TRANSPORT ROUTE STUDY

Chalumbin Wind Farm

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Prepared By	Daniel Kyriacou
Released By	Travis Smith
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1.0	16/07/2021	Issued to client
1.1	08/12/2021	Minor updates to project description which did not change the overall findings of the report
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Released by:

Travis Smith
MIEAust CPEng NER CPESC
Principal Civil Engineer

STATEMENT OF LIMITATION

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CONTENTS

1 Introduction

icubed consulting was engaged by Attexo Group to undertake a Transport Route Study of Chalumbin Wind Farm (the Project) which is to be included with an application for a development approval under the provisions of the Queensland State Code 23 Wind Farm Development. The wind farm is located some 20 km south of Ravenshoe, QLD and (at time of writing) will consist of up to 86 Wind Turbine Generators (WTGs). The wind farm is to be developed by Chalumbin Wind Farm Pty Ltd.

This report details the results of the assessment, including an evaluation of:

- Existing conditions of the proposed transport route from the Port of Cairns to the site;
- Identifying the key intersections and turning movements the oversized vehicles will undertake;
- Investigating the most appropriate turning path for the truck to undertake at the key locations;
- Vehicle Swept path analysis of intersections along the proposed transport route;
- Identification of any road or intersection upgrades required to enable transportation of vehicles to site.

Preliminary investigations were conducted during a desktop study using aerial imagery and a site visit was conducted to observe the routes and perform physical measurements of key overpasses.

Overall, although several conflicts exist, it is considered that a viable route to the Project site is available, subject to resolving the potential conflicts with the relevant stakeholders.

Of the multiple elements of wind farm infrastructure to be transported, turbine blades present the largest challenge logistically due to their excessive length and requirement to be transported as a single piece. This specific Project is expected to have WTG blades of up to 90 m long. Further challenges are presented by other key components including the base tower sections – the diameter of which governs the allowable vertical height clearance along a route – and the Project's substation(s) transformer(s) – which will be the heaviest vehicles of the Over Size Over Mass (OSOM) fleet.

Site inspections of the route were undertaken on 26th May 2021 and 12th September 2022, which were utilised to ground truth several elements of the assessment within this report.

Once a contractor has been selected, this report will need to be revised to reflect the specifics of the detailed design and contractor's equipment and delivery method.

1.1 Limits of Report

The above tasks have been carried out based on information supplied by other members of the Project team, a desktop review and information from relevant authorities. These are detailed in the report.

While icubed has taken care in the preparation of this report, it neither accepts liability nor responsibility whatsoever in respect of;

- Any use of this report by any third party; and
- Any third party whose interests may be affected by any decision made regarding the contents of this report.

2 Existing Conditions

This report assesses a route starting from wharf 4 – 6 of Port of Cairns heading directly to the site. It also assesses an alternate route travelling from the port to a nearby laydown area on Tingira Street, and consequently from the laydown area to the site. This report has also assessed a potential detour route to avoid a bridge which may not have adequate vertical clearance for some Over Size Over Mass (OSOM) vehicles.

At time of writing, the Department of Transport and Main Roads (TMR) are upgrading a section of Bruce Highway between the towns of Edmonton and Gordonvale, just south of Cairns. The upgrade is referred to as 'E2G' by TMR and within this report. The upgrade includes a realignment of Bruce Highway in some sections, upgrades to council roads adjacent to the Bruce Highway and also a new overpass over the Bruce Highway. The entirety of the upgrade is expected to be completed mid-2023, approximately prior to any OSOM vehicles utilising the Bruce Highway from Cairns, and so the transport routes in this report have been assessed under the assumption that the upgrade will be completed when the OSOM vehicles use the route. Where appropriate, the assessment will ignore the existing conditions of current roads and assess the suitability of the planned upgrades instead.

Further information on the upgrade can be found on the TMR website, in the link below. To find a detailed upgrade plan, refer to the 'E2G Project Map' PDF map in the Downloads heading. The Project Map has also been attached in Appendix D – Bruce Highway 'E2G' Upgrade Plan.

https://www.tmr.qld.gov.au/projects/bruce-highway-cairns-southern-access-corridor-stage-3-edmonton-to-gordonvale

2.1 Site Location

The subject site is located some 20 km south of Ravenshoe and 70 km south-west of Innisfail. As shown in Figure 1, the wind farm Project is planned to be constructed over the following lots: Lot 31 SP288862 and Lot 1 CWL3298.

The proposed preliminary site layout is attached in Appendix A.

Figure 1 – Current site Project boundary

3 Proposed Development Details

The proposed development will comprise of a wind farm to be built south of Ravenshoe. It has been assumed that the Project execution will be over approximately 2 - 3 years in total. It is anticipated that the wind farm will comprise up to 86 Wind Turbine Generators (WTG's) across the subject site. At this time, the final WTG configuration is still to be finalised, but the WTG blade configuration may be up to 90 m in length, and the tower base up to 5.5 m in diameter.

4 Oversize Transport Route

4.1 Proposed Oversize Transportation Route

Two transport 'Options' within Cairns were evaluated during this assessment depending on the Project's need to utilise a turbine component laydown area prior to being transported to site. In total, three (3) possible routes within the Cairns limits were assessed as described below:

- Option 1 – travelling directly from the wharf to the Project site:
    - **Route 1**: from the wharf directly to Project site

- Option 2 – travelling from the wharf to a laydown area on Tingira Street, and then from the laydown area to the Project site.
    - **Route 2**: from the wharf to a laydown area on Tingira Street
    - **Route 3**: from laydown area on Tingira Street to the Project site.

It should also be noted that while the roads prior to Ray Jones Drive vary between Option 1 and 2, the route afterwards is the same until reaching the local access roads. There are two options for local access to the Project site, both of which turn off from Kennedy Highway. The first option turns off Kennedy Highway at the township of Ravenshoe onto Tully Falls Rd. This report will refer to the local access option from Ravenshoe as the 'primary' option. The other local access option – which will be referred to as the 'alternative' option – turns off Kennedy Highway at the next township, west along the highway at Innot Hot Springs (IHS).

Below, a map of the routes are shown in Figure 2 – Figure 6, while Table 1 lists the roads utilised by each route.

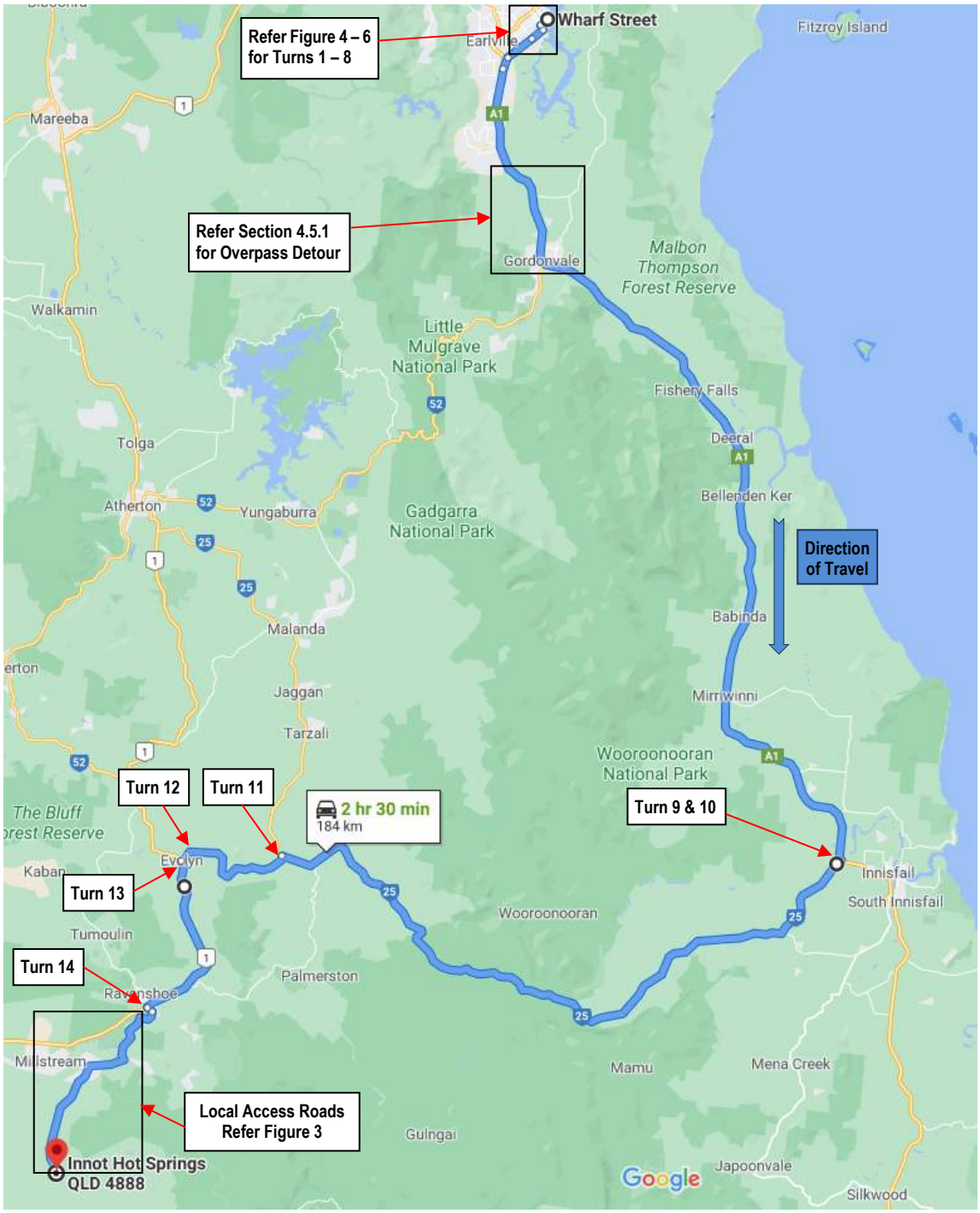


Figure 2 – Proposed transport route (whole route from Port of Cairns to site)

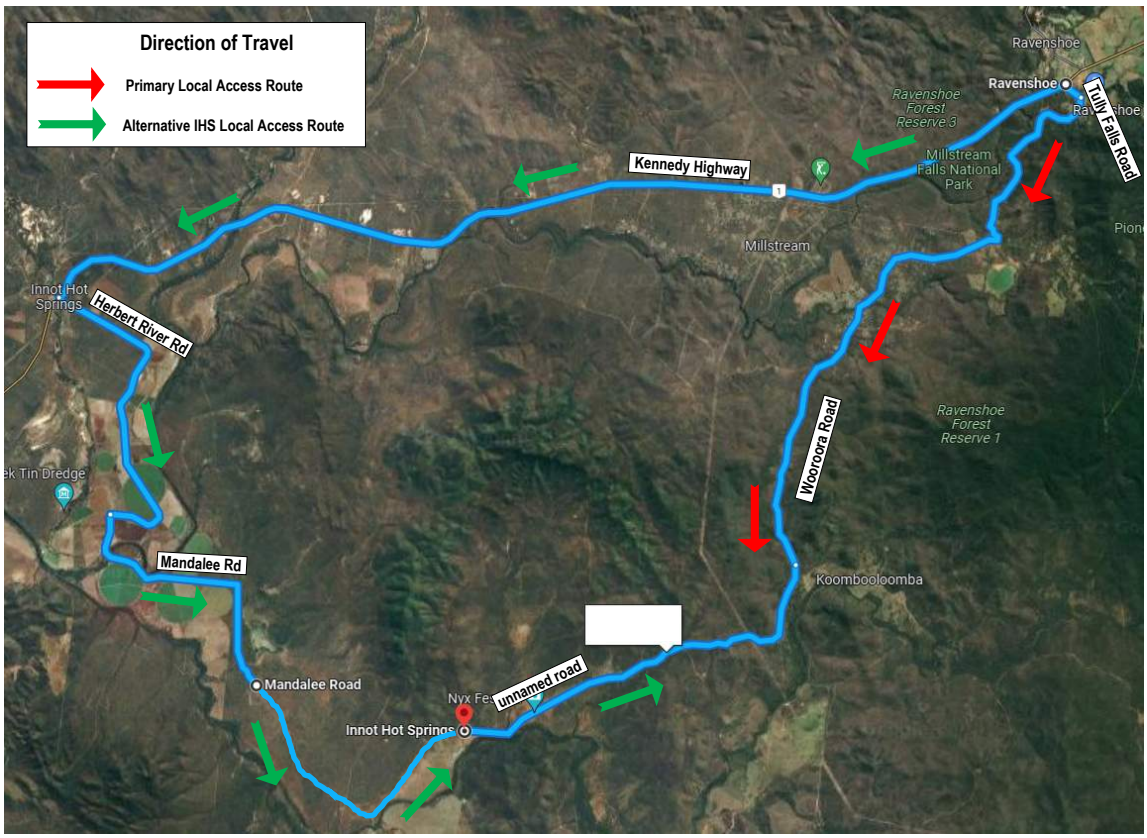


Figure 3 – Project Local Access Routes

Figure 4 – Proposed Transport Route 1 (from wharf to Ray Jones Drive)

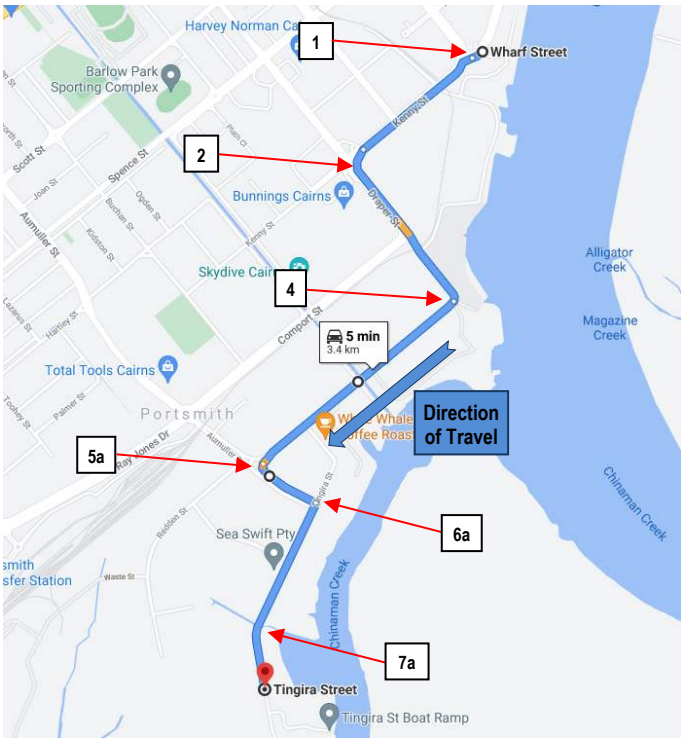


Figure 5 – Proposed Transport Route 2 (from wharf to Tingira Street laydown area)

Figure 6 – Proposed Transport Route 3 - from Tingira Street laydown to Ray Jones Dr

Table 1 below lists the constituting roads within each of the routes. A fourth route was also assessed as a potential detour to an overpass if needed. The vertical clearance detour (Transport Route 4) is discussed in Section 4.5.

Table 1: Transportation Route Description – OSOM Vehicles

Transport Route Description	Constituting Roads
From the wharf directly to the Project site **(Option 1, Route 1)**	Wharf Street Kenny Street Draper Street Comport Street Ray Jones Drive Bruce Highway Palmerston Highway East Evelyn Road Kennedy Highway Tully Falls Road [1] Wooroora Road [1] (Project site)
From the wharf to the Tingira Street laydown area **(Option 2, Route 2)**	Wharf Street Kenny Street Draper Street Cook Street Aumuller Street Tingira Street
From Tingira Street laydown area to Project site **(Option 2, Route 3)**	Tingira Street Aumuller Street Ray Jones Drive Bruce Highway Palmerston Highway East Evelyn Road Kennedy Highway Tully Falls Road [1] Wooroora Road [1] (Project site)
Vertical clearance detour for vehicles taller than 6 m: Turning off Bruce Highway prior to cane rail overpass and rejoining highway after overpass **(Transport Route 4)**	Maitland Road Pine Creek Yarrabah Road [2] Jones Road [2]
Alternative local access route travelling past Ravenshoe and turning off Kennedy Highway via Innot Hot Springs **(Transport Route A)**	Kennedy Highway Herbert River Road Mandalee Road unnamed road (Project Site)

1 – Primary local access route. Alternate Local Access Route option described in Transport Route A
2 – Newly constructed route not appearing on Google map imagery at time of writing.

The Port of Cairns wharf chosen for the assessment is wharf 4 – 6. The final berth to be used should be confirmed and this report revised. The assessment undertaken considers a one-way (south-bound) trip only.

4.2 Design Vehicles

The delivery vehicle providing the worst-case horizontal alignment during the construction of the wind farm will be a WTG blade transport. The vehicle arrangement used in the assessment is shown in Figure 7 below. The assumed Project blade length is 85m, however, as the specific dimensions and vehicle configuration is yet to be confirmed, a 90 m blade length has been adopted. This conservative approach was taken to provide additional surety. Given the large size of the blade trailer, this vehicle is deemed the governing vehicle that dictates the required intersection works. The oversize vehicles will be escorted to site.

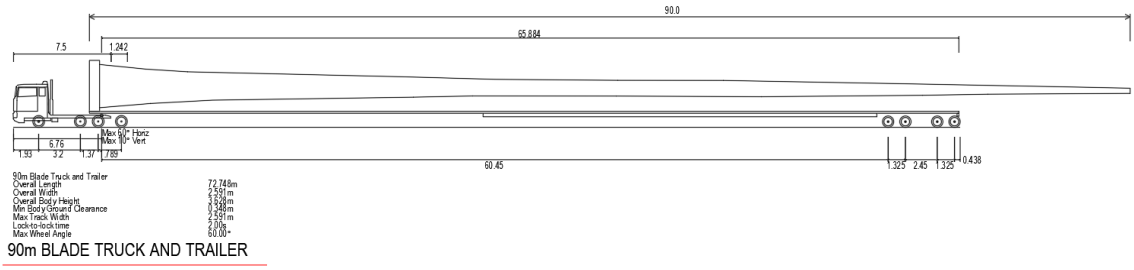


Figure 7 – Dimensions of Oversized Vehicle for Wind Turbine Generator (WTG) Blade Transportation

The vehicle providing the worst-case vertical clearance requirement is the transport delivering the turbine tower base. At this time the turbine base diameter has been provided as 5.5 m, however this is not final and should be confirmed by the Project Developer. The overhead obstruction clearances have been investigated in Section 4.5.

Another notable OSOM vehicle is the transformer transport, which can vary in size depending on the electrical design of the Project. Transformers are typically delivered on large, multi-row floats to effectively distribute the substantial weight. As a general rule, transformer delivery vehicles do not pose more geometrical issues than the blade transport in urban areas and on highways. Transformer transports, however, do tend to govern the track width requirement of the internal tracks more than the other OSOM vehicles.

Other large vehicles that are likely during construction, such as oversize vehicles for deliveries of power poles or B-Double vehicles for other material deliveries, are much smaller in size than the blade trailer vehicle.

4.3 Transport Permits

The use of oversize vehicles in transportation of Wind Turbine Generator components and wind transmission line components will require the Contractor's appointed transportation company to apply for permits to the National Heavy Vehicle Regulator (NHVR). As part of obtaining the oversize permits, the proposed transport route will be assessed by NHVR and other referred assessors such as the Department of Transport and Main Roads.

4.4 Oversize Length Assessment

A desktop assessment was conducted to determine the viability of key intersections and road curves along the anticipated transport route. A swept path has been completed using AutoCAD Vehicle Tracking software to identify where temporary upgrades are required to intersections to enable the oversize vehicles to travel to site.

It's worth noting that there are two other wind farm projects just north of Ravenshoe which are likely to utilise a significant proportion of the route proposed in this report. At time of writing, the Kaban Green Power Hub (wind farm) is under construction and located approximately 8 km north-west of Ravenshoe; and the proposed High Road Wind Farm is located approximately 13 km north of Ravenshoe. The upgrades needed to accommodate these two projects will likely mean that some of the conflicts identified in this report are not present at the time of OSOM transportation for the Chalumbin Wind Farm.

As mentioned in section 4.2 the swept path assessment was carried out using a 90 m long blade transport, which is a slightly more conservative length of the current WTG model being considered for the wind farm.

Table 2 summarises the road intersections and curves that were reviewed as potential areas of concern along the transport route for the blade trailer vehicle, with drawings showing the manoeuvres and required upgrades in Appendix C.

Table 2: Review of Intersections and Road Curves along Oversize Transportation Route

No.	Location Description	Map Reference Coordinates	Loaded Vehicle Manoeuvre	Modifications Required
1	Laydown area road, Wharf St & Kenny St intersection	-16.928961, 145.778399	2x left turn	Yes
2	Kenny St & Draper St intersection	-16.932609, 145.773947	Left turn	Yes
3	Draper St & Comport St intersection	-16.935214, 145.775864	Right turn	Yes
4	Draper St & Cook St intersection	-16.937455, 145.777640	Right turn	Yes
5a	Cook St & Aumuller St roundabout intersection	-16.943290, 145.770404	Left turn	Yes
5b	Aumuller Street roundabout	-16.943290, 145.770404	Straight through	Yes
6a & 6b	Aumuller St & Tingira St intersection	-16.944722, 145.772526	Right turn	Yes
7a & 7b	Tingira St bend	-16.949110, 145.770356	Left turn	No
8	Aumuller St & Ray Jones Dr	-16.949110, 145.770356	Right turn	Yes
9	Bruce Highway & Palmerston Highway intersection	-16.941723, 145.767780	Left turn	Yes
10	Palmerston Highway bend (300 m from Bruce Highway intersection)	-17.514317, 145.993736	Right turn	Yes
11	Millaa Millaa – Malanda Road & East Evelyn Road intersection	-17.510827, 145.585535	Left turn	Yes
12	East Evelyn Road bend (1 km from Kennedy Highway)	-17.508146, 145.517596	Left turn	No
13	East Evelyn Road & Kennedy Highway intersection	-17.514086, 145.512097	Left turn	Yes
14	Kennedy Highway & Tully Falls Road intersection	-17.615999, 145.487155	Left turn	Yes
Primary Local Road Route	Tully Falls Road & Wooroora Road	Starting from: -17.615999, 145.487155	Assorted manoeuvres	Yes
Alternate Local Road Route	Herbert River Road, Mandalee Road & unnamed road	Starting from: -17.665955, 145.240555	Assorted manoeuvres	Yes

4.5 Overhead Obstruction Assessment

To check the vertical clearance along the transport route, a review has been carried out on each of the overpasses along the route to ensure adequate clearance is available. All overhead obstructions along the anticipated transport route have been identified, with heights given where available. None of the overpass heights along the route were signed, but they were physically measured during the site investigation and the results summarised in Table 3 below.

The E2G upgrade includes realignment of the Bruce Highway underneath Overpass 3 and the construction of Overpass 4 and 5, hence TMR were contacted to determine:

a) the vertical clearance of Overpass 3 after the upgrade is complete;
b) the vertical clearance of Overpass 4 after it is constructed; and
c) the vertical clearance of Overpass 5 after it is constructed

The heights provided by TMR are also provided in Table 3.

It is icubed consulting's experience that TMR tend to be conservative with their provided overpass height values, which is consistent with the height discrepancy seen between TMR's height and the measured height shown in Table 3. TMR also stated that the existing height of Overpass 3 (pre-upgrade) was to be maintained, implying it is likely the measured height of 6 m will be kept after the upgrade. The height of Overpass 3, 4 and 5 should be confirmed after the upgrade and before the OSOM vehicles travel the route.

Table 3: Review of Overhead Obstructions Along Transport Route

Location No.	Location Description	Map Reference Coordinates	TMR Provided Height (m)	Measured Height (m)
1	Caleb Shang Bridge	-16.967704, 145.746651	-	7.79
2	Murgatroyd Road	-16.977082, 145.743903	-	6.90
3 *	Cane train bridge, near Maitland Road	-17.060718, 145.769687	5.50	6.00
4 **	Menmuny Overpass (Pine-Creek Yarrabah Road)	-17.063817, 145.770342	6.50	-
5 **	Gabay Gubudala Pedestrian Overpass	-17.091666, 145.773899	6.80	-

* Bruce Highway road-alignment under overpass is due to be altered. Height should be confirmed after the upgrade is complete.
** Overpass currently under construction. Height should be confirmed after the upgrade is complete.

As stated in Section 4.2, the assumed WTG tower section diameter used for this assessment is 5.5 m. Taking into account the additional height from the vehicle to transport the tower, it is possible the total height of the vehicle carrying the tower will exceed the allowable vertical clearance of Overpass 3. It is noted however that 'bookend' transports are a common transport method for WTG towers as they allow for the lowest possible load height. With a bookend trailer, it is expected the total transport height could be in the approximate vicinity of 5.75 – 6.1 m. The appropriateness of this would need to be assessed when a turbine has been selected by the proponent and further logistical information is at hand.

A potential detour to Overpass 3 has been discussed in Section 4.5.1 below.

4.5.1 Overhead Obstruction Detour Analysis

If Overpass 3 (described in Section 4.5) needs to be avoided, a potential detour is suggested by utilising Maitland Rd just north-west of Overpass 3. The OSOM vehicles would turn off this road onto the newly constructed Pine Creek Yarrabah Road and then onto Jones Road which runs parallel to the Bruce Highway. With the relevant traffic management controls in affect, the OSOM vehicles may utilise a gravel connection between these two roads (as shown in the Nearmap aerial image from September 2022 in Figure 8 below) to re-join the Bruce Highway contraflow until the intersection with Draper Road. It is unknown whether the current gravel connection is a temporary or permanent feature. If it is the former, it can be reinstated.

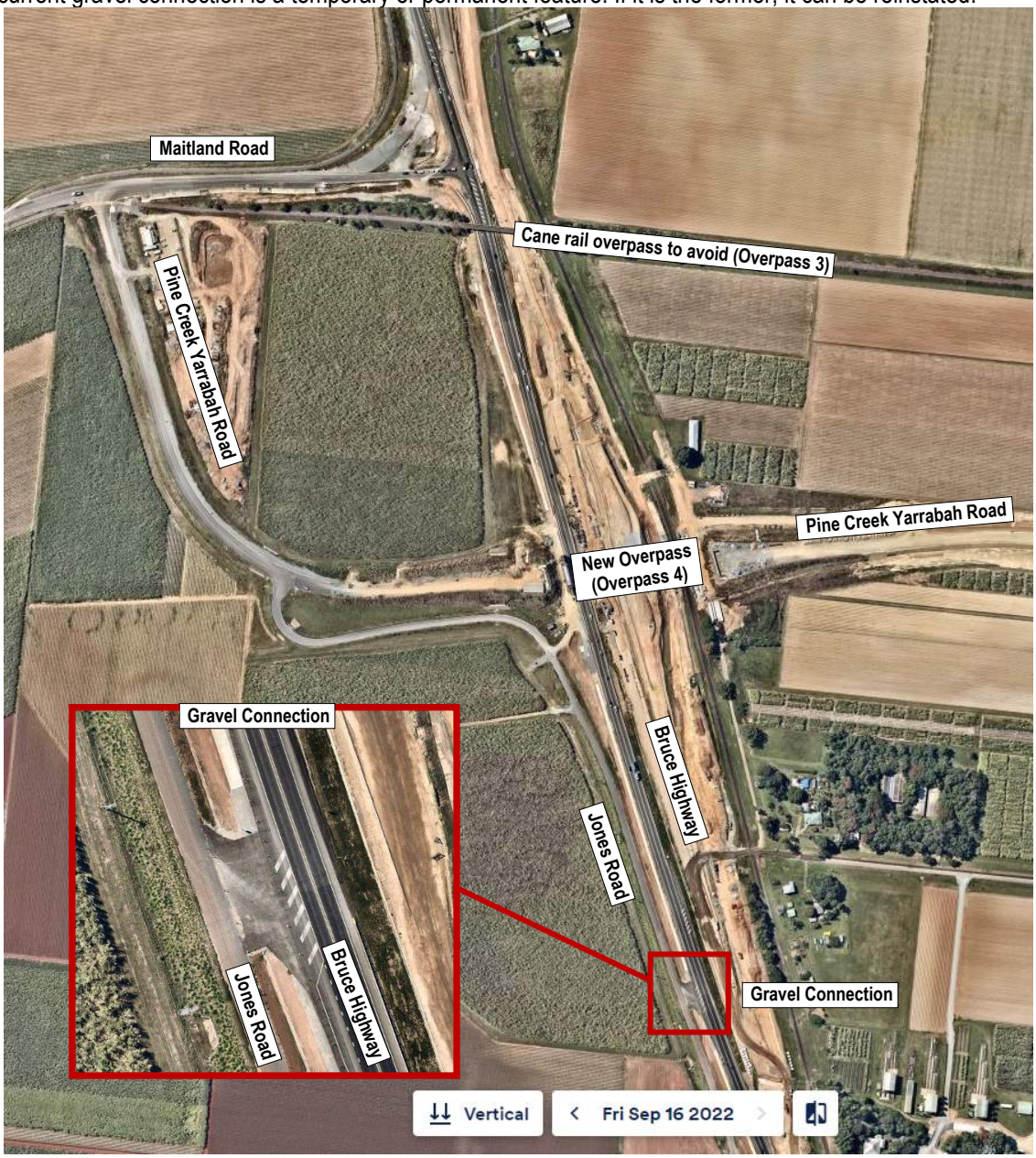


Figure 8 – Vertical clearance detour. New roads as shown from Nearmap Imagery (16 September 2022)

When the upgrade works to the Bruce Highway have been completed the access Maitland Road will need to be reassessed. There appears to be two viable options.

The first option – similar to the gravel connection shown in Figure 8 – is to install a gravel connection between the two under-construction Bruce Highway carriageways allowing the southbound OSOM vehicles to cut across the northbound lane (with traffic controls) onto Maitland Rd. See Figure 9 below.

The second option is to utilise the under-construction service road for the upgraded Bruce Highway, which is being formed from sections of the old Bruce Highway and a new connection directly to Maitland Rd. This new connection is shown in Figure 9 and Figure 10 below. Access onto the new service road and any required upgrade / modification works (if any) will need to be assessed after construction.

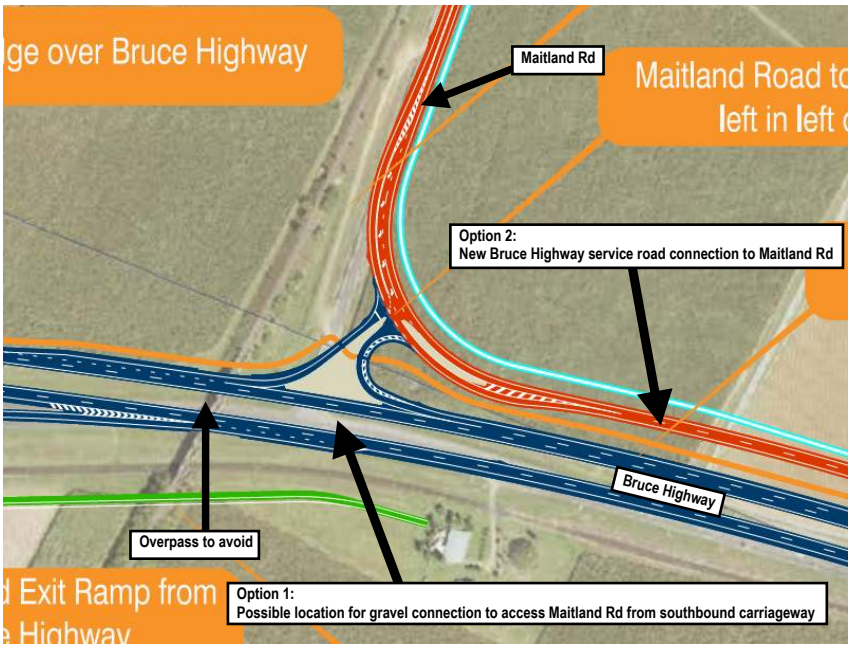


Figure 9 – Under-construction Bruce Highway / Maitland Rd upgrade works

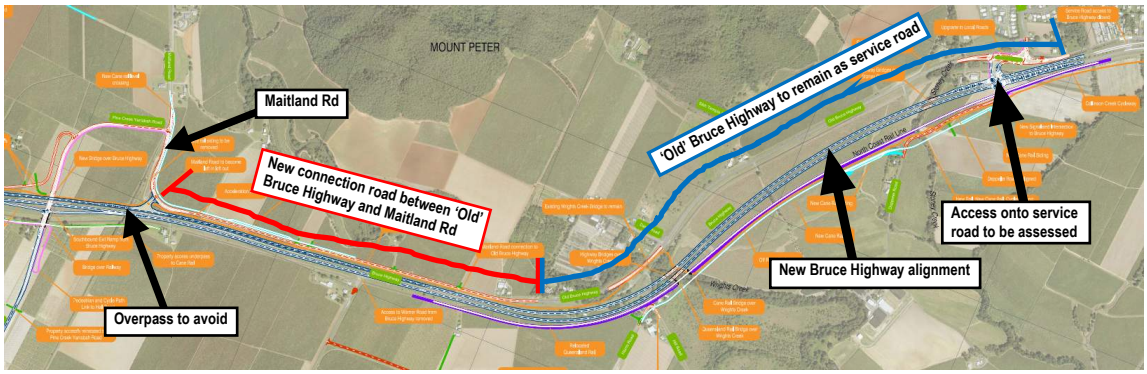


Figure 10 – Under-construction Bruce Highway service road connection to Maitland Road

4.6 Local Roadway Assessment

Two local access routes were assessed for the Project. The 'primary' route is discussed in Section 4.6.1 and the 'alternate' route is discussed in Section 4.6.2

4.6.1 Primary Local Access Route (Tully Falls Road and Wooroora Road)

Tully Falls Road (0.6 km) and Wooroora Road (19.3 km) are both contained wholly within the jurisdiction of Tablelands Regional Council. The arrows shown in Figure 3 indicate the direction that chainage (CH) was assigned for the report and supplementary drawings. Supplementary drawings can be found in Appendix C. The drawings utilise AutoCAD's Vehicle Tracking software, to draw swept paths of the OSOM vehicles over road alignments. In conjunction with AutoCAD's in-built aerial imagery the swept paths can be used to assess the existing horizontal road alignment for areas where upgrades / modifications may be required.

A site visit was undertaken by icubed personnel on 16 February 2021 where videos and photos were taken of this route. Findings from this visit as well as photo images are used to help identify and inform constraints

and areas where further study may be required. Confirmation of road grading is outside the scope of this report and will require assessment at a future stage.

The issues identified with in the section are based on the existing road, it is however recommended that the roadway be reconstructed within the road reserve to current design standards and as such mitigate the issues.

4.6.1.1 Existing Road Environment – Primary Local Access Route

This section will describe the existing road conditions of the local roads Tully Falls Road and Wooroora Road. It is best read in conjunction with drawing CHLWF-TRS-WOOR 1 (in Appendix C) which shows the location of the different 'Sections' described in this section of the report.
Section 1: Tully Falls Road is generally in good condition, with little to no upgrade works being required. A structural assessment will likely be required to confirm South Cedar Creek Bridge can sustain the loads imposed by OSOM vehicles and construction traffic. Minor intersection works will be required at both the Kennedy Highway / Tully Falls Road Intersection and Tully Falls Road / Wooroora Road intersection. Upgrades are likely to involve temporary relocation of services, temporary removal of traffic islands, vegetation removal and minor pavement widening, if any widening is needed at all.

Section 2: Wooroora Road will require little to no work in this section along the straights. At bends there will be some localised requirement for vegetation removal and pavement widening, and encroachment into private properties will need to be confirmed. Existing causeways will need to be confirmed for vertical clearance.

Section 3: This section of Wooroora Road is constrained horizontally and vertically, there will need to be pavement widening and vegetation removal to facilitate OSOM delivery. Vertically, the causeway of Stoney Creek will likely require removal and reinstatement. Due to the proximity of upstream houses (approximately 120 m), the upgrade will need to ensure that water level increases in flooding events are minimised.

Section 4: Limited upgrades are anticipated in this section, there may be localised widening and vegetation removal and some tighter bends. Several vertical curves will require confirmation of adequacy.

Section 5: The horizontal geometry of the approach into Vine Creek Bridge is tight (an approximate R30 curve). Vine Creek Bridge itself is narrow; approximately 4.0 m wide. The modelled OSOM vehicle manoeuvres suggest that a bridge replacement is likely to be required. There is an opportunity to improve the approach geometry to avoid bridge removal; however, this is expected to require considerable encroachment into adjoining private properties. Further studies would be required to confirm if it is feasible to maintain the bridge.

Section 6: Horizontally this section of road is straight with large radius bends, the width of road should be able to facilitate OSOM delivery. There are several vertical curves which require checks to confirm adequacy. Break-O-Day Creek causeway will likely require removal and reinstatement due to the tightness of the vertical sag.

Section 7: It is likely that the entire section of road will have to be upgraded to facilitate OSOM delivery. It is expected all causeways will require removal and reinstatement.

Section 8: The entirety of this road section will require a rebuild. Oaky Creek Causeway will need to be investigated further as this has a large upstream catchment and will require removal and reinstatement.

Unsealed sections of Wooroora Road will require more significant upgrades to facilitate OSOM delivery. The unsealed section of road has reduced road standards; tighter horizontal bends, tighter vertical curves

(particularly at causeways), reduced road widths, reduced clearance zones (vegetation is closer to the roadside). There will be more upgrades required here as a result of the currently lower road standard.

4.6.1.2 Waterway Crossings – Primary Access Route

The waterway crossings on the existing roadway consist of a mix of bridges, culverts and causeway of various standards and have been itemised in Table 4. Should the existing roadway be utilised to access the site each of the crossings will need to be assessed from a vertical curve and mass limit perspective.

Table 4: External Route Major Waterway Crossing Summary

Road	Chainage	Structure	Stream Name
Tully Falls Road	0.30 km	Bridge	South Cedar Creek
Wooroora Road	1.05 km	Culvert	Unnamed tributary – Spanswick Creek
Wooroora Road	3.00 km	Causeway	Spanswick Creek
Wooroora Road	5.40 km	Causeway	Stoney Batter Creek
Wooroora Road	5.60 km	Causeway	Unnamed tributary – Stoney Batter Creek
Wooroora Road	7.25 km	Culvert	Unnamed tributary – The Millstream
Wooroora Road	9.90 km	Bridge	Vine Creek
Wooroora Road	11.00 km	Causeway	Break-O-Day Creek
Wooroora Road	12.40 km	Causeway	Unnamed tributary – Oaky Creek
Wooroora Road	13.40 km	Causeway	Unnamed tributary – Oaky Creek
Wooroora Road	13.60 km	Causeway	Unnamed tributary – Oaky Creek
Wooroora Road	14.70 km	Causeway	Unnamed tributary – Oaky Creek
Wooroora Road	14.90 km	Causeway (no concrete)	Unnamed tributary – Oaky Creek
Wooroora Road	15.80 km	Causeway	Unnamed tributary – Oaky Creek
Wooroora Road	16.75 km	Causeway	Oaky Creek
Wooroora Road	18.20 km	Unknown	Unnamed tributary – Oaky Creek
Wooroora Road	18.80 km	Unknown	Unnamed tributary – Blunder Creek

4.6.1.3 Overhead Lines – Primary Access Route

There are several overhead lines within the local roadway section which will need to be assessed in consultation with the power authority to ascertain whether they can be propped during the transportation of the vehicles. Table 5, shows the locations where overhead lines are present along the roadway. Figure 11 shows an overhead line crossing the road.

Table 5: Overhead lines

Road	Chainage (km) [1]
Tully Falls Road	0.0 – 0.6
Wooroora Road	0.0 – 0.3
Wooroora Road	1.9
Wooroora Road	2.8
Wooroora Road	3.6
Wooroora Road	4.4 – 4.9
Wooroora Road	5.6
Wooroora Road	7.2 – 10.4
Wooroora Road	11.1 – 11.6
Wooroora Road	11.9

1. *Where a chainage range is given e.g., 7.2 – 10.4 there are multiple overhead line crossings, these areas are typically rural residential zones.*

Figure 11 – Wooroora Road Overhead Lines

4.6.1.4 Roadside Vegetation – Primary Access Route

Roadside vegetation is present for most of the local roadway section, along straights where OSOM vehicles remain within the road pavement there is little to no impact on vegetation. Around curves vegetation presents a larger the blade trailer requires larger clearances and is more likely to impact vegetation, in these locations clearing may be required.

Figure 12 – Typical Wooroora Road roadside vegetation

4.6.1.5 Cattle Grids – Primary Access Route

Cattle grids are existing road features that prevent stock from leaving the property they are on via the road, as shown in Figure 13. Cattle grids will require a structural assessment to ensure they can carry OSOM and heavy vehicular loads. Refer to Table 6 for cattle grid locations.

Figure 13 – Typical Wooroora Road Cattle Grid

Table 6: Cattle Grid Locations

Road	Chainage
Wooroora Road	12.2
Wooroora Road	17.7

4.6.1.6 Road Reserve Boundaries – Primary Access Route

As noted above the local roadway section has not been constructed within the road reserve for much of its length, additionally there are areas where although the roadway is within the road reserve the OSOM swept path will encroach on private property. Each of these issues is discussed separately in the following sections.

1. The existing road sits outside the designated road reserve boundary.
2. OSOM swept manoeuvres encroach into private property.

Existing road reserve and property boundaries are taken from high level spatial information. Historically this information has a high degree of variability and accuracy can vary widely. Outputs of this report are based on provided input data. At the time of detailed design, a cadastral survey may be required to confirm accuracy of boundaries.

4.6.1.7 Existing Road Outside Road Reserve Boundaries – Primary Access Route

On lower order rural roads it is not uncommon for the road to be built partially or fully outside the designated road reserve. When undertaking upgrade road works the overseeing authority may require the proponent to reinstate correct road reserve boundaries.

Table 7 shows the chainages along Wooroora Road where the existing carriageway is outside the current road reserve boundaries. The extent is nominated as either being partially or fully outside the road reserve, information is based off aerial mapping and does not account for table drains or batters extending outside of the road reserve.

Table 7: Road Reserve Boundary Deviations

Chainage (km)	Extent
2.50 – 2.70	Partial
4.95 – 5.00	Partial
12.40 – 12.50	Partial
12.80 – 12.85	Partial
13.40 – 13.60	Partial
13.95 – 14.30	Full
14.75 – 14.95	Full
15.05 – 15.70	Full
15.80 – 16.40	Full
16.65 – 16.95	Full
17.45 – 18.95	Full

It is recommended that the proponent engages with Tablelands Regional Council to discuss the likely implications of the existing carriageway deviating from the road reserve boundaries, in the context of future upgrade works for Wooroora Road associated with the Project.

4.6.1.8 Swept Path OSOM Encroachment – Primary Access Route

In constrained locations, particularly, tight horizontal curves OSOM vehicles may encroach into private property. In these situations, landowner permission would need to be sought to confirm that encroachment into private property is acceptable, if permission is not granted road realignment would likely be required to facilitate OSOM delivery. Table 8, shows lots where encroachment into private properties occurs on Wooroora Road based off swept path manoeuvres.

Table 8: OSOM swept path lot encroachment.

Chainage (km)	Affected Lots
2.75 – 2.80 [1]	71 SP 202131, 6 SP 106013
4.90 – 5.00	6 RP 748424
5.10 – 5.50 [1]	6 RP 748424, 7 RP 743381, 8 RP 743381
9.80 – 9.85	437 RP 889658

1 – Multiple encroachments incur in this location.

4.6.2 Alternate Local Access Route (Herbert River Road and Mandalee Road)

Herbert River Road (8.9 km) and Mandalee Road (19.3 km) are both contained within the jurisdiction of the Tablelands Regional Council. Additionally, this local route uses an unnamed road towards Glen Gordon Station to access the project site. Supplementary drawings of this route can be found in Appendix C. The drawings utilise AutoCAD's Vehicle Tracking software, to draw swept paths of the OSOM Blade vehicle over road alignments. In conjunction with AutoCAD's in-built aerial imagery the swept paths can be used to assess the existing horizontal road alignment for areas where upgrades / modifications may be required.

A site visit was undertaken by icubed personnel on 12 September 2022 where videos and photos were taken. Findings from this visit, as well as photo images are used to help identify and inform constraints and areas where further study may be required. Confirmation of road grading is outside the scope of this report and will require assessment at a future stage.

4.6.2.1 Existing Road Environment – Alternate Local Access Route

This section will describe the existing road conditions of the local roads, Herbert River Road and Mandalee Road and the unnamed road towards Glen Gordon Station. The site inspection could only extend 3km past the unnamed road towards Glen Gordon Station due to a locked gate, so observations past this point are made solely based on aerial imagery.

Table 9: General road description along Alternate access route

Section Number	Chainage (km)	Road Name	Description
1	0 – 1.2	Herbert River Rd	6m seal width, 0.0 - 0.5m gravel shoulder
2	1.2 – 5.2	Herbert River Rd	3.5m seal width, 1m gravel shoulders
3	5.2 – 6.2	Herbert River Rd	5m seal width
4	6.2 – 7.3	Herbert River Rd	3.5m seal width, 1.4m shoulders
5	7.3 – 8.9	Herbert River Rd	5m seal width
6	8.9 – 9.7	Mandalee Rd	5m unsealed
7	9.7 – 9.9	Mandalee Rd	5m seal width
8	9.9 – 10.05	Mandalee Rd	Herbert River Bridge, 4.1 - 4.3m trafficable width
9	10.05 – 10.1	Mandalee Rd	5m seal width
10	10.1 – 20.7	unnamed road	Unsealed 5.2 – 5.7m wide
11	20.7 – 23.7	unnamed road	Unsealed 4.6m wide

The Herbert River bridge is currently not wide enough to support the OSOM fleet. At a minimum, the bridge will need to be widened. A structural assessment will need to be carried out to confirm that the structural integrity of the existing bridge is adequate for the loads imposed by the OSOM vehicles.

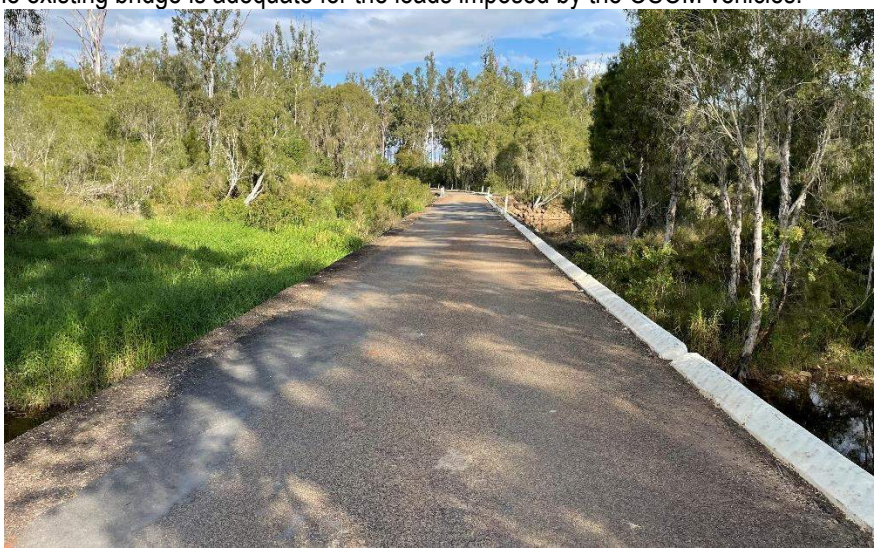


Figure 14 – Herbert River Bridge (12th September 2022, looking south)

The desktop assessment has also identified that many sections of the existing road alignment deviate outside of the cadastral boundaries (taken from Queensland Globe online portal) which is typical for rural roads. Additionally, there is a 5km section of Mandalee Rd that doesn't have a road parcel. It is unclear whether this section of road is Council owned or perhaps privately owned. These areas have been identified in the drawings in Appendix C.

Generally, the roads are in good condition and (besides the Herbert River bridge) are not expected to require significant upgrades or modifications to be suitable for the OSOM access. The road corridors were wide for a rural road and even the more densely vegetated areas have a reasonably wide cleared width either side of the road (example below in Figure 15). This however becomes less true further along the unnamed road where more areas requiring vegetation clearing were identified. The swept path assessment didn't identify any locations where the blade vehicle needed to encroach out of the road corridor and into private land – however this would need to be confirmed with detailed survey and/or after the cadastral boundaries are reinstated.

Figure 15 – Herbert River Rd bend through dense vegetation

The Kennedy Highway / Herbert River Rd intersection and the Herbert River Rd / Mandalee Rd intersections were identified as requiring some minor gravel widening works. Additionally, the Kennedy Highway swept path analysis identified at least 2 power poles within the blade vehicle's swept path.

The road horizontal geometry and alignment is generally already suitable for the OSOM vehicles with only some isolated areas identified as requiring gravel widening. However, the aerial imagery suggests that there were some unsuitable horizontal bends along the unnamed road towards Glen Gordon Station, however these could not be accessed during the site visit.

Only one unsuitable vertical curve was identified along the route, located along the unnamed road (see Figure 16). More unsuitable vertical curves are expected along the unnamed road past the locked gate.

Figure 16 – Unsuitable vertical bend along unnamed road, approximately 2.5km from Mandalee Rd

Overhead lines, culverts and cattle grids were also identified along the route, but these were infrequent features and are not expected to be a hindrance.

4.7 Mass Limit Assessment

The Transport Route from the Port of Cairns to the Cairns laydown area and to the development site was assessed using the National Heavy Vehicle Regulator's (NHVR) Portal. From this assessment it was determined that the roads assessed within the Swept Path analysis were generally approved Higher Mass Limit roads. The mass limit assessment on these roads is listed in Table 10. None of the roads in the detour route (TR4) are HML approved.

Table 10: NHVR HML Approved Roads

Relevant Transport Route	Road Section	HML Approved Route
1, 2	Wharf Street	No
1, 2	Kenny Street	Partially – first 150 m from Wharf Street isn't approved
1	Draper Street	Yes
2	Draper Street	Partially – Draper Street east of intersection with Comport Street is not HML approved
2	Cook Street	No
2	Aumuller Street and roundabout	No
3	Aumuller Street and roundabout	Partially – Aumuller west of roundabout is approved, Aumuller east of roundabout is not approved, and the roundabout itself is not approved.
2, 3	Tingira Street	No
1	Comport Street	Yes
1	Ray Jones Drive	Yes
1	Bruce Highway	Yes
1	Palmerston Highway	Partially – only first 6 km from Bruce Highway is approved
1	Kennedy Highway	No
1	Tully Falls Road	No
1	Wooroora Road	No
Alternate (A)	Herbert River Road	No
Alternate (A)	Mandalee Road	No
Alternate (A)	Unnamed road towards GG Station	No

There are a number of roads along the routes that either have conditions imposed on the heavy vehicle usage or are not currently approved as a higher mass limit route. Upon confirmation of the final vehicle configurations, an assessment will be needed to determine whether the heavy vehicles transporting turbine components are within the requirements for the heavy vehicle road conditions or are suitable to be on the approved heavy vehicle registry. If required, an application can be arranged to have the relevant roads placed on the register. Table 11 summarises the mass limits used in the NHVR assessment.

Table 11: Heavy Vehicle Mass Limits (NHVR, 2014)

Type of Axle Group	Maximum mass (tonnes) permitted under GML [1]	Maximum mass (tonnes) permitted under HML
Tandem axle group	16.5t	17.0t
Tri-axle group	20.0t	22.5t
Single drive axles on buses	9.0t	10.0t
Six tyred tandem axle groups	13.0t	14.0t

1 – General Mass Limits (GML)

5 Road and Intersection Upgrades

From review of the oversize Transportation Route (refer to Table 2 above), the following upgrade works or temporary works listed in Table 12 were identified as being required to enable oversize vehicles to negotiate the roads. Refer to Appendix C, which shows the associated swept path drawings.

The required modifications will need to be confirmed prior to transportation to ensure that no further amendments to the intersections are needed.

Table 12: Review of Intersections and Road Curves along Oversize Transportation Routes

No.	Location Description	Modifications Required
1	Laydown area road, Wharf St & Kenny St intersection	• Temporary lane closure • Vegetation and obstruction clearing • 5x signs to temporarily remove • 1x light pole to remove
2	Kenny St & Draper St intersection	• 5x traffic lights to remove • Temporary lane closure
3	Draper St & Comport St intersection	• Temporary lane closure • 1x traffic light to remove • 2x light poles to remove
4	Draper St & Cook St intersection	• Temporary lane closure • 2x light poles to remove
5a	Cook St & Aumuller St roundabout intersection	• 4x signs to temporarily remove • Temporary lane closure • 1x light pole to remove • 1x power pole to remove • Minor vegetation clearing
5b	Aumuller Street roundabout	• Temporary lane closure • 2x sign to remove
6a & 6b	Aumuller St & Tingira St intersection	• Temporary lane closure • 4x signs to be removed • 1x light pole to be removed • Vegetation clearing
7a & 7b	Tingira St bend	• Temporary lane closure
8	Aumuller St & Ray Jones Dr	• Temporary lane closure • 1x traffic light to be removed
9	Bruce Highway & Palmerston Highway intersection	• Temporary lane closure • 3x light poles to be temporarily removed • 2x signs to be temporarily removed
10	Palmerston Highway bend (300 m from Bruce Highway intersection)	• Pavement widening • 1x power poles to remove
11	Millaa Millaa – Malanda Road & East Evelyn Road intersection	• Temporary lane closure • 4x light poles to temporarily remove • 1x sign to temporarily remove • 1x power pole to remove • Possible vegetation clearing
12	East Evelyn Road bend (1 km from Kennedy Highway)	• Vegetation clearing • Unlikely pavement widening (TBC with survey)

No.	Location Description	Modifications Required
13	East Evelyn Road & Kennedy Highway intersection	• Temporary lane closure • 9x sign to temporarily remove • Pavement widening
14	Kennedy Highway & Tully Falls Road intersection	• Temporary lane closure • 5x light poles to remove • 2x signs to remove
Primary Local Route Roads	Wooroora Rd & Tully Falls Road	• Multiple instances of vegetation clearing • Road to be realigned into road corridor • Localised pavement widening • Likely re-sheet of pavement required over unsealed sections of Wooroora Road
Alternate Local Route Roads	Kennedy Highway & Herbert River Rd intersection	• Pavement widening • 1-2 signs to temporarily remove • 2 power poles to temporarily remove / relocate • Possible culvert extension
Alternate Local Route Roads	Herbert River Road, Mandalee Road and unnamed road towards Glen Gordon Station	• Multiple instances of vegetation clearing • Road possibly to be realigned into road corridor • Localised pavement widening • Possible re-sheet of pavement required over unsealed sections of route

5.1 Traffic Control Measures

Traffic Control Measures will be implemented to enable road upgrade works to commence. These measures will be determined at a later date by the appointed Civil Contractors Traffic Management subcontractor.

6 Conclusion and Recommendations

This report presents an assessment of proposed OSOM transport routes from the Port of Cairns to the Chalumbin Wind Farm site located some 20 km south of Ravenshoe, QLD. The Project execution is expected to be over approximately 2.5 years, starting from approximately 2023. This report also incorporated TMR's planned Bruce Highway upgrades (known as E2G) between the towns of Edmonton and Gordonvale, due to be completed mid-2023.

The transport routes presented include a route direct from the Port of Cairns to the Project site and also routes aiming to utilise a laydown area in proximity to the port before heading to the Project site. This report has shown 17 locations along the approximate 185 km transportation route from the Port of Cairns to the site that have potential to be unsuitable in their existing arrangement for the OSOM vehicles to traverse and/or result in clashes between a 90 m long blade trailer vehicle and existing infrastructure. The 17 identified locations were assessed using AutoCAD's Vehicle Tracking software and it was found that 15 required some level of upgrade or minor temporary works. The anticipated upgrades are listed in Table 12, and typically involve minor works such as temporary removal/upgrade of road furniture (such as signs, barriers and poles, etc), trimming/temporary removal of vegetation or gravel pavement widening. By carrying out these road upgrades, the oversize WTG blade transportation vehicles are expected to negotiate the transportation route successfully. The oversize blade and trailer configuration used in this assessment was 90 m in length, which is more conservative than the current proposed 85m blade length for the Project.

Through a desktop analysis and physical overpass measurements along the transport route, it was also determined that the tallest vehicle able to easily travel to site will likely have a maximum height of 6.0 m. This height will need to be confirmed after the completion of the relevant works in TMR's unfolding E2G Bruce Highway upgrade, which includes a road realignment under the overpass governing maximum vehicle height (the cane rail bridge next to Maitland Road, Overpass 3 in this report). E2G works also include two new overpasses along the transport route but these are not expected to govern maximum vehicle height. A vertical clearance detour was also identified and assessed for WTG tower section vehicles that may exceed the assumed 6.0 m allowable height clearance, which is discussed in detail in Section 4.5.1. The identified detour should be reassessed following the completion of the E2G upgrades. The E2G upgrades are expected to be completed prior to this Project's OSOM deliveries.

Confirmation of substandard vertical curvature and boundary encroachments will need to be confirmed through survey.

Note that signboards and power lines clearances have not been assessed in this report, however many overhead lines have been identified along the route.

The transport routes assessed on the NHVR's portal shows that the route is mostly an approved Higher Mass Limit (HML) path, with some roads needing to be added to the register with an application, if required.

It is noted that some further actions will be needed to allow vehicles to utilise the designated transportation route. These actions include:

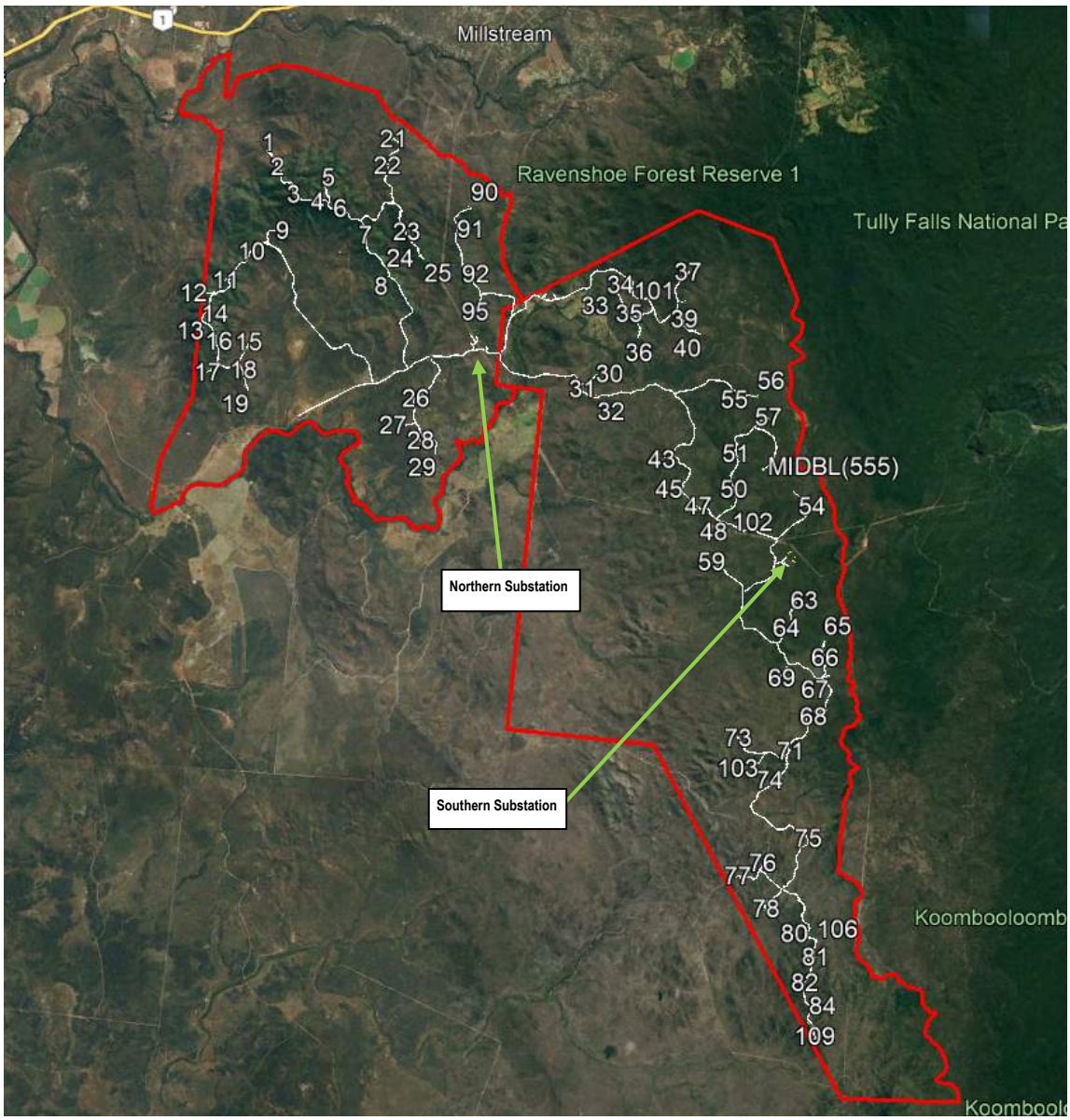
- Prior to delivery to site, the transport contractor will need to conduct a survey of vertical height clearances at confined locations such as bridges, overhead electrical or telecommunication wires or infrastructure or other infrastructure and adequate clearances be checked to be suitable.
- National Heavy Vehicle Regulator permits shall be applied for and obtained by the appointed transportation contractor prior to deliveries to site.
- The load capacities of sections identified along the transportation route (such as but not limited to culverts, bridges, unsealed or sealed pavements in poor condition) shall be checked and approved for use by the relevant authority.
- It is recommended that the proponent engages with Tablelands Regional Council to discuss the likely implications of the existing carriageway deviating from the road reserve boundaries in the context of future upgrade works for the local access roads associated with the Project, and the absence of a road corridor along a section of Mandalee Road.
- An assessment on the plausibility of the Herbert River bridge to accommodate the OSOM vehicles and any upgrade works associated with the bridge.

Note that the assessment has been carried out based on typical vehicle and blade dimensions. Actual vehicle and blade characteristics may differ.

Based on the preliminary assessment undertaken it is considered that a feasible transport route from the Port of Cairns to the Project site is available, subject to resolving the potential conflicts with the relevant stakeholders, and conducting the identified works and implementing appropriate mitigation measures where required.

In light of the above, the Project achieves compliance with Performance Outcome 6 of State Code 23: Wind farm development, to the extent that it relates to identification and assessment of a feasible transport route to the Project site.

Appendix A – Preliminary Wind Farm Layout



Appendix B – Overhead Obstruction Locations

Table B1 – Overhead lines observed from Cairns to Palmerston Highway / Bruce Highway intersection

No.	OHL Coordinate	No.	OHL Coordinate	No.	OHL Coordinate
1	-16.94256, 145.76899	46	-17.06259, 145.79569	91	-17.44506, 145.95335
2	-16.94318, 145.76988	47	-17.05997, 145.79543	92	-17.44497, 145.95301
3	-16.94345, 145.77045	48	-17.05811, 145.79524	93	-17.43934, 145.94125
4	-16.94325, 145.77062	49	-17.05537, 145.79497	94	-17.43546, 145.93904
5	-16.94308, 145.7707	50	-17.0546, 145.79489	95	-17.43262, 145.93012
6	-16.94259, 145.77117	51	-17.05351, 145.79479	96	-17.43161, 145.92421
7	-16.94221, 145.77154	52	-17.05351, 145.79479	97	-17.42797, 145.91992
8	-16.94203, 145.77174	53	-17.05217, 145.79465	98	-17.42549, 145.91354
9	-16.94187, 145.77193	54	-17.0514, 145.79458	99	-17.41706, 145.90889
10	-16.94442, 145.77267	55	-17.05152, 145.79428	100	-17.41552, 145.90905
11	-16.93984, 145.77476	56	-17.05194, 145.79344	101	-17.41475, 145.90913
12	-16.9354, 145.77615	57	-17.05237, 145.78258	102	-17.41321, 145.9093
13	-16.9353, 145.7761	58	-17.05184, 145.77714	103	-17.40977, 145.90966
14	-16.9342, 145.77523	59	-17.05138, 145.7724	104	-17.40821, 145.90983
15	-16.93378, 145.77487	60	-17.05112, 145.76968	105	-17.40543, 145.90992
16	-16.93156, 145.77514	61	-17.05101, 145.76882	106	-17.40242, 145.90911
17	-16.93127, 145.77551	62	-17.05073, 145.76846	107	-17.40175, 145.90905
18	-16.93107, 145.77577	63	-17.04054, 145.76415	108	-17.40127, 145.90902
19	-16.93091, 145.77597	64	-17.04001, 145.76419	109	-17.40052, 145.90906
20	-16.93074, 145.77618	65	-17.03412, 145.76921	110	-17.40038, 145.90908
21	-16.9304, 145.77663	66	-17.0323, 145.77068	111	-17.39983, 145.90914
22	-16.93012, 145.77698	67	-17.02347, 145.77086	112	-17.39955, 145.90917
23	-16.92994, 145.77723	68	-17.02065, 145.76974	113	-17.39901, 145.90922
24	-17.08644, 145.78033	69	-17.01664, 145.76991	114	-17.39874, 145.90925
25	-17.08756, 145.78352	70	-17.01557, 145.76007	115	-17.39846, 145.90928
26	-17.08827, 145.78568	71	-17.01529, 145.75621	116	-17.39791, 145.90934
27	-17.08831, 145.78582	72	-17.0152, 145.75508	117	-17.39777, 145.90935
28	-17.0884, 145.78677	73	-17.01745, 145.75213	118	-17.3972, 145.90941
29	-17.08811, 145.7868	74	-17.01778, 145.75173	119	-17.39501, 145.90965
30	-17.08713, 145.78664	75	-17.01897, 145.74959	120	-17.38527, 145.91073
31	-17.08651, 145.78641	76	-17.0189, 145.74891	121	-17.38073, 145.9115
32	-17.08622, 145.78629	77	-17.01879, 145.74776	122	-17.3729, 145.91288
33	-17.08518, 145.78605	78	-17.01876, 145.74745	123	-17.36754, 145.91466
34	-17.08352, 145.78602	79	-17.01865, 145.74634	124	-17.34525, 145.9248
35	-17.08248, 145.78673	80	-17.51219, 145.99243	125	-17.3362, 145.92759
36	-17.08228, 145.78689	81	-17.51063, 145.99229	126	-17.33316, 145.92788
37	-17.0804, 145.78832	82	-17.50364, 145.99299	127	-17.3262, 145.92871
38	-17.0761, 145.79171	83	-17.50304, 145.99305	128	-17.32557, 145.92869
39	-17.07415, 145.79298	84	-17.48086, 145.99	129	-17.32128, 145.92799
40	-17.07141, 145.79382	85	-17.48057, 145.98969	130	-17.31779, 145.9277
41	-17.07069, 145.79432	86	-17.47662, 145.97865	131	-17.31431, 145.92634
42	-17.06847, 145.79597	87	-17.47199, 145.96809	132	-17.3102, 145.92543
43	-17.06669, 145.79684	88	-17.45753, 145.9621	133	-17.30939, 145.92564
44	-17.0664, 145.79683	89	-17.45571, 145.96154	134	-17.30866, 145.92595
45	-17.06542, 145.79643	90	-17.4459, 145.95564	135	-17.30715, 145.92683

136	-17.29948, 145.92799	**185**	-17.16351, 145.87708	**194**	-17.15364, 145.86249
137	-17.29925, 145.92801	**186**	-17.16278, 145.87631	**195**	-17.15208, 145.85977
138	-17.29758, 145.92816	**187**	-17.16112, 145.87431	**196**	-17.14951, 145.85608
139	-17.29712, 145.92818	**188**	-17.16042, 145.87346	**197**	-17.14785, 145.85369
140	-17.29667, 145.92819	**189**	-17.1588, 145.87149	**198**	-17.14694, 145.85237
141	-17.29473, 145.92783	**190**	-17.1575, 145.86952	**199**	-17.1464, 145.85159
142	-17.28696, 145.92257	**191**	-17.15659, 145.86689	**200**	-17.12669, 145.82272
143	-17.28511, 145.92166	**192**	-17.15454, 145.86361	**201**	-17.11661, 145.8136
144	-17.28405, 145.92137	**193**	-17.15422, 145.86325	**202**	-17.11478, 145.81227
145	-17.2795, 145.92144	**194**	-17.15364, 145.86249	**203**	-17.1056, 145.79866
146	-17.27862, 145.92152	**195**	-17.15208, 145.85977	**204**	-17.10353, 145.79557
147	-17.27564, 145.92117	**196**	-17.14951, 145.85608	**205**	-17.09935, 145.77985
148	-17.27357, 145.92039	**197**	-17.14785, 145.85369	**206**	-17.08088, 145.77539
149	-17.27261, 145.92015	**198**	-17.14694, 145.85237	**207**	-17.08008, 145.77542
150	-17.27214, 145.92007	**199**	-17.1464, 145.85159	**208**	-17.07664, 145.77558
151	-17.27165, 145.91999	**200**	-17.12669, 145.82272	**209**	-17.07596, 145.77558
152	-17.27093, 145.91987	**201**	-17.11661, 145.8136	**210**	-17.06947, 145.77255
153	-17.25189, 145.92304	**202**	-17.11478, 145.81227	**211**	-17.0663, 145.77166
154	-17.25092, 145.92311	**203**	-17.1056, 145.79866	**212**	-17.0646, 145.77123
155	-17.24293, 145.9229	**204**	-17.10353, 145.79557	**213**	-17.06367, 145.77096
156	-17.24002, 145.92301	**205**	-17.09935, 145.77985	**214**	-17.06277, 145.7706
157	-17.2369, 145.92245	**206**	-17.08088, 145.77539	**215**	-17.05885, 145.76934
158	-17.23307, 145.92153	**207**	-17.08008, 145.77542	**216**	-17.05065, 145.76839
159	-17.2244, 145.91713	**208**	-17.07664, 145.77558	**217**	-17.04689, 145.76791
160	-17.22236, 145.9158	**209**	-17.07596, 145.77558	**218**	-17.04229, 145.76587
161	-17.22225, 145.91572	**210**	-17.06947, 145.77255	**219**	-17.04182, 145.7655
162	-17.22133, 145.91508	**211**	-17.0663, 145.77166	**220**	-17.04141, 145.76507
163	-17.22067, 145.91463	**212**	-17.0646, 145.77123	**221**	-17.04063, 145.76391
164	-17.2197, 145.91395	**213**	-17.06367, 145.77096	**222**	-17.03333, 145.75232
165	-17.21872, 145.91327	**214**	-17.06277, 145.7706	**223**	-17.03129, 145.75047
166	-17.21737, 145.91232	**215**	-17.05885, 145.76934	**224**	-17.01835, 145.74483
167	-17.2164, 145.91164	**216**	-17.05065, 145.76839	**225**	-17.01579, 145.74442
168	-17.20842, 145.90775	**217**	-17.04689, 145.76791	**226**	-17.01287, 145.74437
169	-17.20581, 145.90583	**218**	-17.04229, 145.76587	**227**	-17.01202, 145.74437
170	-17.20462, 145.9048	**219**	-17.04182, 145.7655	**228**	-17.00482, 145.74448
171	-17.20379, 145.90405	**220**	-17.04141, 145.76507	**229**	-16.97664, 145.74399
172	-17.19798, 145.89885	**221**	-17.04063, 145.76391	**230**	-16.96745, 145.74681
173	-17.19326, 145.89365	**222**	-17.03333, 145.75232	**231**	-16.96672, 145.74699
174	-17.19297, 145.89332	**223**	-17.03129, 145.75047	**232**	-16.95632, 145.74919
175	-17.18697, 145.88878	**224**	-17.01835, 145.74483	**233**	-16.95177, 145.75235
176	-17.18585, 145.88823	**185**	-17.16351, 145.87708	**234**	-16.93542, 145.77567
177	-17.18515, 145.88784	**186**	-17.16278, 145.87631	**235**	-16.93473, 145.7757
178	-17.18263, 145.88643	**187**	-17.16112, 145.87431	**194**	-17.15364, 145.86249
179	-17.17685, 145.8832	**188**	-17.16042, 145.87346	**195**	-17.15208, 145.85977
180	-17.17592, 145.88237	**189**	-17.1588, 145.87149	**196**	-17.14951, 145.85608
181	-17.17347, 145.87972	**190**	-17.1575, 145.86952	**197**	-17.14785, 145.85369
182	-17.16752, 145.87847	**191**	-17.15659, 145.86689	**198**	-17.14694, 145.85237
183	-17.16641, 145.87842	**192**	-17.15454, 145.86361	**199**	-17.1464, 145.85159
184	-17.16418, 145.8776	**193**	-17.15422, 145.86325	**200**	-17.12669, 145.82272

201	-17.11661, 145.8136	**213**	-17.06367, 145.77096	**225**	-17.01579, 145.74442
202	-17.11478, 145.81227	**214**	-17.06277, 145.7706	**226**	-17.01287, 145.74437
203	-17.1056, 145.79866	**215**	-17.05885, 145.76934	**227**	-17.01202, 145.74437
204	-17.10353, 145.79557	**216**	-17.05065, 145.76839	**228**	-17.00482, 145.74448
205	-17.09935, 145.77985	**217**	-17.04689, 145.76791	**229**	-16.97664, 145.74399
206	-17.08088, 145.77539	**218**	-17.04229, 145.76587	**230**	-16.96745, 145.74681
207	-17.08008, 145.77542	**219**	-17.04182, 145.7655	**231**	-16.96672, 145.74699
208	-17.07664, 145.77558	**220**	-17.04141, 145.76507	**232**	-16.95632, 145.74919
209	-17.07596, 145.77558	**221**	-17.04063, 145.76391	**233**	-16.95177, 145.75235
210	-17.06947, 145.77255	**222**	-17.03333, 145.75232	**234**	-16.93542, 145.77567
211	-17.0663, 145.77166	**223**	-17.03129, 145.75047	**235**	-16.93473, 145.7757
212	-17.0646, 145.77123	**224**	-17.01835, 145.74483		

Table B2 – Overhead Obstructions Observed between Bruce Highway and Tully Falls Road (chainage measured from Bruce Highway intersection with Palmerston Highway).

No.	Obstruction Description	Chainage	Comment	No.	Obstruction Description	Chainage	Comment
1	OHL	0.15		44	OHL	8.25	2 crossings
2	OHL	0.3		45	OHL	8.4	
3	OHL	0.3		46	OHL	9.0	
4	OHL	0.4		47	OHL	9.9	
5	OHL	0.8		48	OHL	10.0 – 10.2	4 crossings
6	OHL	0.9		49	OHL	10.8	
7	OHL	1.0		50	OHL	11.2	
8	OHL	1.1		51	OHL	11.8	
9	OHL	1.5		52	OHL	11.9	
10	OHL	1.6		53	OHL	12.0	
11	OHL	1.7		54	OHL	12.1	
12	OHL	1.9		55	OHL	12.2	
13	OHL	2.0		56	OHL	12.6	
14	OHL	2.5		57	OHL	12.7	
15	OHL	2.6		58	OHL	13.1	
16	OHL	2.65		59	Pruning	14.0	
17	OHL	3.1	Ample clearance	60	OHL	14.1	
18	OHL	3.2		61	OHL	15.3	2 crossings
19	OHL	3.4	2 crossings	62	OHL	18.0	
20	OHL	3.5		63	OHL	18.1	2 crossings
21	OHL	3.5		64	OHL	18.2	2 crossings
22	OHL	4.1		65	OHL	18.3	
23	OHL	4.7		66	Pruning & OHL	20.4	
24	OHL	4.8		67	OHL	20.7	
25	OHL	4.85		68	OHL	20.75	
26	OHL	4.9		69	OHL	20.8	3 crossings
27	OHL	4.95		70	OHL	21.0	
28	OHL	5.1		71	OHL	21.4	
29	OHL	5.3		72	OHL	22.7	
30	OHL	5.5	2 crossings	73	OHL	23.2	
31	OHL	5.6		74	OHL	23.6	
32	OHL	5.9		75	OHL	25.1	
33	OHL	6.0		76	OHL	27.3	
34	OHL	6.3		77	Various pruning	27.8 – 43.8	
35	OHL	6.4		78	3 Fauna crossings	38.8 – 39	See Figure B2
36	OHL	6.45	2 crossings	79	Overhead electric sign	44.5	See Figure B3
37	OHL	6.7		80	OHL	44.8	
38	OHL	6.75		81	OHL	45.2	
39	OHL	6.8		82	OHL	46.9	
40	OHL	6.9		83	OHL	47.2	
41	OHL	7.4		84	OHL	47.6	
42	OHL	7.8		85	OHL	48.2 – 48.3	3 crossings
43	OHL	7.9		86	OHL	48.8	2 crossings

87	Possible Pruning	48.9 – 49.2		**124**	OHL	67.7 – 67.8	3 crossings
88	OHL	49.0		**125**	OHL	68.1	
89	OHL	49.1		**126**	OHL	68.2	
90	OHL	49.3		**127**	OHL	68.3	2 crossings
91	OHL	50.9		**128**	OHL	68.7	
92	OHL	53.0		**129**	OHL	69.4	
93	OHL	53.5	3 crossings	**130**	Various pruning	69.4 – 71.2	
94	OHL	53.6		**131**	OHL	71.2	
95	OHL	53.7		**132**	OHL	71.3	
96	OHL	54.1		**133**	OHL	71.4	
97	OHL	54.2		**134**	OHL	71.9	2 crossings
98	OHL	54.6 – 55.0	8 crossings	**135**	OHL	72.1	
99	OHL	55.3		**136**	OHL	72.3	
100	OHL	55.4	2 crossings	**137**	OHL	72.9	
101	OHL	55.5		**138**	OHL	73.0	
102	OHL	56.1		**139**	OHL	73.7	
103	OHL	56.7		**140**	OHL	73.9	
104	OHL	56.9		**141**	OHL	75.3	
105	OHL	57.7		**142**	OHL	75.7	
106	OHL	58.2		**143**	OHL	76.6	
107	OHL	58.7	2 crossings	**144**	OHL	76.8	
108	OHL	59.8		**145**	OHL	77.4	
109	OHL	60.0		**146**	OHL	78.1	2 crossings
110	OHL	61.0		**147**	OHL	78.5	2 crossings
111	OHL	61.3		**148**	OHL	78.8	
112	OHL	61.6		**149**	OHL	79.1	2 crossings
113	OHL	62.0		**150**	OHL	79.6	
114	OHL	62.1		**151**	OHL	79.7	
115	OHL	63.7		**152**	OHL	80.0	
116	OHL	64.2		**153**	OHL	80.1	
117	OHL	64.3		**154**	OHL	80.7	
118	OHL	65.7		**155**	OHL	80.9	
119	OHL	66.5		**156**	OHL	81.4	
120	OHL	67.0		**157**	OHL	81.5	
121	OHL	67.2		**158**	OHL	81.7	
122	OHL	67.5		**159**	OHL	82.7	
123	OHL	67.6		**160**	OHL	83.0	

Figure B1 – Example of required pruning from overhanging tree branches, located on Palmerston Highway, 13.7 km from Bruce Highway

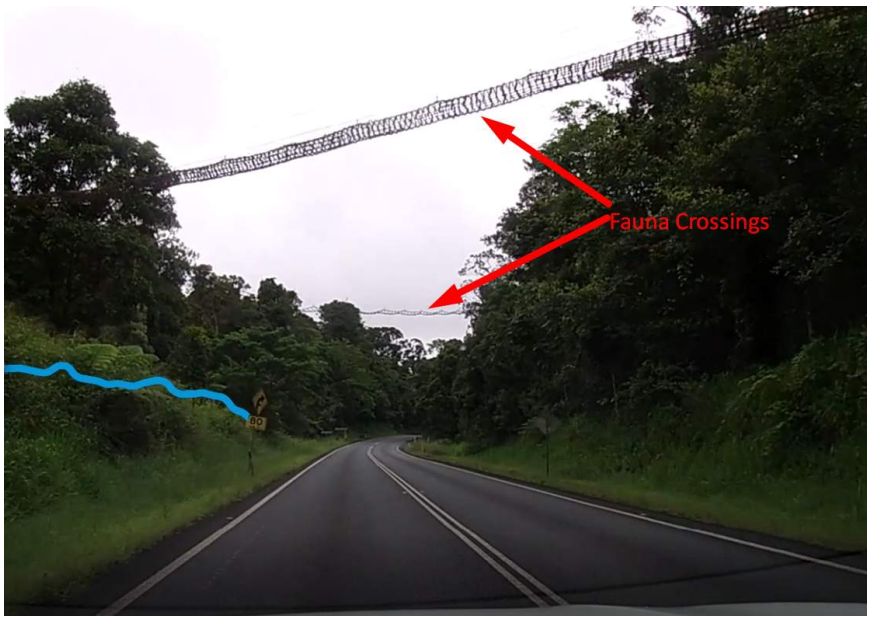
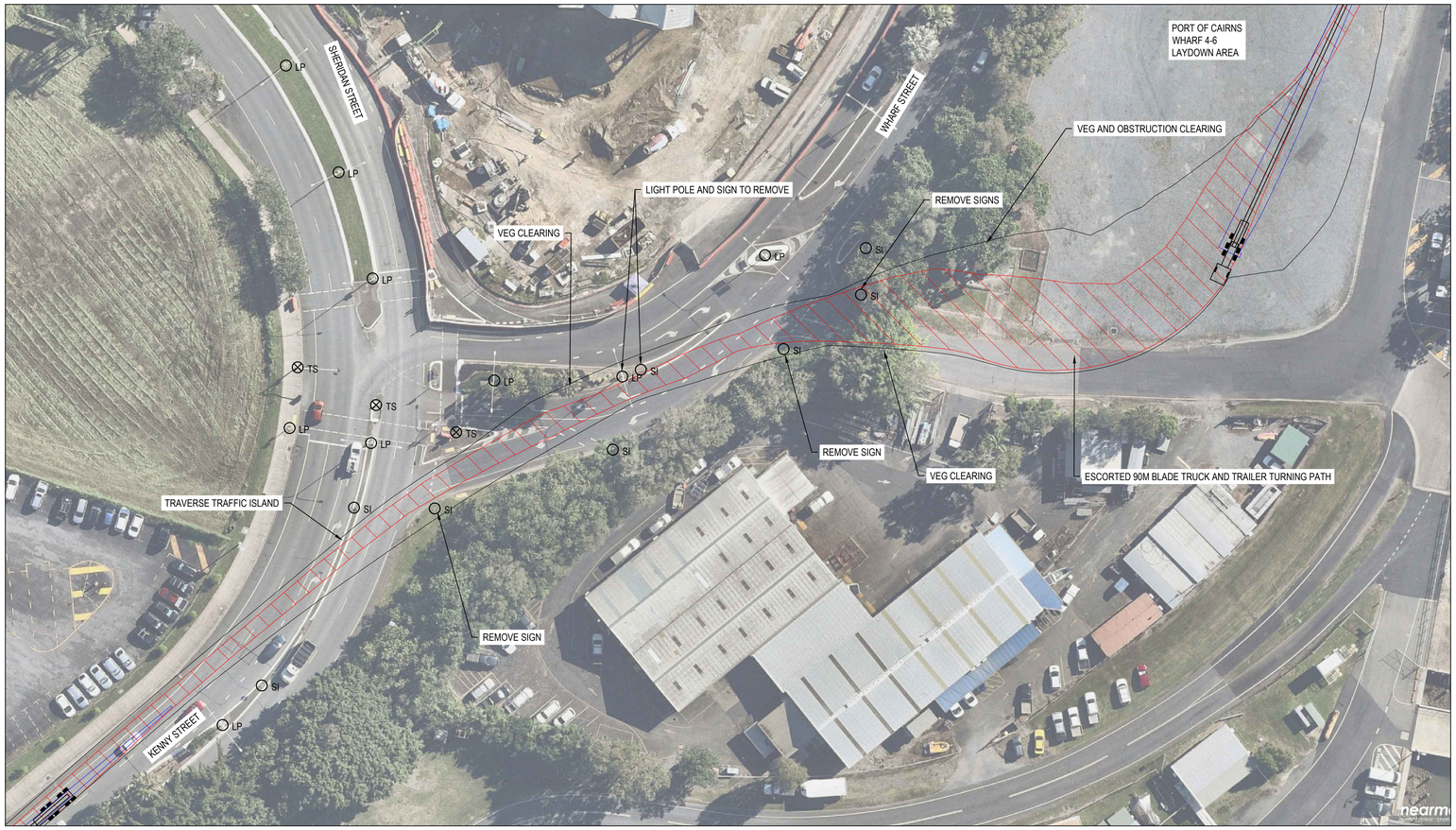


Figure B2 – Overhead Fauna Crossings on Palmerston Highway, 38.8 km from Bruce Highway

Figure B3 – Overhead Electrical Road Sign

Appendix C – Swept Path Drawings

Plans shown overleaf



INTERSECTION WHARF STREET / KENNY STREET - 90m BLADE TRUCK AND TRAILER

SCALE 1:500

LEGEND

- LP — EXISTING LIGHT POLE
- SI — EXISTING SIGN
- PP — EXISTING POWER POLE
- TS — EXISTING TRAFFIC SIGNAL
- EXTENT OF AREA TO BE CLEARED (EXTENT OF BLADE)
- TRUCK OVER DIMENSIONAL WHEEL PATH
- OVER DIMENSIONAL TURNING AREA
- PROPOSED GRAVEL WIDENING

NOTES

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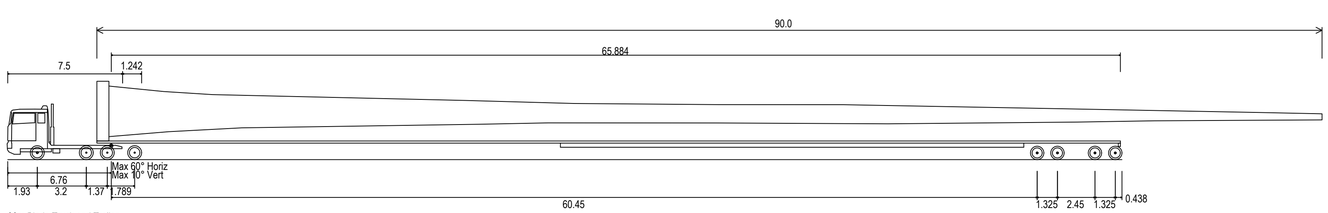

90m Blade Truck and Trailer	
Overall Length	72.748m
Overall Width	2.591m
Overall Body Height	3.628m
Min Body Ground Clearance	0.348m
Max Track Width	2.591m
Lock-to-lock time	2.00s
Max Wheel Angle	60.00°

90m BLADE TRUCK AND TRAILER

SCALE NTS

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ACN 106 675 156
p 07 3870 8888

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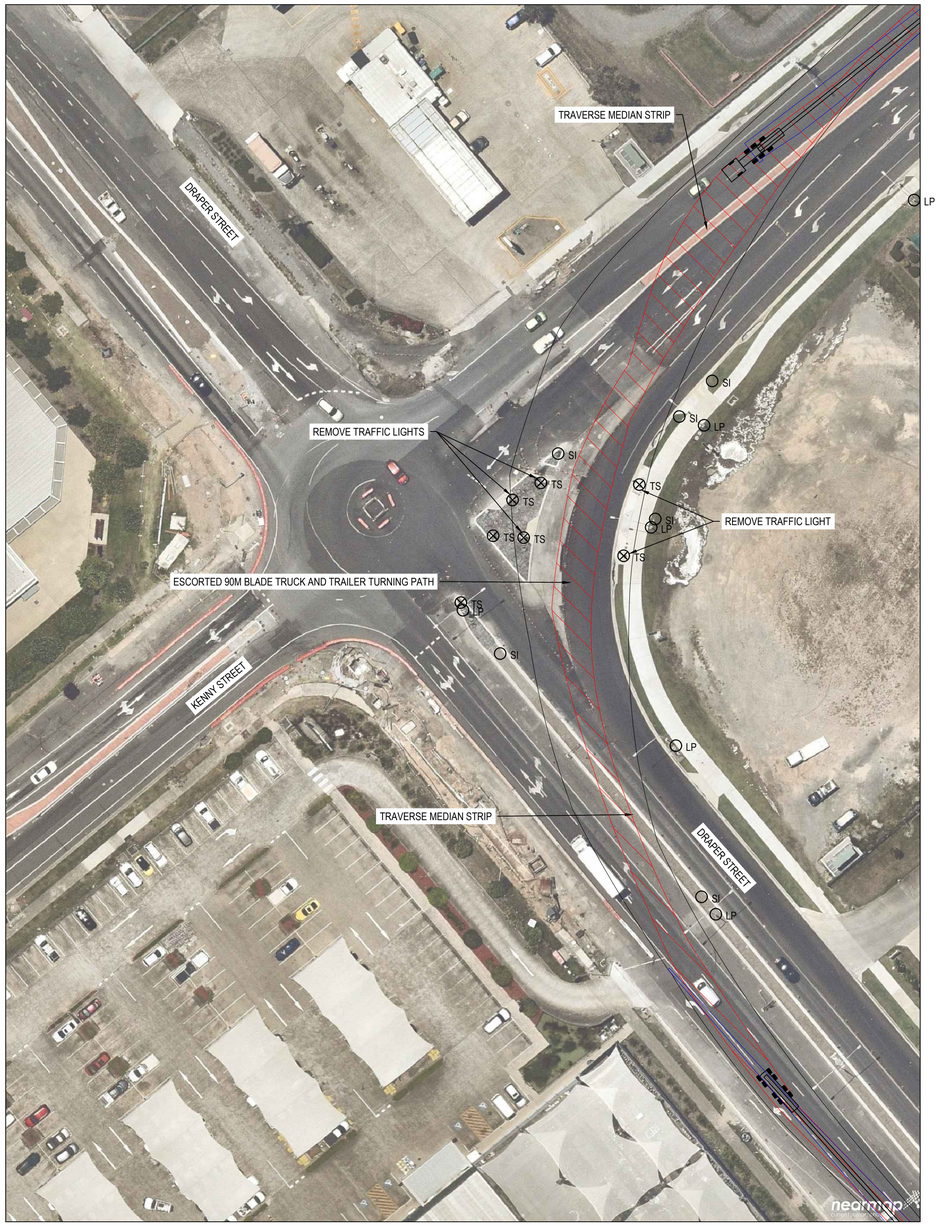
PROJECT	CHALUMBIN WIND FARM
TITLE	TRANSPORT ROUTE STUDY ROUTE 1 TURN 1
DRAWING STATUS	PRELIMINARY
PROJECT No.	20-315
SCALE	AS SHOWN
SIZE	A1
DRAWING No.	CHLWF-TRS-TURN 1
REV.	B



INTERSECTION KENNY STREET / DRAPER STREET - 90m BLADE TRUCK AND TRAILER

SCALE 1:500

LEGEND

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- SI — EXISTING SIGN
- PP — EXISTING POWER POLE
- TS — EXISTING TRAFFIC SIGNAL
- EXTENT OF AREA TO BE CLEARED (EXTENT OF BLADE)
- TRUCK OVER DIMENSIONAL WHEEL PATH
- OVER DIMENSIONAL TURNING AREA
- PROPOSED GRAVEL WIDENING

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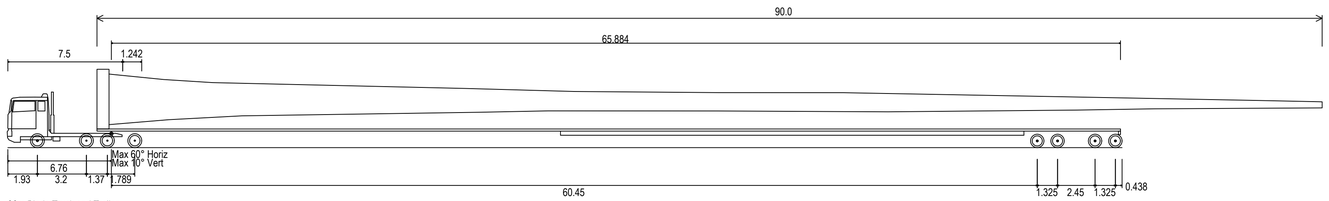

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Max Track Width	2.591m
Lock-to-lock time	2.00s
Max Wheel Angle	60.00°

90m BLADE TRUCK AND TRAILER

SCALE NTS

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Toowong, Qld 4066
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ABN 89 106 675 156
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PO Box 875
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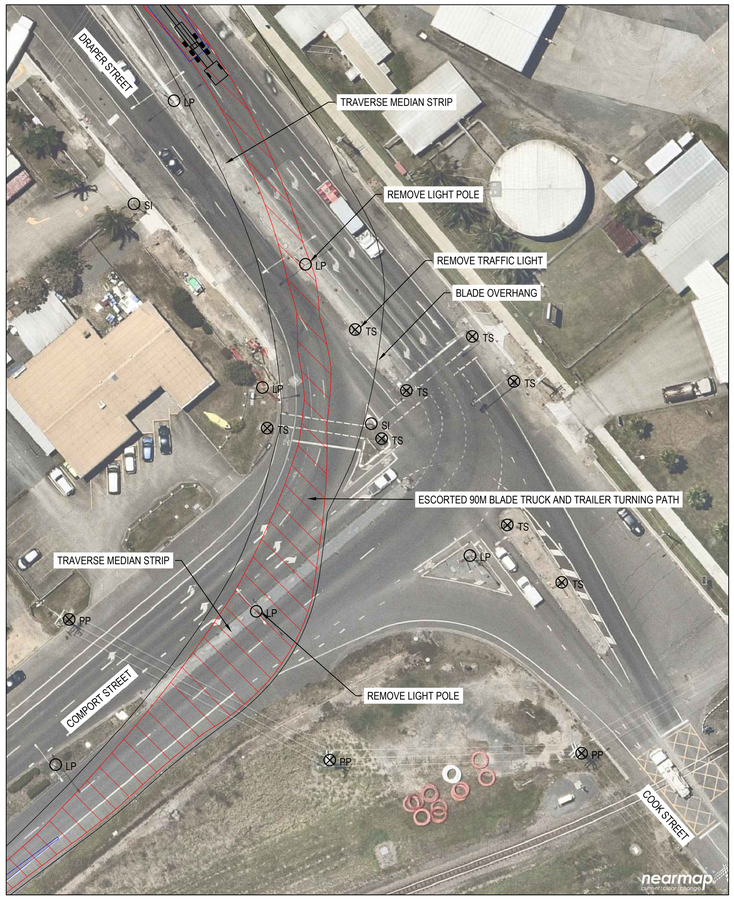
mail@icubed.com.au
ACN 106 675 156

Attexo

PROJECT	CHALUMBIN WIND FARM
TITLE	TRANSPORT ROUTE STUDY ROUTE 1 TURN 2
DRAWING STATUS	PRELIMINARY
PROJECT No.	20-315
SCALE	AS SHOWN
SIZE	A1
DRAWING No.	CHLWF-TRS-TURN 2
REV.	B



INTERSECTION DRAPER STREET / COMPORT STREET - 90m BLADE TRUCK AND TRAILER

SCALE 1:500

LEGEND

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- SI — EXISTING SIGN
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- TS — EXISTING TRAFFIC SIGNAL
- EXTENT OF AREA TO BE CLEARED (EXTENT OF BLADE)
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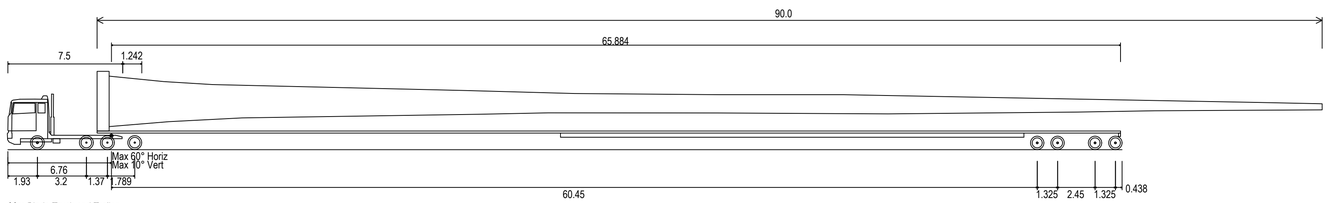

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90m BLADE TRUCK AND TRAILER

SCALE NTS

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A	PRELIMINARY	DK	BP	TJS	11/06/2021

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ACN 106 675 156
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PROJECT	CHALUMBIN WIND FARM
TITLE	TRANSPORT ROUTE STUDY ROUTE 1 TURN 3
DRAWING STATUS	PRELIMINARY
PROJECT No.	20-315
SCALE	AS SHOWN
SIZE	A1
DRAWING No.	CHLWF-TRS-TURN 3
REV.	B

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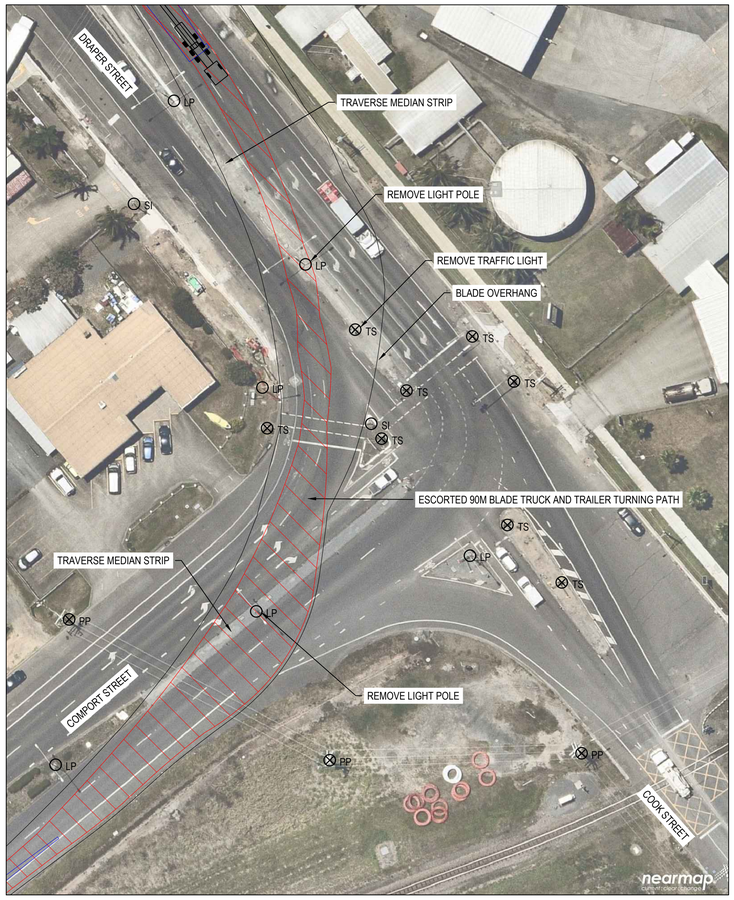

INTERSECTION DRAPER STREET / COMPORT STREET - 90m BLADE TRUCK AND TRAILER

SCALE AS SHOWN

LEGEND

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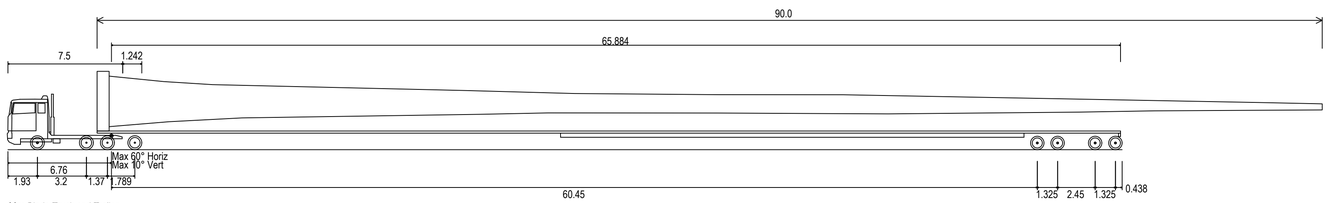

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90m BLADE TRUCK AND TRAILER

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ABN 89 106 675 156
ACN 106 675 156
p 07 3870 8888

Attexo

PROJECT: CHALUMBIN WIND FARM

TITLE: TRANSPORT ROUTE STUDY
ROUTE 1
TURN 3

DRAWING STATUS: PRELIMINARY

PROJECT No. 20-315

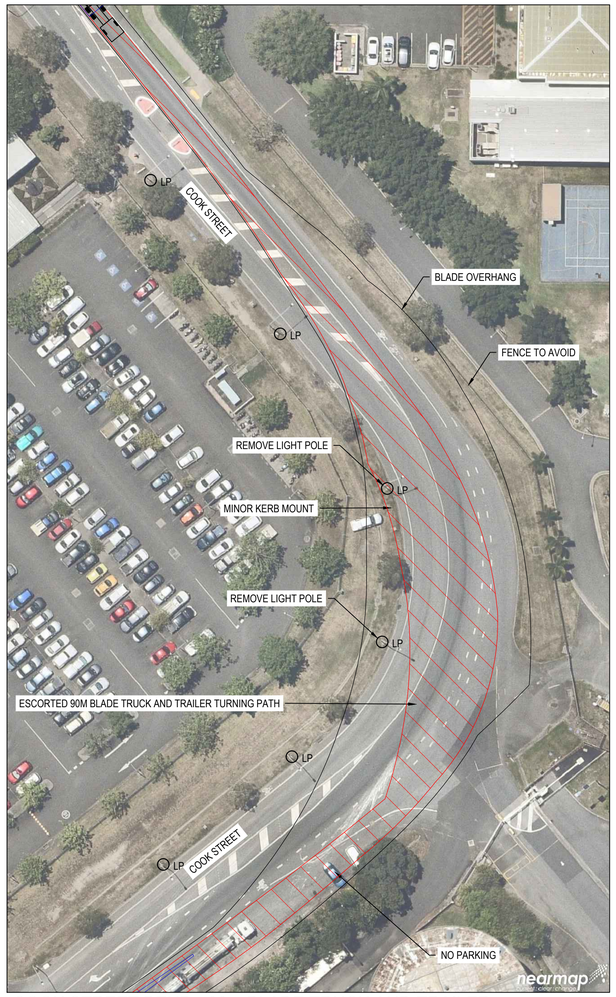
DO NOT SCALE MANUALLY

SCALE: AS SHOWN

SIZE: A1

DRAWING No. CHLWF-TRS-TURN 3

REV. B



COOK STREET BEND - 90m BLADE TRUCK AND TRAILER

SCALE 1:500

LEGEND

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- SI — EXISTING SIGN
- PP — EXISTING POWER POLE
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- EXTENT OF AREA TO BE CLEARED (EXTENT OF BLADE)
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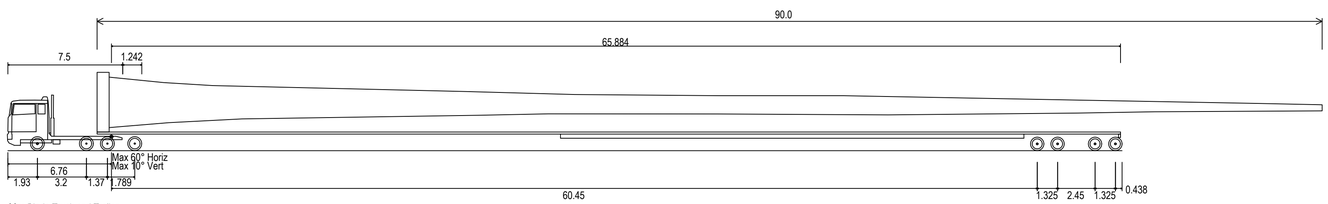

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Max Track Width	2.591m
Lock-to-lock time	2.00s
Max Wheel Angle	60.00°

90m BLADE TRUCK AND TRAILER

SCALE NTS

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p 07 3870 8888
PO Box 876
Toowong, Qld 4066
mail@icubed.com.au
ACN 106 675 156

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PROJECT	CHALUMBIN WIND FARM
TITLE	TRANSPORT ROUTE STUDY ROUTE 2 TURN 4
DRAWING STATUS	PRELIMINARY
PROJECT No.	20-315
SCALE	AS SHOWN
SIZE	A1
DRAWING No.	CHLWF-TRS-TURN 4
REV.	B

LEGEND

- LP — EXISTING LIGHT POLE
- SI — EXISTING SIGN
- PP — EXISTING POWER POLE
- TS — EXISTING TRAFFIC SIGNAL
- EXTENT OF AREA TO BE CLEARED (EXTENT OF BLADE)
- TRUCK OVER DIMENSIONAL WHEEL PATH
- OVER DIMENSIONAL TURNING AREA
- PROPOSED GRAVEL WIDENING

NOTES

1. ALL GUIDEPOSTS WITHIN OVER-DIMENSIONAL WHEEL PATH TO BE REMOVED PRIOR TO TRANSPORTATION OF WIND TURBINE BLADES
2. CLEARING OF VEGETATION SHALL ONLY BE PERFORMED AFTER RELEVANT AUTHORITY APPROVALS ARE OBTAINED, IF REQUIRED FOR ROAD UPGRADE
3. SURVEY OF HEIGHT CLEARANCES ALONG TRANSPORTATION ROUTE SHALL BE COMPLETED BY THE APPOINTED TRANSPORTATION CONTRACTOR
4. POTENTIAL CLASHES OF BLADE TRANSPORT VEHICLE WITH GUARDRAILS, TRAFFIC SIGNALS AND STREET LIGHTING TO BE CONFIRMED BY THE APPOINTED TRANSPORTATION CONTRACTOR
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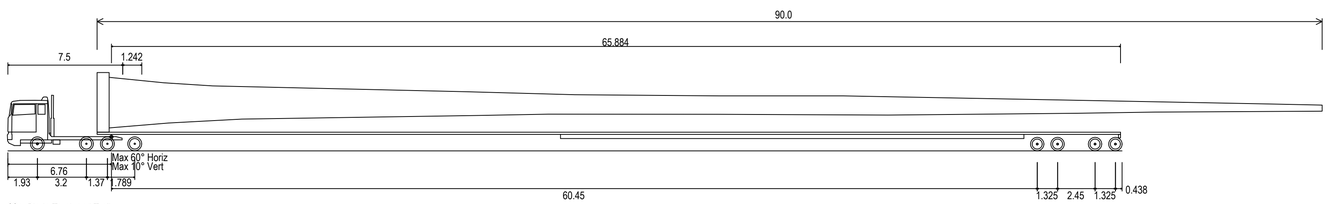
INTERSECTION COOK STREET / AUMULLER STREET ROUNDABOUT - 90m BLADE TRUCK AND TRAILER

SCALE 1:500



90m Blade Truck and Trailer	
Overall Length	72.748m
Overall Width	2.591m
Overall Body Height	3.628m
Min Body Ground Clearance	0.348m
Max Track Width	2.591m
Lock-to-lock time	2.00s
Max Wheel Angle	60.00°

90m BLADE TRUCK AND TRAILER

SCALE NTS

TO BE PRINTED IN COLOUR

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REV	DETAIL	DRN	CHK	APP	DATE
B	PRELIMINARY	DK	BP	TJS	16/07/2021
A	PRELIMINARY	DK	BP	TJS	11/06/2021

REVISIONS AND APPROVALS

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PO Box 878, Toowong, Qld 4066
www.icubed.com.au
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PROJECT: CHALUMBIN WIND FARM

TITLE: TRANSPORT ROUTE STUDY
ROUTE 2 & 3
TURN 5 (5A & 5B)

DRAWING STATUS: PRELIMINARY

PROJECT No. 20-315 | CAD DO NOT AMEND MANUALLY | SCALE AS SHOWN | SIZE A1

DRAWING No. CHLWF-TRS-TURN 5 | REV. B

LEGEND

- LP — EXISTING LIGHT POLE
- SI — EXISTING SIGN
- PP — EXISTING POWER POLE
- TS — EXISTING TRAFFIC SIGNAL
- EXTENT OF AREA TO BE CLEARED (EXTENT OF BLADE)
- TRUCK OVER DIMENSIONAL WHEEL PATH
- OVER DIMENSIONAL TURNING AREA
- PROPOSED GRAVEL WIDENING

NOTES

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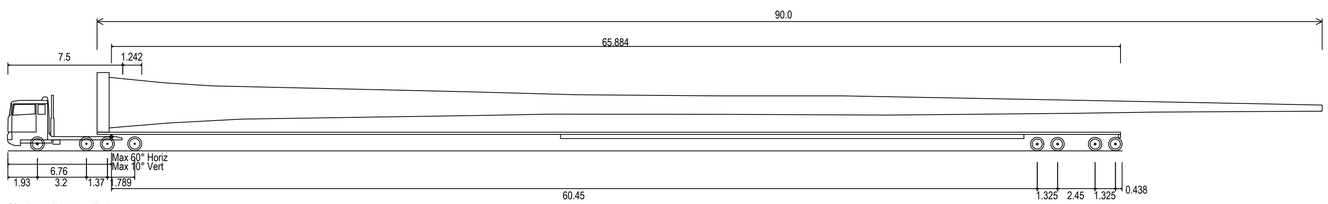
INTERSECTION COOK STREET / AUMULLER STREET ROUNDABOUT - 90m BLADE TRUCK AND TRAILER

SCALE AS SHOWN



90m Blade Truck and Trailer	
Overall Length	72.748m
Overall Width	2.591m
Overall Body Height	3.628m
Min Body Ground Clearance	0.348m
Max Track Width	2.591m
Lock-to-lock time	2.00s
Max Wheel Angle	60.00°

90m BLADE TRUCK AND TRAILER

SCALE NTS

TO BE PRINTED IN COLOUR

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REV	DETAIL	DRN	CHK	APP	DATE
B	PRELIMINARY	DK	BP	TJS	16/07/2021
A	PRELIMINARY	DK	BP	TJS	11/06/2021

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engineering consultants
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Attexo

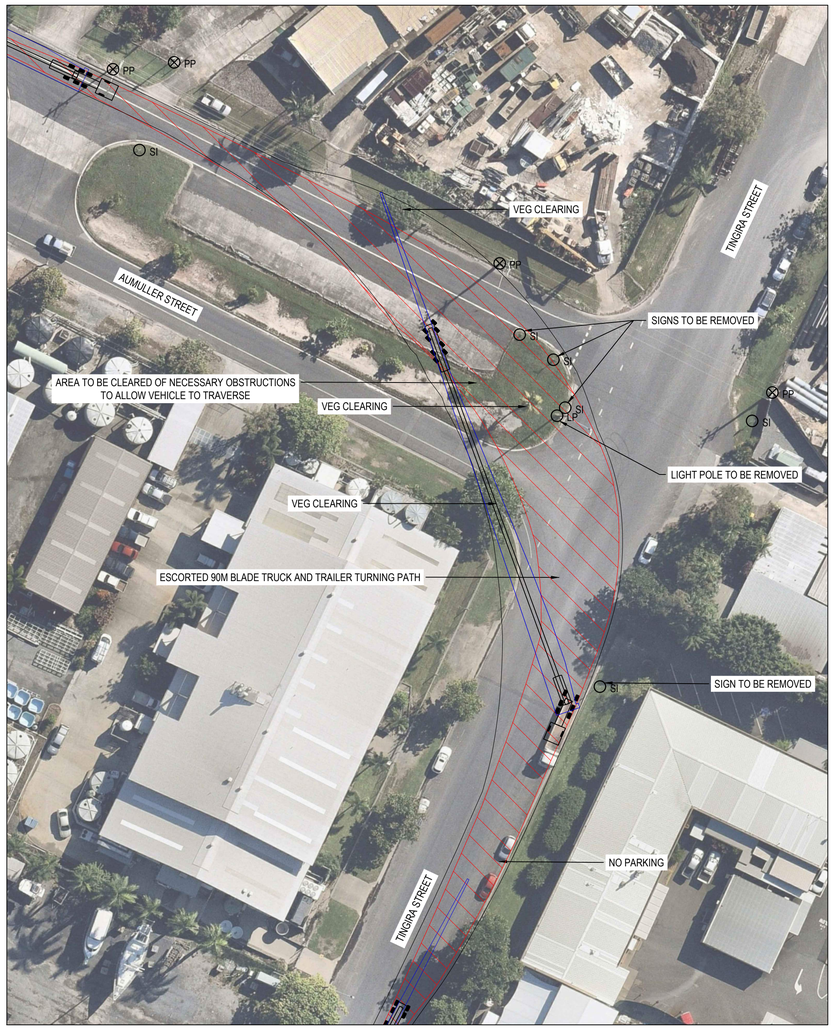
PROJECT: CHALUMBIN WIND FARM

TITLE: TRANSPORT ROUTE STUDY
ROUTE 2 & 3
TURN 5 (5A & 5B)

DRAWING STATUS: PRELIMINARY

PROJECT No.		SCALE	SIZE
20-315	DO NOT AMEND MANUALLY	AS SHOWN	A1

DRAWING No.: CHLWF-TRS-TURN 5 — REV.: B



AUMULLER STREET / TINGIRA STREET INTERSECTION - 90m BLADE TRUCK AND TRAILER (TRAVELLING TO LAYDOWN)

SCALE 1:500

AUMULLER STREET / TINGIRA STREET INTERSECTION - 90m BLADE TRUCK AND TRAILER (TRAVELLING TO SITE)

SCALE 1:500

LEGEND

- LP — EXISTING LIGHT POLE
- SI — EXISTING SIGN
- PP — EXISTING POWER POLE
- TS — EXISTING TRAFFIC SIGNAL
- EXTENT OF AREA TO BE CLEARED (EXTENT OF BLADE)
- TRUCK OVER DIMENSIONAL WHEEL PATH
- OVER DIMENSIONAL TURNING AREA
- PROPOSED GRAVEL WIDENING

NOTES

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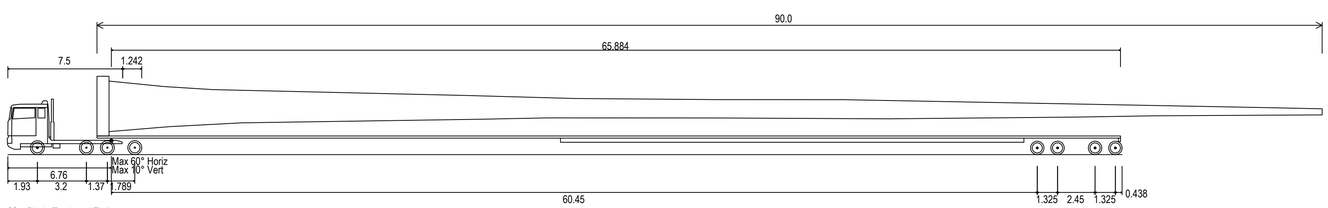

90m Blade Truck and Trailer	
Overall Length	72.748m
Overall Width	2.591m
Overall Body Height	3.628m
Min Body Ground Clearance	0.348m
Max Track Width	2.591m
Lock-to-lock time	2.00s
Max Wheel Angle	60.00°

90m BLADE TRUCK AND TRAILER

SCALE NTS

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REV	DETAIL	DRN	CHK	APP	DATE
B	PRELIMINARY	DK	BP	TJS	16/07/2021
A	PRELIMINARY	DK	BP	TJS	11/06/2021

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p 07 3870 8888
PO Box 978, Toowong, Qld 4066
mail@icubed.com.au
ACN 106 675 156

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PROJECT: CHALUMBIN WIND FARM

TITLE: TRANSPORT ROUTE STUDY
ROUTE 2 & 3
TURN 6 (6A & 6B)

DRAWING STATUS: PRELIMINARY

PROJECT No. 20-315

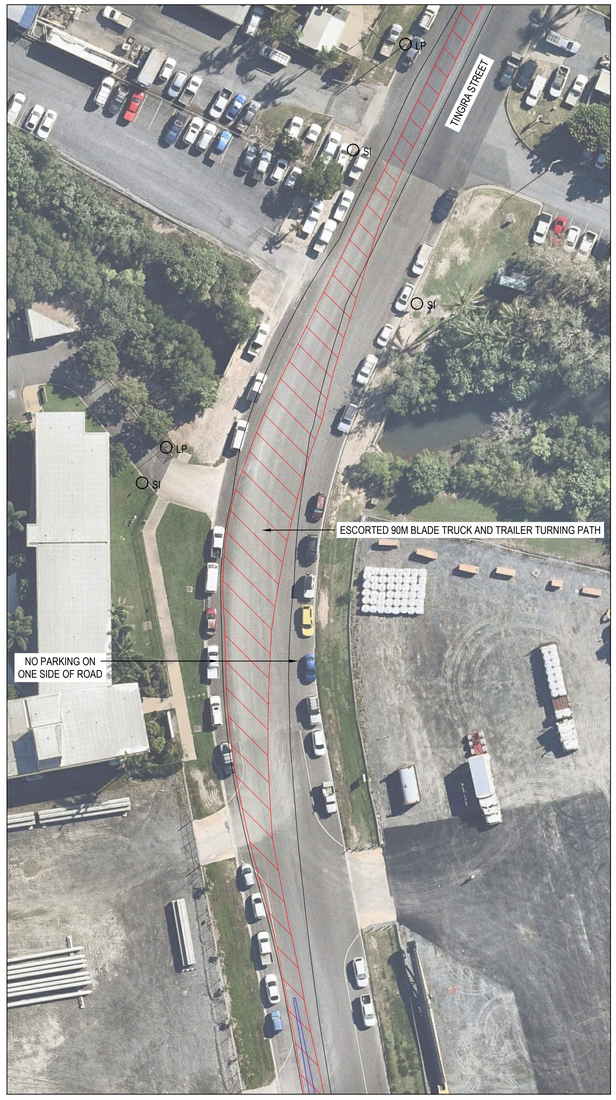
GRID ORIENT AMEND MANUALLY

SCALE: AS SHOWN

SIZE: A1

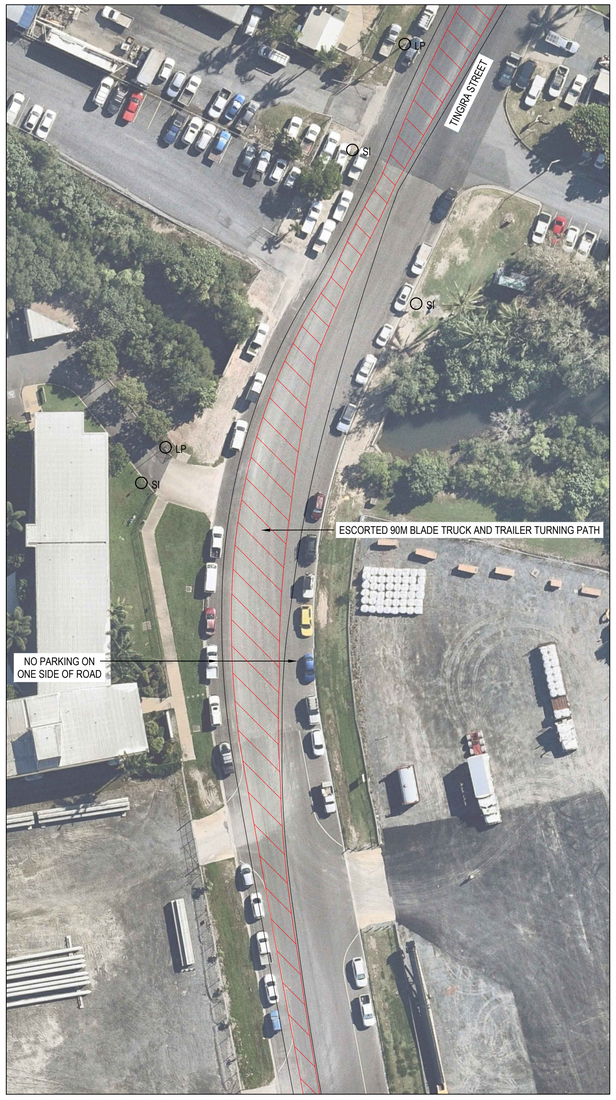
DRAWING No. CHLWF-TRS-TURN 6

REV. B



TINGIRA STREET BEND - 90m BLADE TRUCK AND TRAILER (TRAVELLING TO LAYDOWN)

SCALE 1:500



TINGIRA STREET BEND - 90m BLADE TRUCK AND TRAILER (TRAVELLING TO SITE)

SCALE 1:500

LEGEND

LP	EXISTING LIGHT POLE
SI	EXISTING SIGN
PP	EXISTING POWER POLE
TS	EXISTING TRAFFIC SIGNAL
	EXTENT OF AREA TO BE CLEARED (EXTENT OF BLADE)
	TRUCK OVER DIMENSIONAL WHEEL PATH
	OVER DIMENSIONAL TURNING AREA
	PROPOSED GRAVEL WIDENING

NOTES

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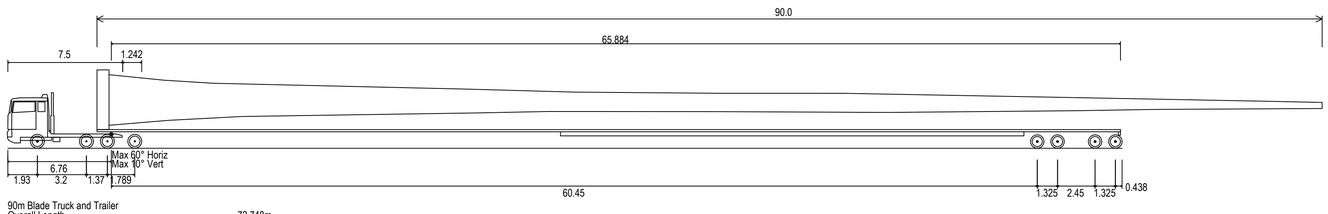

90m Blade Truck and Trailer	
Overall Length	72.748m
Overall Width	2.591m
Overall Body Height	3.628m
Min Body Ground Clearance	0.348m
Max Track Width	2.591m
Lock-to-lock time	2.00s
Max Wheel Angle	60.00°

90m BLADE TRUCK AND TRAILER

SCALE NTS

TO BE PRINTED IN COLOUR

REV	DETAIL	DRN	CHK	APP	DATE
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A	PRELIMINARY	DK	BP	TJS	11/06/2021

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engineering consultants
innovation, ingenuity, inspiration
L2 39 Sherwood Rd
Toowong, Qld 4066
www.icubed.com.au
ABN 89 106 675 156
p 07 3870 8888
PO Box 878
Toowong, Qld 4066
mail@icubed.com.au
ACN 106 675 156

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PROJECT	CHALUMBIN WIND FARM	DRAWING STATUS	PRELIMINARY
TITLE	TRANSPORT ROUTE STUDY ROUTE 2 & 3 TURN 7 (7A & 7B)	PROJECT No. 20-315	SCALE AS SHOWN
		DO NOT AMEND MANUALLY	SIZE A1
		DRAWING No. CHLWF-TRS-TURN 7	REV. B

INTERSECTION AUMULLER STREET / RAY JONES DRIVE - 90m BLADE TRUCK AND TRAILER

SCALE 1:500

LEGEND

- LP — EXISTING LIGHT POLE
- SI — EXISTING SIGN
- PP — EXISTING POWER POLE
- TS — EXISTING TRAFFIC SIGNAL
- EXTENT OF AREA TO BE CLEARED (EXTENT OF BLADE)
- TRUCK OVER DIMENSIONAL WHEEL PATH
- OVER DIMENSIONAL TURNING AREA
- PROPOSED GRAVEL WIDENING

NOTES

1. ALL GUIDEPOSTS WITHIN OVER-DIMENSIONAL WHEEL PATH TO BE REMOVED PRIOR TO TRANSPORTATION OF WIND TURBINE BLADES
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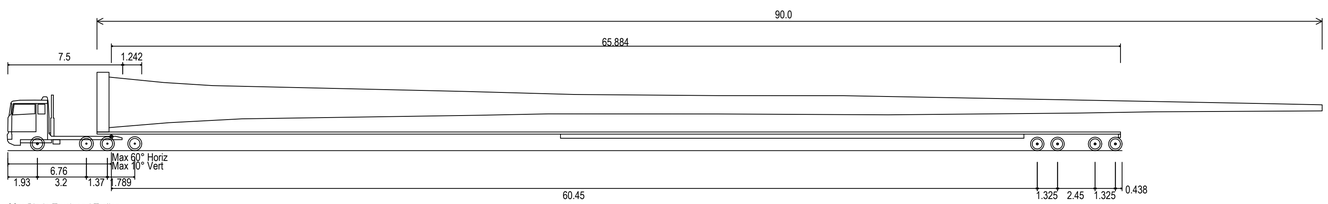

90m Blade Truck and Trailer	
Overall Length	72.748m
Overall Width	2.591m
Overall Body Height	3.628m
Min Body Ground Clearance	0.348m
Max Track Width	2.591m
Lock-to-lock time	2.00s
Max Wheel Angle	60.00°

90m BLADE TRUCK AND TRAILER

SCALE NTS

TO BE PRINTED IN COLOUR

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REV	DETAIL	DRN	CHK	APP	DATE
B	PRELIMINARY	DK	BP	TJS	16/07/2021
A	PRELIMINARY	DK	BP	TJS	11/06/2021

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engineering consultants
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LZ 39 Sherwood Rd, Toowong, Qld 4066
PO Box 878, Toowong, Qld 4066
www.icubed.com.au
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ABN 89 106 675 156
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p 07 3870 8888

Attexo

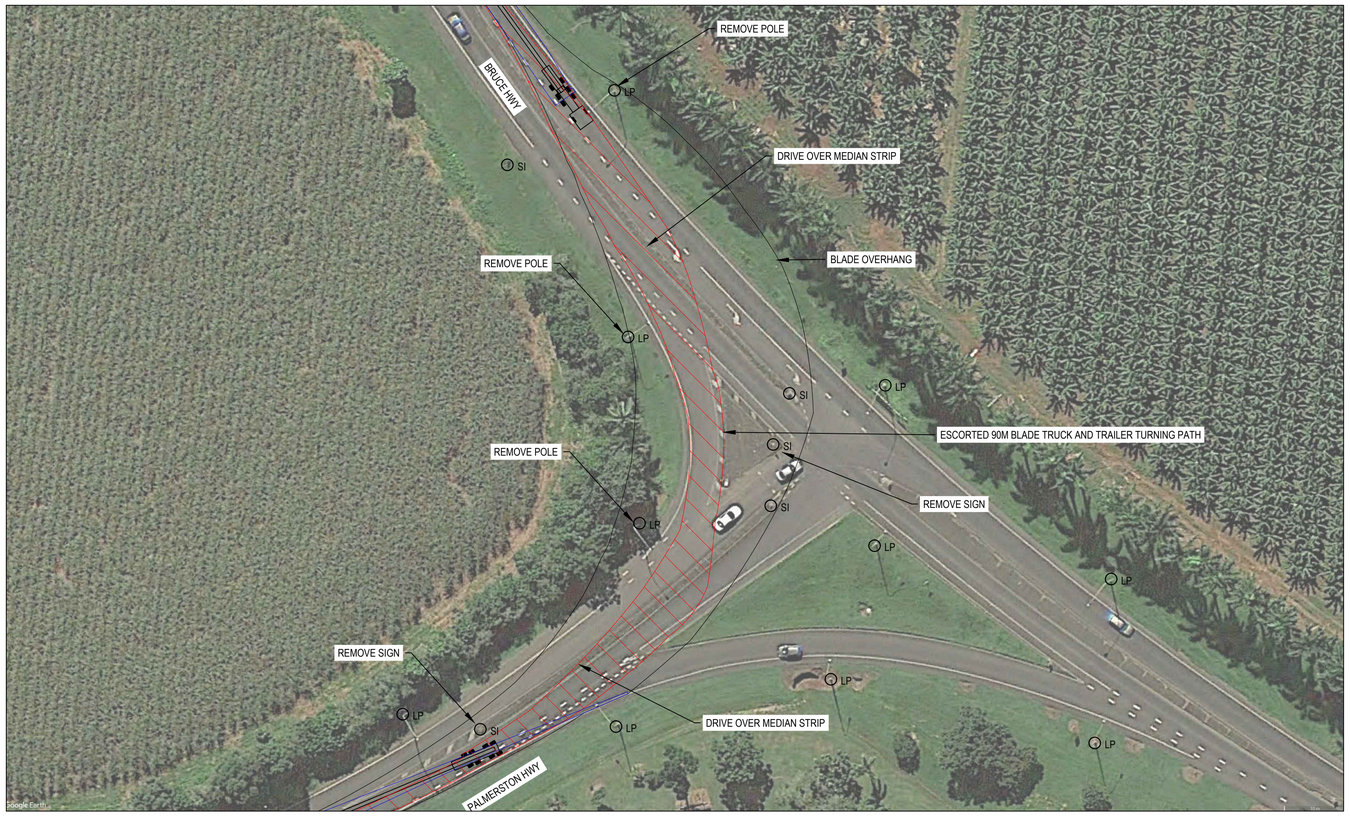
PROJECT: CHALUMBIN WIND FARM

TITLE: TRANSPORT ROUTE STUDY
ROUTE 3
TURN 8

DRAWING STATUS: PRELIMINARY

PROJECT No. 20-315 | CAD DO NOT AMEND MANUALLY | SCALE AS SHOWN | SIZE A1

DRAWING No. CHLWF-TRS-TURN 8 | REV. B



INTERSECTION BRUCE HWY / PALMERSTON HWY - 90m BLADE TRUCK AND TRAILER

SCALE 1:500

LEGEND

- LP — EXISTING LIGHT POLE
- SI — EXISTING SIGN
- PP — EXISTING POWER POLE
- TS — EXISTING TRAFFIC SIGNAL
- EXTENT OF AREA TO BE CLEARED (EXTENT OF BLADE)
- TRUCK OVER DIMENSIONAL WHEEL PATH
- OVER DIMENSIONAL TURNING AREA
- PROPOSED GRAVEL WIDENING

NOTES

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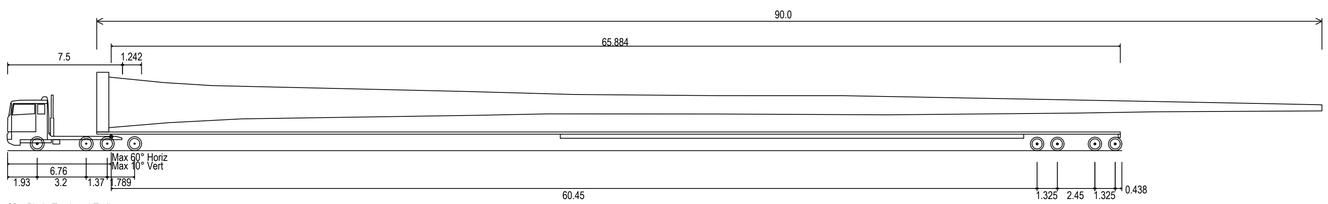

90m Blade Truck and Trailer	
Overall Length	72.748m
Overall Width	2.591m
Overall Body Height	3.628m
Min Body Ground Clearance	0.348m
Max Track Width	2.591m
Lock-to-lock time	2.00s
Max Wheel Angle	60.00°

90m BLADE TRUCK AND TRAILER

SCALE NTS

TO BE PRINTED IN COLOUR

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REV	DETAIL	DRN	CHK	APP	DATE
B	PRELIMINARY	DK	BP	TJS	16/06/2021
A	PRELIMINARY	DK	BP	TJS	11/06/2021

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ACN 106 675 156

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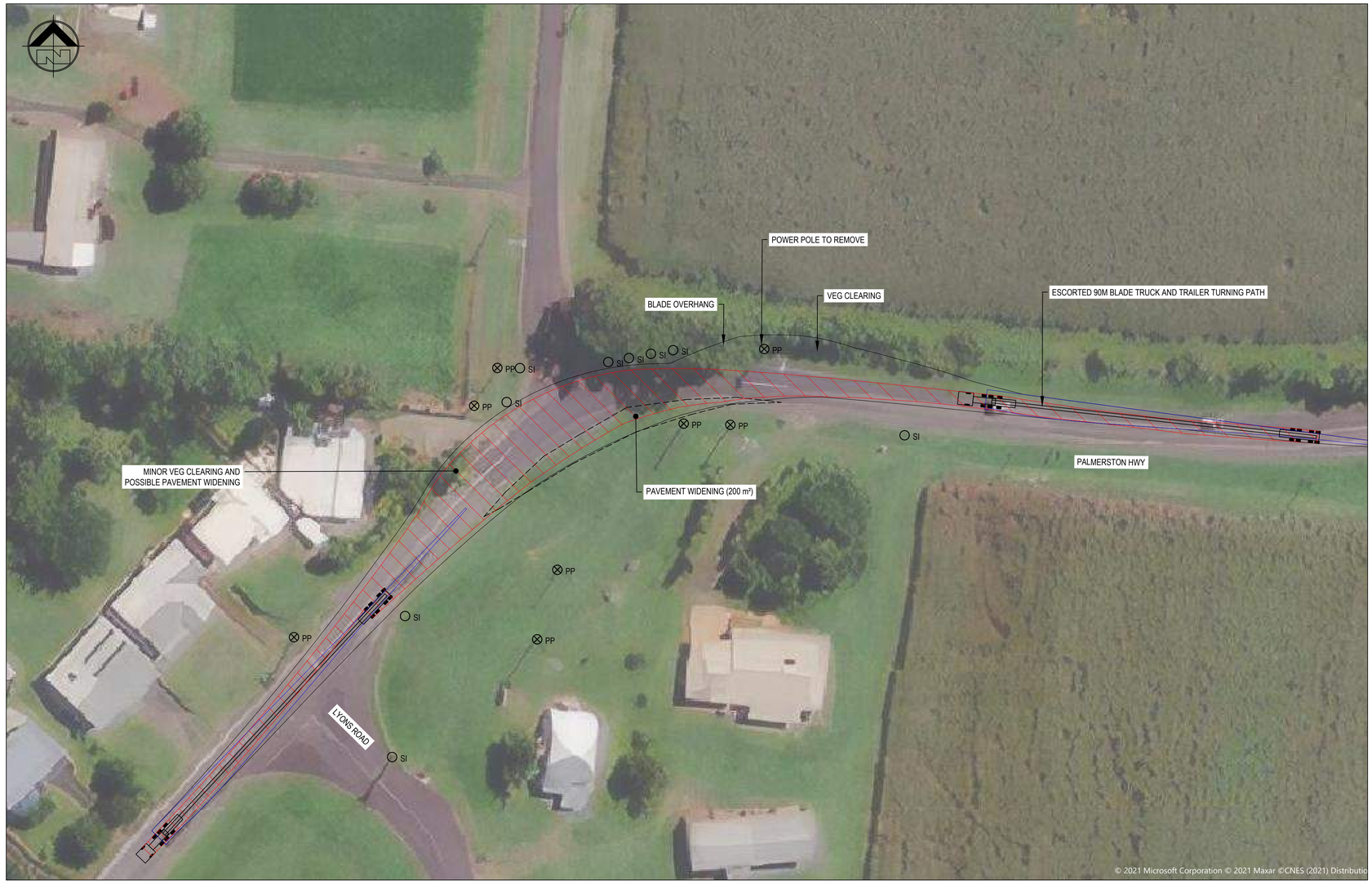
PROJECT	CHALUMBIN WIND FARM
TITLE	TRANSPORT ROUTE STUDY ROUTE 1 TURN 9
DRAWING STATUS	PRELIMINARY
PROJECT No.	20-315
SCALE	AS SHOWN
SIZE	A1
DRAWING No.	CHLWF-TRS-TURN 9
REV.	B

DO NOT SCALE MANUALLY



LEGEND

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- TS — EXISTING TRAFFIC SIGNAL
- EXTENT OF AREA TO BE CLEARED (EXTENT OF BLADE)
- TRUCK OVER DIMENSIONAL WHEEL PATH
- OVER DIMENSIONAL TURNING AREA
- PROPOSED GRAVEL WIDENING

NOTES

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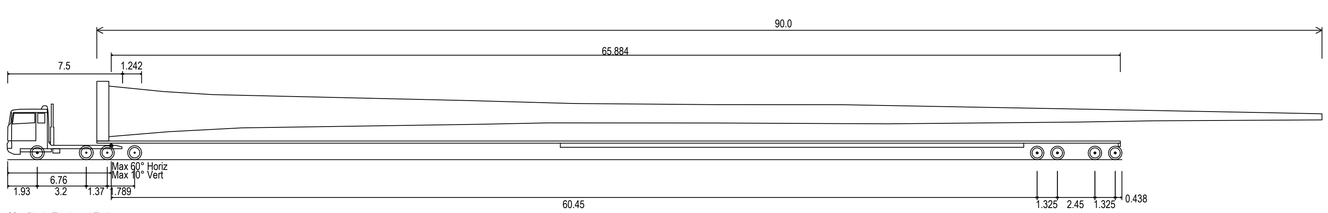
PALMERSTON HWY - 90m BLADE TRUCK AND TRAILER

SCALE 1:500



90m Blade Truck and Trailer	
Overall Length	72.748m
Overall Width	2.591m
Overall Body Height	3.628m
Min Body Ground Clearance	0.348m
Max Track Width	2.591m
Lock-to-lock time	2.00s
Max Wheel Angle	60.00°

90m BLADE TRUCK AND TRAILER

SCALE NTS

TO BE PRINTED IN COLOUR

DIAL BEFORE YOU DIG www.1100.com.au

REV	DETAIL	DRN	CHK	APP	DATE
B	PRELIMINARY	DK	BP	TJS	16/06/2021
A	PRELIMINARY	DK	BP	TJS	11/06/2021

REVISIONS AND APPROVALS

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Attexo

PROJECT: CHALUMBIN WIND FARM

TITLE: TRANSPORT ROUTE STUDY
ROUTE 1
TURN 10

DRAWING STATUS: PRELIMINARY

PROJECT No. 20-315 | CAD: DO NOT AMEND MANUALLY | SCALE: AS SHOWN | SIZE: A1

DRAWING No. CHLWF-TRS-TURN 10 | REV. B

INTERSECTION MILLAA MILLAA MALANDA HWY / EAST EVELYN ROAD - 90m BLADE TRUCK AND TRAILER

SCALE 1:500

LEGEND

- LP — EXISTING LIGHT POLE
- SI — EXISTING SIGN
- PP — EXISTING POWER POLE
- TS — EXISTING TRAFFIC SIGNAL
- EXTENT OF AREA TO BE CLEARED (EXTENT OF BLADE)
- TRUCK OVER DIMENSIONAL WHEEL PATH
- OVER DIMENSIONAL TURNING AREA
- PROPOSED GRAVEL WIDENING

NOTES

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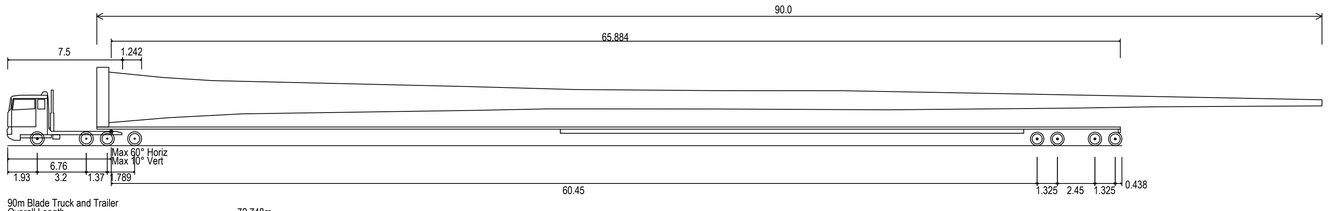

90m Blade Truck and Trailer	
Overall Length	72.748m
Overall Width	2.591m
Overall Body Height	3.828m
Min Body Ground Clearance	0.348m
Max Track Width	2.591m
Lock-to-lock time	2.00s
Max Wheel Angle	60.00°

90m BLADE TRUCK AND TRAILER

SCALE NTS

TO BE PRINTED IN COLOUR

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REV	DETAIL	DRN	CHK	APP	DATE
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A	PRELIMINARY	DK	BP	TJS	11/06/2021

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i³ consulting pty ltd
engineering consultants
innovation, ingenuity, inspiration
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PO Box 878 Toowong, Qld 4066
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p 07 3870 8888

Attexo

PROJECT: CHALUMBIN WIND FARM

TITLE: TRANSPORT ROUTE STUDY
ROUTE 1
TURN 11

DRAWING STATUS: PRELIMINARY

PROJECT No. 20-315

eGd DO NOT AMEND MANUALLY

SCALE: AS SHOWN

SIZE: A1

DRAWING No. CHLWF-TRS-TURN 11

REV. B

EAST EVELYN ROAD - 90m BLADE TRUCK AND TRAILER

SCALE 1:500

LEGEND

- LP — EXISTING LIGHT POLE
- SI — EXISTING SIGN
- PP — EXISTING POWER POLE
- TS — EXISTING TRAFFIC SIGNAL
- EXTENT OF AREA TO BE CLEARED (EXTENT OF BLADE)
- TRUCK OVER DIMENSIONAL WHEEL PATH
- OVER DIMENSIONAL TURNING AREA
- PROPOSED GRAVEL WIDENING

NOTES

1. ALL GUIDEPOSTS WITHIN OVER-DIMENSIONAL WHEEL PATH TO BE REMOVED PRIOR TO TRANSPORTATION OF WIND TURBINE BLADES
2. CLEARING OF VEGETATION SHALL ONLY BE PERFORMED AFTER RELEVANT AUTHORITY APPROVALS ARE OBTAINED, IF REQUIRED FOR ROAD UPGRADE
3. SURVEY OF HEIGHT CLEARANCES ALONG TRANSPORTATION ROUTE SHALL BE COMPLETED BY THE APPOINTED TRANSPORTATION CONTRACTOR
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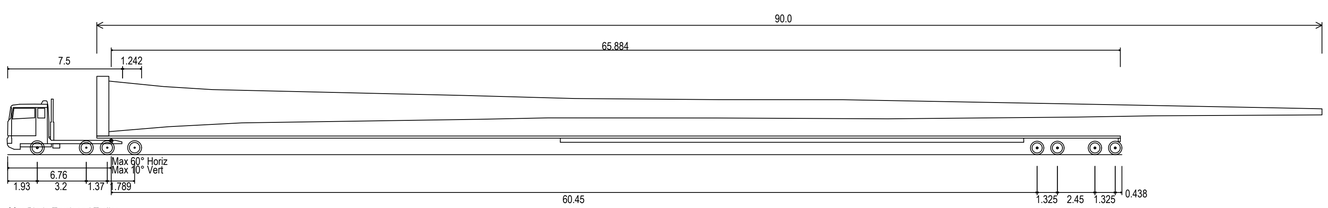

90m Blade Truck and Trailer	
Overall Length	72.748m
Overall Width	2.591m
Overall Body Height	3.628m
Min Body Ground Clearance	0.348m
Max Track Width	2.591m
Lock-to-lock time	2.00s
Max Wheel Angle	60.00°

90m BLADE TRUCK AND TRAILER

SCALE NTS

TO BE PRINTED IN COLOUR

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REV	DETAIL	DRN	CHK	APP	DATE

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p 07 3870 8868
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mail@icubed.com.au
ACN 106 675 156

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PROJECT	CHALUMBIN WIND FARM
TITLE	TRANSPORT ROUTE STUDY ROUTE 1 TURN 12
DRAWING STATUS	PRELIMINARY
PROJECT No.	20-315
GDA	DO NOT SCALE DRAWING MANUALLY
SCALE	AS SHOWN
SIZE	A1
DRAWING No.	CHLWF-TRS-TURN 12
REV.	B

LEGEND

- LP — EXISTING LIGHT POLE
- SI — EXISTING SIGN
- PP — EXISTING POWER POLE
- TS — EXISTING TRAFFIC SIGNAL
- EXTENT OF AREA TO BE CLEARED (EXTENT OF BLADE)
- TRUCK OVER DIMENSIONAL WHEEL PATH
- OVER DIMENSIONAL TURNING AREA
- PROPOSED GRAVEL WIDENING

NOTES

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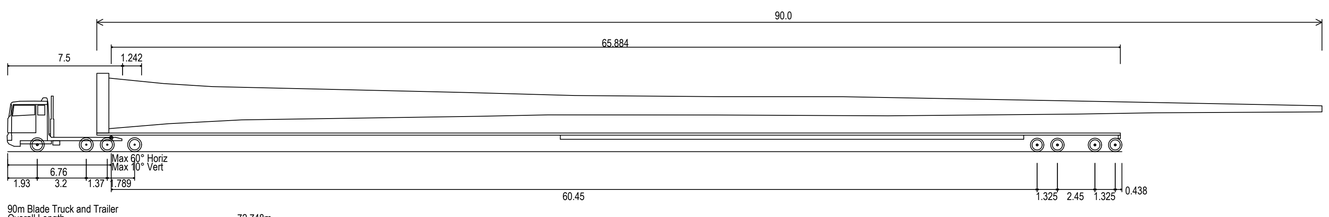
INTERSECTION EAST EVELYN ROAD / KENNEDY HWY - 90m BLADE TRUCK AND TRAILER

SCALE 1:500



90m Blade Truck and Trailer	
Overall Length	72.748m
Overall Width	2.591m
Overall Body Height	3.628m
Min Body Ground Clearance	0.348m
Max Track Width	2.591m
Lock-to-lock time	2.00s
Max Wheel Angle	60.00°

90m BLADE TRUCK AND TRAILER

SCALE NTS

TO BE PRINTED IN COLOUR

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REV	DETAIL	DRN	CHK	APP	DATE
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A	PRELIMINARY	DK	BP	TJS	11/06/2021

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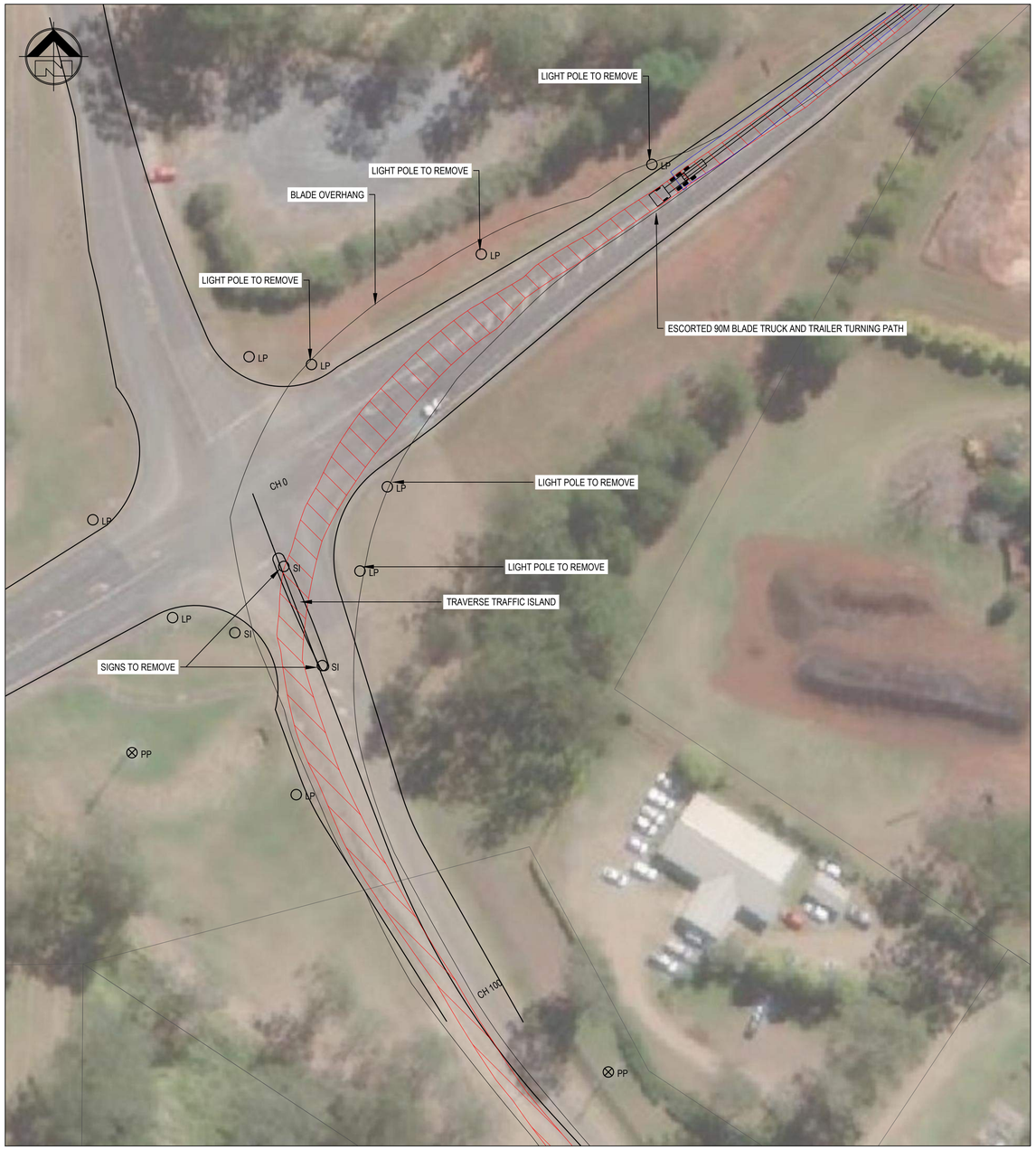
Attexo

PROJECT	CHALUMBIN WIND FARM
TITLE	TRANSPORT ROUTE STUDY ROUTE 1 TURN 13
DRAWING STATUS	PRELIMINARY
PROJECT No.	20-315
SCALE	AS SHOWN
SIZE	A1
DRAWING No.	CHLWF-TRS-TURN 13
REV.	B



INTERSECTION KENNEDY HWY / TULLY FALLS ROAD - 90m BLADE TRUCK AND TRAILER

SCALE 1:500

LEGEND

LP	EXISTING LIGHT POLE
SI	EXISTING SIGN
PP	EXISTING POWER POLE
TS	EXISTING TRAFFIC SIGNAL
	EXTENT OF AREA TO BE CLEARED (EXTENT OF BLADE)
	TRUCK OVER DIMENSIONAL WHEEL PATH
	OVER DIMENSIONAL TURNING AREA
	PROPOSED GRAVEL WIDENING

NOTES

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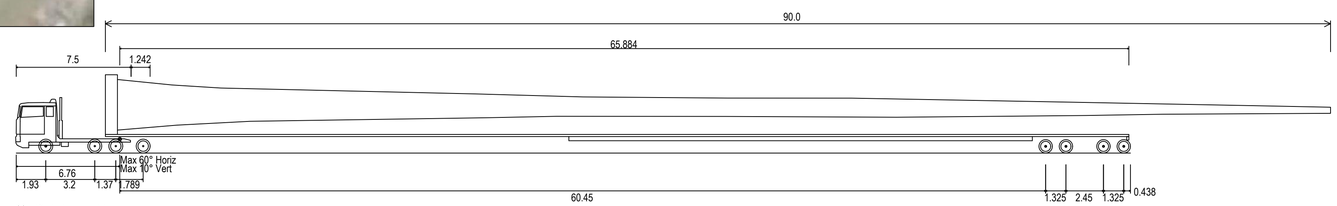

90m Blade Truck and Trailer

Overall Length	72.748m
Overall Width	2.591m
Overall Body Height	3.628m
Min Body Ground Clearance	0.348m
Max Track Width	2.591m
Lock-to-lock time	2.00s
Max Wheel Angle	60.00°

90m BLADE TRUCK AND TRAILER

SCALE NTS

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REV	DETAIL	DRN	CHK	APP	DATE
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PO Box 878
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ACN 106 675 156

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PROJECT: CHALUMBIN WIND FARM

TITLE: TRANSPORT ROUTE STUDY
ROUTE 1
TURN 14

DRAWING STATUS: PRELIMINARY

PROJECT No. 20-315

CAD DO NOT AMEND MANUALLY

SCALE: AS SHOWN

SIZE: A1

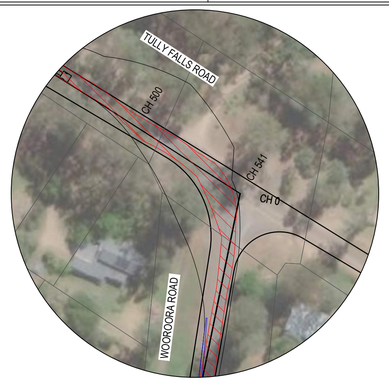
DRAWING No. CHLWF-TRS-TURN 14

REV: B

LEGEND

- STREAM ORDER - LOW IMPACT
- STREAM ORDER - MODERATE IMPACT
- STREAM ORDER - HIGH IMPACT
- STREAM ORDER - MAJOR IMPACT
- PROPERTY BOUNDARY
- PROJECT BOUNDARY
- BLADE IMPACT OUTSIDE OF ROAD RESERVE
- EXISTING ROAD OUTSIDE OF ROAD RESERVE
- CULTURAL HERITAGE HIGH CONSTRAINTS
- ECOLOGICAL SENSITIVITY HIGH CONSTRAINTS

- ROAD SECTION - 1
- ROAD SECTION - 2
- ROAD SECTION - 3
- ROAD SECTION - 4
- ROAD SECTION - 5
- ROAD SECTION - 6
- ROAD SECTION - 7
- ROAD SECTION - 8

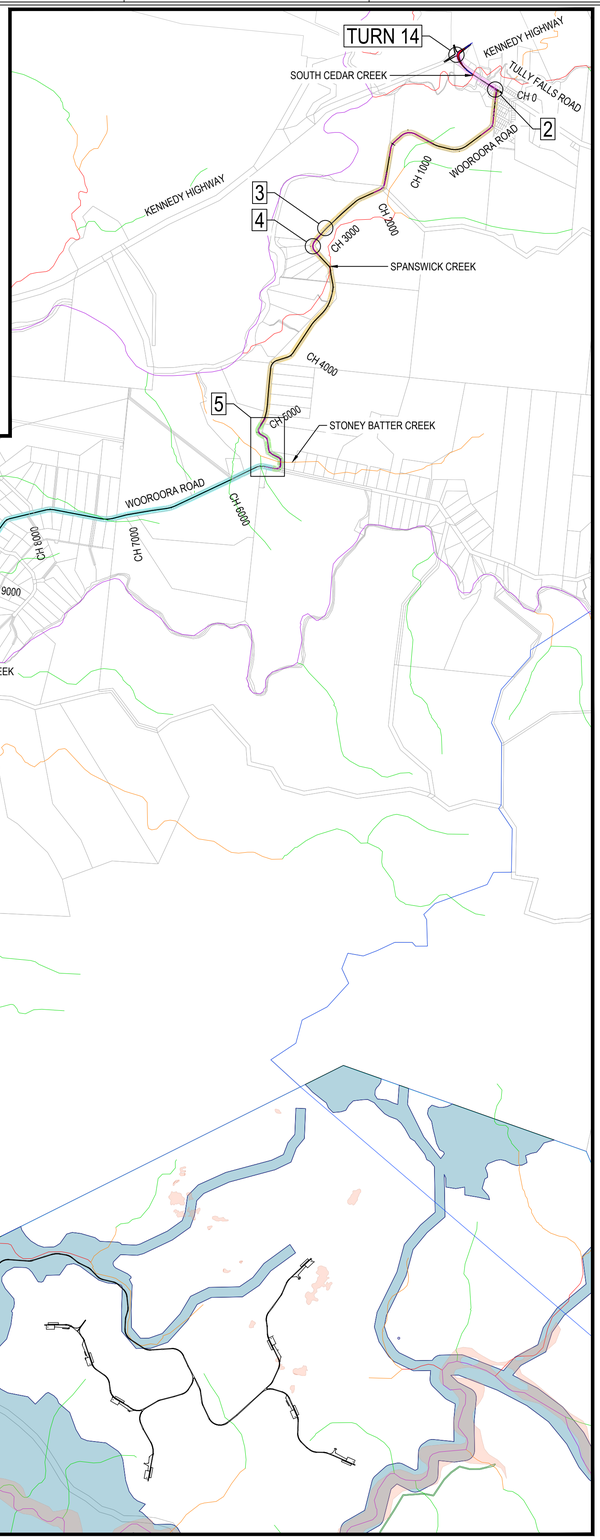


[2] TULLY FALLS/WOOROORA RD

SCALE 1:1,000

[3] WOOROORA RD - CH 2,600

SCALE 1:1,000

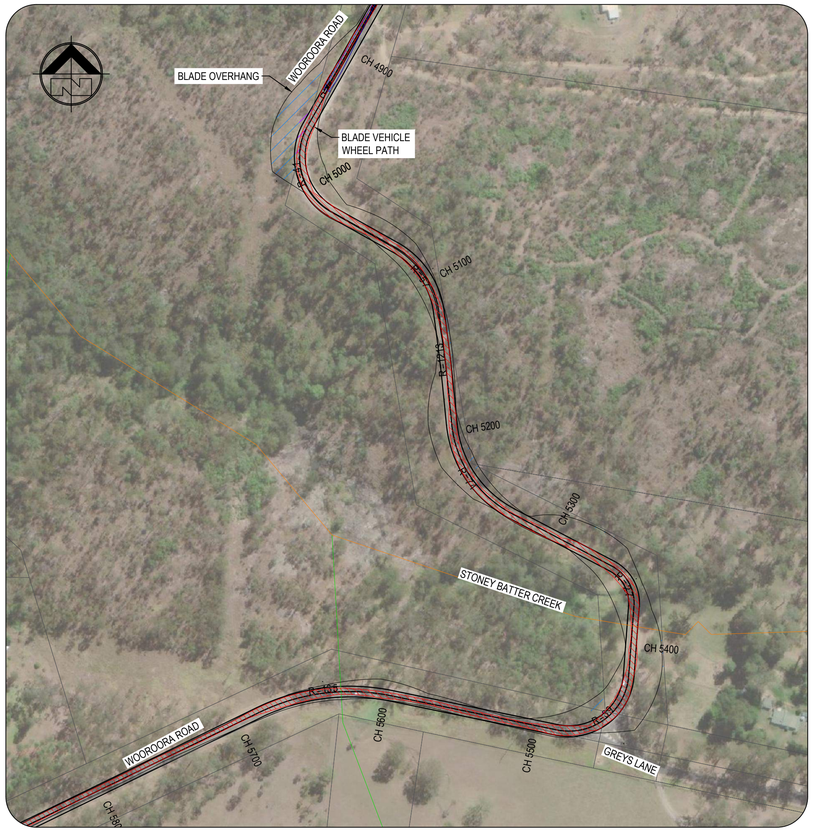


EXTERNAL DELIVERY ROUTE

SCALE 1:30,000

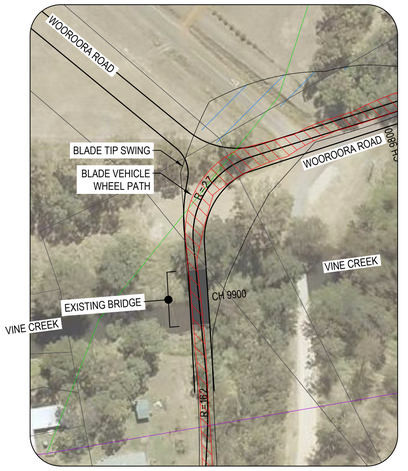
[4] WOOROORA RD - CH 2,800

SCALE 1:1,000



[5] WOOROORA RD - CH 4,900 - 5,500

SCALE 1:2,000



[6] WOOROORA RD - CH 9,850

SCALE 1:1,000

[7] WOOROORA RD - CH12,450

SCALE 1:1,000

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mail@icubed.com.au ACN 106 675 156
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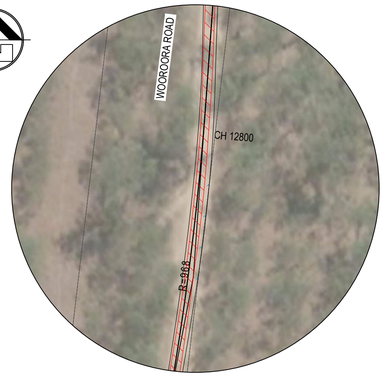
PROJECT: CHALUMBIN WIND FARM

TITLE: TRANSPORT ROUTE STUDY
ROUTE 1
RAVENSHOE TO SITE - SHEET 1

DRAWING STATUS: PRELIMINARY

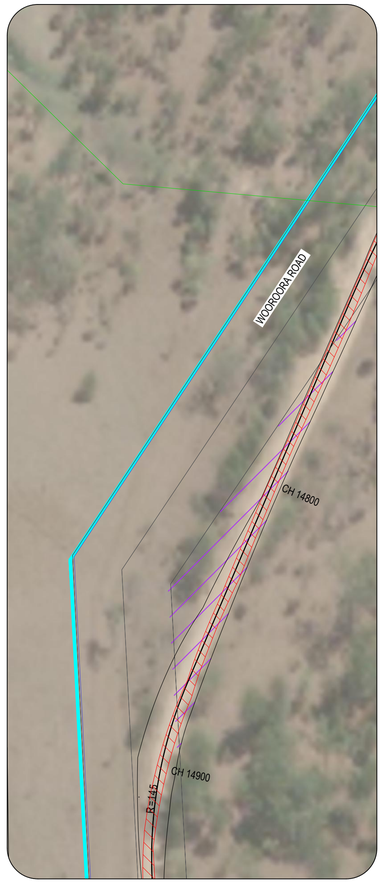
PROJECT No. 20-315 | cad DO NOT AMEND MANUALLY | SCALE AS SHOWN | SIZE A1

DRAWING No. CHLWF-TRS-WOOR 1 | REV. B

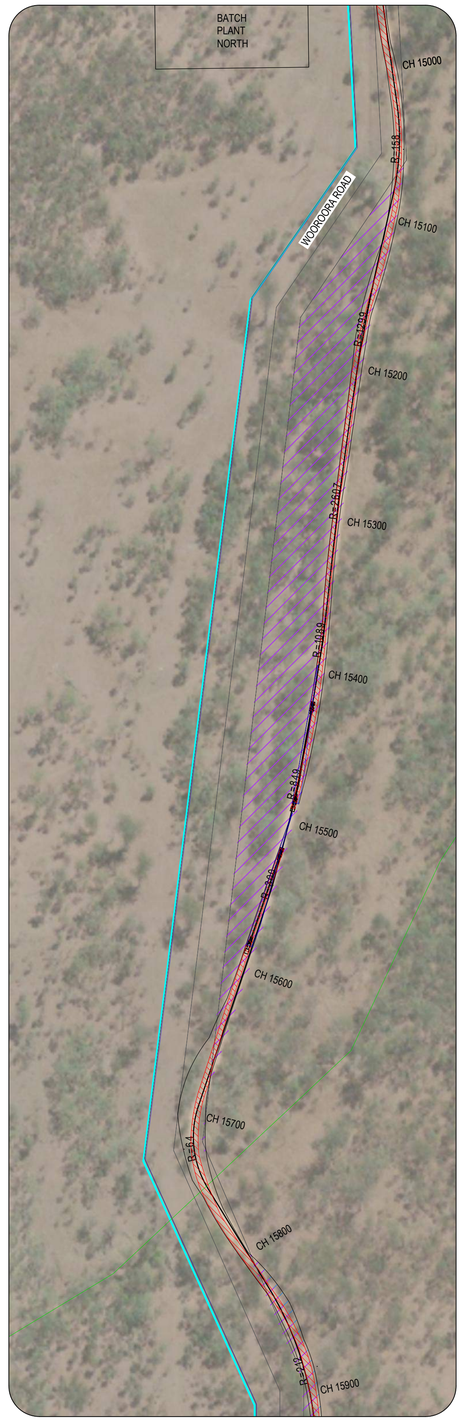


[8] WOOROORA RD - CH12,850

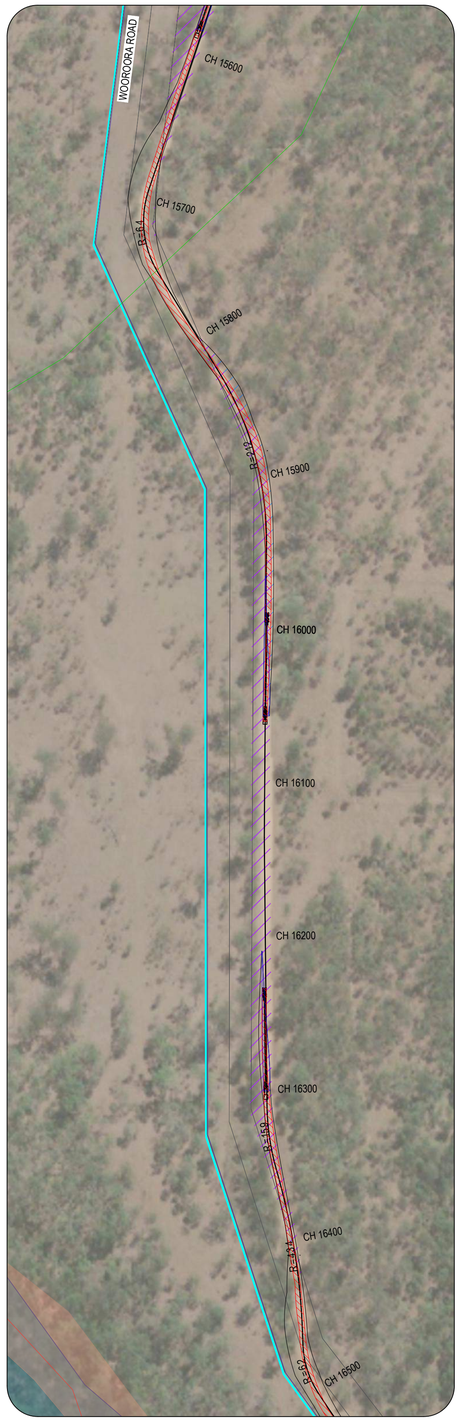
[9] WOOROORA RD - CH 13,550



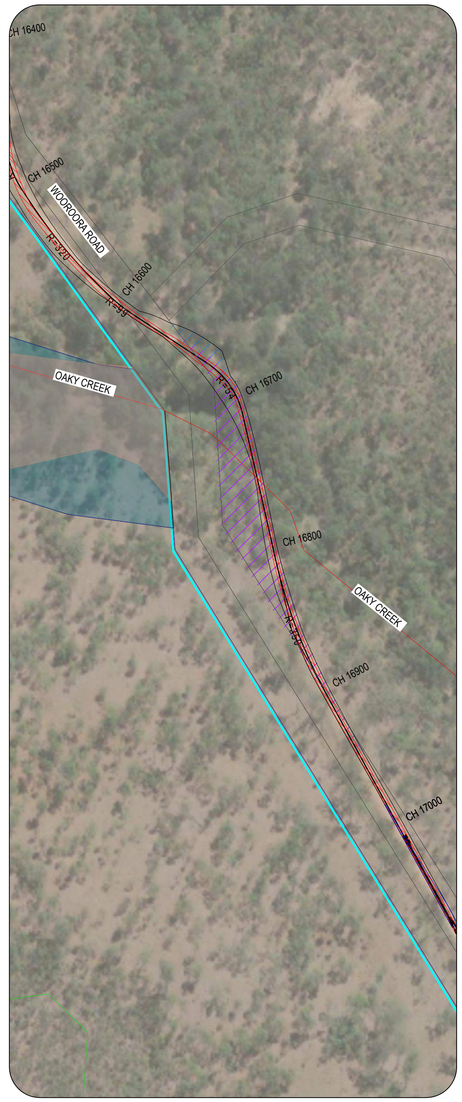
[11] WOOROORA RD - CH14,800



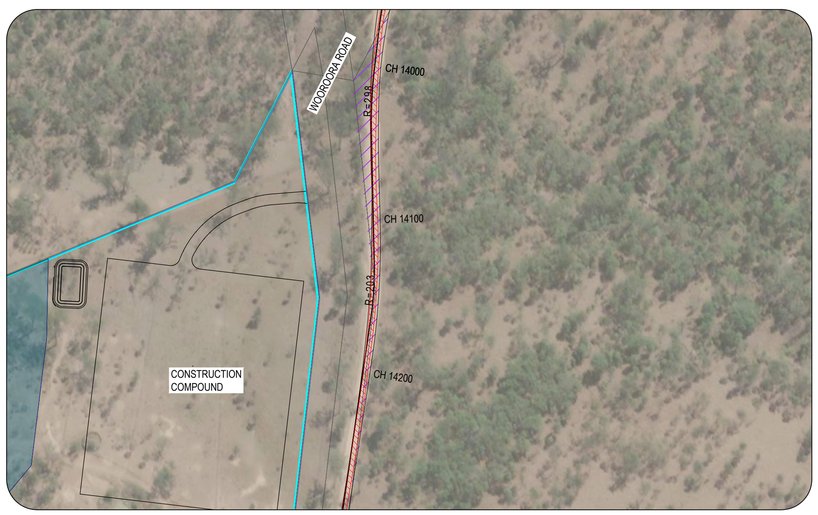
[12] WOOROORA RD - CH 15,100 - 15,700



[13] WOOROORA RD - CH 15,800 - 16,400



[14] WOOROORA RD - CH 16,650 - 16,950



[10] WOOROORA RD - CH 14,000 - 14,300

LEGEND

- STREAM ORDER - LOW IMPACT
- STREAM ORDER - MODERATE IMPACT
- STREAM ORDER - HIGH IMPACT
- STREAM ORDER - MAJOR IMPACT
- PROJECT BOUNDARY
- PROPERTY BOUNDARY
- BLADE IMPACT OUTSIDE OF ROAD RESERVE
- EXISTING ROAD OUTSIDE OF ROAD RESERVE
- CULTURAL HERITAGE HIGH CONSTRAINTS
- ECOLOGICAL SENSITIVITY HIGH CONSTRAINTS

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ACN 106 675 156

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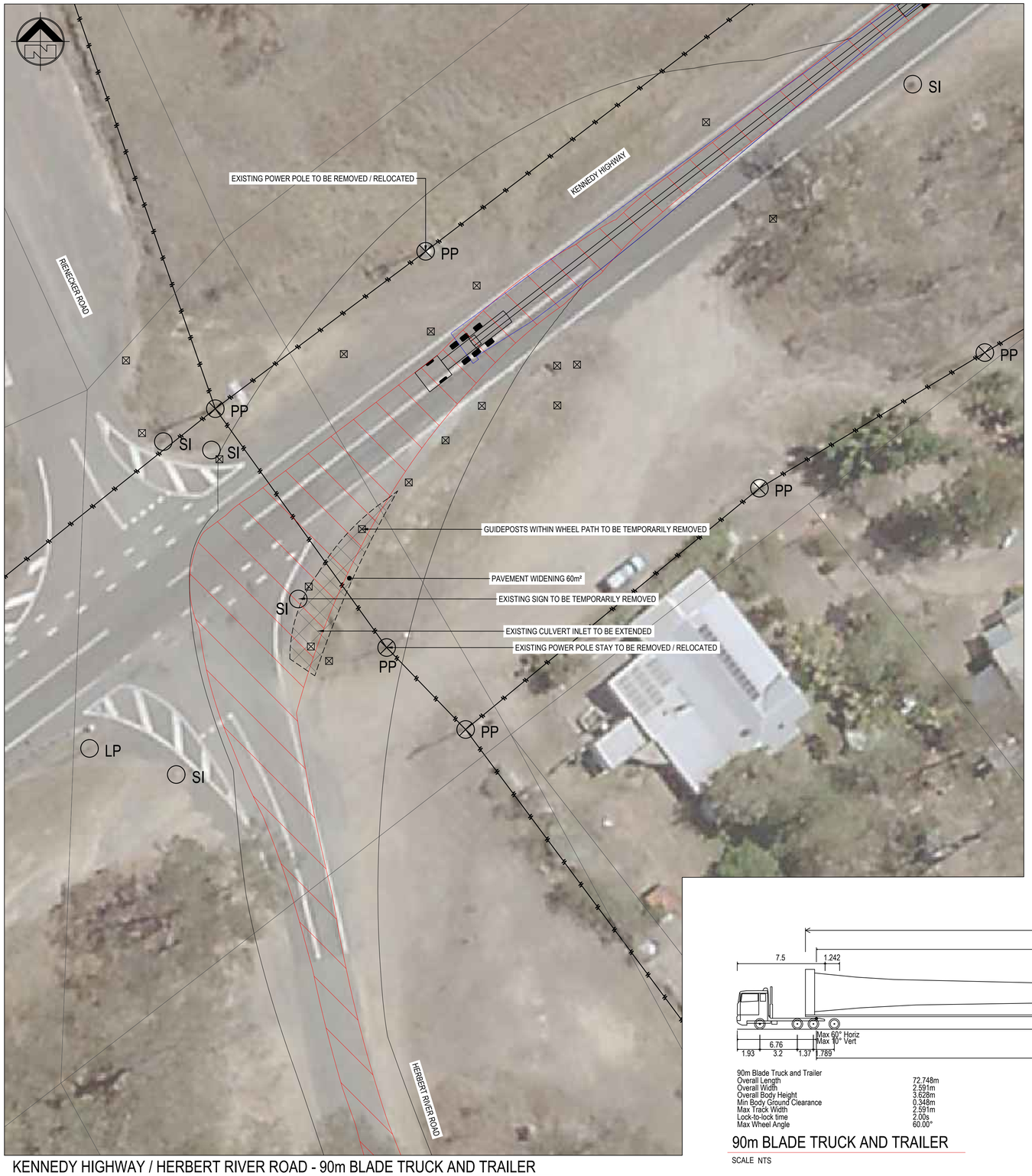
PROJECT: CHALUMBIN WIND FARM
TITLE: TRANSPORT ROUTE STUDY
ROUTE 1
RAVENSHOE TO SITE - SHEET 2

DRAWING STATUS: PRELIMINARY
PROJECT No: 20-315
SCALE: AS SHOWN
SIZE: A1
DRAWING No: CHLWF-TRS-WOOR 2
REV: B



KENNEDY HIGHWAY / HERBERT RIVER ROAD - 90m BLADE TRUCK AND TRAILER

SCALE 1:250

LEGEND

- LP — EXISTING LIGHT POLE
- SI — EXISTING SIGN
- PP — EXISTING POWER POLE
- TS — EXISTING TRAFFIC SIGNAL
- EXTENT OF AREA TO BE CLEARED (EXTENT OF BLADE)
- TRUCK OVER DIMENSIONAL WHEEL PATH
- OVER DIMENSIONAL TURNING AREA
- PROPOSED GRAVEL WIDENING
- CADASTRAL BOUNDARIES

NOTES

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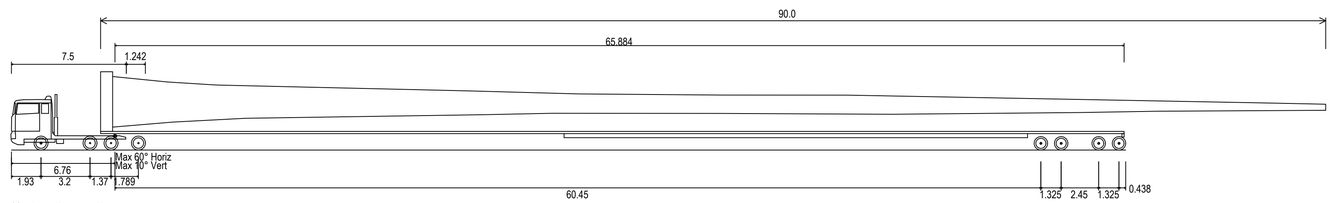

90m Blade Truck and Trailer	
Overall Length	72.748m
Overall Width	2.591m
Overall Body Height	3.628m
Min Body Ground Clearance	0.348m
Max Track Width	2.591m
Lock-to-lock time	2.00s
Max Wheel Angle	60.00°

90m BLADE TRUCK AND TRAILER

SCALE NTS

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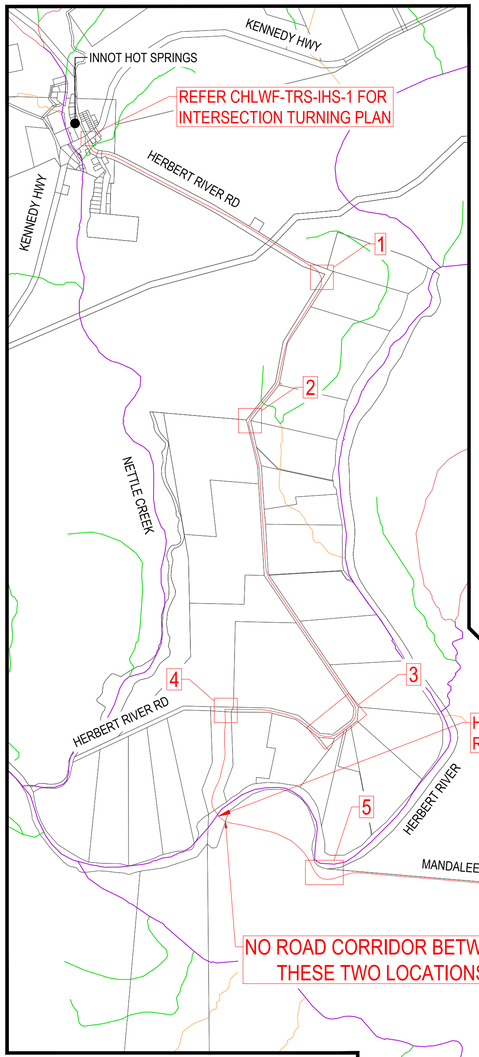
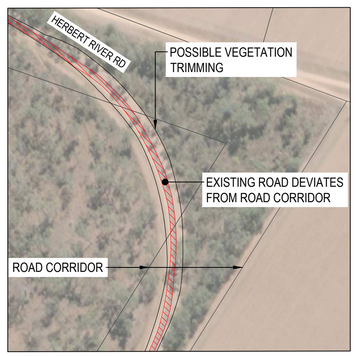
PROJECT	CHALUMBIN WIND FARM
TITLE	TRANSPORT ROUTE STUDY ALTERNATE ROUTE - INNOT HOT SPRINGS KENNEDY HIGHWAY / HERBERT RIVER ROAD INT.
DRAWING STATUS	PRELIMINARY
PROJECT No.	20-315
SCALE	AS SHOWN
SIZE	A1
DRAWING No.	CHLWF-TRS-IHS-1
REV	A





[1] EXISTING ROAD LEAVING CORRIDOR

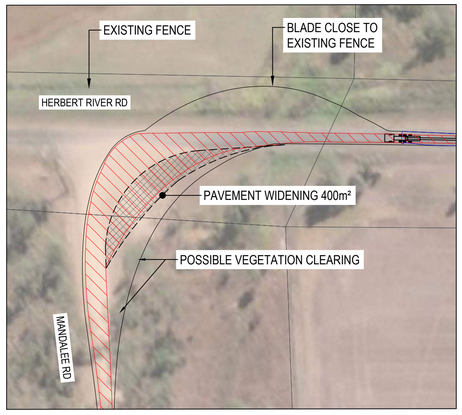
SCALE 1:2000

[2] ROAD BEND

SCALE 1:2000

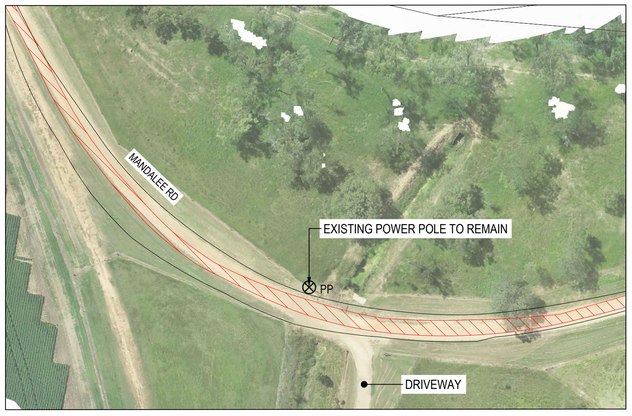
[3] ROAD BENDS

SCALE 1:2000



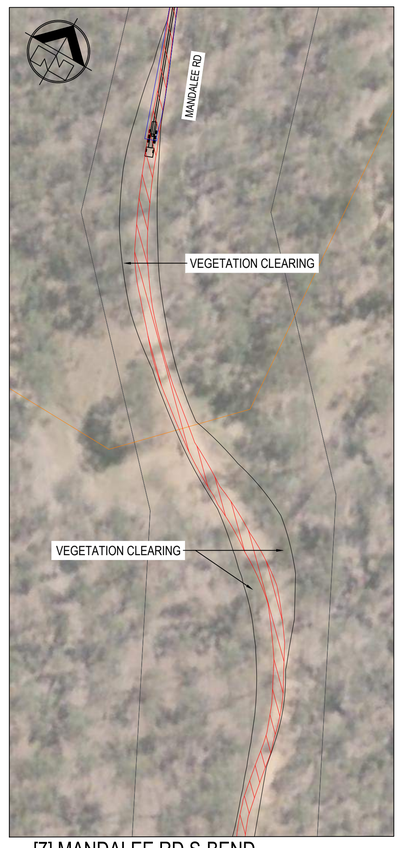
[4] HERBERT RIVER RD / MANDALEE RD INTERSECTION

SCALE 1:1000



[5] MANDALEE RD BEND

SCALE 1:1000



[7] MANDALEE RD S-BEND

SCALE 1:1000

ALL VIEWPORTS ARE ORIENTATED WITH NORTH UP THE PAGE UNLESS NOTED OTHERWISE

LEGEND

- EXTENT OF AREA TO BE CLEARED (EXTENT OF BLADE)
- TRUCK OVER DIMENSIONAL WHEEL PATH
- OVER DIMENSIONAL TURNING AREA
- PROPOSED GRAVEL WIDENING
- CADASTRAL BOUNDARIES
- STREAM ORDER - LOW
- STREAM ORDER - MODERATE
- STREAM ORDER - HIGH
- STREAM ORDER - MAJOR

NOTES

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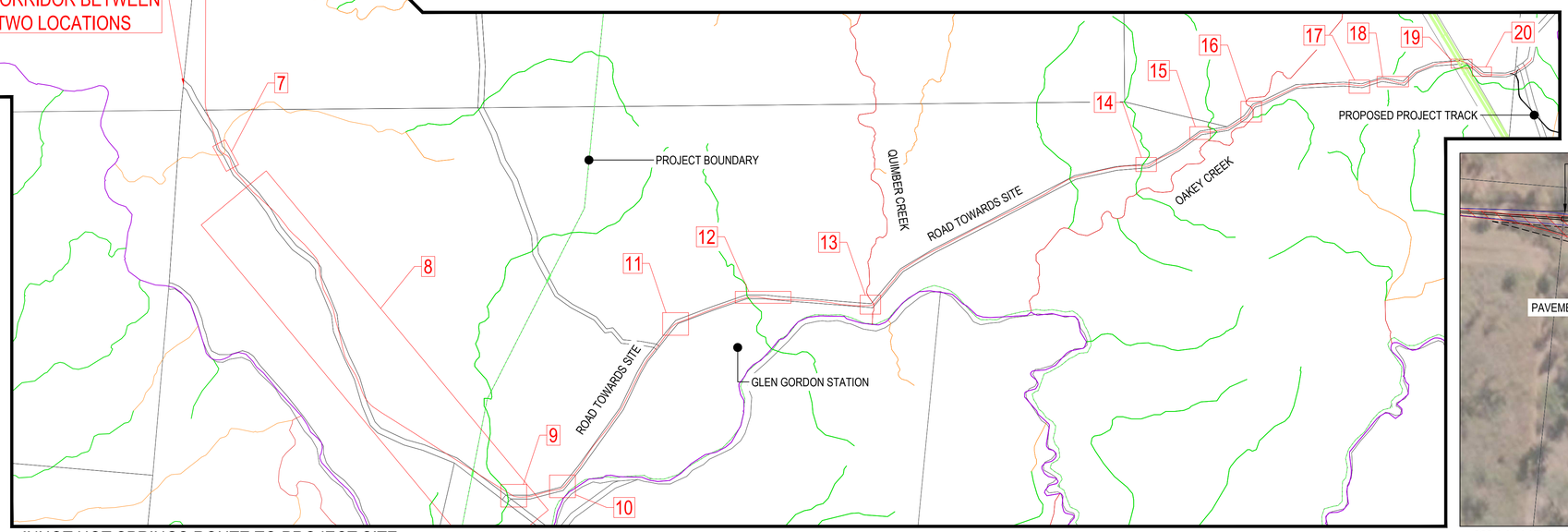
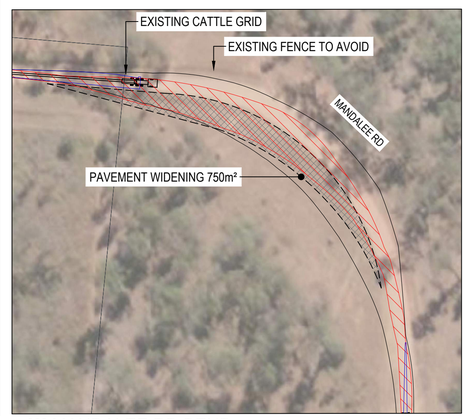


INNOT HOT SPRINGS ROUTE TO PROJECT SITE

SCALE 1:30,000



[6] MANDALEE RD BEND

SCALE 1:1000

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REV	DETAIL	DRN	CHK	APP	DATE
A	PRELIMINARY	DK	BP	TJS	7/10/2022

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i³ consulting pty ltd
engineering consultants
innovation, ingenuity, inspiration
L2 39 Sherwood Rd, Toowong, Qld 4066
PO Box 978, Toowong, Qld 4066
www.icubed.com.au
mail@icubed.com.au
ABN 89 106 675 156
ACN 106 675 156
p 07 3870 8888

Attexo

PROJECT: CHALUMBIN WIND FARM

TITLE: TRANSPORT ROUTE STUDY
ALTERNATE ROUTE - INNOT HOT SPRINGS
INNOT HOT SPRINGS TO SITE - SHEET 1 OF 3

DRAWING STATUS: PRELIMINARY

PROJECT No. 20-315

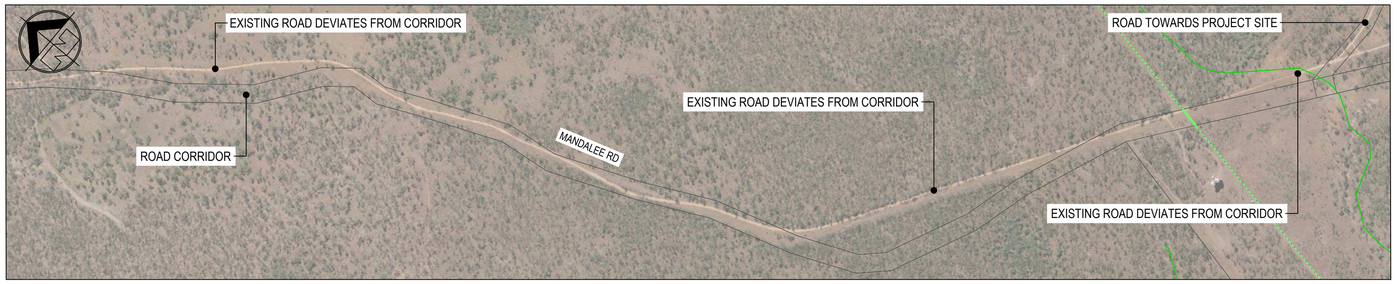
CAD DO NOT WORK MANUALLY

SCALE: AS SHOWN

SIZE: A1

DRAWING No. CHLWF-TRS-IHS-2

REV. A

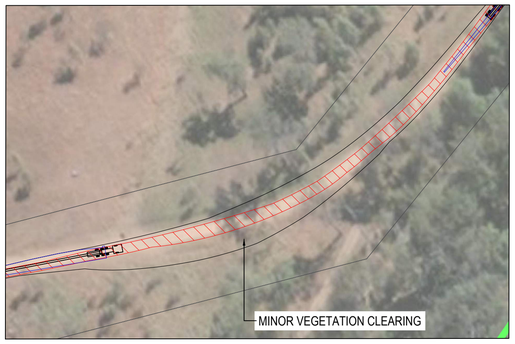


[8] EXISTING ROAD DEVIATES FROM CORRIDOR

SCALE 1:10000

[9] MANDALEE ROAD BEND TOWARDS PROJECT

SCALE 1:1000

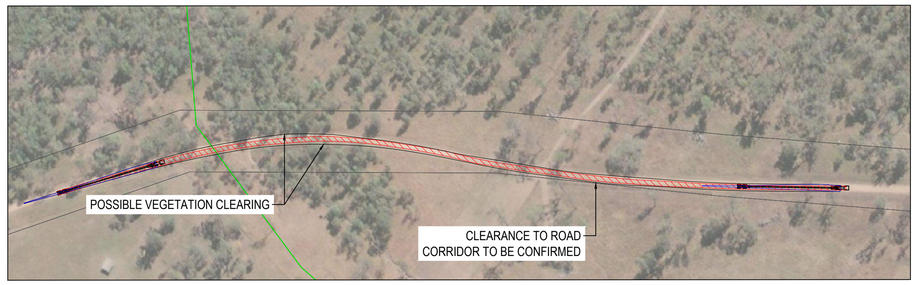


[10] ROAD BEND

SCALE 1:1000

[11] ROAD BEND

SCALE 1:1000

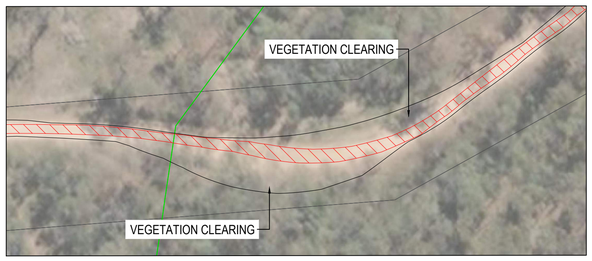


[12] ROAD BEND

SCALE 1:2000

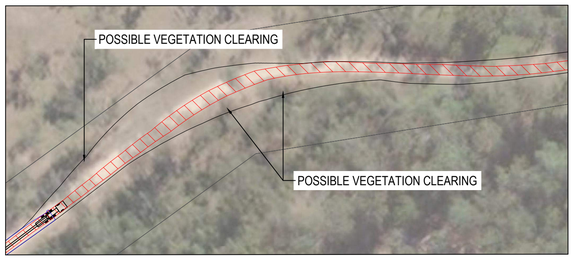
[13] ROAD BEND

SCALE 1:1000



[14] ROAD BEND

SCALE 1:1000



[15] ROAD BEND

SCALE 1:1000

[16] ROAD S-BEND

SCALE 1:1000

ALL VIEWPORTS ARE ORIENTATED WITH NORTH UP THE PAGE UNLESS NOTED OTHERWISE

LEGEND

- EXTENT OF AREA TO BE CLEARED (EXTENT OF BLADE)
- TRUCK OVER DIMENSIONAL WHEEL PATH
- OVER DIMENSIONAL TURNING AREA
- PROPOSED GRAVEL WIDENING
- CADASTRAL BOUNDARIES

NOTES

1. ALL GUIDEPOSTS WITHIN OVER-DIMENSIONAL WHEEL PATH TO BE REMOVED PRIOR TO TRANSPORTATION OF WIND TURBINE BLADES
2. CLEARING OF VEGETATION SHALL ONLY BE PERFORMED AFTER RELEVANT AUTHORITY APPROVALS ARE OBTAINED, IF REQUIRED FOR ROAD UPGRADE
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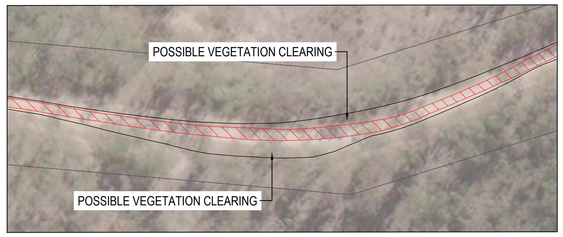
PROJECT	CHALUMBIN WIND FARM
TITLE	TRANSPORT ROUTE STUDY ALTERNATE ROUTE - INNOT HOT SPRINGS INNOT HOT SPRINGS TO SITE - SHEET 2 OF 3
DRAWING STATUS	PRELIMINARY
PROJECT No.	20-315
SCALE	AS SHOWN
SIZE	A1
DRAWING No.	CHLWF-TRS-IHS-3
REV.	A

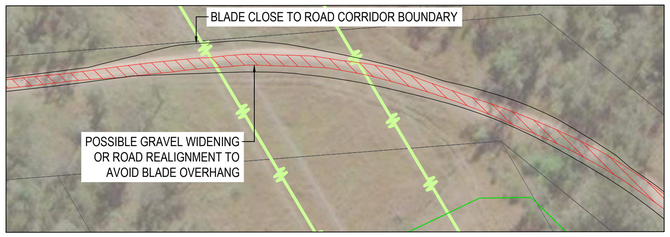


[17] ROAD BEND

SCALE 1:1000

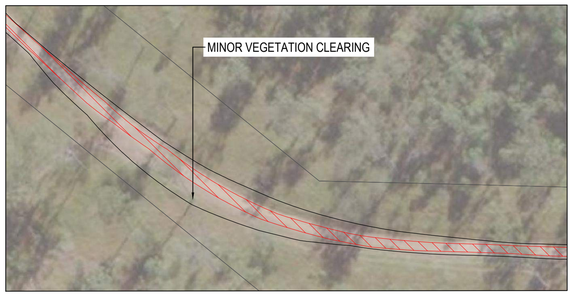
[18] ROAD S-BEND

SCALE 1:1000



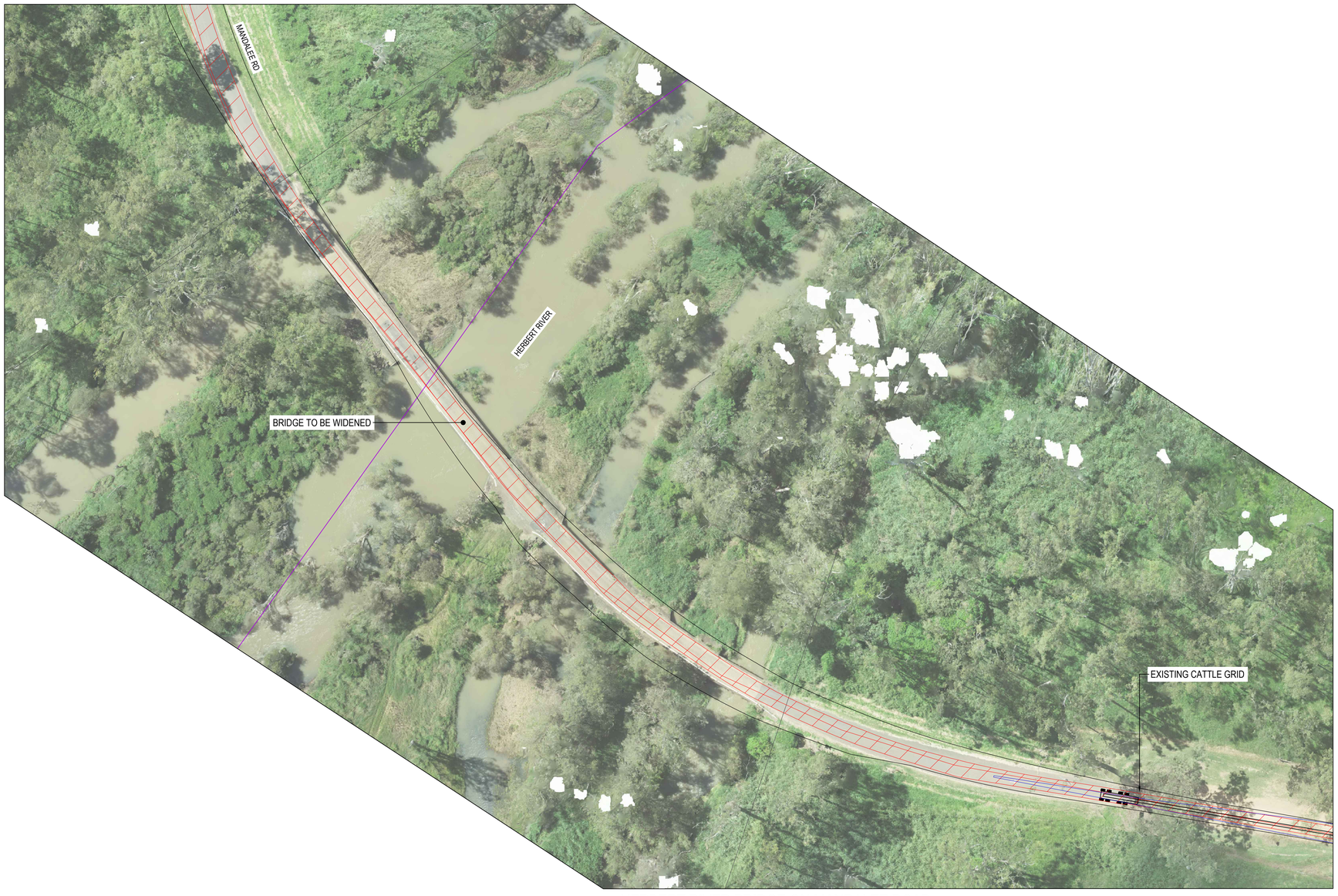
[19] ROAD BEND

SCALE 1:1000



[20] ROAD BEND

SCALE 1:1000



HERBERT RIVER BRIDGE ON MANDALEE ROAD

SCALE 1:500

ALL VIEWPORTS ARE ORIENTATED WITH NORTH UP THE PAGE UNLESS NOTED OTHERWISE

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PROJECT: CHALUMBIN WIND FARM

TITLE: TRANSPORT ROUTE STUDY
ALTERNATE ROUTE - INNOT HOT SPRINGS
INNOT HOT SPRINGS TO SITE - SHEET 3 OF 3

DRAWING STATUS: PRELIMINARY

PROJECT No. 20-315

cad DO NOT AMEND MANUALLY

SCALE: AS SHOWN

SIZE: A1

DRAWING No. CHLWF-TRS-IHS-4

REV. A

Appendix D – Bruce Highway 'E2G' Upgrade Plan

Plan shown overleaf