# Crookwell 2 Wind Farm
# Section 75 Modification-2
# Transport Impact Assessment

| | |
|---|---|
| **Client //** | Crookwell Development Pty Ltd |
| **Office //** | NSW |
| **Reference //** | 15S1569000 |
| **Date //** | 02/03/16 |

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# Section 75 Modification-2

# Transport Impact Assessment

Issue: B 02/03/16

Client: Crookwell Development Pty Ltd
Reference: 15S1569000
GTA Consultants Office: NSW

**Quality Record**

| Issue | Date | Description | Prepared By | Checked By | Approved By | Signed |
|---|---|---|---|---|---|---|
| A | 15/01/16 | Final | Oasika Faiz, Cameron Ward | Cameron Ward | Brett Maynard | Brett Maynard |
| B | 02/03/16 | Updated Final | Oasika Faiz, Joshua Haigh | Andrew Farran | Brett Maynard |  |





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# 1. Introduction



## 1.1 Background

It is understood that Crookwell Development Pty Ltd intends to submit a Section 75W application for a proposed modification (Mod-2) to the Crookwell 2 Wind Farm (C2WF) development. The Mod-2 proposal is a modification to the 2009 Modified DA Consent (Mod-1).

The original C2WF proposal was approved by the Department of Planning on 10 June 2005 with the following equipment parameters:

- 46 wind turbines
- 67 metre tower
- 39 metre blades
- 80 metre rotor diameter
- 107 metre blade tip height.

As part of Mod-1 to the development consent, approved 29 June 2009, the number of proposed turbines was maintained, however the size of the tower and blades increased. Mod-1 included the following equipment parameters:

- 46 wind turbines
- 80 metre tower
- 47 metre blades
- 96 metre rotor diameter
- 128 metre blade tip height.

The Mod-2 is to be submitted for provision of a reduced number of larger turbines on-site (33 instead of 46). This represents a reduction of 13 turbines or approximately 30% of what was originally proposed. The revised equipment parameters to be submitted as part of Modification 2 are:

- 33 wind turbines
- 95 metre tower
- 64 metre blades
- 130 metre rotor diameter
- 160 metre blade tip height.

It is noted that a final turbine supplier is yet to be selected and the above parameters are a combination of several systems that represent a conservative design envelope.

In relation to this, Crookwell Development Pty Ltd has commissioned GTA Consultants to prepare an updated traffic impact assessment to accompany the Mod-2 application. GTA's assessment should be treated as a supplementary report to the previous (approved) traffic impact assessment prepared by URS in 2009.

A Traffic Management Plan (TMP) would be proposed prior to the transport of any blades as required by the condition of the Project Approval. This would be done in consultation with the Road and Maritime Services and affected Councils. To minimise the impacts of the blade delivery, the TMP would set out strategies and processes to maintain the safety and performance of the local road networks. The TMP would also include commentary on escort vehicles (including by police) and temporary restrictions required to manage conflicts so all intersections are clear from parking and oncoming traffic.

## 1.2 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development, including consideration of the following:

i identify appropriate construction vehicle routes to the site for general construction vehicle and oversize/ overmass (OSOM) construction vehicles
ii the traffic generating characteristics of the proposed development during construction and operation phases
iii suitability of the proposed access arrangements for the site
iv the transport impact of the development proposal on the surrounding road network.

This report does not include an assessment of the structural integrity of roads and bridges surrounding the site nor does it include a dilapidation survey of the existing roads.

## 1.3 References

In preparing this report, reference has been made to the following:

- an inspection of the site and transport route
- Goulburn Mulwaree Council and Upper Lachlan Shire Council Development Control Plans
- Transportation Research Board's *'Highway Capacity Manual'*, 2010 (HCM)
- RMS 'Traffic Control at Worksites' document (dated June 2010, Version 1)
- Austroads 'Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections' dated 2009
- plans for the proposed development prepared by ERM
- various traffic reports prepared for surrounding wind farm developments:
    - Gullen Range Wind Farm – Bega Duo Designs (March 2008)
    - Rye Park Wind Farm – Epuron (April 2013)
    - Crookwell III Wind Farm – URS (September 2010)
    - Paling Yards Wind Farm – URS (April 2012)
    - Flyers Creek Wind Farm – Aurecon (May 2011)
    - Capital II Wind farm – TPK & Associates (October 2010)
    - Capital II Wind farm – Aurecon (October 2014)
    - Jupiter Wind Farm – GTA (January 2015)
    - Biala Wind Farm – GTA (July 2015)
    - Crookwell Wind Farm II DA Modification – URS (January 2009)
    - Crookwell II Wind Farm – URS (April 2004)
- RMS 'Guide to Traffic Generating Developments' Version 2.2, dated October 2002
- other documents and data as referenced in this report.

# 2. Location and Access

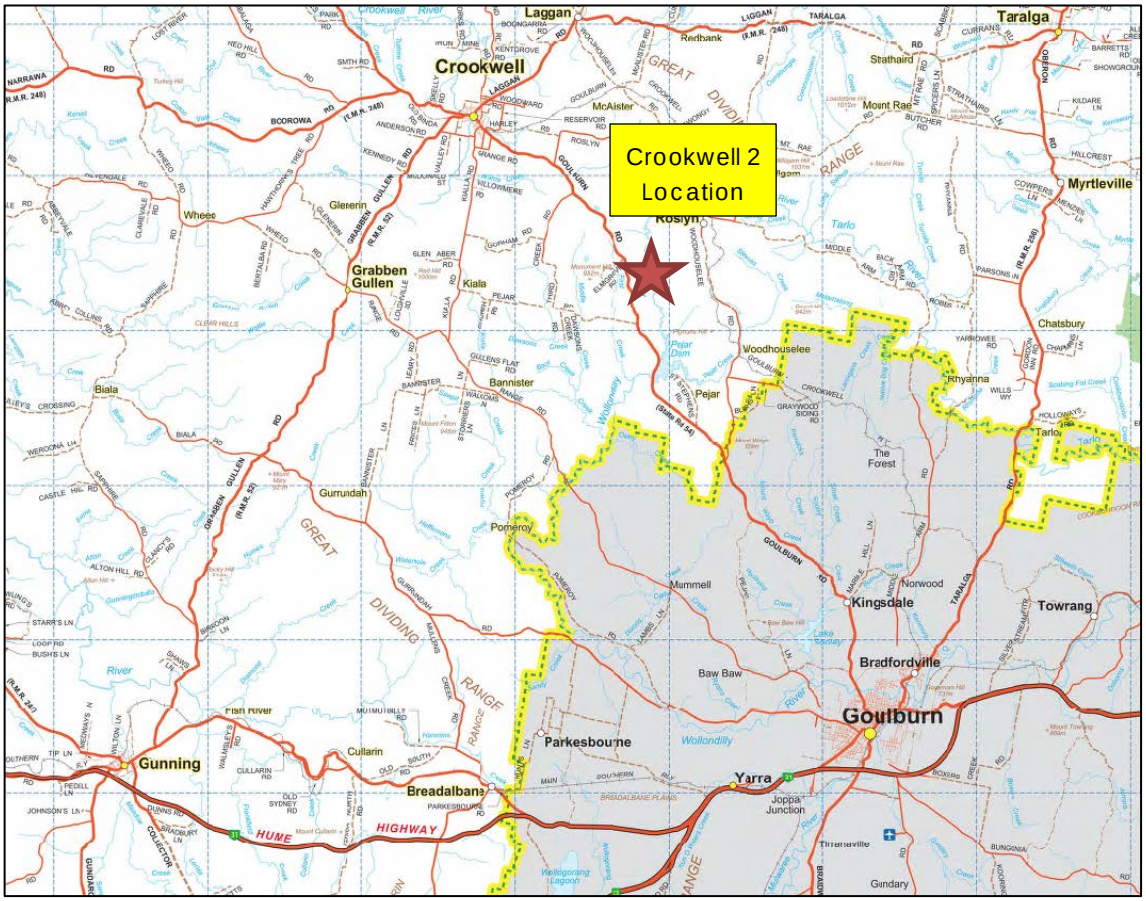
## 2.1 Project Area

The proposed C2WF is located approximately 14km southeast of Crookwell in southern New South Wales (approximately 20km northwest of Goulburn). The proposed development covers an area of 2,088 hectares and is within the Upper Lachlan Shire Local Government Area.

The surrounding properties are predominantly used for grazing.

The location of the project area and its surrounding environs is shown in Figure 2.1.

**Figure 2.1: Project Area and Its Environs**




Basemap source: Upper Lachlan Shire Council

## 2.2 Restricted Access Vehicle Map

The existing B-double (26m) approved routes in the broader vicinity of the site are detailed on the RMS website[1] and are reproduced in Figure 2.2. Crookwell Road, Hume Street, Clinton Street, Deecan Street and Hume Highway in the vicinity of and on-route to the site are approved B-double (26m) routes.

[1] RMS website - http://www.rms.nsw.gov.au/business-industry/heavy-vehicles/maps/restricted-access-vehicles-map/index.html

**Figure 2.2: Existing 26m B-Double Approved Routes**

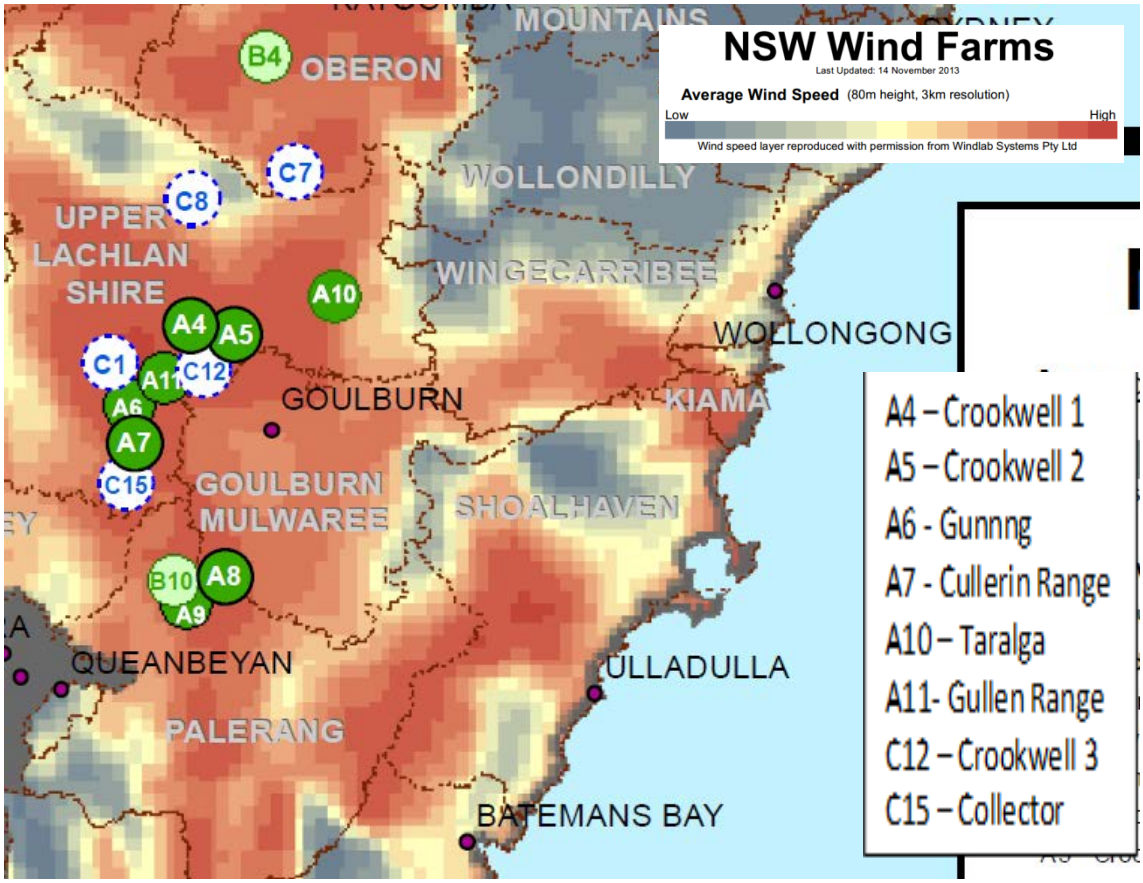

Basemap source: RMS

## 2.3 Surrounding Wind Farm Developments

Due to excellent wind resources by international standards, the Southern Tablelands is a popular region for wind farms. Currently a number of wind farms are either operational, under construction or proposed for the region. Figure 2.3 shows a map of the wind speeds in the area and existing/ approved/ proposed wind farms in the area.

The Crookwell 1 Wind Farm is located to the west of project area and is currently operational. Crookwell 3 wind farm (C3WF) is proposed to the east and south of the C2WF site. The Gullen Range wind farm is located to the west of the project area, Gunning and Cullerin wind farms are located further south-west of the project area, and Taralga wind farm is located further east of the project area, and are currently operational.

**Figure 2.3: Wind Farms in the Upper Lachlan Shire**




## 2.4 Restricted Access Vehicles (RAVs)

RAVs (i.e. oversize and overmass vehicles) will be used to deliver the turbine components to the project area.

Whilst RAVs will contribute the smallest percentage of trips to the project area (refer to Section 3) during the construction period, they will be the most critical from a vehicle access perspective, and will require some road and intersection upgrades to the existing network. This is discussed further in Section 4 of this report.

The typical oversize vehicles to be used to transport the tower sections, hub and nacelle and the blades are illustrated in Figure 2.4, Figure 2.5 and Figure 2.6.

Figure 2.4: Typical Oversize Load (Tower Section)

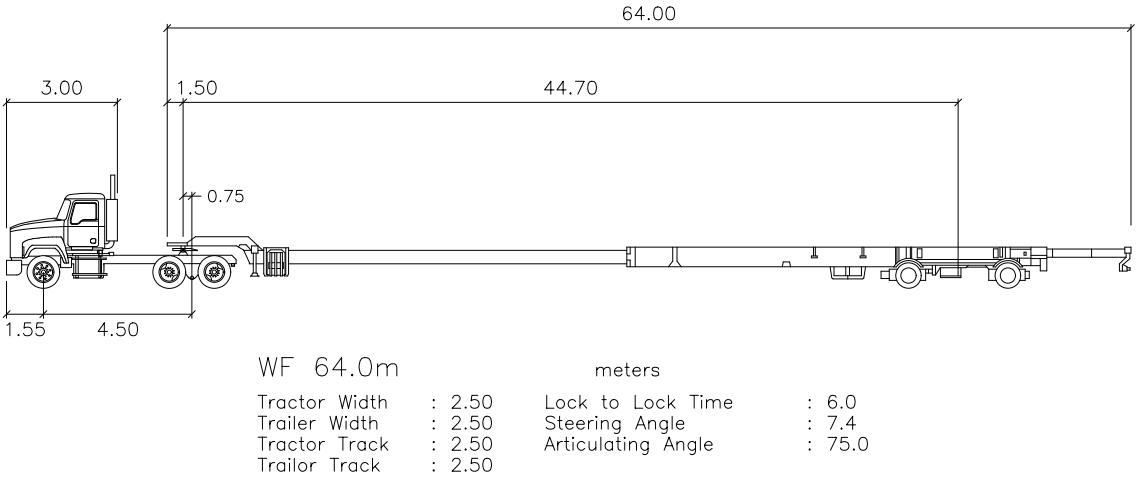

Figure 2.5: Typical Oversize Load (Nacelle Section)


Figure 2.6: Typical Oversize Load (Blade Section)

Based on our experience, the most difficult part of the turbine to transport is the blades, which are typically transported in one piece. The other components such as tower and the turbine itself can typically be assembled on site.

For the purpose of this assessment a vehicle configuration for transporting a 64 metre long blade has been assumed. The dimensions of the vehicle typically used for this assessment is shown in Figure 2.7 and has a total length of 67.8 metres. The adopted vehicle consists of a fixed axle pair approximately two thirds along the blade's length. This has been developed based on supplier specifications. The use of an independent steerable rear trailer could also be used and may benefit manoeuvrability. The final selection of transport vehicle would be considered in consultation with authorities as part of the development of the TMP and route approvals. It is noted that the blades would be transported using an extendable trailer which would significantly reduce turning constraints on the return journey.

**Figure 2.7: Proposed Design Vehicle (Total Vehicle Length = 67.8 metres)**




- Maximum RAV Length: 66.5 metres
- Minimum Height Clearance: 5.5 metres
- Minimum Road Width: 5.5 metres

Vehicle swept paths, contained in Appendix A, have been developed using Autoturn with the following line colours for the vehicle profile:

- **Black**: centreline of tractor body
- **Grey (dashed):** tyre paths
- **Blue**: Outer body envelop path
- **Red (dashed):** 0.5m clearance envelope

## 2.5 Travel Route

The preferred nominated transport route for the turbine blades is as proposed as part of the original consent for the site and would include State and National routes up to Goulburn and continue via local roads to the site. The route from Port Kembla to the site is as follows:

- Picton Road (Main road 88), Hume Highway, Cowper Street, Clinton Street, Deccan Street, Fitzroy Street, Crookwell Road

Appendix A shows the route for access to the site. The proposed route is consistent with routes proposed as part of other approved/ constructed wind farms within the region, including the proposed Crookwell 3 Wind Farm.

# 3. Traffic Generation

The traffic generation during typical operation of C2WF is not expected to change under the proposed development modification and will remain as per the approved development.

The daily traffic generation during the construction of the modified development is also expected to be consistent with the volumes estimated in the 2009 URS report. However, the duration of the construction period and overall construction traffic generated (total) by the development is expected to vary from the approved development given that there is a reduction in the number of turbines required to be constructed.

Any traffic generated for construction of the proposed Mod-2 application has been analysed and is presented below.

## 3.1 Approved Traffic Generation

The 2009 Mod-1 application consent included the construction of 46 turbines.

The peak daily traffic generation estimate for the construction of the turbines included 80 light vehicles and 203 heavy vehicles per day on Crookwell Road. The total traffic generation for the construction of the 46 turbines included:

- 142 semi-trailers, 323 oversized vehicles and 46 over-mass vehicles for the delivery of the turbine components and equipment. This totals 511 vehicles or 1,022 vehicle movements during the construction period
- 6,072 movements (3,036 vehicles) for the delivery of concrete
- 205 movements per month for the delivery of water and concrete reinforcement
- 2,200 movements per month for gravel via Crookwell Road
- 2,186 movements per month for gravel via Woodhouselee Road
- 160 movements per day of construction personnel.

## 3.2 Mod-2 Traffic Generation

As discussed, the daily traffic generation for the construction of each turbine would remain as determined within the Traffic Impact Assessment prepared by URS. The overall traffic generation relating to the delivery of turbine components, equipment and materials would alter as detailed in Table 3.1.

**Table 3.1: Delivery of Turbine Components and Equipment (Number of Vehicles)**

| Component | Traffic Generation per Turbine [1] | | | Total Traffic Generation [1] (2009 Mod-1 Approved) | | | Total Traffic Generation (Mod-2 Application) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Semi-Trailer | Oversize | Over-mass | Semi-Trailer | Oversize | Over-mass | Semi-Trailer | Oversize | Over-mass |
| Turbine Components and Equipment | 3 | 7 | 1 | 138 | 322 | 46 | 99 | 231 | 33 |
| Crane | | | | 4 | 1 | | 4 | 1 | |
| Concrete | 66 | | | 3,036 | | | 2,178 | | |
| **Total** | **3** | **7** | **1** | **3,178** | **323** | **46** | **2,281** | **232** | **33** |

[1] Source: URS, 2009, Crookwell Wind Farm II DA Modification, Traffic Impact Assessment

It is assumed that traffic generation for the delivery of water would remain as estimated for the approved development as these materials are related to site set-up and operation, not on an individual tower basis. The traffic generation for the delivery of gravel will reduce as the number of crane hardstands and area for access tracks have reduced from the 2009 Mod-1 consent.

In summary, it is assessed that the proposed development modification would result in an overall reduction of approximately 1,000 vehicles accessing the site for the development.

# 4. Swept Path Analysis

GTA has undertaken swept path assessments using AutoTURN of the following key intersections along nominated transport route. This section summarises the assessment, which has identified existing constraints that would need to be temporarily removed or require mitigation measures to allow the RAV safe passage:

- Tom Thumb Road/ Springhill Road, Port Kembla
- Springhill Road/ Masters Road, Port Kembla
- M1 Princes Motorway/ Picton Road, Wollongong
- Picton Road/ M31 Hume Motorway on-ramp, Wilton
- M31 Hume Motorway off-ramp/ Hume Street Roundabout, Goulburn
- Hume Street/ Ducks Lane Roundabout, Goulburn
- Cowper Street/ Clinton Street, Goulburn
- Clinton Street/ Deccan Street, Goulburn
- Deccan Street/ Fitzroy Street Roundabout, Goulburn

Given the amount of road space that the RAVs require to pass through the intersections (including the opposite side of the road) they will be accompanied by pilot vehicles, with affected intersections to include appropriate traffic management measures. The swept path assessments are detailed in the following sections and provided in Appendix A.

### 4.1.1 Tom Thumb Road/ Springhill Road, Port Kembla (15S1569000-01-01)

The Tom Thumb Road and Springhill Road intersection is currently signalised. An assessment of RAV swept paths indicates the following:

- The rear of the RAV would encroach on to the eastern road verge of Tom Thumb Road where there is a light pole and road sign along the vehicle path. Temporary removal of these would be required to allow the RAV swept path.
- The RAV would encroach upon the opposing traffic lanes to undertake the left turn. The central median may need to be reconstructed as a low height mountable median to allow this swept path. Appropriate traffic management would be in place to control traffic while the vehicle travels on the opposing traffic lanes.
- The RAV passes close to two traffic signal gantries. Design standards for these gantries require a minimum height clearance of 5.5 metres above the surface of the road. With the maximum height of the RAV to be 5.5 metres, the RAV should pass underneath unimpeded. The vertical clearance should be reassessed once the height of the RAV, blades and gantries are confirmed.

### 4.1.2 Masters Road and Springhill Road, Port Kembla (15S1569000-01-02)

The Masters Road and Springhill Road intersection is currently signalised. An assessment of RAV swept paths indicates the following:

- The RAV swept path would encroach on the southern slip lane island. A mountable kerb and hardstand area should be constructed to allow the vehicle swept path.

- The RAV swept path would swing close to, however remain clear of, the traffic signal lanterns within the median of Springhill Road. Care should be taken when manoeuvring around the corner to avoid the lanterns.

### 4.1.3 M1 Princes Motorway/ Picton Road, Wollongong (15S1569000-01-03)

An assessment of the RAV swept path through M1 Princes Motorway and Picton Road intersection indicates the following:

- The RAV is required to traverse the existing mountable island on exit from Princes Motorway. As this route has been used for blade transport in the past, it is assumed that the current island is safely traversable by an RAV. It is recommended that this is reviewed as part of the TMP.
- The rear of the RAV would swing over the concrete F-type road safety barrier within the median of Princes Motorway. The rear dolly of the vehicle would remain on the western side of the motorway, however the blade would overhang the two southbound lanes. The RAV would need to be designed to allow for this (blade travel height) and appropriate traffic control would be required to stop southbound traffic while the vehicle undertakes this movement. Given the downhill gradient of the southbound traffic lanes and the 100km/h speed limit, warning signage would be required well in advance to ensure southbound vehicles have an appropriate distance to slow down.

### 4.1.4 Picton Road/ M31 Hume Motorway on-ramp, Wilton (15S1569000-01-04)

An assessment of the RAV swept path travelling from Picton Road to the Hume Motorway on-ramp indicates the following:

- The wheels of the RAV would remain within the existing pavement surface, however the rear of the RAV would encroach upon the southern side of the slip lane island. Road signage located on the island would need to be temporarily removed/ relocated.

### 4.1.5 M31 Hume Motorway off-ramp/ Hume Street Roundabout, Goulburn (15S1569000-01-05)

An assessment of the RAV swept path travelling from the Hume Motorway off-ramp to Hume Street indicates the following:

- The wheels of the RAV would remain within the existing pavement surface, however the rear of the RAV would overhang the northern road verge on entrance to the roundabout. Consideration should be given to removing the guard rail at this location in case the vehicle encroaches upon it (or manage blade travel height).
- The RAV would encroach upon the northern verge of the island on the southern leg of the intersection. Two road signs on the island are required to be temporarily removed.

### 4.1.6 Hume Street/ Ducks Lane Roundabout, Goulburn (15S1569000-01-06)

The intersection of Hume Street and Ducks Lane is currently roundabout controlled. A swept path assessment of the intersection indicates the following:

- The RAV would encroach upon the slip lane island on Ducks Lane while it travels through the roundabout. The road sign on the island is required to be temporarily removed. It is noted that this island is currently mountable.

### 4.1.7 Cowper Street/ Clinton Street, Goulburn (15S1569000-01-07)

The Clinton Street and Cowper Street intersection is priority controlled, with central medians and slip lane islands to control movement. A swept path assessment intersection indicates the following:

- The left turn for the RAV would require the vehicle to travel along the opposing traffic lanes of both Cowper Street and Clinton Street as it passes through the intersection. As such, appropriate traffic control would be required to stop traffic at the intersection while the RAV undertakes the required manoeuvre.
- The central median on Cowper Street would need to be reconstructed as mountable. Other median islands within the intersection and Clinton Street are currently mountable and do not require reconstruction.
- Road signage should be removed including the two signs located on the Clinton Street central median, and one on the Cowper Street central median.

### 4.1.8 Clinton Street/ Deccan Street, Goulburn (15S1569000-01-08)

A swept path assessment of the Clinton Street and Deccan Street intersection indicates the following:

- To turn right, the RAV would be required to travel on the northern side of Clinton Street on approach to the intersection. Appropriate traffic management would be required to stop traffic on the eastern and northern legs of the intersection while the vehicle undertakes a right turn.
- The RAV would require the use of parking lanes on both sides of Clinton Street. On the northern side of Clinton Street, parking should be temporarily banned. On the southern side, relocation of the existing bus stop should be considered for the duration of oversize vehicle activity. The trees located on the southern verge of Clinton Street should be trimmed or removed where required to ensure vertical clearance.
- The RAV would require use of parking lane on the western side of Deccan Street. Parking should be temporarily banned as necessary.
- The road sign located on the central median at Deccan Street should be temporarily removed. No changes are required to the median itself as it is currently mountable.

### 4.1.9 Deccan Street and Fitzroy Street, Goulburn (15S1569000-01-09)

The intersection of Fitzroy Street and Deccan Street is currently roundabout controlled. A swept path assessment of the intersection indicates the following:

- The RAV would be required to travel along the opposing traffic lanes of both Fitzroy Street and Deccan Street, as well as travel over the roundabout island. Appropriate traffic management would be required to stop traffic at the intersection while the RAV undertakes the required manoeuvre. It is noted that the roundabout has been constructed as mountable.

- The RAV would be required to travel in close proximity to a tree located along the western side of Deccan Street. An appropriately positioned traffic controller should ensure that the RAV is travelling with sufficient vertical height clearance from the tree branches.
- Signage on the roundabout and northern and southern median islands should be temporarily removed.
- Parking is required to be banned on Fitzroy Street in the vicinity of the intersection.

### 4.1.10 Woodhouselee Road/ Existing Site Access (West) (15S1569000-01-10)

An existing crossover is available along Woodhouselee Road providing access to the western area of Crookwell 2. The swept path analysis of the existing crossover indicates that it will satisfactorily accommodate the proposed RAV.

### 4.1.11 Crookwell Road/ Existing Site Access (East) (15S1569000-01-11)

An existing crossover is available along Crookwell Road providing access to the eastern area of Crookwell 2. The swept path analysis of the existing crossover indicates that it will satisfactorily accommodate the proposed RAV.

### 4.1.12 Crookwell Road/ Existing Site Access (West) (15S1569000-01-12)

An existing crossover is available along Crookwell Road providing access to the western area of Crookwell 2. The swept path analysis of the existing crossover indicates that it will satisfactorily accommodate the proposed RAV.

# 5. Conclusion



It is proposed to modify the current development consent for Crookwell 2 Wind Farm to reduce the number of turbines from 46 to 33. The reduction would be compensated by the use larger turbines, with the blade size increasing from 47 to 64 metres.

The peak daily traffic generation for the construction and operation of the Wind Farm would be consistent with the 2009 modified Development Consent (Mod 1), however given the reduced number of turbines required to constructed, the construction period and overall traffic generation is expected to be lower than the approved development.

Based on an inspection of the nominated Restricted Access Vehicle transport route and vehicle swept path assessment, GTA has determined that the transportation of the 64 metre blades from Port Kembla to the Crookwell 2 Wind Farm via the nominated transport route would be possible, subject to the temporary removal or relocation of various roadside elements at key intersections. A summary of the anticipated road and intersection upgrade works are provided in Table 5.1, however the main issues that have been raised in respect to the 64m blade swept paths include:

- Impacts on street furniture, signage, poles, traffic signal infrastructure
- Safety and impacts on road infrastructure including concrete medians, kerbs and road safety barriers

**Table 5.1: Summary of Temporary Road Network Improvement Works – Crookwell 2 Wind Farm**

| 64m Blade | | | | | | |
|---|---|---|---|---|---|---|
| **Location** | **GTA Drawing No** | **Vegetation OR Signage Removal/ Trimming** | **Traffic Controlled** | **Parking Relocation** | **Pavement or Kerb Reconstruction** | **General Comments** |
| Tom Thumb Road/ Springhill Road | 15S1569000-01-01-P1 | ✓ | × | × | ✓ | Removal of light pole, signage and mountable median |
| Springhill Road/ Masters Road | 15S1569000-01-02-P1 | × | × | × | ✓ | Ensure island is mountable |
| Princes Motorway/ Picton Road | 15S1569000-01-03-P1 | × | ✓ | × | × | Ensure appropriate traffic management to stop southbound traffic. |
| Picton Road/ Hume Motorway | 15S1569000-01-04-P1 | ✓ | × | × | × | Ensure nominated signs are temporarily removed. |
| Hume Highway/ Hume Street Interchange | 15S1569000-01-05-P1 | ✓ | × | × | × | Possible removal of guard rail on off-ramp as a result of vehicle overhang |
| Hume Street/ Ducks Lane | 15S1569000-01-06-P1 | ✓ | × | × | × | Ensure nominated signs are temporarily removed. Note; roundabout is not mountable. |

| 64m Blade | | | | | | |
|---|---|---|---|---|---|---|
| Location | GTA Drawing No | Vegetation OR Signage Removal/ Trimming | Traffic Controlled | Parking Relocation | Pavement or Kerb Reconstruction | General Comments |
| Cowper Street/ Clinton Street | 15S1569000-01-07-P1 | ✓ | ✓ | × | ✓ | Ensure nominated signs are temporarily removed. |
| Clinton Street/ Deccan Street | 15S1569000-01-08-P1 | ✓ | ✓ | ✓ | × | Consider temporary bus stop relocation. Vehicle clearance to existing electrical pole should be noted. Temporary no stopping area will be required. |
| Deccan Street/ Fitzroy Street | 15S1569000-01-09-P1 | ✓ | ✓ | × | × | Ensure signs surrounding roundabouts are removed. Temporary no stopping area will be required. |
| Woodhouse-lee Road/ Existing Site Access (West) | 15S1569000-01-10-P1 | × | × | × | × | - |
| Crookwell Road/ Existing Site Access (East) | 15S1569000-01-11-P1 | × | × | × | × | - |
| Crookwell Road/ Existing Site Access (West) | 15S1569000-01-12-P1 | × | × | × | × | - |

Once the final specifications for the RAV to be used to transport the blades are known, a detailed traffic management plan should be prepared, in consultation with Roads and Maritime Services and affected Councils. The plan should be provided to NSW Department of Planning and Environment for approval prior to delivery of the turbine equipment to site.

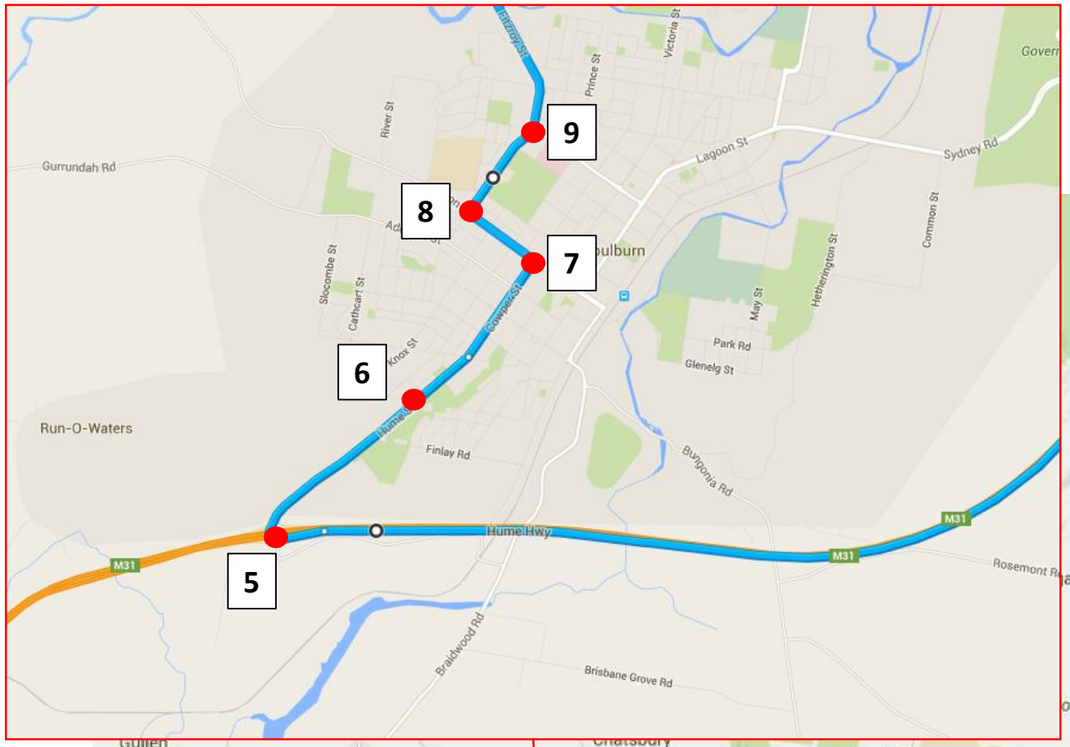
## 5.1 Council Feedback

GTA Consultants consulted with Upper Lachlan Shire Council in relation to the proposed use of a larger blade. Phil Newham (Director of Works and Operations) did not raise any direct objections to the proposal, however noted that the agreed road upgrades would need to be adjusted to suit the larger blades.

# Appendix A



## Swept Path Assessment







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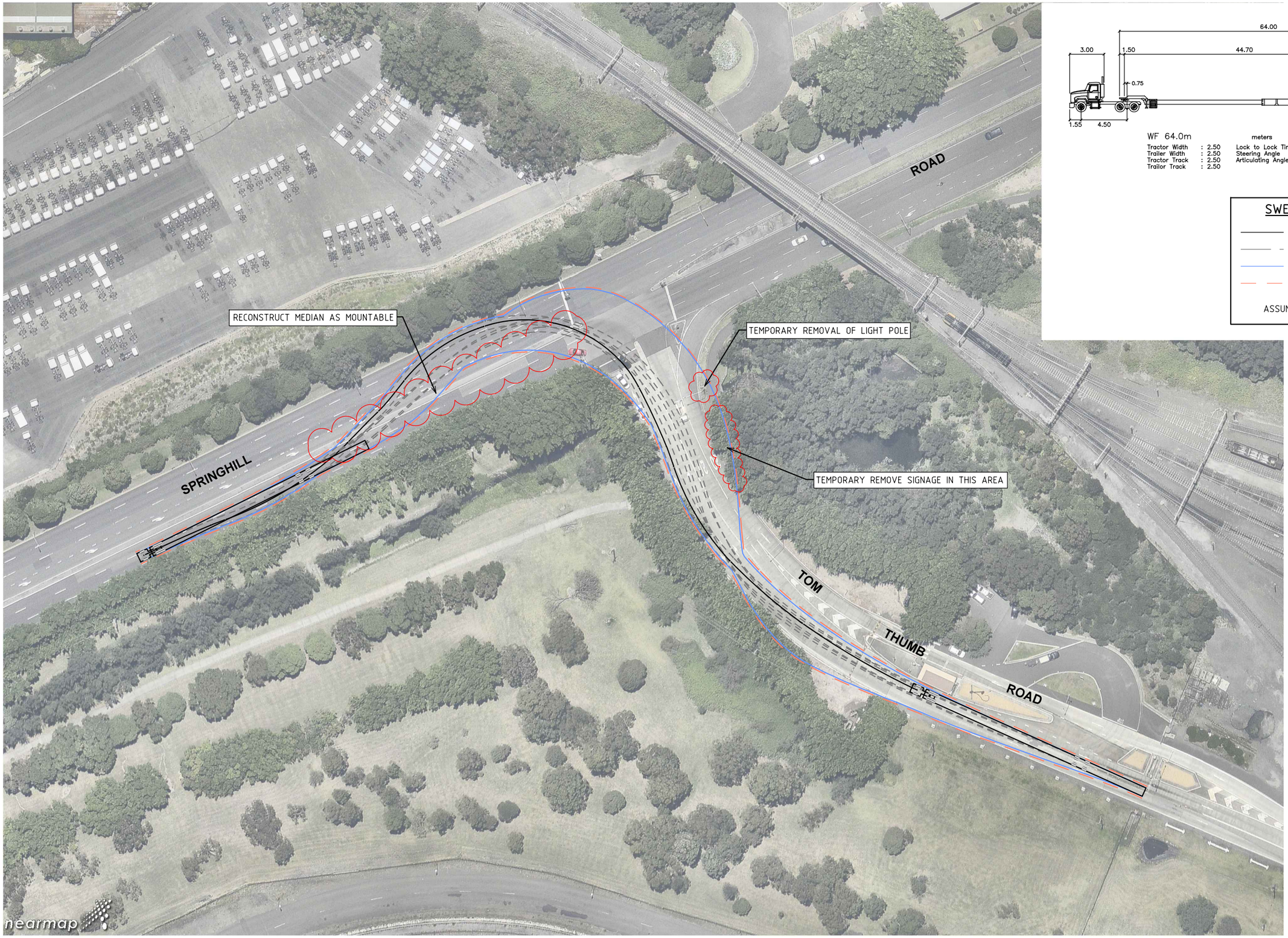
CROOKWELL 2 WIND FARM – SECTION 75
SWEPT PATH ASSESSMENT
COVER PAGE

DATE:
24.08.15

FIGURE NO.
15S1569000-01-MAP







WF 64.0m

meters

| | | | |
|---|---|---|---|
| Tractor Width | : 2.50 | Lock to Lock Time | : 6.0 |
| Trailer Width | : 2.50 | Steering Angle | : 7.4 |
| Tractor Track | : 2.50 | Articulating Angle | : 75.0 |
| Trailor Track | : 2.50 | | |

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h


Melbourne 03 9851 9600
Sydney 02 8448 1800
Brisbane 07 3113 5000
Canberra 02 6263 9400
Adelaide 08 8334 3600

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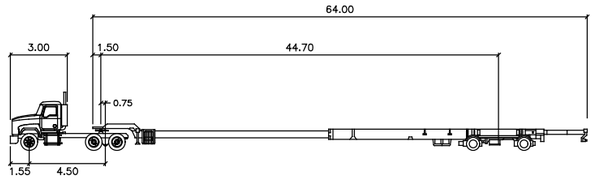
PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION

CROOKWELL 2 WIND FARM - SECTION 75
SWEPT PATH ASSESSMENT
65m SPECIAL WIND BLADE TRAILER

DATE: 28.08.2015
SCALE: 1:1000@A3 (0 10 20 30)
APPROVED: CDW
DRAWING NO. 15S1569000-01-01-P2
SHEET: 01 OF 09

PLOTTED BY: cameron.ward ON 28/08/2015 AT 3:33:34 PM 15S1569000-01-P2.dgn


WF 64.0m

meters

| | | | |
|---|---|---|---|
| Tractor Width | : 2.50 | Lock to Lock Time | : 6.0 |
| Trailer Width | : 2.50 | Steering Angle | : 7.4 |
| Tractor Track | : 2.50 | Articulating Angle | : 75.0 |
| Trailor Track | : 2.50 | | |

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

PLOTTED BY : cameron.ward ON 28/08/2015 AT 3:33:56 PM 15S1569000-01-P2.dgn

Melbourne 03 9851 9600
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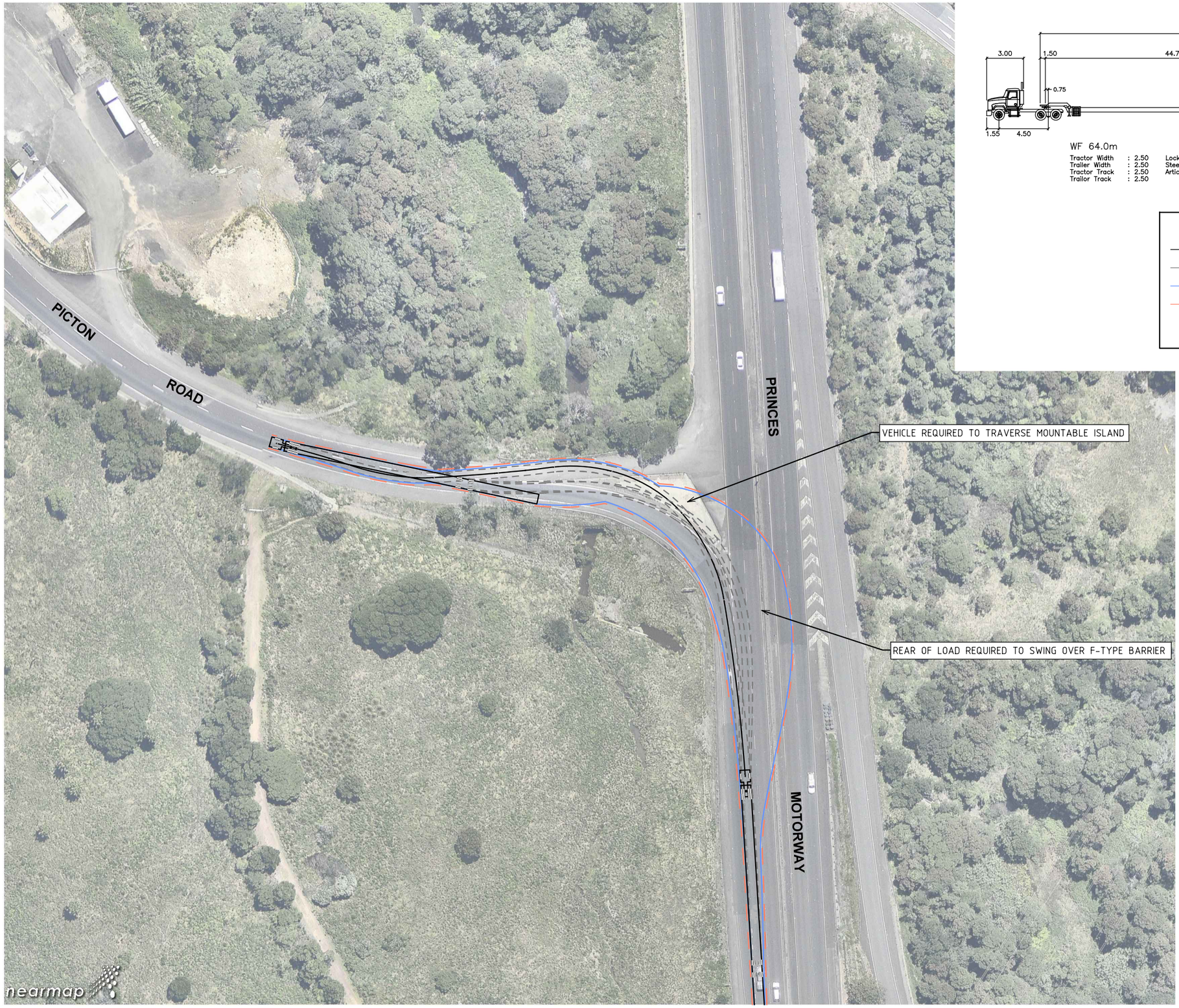
PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION

CROOKWELL 2 WIND FARM - SECTION 75
SWEPT PATH ASSESSMENT
64m SPECIAL WIND BLADE TRAILER

DATE: 28.08.2015
SCALE: 1:1000@A3 (0 10 20 30)
APPROVED: CDW
DRAWING NO. 15S1569000-01-02-P2
SHEET: 02 OF 09







WF 64.0m

meters

| | | | |
|---|---|---|---|
| Tractor Width | : 2.50 | Lock to Lock Time | : 6.0 |
| Trailer Width | : 2.50 | Steering Angle | : 7.4 |
| Tractor Track | : 2.50 | Articulating Angle | : 75.0 |
| Trailor Track | : 2.50 | | |

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

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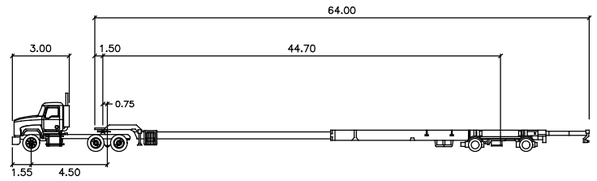
PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION

CROOKWELL 2 WIND FARM - SECTION 75
SWEPT PATH ASSESSMENT
64m SPECIAL WIND BLADE TRAILER

DATE: 28.08.2015
SCALE: 1:1000@A3 (0 10 20 30)
APPROVED: CDW
DRAWING NO. 15S1569000-01-03-P2
SHEET: 03 OF 09


WF 64.0m

meters

| | | | |
|---|---|---|---|
| Tractor Width | : 2.50 | Lock to Lock Time | : 6.0 |
| Trailer Width | : 2.50 | Steering Angle | : 7.4 |
| Tractor Track | : 2.50 | Articulating Angle | : 75.0 |
| Trailor Track | : 2.50 | | |

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

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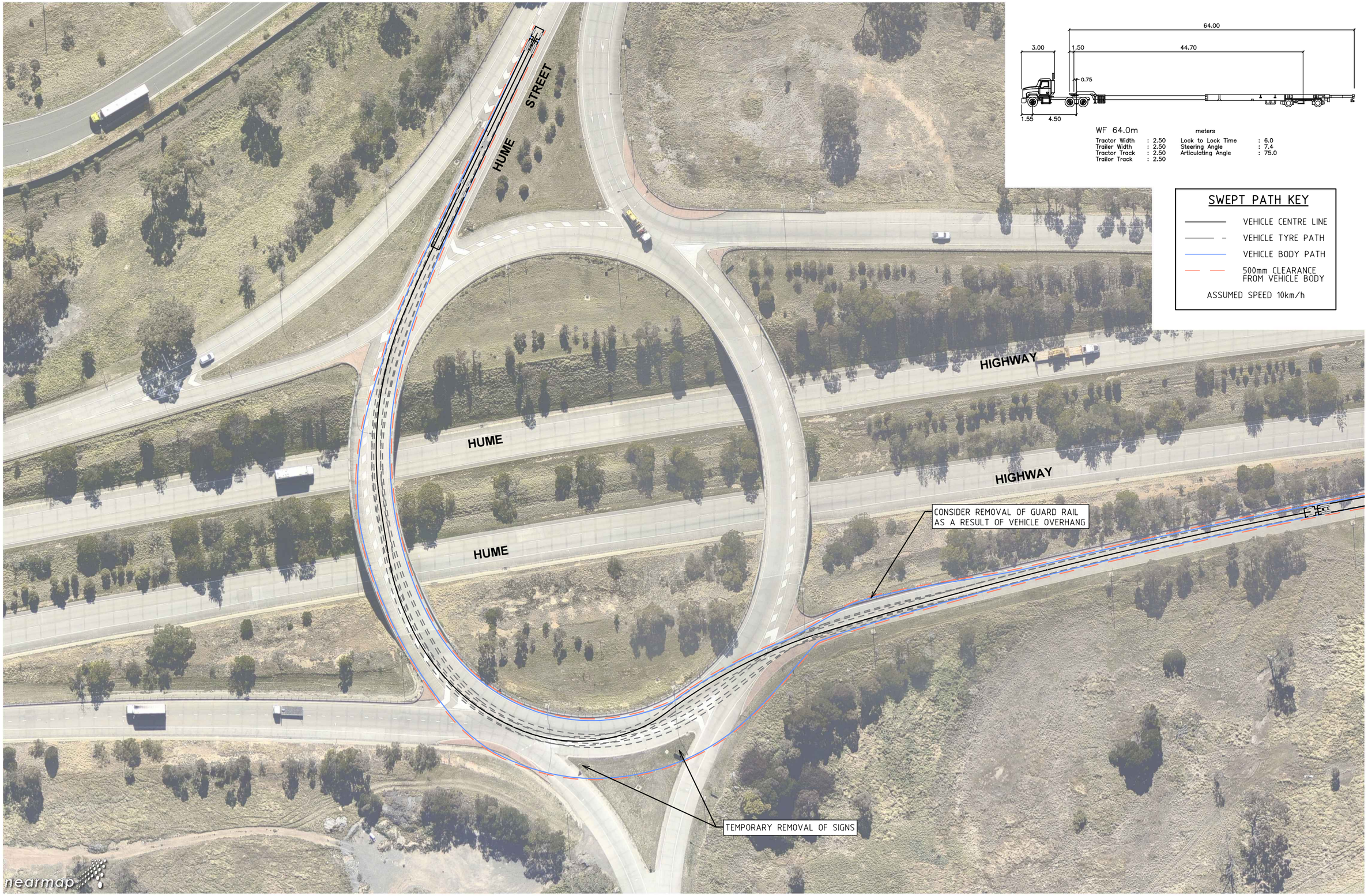
PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION

CROOKWELL 2 WIND FARM - SECTION 75
SWEPT PATH ASSESSMENT
64m SPECIAL WIND BLADE TRAILER

DATE: 28.08.2015
SCALE: 1:1000@A3 (0 10 20 30)
APPROVED: CDW
DRAWING NO. 15S1569000-01-04-P2
SHEET: 04 OF 09







WF 64.0m

meters

| | | | |
|---|---|---|---|
| Tractor Width | : 2.50 | Lock to Lock Time | : 6.0 |
| Trailer Width | : 2.50 | Steering Angle | : 7.4 |
| Tractor Track | : 2.50 | Articulating Angle | : 75.0 |
| Trailor Track | : 2.50 | | |

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h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PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION

CROOKWELL 2 WIND FARM - SECTION 75
SWEPT PATH ASSESSMENT
64m SPECIAL WIND BLADE TRAILER

DATE: 28.08.2015
SCALE: 1:1000@A3 (0 10 20 30)
APPROVED: CDW
DRAWING NO. 15S1569000-01-05-P2
SHEET: 05 OF 09

PLOTTED BY : cameron.ward ON 28/08/2015 AT 3:35:47 PM 15S1569000-01-P2.dgn





WF 64.0m

meters

| | | | |
|---|---|---|---|
| Tractor Width | : 2.50 | Lock to Lock Time | : 6.0 |
| Trailer Width | : 2.50 | Steering Angle | : 7.4 |
| Tractor Track | : 2.50 | Articulating Angle | : 75.0 |
| Trailor Track | : 2.50 | | |

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

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PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION

CROOKWELL 2 WIND FARM - SECTION 75
SWEPT PATH ASSESSMENT
64m SPECIAL WIND BLADE TRAILER

DATE: 28.08.2015
SCALE: 1:1000@A3 (0 10 20 30)
APPROVED: CDW
DRAWING NO. 15S1569000-01-06-P2
SHEET: 06 OF 09





WF 64.0m

meters

| | | | |
|---|---|---|---|
| Tractor Width | : 2.50 | Lock to Lock Time | : 6.0 |
| Trailer Width | : 2.50 | Steering Angle | : 7.4 |
| Tractor Track | : 2.50 | Articulating Angle | : 75.0 |
| Trailor Track | : 2.50 | | |

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

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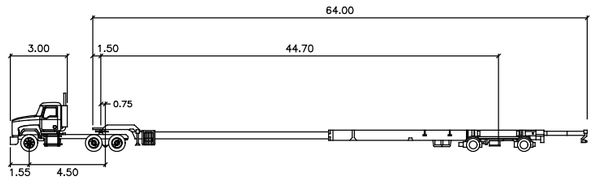
PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION

CROOKWELL 2 WIND FARM - SECTION 75
SWEPT PATH ASSESSMENT
64m SPECIAL WIND BLADE TRAILER

DATE: 28.08.2015
SCALE: 1:1000@A3 (0 10 20 30)
APPROVED: CDW
DRAWING NO.: 15S1569000-01-07-P2
SHEET: 07 OF 09


WF 64.0m

meters

| | | | |
|---|---|---|---|
| Tractor Width | : 2.50 | Lock to Lock Time | : 6.0 |
| Trailer Width | : 2.50 | Steering Angle | : 7.4 |
| Tractor Track | : 2.50 | Articulating Angle | : 75.0 |
| Trailor Track | : 2.50 | | |

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

PLOTTED BY : cameron.ward ON 28/08/2015 AT 3:36:59 PM 15S1569000-01-P2.dgn

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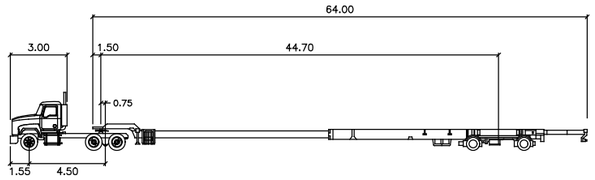
CROOKWELL 2 WIND FARM - SECTION 75
SWEPT PATH ASSESSMENT
64m SPECIAL WIND BLADE TRAILER

DATE: 28.08.2015
SCALE: 1:1000@A3 (0 10 20 30)
APPROVED: CDW
DRAWING NO. 15S1569000-01-08-P2
SHEET: 08 OF 09


WF 64.0m

meters

| | | | |
|---|---|---|---|
| Tractor Width | : 2.50 | Lock to Lock Time | : 6.0 |
| Trailer Width | : 2.50 | Steering Angle | : 7.4 |
| Tractor Track | : 2.50 | Articulating Angle | : 75.0 |
| Trailor Track | : 2.50 | | |

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

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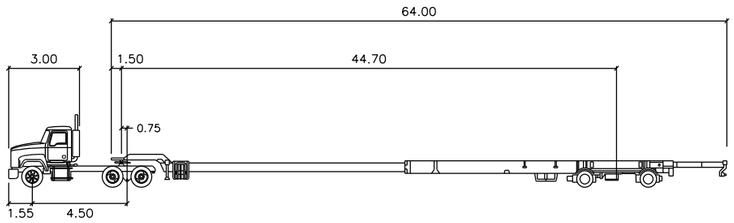
CROOKWELL 2 WIND FARM - SECTION 75
SWEPT PATH ASSESSMENT
64m SPECIAL WIND BLADE TRAILER

DATE: 28.08.2015
SCALE: 1:1000@A3 (0 10 20 30)
APPROVED: CDW
DRAWING NO. 15S1569000-01-09-P2
SHEET: 09 OF 09




WF 64.0m

meters

| | | | |
|---|---|---|---|
| Tractor Width | : 2.50 | Lock to Lock Time | : 6.0 |
| Trailer Width | : 2.50 | Steering Angle | : 7.4 |
| Tractor Track | : 2.50 | Articulating Angle | : 75.0 |
| Trailor Track | : 2.50 | | |

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h

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PRELIMINARY PLAN
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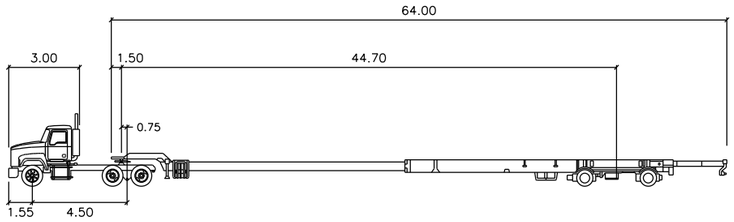
CROOKWELL 2 WIND FARM
SWEPT PATH ASSESSMENT
SPECIAL WIND BLADE TRAILER

DATE: 26.02.16

SCALE: 1:2000 @A3 (0 10 20 30)

APPROVED: ADF

DRAWING NO. 15S1569100-01-10-P2




WF 64.0m

meters

| | | | |
|---|---|---|---|
| Tractor Width | : 2.50 | Lock to Lock Time | : 6.0 |
| Trailer Width | : 2.50 | Steering Angle | : 7.4 |
| Tractor Track | : 2.50 | Articulating Angle | : 75.0 |
| Trailor Track | : 2.50 | | |

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h

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CROOKWELL 2 WIND FARM
SWEPT PATH ASSESSMENT
SPECIAL WIND BLADE TRAILER

DATE: 26.02.16
SCALE: 1:2000 @A3 (0 10 20 30)
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DRAWING NO. 15S1569100-01-11-P2

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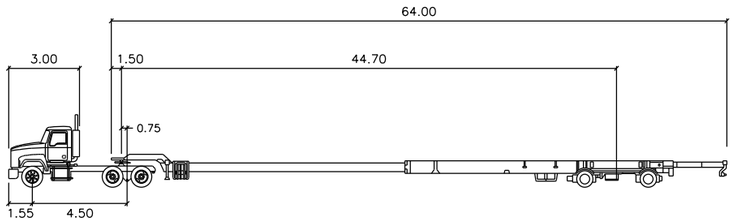


WF 64.0m

meters

| | | | |
|---|---|---|---|
| Tractor Width | : 2.50 | Lock to Lock Time | : 6.0 |
| Trailer Width | : 2.50 | Steering Angle | : 7.4 |
| Tractor Track | : 2.50 | Articulating Angle | : 75.0 |
| Trailor Track | : 2.50 | | |

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h




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PRELIMINARY PLAN
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SUBJECT TO CHANGE WITHOUT NOTIFICATION

CROOKWELL 2 WIND FARM
SWEPT PATH ASSESSMENT
SPECIAL WIND BLADE TRAILER

DATE: 26.02.16

SCALE: 1:2000 @A3 (0 10 20 30)

APPROVED: ADF

DRAWING NO. 15S1569100-01-12-P2

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