



Crookwell 3 Wind Farm Blade Modification Transport Impact Assessment

Client // Crookwell Development Pty Ltd
Office // NSW
Reference // 15S1569100
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Crookwell 3 Wind Farm

Blade Modification

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Quality Record

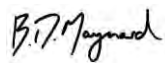
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1. Introduction

1.1 Background

It is understood that Crookwell Development Pty Ltd intends to modify the parameters for the proposed Crookwell 3 Wind Farm (C3WF) development. A development application for C3WF has been submitted and is currently under assessment by the NSW Department of Planning and Environment.

The original development application included a proposal for 28 turbines with a tower height of up to 105m and blades up to 51m in length. The subject modification includes a reduction in the number of turbines to 23 turbines. This represents a reduction of 5 turbines or approximately 17% of what was originally proposed. The revised equipment parameters to be submitted as part of this modification are:

- 23 wind turbines
- 95 metre tower
- 64 metre blades
- 130 metre rotor diameter
- 157 metre blade tip height

In relation to this, Crookwell Development Pty Ltd has commissioned GTA Consultants to prepare an updated traffic impact assessment to assess the modifications. In addition, GTA is to prepare an assessment of truck manoeuvrability during the transportation of the turbine parts to the site. GTA's assessment should be treated as a supplementary report to the previous traffic impact assessment prepared by URS in 2010.

A Traffic Management Plan (TMP) would be prepared 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
- 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)
 - Crookwell II Wind Farm – GTA (February 2016)
- 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

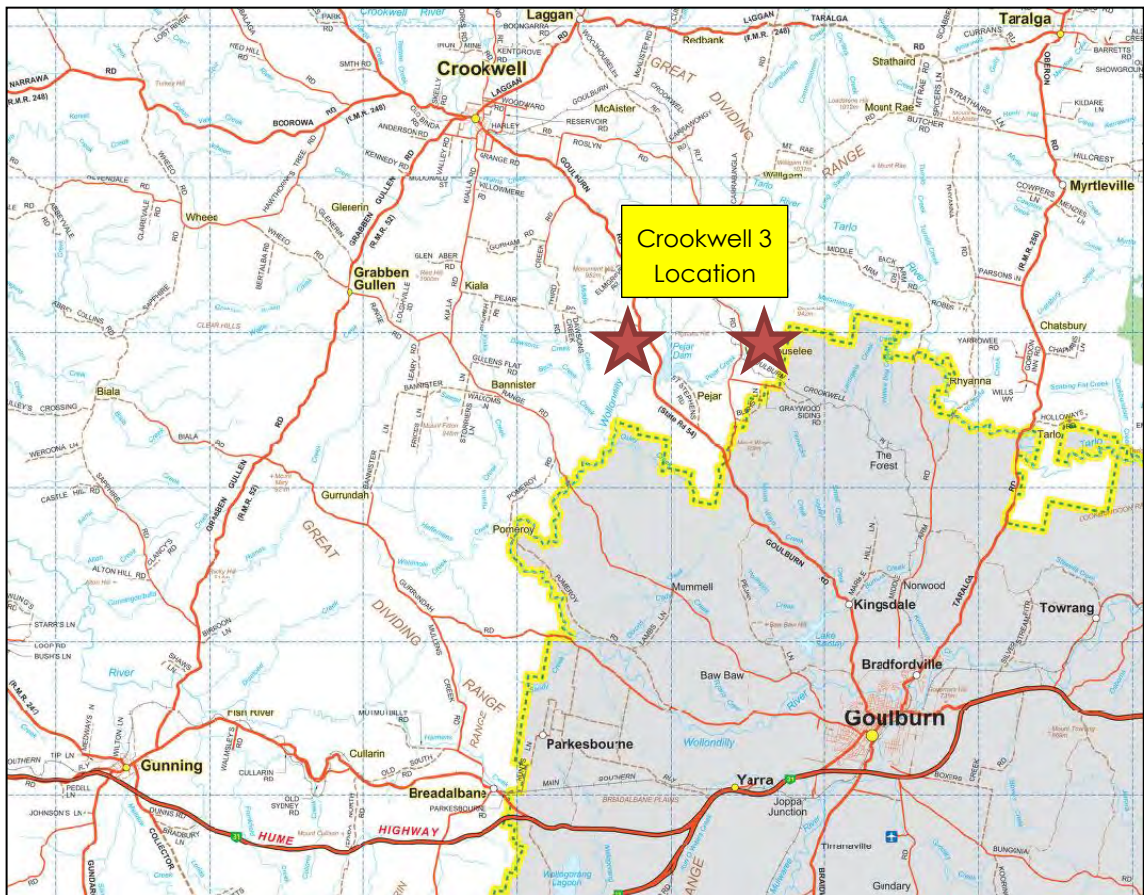
2.1 Project Area

The proposed C3WF is located approximately 15km southeast of Crookwell in southern New South Wales (approximately 25km northwest of Goulburn). The proposed development is split over two areas known as C3WF east and C3WF south. The development includes an area of 1100 hectares in C3WF east, and 400 hectares in C3WF south. The subject site 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

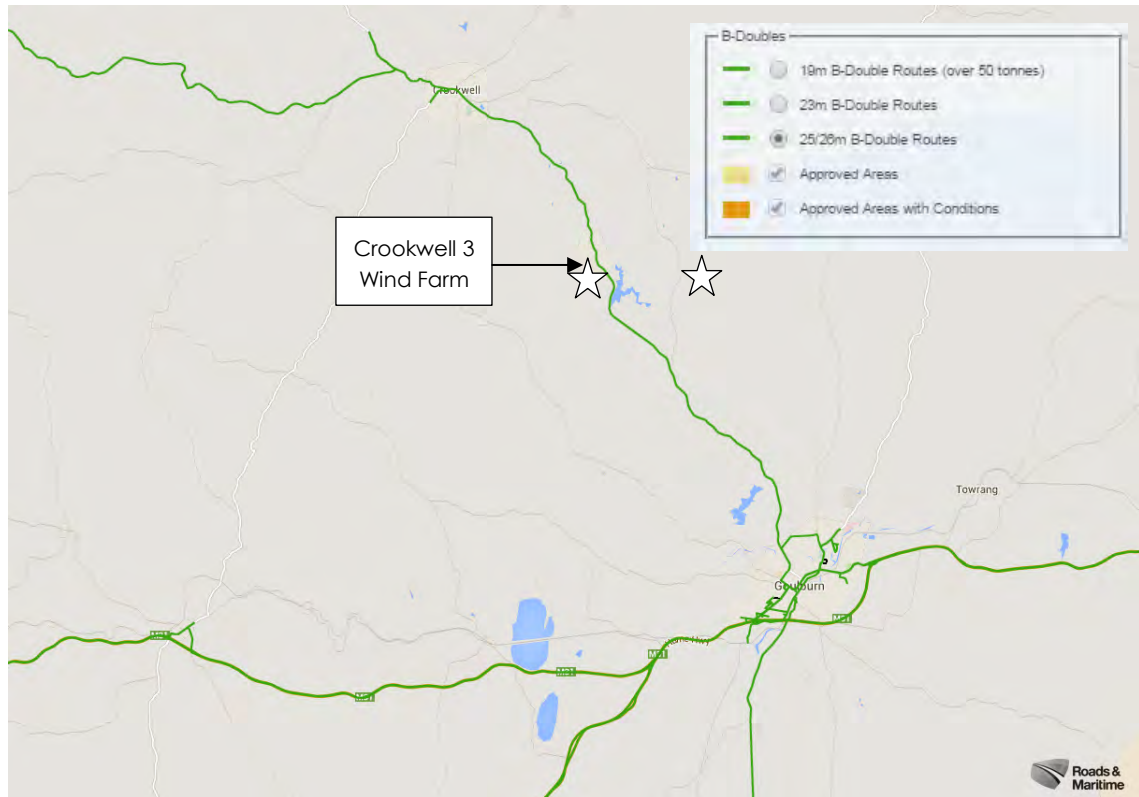
2.2 Restricted Access Vehicle Map

The existing B-double (26m) approved routes in the broader vicinity of the site are detailed on the RMS website¹ and are reproduced in Figure 2.2. Crookwell Road, Hume Street, Clinton Street,

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

Deccan Street and Hume Highway in the vicinity of and on-route to the site are approved B-double (26m) routes.

Figure 2.2: Existing 26m B-Double Approved Routes

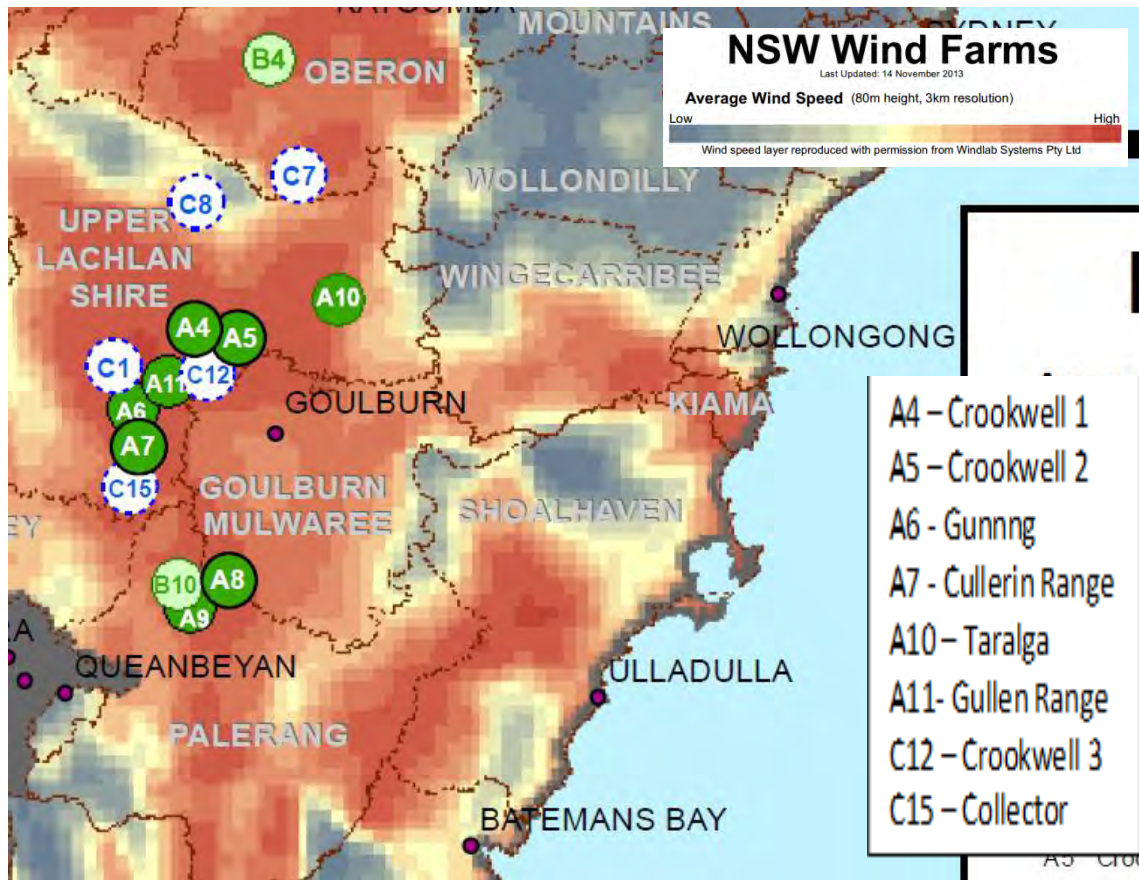


2.3 Surrounding Wind Farm Developments

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 north of project area and currently operational. Crookwell 2 wind farm (C2WF) is proposed to the north and east of the C3WF sites. 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 north-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)



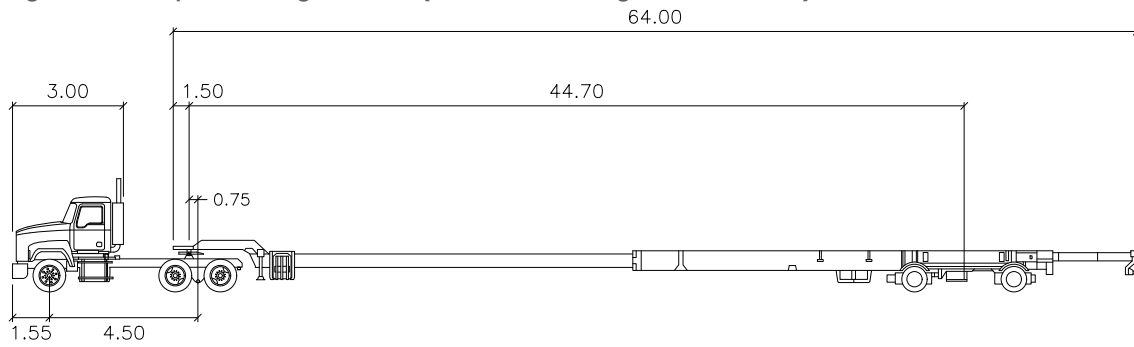
Figure 2.6: Typical Oversize Load (Blade Section)



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)



WF	64.0m	metres	
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
Trailer Track	: 2.50		

- Maximum RAV Length: 67.8 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 per the original proposal 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:

- **Crookwell 3 East:** Picton Road (Main road 88), Hume Highway, Cowper Street, Clinton Street, Deccan Street, Fitzroy Street, Crookwell Road, Woodhouselee Road
- **Crookwell 3 South:** 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 2 Wind Farm.

3. Traffic Generation

The traffic generation during typical operation of C3WF is not expected to change from the original development proposal.

The daily and peak hour traffic generation during the construction of the development is expected to be consistent with the volumes estimated in the 2010 URS report for C3WF. These are summarised in Table 3.1.

Table 3.1: Vehicles Volumes Generated by Development (Construction Vehicles only)

Vehicle Class	Peak One-way Vehicle Movements Generated			Vehicle Proportion during peak hour
	Per Month	Per Day	Peak Hour	
RAVs	58	3	2	3.3%
Heavy Vehicles	429	27	14	23.0%
Light Vehicles	1,116	47	45	73.8%
Total	1,603	77	61	

Source: URS 2010, Table 3-2

It is assumed that traffic generation for the delivery of cement and water would remain as estimated for the original development proposal as the reduction in the number of turbines would be offset by the slightly larger foundation required for an increased tower size. 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 original proposal.

The duration of the construction period and overall construction traffic generated (total) by the development is however, expected to vary from the original development proposal. As there is a reduction in the total number of turbines required to be constructed, the construction period is expected to be reduced.

4. Swept Path Analysis

GTA has undertaken swept path assessments using AutoTURN of the following key intersections and road corridors 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
- Crookwell Road and Woodhouselee Road, Wayo
- Woodhouselee Road, Wayo
- Crookwell Road/ Crookwell 3 South - Access Option 1, Pejar

It is noted that many of the mitigation measures and intersection upgrades detailed below would be required and implemented for the construction of C2WF. Following completion of the construction it is expected that the construction route would generally be returned to its existing state.

As such, where possible it would be recommended to carry out the construction of C2WF and C3WF concurrently. Otherwise, any required mitigation measures would need to be re-installed for C3WF, after removal of measures following C2WF completion.

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 (15S1569100-01-01)

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 (15S1569100-01-02)

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 (15S1569100-01-03)

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 (15S1569100-01-04)

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 (15S1569100-01-05)

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 (15S1569100-01-06)

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 (15S1569100-01-07)

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 (15S1569100-01-08)

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 (15S1569100-01-09)

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 Crookwell Road and Woodhouselee Road, Wayo (15S1569100-01-10)

The intersection of Crookwell Road and Woodhouselee Road is currently a wide priority controlled intersection. A swept path assessment of the intersection indicates the following:

- The wheels of the RAV would remain within the existing pavement surface, however would encroach upon the opposing traffic lanes while undertaking the turning movement, requiring appropriate traffic management.
- No physical modifications would be required to this intersection.

4.1.11 Woodhouselee Road, Wayo

Access into the Crookwell 3 East area is to be via Woodhouselee Road, east of Crookwell Road. Woodhouselee Road is a rural road with typically a 6-7m wide sealed road surface. Limited linemarking is provided along the section between Crookwell Road and the proposed site access locations.

Investigations undertaken by Crookwell Development Pty Ltd and GTA Consultants indicate that the RAV would be able to negotiate the majority of the road without the need for potential upgrades. However, several locations have been identified in which localised upgrade works (road widening/ tree removal) may be required. These include:

- In the vicinity of Pejar Creek Bridge
- North of Woodhouselee.

Given the complex geometry of the road in these areas and the close proximity of trees and embankments the use of a "typical" vehicle profile may not appropriately assess the impact of the RAV. As such, a swept path assessment of Woodhouselee Road has not been completed.

It is recommended that once a transport provider has been selected and the proposed RAV is known, a detailed swept path assessment be carried out and an on-site vehicle trial be conducted.

4.1.12 Crookwell Road/ Crookwell 3 South - Access Option 1, Pejar (15S1569100-01-11)

Option 1 for the access into the Crookwell 3 South area is via an existing road easement approximately 750 metres north of Pejar Dam. The RAV would be required to carry out a 170 degree turn to head south towards Crookwell 3 South. A swept path assessment of the manoeuvre indicates the following:

- A temporary access road would need to be constructed to allow for a sound and even surface for the RAV to track over. In conjunction with this, several trees between

Crookwell Road and the access road would require removal to allow for the RAV swept path.

- The wheels of the RAV would remain within the existing pavement surface, however the rear of the RAV would overhang the eastern road verge of Crookwell Road. Several trees are located within this area which would need to be removed to allow for the RAV swept path.

4.1.13 Woodhouselee Road/ Crookwell 3 East - Access Option 1 (15S1569100-01-12)

Option 1 for the access into the Crookwell 3 East area is via an existing road easement approximately 4km south of the intersection of Woodhouselee Road/ Middle Arm Road on Woodhouselee Road. The RAV would be required to carry out a 120 degree turn to head east towards Crookwell 3 East. A swept path assessment of the manoeuvre indicates the following:

- The existing access road would require widening to allow for the RAV to access the existing road easement.
- Some minor vegetation would be required to be removed along the east side of Woodhouselee Road to accommodate the turning path of the RAV.
- The wheels of the RAV would remain within the Crookwell Road road reserve, however the rear of the RAV would overhang the western side of Crookwell Road.

4.1.14 Woodhouselee Road/ Crookwell 3 East - Access Option 2 (15S1569100-01-13)

Option 2 for the access into the Crookwell 3 East area would require the construction of a new crossover and access point approximately 6km south of the intersection of Woodhouselee Road/Middle Arm Road on Woodhouselee Road. The RAV would be required to carry out a 90 degree turn to head northeast towards Crookwell 3 East. A swept path assessment of the manoeuvre indicates the following:

- A new vehicle crossover and temporary access road would need to be constructed to allow for a sound and even surface for the RAV to track over.
- Several trees between Woodhouselee Road and the access road (both sides of the carriageway) would require removal to allow for the RAV swept path.

4.1.15 Woodhouselee Road/ Crookwell 3 East - Access Option 3 (15S1569100-01-14)

Option 3 for the access into the Crookwell 3 East area is via an existing road easement approximately 2.6km north of Trappers Way on Woodhouselee Road. The RAV would be required to carry out a 90 degree turn towards Crookwell 3 East. A swept path assessment of the manoeuvre indicates the following:

- The existing crossover would require widening to accommodate the RAV.
- An access road would be required to link Crookwell 3 to the unnamed road easement.

5. Conclusion

It is proposed to modify the original development proposal for Crookwell 3 Wind Farm to reduce the number of turbines from 28 to 23.

The peak daily traffic generation for the construction and operation of the Wind Farm would be consistent with the original application, however given the reduced number of turbines required to be 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 3 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

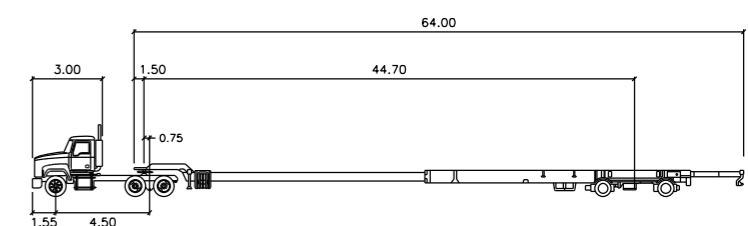
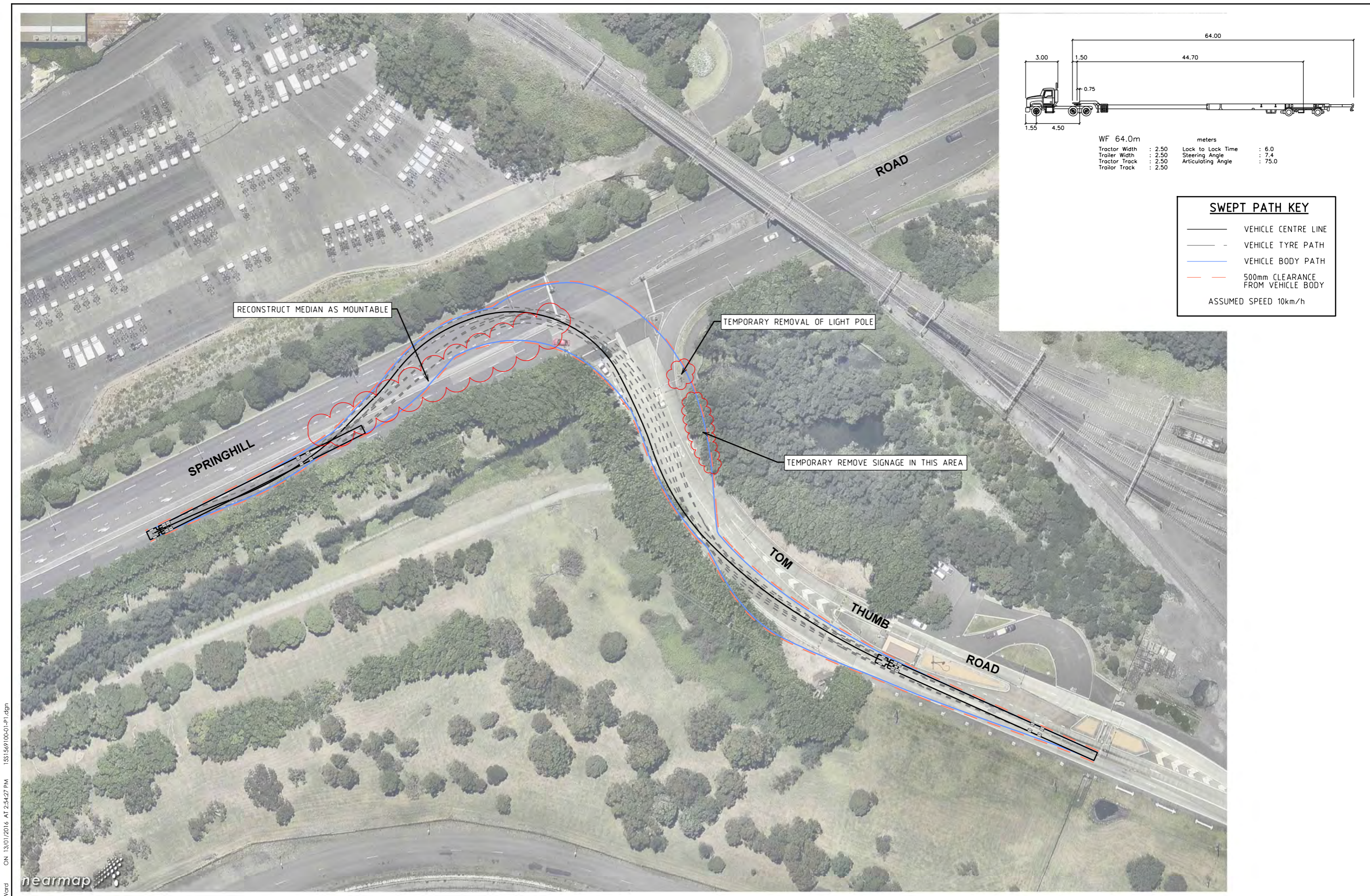
64m Blade						
Location	GTA Drawing No	Vegetation or Signage Removal/Trimming	Traffic Controlled	Parking Relocation	Pavement or Kerb Reconstruction	General Comments
Tom Thumb Road/ Springhill Road	15S1569100-01-01-P1	✓	x	x	✓	Removal of light pole, signage and mountable median
Springhill Road/ Masters Road	15S1569100-01-02-P1	x	x	x	✓	Ensure island is mountable
Princes Motorway/ Picton Road	15S1569100-01-03-P1	x	✓	x	x	Ensure appropriate traffic management to stop southbound traffic.
Picton Road/ Hume Motorway	15S1569100-01-04-P1	✓	x	x	x	Ensure nominated signs are temporarily removed.
Hume Highway/ Hume Street Interchange	15S1569100-01-05-P1	✓	x	x	x	Possible removal of guard rail on off-ramp as a result of vehicle overhang
Hume Street/ Ducks Lane	15S1569100-01-06-P1	✓	x	x	x	Ensure nominated signs are temporarily removed. Note; roundabout is not mountable.
Cowper Street/ Clinton Street	15S1569100-01-07-P1	✓	✓	x	✓	Ensure nominated signs are temporarily removed.

64m Blade						
Location	GTA Drawing No	Vegetation or Signage Removal/Trimming	Traffic Controlled	Parking Relocation	Pavement or Kerb Reconstruction	General Comments
Clinton Street/ Deccan Street	15S1569100-01-08-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	15S1569100-01-09-P1	✓	✓	✗	✗	Ensure signs surrounding roundabouts are removed. Temporary no stopping area will be required.
Crookwell Road/ Woodhouselee Road	15S1569100-01-10-P1	✗	✓	✗	✗	No modifications required.
Woodhouselee Road	-	✓ (localised)	✓	✗	✓ (localised)	Detailed assessment and on-site vehicle trial recommended.
Crookwell Road/ Crookwell 3 South - Access Option 1, Pejar	15S1569100-01-11-P1	✓	✓	✗	✓	Construction of temporary access road and removal of several trees.
Woodhouselee Road/ Crookwell 3 East – Access Option 1	15S1569100-01-12-P1	✓	✗	✗	✓	Widen existing access road to accommodate RAV
Woodhouselee Road/ Crookwell 3 East – Access Option 2	15S1569100-01-13-P1	✓	✗	✗	✓	Construction of crossover and temporary access road required in addition to tree removal
Woodhouselee Road/ Crookwell 3 East – Access Option 3	15S1569100-01-14-P1	✗	✗	✗	✓	Widen existing crossover to accommodate vehicle path. Construction of an access road linking with the existing road easement

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.

Appendix A

Swept Path Assessment



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
Trailer 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: 13/01/2016 AT 2:54:27 PM ISS: 156100-01-P1.dgn

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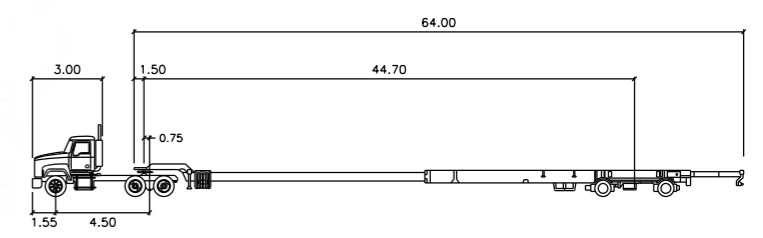


PRELIMINARY PLAN
 FOR DISCUSSION PURPOSES ONLY
 SUBJECT TO CHANGE WITHOUT
 NOTIFICATION

**CROOKWELL 3 WIND FARM
 SWEPT PATH ASSESSMENT
 65m SPECIAL WIND BLADE TRAILER**

DATE: 11.01.2016 SCALE: 1:1000@A3

APPROVED: CDW DRAWING NO. 15S1569100-01-01-P1 SHEET: 01 OF 11



WF 64.0m	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
	Trailer Track	: 2.50		

SWEPT PATH KEY

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

ASSUMED SPEED 10km/h

INSTALL MOUNTABLE KERB AND HARDSTAND AREA

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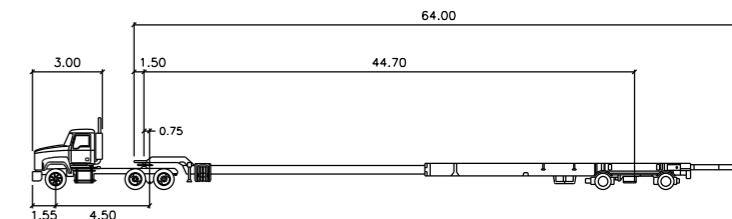
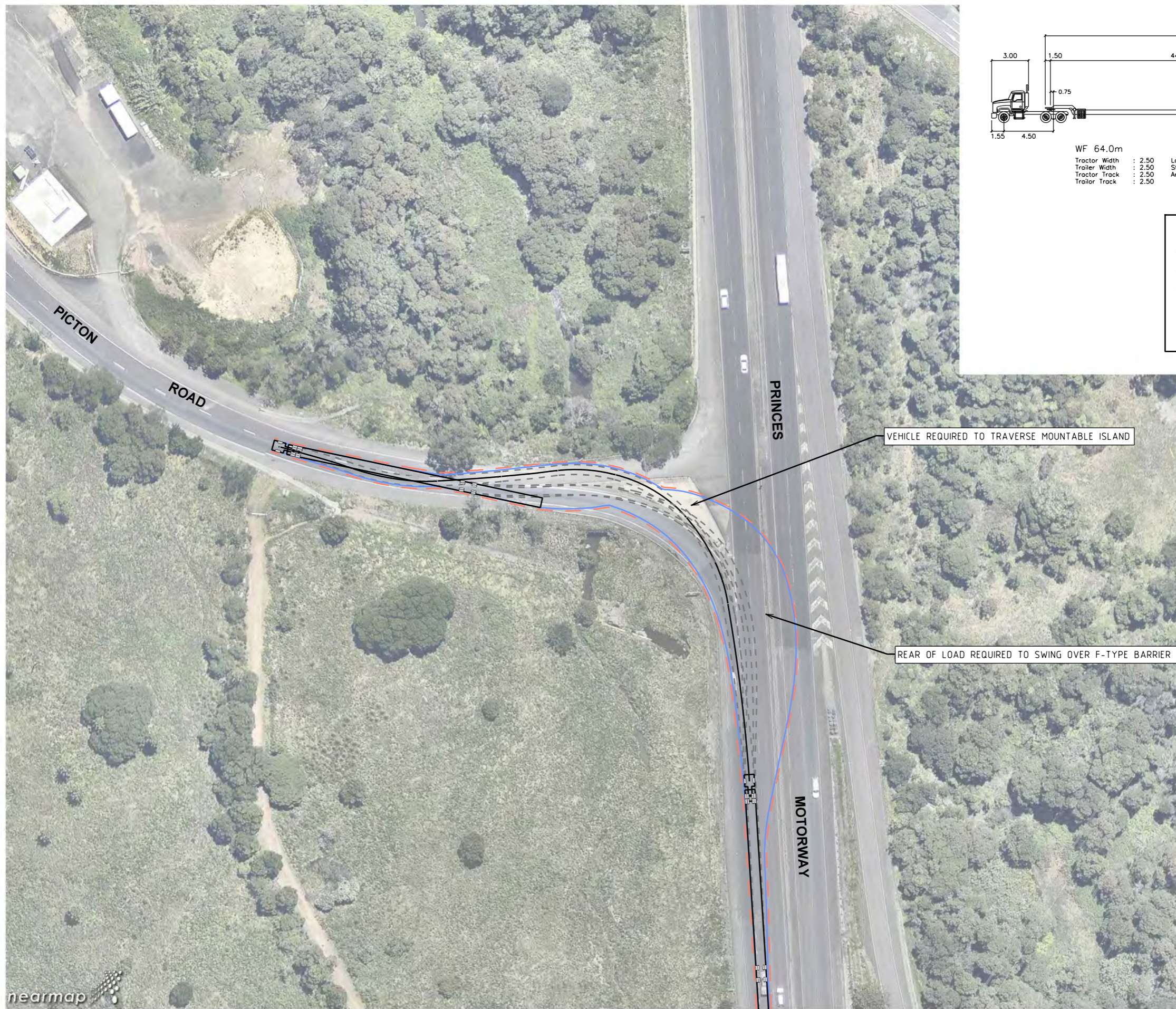


PRELIMINARY PLAN
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CROOKWELL 3 WIND FARM
 SWEPT PATH ASSESSMENT
 64m SPECIAL WIND BLADE TRAILER

DATE: 11.01.2016 SCALE: 1:1000@A3

APPROVED: CDW DRAWING NO. 15S1569100-01-02-P1 SHEET: 02 OF 11



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
Trailer Track	: 2.50		

SWEPT PATH KEY

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

ASSUMED SPEED 10km/h

VEHICLE REQUIRED TO TRAVERSE MOUNTABLE ISLAND

REAR OF LOAD REQUIRED TO SWING OVER F-TYPE BARRIER

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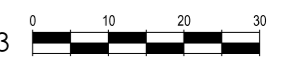
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PRELIMINARY PLAN
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CROOKWELL 3 WIND FARM
 SWEPT PATH ASSESSMENT
 64m SPECIAL WIND BLADE TRAILER

DATE: 11.01.2016 SCALE: 1:1000@A3
 APPROVED: CDW DRAWING NO. 15S1569100-01-03-P1 SHEET: 03 OF 11





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: 13/01/2016 AT 2:55:12 PM 15S1569100-01-04-P1.dgn

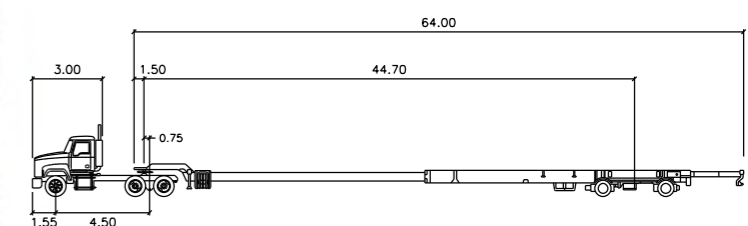
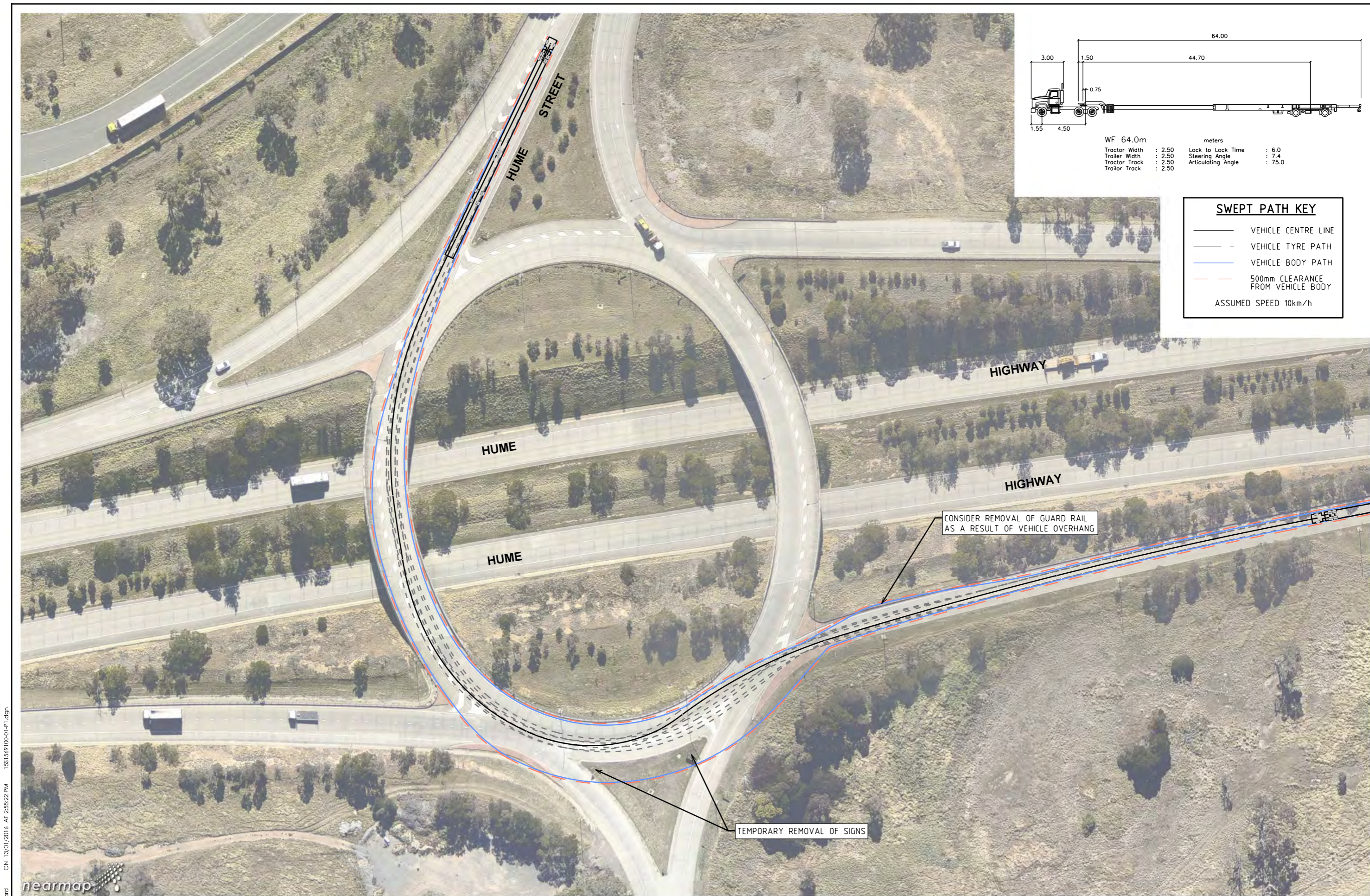
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PRELIMINARY PLAN
 FOR DISCUSSION PURPOSES ONLY
 SUBJECT TO CHANGE WITHOUT
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**CROOKWELL 3 WIND FARM
 SWEPT PATH ASSESSMENT
 64m SPECIAL WIND BLADE TRAILER**

DATE: 13.01.2016 SCALE: 1:1000@A3
 APPROVED: CDW DRAWING NO. 15S1569100-01-04-P1 SHEET: 04 OF 11



WF	64.0m	Lock to Lock Time	6.0
Tractor Width	2.50	Steering Angle	7.4
Trailer Width	2.50	Articulating Angle	75.0
Tractor Track	2.50		

SWEPT PATH KEY

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

ASSUMED SPEED 10km/h

CONSIDER REMOVAL OF GUARD RAIL AS A RESULT OF VEHICLE OVERHANG

TEMPORARY REMOVAL OF SIGNS

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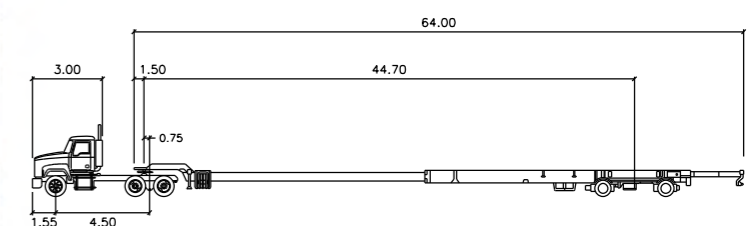


PRELIMINARY PLAN
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CROOKWELL 3 WIND FARM
 SWEPT PATH ASSESSMENT
 64m SPECIAL WIND BLADE TRAILER

DATE: 13.01.2016 SCALE: 1:1000@A3

APPROVED: CDW DRAWING NO. 15S1569100-01-05-P1 SHEET: 05 OF 11



WF 64.0m	Tractor Width : 2.50	Trailer Width : 2.50	Tractor Track : 2.50	Lock to Lock Time : 6.0	Steering Angle : 7.4	Articulating Angle : 75.0
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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 3 WIND FARM
SWEPT PATH ASSESSMENT
64m SPECIAL WIND BLADE TRAILER

DATE:	SCALE:	
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CDW	15S1569100-01-06-P1	06 OF 11



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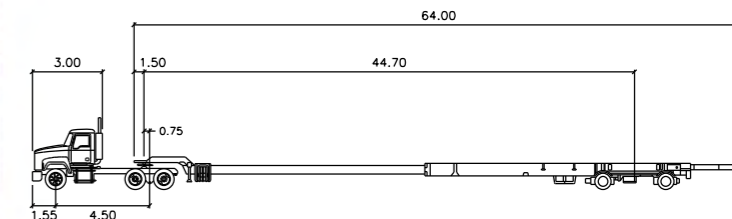
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PRELIMINARY PLAN
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CROOKWELL 3 WIND FARM
SWEPT PATH ASSESSMENT
64m SPECIAL WIND BLADE TRAILER

DATE: 13.01.2016 SCALE: 1:1000@A3
 APPROVED: CDW DRAWING NO. 15S1569100-01-07-P1 SHEET: 07 OF 11



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
Trailer 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: 13/01/2016 AT 2:56:50 PM 15S1569100-01-PI.dgn

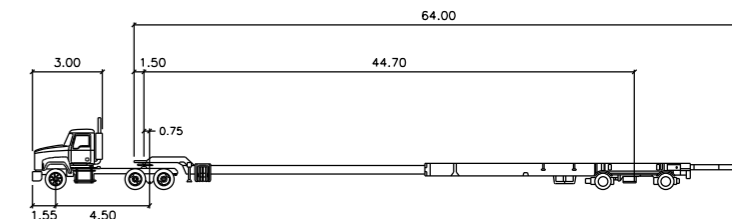
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PRELIMINARY PLAN
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CROOKWELL 3 WIND FARM
SWEPT PATH ASSESSMENT
64m SPECIAL WIND BLADE TRAILER

DATE: 13.01.2016 SCALE: 1:1000@A3
 APPROVED: CDW DRAWING NO. 15S1569100-01-08-P1 SHEET: 08 OF 11



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
Trailer 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: 13/01/2016 AT 2:57:00 PM 15S1569100-01-09-P1.dgn

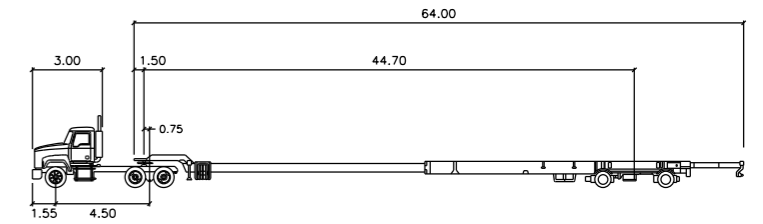
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PRELIMINARY PLAN
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CROOKWELL 3 WIND FARM
 SWEPT PATH ASSESSMENT
 64m SPECIAL WIND BLADE TRAILER

DATE:	SCALE:	
13.01.2016	1:1000@A3	
APPROVED:	DRAWING NO.	SHEET:
CDW	15S1569100-01-09-P1	09 OF 11



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
Trailer 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: 13/01/2016 AT 2:59:39 PM 15S1569100-01-P1.dgn

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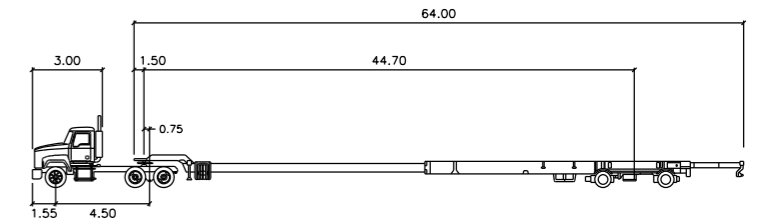


PRELIMINARY PLAN
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**CROOKWELL 3 WIND FARM
 SWEPT PATH ASSESSMENT
 64m SPECIAL WIND BLADE TRAILER**

DATE: 13.01.2016 SCALE: 1:1000@A3

APPROVED: CDW DRAWING NO. 15S1569100-01-10-P1 SHEET: 10 OF 11



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
Trailer 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 13/01/2016 AT 3:29:39 PM 15S1569100-01-P1.dgn

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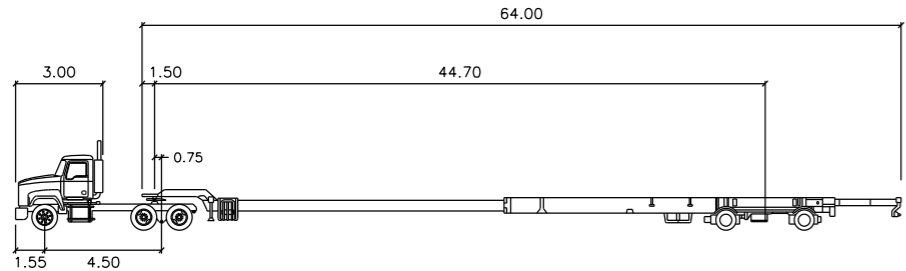
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PRELIMINARY PLAN
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CROOKWELL 3 WIND FARM
SWEPT PATH ASSESSMENT
64m SPECIAL WIND BLADE TRAILER

DATE: 13.01.2016 SCALE: 1:1000@A3
 APPROVED: CDW DRAWING NO.: 15S1569100-01-11-P1 SHEET: 11 OF 11



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
Trailer Track	: 2.50		

SWEPT PATH KEY

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

ASSUMED SPEED 5km/h



PLOTTED BY: draughting@holdek ON: 8/03/2016 AT 4:32:02 PM 15S1569100-AT01-P1.dgn

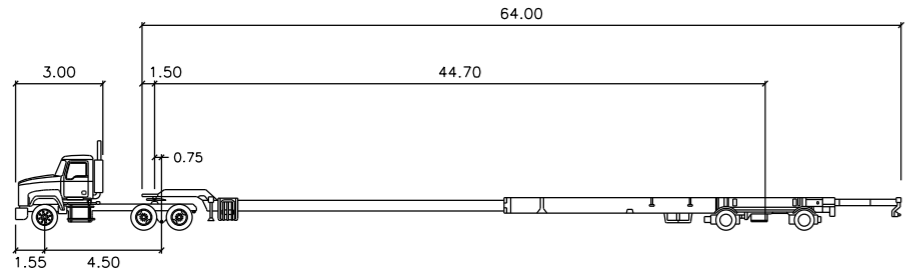
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PRELIMINARY PLAN
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CROOKWELL 3 WIND FARM
SWEPT PATH ASSESSMENT
SPECIAL WIND BLADE TRAILER

DATE: 08.03.16 SCALE: 1:2000 @A3
 APPROVED: ADF DRAWING NO. 15S1569100-01-12-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
Trailer Track	: 2.50		

SWEPT PATH KEY

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

ASSUMED SPEED 5km/h

REMOVE TREES LOCATED WITHIN VEHICLE BODY PATH

CONSTRUCT ACCESS POINT TO ACCOMMODATE SWEPT PATH SHOWN



PLOTTED BY: Drafting/holddesk ON: 29/02/2016 AT 10:58:54 AM 15S1569100-AT01-P1.dgn

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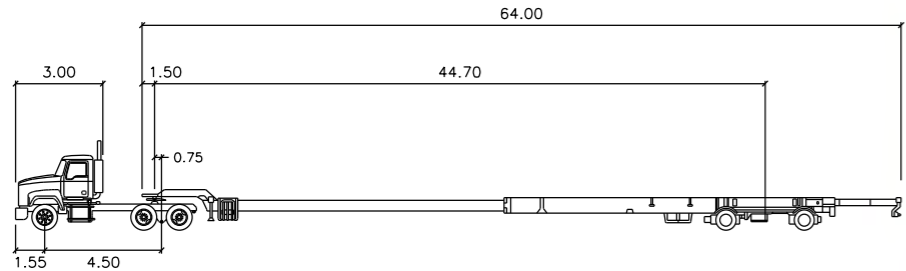


PRELIMINARY PLAN
 FOR DISCUSSION PURPOSES ONLY
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CROOKWELL 3 WIND FARM
 SWEPT PATH ASSESSMENT
 SPECIAL WIND BLADE TRAILER

DATE: 26.02.16 SCALE: 1:2000 @A3

APPROVED: ADF DRAWING NO. 15S1569100-01-13-P1



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
Trailer Track	: 2.50		

SWEPT PATH KEY

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

ASSUMED SPEED 5km/h



WIDEN CROSSOVER TO ACCOMMODATE VEHICLE PATH

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 SWEPT PATH ASSESSMENT
 SPECIAL WIND BLADE TRAILER

DATE: 26.02.16 SCALE: 1:2000 @A3

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