sign, at the discretion of the engineering team. If approval from Traffic Committee is required, it would take from 8 weeks to 10 weeks If it does not require Traffic Committee approval it would take between one to two weeks	Tomingley Road is not a suitable OSOM route. Council recommended that OD transport is undertaken via the Newell Highway.
Encroachment onto road verge along northern edge of Tomingley Road	Section 138- Road Work Application	One to two weeks	

Temora Shire Council (Route 2)

Table 3.9: Temora Shire Council contact details

Name and position	Contact details
Rob Fisher Engineering Technical Manager	02 6980 1107 rfisher@temora.nsw.gov.au

Council advised that traffic signals have been recently installed at Waratah Street/ Burley Griffin Way intersection, which is not shown in google maps. Council advised the traffic lights can be temporarily removed for the transport of turbine components as the traffic volumes are not considerable at this location.

Table 3.10: Type of modifications and permit process

Type of modification	Permit type	Lead time	Note
Encroachment onto road verge	No specific separate approval required- it can be done as the result of Council's consent to NHVR permit	One week to 2 months after NHVR permit approved.	Council could make modifications for a fee (hourly rate is around $140/h (2 staff and a vehicle). If contractor is used for modifications (encouraged), Council can give approval. Any permanent damage from OD transport (say concrete median damage) would need to be made good.
Temporary removal of concrete island or sign	No specific separate approval required- it can be done as the result of Council's consent to NHVR permit	All arrangements can be made in less than one week	As Council roads have low traffic volumes, all temporary removal and changes to road infrastructure can be done before, and repair/ reinstatement after, all OD transport movements are completed. Contractor is required to have Public Liability Insurance for no less than $20,000,000

Ports NSW (Route 3)

Table 3.11: Ports NSW contact details

Name and position	Contact details
Lana Howell	0417 069 358 Lana.Howell@nswports.com.au

Based discussions with Ports NSW, the majority of the identified road works for Rye Park Wind Farm may not be required as the Port is undertaking some road works on Tom Thumb Road to be able to cater for similar size vehicles for other projects.

It is recommended to contact Ports NSW to update the required road works before preparing the detailed Transport Management Plan and NHVR application as it relates to encroachment into the lot boundary along the northern and southern sides of Tom Thumb Road and the western edge of Tom Thumb Road.

Table 3.12: Type of modifications and permit process

Type of modification	Permit type	Lead time	Note
Temporary removal of existing sign	Approval via NHVR permit A transport contractor is required contacting the Ports NSW and have the sign sleeved for temporary removal.	Maximum 8 weeks	Temporary removal is performed by the transport contractor each trip
Temporary light pole along southern edge of Tom Thumb Road	There are two types of pole lights including those are under electricity provider's and the Port's authority. However, Ports NSW will arrange the road work permissions within the Ports NSW Land. If it is under council authority, a lighting plan and back-up poles are required.	Maximum 12 Weeks	This task is performed by the transport contractor for each trip
Encroachment into lot boundary along northern and southern sides of Tom Thumb Road and western edge of Tom Thumb Road	As the land is owned by Wollongong Council and Ports NSW, lodgement of Section 138 applications is required which include detailed road design drawings	Maximum 12 Weeks	Ports NSW are working with Cardno to provide plans and survey of this area. The plan and survey work deals with tree removal to facilitate delivery without removing RMS traffic signal assets). Ports NSW expect this work to be undertaken by the end of October 2020, which will allow them to go to Council with the proposal, which will be subject to their approval.

Transport for NSW

Table 2.1 provides the relevant TfNSW Oversize Overmass road access contact details related to each region, as each of these three routes operate with different TfNSW regions.

Table 3.13: TfNSW contact details

Stakeholder	Contact Details
Road Access Manager (all regions)	Scott Brown, Oversize and Overmass Access Manager Operations Regional and Outer Metropolitan 02 6732 9142 0429 505 274 Scott.BROWN@transport.nsw.gov.au
Land Use Assessment (Western region)	Ainsley Bruem, A/Manager, Land Use Assessments, Community & Place 02 6861 1449 0408 571 088 ainsley.bruem@transport.nsw.gov.au
Development Assessment (Western region)	Maurice Morgan, Development Assessment Officer 02 6937 1611 0428 471 824 Maurice.MORGAN@rms.nsw.gov.au
Network Operations (North region- Hunter region)	Bruce Kimber, Senior Traffic Operations Officer – Hunter 02 4908 7859 operations.hunter@rms.nsw.gov.au
Maintenance (North region- Hunter region)	Stewart Frame Stewart.FRAME@transport.nsw.gov.au John Francis John.FRANCIS@transport.nsw.gov.au Luke Skelton Luke.Skelton2@transport.nsw.gov.au Downer Mouchel (ITS Faults) faults@downermouchel.com
Traffic Facilities (North region- Hunter region)	Khan Pussegoda 0413 008 690 khan.pussegoda@transport.nsw.gov.au
Regional Infrastructure Services	David Howe David.HOWE@transport.nsw.gov.au Adam Mckenzie Adam.MCKENZIE@transport.nsw.gov.au
Camera Networks	Helen Hartley Helen.HARTLEY@transport.nsw.gov.au

The process and lead time required for getting approval of undertaking some of the main road works provided below. The road modification process and timeframe required have been discussed with TfNSW Hunter Region. It is expected that all regions have a similar generic process for review and providing the required approvals, given the complexity of the type of modifications.

Based on the consultation to-date and GTA's experience, the most important part of the infrastructure changes would be modifications to traffic signals, which would require a longer lead time to obtain approvals (in the order of 4 to 8 months).

As the number of trips and the length of time required to complete all trips have not finalised yet, providing the exact process and expected lead times is challenging, with all stakeholders requesting more specific details.

Table 3.14 details each road modification, stakeholders involved and the approximate required lead time.

Table 3.14: Type of modifications and permit process

Type of modification	TfNSW department to contact	Permit type required	Lead time (approximate)	Note
Removal of tree(s) or Pruning of tree(s)	TfNSW Maintenance	Pending	Pending	Relatively straight forward if addressed by EIS, significantly more problematic if impacts are beyond SSD approvals
Temporary or permanent modification to traffic sign(s), relocation of traffic signal components	TfNSW Traffic Facilities	Works Authorisation Deed (WAD) process for State roads Traffic staging plan and/or TCS design plan	At least 4 to 6 months (traffic signal modifications)	Use of proposed routes by other OSOM vehicles required when considering modifications (e.g. use by other over-height vehicles may reduce feasibility of mast-arm traffic signals). The WAD process can involve multiple design reviews and a road safety audit, depending on the extent/ complexity of works
Road pavement modifications/ widening	Land Use Assessment/ Development Assessment	Works Authorisation Deed (WAD) process for State roads Detailed civil design plans	Between 2 and 4 months (GTA estimate)	As above
Removal of light pole(s)	TfNSW Maintenance or provider (Essential Energy)	Formal request including the final routes to identify assess owner	Between 2 and 4 months	TfNSW would require 1 month to organise a removal of a lighting asset. This includes 2 weeks to ensure the ROL is received, 1 week to organise the plant and crew to do the works, and 1 week as a contingency
Relocation of utility pole(s)	Relevant Utility Company	Pending	3 months (GTA estimate)	Temporary removal of utility poles not expected to be feasible. Standard application via Level 3 electrical designer anticipated. Timing and requirements dependent on location and complexity (e.g. re-stringing required, impacts of associated power outage)
Temporary removal of traffic safety barrier(s)	Downer Mouchel ITS Faults TfNSW Regional Infrastructure Services	Traffic Management Plan	Between 2 months and 4 months	Dependent on complexity and whether removal has occurred previously.
Temporary relocation of speed camera	TfNSW Camera Networks	Pending	3 months (GTA estimate)	Given siting and calibration requirements, it may be more practical to remove and store for the duration of OSOM movements.

TfNSW Traffic Facilities advised that temporary relocate/removal of traffic lights might not be cost effective and feasible due to approximate number of trips and time duration required to transport all components. Therefore, further detailed discussions with TfNSW Traffic Facilities and Network Operations teams in each region will be required to obtain an in-principle agreement on the appropriate solution. A staging plan and Traffic Control Signal (TCS) design plan are required to be submitted for each set of traffic signals requiring modification.

Once in-principle design approval has been obtained for works on State roads (e.g. traffic signal or road pavement modifications), a Works Authorisation Deed (WAD) will need to be signed with TfNSW in order to commence the detailed design and construction approvals process, with all works carried out by prequalified contractors to TfNSW specifications.

Where works are proposed on Regional roads, local councils typically have operational control in rural areas. The typical Section 138 Approvals process can be followed in this instance, as required by the specific council, with TfNSW providing concurrence through a referral process.

For any road pavement works, the sourcing of materials and the availability of suitable contractors should be considered, as this can have a significant impact on cost and timing of works. Any opportunity to tie into other works contracts in the broader area should be considered (TfNSW or council).

4. RECOMMENDATIONS

4.1. Overview

The longest lead time is the stakeholder engagement to permanently modify road infrastructure on State roads. To this end, GTA recommends:

- Finalise the route(s) to be used and load specifications, as well as number of trips, duration of trips and approximate start date.
- Investigate the opportunity to share the burden of OD vehicle movements across several transport routes, in order to best manage community impacts.
- Engage with councils during finalisation of route(s) to make sure all identified routes are suitable. For example, Tomingley Road within route two is apparently not suitable for OD vehicle movements.
- Firm up details of required route modifications and prepare preliminary design plans where possible.
- Consider the extent of temporary traffic management required for OD vehicle movements in conjunction with route modifications, balancing overall costs and community impacts.
- Engage with TfNSW Land Use Assessment for each region and discuss the details of any road works in order to receive more specific feedback on the acceptability of solutions, required approvals and associated timing.
- Prepare the Traffic Management Plan in close consultation with identified contact persons from TfNSW, Local Government, Ports NSW and utility providers.
- Engage with TfNSW and the councils to discuss how road works can be best implemented/ constructed.
- Maintain contact with Ports NSW for information on enabling road works that may be completed by others, to the benefit of the project.

In order to mitigate risks with approvals and licences required to transport Rye Park Wind Farm components, it is recommended that stakeholders are engaged to facilitate an easier pathway when the Transport Operator applies for the road access permits.

Proactive stakeholder management will be essential and clear accountabilities to mitigate any stakeholder risks:

- The Transport Operator will need to demonstrate that the vehicles are approved for the loads
- The Transport Operator will be required to apply for the road access permits, which requires a minimum 28 days.
- The process of getting NHVR permits can be extended from the minimum 28 days to a maximum of 6 months based at stakeholders' requests. To avoid this, early engagement with stakeholders is recommended.

4.2. Recommended Timeline for Relevant Permits/ Approvals

As summarised in Table 4.1, the NHVR road access approvals take minimum 28 days, however to achieve the minimum timeframe a common understanding of the issues at hand with each authority and proposed treatments is required. Approval for route modifications could feasibly take up to six months, as summarised in Table 4.2, with construction timeframes for any permanent modifications subsequent to these approvals and specific to the works required and location.

GTA recommends a conservative approach to managing stakeholder matters and recommends that detailed road network stakeholder engagement commences at least 12 months prior to the transport of wind farm components commencing.

Table 4.1: Lead time for permits and licences

Stakeholder	Approval required	Lead time
National Heavy Vehicle Regulator	Access permit to use roads.	Minimum 28 days to 6 months
Toll Road Operator	Road Manager permission to take OSOM loads through the NorthConnex/M2/M7	Dependent on the loads are proposed and any assessment required (minimum 5 business days)

Table 4.2: Lead time for changes to infrastructure

Stakeholder	Approval required	Typical Lead time (excluding construction works)
TfNSW	Various, incl. Section 138 Approvals and WAD process	Two to six months
Ports NSW	Authority-specific	Maximum 12 weeks
Local Roads	Various, incl. Section 138 Approvals	One to 10 weeks

A.STAKEHOLDER CONSULTATION RECORD

A

Email issued 16 June 2020 – Special Permits Unit, Transport for NSW

Dear Special Permits Unit

Thank you for your assistance in progressing our understanding further for transporting large and heavy equipment along 3 origin destination routes for OSOM transport. We would be most appreciative of an officer that we could have a telephone conversation with or Teams video meeting with to understand how we navigate through some of the challenges that this transport task poses. We are particularly concerned with understanding any constraints with regards to Pennant Hills Road and Northconnex and also more broadly across the 3 OD routes detailed below.

In response to the questions being asked by Special Permits Unit, we provide the following responses noting that we are yet to have detail of axel masses – at this stage we have indicative load information. We hope this is sufficient to progress the conversation.

In response to the questions being asked by Special Permits Unit, we provide the following responses noting that we are yet to have detail of axel masses – at this stage we have indicative load information. We hope this is sufficient to progress the conversation.

2. What is being carried

   Our client is planning on constructing and operating a windfarm. The components required for transportation include nacelles, drive trains, hubs, wind blades and the wind blade towers.

3. Requested dimensions

   Largest and heaviest dimensions including prime mover: The heaviest component is a nacelle with dimensions 14.7l x 4.7w x 3.5h x 98.0T. When adding the weight of the Prime mover with 10 x 8 platform trailer and back up prime mover the total dimensions become Vehicle + Nacelles: 40.0l x 4.7w x 5.0h x 164.5T

   The dimension for each component are as follows:

- Nacelles: 14.7l x 4.7w x 3.5h x 98.0T
- Drive trains: 6.7l x 3.2w x 2.3h x 76.3T
- Hubs: 4.6l x 4.2w x 4.0h x 54.9T
- Wind blades: 83.5l x 4.78w x 3.5h x 30.5T
- Wind blade towers (the tower is broken into five section)
    - Section 1 – 13.5l x 4.7w x 4.7h x 85T
    - Section 2 – 18.2l x 4.7w x 4.4h x 85T
    - Section 3 – 23.7l x 4.45w x 4.45h x 85T
    - Section 4 – 27.0l x 4.45w x 3.6h x 75T
    - Section 5 – 29.9l x 3.6w x 3.4h x 66T

4. Details of combination (eg. Prime mover + 2x8 dolly + 4x8 low loader)

The following transport combinations will be utilised for each component:

- Nacelles: Prime mover with 10 x 8 platform trailer and back up prime mover
- Drive trains: Prime mover with 2x8 – 5x8 low loader
- Hubs: Prime mover with 2x8 – 4x8 low loader
- Wind blades:

  Option 1 – Prime mover with 2x8 low dolly and 3x4 extendable blade trailers

  Option 2 – Prime mover with 1x4 dolly/bookend and 3x4 extendable blade trailers
- Wind blade towers:
  - Section 1 and 2 – Prime mover with 3x8 – 4x8 bookend trailer
  - Section 3 – Prime mover with low 8x8 extending platform trailer
  - Section 4 – Prime mover with 3x8 – 3x8 extending platform trailer
  - Section 5 – Prime mover with 4x4 – 3x8 dolly and jinker.

5. Axle masses and overall mass being requested.

While we do not have the axle mass detail just yet, we do have the overall masses for each vehicle with the corresponding component are as follows:

- Vehicle + Nacelles: 40.0l x 4.7w x 5.0h x 164.5T
- Vehicle + Drive trains: 30.0l x 4.2w x 9.9h 112T
- Vehicle + Hubs: 28.0l x 4.7w x 5.1h x 105.5T
- Vehicle + Blades: 95.0l x 4.7w x 5.2h x 76.5T
- Vehicle + Wind blade tower
  - Vehicle + Section 1 – 36.0l x 4.7w x 5.2h x 126.5T
  - Vehicle + Section 2 – 42.0l x 4.7w x 5.2h X 126.5T
  - Vehicle + Section 3 – 35.0l x 4.5w x 5.2h x 128.5T
  - Vehicle + Section 4 – 39.0l x 4.5w x 5.2h x 118.5T
  - Vehicle + Section 5 – 42.0l x 4.3w x 5.2h x 102.5T

B.PERMIT FORMS

B

Road Use Approval Application

Applicant:
Roads: Wybong Road

This approval relates only to Class 1 Special Permit No.
In accordance with RMS documentation referenced below Council approves the use of Council's abovementioned roads subject to the following conditions:

1. **Inform the exact time of the transport to Council's Technical Officer Roads & Drainage, Mr Russell Fitzgerald on 0418 110 010 or Mrs Elizabeth Curnow on 0428 168 078 on the morning of the proposed date of the transport who will arrange somebody to observe the load as it travels Wybong Road.**

2. **Loads travel no more than 10km/h over bridge structures.**

3. **The load travels outside of school bus times 7:30 to 9:00 AM and 3:00 to 5 PM on Wybong Road.**

4. **The applicant takes full responsibility for all damage to Council assets and will repair such damage within an agreed time frame. Note: Council reserves the right to repair the damage itself if necessary for public safety and charge costs to the applicant.**

5. **This approval is not valid without your return agreement to the above conditions and permit issued.**

6. **Maximum axle mass limits and the total mass limits in this permit shall be automatically suspended or decreased in the event of heavy or prolonged rain affecting the route used, as directed by the road authority (Muswellbrook Shire Council).**

Fee: Observation fee $343 plus $335 Overtime fee (if applicable). Please fill in the attached form so that Council can deduct the appropriate amount from your credit card.

Reference Document:

Operating Conditions:
Specific permits for oversize and
overmass vehicles and loads
Prepared by the NSW Roads and Traffic Authority
RTA Special Permits Unit
PO Box 97
Glen Innes NSW 2370
Phone: 1300 656 371
Fax: 1300 361 570
Email: special_permits_unit@rta.nsw.gov.au
Online Permit Applications: http://www.rta.nsw.gov.au/myrta/index.html
Gazette Notices:
www.rta.nsw.gov.au/heavyvehicles/downloads/permitnotices/permit_notices_dl1.html

This publication is available online at:
www.rta.nsw.gov.au/heavyvehicles/oversizeovermass
ISBN: 9781921242045

OVERMASS PERMIT CONDITIONS
Conditions – A (Applicable to all overmass permits)

13. Where the journey specified in the permit involves travel over roads or structures maintained by councils or other authorities, the relevant council, councils or authority is to be contacted to obtain permission prior to travelling on those structures or roads.

I _____ of _____ give Muswellbrook Shire Council approval to deduct the Observation fee of $336.50 and, if applicable, the Overtime fee of $335 from my credit card below:

Name on Card _____

Credit Card Number _____

Expiry Date _____

Authorised by _____ (name)

Signature _____

GTAconsultants

www.gta.com.au

Appendix B: Rex J Andrews Route Study from Newcastle to Rye Park

REX J ANDREWS
ENGINEERED TRANSPORTATION

ROUTE STUDY

CLIENT: SIEMENS/GAMESA
PROJECT: RYE PARK WIND FARM
PORT OF IMPORT: NEWCASTLE

26/02/2020 REV 00

Rev.	Date	Change	Responsible	Checked
00	09/08/18	Route Assessed	W Andrews	✓
00	26/02/20	Report compiled	W Andrews	✓
00	26/02/20	Report completed	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 Newcastle to Rye Park wind farm.

This Route survey took place on 09-08-18.

2.0 Evaluation

1	No work required
2	Some Work required
3	Moderate amount of works required
4	Large amount of works required

(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: 09/08/2017
Survey undertaken by: (Rex J Andrews P/L)
Project name: Rye Park Windfarm
Location: Newcastle (NSW) to Rye Park (NSW)
Turbine type: 70 x SG170, 115 metre H/H, 5 section tower.

4.0 Transport combinations and escort requirements.

70 x Nacelles (14.7l x 4.7w x 3.5h x 98.0T)
Configuration. Prime mover with 10x8 platform trailer and backup prime mover.
Overall dimension: 40.0l x 4.7w x 5.0h x 164.5T.
Escort requirement: (3 x Company pilots).

70 x Drive trains (6.7l x 3.2 w x 2.3h x 76.3T)
Configuration. Prime mover with 2x8-5x8 Low loader.
Overall dimension: 30.0l x 4.2w x 9.9h x 112T.
Escort requirement: (2 x Company pilots).

70 x Hubs (4.6l x 4.2w x 4.0h x 54.9T)
Configuration. Prime mover with 2x8-4x8 Low loader.
Overall dimension: 28.0l x 4.7w x 5.1h x 105.5T.
Escort requirement: (2 x Company pilots).

210 x Blades (83.5l x 4.7w x 3.5h x 30.5T)
Option 1. Prime mover with 2x8 low dolly & 3x4 Extendable Blade trailers.
Option 2. Prime mover with 1x4 dolly/bookend & 3x4 Extendable Blade trailers.
Overall dimension: 95.0l x 4.7w x 5.2h x 76.5T.
Escort requirement: (4 x Company pilots, 2 x NSW Police).

70 x Section 1 Towers (13.5l x 4.7 x 4.7 x 85T)
Configuration. Prime mover with 3x8-4x8 Bookend trailer.
Overall dimension: 36.0l x 4.7w x 5.2h x 126.5T.
Escort requirement: (3 x Company pilots).

70 x Section 2 Towers (18.2l x 4.7 x 4.4 x 85T)
Configuration. Prime mover with 3x8-4x8 Bookend trailer.
Overall dimension: 42.0l x 4.7w x 5.2h x 126.5T.
Escort requirement: (1 x NSW police, 3 x Company pilots).

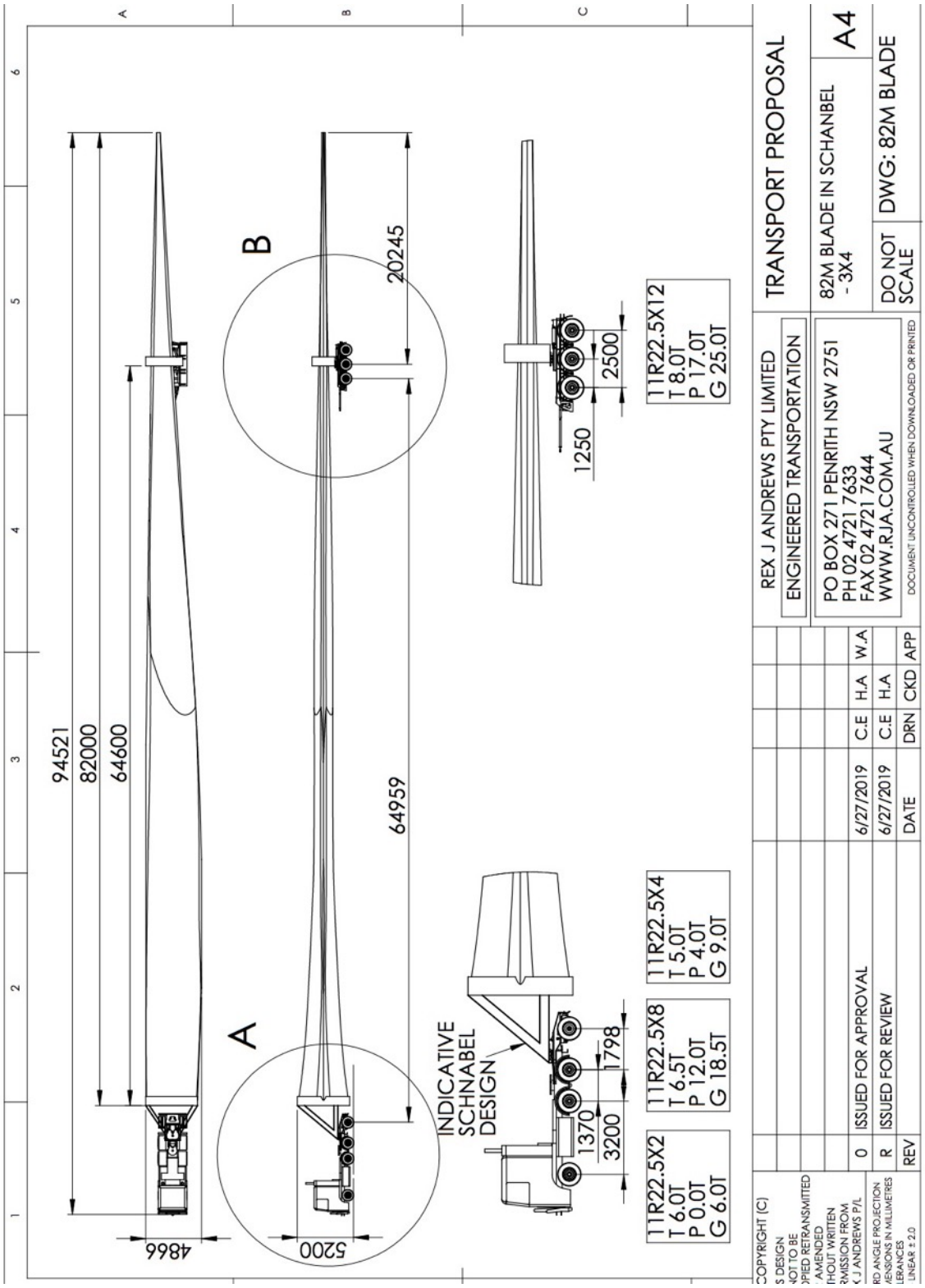
70 x Section 3 Towers (23.7l x 4.45 x 4.45h x 85T)
Configuration. Prime mover with Low 8x8 extending platform trailer.
Overall dimension: 35.0l x 4.5w x 5.2h x 128.5T.
Escort requirement: (3 x Company pilots).

70 x Section 4 Towers (27.0l x 4.45 x 3.6h x 75T)
Configuration. Prime mover with 3x8-3x8 extending platform trailer.
Overall dimension: 39.0l x 4.5w x 5.2h x 118.5T.
Escort requirement: (3 x Company pilots).

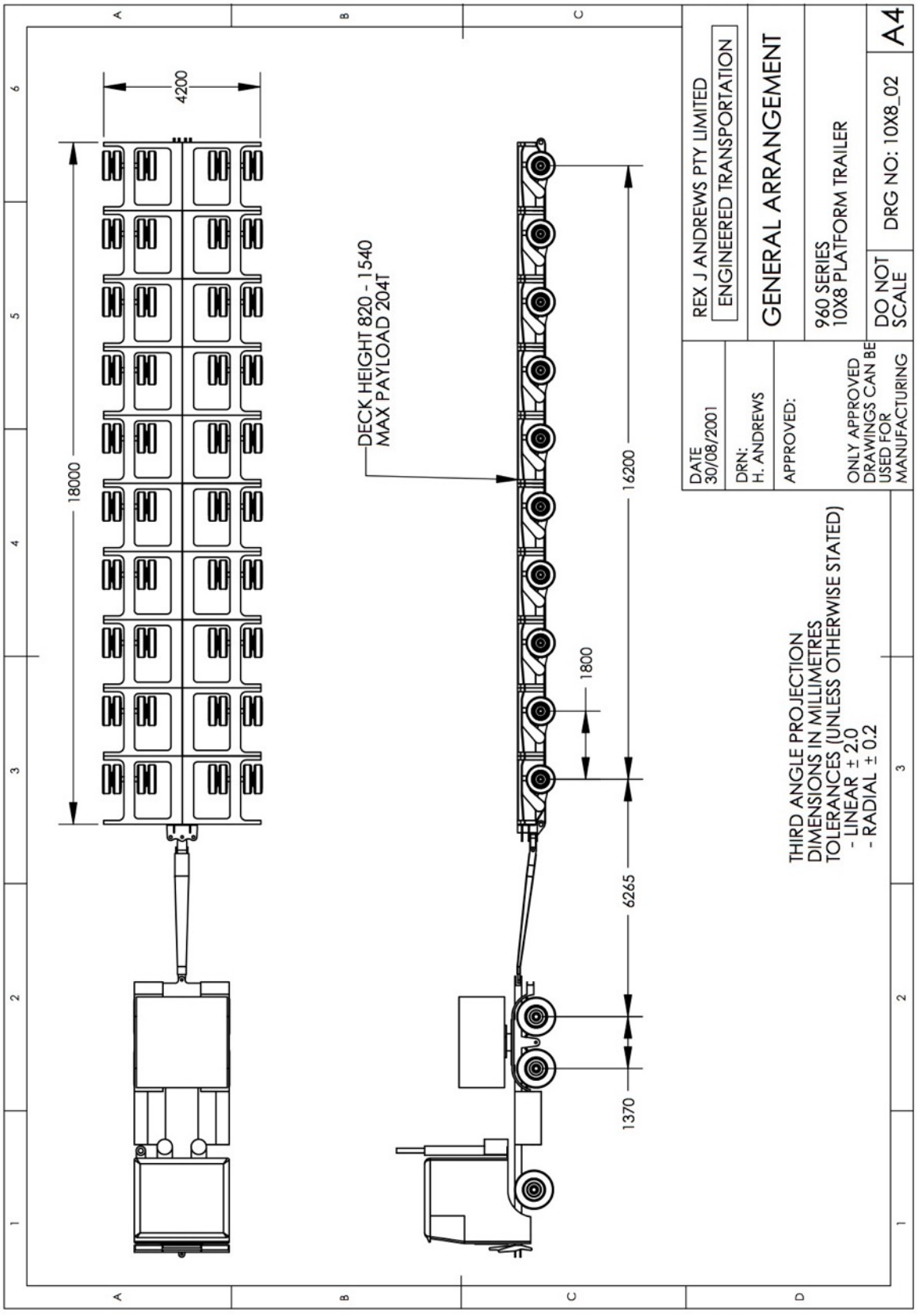
70 x Section 5 Towers (29.9l x 3.6 x 3.4h x 66T)
Configuration. Prime mover with 4x4-3x8 Dolly and Jinker.
Overall dimension: 42.0l x 4.3w x 5.2h x 102.5T.
Escort requirement: (1 x NSW police, 3 x Company pilots).

5.0 Transport drawings.

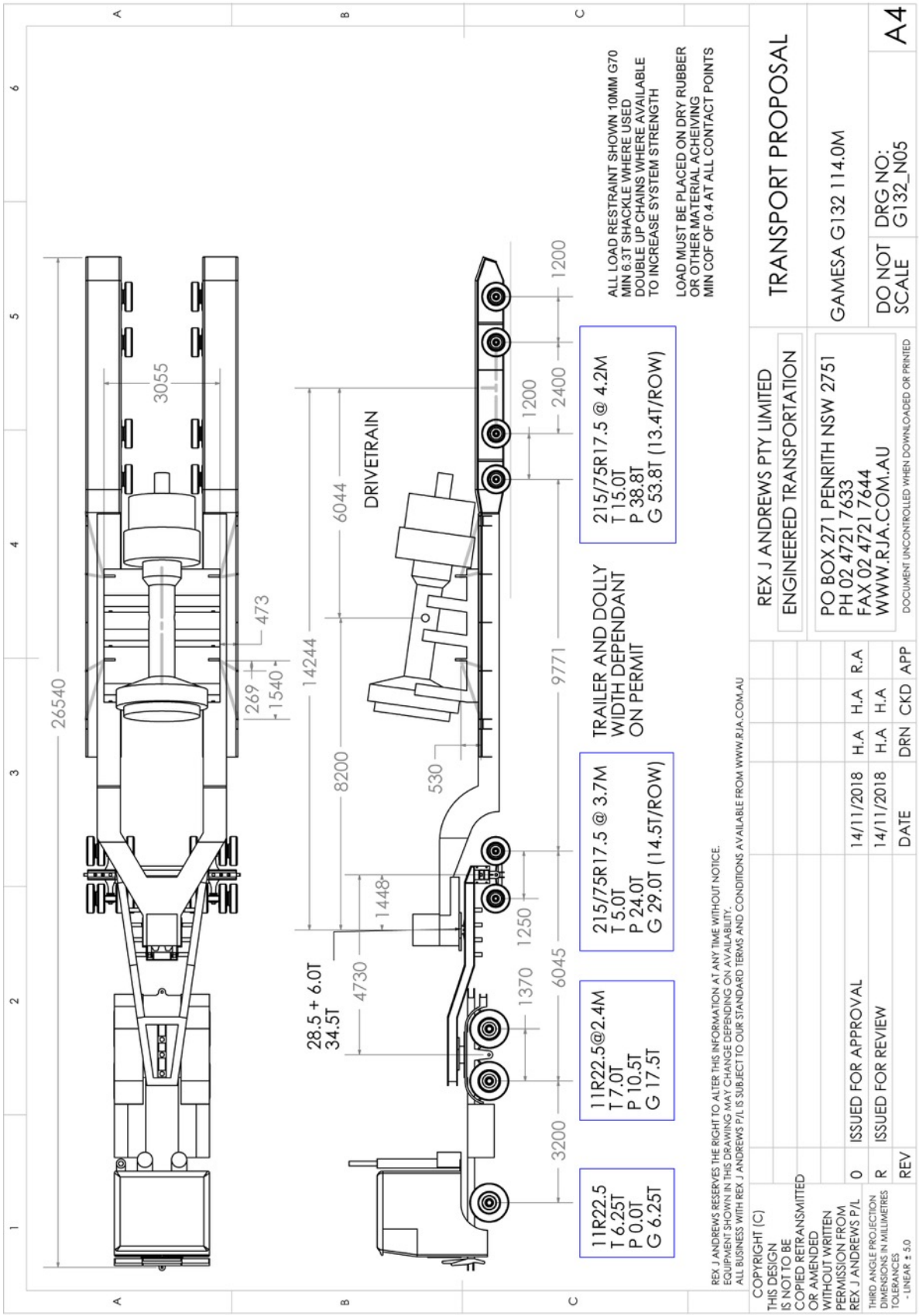
Blade Combination: Example



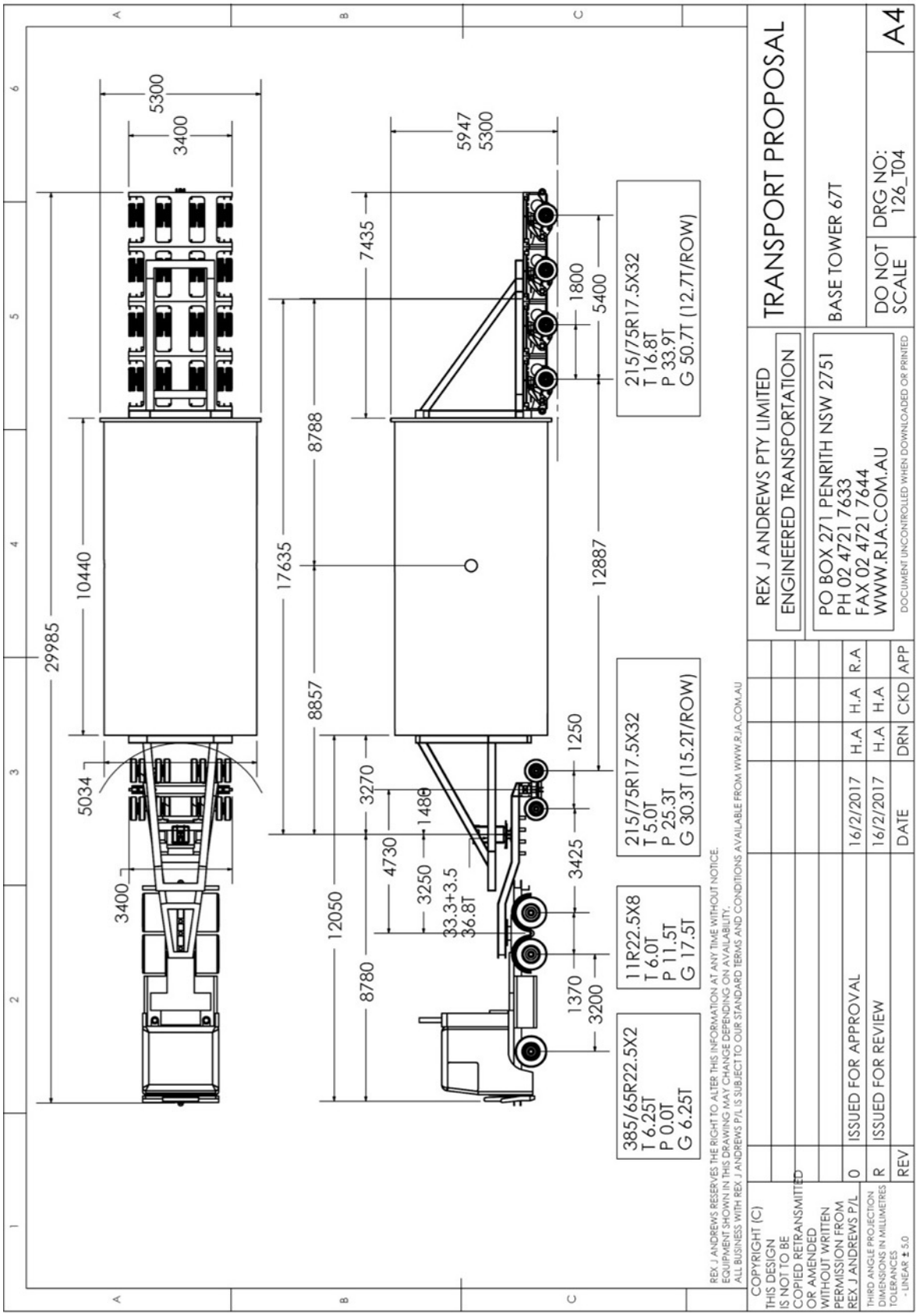
Nacelle combination: Example

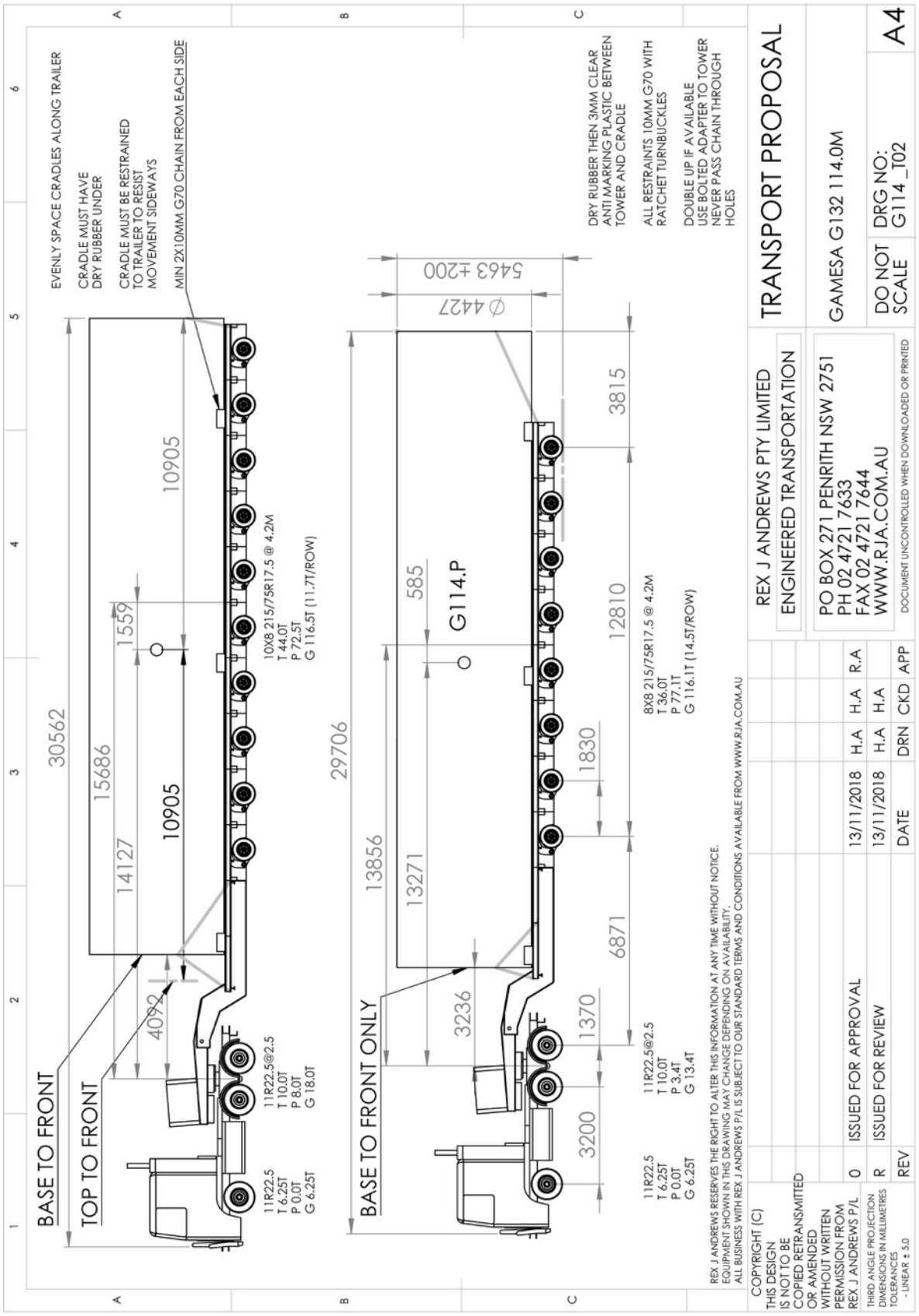


Drivetrain/Hub combination: Example



Tower combinations: Examples




BASE TO FRONT
TOP TO FRONT
30562
15686
14127
10905
1559
4092
10905
EVENLY SPACE CRADLES ALONG TRAILER
CRADLE MUST HAVE DRY RUBBER UNDER
CRADLE MUST BE RESTRAINED TO TRAILER TO RESIST MOVEMENT SIDEWAYS
MIN 2X10MM G70 CHAIN FROM EACH SIDE
11R22.5 T 6.25T P 0.0T G 6.25T
11R22.5@2.5 T 10.0T P 8.0T G 18.0T
10X8 215/75R17.5 @ 4.2M T 44.0T P 72.5T G 116.5T (11.7T/ROW)
BASE TO FRONT ONLY
29706
13856
13271
3236
3200
1370
6871
1830
12810
585
G114.P
3815
Ø 4427
5463 ±200
11R22.5 T 6.25T P 0.0T G 6.25T
11R22.5@2.5 T 10.0T P 3.4T G 13.4T
8X8 215/75R17.5 @ 4.2M T 36.0T P 77.1T G 116.1T (14.5T/ROW)
DRY RUBBER THEN 3MM CLEAR ANTI MARKING PLASTIC BETWEEN TOWER AND CRADLE
ALL RESTRAINTS 10MM G70 WITH RATCHET TURNBUCKLES
DOUBLE UP IF AVAILABLE USE BOLTED ADAPTER TO TOWER NEVER PASS CHAIN THROUGH HOLES
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TOLERANCES - LINEAR ± 5.0
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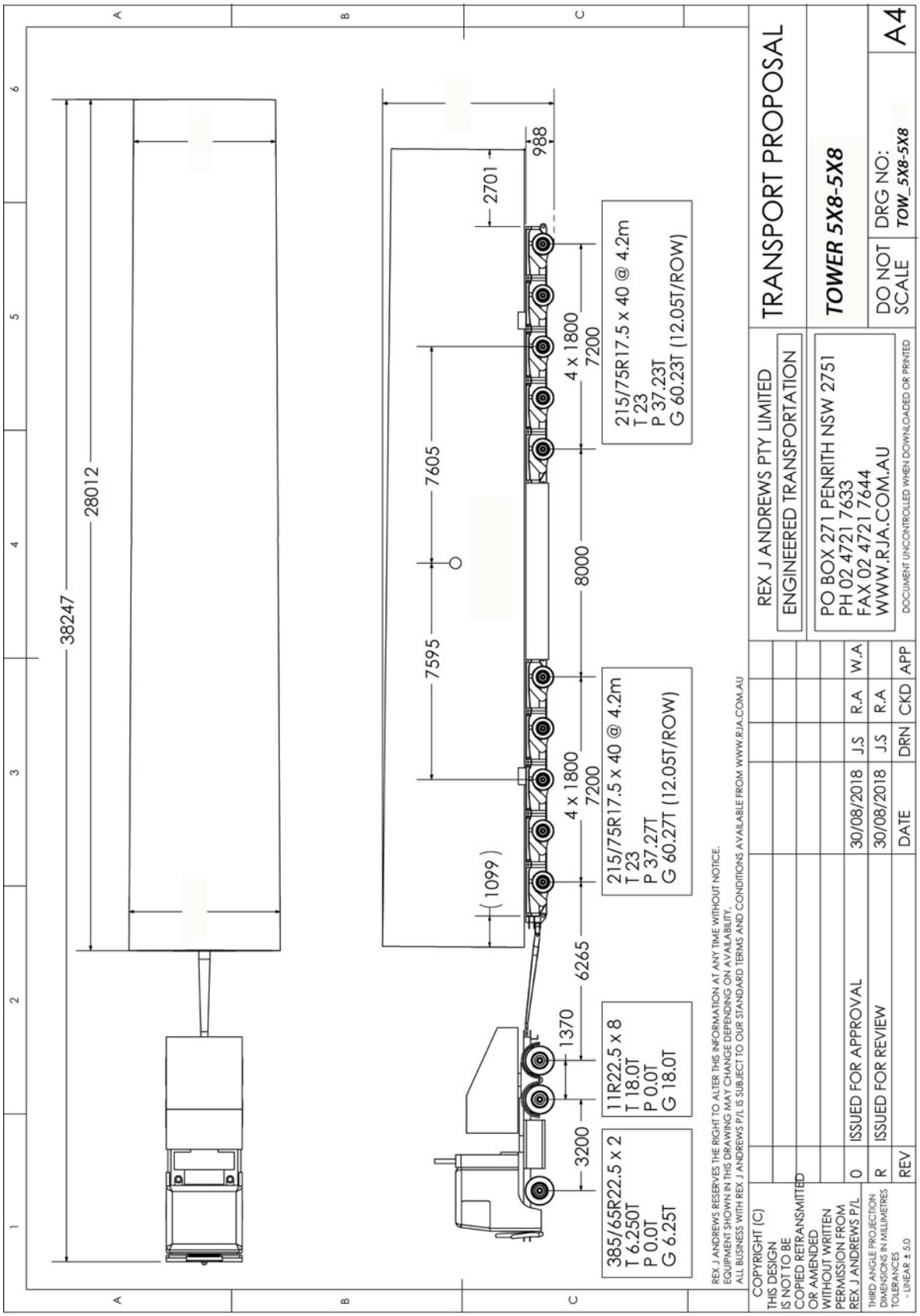
38247
28012
385/65R22.5 x 2
T 6.250T
P 0.0T
G 6.25T
3200
11R22.5 x 8
T 18.0T
P 0.0T
G 18.0T
1370
6265
(1099)
4 x 1800
7200
215/75R17.5 x 40 @ 4.2m
T 23
P 37.27T
G 60.27T (12.05T/ROW)
7595
7605
2701
988
4 x 1800
7200
8000
215/75R17.5 x 40 @ 4.2m
T 23
P 37.23T
G 60.23T (12.05T/ROW)
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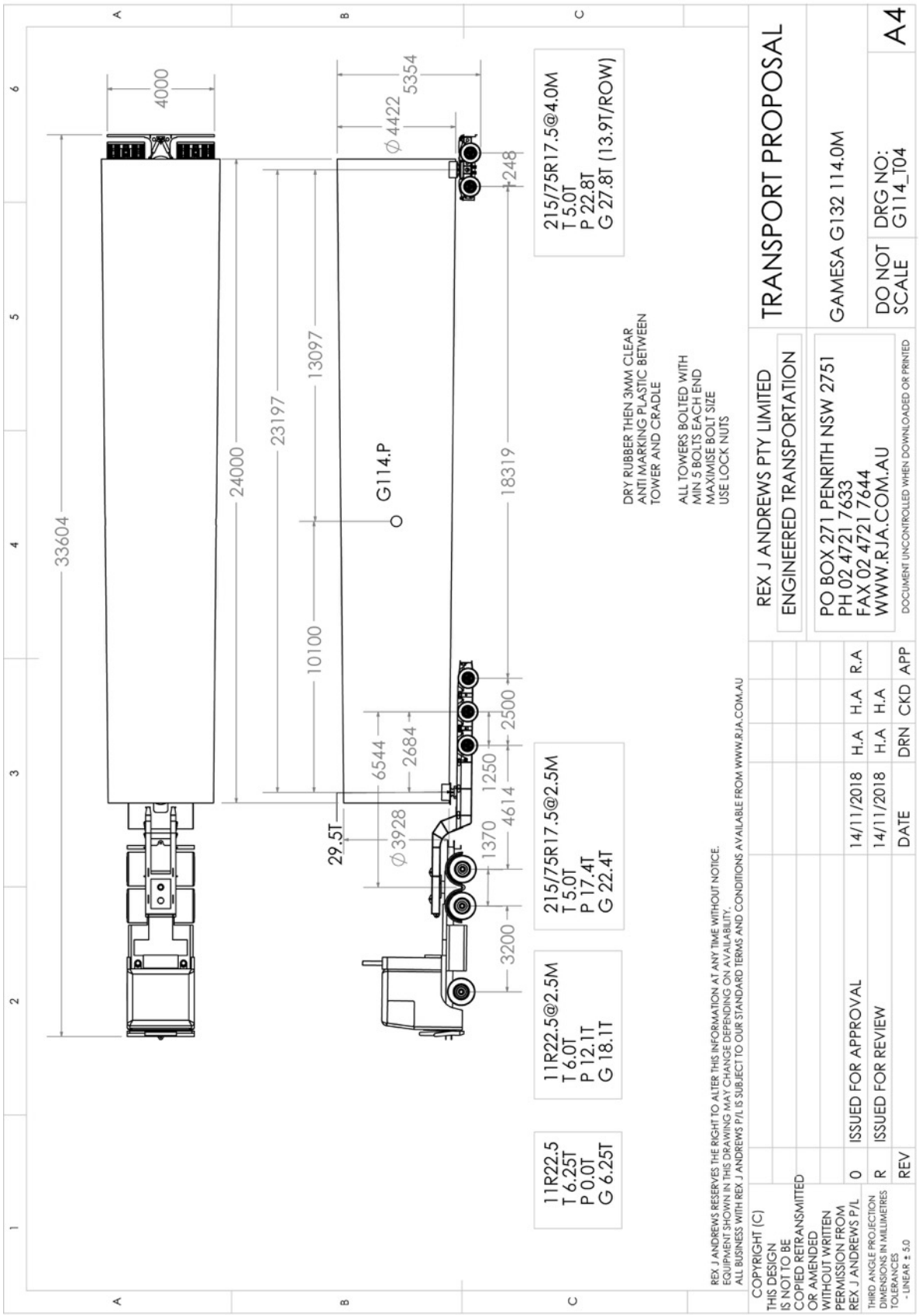
TRANSPORT PROPOSAL
TOWER 5X8-5X8
DO NOT SCALE
DRG NO: TOW_5X8-5X8
A4


4000
33604
24000
23197
13097
10100
G114.P
Ø 4422
5354
248
18319
2500
1250
2684
6544
Ø 3928
29.5T
1370
4614
3200
215/75R17.5@4.0M
T 5.0T
P 22.8T
G 27.8T (13.9T/ROW)
215/75R17.5@2.5M
T 5.0T
P 17.4T
G 22.4T
11R22.5@2.5M
T 6.0T
P 12.1T
G 18.1T
11R22.5
T 6.25T
P 0.0T
G 6.25T
DRY RUBBER THEN 3MM CLEAR
ANTI MARKING PLASTIC BETWEEN
TOWER AND CRADLE
ALL TOWERS BOLTED WITH
MIN 5 BOLTS EACH END
MAXIMISE BOLT SIZE
USE LOCK NUTS
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DO NOT SCALE
DRG NO: G114_T04
A4

6.0 Port of Import.

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

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

Image 1: Port overview.

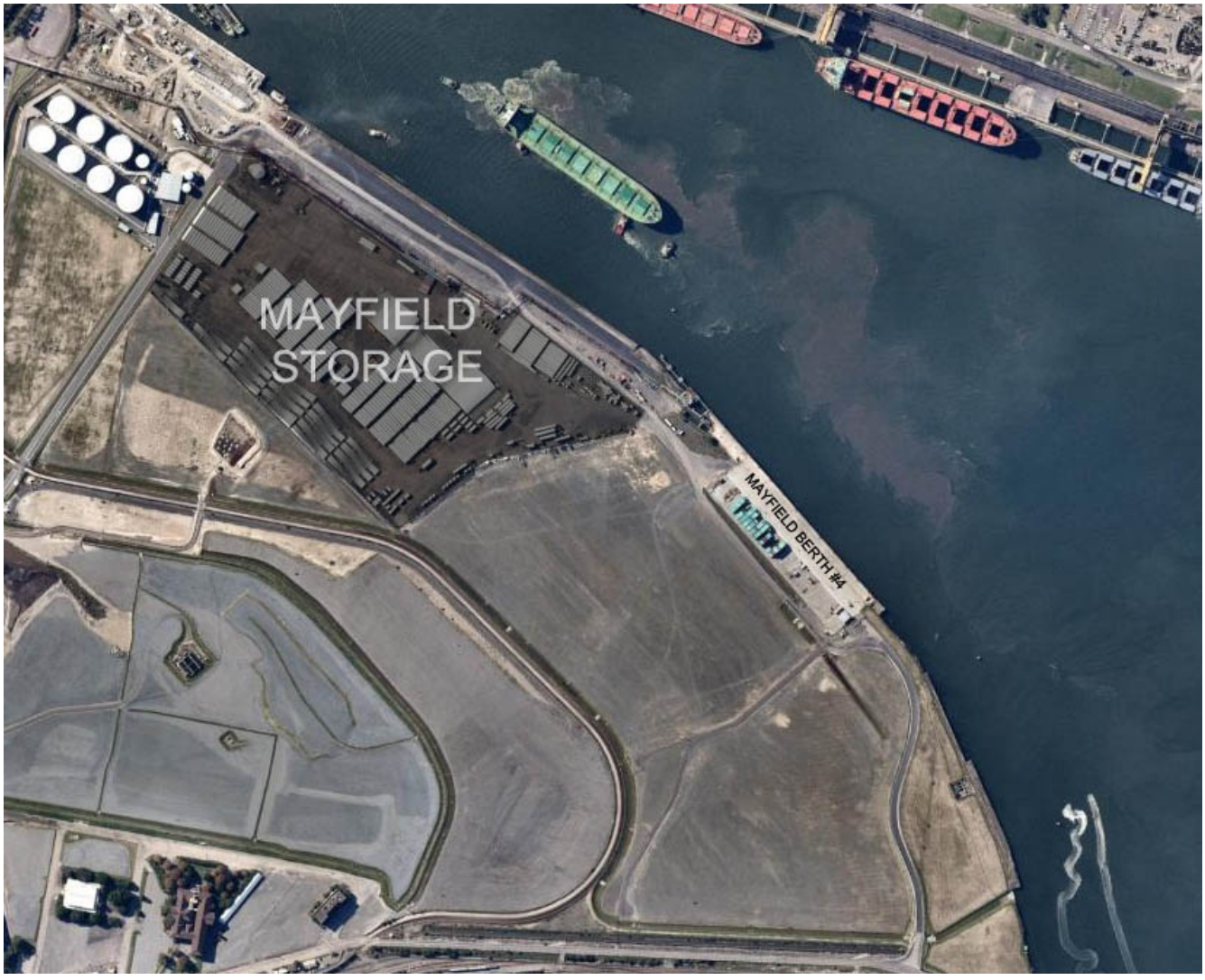
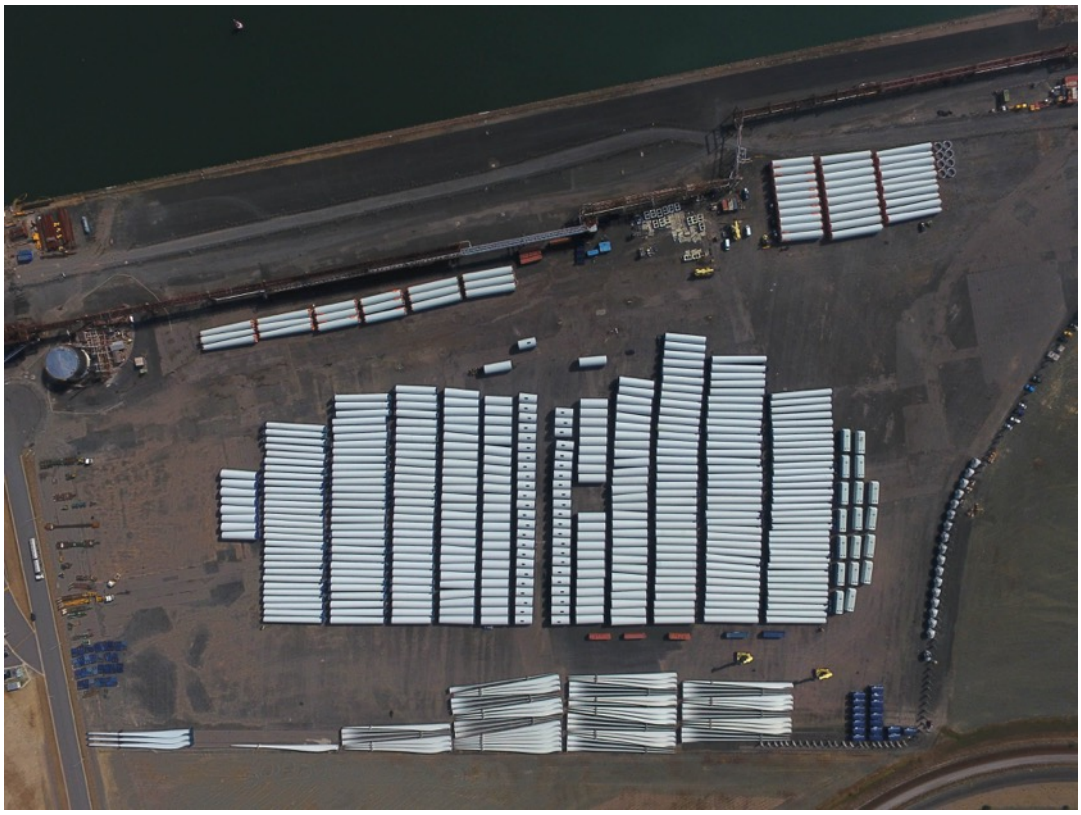
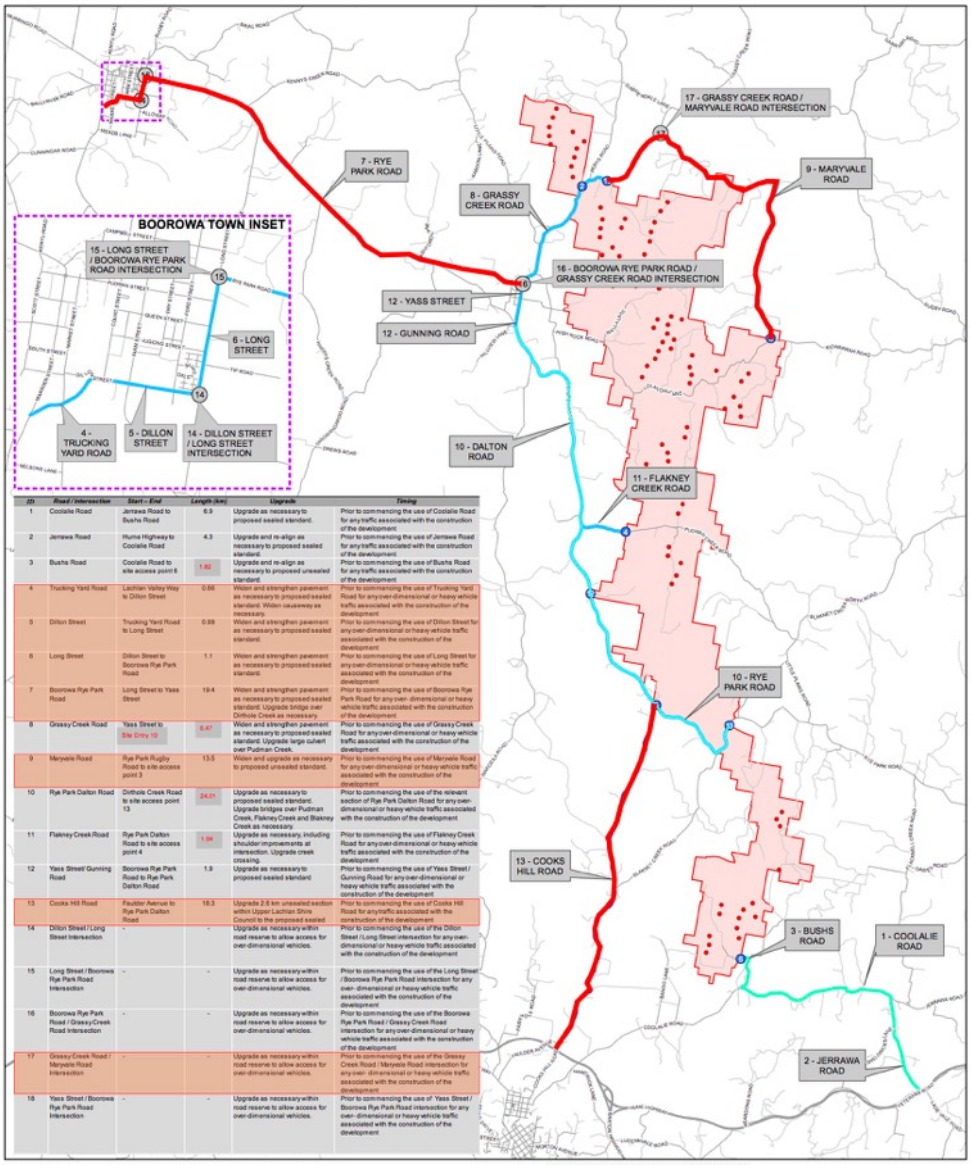


Image 2 & 3: Mayfield #4 Port storage area.



7.0 Site Location and layout.

The Rye Park Wind farm is located to the north of Yass and east of Boorowa and is 515 Kilometers by road from Newcastle.



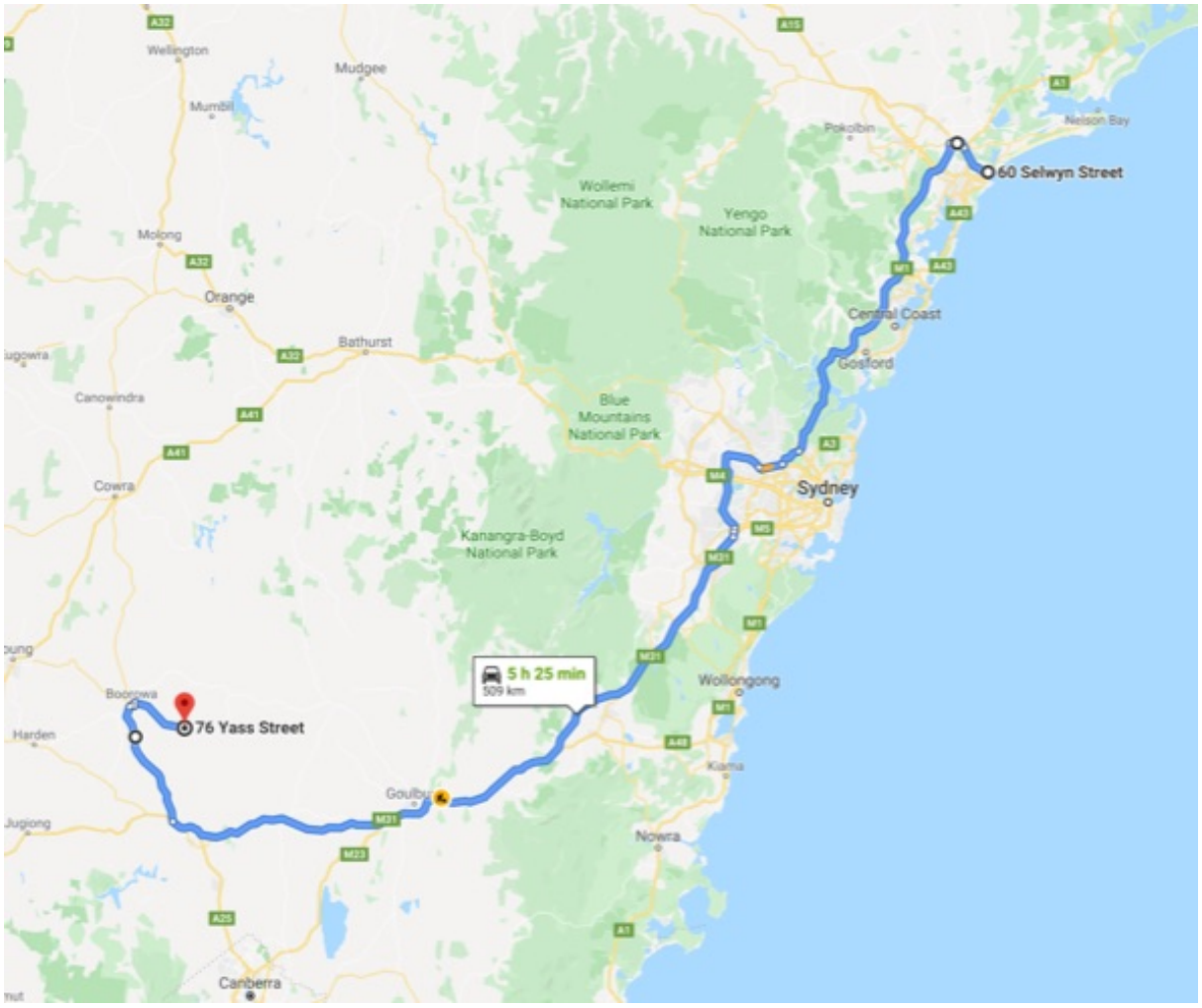
8.0 Selected routes: Newcastle to Rye Park Wind Farm.

We have based this study on the turbine components, and all imported towers entering Australia via the Mayfield # 4 Berth at Newcastle. The study will show 3 sections of route. Stage 1 study is from Newcastle Port to Rye Park township. Stage 2 will travel from Rye Park township through to the North Access entrance, and Stage 3 will travel from Rye Park township through to the South access entrance.

STAGE 1:

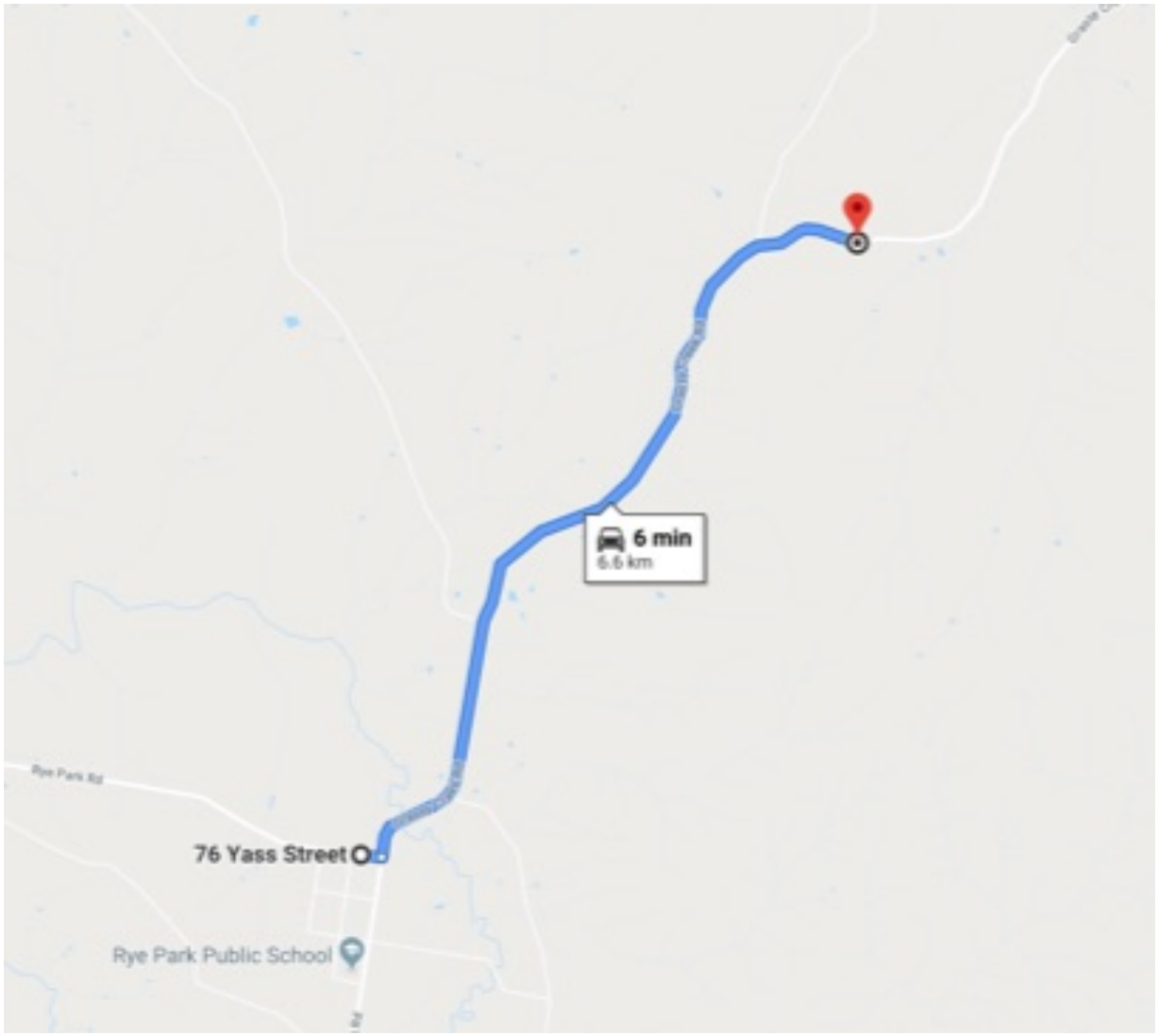
DISTANCE: 509.0 kilometres:

This route took us via Selwyn street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, M1, Pennant Hills Road, M2, M7, M5, Hume Highway, Lachlan Valley Way, Trucking Yard Road, Dillon Street, Long Street, Rye Park Road.



GPS LINK: https://goo.gl/maps/8iDNh9ibXyutKboP7

STAGE 2:
DISTANCE: 6.6 kilometres:
This route took us via Rye Park Road, Grassy Creek Road.

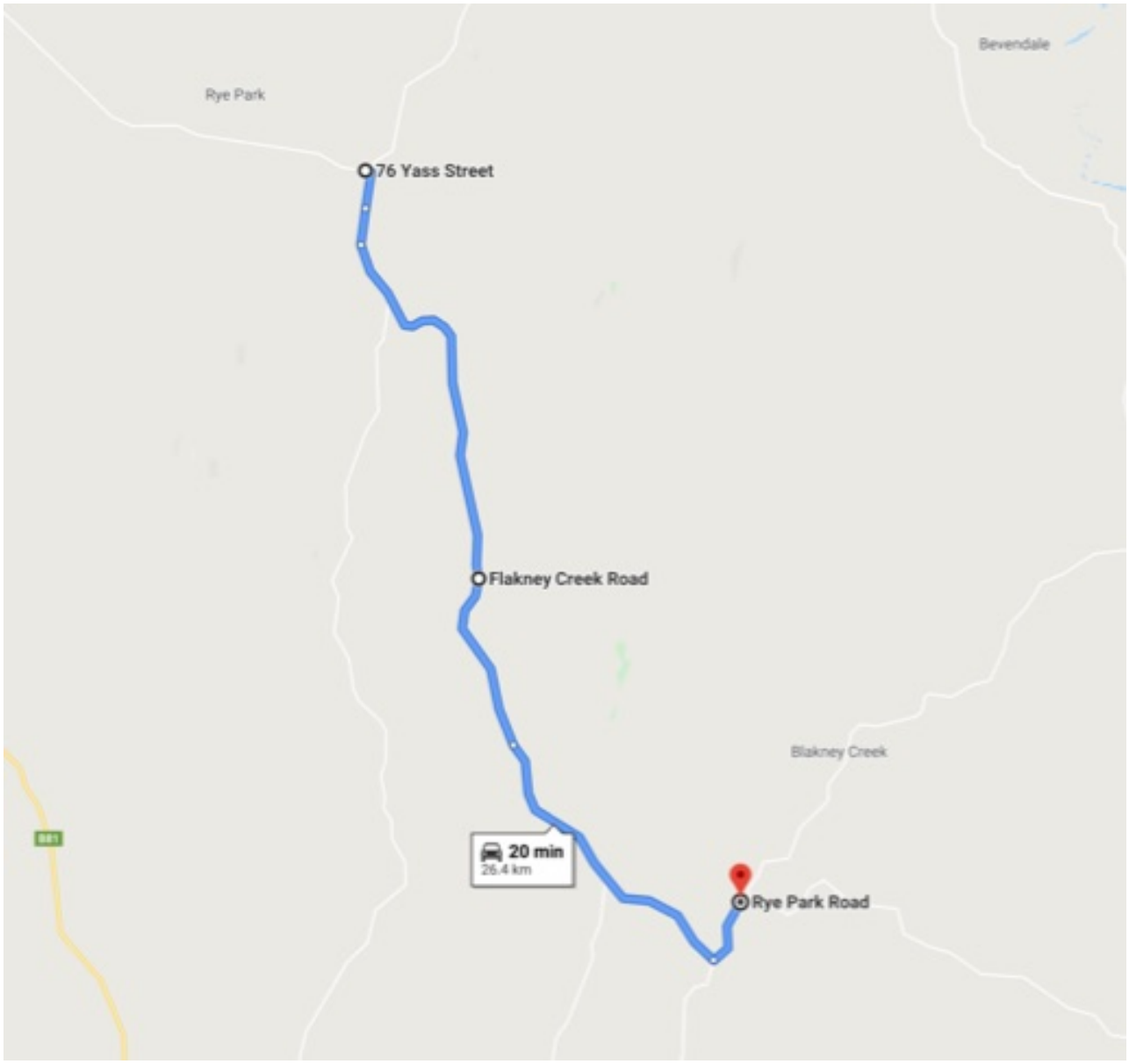


GPS LINK: https://goo.gl/maps/NC1AQuTTZPJHDDfk9

STAGE 3:

DISTANCE: 26.4 kilometres:

This route took us via Rye Park Road, Yass Street, Gunning Street, Dalton Road, Rye Park Road. (Including a possible site access point off Flackney Creek Road).



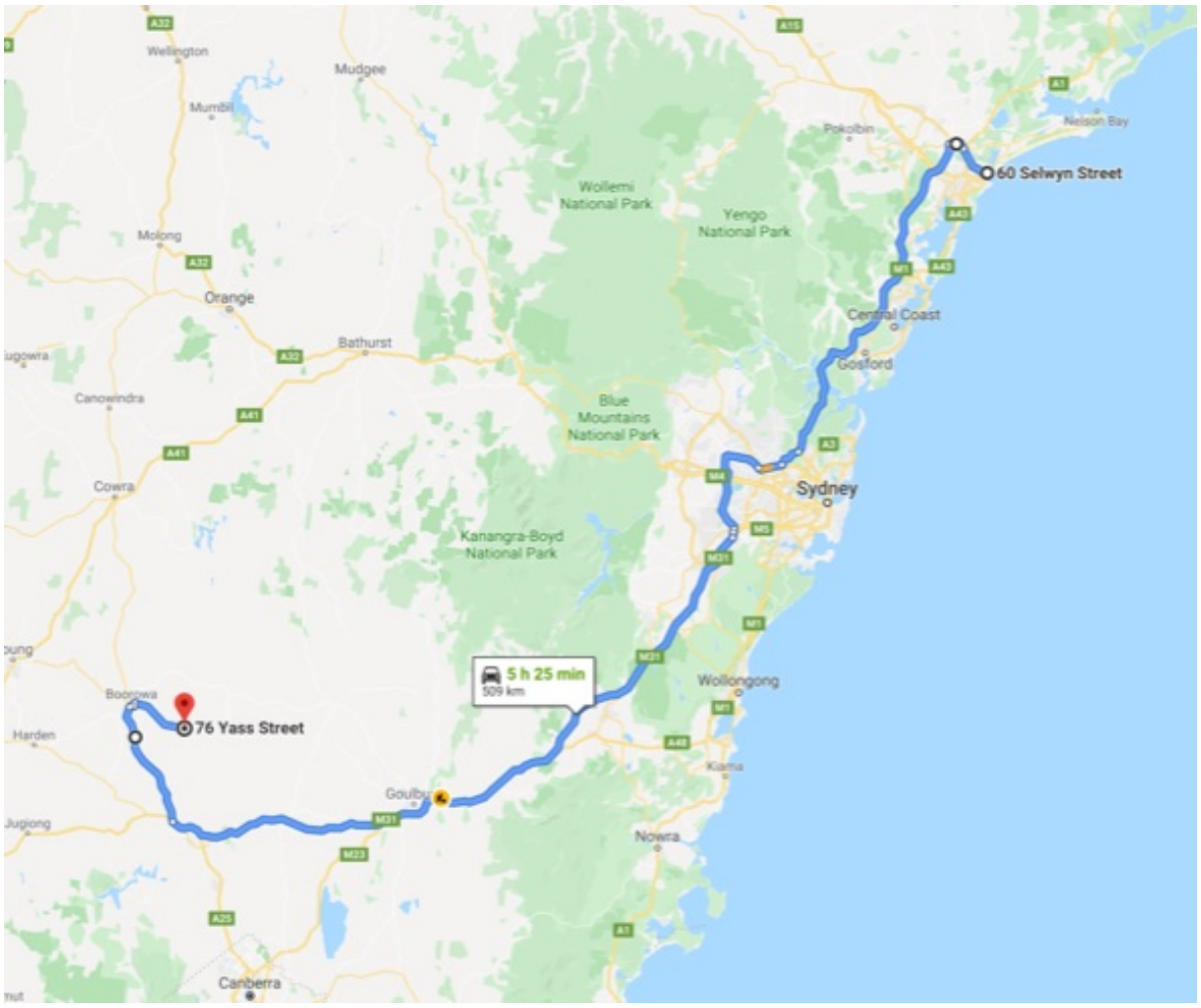
GPS LINK: https://goo.gl/maps/xsk8nmSVdquTpEZDA

9.0 Stage 1 Route survey (Newcastle to Rye Park township)

STAGE 1:

DISTANCE: 509.0 kilometres:

This route took us via Selwyn street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, M1, Pennant Hills Road, M2, M7, M5, Hume Highway, Lachlan Valley Way, Trucking Yard Road, Dillon Street, Long Street, Rye Park Road.



GPS LINK: https://goo.gl/maps/8iDNh9ibXyutKboP7

KEY	
MODIFICATIONS REQUIRED	
PINCH POINT	
EMERGENCY PARKING	

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
Route: Newcastle to Rye Park township					
0.0	Mayfield	Mayfield #4 berth onto Selwyn Street GPS link: https://goo.gl/maps/afLwPYKuNdm	70.0 metres clearance	Moderate right hand turn	Some hardstand will need to be added on the left entrance and exit of the corner. The fence on both sides of the road and the gate will need to be relocated.
0.4	Mayfield	Selwyn Street rail crossing GPS link: https://goo.gl/maps/AmohE54hKSz	9.0 Metres wide	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
1.3	Mayfield	Selwyn Street onto Industrial Drive via George Street GPS link: https://goo.gl/maps/gXeHvBtCp4D2	70.0 metres clearance	Right hand turn	Truck will need to travel over the hardstand area than return to the correct side of Industrial Drive. The trailer will need to cross over to the incorrect side before travelling over the centre median and returning to the correct side of Industrial Drive. The traffic signal in the centre of the intersection will need to be relocated. A sign will also need to be relocated on the inside of the corner and a pole removed on the outside of the corner. A hardstand area will need to be constructed on the south side of the intersection.
5.5	Mayfield West	Industrial Drive onto Maitland Road GPS link: https://goo.gl/maps/Kn49dhWG2qG2	70.0 metres clearance	Right hand turn	The blades will need to cross to the incorrect side metres prior to the intersection, then return to the correct side 120 metres past the intersection. The centre median strip will need to be lowered, or the trucks are to cross to the incorrect side of Industrial drive further to the east of the intersection.
17.4	Tarro	New England Highway onto John Renshaw Drive GPS link: https://goo.gl/maps/SRDr5JigkBp	100.0 metres clearance	Left hand merge	No problems with this section of road.
18.5	Beresfield	John Renshaw Drive onto the M1 GPS link: https://goo.gl/maps/A34ihxCjM5wfRDdq6	100.0 metres clearance	Left hand bend	No problems with this section of road.

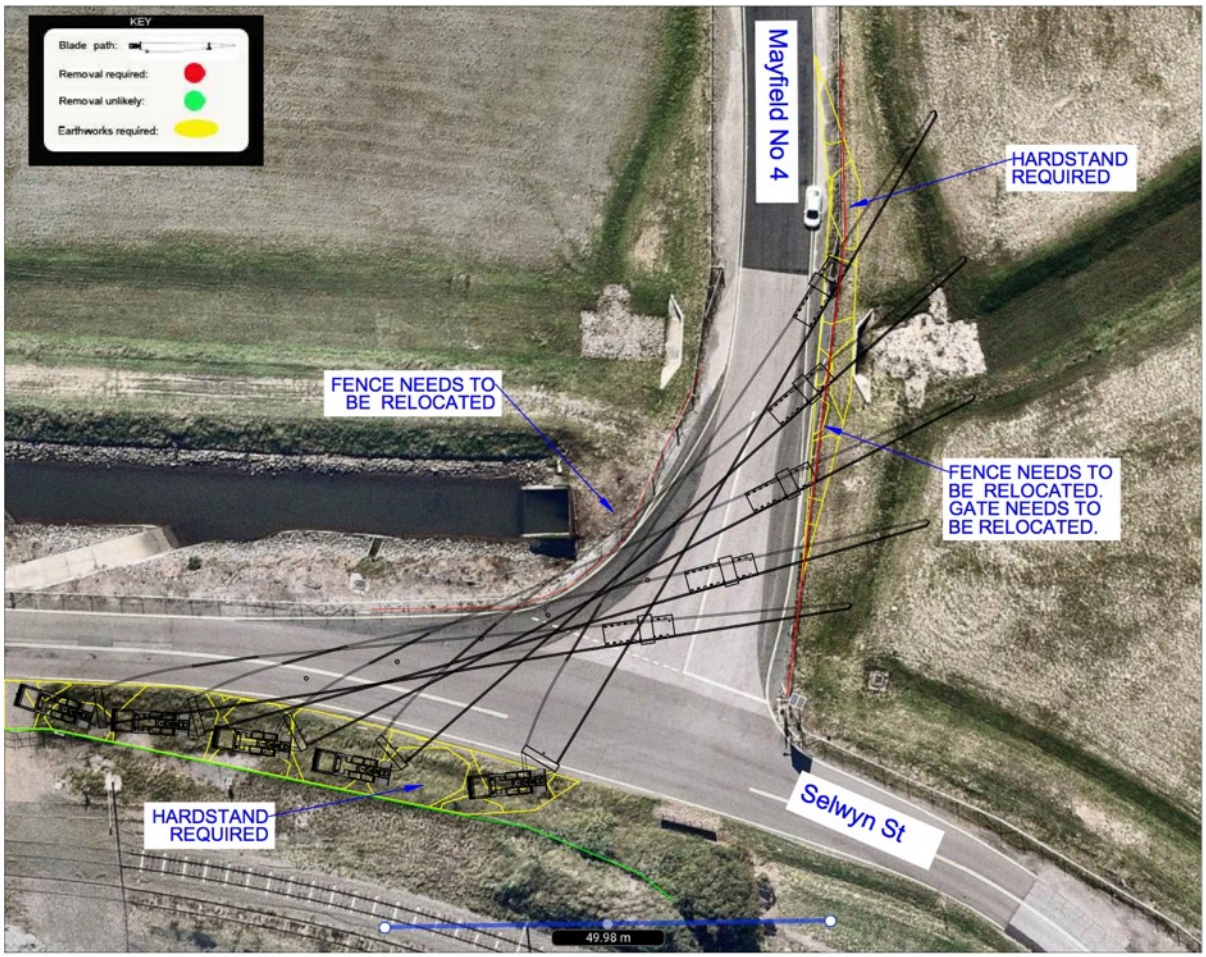
KM index	Location	Section of road	Critical Measurement	Procedure	Notes
113.0	Mt White	M1 Motorway under Mt White overpass GPS link: https://goo.gl/maps/K3fPPe4fNx63xB3j7	Left Lane: 5.2 mtrs Centre Lane: 5.3 mtrs Right Lane: 5.4 mtrs	Travel directly ahead	Loads that exceed 5.3 metres high are not to travel under this structure. Loads over 5.2 metres high are to travel under the bridge in the far-right lane, and at a speed of no more than 5 km's per hour. Spotter to guide load through this section of road.
122.0	Hawkesbury River	M1 Motorway GPS link: https://goo.gl/maps/yDzjirEKLAbREE8B6	100.0 long x 6.0 wide	Merge to left	Large parking area
146.0	Wahroonga	M1 onto Pennant Hills Rd GPS link: https://goo.gl/maps/bskC8kD4CdW9xmwYA	75.0 metres clearance	Left hand turn	It is recommended that the centre median strip be modified to allow a suitable clearance for the truck to travel over. Blade loads are to turn from the correct side to the incorrect side of the road. The prime mover will need to turn from the far-right lane and cross onto the incorrect side of Pennant Hills Road, before returning to the correct side once the trailer has cleared the corner.
147.0	Normanhurst	Pennant Hills Road under Pedestrian overpass GPS link: https://goo.gl/maps/nYbjkf5AJ9D2xvUt7	Left Lane: 5.15 mtrs Centre Lane: 5.2 mtrs Right Lane: 5.3 mtrs	Travel directly ahead	Loads that exceed 5.3 metres high are not to travel under this structure. Loads over 5.2 metres high are to travel under the bridge in the far-right lane, and at a speed of no more than 5 km's per hour. Spotter to guide load through this section of road.
151.0	Beecroft	Pennant Hills Road under Pedestrian overpass GPS link: https://goo.gl/maps/sjnLQqYRudUSKgTQ8	Left Lane: 5.3 mtrs Centre Lane: 5.4 mtrs Right Lane: 5.5 mtrs	Travel directly ahead	Loads that exceed 5.3 metres high are not to travel under this structure. Loads over 5.2 metres high are to travel under the bridge in the centre lane, and at a speed of no more than 5 km's per hour. Spotter to guide load through this section of road.
154.0	West Pennant Hills	Pennant Hills Rd onto M2 Motorway GPS link: https://goo.gl/maps/cCsJwSt1NsRj5cSs6	75.0 metres clearance	Right hand turn	A traffic signal will need to be relocated, and a section of fence removed on the inside of the corner. A barrier will also need to be relocated on the outside of the corner. Trucks are to turn from the correct side to the correct side of the road. The prime mover will need to turn from the far left lane on Pennant Hills Road and enter the on ramp as wide as possible. Spotter to guide the load through the corner.
163.0	Winston Hills	M2 Motorway onto M7 Motorway GPS link: https://goo.gl/maps/PC96cBq2xqtW85vG7	75.0 metres clearance	Travel directly ahead	No problems with this section of road.
167.0	Kings Park	M7 Motorway GPS link: https://goo.gl/maps/T8WcbR9T84Zs7WpF7	100.0 long x 6.0 wide	Merge to left	Large parking area

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
201.0	Prestons	M7 Motorway onto M5 Motorway GPS link: https://goo.gl/maps/FA2mF7PxZkxrRDTR9	75.0 metres clearance	Travel directly ahead	No problems with this section of road.
229.0	Menangle	Hume Highway https://goo.gl/maps/KPMdLS1XuRWHrcyb6	200.0 long x 8.0 wide	Merge to left	Large parking area for towers and motors, no blades to enter this parking bay.
238.0	Wilton	Hume Highway under Farm access overpass GPS link: https://goo.gl/maps/2ZsVqYJ9j9qPTGqa9	Left Lane: 5.5 mtrs Centre Lane: 5.4 mtrs Right Lane: 5.3 mtrs	Travel directly ahead	Loads that exceed 5.3 metres high are not to travel under this structure. Loads over 5.2 metres high are to travel under the bridge in the left lane, and at a speed of no more than 5 km's per hour. Spotter to guide load through this section of road.
303.0	Sutton Forest	Hume Highway https://goo.gl/maps/uT1ubtSuawS2	150.0 long x 10.0 wide	Merge to left	Large parking area
352.0	Goulburn	Hume Highway https://goo.gl/maps/7HywRcjZiJv	180.0 long x 15.0 wide	Merge to left	Large parking area
375.0	Breadalbane	Hume Highway https://goo.gl/maps/PmpDm5ymjjnK7ciW8	140.0 long x 12.0 wide	Merge to left	Large parking area
388.0	Cullerin ridge	Hume Highway https://goo.gl/maps/3r7x8uzs9Fy7pVmp8	100.0 long x 10.0 wide	Merge to left	Large parking area
409.0	Oolong	Hume Highway https://goo.gl/maps/EVyT3US6dgcapAWWA	130.0 long x 15.0 wide	Merge to left	Large parking area
444.0	Bowning	Hume Highway onto Lachlan Valley Way GPS link: https://goo.gl/maps/j1Nvy5sXDonei1K99	75.0 metres clearance	Right hand turn	Some signs in the centre median strip will need to be relocated. Truck to turn from the far left lane and enter the corner as wide as possible.
486.0	Boorowa	Lachlan Valley Way onto Trucking Yard Road GPS link: https://goo.gl/maps/qCR2CX4EADMGK3WR8	75.0 metres clearance	Right hand turn	Some signs in the inside of the corner will need to be relocated.
487.0	Boorowa	Trucking Yard Road GPS link: https://goo.gl/maps/HTJCwCnUerjtqc5z9	50.0 metres clearance	Right hand bend	The causeway will need to be widened, and hardstand added to the inside of the corner.
487.2	Boorowa	Trucking Yard Road onto Dillon Street GPS link: https://goo.gl/maps/sQFVtnE3CPvhVibS8	90.0 metres clearance	Travel directly ahead.	No Problems with this section of road.
488.0	Boorowa	Dillon Street onto Long Street GPS link: https://goo.gl/maps/mnV8spf8JGG6LsT99	50.0 metres clearance	Left hand turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the inside of the corner, and a fence relocated within the landowner's boundaries. Additionally, some vegetation needs to be removed.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
489.5	Boorowa	Long Street onto Rye Park Road GPS link: https://goo.gl/maps/Ry5s7svqx1BDzRAMA	50.0 metres clearance	Right hand turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the inside of the corner, and a fence relocated within the landowner's boundaries. Additionally, some vegetation needs to be removed.
509.0	Boorowa to Rye Park township	Rye Park Road GPS link: https://goo.gl/maps/LGgWeQKDCERMsHQy7	90.0 metres clearance	Travel directly ahead	No problems with this section of road.

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

Image 1:



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

PROCEDURE: Right hand turn.

COMMENTS: Some hardstand will need to be added on the left entrance and exit of the corner. The fence on both sides of the road and the gate will need to be relocated.

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

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

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

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

PROCEDURE: Travel directly ahead over the crossing.

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

ROAD MODIFICATIONS: No works required.

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

Image 1:

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

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

COMMENTS: The traffic signal in the centre of the intersection will need to be relocated. A sign will also need to be relocated on the inside of the corner and a pole removed on the outside of the corner.

A hardstand area will need to be constructed on the south side of the intersection.

Truck will need to travel over the hardstand area than return to the correct side of Industrial Drive. The trailer will need to cross over to the incorrect side before travelling over the centre median and returning to the correct side of Industrial Drive.

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

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

Image 1:

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

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

COMMENTS: The centre median strip will need to be lowered, or the trucks are to cross to the incorrect side of Industrial drive further to the east of the intersection.

The blades will need to cross to the incorrect side metres prior to the intersection, then return to the correct side 120 metres past the intersection.

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

18.5 Km's: Intersection of John Renshaw Drive and M1 at Beresfield.

Image 1:

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/A34ihxCjM5wfRDdq6

PROCEDURE: Merge to the left and travel around a left-hand bend before merging to the right onto the M1 Motorway.

COMMENTS: Loads to turn left onto the slip lane. Spotter to guide the load through the corner.

ROAD MODIFICATIONS: No modifications required.

146.0 Km's: M1 Motorway onto Pennant Hills Road at Wahroonga.

Image 1:

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/bskC8kD4CdW9xmwYA

PROCEDURE: Left hand turn from the M1 Motorway onto Pennant Hills Road.

COMMENTS: It is recommended that the centre median strip be modified to allow a suitable clearance for the truck to travel over.

Blade loads are to turn from the correct side to the incorrect side of the road. The prime mover will need to turn from the far-right lane and cross onto the incorrect side of Pennant Hills Road, before returning to the correct side once the trailer has cleared the corner.

ROAD MODIFICATIONS: Yes moderate amounts of works are required.

154.0 Km's: Pennant Hills Road onto the M2 Motorway at West Pennant Hills.

Image 1:

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/cCsJwSt1NsRi5cSs6

PROCEDURE: Right hand turn from Pennant Hills Road onto the M2 Motorway.

COMMENTS: A traffic signal will need to be relocated, and a section of fence removed on the inside of the corner. A barrier will also need to be relocated on the outside of the corner.

Trucks are to turn from the correct side to the correct side of the road. The prime mover will need to turn from the far-left lane on Pennant Hills Road and enter the on ramp as wide as possible. Spotter to guide the load through the corner.

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

444.0 Km's: Hume Highway onto Lachlan Valley Highway at Yass.

Image 1:

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/j1Nvy5sXDonei1K99

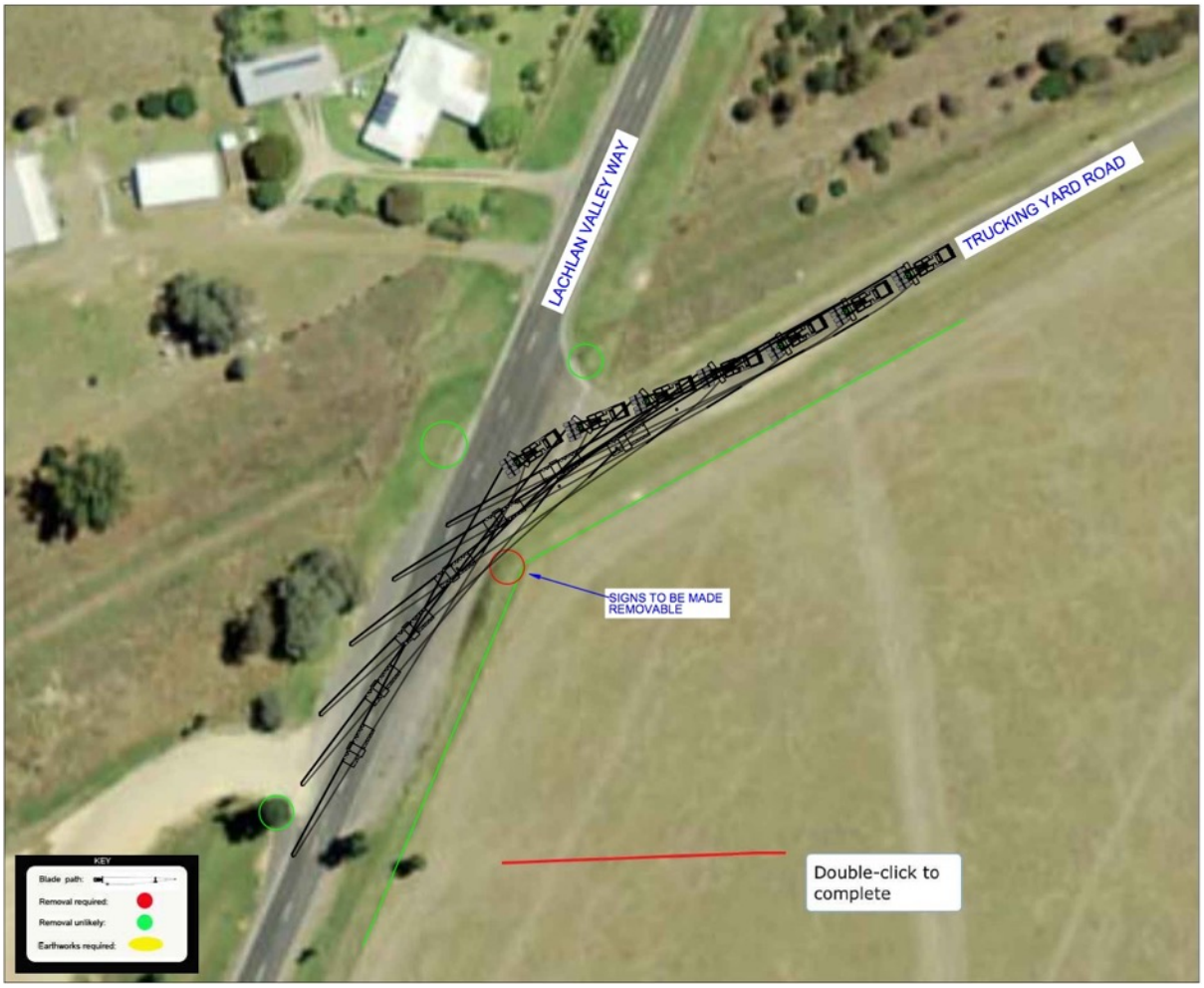
PROCEDURE: Right hand turn from Hume Highway onto Jerrawa Road.

COMMENTS: Load to turn from the far-left lanes onto the correct side of Jerrawa Road. Some signs will need to be relocated or made removable in the centre median strip.

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

486.0 Km's: Lachlan Valley way onto Trucking Yard Road at Boorowa.

Image 1:



PROCEDURE: Right hand turn from Lachlan Valley Way onto Trucking Yard Road.
COMMENTS: Some signs in the inside of the corner will need to be relocated.
ROAD MODIFICATIONS: Small amounts of works are required on this section of road.
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/qCR2CX4EADMGK3WR8

487.0 Km's: Trucking Yard Road at Boorowa

Image 1:

Image 2:

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/HTJCwCnUerjtgc5z9

PROCEDURE: Right-hand bend on Trucking Yard Road.

COMMENTS: The causeway will need to be widened, and hardstand added to the inside of the corner.

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

488.0 Km's: Dillon Street onto Long Street at Boorowa

Image 1:

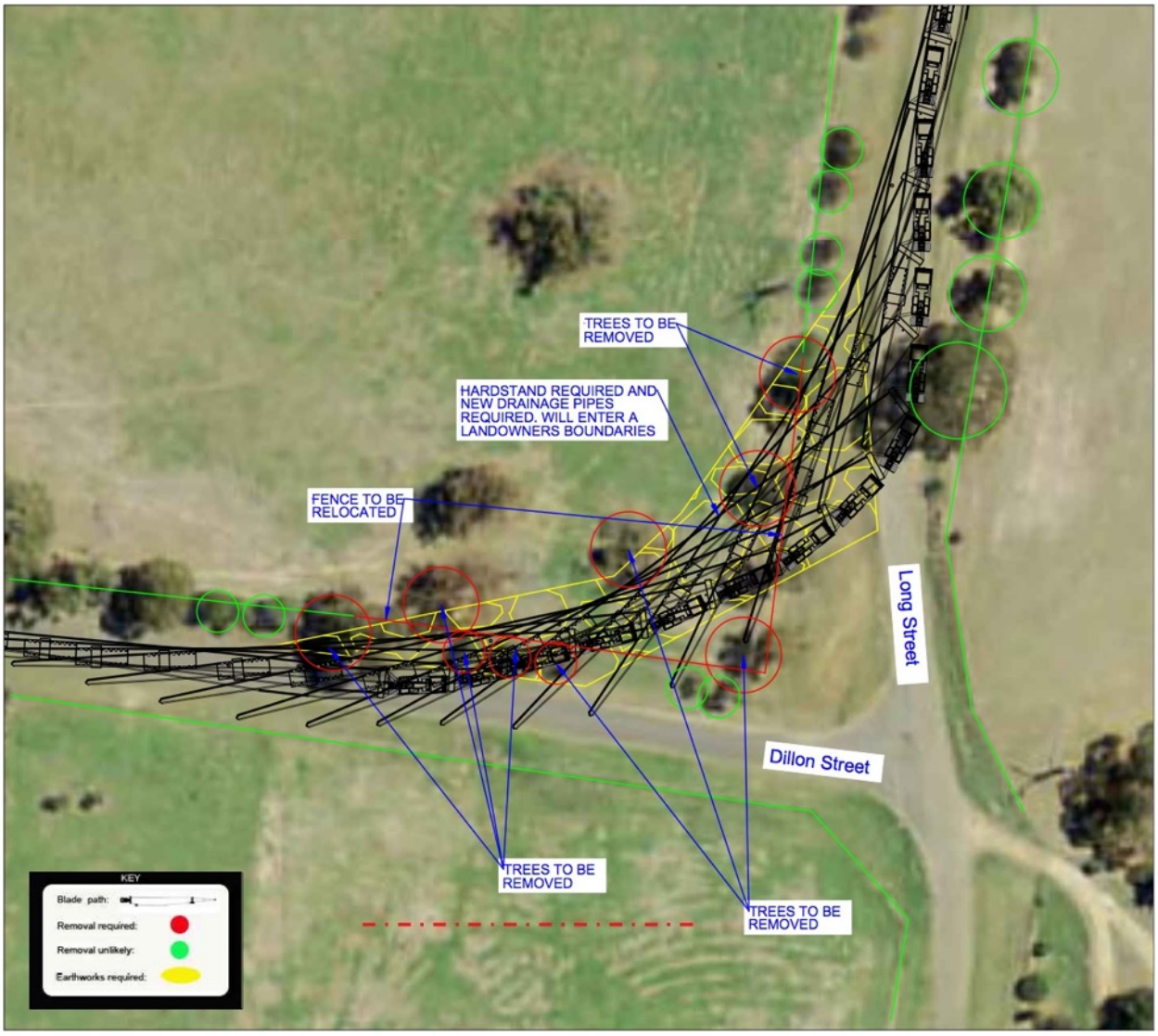


Image 2:

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/mnV8spf8JGG6LsT99

PROCEDURE: Left-hand turn from Dillon Street onto Long Street.

COMMENTS: Access through a landowner's boundary will be required to make this turn. Hardstand is required on the inside of the corner, and a fence relocated within the landowner's boundaries. Additionally, some vegetation needs to be removed.

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

489.5 Km's: Long Street onto Rye Park Road at Boorowa

Image 1:

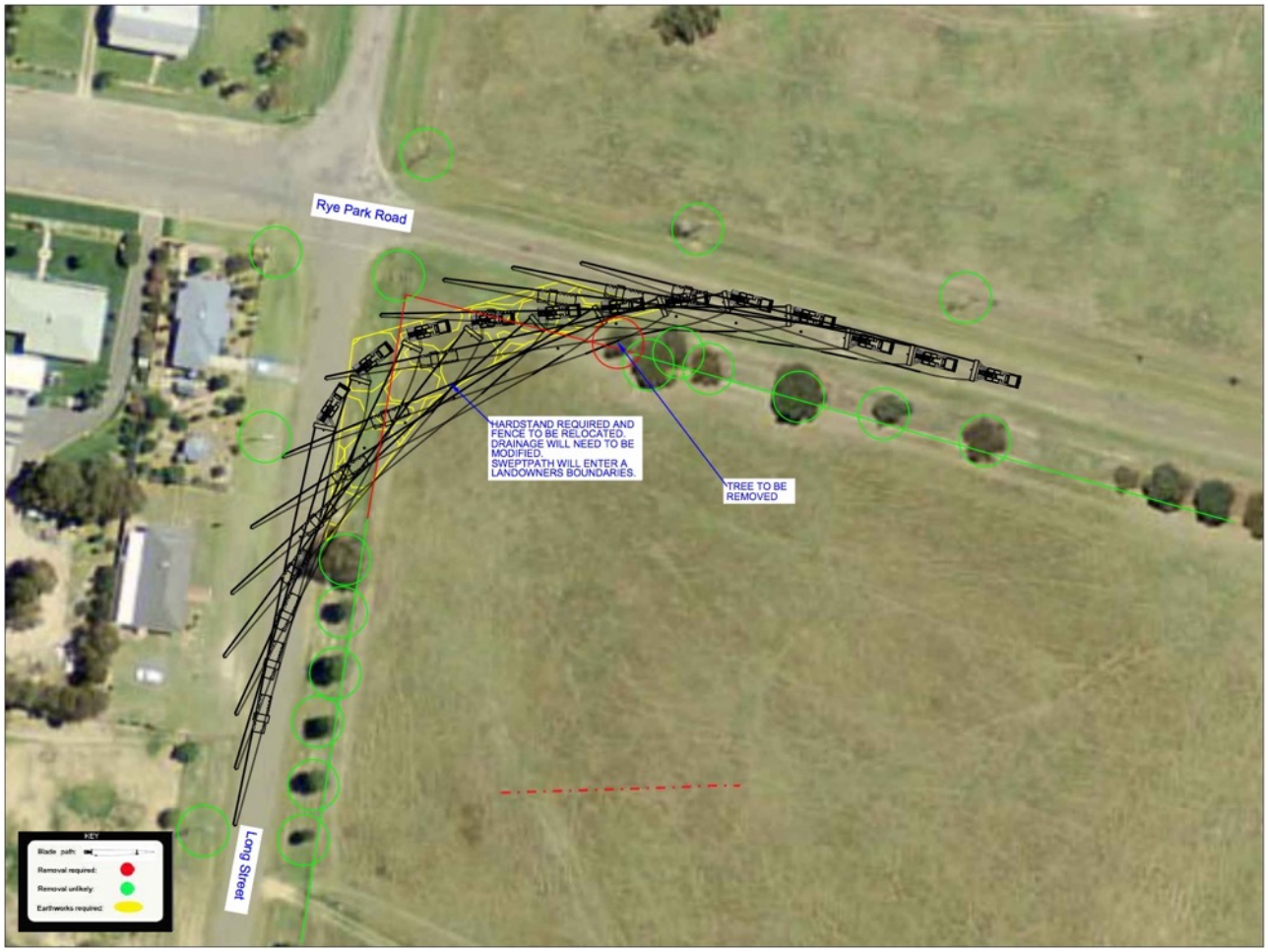


Image 2:

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/Ry5s7svgx1BDzRAMA

PROCEDURE: Right-hand turn from Long Street onto Rye Park Road.

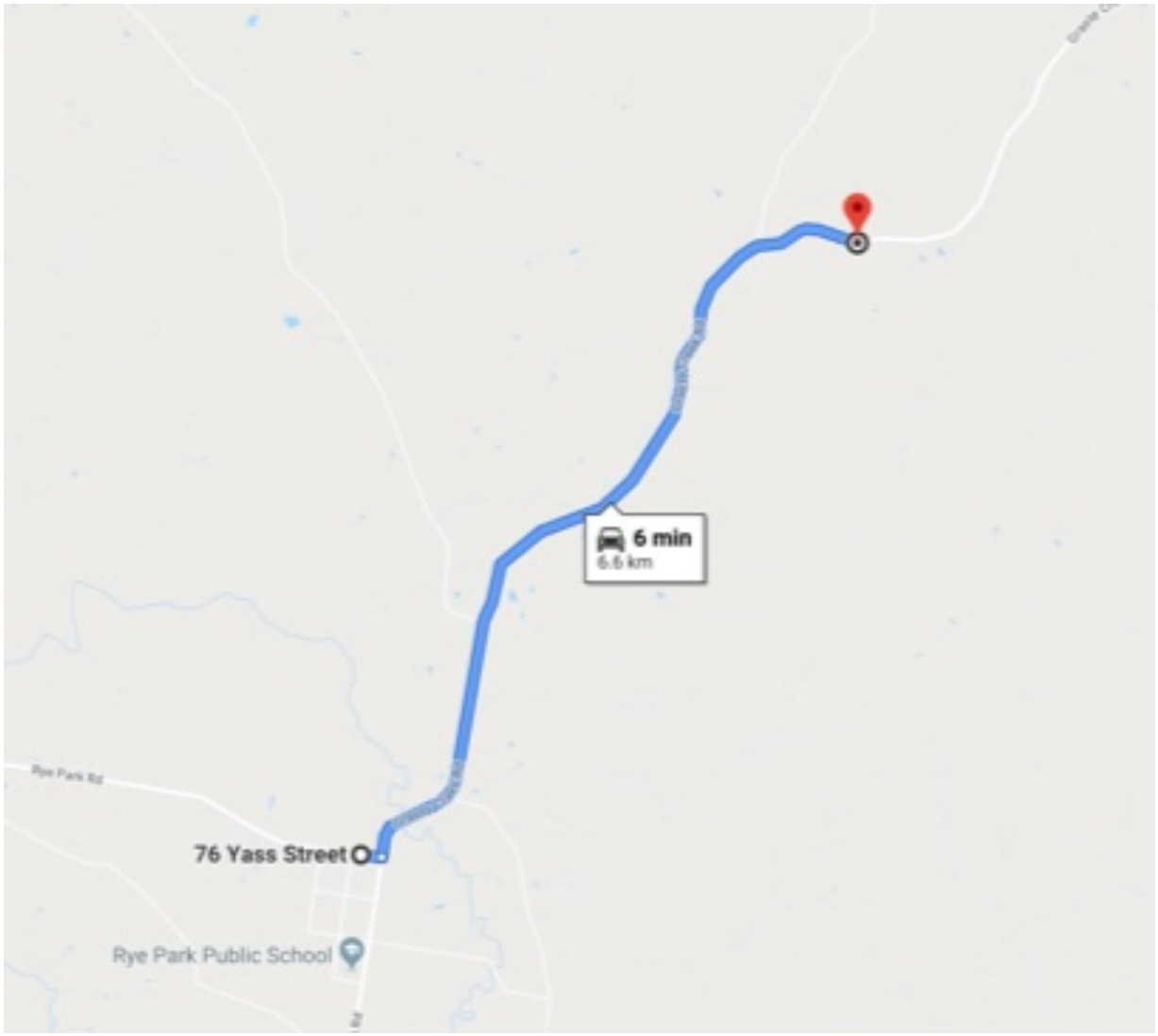
COMMENTS: Access through a landowner's boundary will be required to make this turn. Hardstand is required on the inside of the corner, and a fence relocated within the landowner's boundaries. Additionally, some vegetation needs to be removed.

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

10.0 Stage 2 Route survey (Rye Park Township to Rye Park North)

DISTANCE: 6.6 kilometres:

This route took us via Rye Park Road, Grassy Creek Road.



GPS LINK: https://goo.gl/maps/NC1AQuTTZPJHDDfk9

KEY	
MODIFICATIONS REQUIRED	
PINCH POINT	
EMERGENCY PARKING	

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
Route: Rye Park Township to Rye Park Windfarm North					
0.0	Rye park	Rye Park Road onto Grassy Creek Road GPS link: https://goo.gl/maps/LGgWeQKDCERMsHQv7	Length: 30 Metres	Left hand turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the landowner's property and some trees and fence will need to be removed.
0.0 to 6.6	Rye Park	Grassy Creek Road GPS link: https://goo.gl/maps/NC1AQuTTZPJHDDfk9	Width: 4.5 metres	Travel directly ahead	Grassy Creek road is generally 4.5 metres of width with no shoulder. The pavement is in fair condition but may show wear with the volume of heavy traffic. Some trees will need to be trimmed and removed on sections of this road. The floodway has an adequate swept path.
5.4	Rye park	Grassy Creek Road into site entrance # 2 https://goo.gl/maps/5LwRX2EKMkNAFYsT8		Left turn	Site entrance to be made suitable for the swept path of the largest loads.
6.6	Rye park	Grassy Creek Road into site entrance # 1 https://goo.gl/maps/B2bjRMNjVvybbfZt6		Right turn	Site entrance to be made suitable for the swept path of the largest loads.

0.0 Km's: Rye Park Road onto Grassy Creek Road at Rye Park

Image 1:

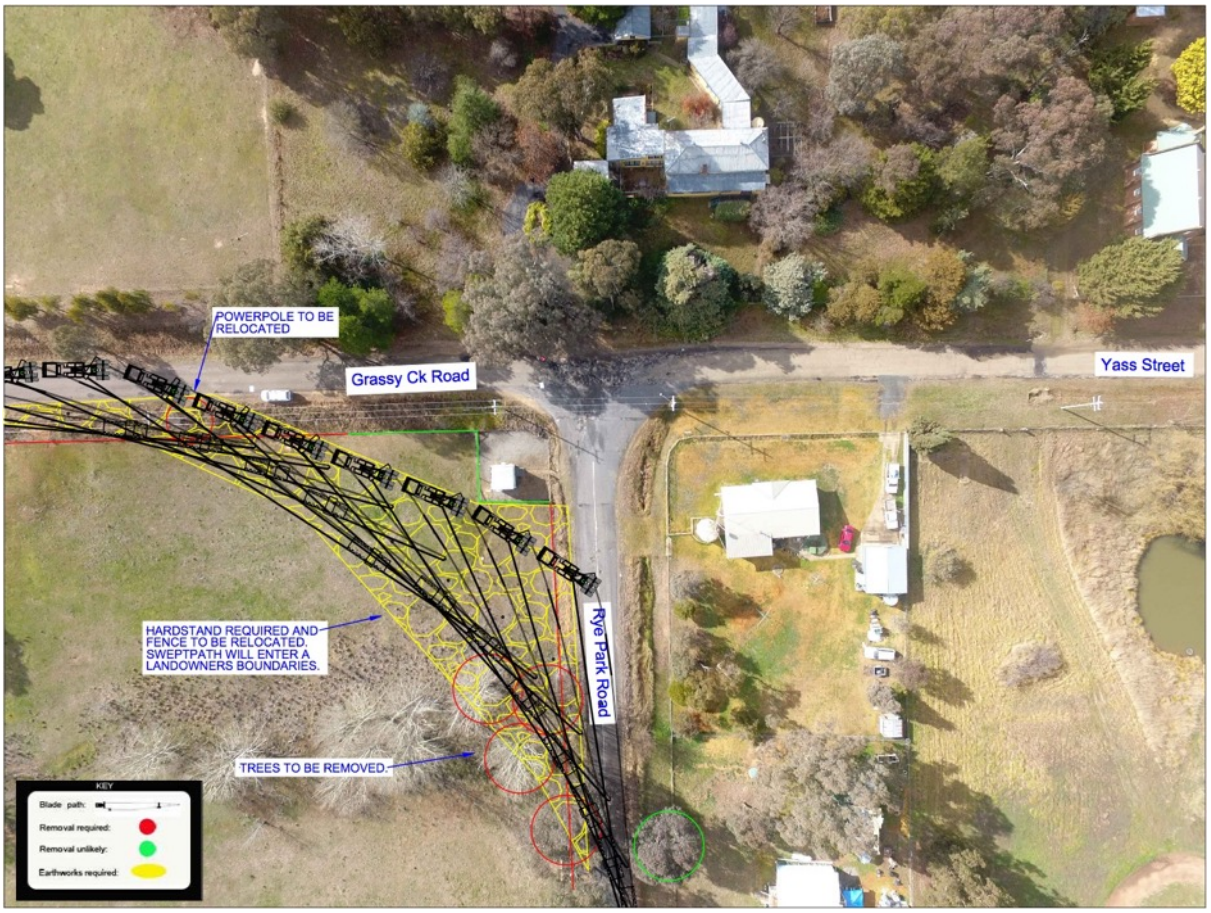


Image 2:

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/LGgWeQKDCERMsHQy7
PROCEDURE: Left-hand turn from Rye Park Road onto Grassy Creek Road.
COMMENTS: Access through a landowner's boundary will be required to make this turn. Hardstand is required on the landowner's property and some trees and fence will need to be removed.
ROAD MODIFICATIONS: Large amounts of works are required on this section of road.

0.0 to 6.6 Km's: Grassy Creek Rd.

Image 1:

Image 2:

PROCEDURE: Travel directly ahead on Grassy Creek Road.

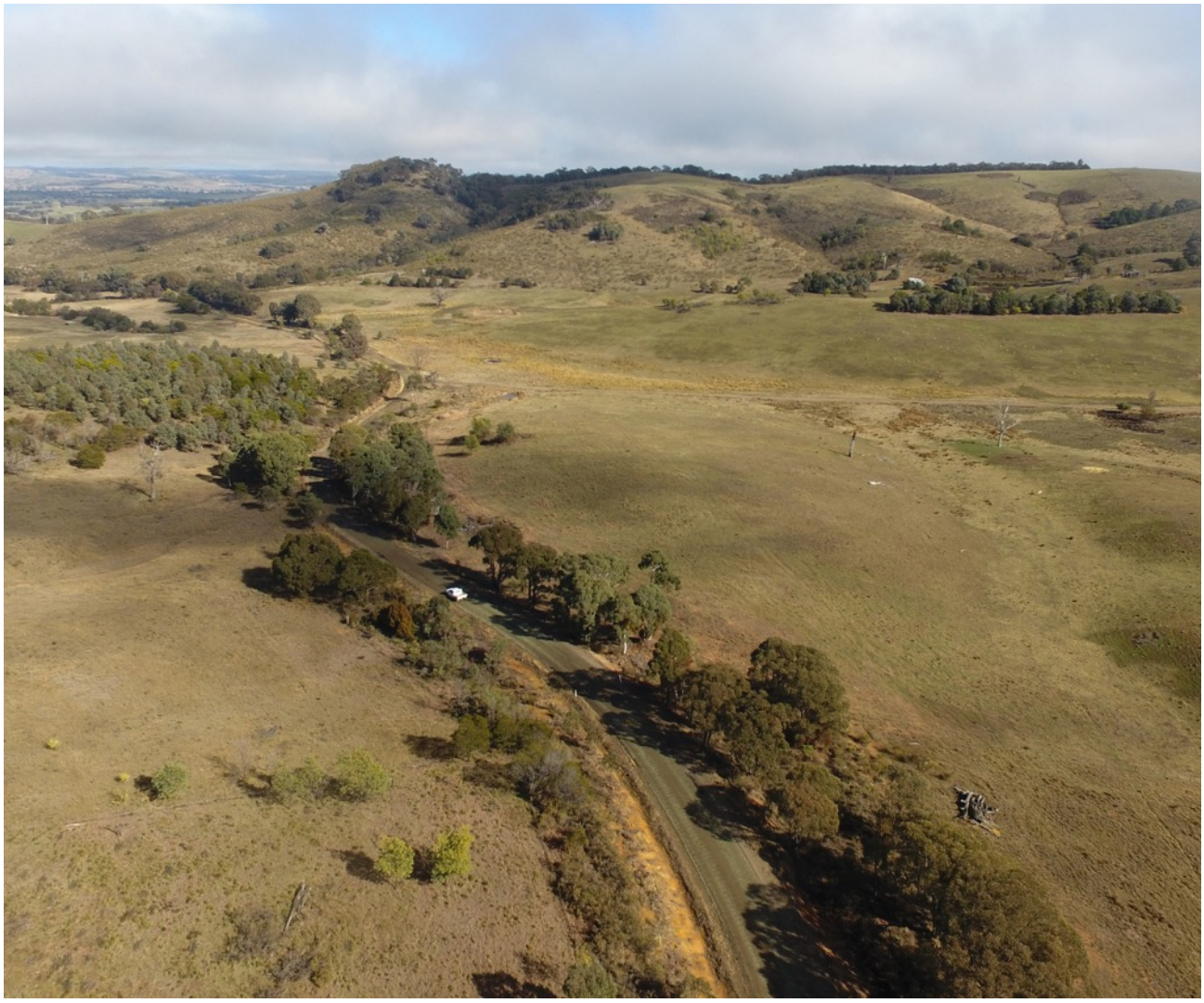
COMMENTS: Grassy Creek road is generally 4.5 metres of width with no shoulder. The pavement is in fair condition but may show wear with the volume of heavy traffic. Some trees will need to be trimmed and removed on sections of this road. The floodway has an adequate swept path.

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

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/Aw2n6KdNtLz

5.4 Km's: Grassy Creek Rd looking north towards site entrance # 2 at Rye Park

Image 1:



PROCEDURE: Loads to turn left off Grassy Creek Road into site access Road.

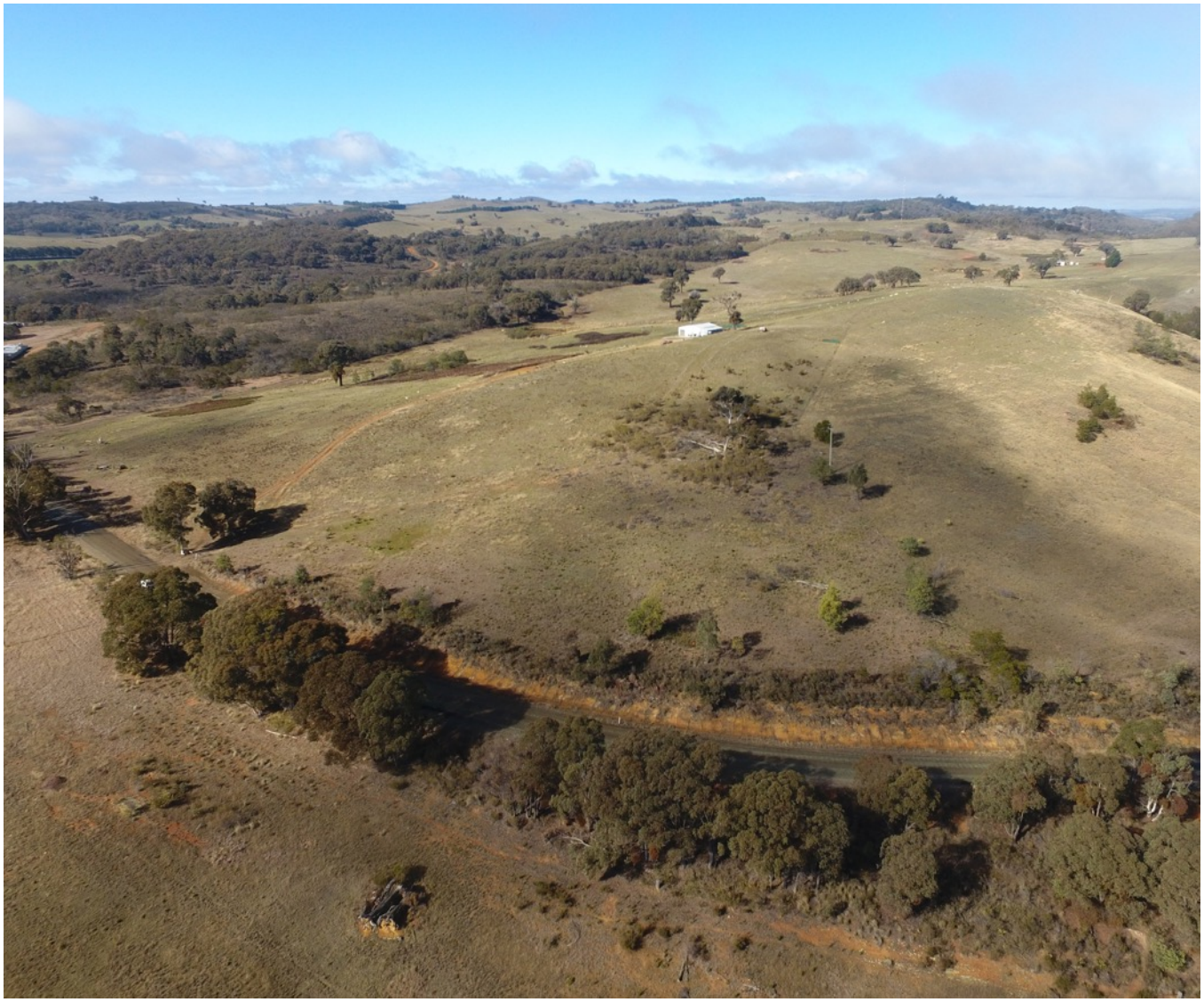
COMMENTS: Site entrance to be made suitable for the swept path of the largest loads.

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

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/8EToBmm8FqL2

6.6 Km's: Grassy Creek Rd looking south towards site entrance # 1 at Rye Park

Image 1:



PROCEDURE: Loads to turn right off Grassy Creek Road into site access Road.

COMMENTS: Site entrance to be made suitable for the swept path of the largest loads.

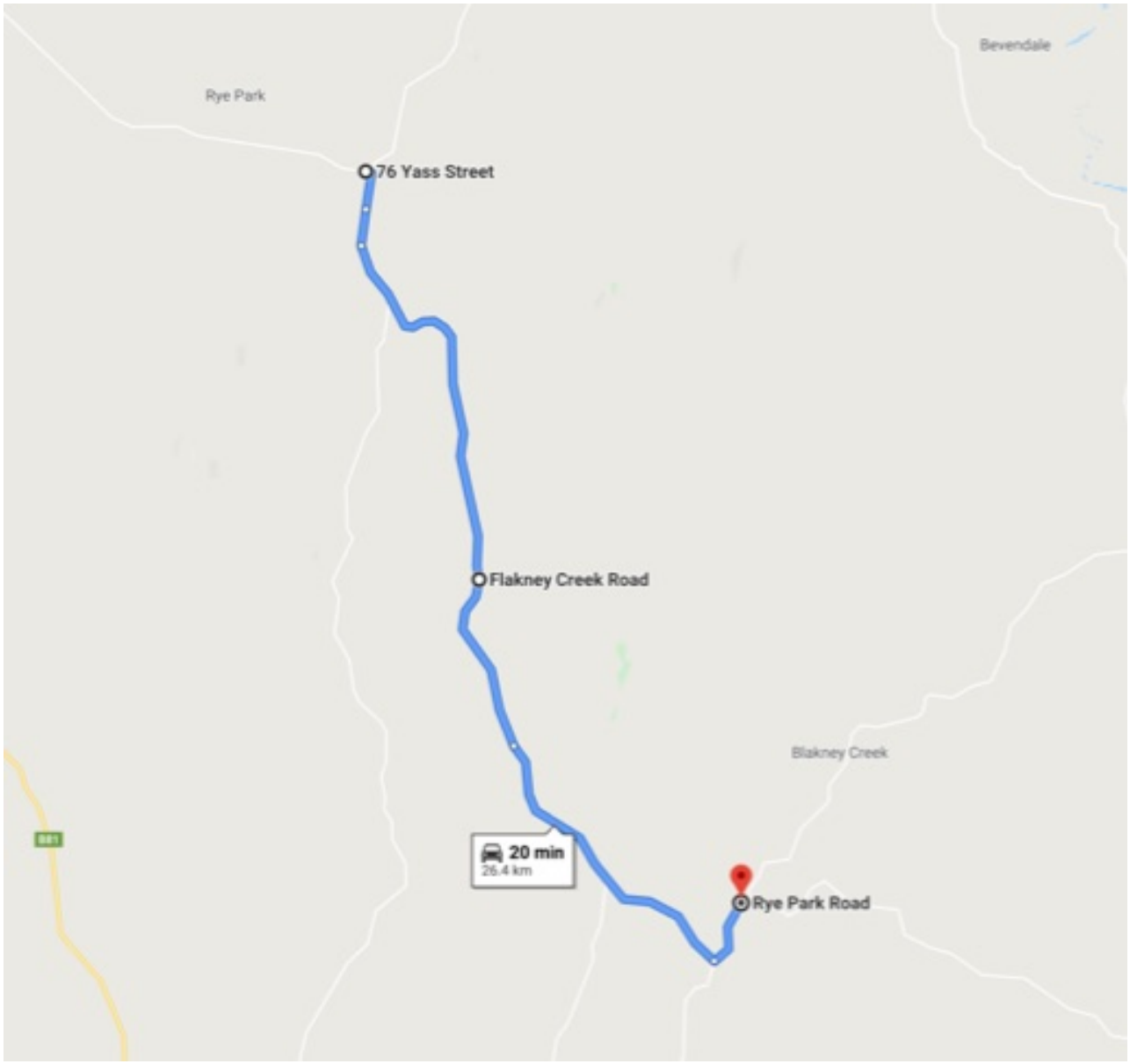
ROAD MODIFICATIONS: Moderate amounts of works are required on this section of road.

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/8EToBmm8FqL2

11.0 Stage 3 Route survey (Rye Park Township to Rye Park South)

DISTANCE: 26.4 kilometres:

This route took us via Rye Park Road, Yass Street, Gunning Street, Dalton Road, Rye Park Road. (Including a possible site access point off Flackney Creek Road).



GPS LINK: https://goo.gl/maps/xsk8nmSVdquTpEZDA

KEY	
MODIFICATIONS REQUIRED	
PINCH POINT	
EMERGENCY PARKING	

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
Route: Rye Park Township to Rye Park Windfarm North					
0.0	Rye park	Rye Park Road onto Yass Street Road GPS link: https://goo.gl/maps/LGgWeQKDCERMsHQv7	Length: 30 Metres	Right turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the landowner's property and some trees and fence will need to be removed.
0.0 to 26.4	Rye Park	Yass street through to Site entrance #13 https://goo.gl/maps/DV4fpurJ45k6HGvD7	4.5 Metres width clearance	Travel directly ahead	This section of road will need to be checked for swept path and vertical curve of the largest loads. Some sections of this road will require upgrades. Sections of this road have trees that would need to be trimmed/removed.
1.0	Rye Park	Yass Street onto Gunning Road https://goo.gl/maps/LLydmFC4TMxwjSzH7	5.5 Metres width clearance	Travel directly ahead	No problem with this section of road.
2.0	Rye Park	Gunning Road onto Dalton Road https://goo.gl/maps/zC4FNES8z1B1iJYk7	5.5 Metres width clearance	Travel directly ahead	No problems with this section of road.
12.0	Rye Park	Dalton Road onto Flakney Creek Road. (Site entrance #4) GPS link: https://goo.gl/maps/SWaaW7LWhcnekCJc7	30.0 metres clearance	Left turn	This corner and through to site will need to be made suitable for the swept path of the largest loads.
16.7	Rye Park	Dalton Road onto Rye Park Road https://goo.gl/maps/ah3wGy1QP5BrZzoU6	5.5 Metres width clearance	Travel directly ahead	No problems with this section of road.
24.7	Blakney Creek	Rye Park Road intersection of Blakney Creek South Road GPS link: https://goo.gl/maps/CGWNggq3i9ANQbMx8	30.0 metres clearance	Left turn	
26.4	Blakney Creek	Rye Park windfarm (Site entrance # 13) onto Rye Park Road GPS link: https://goo.gl/maps/saww6PjtwotzvKB36	0.0 metres clearance	Left turn	Site to supply adequate access for the swept path of the largest loads.

0.0 Km's: Rye Park Road onto Yass Street at Rye Park

Image 1:

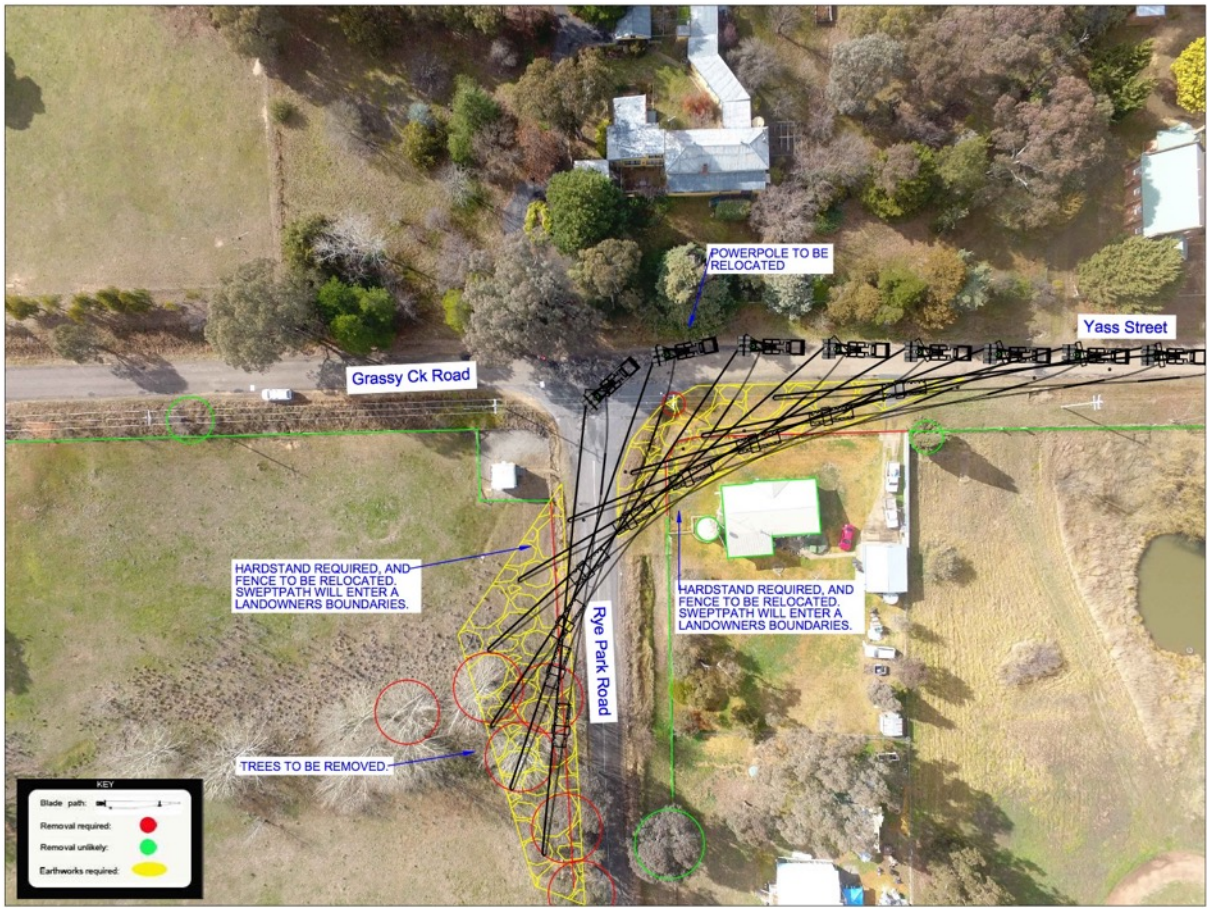


Image 2:

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/LGgWeQKDCERMsHQy7

PROCEDURE: Right-hand turn from Rye Park Road onto Yass Street.

COMMENTS: Access through a landowner's boundary will be required to make this turn. Hardstand is required on the landowner's property and some trees and fence will need to be removed.

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

12.0 Km's: Dalton Road onto Flakney Creek Road at Blakney Creek. (Site entrance # 4).

Image 1: (Option 1)

Image 2:

PROCEDURE: Turn Left from Dalton Road onto Flakney Creek Road.

COMMENTS: This corner and through to site will need to be made suitable for the swept path of the largest loads. This procedure will require hardstand and tree removal.

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

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/SWaaW7LWhcnekCJc7

24.7 Km's: Rye Park Road intersection of Blakney Creek South Road at Blakney Creek.

Image 1:

Image 2:

PROCEDURE: Turn left from Rye Park Road onto Rye Park Road.

COMMENTS: The existing turn would need to be relocated and made substantially wider. Large amounts of hardstand are required, and it is likely that some trees and fences will need to be removed. The causeway will also require modifications.

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

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/CGWNggq3i9ANQbMx8

26.4 Km's: Rye Park Road into Site entrance #13 at Blakney Creek.

Image 1: (Looking south-west along Rye Park Road from site entrance 13)

PROCEDURE: Right hand turn from rye Park Road into site entrance # 13.

COMMENTS: Site to supply adequate access for the swept path of the largest loads to re-enter the local road network.

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

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/saww6PjtwotzvKB36

12.0 Conclusion:

After studying all options and undertaking a route survey, this route in its current condition will require a large number 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. The route up to the turnoff of the Hume Highway is likely to be okay.

OVERHEAD STRUCTURES: (5.3 Maximum loaded height)

- There are a large number of overhead structures between Newcastle and Rye Park. The lowest of these structures is the pedestrian bridge over Pennant Hills Road at Normanhurst. There are a number of other structures noted as pinch points in the survey. Each of these pinch points will show the height clearance in each lane.

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:

- The route up until Boorowa is clear of vegetation. All roads from this point through to site will need to be checked for a clear passage of at least 5.3 metres for overhead branches. Some trimming/removal is likely from this point onwards.

WIDTH:

- The route up until Rye Park is suitable for a width of up to 5.0 metres. From Rye Park through to each site entrance there are sections that will require widening.
- Site entrance #1 through to Site entrance #13 has a number of sections that will need some widening. Rye Park Road from Rye Park and Grassy Creek road are particularly tight in some sections.

FLOODWAYS:

- All floodways on the local roads need to be checked. These floodways should be checked for axle loadings and width as well as the vertical curve of the trailers.

PAVEMENT:

- The route up until Boorowa is of Highway standard. From this point on the pavement varies from 5.0 metres in width with a good surface in some sections to patchy thin asphalt with poor surface in others as well as some gravel roads. There is likely to be some wear during the deliveries on these lesser roads.
- Site access # 11 through to Site access # 13: The pavement changes from good asphalt to gravel in sections of this route. There is likely to be some wear during the deliveries on these lesser roads. All gravel roads will need to be made suitable for all weather travel.

ROADWORKS:

- The project will need to start discussions with government authorities at least 18 months prior to turbine transport to understand if the project would conflict with any upcoming roadworks. Once a TMP has been approved for the transport of the turbines, then the exact movement dates need to be communicated with transport NSW to make all road stakeholders aware of the movements.

NEWCASTLE:

- Several intersections will need modifications to allow the blades a suitable swept path around these corners. This will include relocation of a traffic signal, several signs and a pole. Additionally, some hardstand is required on 2 corners and a median strip will need to be lowered.

SYDNEY:

- The turn from the M1 Motorway onto Pennant Hills Road requires only a small amount of work on the centre median. However, this corner needs to be rechecked on completion of the Northconnex.
- The turn from Pennant Hills Road onto the M2 Motorway will require modifications This will include relocation of a traffic signal, a section of fence removed, and the relocating of a barrier.

YASS:

- Some signs need to be relocated or made removable on the turnoff from the Hume Highway onto Lachlan Valley way.

BOOROWA:

- Several intersections will need to be upgraded to allow a suitable swept path. Two of these corners will travel through a landowner's boundaries.

RYE PARK:

- The route from Site entrance # 1 to Site entrance # 13 was found to be in fair condition with the route needing some widening in some sections. A large amount of works would be required on all intersections and site access points.
- Grassy Creek Road will require some tree pruning/Removal; however the swept path seems to be suitable in it's current form.
- Site entrances off Grassy Creek Road will need to be made suitable for the swept path of the largest loads.

BLACKNEY CREEK:

- Site entrances off Rye Park Road will need to be made suitable for the swept path of the largest loads.

EMPTY RETURN:

- It would be advisable that the project discusses additional return routes for empty travel, which would avoid all of the Northern traffic returning via the Southern Site. We would suggest seeking approval for Cooks Hill Road and Faulder Avenue to be used for empty return travel to Yass.

13.0 References:

Australian Load Restraint Guide
Rex J Andrews P/L Drawings
Rex J Andrews route survey # 248 REV03
Tilt Renewables
Siemens/Gamesa
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 the listed routes.

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

Appendix C: Ares Transport Group Route Study from Port Kembla to Rye Park

Vestas Australian Wind Technology P/L

Route Survey – Port Kembla to Rye Park Wind Farm

Varsha Hariharan
0436 921 346
vahah@vestas.com

Date: 28 February 2020
Prepared by ARES TRANSPORT GROUP PTY LTD
ABN: 24 614 163 754

Declaration and Revision Status

Rev	Issued	Creator	Reviewed	Approved by and Date		Revision Type
0	28/02/2020	Ian Wong		Jason Millar		Preliminary issue

Revision: 0
Prepared By: Ian Wong
Name of Organisation: Ares Transport Group Pty Ltd
Date: 28 February 2020
Prepared For: Vestas Australian Wind Technology P/L

Table of Contents

Cover photograph

Courtesy of Drake Trailers © Drake

1 INTRODUCTION

ARES Transport Group is an Australian owned heavy haulage transport company specializing in infrastructure logistics and heavy haulage.

ARES are premier service providers who demonstrate world's best practice in health, safety and risk mitigation. The senior team have been the market leaders in this sector for the past 15 years in each of their respective fields. This extends to award winning equipment, innovation and business know-how.

Our development team, communication systems and project planning brings reliable, safe trouble free results to you ensuring that your project is delivered, safely, on time and on budget every time. As a result, the customer at the end of the day can rest assured that they will receive the same level of service and appreciation through the whole project/contract that they have previously become accustomed to from us.

Through continual innovation, we have raised industry standards with our advanced planning and engineering, clear policies, robust procedures and experienced qualified staff.

ARES are currently bidding on the onshore logistics scope of Vestas wind turbine components for the construction of the Rye Park Wind Farm (RPWF).

This preliminary Route Survey covers the proposed transport route of oversized components from the port of discharge Port Kembla to the wind farm site.

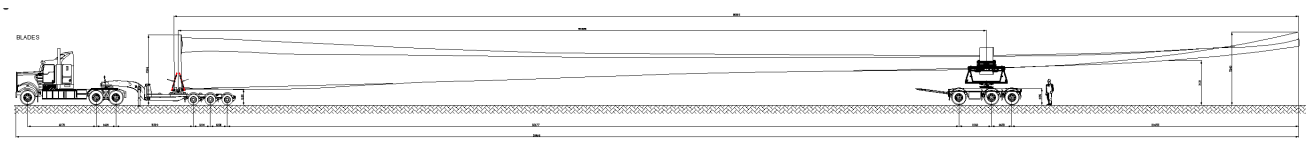
1.1 Methodology

This preliminary Route Survey has been conducted as a mix of physical survey by driving the proposed route, and desktop assessment for sections of the route which have not been driven. ARES intend to perform a full physical survey of the route to validate the desktop assessment results if we are selected for the transport scope for RPWF.

The wind turbine proposed for the wind farm is the Vestas EnVentus V162-5.6MW. Based on dimensional information provided by Vestas, we have based our swept path analyses on the worst-case component, which is the 81.1m-long blade.

Dimension	Measure	SOURCE
Length	81,100mm	Preliminary Weights and Dimensions – Vestas EnVentus V162-5.6MW
Width	4,500mm	
Height	4,000mm	
Weight	28.1 Tons	

Using a dolly and jinker configuration, the overall length of the truck and trailer configuration would be around 91.5m.



2 PROPOSED ROUTES

From the Port there are 2 routes:

1. High loads via North Wollongong.
2. All other loads to travel along the M1 Princes motorway.

The next section outlines the obstacles on the routes in detail and time taken.

2.1 Current Known Restrictions

ARES note the following restrictions along the proposed transport route:

1. NSW Police escorts required on High Risk Moves (over 40mL) and potential limitations for Police escorts on Saturdays
2. Picton Rd roadworks
3. Curfew travel time restrictions from the edge of Wollongong Metro per below table:

Vehicle Dimensions	Wollongong Metro Monday - Friday (not public holidays)	Wollongong Metro Saturdays, Sunday & public holidays	Rural Areas	Major Roads	Freeways
Up to 2.5m wide and/or 22.0m Long	At All times	At All times	At All times	At All times	At All times
Over 2.5m wide and/or 19.0m long	Sunrise - 7:00 am 9.00 am - 4.00 pm 6.00 pm - sunset	Sunrise – Sunset **No Travel** on Public Holiday weekends	Sunrise to Sunset	Sunrise to Sunset	Sunrise to Sunset

2.2 Route 1: Port Kembla to Rye Park Wind Farm (excl. high loads)

This route information is current as at February 2020.

- This route is to be used for all configurations except those over 5.0mH.
- Contact to be made with roadworks site on Picton Road to ensure loads can be accommodated

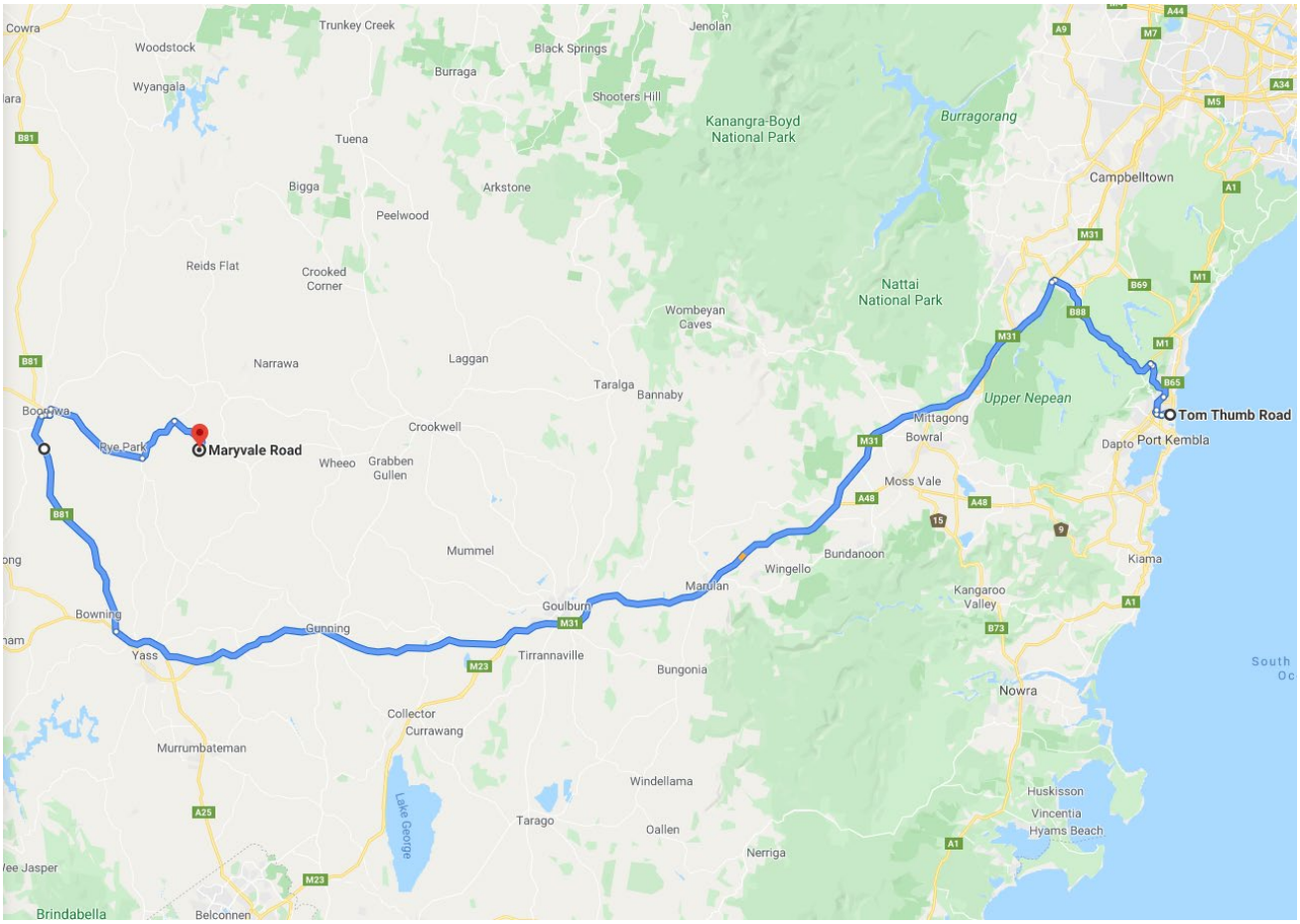
Road Modifications

Several road modifications on the proposed route in the Boorowa vicinity would be required to allow oversized components to traverse – please refer to the following section for details.

Street Furniture

Removal and replacement of any road signs (Keep Left, Give Way, etc.) are easily achieved with the signs being held in place by bolts or wedges. The lead pilot will remove signs with the rear pilot replacing after the load has passed through.

Route: https://goo.gl/maps/TUYvQzWFoxnEyQfy8
Total distance to site: 329 km



Proposed Route 1 – Port Kembla to Rye Park

ACTION	LOCATION	KM	OBSTRUCTION	HEIGHT			Rating	COMMENT
				L	M	R		
LHT	Exit Tom Thumb Road	0.0	**intersection**				●	Light and trees to be removed
RHT	Masters Road	1.2	**intersection**				●	Slow travel
STR	M1	4.6	**Bridge**	5.05	5.18	5.31	●	Slow travel
STR	M1	6.7	**Bridge**	5.43	5.35	5.28	●	Slow travel
LHT	Picton Road	13.8	**intersection**				●	Oncoming traffic to be stopped by police
STR	Picton Road	31.0	**Road works**				●	Take caution- slow travel
LHT	Hume Highway	40.9	**intersection**				●	Steering required. Light pole to be moved
STR	Hume Highway	126.2	**HVIS**				●	slow travel
RHT	Lachlan Valley Way	244.4	**intersection**				●	Take Caution
RHT	Trucking Yard Rd	287.5	**intersection**				●	Take Caution
LHT	Long Rd	289.2	**Intersection**				●	Trees and fences obstruct turn. Requires modification of corner.
RHT	Rye Park Rd	290.3	**Intersection**				●	Sharp corner, requires modification.
LHT	Grassy Creek Rd	309.7	**intersection**				●	Power pole and Telstra box obstruct turn. Requires modification of corner.
RHT	Maryvale Rd	319.5	**Roundabout**				●	Take Caution

LEGEND

●	Take Caution
●	Medium Maneuver
●	Difficult Maneuver

Notes:

- The route from Port Kembla to Goulburn was physically surveyed by ARES in 2019 and all pinch points are well known
- The route from Goulburn to Boorowa via Yass has not been physically surveyed recently but is very familiar to ARES. The Hume Highway (Goulburn to Yass) and Lachlan Valley Way (Yass to Boorowa) are well established oversize routes and are being used for other wind farm projects in 2020

2.2.1 Tom Thumb Road Exit

ACTION	LOCATION	KM	OBSTRUCTION	HEIGHT			Rating	COMMENT
				L	M	R		
LHT	Exit Tom Thumb Road	0.0	**intersection**				●	Light and trees to be removed

INTERSECTION OF:
TOM THUM RD &
SPRINGHILL RD

OBSTACLES:
- POWERPOLES / LIGHTS
- TREES ON OUTSIDE EDGE

SUGGESTION
LIHT & TREES TO BE REMOVED BY NSW PORTS

AFFECTED LAND OWNERS: NIL

REV	DATE	DESCRIPTION	DRN	CHK	APP	REFERENCE DRAWINGS
1	5/08/2016	INITIAL DRAWING	JM			

DRAWING NOTES:

ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE (UNO) ALL WEIGHTS ARE IN t (METRIC TONNES) UNO ALL DETAILS ARE PROVISIONAL AND SUBJECT TO CONFIRMATION LASHINGS CALCULATIONS AS PER RESTRAINT GUIDELINES

TECHNICAL NOTES:

WEIGHT, DIMENSIONS AND COG POSITION TO BE CONFIRMED BY CLIENT STRUCTURAL INTEGRITY TO BE CHECKED BY CLIENT OPERATIONAL DIAGRAMS AND MANUAL MUST BE OBSERVED HYDRAULIC STABILITY REFERS TO STATIC LOAD ONLY STABILITY PROVISIONAL UNTIL COG CONFIRMED

ARES TRANSPORT GROUP PTY LTD - ABN: 24 614 163 754

ARES

DRAWN BY:
DRAWN DATE:
CHECKED BY:

CUSTOMER	VESTAS	SIZE	A3
PROJECT	RYE PARK	SCALE	NTS
DRAWING TITLE	RYE PARK SWEPT PATHS	SHEET No	
DRAWING NAME	RYE PARK SWEPT PATHS.DWG	REV	A3

2.2.2 Springhill Rd / Masters Rd RHT

ACTION	LOCATION	KM	OBSTRUCTION	HEIGHT			Rating	COMMENT
				L	M	R		
RHT	Masters Road	1.2	**intersection**				●	Slow travel

INTERSECTION OF:
SPRINGHILL RD &
MASTERS RD

OBSTACLES:
- TRAFFIC LIGHTS
- MEDIAN STRIP

SUGGESTION
TRUCK WILL TRAVERSE THE MEDIAN STRIP. HARD STAND WILL BE REQUIRED ON THIS MEDIAN STRIP.

AFFECTED LAND OWNERS: Nil

REV	DATE	DESCRIPTION	DRN	CHK	APP	REFERENCE DRAWINGS
1	5/08/2016	INITIAL DRAWING	JM			

DRAWING NOTES:

ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE (UNO) ALL WEIGHTS ARE IN t (METRIC TONNES) UNO ALL DETAILS ARE PROVISIONAL AND SUBJECT TO CONFIRMATION LASHINGS CALCULATIONS AS PER RESTRAINT GUIDELINES

TECHNICAL NOTES:

WEIGHT, DIMENSIONS AND COG POSITION TO BE CONFIRMED BY CLIENT STRUCTURAL INTEGRITY TO BE CHECKED BY CLIENT OPERATIONAL DIAGRAMS AND MANUAL MUST BE OBSERVED HYDRAULIC STABILITY REFERS TO STATIC LOAD ONLY STABILITY PROVISIONAL UNTIL COG CONFIRMED

ARES TRANSPORT GROUP PTY LTD - ABN: 24 614 163 754

ARES

DRAWN BY:
DRAWN DATE:
CHECKED BY:

CUSTOMER	VESTAS	SIZE A3
PROJECT	RYE PARK	SCALE NTS
DRAWING TITLE	RYE PARK SWEPT PATHS	SHEET No
DRAWING NAME	RYE PARK SWEPT PATHS.DWG	REV A3

2.2.3 University Ave Bridge

ACTION	LOCATION	KM	OBSTRUCTION	HEIGHT			Rating	COMMENT
				L	M	R		
STR	M1	4.6	**Bridge**	5.05	5.18	5.31	●	Slow travel

2.2.4 New Mt Pleasant Rd Bridge

ACTION	LOCATION	KM	OBSTRUCTION	HEIGHT			Rating	COMMENT
				L	M	R		
STR	M1	6.7	**Bridge**	5.43	5.35	5.28	●	Slow travel

2.2.5 Mt Ousley Rd / Picton Rd LHT

ACTION	LOCATION	KM	OBSTRUCTION	HEIGHT			Rating	COMMENT
				L	M	R		
LHT	Picton Road	13.8	**intersection**				●	Oncoming traffic to be stopped by police

INTERSECTION OF:
MOUNT OUSLEY RD &
PICTON RD

OBSTACLES:
ONCOMING SOUTHBOUND TRAFFIC

SUGGESTION
POLICE WILL NEED TO STOP SOUTHBOUND TRAFFIC AS THEY DO ON ALL BLADES ALREADY

AFFECTED LAND OWNERS: Nil

REV	DATE	DESCRIPTION	DRN	CHK	APP	REFERENCE DRAWINGS
1	5/08/2016	INITIAL DRAWING	JM			

DRAWING NOTES:

ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE (UNO) ALL WEIGHTS ARE IN t (METRIC TONNES) UNO ALL DETAILS ARE PROVISIONAL AND SUBJECT TO CONFIRMATION LASHINGS CALCULATIONS AS PER RESTRAINT GUIDELINES

TECHNICAL NOTES:

WEIGHT, DIMENSIONS AND COG POSITION TO BE CONFIRMED BY CLIENT STRUCTURAL INTEGRITY TO BE CHECKED BY CLIENT OPERATIONAL DIAGRAMS AND MANUAL MUST BE OBSERVED HYDRAULIC STABILITY REFERS TO STATIC LOAD ONLY STABILITY PROVISIONAL UNTIL COG CONFIRMED

ARES TRANSPORT GROUP PTY LTD - ABN: 24 614 163 754

ARES

DRAWN BY:
DRAWN DATE:
CHECKED BY:

CUSTOMER	VESTAS	SIZE	A3
PROJECT	RYE PARK	SCALE	NTS
DRAWING TITLE	RYE PARK SWEPT PATHS	SHEET No	
DRAWING NAME	RYE PARK SWEPT PATHS.DWG	REV	A3

2.2.6 Picton Rd / Hume Motorway LHT

ACTION	LOCATION	KM	OBSTRUCTION	HEIGHT			Rating	COMMENT
				L	M	R		
LHT	Hume Highway	40.9	**intersection**				●	Steering required. Light pole to be moved

INTERSECTION OF:
PICTON RD &
HUME HIGHWAY RD

OBSTACLES:
LIGHT POLE ON INSIDE EDGE

SUGGESTION
MOVE LIGHTPOLE INWARDS 3 METERES

AFFECTED LAND OWNERS: NIL

REV	DATE	DESCRIPTION	DRN	CHK	APP	REFERENCE DRAWINGS
1	5/08/2016	INITIAL DRAWING	JM			

DRAWING NOTES:

ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE (UNO) ALL WEIGHTS ARE IN t (METRIC TONNES) UNO ALL DETAILS ARE PROVISIONAL AND SUBJECT TO CONFIRMATION LASHINGS CALCULATIONS AS PER RESTRAINT GUIDELINES

TECHNICAL NOTES:

WEIGHT, DIMENSIONS AND COG POSITION TO BE CONFIRMED BY CLIENT STRUCTURAL INTEGRITY TO BE CHECKED BY CLIENT OPERATIONAL DIAGRAMS AND MANUAL MUST BE OBSERVED HYDRAULIC STABILITY REFERS TO STATIC LOAD ONLY STABILITY PROVISIONAL UNTIL COG CONFIRMED

ARES TRANSPORT GROUP PTY LTD - ABN: 24 614 163 754

ARES

DRAWN BY:
DRAWN DATE:
CHECKED BY:

CUSTOMER	VESTAS	SIZE A3
PROJECT	RYE PARK	SCALE NTS
DRAWING TITLE	RYE PARK SWEPT PATHS	SHEET No
DRAWING NAME	RYE PARK SWEPT PATHS.DWG	REV A3

2.2.7 Hume Hwy / Lachlan Valley Way RHT

ACTION	LOCATION	KM	OBSTRUCTION	HEIGHT			Rating	COMMENT
				L	M	R		
RHT	Lachlan Valley Way	244.4	**intersection**				●	Take Caution

INTERSECTION OF:
HUME HIGHWAY &
LAUCHLAN VALLEY WAY

OBSTACLES:
NIL

SUGGESTION
NIL

AFFECTED LAND OWNERS: NIL

REV	DATE	DESCRIPTION	DRN	CHK	APP	REFERENCE DRAWINGS
1	5/08/2016	INITIAL DRAWING	JM			

DRAWING NOTES:

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TECHNICAL NOTES:

WEIGHT, DIMENSIONS AND COG POSITION TO BE CONFIRMED BY CLIENT STRUCTURAL INTEGRITY TO BE CHECKED BY CLIENT OPERATIONAL DIAGRAMS AND MANUAL MUST BE OBSERVED HYDRAULIC STABILITY REFERS TO STATIC LOAD ONLY STABILITY PROVISIONAL UNTIL COG CONFIRMED

ARES TRANSPORT GROUP PTY LTD - ABN: 24 614 163 754

ARES

DRAWN BY:
DRAWN DATE:
CHECKED BY:

CUSTOMER	VESTAS	SIZE A3
PROJECT	RYE PARK	SCALE NTS
DRAWING TITLE	RYE PARK SWEPT PATHS	SHEET No
DRAWING NAME	RYE PARK SWEPT PATHS.DWG	REV A3

2.2.8 Lachlan Valley Way / Trucking Yard Rd RHT

ACTION	LOCATION	KM	OBSTRUCTION	HEIGHT			Rating	COMMENT
				L	M	R		
RHT	Trucking Yard Rd	287.5	**intersection**				●	Take Caution

INTERSECTION OF:
LAUCHLAN VALLEY WAY &
TRUCKING YARD RD

OBSTACLES:
NIL

SUGGESTION
NIL

AFFECTED LAND OWNERS: NIL

Plot date: Tuesday, 29 October 2019 8:21:19 PM

REV	DATE	DESCRIPTION	DRN	CHK	APP	REFERENCE DRAWINGS
1	5/08/2016	INITIAL DRAWING	JM			

DRAWING NOTES:

ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE (UNO) ALL WEIGHTS ARE IN t (METRIC TONNES) UNO ALL DETAILS ARE PROVISIONAL AND SUBJECT TO CONFIRMATION LASHINGS CALCULATIONS AS PER RESTRAINT GUIDELINES

TECHNICAL NOTES:

WEIGHT, DIMENSIONS AND COG POSITION TO BE CONFIRMED BY CLIENT STRUCTURAL INTEGRITY TO BE CHECKED BY CLIENT OPERATIONAL DIAGRAMS AND MANUAL MUST BE OBSERVED HYDRAULIC STABILITY REFERS TO STATIC LOAD ONLY STABILITY PROVISIONAL UNTIL COG CONFIRMED

ARES TRANSPORT GROUP PTY LTD - ABN: 24 614 163 754

ARES

DRAWN BY:
DRAWN DATE:
CHECKED BY:

CUSTOMER	VESTAS	SIZE	A3
PROJECT	RYE PARK	SCALE	NTS
DRAWING TITLE	RYE PARK SWEPT PATHS	SHEET No	
DRAWING NAME	RYE PARK SWEPT PATHS.DWG	REV	A3

2.2.9 Dillon Rd / Long Rd LHT

ACTION	LOCATION	KM	OBSTRUCTION	HEIGHT			Rating	COMMENT
				L	M	R		
LHT	Long Rd	289.2	**Intersection**				●	Trees and fences obstruct turn. Requires modification of corner.

INTERSECTION OF:
DILLON RD &
LONG RD

OBSTACLES:
TREES AND FENCES

SUGGESTION
CONSTRUCT A ROAD ON THE OUTSIDE OF THE INTERSECTION.

AFFECTED LAND OWNERS: 2

REV	DATE	DESCRIPTION	DRN	CHK	APP	REFERENCE DRAWINGS
1	5/08/2016	INITIAL DRAWING	JM			

DRAWING NOTES:

ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE (UNO) ALL WEIGHTS ARE IN t (METRIC TONNES) UNO ALL DETAILS ARE PROVISIONAL AND SUBJECT TO CONFIRMATION LASHINGS CALCULATIONS AS PER RESTRAINT GUIDELINES

TECHNICAL NOTES:

WEIGHT, DIMENSIONS AND COG POSITION TO BE CONFIRMED BY CLIENT STRUCTURAL INTEGRITY TO BE CHECKED BY CLIENT OPERATIONAL DIAGRAMS AND MANUAL MUST BE OBSERVED HYDRAULIC STABILITY REFERS TO STATIC LOAD ONLY STABILITY PROVISIONAL UNTIL COG CONFIRMED

ARES TRANSPORT GROUP PTY LTD - ABN: 24 614 163 754

ARES

DRAWN BY:
DRAWN DATE:
CHECKED BY:

CUSTOMER	VESTAS	SIZE	A3
PROJECT	RYE PARK	SCALE	NTS
DRAWING TITLE	RYE PARK SWEPT PATHS	SHEET No	
DRAWING NAME	RYE PARK SWEPT PATHS.DWG	REV	A3

Plot date: Tuesday, 29 October 2019 8:21:30 PM

2.2.10 Long Rd / Rye Park Rd RHT

ACTION	LOCATION	KM	OBSTRUCTION	HEIGHT			Rating	COMMENT
				L	M	R		
RHT	Rye Park Rd	290.3	**Intersection**				●	Sharp corner, requires modification.

REV	DATE	DESCRIPTION	DRN	CHK	APP	REFERENCE DRAWINGS
1	5/08/2016	INITIAL DRAWING	JM			

DRAWING NOTES:

ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE (UNO) ALL WEIGHTS ARE IN t (METRIC TONNES) UNO ALL DETAILS ARE PROVISIONAL AND SUBJECT TO CONFIRMATION LASHINGS CALCULATIONS AS PER RESTRAINT GUIDELINES

TECHNICAL NOTES:

WEIGHT, DIMENSIONS AND COG POSITION TO BE CONFIRMED BY CLIENT STRUCTURAL INTEGRITY TO BE CHECKED BY CLIENT OPERATIONAL DIAGRAMS AND MANUAL MUST BE OBSERVED HYDRAULIC STABILITY REFERS TO STATIC LOAD ONLY STABILITY PROVISIONAL UNTIL COG CONFIRMED

ARES TRANSPORT GROUP PTY LTD - ABN: 24 614 163 754

ARES

DRAWN BY:
DRAWN DATE:
CHECKED BY:

CUSTOMER	VESTAS	SIZE	A3
PROJECT	RYE PARK	SCALE	NTS
DRAWING TITLE	RYE PARK SWEPT PATHS	SHEET No	
DRAWING NAME	RYE PARK SWEPT PATHS.DWG	REV	A3

2.2.11 Rye Park Rd / Grassy Creek Rd LHT

ACTION	LOCATION	KM	OBSTRUCTION	HEIGHT			Rating	COMMENT
				L	M	R		
LHT	Grassy Creek Rd	309.7	**intersection**				●	Power pole and Telstra box obstruct turn. Requires modification of corner.

INTERSECTION OF:
RYE PARK RD &
GRASSY CREEK RD

OBSTACLES:
- POWERPOLE ON INSIDE EDGE
- TELSTRA BOX ON INSIDE EDGE

SUGGESTION
CONSTRUCT A ROAD ON THE INSIDE OF THE INTERSECTION.

AFFECTED LAND OWNERS: 1

REV	DATE	DESCRIPTION	DRN	CHK	APP	REFERENCE DRAWINGS
1	5/08/2016	INITIAL DRAWING	JM			

DRAWING NOTES:

ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE (UNO) ALL WEIGHTS ARE IN t (METRIC TONNES) UNO ALL DETAILS ARE PROVISIONAL AND SUBJECT TO CONFIRMATION LASHINGS CALCULATIONS AS PER RESTRAINT GUIDELINES

TECHNICAL NOTES:

WEIGHT, DIMENSIONS AND COG POSITION TO BE CONFIRMED BY CLIENT STRUCTURAL INTEGRITY TO BE CHECKED BY CLIENT OPERATIONAL DIAGRAMS AND MANUAL MUST BE OBSERVED HYDRAULIC STABILITY REFERS TO STATIC LOAD ONLY STABILITY PROVISIONAL UNTIL COG CONFIRMED

ARES TRANSPORT GROUP PTY LTD - ABN: 24 614 163 754

ARES

DRAWN BY:
DRAWN DATE:
CHECKED BY:

CUSTOMER	VESTAS	SIZE	A3
PROJECT	RYE PARK	SCALE	NTS
DRAWING TITLE	RYE PARK SWEPT PATHS	SHEET No	
DRAWING NAME	RYE PARK SWEPT PATHS.DWG	REV	A3

2.3 Route 2: Port Kembla to Rye Park Wind Farm (high load detour)

This route information is current as at February 2020.

- This route is to be used for all configurations **exceeding 5.0mH**
- The maximum height limitation (excluding high wire) is 5.3 meters.
- Contact to be made with roadworks site on Picton Road to ensure loads can be accommodated

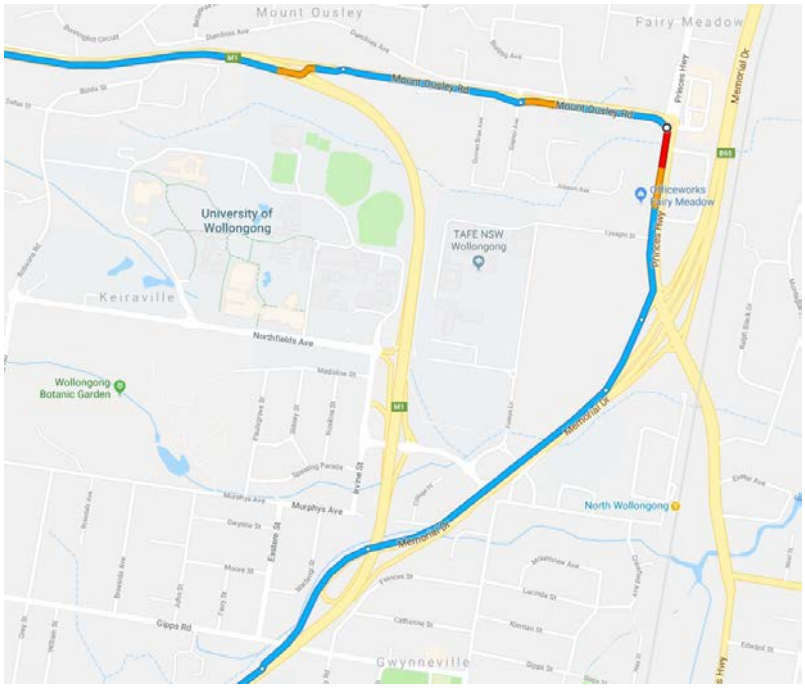
Road Modifications

Several road modifications on the proposed route in the Boorowa vicinity would be required to allow oversized components to traverse – please refer to the following table for details.

Street Furniture

Removal and replacement of any road signs (Keep Left, Give Way, etc.) are easily achieved with the signs being held in place by bolts or wedges. The lead pilot will remove signs with the rear pilot replacing after the load has passed through.

Route: https://goo.gl/maps/GdaTJm5LQvvoEGe7A
Total distance to site: 330 km



North Wollongong diversion for >5.0m high configurations

ACTION	LOCATION	KM	OBSTRUCTION	HEIGHT			Rating	COMMENT
				L	M	R		
LHT	Exit Tom Thumb Road	0.0	**intersection**				●	Light and trees to be removed
RHT	Masters Road	1.2	**intersection**				●	Slow travel
STR	Memorial drive	7.5	**Bridge**	5.21	5.40	5.61	●	Take caution
LHT	Princes Highway	7.9	**intersection**				●	Slow travel
LHT	Mt Ousley Road	8.5	**Roundabout**				●	Take caution- slow travel
STR	Mt Ousley Road	8.9	**Roundabout**				●	Slow travel
RHT	Mt Ousley Road	9.3	**intersection**				●	slow travel
LHT	Picton Road	13.8	**intersection**				●	Oncoming traffic to be stopped by police
STR	Picton Road	31.0	**Road works**				●	Take caution- slow travel
LHT	Hume Highway	40.9	**intersection**				●	Steering required. Light pole to be moved

STR	Hume Highway	126.2	**HVIS**				●	slow travel
RHT	Lachlan Valley Way	244.4	**intersection**				●	Take Caution
RHT	Trucking Yard Rd	287.5	**intersection**				●	Take Caution
LHT	Long St	289.2	**Intersection**				●	Trees and fences obstruct turn. Requires modification of corner.
RHT	Rye Park Rd	290.3	**Intersection**				●	Sharp corner, requires modification.
LHT	Grassy Creek Rd	309.7	**intersection**				●	Power pole and Telstra box obstruct turn. Requires modification of corner.
RHT	Maryvale Rd	319.5	**Roundabout**				●	Take Caution

LEGEND

●	Take Caution
●	Medium Maneuver
●	Difficult Maneuver

2.3.1 University Ave Bridge (Memorial Dr)

ACTION	LOCATION	KM	OBSTRUCTION	HEIGHT			Rating	COMMENT
				L	M	R		
STR	Memorial drive	7.5	**Bridge**	5.21	5.40	5.61	●	Take caution

2.3.2 Memorial Dr / Princes Hwy LHT

ACTION	LOCATION	KM	OBSTRUCTION	HEIGHT			Rating	COMMENT
				L	M	R		
LHT	Princes Highway	7.9	**intersection**				●	Slow travel

2.3.3 Princes Hwy / Mt Ousley Rd LHT

ACTION	LOCATION	KM	OBSTRUCTION	HEIGHT			Rating	COMMENT
				L	M	R		
LHT	Mt Ousley Road	8.5	**Roundabout**				●	Take caution- slow travel

2.3.4 Mt Ousley Rd / Gaynor Ave Roundabout

ACTION	LOCATION	KM	OBSTRUCTION	HEIGHT			Rating	COMMENT
				L	M	R		
STR	Mt Ousley Road	8.9	**Roundabout**				●	Slow travel

2.3.5 Mt Ousley Rd / Princes Motorway RHT

ACTION	LOCATION	KM	OBSTRUCTION	HEIGHT			Rating	COMMENT
				L	M	R		
RHT	Mt Ousley Road	9.3	**intersection**				●	slow travel

2.4 Site Entrances

As part of the route assessment, ARES also conducted swept path analyses on the four proposed site entrances at the wind farm:

- Cockerill
- Cotter
- Howard
- Ross

These are attached in the following pages.

SITE ENTRANCE
NAMED: COCKERILL SUPER

OBSTACLES:
- TREES
- ROAD WILL NEED TO BE BUILT

SUGGESTION
CONSTRUCT A ROAD THAT CUTS DIRECTLY THROUGH AND REMOVE THE DOG LEG IN THE CORNER.

AFFECTED LAND OWNERS: 1

REV	DATE	DESCRIPTION	DRN	CHK	APP	REFERENCE DRAWINGS
1	5/08/2016	INITIAL DRAWING	JM			

DRAWING NOTES:

ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE (UNO) ALL WEIGHTS ARE IN t (METRIC TONNES) UNO ALL DETAILS ARE PROVISIONAL AND SUBJECT TO CONFIRMATION LASHINGS CALCULATIONS AS PER RESTRAINT GUIDELINES

TECHNICAL NOTES:

WEIGHT, DIMENSIONS AND COG POSITION TO BE CONFIRMED BY CLIENT STRUCTURAL INTEGRITY TO BE CHECKED BY CLIENT OPERATIONAL DIAGRAMS AND MANUAL MUST BE OBSERVED HYDRAULIC STABILITY REFERS TO STATIC LOAD ONLY STABILITY PROVISIONAL UNTIL COG CONFIRMED

ARES TRANSPORT GROUP PTY LTD - ABN: 24 614 163 754

DRAWN BY:
DRAWN DATE:
CHECKED BY:

CUSTOMER	VESTAS
PROJECT	RYE PARK
DRAWING TITLE	RYE PARK SWEPT PATHS
DRAWING NAME	RYE PARK SWEPT PATHS.DWG
SIZE	A3
SCALE	NTS
SHEET No	
REV	A3

SITE ENTRANCE
NAMED: COTTER

OBSTACLES:
- TREES
- ROAD WILL NEED TO BE BUILT

SUGGESTION
CONSTRUCT A ROAD ON THE INSIDE OF THE INTERSECTION.

AFFECTED LAND OWNERS: 1

REV	DATE	DESCRIPTION	DRN	CHK	APP	REFERENCE DRAWINGS
1	5/08/2016	INITIAL DRAWING	JM			

DRAWING NOTES:

ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE (UNO) ALL WEIGHTS ARE IN t (METRIC TONNES) UNO ALL DETAILS ARE PROVISIONAL AND SUBJECT TO CONFIRMATION LASHINGS CALCULATIONS AS PER RESTRAINT GUIDELINES

TECHNICAL NOTES:

WEIGHT, DIMENSIONS AND COG POSITION TO BE CONFIRMED BY CLIENT STRUCTURAL INTEGRITY TO BE CHECKED BY CLIENT OPERATIONAL DIAGRAMS AND MANUAL MUST BE OBSERVED HYDRAULIC STABILITY REFERS TO STATIC LOAD ONLY STABILITY PROVISIONAL UNTIL COG CONFIRMED

ARES TRANSPORT GROUP PTY LTD - ABN: 24 614 163 754

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DRAWN BY:
DRAWN DATE:
CHECKED BY:

CUSTOMER	VESTAS	SIZE	A3
PROJECT	RYE PARK	SCALE	NTS
DRAWING TITLE	RYE PARK SWEPT PATHS	SHEET No	
DRAWING NAME	RYE PARK SWEPT PATHS.DWG	REV	A3

SITE ENTRANCE
NAMED: HOWARD

OBSTACLES:
- TREES
- ROAD WILL NEED TO BE BUILT

SUGGESTION
NEW ROAD WILL NEED TO BE CONTRUCTED

AFFECTED LAND OWNERS: 1

REV	DATE	DESCRIPTION	DRN	CHK	APP	REFERENCE DRAWINGS
1	5/08/2016	INITIAL DRAWING	JM			

DRAWING NOTES:

ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE (UNO) ALL WEIGHTS ARE IN t (METRIC TONNES) UNO ALL DETAILS ARE PROVISIONAL AND SUBJECT TO CONFIRMATION LASHINGS CALCULATIONS AS PER RESTRAINT GUIDELINES

TECHNICAL NOTES:

WEIGHT, DIMENSIONS AND COG POSITION TO BE CONFIRMED BY CLIENT STRUCTURAL INTEGRITY TO BE CHECKED BY CLIENT OPERATIONAL DIAGRAMS AND MANUAL MUST BE OBSERVED HYDRAULIC STABILITY REFERS TO STATIC LOAD ONLY STABILITY PROVISIONAL UNTIL COG CONFIRMED

ARES TRANSPORT GROUP PTY LTD - ABN: 24 614 163 754

DRAWN BY:
DRAWN DATE:
CHECKED BY:

CUSTOMER	VESTAS
PROJECT	RYE PARK
DRAWING TITLE	RYE PARK SWEPT PATHS
DRAWING NAME	RYE PARK SWEPT PATHS.DWG
SIZE	A3
SCALE	NTS
SHEET No	
REV	A3

Plot date: Friday, 26 February 2016 8:47:13 AM

SITE ENTRANCE
NAMED: ROSS

OBSTACLES:
- TREES
- ROAD WILL NEED TO BE BUILT

SUGGESTION
CONSTRUCT A ROAD THAT CUTS DIRECTLY THROUGH AND REMOVE THE DOG LEG IN THE CORNER.

AFFECTED LAND OWNERS: 1

REV	DATE	DESCRIPTION	DRN	CHK	APP	REFERENCE DRAWINGS
1	5/08/2016	INITIAL DRAWING	JM			

DRAWING NOTES:

ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE (UNO) ALL WEIGHTS ARE IN t (METRIC TONNES) UNO ALL DETAILS ARE PROVISIONAL AND SUBJECT TO CONFIRMATION LASHINGS CALCULATIONS AS PER RESTRAINT GUIDELINES

TECHNICAL NOTES:

WEIGHT, DIMENSIONS AND COG POSITION TO BE CONFIRMED BY CLIENT STRUCTURAL INTEGRITY TO BE CHECKED BY CLIENT OPERATIONAL DIAGRAMS AND MANUAL MUST BE OBSERVED HYDRAULIC STABILITY REFERS TO STATIC LOAD ONLY STABILITY PROVISIONAL UNTIL COG CONFIRMED

ARES TRANSPORT GROUP PTY LTD - ABN: 24 614 163 754

DRAWN BY:
DRAWN DATE:
CHECKED BY:

CUSTOMER	VESTAS
PROJECT	RYE PARK
DRAWING TITLE	RYE PARK SWEPT PATHS
DRAWING NAME	RYE PARK SWEPT PATHS.DWG

SIZE A3 | SCALE NTS | SHEET No | REV A3

Head Office

Ares Transport Group Pty LTD
Suite 1.05, 480 St Kilda Rd
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T 1300 243 289
F (03) 8560 7020
www.aresgroup.com.au

Appendix D: Rex J Andrews Route Study from Newcastle to Rye Park (via Dubbo)

REX J ANDREWS
ENGINEERED TRANSPORTATION

ROUTE STUDY

CLIENT: VESTAS
PROJECT: RYE PARK WIND FARM
PORT OF IMPORT: NEWCASTLE

07/04/2020 REV 02

Rev.	Date	Change	Responsible	Checked
00	09/08/18	Route Assessed	W Andrews	✓
00	06/03/20	Report compiled	W Andrews	✓
00	11/03/20	Report completed	W Andrews	✓
01	16/03/20	Tower route added	W Andrews	✓
02	07/04/20	Tower route updated	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 Newcastle to Rye Park wind farm.

This Route survey took place on 09-08-18.

2.0 Evaluation

1	No work required
2	Some Work required
3	Moderate amount of works required
4	Large amount of works required

(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: 09/08/2018
Survey undertaken by: (Rex J Andrews P/L)
Project name: Rye Park Windfarm
Location: Newcastle (NSW) to Rye Park (NSW)
Turbine type: 71 x V162, 118 metre H/H.

4.0 Transport combinations and escort requirements.

71 x Nacelles (12.7l x 4.1 w x 4.2h x 67.0T)
Configuration. Prime mover with 2x8-4x8 Low loader.
Overall dimensions: 28.0l x 4.2w x 5.2h x 110T.
Escort requirement: (2 x Company pilots).

71 x Drive trains (7.6l x 3.40 w x 3.2h x 67T)
Configuration. Prime mover with 2x8-4x8 Low loader.
Overall dimension: 28.0l x 4.2w x 5.2h x 104T.
Escort requirement: (2 x Company pilots).

71 x Hubs (5.5l x 3.8w x 3.9h x 36.0T)
Configuration. Prime mover with 4x4 Low Loader.
Overall dimension: 19.0l x 4.0w x 4.9h x 54.5T.
Escort requirement: (2 x Company pilots).

213 x Blades (81.0l x 4.4w x 4.5h x 28T)
Configuration. Prime mover with 1x4 dolly 3x4 Bookend jinker combo.
Overall dimension: 92.0l x 4.4w x 5.2h x 52.5T.
Escort requirement: (4 x Company pilots, 2 x NSW Police).

71 x Section 1 Towers (11.6l x 5.6 x 5.3 x 76T)
Configuration. Prime mover with 2x8-4x8 Bookend.
Overall dimension: 33.0l x 5.6w x 5.8h x 122.0T.
Escort requirement: (3 x Company pilots).

71 x Section 2 Towers (11.0l x 5.3 x 5.3 x 68T)
Configuration. Prime mover with 2x8-4x8 Bookend.
Overall dimension: 33.0l x 5.3w x 5.5h x 110.0T.
Escort requirement: (3 x Company pilots).

71 x Section 3 Towers (13.0l x 5.3 x 5.0 x 69T)
Configuration. Prime mover with 2x8-4x8 Bookend.
Overall dimension: 35.0l x 5.3w x 5.5h x 110.0T.
Escort requirement: (3 x Company pilots).

71 x Section 4 Towers (15.0l x 5.0 x 4.65 x 67T)
Configuration. Prime mover with 2x8-4x8 Bookend.
Overall dimension: 35.0l x 4.8w x 5.2h x 110.0T.
Escort requirement: (3 x Company pilots).

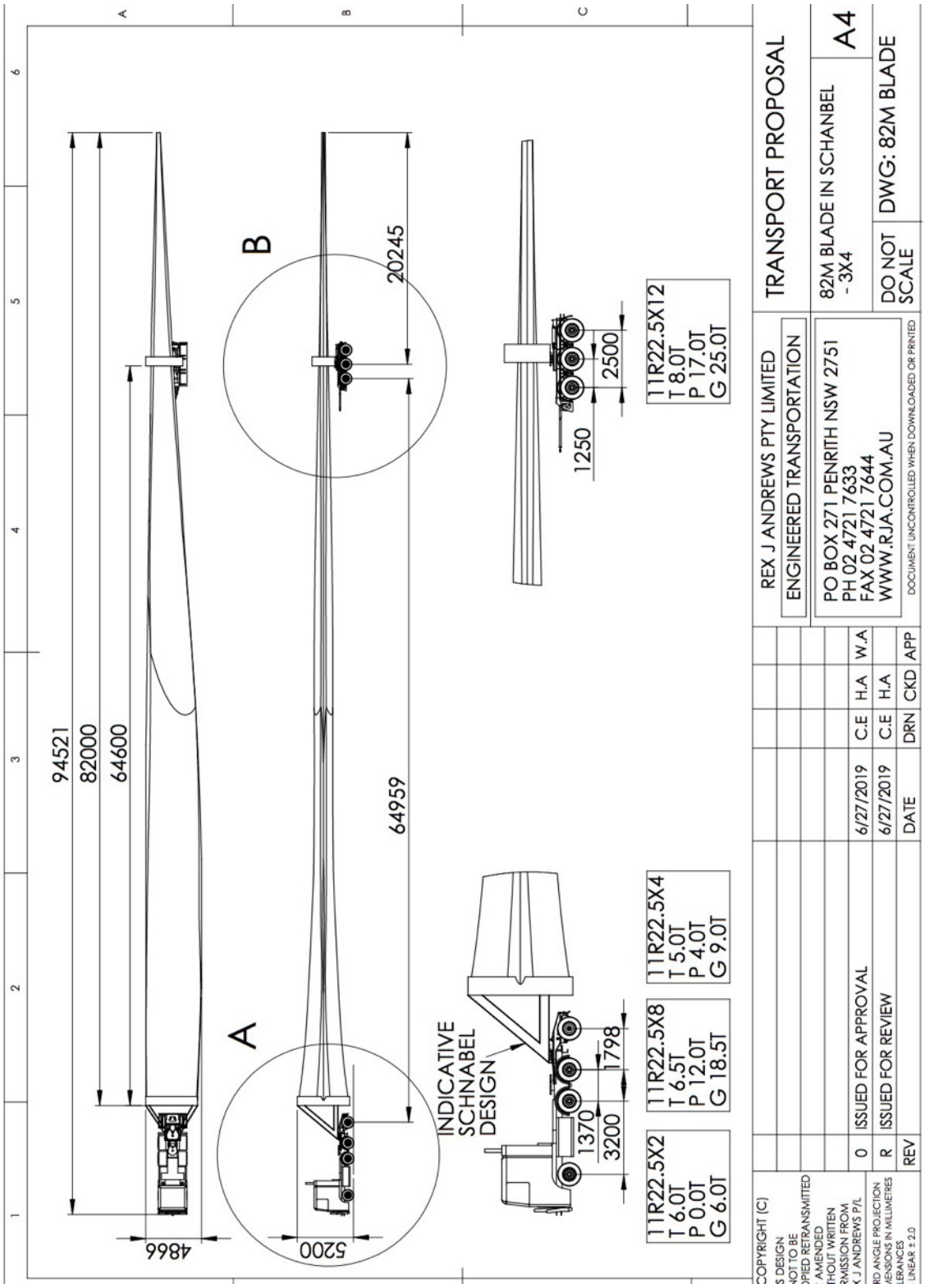
71 x Section 5 Towers (17.0l x 4.65 x 4.4 x 68T)
Configuration. Prime mover with 2x8-4x8 Bookend.
Overall dimension: 39.0l x 4.8w x 5.2h x 110.0T.
Escort requirement: (3 x Company pilots).

71 x Section 6 Towers (19.0l x 4.4 x 4.4 x 55T)
Configuration. Prime mover with 7x8 Low platform trailer
Overall dimension: 36.0l x 4.5w x 5.3h x 98.5T.
Escort requirement: (3 x Company pilots).

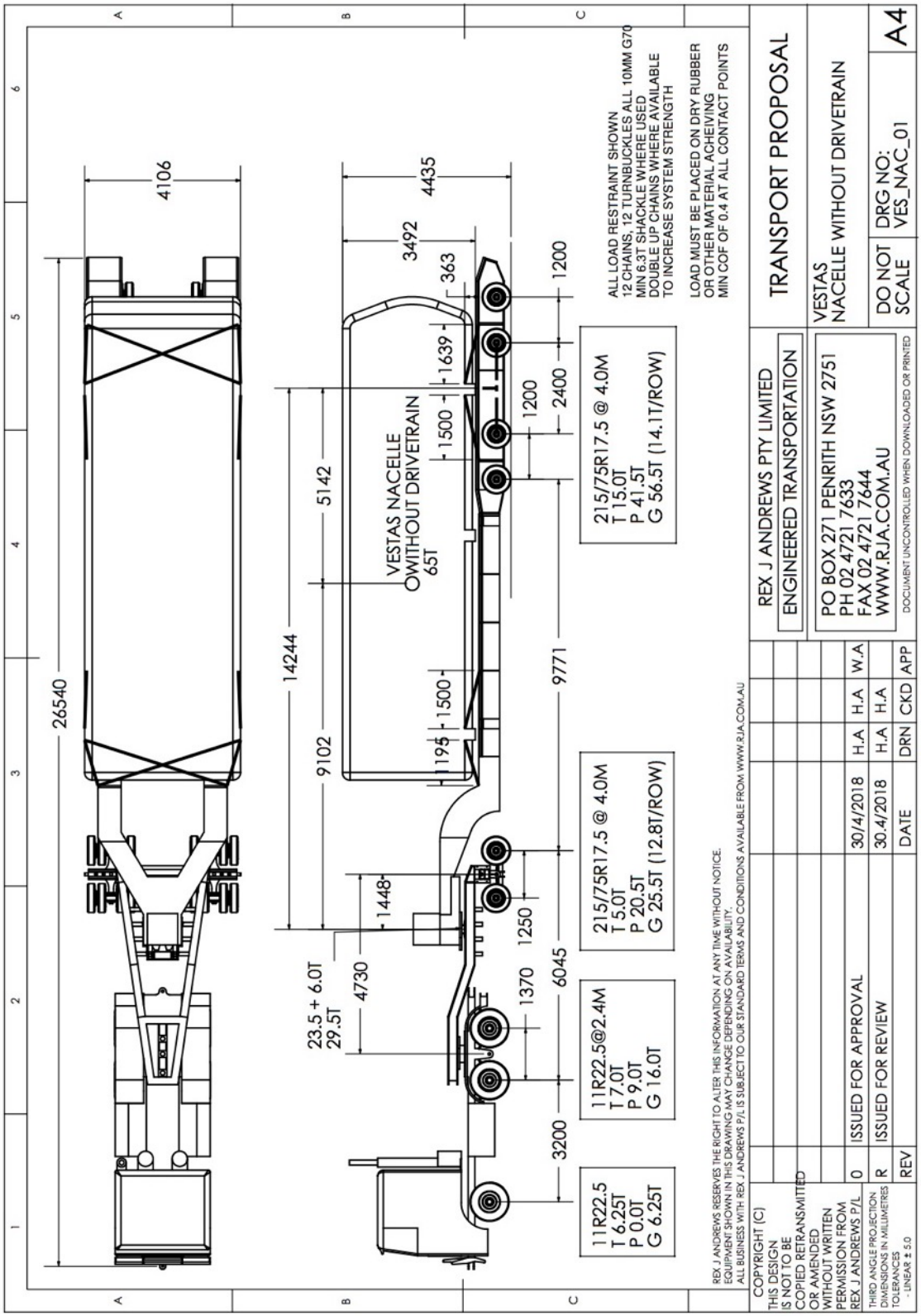
71 x Section 7 Towers (30.0l x 4.4 x 4.0 x 51T)
Configuration. Prime mover with 3x4 Dolly 3x8 Jinker
Overall dimension: 42.0l x 4.2w x 5.2h x 98.5T.
Escort requirement: (3 x Company pilots, 1 x NSW police).

5.0 Transport drawings.

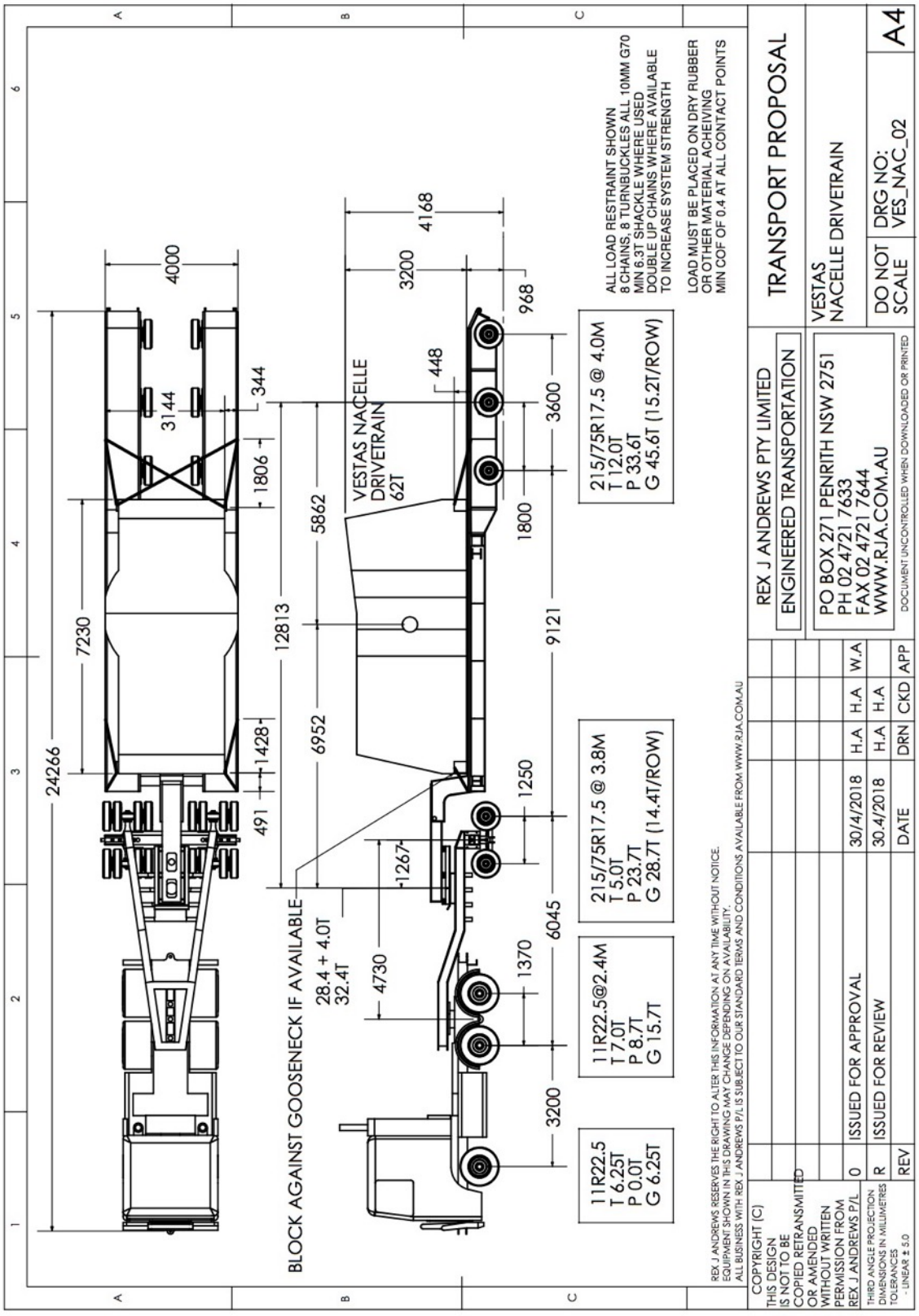
Blade combination



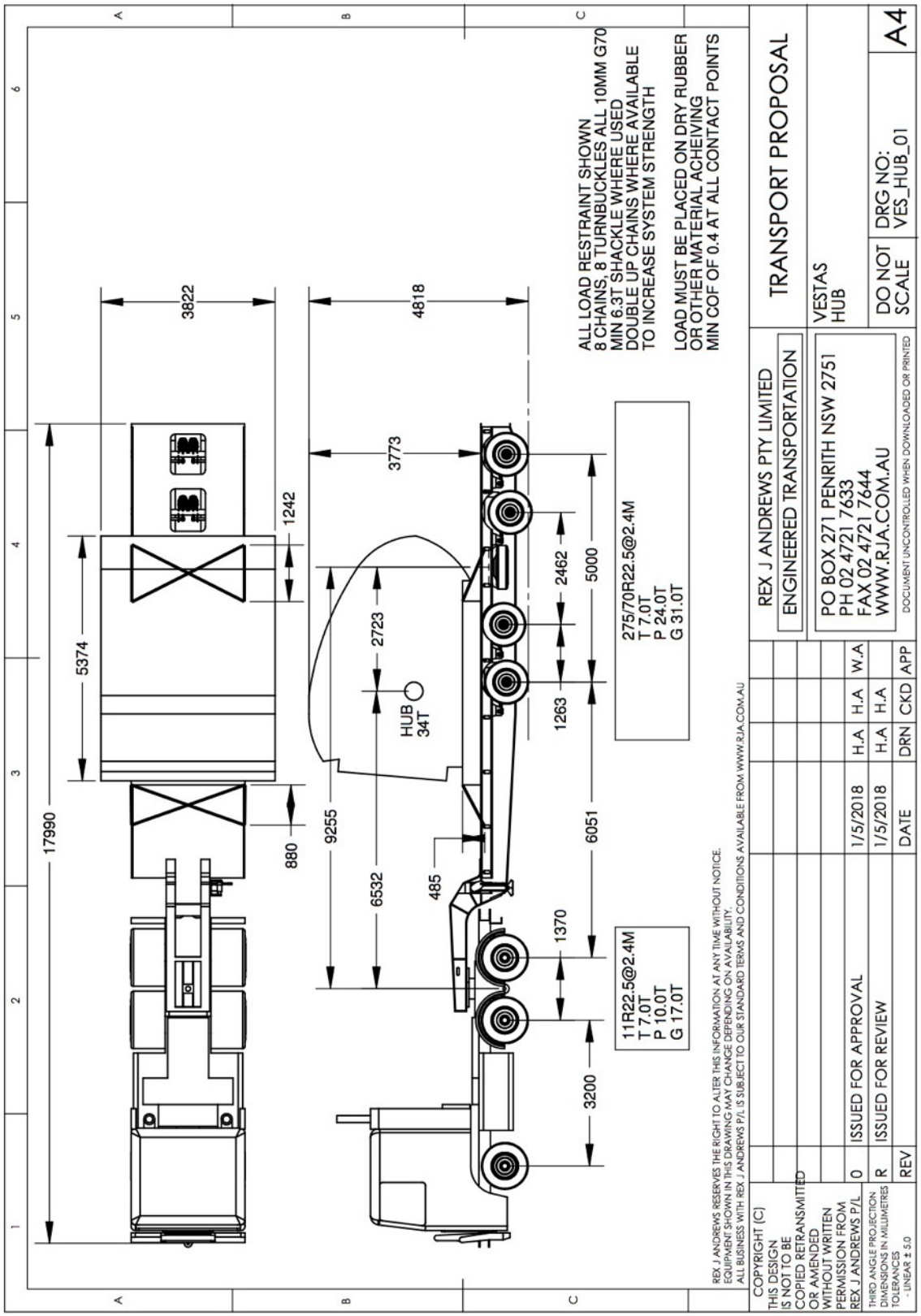
Nacelle diagram:



Drivetrain diagram:



Hub diagram:


ALL LOAD RESTRAINT SHOWN
8 CHAINS, 8 TURNBUCKLES ALL 10MM G70
MIN 6.3T SHACKLE WHERE USED
DOUBLE UP CHAINS WHERE AVAILABLE
TO INCREASE SYSTEM STRENGTH
LOAD MUST BE PLACED ON DRY RUBBER
OR OTHER MATERIAL ACHEIVING
MIN COF OF 0.4 AT ALL CONTACT POINTS
3822
4818
3773
1242
5374
17990
880
9255
6532
2723
HUB
34T
485
2462
5000
1263
6051
1370
3200
275/70R22.5@2.4M
T 7.0T
P 24.0T
G 31.0T
11R22.5@2.4M
T 7.0T
P 10.0T
G 17.0T
TRANSPORT PROPOSAL
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ENGINEERED TRANSPORTATION
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VESTAS
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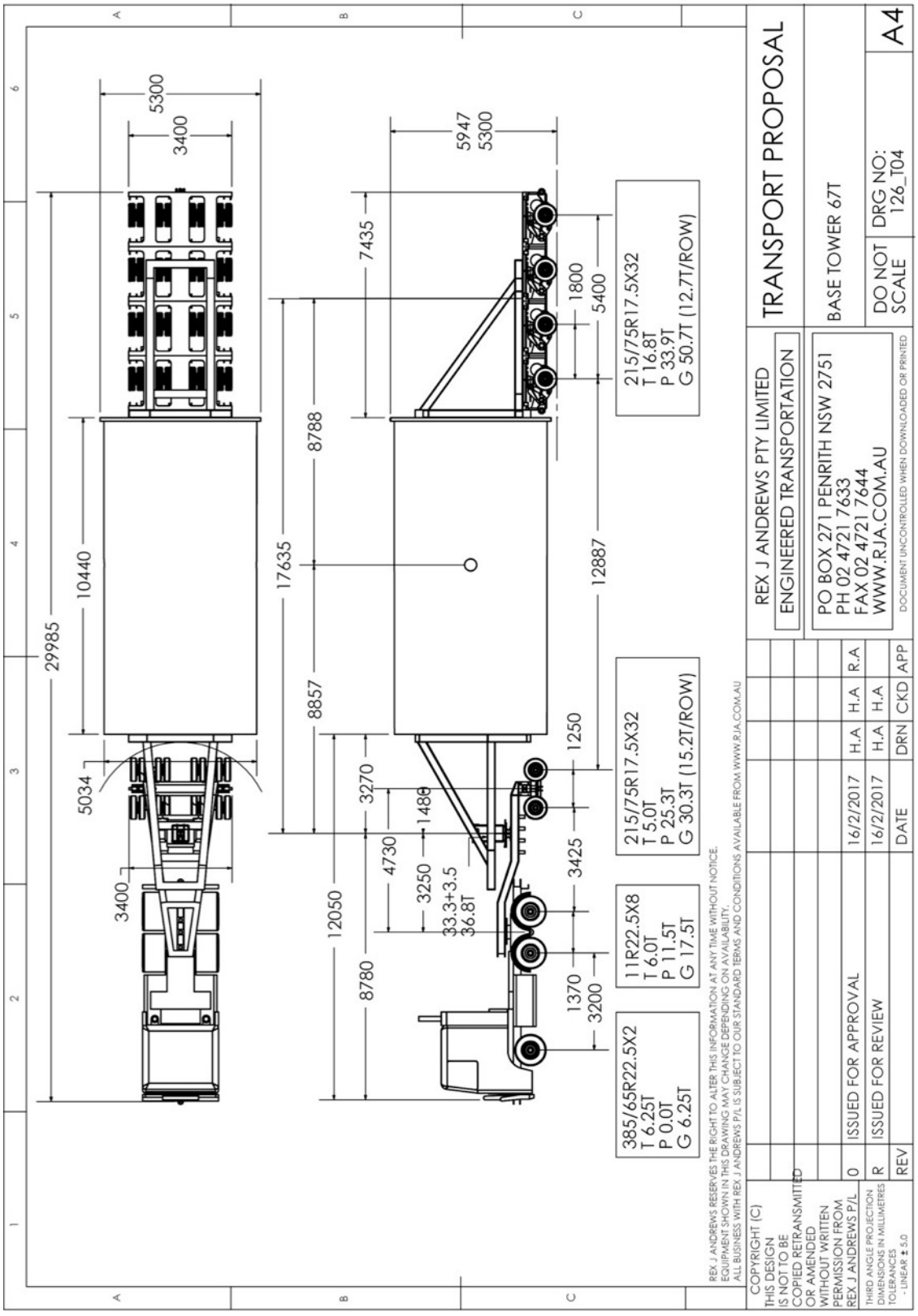
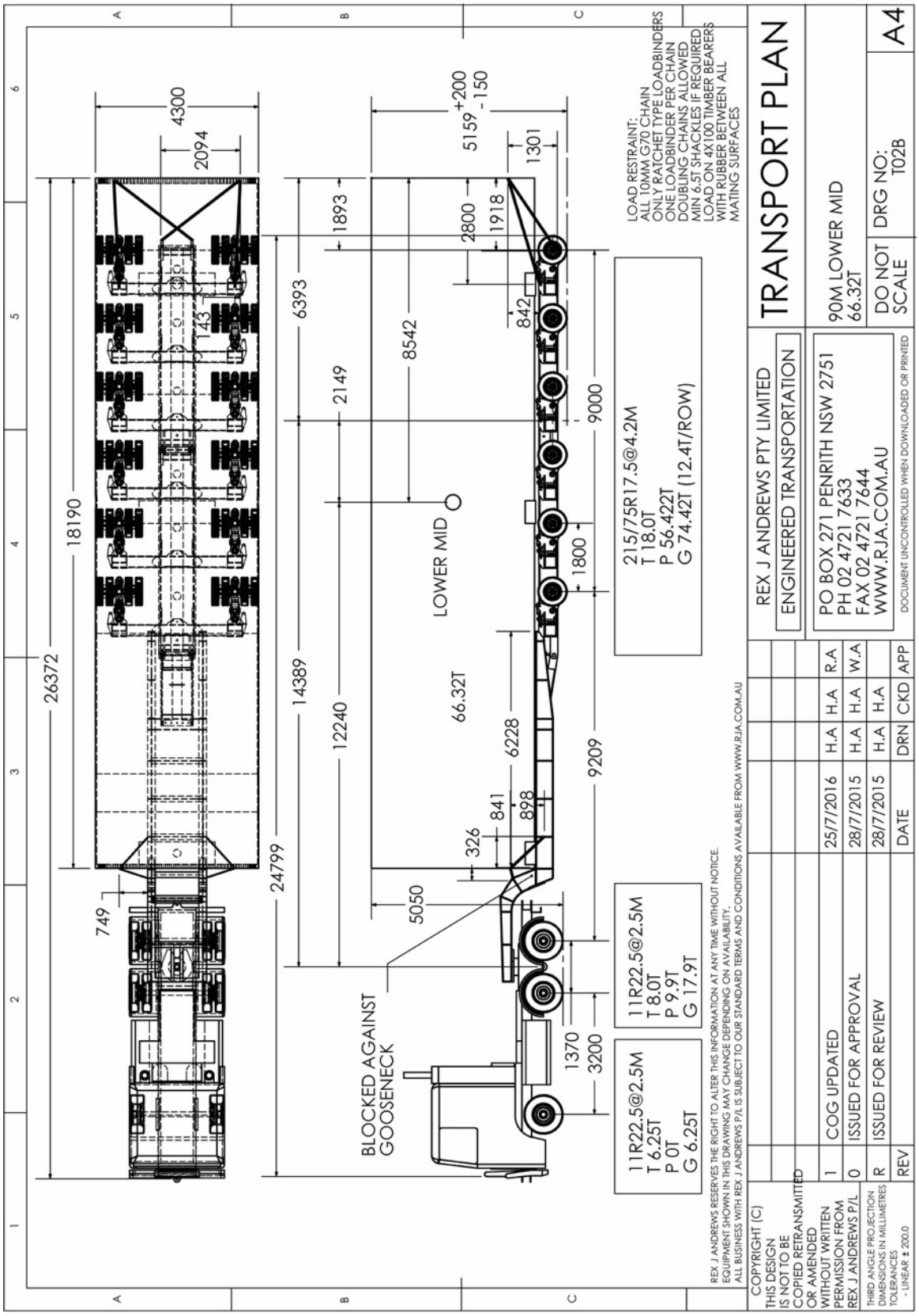
THIRD ANGLE PROJECTION
DIMENSIONS IN MILLIMETRES
TOLERANCES
- LINEAR ± 5.0
REV
DATE
DRN
CKD
APP
0 ISSUED FOR APPROVAL 1/5/2018 H.A H.A W.A
R ISSUED FOR REVIEW 1/5/2018 H.A H.A

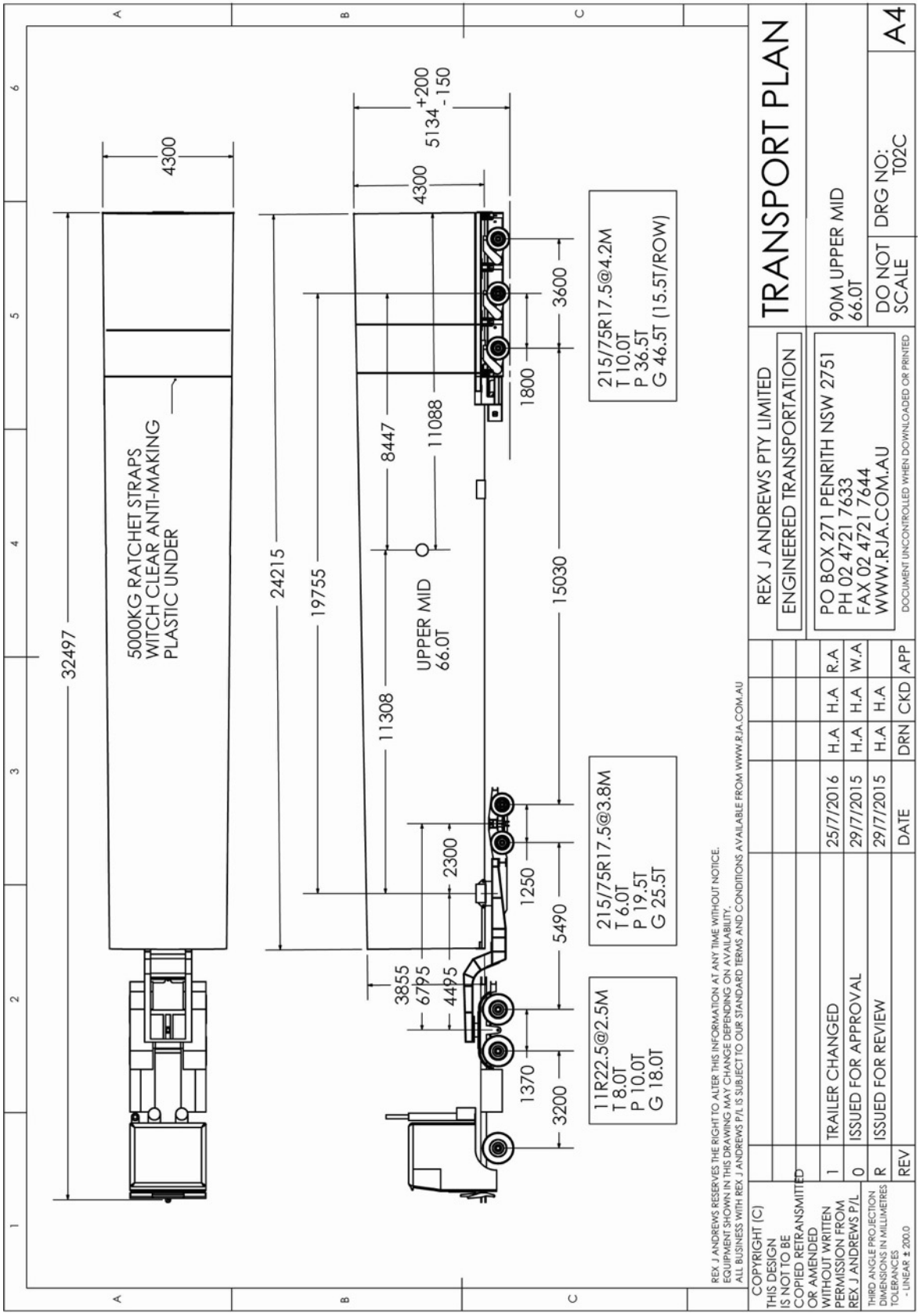
Tower: Bookend combination



Tower: Low platform combination



Tower: Dolly jinker combination



6.0 Port of Import.

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

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

Image 1: Port overview.

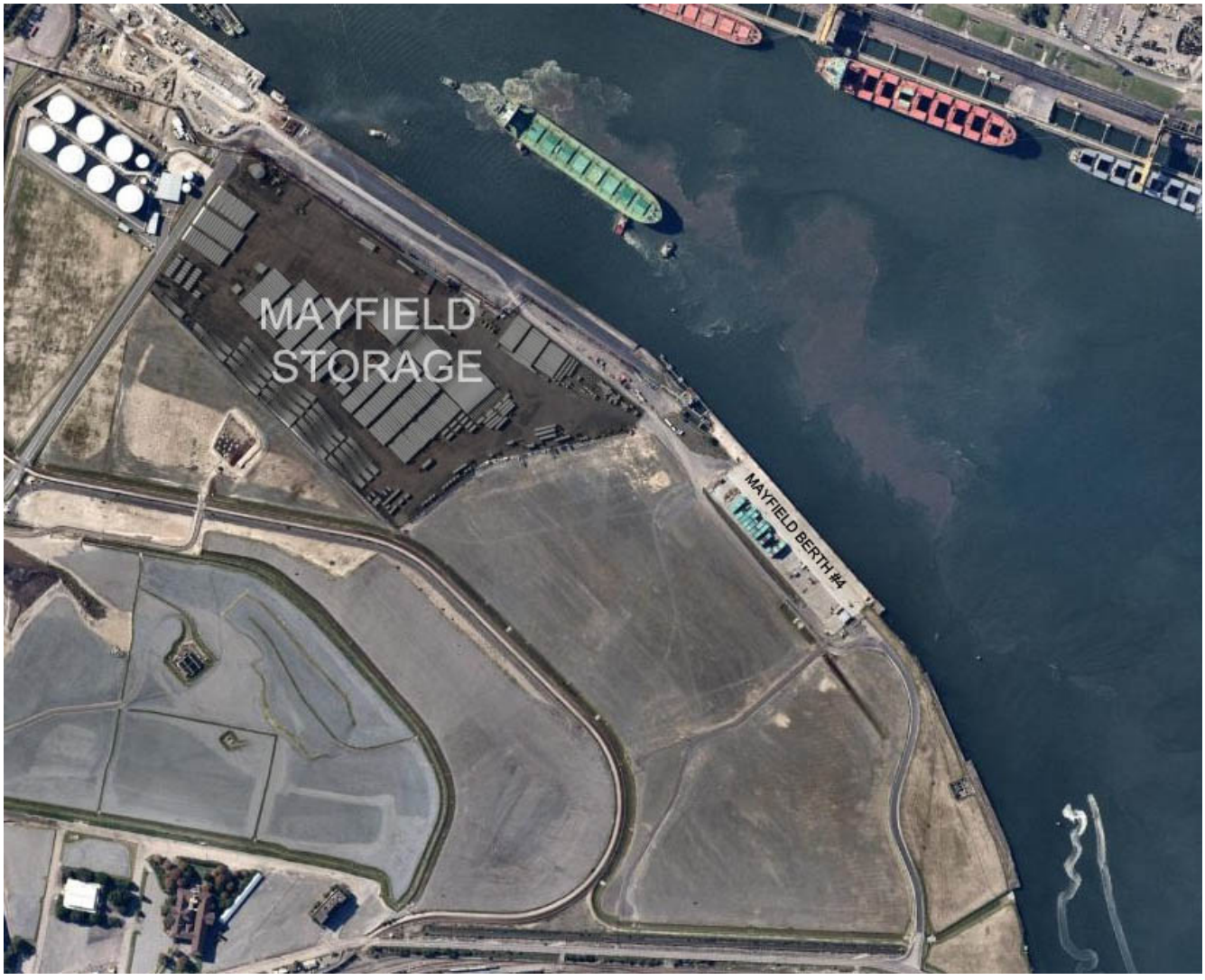
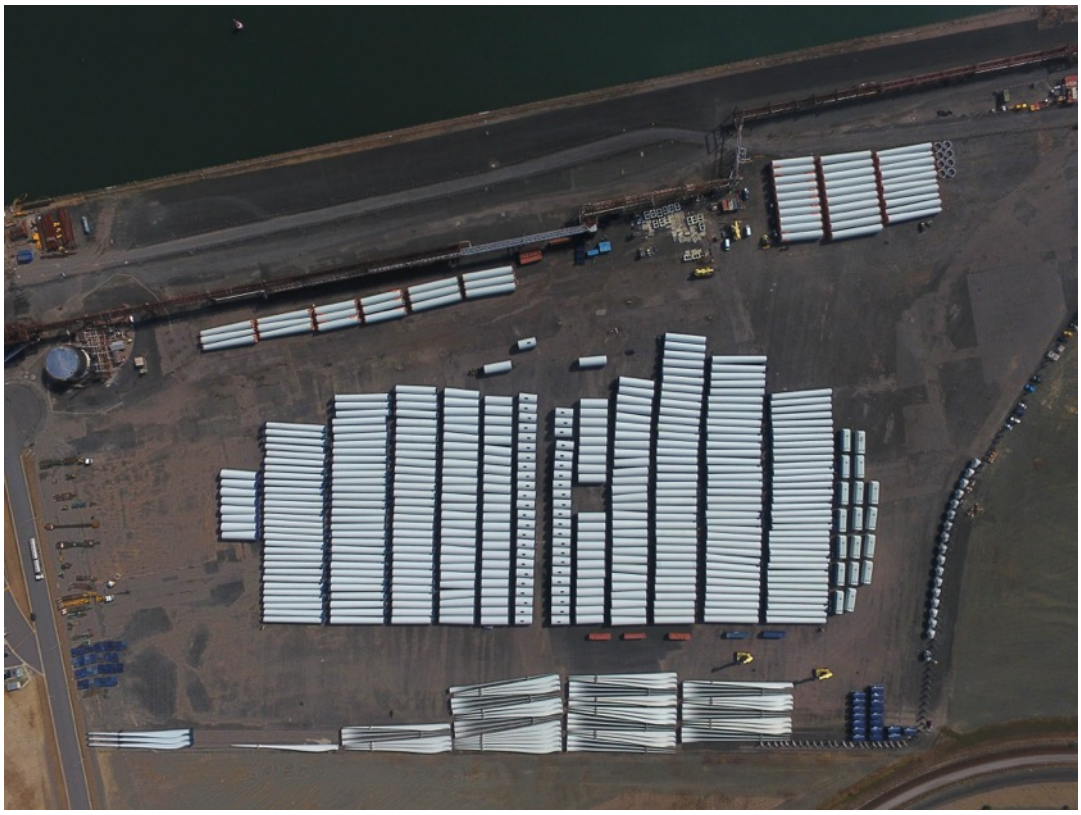
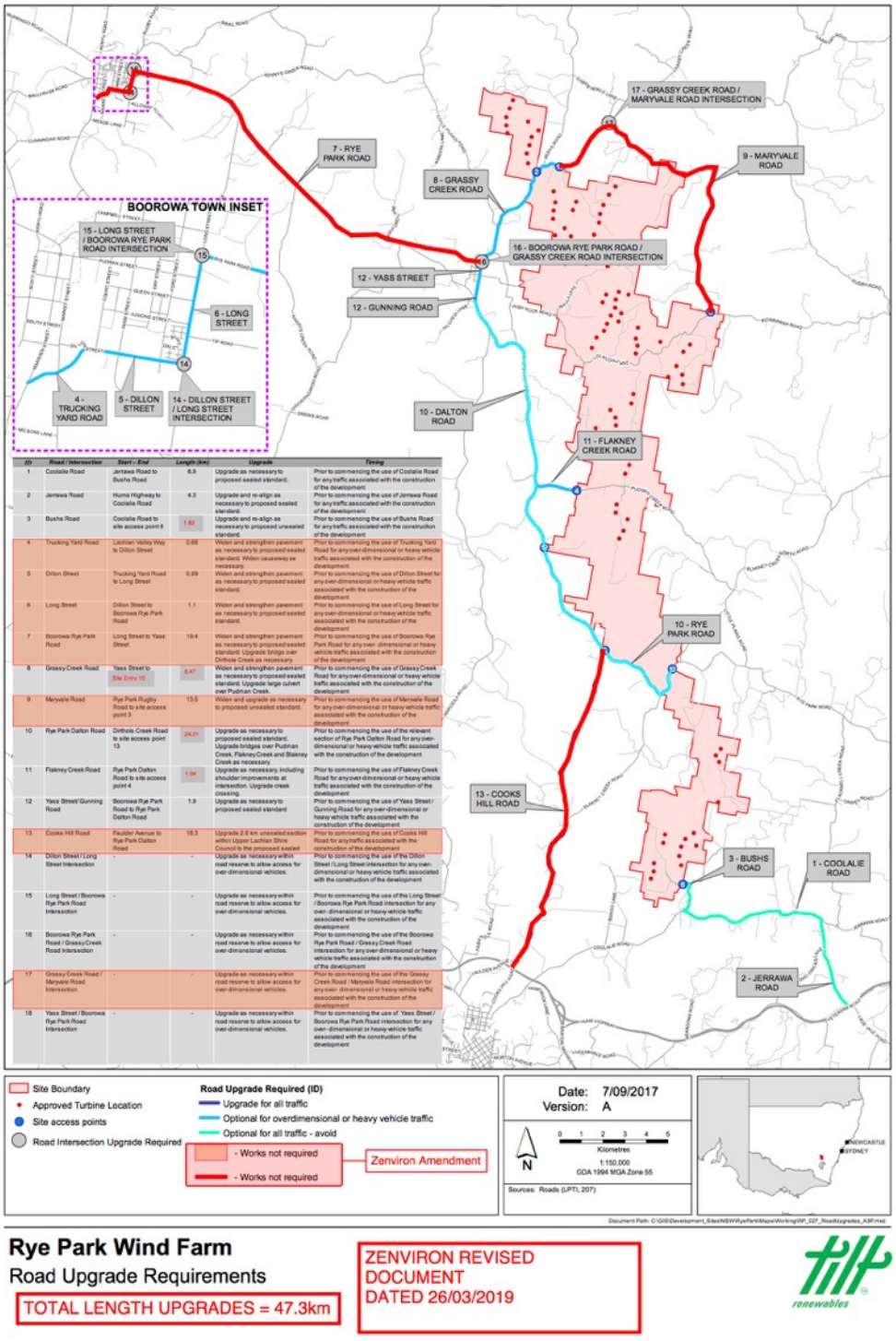


Image 2 & 3: Mayfield #4 Port storage area.



7.0 Site Location and layout.

The Rye Park Wind farm is located to the north of Yass and east of Boorowa and is 515 Kilometers by road from Newcastle.



8.0 Selected routes: Newcastle to Rye Park Wind Farm.

We have based this study on the turbine components, and all imported towers entering Australia via the Mayfield # 4 Berth at Newcastle. The study will show 3 sections of route for all components other than towers of 5.2 metres or higher which would need to use the high tower route. Stage 1 study is from Newcastle Port to Rye Park township. Stage 2 will travel from Rye Park township through to the North Access entrance, and Stage 3 will travel from Rye Park township through to the South access entrance. And the High Tower route that will travel with the larger towers via Dubbo.

STAGE 1 ROUTE: (All components other than the High towers)

DISTANCE: 509.0 kilometres:

This route took us via Selwyn street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, M1, Pennant Hills Road, M2, M7, M5, Hume Highway, Lachlan Valley Way, Trucking Yard Road, Dillon Street, Long Street, Rye Park Road.

GPS LINK: https://goo.gl/maps/8iDNh9ibXyutKboP7

STAGE 2 ROUTE: (All components)

DISTANCE: 6.6 kilometres:

This route took us via Rye Park Road, Grassy Creek Road.

GPS LINK: https://goo.gl/maps/NC1AQuTTZPJHDDfk9

STAGE 3 ROUTE: (All components)

DISTANCE: 26.4 kilometres:

This route took us via Rye Park Road, Yass Street, Gunning Street, Dalton Road, Rye Park Road. (Including a possible site access point off Flackney Creek Road).

GPS LINK: https://goo.gl/maps/xsk8nmSVdquTpEZDA

HIGH TOWER ROUTE: (Towers over 5.2 metres in diameter)

DISTANCE: 959.0 kilometres:

This route took us via Selwyn street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Golden Highway, Denman Road, Bengalla Road, Wybong Road, Golden Highway, Boothenba Road,Troy Bridge Road, Bunglegumbie Road, Mitchell Highway, Manildra Street, Derribong Avenue, Algalah Street, Tomingley Road, Newell Highway, Thomas Street, Moulden Street, Henry Parkes Way, Westlime Road, Hartigan Avenue, Newell Highway, Goldfields Way, Kitchener Road, Bundawarrah Road, Milvale Road, Waratah Street, Burley Griffin Way, Hume Highway, Lachlan Valley Way, Trucking Yard Road, Dillon Street, Long Street, Rye Park Road.

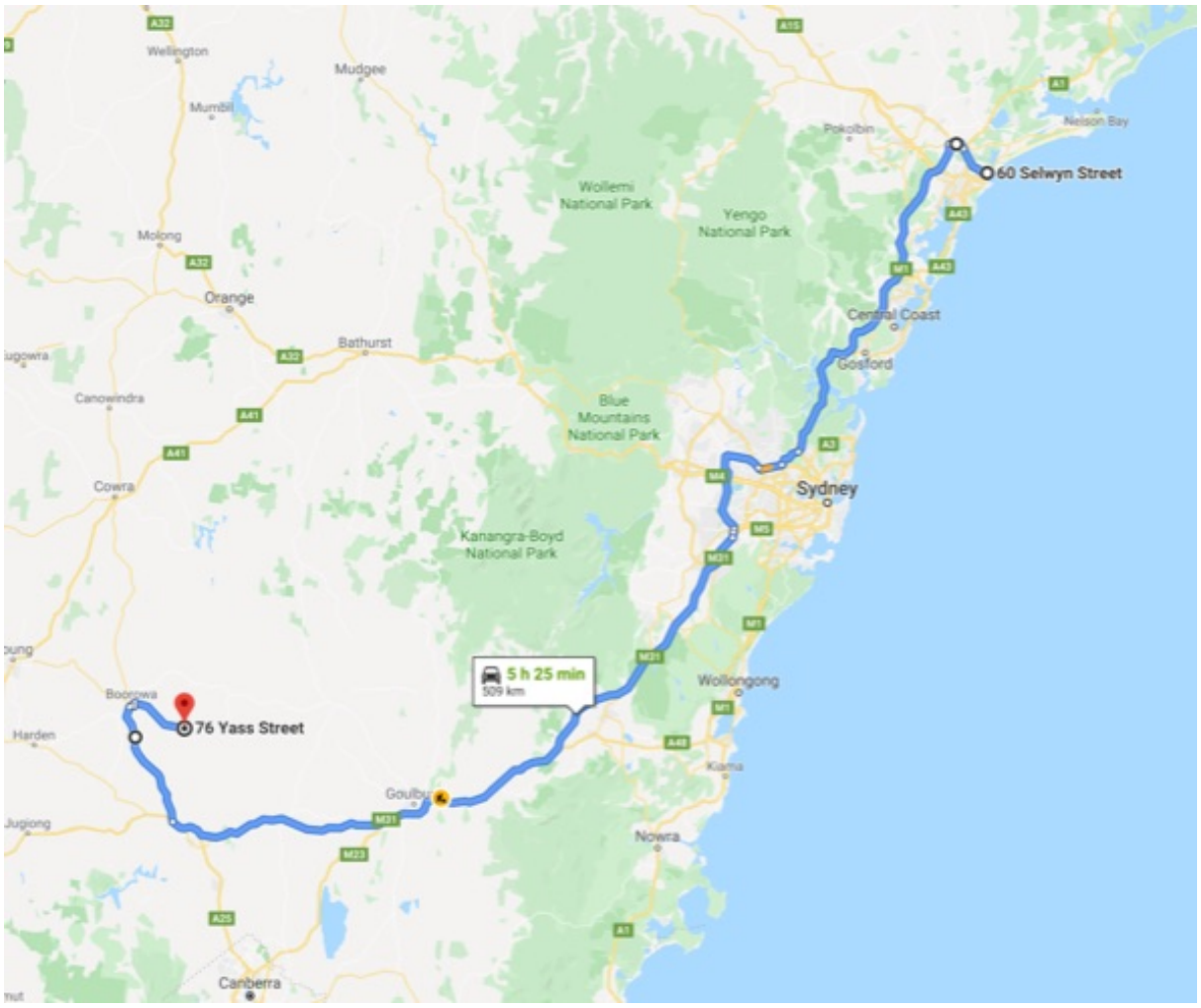
GPS LINK: https://goo.gl/maps/J6nxRe3M1ounta7r9

9.0 Stage 1 Route survey (Newcastle to Rye Park township)

STAGE 1 ROUTE: (All components other than the High towers)

DISTANCE: 509.0 kilometres:

This route took us via Selwyn street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, M1, Pennant Hills Road, M2, M7, M5, Hume Highway, Lachlan Valley Way, Trucking Yard Road, Dillon Street, Long Street, Rye Park Road.



GPS LINK: https://goo.gl/maps/8iDNh9ibXyutKboP7

KEY	
MODIFICATIONS REQUIRED	
PINCH POINT	
EMERGENCY PARKING	

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
Route: Newcastle to Rye Park township					
0.0	Mayfield	Mayfield #4 berth onto Selwyn Street GPS link: https://goo.gl/maps/afLwPYKuNdm	70.0 metres clearance	Moderate right hand turn	Some hardstand will need to be added on the left entrance and exit of the corner. The fence on both sides of the road and the gate will need to be relocated.
0.4	Mayfield	Selwyn Street rail crossing GPS link: https://goo.gl/maps/AmohE54hKSz	9.0 Metres wide	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
1.3	Mayfield	Selwyn Street onto Industrial Drive via George Street GPS link: https://goo.gl/maps/gXeHvBtCp4D2	70.0 metres clearance	Right hand turn	Truck will need to travel over the hardstand area than return to the correct side of Industrial Drive. The trailer will need to cross over to the incorrect side before travelling over the centre median and returning to the correct side of Industrial Drive. The traffic signal in the centre of the intersection will need to be relocated. A sign will also need to be relocated on the inside of the corner and a pole removed on the outside of the corner. A hardstand area will need to be constructed on the south side of the intersection.
5.5	Mayfield West	Industrial Drive onto Maitland Road GPS link: https://goo.gl/maps/Kn49dhWG2qG2	70.0 metres clearance	Right hand turn	The blades will need to cross to the incorrect side metres prior to the intersection, then return to the correct side 120 metres past the intersection. The centre median strip will need to be lowered, or the trucks are to cross to the incorrect side of Industrial drive further to the east of the intersection.
17.4	Tarro	New England Highway onto John Renshaw Drive GPS link: https://goo.gl/maps/SRDr5JigkBp	100.0 metres clearance	Left hand merge	No problems with this section of road.
18.5	Beresfield	John Renshaw Drive onto the M1 GPS link: https://goo.gl/maps/A34ihxCjM5wfRDdq6	100.0 metres clearance	Left hand bend	No problems with this section of road.

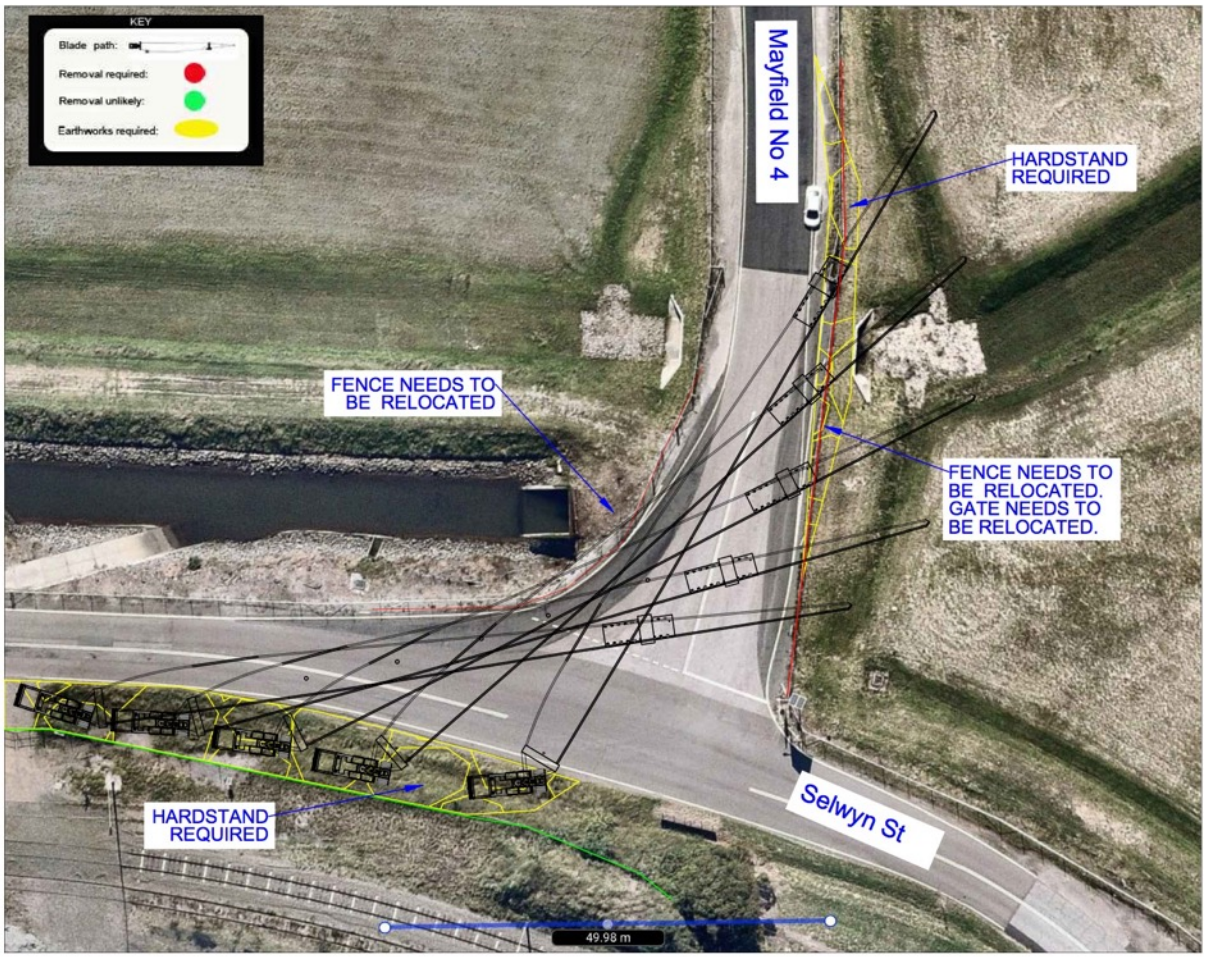
KM index	Location	Section of road	Critical Measurement	Procedure	Notes
113.0	Mt White	M1 Motorway under Mt White overpass GPS link: https://goo.gl/maps/K3fPPe4fNx63xB3j7	Left Lane: 5.2 mtrs Centre Lane: 5.3 mtrs Right Lane: 5.4 mtrs	Travel directly ahead	Loads that exceed 5.3 metres high are not to travel under this structure. Loads over 5.2 metres high are to travel under the bridge in the far-right lane, and at a speed of no more than 5 km's per hour. Spotter to guide load through this section of road.
122.0	Hawkesbury River	M1 Motorway GPS link: https://goo.gl/maps/yDzjirEKLAbREE8B6	100.0 long x 6.0 wide	Merge to left	Large parking area
146.0	Wahroonga	M1 onto Pennant Hills Rd GPS link: https://goo.gl/maps/bskC8kD4CdW9xmwYA	75.0 metres clearance	Left hand turn	It is recommended that the centre median strip be modified to allow a suitable clearance for the truck to travel over. Blade loads are to turn from the correct side to the incorrect side of the road. The prime mover will need to turn from the far-right lane and cross onto the incorrect side of Pennant Hills Road, before returning to the correct side once the trailer has cleared the corner.
147.0	Normanhurst	Pennant Hills Road under Pedestrian overpass GPS link: https://goo.gl/maps/nYbjkf5AJ9D2xvUt7	Left Lane: 5.15 mtrs Centre Lane: 5.2 mtrs Right Lane: 5.3 mtrs	Travel directly ahead	Loads that exceed 5.3 metres high are not to travel under this structure. Loads over 5.2 metres high are to travel under the bridge in the far-right lane, and at a speed of no more than 5 km's per hour. Spotter to guide load through this section of road.
151.0	Beecroft	Pennant Hills Road under Pedestrian overpass GPS link: https://goo.gl/maps/sjnLQqYRudUSKgTQ8	Left Lane: 5.3 mtrs Centre Lane: 5.4 mtrs Right Lane: 5.5 mtrs	Travel directly ahead	Loads that exceed 5.3 metres high are not to travel under this structure. Loads over 5.2 metres high are to travel under the bridge in the centre lane, and at a speed of no more than 5 km's per hour. Spotter to guide load through this section of road.
154.0	West Pennant Hills	Pennant Hills Rd onto M2 Motorway GPS link: https://goo.gl/maps/cCsJwSt1NsRj5cSs6	75.0 metres clearance	Right hand turn	A traffic signal will need to be relocated, and a section of fence removed on the inside of the corner. A barrier will also need to be relocated on the outside of the corner. Trucks are to turn from the correct side to the correct side of the road. The prime mover will need to turn from the far left lane on Pennant Hills Road and enter the on ramp as wide as possible. Spotter to guide the load through the corner.
163.0	Winston Hills	M2 Motorway onto M7 Motorway GPS link: https://goo.gl/maps/PC96cBq2xqtW85vG7	75.0 metres clearance	Travel directly ahead	No problems with this section of road.
167.0	Kings Park	M7 Motorway GPS link: https://goo.gl/maps/T8WcbR9T84Zs7WpF7	100.0 long x 6.0 wide	Merge to left	Large parking area

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
201.0	Prestons	M7 Motorway onto M5 Motorway GPS link: https://goo.gl/maps/FA2mF7PxZkxrRDTR9	75.0 metres clearance	Travel directly ahead	No problems with this section of road.
229.0	Menangle	Hume Highway https://goo.gl/maps/KPMdLS1XuRWHrcyb6	200.0 long x 8.0 wide	Merge to left	Large parking area for towers and motors, no blades to enter this parking bay.
238.0	Wilton	Hume Highway under Farm access overpass GPS link: https://goo.gl/maps/2ZsVqYJ9j9qPTGqa9	Left Lane: 5.5 mtrs Centre Lane: 5.4 mtrs Right Lane: 5.3 mtrs	Travel directly ahead	Loads that exceed 5.3 metres high are not to travel under this structure. Loads over 5.2 metres high are to travel under the bridge in the left lane, and at a speed of no more than 5 km's per hour. Spotter to guide load through this section of road.
303.0	Sutton Forest	Hume Highway https://goo.gl/maps/uT1ubtSuawS2	150.0 long x 10.0 wide	Merge to left	Large parking area
352.0	Goulburn	Hume Highway https://goo.gl/maps/7HywRcjZiJv	180.0 long x 15.0 wide	Merge to left	Large parking area
375.0	Breadalbane	Hume Highway https://goo.gl/maps/PmpDm5ymjjnK7ciW8	140.0 long x 12.0 wide	Merge to left	Large parking area
388.0	Cullerin ridge	Hume Highway https://goo.gl/maps/3r7x8uzs9Fy7pVmp8	100.0 long x 10.0 wide	Merge to left	Large parking area
409.0	Oolong	Hume Highway https://goo.gl/maps/EVyT3US6dgcapAWWA	130.0 long x 15.0 wide	Merge to left	Large parking area
444.0	Bowning	Hume Highway onto Lachlan Valley Way GPS link: https://goo.gl/maps/j1Nvy5sXDonei1K99	75.0 metres clearance	Right hand turn	Some signs in the centre median strip will need to be relocated. Truck to turn from the far left lane and enter the corner as wide as possible.
486.0	Boorowa	Lachlan Valley Way onto Trucking Yard Road GPS link: https://goo.gl/maps/qCR2CX4EADMGK3WR8	75.0 metres clearance	Right hand turn	Some signs in the inside of the corner will need to be relocated.
487.0	Boorowa	Trucking Yard Road GPS link: https://goo.gl/maps/HTJCwCnUerjtqc5z9	50.0 metres clearance	Right hand bend	The causeway will need to be widened, and hardstand added to the inside of the corner.
487.2	Boorowa	Trucking Yard Road onto Dillon Street GPS link: https://goo.gl/maps/sQFVtnE3CPvhVibS8	90.0 metres clearance	Travel directly ahead.	No Problems with this section of road.
488.0	Boorowa	Dillon Street onto Long Street GPS link: https://goo.gl/maps/mnV8spf8JGG6LsT99	50.0 metres clearance	Left hand turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the inside of the corner, and a fence relocated within the landowner's boundaries. Additionally, some vegetation needs to be removed.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
489.5	Boorowa	Long Street onto Rye Park Road GPS link: https://goo.gl/maps/Ry5s7svqx1BDzRAMA	50.0 metres clearance	Right hand turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the inside of the corner, and a fence relocated within the landowner's boundaries. Additionally, some vegetation needs to be removed.
509.0	Boorowa to Rye Park township	Rye Park Road GPS link: https://goo.gl/maps/LGgWeQKDCERMsHQy7	90.0 metres clearance	Travel directly ahead	No problems with this section of road.

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

Image 1:



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

PROCEDURE: Right hand turn.

COMMENTS: Some hardstand will need to be added on the left entrance and exit of the corner. The fence on both sides of the road and the gate will need to be relocated.

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

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

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

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

PROCEDURE: Travel directly ahead over the crossing.

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

ROAD MODIFICATIONS: No works required.

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

Image 1:

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

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

COMMENTS: The traffic signal in the centre of the intersection will need to be relocated. A sign will also need to be relocated on the inside of the corner and a pole removed on the outside of the corner.

A hardstand area will need to be constructed on the south side of the intersection.

Truck will need to travel over the hardstand area than return to the correct side of Industrial Drive. The trailer will need to cross over to the incorrect side before travelling over the centre median and returning to the correct side of Industrial Drive.

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

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

Image 1:

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

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

COMMENTS: The centre median strip will need to be lowered, or the trucks are to cross to the incorrect side of Industrial drive further to the east of the intersection.

The blades will need to cross to the incorrect side metres prior to the intersection, then return to the correct side 120 metres past the intersection.

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

18.5 Km's: Intersection of John Renshaw Drive and M1 at Beresfield.

Image 1:

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/A34ihxCjM5wfRDdq6

PROCEDURE: Merge to the left and travel around a left-hand bend before merging to the right onto the M1 Motorway.

COMMENTS: Loads to turn left onto the slip lane. Spotter to guide the load through the corner.

ROAD MODIFICATIONS: No modifications required.

146.0 Km's: M1 Motorway onto Pennant Hills Road at Wahroonga.

Image 1:

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/bskC8kD4CdW9xmwYA

PROCEDURE: Left hand turn from the M1 Motorway onto Pennant Hills Road.

COMMENTS: It is recommended that the centre median strip be modified to allow a suitable clearance for the truck to travel over.

Blade loads are to turn from the correct side to the incorrect side of the road. The prime mover will need to turn from the far-right lane and cross onto the incorrect side of Pennant Hills Road, before returning to the correct side once the trailer has cleared the corner.

ROAD MODIFICATIONS: Yes moderate amounts of works are required.

154.0 Km's: Pennant Hills Road onto the M2 Motorway at West Pennant Hills.

Image 1:

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/cCsJwSt1NsRi5cSs6

PROCEDURE: Right hand turn from Pennant Hills Road onto the M2 Motorway.

COMMENTS: A traffic signal will need to be relocated, and a section of fence removed on the inside of the corner. A barrier will also need to be relocated on the outside of the corner.

Trucks are to turn from the correct side to the correct side of the road. The prime mover will need to turn from the far-left lane on Pennant Hills Road and enter the on ramp as wide as possible. Spotter to guide the load through the corner.

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

418.0 Km's: Hume Highway onto Lachlan Valley Highway at Yass.

Image 1:

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/j1Nvy5sXDonei1K99

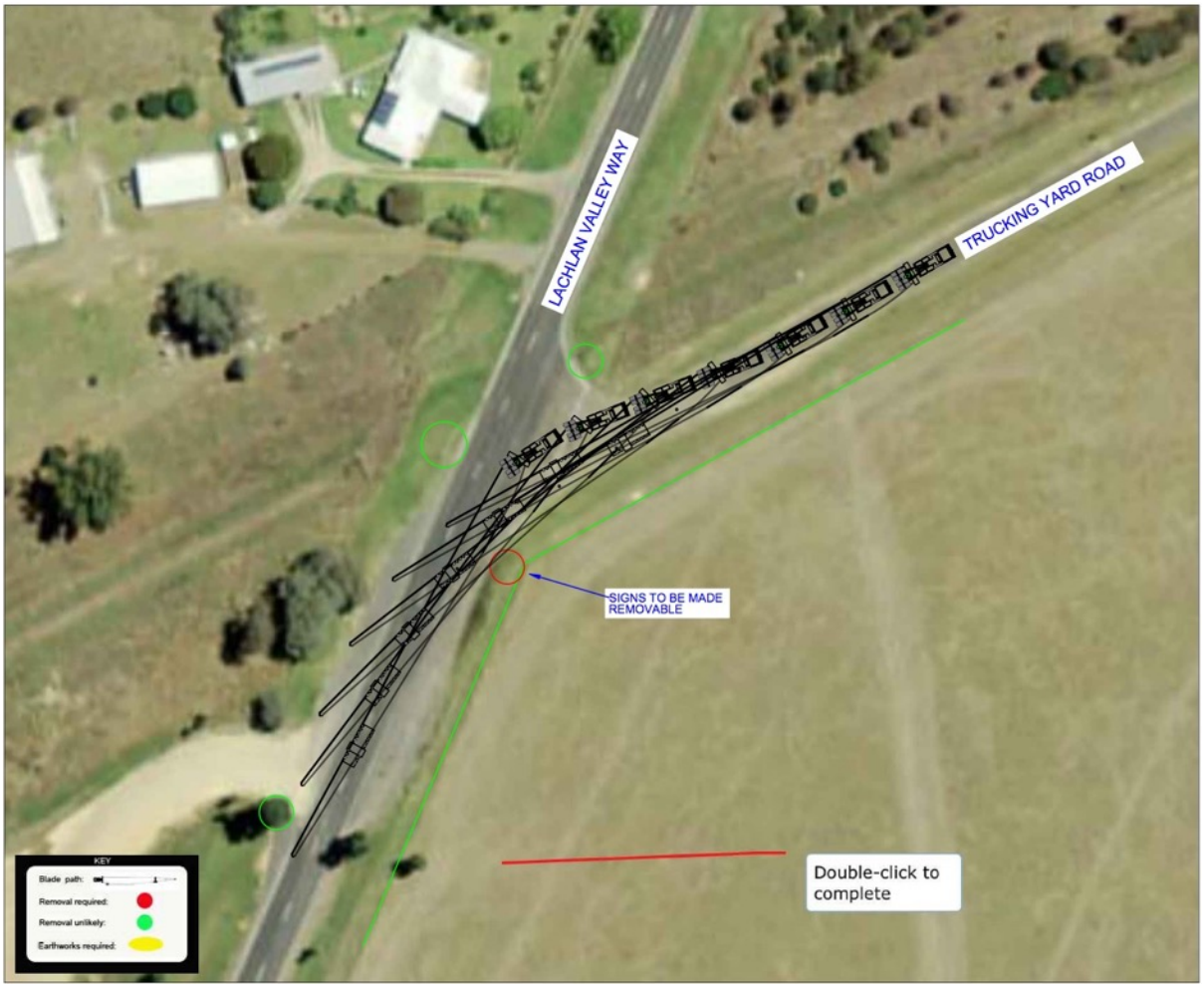
PROCEDURE: Right hand turn from Hume Highway onto Jerrawa Road.

COMMENTS: Load to turn from the far-left lanes onto the correct side of Jerrawa Road. Some signs will need to be relocated or made removable in the centre median strip.

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

486.0 Km's: Lachlan Valley way onto Trucking Yard Road at Boorowa.

Image 1:



PROCEDURE: Right hand turn from Lachlan Valley Way onto Trucking Yard Road.
COMMENTS: Some signs in the inside of the corner will need to be relocated.
ROAD MODIFICATIONS: Small amounts of works are required on this section of road.
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/qCR2CX4EADMGK3WR8

487.0 Km's: Trucking Yard Road at Boorowa

Image 1:

Image 2:

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/HTJCwCnUerjtgc5z9

PROCEDURE: Right-hand bend on Trucking Yard Road.

COMMENTS: The causeway will need to be widened, and hardstand added to the inside of the corner.

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

488.0 Km's: Dillon Street onto Long Street at Boorowa

Image 1:

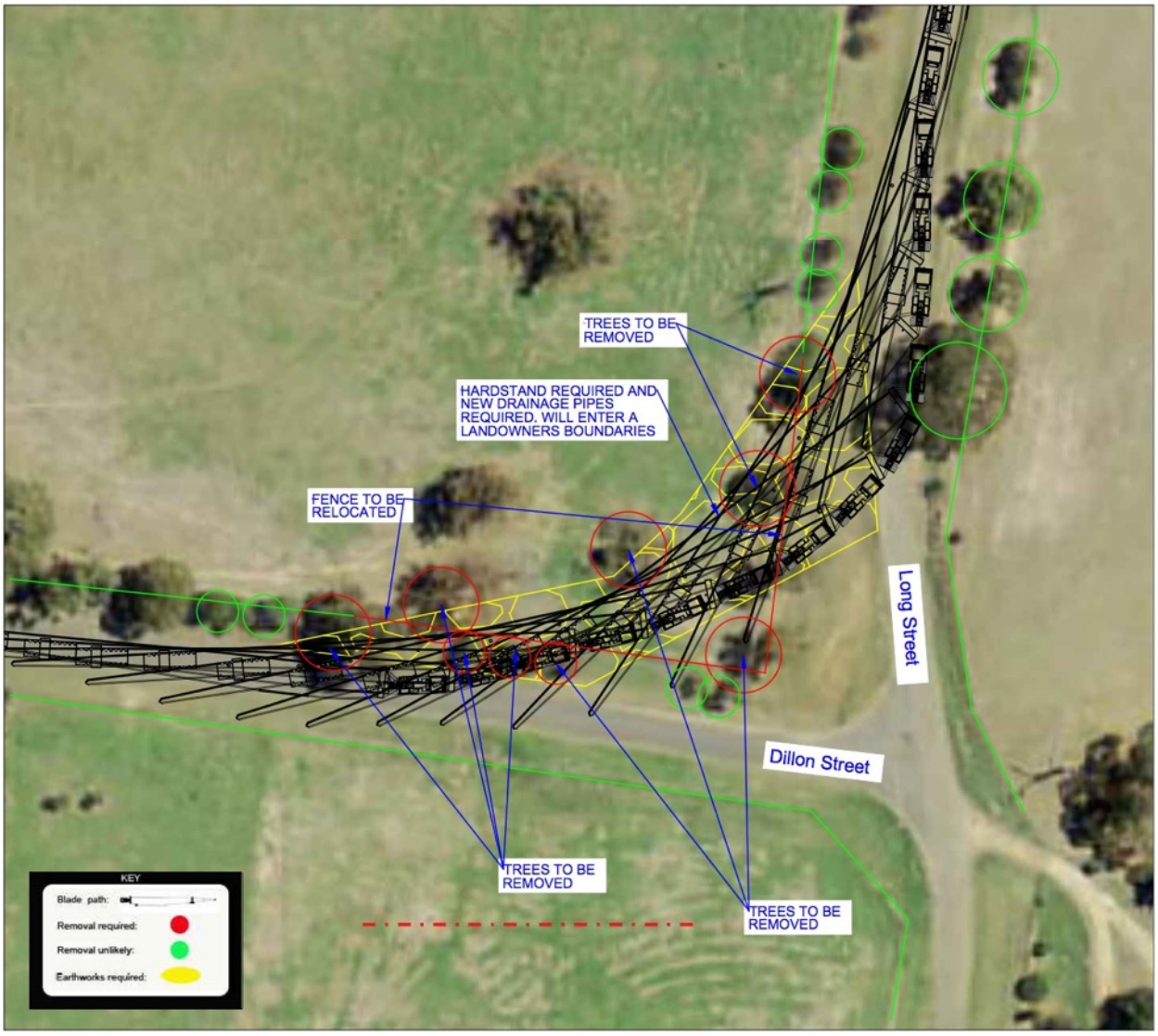


Image 2:

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/mnV8spf8JGG6LsT99

PROCEDURE: Left-hand turn from Dillon Street onto Long Street.

COMMENTS: Access through a landowner's boundary will be required to make this turn. Hardstand is required on the inside of the corner, and a fence relocated within the landowner's boundaries. Additionally, some vegetation needs to be removed.

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

489.5 Km's: Long Street onto Rye Park Road at Boorowa

Image 1:

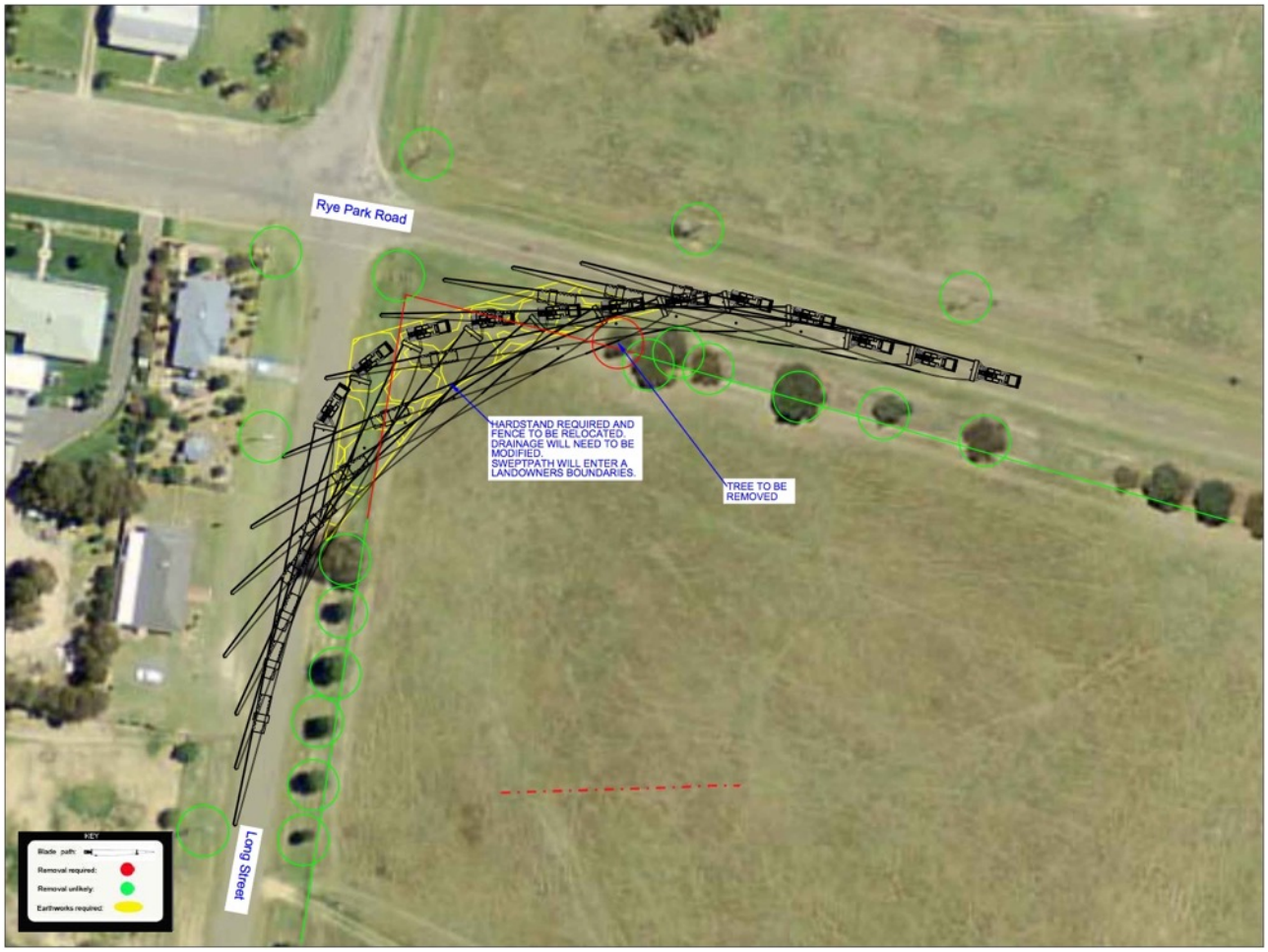


Image 2:

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/Ry5s7svgx1BDzRAMA

PROCEDURE: Right-hand turn from Long Street onto Rye Park Road.

COMMENTS: Access through a landowner's boundary will be required to make this turn. Hardstand is required on the inside of the corner, and a fence relocated within the landowner's boundaries. Additionally, some vegetation needs to be removed.

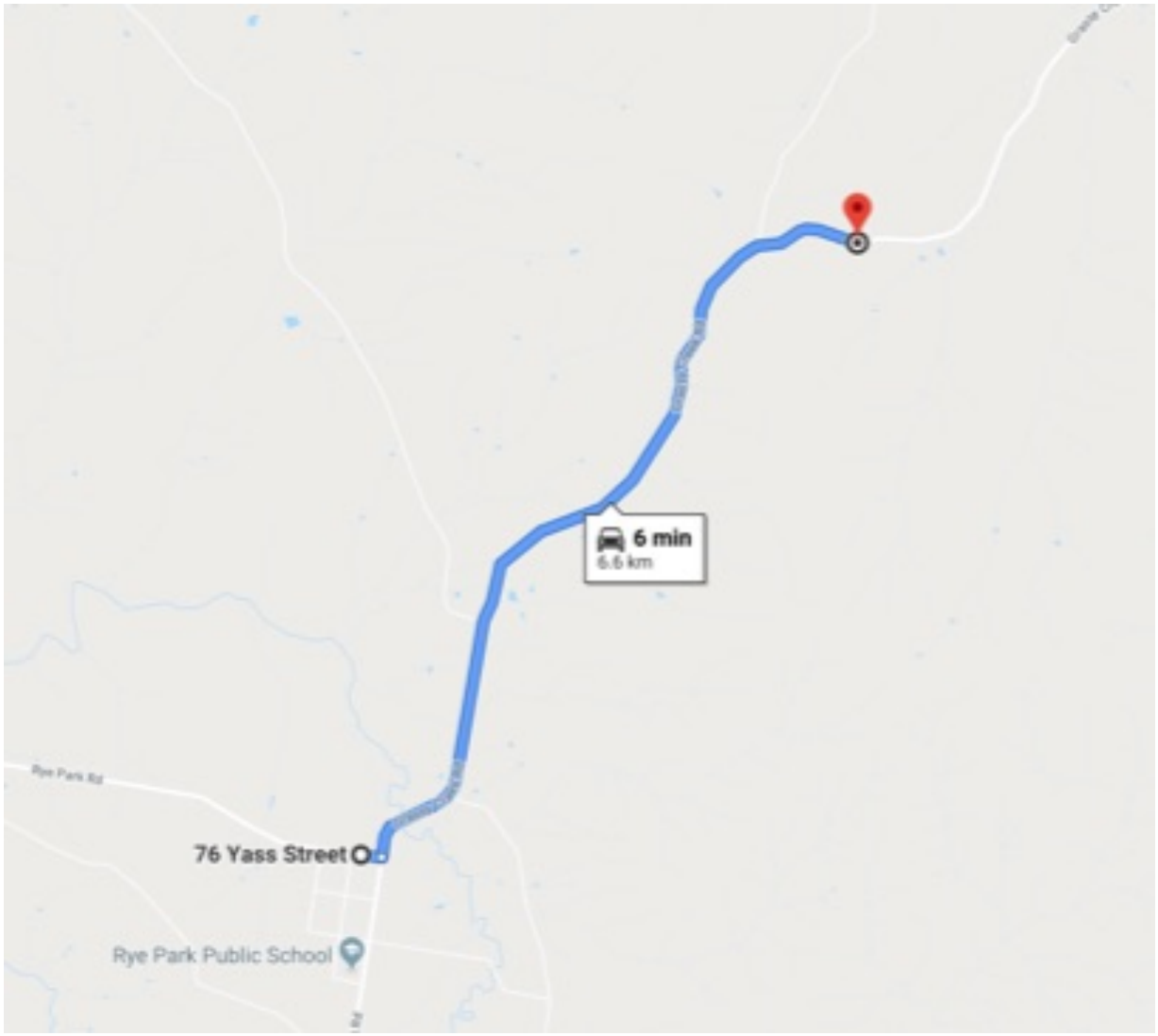
ROAD MODIFICATIONS: Large amounts of works are required on this section of road.

10.0 Stage 2 Route survey (Rye Park Township to Rye Park North)

STAGE 2 ROUTE: (All components)

DISTANCE: 6.6 kilometres:

This route took us via Rye Park Road, Grassy Creek Road.



GPS LINK: https://goo.gl/maps/NC1AQuTTZPJHDDfk9

KEY	
MODIFICATIONS REQUIRED	
PINCH POINT	
EMERGENCY PARKING	

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
Route: Rye Park Township to Rye Park Windfarm North					
0.0	Rye park	Rye Park Road onto Grassy Creek Road GPS link: https://goo.gl/maps/LGgWeQKDCERMsHQv7	Length: 30 Metres	Left hand turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the landowner's property and some trees and fence will need to be removed.
0.0 to 6.6	Rye Park	Grassy Creek Road GPS link: https://goo.gl/maps/NC1AQuTTZPJHDDfk9	Width: 4.5 metres	Travel directly ahead	Grassy Creek road is generally 4.5 metres of width with no shoulder. The pavement is in fair condition but may show wear with the volume of heavy traffic. Some trees will need to be trimmed and removed on sections of this road. The floodway has an adequate swept path.
5.4	Rye park	Grassy Creek Road into site entrance # 2 https://goo.gl/maps/5LwRX2EKMkNAFYsT8		Left turn	Site entrance to be made suitable for the swept path of the largest loads.
6.6	Rye park	Grassy Creek Road into site entrance # 1 https://goo.gl/maps/B2bjRMNjVvybbfZt6		Right turn	Site entrance to be made suitable for the swept path of the largest loads.

0.0 Km's: Rye Park Road onto Grassy Creek Road at Rye Park

Image 1:

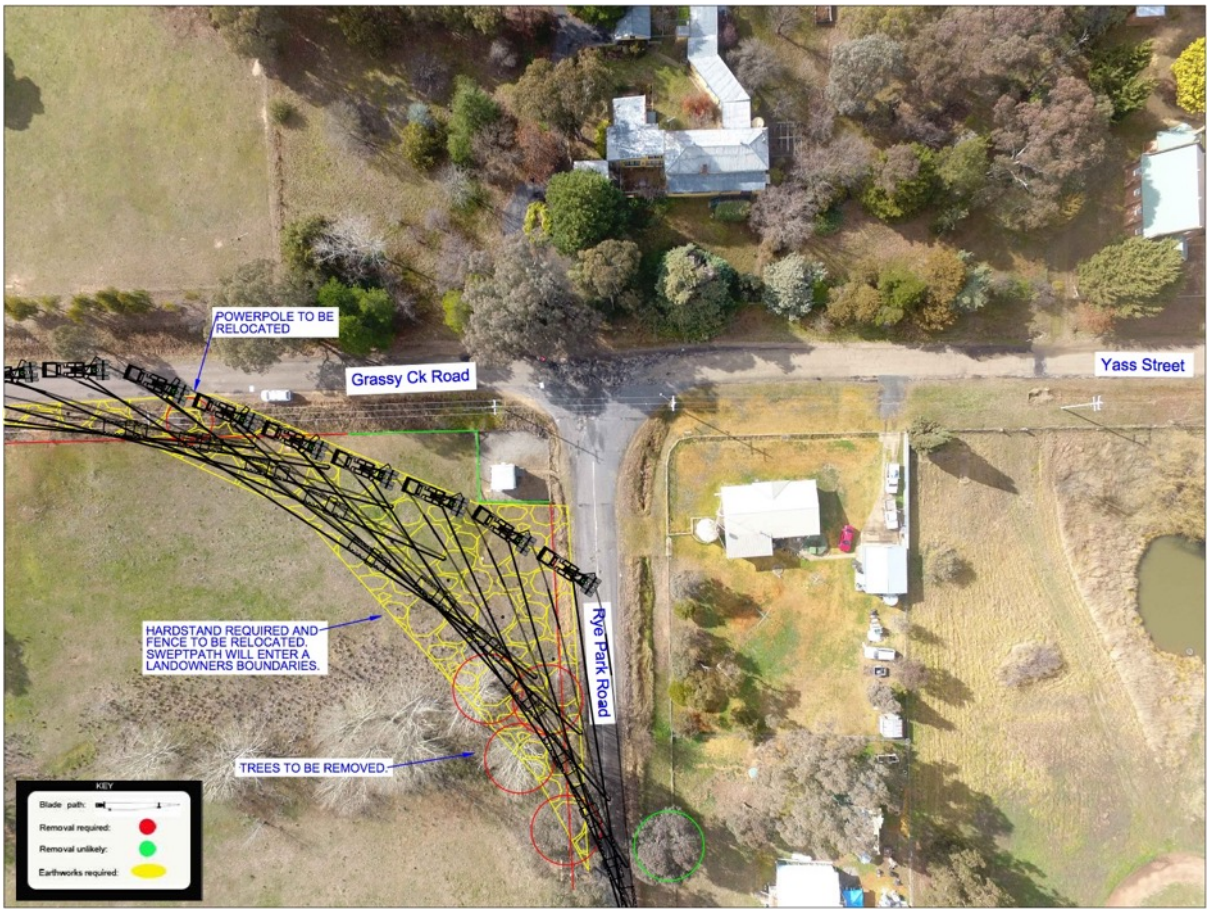


Image 2:

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/LGgWeQKDCERMsHQy7
PROCEDURE: Left-hand turn from Rye Park Road onto Grassy Creek Road.
COMMENTS: Access through a landowner's boundary will be required to make this turn. Hardstand is required on the landowner's property and some trees and fence will need to be removed.
ROAD MODIFICATIONS: Large amounts of works are required on this section of road.

0.0 to 6.6 Km's: Grassy Creek Rd.

Image 1:

Image 2:

PROCEDURE: Travel directly ahead on Grassy Creek Road.

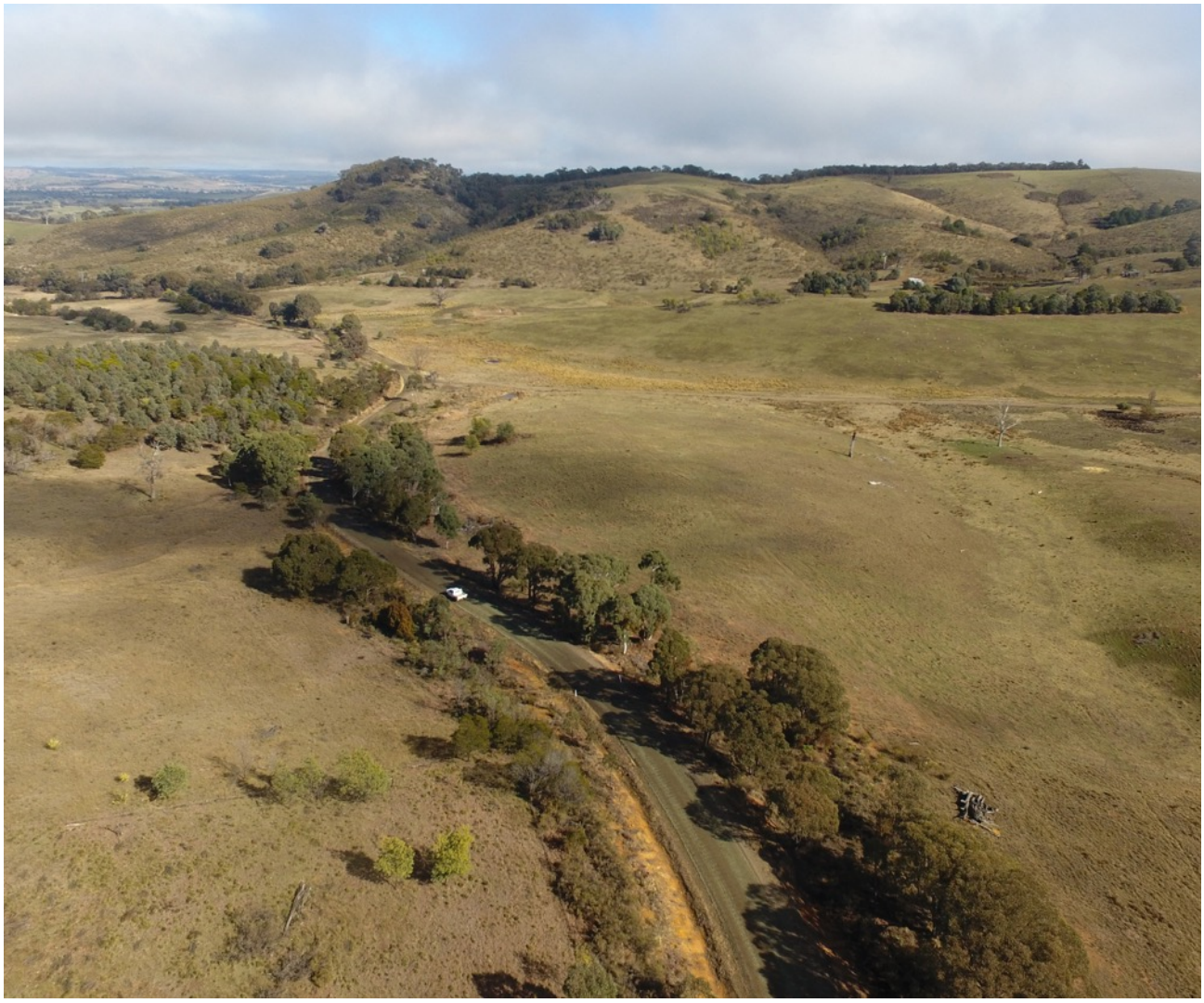
COMMENTS: Grassy Creek road is generally 4.5 metres of width with no shoulder. The pavement is in fair condition but may show wear with the volume of heavy traffic. Some trees will need to be trimmed and removed on sections of this road. The floodway has an adequate swept path.

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

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/Aw2n6KdNtLz

5.4 Km's: Grassy Creek Rd looking north towards site entrance # 2 at Rye Park

Image 1:



PROCEDURE: Loads to turn left off Grassy Creek Road into site access Road.

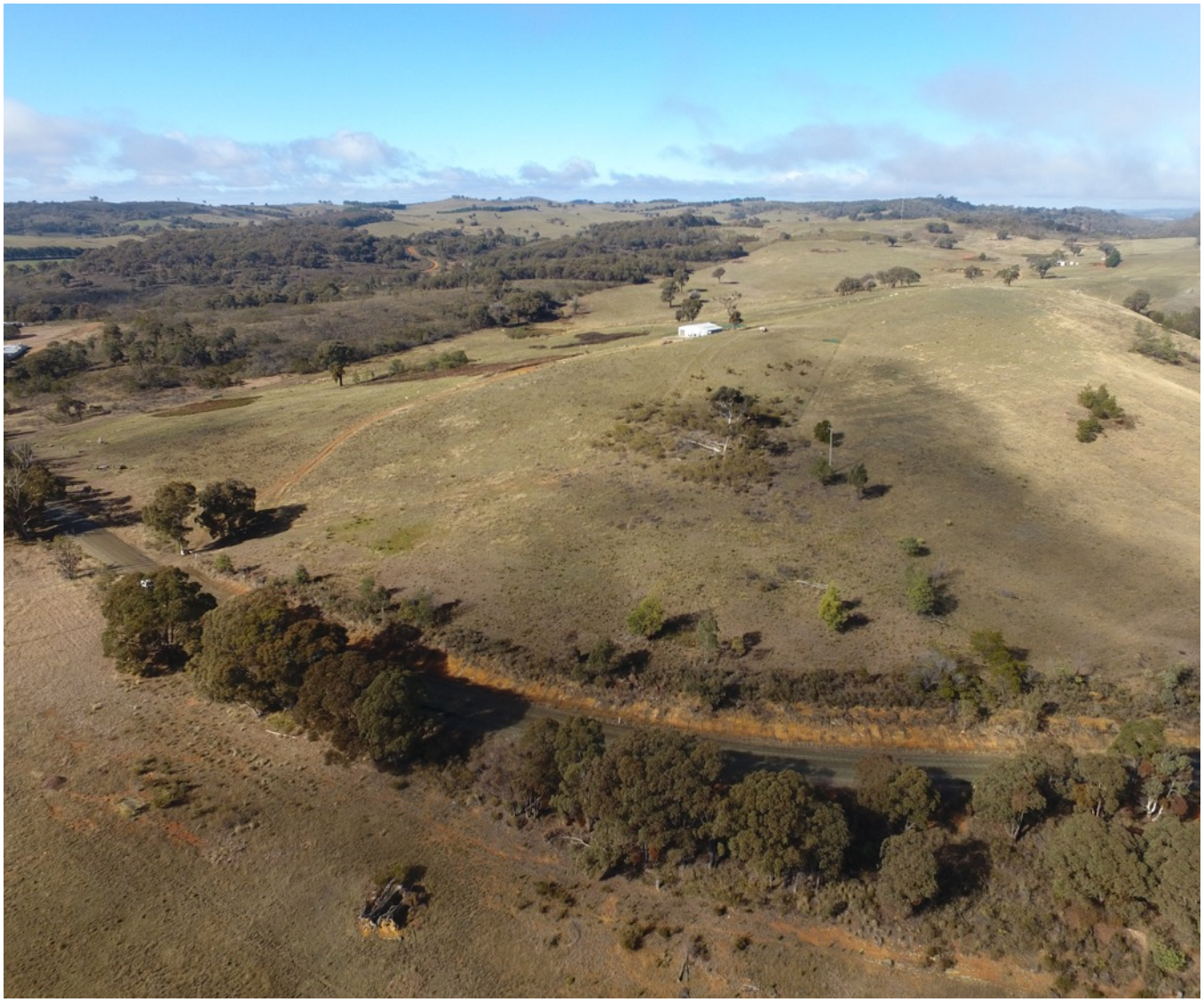
COMMENTS: Site entrance to be made suitable for the swept path of the largest loads.

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

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/8EToBmm8FqL2

6.6 Km's: Grassy Creek Rd looking south towards site entrance # 1 at Rye Park

Image 1:



PROCEDURE: Loads to turn right off Grassy Creek Road into site access Road.

COMMENTS: Site entrance to be made suitable for the swept path of the largest loads.

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

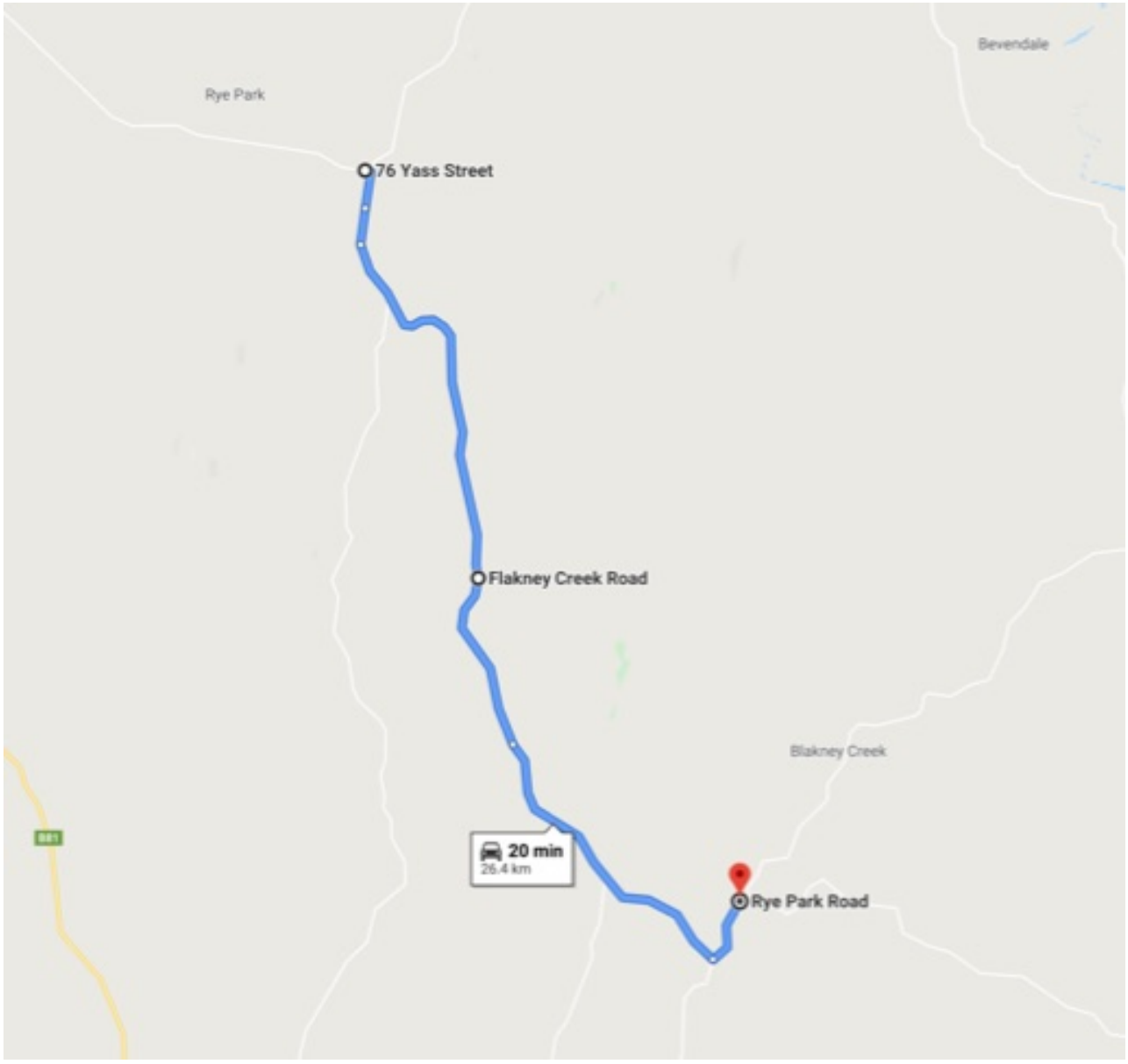
GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/8EToBmm8FqL2

11.0 Stage 3 Route survey (Rye Park Township to Rye Park South)

STAGE 3 ROUTE: (All components)

DISTANCE: 26.4 kilometres:

This route took us via Rye Park Road, Yass Street, Gunning Street, Dalton Road, Rye Park Road. (Including a possible site access point off Flackney Creek Road).



GPS LINK: https://goo.gl/maps/xsk8nmSVdquTpEZDA

KEY	
MODIFICATIONS REQUIRED	
PINCH POINT	
EMERGENCY PARKING	

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
Route: Rye Park Township to Rye Park Windfarm North					
0.0	Rye park	Rye Park Road onto Yass Street Road GPS link: https://goo.gl/maps/LGgWeQKDCERMsHQv7	Length: 30 Metres	Right turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the landowner's property and some trees and fence will need to be removed.
0.0 to 26.4	Rye Park	Yass street through to Site entrance #13 https://goo.gl/maps/DV4fpurJ45k6HGvD7	4.5 Metres width clearance	Travel directly ahead	This section of road will need to be checked for swept path and vertical curve of the largest loads. Some sections of this road will require upgrades. Sections of this road have trees that would need to be trimmed/removed.
1.0	Rye Park	Yass Street onto Gunning Road https://goo.gl/maps/LLydmFC4TMxwjSzH7	5.5 Metres width clearance	Travel directly ahead	No problem with this section of road.
2.0	Rye Park	Gunning Road onto Dalton Road https://goo.gl/maps/zC4FNES8z1B1iJYk7	5.5 Metres width clearance	Travel directly ahead	No problems with this section of road.
12.0	Rye Park	Dalton Road onto Flakney Creek Road. (Site entrance #4) GPS link: https://goo.gl/maps/SWaaW7LWhcnekCJc7	30.0 metres clearance	Left turn	This corner and through to site will need to be made suitable for the swept path of the largest loads.
16.7	Rye Park	Dalton Road onto Rye Park Road https://goo.gl/maps/ah3wGy1QP5BrZzoU6	5.5 Metres width clearance	Travel directly ahead	No problems with this section of road.
24.7	Blakney Creek	Rye Park Road intersection of Blakney Creek South Road GPS link: https://goo.gl/maps/CGWNggq3i9ANQbMx8	30.0 metres clearance	Left turn	
26.4	Blakney Creek	Rye Park windfarm (Site entrance # 13) onto Rye Park Road GPS link: https://goo.gl/maps/saww6PjtwotzvKB36	0.0 metres clearance	Left turn	Site to supply adequate access for the swept path of the largest loads.

0.0 Km's: Rye Park Road onto Yass Street at Rye Park

Image 1:

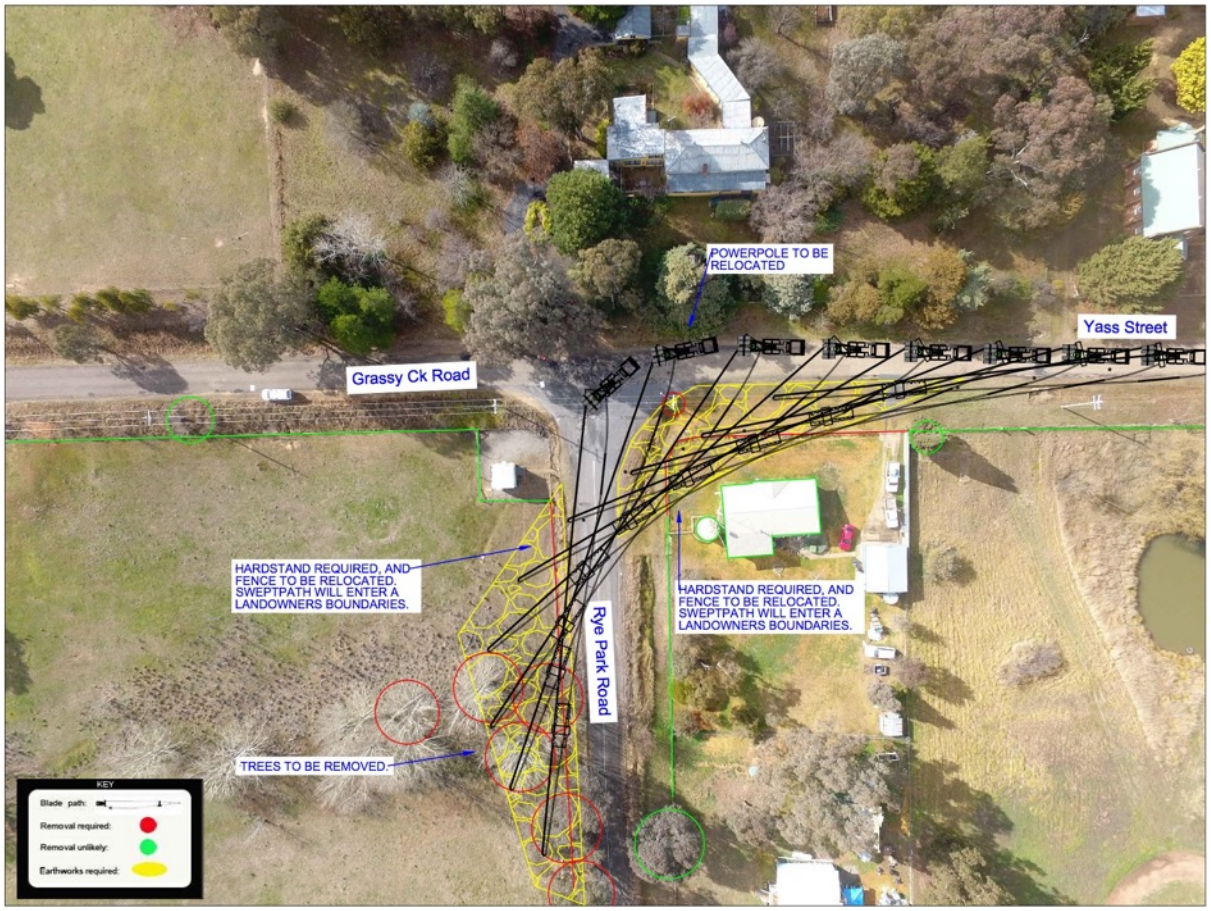


Image 2:

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/LGgWeQKDCERMsHQy7

PROCEDURE: Right-hand turn from Rye Park Road onto Yass Street.

COMMENTS: Access through a landowner's boundary will be required to make this turn. Hardstand is required on the landowner's property and some trees and fence will need to be removed.

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

12.0 Km's: Dalton Road onto Flakney Creek Road at Blakney Creek. (Site entrance # 4).

Image 1: (Option 1)

Image 2:

PROCEDURE: Turn Left from Dalton Road onto Flakney Creek Road.

COMMENTS: This corner and through to site will need to be made suitable for the swept path of the largest loads. This procedure will require hardstand and tree removal.

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

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/SWaaW7LWhcnekCJc7

24.7 Km's: Rye Park Road intersection of Blakney Creek South Road at Blakney Creek.

Image 1:

Image 2:

PROCEDURE: Turn left from Rye Park Road onto Rye Park Road.

COMMENTS: The existing turn would need to be relocated and made substantially wider. Large amounts of hardstand are required, and it is likely that some trees and fences will need to be removed. The causeway will also require modifications.

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

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/CGWNggq3i9ANQbMx8

26.4 Km's: Rye Park Road into Site entrance #13 at Blakney Creek.

Image 1: (Looking south-west along Rye Park Road from site entrance 13)

PROCEDURE: Right hand turn from rye Park Road into site entrance # 13.

COMMENTS: Site to supply adequate access for the swept path of the largest loads to re-enter the local road network.

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

GPS LINK FOR SECTION OF ROAD: https://goo.gl/maps/saww6PjtwotzvKB36

12.0 Conclusion (Stage 1,2 & 3)

After studying all options and undertaking a route survey, this route in its current condition will require a large number 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. The route up to the turnoff of the Hume Highway is likely to be okay.

OVERHEAD STRUCTURES: (5.3 Maximum loaded height)

- There are a large number of overhead structures between Newcastle and Rye Park. The lowest of these structures is the pedestrian bridge over Pennant Hills Road at Normanhurst. There are a number of other structures noted as pinch points in the survey. Each of these pinch points will show the height clearance in each lane. We would recommend that all loads over 5.2 metres use the High Tower route.

OVERHEAD UTILITIES:

- This route will need to be checked by an authorised scoping company. It is likely that a route of at least 5.2 metres is required for route 1 and 5.8 metres for route 2 & 3.

OVERHEAD TREES:

- The route up until Boorowa is clear of vegetation. All roads from this point through to site will need to be checked for a clear passage of at least 5.8 metres for overhead branches. Some trimming/removal is likely from this point onwards.

WIDTH:

- The route up until Rye Park is suitable for a width of up to 5.6 metres. From Rye Park through to each site entrance there are sections that will require widening.
- Site entrance #1 through to Site entrance #13 has a number of sections that will need some widening. Rye Park Road from Rye Park and Grassy Creek road are particularly tight in some sections.

FLOODWAYS:

- All floodways on the local roads need to be checked. These floodways should be checked for axle loadings and width as well as the vertical curve of the trailers.

PAVEMENT:

- The route up until Boorowa is of Highway standard. From this point on the pavement varies from 5.0 metres in width with a good surface in some sections to patchy thin asphalt with poor surface in others as well as some gravel roads. There is likely to be some wear during the deliveries on these lesser roads.
- Site access # 11 through to Site access # 13: The pavement changes from good asphalt to gravel in sections of this route. There is likely to be some wear during the deliveries on these lesser roads. All gravel roads will need to be made suitable for all weather travel.

ROADWORKS:

- The project will need to start discussions with government authorities at least 18 months prior to turbine transport to understand if the project would conflict with any upcoming roadworks. Once a TMP has been approved for the transport of the turbines, then the exact movement dates need to be communicated with transport NSW to make all road stakeholders aware of the movements.

NEWCASTLE:

- Several intersections will need modifications to allow the blades a suitable swept path around these corners. This will include relocation of a traffic signal, several signs and a pole. Additionally, some hardstand is required on 2 corners and a median strip will need to be lowered.

SYDNEY:

- The turn from the M1 Motorway onto Pennant Hills Road requires only a small amount of work on the centre median. However, this corner needs to be rechecked on completion of the Northconnex.
- The turn from Pennant Hills Road onto the M2 Motorway will require modifications This will include relocation of a traffic signal, a section of fence removed, and the relocating of a barrier.

YASS:

- Some signs need to be relocated or made removable on the turnoff from the Hume Highway onto Lachlan Valley way.

BOOROWA:

- Several intersections will need to be upgraded to allow a suitable swept path. Two of these corners will travel through a landowner's boundaries.

RYE PARK:

- The route from Site entrance # 1 to Site entrance # 13 was found to be in fair condition with the route needing some widening in some sections. A large amount of works would be required on all intersections and site access points.
- Grassy Creek Road will require some tree pruning/Removal; however, the swept path seems to be suitable in its current form.
- Site entrances off Grassy Creek Road will need to be made suitable for the swept path of the largest loads.

BLACKNEY CREEK:

- Site entrances off Rye Park Road will need to be made suitable for the swept path of the largest loads.

EMPTY RETURN:

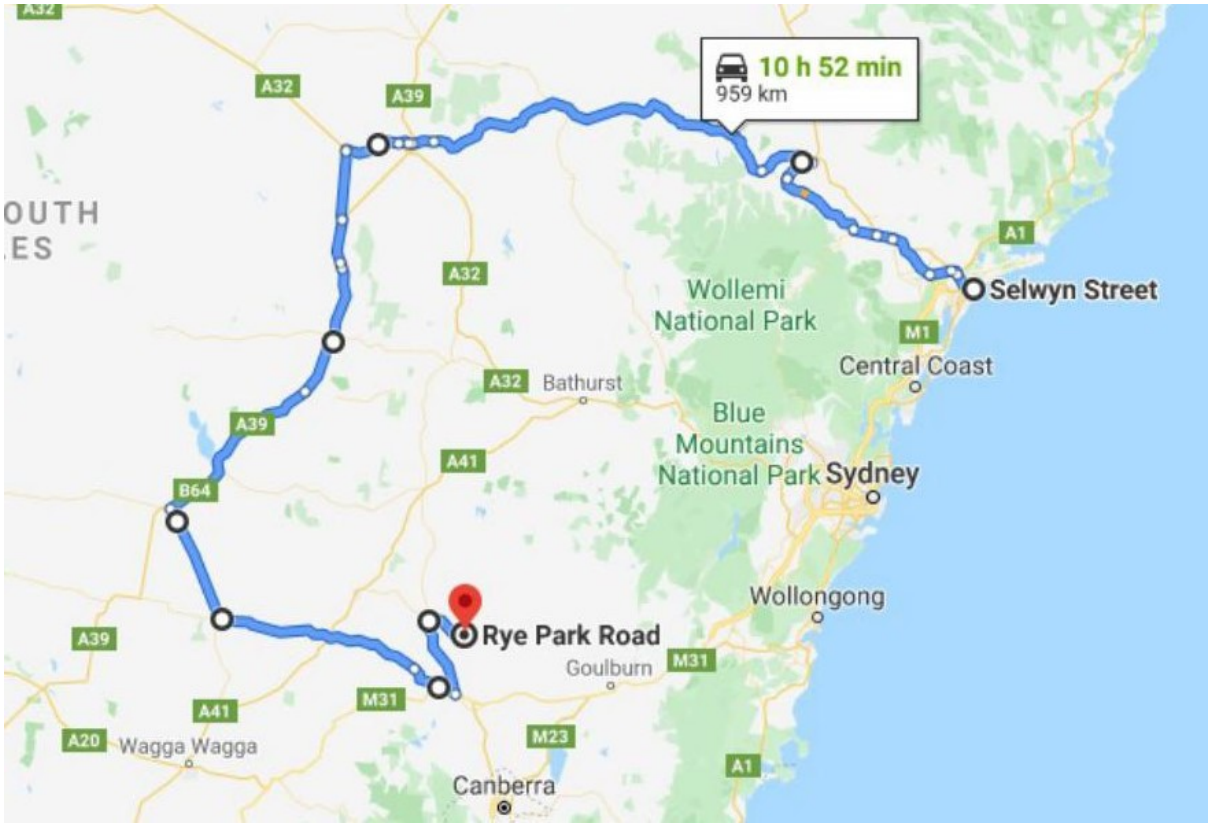
- It would be advisable that the project discusses additional return routes for empty travel, which would avoid all of the Northern traffic returning via the Southern Site. We would suggest seeking approval for Cooks Hill Road and Faulder Avenue to be used for empty return travel to Yass.

13.0 Route for high towers (Newcastle to Rye Park township)

HIGH TOWER ROUTE: (Towers over 5.2 metres in diameter)

DISTANCE: 959.0 kilometres:

This route took us via Selwyn street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Golden Highway, Denman Road, Bengalla Road, Wybong Road, Golden Highway, Boothenba Road,Troy Bridge Road, Bunglegumbie Road, Mitchell Highway, Manildra Street, Derribong Avenue, Algalah Street, Tomingley Road, Newell Highway, Thomas Street, Moulden Street, Henry Parkes Way, Westlime Road, Hartigan Avenue, Newell Highway, Goldfields Way, Kitchener Road, Bundawarrah Road, Milvale Road, Waratah Street, Burley Griffin Way, Hume Highway, Lachlan Valley Way, Trucking Yard Road, Dillon Street, Long Street, Rye Park Road.



GPS LINK: https://goo.gl/maps/J6nxRe3M1ounta7r9

KEY	
CRITICAL	
CAUTION	
EMERGENCY PARKING	

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
0.0	Mayfield	Mayfield #4 berth onto Selwyn Street GPS link: https://goo.gl/maps/afLwPYKuNdm	Length: 70.0 Mtrs Width: 8.0 Mtrs	Moderate right hand turn	No problems with the towers on this section of road.
0.4	Mayfield	Selwyn Street over rail crossing GPS link: https://goo.gl/maps/AmohE54hKSz	Length: 90 metres Width: 9.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
1.3	Mayfield	Selwyn Street onto George Street GPS link: https://goo.gl/maps/gXeHvBtCp4D2	Length: 40.0 Mtrs Width: 8.0 Mtrs	Right hand turn	No problems with the towers on this section of road.
1.4	Mayfield	George Street onto Industrial Drive https://goo.gl/maps/s4ayrsuoAsD2	Length: 40.0 Mtrs Width: 8.0 Mtrs	Right hand turn	No problems with the towers on this section of road.
4.9	Mayfield	Industrial Drive under traffic signals GPS link: https://goo.gl/maps/YmqhiS2iR582	Height: 5.4 metres	Travel directly ahead in the far right lane.	The lowest traffic signal on route is at the intersection of Steel River Blvd. Trucks that exceed 5.3 metres will need to travel in the right-hand lane. Clearance in the right end lane is 6.0 metres.
5.5	Mayfield West	Industrial Drive onto Maitland Road GPS link: https://goo.gl/maps/Kn49dhWG2qG2	Length: 40.0 Mtrs Width: 7.0 Mtrs	Right hand turn	No problems with the towers on this section of road.
6.4	Sandgate	Maitland Road over rail bridge GPS link: https://goo.gl/maps/W2JWWjhfqv5UMviB7	Length: 90 metres Width: 9.0 Metres	Travel directly ahead in the right-hand lane	Approval from Rail company required to cross this structure. Travel over this structure may have specific conditions.
13.9	Hexham	New England Highway under gantry GPS link: https://goo.gl/maps/YTMoFe7Aick	Height: 5.9 metres	Travel directly ahead	This is the lowest structure on route. There is no bypass around the gantry. A maximum loaded height of 5.9 metres should not be exceeded.
15.1	Tarro	New England Highway over rail bridge GPS link: https://goo.gl/maps/tTnWLwQC2hzSPhAp6	Length: 90 metres Width: 7.0 Metres	Travel directly ahead in the right-hand lane	Approval from Rail company required to cross this structure. Travel over this structure may have specific conditions.
17.4	Tarro	New England Highway onto John Renshaw Drive GPS link: https://goo.gl/maps/SRDr5JigkBp	Length: 100.0 Mtrs Width: 12.0 Mtrs	Left hand merge	No problems with the towers on this section of road.
18.4	Beresfield	John Renshaw Drive GPS link: https://goo.gl/maps/N19vJih1Fgr	Length: 100.0 Mtrs Width: 10.0 Mtrs	Travel directly ahead	The roundabout has been removed. A set of dual lanes now takes traffic directly across the intersection.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
28.7	Buchanan	John Renshaw Drive onto the Hunter Expressway GPS link: https://goo.gl/maps/1STJ1PfQt9E2	Length: 65.0 Mtrs Width: 7.0 Mtrs	Right hand turn	No problems with the towers on this section of road.
58.9	Branxton	The Hunter Expressway onto The New England Highway GPS link: https://goo.gl/maps/7rauNuxzqjq	Length: 100.0 Mtrs Width: 12.0 Mtrs	Travel directly ahead	No problems with this section of road.
67.3	Whittingham	The New England Highway onto the Golden Highway GPS link: https://goo.gl/maps/nAnfkYfeUn42	Length: 70.0 Mtrs Width: 8.0 Mtrs	Left Hand turn	The NSW Government is currently upgrading this intersection. At this stage the data that is available for the upgrades shows that the section of road that we would need to access does not change considerably. However, it is recommended that you monitor the progress of the upgrades, and that any changes are thoroughly looked at.
67.4	Whittingham	Golden Highway GPS link: https://goo.gl/maps/R86RFuPnmFU2	115.0 x 9.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
68.0	Whittingham	Golden Highway over rail bridge GPS link: https://goo.gl/maps/5NwDQofandvvMKfY9	Length: 90 metres Width: 9.0 Metres	Travel directly ahead in the centre of the road.	Approval from Rail company required to cross this structure. Travel over this structure may have specific conditions.
77.3	Mount Thorley	Golden Highway over rail bridge GPS link: https://goo.gl/maps/qTxSbkxPu87L5hx4A	Length: 90 metres Width: 9.0 Metres	Travel directly ahead in the centre of the road.	Approval from Rail company required to cross this structure. Travel over this structure may have specific conditions.
77.4	Whittingham	Golden Highway intersection with the Putty Road GPS link: https://goo.gl/maps/7hQdEmK1EgE2	Length: 65 metres Width: 6.0 Metres	Left hand turn	No problems with this section of road.
77.5	Mount Thorley	Golden Highway GPS link: https://goo.gl/maps/zGvdupDuixx	100.0 x 10.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
80.6	Mount Thorley	Golden Highway over rail bridge GPS link: https://goo.gl/maps/ipGU4USXmWZ8GkJs6	Length: 90 metres Width: 9.0 Metres Height: 5.2 metres	Travel directly ahead in the centre of the road.	Approval from Rail company required to cross this structure. Travel over this structure may have specific conditions.
80.8	Mount Thorley	Putty Road under Mt Thorley Road GPS link: https://goo.gl/maps/SMzSLP1kvQYDMqa86	Heights: Left: 6.6 metres Centre: 6.3 Metres Right: 6.3 metres	Travel under the bridge in the left lane	Mt Thorley underpass is 6.3 metres in the centre of the road. Towers to pass under this structure on the correct side.
80.8	Mount Thorley	Golden Highway intersection with the Putty Road GPS link: https://goo.gl/maps/QS9quvSyHYWaFHoX9	Length: 45 metres Width: 6.0 Metres	Right hand turn	No problems with this section of road.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
98.0	Warkworth	Golden Highway GPS link: https://goo.gl/maps/Y6V6EXaCwxq	100.0 x 8.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
107.0	Jerrys Plains	Golden Highway through Jerrys Plains village GPS link: https://goo.gl/maps/WgSCRsJ9ZGt	Length: 60 metres Width: 6.0 Metres	Left hand than right hand turn	No problems with this section of road.
126.0	Ogilvy	Golden Highway GPS link: https://goo.gl/maps/58Tj9ojs7CC2	6% gradient	Travel directly ahead	This section of road has a steep mountain range that will require additional pull trucks to assists loads that exceed 80T gross weight. Additionally, the NSW Government is currently upgrading this section of road. It is recommended that you monitor the progress of the upgrades, and that any changes are thoroughly looked at.
131.9	Denman	Golden Highway onto Denman Road GPS link: https://goo.gl/maps/sf4PNnycxB32	Length: 55 metres Width: 6.0 Metres	Right hand turn	No problems with this section of road.
137.9	Muswellbrook	Denman Road onto Bengalla Road GPS link: https://goo.gl/maps/3sK4m6YSHNHqkqn68	Length: 60 metres Width: 8.0 Metres	Left hand turn	No problems with this section of road.
149.0	Bengalla	Bengalla Road onto Wybong Road GPS link: https://goo.gl/maps/zfDyG4GQq6G37imB9	Length: 90 metres Width: 8.0 Metres	Left hand bend	No problems with this section of road.
158.0 to 183.0	Bengalla	Wybong Road GPS link: https://goo.gl/maps/ekGZA5wFFK55Mvmc7	Length: 60 metres Width: 8.0 Metres	Travel directly ahead	This road is maintained by Muswellbrook Council. Approval will be required to travel on this section of Road.
183.0	Sandy Hollow	Wybong Road onto Golden Highway GPS link: https://goo.gl/maps/5ft3VnWpnPhpeN4u7	Length: 60 metres Width: 8.0 Metres	Right hand turn	No problems with this section of road.
190.1	Sandy Hollow	Golden highway GPS link: https://goo.gl/maps/2THBuV165xx	50.0 x 4.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
193.0	Sandy Hollow	Golden Highway under safety Cam GPS link: https://goo.gl/maps/b7t9zH2ankJcvWpT6	Height: Left: 6.3 metres	Travel directly ahead on the correct side	No problems with this section of road.
201.0	Gungal	Golden highway GPS link: https://goo.gl/maps/WDoL2LfeCoP2	70.0 x 6.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
221.0	Merriwa	Golden Highway under safety Cam GPS link: https://goo.gl/maps/D92rzQ8vnUcYsqj56	Height: Right: 6.4 metres	Travel directly ahead on the correct side	No problems with this section of road.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
224.0	Merriwa	Golden highway GPS link: https://goo.gl/maps/NqrWzTsRmnt	100.0 x 5.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
274.0	Cassilis	Golden highway GPS link: https://goo.gl/maps/vs6YMT6TxCA2	200.0 x 8.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
305.0	Leadville	Golden highway GPS link: https://goo.gl/maps/ujxMGukhopeFWRhb8	200.0 x 8.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
331.0	Dunedoo	Golden Highway over rail crossing GPS link: https://goo.gl/maps/wsyNKfcoAij3SosY9	Length: 90 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
331.1	Dunedoo	Golden Highway intersection with Wargundy Street GPS link: https://goo.gl/maps/WzACUHey3jYadj1K7	Length: 60 metres Width: 6.0 Metres	Right hand bend	No problems with this section of road.
384.0	Ballimore	Golden Highway GPS link: https://goo.gl/maps/RuKKrfHarw1Mjy5E9	150.0 x 8.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
392.0	Ballimore	Golden Highway over rail crossing GPS link: https://goo.gl/maps/yb15Kz6R2r3E69fj6	Length: 90 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
400.0	Dubbo	Golden Highway onto Boothenba Road GPS link: https://goo.gl/maps/TJLi5W4ir11ejgtb6	Length: 50 metres Width: 6.5 Metres	Right hand turn	No problems with this section of road.
411.0	Dubbo	Boothenba Road over rail crossing GPS link: https://goo.gl/maps/72ageimPLqPWYY7M9	Length: 90 metres Width: 6.5 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
411.1	Dubbo	Boothenba Road onto Troy Bridge Road GPS link: https://goo.gl/maps/2u5uRf2BvKxseoFm9	Length: 90 metres Width: 6.5 Metres	Travel directly ahead	No problems with this section of road.
414.0	Dubbo	Troy Bridge Road onto Bunglegumbie road GPS link: https://goo.gl/maps/6Uke9jwPypNYVPux5	Length: 90 metres Width: 6.5 Metres	Travel directly ahead	No problems with this section of road.
420.0	Dubbo	Bunglegumbie road onto the Mitchell Highway GPS link: https://goo.gl/maps/jCWqmaQsd3fChp837	Length: 50 metres Width: 6.5 Metres	Right hand turn	No problems with this section of road.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
450.0	Narromine	Mitchell Highway onto Manildra Street GPS link: https://goo.gl/maps/hFG648tcSMUHxJ8h6	Length: 40 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
450.1	Narromine	Manildra Street over rail crossing GPS link: https://goo.gl/maps/4s2HYJJfJQ5pGbKg7	Length: 60 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
450.2	Narromine	Manildra Street onto Derribong Avenue GPS link: https://goo.gl/maps/776aPaxgsFTWi6qL6	Length: 40 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
450.5	Narromine	Derribong Avenue onto Algalah Street GPS link: https://goo.gl/maps/9s8cb8G4T2c75t1V8	Length: 40 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
452.0	Narromine	Algalah Street onto Tomingley Road GPS link: https://goo.gl/maps/EWfZYo3Xos6T3J8A8	Length: 60 metres Width: 7.0 Metres	Travel directly ahead	No problems with this section of road.
487.5	Tomingley	Tomingley Road onto the Newell Highway GPS link: https://goo.gl/maps/NJtXmHCFHxaiMaq39	Length: 60 metres Width: 7.0 Metres	Travel directly ahead	No problems with this section of road.
488.0	Tomingley	Newell Highway GPS link: https://goo.gl/maps/ADMke5At2A1Uy1z4A	200.0 x 15.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
489.0	Tomingley	Newell Highway under safety Cam GPS link: https://goo.gl/maps/9Vqu9xXxRwhHt4Uk6	Height: Right: 6.8 metres	Travel directly ahead on the correct side	No problems with this section of road.
490.0	South Tomingley	Newell Highway GPS link: https://goo.gl/maps/1q8f6HJ2zsZSxup66	150.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
502.0	Peak Hill	Newell Highway GPS link: https://goo.gl/maps/orKTBB8wobK6exsc6	90.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
503.0	Peak Hill	Newell Highway under safety Cam GPS link: https://goo.gl/maps/sAbh8zwZzZVMriD2A	Height: Right: 6.3 metres	Travel directly ahead on the correct side	No problems with this section of road.
526.0	Alectown	Newell Highway GPS link: https://goo.gl/maps/GMGbEJHAEkeWuRyz5	90.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
552.0	Parkes	Newell Highway onto Thomas Street GPS link: https://goo.gl/maps/fSnFVWPr78RePSTz9	Length: 55 metres Width: 6.5 Metres	Right hand turn	No problems with this section of road.
554.0	Parkes	Thomas Street onto Moulden Street GPS link: https://goo.gl/maps/HpYrcwcx8BHrUmfc8	Length: 55 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
554.8	Parkes	Moulden Street onto Henry Parkes Way GPS link: https://goo.gl/maps/atnNtdtyi21wK4PF9	Length: 55 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
555.0	Parkes	Henry Parkes Way onto Westlime Road GPS link: https://goo.gl/maps/Uk2nuLS7xvfnv5dt6	Length: 55 metres Width: 6.5 Metres	Right hand turn	No problems with this section of road.
556.0	Parkes	Westlime Road onto Hartigan Ave GPS link: https://goo.gl/maps/XtKgPrWcZHY3im65A	Length: 55 metres Width: 6.5 Metres	Travel directly ahead	No problems with this section of road.
557.0	Parkes	Hartigan Avenue under traffic signal GPS link: https://goo.gl/maps/sQxVxzZivbDX7E3j6	Height: Left: 5.5 metres	Travel around the traffic signal on the incorrect side of the road.	Traffic signal is too low. Pass on right hand side.
558.0	Parkes	Hartigan Ave onto the Newell Highway GPS link: https://goo.gl/maps/y3rabftt4HGreX9e6	Length: 55 metres Width: 6.5 Metres	Travel directly ahead	No problems with this section of road.
558.1	Parkes	Newell Highway over rail crossing GPS link: https://goo.gl/maps/7tSoLfFManXyKV3T9	Length: 60 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
562.0	Parkes	Newell Highway over rail crossing GPS link: https://goo.gl/maps/Kxa3shUCMiuKe2sX7	Length: 60 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
569.0	Tichborne	Newell Highway over rail crossing GPS link: https://goo.gl/maps/gxYUZLLe3jsCEJqD7	Length: 60 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
576.0	Daroobalgie rest area	Newell Highway GPS link: https://goo.gl/maps/swec16PWh1N8ZbUR7	200.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
590.0	Forbes	Newell Highway intersection with Dowling Street GPS link: https://goo.gl/maps/DqkvxH4qtWnXvLJ26	Length: 45 metres Width: 6.0 Metres	Left hand turn	No problems with this section of road.
590.2	Forbes	Newell Highway GPS link: https://goo.gl/maps/Hsmjs9pqvZ5UYFAH7	100.0 x 6.5 metres	Parking Bay	Suitable parking for Fatigue breaks.
595.5	Forbes	Newell Highway under safety Cam GPS link: https://goo.gl/maps/hUdv6YJunC9yfoxF7	Height: Right: 6.4 metres	Travel directly ahead on the correct side	No problems with this section of road.
658.0	Marsden	Newell Highway under safety Cam GPS link: https://goo.gl/maps/fRpjbRoXfup29Swx6	Height: Right: 6.9 metres	Travel directly ahead on the correct side	No problems with this section of road.
659.0	Marsden rest area	Newell Highway GPS link: https://goo.gl/maps/AfAfr2wuNTjQMdKT8	200.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
689.0	Wyalong	Newell Highway under safety Cam GPS link: https://goo.gl/maps/sudP4qYXPWbDB6sL6	Height: Centre: 6.2 metres	Travel directly ahead on the correct side	No problems with this section of road.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
690.0	Wyalong	Newell Highway onto Goldfields Way GPS link: https://goo.gl/maps/T719JaaurSGKqLFG8	Length: 55 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
703.0	Yiddah	Goldfields Way GPS link: https://goo.gl/maps/xZq9CdyFsA6xCMtj8	200.0 x 6.5 metres	Parking Bay	Suitable parking for Fatigue breaks.
717.0	Barmedman	Goldfields Way intersection of Nobby's Road GPS link: https://goo.gl/maps/NQ1CJ8Vd4hrpNn5e9	Length: 50 metres Width: 6.5 Metres	Right hand turn	No problems with this section of road.
753.0	Temora	Goldfields Way onto Kitchener Road GPS link: https://goo.gl/maps/4nu8hpHgVwrZaRqu9	Length: 40 metres Width: 6.0 Metres	Left hand turn	No problems with this section of road.
753.0 to 754.5	Temora	Kitchener Road GPS link: https://goo.gl/maps/ZvsdgQ2ztSgn2XCa8	Height: Left: 4.8 Metres	Travel directly ahead	There are several low trees on Kitchener road. The load will need to travel around these trees on the incorrect side of the road.
754.5	Temora	Kitchener Road onto Bundawarrah Road GPS link: https://goo.gl/maps/HgS5zfdDxndXy4kXA	Length: 40 metres Width: 6.0 Metres	Right hand turn	No problems with this section of road.
754.8	Temora	Bundawarrah Road onto Milvale road GPS link: https://goo.gl/maps/fGde9dUjotP27gzj8	Length: 40 metres Width: 6.0 Metres	Left hand turn	No problems with this section of road.
755.4	Temora	Milvale road onto Waratah Street GPS link: https://goo.gl/maps/xaDowcuSLeaNrMui8	Length: 40 metres Width: 6.0 Metres	Right hand turn	No problems with this section of road.
756.3	Temora	Waratah Street onto Burley Griffin Way GPS link: https://goo.gl/maps/n14EJJnv22o8qL7R9	Length: 40 metres Width: 6.0 Metres	Left hand turn	No problems with this section of road.
772.0	Springdale	Burley Griffin Way GPS link: https://goo.gl/maps/EFsSZqGeVRxP3HDs7	100.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
816.0	Wallendbeen	Burley Griffin Way roundabout at Olympic Highway GPS link: https://goo.gl/maps/KbDXmF2JLCHUMsVc6	Length: 40 metres Width: 6.0 Metres	Travel directly ahead through the roundabout	Spotter to guide load through this pinchpoint.
827.0	Murrumburrah	Burley Griffin Way GPS link: https://goo.gl/maps/gExxjqjtMqpJLMtH9	200.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
834.0 to 836.5	Harden	Burley Griffin Way through 3 pedestrian median strips GPS link: https://goo.gl/maps/8XwWsmwgezQrjGzu6	Width: 5.5 Metres Axle width: 3.8 Metres	Travel directly ahead on the correct side	Spotter to guide load through this pinchpoint. Possible works on these pedestrian islands
837.3	Harden	Burley Griffin Way under Town Banner GPS link: https://goo.gl/maps/5ubTjzHsm3ELTPJN7	Height?	Travel directly ahead on the correct side	Will need to talk to the shire on when the banner is hung, and at what height it would be strung at.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
864.6	Binnalong	Burley Griffin Way intersection of Queen Street & Manning Street GPS link: https://goo.gl/maps/nz3TaNzD2LpRxq398	Length: 45 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
865.0	Binnalong	Burley Griffin Way intersection of Queen & Stephens St GPS link: https://goo.gl/maps/WpKLMpFS72QPPQ7L6	Length: 45 metres Width: 6.5 Metres	Right hand turn	No problems with this section of road.
870.0	Binnalong	Burley Griffin Way GPS link: https://goo.gl/maps/F1do76VRh7sMjWcHA	200.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
883.0	Bowning	Burley Griffin Way onto Hume Highway GPS link: https://goo.gl/maps/1dc42UtNeBsZNi7s8	Length: 60 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
894.0	Bowning	Hume Highway onto Lachlan Valley Way GPS link: https://goo.gl/maps/j1Nvy5sXDonei1K99	75.0 metres clearance	Left hand turn	No problems with this section of road.
936.0	Boorowa	Lachlan Valley Way onto Trucking Yard Road GPS link: https://goo.gl/maps/qCR2CX4EADMGK3WR8	75.0 metres clearance	Right hand turn	No problems with this section of road.
937.0	Boorowa	Trucking Yard Road GPS link: https://goo.gl/maps/HTJCwCnUerjtqc5z9	50.0 metres clearance	Right hand bend	The causeway will need to be widened, and hardstand added to the inside of the corner.
937.2	Boorowa	Trucking Yard Road onto Dillon Street GPS link: https://goo.gl/maps/sQFVtnE3CPvhVibS8	90.0 metres clearance	Travel directly ahead.	No Problems with this section of road.
938.0	Boorowa	Dillon Street onto Long Street GPS link: https://goo.gl/maps/mnV8spf8JGG6LsT99	50.0 metres clearance	Left hand turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the inside of the corner, and a fence relocated within the landowner's boundaries. Additionally, some vegetation needs to be removed.
939.5	Boorowa	Long Street onto Rye Park Road GPS link: https://goo.gl/maps/Ry5s7svgx1BDzRAMA	50.0 metres clearance	Right hand turn	Access through a landowner's boundary will be required to make this turn. Hardstand is required on the inside of the corner, and a fence relocated within the landowner's boundaries. Additionally, some vegetation needs to be removed.
939.0 to 959.0	Boorowa to Rye Park township	Rye Park Road GPS link: https://goo.gl/maps/LGqWeQKDCERMsHQy7	90.0 metres clearance	Travel directly ahead	Some sections of this road will need tree trimming.

14.0 Conclusion High tower route:

After studying all options and undertaking a route survey, this route in its current condition will require a small number of road modifications up to Boorowa before it could be deemed suitable for transporting the high towers. From Boorowa through to Rye Park will require large amounts of work before it could be deemed suitable for transporting of all components.

This study did not take into account the power lines. A separate study would need to be done by the power authorities to determine the extent of the works.

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 large number of bridges on route that will require bridge assessments.

OVERHEAD STRUCTURES: (5.8 Maximum loaded height)

- The lowest structures on route are 2 traffic signals. One at Mayfield West and one at Parkes. These traffic signals can be avoided by travelling on the right-hand side of the road.
- There are several overhead gantries on route, the lowest been the gantry at Hexham with a maximum clearance of 5.9 metres.
- The lowest bridge is the Tarro underpass on the New England Highway at Tarro. This structure is 6.0 metres high.
- There are 2 poles at Harden that have a banner erected twice a year. This banner may be under 5.6 metres but was not erected during the study, so was not measured. It is advisable that the local shire be contacted to get further information.

OVERHEAD UTILITIES:

- This route will need to be checked by an authorised scoping company. It is likely that a route of 5.8 metres is required for this project.

VEGETATION:

- Several trees will need to be bypassed in Temora. This can be done by passing the low trees on the incorrect side of the road.
- The Boorowa detour and Rye Park Road will need some tree removal and trimming.

WIDTH:

- The route up until Rye Park is generally 6.0 metres wide, however there are several towns that have pedestrian islands that the trailer axles will travel over if wider than 3.5 metres. If 4.2-metre-wide trailers are to be used than there will be at least 3 sites that would need minor modifications, these are in the township of Harden.
- From Rye Park through to each site entry point, the road will need to be cleared to at least 6.0 metres in width.

PAVEMENT:

- The route up until Rye Park is of a Highway standard.

ROADWORKS:

- The project will need to start discussions with government authorities at least 18 months prior to turbine transport to understand if the project would conflict with any upcoming roadworks. Once a TMP has been approved for the transport of the turbines, then the exact movement dates need to be communicated with transport NSW to make all road stakeholders aware of the movements.

WYBONG ROAD:

- Denman bridge has a maximum clearance of 5.5 metres. To detour this bridge the loads would need to travel via Wybong Road. This is a council road and council would need to be consulted before this route can be confirmed.

TEMORA:

- The detour of the main street is a council road and council would need to be consulted before this route can be confirmed.

15.0 References:

Australian Load Restraint Guide
Rex J Andrews P/L Drawings
Rex J Andrews route survey # 248 REV05
Tilt Renewables
Vestas
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 the listed routes.

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

Appendix E: Visual Impact Assessment of Realigned Transmission Line

Tilt Renewables Pty Ltd
535 Bourke Street, Melbourne
VIC 3000

30 October 2020

Rye Park Wind Farm Modification 1 – Amendments to consented 33kV and 330kV transmission lines

We understand that amendments have been made to the consented 33kV and 330kV transmission line routes assessed in the Rye Park Wind Farm Landscape and Visual Impact Assessment v4 November 2013 (Rye Park Wind Farm LVIA). The Rye Park Wind Farm LVIA was prepared and submitted with the Rye Park Wind Farm Environmental Assessment January 2014 and approved by the Independent Planning Commission in May 2017.

Proposed amendments to the 33kV and 330kV transmission line routes are illustrated in the attached **Figures 1** and **2**. The amendments include sections of transmission line in the north and central to southern extents of the wind farm site and are illustrated in conjunction with the extent of Visual Absorption Capability applicable to the amended transmission line routes illustrated in **Figures 1** and **2**.

We understand that the:

- 33kV and 330kV supporting structures remain as a single pole arrangement as consented (the support structures do not include any metal lattice tower designs)
- 330kV supporting structures will extend to around 45 metres above existing ground level. We note that the Rye Park Wind Farm LVIA included an assessment for 330kV single pole structures up to around 50 metres above existing round levels
- 33kV supporting structures will extend to around 25 metres above existing ground level as consented, and
- Substation (and alternate substation) locations remain as consented.

The Rye Park Wind Farm LVIA identified 27 dwellings within 2km of the consented transmission line (18 associated with the project and 9 non-associated). The amended transmission line includes 36 dwellings within 2km (20 associated with the project and 16 non-associated).

The following criteria and definitions were adopted in the assessment and determination of visual impacts for the consented transmission line in the Rye Park Wind Farm LVIA. These criteria and definitions have been applied to the assessment of the amended transmission line routes.

Visual absorption capability

Visual absorption capability (VAC) is a classification system used to describe the relative ability of the landscape to accept modifications and alterations without the loss of landscape character or deterioration of visual amenity. It is often applied to smaller ancillary structures, such as powerline infrastructure, where scale and form is more readily absorbed by elements (topography and vegetation) within the surrounding landscape. VAC relates to physical characteristics of the landscape that are often inherent and often quite static in the long term.

Undulating areas with a combination of open views interrupted by groups of trees and small forested areas would have a higher capability to visually absorb the amended transmission line without significantly changing its amenity.

On the other hand, areas of cleared vegetation on level ground with limited screening, or areas spanning across prominent ridgelines without significant vegetation, would have a lower capability to visually absorb the amended transmission line without changing the visual character and potentially reducing visual amenity.

Given the extent and combination of existing natural and cultural character within the wind farm site, the capability of the landscape to absorb the key components of the electrical infrastructure would be primarily dependent upon vegetation cover and landform.

For the purpose of this assessment, the VAC ratings have been determined as:

Low – electrical infrastructure components would be highly visible either due to lack of screening by existing vegetation or surrounding landform (e.g. open flat farmland cleared of vegetation, or steep hillside crossing ridgeline).

Medium – electrical infrastructure components would be visible but existing vegetation and surrounding landform would provide some screening or background to reduce visual contrast.

High – electrical infrastructure components would be extensively screened by surrounding vegetation and undulating landform.

The landscape VAC along and surrounding the amended 33kV and 330kV transmission line is illustrated in **Figures 1** and **2**.

Assessment of visual significance (electrical infrastructure)

Potential visibility and resultant visual impact of the amended transmission line would primarily result from the combination of two factors:

- the extent to which the amended transmission line would be visible from surrounding areas; and
- the degree of visual contrast between the amended transmission line and the surrounding landscape that would be visible from surrounding receiver locations.

The overall visual impact is generally determined by a combination of factors including:

- the category and type of situation from which people may view the amended transmission line
- the potential number of people with a view toward the amended transmission line from any one receiver location
- the distance between a dwelling and the amended transmission line and
- the duration of time a person may view the amended transmission line.

The potential view catchment is the extent to which the amended transmission line would be visible from surrounding areas. Identification of the view catchment considers the character of the landscape, landform and existing structural elements with regard to their potential for localised visual screening effects.

For the purpose of this assessment, the view catchment has been determined within an approximate 2km offset from each side of the transmission line, beyond which the views would have a greater tendency to be screened by undulating landform or the presence of vegetation for portions of the amended transmission line route. The amended transmission line is unlikely to appear as a dominant visual element within the landscape beyond a 2km distance.

The distance criteria for the amended transmission line visual assessment have been adopted as follows:

Category	**Distance**
Long distance view	>1 km
Medium distance view	500 m – 1 km
Short distance view	200 m – 500 m
Very short distance view	< 200 m

The potential visual significance of the amended transmission line is expressed as a rating of High, Medium, Low or Nil. For the purposes of this LVIA visibility ratings have been defined as:

High – The construction of the amended transmission line may result in a very prominent physical change to the landscape, and includes the potential for proximate views toward extensive sections of the amended transmission line from sensitive receptor locations.

Medium – The construction of the amended transmission line may result in a noticeable physical change to the landscape although the powerline would not appear to be substantially different in scale and character to the existing landscape from surrounding receptor locations.

Low – The construction of the amended transmission line is unlikely to result in a prominent change to the landscape and views from surrounding receptor locations toward the powerline may be difficult to distinguish from elements within the surrounding landscape.

Nil – The construction of the amended transmission line would not create a noticeable change to the existing landscape and is unlikely to result in views toward the transmission line from surrounding receptor locations

Table 1 identifies non-associated dwellings which have the potential to experience a change in visual impact due to the amended transmission line, or where the distance between a dwelling and the amended transmission line has decreased. **Table 1** has been replicated from the Rye Park Wind Farm LVIA and includes the assessment and determination of visual impacts from the consented transmission line and amended transmission line, identifying changes in distance and transmission line visibility.

One dwelling (R85) included in **Table 1** was not assessed against the transmission line in the original Rye Park Wind Farm LVIA as it was beyond 2km of the consented transmission line.

Table 1 – Visual significance (Refer **Figures 1** and **2** for dwelling locations)

Dwelling location	Category of receiver and sensitivity	Relative number of people	Approximate distance to transmission line	Duration of effect	VAC within proximity to transmission line	Degree of visibility for consented and amended transmission line	Visual significance
R47	Non associated landowner Dwelling High sensitivity	Very low	1,165m (Consented) 339m (Amended)	High	Medium	**Consented transmission line:** Long distance views within proximity to the residential dwelling will extend east to north east toward the proposed 330kV powerline. Views of the powerline will be partially screened by a low undulating landform below the main wind farm ridgeline, and by scattered to denser areas of tree cover on hillside slopes beyond the ridgeline. Strategic planting to the north and north east of the dwelling would potentially screen portions of the powerline from views surrounding the dwelling. There will be no views toward the proposed substation locations. **Amended transmission line:** Short distance views from the dwelling and curtilage will extend directly toward the 330kV transmission line, potential extending north through to south east along the transmission line easement. Landscape mitigation works including tree and shrub planting would provide a degree of screening and filtering	Nil (Consented) High (Amended)

Table 1 – Visual significance (Refer **Figures 1** and **2** for dwelling locations)

Dwelling location	Category of receiver and sensitivity	Relative number of people	Approximate distance to transmission line	Duration of effect	VAC within proximity to transmission line	Degree of visibility for consented and amended transmission line	Visual significance
						of views toward sections of the transmission line from the dwelling. Residual visual impacts following landscape mitigation works would be low to moderate.	
R48	Non associated landowner Dwelling High sensitivity	Very low	919m (Consented) 570m (Amended)	High	Medium	**Consented transmission line:** Medium distance views within proximity to the residential dwelling will extend east to north east toward the proposed 330 kV powerline. Views of the powerline will be partially screened by a low undulating landform below the main wind farm ridgeline, and by scattered to denser areas of tree cover on hillside slopes beyond the ridgeline. Strategic planting to the north and north east of the dwelling would potentially screen portions of the powerline from views surrounding the dwelling. There will be no views toward the proposed substation locations. **Amended transmission line:** Medium distance views from the dwelling and curtilage will extend directly toward the 330kV transmission line,	Nil (Consented) High (Amended)

Table 1 – Visual significance (Refer **Figures 1** and **2** for dwelling locations)

Dwelling location	Category of receiver and sensitivity	Relative number of people	Approximate distance to transmission line	Duration of effect	VAC within proximity to transmission line	Degree of visibility for consented and amended transmission line	Visual significance
						potential extending north through to south east along the transmission line easement. Landscape mitigation works including tree and shrub planting would provide a degree of screening and filtering of views toward sections of the transmission line from the dwelling. Residual visual impacts following landscape mitigation works would be low to moderate.	
R50	Non associated landowner Dwelling High sensitivity	Very low	1,565m (Consented) 610m (Amended)	High	Medium	**Consented transmission line:** Long distance views within proximity to the residential dwelling will extend east to north east toward the proposed 330 kV powerline. Views of the powerline will be partially screened by a low undulating landform below the main wind farm ridgeline, and by scattered to denser areas of tree cover on hillside slopes beyond the ridgeline. Strategic planting to the north and north east of the dwelling would potentially screen portions of the	Nil (Consented) Moderate to High (Amended)

Table 1 – Visual significance (Refer **Figures 1** and **2** for dwelling locations)

Dwelling location	Category of receiver and sensitivity	Relative number of people	Approximate distance to transmission line	Duration of effect	VAC within proximity to transmission line	Degree of visibility for consented and amended transmission line	Visual significance
						powerline from views surrounding the dwelling. There will be no views toward the proposed substation locations. **Amended transmission line:** Medium distance views from the dwelling and curtilage will extend directly toward the 330kV transmission line, potential extending north through to south east along the transmission line easement. Landscape mitigation works including tree and shrub planting would provide a degree of screening and filtering of views toward sections of the transmission line from the dwelling. Residual visual impacts following landscape mitigation works would be low to moderate.	
R53	Non associated landowner Dwelling High sensitivity	Very low	1,708m (Consented) 948m (Amended)	High	Medium	**Consented transmission line:** Long distance views north to north east toward the proposed alternative powerline route will be partially screened by tree cover within the property as well as trees along the Rye Park Dalton Road corridor.	Low (Consented) Low (Amended)

Table 1 – Visual significance (Refer **Figures 1** and **2** for dwelling locations)

Dwelling location	Category of receiver and sensitivity	Relative number of people	Approximate distance to transmission line	Duration of effect	VAC within proximity to transmission line	Degree of visibility for consented and amended transmission line	Visual significance
						Amended transmission line: Medium distance views north to north east toward the amended transmission line will be partially screened by a combination of scattered tree cover within the property as well as trees along the Rye Park Dalton Road corridor and a low undulating landform to the east and north east of the Rye Park Dalton Road.	
R83	Non associated landowner Dwelling High sensitivity	Very low	1,972m (Consented) 1,351m (Amended)	High	Medium	**Consented transmission line:** Long distance views east toward the 330kV powerline will be filtered and largely screened by tree planting surrounding and beyond the dwelling. **Amended transmission:** Long distance views east toward the 330kV powerline will be filtered and largely screened by tree planting surrounding and beyond the dwelling.	Nil (Consented) Nil (Amended)

Table 1 – Visual significance (Refer **Figures 1** and **2** for dwelling locations)

Dwelling location	Category of receiver and sensitivity	Relative number of people	Approximate distance to transmission line	Duration of effect	VAC within proximity to transmission line	Degree of visibility for consented and amended transmission line	Visual significance
R85	Non associated landowner Dwelling High sensitivity	Very low	2,322m (Consented) 1,430m (Amended)	High	Medium	**Consented transmission line:** Not assessed in the Rye Park Wind Farm LVIA (beyond 2km) **Amended transmission line:** Long distance views toward the amended 330kV transmission line will be largely screened by scattered tree cover beyond the dwelling and a low undulating landform north east of the Rye Park Dalton Road.	Not assessed (Consented) Low (Amended)
R324	Non associated landowner Dwelling High sensitivity	Very low	2,000m (Consented) 1,024m (Amended)	High	Medium	**Consented transmission line:** Long distance views east to north east toward the 330kV powerline will be partially screened and filtered by scattered tree planting beyond the dwelling and landform to the north east of the Rye Park Dalton Road.	Low (Consented) Low (Amended)

Table 1 – Visual significance (Refer **Figures 1** and **2** for dwelling locations)

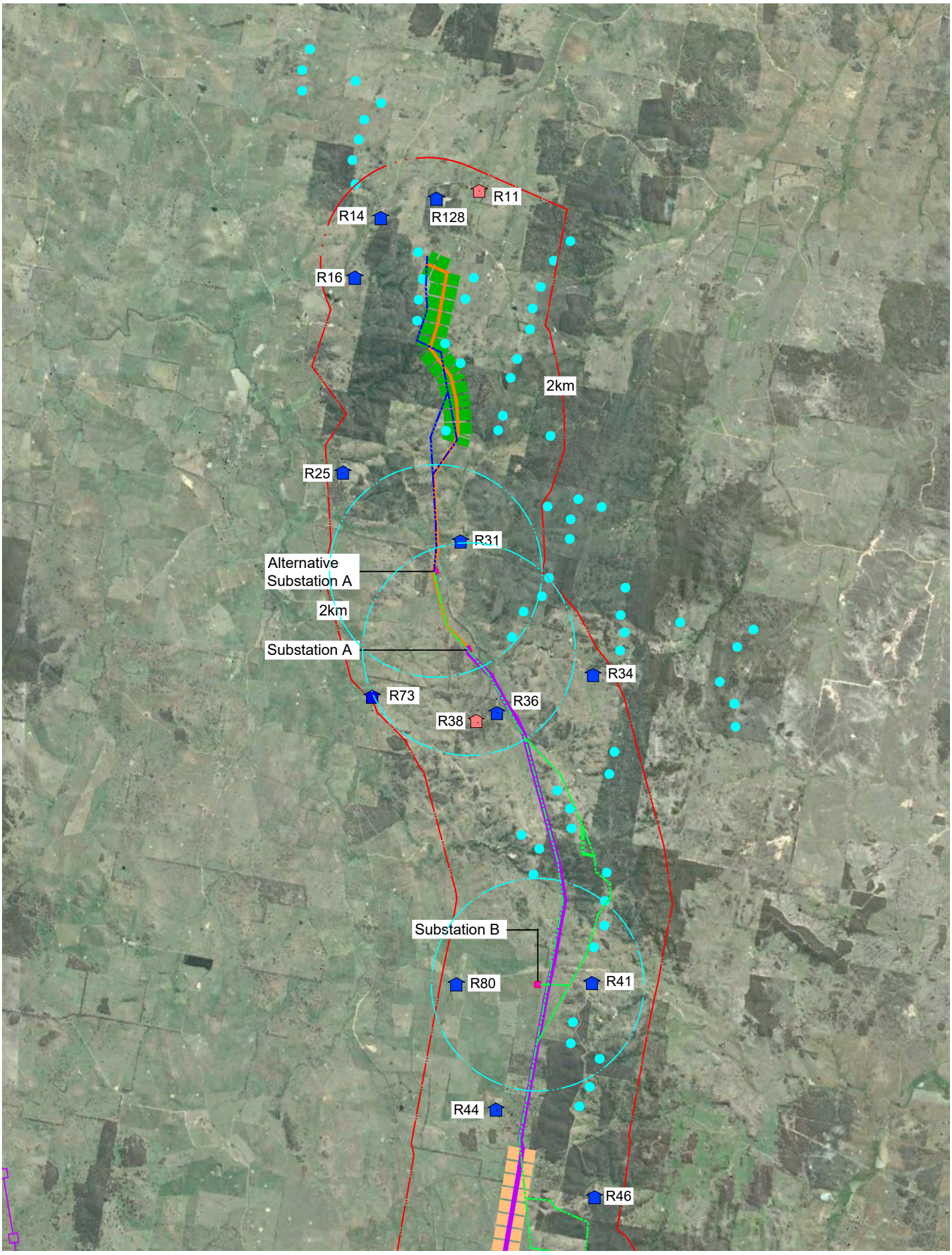
Dwelling location	Category of receiver and sensitivity	Relative number of people	Approximate distance to transmission line	Duration of effect	VAC within proximity to transmission line	Degree of visibility for consented and amended transmission line	Visual significance
						Amended transmission line: Long distance views east to north east toward the amended 330kV transmission line will be partially screened and filtered by scattered tree planting beyond the dwelling.	

This assessment has determined that amendments to the northern section of the consented 33kV transmission line (approximately 4km in length) will not result in any landscape or visual impacts in addition to those associated with the consented project. This section of amended transmission line is contained within an area of High Visual Absorption Capability, with views toward the 33kV transmission line largely screened by vegetation and undulating landform. Similarly, amendments to the southern section of the consented 330kV transmission line (approximately 2.8km in length) will not result in any landscape or visual impacts in addition to those associated with the consented project.

Amendments to the mid/southern section of the consented 330kV transmission line (approximately 12km in length) extending generally north to south between wind turbines T87 and north of T145 will have some potential to increase visual impacts from dwellings to the west of the amended transmission line including non-associated dwellings R47, R48 and R50. The amended transmission line visibility from these dwellings may be mitigated to some degree through planting works within and beyond the dwelling curtilage in accordance with the Development Consent.

Dwellings to the east of the amended transmission line have less potential to be impacted where the distance to the amended transmission line increases and tree cover and landform provides an additional degree of visual mitigation toward the amended transmission line. Dwellings R68, R102, R108 and R315 will not experience any visual impacts in addition to those associated with the consented project. This section of amended transmission line is contained within an area of Medium Visual Absorption Capability, with views toward sections of the 330kV transmission line largely viewed against a backdrop undulating and tree covered landform.

Most non-associated dwellings within 2km of the amended transmission line will not experience a visual impact any greater than the impact determined for the consented 33kV and 330kV transmission lines. Amendments to the 33kV and 330kV transmission lines in the north and south portions of the project site will not result in any additional landscape or visual impacts.



Legend

- Associated residential dwelling (wind turbine and/or transmission line)
- Non associated residential dwelling within 2km of transmission line
- Non residential structure
- Consented RPWF wind turbines (indicative location)
- Powerline 2km distance offset
- Substation 2km distance offset
- Consented 330kV transmission line route
- Modified 330kV transmission line route
- Consented 33kV power line route
- Modified33 kV power line route

Visual Absorption Capability (VAC)

High Medium

0km 2km

Figure 1
Consented and amended 33kV and 330kV alignments

Rye Park Wind Farm Modification 1

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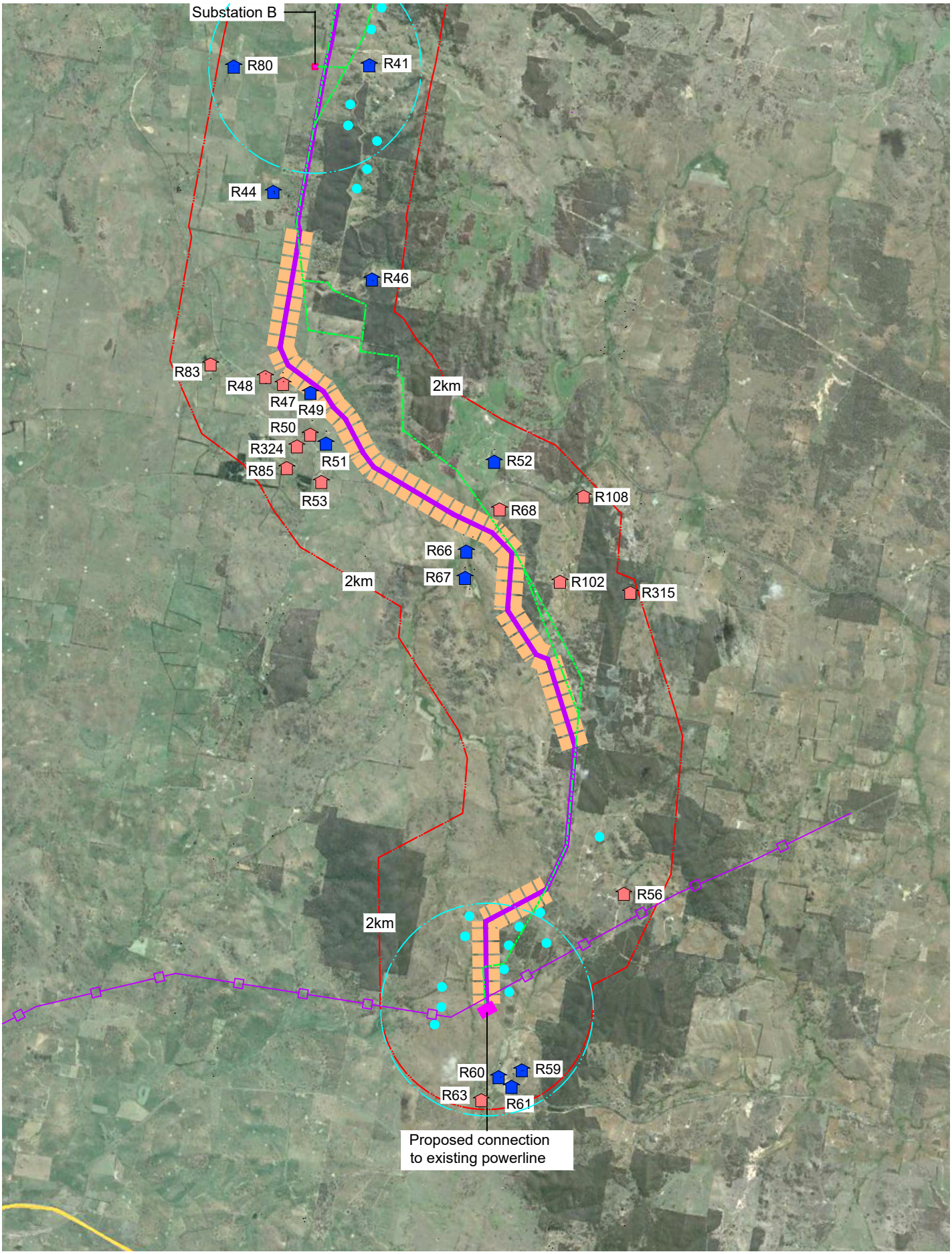

Legend

- Associated residential dwelling (wind turbine and/or transmission line)
- Non associated residential dwelling within 2km of transmission line
- Non residential structure
- Consented RPWF wind turbines (indicative location)
- Powerline 2km distance offset
- Substation 2km distance offset
- Consented 330kV transmission line route
- Modified 330kV transmission line route
- Consented 33kV power line route
- Modified33 kV power line route

Visual Absorption Capability (VAC)

High Medium

0km 2km

Figure 2
Consented and amended 33kV and 330kV alignments

Rye Park Wind Farm Modification 1

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