



APPENDIX I TRANSPORT ROUTE ASSESSMENT



ROUTE STUDY: SOMEVA P/L
PROJECT: HILLS OF GOLD WINDFARM
EX PORT OF NEWCASTLE.

08/04/2021 REV 04

| Rev. | Date | Change | Responsible | Checked |
|------|----------|-------------------------|-------------|---------|
| 00 | 17/06/19 | Route Assessed | W Andrews | ✓ |
| 00 | 03/07/19 | Report compiled | W Andrews | ✓ |
| 00 | 19/07/19 | Report completed | W Andrews | ✓ |
| 01 | 04/09/19 | GE 158 blade added | W Andrews | ✓ |
| 02 | 19/03/21 | Revised routes | W Andrews | ✓ |
| 03 | 30/03/21 | Updated survey drawings | W Andrews | ✓ |
| 04 | 08/04/21 | Various revisions | W Andrews | ✓ |

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1.0 Introduction

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

This Route survey took place on 17-06-19.

2.0 Evaluation

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

(Mark below boxes with an X)

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

3.0 Project data.

Date of latest Route Assessment. 17/06/2019

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

Project name. White Hills of Gold windfarm

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

Turbine type (Example)

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

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

4.0 Transport combinations (Examples).

Nacelle with drivetrain out (12l x 4.2w x 4.2h x 70T)

Possible transport configuration. Prime mover with 8x8 Platform trailer.

Overall length: 30.0l x 4.2w x 4.9h x 122.0T.

Drivetrain (7l x 3.5w x 3.5h x 68T)

Possible transport configuration. Prime mover with 2x8-4x8 Platform Low loader.

Overall length: 30.0l x 4.2w x 4.9h x 122.0T.

Nacelle with drivetrain in (12l x 4.2w x 4.2h x 125T)

Possible transport configuration. Prime mover with 11x8 Platform trailer.

Overall length: 49.0l x 4.2w x 5.2h x 195.0T.

Hubs (4.0l x 3.5w x 3.8h x 50.0T)

Possible transport configuration. Prime mover with 2x8 4x8 Low Loader.

Overall length: 28.0l x 5.1w x 5.9h x 92.5T.

Blade 170 rotor (82.0l x 4.5w x 4.0h x 35T)

Possible transport configuration. Prime mover with 2x8 dolly with 2x8 jinker.

Overall length: 92.0l x 5.6w x 5.3h x 86.5T.

Blade 158 rotor (65.4l x 4.7w x 3.4h x 24T)

Possible transport configuration. Prime mover with 1x4 dolly with 4x4 extendable blade trailer.

Overall length: 92.0l x 5.6w x 5.3h x 86.5T.

Bottom section (16.2l x 4.8 x 4.5 x 100T)

Possible transport configuration. Prime mover with 8x8 Platform trailer.

Overall length: 30.0l x 4.8w x 5.5h x 108.5T.

Mid lower section (21.8l x 4.5 x 4.5 x 95.2T)

Possible transport configuration. Prime mover with 10x8 platform trailer.

Overall length: 32.0l x 4.5w x 5.5h x 157.5T.

Mid section (21.8l x 4.5 x 4.5 x 72.5T)

Possible transport configuration. Prime mover with 10x8 platform trailer.

Overall length: 32.0l x 4.5w x 5.5h x 137.5T.

Mid upper section (28.8l x 4.5 x 4.5 x 52.3T)

Possible transport configuration. Prime mover with 3x4-2x8 Dolly jinker

Overall length: 40.0l x 4.5w x 5.5h x 92.5T.

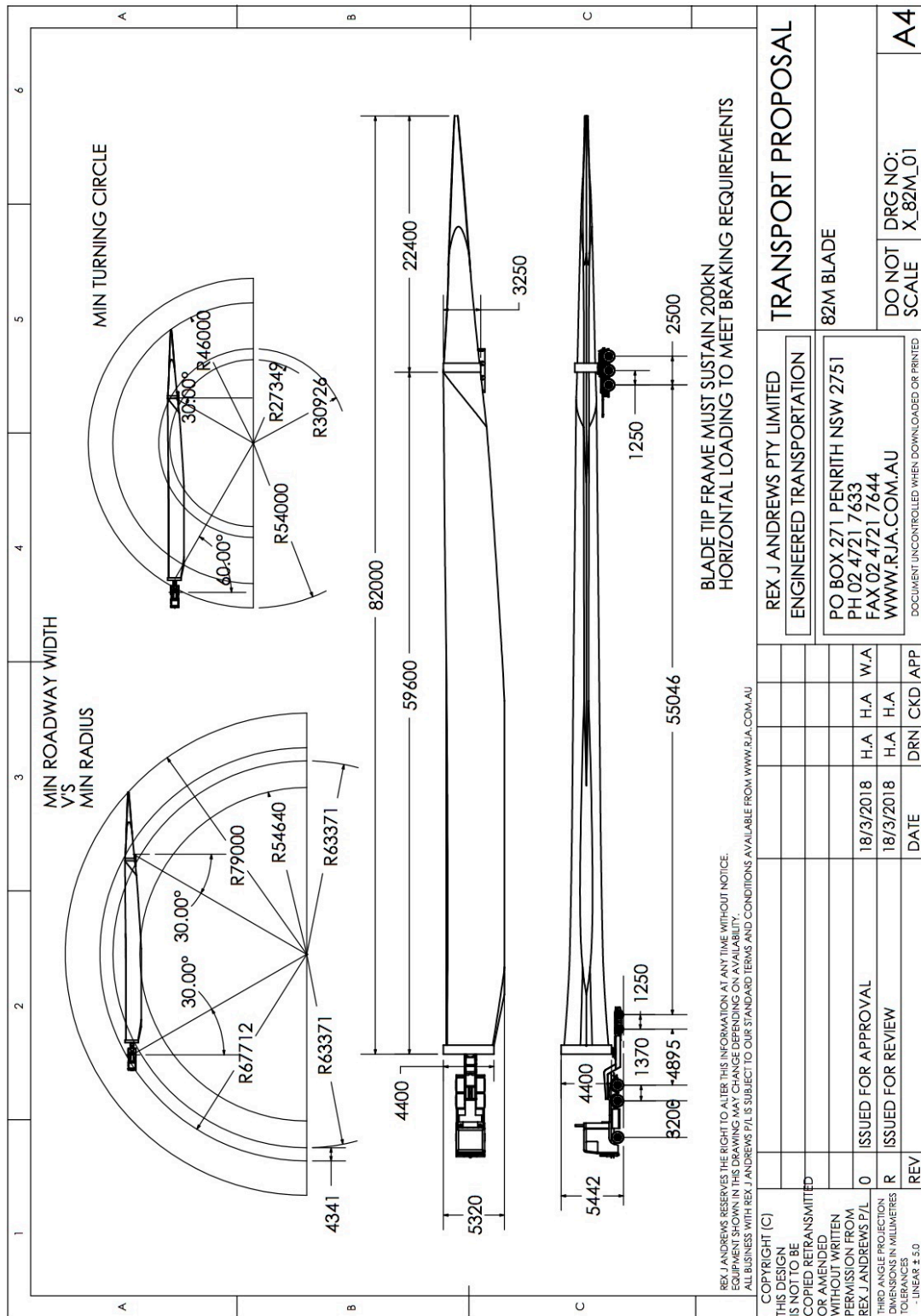
Top section (30.8l x 4.5 x 3.4h x 50.0T)

Possible transport configuration. Prime mover with 3x4-2x8 Dolly jinker

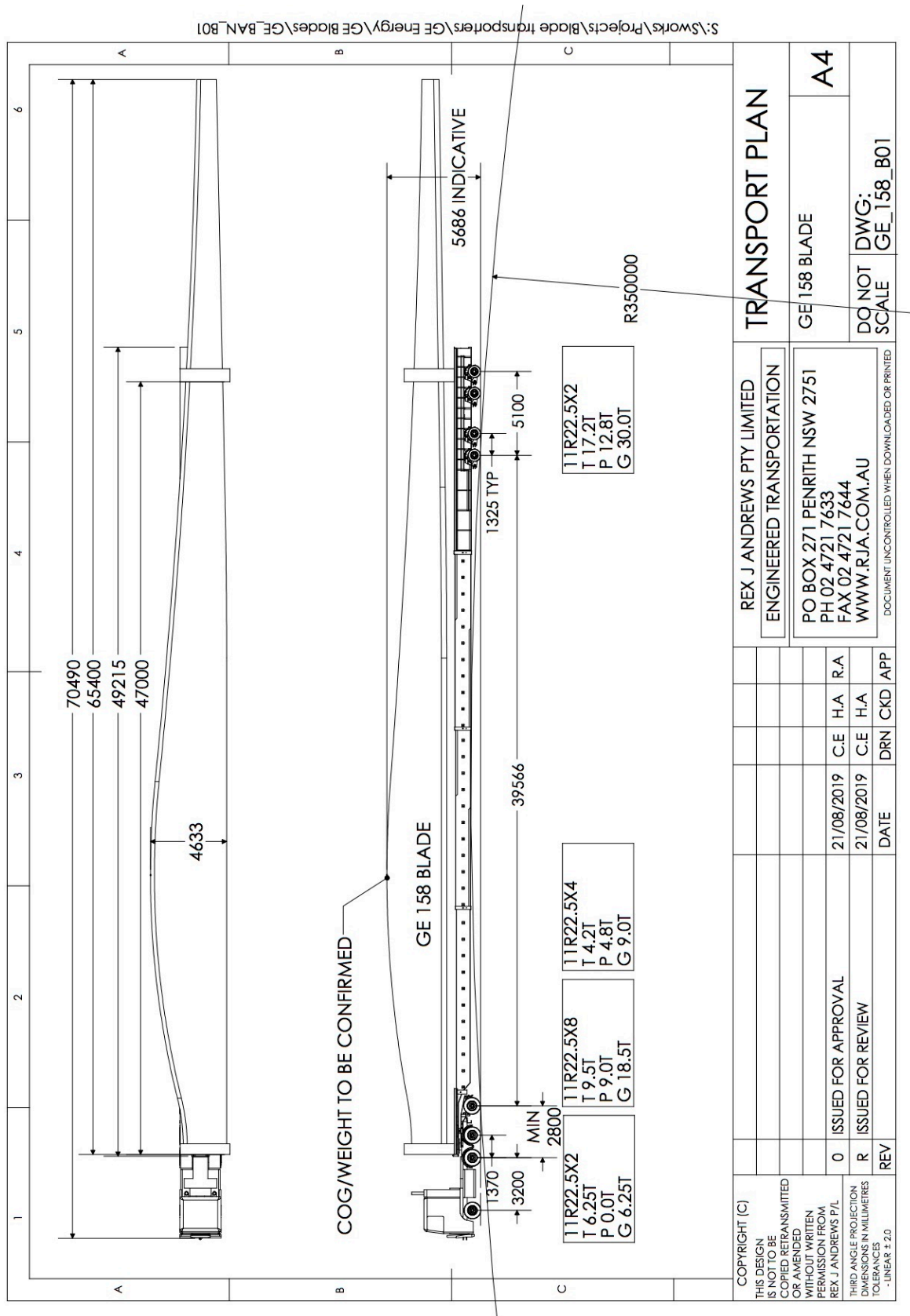
Overall length: 40.0l x 4.5w x 5.5h x 90.5T.

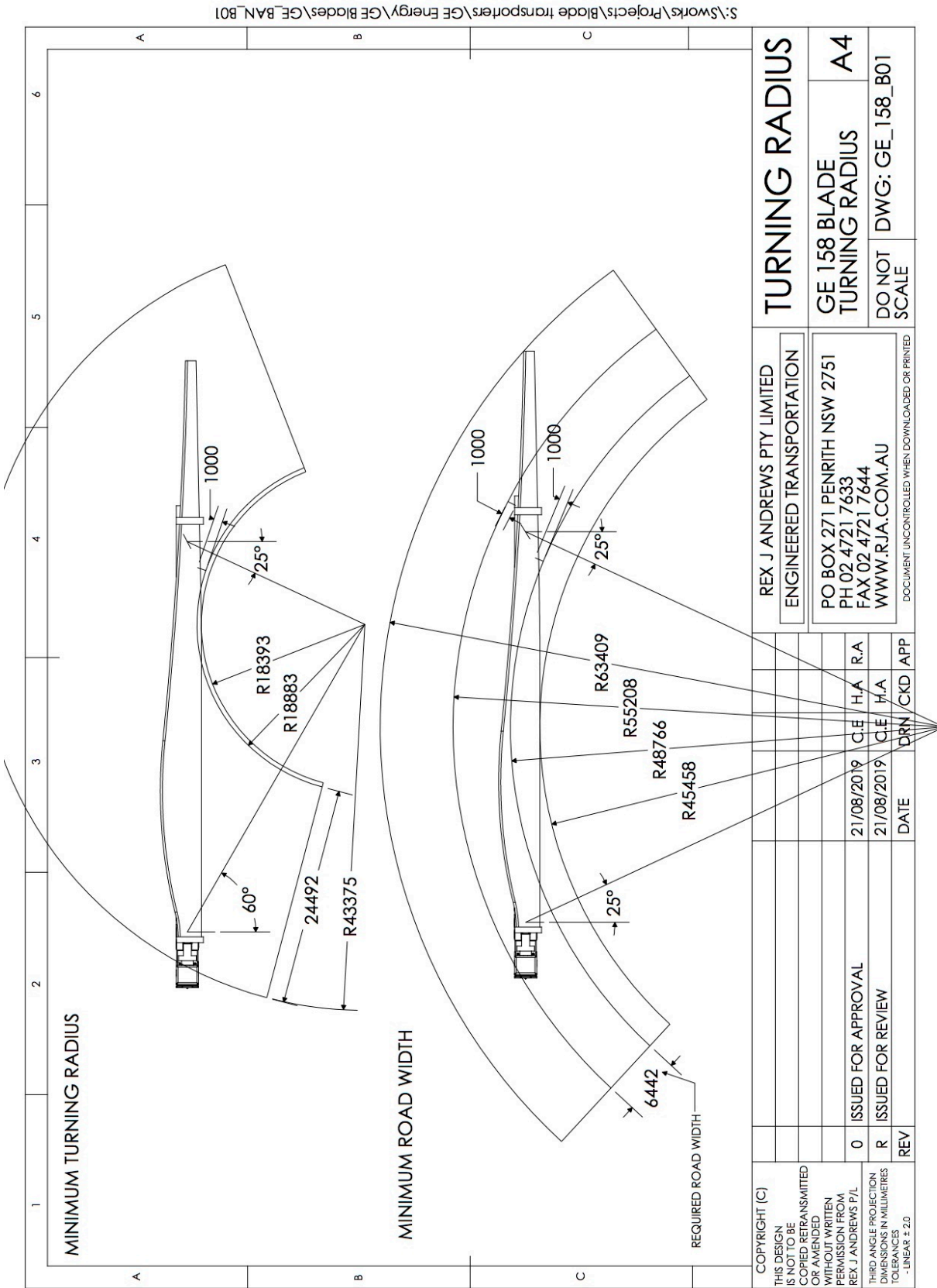
5.0 Transport drawings (Examples)

Blade diagram (170 rotor):



Blade diagram (158 rotor):





TRANSPORT PROPOSAL

GOLDWIND HUB 3.0MW

DO NOT SCALE

DRG NO: GOLD_CAI_HUB_03 A4

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

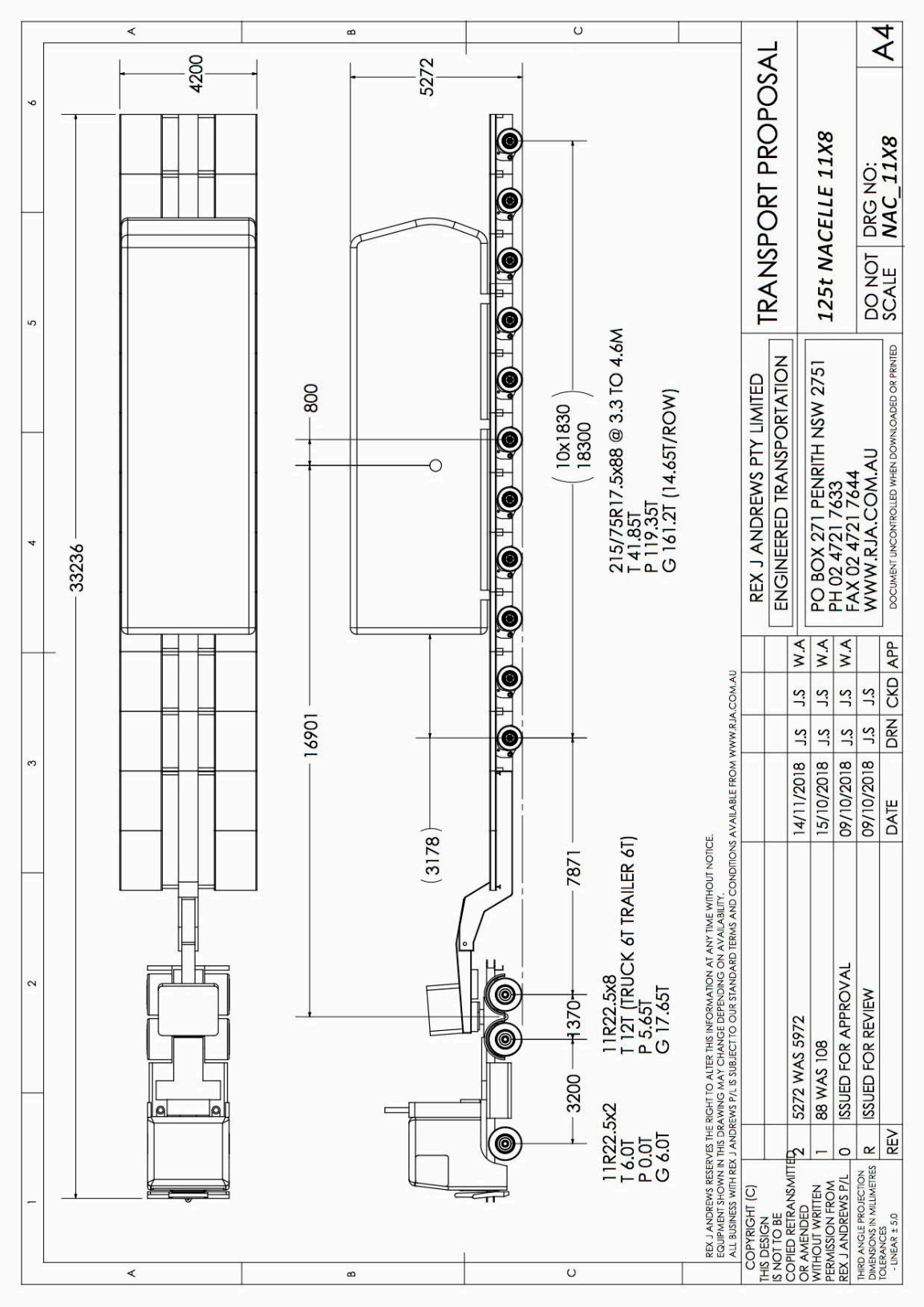
LOAD MUST BE PLACED ON DRY RUBBER
OR OTHER MATERIAL ACHIEVING
MIN COF OF 0.4 AT ALL CONTACT POINTS

REX J ANDREWS PTY LIMITED
ENGINEERED TRANSPORTATION

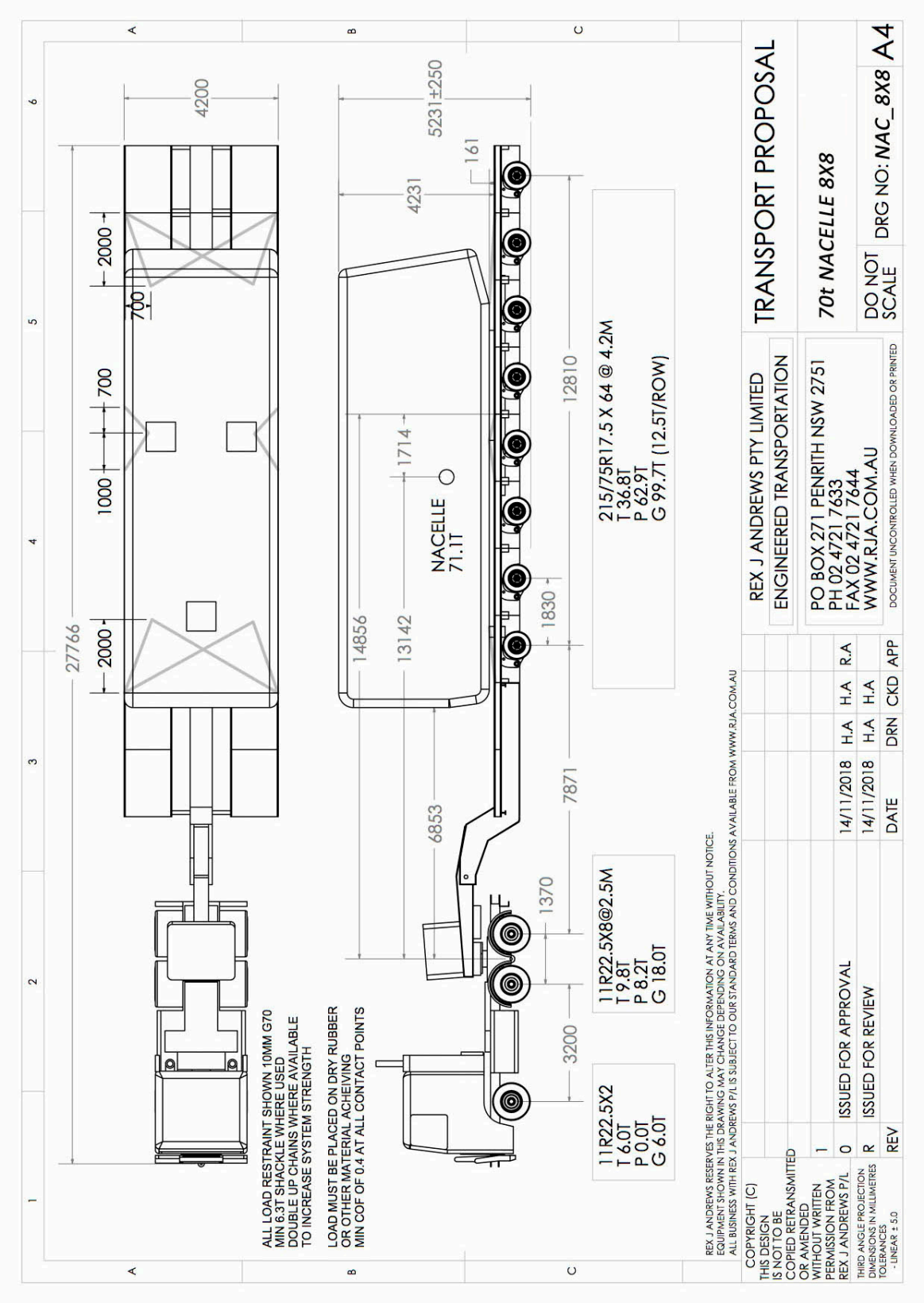
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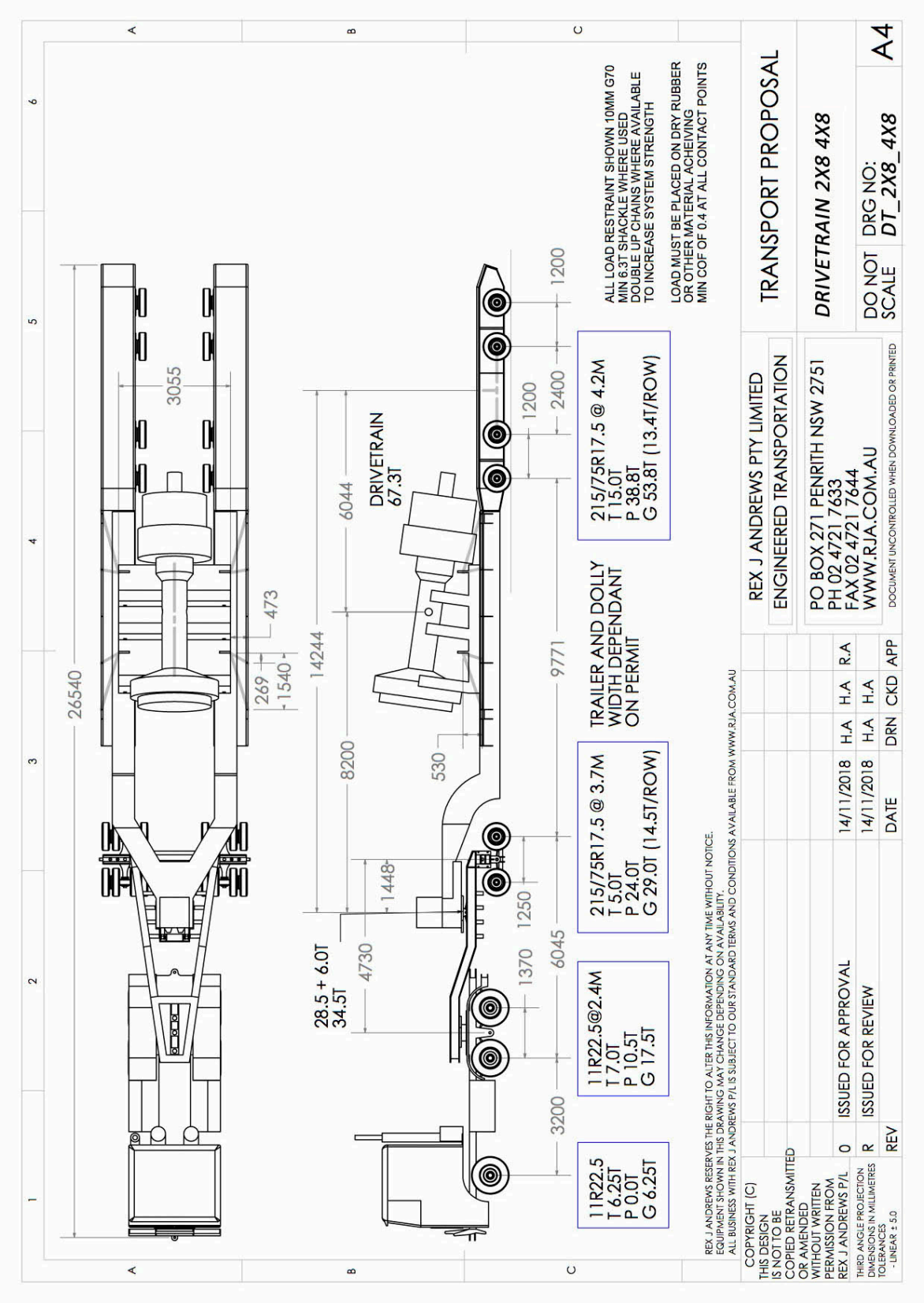
Nacelle Drivetrain in:



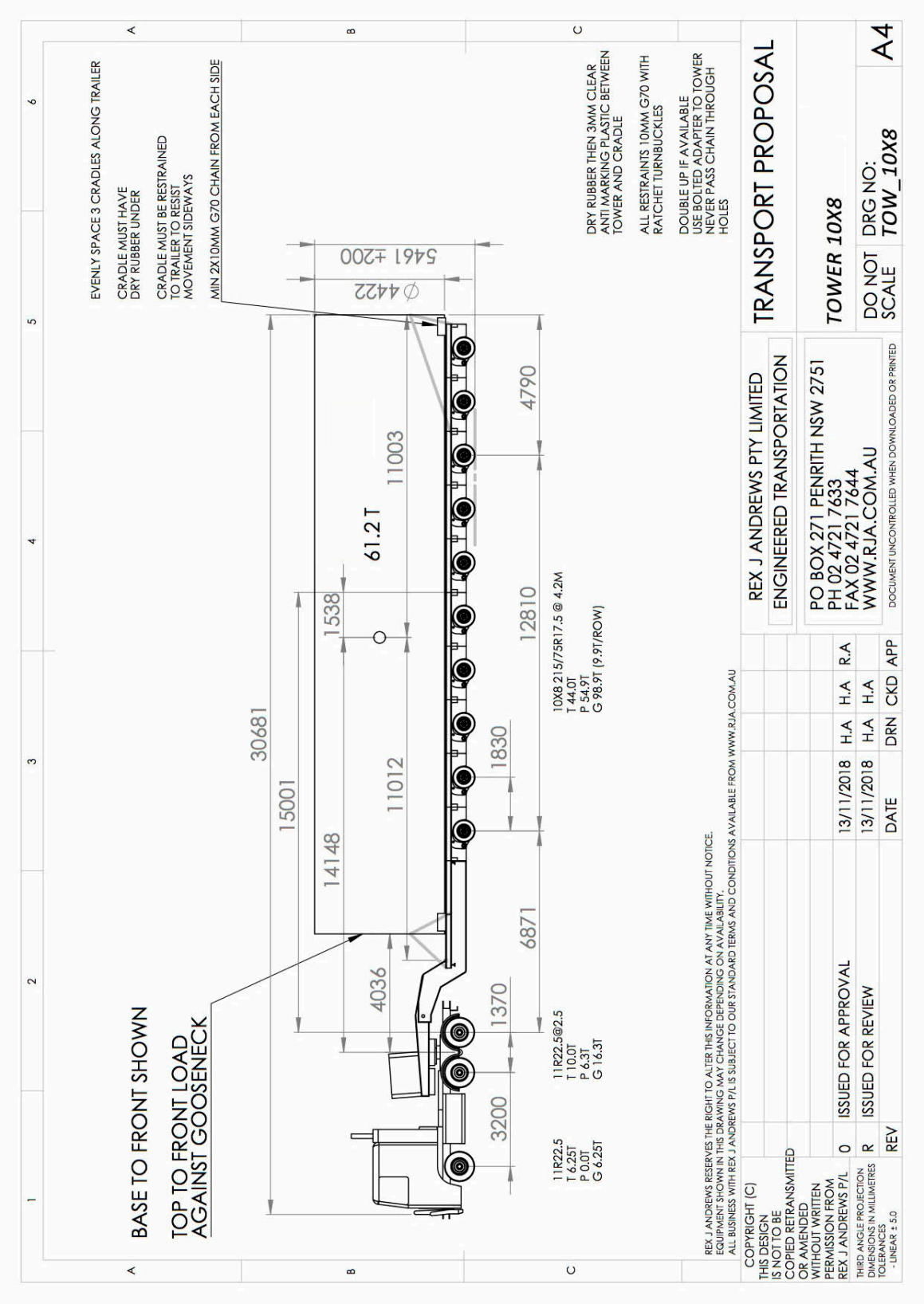
Nacelle drivetrain out:



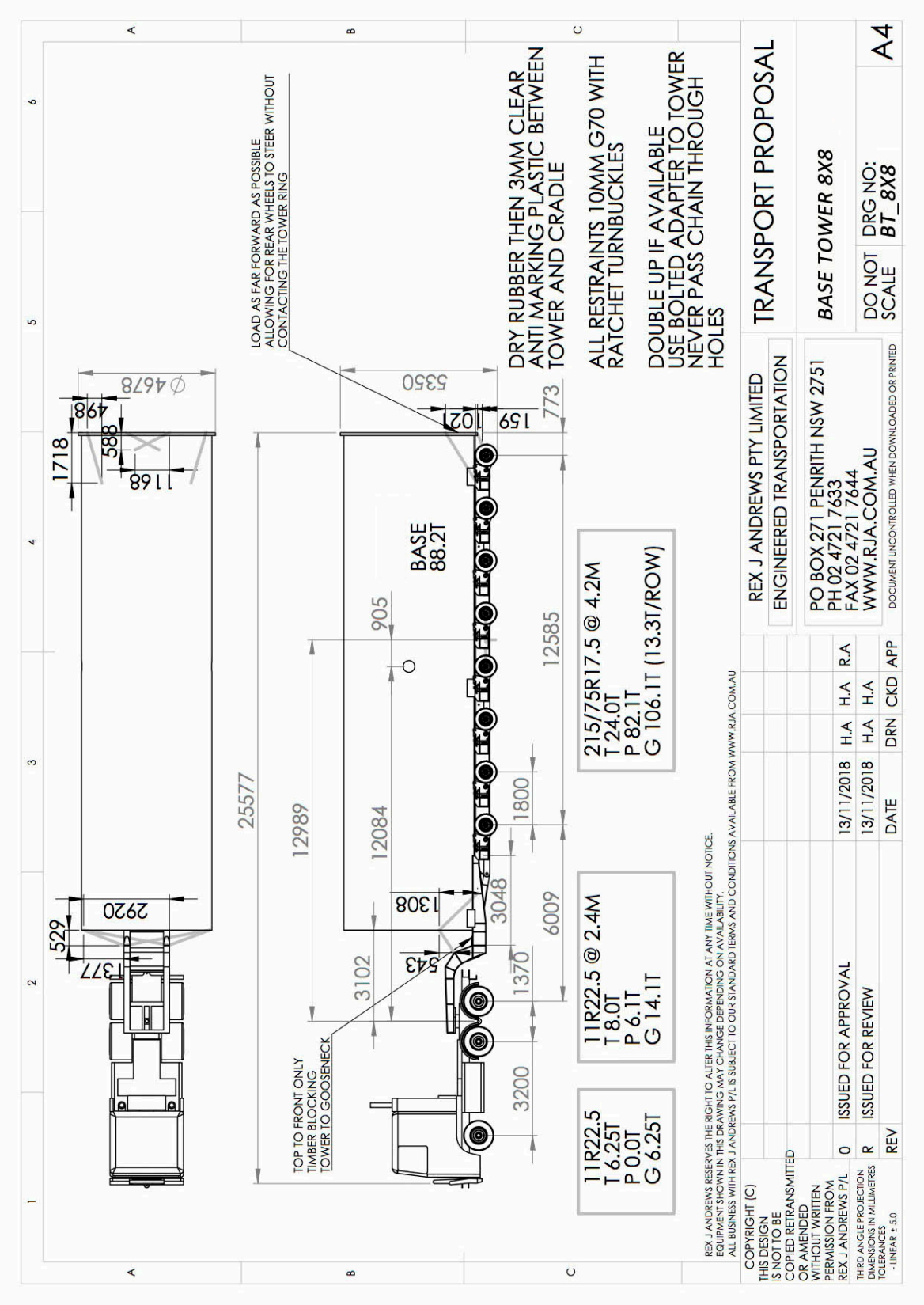
Drivetrain:



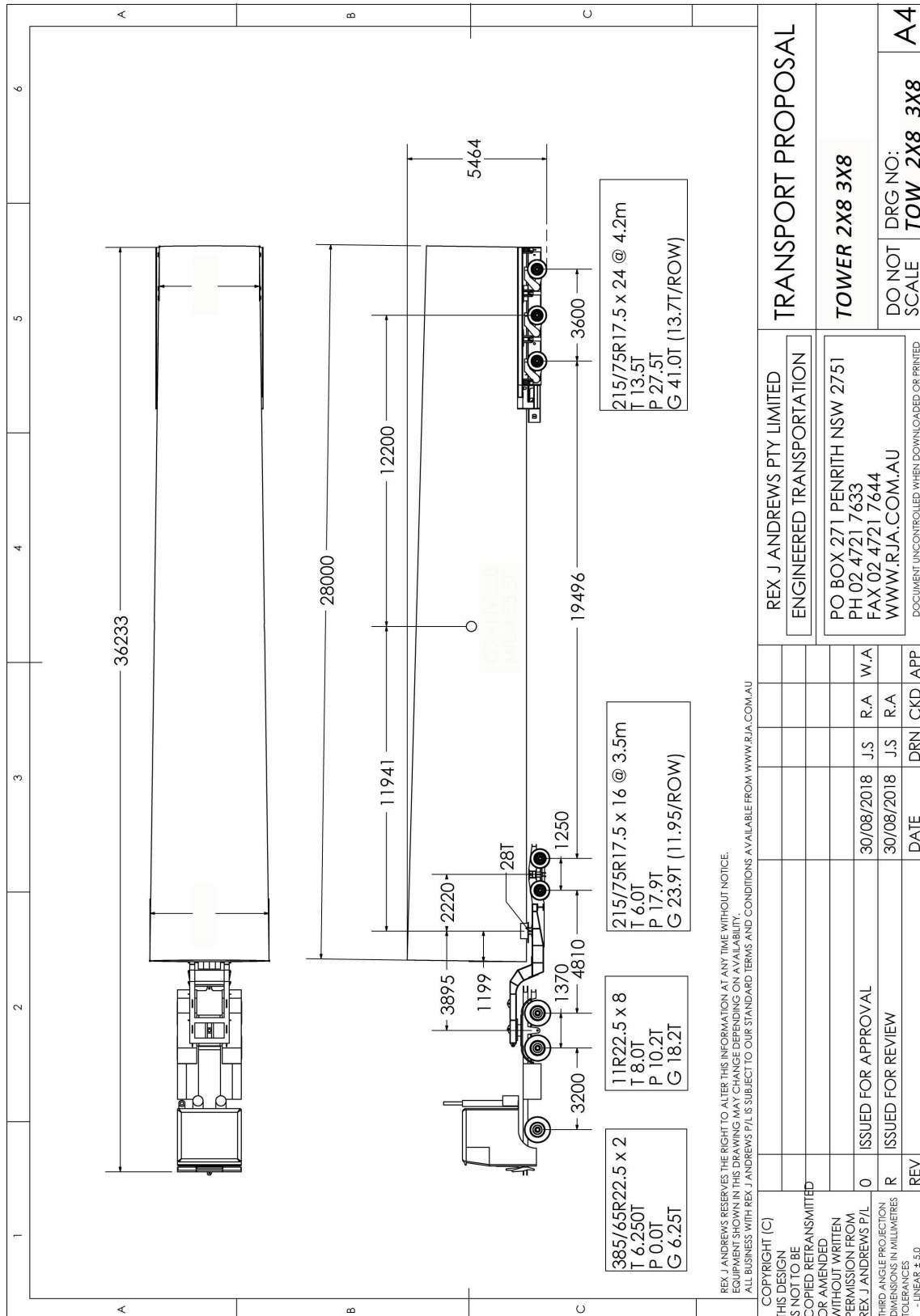
Tower trailer 10x8:



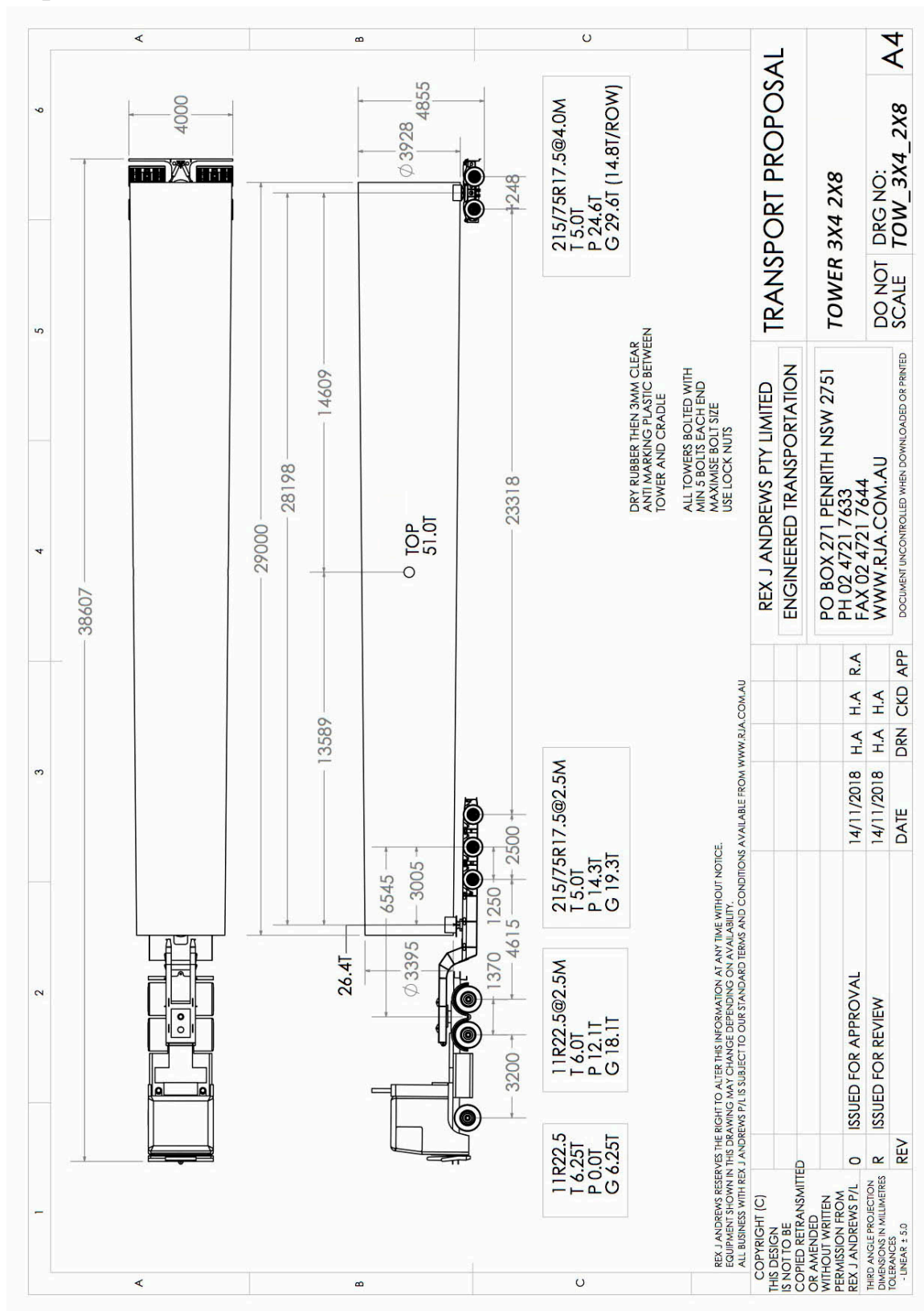
Tower trailer 8x8:



Mid tower trailer 10x8:



Top tower trailer:



Top View Dimensions:

- Overall Length: 29985
- Front Overlap: 5034
- Front Section Length: 10440
- Front Section Width: 3400
- Front Section Depth: 5300
- Front Section Width (Inner): 3400

Side View Dimensions:

- Overall Width: 17635
- Front Section Width: 8857
- Front Section Depth: 12050
- Front Section Width (Inner): 8780
- Front Section Depth (Inner): 4730
- Front Section Width (Inner): 3250
- Front Section Depth (Inner): 1480
- Front Section Width (Inner): 33.3+3.5
- Front Section Depth (Inner): 36.8T
- Front Section Width (Inner): 1250
- Front Section Depth (Inner): 1370
- Front Section Width (Inner): 3200
- Front Section Depth (Inner): 3425
- Front Section Width (Inner): 12887
- Front Section Depth (Inner): 5400
- Front Section Width (Inner): 1800
- Front Section Depth (Inner): 5947
- Front Section Width (Inner): 5300
- Front Section Depth (Inner): 7435

Specifications:

- 385/65R22.5X2
T 6.25T
P 0.0T
G 6.25T
- 11R22.5X8
T 6.0T
P 11.5T
G 17.5T
- 215/75R17.5X32
T 5.0T
P 25.3T
G 30.3T (15.2T/ROW)
- 215/75R17.5X32
T 16.8T
P 33.9T
G 50.7T (12.7T/ROW)

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ISSUED FOR APPROVAL

ISSUED FOR REVIEW

THIRD ANGLE PROJECTION

DIMENSIONS IN MILLIMETRES

TOLERANCES

LINEAR ± 5.0

ANGULAR ± 5.0

REVISIONS

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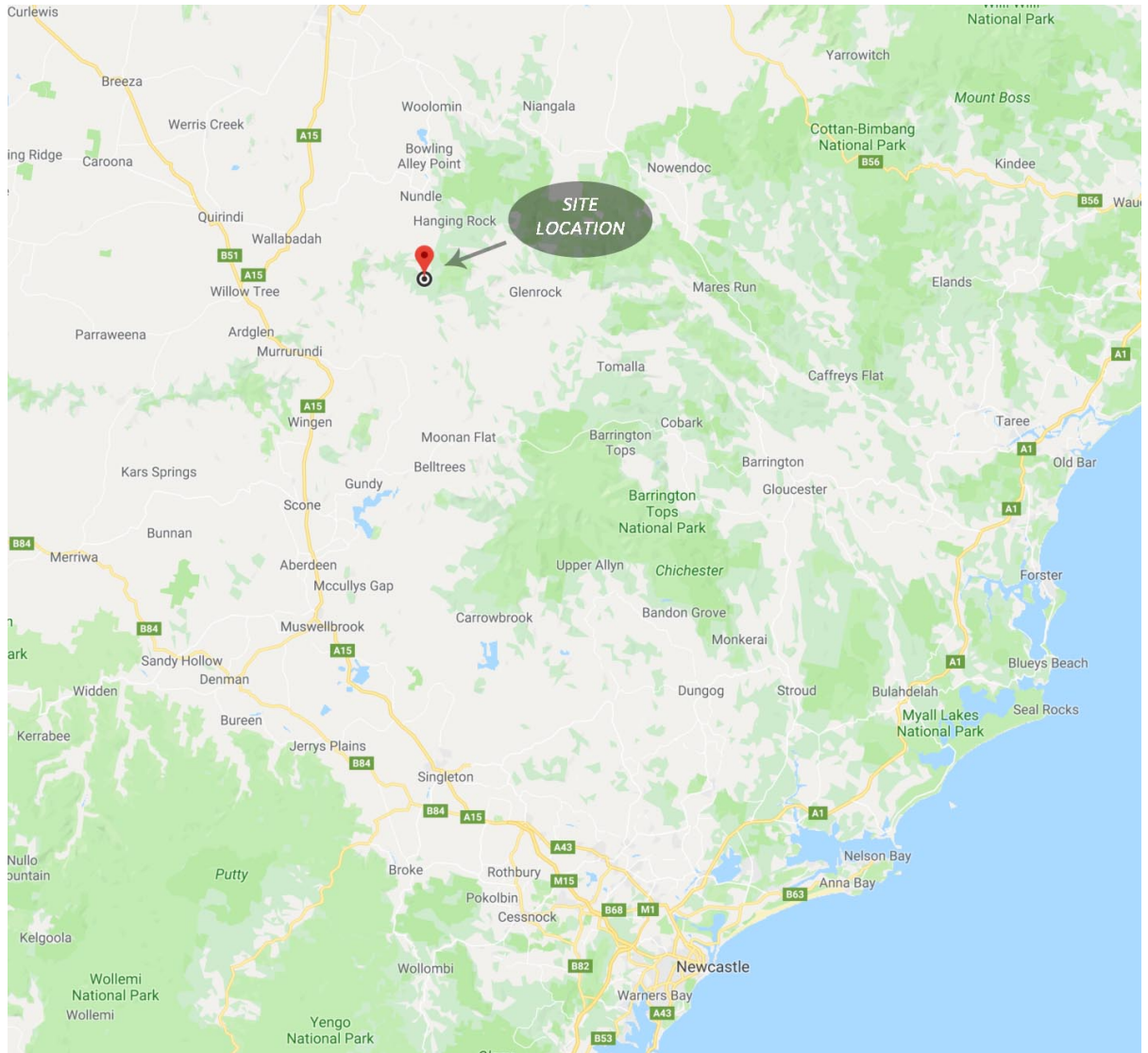
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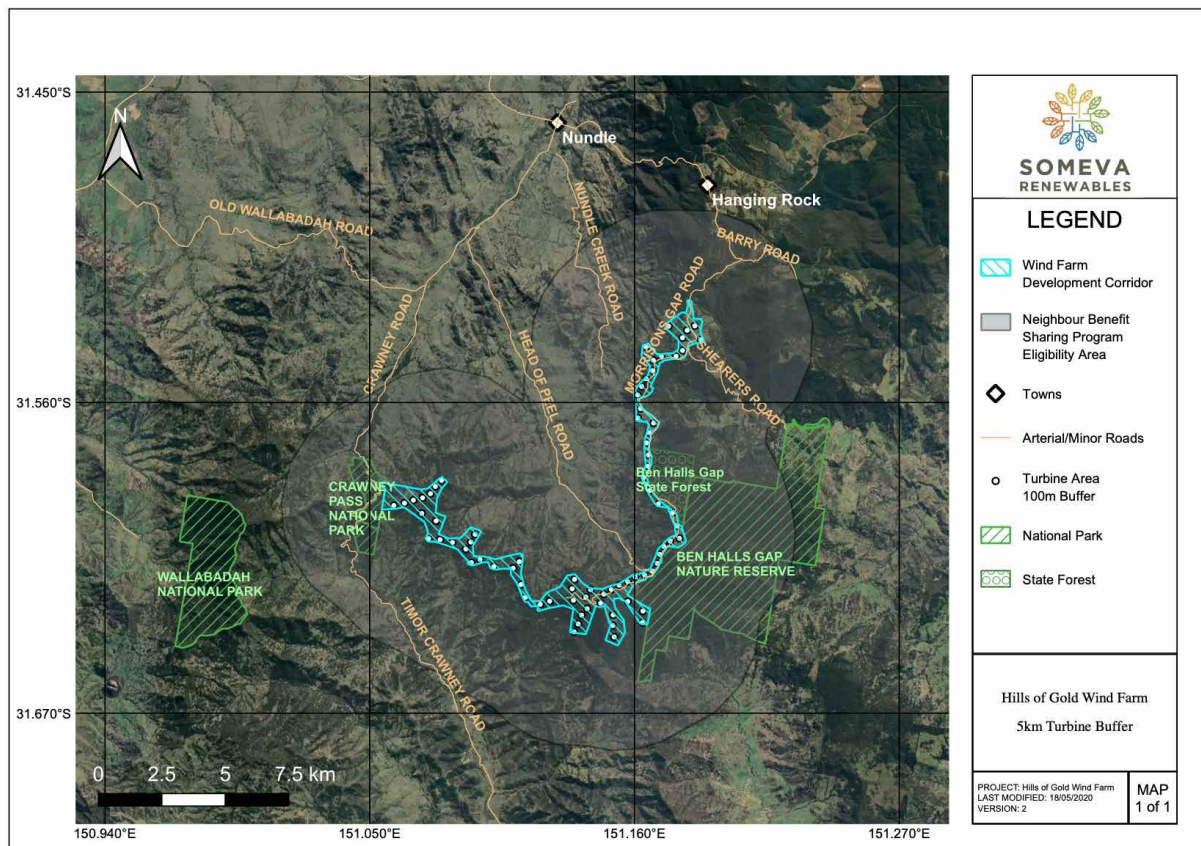
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6.0 Site Location.

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



7.0 Windfarm site map.



8.0 Port of Import.

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

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

Image 1: Port overview.

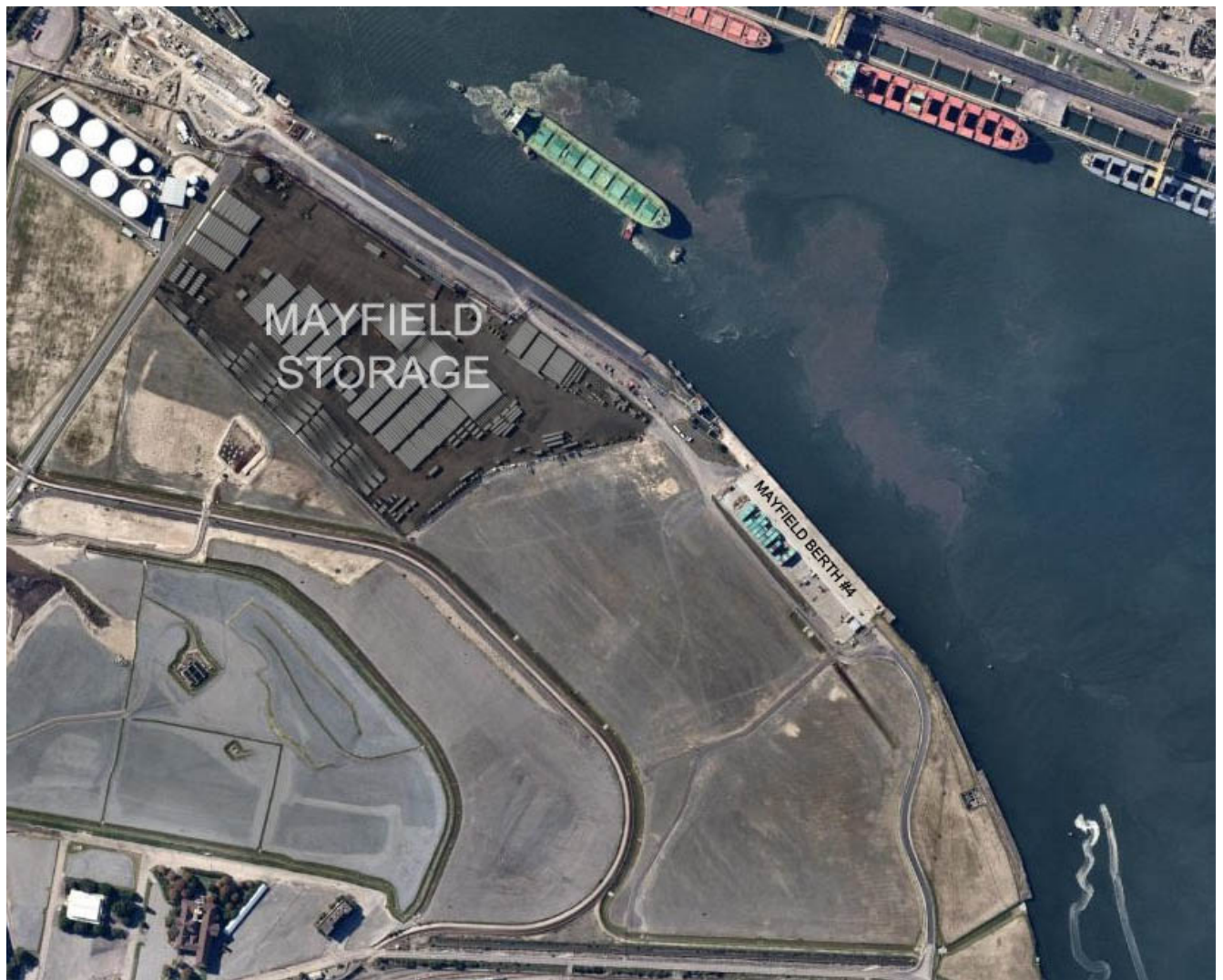


Image 2: Mayfield #4 Berth



Image 3: Mayfield #4 Port storage area.



Image 4: Mayfield #4 Port storage area.



9.0 Transport Summary.

We have based this study on the turbine components, and towers entering Australia via the Port of Newcastle. The following shows the blade route and 3 additional routes depending on the size of the load.

ROUTE A: PORT OF NEWCASTLE TO HILLS OF GOLD WF, BLADE ROUTE: (326.0

kilometres): After completing this route survey, we believe the following is the most suitable option for the blades, and possibly the towers and motors.

This route took us via Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Golden Highway, Denman Road, (Muswellbrook bypass via Bengalla Road, Wybong Road, Kayuga Road, Ivermein Street, Dartbrook mine access Road), New England Highway, Lindsays Gap Road, Nundle Road, Crosby Street, Oakenville Street, Old Hanging Rock Road, Barry Road, Morrisons Gap Road.

GPS Link: <https://goo.gl/maps/NrA7rYBLwoV6PE7n7>

ROUTE B: PORT OF NEWCASTLE TO HILLS OF GOLD WF, LOADS UP TO 5.2

METRES HIGH: (284.0 kilometres): After completing this route survey, we believe the following is the most suitable option for loads up to 5.2 metres in height, except the blades.

This route took us via Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Bell Street, Victoria Street, Market Street, New England Highway, Lindsays Gap Road, Nundle Road, Crosby Street, Oakenville Street, Old Hanging Rock Road, Barry Road, Morrisons Gap Road.

GPS Link: <https://goo.gl/maps/rouAWyxLZ53pMB3v7>

ROUTE C: PORT OF NEWCASTLE TO HILLS OF GOLD WF, LOADS OVER 5.2 METRES

HIGH: (328.0 kilometres): After completing this route survey, we believe the following is the most suitable option for loads over 5.2 metres in height, except the blades.

This route took us via Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Golden Highway, Denman Road, Thomas Mitchell Drive, New England Highway, Bell Street, Victoria Street, Market Street, New England Highway, Lindsays Gap Road, Nundle Road, Crosby Street, Oakenville Street, Old Hanging Rock Road, Barry Road, Morrisons Gap Road.

GPS Link: <https://goo.gl/maps/tMkKEEQKNL7azUDi7>

ROUTE D: PORT OF NEWCASTLE TO HILLS OF GOLD WF, STANDARD LOADS:

(284.0 kilometres): After completing this route survey, we believe the following is the most suitable option for standard loads up to 3.5 metres wide, and 5.2 metres in height.

This route took us via Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Lindsays Gap Road, Nundle Road, Crosby Street, Oakenville Street, Old Hanging Rock Road, Barry Road, Morrisons Gap Road.

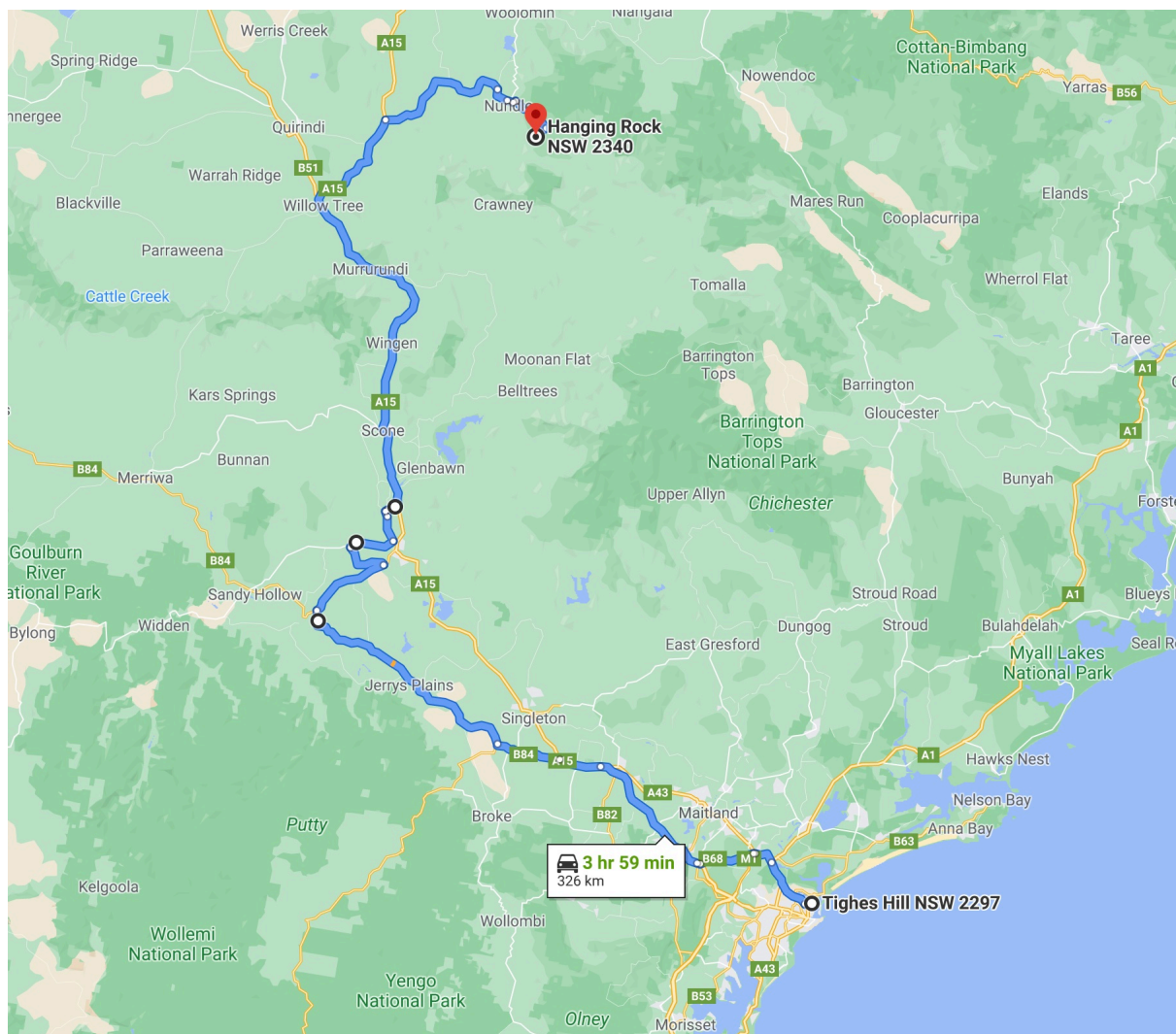
GPS Link: <https://goo.gl/maps/rd4SwBkQqnga1RjY7>

10.0 Route Survey A: Newcastle port to Hills of Gold WF Via the Golden Hwy. (Blade route)

Distance: (326.0 Kilometres).

Via: Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Golden Highway, Denman Road, (Muswellbrook bypass via Bengalla Road, Wybong Road, Kayuga Road, Ivermein Street, Dartbrook mine access Road), New England Highway, Lindsays Gap Road, Nundle Road, Crosby Street, Oakenville Street, Old Hanging Rock Road, Barry Road, Morrisons Gap Road.

GPS Link: <https://goo.gl/maps/NrA7rYBLwoV6PE7n7>



ROUTE STUDY
Newcastle to Hills of Gold
Windfarm

| KEY | |
|------------------------|--|
| MODIFICATIONS REQUIRED | |
| MINOR WORKS OR CAUTION | |
| PARKING | |

| KM index | Location | Section of road | Critical Measurement | Procedure | Comments 170.0m rotor | Comments 158.0m rotor |
|----------|----------|--|-----------------------------------|--------------------------|--|--|
| 0.0 | Mayfield | Mayfield #4 berth onto Selwyn Street GPS link: https://goo.gl/maps/aflwPYKuNdm | Clearance: Length: 70.0 metres | Right hand turn | Both options will require the fence to be relocated on the left-hand side. Some hardstand will need to be added to the left side entering the corner and while exiting the corner. | Fence may need to be modified. |
| 0.4 | Mayfield | Selwyn Street rail crossing GPS link: https://goo.gl/maps/AmohE54hKSz | Clearance: Width: 9.0 metres | Travel directly ahead | Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution. | Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution. |
| 1.3 | Mayfield | Selwyn Street onto George Street GPS link: https://goo.gl/maps/qXeHvBtCp4D2 | Clearance: Length: 70.0 metres | Right hand turn | The sign on the inside of the corner will need to be made removable. | No problem with this section of road. |
| 1.4 | Mayfield | George Street onto Industrial Drive https://goo.gl/maps/s4ayrsuoAsD2 | Clearance: Length: 70.0 metres | Moderate right-hand turn | Load to travel across to the correct side to the correct side. The traffic signal in the middle of the intersection will need to be relocated. Additionally, hardstand will need to be placed on the south side of the intersection. | Load to travel across to the correct side to the correct side. Hardstand will need to be placed on the south side of the intersection. |

ROUTE STUDY
Newcastle to Hills of Gold
Windfarm

| | | | | | | |
|------|---------------|---|---|--------------------------|--|--|
| 4.9 | Mayfield | Industrial Drive under traffic signals GPS link: https://goo.gl/maps/YmqhiS2iR582 | Clearance: Height: 5.4 Metres | Travel directly ahead | The lowest traffic signal on route is at the intersection of Steel River Blvd. Trucks that exceed 5.3 meters will need to travel in the right-hand lane. | The lowest traffic signal on route is at the intersection of Steel River Blvd. Trucks that exceed 5.3 meters will need to travel in the right hand lane. |
| 5.5 | Mayfield West | Industrial Drive onto Maitland Road GPS link: https://goo.gl/maps/Kn49dhWG2qG2 | Clearance: Length: 70.0 metres | Moderate right hand turn | The blades will need to cross to the incorrect side 150 metres prior to the intersection, then return to the correct side 120 metres past the intersection. No road modifications required. | The blades will need to cross to the incorrect side 150 metres prior to the intersection, then return to the correct side 120 metres past the intersection. No road modifications required. |
| 13.9 | Hexham | New England Highway under gantry GPS link: https://goo.gl/maps/YTMoFe7Aick | Clearance: Height: 5.95 Metres | Travel directly ahead | This is the lowest structure on route. There is no bypass around the gantry. A maximum loaded height of 5.8 metres should not be exceeded. | This is the lowest structure on route. There is no bypass around the gantry. A maximum loaded height of 5.8 metres should not be exceeded. |
| 17.4 | Tarro | New England Highway onto John Renshaw Drive GPS link: https://goo.gl/maps/SRDr5JigkBg | Clearance: Width: 12.0 metres | Left hand merge | No problems with this section of road. | No problems with this section of road. |
| 18.4 | Beresfield | John Renshaw Drive through M1 intersection GPS link: https://goo.gl/maps/N19vJih1Fqr | Clearance: Width: 9.0 metres Height: 5.9 metres | Travel directly ahead | No problems with this section of road. | No problems with this section of road. |
| 28.7 | Buchanan | John Renshaw Drive onto the Hunter Expressway GPS link: https://goo.gl/maps/FH5DqHBXwSkntAmz9 | Clearance: Length: 65.0 metres | Right hand turn | The blades will need to cross to the incorrect side than down the off-ramp onto the incorrect side of the expressway. Approx 600 metres along the expressway there is a break in the road, which will allow the blades to cross back to the correct side of the expressway, this may require additional hardstand. Traffic control and or police will be required to perform this procedure. | Travel around the roundabout and take the third exit onto the Hunter Expressway onramp. A sign will need to be made removable. Spotter to guide load through this pinchpoint. |

ROUTE STUDY
Newcastle to Hills of Gold
Windfarm

| | | | | | | |
|------|---------------|---|-----------------------------------|-----------------------|---|---|
| 58.9 | Branxton | The Hunter Expressway onto New England Highway GPS link: https://goo.gl/maps/7rauNuxzqjg | Clearance: Width: 9.0 metres | Travel directly ahead | No problems with this section of road. | No problems with this section of road. |
| 67.3 | Whittingham | The New England Highway onto the Golden Highway GPS link: https://goo.gl/maps/nAnfkYfeUn42 | Clearance: Width: 12.0 metres | Left Hand turn | The NSW Government is currently upgrading this intersection. The intersection in its current form has a number of signs that would need to be made removable, but no modifications are required on the existing corner. At this stage the data that is available for the upgrades shows that the section of road that we would need to access does not change considerably. However, it is recommended that you monitor the progress of the upgrades, and that any changes are thoroughly looked at. | The NSW Government is currently upgrading this intersection. The intersection in its current form has a number of signs that would need to be made removable, but no modifications are required on the existing corner. At this stage the data that is available for the upgrades shows that the section of road that we would need to access does not change considerably. However, it is recommended that you monitor the progress of the upgrades, and that any changes are thoroughly looked at. |
| 67.4 | Whittingham | Golden Highway GPS link: https://goo.gl/maps/R86RFuPnmFU2 | Clearance: 115.0 x 9.0 metres | Parking Bay | Suitable parking for Fatigue breaks. | Suitable parking for Fatigue breaks. |
| 77.3 | Whittingham | Golden Highway intersection with the Putty Road GPS link: https://goo.gl/maps/7hQdEmK1EqE2 | Clearance: Length: 85.0 metres | Left hand turn | Blades to cross from the incorrect side to the incorrect side. Some signs will need to be made removable. | Blades to cross from the incorrect side to the incorrect side. Some signs will need to be made removable. |
| 77.4 | Mount Thorley | Golden Highway GPS link: https://goo.gl/maps/zGvdupDuixx | Clearance: 100.0 x 10.0 metres | Parking Bay | Suitable parking for Fatigue breaks. | Suitable parking for Fatigue breaks. |
| 80.8 | Mount Thorley | Golden Highway intersection with the Putty Road GPS link: https://goo.gl/maps/VyA42n1CqZx | Clearance: Length: 85.0 metres | Right hand turn | Blades to cross from the incorrect side and cross back to the correct side approx. 500 metres west of the intersection. | Blades to cross from the incorrect side and cross back to the correct side approx. 500 metres west of the intersection. |

ROUTE STUDY
Newcastle to Hills of Gold
Windfarm

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|-------|---------------|--|--------------------------------------|-----------------------|--|--|
| 98.0 | Warkworth | Golden Highway GPS link: https://goo.gl/maps/Y6V6EXaCwxq | Clearance: 100.0 x 8.0 metres | Parking Bay | Suitable parking for Fatigue breaks. | Suitable parking for Fatigue breaks. |
| 107.0 | Jerrys Plains | Golden Highway through Jerrys Plains village GPS link: https://goo.gl/maps/AiuT8MMVTh5scrs348 | Clearance: Length: 70.0 metres | Dogleg | Blades to cross from the incorrect side to the incorrect side. Some hardstand will need to be added to the outside of the right hand corner. The swept path will stay within the road reserve. | No problems with this section of road. |
| 126.0 | Ogilvy | Golden Highway GPS link: https://goo.gl/maps/ShT4hrj8WQeMcris7 | 6% gradient | Travel directly ahead | This section of road has a steep mountain range that will require additional pull trucks to assist loads that exceed 80T gross weight. Additionally, the NSW Government is currently upgrading this section of road. It is recommended that you monitor the progress of the upgrades, and that any changes are thoroughly looked at. | This section of road has a steep mountain range that will require additional pull trucks to assist loads that exceed 80T gross weight. Additionally, the NSW Government is currently upgrading this section of road. It is recommended that you monitor the progress of the upgrades, and that any changes are thoroughly looked at. |
| 141.9 | Denman | Golden Highway onto Denman Road GPS link: https://goo.gl/maps/sf4PNnycxB32 | Clearance: Length: 60.0 metres | Right hand turn | The blades will travel around the corner from correct side onto the correct side. The existing corner will require hardstand to be added and signs made removable. The swept path will stay within the road reserve. | The blades will travel around the corner from correct side onto the correct side. The existing corner will require hardstand to be added and signs made removable. |
| 149.0 | Muswellbrook | Denman Road onto Bengalla Road GPS link: https://goo.gl/maps/CJYtSMtTtJ2 | Clearance: Length: 65.0 metres | Left hand turn | Blades to cross from the incorrect side to the incorrect side. Some signs will need to be made removable and some hardstand added to the inside and outside of the corner. The swept path will enter a landowner's boundaries on the inside of the corner. | Blades to cross from the incorrect side to the incorrect side. No works required on this intersection. |

ROUTE STUDY
Newcastle to Hills of Gold
Windfarm

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|-------|--------------|---|-----------------------------------|-----------------------|--|--|
| 158.5 | Muswellbrook | Bengalla Road onto Wybong Road GPS link: https://goo.gl/maps/vibQvHkxXE2 | Clearance: Length: 70.0 metres | Right hand turn | Blades to cross from the correct side to the correct side. Some signs will need to be made removable. | Blades to cross from the correct side to the correct side. Some signs will need to be made removable. |
| 168.1 | Muswellbrook | Wybong Road onto Kayuga Road OPTION 1: GPS link: https://goo.gl/maps/xVscKUT1isJ2 | Clearance: Length: 40.0 metres | Left hand turn | Blades to cross from the incorrect side to the incorrect side. Some signs will need to be relocated or made removable. Permission will be required from the landowner to travel over the private land. This will require removal and realigning the fence, and adding hardstand. | Blades to cross from the incorrect side to the incorrect side. Some signs will need to be relocated or made removable. Permission will be required from the landowner to travel over the private land. This will require removal and realigning the fence, and adding hardstand. |
| 173.3 | Muswellbrook | Kayuga Road onto Ivermein Street GPS link: https://goo.gl/maps/JpTfmcS6Z6Sk | Clearance: Length: 85.0 metres | Travel directly ahead | No problems with this section of road. | No problems with this section of road. |
| 174.0 | Muswellbrook | Ivermein Street onto Dartbrook mine access Road GPS link: https://goo.gl/maps/ddMHa4CmXK32 | Clearance: Length: 50.0 metres | Right hand turn | Blades to cross from the correct side to the correct side. Some signs will need to be made removable and some hardstand added to the inside and outside of the corner. Additionally, a drainage pipe will need to be extended on the inside of the corner. | Blades to cross from the correct side to the correct side. Some signs will need to be made removable and some hardstand added to the inside and outside of the corner. Additionally, a drainage pipe will need to be extended on the inside of the corner. |
| 174.8 | Muswellbrook | Dartbrook Road GPS link: https://goo.gl/maps/u9vSXiSV7Jt | Clearance: Length: 60.0 metres | Right hand turn | Blades to cross from the correct side to the correct side but cut across the inside of the corner. Some signs will need to be made removable and some hardstand added to the inside of the corner. | Blades to cross from the correct side to the correct side but cut across the inside of the corner. Some signs will need to be made removable and some hardstand added to the inside of the corner. |
| 177.0 | Muswellbrook | Dartbrook Road onto New England Highway GPS link: https://goo.gl/maps/twTsmUKaED82 | Clearance: Length: 60.0 metres | Left hand turn | Blades to cross from the incorrect side to the incorrect side. Some signs will need to be made removable on the corner and some hardstand added. | Blades to cross from the incorrect side to the incorrect side. Some signs will need to be made removable on the corner and some hardstand added. |
| 240.8 | Murrurundi | New England highway (Township) GPS link: https://goo.gl/maps/Sj3ixAkhujt | Clearance: 60.0 x 5.0 metres | Parking Bay | Suitable parking for Fatigue breaks. | Suitable parking for Fatigue breaks. |

ROUTE STUDY
Newcastle to Hills of Gold
Windfarm

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|-------|--------------------------|---|---|--|---|---|
| 245.4 | Murrurundi Hill | New England highway Nowlands Gap GPS link: https://goo.gl/maps/R5yufobPeMG2 | Clearance: 120.0 x 12.0 metres | Parking Bay | Emergency parking only. | Emergency parking only. |
| 251.3 | Willow Tree | New England highway GPS link: https://goo.gl/maps/XLTg7CRV7EU2 | Clearance: Width: 7.0m Length: 35m Height: 5.2m | Kankool weighbridge | It is likely that the towers and defiantly the blades will not fit into this facility. Engineered documentation showing correct weights for all loads will be required. | It is likely that the towers and defiantly the blades will not fit into this facility. Engineered documentation showing correct weights for all loads will be required. |
| 257.9 | Willow Tree Township | New England highway GPS link: https://goo.gl/maps/gw38qmvVfTC2 | Clearance: 60.0 x 5.0 metres | Parking Bay | Suitable parking for Fatigue breaks. | Suitable parking for Fatigue breaks. |
| 259.5 | Willow Tree Truck Stop N | New England highway GPS link: https://goo.gl/maps/RRdPVHupGCs | Clearance: 120.0 x 12.0 metres | Parking Bay | Suitable parking for Fatigue breaks for small loads only. | Suitable parking for Fatigue breaks for small loads only. |
| 269.0 | Wallabadah | New England highway GPS link: https://goo.gl/maps/QWCyeHQSoHs2 | Clearance: 80.0 x 5.0 metres | Parking Bay (side of road) | Suitable parking for Fatigue breaks. | Suitable parking for Fatigue breaks. |
| 276.0 | Wallabadah | New England highway onto Lindsay's Gap Road GPS link: https://goo.gl/maps/ePbYctjJootkBZiM9 | Clearance: Length: 50.0 metres | Right hand turn | Blades to cross from the correct side to the correct side but cut across the inside of the corner. Some signs will need to be made removable and some hardstand added to the inside of the corner. | Blades to cross from the correct side to the correct side but cut across the inside of the corner. Some signs will need to be made removable on the inside of the corner. |
| 287.7 | Garoo | Lindsay's Gap Road over Goonoo Goonoo Creek GPS link: https://goo.gl/maps/9ELSk5ZLRWnf14tm7 | Clearance: Axle width: 3.60m Overall width: 6.20m Guard rail height: 850mm | Travel directly ahead over bridge in the centre of the road. | The blades will fit over the structure in its current condition. Loads that are been carried on trailers with an axle width exceeding 3.5 meters will not fit over this structure in its current form. This bridge will need to be replaced or modified before the towers or motors can be delivered on this route. A trafficable deck width of at least 4.6 meters is required for these heavier loads. | The blades will fit over the structure in its current condition. Loads that are been carried on trailers with an axle width exceeding 3.5 meters will not fit over this structure in its current form. This bridge will need to be replaced or modified before the towers or motors can be delivered on this route. |

ROUTE STUDY
Newcastle to Hills of Gold
Windfarm

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| | | | | | | A trafficable deck width of at least 4.6 meters is required for these heavier loads. |
| 295.7 | Garoo | Lindsay's Gap Road over Middlebrook Creek GPS link: https://goo.gl/maps/DyxGUid9JucoAHhHA | Clearance: Axle width: 4.50m Overall width: 6.10m Guard rail height: 750mm | Travel directly ahead over bridge in the centre of the road. | The blades will fit over the structure in its current condition. This bridge will need to be modified or replaced before the towers or motors can be delivered on this route. A trafficable deck width of at least 4.6 meters is required for these heavier loads. | The blades will fit over the structure in its current condition. This bridge will need to be modified or replaced before the towers or motors can be delivered on this route. A trafficable deck width of at least 4.6 meters is required for these heavier loads. |
| 301.2 | Garoo | Lindsay's Gap Road through Lindsay's Gap GPS link: https://goo.gl/maps/GGKmqemziKdth8wH9 | Clearance: Length: 90.0 metres | Travel directly ahead | Load to travel in the centre of the road, escorts to warn traffic 500 metres to the east of the gap. | Load to travel in the centre of the road, escorts to warn traffic 500 metres to the east of the gap. |
| 306.8 | Nundle | Lindsay's Gap Road onto Nundle Road GPS link: https://goo.gl/maps/FX4ZRx2YG9i2BsXMA | Clearance: Length: 50.0 metres | Right hand turn | Blades to cross from the correct side to the correct side but cut across the inside of the corner. Some signs will need to be made removable and some hardstand added to the inside of the corner. A power pole will also need to be relocated. | Blades to cross from the correct side to the correct side but cut across the inside of the corner. Some signs will need to be made removable. |
| 310.3 | Nundle | Nundle Road onto Crosby Street GPS link: https://goo.gl/maps/uVvcN9QkPyTDP1YR6 | Clearance: Width: 8.0 metres | Travel directly ahead | No problems with this section of road. | No problems with this section of road. |
| 310.6 | Nundle | Crosby Street onto Oakenville Street GPS link: https://goo.gl/maps/aZNDKURdSBERedMr9 | Clearance: Width: 8.0 metres | Travel directly ahead | No problems with this section of road. | No problems with this section of road. |
| 311.0 | Nundle | Oakenville Street and Jenkins Street intersection GPS link: https://goo.gl/maps/7YM56hQq8bnCS0Zv8 | 5.0 metres width clearance | | Blades to travel directly ahead on the correct side of the road. A no parking exclusion zone will need to be placed on the left-hand side while travelling through this intersection. Two signs will also need to be made removable. | Blades to travel directly ahead on the correct side of the road. A no parking exclusion zone will need to be placed on the left-hand side while travelling through this intersection. Two signs will also need to be made removable. |

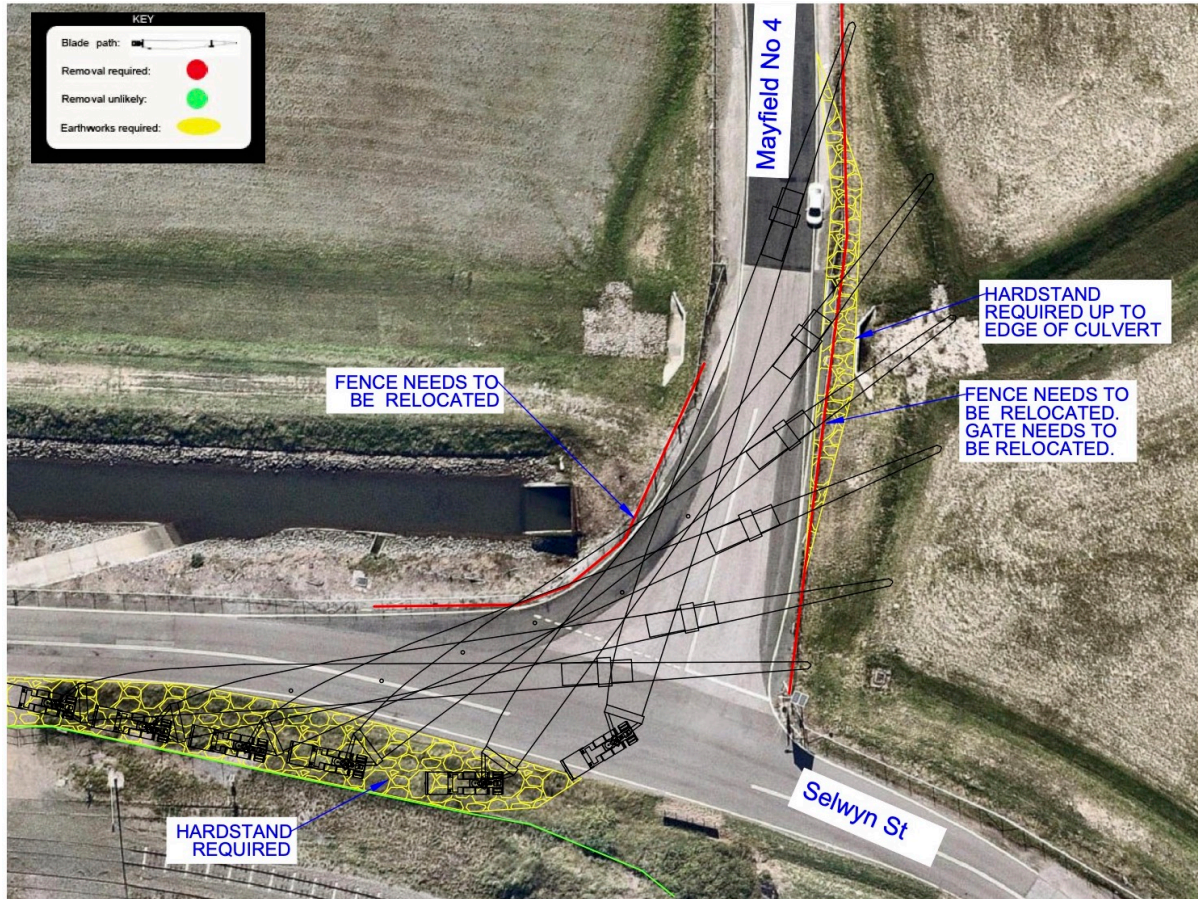
ROUTE STUDY
Newcastle to Hills of Gold
Windfarm

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|---------------------------|---------------------------|---|---------------------------------|--|---|---|
| 312.0 | Nundle | Oakenville Street onto Old Hanging Rock GPS link: https://goo.gl/maps/1UMr2EwZetiE76Ey9 | 35.0 metres length clearance | Left hand turn | Blades to turn left from the incorrect side to the incorrect side of the road. The swept path will have the blades travel through a landowner's boundaries. This will require a fence to be relocated and hardstand added. Additionally, while travelling over the bridge some signs will need to be relocated and some sections of guardrail relocated. | Blades to turn left from the incorrect side to the incorrect side of the road. The swept path will have the blades travel through a landowner's boundaries. This will require a fence to be relocated and hardstand added. Additionally, while travelling over the bridge some signs will need to be relocated. |
| 313.0 | Nundle | Old Hanging Rock Road onto Barry Road GPS link: https://goo.gl/maps/ve9zvmdJnLBYtQSz5 | 90.0 metres clearance | Right hand bend | No problems with this section of road. | No problems with this section of road. |
| 313.0 to 323.0 Km's | Nundle to Hanging Rock | Barrys Road https://goo.gl/maps/BUBe2MCfoQ215qKE6 | 25.0 metres length clearance | Travel directly ahead through multiple tight turns and steep terrain | Barrys Road has a section of road known as the Devils Elbows. The existing hairpin corners are impassable for the blades, towers and motors. A detour of the Devils Elbow has been looked at and will likely be the best solution for all loads. To the west and east of the Devils Elbows the road will need to be widened on a few corners, this would include hardstand and tree removal. | Barrys Road has a section of road known as the Devils Elbows. The existing hairpin corners are impassable for the blades, towers and motors. A detour of the Devils Elbow has been looked at and will likely be the best solution for all loads. To the west and east of the Devils Elbows the road will need to be widened on a few corners, this would include hardstand and tree removal. |
| 323.0 | Hanging Rock | Barrys Road onto Morrisons Gap Road GPS link: https://goo.gl/maps/CLZDJSjENx8rifAg7 | 35.0 metres length clearance | Right hand turn | Blades to turn right from the correct side to the correct side of the road. The swept path will have the blades travel through a landowner's boundaries on the inside of the corner. This will require a fence to be relocated and hardstand added. Additionally, some trees will need to be removed. | Blades to turn right from the correct side to the correct side of the road. The swept path will have the blades travel through a landowner's boundaries on the inside of the corner. This will require a fence to be relocated and hardstand added. Additionally, some trees will need to be removed. |

ROUTE STUDY
Newcastle to Hills of Gold
Windfarm

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|---------------------|--------------|--|------------------------------|---|---|---|
| 323.0 to 326.0 Km's | Hanging Rock | Morrisons Gap Road GPS link: https://goo.gl/maps/kLtYYnmhTgvE6ZPFA | 25.0 metres length clearance | Travel around several sweeping bends on a gravel road | This section of road is gravel for the entirety. The road will need to be widened for the majority of the road. Typically, the road will need to be widened to 5.5 meters in all straight sections and made wider on the corners depending on the radius. A swept path analysis of this section of road, shows that the corridor would be able to stay within the road reserve. Additionally, there will need to be trees removed. The vertical curve will also need to be checked for the entirety of this road. | This section of road is gravel for the entirety. The road will need to be widened for the majority of the road. Typically, the road will need to be widened to 5.5 meters in all straight sections and made wider on the corners depending on the radius. A swept path analysis of this section of road, shows that the corridor would be able to stay within the road reserve. Additionally, there will need to be trees removed. The vertical curve will also need to be checked for the entirety of this road. |
| 326.0 Km's | Hanging Rock | Morrisons Gap Road into Hills of Gold windfarm GPS link: https://goo.gl/maps/5VFMQCB3drgXcivU8 | | Travel directly ahead into site entrance | Windfarm to supply suitable access for the dimensions and swept path of all loads. | Windfarm to supply suitable access for the dimensions and swept path of all loads. |

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



PROCEDURE: Right hand turn.

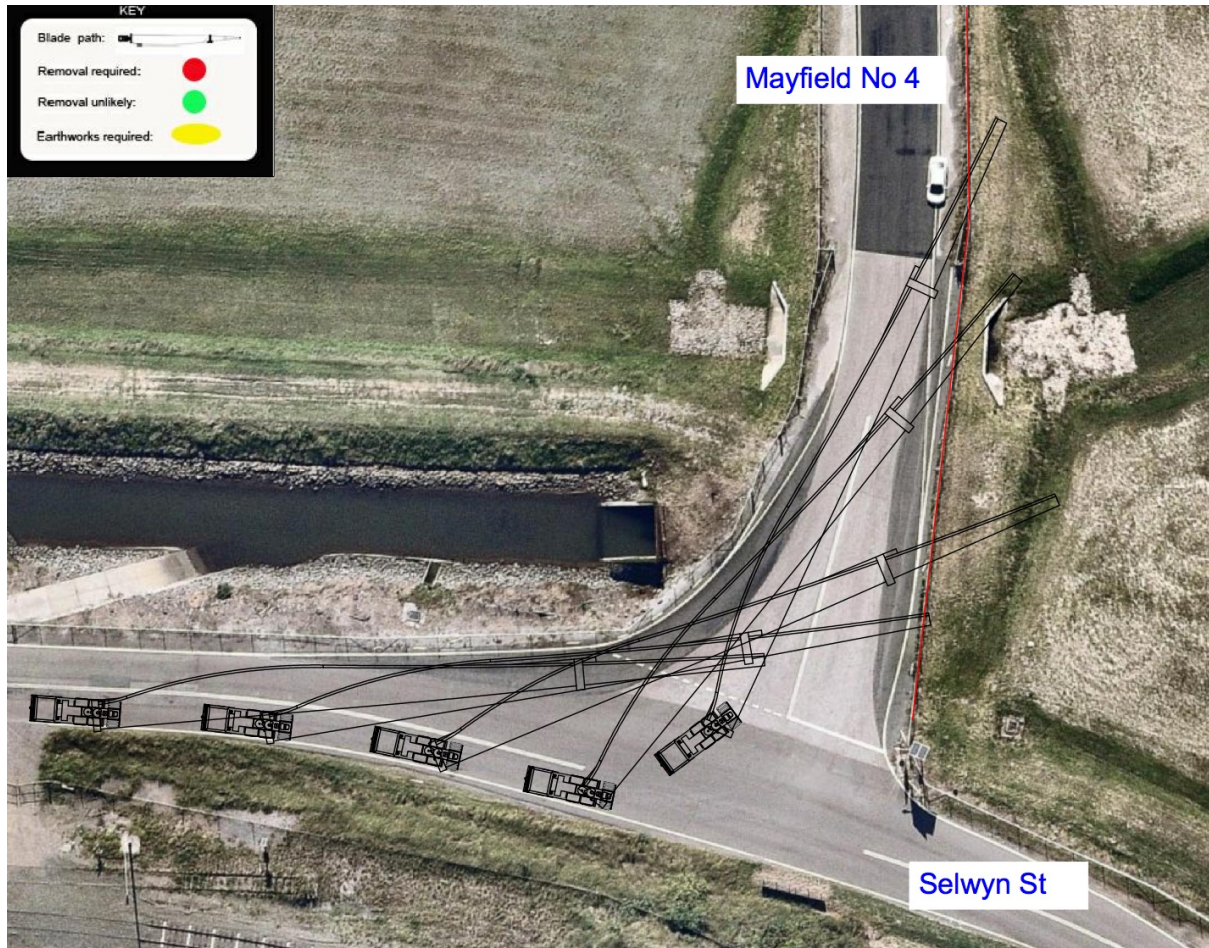
GPS LINK FOR SECTION OF ROAD: <https://goo.gl/maps/afLwPYKuNdm>

COMMENTS: Some hardstand will need to be added to the left entry up to but not past the culvert and also the exit of the corner. Some signs will need to be relocated and or made removable and some fence will need to be relocated.

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

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

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



PROCEDURE: Right hand turn.

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

COMMENTS: Fence may need to be modified.

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

ROAD MODIFICATIONS: Yes small amounts of work are required.

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



PROCEDURE: Travel directly ahead over the crossing.

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

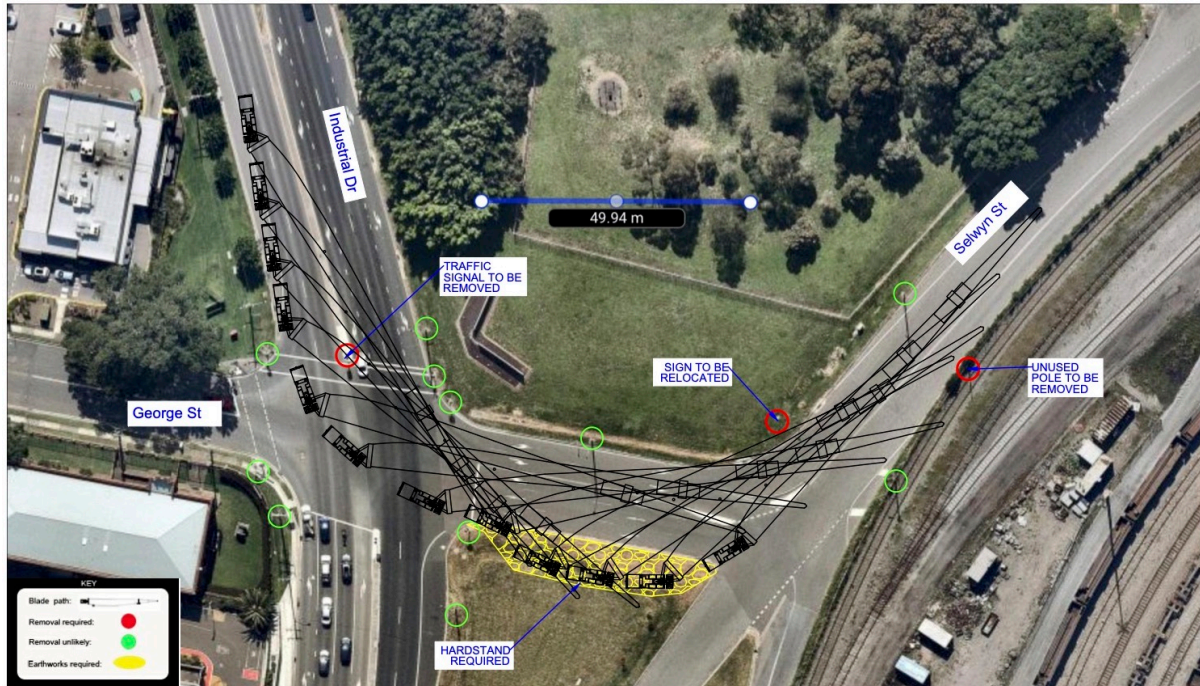
COMMENTS: Large width clearance and good ground clearance over this crossing.

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

ROAD MODIFICATIONS: No works required.

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

170 Metre rotor:



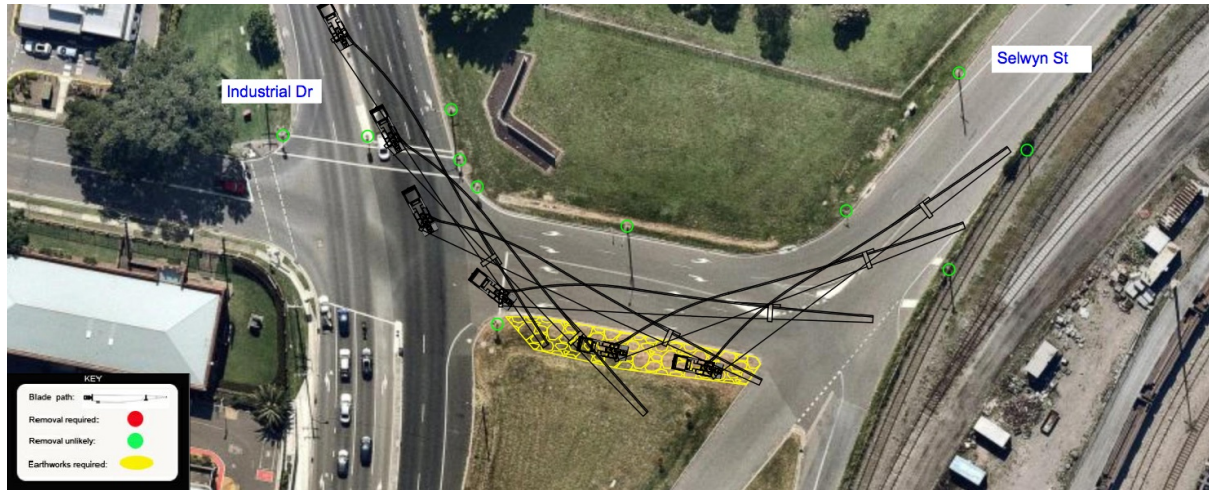
PROCEDURE: Right hand turn from Selwyn Street through George Street and onto Industrial Drive.

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

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

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

158 Metre rotor:



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

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

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

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

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



PROCEDURE: Overhanging signals while travelling through the intersection.

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

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

ROAD MODIFICATIONS: No works are required.

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

170 Metre rotor:



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

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

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

Spotter to keep the driver informed throughout the procedure.

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

ROAD MODIFICATIONS: Nil.

158 Metre rotor:



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

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

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

Spotter to keep the driver informed throughout the procedure.

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

ROAD MODIFICATIONS: Nil.

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

Image 1:



PROCEDURE: Travel directly ahead in the centre lane.

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

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

ROAD MODIFICATIONS: No works are required.

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

170 Metre rotor and 158 Metre rotor:



PROCEDURE: Travel directly ahead in the centre lane.

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

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

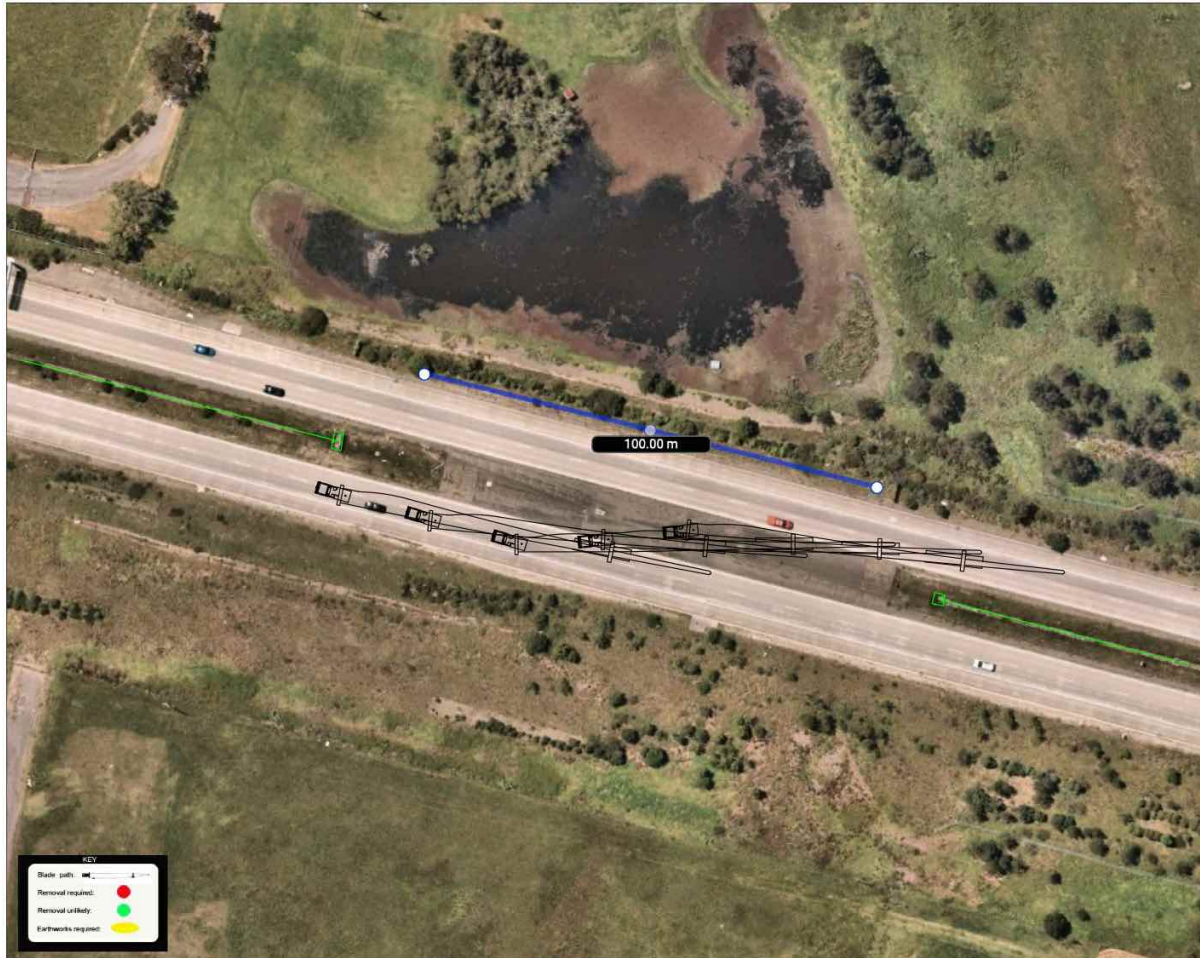
ROAD MODIFICATIONS: No works are required.

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

170 Metre rotor:



170 Metre rotor:



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

GPS LINK FOR SECTION OF ROAD: <https://goo.gl/maps/FH5DqHBXwSkntAmz9>

COMMENTS: Cross to the incorrect side than down the off-ramp onto the incorrect side of the expressway. Approx 600 metres along the expressway there is a break in the road, which will allow the blades to cross back to the correct side of the expressway. Traffic control and or police will be required to perform this procedure.

ROAD MODIFICATIONS: No works required.

158 Metre rotor:



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

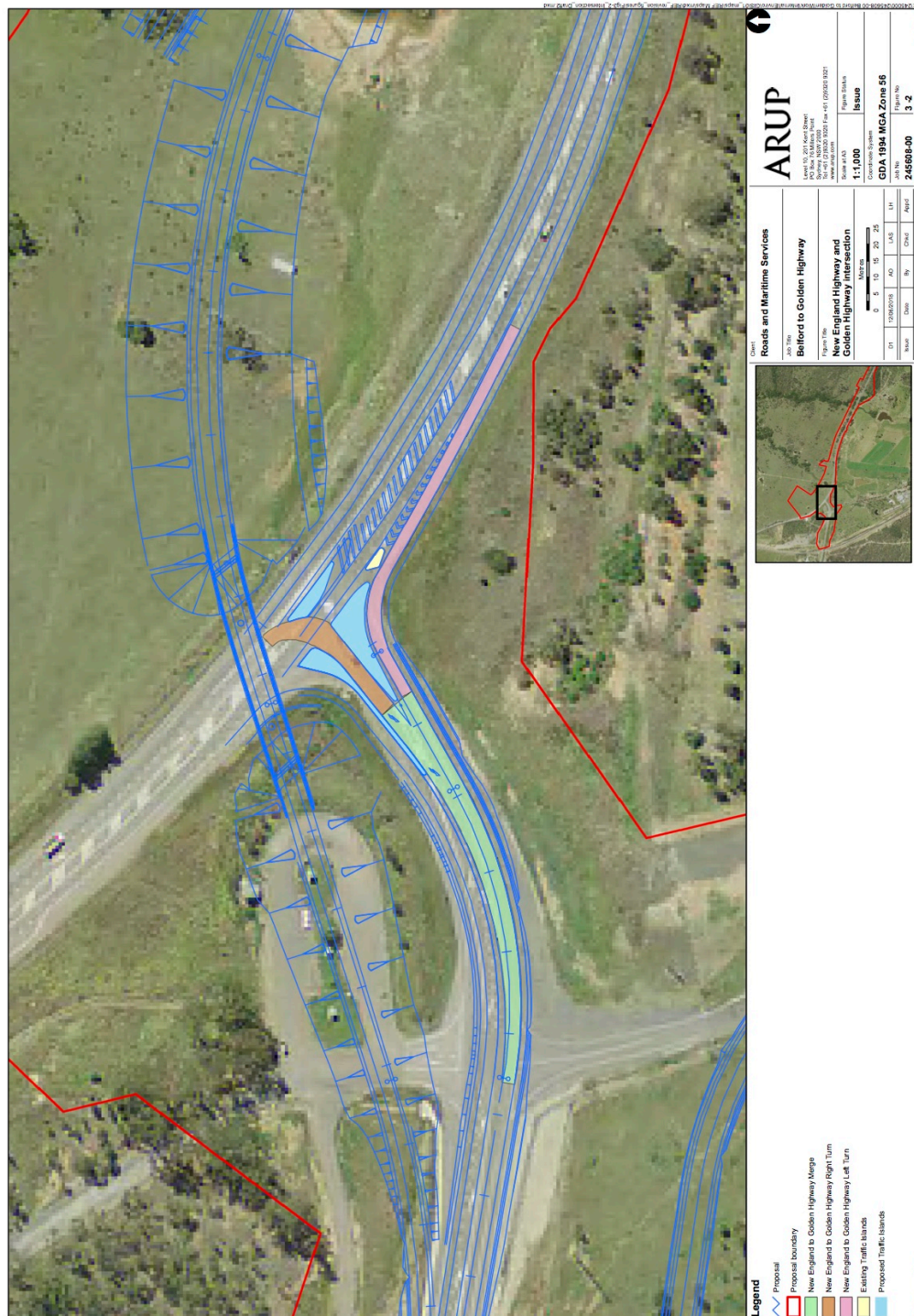
GPS LINK FOR SECTION OF ROAD: <https://goo.gl/maps/cEnuC5th1p52>

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

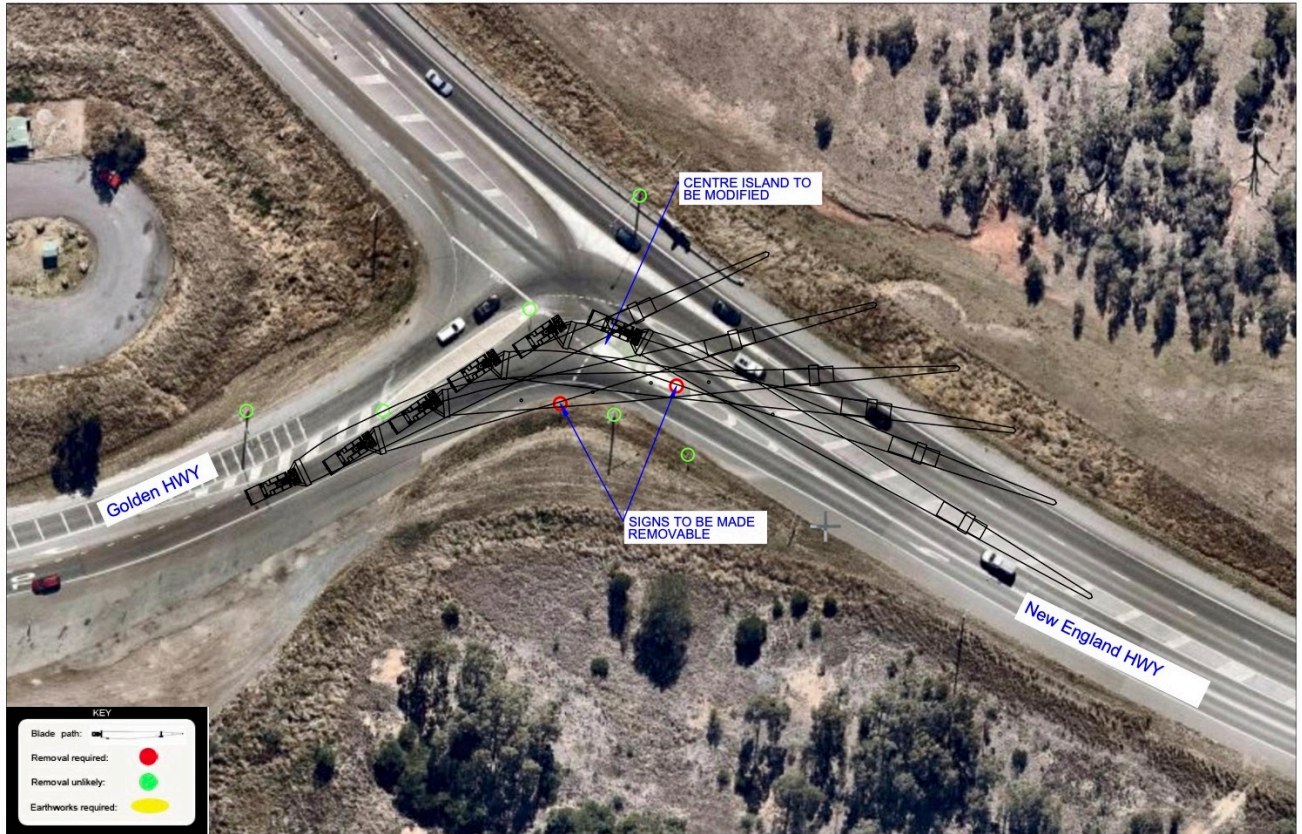
ROAD MODIFICATIONS: No works required.

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

Image 1: Proposed upgrades



170 Metre rotor:



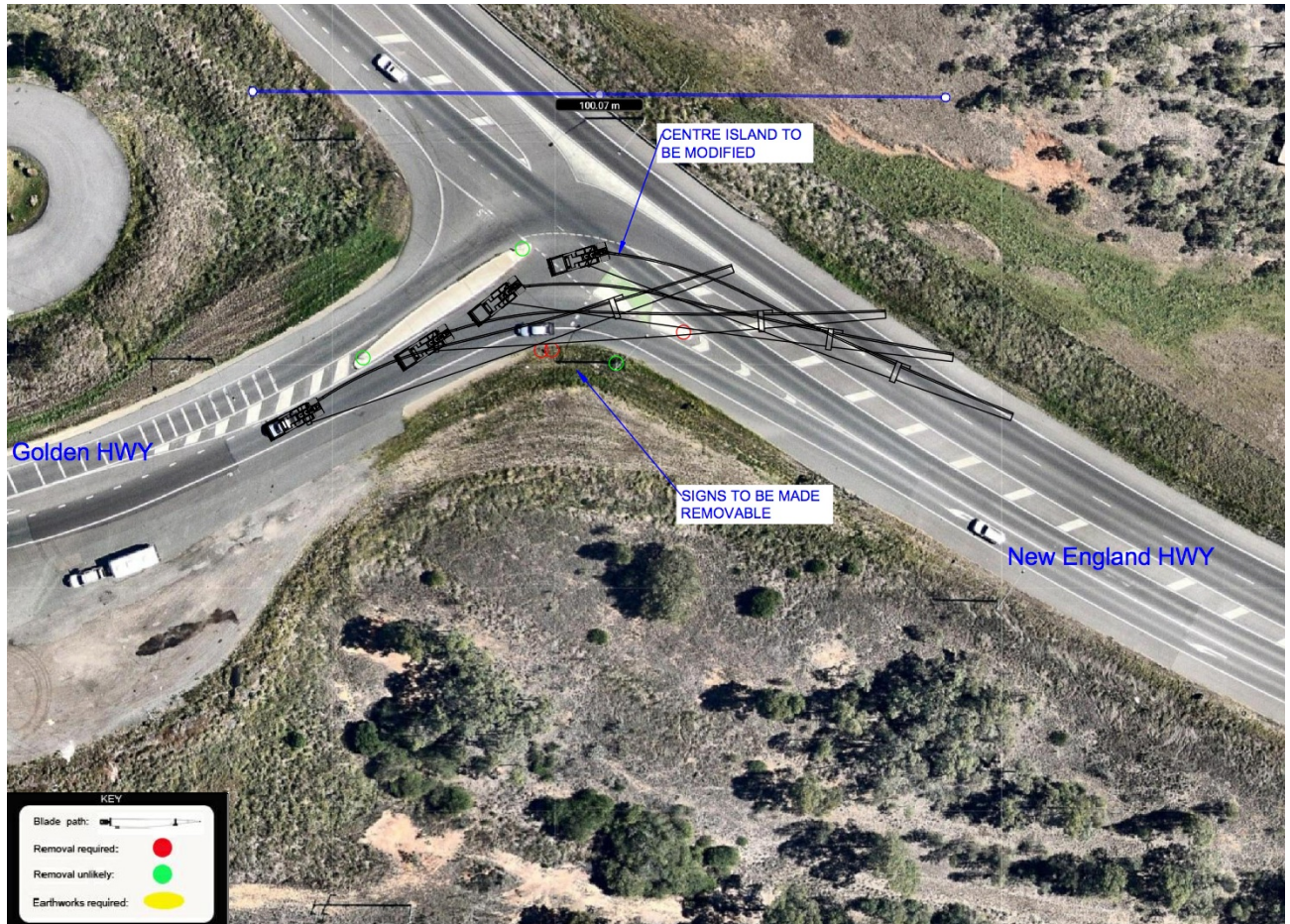
PROCEDURE: Left hand turn from the New England Highway onto the Golden Highway.

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

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

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

158 Metre rotor:



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

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

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

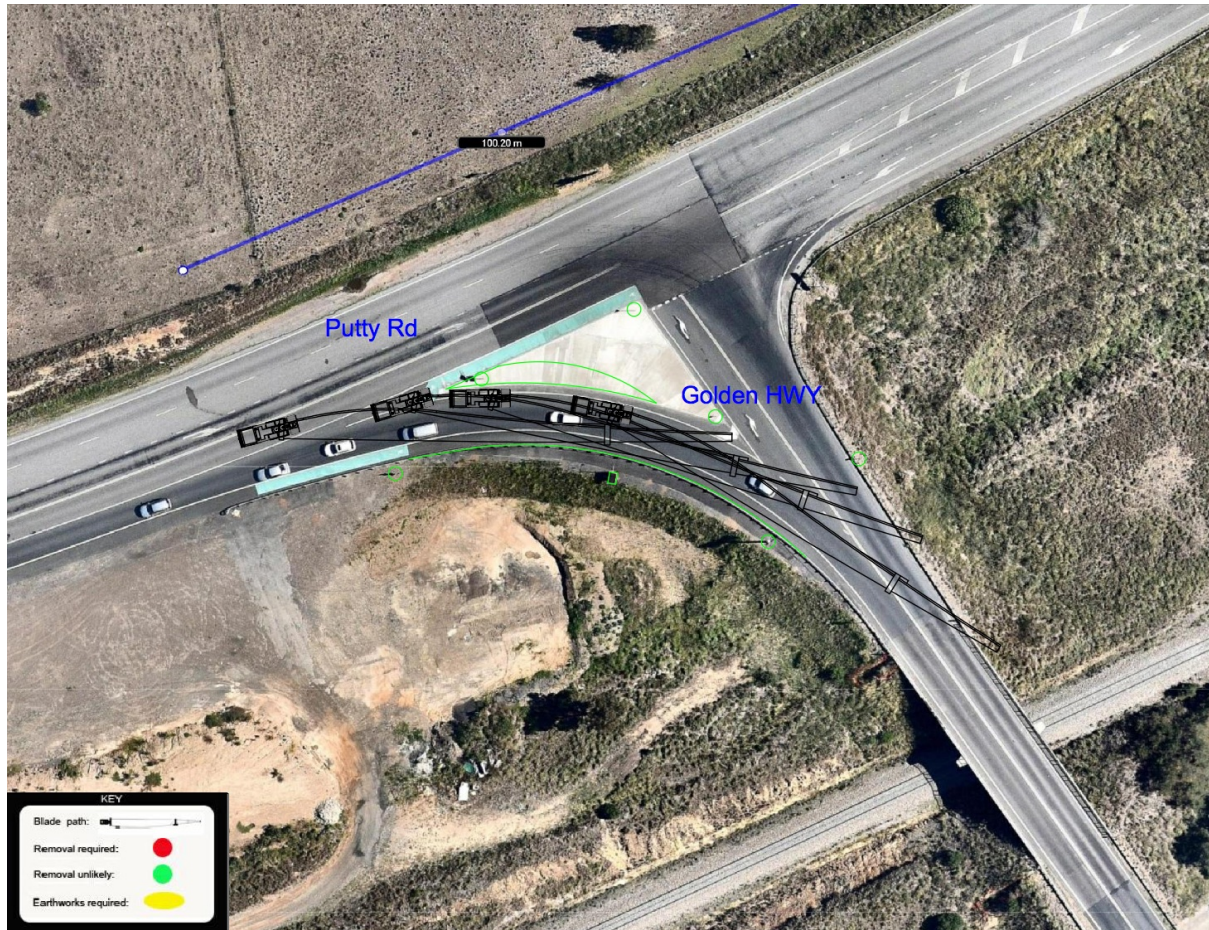
ROAD MODIFICATIONS: NOTE: This intersection is currently in line to be upgraded. The details on image 1 shows that the changes should not affect the swept path, however it is recommended that this is monitored.

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

170 Metre rotor:



158 Metre rotor:



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

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

COMMENTS: Loads to turn from the incorrect side to the incorrect side. Spotter to keep the driver informed throughout the procedure.

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

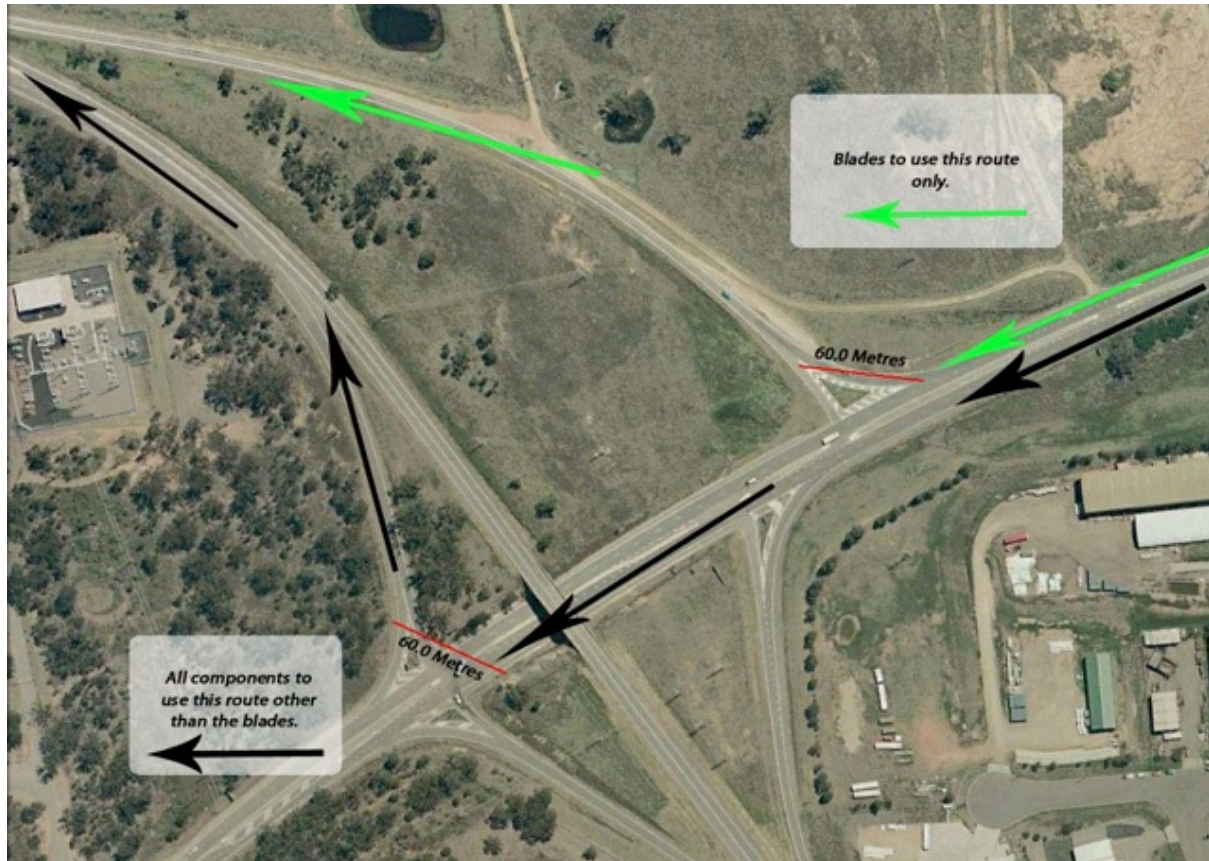
ROAD MODIFICATIONS: No works required.

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

170 Metre rotor:



Image 2:



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

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

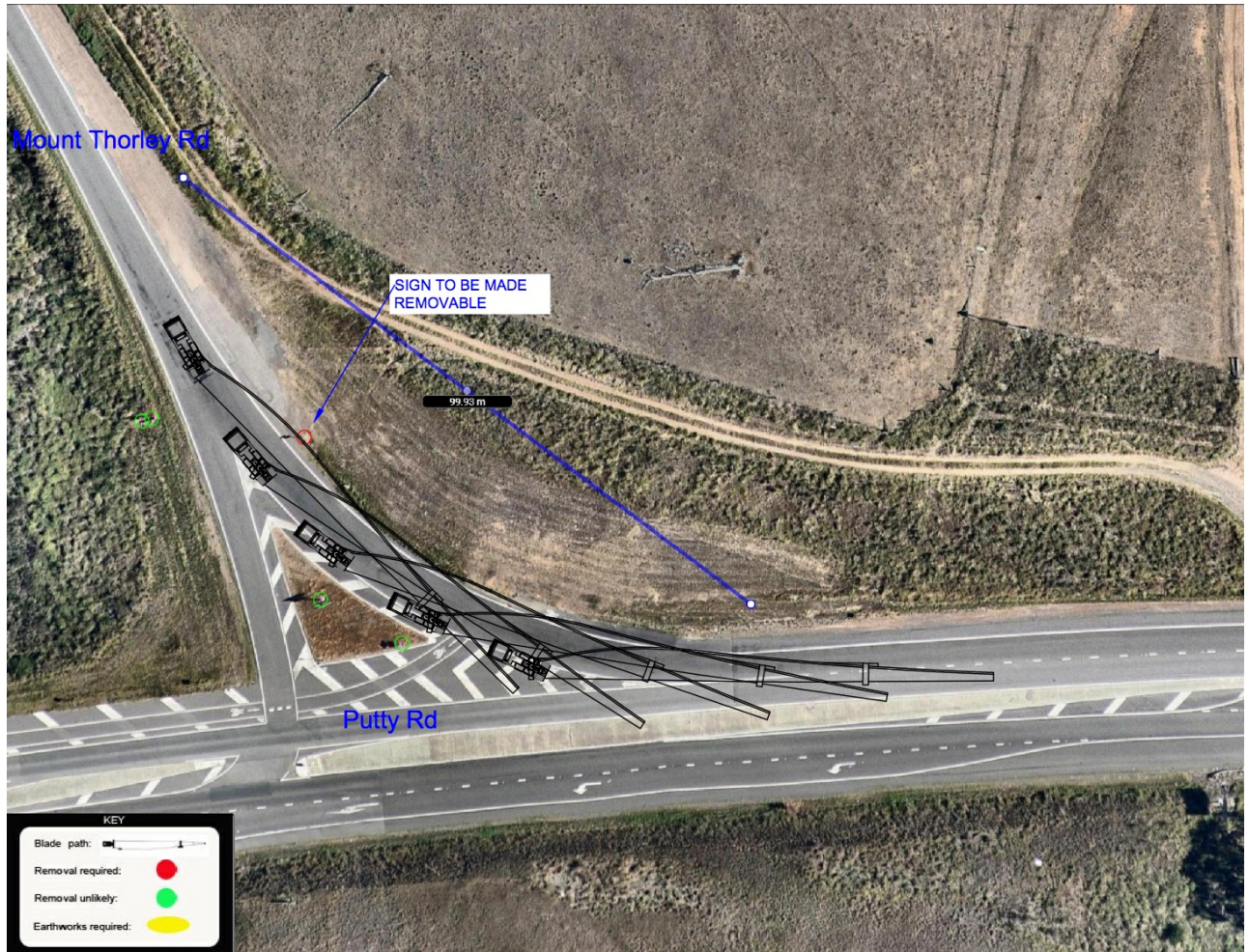
COMMENTS: Loads to turn from the incorrect side to the incorrect side. Blades to cross to the incorrect side prior to the intersection, and return to the correct side when the lanes remerge. Spotter to keep the driver informed throughout the procedure.

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

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

ROAD MODIFICATIONS: No works required.

158 Metre rotor



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

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

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

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

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

ROAD MODIFICATIONS: No works required.

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



170 Metre rotor:



PROCEDURE: Right and left hand turn through the village.

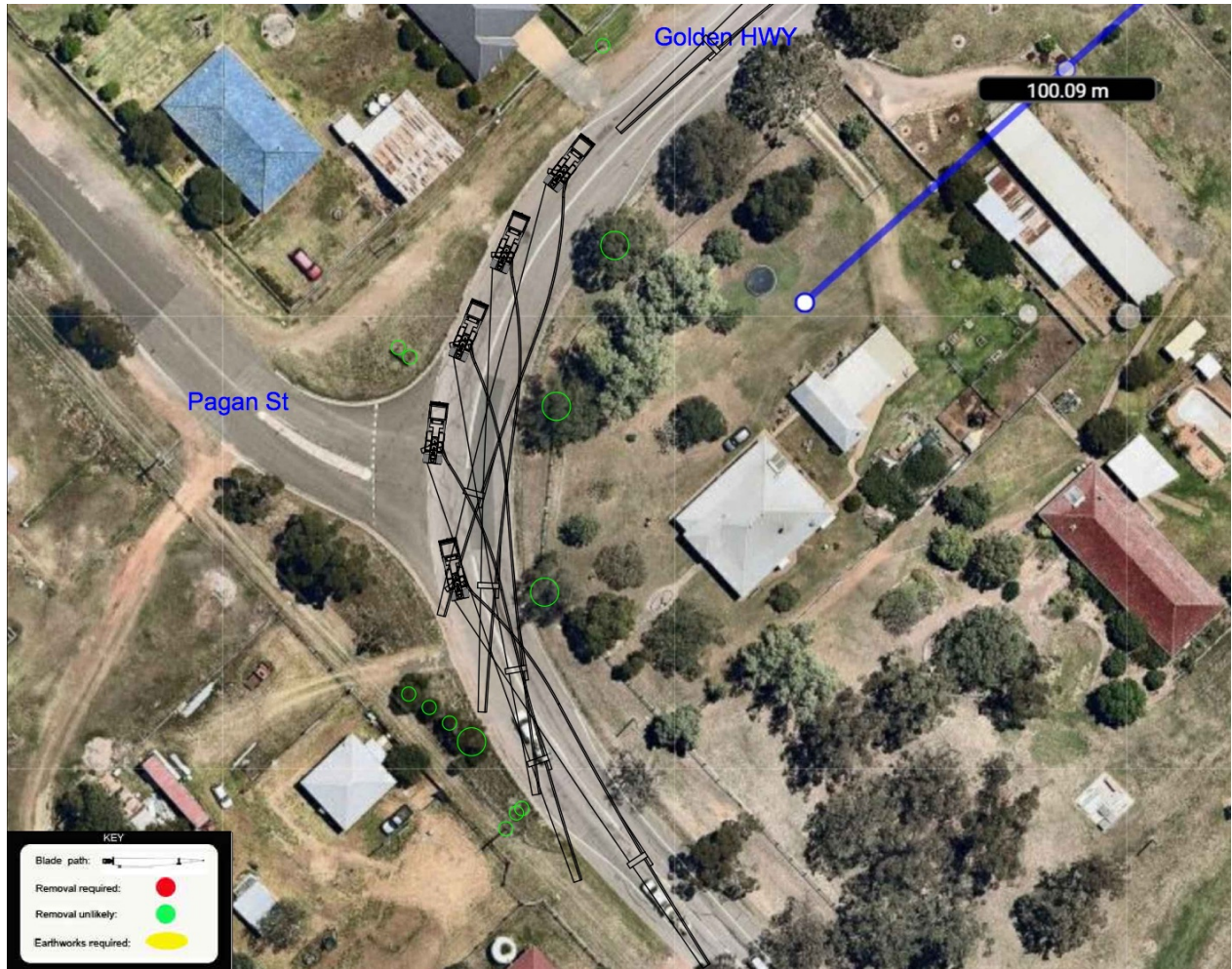
GPS LINK FOR SECTION OF ROAD: <https://goo.gl/maps/AiuT8MMVTh5crs348>

COMMENTS: Blades to cross from the incorrect side to the incorrect side. Some hardstand needs to be added to the outside of the corner for the right-hand turn. The swept path will stay within the existing road reserve.

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

ROAD MODIFICATIONS: Moderate amounts of work are required.

158 Metre rotor:



158 Metre rotor:



PROCEDURE: Right and left hand turn through the village.

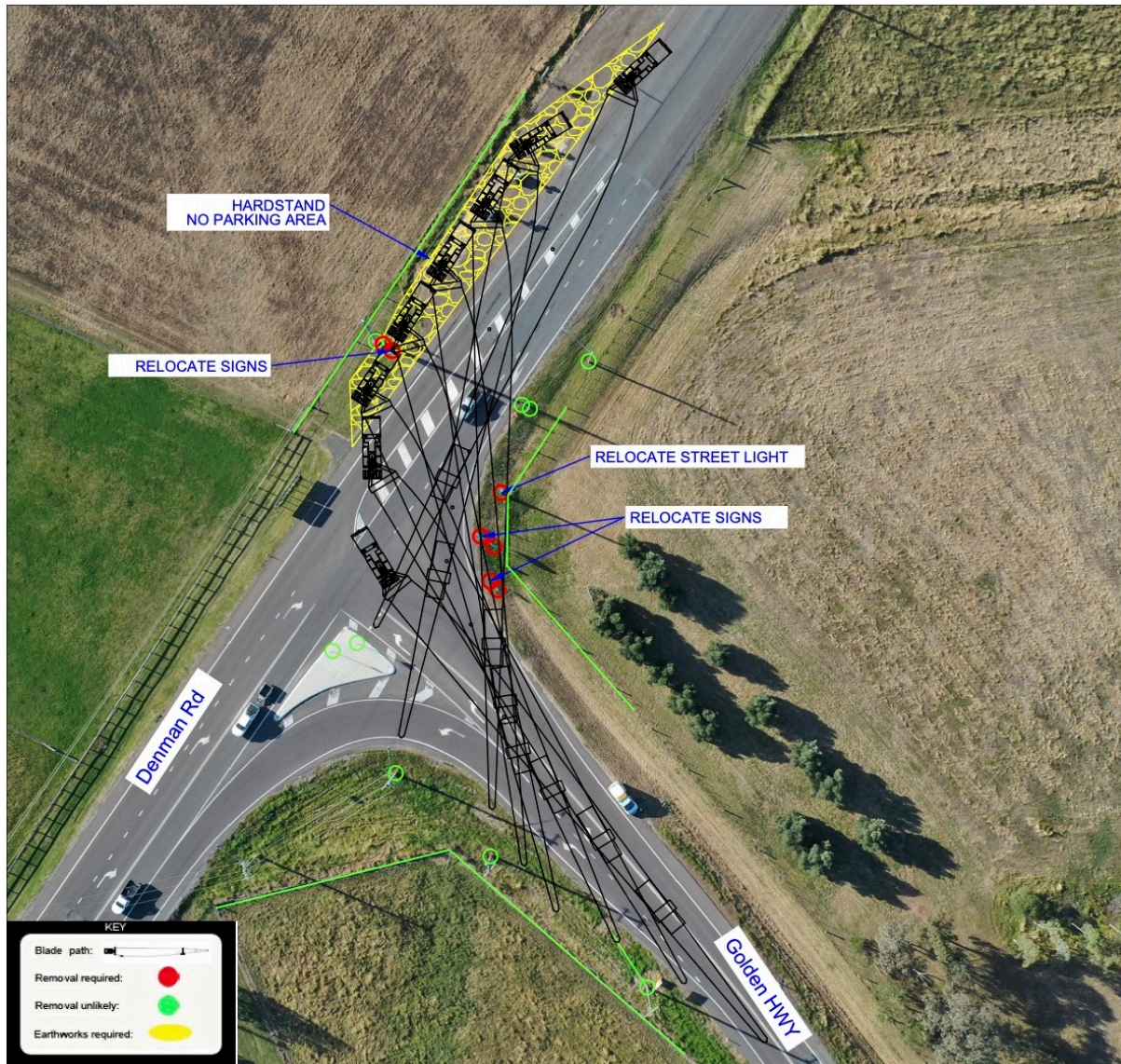
GPS LINK FOR SECTION OF ROAD: <https://goo.gl/maps/AiuT8MMVTh5crs348>

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

ROAD MODIFICATIONS: No works required.

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

170 Metre rotor:



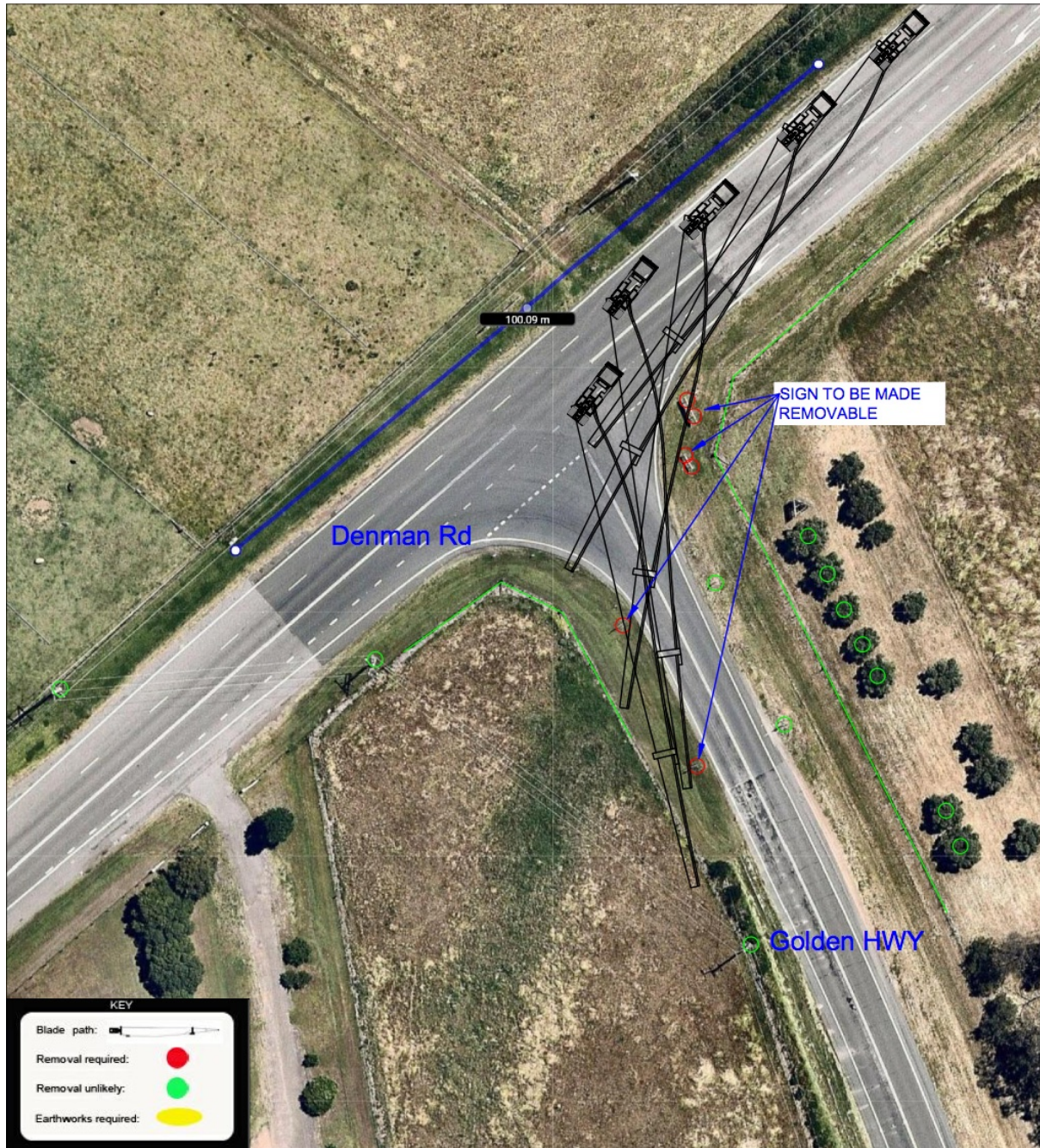
PROCEDURE: Right hand turn from the Golden Highway at the intersection of Denman Road.

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

COMMENTS: Blades to cross from the correct side to the correct side. Some signs will need to be made removable and some hardstand added to the outside exit of the turn. Police and escorts to control local traffic either side of the intersection. Loads swept path will stay within the road reserve.

ROAD MODIFICATIONS: Moderate amounts of work are required.

158 Metre rotor:



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

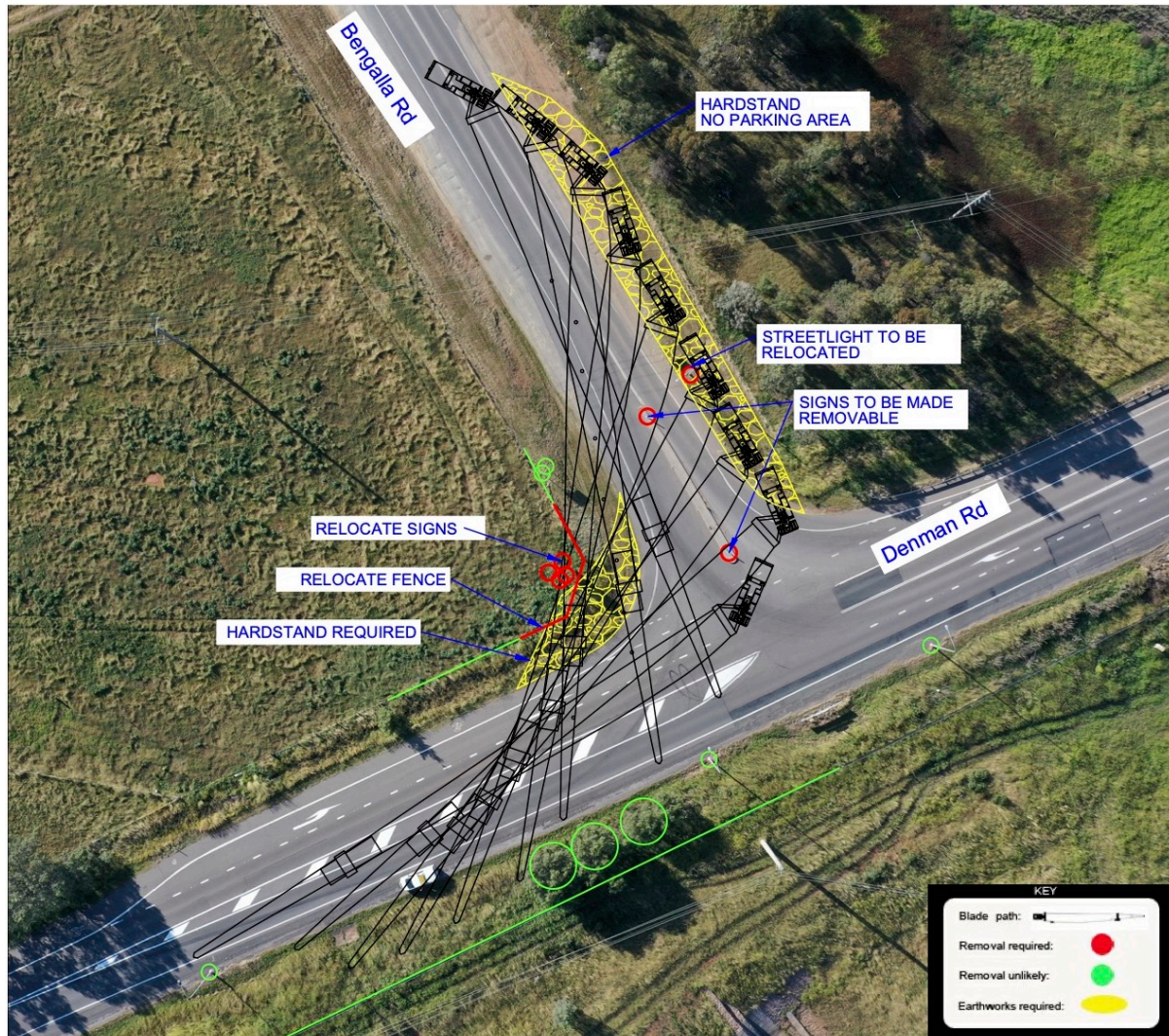
GPS LINK FOR SECTION OF ROAD: <https://goo.gl/maps/T4m46bBNuro>

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

ROAD MODIFICATIONS: Small amounts of work are required.

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

170 Metre rotor:



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

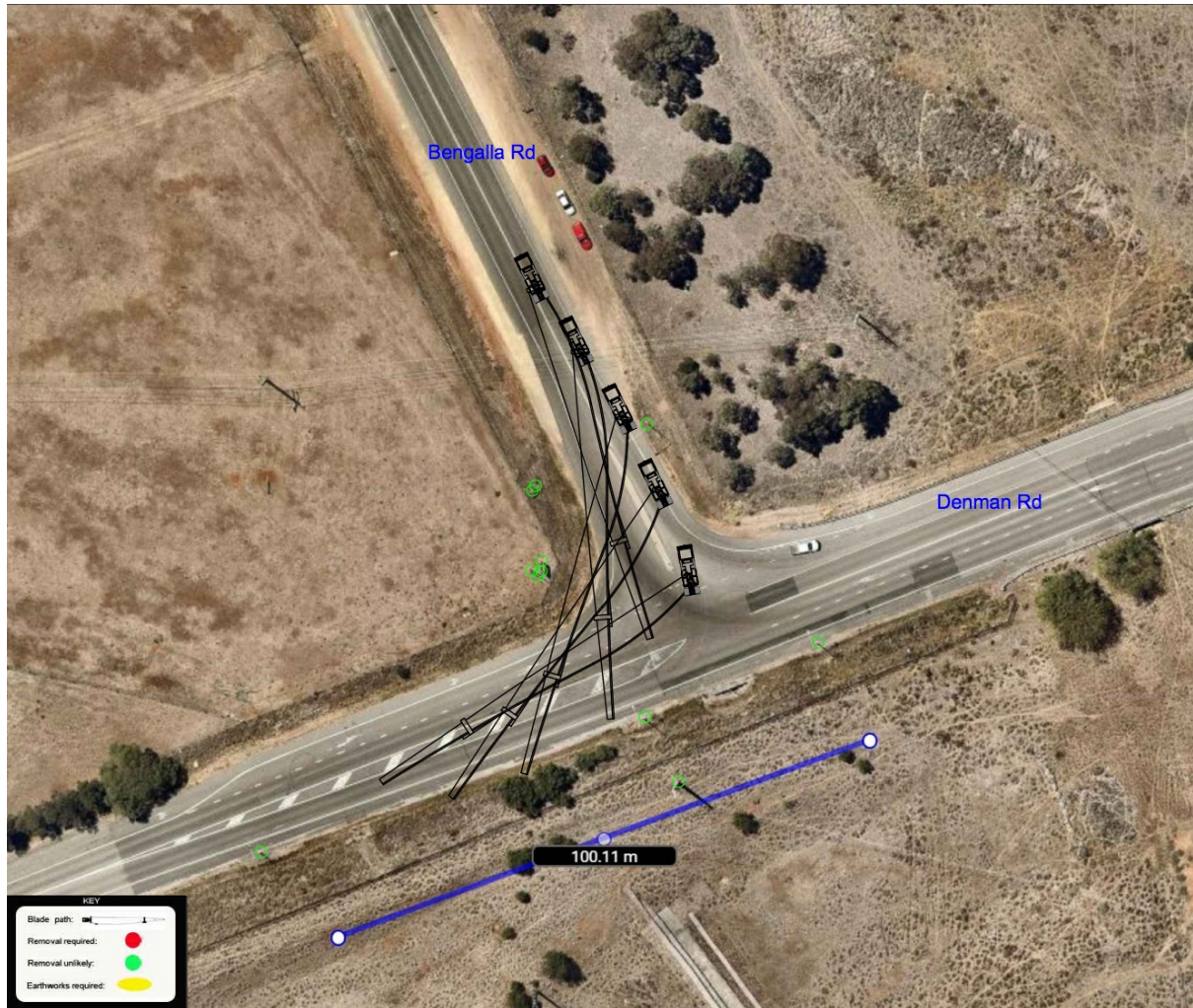
GPS LINK FOR SECTION OF ROAD: <https://goo.gl/maps/CJYMtSMTtJ2>

COMMENTS: Blades to cross from the incorrect side to the incorrect side. Some signs will need to be made removable and some hardstand added to the inside of the corner as well as a fence removed. Loads swept path will enter a landowner's boundaries on the inside of the corner.

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

ROAD MODIFICATIONS: Moderate amounts of work are required.

158 Metre rotor:



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

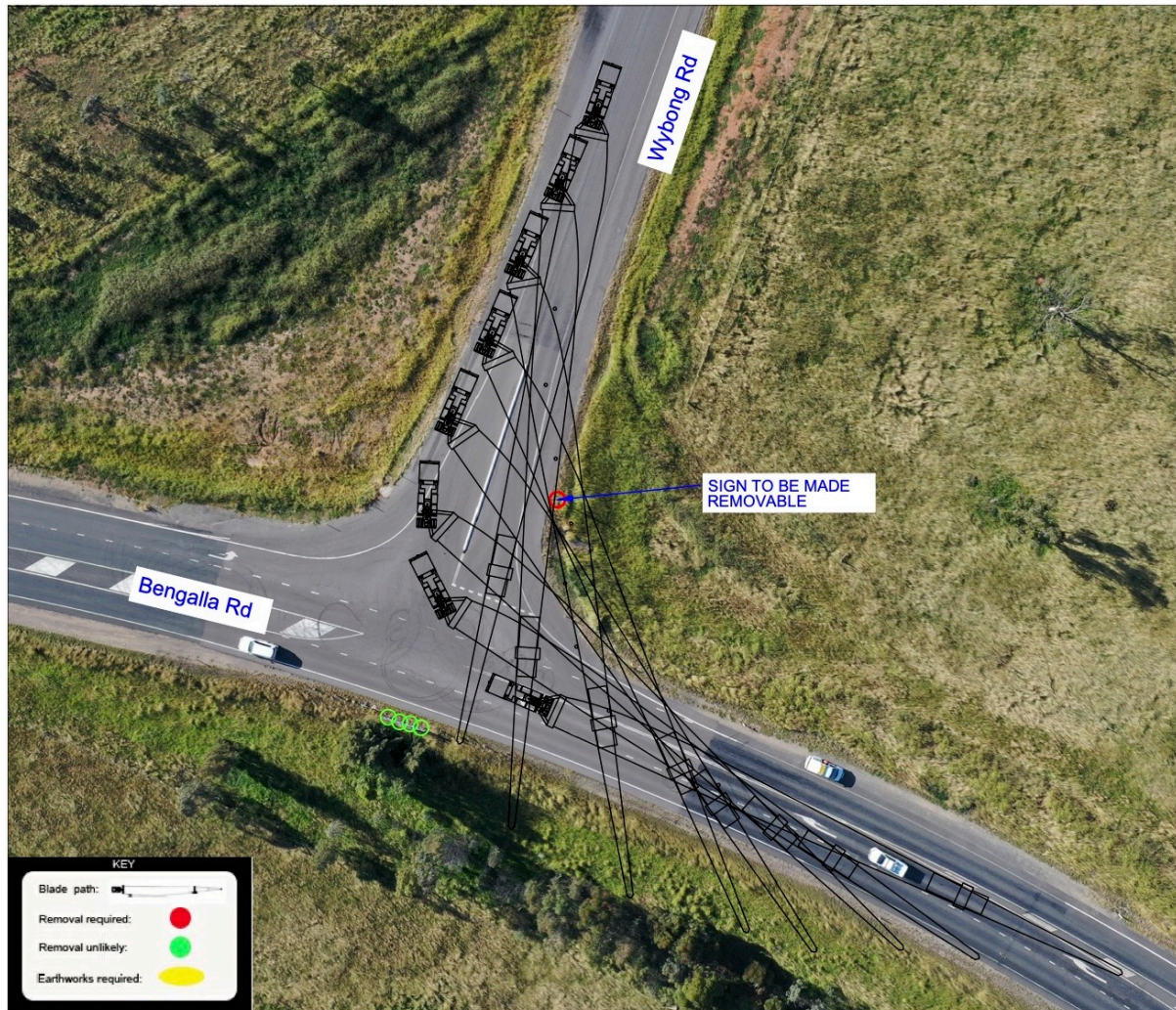
GPS LINK FOR SECTION OF ROAD: <https://goo.gl/maps/CJYMtSMTttJ2>

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

ROAD MODIFICATIONS: No works required.

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

170 Metre rotor:



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

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

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

ROAD MODIFICATIONS: Small amounts of work are required.

158 Metre rotor:



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

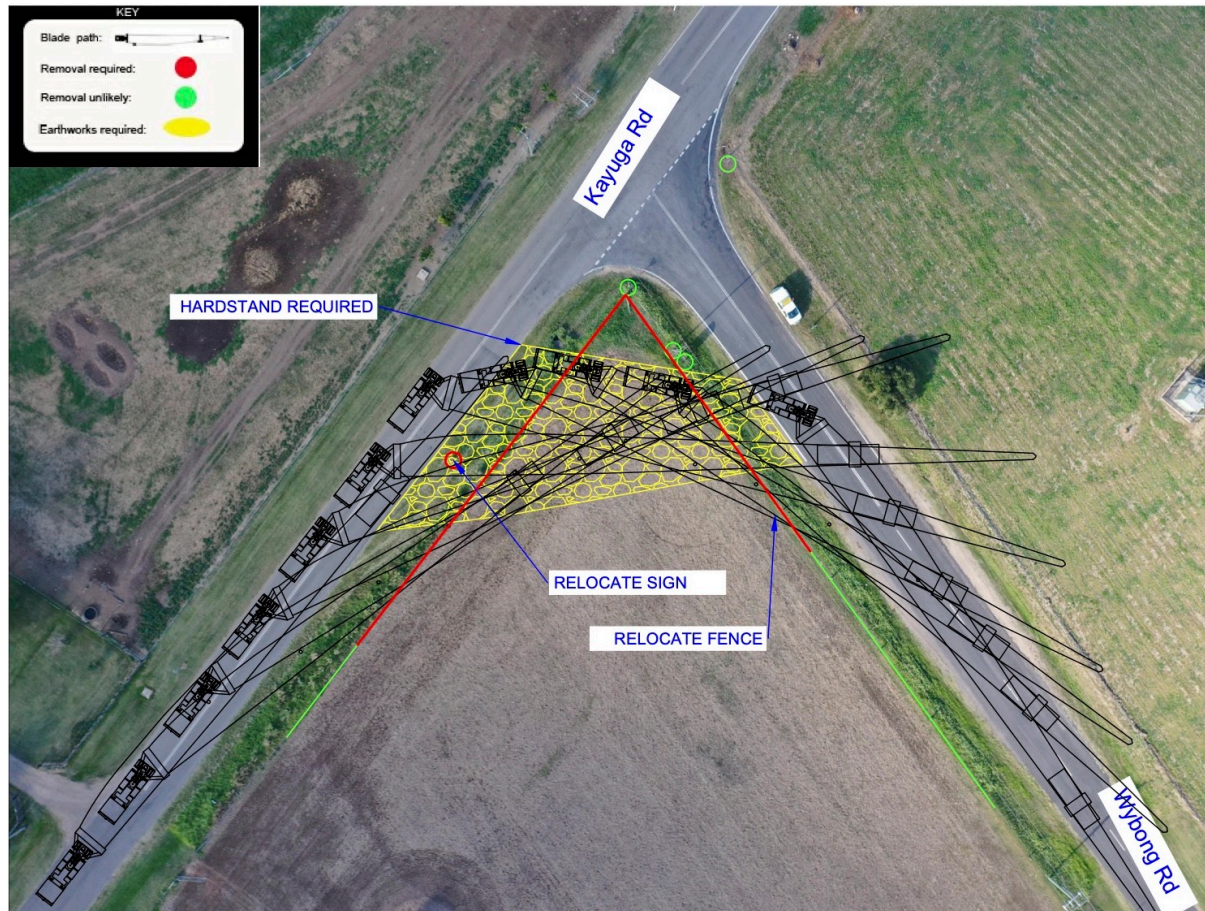
GPS LINK FOR SECTION OF ROAD: <https://goo.gl/maps/vibQtvHkxXE2>

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

ROAD MODIFICATIONS: Small amounts of work are required.

**168.1 Km's: Wybong Road onto Kayuga Road at
Muswellbrook. OPTION 1**

170 Metre rotor:



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

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

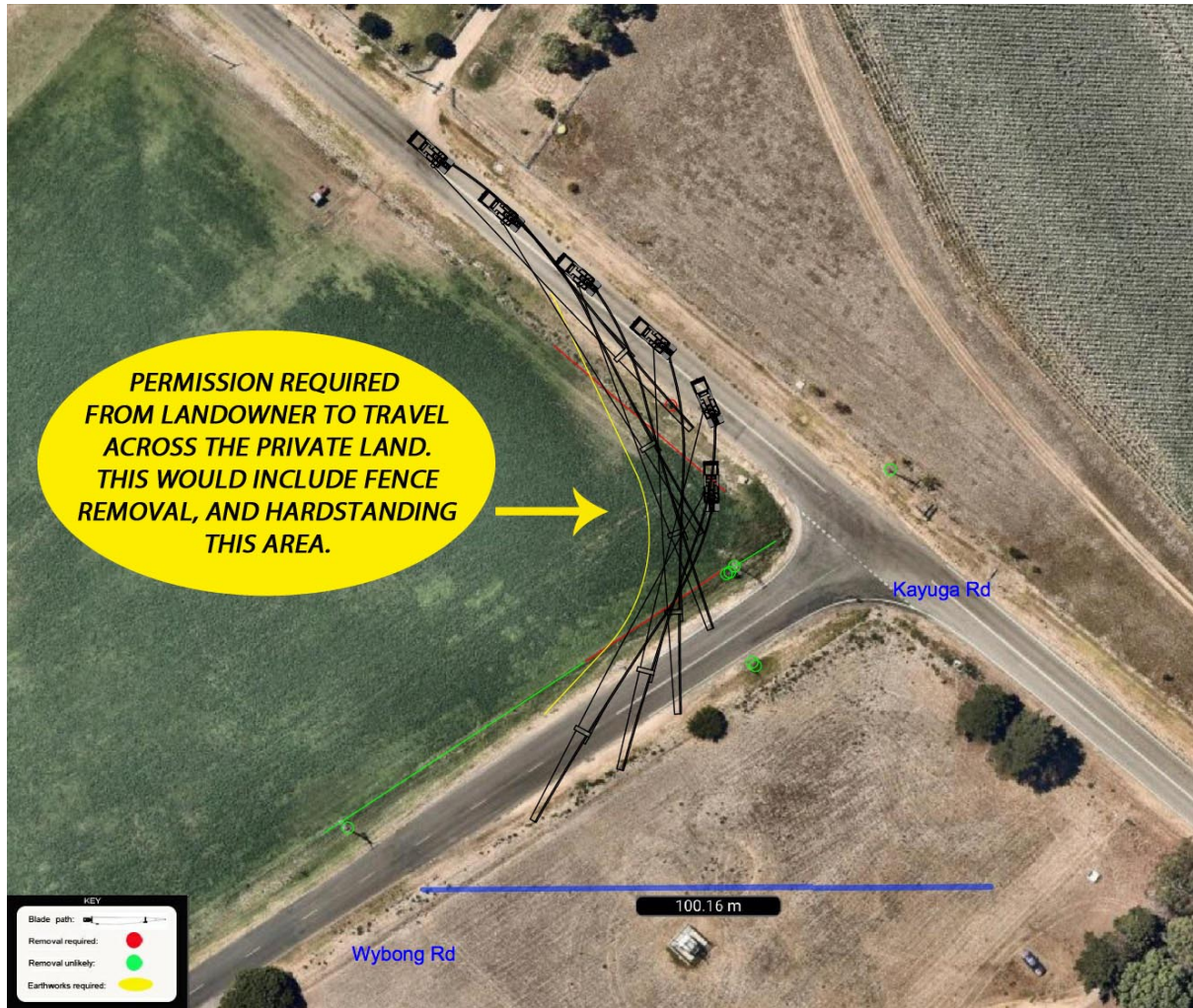
COMMENTS: Blades to cross from the incorrect side to the incorrect side with the load travelling across the inside of the telegraph pole and through private land.

Permission will be required from the landowner to travel over the private land. This will require removal and realigning the fence and adding hardstand.

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

ROAD MODIFICATIONS: Large amounts of work are required.

158 Metre rotor:



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

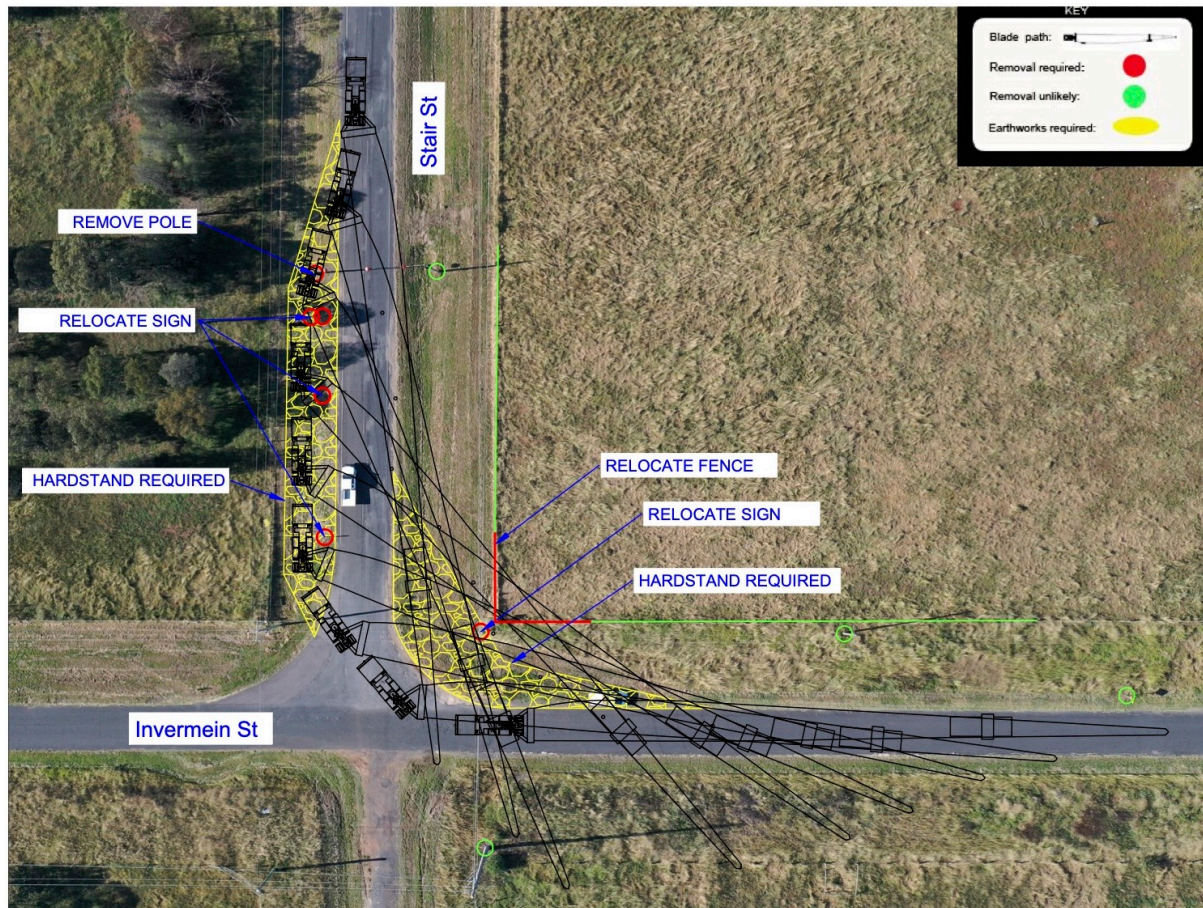
GPS LINK FOR SECTION OF ROAD: <https://goo.gl/maps/xVscKUT1isJ2>

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

ROAD MODIFICATIONS: Large amounts of work are required.

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

170 Metre rotor:



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

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

COMMENTS: Blades to cross from the correct side to the correct side. Some signs will need to be made removable and some hardstand added to the inside and outside of the corner. Additionally, a drainage pipe will need to be extended on the inside of the corner.

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

ROAD MODIFICATIONS: Moderate amounts of work are required.

158 Metre rotor:



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

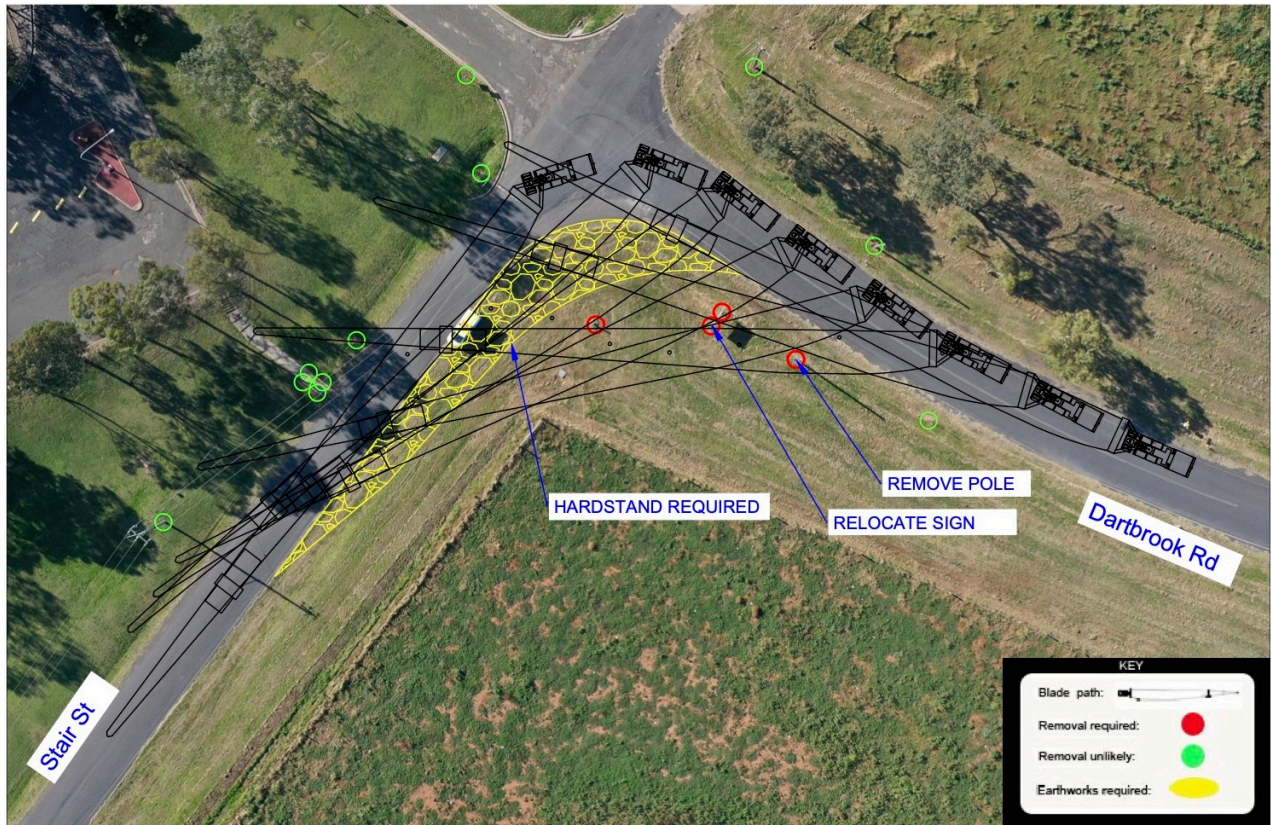
GPS LINK FOR SECTION OF ROAD: <https://goo.gl/maps/ddMHa4CmXK32>

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

ROAD MODIFICATIONS: Moderate amounts of work are required.

174.8 Km's: Dartbrook access Road at Muswellbrook.

170 Metre rotor:



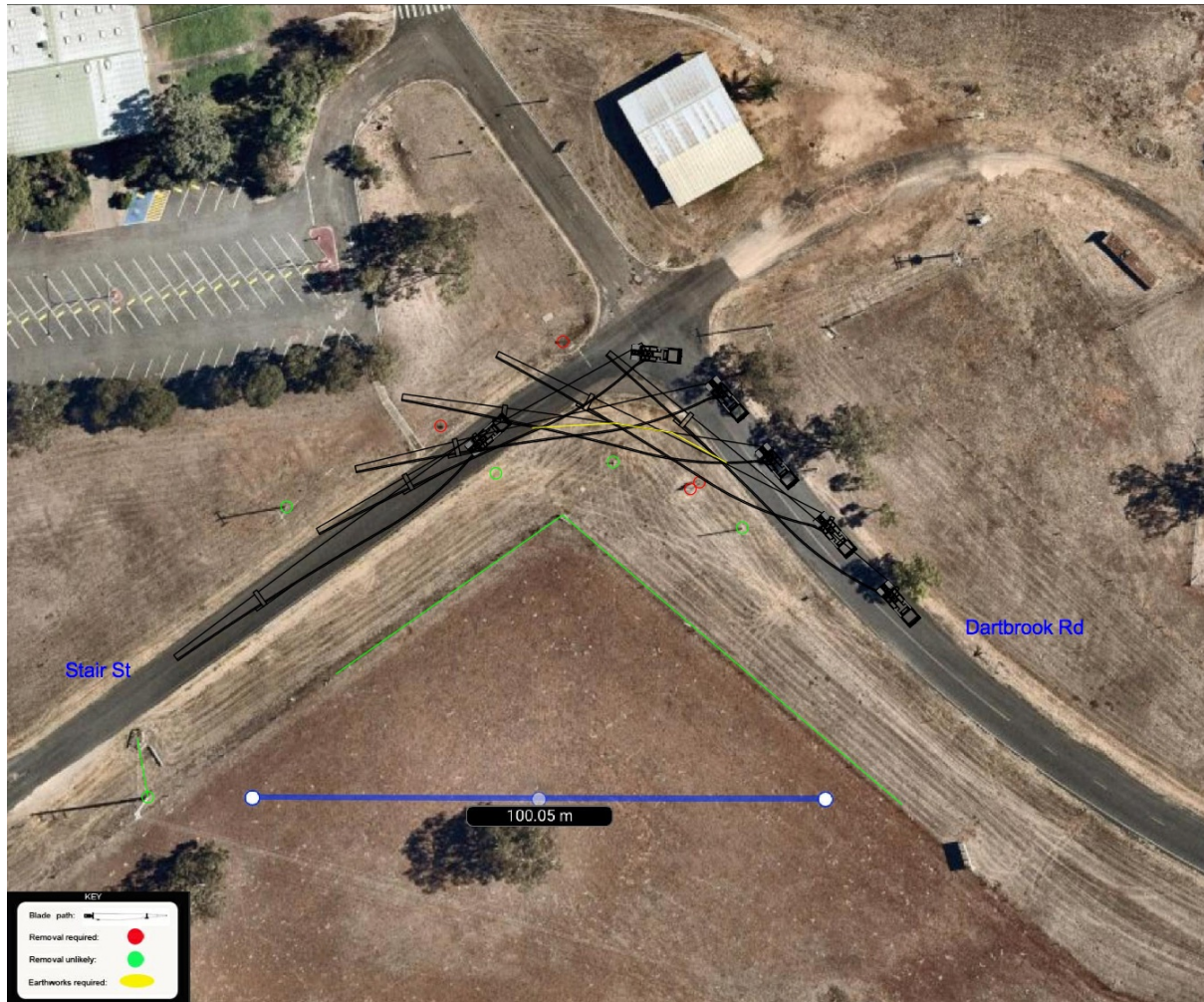
PROCEDURE: Right hand turn on the Dartbrook mine access Road.

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

COMMENTS: Blades to cross from the correct side to the correct side, but cut across the inside of the corner. Some signs will need to be made removable and some hardstand added to the inside of the corner. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: Moderate amounts of work are required.

158 Metre rotor:



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

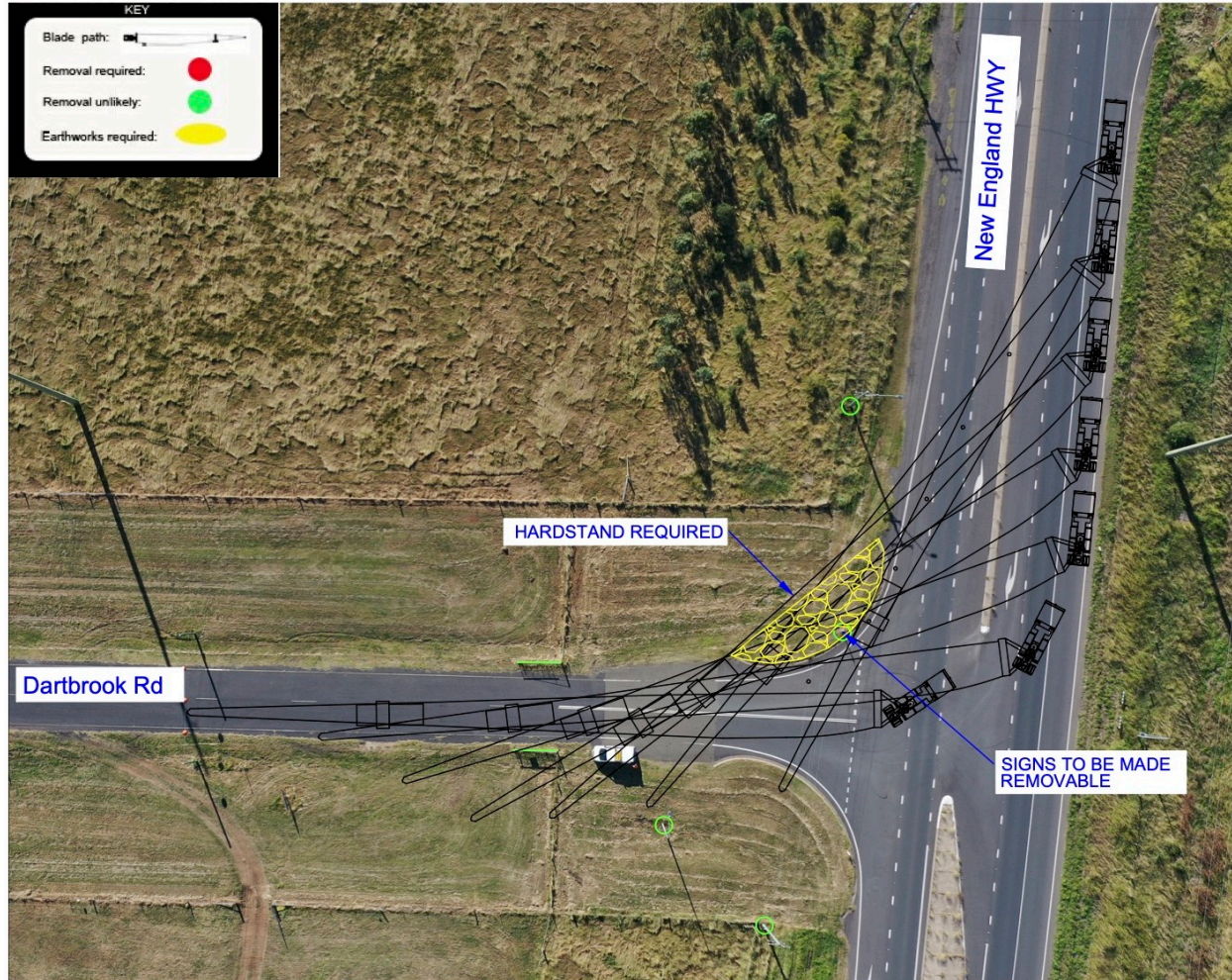
GPS LINK FOR SECTION OF ROAD: <https://goo.gl/maps/u9vSXiSV7Jt>

COMMENTS: Blades to cross from the correct side to the correct side, but cut across the inside of the corner. Some signs will need to be made removable and some hardstand added to the inside of the corner. Police and escorts to control local traffic either side of the intersection.

ROAD MODIFICATIONS: Small amounts of work are required.

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

170 Metre rotor:



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

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

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

ROAD MODIFICATIONS: Moderate amounts of work are required.

158 Metre rotor:



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

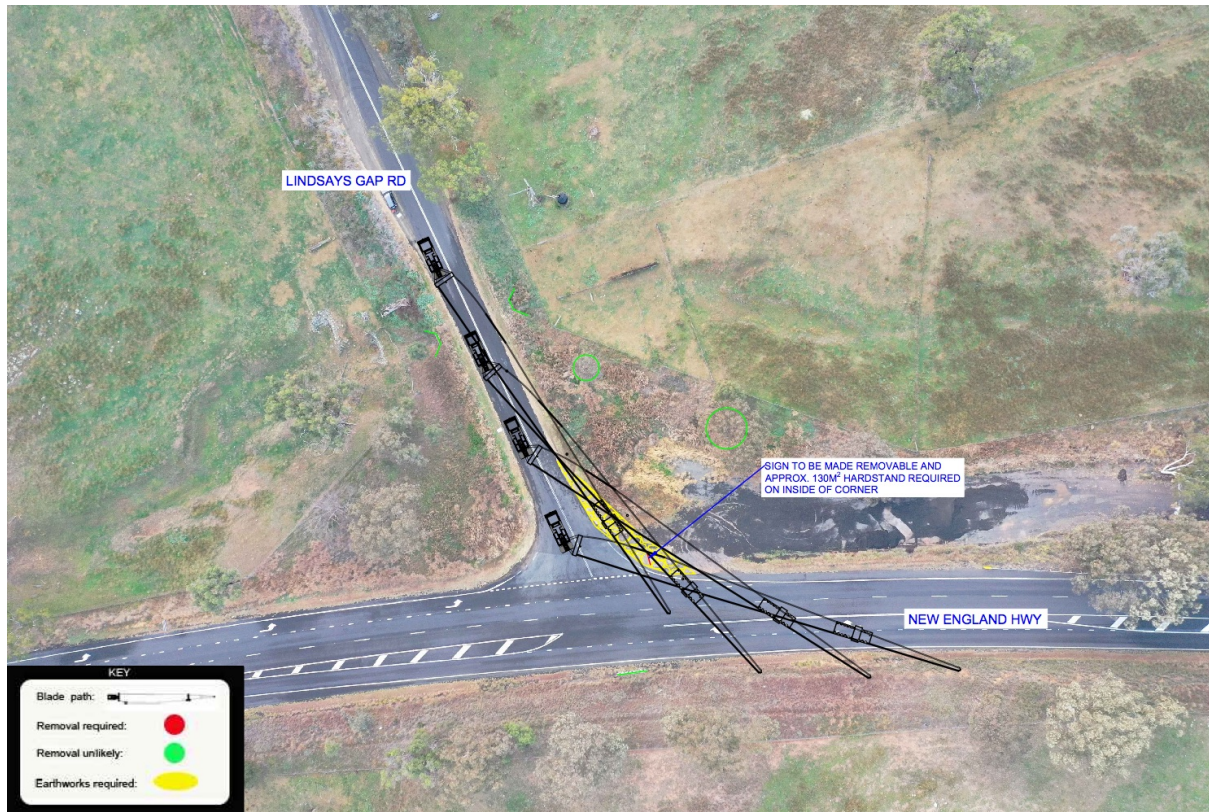
GPS LINK FOR SECTION OF ROAD: <https://goo.gl/maps/twTsmUKaED82>

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

ROAD MODIFICATIONS: Moderate amounts of work are required.

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

170 Metre rotor:



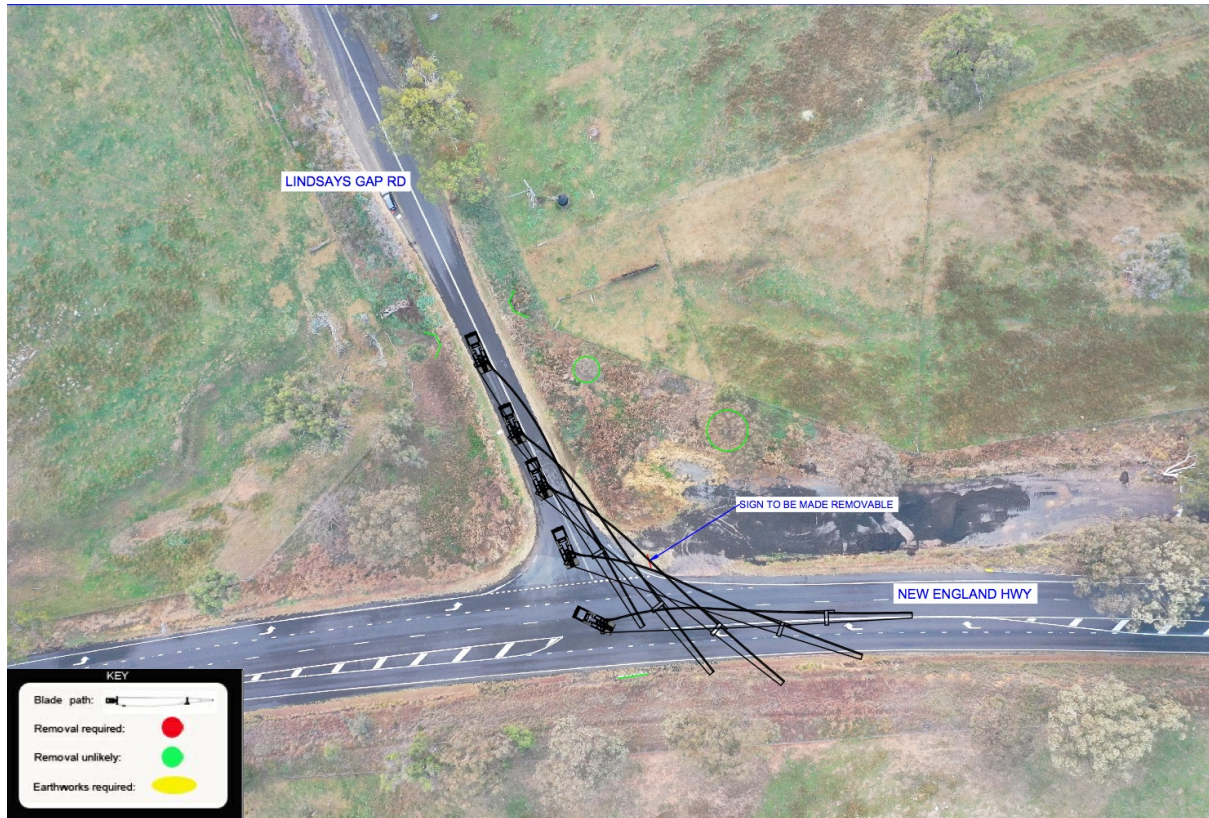
PROCEDURE: Right hand turn from the New England Highway onto Lindsay's Gap Road.

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

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

ROAD MODIFICATIONS: Moderate amounts of work are required.

158 Metre rotor:



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

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

COMMENTS: Blades to cross from the correct side to the correct side but cut across the inside of the corner. Some signs will need to be made removable.

ROAD MODIFICATIONS: Small amounts of work are required.

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

Image 1:



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

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

COMMENTS: The blades will fit over the structure in its current condition.

Loads that are been carried on trailers with an axle width exceeding 3.5 meters will not fit over this structure in its current form.

This bridge will need to be replaced or modified before the towers or motors can be delivered on this route.

A trafficable deck width of at least 4.6 meters is required for these heavier loads. And possibly turn the bridge into dual lane.

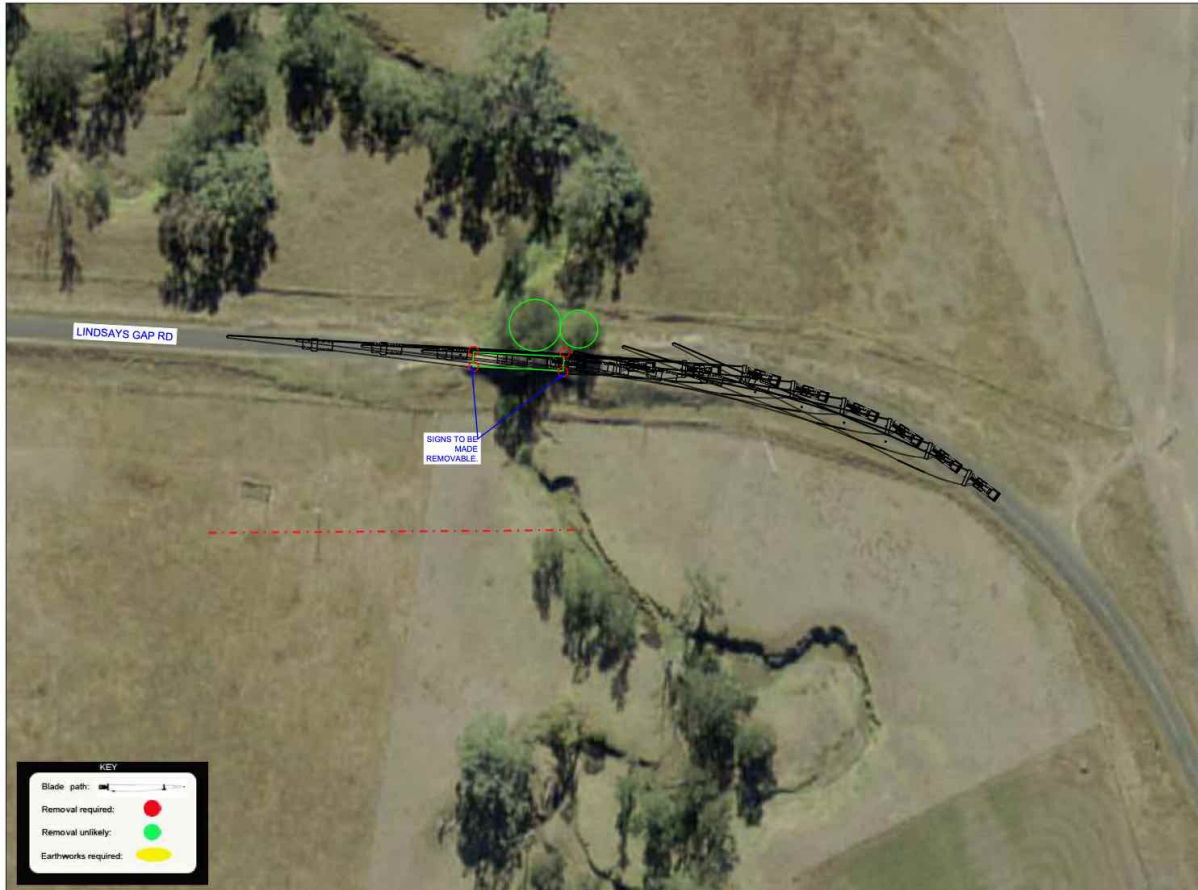
ROAD MODIFICATIONS: Yes, a large amount of works is required.

295.7 Km's: Lindsay's Gap Road over Middlebrook Creek at Garoo.

Image 1:



Image 2:



PROCEDURE: Travel directly ahead in the centre of the bridge before entering a right-hand bend.

GPS LINK FOR SECTION OF ROAD: <https://goo.gl/maps/DyxGUi9JucoAHhHA>

COMMENTS: The blades will fit over the structure in its current condition.

Loads that are been carried on trailers with an axle width exceeding 3.5 meters will not fit over this structure in its current form.

This bridge will need to be replaced or modified before the towers or motors can be delivered on this route. A trafficable deck width of at least 4.6 meters is required for these heavier loads. And possibly turn the bridge into dual lane.

ROAD MODIFICATIONS: Yes, a large amount of works is required.

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



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

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

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

ROAD MODIFICATIONS: Large amounts of work are required.

158 Metre rotor:



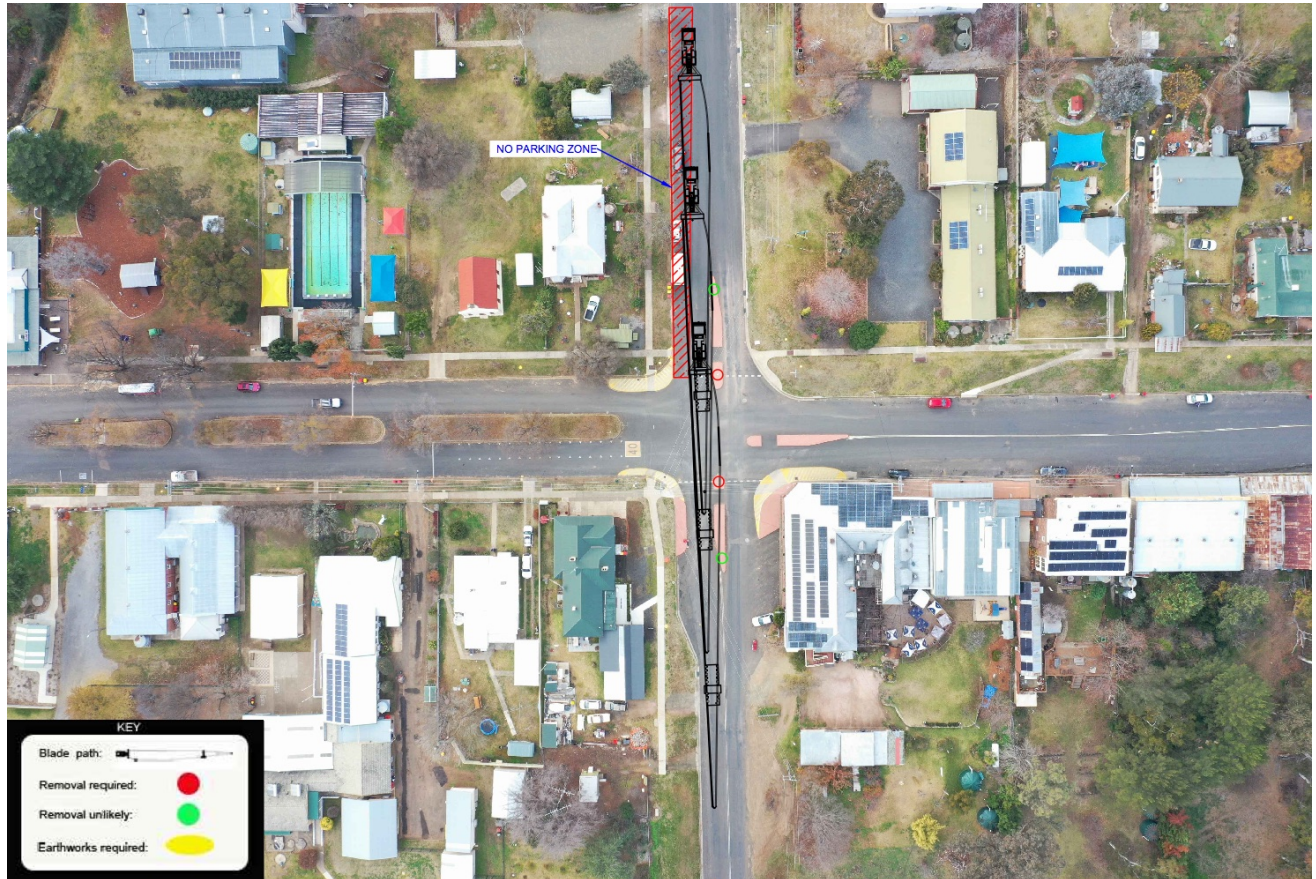
PROCEDURE: Right hand turn from Lindsay's Gap Road onto Nundle Road.

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

COMMENTS: Blades to cross from the correct side to the correct side but cut across the inside of the corner. Some signs will need to be made removable.

ROAD MODIFICATIONS: Small amounts of work are required.

311.0 Km's: Oakenville Street at Nundle.
170 Metre rotor and 158 Metre rotor:



PROCEDURE: Travel directly ahead on Oakenville Street.

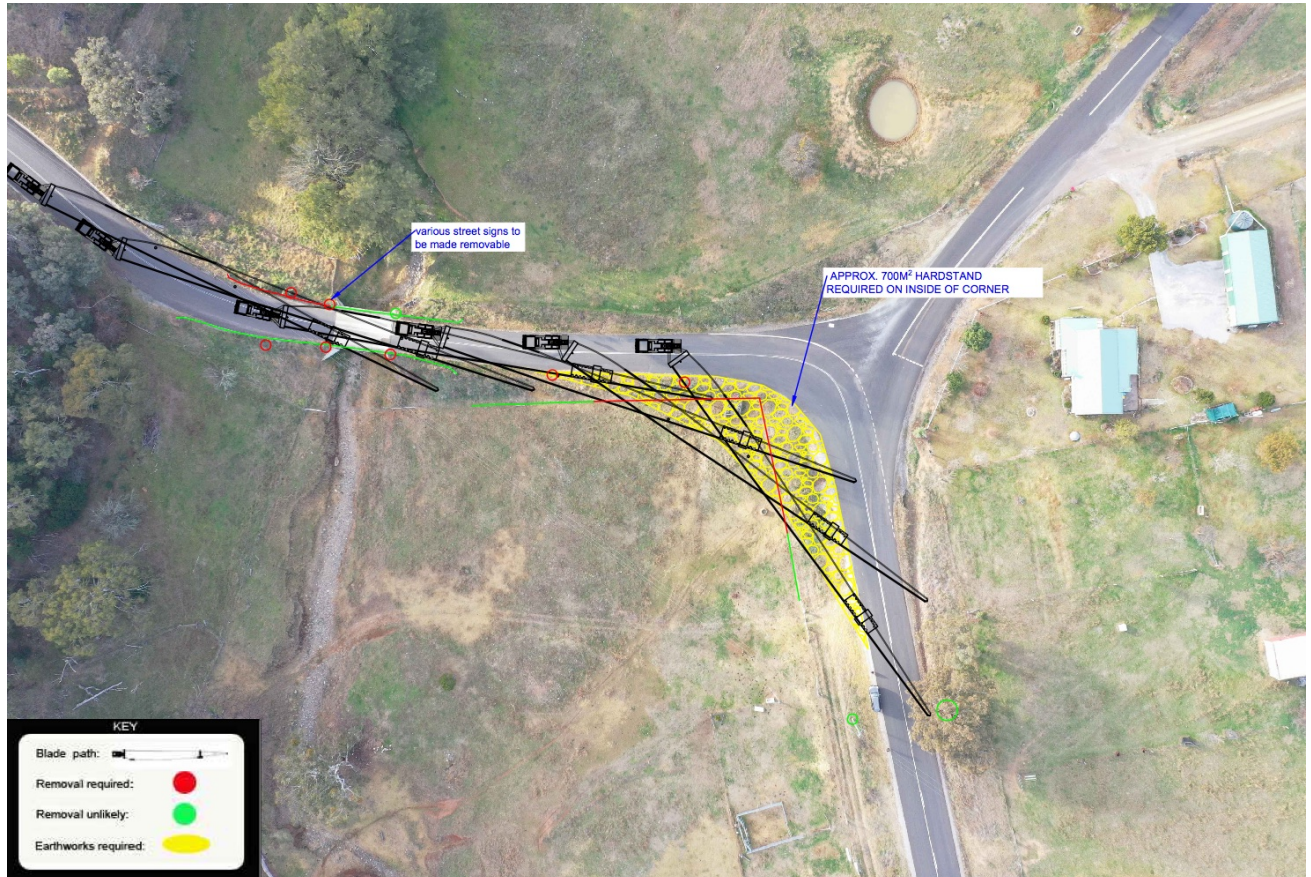
GPS LINK FOR SECTION OF ROAD: <https://goo.gl/maps/7YM56hQq8bnCS0Zy8>

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

ROAD MODIFICATIONS: Small amounts of work are required.

312.0 Km's: Oakenville Street onto Hanging Rock Road at Nundle.

170 Metre rotor:



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

GPS LINK FOR SECTION OF ROAD: <https://goo.gl/maps/dTVzsVzuaY1qvLHd7>

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

ROAD MODIFICATIONS: Large amounts of work are required.

313.0 to 323.0 Km's: Barry's Gap Road from Nundle to Hanging Rock.

170 Metre rotor:

Image 1: Looking east towards Devils Elbow.



Image 2: (Proposed bypass of Devils Elbow).



Image 3: (Upgrades on Barrys Road).



PROCEDURE: Travel directly ahead on Barrys Road.

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

COMMENTS: Barrys Road has a section of road known as the Devils Elbows. The existing hairpin corners are impassable for the blades, towers and motors. A detour of the Devils Elbow as per Image 3 has been looked at and will likely be the best solution for all loads.

If the gradient of this new detour exceeds 14% than it will need to be sealed.

To the west and east of the Devils Elbows the road will need to be widened on a few corners, this would include hardstand and tree removal.

ROAD MODIFICATIONS: Large amounts of work are required.

323.0 Km's: Barrys Road onto Morrisons Gap Road.
170 Metre rotor:



PROCEDURE: Right hand turn from Barrys Road onto Morrisons Gap Road.

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

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

ROAD MODIFICATIONS: Large amounts of work are required.

158 Metre rotor:



PROCEDURE: Right hand turn from Barrys Road onto Morrisons Gap Road.

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

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

ROAD MODIFICATIONS: Large amounts of work are required.

323.0 to 326.0 Km's: Morrisons Gap Road at Hanging Rock.

170 Metre rotor and 158 Metre rotor:

Image 1: (Looking along Morrisons Gap Road from Barry Road)



Image 2: (Swept path staying within the road reserve)



Image 3: (Swept path staying within the road reserve)



Image 4: (Swept path staying within the road reserve)



Image 5: (Swept path staying on existing road).



Image 6: (Swept path staying on existing road).



Image 7: (Swept path staying on existing road).



PROCEDURE: Travel directly ahead on Morrisons Gap Road.

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

COMMENTS: This section of road is gravel for the entirety. The road will need to be widened for the majority of the road. Typically, the road will need to be widened to 5.5 meters in all straight sections and made wider on the corners depending on the radius. A swept path analysis of this section of road, shows that the corridor would be able to stay within the road reserve. Additionally, there will need to be trees removed. The vertical curve will also need to be checked for the entirety of this road.

ROAD MODIFICATIONS: Large amounts of work are required.

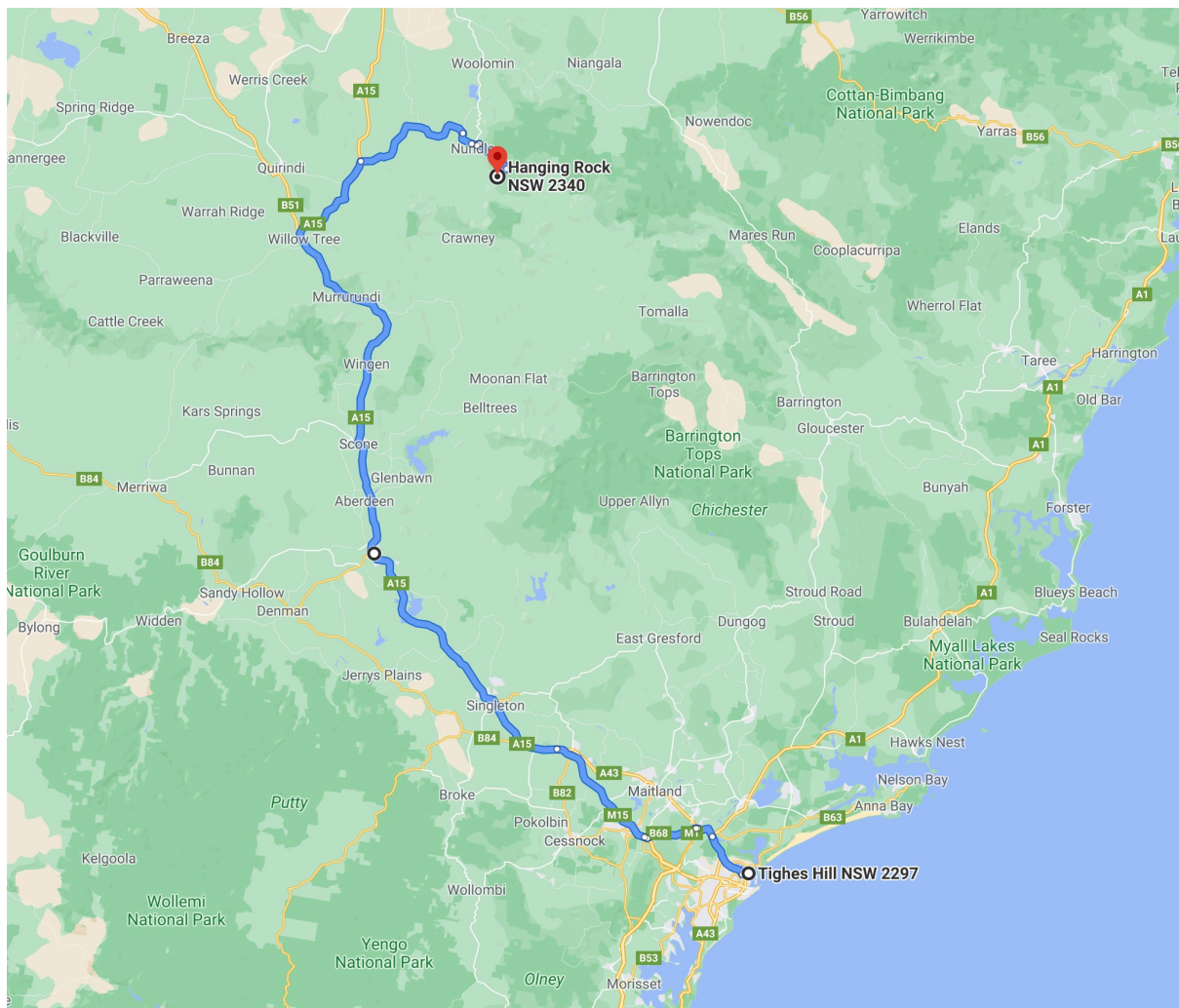
NOTE: From this point on all access roads through to final delivery points will need to be made suitable for the swept path of the largest items. These access roads will also need to be made with suitable gradients and vertical curves.

11.0 Route Survey B: Newcastle port to Hills of Gold WF for loads up to 5.2 metres in height.

Distance: (284.0 Kilometres).

Via: Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Bell Street, Victoria Street, Market Street, New England Highway, Lindsays Gap Road, Nundle Road, Crosby Street, Oakenville Street, Old Hanging Rock Road, Barry Road, Morrisons Gap Road.

GPS Link: <https://goo.gl/maps/rouAWyxLZ53pMB3v7>



| KEY | |
|------------------------|--|
| MODIFICATIONS REQUIRED | |
| MINOR WORKS OR CAUTION | |
| PARKING | |

| KM index | Location | Section of road | Critical Measurement | Procedure | Notes |
|--------------------|---------------|---|---|--------------------------|--|
| Route Index | | | | | |
| 0.0 | Mayfield | Mayfield #4 berth onto Selwyn Street GPS link: https://goo.gl/maps/aflwPYKuNdm | Clearance: Length: 70.0 metres Width: 8.0 metres | Right hand turn | No problems with this section of road. |
| 0.4 | Mayfield | Selwyn Street rail crossing GPS link: https://goo.gl/maps/AmohE54hKSz | Clearance: Width: 9.0 metres | Travel directly ahead | Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution. |
| 1.3 | Mayfield | Selwyn Street onto George Street GPS link: https://goo.gl/maps/gXeHvBtCp4D2 | Clearance: Length: 70.0 metres Width: 8.0 metres | Right hand turn | No problems with this section of road. |
| 1.4 | Mayfield | George Street onto Industrial Drive https://goo.gl/maps/s4ayrsuoAsD2 | Clearance: Length: 70.0 metres Width: 8.0 metres | Moderate right hand turn | No problems with this section of road. |
| 4.9 | Mayfield | Industrial Drive under traffic signals GPS link: https://goo.gl/maps/YmqhiS2iR582 | Clearance: Height: 5.4 Metres | Travel directly ahead | The lowest traffic signal on route is at the intersection of Steel River Blvd. Trucks that exceed 5.3 metres will need to travel in the right hand lane. |
| 5.5 | Mayfield West | Industrial Drive onto Maitland Road GPS link: https://goo.gl/maps/Kn49dhWG2qG2 | Clearance: Length: 50.0 metres Width: 10.0 metres | Right hand turn | No problems with this section of road. |
| 13.9 | Hexham | New England Highway under gantry GPS link: https://goo.gl/maps/YTMoFe7Aick | Clearance: Height: 5.95 Metres | Travel directly ahead | This is the lowest structure on route. There is no bypass around the gantry. A maximum loaded height of 5.8 metres should not be exceeded. |
| 17.4 | Tarro | New England Highway onto John Renshaw Drive GPS link: https://goo.gl/maps/SRDr5JigkBg | Clearance: Width: 12.0 metres | Left hand merge | No problems with this section of road. |
| 18.4 | Beresfield | John Renshaw Drive GPS link: https://goo.gl/maps/N19vJih1Fgr | Clearance: Width: 9.0 metres Height: 5.9 metres | Travel directly ahead | No problems with this section of road. |
| 28.7 | Buchanan | John Renshaw Drive onto the Hunter Expressway GPS link: https://goo.gl/maps/1STJ1PfQit9E2 | Clearance: Length: 65.0 metres Width: 7.0 metres | Right hand turn | No problems with this section of road. |

| KM index | Location | Section of road | Critical Measurement | Procedure | Notes |
|----------|--------------------------|---|--|-------------------------------|---|
| 59.0 | Branxton | The Hunter Expressway onto The New England Highway GPS link: https://goo.gl/maps/7rauNuxzqjg | Clearance: Width: 9.0 metres | Travel directly ahead | No problems with this section of road. |
| 124.5 | Muswellbrook | New England Highway onto Bell Street GPS link: https://goo.gl/maps/H94bMYOMcSHay7918 | Clearance: Length: 40.0 metres Width: 6.0 metres | Right hand turn | No problems with this section of road. |
| 125.0 | Muswellbrook | Bell Street onto Victoria Street GPS link: https://goo.gl/maps/aHhW27tcZy9y3WNq9 | Clearance: Length: 40.0 metres Width: 7.0 metres | Left hand corners | Tight left-hand bend over a rail bridge before another tight left hand bend. Spotter to guide loads through this section of road, and approval from rail required to cross this structure. |
| 125.5 | Muswellbrook | Victoria Street onto Market Street GPS link: https://goo.gl/maps/pyiTUH25bANG3m9n9 | Clearance: Width: 7.0 metres | Travel directly ahead | No problems with this section of road. |
| 126.0 | Muswellbrook | Market Street onto New England Highway GPS link: https://goo.gl/maps/3kpU6XdCBmCW75gM7 | Clearance: Length: 30.0 metres Width: 7.0 metres | Right hand turn at roundabout | Loads may need to cross to the incorrect side of the roundabout if they exceed 30.0 meters in length, and do not exceed 42 meters in length. |
| 201.8 | Murrurundi | New England highway (Township) GPS link: https://goo.gl/maps/Sj3ixAkhujt | Clearance: 60.0 x 5.0 metres | Parking Bay | Suitable parking for Fatigue breaks. |
| 206.4 | Murrurundi Hill | New England highway Nowlands Gap GPS link: https://goo.gl/maps/R5yufobPeMG2 | Clearance: 120.0 x 12.0 metres | Parking Bay (small) | Emergency parking only. |
| 203.0 | Willow Tree | New England highway GPS link: https://goo.gl/maps/XLTg7CRV7EU2 | Clearance: Width: 7.0 metres Length: 35 metres Height: 5.2 metres | Kankool weighbridge | It is likely that the towers and defiantly the blades will not fit into this facility. We have engineered documentation showing correct weights for all loads. |
| 208.9 | Willow Tree Township | New England highway GPS link: https://goo.gl/maps/gw38qmvVfTC2 | Clearance: 60.0 x 5.0 metres | Parking Bay | Suitable parking for Fatigue breaks. |
| 210.5 | Willow Tree Truck Stop N | New England highway GPS link: https://goo.gl/maps/RRdPVHupGCs | Clearance: 120.0 x 12.0 metres | Parking Bay (small) | Suitable parking for Fatigue breaks for small loads only. |
| 230.0 | Wallabadah | New England highway GPS link: https://goo.gl/maps/QWCyeHQSOHs2 | Clearance: 80.0 x 5.0 metres | Parking Bay (side of road) | Suitable parking for Fatigue breaks. |
| 235.0 | Wallabadah | New England highway onto Lindsay's Gap Road GPS link: https://goo.gl/maps/ePbYctjJootkBZiM9 | Clearance: Length: 50.0 metres | Right hand turn | If the upgrades are completed for the blades than this corner will be suitable for the remaining components. |

| KM index | Location | Section of road | Critical Measurement | Procedure | Notes |
|----------|----------|---|---|--|---|
| 245.7 | Garoo | Lindsay's Gap Road over Goonoo Creek GPS link: https://goo.gl/maps/9FLSL37LRWaf13ta7 | Clearance: Axle width: 3.60m Overall width: 6.20m Guard rail height: 850mm | Travel directly ahead over bridge in the centre of the road. | Loads that are been carried on trailers with an axle width exceeding 3.5 meters will not fit over this structure in its current form. This bridge will need to be replaced or modified before the towers or motors can be delivered on this route. A trafficable deck width of at least 4.6 meters is required for these heavier loads. |
| 253.7 | Garoo | Lindsay's Gap Road over Middlebrook Creek GPS link: https://goo.gl/maps/Dxv3Q39JacoAIBHA | Clearance: Axle width: 4.50m Overall width: 6.10m Guard rail height: 750mm | Travel directly ahead over bridge in the centre of the road. | Loads that are been carried on trailers with an axle width exceeding 3.5 meters will not fit over this structure in its current form. This bridge will need to be replaced or modified before the towers or motors can be delivered on this route. |
| 259.2 | Garoo | Lindsay's Gap Road through Lindsay's Gap GPS link: https://goo.gl/maps/GGKmqqemziKdth8wH9 | Clearance: Length: 90.0 metres | Travel directly ahead | Load to travel in the centre of the road, escorts to warn traffic 500 metres to the east of the gap. |
| 264.8 | Nundle | Lindsay's Gap Road onto Nundle Road GPS link: https://goo.gl/maps/FX4ZRx2YG9i2BsXMA | Clearance: Length: 50.0 metres | Right hand turn | If the upgrades are completed for the blades than this corner will be suitable for the remaining components. |
| 268.3 | Nundle | Nundle Road onto Crosby Street GPS link: https://goo.gl/maps/uVveN9QkPyTDP1YR6 | Clearance: Width: 8.0 metres | Travel directly ahead | No problems with this section of road. |
| 268.6 | Nundle | Crosby Street onto Oakenville Street GPS link: https://goo.gl/maps/aZNDKURdSBERedMr9 | Clearance: Width: 8.0 metres | Travel directly ahead | No problems with this section of road. |
| 269.0 | Nundle | Oakenville Street and Jenkins Street intersection GPS link: https://goo.gl/maps/7YM56hQq8bnCS0Zy8 | 5.0 metres width clearance | | A no parking exclusion zone will need to be placed on the left-hand side while travelling through this intersection. Two signs will also need to be made removable. |
| 270.0 | Nundle | Oakenville Street onto Old Hanging Rock GPS link: https://goo.gl/maps/1UMr2EwZetiE76Ey9 | 35.0 metres length clearance | Left hand turn | If the upgrades are completed for the blades than this corner will be suitable for the remaining components. |
| 271.0 | Nundle | Old Hanging Rock Road onto Barry Road GPS link: https://goo.gl/maps/ve9zvmdJnLBYtQSz5 | 90.0 metres clearance | Right hand bend | No problems with this section of road. |

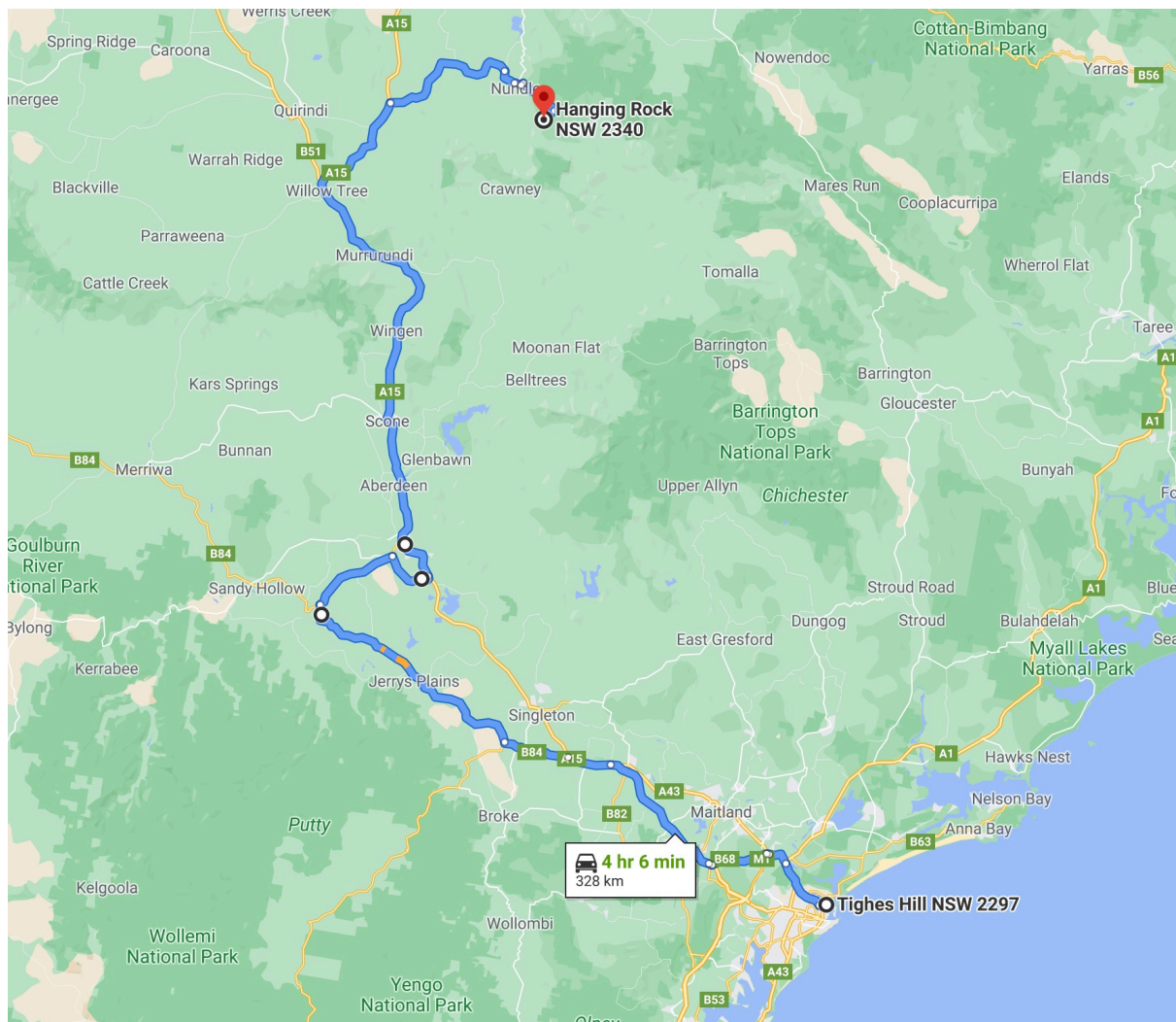
| KM index | Location | Section of road | Critical Measurement | Procedure | Notes |
|---------------------|------------------------|--|------------------------------|--|---|
| 271.0 to 281.0 Km's | Nundle to Hanging Rock | Barrys Road https://goo.gl/maps/BUWe2MC6xQ215qKE6 | 25.0 metres length clearance | Travel directly ahead through multiple tight turns and steep terrain | As per the blades Barrys Road has a section of road known as the Devils Elbows. The existing hairpin corners are impassable for the blades, towers and motors. A detour of the Devils Elbow has been looked at and will likely be the best solution for all loads. To the west and east of the Devils Elbows the road will need to be widened on a few corners, this would include hardstand and tree removal. |
| 281.0 | Hanging Rock | Barrys Road onto Morrisons Gap Road GPS link: https://goo.gl/maps/CLZDJ5jFNeRpAg7 | 35.0 metres length clearance | Right hand turn | Blades to turn right from the correct side to the correct side of the road. The swept path will have the blades travel through a landowner's boundaries on the inside of the corner. This will require a fence to be relocated and hardstand added. Additionally, some trees will need to be removed. |
| 281.0 to 284.0 Km's | Hanging Rock | Morrisons Gap Road GPS link: https://goo.gl/maps/McYYnnkTgE6ZPEA | 25.0 metres length clearance | Travel around several sweeping bends on a gravel road | This section of road is gravel for the entirety. The road will need to be widened for the majority of the road. Typically, the road will need to be widened to 5.5 meters in all straight sections and made wider on the corners depending on the radius. A swept path analysis of this section of road, shows that the corridor would be able to stay within the road reserve. Additionally, there will need to be trees removed. The vertical curve will also need to be checked for the entirety of this road. |
| 284.0 Km's | Hanging Rock | Morrisons Gap Road into Hills of Gold windfarm GPS link: https://goo.gl/maps/TVFMQCB3drgXcivU8 | | Travel directly ahead into site entrance | Windfarm to supply suitable access for the dimensions and swept path of all loads. |

12.0 Route Survey C: Newcastle port to Hills of Gold WF for loads over 5.2 metres in height.

Distance: (328.0 Kilometres).

Via: Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Golden Highway, Denman Road, Thomas Mitchell Drive, New England Highway, Bell Street, Victoria Street, Market Street, New England Highway, Lindsays Gap Road, Nundle Road, Crosby Street, Oakenville Street, Old Hanging Rock Road, Barry Road, Morrisons Gap Road.

GPS Link: <https://goo.gl/maps/tMkKEEQKNL7azUDi7>



| KEY | |
|------------------------|--|
| MODIFICATIONS REQUIRED | |
| MINOR WORKS OR CAUTION | |
| PARKING | |

| KM index | Location | Section of road | Critical Measurement | Procedure | Notes |
|--------------------|---------------|---|---|--------------------------|--|
| Route Index | | | | | |
| 0.0 | Mayfield | Mayfield #4 berth onto Selwyn Street GPS link: https://goo.gl/maps/aflwPYKuNdm | Clearance: Length: 70.0 metres Width: 8.0 metres | Right hand turn | No problems with this section of road. |
| 0.4 | Mayfield | Selwyn Street rail crossing GPS link: https://goo.gl/maps/AmohE54hKSz | Clearance: Width: 9.0 metres | Travel directly ahead | Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution. |
| 1.3 | Mayfield | Selwyn Street onto George Street GPS link: https://goo.gl/maps/gXeHvBtCp4D2 | Clearance: Length: 70.0 metres Width: 8.0 metres | Right hand turn | No problems with this section of road. |
| 1.4 | Mayfield | George Street onto Industrial Drive https://goo.gl/maps/s4ayrsuoAsD2 | Clearance: Length: 70.0 metres Width: 8.0 metres | Moderate right hand turn | No problems with this section of road. |
| 4.9 | Mayfield | Industrial Drive under traffic signals GPS link: https://goo.gl/maps/YmqhiS2iR582 | Clearance: Height: 5.4 Metres | Travel directly ahead | The lowest traffic signal on route is at the intersection of Steel River Blvd. Trucks that exceed 5.3 metres will need to travel in the right hand lane. |
| 5.5 | Mayfield West | Industrial Drive onto Maitland Road GPS link: https://goo.gl/maps/Kn49dhWG2qG2 | Clearance: Length: 50.0 metres Width: 10.0 metres | Right hand turn | No problems with this section of road. |
| 13.9 | Hexham | New England Highway under gantry GPS link: https://goo.gl/maps/YTMoFe7Aick | Clearance: Height: 5.95 Metres | Travel directly ahead | This is the lowest structure on route. There is no bypass around the gantry. A maximum loaded height of 5.8 metres should not be exceeded. |
| 17.4 | Tarro | New England Highway onto John Renshaw Drive GPS link: https://goo.gl/maps/SRDr5JigkBg | Clearance: Width: 12.0 metres | Left hand merge | No problems with this section of road. |
| 18.4 | Beresfield | John Renshaw Drive GPS link: https://goo.gl/maps/N19vJih1Fgr | Clearance: Width: 9.0 metres Height: 5.9 metres | Travel directly ahead | No problems with this section of road. |
| 28.7 | Buchanan | John Renshaw Drive onto the Hunter Expressway GPS link: https://goo.gl/maps/1STJ1PfQit9E2 | Clearance: Length: 65.0 metres Width: 7.0 metres | Right hand turn | No problems with this section of road. |

| KM index | Location | Section of road | Critical Measurement | Procedure | Notes |
|----------|---------------|--|--|-----------------------|---|
| 59.0 | Branxton | The Hunter Expressway onto The New England Highway GPS link: https://goo.gl/maps/7rauNuxzqjg | Clearance: Width: 9.0 metres | Travel directly ahead | No problems with this section of road. |
| 67.3 | Whittingham | The New England Highway onto the Golden Highway GPS link: https://goo.gl/maps/nAnfKYfeUn42 | Clearance: Width: 12.0 metres | Left Hand turn | No problems with this section of road. |
| 67.4 | Whittingham | Golden Highway GPS link: https://goo.gl/maps/R86RFuPnmFU2 | Clearance: 115.0 x 9.0 metres | Parking Bay | Suitable parking for Fatigue breaks. |
| 77.3 | Whittingham | Golden Highway intersection with the Putty Road GPS link: https://goo.gl/maps/7hQdEmK1EgE2 | Clearance: Length: 85.0 metres Width: 12.0 metres | Left hand turn | No problems with this section of road. |
| 77.4 | Mount Thorley | Golden Highway GPS link: https://goo.gl/maps/zGvdupDuixx | Clearance: 100.0 x 10.0 metres | Parking Bay | Suitable parking for Fatigue breaks. |
| 80.8 | Mount Thorley | Golden Highway intersection with Mt Thorley Road. GPS link: https://goo.gl/maps/VyA42n1CqZx | Clearance: Length: 45.0 metres Width: 8.0 metres Height: 5.6 metres | Right hand turn | Loads over the listed clearances will need to travel along the incorrect side of the road. Loads will need to cross to the incorrect side 100 metres prior to the Mt Thorley Road underpass. |
| 98.0 | Warkworth | Golden Highway GPS link: https://goo.gl/maps/Y6V6EXaCwxg | Clearance: 100.0 x 8.0 metres | Parking Bay | Suitable parking for Fatigue breaks. |
| 107.0 | Jerrys Plains | Golden Highway through Jerrys Plains village GPS link: https://goo.gl/maps/WgSCRsJ9ZGt | Clearance: Length: 70.0 metres Width: 9.0 metres | Dogleg | No problems with this section of road. |
| 126.0 | Ogilvy | Golden Highway GPS link: https://goo.gl/maps/ShT4hrj8WQeMcris7 | 6% gradient | Travel directly ahead | This section of road has a steep mountain range that will require additional pull trucks to assist loads that exceed 80T gross weight. Additionally, the NSW Government is currently upgrading this section of road. It is recommended that you monitor the progress of the upgrades, and that any changes are thoroughly looked at. |
| 141.9 | Denman | Golden Highway onto Denman Road GPS link: https://goo.gl/maps/sf4PNnycxB32 | Clearance: Length: 60.0 metres Width: 10.0 metres | Right hand turn | No problems with this section of road. |

| KM index | Location | Section of road | Critical Measurement | Procedure | Notes |
|----------|--------------------------|--|--|-------------------------------|---|
| 150.0 | Muswellbrook | Denman Road onto Thomas Mitchell Drive GPS link: https://goo.gl/maps/XxZcg2MKqAgURuGu8 | Clearance: Length: 65.0 metres Width: 12.0 metres | Right hand turn | No problems with this section of road. |
| 160.6 | Muswellbrook | Thomas Mitchell onto New England Highway GPS link: https://goo.gl/maps/3SyWufXF3gXqxaAt5 | Clearance: Length: 70.0 metres Width: 10.0 metres | Left hand turn | No problems with this section of road. |
| 169.5 | Muswellbrook | New England Highway onto Bell Street GPS link: https://goo.gl/maps/H94bMYOMeSHay7918 | Clearance: Length: 40.0 metres Width: 6.0 metres | Right hand turn | No problems with this section of road. |
| 170.0 | Muswellbrook | Bell Street onto Victoria Street GPS link: https://goo.gl/maps/aHhW27tcZy9y3WNq9 | Clearance: Length: 40.0 metres Width: 7.0 metres | Left hand corners | Tight left-hand bend over a rail bridge before another tight left hand bend. Spotter to guide loads through this section of road, and approval from rail required to cross this structure. |
| 170.5 | Muswellbrook | Victoria Street onto Market Street GPS link: https://goo.gl/maps/pviTUH25bANG3m9n9 | Clearance: Width: 7.0 metres | Travel directly ahead | No problems with this section of road. |
| 171.0 | Muswellbrook | Market Street onto New England Highway GPS link: https://goo.gl/maps/3kpU6XdcBmCW75gM7 | Clearance: Length: 30.0 metres Width: 7.0 metres | Right hand turn at roundabout | Loads may need to cross to the incorrect side of the roundabout if they exceed 30.0 meters in length, and do not exceed 42 meters in length. |
| 246.8 | Murrurundi | New England highway (Township) GPS link: https://goo.gl/maps/Sj3ixAkhujt | Clearance: 60.0 x 5.0 metres | Parking Bay | Suitable parking for Fatigue breaks. |
| 251.4 | Murrurundi Hill | New England highway Nowlands Gap GPS link: https://goo.gl/maps/R5yufobPeMG2 | Clearance: 120.0 x 12.0 metres | Parking Bay (small) | Emergency parking only. |
| 248.0 | Willow Tree | New England highway GPS link: https://goo.gl/maps/XLTg7CRV7EU2 | Clearance: Width: 7.0 metres Length: 35 metres Height: 5.2 metres | Kankool weighbridge | It is likely that the towers and defiantly the blades will not fit into this facility. We have engineered documentation showing correct weights for all loads. |
| 253.9 | Willow Tree Township | New England highway GPS link: https://goo.gl/maps/gw38qmvVfTC2 | Clearance: 60.0 x 5.0 metres | Parking Bay | Suitable parking for Fatigue breaks. |
| 255.5 | Willow Tree Truck Stop N | New England highway GPS link: https://goo.gl/maps/RRdPVHupGCs | Clearance: 120.0 x 12.0 metres | Parking Bay (small) | Suitable parking for Fatigue breaks for small loads only. |
| 275.0 | Wallabadah | New England highway GPS link: https://goo.gl/maps/QWCyeHQSohS2 | Clearance: 80.0 x 5.0 metres | Parking Bay (side of road) | Suitable parking for Fatigue breaks. |

| KM index | Location | Section of road | Critical Measurement | Procedure | Notes |
|----------|------------|---|---|--|---|
| 282.0 | Wallabadah | New England highway onto Lindsay's Gap Road GPS link: https://goo.gl/maps/ePhYctjJootkBZiM9 | Clearance: Length: 50.0 metres | Right hand turn | If the upgrades are completed for the blades than this corner will be suitable for the remaining components. |
| 289.7 | Garoo | Lindsay's Gap Road over Goonoo Creek GPS link: https://goo.gl/maps/9ELSk5ZLRWn14m7 | Clearance: Axle width: 3.60m Overall width: 6.20m Guard rail height: 850mm | Travel directly ahead over bridge in the centre of the road. | Loads that are been carried on trailers with an axle width exceeding 3.5 meters will not fit over this structure in its current form. This bridge will need to be replaced or modified before the towers or motors can be delivered on this route. A trafficable deck width of at least 4.6 metres is required. |
| 297.7 | Garoo | Lindsay's Gap Road over Middlebrook Creek GPS link: https://goo.gl/maps/DxcGL3d9JacoAHbHA | Clearance: Axle width: 4.50m Overall width: 6.10m Guard rail height: 750mm | Travel directly ahead over bridge in the centre of the road. | Loads that are been carried on trailers with an axle width exceeding 3.5 meters will not fit over this structure in its current form. This bridge will need to be replaced or modified before the towers or motors can be delivered on this route. |
| 303.2 | Garoo | Lindsay's Gap Road through Lindsay's Gap GPS link: https://goo.gl/maps/GGKmqqmziKdth8wH9 | Clearance: Length: 90.0 metres | Travel directly ahead | Load to travel in the centre of the road, escorts to warn traffic 500 metres to the east of the gap. |
| 308.8 | Nundle | Lindsay's Gap Road onto Nundle Road GPS link: https://goo.gl/maps/FX4ZRx2YG9i2BsXMA | Clearance: Length: 50.0 metres | Right hand turn | If the upgrades are completed for the blades than this corner will be suitable for the remaining components. |
| 311.3 | Nundle | Nundle Road onto Crosby Street GPS link: https://goo.gl/maps/uVvcN9QkPyTDP1YR6 | Clearance: Width: 8.0 metres | Travel directly ahead | No problems with this section of road. |
| 312.6 | Nundle | Crosby Street onto Oakenville Street GPS link: https://goo.gl/maps/aZNDKURdSBERedMr9 | Clearance: Width: 8.0 metres | Travel directly ahead | No problems with this section of road. |
| 313.0 | Nundle | Oakenville Street and Jenkins Street intersection GPS link: https://goo.gl/maps/7YM56hOq8bnCS0Zy8 | 5.0 metres width clearance | | A no parking exclusion zone will need to be placed on the left-hand side while travelling through this intersection. Two signs will also need to be made removable. |
| 314.0 | Nundle | Oakenville Street onto Old Hanging Rock GPS link: https://goo.gl/maps/1UMr2EwZetiE76Ey9 | 35.0 metres length clearance | Left hand turn | If the upgrades are completed for the blades than this corner will be suitable for the remaining components. |

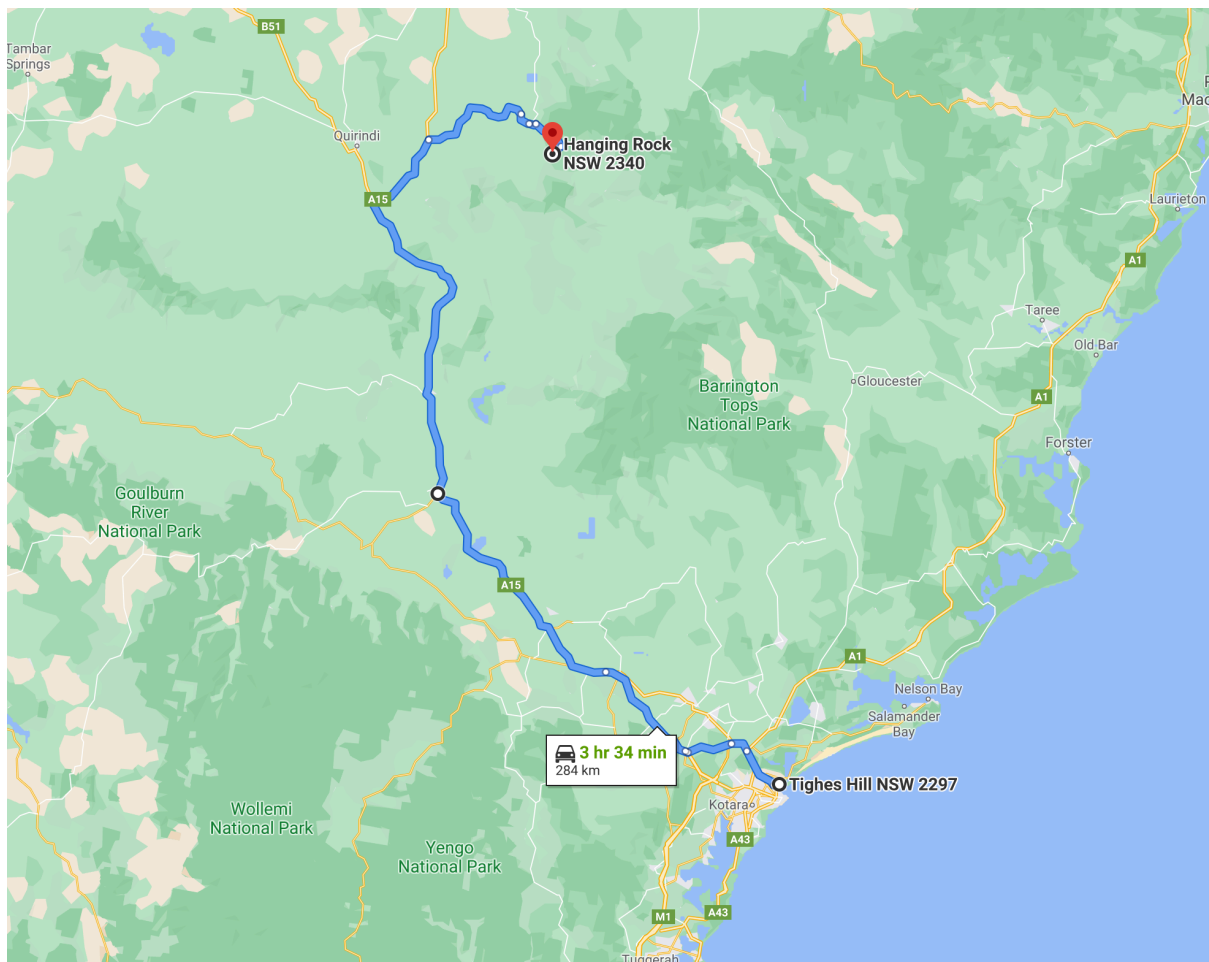
| KM index | Location | Section of road | Critical Measurement | Procedure | Notes |
|---------------------|------------------------|--|------------------------------|--|---|
| 315.0 | Nundle | Old Hanging Rock Road onto Barry Road GPS link: https://goo.gl/maps/ve9zvmJnLBYtQSz5 | 90.0 metres clearance | Right hand bend | No problems with this section of road. |
| 315.0 to 325.0 Km's | Nundle to Hanging Rock | Barrys Road https://goo.gl/maps/8L3Hs3MC6eQ215qkE6 | 25.0 metres length clearance | Travel directly ahead through multiple tight turns and steep terrain | As per the blades Barrys Road has a section of road known as the Devils Elbows. The existing hairpin corners are impassable for the blades, towers and motors. A detour of the Devils Elbow has been looked at and will likely be the best solution for all loads. To the west and east of the Devils Elbows the road will need to be widened on a few corners, this would include hardstand and tree removal. |
| 325.0 | Hanging Rock | Barrys Road onto Morrisons Gap Road GPS link: https://goo.gl/maps/CLZDJ5iENx8nAg7 | 35.0 metres length clearance | Right hand turn | Loads to turn right from the correct side to the correct side of the road. The swept path will have the longer loads travel through a landowner's boundaries on the inside of the corner. This will require a fence to be relocated and hardstand added. Additionally, some trees will need to be removed. |
| 325.0 to 328.0 Km's | Hanging Rock | Morrisons Gap Road GPS link: https://goo.gl/maps/McYVnnhTgsEh2PLA | 25.0 metres length clearance | Travel around several sweeping bends on a gravel road | This section of road is gravel for the entirety. The road will need to be widened for the majority of the road. Typically, the road will need to be widened to 5.5 meters in all straight sections and made wider on the corners depending on the radius. A swept path analysis of this section of road, shows that the corridor would be able to stay within the road reserve. Additionally, there will need to be trees removed. The vertical curve will also need to be checked for the entirety of this road. |
| 328.0 Km's | Hanging Rock | Morrisons Gap Road into Hills of Gold windfarm GPS link: https://goo.gl/maps/TVFMQC83dmXcWU8 | | Travel directly ahead into site entrance | Windfarm to supply suitable access for the dimensions and swept path of all loads. |

13.0 Route Survey D: Newcastle port to Hills of Gold WF for standard loads.

Distance: (284.0 Kilometres).

Via: Selwyn Street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Lindsays Gap Road, Nundle Road, Crosby Street, Oakenville Street, Old Hanging Rock Road, Barry Road, Morrisons Gap Road.

GPS Link: <https://goo.gl/maps/rouAWyXLZ53pMB3v7>



| KEY | |
|------------------------|--|
| MODIFICATIONS REQUIRED | |
| MINOR WORKS OR CAUTION | |
| PARKING | |

| KM index | Location | Section of road | Critical Measurement | Procedure | Notes |
|--------------------|---------------|---|---|--------------------------|--|
| Route Index | | | | | |
| 0.0 | Mayfield | Mayfield #4 berth onto Selwyn Street GPS link: https://goo.gl/maps/aflwPYKuNdm | Clearance: Length: 70.0 metres Width: 8.0 metres | Right hand turn | No problems with this section of road. |
| 0.4 | Mayfield | Selwyn Street rail crossing GPS link: https://goo.gl/maps/AmohE54hKSz | Clearance: Width: 9.0 metres | Travel directly ahead | Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution. |
| 1.3 | Mayfield | Selwyn Street onto George Street GPS link: https://goo.gl/maps/gXeHvBtCp4D2 | Clearance: Length: 70.0 metres Width: 8.0 metres | Right hand turn | No problems with this section of road. |
| 1.4 | Mayfield | George Street onto Industrial Drive https://goo.gl/maps/s4ayrsuoAsD2 | Clearance: Length: 70.0 metres Width: 8.0 metres | Moderate right-hand turn | No problems with this section of road. |
| 4.9 | Mayfield | Industrial Drive under traffic signals GPS link: https://goo.gl/maps/YmqhiS2iR582 | Clearance: Height: 5.4 Metres | Travel directly ahead | The lowest traffic signal on route is at the intersection of Steel River Blvd. Trucks that exceed 5.3 metres will need to travel in the right hand lane. |
| 5.5 | Mayfield West | Industrial Drive onto Maitland Road GPS link: https://goo.gl/maps/Kn49dhWG2qG2 | Clearance: Length: 50.0 metres Width: 10.0 metres | Right hand turn | No problems with this section of road. |
| 13.9 | Hexham | New England Highway under gantry GPS link: https://goo.gl/maps/YTMoFe7Aick | Clearance: Height: 5.95 Metres | Travel directly ahead | This is the lowest structure on route. There is no bypass around the gantry. A maximum loaded height of 5.8 metres should not be exceeded. |
| 17.4 | Tarro | New England Highway onto John Renshaw Drive GPS link: https://goo.gl/maps/SRDr5JigkBg | Clearance: Width: 12.0 metres | Left hand merge | No problems with this section of road. |
| 18.4 | Beresfield | John Renshaw Drive GPS link: https://goo.gl/maps/N19vJih1Fgr | Clearance: Width: 9.0 metres Height: 5.9 metres | Travel directly ahead | No problems with this section of road. |
| 28.7 | Buchanan | John Renshaw Drive onto the Hunter Expressway GPS link: https://goo.gl/maps/1STJ1PfQit9E2 | Clearance: Length: 65.0 metres Width: 7.0 metres | Right hand turn | No problems with this section of road. |

| KM index | Location | Section of road | Critical Measurement | Procedure | Notes |
|----------|--------------------------|---|---|--|--|
| 59.0 | Branxton | The Hunter Expressway onto The New England Highway GPS link: https://goo.gl/maps/7rauNuxzqjg | Clearance: Width: 9.0 metres | Travel directly ahead | No problems with this section of road. |
| 125.0 | Muswellbrook | New England Highway intersection of Sydney Road GPS link: https://goo.gl/maps/HMs11pkPQWqQbJny7 | Clearance: Length: 40.0 metres Width: 6.0 metres | Right hand turn | No problems with this section of road. |
| 125.3 | Muswellbrook | New England Highway under rail overpass GPS link: https://goo.gl/maps/2KU2zsFJrJamDe2a7 | Clearance: Height: 5.1 metres Width: 4.0 metres | Travel directly ahead | Loads over the listed critical measurement are not to travel under this structure. |
| 201.8 | Murrurundi | New England highway (Township) GPS link: https://goo.gl/maps/Sj3ixAkhuit | Clearance: 60.0 x 5.0 metres | Parking Bay | Suitable parking for Fatigue breaks. |
| 206.4 | Murrurundi Hill | New England highway Nowlands Gap GPS link: https://goo.gl/maps/R5yufobPeMG2 | Clearance: 120.0 x 12.0 metres | Parking Bay (small) | Emergency parking only. |
| 203.0 | Willow Tree | New England highway GPS link: https://goo.gl/maps/XLTg7CRV7EU2 | Clearance: Width: 7.0 metres Length: 35 metres Height: 5.2 metres | Kankool weighbridge | No problems with this section of road. |
| 208.9 | Willow Tree Township | New England highway GPS link: https://goo.gl/maps/qw38qmvVITC2 | Clearance: 60.0 x 5.0 metres | Parking Bay | Suitable parking for Fatigue breaks. |
| 210.5 | Willow Tree Truck Stop N | New England highway GPS link: https://goo.gl/maps/RRdPVHupGCs | Clearance: 120.0 x 12.0 metres | Parking Bay (small) | Suitable parking for Fatigue breaks for small loads only. |
| 230.0 | Wallabadah | New England highway GPS link: https://goo.gl/maps/QWCyeHQSoHS2 | Clearance: 80.0 x 5.0 metres | Parking Bay (side of road) | Suitable parking for Fatigue breaks. |
| 235.0 | Wallabadah | New England highway onto Lindsay's Gap Road GPS link: https://goo.gl/maps/ePbYctjJootkBZiM9 | Clearance: Length: 50.0 metres | Right hand turn | No problems with this section of road. |
| 245.7 | Garoo | Lindsay's Gap Road over Goonoo Creek GPS link: https://goo.gl/maps/9ELSk5ZLRWnf14tm7 | Clearance: Axle width: 3.60m Overall width: 6.20m Guard rail height: 850mm | Travel directly ahead over bridge in the centre of the road. | No problems with this section of road. |
| 253.7 | Garoo | Lindsay's Gap Road over Middlebrook Creek GPS link: https://goo.gl/maps/DyxGUId9JucoAHhHA | Clearance: Axle width: 4.50m Overall width: 6.10m Guard rail height: 750mm | Travel directly ahead over bridge in the centre of the road. | No problems with this section of road. |

| KM index | Location | Section of road | Critical Measurement | Procedure | Notes |
|---------------------|------------------------|---|-----------------------------------|--|--|
| 259.2 | Garoo | Lindsay's Gap Road through Lindsay's Gap GPS link: https://goo.gl/maps/GGKmqqemziKdth8wH9 | Clearance: Length: 90.0 metres | Travel directly ahead | No problems with this section of road. |
| 264.8 | Nundle | Lindsay's Gap Road onto Nundle Road GPS link: https://goo.gl/maps/FX4ZRx2YG9i2BsXMA | Clearance: Length: 50.0 metres | Right hand turn | No problems with this section of road. |
| 268.3 | Nundle | Nundle Road onto Crosby Street GPS link: https://goo.gl/maps/uVvcN9QkPyTDP1YR6 | Clearance: Width: 8.0 metres | Travel directly ahead | No problems with this section of road. |
| 268.6 | Nundle | Crosby Street onto Oakenville Street GPS link: https://goo.gl/maps/aZNDKURdSBERedMr9 | Clearance: Width: 8.0 metres | Travel directly ahead | No problems with this section of road. |
| 269.0 | Nundle | Oakenville Street and Jenkins Street intersection GPS link: https://goo.gl/maps/7YM56hOq8bnCS0Zv8 | 5.0 metres width clearance | | No problems with this section of road. |
| 270.0 | Nundle | Oakenville Street onto Old Hanging Rock GPS link: https://goo.gl/maps/1UMr2EwZetiE76Ev9 | 35.0 metres length clearance | Left hand turn | No problems with this section of road. |
| 271.0 | Nundle | Old Hanging Rock Road onto Barry Road GPS link: https://goo.gl/maps/ve9zvmdJnLBYtQSZ5 | 90.0 metres clearance | Right hand bend | No problems with this section of road. |
| 271.0 to 281.0 Km's | Nundle to Hanging Rock | Barrys Road https://goo.gl/maps/BUBe2MCfoQ215qKE6 | 25.0 metres length clearance | Travel directly ahead through multiple tight turns and steep terrain | No problems with this section of road. |
| 281.0 | Hanging Rock | Barrys Road onto Morrisons Gap Road GPS link: https://goo.gl/maps/CLZDJSjENx8rifAg7 | 35.0 metres length clearance | Right hand turn | No problems with this section of road. |
| 281.0 to 284.0 Km's | Hanging Rock | Morrisons Gap Road GPS link: https://goo.gl/maps/Mc0YymhTgE6ZPEA | 25.0 metres length clearance | Travel around several sweeping bends on a gravel road | This section of road is gravel for the entirety. The road will need upgrades for standard loads to pass through. |
| 284.0 Km's | Hanging Rock | Morrisons Gap Road into Hills of Gold windfarm GPS link: https://goo.gl/maps/5vFEMQCB3dnX0jvU8 | | Travel directly ahead into site entrance | Windfarm to supply suitable access for the dimensions and swept path of all loads. |

14.0 Conclusion:

ROUTE SELECTION:

After studying all options and undertaking a route survey, it was observed that the components would need to be transported on several different routes through to the Hill of Gold project as listed in the report.

Route A: Suitable for all loads if modifications are undertaken.

Route B: Suitable for Towers and motors up to 5.2 metres in height, but not blades.

Route C: Suitable for Towers and motors over 5.2 metres in height, but not blades.

Route D: Suitable for standard loads up to 3.5 metres wide, and no higher than 5.2 metres in overall height.

NEWCASTLE:

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

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

HUNTER EXPRESSWAY:

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

For the 83-metre blade traffic control/Police would be required to block the eastbound lanes of the Hunter expressway while the blades travel down the incorrect side before crossing over at the centre crossover point.

NEW ENGLAND HIGHWAY ONTO THE GOLDEN HIGHWAY:

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

THE GOLDEN HIGHWAY:

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

MUSWELLBROOK:

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

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

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

- ROUTE B & C VIA: New England Highway, Golden Highway, Denman Road, Thomas Mitchell Drive, New England Highway, Bell Street, Victoria street, Market Street, New England Highway.

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

- ROUTE D VIA: New England Highway.

LINDSAY'S GAP ROAD THROUGH TO NUNDLE:

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

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

The bridge over Goonoo Goonoo creek has a maximum axle width of 3.5 metres. The bridge over Middlebrook Creek also has axle width restrictions. These bridges will require replacement or upgrades before the towers or motors could be delivered to the project. A deck width of at least 4.6 metres is required for the heavier loads.

- Upgrades required on the turn off from the New England Highway onto Lindsay's Gap Road, and also from Lindsay's Gap Road onto Nundle Road.

The 85 metre blade will require a large amount of upgrades on this section of road, whereas the 65 metre blades only have a moderate amount of works.

- Oakenville Street would require no parking areas put in place throughout the deliveries, these locations are listed in the survey.

BARRY ROAD:

- Barry Road will not accommodate either size blade or the towers and motors. The section of road through the Devils elbows will need to be detoured via a new alignment to the south of Devil's Elbow. This new alignment will need to be sealed if the gradient exceeds 14%.
- Either side of the Devil's Elbow the road has tight sections that would need upgrades, these would include tree removal and hardstand.

MORRISON GAP ROAD:

- Barry Road onto Morrison's Gap Road would require extensive modifications with the swept path currently entering a landowner's boundaries on the inside of the corner.
- Morrison's Gap Road is gravel for the entirety and would need to be made suitable for all weather travel.
The swept path of this road is tight in several sections and would need to be widened to at least 5.5 metres of road width and wider on the corners.
A swept path analysis has been undertaken on Morrison's Gap Road, and the blades would stay within the existing road reserve with some modifications required to the existing alignment.
- Morrison's Gap Road also has several Crests that would also need to be surveyed. This will allow us to determine if the largest trailers have adequate clearance to pass through them without the need for additional road works.
- Morrison's Gap Road has a number of trees that will need to be removed and or trimmed to allow a suitable swept path for the largest loads.

GENERAL ROAD ACCESS:

BRIDGE CROSSINGS:

This route from Newcastle to Tamworth has been used in the past for items up to 100T. Further investigations would be required if item mass exceeds this. Additionally, once the loads turn off the New England Highway all structures that require the loads to travel over them, will need to be assessed for axle loads.

OVERHEAD STRUCTURES:

The lowest structure on this route is the Liddell overpass. This bridge is 5.2 metres in the centre carriageway and 5.3 metres in the far-right lane. Loads that exceed 5.2 metres in overall height will need to bypass the bridge via the Golden Highway. A maximum height of 5.8 metres than would be the lowest structure that cannot be avoided. This structure is on the New England Highway at Hexham.

OVERHEAD WIRES:

This route would need to be assessed to handle a loaded height of up to 5.8 metres. It is likely that there are wires that will need to be raised.

RAIL ASSETS:

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

FLOODWAYS:

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

CRESTS:

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

PAVEMENT:

The Pavement up to Morrison's Gap Road is of suitable highway grade. Morrison's Gap Road is gravel and would need widening as well as upgrading to an all-weather surface.

ROADWORKS:

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

PORT:

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

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

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

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

APPROVALS:

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

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

SUMMARY OF ROUTES:

After reviewing all routes, we are under the opinion that the loads could be delivered through to the Hill of Gold windfarm project with a large number of upgrades.

The 83 metre and the 65 metre blades would require a detour around Muswellbrook via Route A and approvals would still need to be sought to confirm that this is possible. The Towers and motors could use Route A if the upgrades are completed, and if the bridges have the capacity on the detour.

Access to the Hill of Gold windfarm once the loads arrive at Nundle has considerable road modifications that would need to take place before it could become a reality for both blade types.

The additional routes based on the height, allows the project to source larger towers if required. We recommend however that a loaded height of 5.8 metres is not exceeded. In saying that we believe a 5.6 metre flange could be delivered to site but would require bookends to keep the height under 5.8 metres.

We also recommend that a Blade dry run is undertaken once all road modifications have been completed, and prior to the first blade movement.

15.0 References:

Rex Andrews Engineered Transportation Pty. Ltd.

Someva Renewables

Engie

Rex J Andrews P/L Route Survey LL273 REV02.

Google Earth/Maps

Nearmaps

Sixmaps

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.