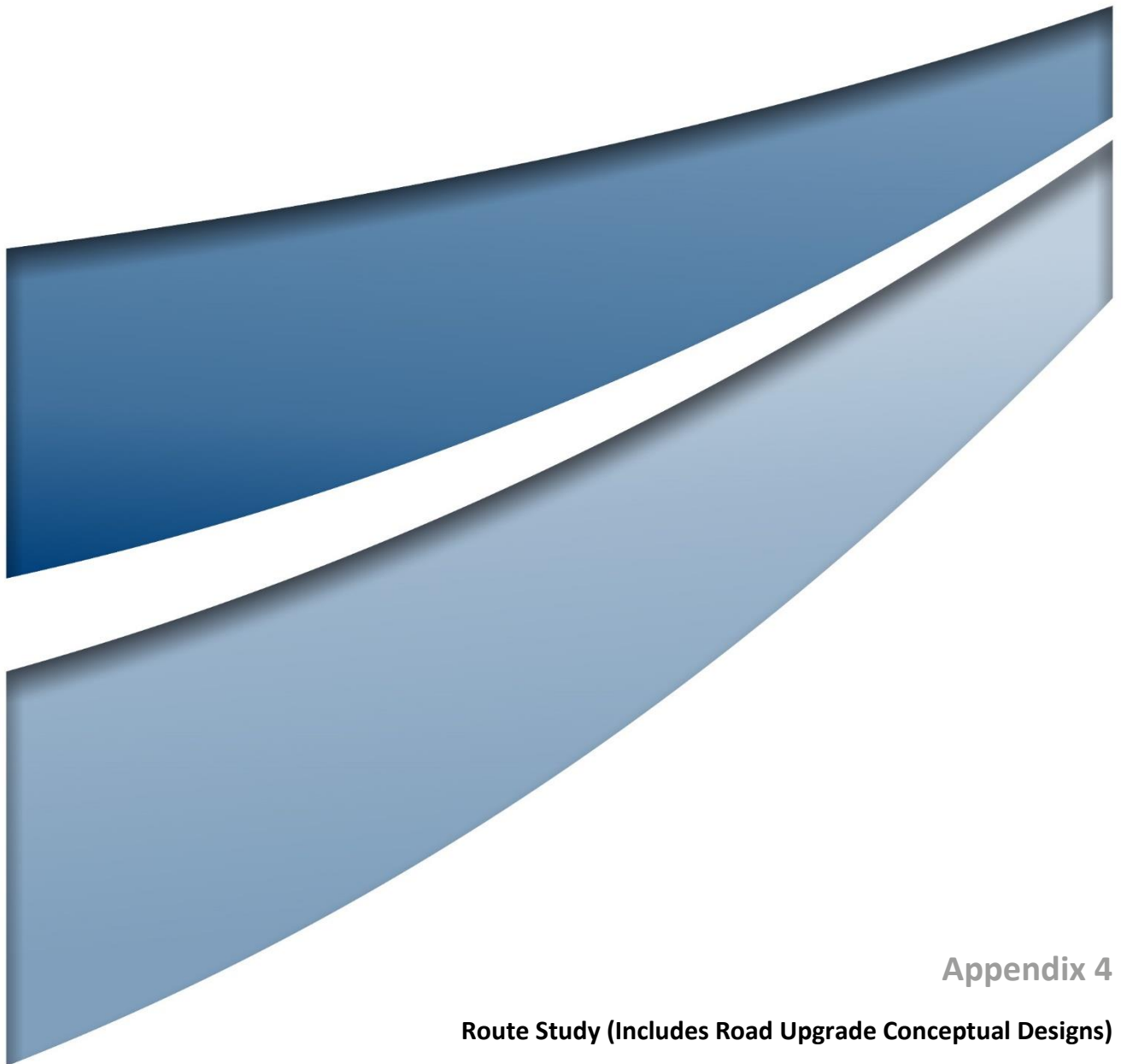




Appendix 4

Route Study (Includes Road Upgrade Conceptual Designs)



ROUTE STUDY:

PROJECT: JUNCTION RIVERS WINDFARM (OPT B)

EXPORT ADELAIDE

BLADE SIZE: 100 METRE

28/03/2024 REV 00

[illegible]

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1.0 Introduction

Windlab Developments Pty Ltd (Windlab) proposes to develop the Junction Rivers wind project (the Project) to provide a reliable and affordable source of energy for the people of New South Wales (NSW) and contribute to reducing greenhouse gas (GHG) emissions associated with energy generation.

The Project is located approximately 15 kilometres (km) south of Balranald, 140 km west of Hay and 20 km northeast of the NSW and Victorian border within the southern section of the Murray-Darling Basin.

The Project is within the Murray River Council Local Government Area (LGA) and immediately east of Balranald Shire LGA. The Project is located within the South-West Renewable Energy Zone (SW REZ), which the NSW Government has identified as a target area for renewable energy development in its Transmission Infrastructure Strategy and Electricity Infrastructure Roadmap.

This study is to understand the transport route constraints for the components listed in this report and assist in planning of the windfarm layout.

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

This study is based on a 100 Metre blade with a hub height of up to 200 metres.

This Route survey took place on the 26/03/2022 and was revised on the 07/08/2023.

2.0 Evaluation

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

(Mark below boxes with an X)

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

3.0 Project Data

Date of latest Route Assessment: 07/08/2023

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

Project name: Junction Rivers Windfarm

Location: Port Adelaide (SA) to Burrawong (NSW)

Turbine types:

Up to 96 wind turbine generators with blades of up to 100 metres in length and a hub height of up to 200 metres. The overall tip height of the turbine is up to 300 metres.

4.0 Transport Combinations (Examples)

TURBINE EXAMPLES:

Blades (100.0 x 4.5w x 4.0h x 30.0T)

Configuration. Prime mover with 2x4 dolly 3x4 Jinker

Overall dimensions: 110.0l x 4.5w x 4.9h x 227.0T

Nacelles (15.1l x 4.2w x 4.2h x 130T)

Configuration. Prime mover with 12x8 Platform trailer + Backup truck.

Overall dimensions: 46.0l x 4.3w x 5.2h x 204.5T + Backup truck.

Drive train/Power train/Generator (8.0l x 5.5w x 4.0h x 110T)

Configuration. Prime mover with 10x8 Platform trailer + Backup truck.

Overall dimensions: 39.9l x 5.5w x 5.0h x 199.5T + Backup truck.

Hubs (5.5l x 5.0w x 4.2h x 70.0T)

Configuration. Prime mover with 2x8 dolly and 5x8 Low loader.

Overall dimensions: 26.0l x 5.0w x 5.2h x 106.5T.

149 METRE TOWER EXAMPLE:

Base Towers (10.1l x 6.0 x 5.5 x 91T)

Configuration. Prime mover with 5x8-5x8 Bookend.

Overall dimension: 42.0l x 5.85w x 6.1h x 164.5T (+ Push truck)

Section 2 Towers (14.1l x 5.5 x 5.5 x 89T)

Configuration. Prime mover with 5x8-5x8 Bookend.

Overall dimension: 44.0l x 5.5w x 5.7h x 164.5T (+ Push truck)

Section 3 Towers (16.5l x 5.5 x 4.95 x 89T)

Configuration. Prime mover with 5x8-5x8 Bookend.

Overall dimension: 46.0l x 5.5w x 5.7h x 164.5T (+ Push truck)

Section 4 Towers (17.2l x 4.95 x 4.65 x 86T)

Configuration. Prime mover with 8x8 low platform.

Overall dimension: 35.0l x 5.0w x 5.9h x 154.5T (+ Push truck)

ROUTE STUDY

Port Adelaide to

Junction Rivers Windfarm



Section 5 Towers (20.5l x 4.65 x 4.65 x 84T)

Configuration. Prime mover with 10x8 platform trailer.

Overall dimension: 38.0l x 4.7w x 5.7h x 164.5T (+ Push truck)

Section 6 Towers (29.9l x 4.65w x 4.65 x 87T)

Configuration. Prime mover with 5x8-5x8 Extending platform trailer.

Overall dimension: 45.0l x 4.7w x 5.7h x 164.5T (+ Push truck)

Top Towers (35.5l x 4.65w x 3.97h x 74T)

Configuration. Prime mover with 4x8-4x8 Extending platform trailer.

Overall dimension: 54.0l x 5.1w x 5.7h x 152.5T (+ Push truck)

ERECTION CRANES:

LG1750 carrier (19.2l x 3.0 x 4.0 x 96T)

Configuration. Prime mover with 10x8 Platform trailer + Backup truck

Overall dimensions: 36.0l x 4.2w x 5.2h x 174.5T + Backup truck

LTM1500 carrier (21.0l x 3.0 x 4.0 x 96T)

Configuration. Prime mover with 10x8 Platform trailer + Backup truck

Overall dimensions: 36.0l x 5.0w x 5.2h x 174.5T + Backup truck

TRANSFORMER:

Possible Transformer size (9.2l x 4.0 x 4.35 x 167T)

Configuration. Prime mover with 10x8-10x8 Beamset + 4 x Backup trucks

Overall dimensions: 45.0l x 4.3w x 5.4h x 324.5T + 4 x Backup trucks

Or

Configuration. Prime mover with 16x8 Platform trailer + 3 x Backup trucks

Overall dimensions: 45.0l x 4.3w x 5.4h x 256.5T + 3 x Backup trucks

SWITCHROOM:

The largest switch room size that is recommended for this site would be as follows.

Switch room dimensions: 30.0l x 6.0w x 4.4h x 90.0T

5.0 Transport Drawings (Possible Combinations)

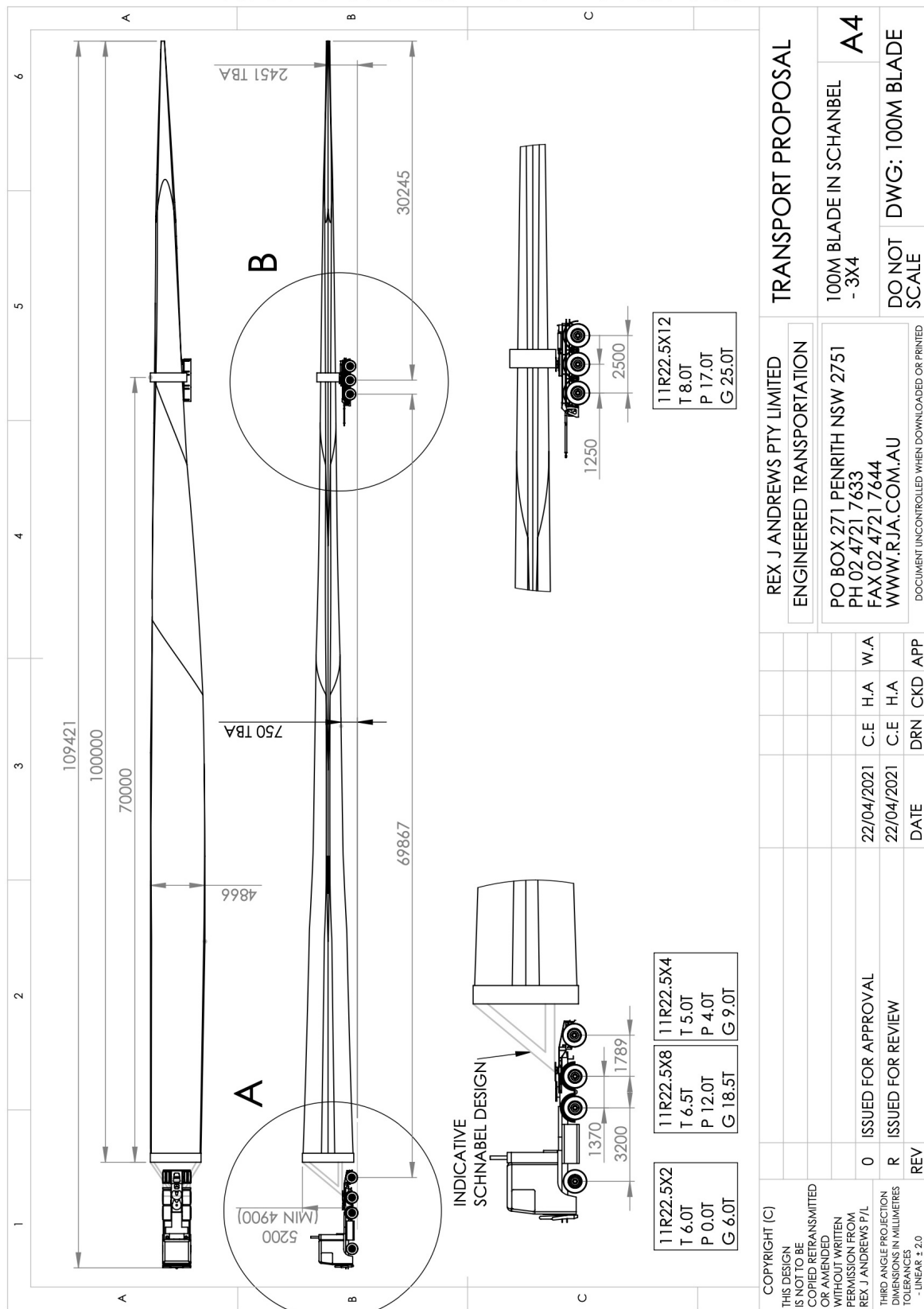


Figure 1 - Blade Diagram (100 Metre blade case study).

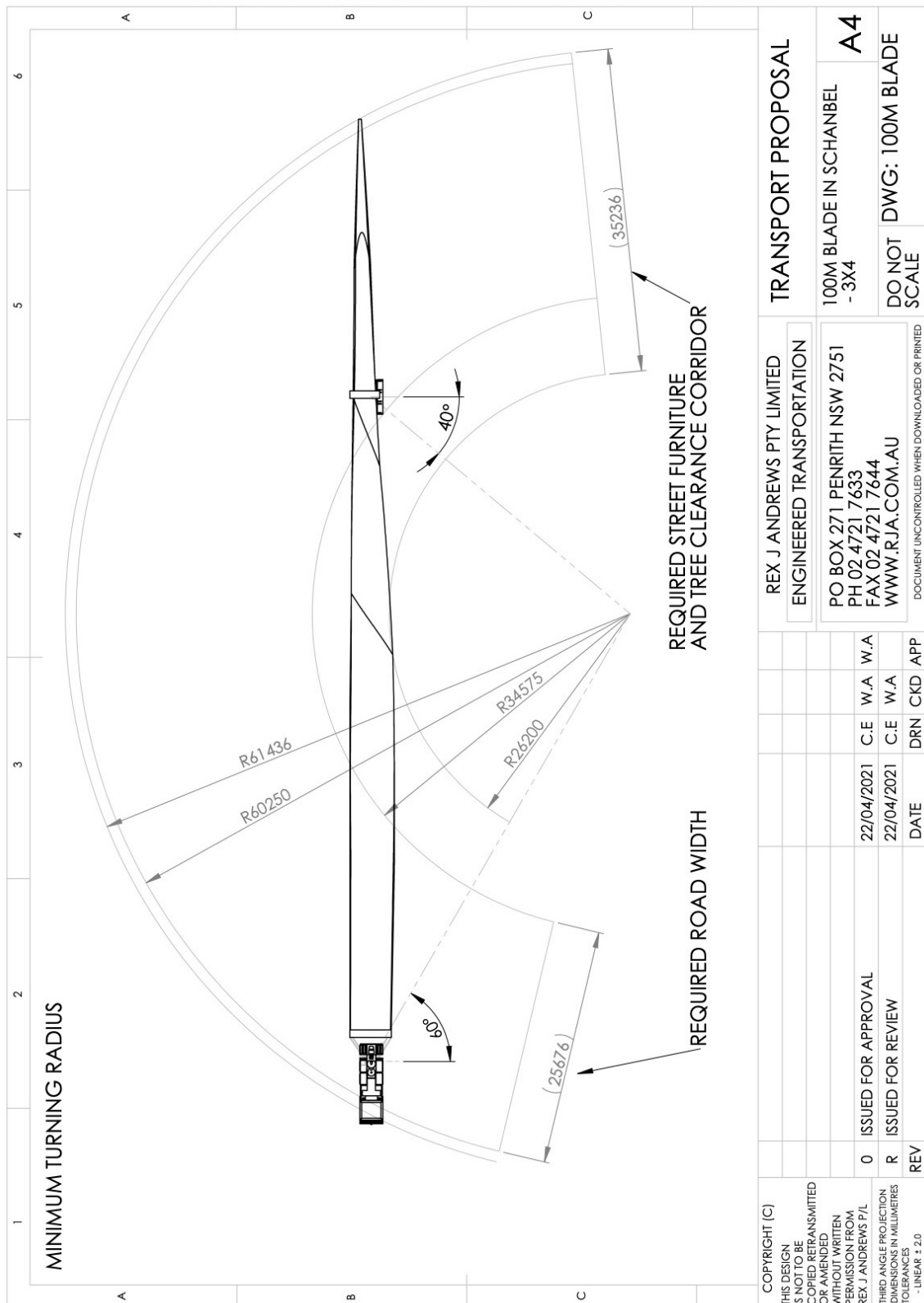


Figure 2 - Blade Diagram Swept Path (100 Metre blade case study)

REX J ANDREWS
ENGINEERED TRANSPORTATION



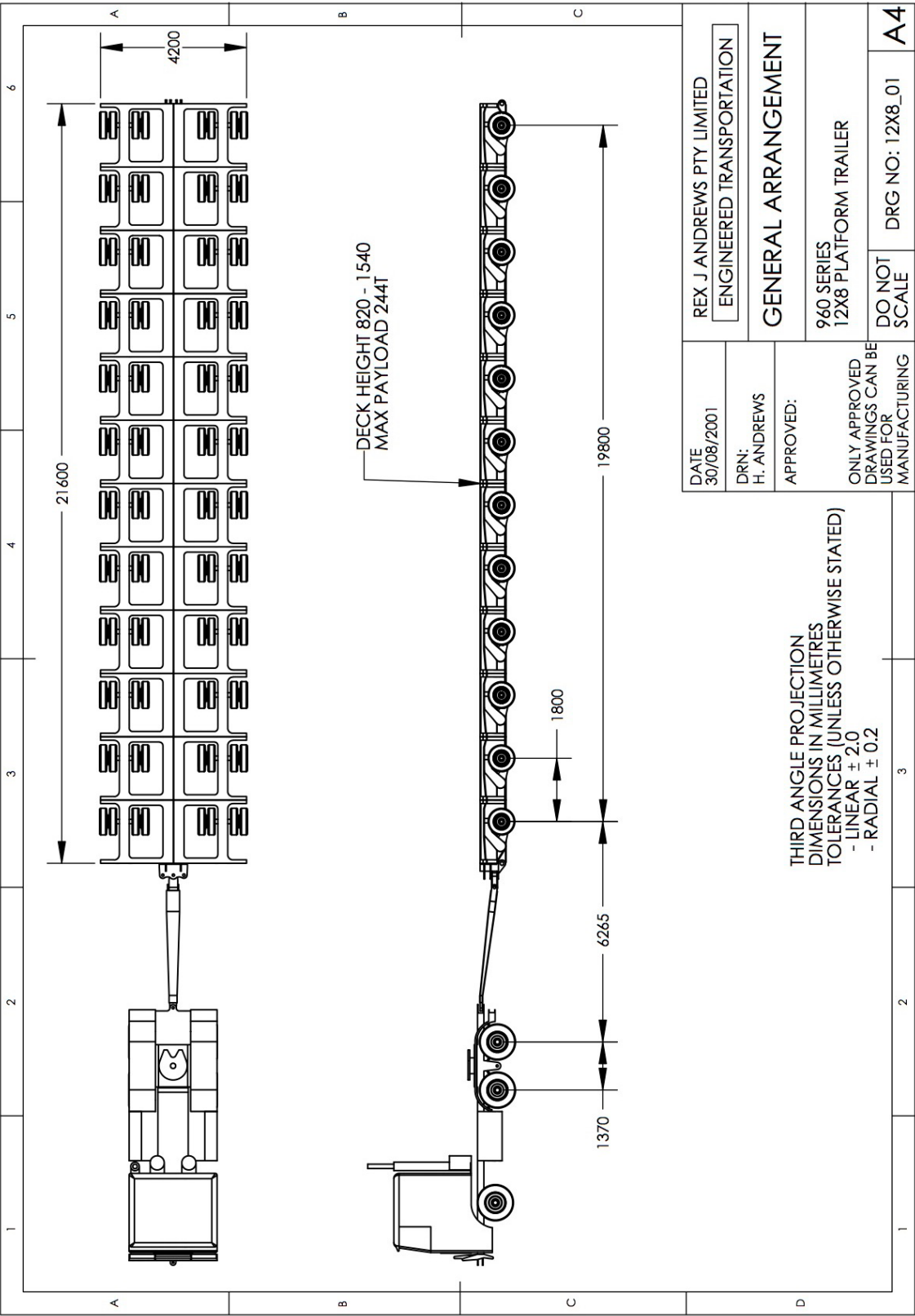


Figure 4 - Nacelle Combination Example

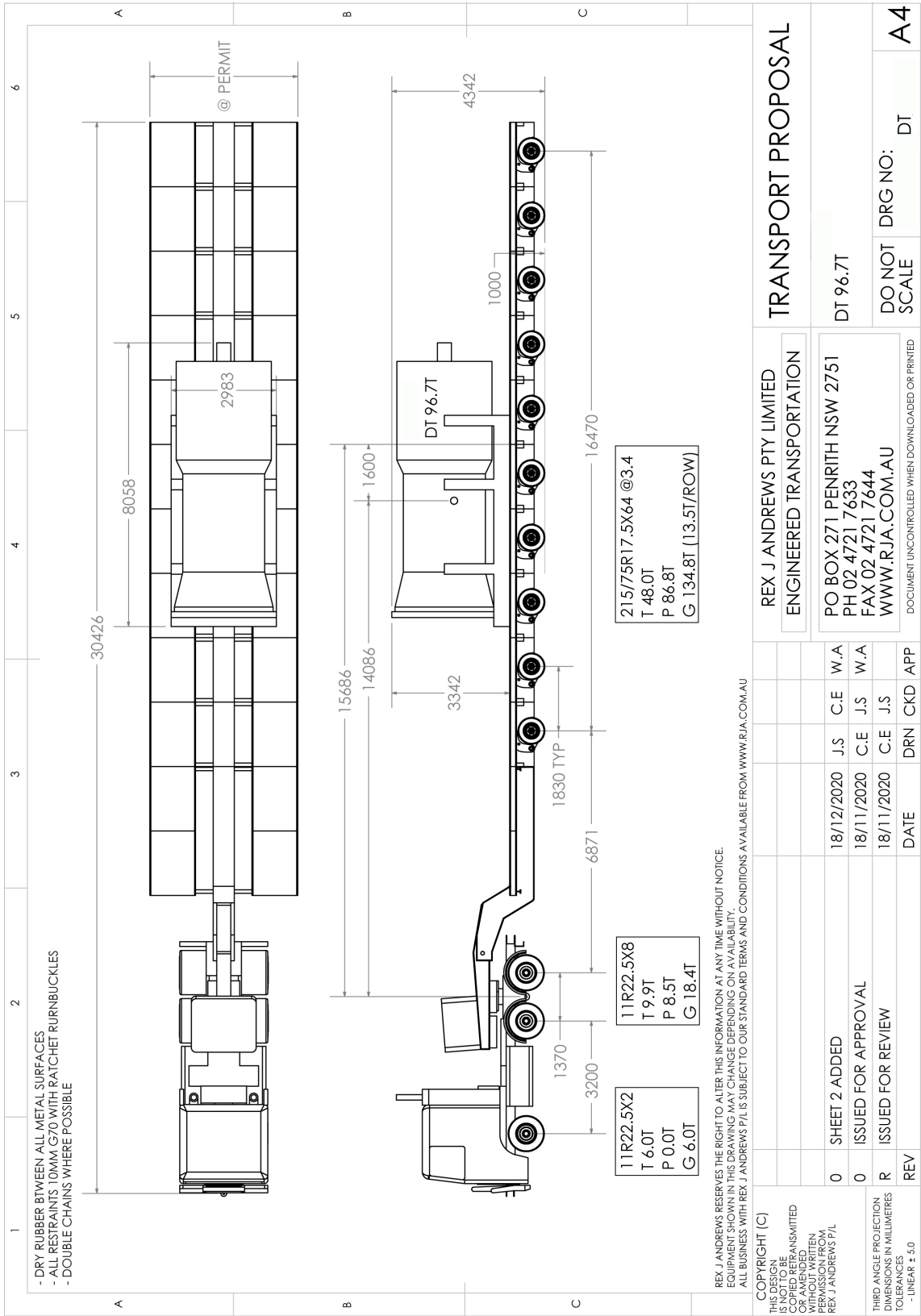


Figure 5 - Drivetrain Combination Example

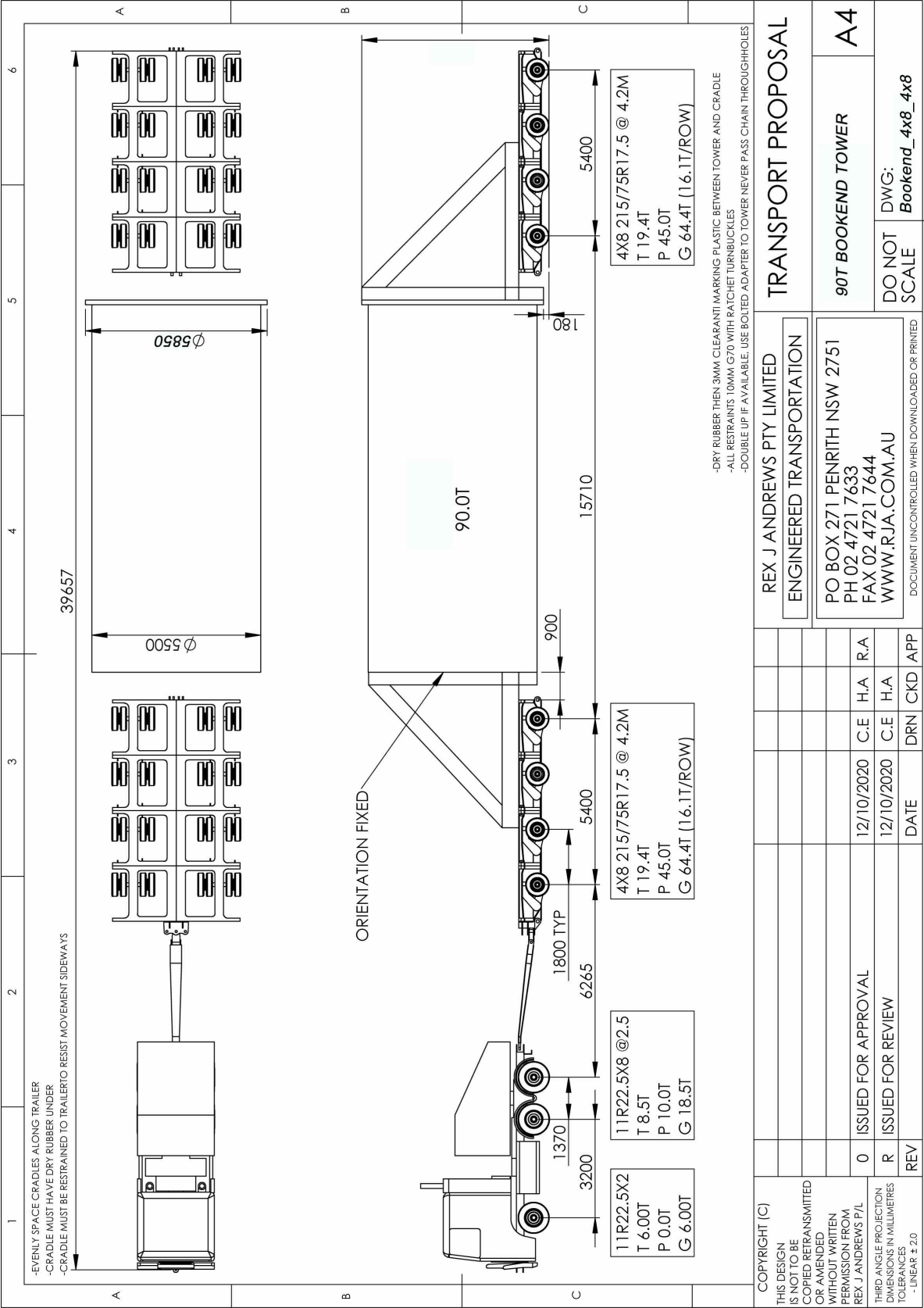


Figure 6 - Tower Trailer Bookend

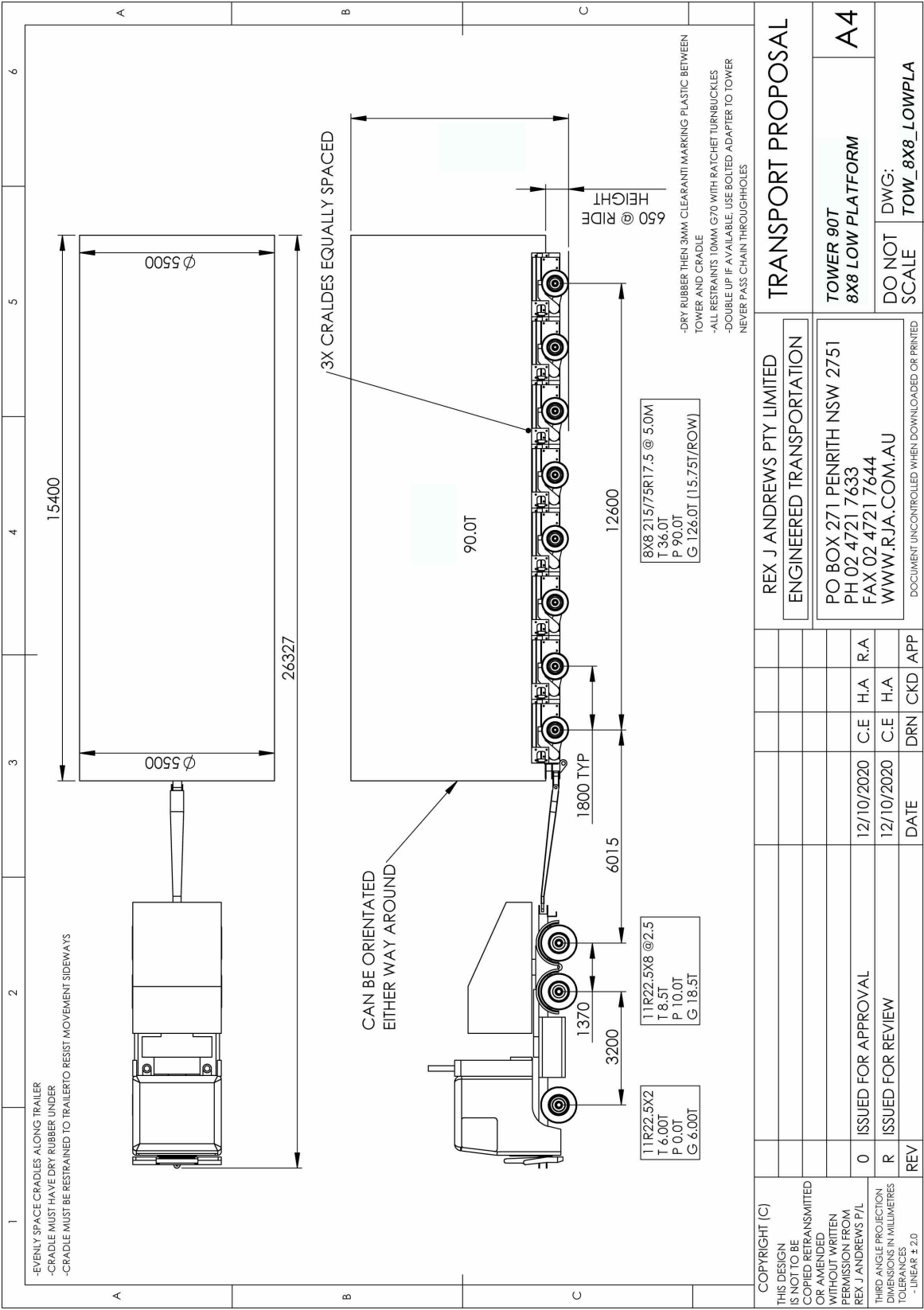


Figure 7 - Tower Trailer 8x8

REX J ANDREWS
ENGINEERED TRANSPORTATION



REX J. ANDREWS
ENGINEERED TRANSPORTATION



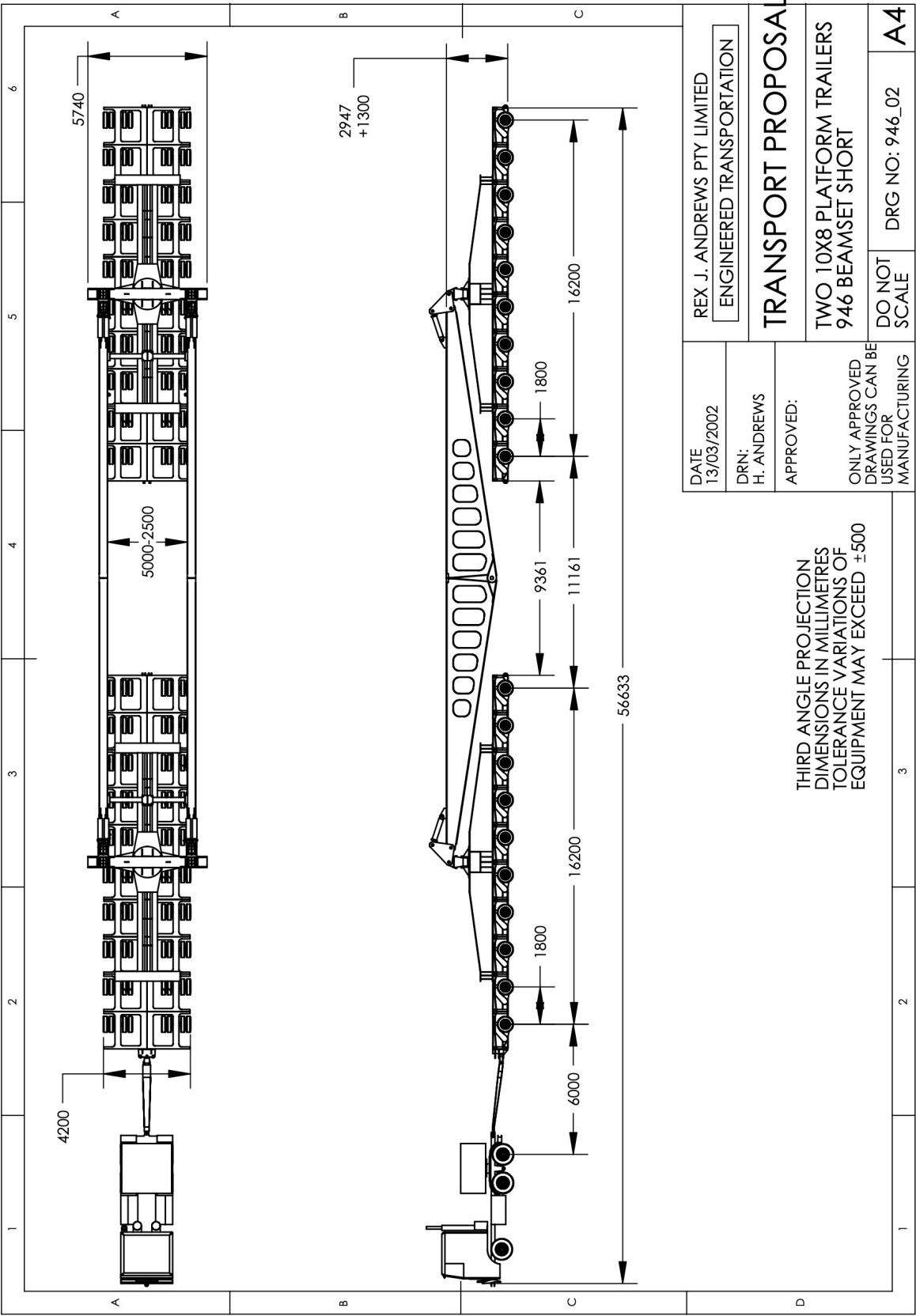


Figure 10 – 300MVA Transformer Trailer 10x8-10x8 Beamset

REX J ANDREWS
ENGINEERED TRANSPORTATION



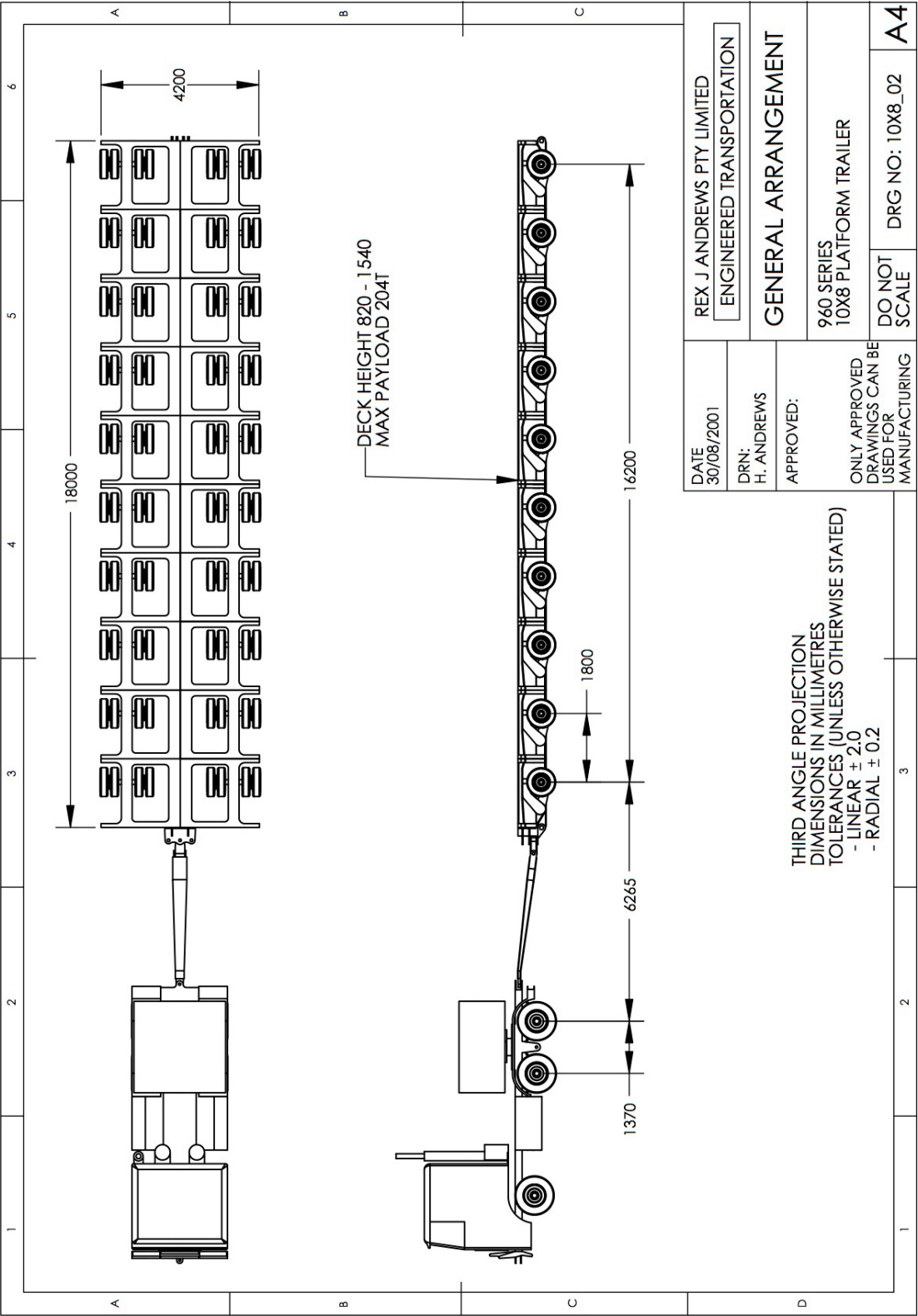


Figure 12 - Crane Trailer 10x8 Platform

6.0 Junction Rivers Windfarm Site Location

This proposed Junction Rivers wind farm development is located approximately 15 kilometres (km) south of Balranald, in southwest New South Wales. Access is via Balranald Road. The Project Area is within the Murray Region of New South Wales (NSW)

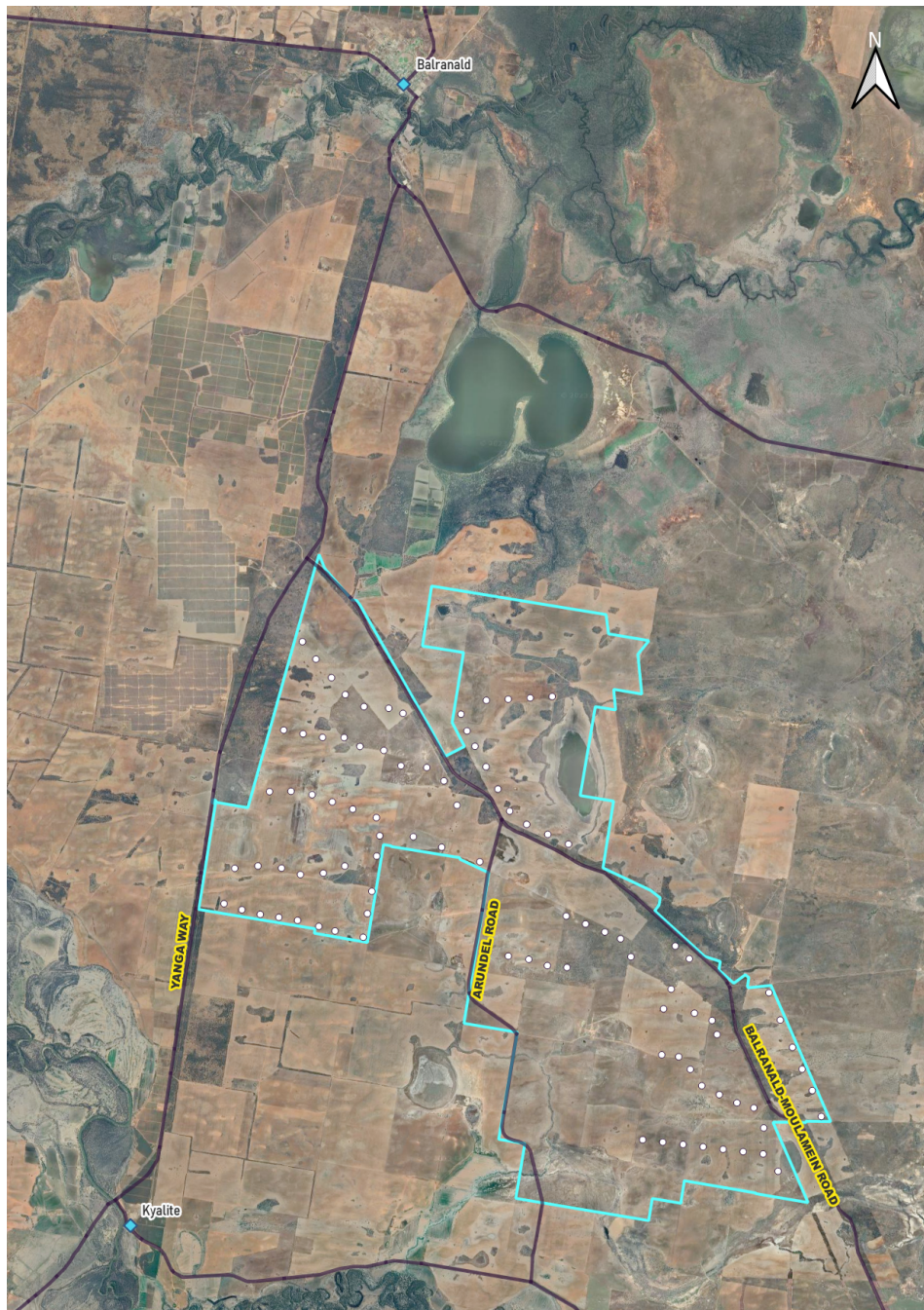


Figure 13 – Junction Rivers Windfarm

7.0 Port of Import

The wind turbine equipment will be imported from various countries and will arrive on ships into the Port of Adelaide. The client may alternately source local towers. The ideal berth for these shipments is the Berth 18-20 Inner Harbor. This facility has a hardstand storage area of roughly 20,000 s/q meters, adjacent to the berth.

Access from the storage to the public roads, is via Ocean Steamers drive. This route will require some upgrades to accommodate a 100m blade.



Figure 14 - Port of Adelaide and Storage Area

8.0 Transport Summary

The study is based on the turbine components and imported towers entering Australia via Port Adelaide. The study details the likely routes for these components, and the constraints that they may encounter on the proposed routes.

The study has chosen 4 routes based on the type of turbine component that needs to be delivered from the port of import through to the windfarm. Route 1 is specifically for the blades. Route 2 is for the components up to 5.2 metres in height. Routes 3 & 4 are the 2 options for the high tower sections.

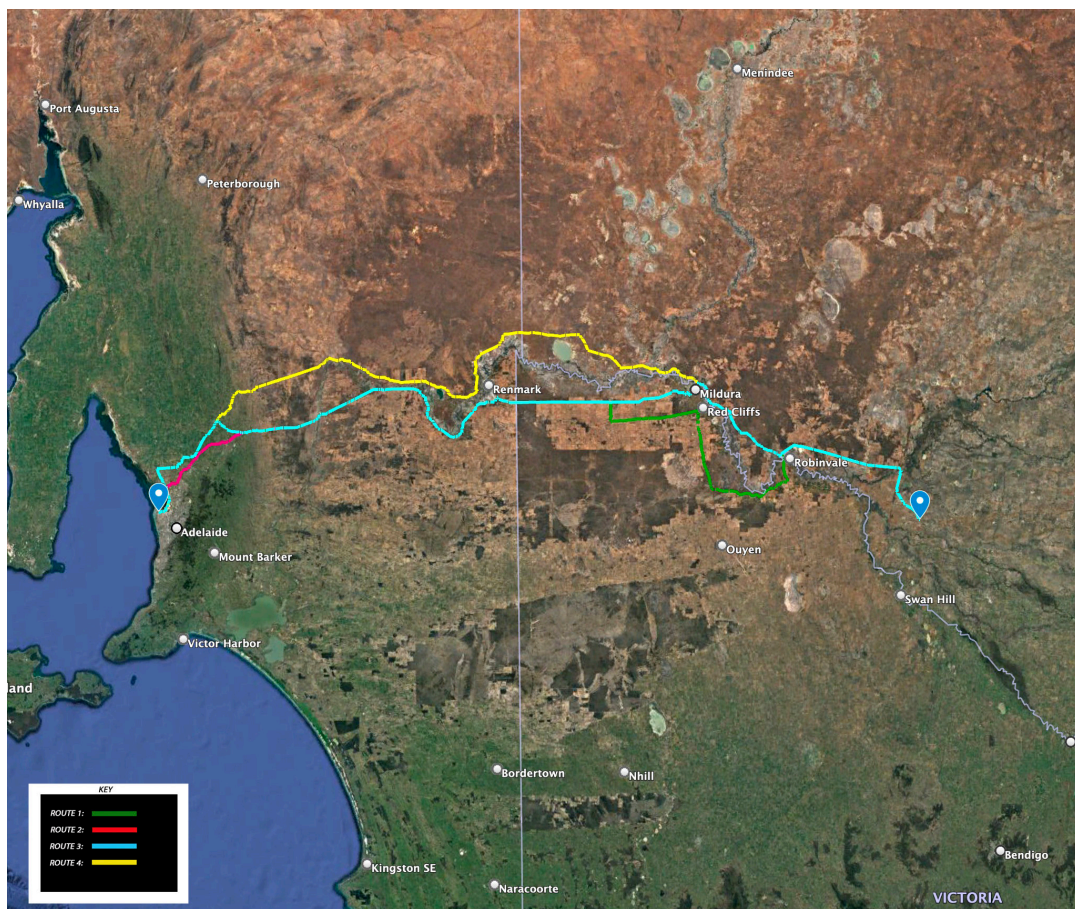


Figure 15: Routes from Pt Adelaide to Junction River WF

ROUTE SURVEY 1: Port Adelaide SA to Junction Rivers Windfarm NSW via Robinvale.

COMPONENTS: Blades only

DISTANCE: 658 kilometres

GPS LINK: <https://maps.app.goo.gl/f8y6PMEPu939C75w9>

VIA: Ocean Steamers Rd, Eastern Parade, Port River Exy (A9), North South Motorway (M2), Northern Expy, Sturt Hwy (A20), Kingston Rd, Hwy (B55), Karoonda Hwy, Bookpurnong Rd, Stanitzki Rd, Sturt Hwy, Werrimull N Rd, Millewa Rd, Calder Hwy, Hattah Robinvale Rd, Robinvale-Sea lake Rd, Murray Valley Hwy, Sturt Hwy, Yanga Way, Balranald Road.

ROUTE STUDY

Port Adelaide to Junction Rivers Windfarm



ROUTE SURVEY 2: Port Adelaide SA to Junction Rivers Windfarm NSW via Mildura.

COMPONENTS: Components with a **Max loaded height 5.2 metres**

DISTANCE: 610 kilometres

GPS LINK: <https://maps.app.goo.gl/DDCP2zgijieWsGkE8>

VIA: Ocean Steamers Rd, Eastern Parade, Port River Exy (A9), North South Motorway (M2), Northern Expy, Sturt Hwy (A20), Kingston Rd, Hwy (B55), Karoonda Hwy, Bookpurnong Rd, Stanitzki Rd, Sturt Hwy, Seventeenth St, Benetook Ave, Seventh St, Sturt Hwy, Yanga Way, Balranald Road.

ROUTE SURVEY 3: Port Adelaide SA to Junction Rivers Windfarm NSW, High load option 1

COMPONENTS: Larger items with a **Max loaded height 6.4 metres**

DISTANCE: 638 kilometres

GPS LINK: <https://maps.app.goo.gl/VzYoLHnsqmknnXkb8>

VIA: Via Ocean Steamers Road, Eastern Parade, Port River Expressway, Northern Connector, Port Wakefield Highway "A1", Mallala Road, Old Port Wakefield Road, Gawler Rd, Two Wells Rd, Wilkinson Road, Hatcher Road, Oates Road, Redbanks Road, Mudla Wirra Road, College Road, Cliff Road, Gartrell Street, Roseworthy, Thiele Hwy, East Terrace, Truro Rd, Sturt Hwy, Kingston Rd, Karoonda Hwy, Bookpurnong Rd, Stanitzki Rd, Sturt Hwy, Seventeenth St, Benetook Ave, Seventh St, Sturt Hwy, Kidman Way, Yanga Way, Balranald Road.

ROUTE SURVEY 4: Port Adelaide SA to Junction Rivers Windfarm NSW, High load option 2

COMPONENTS: Larger items with a **Max loaded height 6.4 metres**

DISTANCE: 659 kilometres

GPS LINK: <https://maps.app.goo.gl/n87wjSd8tn6y6pt18>

VIA: Via Ocean Steamers Road, Eastern Parade, Port River Expressway, Northern Connector, Port Wakefield Highway "A1", Mallala Road, Old Port Wakefield Road, Gawler Road, Two Wells Rd, Wilkinson Road, Hatcher Road, Oates Road, Redbanks Road, Mudla Wirra Road, College Road, Cliff Road, Gartrell Street, Roseworthy Road, Thiele Hwy, East Terrace, Thiele Hwy, Goyder Hwy, Sturt Hwy, Airport Rd, Government Rd, Ral Ral Ave, Wentworth-Renmark Rd, Renmark Rd, Silver City Hwy, Armstrong Ave, Silver City Hwy, Sturt Hwy, Yanga Way, Balranald Road.

ROUTE STUDY

Port Adelaide to Junction Rivers Windfarm

9.0 Route Survey 1: Port Adelaide, SA to Junction Rivers Windfarm, NSW via Robinvale

COMPONENTS: Blades

DISTANCE: 658 kilometres

GPS LINK: <https://maps.app.goo.gl/f8y6PMEPu939C75w9>

VIA: Ocean Steamers Rd, Eastern Parade, Port River Exy (A9), North South Motorway (M2), Northern Expy, Sturt Hwy (A20), Kingston Rd, Hwy (B55), Karoonda Hwy, Bookpurnong Rd, Stanitzki Rd, Sturt Hwy, Werrimull N Rd, Millewa Rd, Calder Hwy, Hattah Robinvale Rd, Robinvale-Sea lake Rd, Murray Valley Hwy, Sturt Hwy, Yanga Way, Balranald Road.

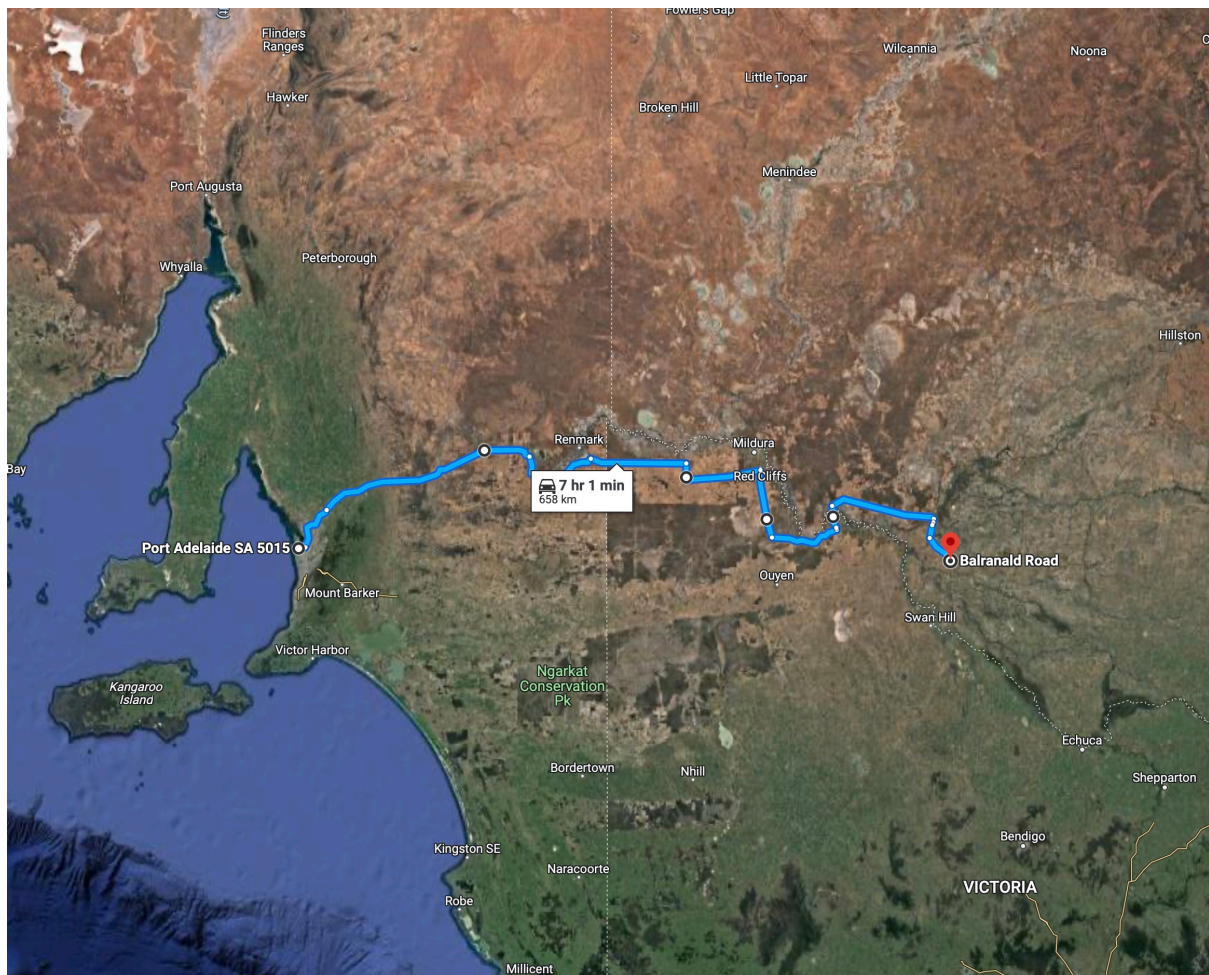


Figure 16 - Route 1 - Blades

ROUTE STUDY

Port Adelaide to Junction Rivers Windfarm

KEY	
PINCH POINT	
CAUTION	
EMERGENCY PARKING	

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
0.0	Port Adelaide, SA	Intersection of Ocean Steamers Rd and Eastern Pde GPS Link: https://goo.gl/maps/3MGe51BvpxTn5Q88	9.9 metres wide at gate	Silght right hand turn	The perimeter fence will need to be modified to allow transit. Sign to be made removable and overhead conductor clearances confirmed.
0.75	Port Adelaide, SA	Eastern Parade onto Port River Expressway GPS Link: https://goo.gl/maps/oa7XGzZn1xL1V3v0	80 metres	Left Hand Merge	To enable the blade to make this corner 1 x light poles and 1x street sign need to be removed. An area of hardstand is also required on the outside of the corner on the Port River on ramp. The blade tip will hang over the drain on the outside of the corner and traffic light on centre island. Blade must be able to lift over traffic signals (4m) The area must be clear of obstacles.
5.65	Dry Creek, SA	Port River Expressway onto North-South Motorway GPS Link: https://goo.gl/maps/tnXSxEvy2zhyWHnLA	120 metres	Left Hand merge	Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.
21.05	Burton, SA	North-South Mwy onto Northern Expy, Sturt Hwy GPS Link: https://goo.gl/maps/23zth7ZxmiDCFotY7	120 metres	Left hand bend	Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.
21.05 to 42.6	Burton to Gawler, SA	Northern Expressway GPS Link: https://goo.gl/maps/GbEiY281FUAdJh4Q7	Bridge heights: 5.2 metres clearance	Travel directly ahead	Loads are not to exceed 5.2 metres in height on this section of road.
42.6	Gawler, SA	Northern Expressway onto Sturt Highway GPS Link: https://goo.gl/maps/cG4yPULRZKy4V73h9	120 metres	Travel directly ahead	No problems with this section of road.
45.0	Gawler, SA	Sturt Highway under Redbanks Road GPS Link: https://goo.gl/maps/n2aHh6MiwHyCeMRH9	Bridge height: 5.2 metres clearance	Travel directly ahead	Loads to slow for this bridge if over 5.0 metres in height. Loads exceeding 5.2 will need to stop and lower to 5.2 metres to travel under this structure.
45.0	Nuriootpa, SA	Sturt Highway under Sir Condor Laucke Way GPS Link: https://goo.gl/maps/J2DaymuDAMZK2PYs8	Bridge height: LHS: 6.15 Centre: 5.8m RHS: 5.6	Travel directly ahead	Loads to slow for this bridge if over 5.5 metres in height. Loads exceeding 6.0m will need to stop and lower to 6.0 metres to travel under this structure.
132.05	Blanchetown, SA	Sturt Highway GPS Link: https://goo.gl/maps/fQvt31Kceog	10.0 metres wide	Left hand merge	Overnight parking at BP service centre
208.75	Kingston on Murray, SA	Sturt Highway onto Kingston Road GPS Link: https://goo.gl/maps/cvafMBJpqWNRudqp8	110 metres	Right Hand Turn	Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.

ROUTE STUDY

Port Adelaide to Junction Rivers Windfarm

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
244.3	Loxton, SA	Kingston Road onto Karoonda Hwy GPS Link: https://goo.gl/maps/QVqcneMAha8ew7Gq9	120 metres	Travel directly ahead	No problems with this section of road.
246.45	Loxton, SA	Karoonda Hwy onto Bookpurnong Road GPS Link: https://goo.gl/maps/gZXFJ8f5ac2eGxgPA	80 metres	Second exit on Roundabout	Hardstand is required on the edge of the roundabout so the blade can cut straight across. 2x signs need to be made removable. Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.
251.25	Loxton North, SA	Bookpurnong Road GPS Link: https://goo.gl/maps/whYj2TCsTw7U5cDH9	90.0 metres long 10.0 metres wide	Left hand merge	Fatigue parking
256.35	Bookpurnong, SA	Bookpurnong Road onto Stanitzki Road GPS Link: https://goo.gl/maps/4D9S2wy8wpSkWqCG8	120 metres	Right Hand Turn	Vegetation on the outside of the corner will need to be checked before deliveries commence. Some trimming may be required. Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.
284.45	Pike River, SA	Stanitzki Road onto Sturt Hwy GPS Link: https://goo.gl/maps/QyNenMv3b9zq8MAUA	60 metres	Right Hand Turn	A large amount of hardstand is required on the inside of the corner. Existing shoulder on entry to be made trafficable. Vegetation on the outside of the corner to be trimmed or removed. Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.
287.40	Yamba, SA	Sturt Hwy GPS Link: https://goo.gl/maps/TAPWrNAcrsWGIXJJ7	90.0 metres long 10.0 metres wide	Left Hand Merge	Possible parking on correct side of the road. Fuel on incorrect side of Road- Ampol
321.80	Meringur, Vic	Sturt Hwy GPS Link: https://goo.gl/maps/Tm7PCDegxcSf6pt5A	90.0 metres long 10.0 metres wide	Left Hand Merge	Possible parking on correct side of the road.
355.5	Cullulleraine, Vic	Sturt Hwy onto Werrimull N Rd GPS Link: https://goo.gl/maps/mEXNrfwPCDYM4Ft9	60 metres	Right Hand Turn	Hardstand is required on the outside of the corner. Numerous trees will need to be removed to allow the tail swing to pass. 2x signs need to be made removable. Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.
368.1	Werrimull, Vic	Werrimull N Rd onto Millewa Rd GPS Link: https://goo.gl/maps/cbs8sRRSbhtq5uN9	80 metres	Left Hand Turn	Hardstand is required on the entry and inside of the corner. 1x sign needs to be made removable. Vegetation to be removed or trimmed. Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.

ROUTE STUDY

Port Adelaide to Junction Rivers Windfarm

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
422.6	Red Cliffs, Vic	Bend on Millewa Rd GPS Link: https://goo.gl/maps/4VgMQGQY3arG755	50 metres	Right Hand Turn	Hardstand to be installed on inside and outside of corner. Signs removed and vegetation trimmed as required. Overhead conductor clearance to be confirmed.
422.7	Red Cliffs, Vic	Millewa Rd onto Calder Hwy GPS Link: https://goo.gl/maps/Bm6Z7EukQW5Ymbkz9	50 metres	Right Hand Turn	The sharp right hand turn on to the Calder highway will need a significant amount of work, including a new bypass road and a new rail crossing. Signs and obstacles to be removed. Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.
474.2	Hattah, Vic	Calder Hwy GPS Link: https://goo.gl/maps/R26CpzXrFJYpJ6TB9	90.0 metres long 10.0 metres wide	Left Hand Merge	Possible parking on correct side of the road. Roadhouse
474.5	Hattah, Vic	Calder Hwy onto Hattah-Robinvale Rd GPS Link: https://goo.gl/maps/ZWzEDLCs71tpP2U27	50 metres	Left Hand Turn Via new bypass road	New bypass road to be installed, vegetation removed and trimmed as required. Overhead conductor clearance to be confirmed. Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.
527.7	Bannerton, Vic	Hattah-Robinvale Rd onto Robinvale-Sea Lake Rd GPS Link: https://goo.gl/maps/4FwG4h1Qz95TX110	80 metre	Left Hand Turn	Hardstand is required on the centre island and 6x signs will need to be made removable. Delineators made removable, Vegetation trimmed as required. Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.
540.9	Robinvale, Vic	Robinvale-Sea Lake Rd turns into Murray Valley Hwy GPS Link: https://goo.gl/maps/55pknuwKNHsoA1vdA	120 metres	Continue Straight	No issues with this section
543.6	Robinvale, Vic	Murray Valley Highway over the Euston-Robinvale Bridge https://goo.gl/maps/uKnaiBJZG5yVWVWJQ9	Width: 8.0 metres	Continue straight	TfNSW have advised that the structure is suitable for OSOM loads. However, a bridge assessment will be required to cross this structure.
546.0	Euston, NSW	Murray Valley Hwy onto Sturt Hwy GPS Link: https://goo.gl/maps/mhvrnIN8VxAWX3eA	50 metres	Right Hand Turn	This is a very tight corner that cuts back on itself. A large amount of hardstand is required. The new alignment will need a lot of fill to bring it level with the highway. Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.

ROUTE STUDY
Port Adelaide to
Junction Rivers Windfarm

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
623.7	Balranald, NSW	Sturt Hwy (market st) onto Sturt Hwy GPS Link: https://goo.gl/maps/xve6ZqbuRtkoPvVr7	50 metres	Right Hand Turn	This section is very tight. A large area of hardstand will be required along with the removal of trees, light poles and numerous signs. Median strip to be made trafficable. Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.
636.8	Yanga, NSW	Sturt Hwy (market st) onto Sturt Hwy GPS Link: https://goo.gl/maps/4xawdL77rM3oQdAA	70 metres	Left Hand Turn	An area of hardstand is required on the inside of the corner. Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.
645.8	Kyalite, NSW	Balranald Rd onto Arundel Rd GPS Link: https://goo.gl/maps/bwFVKmM2PLJrJLoJ8		Site Entrances	Some vegetation may need to be trimmed/removed on the inside and outside of this corner. The first site entrances are proposed in this location. The land is very flat with limited vegetation. Client to provide adequate swept path for the blade to enter site.
659.0	Moolpa, NSW	Balranald Rd into western site entrances GPS Link: https://goo.gl/maps/H89cFQMFonkXDHvE9		Site Entrances	The western site entrances are proposed in this location. As with the eastern entrances the land is very flat with limited vegetation. Client to provide adequate swept path for the blade to enter site.

0.0 Km's: Exiting the Port Storage Area onto Eastern Parade, SA.

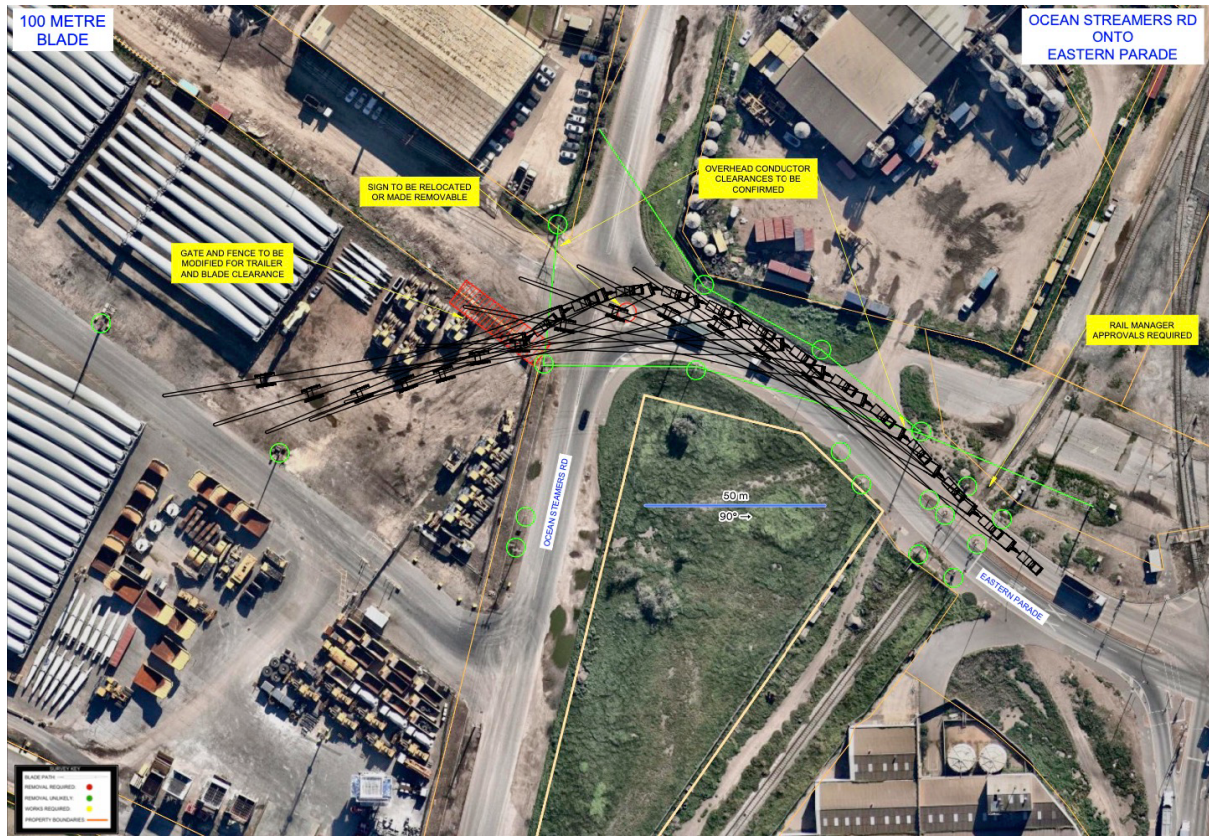


Figure 17 - Exiting the Port Storage Area onto Eastern Parade, SA.

GPS LINK FOR THIS LOCATION: <https://goo.gl/maps/RMGe61BrvczTbEQR8>

PROCEDURE: Slight right hand turn.

COMMENTS: Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.

ROAD MODIFICATIONS: Yes, the perimeter fence will need to be modified to allow transit. Sign to be made removable and overhead conductor clearances confirmed.

0.75 Km's: Eastern Parade onto Port River Expressway, SA.

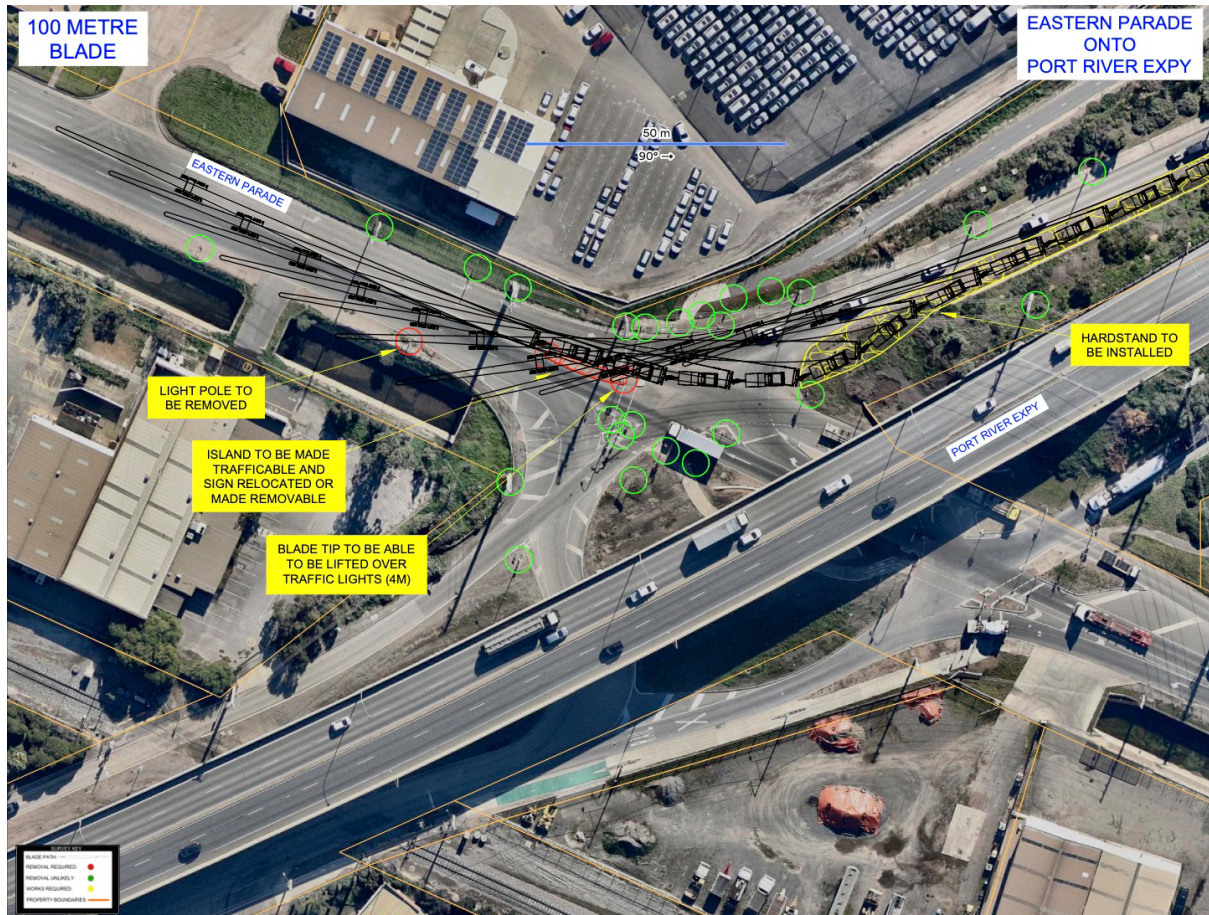


Figure 18 - Eastern Parade onto Port River Expressway, SA.

GPS LINK FOR THIS LOCATION: <https://goo.gl/maps/ora7XGzZgv1zLN3v6>

PROCEDURE: Left hand merge onto Port River Expressway.

COMMENTS: Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.

ROAD MODIFICATIONS: Yes. To enable the blade to make this corner 1 x light poles and 1x street sign need to be removed. An area of hardstand is also required on the outside of the corner on the Port River on ramp. The blade tip will hang over the drain on the outside of the corner and traffic light on centre island. Blade must be able to lift over traffic signals (4m) The area must be clear of obstacles.

208.75 Km's: Sturt Highway onto Kingston Road at Kingston on Murray, SA.



Figure 19 - Sturt Highway onto Kingston Road at Kingston, SA.

GPS LINK FOR THIS LOCATION: <https://goo.gl/maps/cvafMBJpqWNRudqp8>

PROCEDURE: Right hand turn

COMMENTS: No issues with this corner.

Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.

ROAD MODIFICATIONS: No work is required.

246.45 Km's: Karoonda Hwy Roundabout in Loxton, SA.



Figure 20 - Karoonda Hwy Roundabout in Loxton, SA.

GPS LINK FOR THIS LOCATION: <https://goo.gl/maps/gZXFU8r5scZwGxqPA>

PROCEDURE: Travel straight ahead using the hardstand installed on the roundabout and continue on Karoonda Hwy

COMMENTS: Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.

ROAD MODIFICATIONS: Yes. Hardstand is required on the edge of the roundabout so the blade can cut straight across. 2x signs need to be made removable.

256.35 Km's: Bookpurnong Road onto Stanitzki Road at Loxton North, SA.



Figure 21 - Bookpurnong Road onto Stanitzki Road, SA.

GPS LINK FOR THIS LOCATION: <https://goo.gl/maps/4D9S2wy8wpSkWqCG8>

PROCEDURE: Right hand turn

COMMENTS: Vegetation on the outside of the corner will need to be checked before deliveries commence. Some trimming may be required.

Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.

ROAD MODIFICATIONS: No work is required.

284.45 Km's: Stanitzki Road onto Sturt Highway at Pike River, SA.

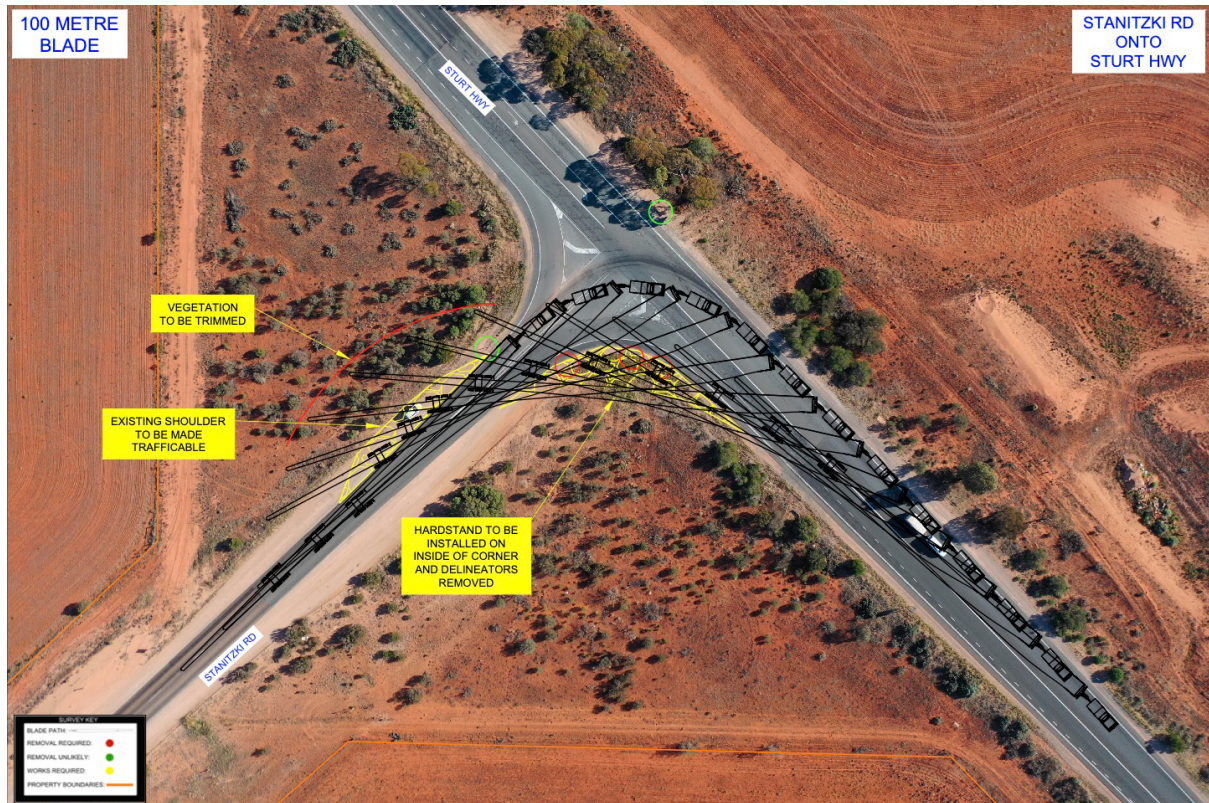


Figure 22 - Stanitzki Road onto Sturt Highway, SA.

GPS LINK FOR THIS LOCATION: <https://goo.gl/maps/QyNogMy3b9zg8MAUA>

PROCEDURE: Right hand turn

COMMENTS: Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.

ROAD MODIFICATIONS: Yes. A large amount of hardstand is required on the inside of the corner. Existing shoulder on entry to be made trafficable. Vegetation on the outside of the corner to be trimmed or removed.

355.50 Km's: Sturt Highway onto Werrimull N Road at Cullulleraine, Vic.

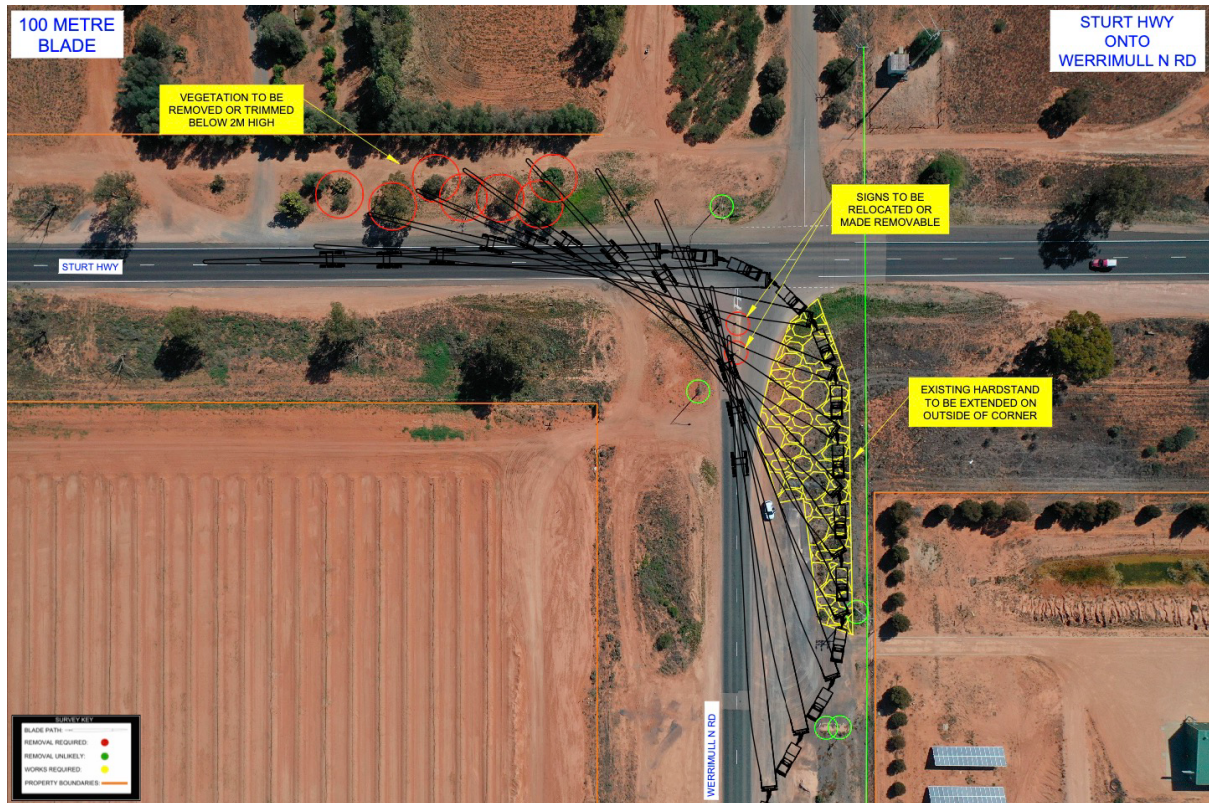


Figure 23 - Sturt Highway onto Werrimull N Road, Vic.

GPS LINK FOR THIS LOCATION: <https://goo.gl/maps/mEXbnEwPCDYMM4Fh8>

PROCEDURE: Right hand turn

COMMENTS: Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.

ROAD MODIFICATIONS: Yes. Hardstand is required on the outside of the corner. Numerous trees will need to be removed to allow the tail swing to pass. 2 x signs need to be made removable.

368.10 Km's: Werrimull N Road onto Millewa Road at Werrimull, Vic.



Figure 24 - Werrimull N Road onto Millewa Road, Vic.

GPS LINK FOR THIS LOCATION: <https://goo.gl/maps/ohs9s9RSbbfqi5uN9>

PROCEDURE: Left hand turn

COMMENTS: Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.

ROAD MODIFICATIONS: Yes. Hardstand is required on the entry and inside of the corner. 1x sign needs to be made removable. Vegetation to be removed or trimmed.

422.60 Km's: Right hand bend on Millewa Road before rail crossing, Vic.

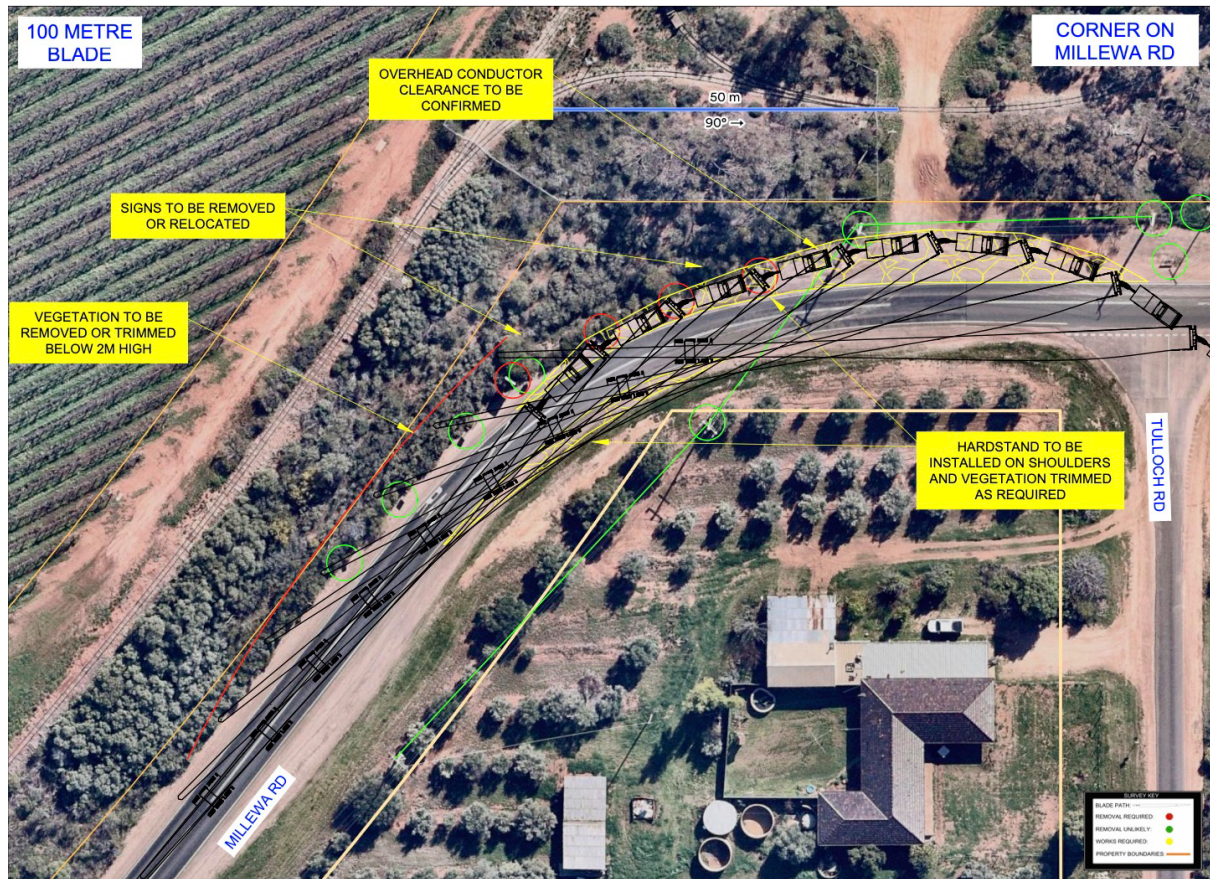


Figure 25 - Right hand bend on Millewa Road, Vic.

GPS LINK FOR THIS LOCATION: <https://goo.gl/maps/4VgMQjQQvY3arG786>

PROCEDURE: Right hand bend then sharp right hand turn over the rail crossing.

COMMENTS: Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.

ROAD MODIFICATIONS: Yes. Hardstand to be installed on inside and outside of corner. Signs removed and vegetation trimmed as required. Overhead conductor clearance to be confirmed.

100 METRE BLADE

50 m

90°

MILLEWA RD

CALDER HWY

NEW RAIL CROSSING TO BE INSTALLED & LEVELS ADJUSTED TO MAINTAIN SUITABLE VERTICAL CURVES, RAIL MANAGER APPROVALS REQUIRED

HARDSTAND TO BE INSTALLED AND MADE TRAFFICABLE

SIGNS AND OTHER INFRASTRUCTURE TO BE RELOCATED OR MADE TRAFFICABLE

20.0000

OVERHEAD CONDUCTOR CLEARANCE TO BE CONFIRMED

BLADE FACTOR
 REMOVAL REQUIRED
 REMOVAL UNLIKELY
 SIGNS REQUIRED
 PROPERTY BOUNDARIES

ROAD MODIFICATIONS: Yes. The sharp right hand turn on to the Calder highway will need a significant amount of work, including a new bypass road and a new rail crossing. Signs and obstacles to be removed.

474.5 Km's: Calder Highway onto Hattah-Robinvale Road at Hattah, Vic.



Figure 27 - Calder Highway onto Hattah-Robinvale Road, Vic.

GPS LINK FOR THIS LOCATION: <https://goo.gl/maps/Z6zEDLCq71fpPZU27>

PROCEDURE: Left hand turn at the roundabout

COMMENTS: Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.

ROAD MODIFICATIONS: Yes. New bypass road to be installed, vegetation removed and trimmed as required. Overhead conductor clearance to be confirmed.

527.7 Km's: Hattah-Robinvale Road onto Robinvale-Sea Lake Road at Bannerton, Vic.



Figure 28 - Hattah-Robinvale Road onto Robinvale-Sea Lake Road, Vic.

GPS LINK FOR THIS LOCATION: <https://goo.gl/maps/4FwG4Lh1Qr95TX1t9>

PROCEDURE: Left hand turn

COMMENTS: Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.

ROAD MODIFICATIONS: Yes. Hardstand is required on the centre island and 6x signs will need to be made removable. Delineators made removable, Vegetation trimmed as required.

546.00 Km's: Murray Valley Highway onto Sturt Highway at Euston, NSW.

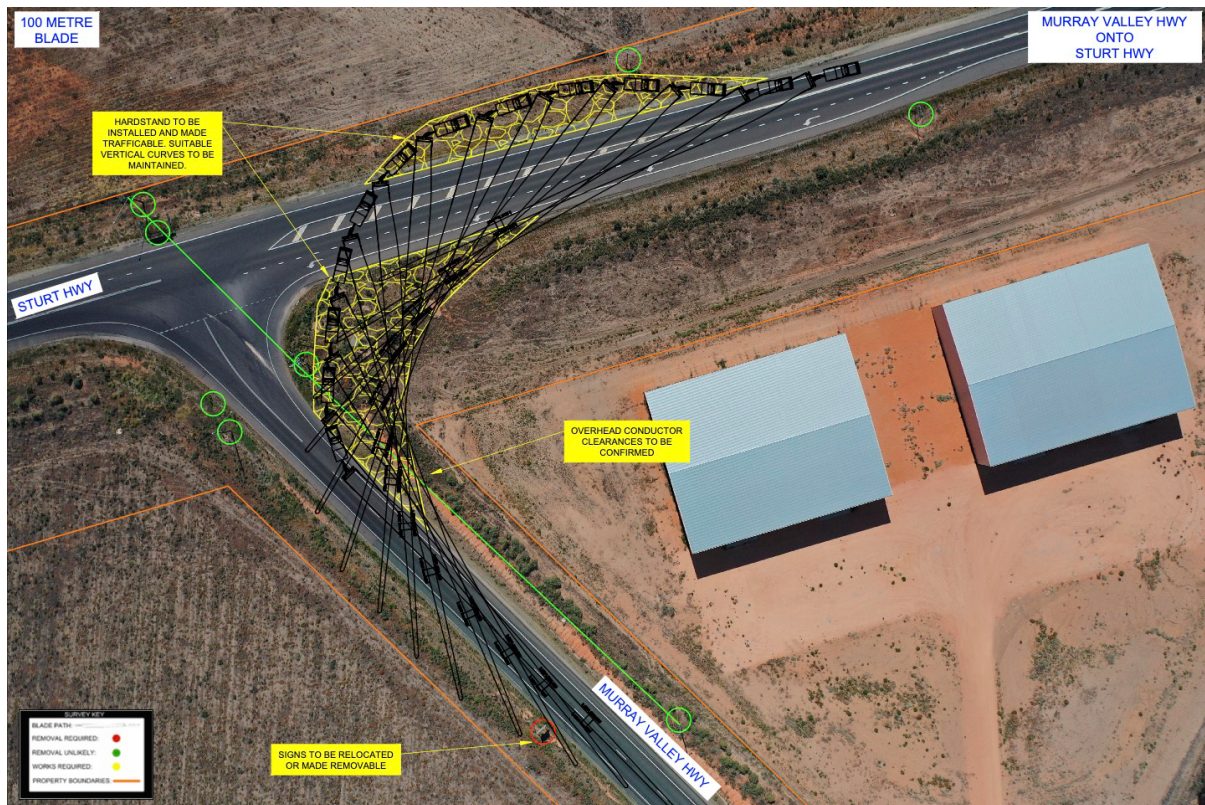


Figure 29 - Murray Valley Highway onto Sturt Highway, NSW.

GPS LINK FOR THIS LOCATION: <https://goo.gl/maps/rnhvnjnN6VkAWX3eA>

PROCEDURE: Right hand turn

COMMENTS: Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.

ROAD MODIFICATIONS: Yes. This is a very tight corner that cuts back on itself. A large amount of hardstand is required. The new alignment will need a lot of fill to bring it level with the highway.

623.70 Km's: Right hand bend on Sturt Highway at Balranald, NSW.



Figure 30 –Sturt Highway at Balranald, NSW.

GPS LINK FOR THIS LOCATION: <https://goo.gl/maps/xve4ZgbuRkqqPvVr7>

PROCEDURE: Right hand turn

COMMENTS: This path requires landholder permission and significant work to be undertaken. Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.

ROAD MODIFICATIONS:

Roadway/hardstand to be installed on outside of corner. Light poles, trees and signs to be removed from swept path. Median strips to be removed and replaced with painted lines and made trafficable.

625.00 Km's: Sturt Highway onto Mallee Highway at Balranald, NSW.



Figure 31 - Sturt Highway onto Mallee Highway at Balranald, NSW.

GPS LINK FOR THIS LOCATION: <https://goo.gl/maps/sUqgHV9PKpztyi5g9>

PROCEDURE: Right hand turn onto the Mallee Highway

COMMENTS: 1x sign will need to be made removable. No issues with this corner otherwise.

Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.

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

636.80 Km's: Mallee Highway onto Balranald Road at Yanga, NSW.

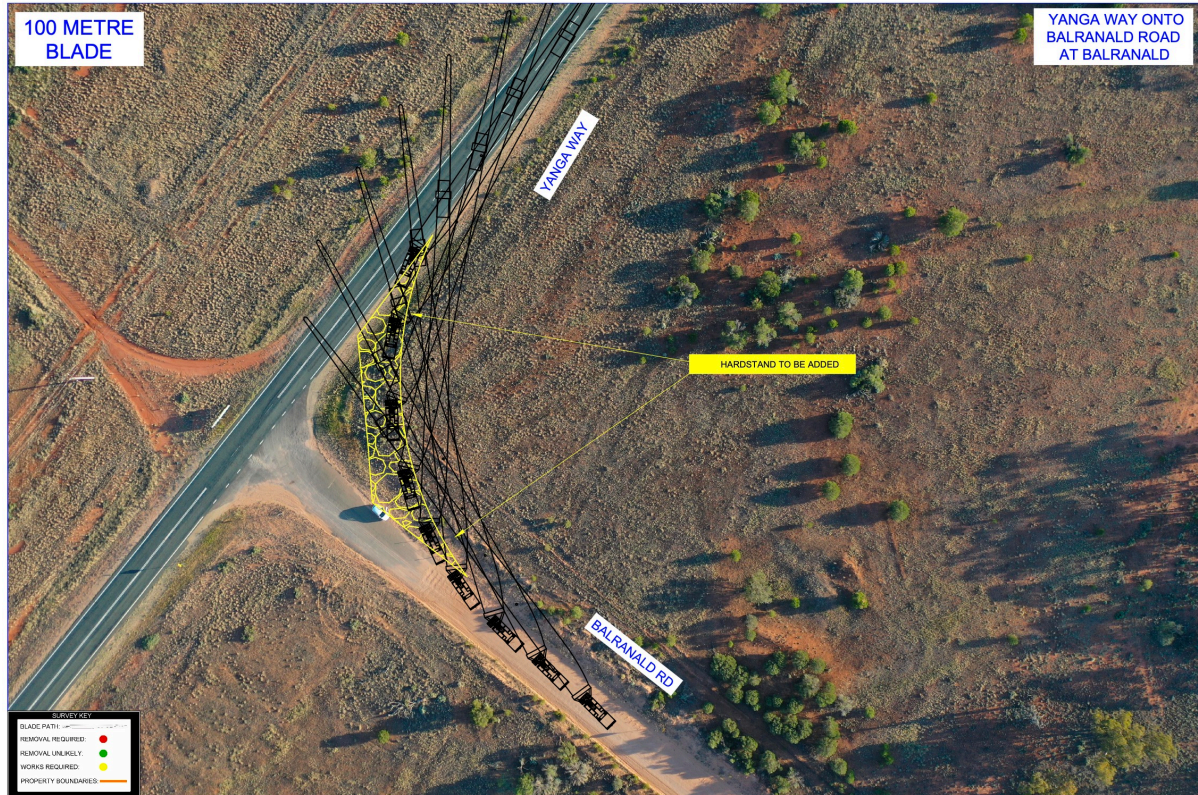


Figure 32 - Mallee Highway onto Balranald Road at Yanga, NSW.



Figure 33 - Low Angle Shot, Mallee Highway onto Balranald Road at Yanga, NSW.

GPS LINK FOR THIS LOCATION: <https://goo.gl/maps/LvawNfJ77rM3pQdAA>

PROCEDURE: Left hand turn

COMMENTS: An area of hardstand is required on the inside of the corner.

Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.

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

645.80 Km's: Balranald Road onto Arundel Road and eastern site entrances at Kayalite, NSW.



Figure 34 - Balranald Road onto Arundel Road and eastern site entrances at Kayalite, NSW.



Figure 35 - Low Angle Shot, Balranald Road onto Arundel Road and eastern site entrances at Kayalite, NSW.



Figure 36 - Aerial shot of surrounding landscape, NSW.



Figure 37 - Typical section of road along Balranald Road, NSW.

GPS LINK FOR THIS LOCATION: <https://goo.gl/maps/bwFVKmM2PLJrJLoJ8>

PROCEDURE: Right hand turn

COMMENTS: Some vegetation may need to be trimmed/removed on the inside and outside of this corner. The eastern site entrances are proposed in this location. The land is very flat with limited vegetation. Client to provide adequate swept path for the blade to enter site.

Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warn all traffic.

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

659.00 Km's: Balranald Road into western site entrances at Moolpa, NSW.



Figure 38 - Proposed Western Site Entrance, NSW.



Figure 39 - Proposed Western Site Entrance, NSW.

GPS LINK FOR THIS LOCATION: <https://goo.gl/maps/H89zRQMFgqkXDHvE9>

PROCEDURE: Left hand bend to continue on the Newell Highway

COMMENTS: The western site entrances are proposed in this location. As with the eastern entrances the land is very flat with limited vegetation. Client to provide adequate swept path for the blade to enter site.

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

10.0 Conclusion Route 1

After studying all options and undertaking a route survey, this route in its current condition will require a major 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.

SWEPT PATH:

- ☐ There are numerous sections along the route that need major work to allow a blade of this size through.
- ☐ The corners that we consider will need significant work and should be investigated early in the planning stages to avoid delays or rejections are:
 - The right hand turn from Millewa Road onto the Calder Highway at Red Cliffs
 - The right hand turn from Murray Valley Highway onto the Sturt Highway at Euston
 - The right-hand bend on the Sturt Highway at Balranald.
 - Initial consultation with relevant road and rail authorities within SA, VIC and NSW have commenced as apart of the EIS process

OVERHEAD STRUCTURES: (5.2 metres maximum loaded height)

- ☐ The lowest structures are the overpasses along the Northern Expressway. The lowest of these has a clearance of 5.2 metres.
- ☐ Loads higher than 5.2 metres cannot use this route and will need to travel along route 3 (high load route)

OVERHEAD UTILITIES:

- ☐ This route will need to be checked by an authorised scoping company. It is likely that a route of at least 5.6 metres is required for this project.

BRIDGES:

- ☐ Majority of the bridges have been used previously for similar loads so it is expected they will be ok. A bridge assessment will still be required.

RAIL ASSETS:

- ☐ There are a number of rail overbridges and crossings on route that will require approval from authorities before loads can access the routes.
- ☐ The corner onto the Calder Highway at Red Cliffs requires a new level rail crossing for the blade trailer. This will need to be discussed with the authorities to determine if it's achievable.

VEGETATION:

- ☐ The route requires a moderate amount of vegetation clearing at various locations.

PAVEMENT:

- ☐ The Pavement on all roads have adequate highway pavement up until Balranald Road.
- ☐ Balranald Road is a gravel road of varying quality. The road will need to be graded before deliveries commence and regular grading will be required over the project delivery period. The road may become unusable in wet conditions which will impact delivery schedules. The average width is 8m so not a concern.

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 Transport Management Plan "TMP" has been approved for the transport of the turbines, then the exact movement dates need to be communicated with all relevant authorities to make all road stakeholders are aware of the scheduled movements for each day.
- ☐ The project will need to regularly check on any new upgrades not listed in the report. If upgrades have taken place on a section of route after this report has been completed, then a swept path study would need to be undertaken on that section of road to confirm that it can still be used.

COMPONENTS THAT WOULD USE ROUTE 1:

- ☐ Blades.

11.0 Route Survey 2: Port Adelaide SA to Junction Rivers Windfarm NSW Via Mildura

COMPONENTS: Smaller components with a **Max loaded height 5.2 metres**

DISTANCE: 610 kilometres

GPS LINK: <https://maps.app.goo.gl/DDCP2zgjjieWsGkE8>

VIA: Ocean Steamers Rd, Eastern Parade, Port River Exy (A9), North South Motorway (M2), Northern Expy, Sturt Hwy (A20), Kingston Rd, Hwy (B55), Karoonda Hwy, Bookpurnong Rd, Stanitzki Rd, Sturt Hwy, Seventeenth St, Benetook Ave, Seventh St, Sturt Hwy, Yanga Way, Balranald Road.

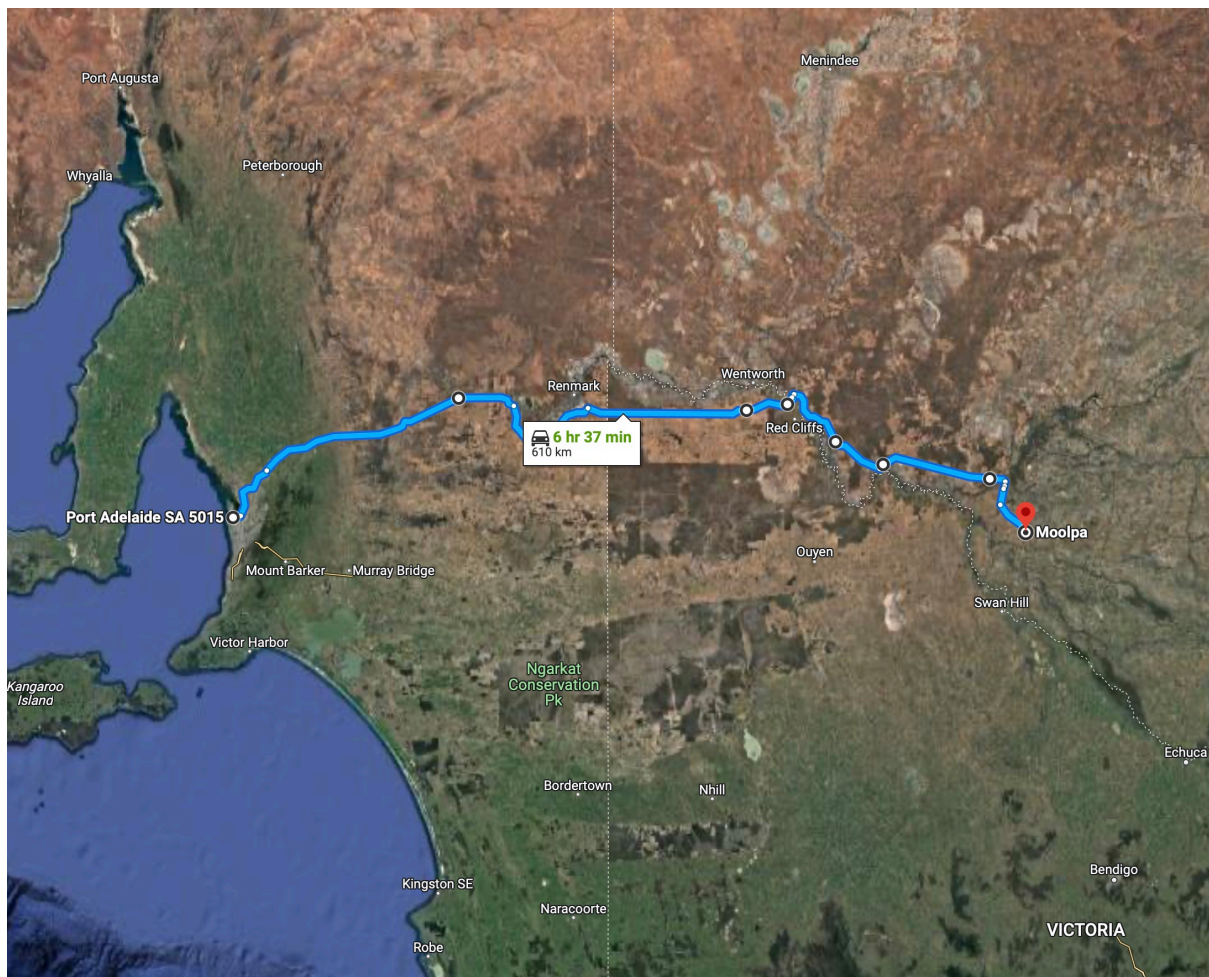


Figure 40 - Route 2

ROUTE STUDY

Port Adelaide to Junction Rivers Windfarm

KEY	
PINCH POINT	
CAUTION	
EMERGENCY PARKING	

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
0.0	Port Adelaide SA	Intersection of Ocean Steamers Rd and Eastern Pde GPS Link: https://goo.gl/maps/RMGe61BvrczTbEQR8	9.9 metres wide at gate	Slight right hand turn	No problems with this section of road.
0.75	Port Adelaide SA	Eastern Parade onto Port River Expressway GPS Link: https://goo.gl/maps/ora7XGzZgv1zLN3v6	80 metres	Left Hand Merge	No problems with this section of road.
5.65	Dry Creek SA	Port River Expressway onto North-South Motorway GPS Link: https://goo.gl/maps/tnXSxEvv2zhyWHnLA	120 metres	Left Hand merge	No problems with this section of road.
21.05	Burton SA	North-South Mwy onto Northern Expy, Sturt Hwy GPS Link: https://goo.gl/maps/23zth7ZxmiDCFotY7	120 metres	Left hand bend	No problems with this section of road.
21.05 to 42.6	Burton to Gawler SA	Northern Expressway GPS Link: https://goo.gl/maps/GbEjYZ81FUAdJh4Q7	Bridge heights: 5.2 metres clearance	Travel directly ahead	Loads are not to exceed 5.2 metres in height on this section of road. NOTE: Vehicles that exceed a loaded height of 5.2 metres are to detour via Two Wells as per the following link. See route survey 3 for details. https://goo.gl/maps/mS6AuxPmuEHyHzca9
42.6	Gawler SA	Northern Expressway onto Sturt Highway GPS Link: https://goo.gl/maps/cG4yPULRZKy4V73h9	120 metres	Travel directly ahead	No problems with this section of road.
45.0	Gawler SA	Sturt Highway under Redbanks Road GPS Link: https://goo.gl/maps/n2aHh6MiwHyCeMRH9	Bridge height: 5.2 metres clearance	Travel directly ahead	Loads are not to exceed 5.2 metres in height on this section of road. NOTE: Vehicles that exceed a loaded height of 5.2 metres are to detour via Two Wells as per the following link. See route survey 3 for details. https://goo.gl/maps/mS6AuxPmuEHyHzca9
45.0	Nuriootpa SA	Sturt Highway under Sir Condor Laucke Way GPS Link: https://goo.gl/maps/J2DaymuDAmZK2PYs8	Bridge height: LHS: 6.15 Centre: 5.8m RHS: 5.6	Travel directly ahead	Loads over 5.6m must stay as far left as possible under this structure. Loads exceeding 6.0m will need to stop and lower to 6.0 metres to travel under this structure. This is the lowest structure on the route without a bypass option.

ROUTE STUDY

Port Adelaide to Junction Rivers Windfarm

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
132.05	Blanchetown SA	Sturt Highway GPS Link: https://goo.gl/maps/fQvt31Kceog	10.0 metres wide	Left hand merge	Overnight parking at BP service centre
208.75	Kingston on Murray SA	Sturt Highway onto Kingston Road GPS Link: https://goo.gl/maps/cvafMBJpgWNRudqp8	110 metres	Right Hand Turn	No problems with this section of road.
244.3	Loxton SA	Kingston Road onto Karoonda Hwy GPS Link: https://goo.gl/maps/QVqncMAha8ew7Gq9	120 metres	Travel directly ahead	No problems with this section of road.
246.45	Loxton SA	Karoonda Hwy onto Bookpurnong Road GPS Link: https://goo.gl/maps/qZXFU8r5scZwGxgPA	80 metres	Second exit on Roundabout	No problems with this section of road.
251.25	Loxton North SA	Bookpurnong Road GPS Link: https://goo.gl/maps/whYi2TCsTw7U5cDH9	90.0 metres long 10.0 metres wide	Left hand merge	Fatigue parking
256.35	Bookpurnong SA	Bookpurnong Road onto Stanitzki Road GPS Link: https://goo.gl/maps/4D9S2wy8wpSkWqCG8	120 metres	Right Hand Turn	No problems with this section of road.
284.45	Pike River SA	Stanitzki Road onto Sturt Hwy GPS Link: https://goo.gl/maps/QyNoqMy3b9zq8MAUA	60 metres	Right Hand Turn	No problems with this section of road.
287.40	Yamba SA	Sturt Hwy GPS Link: https://goo.gl/maps/TAPWrNAcrsWGjXJJ7	90.0 metres long 10.0 metres wide	Left Hand Merge	Possible parking on correct side of the road. Fuel on incorrect side of Road- Ampol
287.50	Yamba SA	Sturt Hwy under the Big Dunlop Tyre GPS Link: https://goo.gl/maps/YLKNB6KuDyZezoQS6	Structure height: LHS: 8.5 Centre: 10.0 RHS: 8.5	Travel under the Big Dunlop Tyre	Loads move to the centre of the road under this structure.
321.80	Meringur VIC	Sturt Hwy GPS Link: https://goo.gl/maps/Tm7PCDeqxcSf6pt5A	90.0 metres long 10.0 metres wide	Left Hand Merge	Possible parking on correct side of the road.
373	Wargan VIC	Sturt Hwy GPS Link: https://goo.gl/maps/pvNeBreE9nzEY47E8	6 metres wide	Travel Directly Ahead	Road curves to the left, stay on Sturt Hwy No Issues with this section
387.10	Merrine VIC	Sturt Hwy GPS Link: https://goo.gl/maps/2dtXF7FjyE8VTwd66	90.0 metres long 10.0 metres wide	Left Hand Merge	Possible parking on correct side of the road.
405.9	Mildura VIC	Sturt Hwy onto Seventeenth St GPS Link: https://goo.gl/maps/RLd39iU6czs9mWiZA	6 metres wide	Right Hand Turn	No problems with this section of road.
407.9	Mildura VIC	Seventeenth St onto Benetook Ave GPS Link: https://goo.gl/maps/zQWVB95NUiss9sdJ8	6 metres wide	First Exit on Round-about	Left turn at Round-about
409.3	Mildura VIC	Benetook Ave GPS Link: https://goo.gl/maps/mCqLEb19oYNkdqrX6	6 metres wide	Second Exit on Round-about	Travel Straight through round-about
410.6	Mildura VIC	Benetook Ave GPS Link: https://goo.gl/maps/FazFiKo4eUykUgDf9	6 metres wide	Second Exit on Round-about	Travel Straight through round-about
411.9	Mildura VIC	Benetook Ave GPS Link: https://goo.gl/maps/GskD21Q6SSqZM6y99	6 metres wide	Second Exit on Round-about	Travel Straight through round-about

ROUTE STUDY

Port Adelaide to Junction Rivers Windfarm

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
413.3	Mildura VIC	Benetook Ave GPS Link: https://goo.gl/maps/QXvR9ZDk57M9zeba8	6 metres wide	Second Exit on Round-about	Travel Straight through round-about
414.2	Mildura VIC	Benetook Ave onto Seventh St E GPS Link: https://goo.gl/maps/BnvS1sBNeMyLJFTz7	6 metres wide	Left Hand Turn	Left Hand Sweeping Bend
415.5	Mildura VIC	Seventh st E onto Sturt Hwy GPS Link: https://goo.gl/maps/DCWU9cDTpnWQFpudA	6 metres wide	Third Exit on Round-about	Right Hand Turn at round-about
417.7	Buronga NSW	Sturt Hwy GPS Link: https://goo.gl/maps/eSH3JMoHGAK221YVA	6 metres wide	Second Exit on Round-about	Travel right at round-about
441.4	Paringi NSW	Sturt Hwy GPS Link: https://goo.gl/maps/aF7DrHsfBEBnzMBZ8	90.0 metres long 10.0 metres wide	Left Hand Merge	Possible parking on correct side of the road.
493.6	Euston NSW	Sturt Hwy GPS Link: https://goo.gl/maps/4WoDVv7TwnbDad6z5	6 metres wide	First Exit on Round-about	Travel left at round-about
573.9	Balranald NSW	Sturt Hwy (market st) onto Sturt Hwy GPS Link: https://goo.gl/maps/xve4ZgbuRkqgPvVr7	6 metres wide	Right Hand Turn	No problems with this section of road.
575.2	Balranald NSW	Sturt Hwy onto Mallee Hwy (Yanga Way) GPS Link: https://goo.gl/maps/sUggHV9PKpztvi5q9	8 metres wide	Right Hand Turn	No problems with this section of road.
587.0	Yanga NSW	Yanga Way onto Balranald Rd GPS Link: https://goo.gl/maps/LvawNfJ77rM3pQdAA	8 metres wide	Left Hand Turn	No problems with this section of road.
596.0	Kyalite NSW	Balranald Rd onto Arundel Rd GPS Link: https://goo.gl/maps/bwFVKmM2PLJrJLoJ8	8 metres wide	Site Entrances	Client to provide adequate swept path for the blade to enter site.
610.0	Moolpa NSW	Balranald Rd into western site entrances GPS Link: https://goo.gl/maps/495xRQMFgqXDHvE9	8 metres wide	Site Entrances	Client to provide adequate swept path for the blade to enter site.

12.0 Conclusion Route 2

After studying all options and undertaking a route survey, this route is suitable in its current condition 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.

LENGTH

- ☐ The longest combination that can travel along this route without upgrades is **40 metres overall length**.
- ☐ There are numerous roundabouts in Mildura that will be tight but achievable for a load of this length.

OVERHEAD STRUCTURES: (5.2 metres maximum loaded height)

- ☐ The lowest structures are the overpasses along the Northern Expressway. The lowest of these has a clearance of 5.2 metres.
- ☐ Loads higher than 5.2 metres cannot use this route and will need to travel along route 3 (high load route)

OVERHEAD UTILITIES:

- ☐ This route will need to be checked by an authorised scoping company. It is likely that a route of at least 6.5 metres is required for this project.

BRIDGES:

- ☐ Majority of the bridges have been used previously for similar loads so it is expected they will be ok. A bridge assessment will still be required.

RAIL ASSETS:

- ☐ There are a number of rail overbridges and crossings on route that will require approval from authorities before loads can access the routes.
- ☐ The corner onto the Calder Highway at Red Cliffs requires a new level rail crossing for the blade trailer. This will need to be discussed with the authorities to determine if it's achievable.

PAVEMENT:

- ☐ The Pavement on all roads have adequate highway pavement up until Balranald Road.
- ☐ Balranald Road is a gravel road of varying quality. The road will need to be graded before deliveries commence and regular grading will be required over the project delivery period. The road may become unusable in wet conditions which will impact delivery schedules. The average width is 8m so not a concern.

COMPONENTS THAT WOULD USE ROUTE 2:

- ☐ Loads under 5.2 metres in height which are usually the Hubs, Nacelles, Generators.
- ☐ Transformers and switchrooms if they don't exceed 5.2 metres in height. Bridge capacity would still need to be checked for the weight of the transformers.
- ☐ Standard loads and containers

ROUTE STUDY

Port Adelaide to Junction Rivers Windfarm

13.0 Route Survey 3: Port Adelaide SA to Junction Rivers Windfarm NSW, High Load Route - Option 1

COMPONENTS: Larger items with a Max loaded height 6.4 metres

DISTANCE: 638 kilometres

GPS LINK: <https://maps.app.goo.gl/VzYoLHnsgmknnXkb8>

VIA: Via Ocean Steamers Road, Eastern Parade, Port River Expressway, Northern Connector, Port Wakefield Highway "A1", Mallala Road, Old Port Wakefield Road, Gawler Rd, Two Wells Rd, Wilkinson Road, Hatcher Road, Oates Road, Redbanks Road, Mudla Wirra Road, College Road, Cliff Road, Gartrell Street, Roseworthy, Thiele Hwy, East Terrace, Truro Rd, Sturt Hwy, Kingston Rd, Karoonda Hwy, Bookpurnong Rd, Stanitzki Rd, Sturt Hwy, Seventeenth St, Benetook Ave, Seventh St, Sturt Hwy, Kidman Way, Yanga Way, Balranald Road.

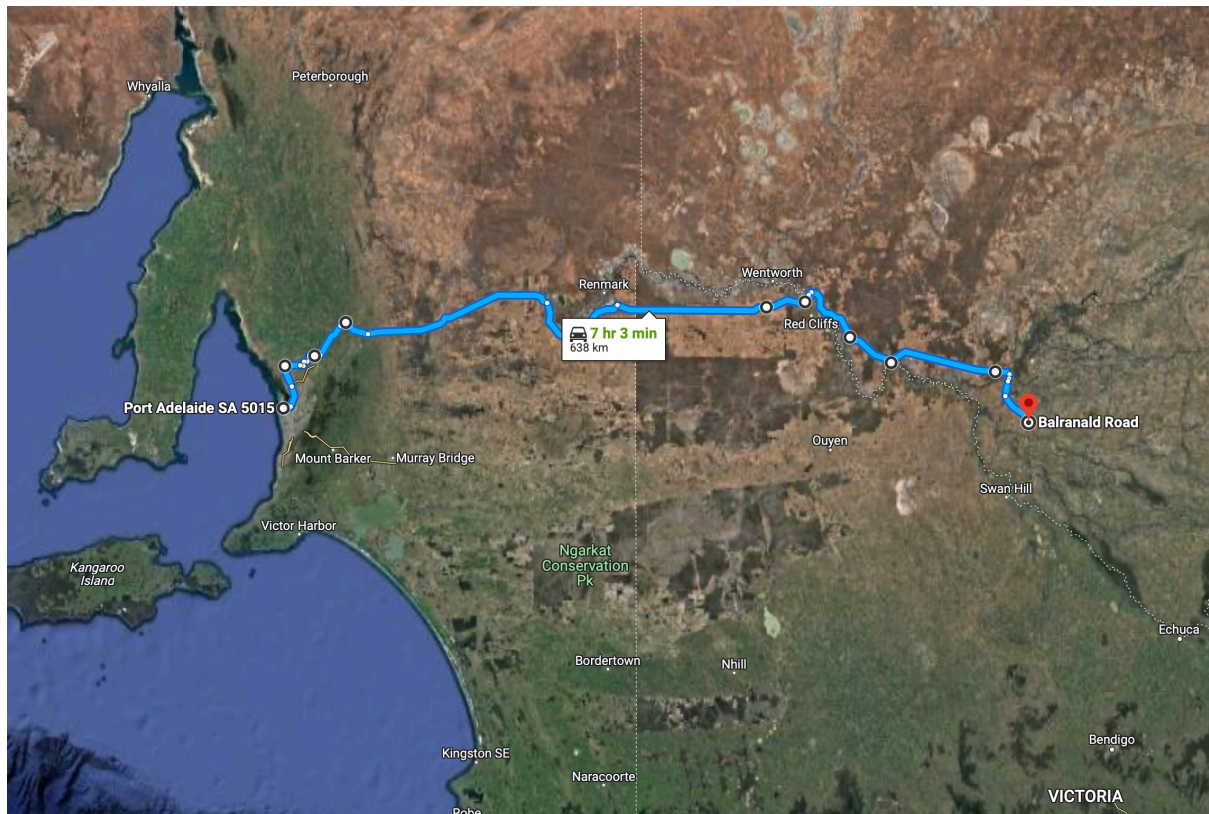


Figure 41 - Route 3

ROUTE STUDY

Port Adelaide to Junction Rivers Windfarm

ROUTE INDEX

KEY	
ROAD MODIFICATION	
CAUTION	
EMERGENCY PARKING	

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
0.0	Port Adelaide SA	Port storage area across Ocean Steamers Rd and onto eastern Parade GPS Link: https://goo.gl/maps/tK6JqG1AjdMDqgSs5	Length: 75.0 metres Width: 8.0 metres Height: N/A	Drive out of storage area and cross to the incorrect side of Eastern Parade	No problems with this section of road to be modified.
0.2	Port Adelaide SA	Eastern Parade over rail crossing GPS Link: https://goo.gl/maps/UfZlVNDkKxRyTed9	Length: 80.5 metres Width: 10.0 metres Height: N/A	Travel directly ahead	Approval required from Rail network provider before crossing this structure. Spotter to Guide load through this pinchpoint.
0.9	Gilman SA	The Eastern Parade onto the Port River Expressway GPS Link: https://goo.gl/maps/mPFZDKYzewGxvm8S8	Length: 70.0 metres Width: 10.9 metres Height: N/A	Left hand turn	No problems with this section of road.
0.9 to 4.3	Gilman to Wingfield SA	Port River Expressway GPS Link: https://goo.gl/maps/rpFDwXM41ACyR2Vv6	Length: 100.0 metres Width: 10.0 metres Height: 6.2 metres	Travel directly ahead.	Loads over 6.2 metres will need to travel over the top of Hansen Road.
4.3	Wingfield SA	Port River Expressway onto Northern Connector GPS Link:	Length: 100.0 metres Width: 8.0 metres Height: 6.5 metres	Left hand bend	No problems with this section of road.
4.3 To 19.2 Km's	Wingfield to Waterloo Corner SA	Northern Connector GPS Link: https://goo.gl/maps/onZFmbVb3PpaJq52A	Length: 100.0 metres Width: 10.5 metres Height: 6.5 metres	Travel directly ahead	No problems with this section of road.
19.8	Waterloo Corner SA	Northern Connector onto Port Wakefield Highway "A1" GPS Link: https://goo.gl/maps/yclGFDgzQ8idciv47	Length: 100.0 metres Width: 8.0 metres Height: N/A	Right hand merge onto A1	No problems with this section of road.
33.4	Two Wells SA	Port Wakefield Highway "A1" onto Mallala Road GPS Link: https://goo.gl/maps/U78MZSBL43D2	Length: 50 metres Width: 8.0 metres Height N/A	Right hand turn	No problems with this section of road
33.7	Two Wells SA	Mallala Road onto Old Port Wakefield Road GPS Link: https://goo.gl/maps/CzpYPwc9cBM2	Length: 50 metres Width: 8.0 metres Height N/A	Right hand turn	No problems with this section of road
33.9	Two Wells SA	Old Port Wakefield Road onto Gawler Road GPS Link: https://goo.gl/maps/TfEJNdGpFP12	Length: 50 metres Width: 8.0 metres Height N/A	Left hand turn	No problems with this section of road

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KM index	Location	Section of road	Critical Measurement	Procedure	Notes
44.6	Gawler River SA	Gawler Road onto Two Wells Road GPS Link: https://goo.gl/maps/ijQJCjKW6uH2	8.0 metres wide	Travel directly ahead	No problems with this section of road
46.8	Gawler River SA	Two Wells Road onto Wilkinson Road GPS Link: https://goo.gl/maps/6DeWPk5rKF32	Length: 35 metres Width: 8.0 metres Height N/A	Left hand turn	If loads exceed an overall length of 35 metres, there will need to be some hardstand added to this intersection.
49.3	Kangaroo Flat SA	Wilkinson Road onto Hatcher Road GPS Link: https://goo.gl/maps/XQ8cNtqzQUG2	Length: 35 metres Width: 8.0 metres Height N/A	Left hand turn	If loads exceed an overall length of 35 metres, there will need to be some hardstand added to this intersection.
51.3	Kangaroo Flat SA	Hatcher Road onto Oates Road GPS Link: https://goo.gl/maps/qXcjdWzNxCDwL8AA	Length: 60 metres Width: 8.0 metres Height N/A	Left hand bend	No problems with this section of road
54.5	Kangaroo Flat SA	Oates Road onto Redbanks Road GPS Link: https://goo.gl/maps/tVCv2BFmnZ72	Length: 40 metres Width: 8.0 metres Height N/A	Right hand turn	If loads exceed an overall length of 40 metres, there will need to be some hardstand added to this intersection.
55.1	Kangaroo Flat SA	Redbanks Road onto Mudla Wirra Road GPS Link: https://goo.gl/maps/2yC31AASRxM2	Length: 35 metres Width: 8.0 metres Height N/A	Left hand turn	If loads exceed an overall length of 35 metres, there will need to be some hardstand added to this intersection.
56.5	Roseworthy SA	Mudla Wirra Road onto College Road GPS Link: https://goo.gl/maps/bu28YmqsfDP2	Length: 40 metres Width: 8.0 metres Height N/A	Right hand turn	If loads exceed an overall length of 40 metres, there will need to be some hardstand added to this intersection.
60.8	Roseworthy SA	College Road onto Cliff Road GPS Link: https://goo.gl/maps/n6BLsSACgHT2	Length: 40 metres Width: 8.0 metres Height N/A	Left hand turn	If loads exceed an overall length of 40 metres, there will need to be some hardstand added to this intersection.
61.4	Roseworthy SA	Cliff Road onto Gartrell Street GPS Link: https://goo.gl/maps/UGN6vnZ8DDG2	9.0 Metres into 9.0 metres	Right hand turn	No problems with this section of road
62.5	Roseworthy SA	Gartrell Street onto Roseworthy Road GPS Link: https://goo.gl/maps/Py6YuP9aWyH2	Length: 80 metres Width: 9.0 metres Height N/A	Left hand bend	No problems with this section of road
64.8	Kingsford SA	Roseworthy Road onto Thiele Hwy GPS Link: https://goo.gl/maps/GpH6AaL4yS4exER47	Length: 80 metres Width: 9.0 metres Height N/A	Left hand turn	No problems with this section of road
88.3	Kapunda SA	Thiele Hwy onto East Terrace GPS Link: https://goo.gl/maps/vqgkXWMZMhpcgAK9	Width: 6.5 metres	Right hand turn	No problems with this section of road
88.3 to 91.8	Kapunda SA	East Terrace GPS Link: https://maps.app.goo.gl/XEWTBkqA7q6i7FLx9	Width: 6.5 metres	Travel directly ahead on a gravel road	This section of road may need to be maintained during deliveries.

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KM index	Location	Section of road	Critical Measurement	Procedure	Notes
91.8	Kapunda SA	East Terrace onto Thiele Hwy GPS Link: https://goo.gl/maps/wVeWZTnSnDTAaxEs6	Length: 60 metres Width: 6.0 metres	Right hand turn	No problems with this section of road
92.0	Kapunda SA	Thiele Hwy onto Truro Rd GPS Link: https://goo.gl/maps/rupYTUbWTiDgQbLg9	Length: 55 metres Width: 6.0 metres	Right hand turn	No problems with this section of road
111	Truro SA	Truro Rd onto Sturt Hwy GPS Link: https://goo.gl/maps/VsQYKAe4MpcqiyYd7	Length: 55 metres Width: 10.0 metres	Left hand turn	No problems with this section of road
235	Kingston on Murray SA	Sturt Hwy onto Kingston Rd GPS Link: https://goo.gl/maps/8PBn53cVsMongKP7A	Length: 100 metres Width: 10.0 metres	Right hand turn	No problems with this section of road
269	Loxton SA	Kingston Rd onto Karoonda Hwy GPS Link: https://goo.gl/maps/pFS9uJqw6ivxmETP8	Length: 100 metres Width: 6.5 metres	Travel directly ahead	No problems with this section of road.
272	Loxton SA	Karoonda Hwy onto Bookpurnong Road GPS Link: https://goo.gl/maps/qZXFU8r5scZwGxqPA	Length: 80 metres Width: 7.0 metres	Second exit on Roundabout	No problems with this section of road
282	Bookpurnong SA	Bookpurnong Road onto Stanitzki Rd GPS Link: https://goo.gl/maps/qPivFcCbL8mXfecF6	Length: 80 metres Width: 8.0 metres	Right Hand Turn	No problems with this section of road
310	Pike River SA	Stanitzki Rd onto Sturt Hwy GPS Link: https://goo.gl/maps/Kwv9FkoF8hAPpobh7	Length: 55 metres Width: 8.0 metres	Right Hand Turn	No problems with this section of road
313	Yamba SA	Sturt Hwy GPS Link: https://goo.gl/maps/TAPWrNAcrsWGjXJJ7	90.0 metres long 10.0 metres wide	Left Hand Merge	Possible parking on correct side of the road. Fuel on incorrect side of Road- Ampol
313	Yamba SA	Sturt Hwy under the Big Dunlop Tyre GPS Link: https://goo.gl/maps/YLKNB6KuDYzozoQs6	Structure height: LHS: 8.5 Centre: 10.0 RHS: 8.5	Travel under the Big Dunlop Tyre	Loads move to the centre of the road under this structure.
347	Meringur VIC	Sturt Hwy GPS Link: https://goo.gl/maps/Tm7PCDegxcSf6pt5A	90.0 metres long 10.0 metres wide	Left Hand Merge	Possible parking on correct side of the road.
398	Wargan VIC	Sturt Hwy GPS Link: https://goo.gl/maps/pvNeBreE9nzEY47E8	6 metres wide	Travel Directly Ahead	Road curves to the left, stay on Sturt Hwy No Issues with this section
412	Merrinee VIC	Sturt Hwy GPS Link: https://goo.gl/maps/2dtXF7FiyE8VTwd66	90.0 metres long 10.0 metres wide	Left Hand Merge	Possible parking on correct side of the road.
431	Mildura VIC	Sturt Hwy onto Seventeenth St GPS Link: https://goo.gl/maps/PL439U8csp8mWZA	6 metres wide	Right Hand Turn	Loads to cross to the incorrect side. Median strips will need to be made trafficable and signs relocated or made removable.
433	Mildura VIC	Seventeenth St onto Benetook Ave GPS Link: https://goo.gl/maps/zQWVB95NUiss9sdJ8	6 metres wide	Left hand turn	No problems with this section of road

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KM index	Location	Section of road	Critical Measurement	Procedure	Notes
434	Mildura VIC	Benetook Ave GPS Link: https://maps.app.goo.gl/5b6JCyQAtw3WnCUA	5.5 metres wide and 5.5 metres in height	Travel directly ahead through 4 roundabouts and over a rail crossing.	A roundabout will need the centre filled with hardstand and temporary Bollards installed. Vegetation will need to be trimmed on sections of this road.
434	Mildura VIC	Benetook Ave at Sixteenth Ave GPS Link: https://goo.gl/maps/mCqLEb19oYNkdqrX6	6 metres wide	Travel directly ahead	No problems with this section of road
436	Mildura VIC	Benetook Ave at the Calder Highway GPS Link: https://goo.gl/maps/FazFiKo4eUykUgDf9	6 metres wide	Travel directly ahead	No problems with this section of road
437	Mildura VIC	Benetook Ave at Fourteenth Ave GPS Link: https://goo.gl/maps/GskD21Q6SSqZM6y99	6 metres wide	Travel directly ahead	No problems with this section of road
439	Mildura VIC	Benetook Ave at Eleventh Street GPS Link: https://goo.gl/maps/QX-8B2Ck57M0znbu8	5.5 metres wide	Travel directly ahead through the centre of the roundabout.	A temporary hardstand will need to be added to the centre of the roundabout. This will allow the loads a direct path across the railway crossing. Temporary bollards would need to be installed over this hardstand.
440	Mildura VIC	Benetook Ave onto Seventh St E GPS Link: https://goo.gl/maps/BnvS1sBNeMyLJFTz7	6 metres wide	Left Hand Turn	Left Hand Sweeping Bend
441	Mildura VIC	Seventh St E onto Sturt Hwy GPS Link: https://goo.gl/maps/DQWUk8DTpwWCFrudA	6 metres wide	Right hand turn	Load to cross the incorrect side of the roundabout. 2 Median strips will need to be made trafficable, and signs made removable.
443	Buronga NSW	Sturt Hwy roundabout at Silver City Hwy GPS Link: https://goo.gl/maps/eSH3JMoHGAK221YVA	6 metres wide	Right hand turn	Load to cross the incorrect side of the roundabout.
467	Paringi NSW	Sturt Hwy GPS Link: https://goo.gl/maps/aF7DrHsfBEBnzMBZ8	90.0 metres long 10.0 metres wide	Left Hand Merge	Possible parking on correct side of the road. Stockpile site/ check condition.
519	Euston NSW	Sturt Hwy GPS Link: https://goo.gl/maps/4WnQVv7TwnbDad8z5	6 metres wide	Left Hand Turn	Travel left at round-about. Median strips will need to be made trafficable, and signs made removable.
599	Balranald NSW	Sturt Hwy (market st) onto Sturt Hwy GPS Link: https://goo.gl/maps/xve3Zgbu9tkgPvVv7	6 metres wide	Right Hand Turn	Load to cross the incorrect side of the corner. Median strips will need to be made trafficable, and signs made removable.
600.0	Balranald NSW	Sturt Hwy onto Mallee Hwy (Yanga Way) GPS Link: https://goo.gl/maps/sUqgHV9PKpzvi5g9	8 metres wide	Right Hand Turn	No problems with this section of road.

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KM index	Location	Section of road	Critical Measurement	Procedure	Notes
612.0	Yanga NSW	Yanga Way onto Balranald Rd GPS Link: https://goo.gl/maps/LvawNfJ77rM3pQdAA	8 metres wide	Left Hand Turn	No problems with this section of road.
623.0	Kyalite NSW	Balranald Rd onto Arundel Rd GPS Link: https://goo.gl/maps/3wFVKmM2PLJrJLoJ8	8 metres wide	Site Entrances	Client to provide adequate swept path for the blade to enter site.
638.0	Moolpa NSW	Balranald Rd into western site entrances GPS Link: https://goo.gl/maps/H89xRCMFvskXDHvEG	8 metres wide	Site Entrances	Client to provide adequate swept path for the blade to enter site.

313.0 Km's: Sturt Hwy under the Big Dunlop Tyre at Yamba SA.

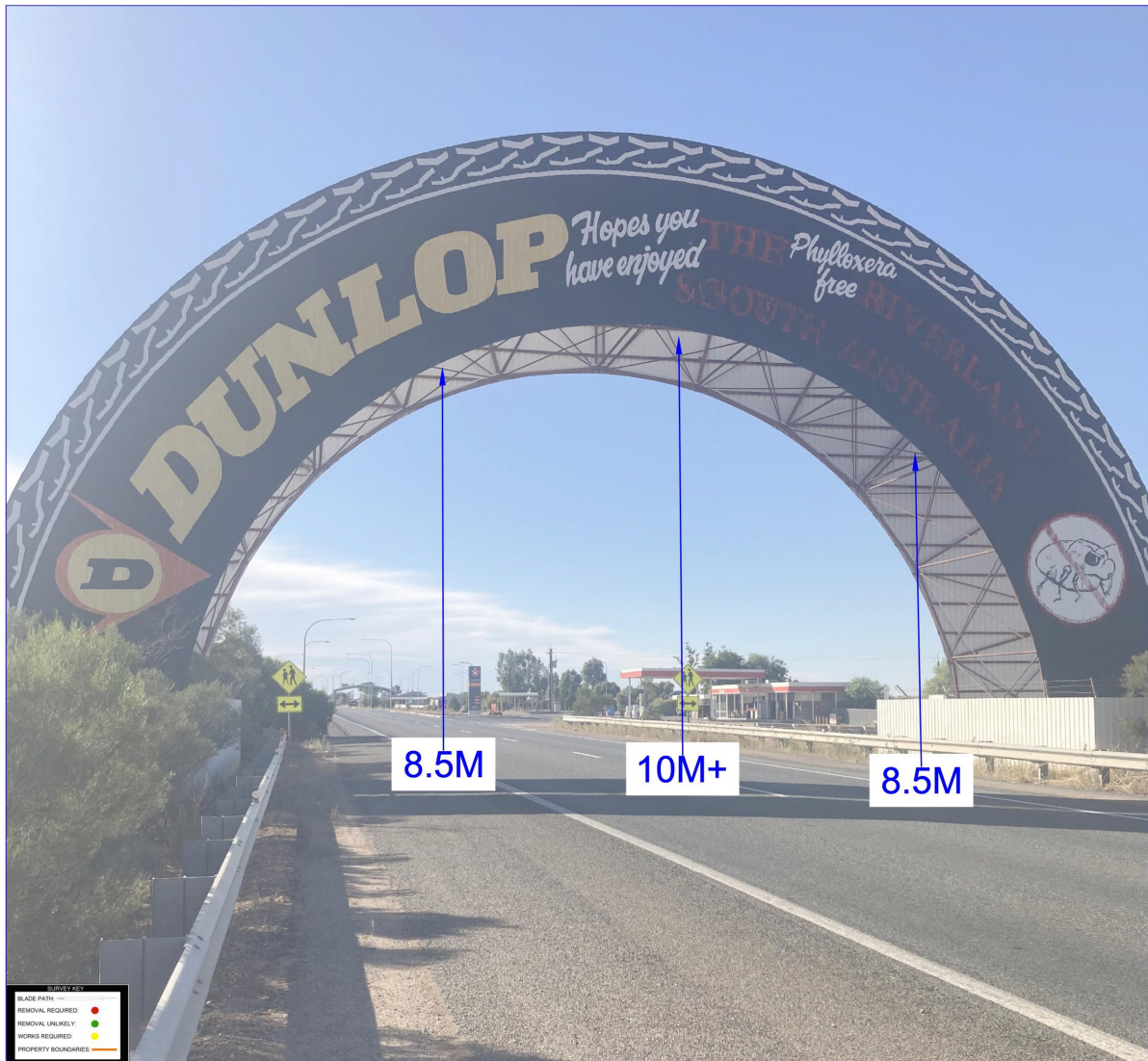


Figure 42 - Approaching the structure

GPS LINK FOR THIS LOCATION: <https://goo.gl/maps/YLKNB6KuDyZezoQS6>

PROCEDURE: Continue on the Sturt Highway

COMMENTS: Loads move to the centre of the road under this structure.

14.0 Conclusion Route 3

After studying all options and undertaking a route survey, this route is suitable in its current condition 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.

LENGTH

- ☐ The longest combination that can travel along this route without upgrades is **35 metres overall length**.
- ☐ If loads exceed 35 metres in overall length, then several corners will need to have hardstand added. They are listed in the index.

OVERHEAD STRUCTURES: (6.5 metres maximum loaded height)

BRIDGES:

- ☐ Majority of the bridges have been used previously for similar loads; however, every load will need to be checked/assessed for capacity to be sure that they could transit this route.

OVERHEAD UTILITIES:

- ☐ This route will need to be checked by an authorised scoping company. It is likely that a route of at least 6.5 metres is required for this project.

VEGETATION:

- ☐ The route requires a moderate amount of vegetation clearing at various locations.

PAVEMENT:

- ☐ The Pavement on all roads have adequate highway pavement up until midway along Balranald Road.
- ☐ Balranald Road becomes gravel and would need to be maintained throughout the delivery of the turbines.

RAIL ASSETS:

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

COMPONENTS THAT WOULD USE ROUTE 3:

- ☐ Loads over 5.2 metres in height which are usually the towers.
- ☐ Transformers and switchrooms if they exceed 5.2 metres in height. Bridge capacity would still need to be checked for the weight of the transformers.

ROUTE STUDY

Port Adelaide to Junction Rivers Windfarm

15.0 Route Survey 4: Port Adelaide SA to Junction Rivers windfarm NSW, High Load Route, Option 2

COMPONENTS: Larger items with a Max loaded height 6.4 metres

DISTANCE: 659 kilometres

GPS LINK: <https://maps.app.goo.gl/n87wjSd8tn6y6pt18>

VIA: Via Ocean Steamers Road, Eastern Parade, Port River Expressway, Northern Connector, Port Wakefield Highway "A1", Mallala Road, Old Port Wakefield Road, Gawler Road, Two Wells Rd, Wilkinson Road, Hatcher Road, Oates Road, Redbanks Road, Mudla Wirra Road, College Road, Cliff Road, Gartrell Street, Roseworthy Road, Thiele Hwy, East Terrace, Thiele Hwy, Goyder Hwy, Sturt Hwy, Airport Rd, Government Rd, Ral Ral Ave, Wentworth-Renmark Rd, Renmark Rd, Silver City Hwy, Armstrong Ave, Silver City Hwy, Sturt Hwy, Yanga Way, Balranald Road.

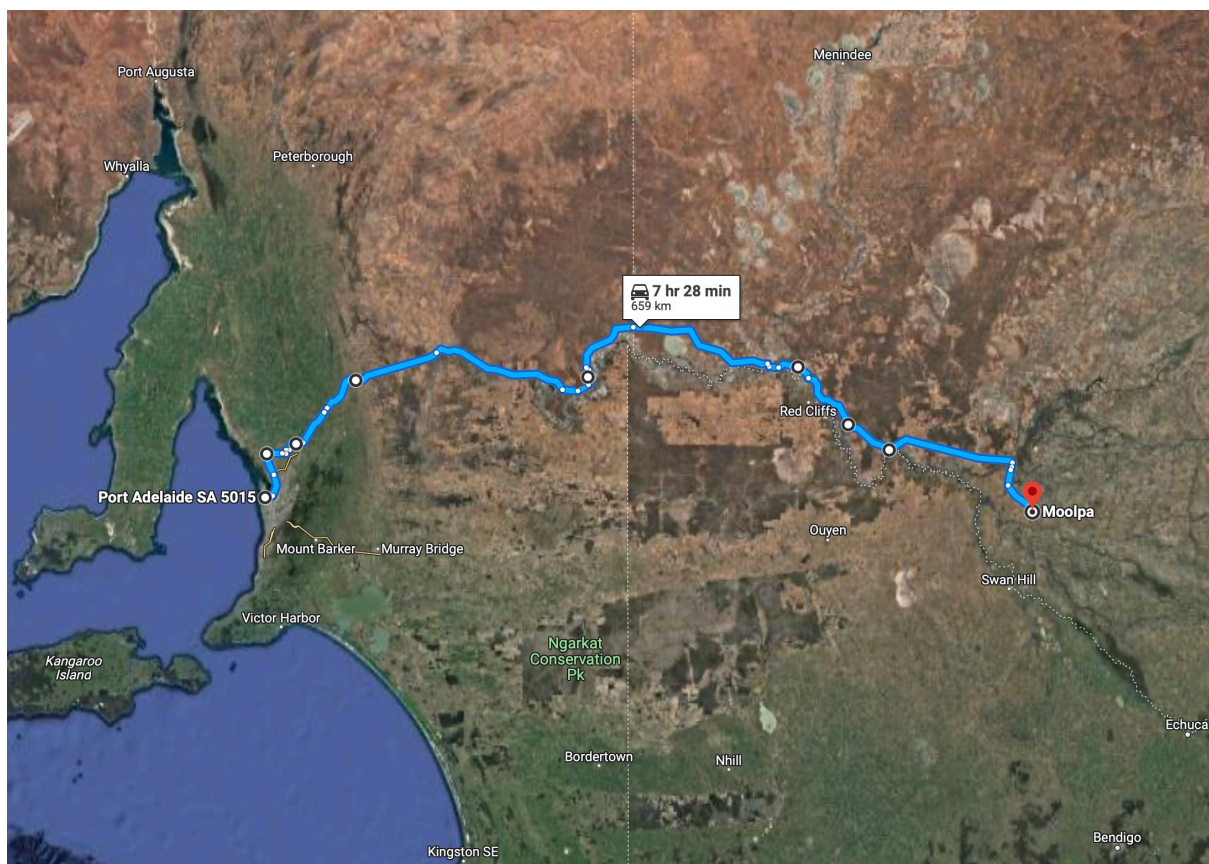


Figure 43 - Route 4

ROUTE STUDY

Port Adelaide to Junction Rivers Windfarm

KEY	
ROAD MODIFICATION	
CAUTION	
EMERGENCY PARKING	

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
0.0	Port Adelaide SA	Port storage area across Ocean Steamers Rd and onto eastern Parade GPS Link: https://goo.gl/maps/tK6JqG1AidMDqSs5	Length: 75.0 metres Width: 8.0 metres Height: N/A	Drive out of storage area and cross to the incorrect side of Eastern Parade	No problems with this section of road.to be modified.
0.2	Port Adelaide SA	Eastern Parade over rail crossing GPS Link: https://goo.gl/maps/UfZfLvNDkKxRvTed9	Length: 80.5 metres Width: 10.0 metres Height: N/A	Travel directly ahead	Approval required from Rail network provider before crossing this structure. Spotter to Guide load through this pinchpoint.
0.9	Gilman SA	The Eastern Parade onto the Port River Expressway GPS Link: https://goo.gl/maps/mPFZDKYzewGxvm8S8	Length: 70.0 metres Width: 10.9 metres Height: N/A	Left hand turn	No problems with this section of road.
0.9 to 4.3	Gilman to Wingfield SA	Port River Expressway GPS Link: https://goo.gl/maps/rpFDwXM41ACyR2Vv6	Length: 100.0 metres Width: 10.0 metres Height: 6.2 metres	Travel directly ahead.	Loads over 6.2 metres will need to travel over the top of Hansen Road.
4.3	Wingfield SA	Port River Expressway onto Northern Connector GPS Link: https://goo.gl/maps/BtCb3VPGg3yqpCt57	Length: 100.0 metres Width: 8.0 metres Height: 6.5 metres	Left hand bend	No problems with this section of road.
4.3 To 19.2 Km's	Wingfield to Waterloo Corner SA	Northern Connector GPS Link: https://goo.gl/maps/onzFMbVb3PpaJq52A	Length: 100.0 metres Width: 10.5 metres Height: 6.5 metres	Travel directly ahead	No problems with this section of road.
19.8	Waterloo Corner SA	Northern Connector onto Port Wakefield Highway "A1" GPS Link: https://goo.gl/maps/yclGFDgzQ8idciv47	Length: 100.0 metres Width: 8.0 metres Height: N/A	Right hand merge onto A1	No problems with this section of road.
33.4	Two Wells SA	Port Wakefield Highway "A1" onto Mallala Road GPS Link: https://goo.gl/maps/U78MZSBL43D2	Length: 50 metres Width: 8.0 metres Height N/A	Right hand turn	No problems with this section of road
33.7	Two Wells SA	Mallala Road onto Old Port Wakefield Road GPS Link: https://goo.gl/maps/CzpYPwc9cBM2	Length: 50 metres Width: 8.0 metres Height N/A	Right hand turn	No problems with this section of road
33.9	Two Wells SA	Old Port Wakefield Road onto Gawler Road GPS Link: https://goo.gl/maps/TfEJNdGpFP12	Length: 50 metres Width: 8.0 metres Height N/A	Left hand turn	No problems with this section of road
44.6	Gawler River SA	Gawler Road onto Two Wells Road GPS Link: https://goo.gl/maps/ijQJCiKW6uH2	8.0 metres wide	Travel directly ahead	No problems with this section of road

ROUTE STUDY

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KM index	Location	Section of road	Critical Measurement	Procedure	Notes
46.8	Gawler River SA	Two Wells Road onto Wilkinson Road GPS Link: https://goo.gl/maps/6DeWPk5rKF32	Length: 35 metres Width: 8.0 metres Height N/A	Left hand turn	If loads exceed an overall length of 35 metres, there will need to be some hardstand added to this intersection.
49.3	Kangaroo Flat SA	Wilkinson Road onto Hatcher Road GPS Link: https://goo.gl/maps/XQ8cNtqzQUG2	Length: 35 metres Width: 8.0 metres Height N/A	Left hand turn	If loads exceed an overall length of 35 metres, there will need to be some hardstand added to this intersection.
51.3	Kangaroo Flat SA	Hatcher Road onto Oates Road GPS Link: https://goo.gl/maps/qXcjdWzNxCdWl8AA	Length: 60 metres Width: 8.0 metres Height N/A	Left hand bend	No problems with this section of road
54.5	Kangaroo Flat SA	Oates Road onto Redbanks Road GPS Link: https://goo.gl/maps/tVCy2BFmnZ72	Length: 40 metres Width: 8.0 metres Height N/A	Right hand turn	If loads exceed an overall length of 40 metres, there will need to be some hardstand added to this intersection.
55.1	Kangaroo Flat SA	Redbanks Road onto Mudla Wirra Road GPS Link: https://goo.gl/maps/2yC31AASRxM2	Length: 35 metres Width: 8.0 metres Height N/A	Left hand turn	If loads exceed an overall length of 35 metres, there will need to be some hardstand added to this intersection.
56.5	Roseworthy SA	Mudla Wirra Road onto College Road GPS Link: https://goo.gl/maps/bu28YmqsfDP2	Length: 40 metres Width: 8.0 metres Height N/A	Right hand turn	If loads exceed an overall length of 40 metres, there will need to be some hardstand added to this intersection.
60.8	Roseworthy SA	College Road onto Cliff Road GPS Link: https://goo.gl/maps/n6BLSSaCqHT2	Length: 40 metres Width: 8.0 metres Height N/A	Left hand turn	If loads exceed an overall length of 40 metres, there will need to be some hardstand added to this intersection.
61.4	Roseworthy SA	Cliff Road onto Gartrell Street GPS Link: https://goo.gl/maps/UGN6vnZ8DDG2	9.0 Metres into 9.0 metres	Right hand turn	No problems with this section of road
62.5	Roseworthy SA	Gartrell Street onto Roseworthy Road GPS Link: https://goo.gl/maps/Py6YuP9aWYH2	Length: 80 metres Width: 9.0 metres Height N/A	Left hand bend	No problems with this section of road
64.8	Kingsford SA	Roseworthy Road onto Thiele Hwy GPS Link: https://goo.gl/maps/GpH6AaL4yS4exER47	Length: 80 metres Width: 9.0 metres Height N/A	Left hand turn	No problems with this section of road
88.3	Kapunda SA	Thiele Hwy onto East Terrace GPS Link: https://goo.gl/maps/vqakXVMZMhCpA59	Width: 6.5 metres	Right hand turn	Sign to be made removable
91.8	Kapunda SA	East Terrace onto Thiele Hwy GPS Link: https://goo.gl/maps/wVeWZTnSnDTAaxEs6	Length: 60 metres Width: 6.0 metres	Right hand turn	Overhead conductor clearance to be confirmed
174	Morgan SA	Thiele Hwy corner at Morgan GPS Link: https://goo.gl/maps/i8dyAS2ding9Jx6U6	Length: 45 metres Width: 6.0 metres	Left hand turn	Overhead conductor and streetlight clearance to be confirmed

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Port Adelaide to Junction Rivers Windfarm

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
175	Morgan SA	Thiele Hwy onto Goyder Hwy GPS Link: https://goo.gl/maps/itxK3tVH3dQw1FqcA	Width: 7.0 metres	Travel directly ahead	No problems with this section of road
264	Monash SA	Goyder Hwy onto Sturt Hwy GPS Link: https://goo.gl/maps/WiNggF14DYrwsHGh8	Length: 75 metres Width: 9.0 metres	Left hand turn	No problems with this section of road
273	Monash SA	Sturt Hwy Roundabout GPS Link: https://goo.gl/maps/ri4hoYgDyaATRDIU9	Width: 6.0 metres	Left hand turn	Use slip lane to continue on Sturt Hwy
281	Renmark South SA	Sturt Hwy onto Airport Rd GPS Link: https://goo.gl/maps/Mxs4f678Vpz62Jyw7	Width: 7.5 metres Length: 50 metres	Left hand turn	Delineators to be made removable
281.4	Renmark South SA	Airport Rd onto Government Rd GPS Link: https://goo.gl/maps/WATqdQgh8owVcP9	Width: 7.0 metres Length: 45 metres	Right hand turn	Hardstand to be installed on outside of corner. Overhead conductor clearance to be confirmed.
291	Renmark North SA	Government Rd onto Ral Ral Ave GPS Link: https://goo.gl/maps/BwhFYX9pHpitfAMw7	Width: 6.5 metres Length: 40 metres	Left hand turn	No problems with this section of road
293	Cooltong SA	Ral Ral Ave onto Wentworth-Renmark Rd GPS Link: https://goo.gl/maps/TA1wuHwQG7ArPdFy8	Width: 7.0 metres Length: 60 metres	Right hand turn	No problems with this section of road
298-431	Cooltong SA/NSW	Wentworth-Renmark Rd GPS Link: https://maps.app.goo.gl/bmrVkuTT0zAtaxVm6	Width: 4.5 metres	Travel directly ahead	Gravel road with multiple stock crossings. Road to be graded prior to commencement and maintained for project duration. May become unusable in wet conditions.
338	Donggall NSW	Wentworth-Renmark Rd becomes Renmark Rd GPS Link: https://goo.gl/maps/ZuFAU4EdRT1KAf6m9	Width: 4.5 metres	Travel directly ahead	SA-NSW border
432	Wentworth NSW	Renmark Rd onto Silver City Hwy GPS Link: https://goo.gl/maps/Wv3auw9tcb4ahhDy6	Width: 6.0 metres Length: 60 metres	Right hand turn	No problems with this section of road
434	Wentworth NSW	Silver City Hwy onto Armstrong Ave GPS Link: https://goo.gl/maps/hQWFRzcn8Lc1Cc2	Width: 9.0 metres Length: 50 metres	Left hand turn	Signs to be made removable as required and island made trafficable
434.5	Wentworth NSW	Armstrong Ave onto Silver City Hwy GPS Link: https://goo.gl/maps/TCQ4L3c37NcUCRJa6	Width: 5.0 metres Length: 50 metres	Right hand turn	Load to use slip lane on incorrect side of road.
441	Curlwaa NSW	Corner on Silver City Hwy at Calder Hwy GPS Link: https://goo.gl/maps/38FSGyGc5VJkUJ4A	Width: 10.0 metres Length: 45 metres	Left hand turn	Signs to be removed and median made trafficable. Load to cross over median strip.
464	Buronga NSW	Silver City Hwy onto Sturt Hwy GPS Link: https://goo.gl/maps/yccENVHn8JN3MU196	Width: 6.0 metres Length: 50 metres	Left hand turn first exit on roundabout	Signs to be removed on island and island made trafficable.
488	Paringi NSW	Sturt Hwy GPS Link: https://goo.gl/maps/aF7DrHsfBEBnzMBZ8	90.0 metres long 10.0 metres wide	Left Hand Merge	Possible parking on correct side of the road. Stockpile site/ check condition.

ROUTE STUDY

Port Adelaide to Junction Rivers Windfarm

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
540	Euston NSW	Sturt Hwy roundabout at Carey St GPS Link: https://goo.gl/maps/4Vn5V4v7TambDad5c5	6 metres wide	Left hand turn first exit on roundabout	Signs on entry and exit island to be relocated or made removable and islands made trafficable.
620	Balranald NSW	Sturt Hwy (market st) onto Sturt Hwy GPS Link: https://goo.gl/maps/hve4ZgtuRkqnPyv7	6 metres wide	Right Hand Turn	Load to cross the incorrect side of the roundabout. Median strips will need to be made trafficable, and signs made removable.
621.0	Balranald NSW	Sturt Hwy onto Mallee Hwy (Yanga Way) GPS Link: https://goo.gl/maps/sUqgHV9PKpzyi5g9	8 metres wide	Right Hand Turn	No problems with this section of road.
633.0	Yanga NSW	Yanga Way onto Balranald Rd GPS Link: https://goo.gl/maps/LvawNfJ77rM3pQdAA	8 metres wide	Left Hand Turn	No problems with this section of road.
644.0	Kyalite NSW	Balranald Rd onto Arundel Rd GPS Link: https://goo.gl/maps/tbdfVYKcM2PLJrJLoJ8	8 metres wide	Site Entrances	Client to provide adequate swept path for the blade to enter site.
659.0	Moolpa NSW	Balranald Rd into western site entrances GPS Link: https://goo.gl/maps/H85zROMEvyaXDHvE9	8 metres wide	Site Entrances	Client to provide adequate swept path for the blade to enter site.

16.0 Conclusion Route 4

After studying all options and undertaking a route survey, this route can be made suitable for transporting the proposed components provided the modifications outlined in the report are completed as a minimum.

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

LENGTH

- ☐ The longest combination that can travel along this route without upgrades is **35 metres overall length**
- ☐ If loads exceed 35 metres in overall length, then several corners will need to have hardstand added. They are listed in the index.

OVERHEAD STRUCTURES: (6.5 metres maximum loaded height)

BRIDGES:

- ☐ This route will need to have all bridge structures checked for capacity before the route could be deemed suitable for use.

OVERHEAD UTILITIES:

- ☐ This route will need to be checked by an authorised scoping company. It is likely that a route of at least 6.5 metres is required for this project.

VEGETATION:

- ☐ The route requires a moderate amount of vegetation clearing at various locations.

PAVEMENT:

- ☐ The Pavement on the majority of the roads have adequate highway pavement.
- ☐ Wentworth-Renmark Road is gravel and will require grading prior to commencement and to be maintained for the duration of the project. The road may become unusable in wet conditions which will impact delivery schedules.
- ☐ Balranald Road becomes gravel and would need to be maintained throughout the delivery of the turbines.

RAIL ASSETS:

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

COMPONENTS THAT WOULD USE ROUTE 3:

- ☐ Loads over 5.2 metres in height which are usually the towers.
- ☐ Transformers and switchrooms if they exceed 5.2 metres in height. Bridge capacity would still need to be checked for the weight of the transformers.

17.0 Route 3 & Route 4 Comparison

We have given 2 different options for the large diameter towers which will allow the project some flexibility if either Route 3 or 4 becomes a problem. Below are the pros and cons of each of the routes.

ROUTE 3:

Pros

- ☐ Route is currently used for similar weight loads.
- ☐ Sealed for the entirety.
- ☐ Shorter out of the 2 routes.

Cons

- ☐ Travels through 3 states.
- ☐ Travels through a major town centre of Mildura.
- ☐ Far larger number of overhead services would need to be relocated.
- ☐ Busier route that would likely affect more motorists.

ROUTE 4:

Pros

- ☐ Travels through 2 states only.
- ☐ Route is remote for long distances and wouldn't affect as many motorists.
- ☐ Fewer overhead services to relocate.

Cons

- ☐ Route would need to be assessed for capacity.
- ☐ Route has 133 km's of unsealed road.
- ☐ Slightly longer route.

CONCLUSION:

Both routes should be kept as options for the project. This takes away some risk to the project in case one of the routes becomes unusable for any reason.

While route 3 is likely the easiest option and the least complicated, route 4 does have merit. If the SW REZ had support from the states if all projects are looked at, as a whole.

Route 4 could be upgraded along the gravel section to accommodate all of the towers, which would take a significant volume of large OSOM loads off the busiest section of the Sturt Highway for over 300 kilometres.

Additionally, there are likely to be far fewer overhead assets to relocate on route 4.

18.0 References

Rex J Andrews P/L
Rex J Andrews P/L Route survey # 348 REV03
Windlab Developments Pty Ltd
Google Earth/Maps
Nearmaps
NHVR (OSOM)
Australian Load Restraint Guide

Disclaimer: This route study is provided on the basis of information only purposes and is to be used strictly as a guide only; Government approvals would be required before these routes could be deemed suitable for transporting the components over the listed routes.

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

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

Actual approved routes may differ from those surveyed.

Proposed routes may change subject to approvals from authorities.

The blade listed in this report is a prototype only. More information on this blade is required before confirmation that the route can accommodate this size load.

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.