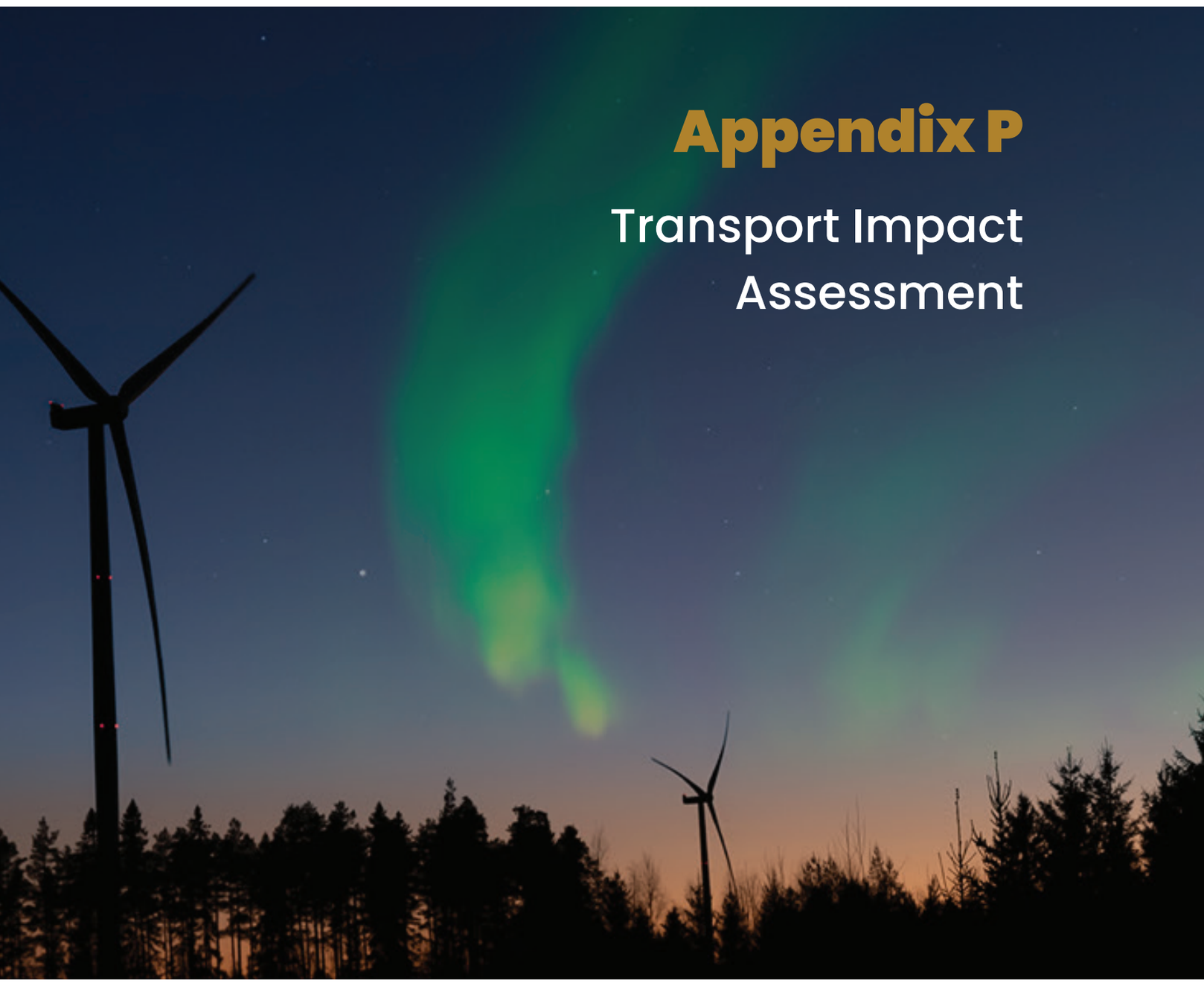

Appendix P

Transport Impact Assessment

KENTBRUCK GREEN POWER HUB

Prepared for
Neoen Australia Pty Ltd
ABN: 57 160 905 706

Transport Impact Assessment

Kentbruck Green Power Hub Environment Effects Statement

28-Jun-2024
Kentbruck Green Power Hub
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Transport Impact Assessment

Kentbruck Green Power Hub Environment Effects Statement

Client: Neoen Australia Pty Ltd

ABN: 57 160 905 706

Prepared by
AECOM Australia Pty Ltd
Wurundjeri and Bunurong Country, Tower 2, Level 10, 727 Collins Street, Melbourne VIC 3008, Australia
T +61 1800 868 654 www.aecom.com
ABN 20 093 846 925

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Quality Information

Document	Transport Impact Assessment
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Date	28-Jun-2024
Prepared by	Will Chen, Aaron Musgrove, Tim Clune
Reviewed by	Tim Clune, Matthew Oka, Anwar Syed, Benjamin Mentha

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Executive Summary

Overview

The Kentbruck Green Power Hub (Project) is a wind farm being proposed by Neoen Australia Pty Ltd (Neoen). The site is in the far southwest area of Victoria, approximately 330 kilometres west of Melbourne, around 5 kilometres from Nelson and 25 kilometres from Portland. The Project indicatively consists of the following:

- Up to 105 wind turbine generators (WTGs) and associated infrastructure, with site accesses via Portland-Nelson Road. The WTGs are located primarily within an actively managed and harvested pine forest, owned by Mount Gambier plantation company: Green Triangle Forest Products (GTFP).
- Electricity from the site will need to be transported to the existing transmission network via the Heywood Terminal Station through a new 275 kV transmission line. The new transmission line would include 26.6 km of underground line through the Cobboboonee National Park and Forest Park, buried underneath Boiler Swamp Road.

EES traffic study requirements

A Transport Impact Assessment (TIA) has been undertaken to determine the potential impacts of the Project on the local transport network with regards to all users. Following which, identification of recommended management and initial mitigation options where appropriate, and next steps in order to reduce potential risks of the Project during all stages, has been undertaken as part of the TIA.

Where possible at this stage of project development the report has aimed to satisfy the Project's Environment Effects Statement (EES), notably chapter 4.6 with regards to transport specific requirements. The TIA inputs form part of the overall EES report submission and are linked to associated EES technical studies where appropriate. As discussed in this TIA report, many of the EES scoping requirements will be considered in more detail as project elements are verified, other specialist studies completed and subsequent Traffic Management Plans (TMP) are completed in consultation with key stakeholders.

The EES requirements specifically related to traffic and transport are outlined in Table 1 in this TIA report, which also includes a reference to the sections within this report in which the requirements have been considered at this stage of the Project.

Existing conditions

An existing transport conditions review was undertaken. This was informed via a combination of desktop reviews, site visit, crash/traffic data analysis and review of relevant policies and legislation. The key existing condition findings are summarised below:

- The major arterial roads to access the wind farm and transmission line options, via Portland-Nelson Road and Henty Highway are lightly trafficked with estimated peak hour two-way traffic volumes of 120 (51% heavy) and 720 (31% heavy) vehicles respectively. Both roads are sealed with good delineation provided and no apparent pavement defects. Given a typical one-way road capacity is 900 vehicles per hour (two-way 1,800 vehicles per hour) there is spare network capacity to facilitate traffic demand associated with the Project.
- All site access roads that form a priority intersection with Portland-Nelson Road and are proposed to serve the wind farm are unsealed. These intersections lead into a network of internal access tracks through the Kentbruck plantation. These roads were observed to have no traffic during site observations but are estimated to have 150 vehicles per week during clear-felling operations which would typically occur during winter months, as advised by GTFP.
- There is no dedicated pedestrian or cyclist infrastructure present along Portland-Nelson Road. However, Portland-Nelson Road is known to be used by recreational (including tourists, Great Southern Bike Trail nominated) and sport training bicycle route users.
- There are several formal and informal walking trails in the vicinity of the Project. Notably the Great South West Walk, which is a 250-kilometre walking track which passes through Lower Glenelg

National Park, the Cobboboonee National Park, the Discovery Bay Coastal Park, the Mount Richmond National Park and the Cape Nelson State Park.

- VicRoads CrashStats was interrogated for the last seven years of crash data (available data between 2013 to 2020) for the length of Portland-Nelson Road from the storage yard at 211 Portland-Nelson Road to the end of the Project boundary. A total of 16 crashes were found to occur with six fatal and ten serious.

  In terms of the fatal crashes, four were classified as head-on, with a single rear end and off-carriageway right bend.

Preliminary vehicle access strategy

The following preliminary vehicle access strategy is proposed at this stage of the Project:

- **Wind farm:** A total of ten vehicle access points (site entrances) are proposed to the Project wind farm site from the public road network. Each of the site entrances intersect with Portland-Nelson Road and are considered major access points to the project, with all but one entry servicing several WTGs. The following has been noted:
  - Each of the proposed access points would be used to facilitate WTG component and blade deliveries, with exception of Cowlands Lower Road. Component delivery vehicles are proposed to approach from the south-east from the storage laydown area at 211 Portland-Nelson Road (subject to agreements), turning onto each of the proposed access points.
  - All of the proposed access roads are unsealed, gravel roads, and, based on visual inspection, appear to be in reasonable condition with limited shape loss or ravelling observed.
  - Localised widening of the existing intersections would be required to permit OSOM delivery vehicles entering the site.
  - Vegetation removal has been identified for removal at all intersections however this is only over limited extents at most intersections due to the existing clearings within the road corridor.
  - It is expected that stormwater drainage management systems including swale drains and pipe culverts may also be required to be installed as part of any proposed intersection upgrade works, as there is currently nothing in place to divert runoff near the access intersections.
- **Transmission line and main substation**
  - The Portland-Nelson Road and Unnamed Road priority intersection (to the north of Sandy Hill Road, the final intersection form is to be investigated) is to be used for the construction of the main substation and commencement of the underground transmission line construction.
  - The transmission line would be underground and travel east onwards to the Heywood Terminal Station via Boiler Swamp Road. Blacks Road will act as the main transmission line entrance on the western end. Other side roads such as Mt Kincaid Road could be utilised during construction of the underground transmission line.
  - At the eastern end of the transmission line, traffic would utilise Jennings Road, accessed from the wider road network via Henty Highway, Coffeys Lane or Jarretts Road.
  - Access to the Heywood Terminal Station would be from the Henty Highway, utilising Meaghers Road and Rifle Range Road.

Impact assessment – key findings

During construction, potential impacts on the transport network include increased traffic delays, damage to road surface due to heavy vehicles and impeded access. These would be managed through the implementation of standard traffic management measures typically applied to projects of this scale and nature and incorporated into a Traffic Management Plan (TMP). The key findings of the construction stage impact assessment for the project are as follows:

- Mid-block and intersection capacity: the analysis included anticipated traffic generated by the project construction across daily, morning peak and afternoon peak. Projected life cycle traffic generation was estimated with construction comparisons and worst-case derived movement of

construction volumes at the nominated major site access points. The capacity analysis shows that construction traffic impact is negligible along Portland-Nelson Road.

- Preliminary routes assessment: Over Dimensional (OD) and Oversize Overmass (OSOM) vehicles routes have been established based on the restrictions of the study area roads. OD swept paths have been assessed and pinch points derived to understand the geometric constraints and required road section upgrades. Traffic management would be required and should be investigated as part of a TMP.
- Preliminary site access and road upgrades: a review was undertaken of the access points and roads to be used by the project during construction. Access road sections which will require upgrades or alterations due to OD movements have been identified. A site access strategy is to be completed to ensure that each of the access point intersections provide safe access and egress for construction vehicles.

Overall, impacts to the transport network during turbine and transmission line construction are expected to be relatively minor given the low traffic volumes and limited local population, and can be suitably managed through measures outlined in a TMP for the project, with the road network found to be sufficient to accommodate anticipated traffic volumes.

Summary of mitigation measures

Mitigation measures have been developed in response to the identified Project impacts to minimise these during the Project stages, these are detailed in Chapter 12.0 of this TIA and summarised below:

- *MM-T01 – Communications Plan*
- *MM-T02 – Traffic Management Plans*
- *MM-T03 – Road Safety Audits*
- *MM-T04 – OD/OSOM transport route assessments*

*MM-T05 – Access strategy and design*The Project will be required to seek the relevant permits and approvals from the Department of Transport and Planning (DTP) and Glenelg Shire Council. These include roadworks, oversize vehicles and rail track crossing permits, as well as Memorandum of Authorisation and other approvals.

Abbreviations

Abbreviation	Definition
AADT	Average Annual Daily Traffic
AECOM	AECOM Australia Pty Ltd
AWDT	Average Weekday Daily Traffic
DEECA	Department of Energy, Environment and Climate Action
DOS	Degree of Saturation
DTP	Department of Transport and Planning
EES	Environment Effects Statement
EMF	Environmental Management Framework
LOS	Level of Service
Kilometres	Kilometre
Kilometres/hr	Kilometres per hour
NHVR	National Heavy Vehicle Regulator
OD	Over dimensional vehicle
OSOM	Oversize Overmass
SISD	Safe Intersection Sight Distances
TMP	Traffic Management Plan

Glossary of terms

Term	Definition
AADT	This measurement provides the total volume of vehicle traffic of a road for a year divided by 365 days.
AWDT	Average daily traffic volume between Monday and Friday.
Average delay	This is the average amount of time it takes a vehicle to negotiate an intersection, including the time to negotiate corners and the time stopped in queues or waiting for a green signal.
Degree of Saturation (DOS)	Ratio of demand to capacity. A DOS of 1.0 or more in theory represents saturated conditions where the demand exceeds the capacity. For a signalised intersection, a DOS of 0.9 is usually adopted as the practical capacity threshold.
LOS	This is an alpha-numeric rating of the overall performance of an intersection, ranging from LOS A (very good) to LOS F (very poor).
Mid-block	A location around the mid-point between two intersections.
National Heavy Vehicle Regulator (NHVR)	The NHVR are Australia's regulator for all heavy vehicles. The National Heavy Vehicle Regulator operates under DTP.
OD vehicle	Over dimensional (OD) vehicles are those that exceed 5.0 metres wide/high or 30.0 metres long or 100.0 tonnes gross mass. OD vehicles should be reviewed for transportation with the NHVR permit process to permit travel. Other additional permits/conditions are required for access, such as escorts, travel times, etc.
OSOM vehicle	Victoria has a class 1 gazetted Oversize and Overmass (OSOM) vehicle network. The VicRoads website details the areas of operation, exemption and prohibited routes and structures that are up to 3.5 metres wide, 4.6 metres high, 25.0 metres long and 49.5 tonnes.
Other Injury	Injury sustained in a road crash for which a person did not require hospitalisation.
Serious Injury	Injury sustained in a road crash for which the person was admitted to hospital.

References

The following reports and / or parties have been referenced or consulted in the preparation of this report:

- Victoria Government Gazette – *Road Management Act 2004*, Code of Practice, Worksite Safety, Traffic Management 2010.
- *Road Management Act 2004*.
- Department of Transport (VicRoads) – General Guidance.
- Department of Transport (VicRoads) Heavy Vehicle Network Maps in Victoria.
- Department of Transport (VicRoads) Road Management Plan
- National Heavy Vehicle Regulator (NHVR) website / journey planner.
- Victorian Planning Provisions, Clause 52.32 – Wind Energy Facility
- Glenelg Planning Scheme – Clause 18.01-1S Land use and transport planning
- Glenelg Planning Scheme – Clause 18.01-2S Transport system
- Glenelg Planning Scheme – Clause 18.02-4S Car parking
- Glenelg Shire Council Road Management Plan 2017
- Best Practice Guidelines for Implementation of Wind Energy Projects in Australia, Clean Energy Council, June 2018
- Representatives from DTP-RRV, GSC and GTFP

1.0 Introduction

AECOM Australia Pty Ltd (AECOM) have been commissioned by Neoen Australia Pty Ltd (Neoen) to produce a Transport Impact Assessment (TIA) report to inform the Kentbruck Green Energy Hub (the Project) Environment Effects Statement (EES).

The Project indicatively consists of up to 105 turbines and associated infrastructure, and a transmission line to connect the Project to the electricity network.

1.1 Purpose

This TIA identifies and assesses potential transport impacts during the construction, operation, and decommissioning stages of the Project. The TIA also identifies and recommends mitigation measures to avoid, minimise and manage potential impacts which will inform the development of an Environmental Management Framework (EMF) for the project. The mitigation measures listed in the EMF would be implemented in the approvals and management plans for the Project.

1.2 Why understanding transport impacts is important

Project activities and vehicles have the potential to impact the surrounding transport network during the construction, operation, and decommissioning stages of the Project. Transport impacts can be to network infrastructure condition, road/intersection operational capacity, safety, ultimately affecting network users, the surrounding community and business.

Understanding how the Project would impact the transport network is important to control and/or inform the development of effective and appropriate mitigation measures to optimise the functionality, operation and safety of the transport network during all stages of the Project.

1.3 Project area

The Kentbruck Green Power Hub is a proposed wind farm in the far southwest area of Victoria, approximately 330 kilometres west of Melbourne. The proposed site is located around five kilometres from Nelson and 25 kilometres from Portland. The site location is shown in Figure 1.

The wind farm site is approximately 8,318 hectares in size and consists of an area modified for commercial forestry use (radiata pine) with small sections of agricultural land for grazing. The site is bound by forestry to the north, highly modified land used for grazing purposes to the east and west, Discovery Bay Coastal Park to the south and the Glenelg River National Park and Cobboboonee National Park to the east and northeast.

The site is located primarily within an actively managed and harvested pine forest, owned by Green Triangle Forest Products (GTFP). A private quarry is located within the site via North Livingston Road.

1.4 Project description

Neoen is proposing a renewable energy development, known as the Kentbruck Green Power Hub, comprising a wind energy facility (wind farm) with associated infrastructure. The Project would be mostly located in an actively managed and harvested pine plantation in southwest Victoria, between Portland andNelson, in the Glenelg LGA.

The Project would involve two main components:

- A wind farm of up to 600 MW comprising up to 105 wind turbines and associated permanent andtemporary infrastructure.
- A new 275 kV underground transmission line, which would connect the Project to the existing AusNet electricity transmission network. The transmission line would extend from the eastern boundary of the wind farm site to the existing 275/500 kV Heywood Terminal Station and would be approximately 26.6km in length.

Wind farm

As shown in Figure 1, permanent infrastructure to be constructed as part of the Projectwould include:

- Up to 105 wind turbines
- Access roads, including:
    - Public roads for site access. Existing site access routes into the commercial forestry operation wouldbe utilised to minimise the need for new site entrances. Some public roads and intersections would need to be upgraded to facilitate delivery of Project components, particularly wind turbine blades.
    - Internal access roads. Existing access tracks within the commercial forestry operation and on landcurrently used for agricultural purposes would be used where possible. Some of these roads and intersections may need to be upgraded.
- Up to eight meteorological monitoring masts within the wind farm site
- Permanent hardstand areas at each turbine location, with a footprint of approximately 0.4 ha, subjectto refinement based on the dimensions of the final wind turbine model selected
- Three collector substations
- Underground powerlines connecting the wind turbines to the collector substations
- A main wind farm substation to which all the collector substations would be connected. The main substation would connect the wind farm to the existing electricity transmission network via a newtransmission line.
- A high voltage powerline connecting the collector substations to the main substation, which would be acombination of overhead and underground cabling
- Transition stations at which the high voltage powerline would transition from overhead to undergroundor vice versa (if needed; see below)
- Up to two permanent site compounds, including 30 carparking spaces at each location.

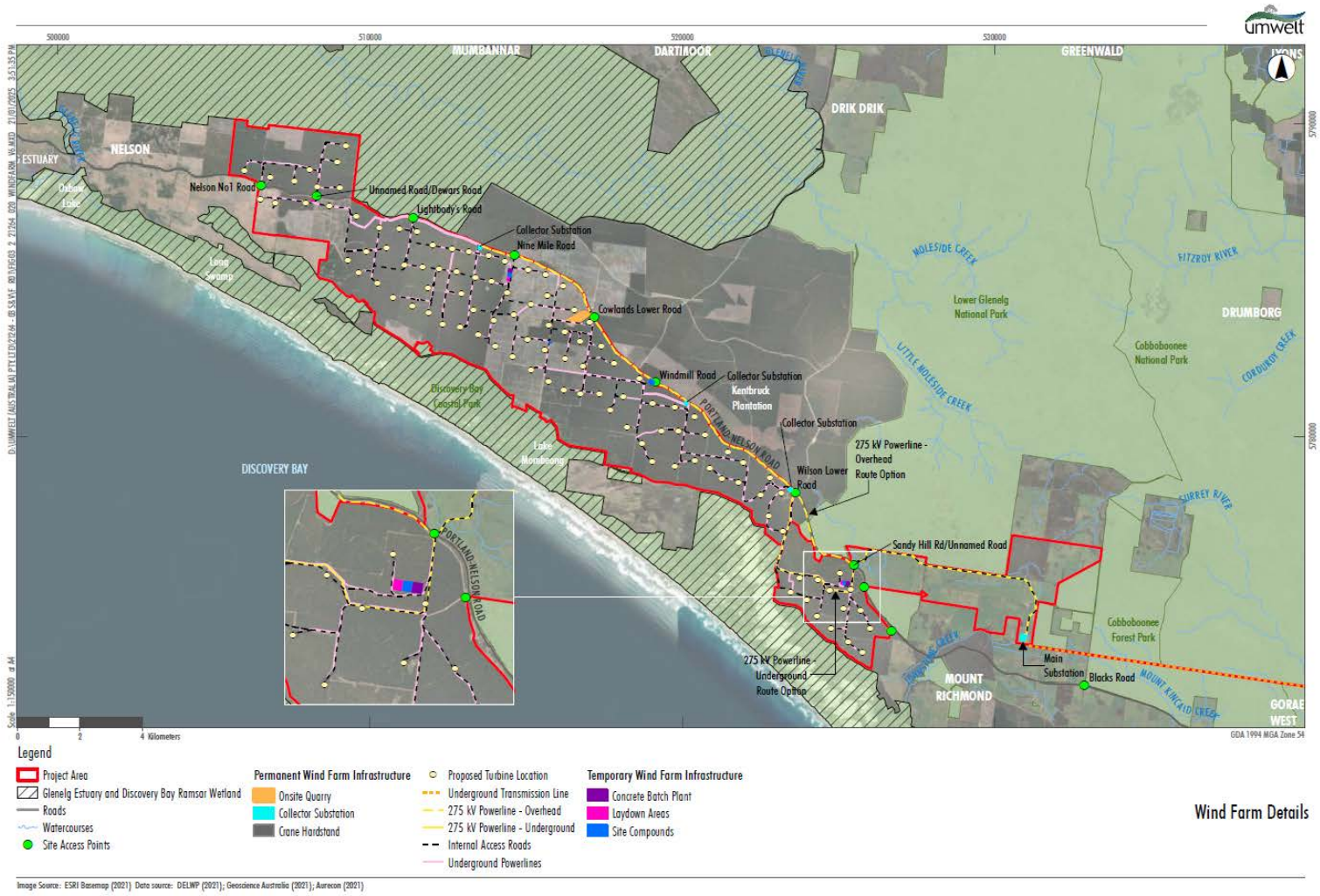


Figure 1 Kentbruck Green Power Hub Details

Temporary infrastructure associated with construction of the wind farm would include:

- Up to three concrete batching plants
- Laydown areas with a footprint of approximately 0.6 ha located at each turbine
- Up to six construction compounds, each containing a site office, carparking, storage, amenities, and aworkshop.

Onsite quarry

A new limestone quarry is also proposed to be established in the wind farm site adjacent to the existing quarry operated by Green Triangle Forest Products (GTFP), on North Livingston Road (see Figure 1). The cemented “cap rock” quarry would operate during both construction and operation, with the extracted material to be used for hardstands and for upgrades to existing access roads or construction of new accessroads.

The quarry would have a maximum footprint of 11 ha and be up to 15 m deep, with actual dimensions to bedetermined following a comprehensive drilling, sampling and testing program during detailed design of the Project. The total extracted volume is estimated to be up to 300,000 cubic metres (m^3), with material to be extracted progressively during construction. The quarry would also be used throughout the Project’s lifetimefor road maintenance and would be made safe and rehabilitated at the end of its use for the Project to a suitable landform

Electrical reticulation

The Project would require new electrical reticulation that involves the construction of underground and overhead cabling throughout the wind farm site and electrical substations. A new transmission line to connect the Project to the existing transmission network is also proposed.

Main substation

A main electrical substation would be constructed in the wind farm site to facilitate connection of the Project to the existing electricity network. This substation would be located near the eastern boundary ofthe wind farm site to minimise the distance between the substation and the connection point to the transmission network (at the Heywood Terminal Station) (see Figure 1*).*

The main substation would have a footprint of up to 3.3 ha with a maximum height of approximately 40 m.It would contain protection equipment and a control room with communications equipment, with tanks forstoring water and oil for maintenance of the collector and main substation equipment. The substation would be constructed on a hardstand, with appropriate contamination/stormwater controls used around the oil tanks such as bunding and concrete slabs. The substation would be fully enclosed in security fencing with sufficient space for a fire break and screening around the perimeter.

The initial construction site for the main on-site substation and commencement works of the underground transmission line can be accessed via Blacks Road which is accessed via Portland-Nelson Road.

Collector substations

Up to three collector substations would be constructed within the wind farm site to facilitate collection anddistribution of electricity generated from the wind turbines into the existing electricity network. Indicative locations of the collector substations are shown on Figure 1*.*

The collector substations would have a footprint of up to 1 ha with a maximum height of approximately 35 m. Each substation would contain a range of electrical equipment including step-up transformers, protection equipment (including lightning protection), and a high voltage bus bar connecting to the high voltage overhead powerline. The collector substations would be constructed on hardstands, with the transformers mounted on concrete slabs. The collector substations would be fully enclosed in security fencing.

Onsite wind farm powerlines

The Project would involve the installation of up to 190 km of underground powerlines (33 kV or 66 kV) connecting the wind turbines to the collector substations, and up to 27.8 km of high voltage powerline

connecting the collector substations to the main wind farm substation. From the collector substation, the proposed underground line travels south-east to Boiler Swamp Road.

The high voltage powerline would likely be 275 kV (subject to detailed design) and would run overhead along Portland-Nelson Road from the western collector substation to the eastern collector substation. The *powerline would then continue overhead to a transition station at the Portland-Nelson Road / Sandy Hill Road intersection*

From the Portland-Nelson Road / Sandy Hill Road intersection it would pass beneath Portland-Nelson Road then continue underground to the main substation. The proposed alignment of the powerline, including theoptions described above, is shown in Figure 1**.**

Transmission line

The Project would require a new 275 kV transmission line to connect the Project to the existing transmission network. The proposed transmission line route measures approximately 26.6 km in length and would extend underground from the main wind farm substation near the eastern boundary of the wind farm site to the existing Heywood Terminal Station (see Figure 2). The transmission line would bisect Cobboboonee National Park and Cobboboonee Forest Park for approximately 17.6 km, where it would be buried beneath an existing road (Boiler Swamp Road).

After exiting Cobboboonee Forest Park the underground line would continue for 1.2 km through freehold agricultural land. As shown on Figure 2, two options have been identified for this section of the transmission line. The slightly shorter southern route is the preferred option, but due to its proximity to a swampy area adjacent to the Surrey River it may not be feasible for underground construction. The viability of this option will be determined in response to geotechnical investigations undertaken during detailed design and only one option would ultimately be constructed. After crossing the Surrey River, the transmission line would continue underground until its connection point into the Heywood Terminal Station.

The underground route through Cobboboonee National Park / Forest Park has been delineated into a 6.5 m-wide construction footprint to minimise impacts on native vegetation within the Boiler Swamp Road corridor. The cabling would be buried using a specialised machine that excavates, lays the cable and backfills the trench in a single pass, minimising the associated construction footprint through small trench widths and minimal spoil generation. Once the transmission line exits Cobboboonee Forest Park, the construction footprint would be approximately 9 m wide as it continues through freehold land until it reaches Heywood Terminal Station. Traditional open-cut trenching methods would be used for this section of the underground transmission line.

All transmission line options that have been considered for the Project, including those which are no longer being pursued by Neoen, are discussed in Chapter 4 of the EES and detailed in the options assessment report prepared by Umwelt (2023). Appendix E of this report provides a summary of the impacts associated with three alternative transmission line options considered by Neoen to date, including a combined overhead-underground option to the Heywood Terminal Station, and overhead and underground options through freehold land southeast of the wind farm site. These options are referred to as Options 1A, 2A and 2B, respectively.

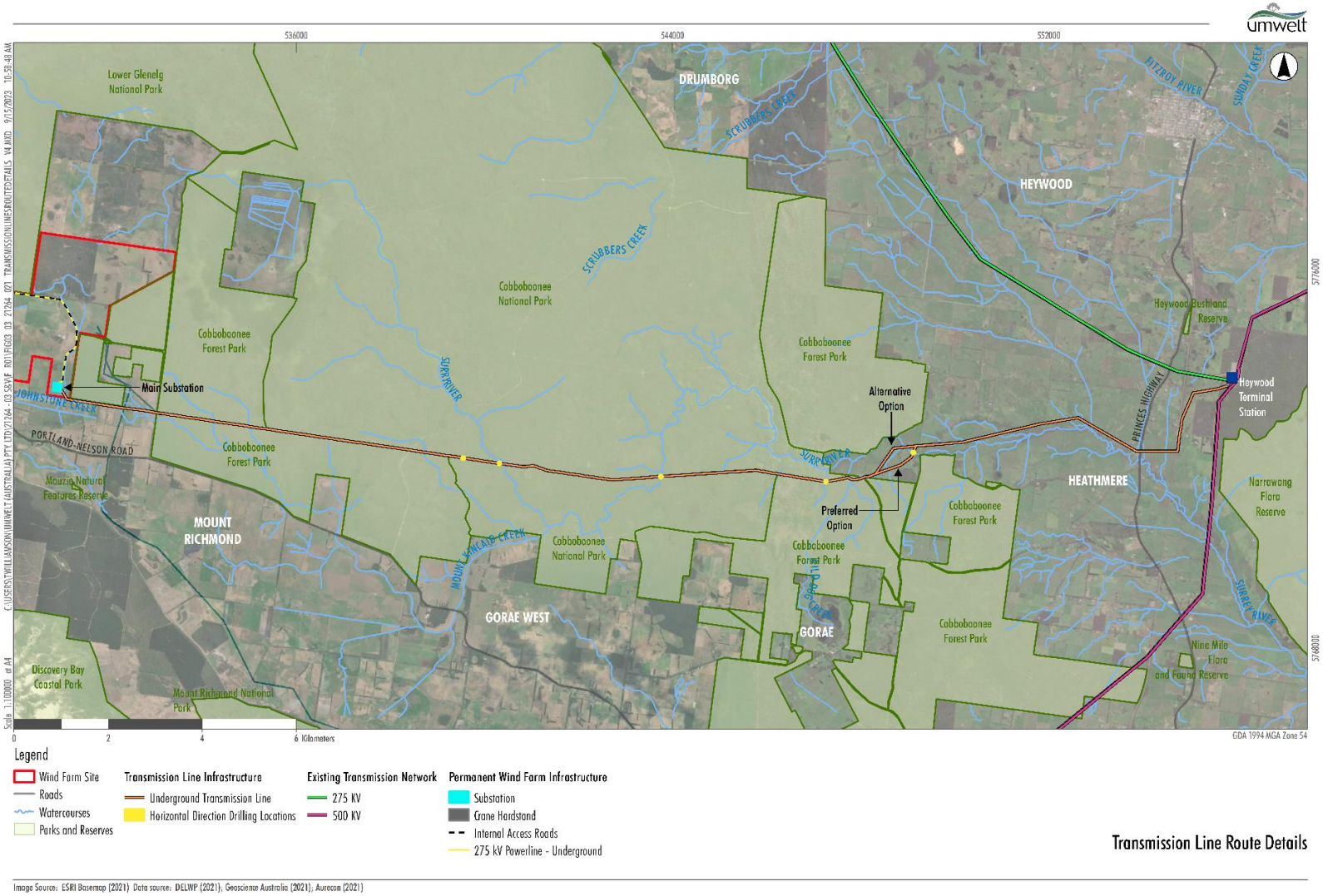


Figure 2 Transmission Line Route Details

1.4.1 Construction – Stage 1

Timing and activities

The indicative construction program and timeframes for the Project are outlined below:

- Pre-construction works - It is estimated that the early works construction period including preparatory works and site clean-up will take approximately two months from site preparation to completion. The typical construction tasks as part of the early works are outlined below:
  - Detailed site investigations
  - Establishment of temporary construction compound areas
  - Access road upgrades leading to the site compound, including necessary vegetation and tree clearing.
  - Construction/upgrade of internal access tracks leading to the site compound
  - Commissioning and clean-up
- Construction works - It is estimated that the construction period, including preparatory works and site rehabilitation will take approximately 24 to 30 months from site preparation to completion. Typical construction tasks of the wind farm are outlined below:
  - Access roads and intersection upgrades.
  - Internal access tracks.
  - Hardstands, batch plants, site compounds, laydown areas.
  - New quarry establishment
  - Foundations, excavation, construction and backfilling.
  - Electrical reticulation works (underground cabling connecting the wind turbines & substations).
  - Substation equipment installation and commissioning.
  - High voltage powerline work (combination of overhead and underground cabling connecting the collector substations to the main substation)
  - 90m blade wind turbine supply (via design vehicle illustrated in 9.1.4.1.1) and erection.
  - Rehabilitation.
- Specific construction tasks relating to the transmission line include:
  - Underground transmission line over approximately 26.6 kilometres (275kV).
  - Access track improvements.
  - Transition Station, with a site area of approximately 0.5ha, with associated landscaping works across approximately 200m^2.

Construction operations and material sources

At this stage, the following construction material sources and operational requirements are known:

- **Equipment and workers:** Transported to the Project site to establish the site. Temporary site offices to be located via Windmill Road along with associated car parking for private vehicles. If site restrictions exist, then carpooling or mini-bus transfer may need to be considered.
- **Quarry:** It is understood a new quarry is to be constructed on North Livingston Road opposite the existing quarry, which is internal to the wind farm. Neoen will not use the existing GTFP quarry, and nor would GTFP use Neoen's quarry. Where practicable, trucks will be constrained to the internal access tracks, supplying the concrete batching plants and localised areas of cut and fill as required. Portland-Nelson Road will need to be accessed by vehicles supplying the southern batching plant for worksite Areas 1 and 2 (which are detailed later in this TIA).

At this stage of the Project this quarry is the only source identified. In the case where this supply is insufficient, other quarries utilised for other wind farm Projects would be considered at the TMP stage.

- **Concrete batch plants:** Two temporary batch plants are expected to be located on site. One will be accessed via a new access road north of Sandy Hill Road and the other will be accessed via Nine Mile Road. They will produce concrete for hardstands and road upgrades but will not be used for turbine foundations.
- **WTG components:** Sources have yet to be verified and are subject to discussions with manufacturers and Port(s) for delivery logistics. The preferred origin port for these components is Port of Portland, due to the proximity of the port to the site. Port of Geelong is under consideration as an alternate port for the delivery of WTG components which do not require OD/OSOM movements. If subsequently the Port of Geelong is selected as an origin destination for WTG components, the quantity and scale of the deliveries involved are likely to be low. Mitigation measures noted in this TIA should also apply to this route. Nonetheless, an assessment has been completed in Appendix D. The findings of this assessment note that the increase in traffic will have a negligible impact on the road network, but mitigation measures such as stakeholder engagement and local council consultation should be considered.

1.4.2 Operation - Stage 2

Following commissioning, the wind farm is expected to operate for approximately 25-30 years. It is predicted that up to 14 staff vehicles per day will commute to and from the site each day to undertake general maintenance activities. Generally, maintenance type vehicles with be a mixture of light and medium sized vehicles.

There could be exceptions to general maintenance in the event of components requiring replacement which could include:

- Wind turbine blade replacement, which requires transport and installation activities, as per the construction stage of the Project.
- Substation or transmission line maintenance or replacement.
- Generator or gearbox replacement.

In the above events larger vehicles will require access to the site, which may include over-dimensional (OD) vehicles. OD deliveries are typically coordinated to occur during off-peak times and are undertaken under convoy.

1.4.3 Re-powering or de-commissioning – Stage 3

At the end of the wind farm lifecycle there are options to either re-power or de-commission the site as outlined below:

- Re-powering the wind farm would involve removing (similar to the de-commissioning activities) the existing WTG components above ground level and upgrading with newer technology wind turbines and associated infrastructure.
- De-commissioning involves dismantling the WTGs whilst leaving sub-surface cables and foundations in-situ.
- In both cases materials and associated machinery would be removed from the site, with material recycled where possible.
- Both will involve similar vehicles to the construction stage, although vehicle frequency will be significantly less as no concrete batching plant or materials deliveries are required.

1.5 Document Status

The estimations detailed herein are considered to reflect the project information currently available, suitable for planning stage works. It is noted that as the project progresses, changes to items such as site layout, turbine design, delivery vehicles, construction methodology, programme and alike are expected – which will impact items documented within this TIA report.

Where possible, conservative estimates have been adopted throughout the report and as such the findings detailed within are expected to be able to hold should minor changes to the Project profile arise.

It is noted that this document will form an input into a subsequent Traffic Management Plan (TMP), which is to be developed to reflect the final detailed wind farm design and construction methodology once verified.

2.0 EES scoping requirements

2.1 Overview

Considering the potential for significant environmental effects, on 25 August 2019 the Minister for Planning (the Minister) determined that Neoen is to prepare an EES for the proposed Kentbruck Green Power Hub.

The scoping requirements set out the specific matters to be investigated and documented in the EES in the context of the *Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978*.

The scoping requirements are outlined in the report entitled *'Scoping Requirements for Kentbruck Green Power Hub Environment Effects Statement, Environment Effects Act 1978, Victoria State Government Environment, Land, Water and Planning, January 2020'*.

Chapter 4 of the scoping requirements report outlines the specific environmental effects to be assessed, these are summarised below:

- 4.1: Biodiversity and habitat
- 4.2: Cultural heritage
- 4.3: Catchment values and hydrology
- 4.4: Landscape and visual
- 4.5: Land use and socioeconomic
- 4.6: Community amenity, safety, roads and transport.

2.2 Assessment of specific transport related environmental effects

As detailed above, specific environmental effects that are required to be assessed with regards to transport are outlined in Chapter 4.6 of the EES scoping requirements, with the draft evaluation objective being:

To avoid and minimise adverse effects for community amenity and safety, with regards to construction noise, vibration, dust, traffic and transport, operational turbine noise and fire risk management.

The requirements specifically related to traffic and transport are outlined in Table 1, which also includes a reference to the sections within this TIA report in which the requirements are addressed.

Table 1 Chapter 4.6 scoping requirements for TIA

Section 4.6 subheading	Scoping requirement	TIA response
Key issues	Managing traffic disruptions for residents, businesses and travellers during the construction of the project	See section 9.4, chapter 11.0 and 12.0
	Potential damage to local and regional road surfaces along transport routes and increased risk to road safety on transport routes.	See section 11.1 and chapter 12.0

Section 4.6 subheading	Scoping requirement	TIA response
Existing environment	Describe the existing road network surrounding the project area, including proposed construction transport route options, in terms of capacity, condition, accessibility and potentially sensitive users.	See Chapters 5.0 to 9.0, with mitigation detailed in Chapter 12.0 The potential sensitive users would be further discussed in the relevant EES chapter with reference to land use and planning, and social and economic EES assessments.
Likely effects	Assess the potential effects of construction activities on existing traffic, preferred traffic routes and road conditions, including amenity and accessibility impacts.	See Chapters 7.0, 8.0, 9.0, 11.0 and 12.0 Amenity impacts arising from the outputs of this TIA would be considered as part of the social assessment.
	Identify any road works required to accommodate the project traffic during the construction stage (having regard to the type and dimensions of vehicles) and potential environment effects.	See Chapters 9.0 and 10.0 The potential environment effects are considered further as part of the Flora and fauna technical report.
	Assess the potential effects to traffic and roads during operation and decommissioning of the project.	See Chapter 8.0
Mitigation measures	Identify the required road upgrades to accommodate construction traffic and additional road maintenance regime to address adverse impacts from project construction (including with reference to potentially limited construction windows due to project area's climate).	See Chapters 9.0 to 11.0 At this stage of project planning any potential limited construction windows are not apparent.
	Describe and evaluate the proposed traffic management and safety principles to address changed traffic conditions during construction of the project, covering (where appropriate) road safety, temporary or permanent road diversions, different traffic routes, hours of use, vehicle operating speeds, types of vehicles and emergency services provisions.	See Chapters 9.0 to 12.0

Section 4.6 subheading	Scoping requirement	TIA response
	Describe consultation undertaken with relevant authorities, to coordinate roadworks and upgrades required for project traffic.	See section 4.2.
Performance objectives	Outline and evaluate proposed measures designed to manage and monitor residual effects on road users and describe contingency measures for responding to unexpected impacts.	See Chapter 9.3 and notably section 9.3.2.1

3.0 Legislation, policy and guidelines

Table 2 summarises the relevant legislation that applies to the Project in the context of this transport impact assessment as well as the project implications and required approvals.

Table 2 Primary legislation and associated information

Legislation/policy/ guidelines	Key policies/strategies	Implications for the Project	Approvals required
Commonwealth			
None			
State			
Victoria Planning Provisions – 52.32 Wind Energy Facility	The purpose of VPP planning clause 52.32 is to facilitate the establishment and expansion of wind energy facilities, in appropriate locations, with minimal impact on the amenity of the area. With regards to traffic and transport 52.34-4 states that the as part of the design response access road options need to be considered. 52.32-6 states that before deciding on an application, in addition to the decision guidelines of Clause 65, the responsible authority must consider several documents and guides as appropriate. The most applicable document to traffic impacts being the Development of Wind Energy Facilities in Victoria, Policy and Planning Guidelines (March 2019).	Ensuring that access options have been considered which provide for all vehicle types in a safe manner. All site access and traffic impact considerations to be consulted with key stakeholders and agreed. Along with subsequent traffic management measures.	As part of planning process

Legislation/policy/ guidelines	Key policies/strategies	Implications for the Project	Approvals required
Development of Wind Energy Facilities in Victoria, Policy and Planning Guidelines (March 2019)	Guide set out: • A framework to provide a consistent and balanced approach to the assessment of wind energy projects across the state; • A set of consistent operational performance standards to inform the assessment and operation of a wind energy facility project; and • Guidance as to how planning permit application requirements might be met. With regards to traffic impacts the guide states: • In section 4.2.2 Seek Expert Advice, the document states that an application should be accompanied by an assessment considering the traffic impacts (amongst others) of the proposal, with the assessment undertaken by a suitably qualified person. • Model planning permit conditions for wind energy facilitates are provided in Appendix B of the guidelines with reference to Traffic Management and the following to be considered as an example to local authorities: - Vehicle access points - Pre-construction public road surveys - Traffic Management Plan (TMP). - Traffic upgrade works.	Ensuring a suitable Traffic Impact Assessment and Traffic Management Plan are produced for the project in consultation with key stakeholders.	None

Legislation/policy/ guidelines	Key policies/strategies	Implications for the Project	Approvals required
Best Practice Guidelines for Implementation of Wind Energy Projects in Australia, Clean Energy Council, June 2018	The Guidelines are intended to be practical and are designed primarily for use by wind farm proponents, owners and operators. The Guidelines are also designed to assist people involved in the planning process, and the general community. The Guidelines aim to help the industry and stakeholders understand the wind farm development process and provide confidence in the level of rigour that can be expected of proponents when preparing a wind farm proposal for development approval. The Guidelines focus on the planning, approval and operational aspects of onshore wind farms, although sections of the document may be relevant for offshore wind farms. Sections 2.5.5, 3.2.1.5 and 3.3.2 outlined key considerations with regards to transport requirements and assessments as part of a wind farm development.	Ensuring a suitable Traffic Impact Assessment and Traffic Management Plan are produced for the project in consultation with key stakeholders.	None
Glenelg Planning Scheme	Notable planning clauses relating to traffic and transport include: • 18.01-1S land use and transport planning • 18.01-2S transport systems • 18.02-4S car parking	Ensuring project meets required planning application standards with regards to traffic and transport. This includes: • Maintaining a safe and efficient road network • Coordinating the wind farm development for all transport modes • Ensuring adequate supply of car parking during both construction and operational stages of the project	As part of planning process

Legislation/policy/ guidelines	Key policies/strategies	Implications for the Project	Approvals required
Road Management Act 2004 (Victoria)	Road Management Act (General) Regulations 2016. Road Management Act (Works and Infrastructure) Regulations 2015. Code of Practice – Worksite Safety Traffic Management.	This Act and associated Regulations must be complied with for all public roads of the Victorian road network. The Act sets out general principles and obligations for which the road authority is responsible for administering. The Road Management Act requires approval for any construction project that may impact or change access of a controlled access road.	None.
Glenelg Shire Council - Road Management Plan 2017	The Glenelg Shire Council Road Management Plan (GSCRMP) sets out the responsibilities of Council and other stakeholders (Regional Roads Victoria, road users) regarding road and path asset management. The GSCRMP aims to inform the community of the ability and expectation of Council to provide and maintain an appropriate level of service that is fit for purpose, accessible, responsive and sustainable.	Ensuring site access and maintenance of the road network is to the satisfaction of Glenelg Shire Council in terms of its own road assets impacted by the Project.	As part of planning process with completion of TIA / TMP
Department of Transport (VicRoads) – Road Management Plan	The VicRoads Road Management Plan details the management and maintenance of roads registered under the VicRoads register of public roads. VicRoads manages its infrastructure in five phases; development of standards and guidelines, development of a maintenance program, implementation of the management program, auditing and review. The VicRoads road management plan also details maintenance inspection and response schedules.	Ensuring site access and maintenance of the road network is to the satisfaction of the Department of Transport (VicRoads) in terms of its own road assets impacted by the Project.	
Transport Integration Act 2010	The Act provides a legislative framework for transport in Victoria. The Act seeks to integrate land use and transport planning and decision-making by applying the framework to land use agencies whose decisions can significantly impact on transport. The Act requires agencies, including the	This Act sets out six transport system objectives and eight decision-making principles. The objectives include triple bottom line assessment: economic prosperity, social and economic inclusion and environmental sustainability. Other objectives include: • Integration of transport and land use • Efficiency, coordination and reliability	None

Legislation/policy/ guidelines	Key policies/strategies	Implications for the Project	Approvals required
	Department of Transport and Planning Authorities, to consider the potential impact of land use planning proposals on transport.	• Safety and health and wellbeing The objectives and principles need to be considered in the evaluation of this project.	
Road Safety Act 1986	Road Safety Road Rules, 2017.	These Rules provide road rules that are substantially consistent across Australia. They also specify behaviour for all road users. This framework is used in this assessment as the basis to assess safe and efficient traffic movements on roads.	None
	Road Safety (Traffic Management) Regulations, 2009.	These Regulations set out requirements for authorisation for implementing traffic control devices on roads (including for traffic management for worksites) This assessment uses this framework as a reference to prescribe traffic management requirements.	None
National Parks Act 1975	National Parks Regulations 2013	Set out the requirements for access to park land. Defines areas which are prohibited or restricted without permit.	None
Victoria's Road Safety Strategy 2021-2030	This strategy aims to halve road deaths and reduce serious injuries by 2030.	This strategy references making local and busy places safer and using roads more safely. Safety considerations represent a critical focus of this assessment.	None
AS1742.3 2009 – Traffic control for works on road		This standard sets out all matters to be considered as being essential to a Traffic Management Plan (TMP) such as traffic demand, traffic routing, traffic control, special vehicle requirements and over-dimensional vehicles which will be developed at later stage of the Project following this TIA.	None
Austroads – Guide to Road Design Part 3: Geometric Design	The Guide to Road Design is one of a set of comprehensive Austroads Guides developed to provide a primary national reference for the development of safe, economical and efficient road design solutions.	AGRD Part 3 provides guidance on geometric requirements for Australian Roads. This guide shall be used to determine likely impacts of changes to road profiles and characteristics resulting from the Project and its associated traffic.	None
Austroads – Guide to Road Design Part 4: Intersections and Crossings		AGRD Part 4 provides guidance on intersection design such as design considerations, design process, choice of design vehicle, pedestrian and cyclist crossing treatments, provision for public transport and property access. This is particularly relevant to the Project as it is anticipated to potentially impact road access.	None
Infrastructure Design Manual (2020)	The Infrastructure design manual (IDM) is a standardised set of requirements for the design and development of infrastructure – required by a set of participating	The IDM is the standard document used by Glenelg City Council, the local government area (LGA) primarily impacted by the Project. Modifications proposed by the Project within the Glenelg LGA will require assessment against requirements set out in the IDM.	None

Legislation/policy/ guidelines	Key policies/strategies	Implications for the Project	Approvals required
	Victorian rural and regional councils		

4.0 Methodology

This section describes how the TIA was conducted to understand the existing environment and potential impacts of the project. The following sections outline the study methodology.

4.1 Study area

The study area for the TIA report includes the project area as described in Section 1.4 and the potential transportation route of over-dimensional (OD) vehicles from the Port of Portland. This TIA report has assessed the potential impacts of project activities within this area.

Other potential Project traffic routes are to be verified and assessed when more certainty of Project delivery components and materials are known (typically at the TMP document development stage).

4.2 Stakeholder consultation methodology

Key stakeholders which are directly or indirectly impacted by the project were identified and consulted to understand and identify any issues for consideration as part of the Project going forward. The outcomes of the stakeholder consultation are included in the TIA where possible.

Stakeholders which may be impacted from a traffic perspective include relevant road authorities, Councils, transportation contractors and other key businesses and communities.

4.3 Existing conditions assessment method

The existing transport conditions assessment comprised of:

- An initial desktop study of the study area and available VicRoads Oversize/Over mass (OSOM) network information.
- Site visit and assessment of the roads within the study area, particularly at key intersections and site accesses, undertaken by AECOM on 29th and 30th of July 2020.
- Investigation of road safety data (sourced from Department of Transport CrashStats), bus routes (sourced from Public Transport Victoria) and designated heavy vehicle routes and restrictions (sourced from VicRoads website).
- Analysis of available traffic data (sourced from Department of Transport and councils).
- Review of relevant policies and legislation.

The existing conditions assessment can be found in Chapter 6.0.

4.4 Preliminary vehicle access strategy methodology

The preliminary vehicle access strategy has been developed as follows:

- A potential turbine supplier and Neoen were consulted on the preferred site access strategy and a total of eight site access intersections were identified via Portland-Nelson Road to the wind farm development site.
- Advice has been sought from key stakeholders and considered in the review process of the nominated eight access locations.
- An existing conditions assessment, including a site visit and review of past crash history (detailed above) has also been undertaken to help inform the review of the vehicle access strategy.
- The access points to the transmission line and substation development options have been informed solely from a desktop assessment at this stage given there are multiple options still being considered. It is considered that at the TMP development stage a finalised option can be documented and associated management or mitigation measures finalised.

The preliminary vehicle access strategy can be found in Chapter 7.0.

4.5 Traffic generation and distribution analysis methodology

A detailed review of the Project was undertaken for the construction and operation stages. The transport specific elements of the Project were extracted and used to form the basis of the impact assessment.

For each project stage, plant and equipment (including the size and volumes of vehicles), and workforce numbers have been determined.

The traffic generation and distribution assumptions discussed throughout Chapter 8.0 have been based on the following data sources:

- Information and knowledge of previously derived estimations from other wind farm developments, notably the Kaban Wind Farm in Queensland (AECOM completed the TIA for Neoen for this project).
- Estimations have been cross checked with the project team, including Neoen and a potential turbine supplier.

The traffic generation and distribution assessment can be found in Chapter 8.0.

4.6 Transport impact assessment methodology

Following a review of the existing conditions, and an understanding of the anticipated construction and operation traffic generation, an assessment of the potential impacts can be undertaken.

4.6.1 Baseline traffic

Descriptions of the local road network, local area road use hierarchy and crash statistics were prepared. Existing traffic volumes (2020 Annual Average Daily Traffic) were obtained from DTP (VicRoads) for Portland-Nelson Road. No data sets were available to the immediate local access roads from GSG; however, site observations and discussions with key stakeholders including GTFP have confirmed that traffic volumes are low.

Traffic volumes estimates are unlikely to change due to the rural location. Given the low background traffic on local roads within the study area, it is not considered necessary to undertake any traffic counts at this stage.

To convert Average Annual Daily Traffic (AADT) to peak hour, the assumption was made that 10 per cent of AADT equates to the peak hour demands.

As informed by GTFP, there are seasonal operational traffic peaks that occur between April and September during harvest operations (depending on the seasons), with an estimate that a total of 150 truck movements per week would occur depending on the operation type.

4.6.2 Construction stage

4.6.2.1 Traffic estimations

As noted previously the construction traffic demands were derived from past projects and confirmed with the project team, including Neoen. These were estimated for the entire construction duration, by month and aggregated down to forecast daily construction volumes.

In terms of the construction program, it is envisaged that this will be undertaken in a sequential manner, therefore each respective site access will have its own specific peak hour traffic impacts at various stages of the Project.

Accordingly, to determine possible intersection upgrades the peak construction activity per proposed access has been undertaken. Dependent upon the site access function, this is expected to occur either during worker arrivals / departures, concrete pours of WTG foundations or quarry truck movements.

At this stage, construction personnel origins and project material sources may be subject to change, however, initial assumptions have been made and documented. Following confirmation these would be finalised as part of the Projects subsequent TMP.

4.6.2.2 Transport impacts

Following identification of the magnitude of impacts on the site access and traffic routes to and from the worksites that would be impacted by the Project, an assessment was undertaken that considered:

- Network capacity, both road link and intersection.
- Intersection safety.
- Network infrastructure.
- Public transport impacts.
- Pedestrian and cyclist impacts.
- Over-dimensional loads.
- Residual impact and legacy.

Upon completion of the impact assessment various treatments were considered to avoid, mitigate and manage the potential impacts. The treatments considered are discussed further in this report in Chapter 10.0.

4.7 Preliminary construction traffic route assessments methodology

It should be noted that the traffic route assessments undertaken as part of the TIA are preliminary and subject to subsequent onboarding of the transport contractor, whom would undertake their own logistical reviews and associated TMPs for the transport of OD materials to the Project sites.

Preliminary construction traffic route assessments have been undertaken as follows:

- Consultation with key stakeholders, notably Rex J Andrews who are a specialist OD transport contractor.
- Desktop analysis and review of the NHVR route planner.
- Site visit undertaken by AECOM at all key site access points, and along the preferred OD delivery route between the Port of Portland and the Project.
- Swept path analysis of worst-case OD vehicles to travel onwards to the site from the Port of Portland, firstly to the storage yard at 211 Portland-Nelson Road, then onwards to the site.
- Road safety and sight distance checks at all arterial linked site access intersections.

At this stage of the Project, the preferred origin port for these components is Port of Portland, due to the proximity of the port to the site. Port of Geelong is under consideration as an alternate port for the delivery of WTG components which do not require OD/OSOM movements. If subsequently the Port of Geelong is selected as an origin destination for WTG components, the quantity and scale of the deliveries involved are likely to be low. Mitigation measures noted in this TIA should also apply to this route. Nonetheless, an assessment has been completed in Appendix D. The findings of this assessment note that the increase in traffic will have a negligible impact on the road network, but mitigation measures such as stakeholder engagement and local council consultation should be considered.

4.8 Mitigation measures methodology

Following the Project impact analysis undertaken as detailed above, mitigation measures have been identified, these have been informed with consideration to the following:

- The construction, operational and de-commissioning stages of the Project.
- Likely modifications to the road network and associated consequences were assessed against relevant design guidelines, road safety data and stakeholder inputs.
- Potential mitigation measures were identified with reference to relevant design guidelines including: AustRoads Guides to Road design, VicRoads design supplements and the Infrastructure design manual, as well as reference to measures undertaken on similar wind farm projects.

4.9 TIA assumptions and limitations

As also outlined in Section 1.5, the estimations detailed herein are considered to reflect the project information currently available, suitable for planning stage works. It is noted that as the project progresses, changes to items such as site layout, turbine design, delivery vehicles, construction methodology, programme and alike are expected – which will impact items documented within this report.

Where possible, conservative estimates have been adopted throughout the report and as such the findings detailed within are expected to be able to hold should minor changes to the project profile arise.

It is noted that this document will form an input into a subsequent Traffic Management Plan (TMP), which is to be developed to reflect the final detailed wind farm design and construction methodology once verified.

4.10 Linkage to other EES technical reports

This TIA should be read in conjunction with other relevant technical reports of the EES. Other potential impacts relating to greenhouse gas as well as potential social and economic effects have been considered in detail in other technical reports.

The outcomes of this TIA were used as inputs to:

- Social impact assessment report (impacts of Project vehicles on road users and landholders)
- Flora and fauna existing conditions and impact assessment report (potential impacts to native vegetation of OD vehicle turning paths)
- Surface water impact assessment report (consideration of stormwater impacts)
- Bushfire risk assessment (potential impacts of changed traffic conditions on emergency bushfire management)
- Economic impact assessment (economic impacts of the Project on the transport sector
- Aboriginal cultural heritage technical report (potential impacts to Aboriginal heritage values from Project vehicles)
- Land use and planning impact assessment (Impacts of the project on local land use and Planning Schemes).

Where relevant to traffic, other technical reports are considered and referenced.

5.0 Stakeholder consultation

Consultation with the following key stakeholders has been undertaken at this planning stage of the Project. This has assisted in identifying any issues and elements for consideration as part of the Project going forward, and where possible considered as part of this TIA report:

- Department of Transport – Regional Roads Victoria (RRV).
- Glenelg Shire Council (GSC).
- Rex J Andrews (over-dimensional transportation company).
- Green Triangle Forest Products (GTFP).
- Green Triangle Freight Committee (GTFC).
- Port of Portland.

5.1.1 Department of Transport – Regional Roads Victoria and Glenelg Shire Council consultation

5.1.1.1 TIA kick-off meeting

A project TIA stakeholder kick-off meeting was held via video conference on 30 July 2020 with RRV and GSC. A summary of the key comments from the stakeholders and where they have been addressed in the TIA report is provided in Table 3.

Table 3 TIA stakeholder kick-off meeting - key discussion points and initial responses at Project planning stage

Stakeholder	Item	Initial response at Project planning stage
DTP	Construction traffic interaction with timber industry vehicles	This will require specific understanding of traffic movements nearer to the start of construction. As a result, further stakeholder consultation and consideration will occur as part of a subsequent TMP for the Project.
	Noted that there are multiple access points via Portland-Nelson Road, interested to understand the cumulative impact on the local area.	The lifecycle project impacts are detailed along with daily and estimated peak volumes per access in this TIA report.
	Site access provisions should be considered, provision of left/right turns, safe stopping distances etc	Considered as part of this TIA report.
	Noted strategic vision to remove height restrictions along the Portland ring road (Bridgewater Road Bridge)	Noted – Neoen to consider as part of project programming and negotiations going forward.
	Raised that other wind farms are likely to use Port of Portland and local storage which may overlap with this project, including Willatook, Hawkesdale, Ryan Corner, Woolsthorpe and Dundonnell Wind Farms.	
GSC	Suggested usage of internal roads, i.e. central spine be considered, to reduce number of accesses / interactions with Portland-Nelson Road	A total of eight access locations are proposed for the wind farm development, which is considered the minimum necessary for the project. It is intended to utilise the internal road network as much as possible, for example during more intensive construction operations such as concrete pours for WTG foundations.

Stakeholder	Item	Initial response at Project planning stage
	Suggested that usage of GSC roads would copy logging industry requirements, with features including: • Precondition survey of impacted roads • MoU transferring maintenance responsibility to the wind farm operator for the construction period • Inspection systems and road standards / maintenance requirements to be agreed between operator and council • Roads handed back over to council following construction. Roads to be restored to existing conditions.	Noted.
	Concerns with impacts to Portland with regards to OD transportation, as routes were only agreed as temporary with regards to the Murra Warra Wind Farm Project. Notably resident complaints on movement of OD vehicles. Further to this Council would have interest in: • Residential impacts of construction traffic • Road condition • Timing of movements (time of day and day of week) • Maintenance plan (noting to be negotiated with Neoen)	Although concerns are noted, there is precedent for such OD movements being possible without bridge works. As such, bridge works are deemed not to be required. This will need to be further discussed with relevant stakeholders as the project progresses. Noted interested impacts, some have been considered as part of this TIA, however these would be considered with more certainty and agreement with relevant stakeholders when a TMP is produced for the Project.
GSC	Council noted that there have been safety issues, including a number of historical crashes along Portland-Nelson Road which need to be considered as part of the TIA.	Considered as part of TIA, this potential concern will require further stakeholder review and consideration as part of the TMP.
	Noted that the timber planation's south and north of Portland-Nelson Road are likely to be primarily more active during winter.	Noted.
DTP GSC	No major infrastructure is currently proposed in the area	Noted
	Noted potential regional stakeholders may need to be consulted such as Porthaul, Calaria, Green Triangle Freight Group	To be undertaken as part of the development of the projects TMP.

Since kickoff, Neoen/the project team has engaged with Parks Vic, DEECA and DTP through the EES process. Further consultation will be undertaken following submission of the National Parks consent application (i.e. post approvals), to inform preparation of the TMP and other management measures.

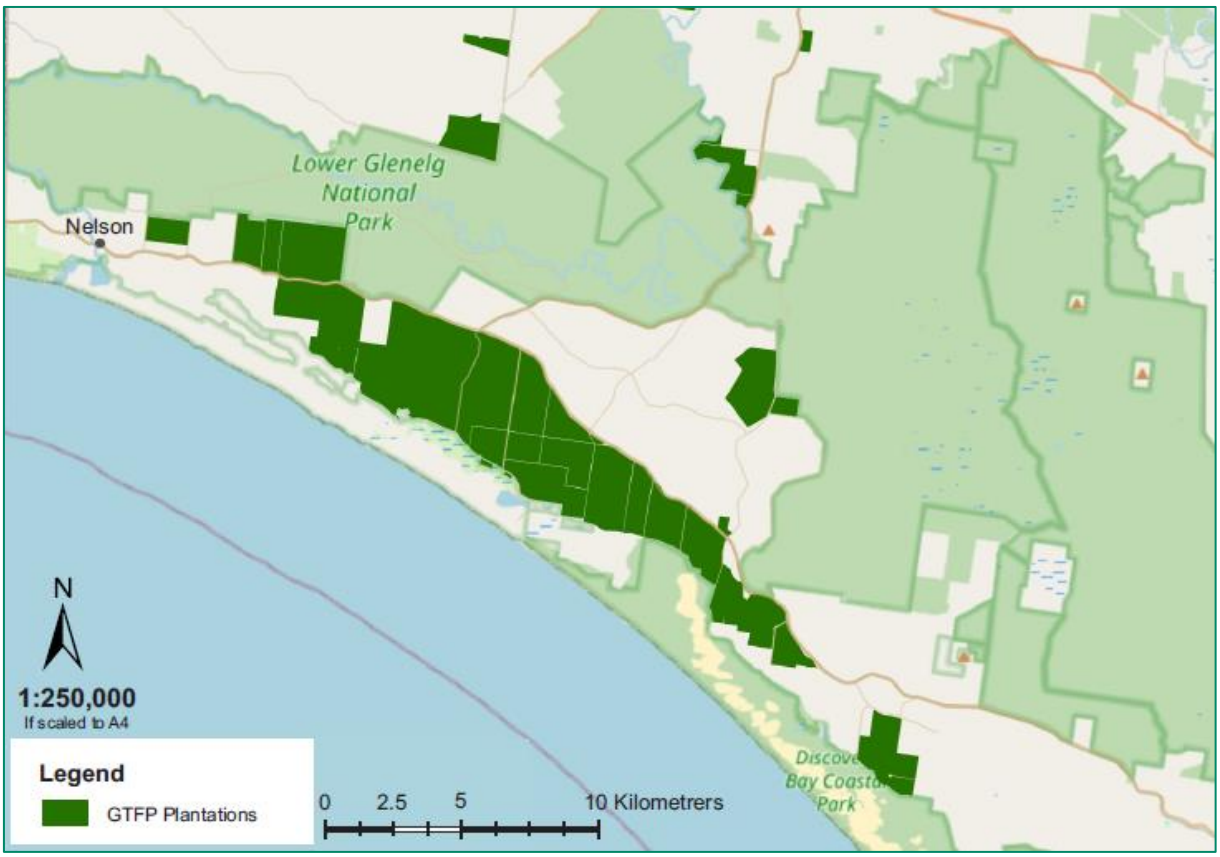
5.1.2 Rex J Andrews consultation

A meeting with Rex J Andrews was held via video conference on 18 July 2022 to understand OD transportation implications for the Kentbruck Green Power Hub Project. A summary of the key comments is outlined below:

- A storage yard is located at 211 Portland-Nelson Road, which has been previously used for WTG components.
- Two transportation routes are utilised from Port of Portland to the storage yard depending on the height restrictions of the load. Confirmation of these routes was given and has been adopted as part of this study.
- The transportation routes cater for wind blades up to 90 metres in length with tower sizes up to 6 metres in height (powerlines have already been lifted to allow for this).
- Advised that the following should be undertaken:
  - Undertake swept path analysis of the proposed loads.
  - Route may require overheads lifted to accommodate load heights more than 6 metres.
  - Bridge structures (if any) traversed should be assessed.
  - Powercor should be procured to undertake a survey of the proposed routes.

5.1.3 Green Triangle Forest Products

The site is located within an actively managed and harvested pine forest, owned by Mount Gambier plantation company Green Triangle Forest Products (GTFP). The extent of the plantation at Kentbruck is shown in Figure 3.



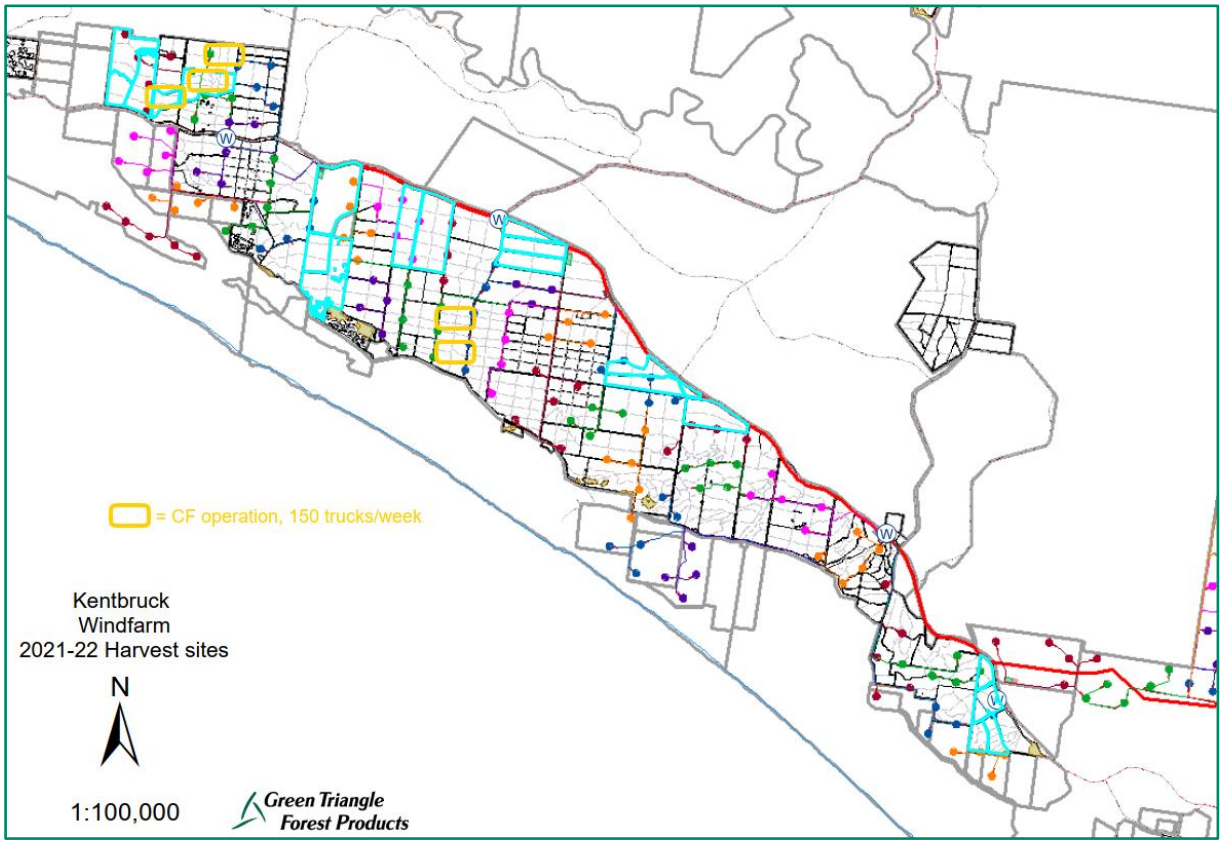
Source: http://www.gtfp.com.au/Documents/files/GTFP%20DFA_web%20maps_May_2020.pdf

Figure 3 GTFP Kentbruck plantations

A meeting was held via tele-conference on 12 August 2020 with the following subsequently advised via email correspondence:

GTFP general operations

- Main harvest activity at Kentbruck occurs between April and September during harvest operations (depending on the seasons), with some operations over the summer.
- Other less intensive operations include firebreak maintenance and land preparation.
- Typical operating hours are 6 days per week, 18 hours a day, between 3am and 9pm.
- Harvest sites for the 2021-22 season are highlighted in cyan in Figure 4. GTFP estimate that depending on the operation type a total of 150 truck movements per week would occur.



Source: GTFP *note that the layout above may not be current and should be used as indicative only

Figure 4 Kentbruck plantation harvest sites 2021-22

GTFP access considerations

The following outlines GTFPs comments on access considerations to the Kentbruck plantation site:

- Numerous current access locations for log trucks, however upgrades will be required to allow OD vehicular access to the site for the Project.
- Following advice on access points proposed for wind farm construction:
  - Wilson Lower entry to bitumen is on the bottom of a hill to the east.
  - Nine Mile Road has poor visibility towards the east.
  - Lightbody Road has poor visibility.
  - Area 10 access has poor visibility, GTFP use the access track located to the east of this.
  - Access to areas 9 and 10 are not currently used by GTFP as entry to the plantation.
- Traffic management considerations:
  - Expected traffic movements will depend on operational requirements at the time. GTFP usually adopt a one-way system around the sites access tracks during operations.

- Speed limits on access tracks are advised at 60 km/hr.
- Maintenance requirements and protocols will need to be co-ordinated and agreed. Expected that inspection prior to construction would occur and any issues fixed as required.

- General impacts/risks:
  - Portland-Nelson Road is used extensively by forest industry trucks to transport logs and woodchips to Portland. Typical traffic volumes of one vehicle passes every minute with a single lane in each direction (noting this is consistent with obtained VicRoads AADT data and AECOM site visit observations).
  - The Port of Portland exports approximately four million tonnes of wood products per year of which approximately 50% of this volume is transported via Portland-Nelson Road.
  - A reasonable amount of illegal entry occurs, including access by 4WD vehicles, trail bike riding and illegal hunting.

5.1.4 Green Triangle Freight Committee

Two meetings were held with representatives (10 September 2020 and 18 September 2020) of the Green Triangle Freight Committee to discuss the Project and any impacts that should be considered during its subsequent construction and operational stages. A summary of these discussions and feedback with regards to the Project is provided below:

Meeting 10 September 2020

- Summary notes from this GTFC meeting are provided below:
  - The GTFC extends from South Australia to Colac, VIC.
  - Mt Gambier is the primary location of forestry related traffic in the area.
  - Committee is involved heavily in DTP (RRV) and NHVR review and assessment of freight movements.
  - Communication and agreements are key, transport contractors are typically easy to discuss and agree specific requirements. Consequently, the timing and needs of the Project need to be communicated.
  - Nacelles on a low loader greater than 6.5 metres in height have restrictions exiting the Port of Portland onto the wider road network.
  - Bridgewater Bridge height restriction, ongoing discussions with government with regards to improving.
  - During peak operations a B-Double every 30 seconds can leave the Port of Portland, however at the time there was a downturn in usage due to Covid.
  - Discussions with Port should be undertaken to understand logistics / unloading requirements etc. Also, how they work with forestry industry during development of other wind farm projects in the past.
  - Consider and note school bus route impacts.
  - Damage and rehab agreements.
  - Intersection impacts / mitigations.
  - Identification of sealed / unsealed pavements.

Follow-up Meeting 18 September 2020

- Summary advice from GTFC meeting are provided below following submission of the draft TIA report for their review:
  - Engagement with community has worked well in the past with regards to other wind farm developments with little or no resident feedback. Good communication critical.

- Established OD routes were confirmed as per those given by Rex J Andrews and documented in the TIA report. Mortlake South and Bulgana wind farms have utilised the local established OD routes.
- Additional WTG component laydown area is located nearer the Port near the smelter yard. Accordingly, there are two potential sites for WTG component storage, either west of Maderia Packet Road (south of the Port) and at 211 Portland-Nelson Road (north-west of the Port).
- GSC advised they would require 1-month notice prior to use of any transportation routes.
- Next step would be to discuss further the Project with the GTFC and provide feedback to help minimise disruption.

5.1.5 Port of Portland

A meeting was held with the Port of Portland commercial manager on the 24 September 2020 to discuss the Project, and to help understand any requirements that would be required as part of the Project to safely deliver components to the site. Summary notes from this meeting are provided below:

- Nacelle weight and point loads should be ok based on previous wind farms.
- No overhead issues.
- Forestry truck interactions potentially not an issue based on other wind farm projects.
- Maderia Packet Road has WTG component storage capacity used from previous projects.
- Port gates might need to be reviewed to permit OD vehicle with blade exit paths. Permitted passage for 73.5m blades.

6.0 Existing conditions

6.1 Site and local land use

The Project Area is predominantly (86%) located within an area that has been heavily modified for commercial Radiata Pine forestry operations. Approximately 14% of land in the Project Area is freehold land that is primarily used for grazing. Around 0.1% of the Project Area is public land. Within the underground transmission line corridor, approximately 66% of land is public (comprising the Parks) and 34% is freehold. The Parks are both Crown land.

Recreational infrastructure in the region surrounding the Project generally aligns with the public land sites that are managed and protected in accordance with the NGNM SW Management Plan. Recreational infrastructure includes:

- Hiking and walking trails
- Camping and picnic areas
- Horse riding areas and trails
- Kayaking and fishing experiences
- Vehicle touring routes and four-wheel driving
- Guided activities and organised/competitive events.

6.1.1 Local road network

6.1.1.1 Wind farm

The site location in the context of the local road network is shown in Figure 5. Table 4 provides a summary of the key transport elements of the existing road network providing connections to the wind farm part of the Project. The local road network is comprised of a combination of Department of Transport (Regional Roads Victoria), Glenelg Shire Council (GSC) and other public road assets.

At this time, no proposed internal thoroughfares for the Project have been investigated or listed below.

A site visit was undertaken by AECOM on Thursday 30 July 2020 to help understand current road network conditions, with Appendix **A** providing photos from the site visit observations. Key observations from the site visit are outlined below:

- Portland-Nelson Road was observed to be lightly trafficked with an equal split of light and heavy vehicles observed. The road is sealed with good delineation provided and no apparent pavement defects.
- The following observations have been made of roads initially proposed to provide access to the wind farm, all roads are under the ownership of GSC (this includes Sandy Hill Road, Wilsons Lower Road, Windmill Road, Cowlands Lower Road, Lightbody Road)
    - All site access roads that form a priority intersection with Portland-Nelson Road, are unsealed and subsequently interconnect via a network of internal access tracks around the plantation. GTFP have advised that associated plantation trucks will usually follow a defined one-way traffic route system.
    - No traffic usage of these access roads was observed during the site visit, it is therefore assumed that generally all accesses have limited daily traffic volumes, which experience increases in usage primarily due to plantation activities.
    - All accesses are unsealed with no posted speed signs present; drivers are expected to drive to the conditions of the road. GTFP advised that truck drivers are instructed to travel at a maximum speed of 60 km/hr.
    - No functional stormwater drainage systems, such as swale drains, or pipe culverts were identified during the site visit at the intersections. It is expected that some localised pooling or sheet flows across the access intersections could occur following significant rainfall.
    - Cowlands Lower Road and Nine Mile Road are approximately seven metres wide and permit two-way access. Other access roads are approximately five metres wide, however it appears that the grassed verges could be used to aid bypassing of two-way vehicle movements if required.
    - Lightbody Road has a pipe culvert present which was observed to be in reasonable condition. An additional access driveway was observed approximately 50 metres to the east of the main access, which is inferred to provide access inbound, with the main intersection being used for vehicles to egress the plantation.
- Other unregistered public road assets include Dewars Road, an unnamed road opposite Dewars Road and Nelson No.1 Road. All these roads were observed to be similar to the above identified GSC road assets, in terms of priority intersection interface with Portland-Nelson Road, traffic usage and condition.

  Dewars Road and the unnamed road opposite Dewars Road are five metres wide but permit vehicle passage via the provided grassed verges. Nelson No. 1 Road is seven metres wide and permits two-way vehicle movements.

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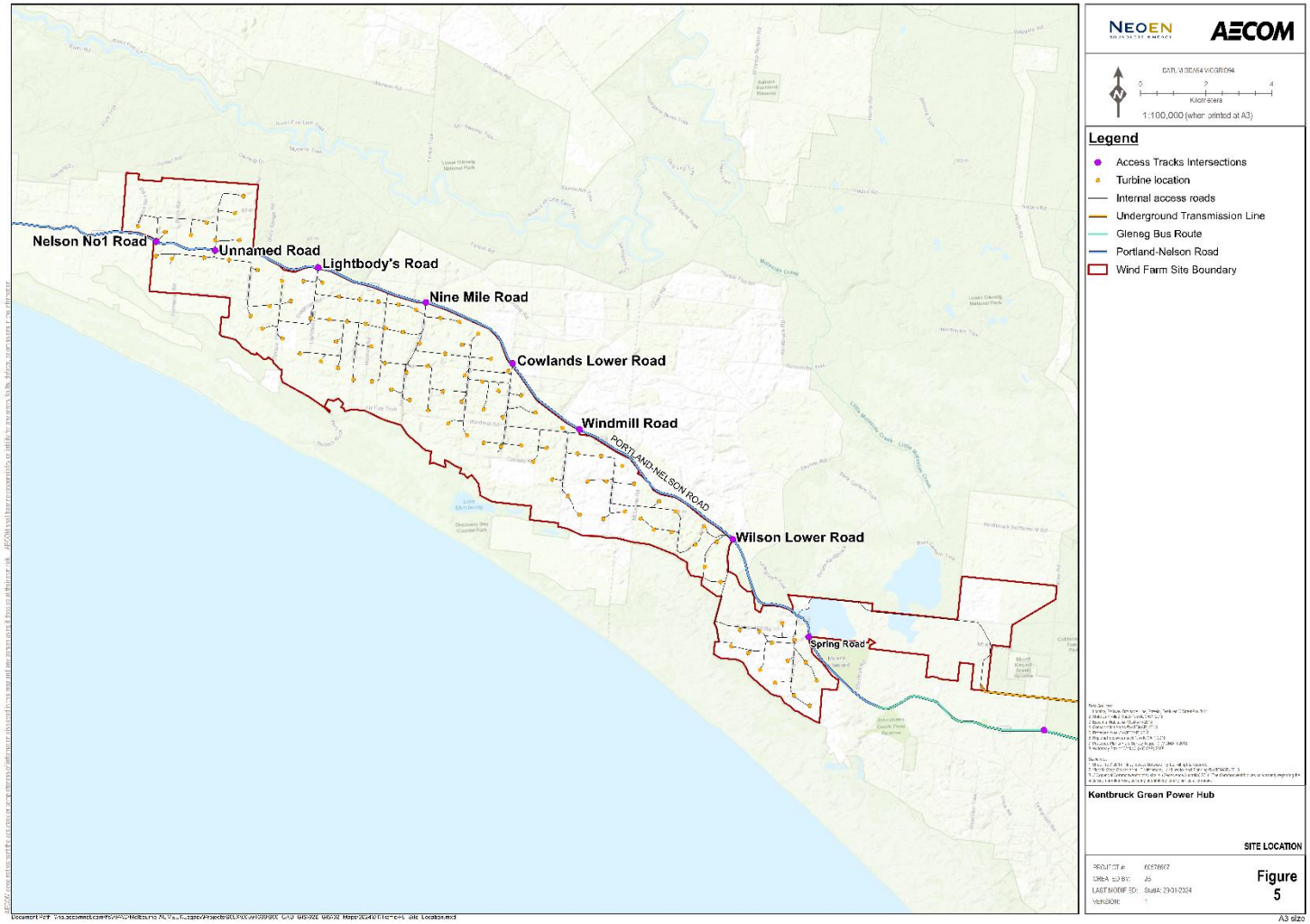


Figure 5 Site location and local road network

Table 4 Existing road conditions near wind farm

Transport element	Portland-Nelson Road	Maderia Packet Road	Henty Highway	Sandy Hill Road	Wilsons Lower Road	Windmill Road	Cowlands Lower Road	Nine Mile Road	Lightbody Road	Dewars Road	Unnamed Road – opp. Dewars Road	Nelson No.1 Road
Speed Limit (kph)	100	80	100	60	60	60	60	60	60	60	60	60
Classification	Highway	Arterial	Highway	Local	Local	Local	Local	Local	Local	Local	Local	Local
Managed by	DTP (RRV)	DTP (RRV)	DTP (RRV)	GSC	GSC	GSC	GSC	GSC	GSC	Private	Private	Private
Approx. road width (m)	7.0	7.0	7.0	7.0	5.0	5.0	7.0	5.0	5.0	7.0	5.0	5.0
Road surface	Sealed	Sealed	Sealed	Unsealed	Unsealed	Unsealed	Unsealed	Unsealed	Unsealed	Unsealed	Unsealed	Unsealed
Total number of lanes	Two	Two	Two	Two	One	One	Two	One	One	Two	One	One
Traffic Control	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority
Heavy vehicle use	Approved route for B-Double and Higher Mass Limit vehicles			Primarily used by vehicles servicing the Kentbruck pine plantation.								

6.1.1.2 Transmission line and substation

The local road network associated with the transmission line connections being considered is comprised of a combination of Department of Transport (Regional Roads Victoria), Glenelg Shire Council (GSC) and other private road assets.

At this time, no proposed internal thoroughfares for the Project have been investigated by AECOM. During the site visit the full extent of these local roads was not assessed given the multitude of options still being considered for transmission line and main substation location options. Accordingly, the potential roads to be utilised during transmission line (onwards to the Heywood Terminal Station) and substation construction have been reviewed by AECOM on a desktop basis at this stage. The key transport elements are outlined in Table 5.

Table 5 Existing road conditions near transmission line and substation

Transport element	Portland-Nelson Road	Henty Highway	Mt Kincaid Road	Cut-out Dam Road	Boiler Swamp Road	Boundary / Blacks Road	Jennings Road	Coffeys Lane	Jarrets Road	Meaghers Road	Rifle Range Road
Speed Limit (kph)	100	100	60	60	60	60	60	60	60	60	60
Classification	Highway	Highway	Local	Local	Local	Local	Local	Local	Local	Local	Local
Road Authority	DTP (RRV)	DTP (RRV)	GSC	DEECA	DEECA	GSC	GSC	DEECA	GSC	GSC	GSC
Approx. road width (m)	7.0	7.0	5.0	5.0	5.0	7.0	7.0	5.0	5.0	5.0	5.0
Road surface	Sealed	Sealed	Unsealed	Unsealed	Unsealed	Unsealed	Unsealed	Sealed	Sealed	Sealed	Unsealed
Total number of lanes	Two	Two	One	One	One	Two	Two	One	One	One	One
Traffic Control	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority
Heavy vehicle use	Approved route for B-Double and Higher Mass Limit vehicles										

6.2 Existing sustainable modes of transport

6.2.1 Pedestrians and cyclists

Given the rural area there is no dedicated pedestrian or bicycle infrastructure provided via or near the road network, notably Portland-Nelson Road.

Portland-Nelson Road is known to be used by recreational (including tourist, Great Southern Bike Trail nominated) and sport training bicycle route users.

There are several formal and informal walking trails, notably the Great South West Walk, which is a 250-kilometre walking track which passes through Lower Glenelg National Park, the Cobboboonee National Park, the Discovery Bay Coastal Park, the Mount Richmond National Park and the Cape Nelson State Park. The walk was designed as a long-distance walking track, with the option for short and day walks. It can be accessed from roads in and near the towns of Portland and Nelson. walk contains 14 camp sites along the track; all supplied with fresh water, cleared tent sites and bush toilets. All overnight stays at 14 campsites require an online booking.

An extract of the walking trail in the vicinity of the Project site area is provided in Figure 6.

Source: Extract taken from https://greatsouthwestwalk.com/

Figure 6 Great South West Walk

6.2.2 Public transport – bus

DTP have advised that there are several bus services that operate daily in the Project area and provided route information which is shown in Figure 7.

PTV shows four public bus routes operating on weekdays within the study area:

- Route 1 Portland North and Route 2 Portland South operate within Portland town centre and the bus frequency is approximately every hour.
- Hamilton - Portland Via Heywood operates along New Street, Henty Highway and Princes Highway within the study area. Services to Hamilton or Portland are once daily.

- Mount Gambier - Warrnambool via Melbourne/Geelong is operated by V/Line and takes the same route within the study area as the Hamilton – Portland route described above. There are approximately four-five daily services in either direction from Portland.

School bus routes share PTV bus routes and operate in the vicinity of the following schools:

- Portland North Primary School accessed from Portland-Nelson Road
- Bolwarra Primary School located on Henty Highway
- Narrawong District Primary School located on Princes Highway
- Within Portland town centre there are multiple primary schools and high schools

Public bus and school routes are expected to be confirmed prior to construction commencement by the works contractor, with timetabling rechecked prior to recommencement of each school term to ensure that construction vehicles do not operate at the same time. Typically for wind farm projects construction vehicle movements would be limited and/or stopped during school drop off (830am to 9am) and pick up (330pm to 4pm) time periods, and/or co-ordinated directly with bus operates to specific times/movements.

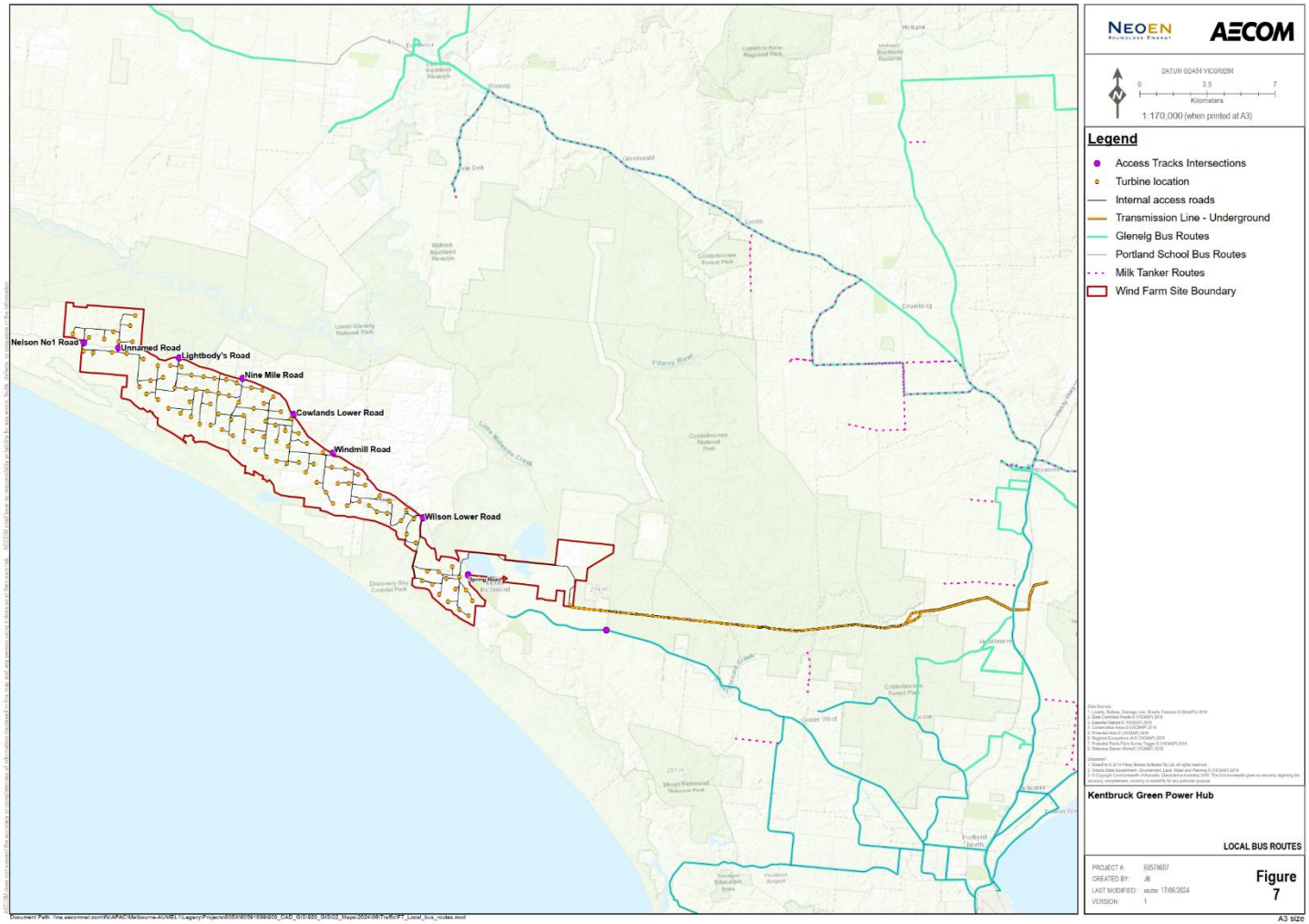


Figure 7 Local bus routes

6.3 Traffic conditions

6.3.1 Austroads

The Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis outlines the typical mid-block capacities for various types of urban roads with interrupted flow. Table 6 of this document states that the one-way mid-block capacity of a undivided road to be 900 passenger carrier units per hour per traffic lane (pc/h/ln), with peak period mid-block traffic volumes increasing to 1200 to 1400 pc/h/ln on any approach road when the following conditions exist or can be implemented:

- Adequate flaring at major upstream intersections.
- Uninterrupted flow from a wider carriageway upstream of an intersection approach and flowing at capacity.
- Control or absence of crossing or entering traffic via minor intersections by major road priority controls.
- Control or absence of parking.
- Control of absence of right turns by banning turning at difficult intersections.
- High volume flows of traffic from upstream intersections during more than one phase of a signal cycle.
- Good co-ordination of traffic signals along the route.

Accordingly, based on the characteristics of Portland-Nelson Road and the Henty Highway a mid-block capacity of 900 pc/h/ln (adopted as vehicles per hour for this assessment) has been adopted as a conservative value, a mid-block volume of up to 1,200 could feasible be considered based on the above conditions.

6.3.2 Annual Average Daily Traffic

Annual Average Daily Traffic (AADT) volumes for Portland-Nelson Road and the Henty Highway have been sourced from the DTP datasets and are outlined in Table 6.

No traffic volume data was available from GSC for their respective road assets, however during site investigations of those observed near the wind farm there was limited, or no vehicles observed to use these roads, which is expected given the rural location.

Based on the existing estimated peak hour traffic volumes currently operating on Portland-Nelson Road and the Henty Highway there is spare operational capacity for increases in traffic on these roads as shown in Table 6.

Table 6 Existing traffic conditions – two-way AADT

Road	Two Way AADT Volumes (2020)	Estimated Two Way Peak Hour Volumes* (% heavy vehicles)	Current spare link capacity (1,800 veh/hr two-way)
Portland-Nelson Road	1,200^ (2020)	120 (51%)	87%
Henty Highway	4,000^ (2020)	400 (21%)	78%

Notes: * *Assumed to be equal to 10% of AADT, rounded up to next whole vehicle.*

6.3.3 Seasonal variations and local traffic demands

Portland-Nelson Road is used extensively by forest industry trucks to transport logs and woodchips to the Port of Portland. Typical traffic volumes of one vehicle passes every minute with a single lane in each direction.

The Port of Portland exports approximately four million tonnes of wood products per year of which approximately 50% of this volume is transported via Portland-Nelson Road.

In the case of the Kentbruck plantation, GTFP have advised that their main activities usually occur between April and September. With the 2021-22 season expected to generate approximately 150 truck movements per week (see Figure 4 for traffic generation locations from GTFP operations in 2021-22).

As part of the Project's TMP further guidance on operational seasonal peaks of business and tourism are to be investigated to ensure that the peak base traffic operations are considered. It is however unlikely to affect the operational capacities of the key road links near the Project site access points.

6.3.4 Crash history review

DTP CrashStats was interrogated for the last seven years of crash data (available data between 2013 to 2020) for the length of Portland-Nelson Road from the storage yard at 211 Portland-Nelson Road to the end of the Project boundary. A summary of the recorded crashes are provided in Table 7, with the relative location of each crash found shown on Figure 8.

In summary the following has been found:

- A total of 16 crashes were found to occur with six fatal and ten serious.
- In terms of the fatal crashes, four were classified as head-on, with a single rear end and off-carriageway right bend.
- In terms of the serious crashes a total of seven crashes were due to off-carriageway crashes, with a single collision with vehicle, struck animal and out of control (overturn) recorded for the remaining crashes.
- The only cluster of crashes were found to occur to the west of the Sandy Hill Road intersection on Portland-Nelson Road (crashes 11 to 13). No distinct correlation in the crashes which have occurred point to a common issue, it may be a combination of alignment and speed that could be contributing factors at this location.
- The head-on crashes (total of four fatal) are more likely to end in fatalities due to the speed of Portland-Nelson Road being 100km/hr.

Between the site and the Victorian-South Australian border, there were an additional two crashes noted, both of which were serious injury crashes due to a vehicle overturning.

6.3.4.1 Recommended mitigation measure

Mitigation measures are detailed and discussed in more detail in Chapter 12.0.

It is recommended with regards to the crash history of Portland-Nelson Road that a formal Road Safety Audit (RSA), *MM-T03*, be undertaken so that any additional mitigation measures to facilitate safe access of vehicles to and from the Project site(s) can be identified. For completeness the RSA should be completed for all nominated access points and internal access roads/tracks.

Table 7 Summary of recorded crashes between 2013 and 2020 along Portland-Nelson Road

Crash No.	Date	Conditions		Vehicles involved	Crash type	Severity
		Day / Night	Wet/ Dry			
1	10/11/13	Day	Wet	1 Motorcycle	Off-carriageway on a left bend	Serious
2	01/05/18	Day	Dry	1 HV and 1 LV	Collision with vehicle	Serious
3	14/03/18	Day	Dry	1 HV and 3 LV's	Rear end	Fatal
4	30/08/16	Night	Wet	1 HV and 1 LV	Non-overtaking head-on	Fatal
5	12/11/16	Day	Wet	1 HV	Off-carriageway on a left bend	Serious
6	18/05/15	Day	Dry	1 HV	Off-carriageway on a left bend	Serious
7	13/05/14	Day	Dry	1 HV	Off-carriageway on a right bend	Serious
8	26/05/16	Night	Wet	1 LV	Off-carriageway on a right bend	Fatal
9	04/09/16	Day	Dry	1 Motorcycle	Struck animal	Serious
10	11/04/17	Night	Dry	1 LV	Off-carriageway on a right bend	Serious
11	02/11/13	Day	Dry	1 Motorcycle	Off-carriageway on a right bend	Serious
12	29/11/17	Day	Dry	1 HV and 1 LV	Overtaking head-on	Fatal
13	02/04/14	Day	Dry	2 LV's	Non-overtaking head-on	Fatal
14	02/01/19	Day	Dry	1 LV	Out of control overturn	Serious
15	19/08/17	Night	Dry	1 LV	Off-carriageway on a right bend	Serious
16	22/01/18	Day	Dry	3 LV's	Non-overtaking head-on	Fatal

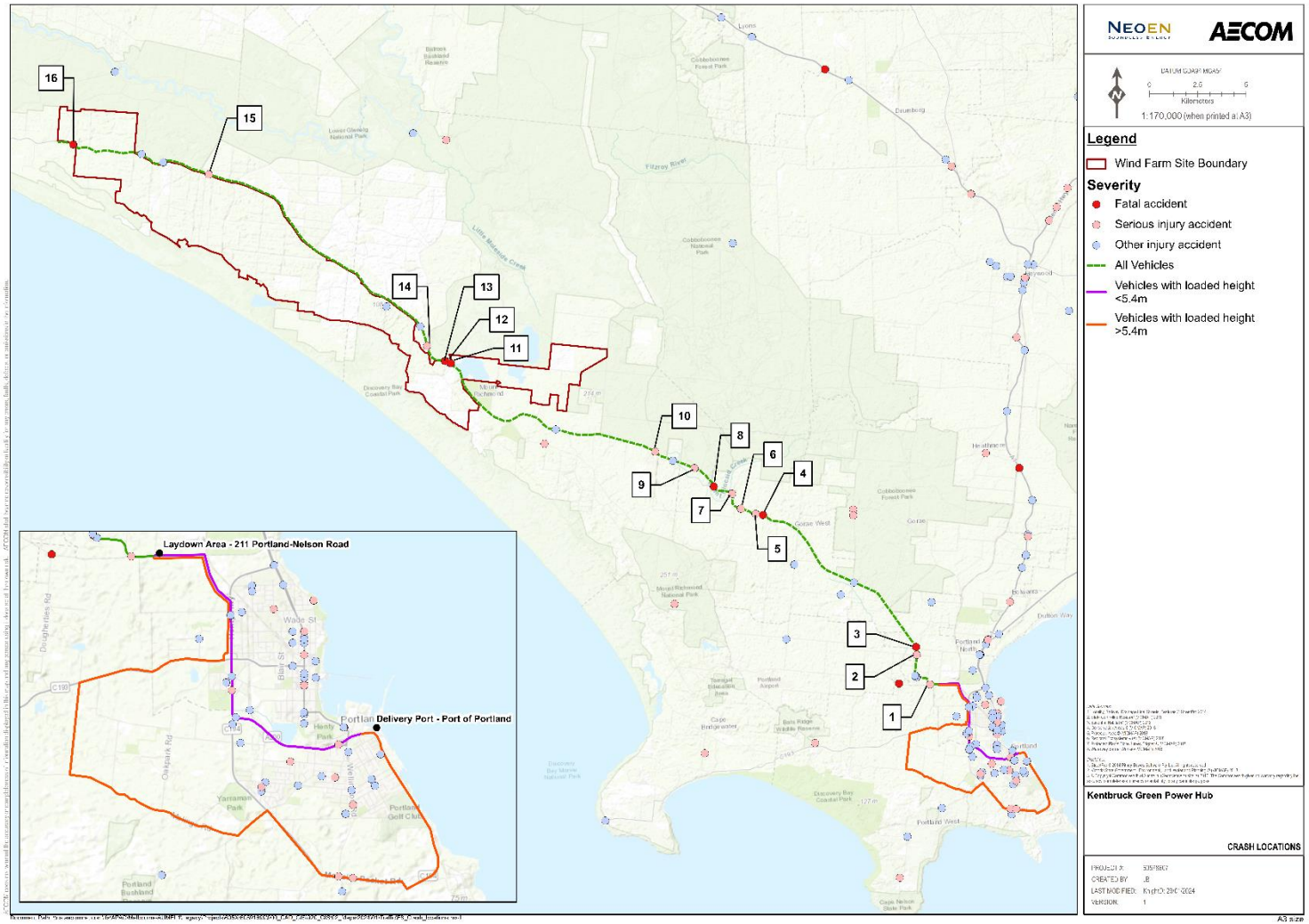


Figure 8 Crash locations from period 2013 to 2018 (Source: DTP Crash Statistics)

7.0 Preliminary Vehicle Access Strategy

7.1 Vehicle access types

The construction vehicle types have been consolidated into groupings for the purposes of aiding with vehicle route assessments by their anticipated size, see Table 8.

Table 8 Construction traffic classification consolidation

Over-arching Vehicle Type	Sub-Vehicle Type	Vehicle Classification	Vehicle Length (based upon classification in metres, m)	Transport Vehicles Gross Vehicle Mass (tonnes, t)
Light Vehicles	Private Car	99th percentile passenger vehicle	5.2	-
	Utes			-
Truck	General Purpose Vehicle	Small Rigid Vehicle (SRV) 2-5 Tonne	6.4	-
	EPV (Elevated Platform Vehicle)	Medium Rigid Vehicle (MRV) 10 Tonne	8.8	-
	Rubbish Truck			-
	Concrete Truck	Heavy Rigid Vehicle (HRV)	8.8 to 12.5	22.4
	Rigid Truck			13.5
	Small Crane			TBC
	Semi-trailers	Articulated Vehicle (AV)	25.0	16.5
	Truck and Dog			30.5
	Low Loader			TBC
OD*	Heavy vehicles	Over-Dimensional – WTG Blades	95.0	~ 67.5
		Over-Dimensional – Tower Sections	~55.0	~164.5
		Over-Dimensional – Nacelles	~35	~144.5
		Over-Dimensional - Hubs	~26	~108.5
		Over-Dimensional – Main transformer	TBC	

**OD vehicle dimensions and weights will be subject to final WTG specifications. OD vehicles will typically have trailer widths ranging from 4.0 metres to 5.0 metres and heights ranging from 4.9 metres to 5.6 metres.*

**OD vehicle specified for building delivery to off-site switching station via Sandy Hill Road. OD vehicle specifics for transmission line works are subject to confirmation, in the main semi-trailers would be used.*

7.2 Wind Farm access strategy

7.2.1 Stage 1 – construction stage access

A total of ten vehicle access points (site entrances) are proposed to be utilised to access the Project site from the public road network. Each of the site entrances intersect with Portland-Nelson Road and are considered major access points to the Project, with all but one entry servicing several WTGs.

A summary of the proposed access locations, and the turbines serviced by each access, are summarised in Table 9 and illustrated in Figure 9.

With regards to the proposed access points, the following is noted:

- Each of the proposed access points would be used to facilitate WTG component and blade deliveries, except for Cowlands Lower Road. Component delivery vehicles would approach from the south-east from the storage laydown area located in Portland, turning onto each of the proposed access points.
- All of the proposed access roads are unsealed, gravel roads, and, based on visual inspection, appear to be in reasonable condition with limited shape loss or ravelling observed.
- Localised widening of the existing intersections would be required to permit oversize and overmass (OSOM) delivery vehicles entering the site. This is further discussed in Chapter 10.0
- Vegetation has been identified for removal at all intersections however this is only over limited extents at most intersections due to the existing clearings from the road corridor. The implications of proposed vegetation removal are considered in EES Technical Report C: Flora and fauna.

The approximate extent of intersection upgrade works required to accommodate OSOM vehicles, as identified by vehicle swept paths, has been noted in Table 9. These areas are broken down into:

1. Approx. additional pavement extents – the approximate extents of new pavements to accommodate the wheel paths of the OSOM. This will require removal / stripping of all vegetation within this area.
2. Approx. additional clearing extents – the approximate extents that fall within the load envelope of the design OSOM vehicle. Vegetation including grass and small shrubs may be retained, but larger trees that may clash with overhanging vehicle trailers and loads must be removed.

The above is subject to associated impact assessment works, final access points determined and subsequent functional design using a procured feature survey.

- Consideration of stormwater drainage management systems including swale drains and pipe culverts would be undertaken during subsequent site access concept and functional design stages, as there is currently nothing in place to divert runoff from the intersecting roads with Portland-Nelson Road. The potential effects on hydrology and surface water quality are considered in EES Technical Report F: Surface water. This report provides a range of measures for managing any identified stormwater drainage and effects.
- Other than the major access points between the site and Portland-Nelson Road, there are a number of internal access roads which will be used to service the WTG. These may include:
  - Lake Mombeong Road
  - Dry Block Road
  - Clarkes Road
  - Carters Road
  - Mcleans Road
  - Browns Road
  - Spring Road
- Inter-site movements would be derived via a Project way-finding strategy (taking into consideration Plantation one-way vehicle movements, tourist access and safety) to minimise the use of Portland-Nelson Road as far as practicable (i.e. movement between construction compounds, batching facilities and WTG locations). Some examples of strategies which may minimise movements may include time of day restrictions or specific crossing points (if moving across Portland-Nelson Road).

7.2.2 Stage 2 – operational stage access

During the operational stage the main operations and maintenance facility is proposed to be located via Smiths Road with sufficient on-site car parking provided for the anticipated permanent staff.

7.2.3 Stage 3 – re-powering or de-commissioning stage access

Access requirements for repowering or decommissioning stages are expected to be as per the construction stage of the Project.

Table 9 Construction vehicle access

Area Number	Access Point	Intersecting Road	Distance between accesses (km)	Road condition	Upgrades	Nearest WTG	Total WTGs accessed	Features	Approx. Additional Pavement Extents for OSOM* (m2)	Approx. Additional Clearing Extents for OSOM (m2)
Area 1	Sandy Hill Road	Portland-Nelson Road	3	Unsealed, gravel, good condition	To permit OSOM access	WTG 34	6	Batch Plant 1	2420	2250
Area 2	Unnamed Road (opposite Sandy Hill Road)	Portland-Nelson Road	3	Unsealed, gravel, good condition	To permit OSOM access	WTG 89	14	On-site substation Transmission line works		
Area 3	Wilson Lower Road	Portland-Nelson Road	3	Unsealed, gravel, good condition	To permit OSOM access	WTG 11	17		3960	7130
Area 4	Windmill Road	Portland-Nelson Road	3	Unsealed, gravel, good condition	To permit OSOM access	WTG 18	14		1270	360
N/A	Cowlands Lower Road	Portland-Nelson Road	3	Unsealed, gravel, good condition	Localised grading and shaping may be required	WTG 108	0	Main Site Compound and On-site Quarry access	Not used	
Area 5	Nine Mile Road	Portland-Nelson Road	3	Unsealed, gravel, good condition	To permit OSOM access	WTG 127	25	Batch Plant 2	1340	1630
Area 6	Lightbody Road	Portland-Nelson Road	2	Unsealed, gravel, good condition	To permit OSOM access, including culvert works	WTG 71	17		670	1280
Area 7	Dewars Road	Portland-Nelson Road	2	Unsealed, gravel, good condition	To permit OSOM access	WTG 113	11		1840	2470
Area 8	Unnamed Road	Portland-Nelson Road	2	Unsealed, gravel, good condition	To permit OSOM access	WTG 129	8			
Area 9	Nelson No. 1 Road	Portland-Nelson Road	2	Unsealed, gravel, good condition	To permit OSOM access	WTG 94	7		1380	320

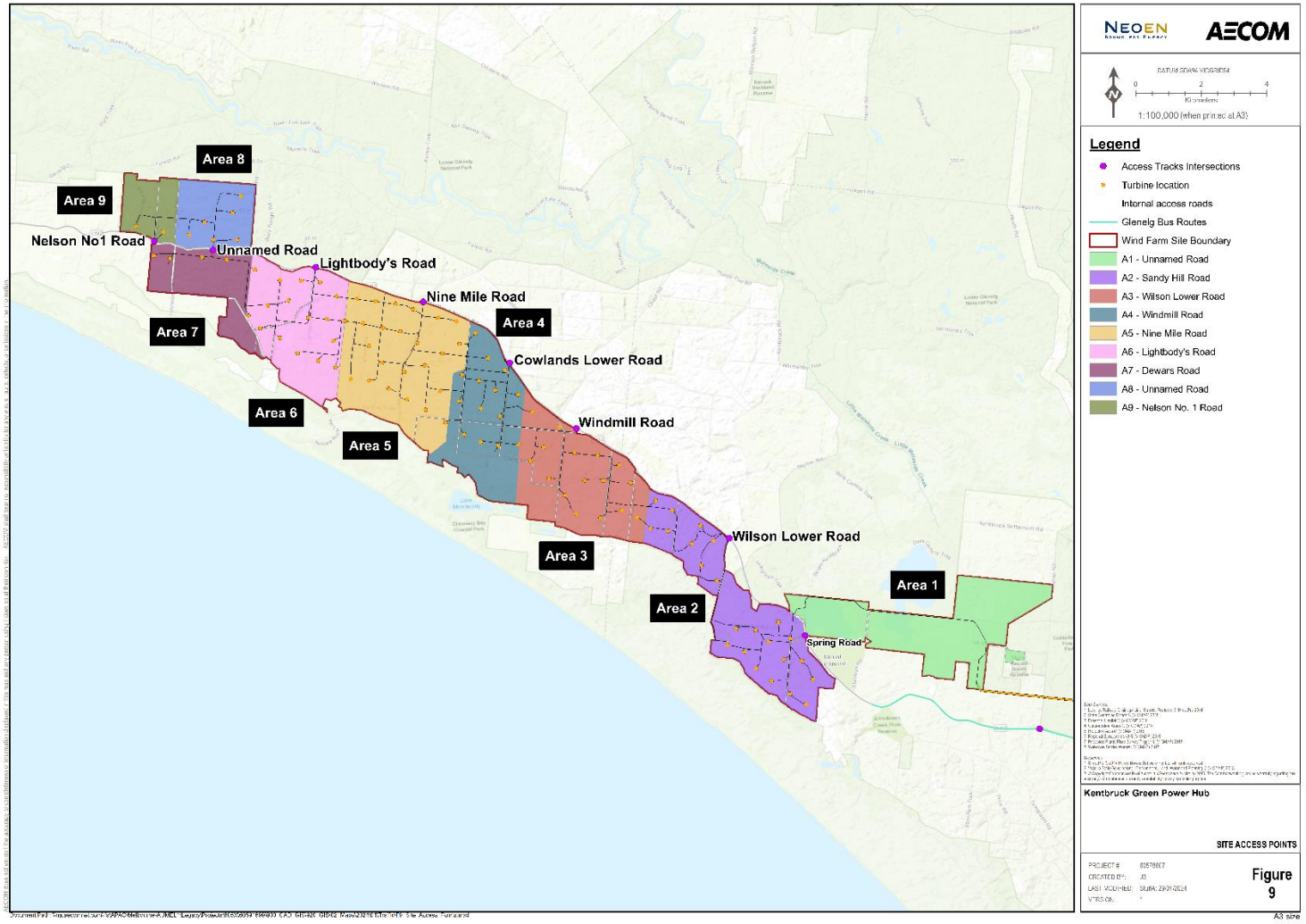


Figure 9 Kentbruck Green Power Hub - proposed Site Access Points

7.3 Transmission line and substation construction

Due to the limited information available and certainty around the preferred construction methodology (e.g. staging, extents of work and construction right of way, impacts from other studies etc.), a desktop review was completed of the local road network to understand potential access points. No site investigation has been completed confirming the existing roads condition to date. It is expected that this would be completed as part of the TMP development stage of the Project.

The Portland-Nelson Road and Blacks Road priority intersection would be used for construction access to the on-site substation and commencement of the underground transmission line construction. The anticipated access points for the transmission line and substation construction are illustrated in Figure 10.

Similar notes as previously outlined as part of the wind farm construction access strategy apply to the transmission line and substation accesses reviews as follows:

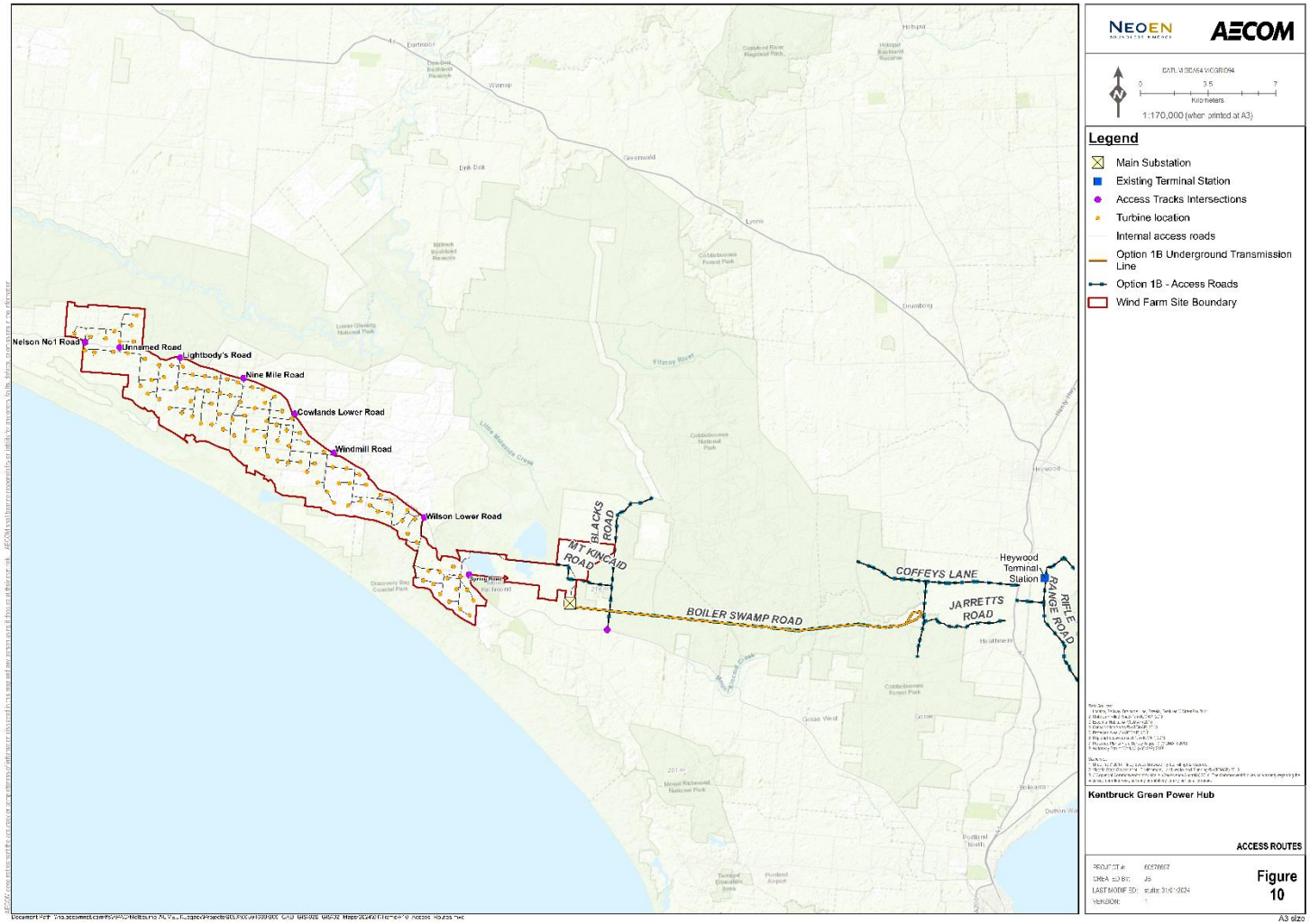


Figure 10 Kentbruck Green Power Hub and Transmission Line Access Routes

A summary of the construction vehicle access points identified via a desktop assessment for the transmission line construction are outlined below and considered further in Table 10 with regards to road conditions and potential upgrades:

- The initial construction site for the main on-site substation and commencement works of the underground transmission line can be accessed via Blacks Road which is accessed via Portland-Nelson Road.
- From the collector substation, the proposed underground line travels south-east to Boiler Swamp Road.
- Mt Kincaid Road may be utilised as a service road for this initial section of the underground line as it inter-connects with the internal access track network adjoining the substation. Mt Kincaid Road can also be accessed by turning left from Blacks Road, which runs north-south intersecting with Portland-Nelson Road.
- Boiler Swamp Road would be expected to be used as a dedicated access track for the construction of the underground line. This road runs east-west and is accessed via Blacks Road (which also forms a priority intersection with Portland-Nelson Road).
- Boiler Swamp Road is an unsealed public road that extends from Blacks Road at Mount Richmond in the west to the intersection with Cut Out Dam Road at Gorae in the east. The roadway (i.e. the trafficable section of the road) is generally between 5 and 6 m wide. Managed shoulders on each side of the road are between 1 and 1.5 m wide
- At the eastern end of the underground transmission line, the construction traffic can utilise Jennings Road, accessed from the wider road network via the Henty Highway, Coffeys Lane or Jarretts Road.
- The line would connect into the existing Heywood Terminal Station east of Rifle Range Road, at the western boundary of Narrawong Flora Reserve. Works at the Heywood Terminal Station would consist of limited augmentation works that would not require the footprint of the terminal station to be expanded.
- Members of the public would not be permitted access through construction areas and would be diverted along alternative routes through Cobboboonee National Park / Forest Park, utilising Wrights Swamp Road, T and W Road, Fish Hole Road and Cut Out Dam Road. Sections of Boiler Swamp Road with a length of approximately 1 km would only be closed when construction is underway for cable installation.
- A TMP will be prepared for the Project, including the transmission line component, and will include vehicle management such as managing any two-way vehicle movements (e.g. of construction vehicles, or construction vehicles and emergency vehicles). The 6.5 m construction corridor is considered sufficient to manage any two-way vehicle movements required.
- Bushfire management during construction of the transmission line will be considered as part of the TMP in terms of emergency access and egress for Project site workers and emergency services personnel and vehicles. The Project will continue to consult with DEECA, DTP, Forest Fire Management Victoria (FFMV), Emergency Management Victoria and the Victorian Country Fire Authority (CFA) in conjunction with any other relevant authorities to ensure adherence to regional guidelines regarding bushfire risk management, including maintaining emergency vehicle access.

Table 10 Construction vehicle access for transmission line

Public Road	Road condition	Upgrades	Features
Unnamed Road (opposite Sandy Hill Road) via Portland-Nelson Road	Unsealed, gravel, good condition	To permit OSOM access	28 WTGs accessed. Main access to UG transmission line
Blacks Road	Unsealed, gravel, condition TBC*	Localised grading and shaping may be required	Access to UG transmission line and alternative access to eastern corner WF. Not for OD and OSOM access

Public Road	Road condition	Upgrades	Features
Mt Kincaid Road	Unsealed, gravel, condition TBC*	Localised grading and shaping may be required	Wind Farm internal road
Boiler Swamp Road	Unsealed, gravel, condition TBC*	Localised grading and shaping may be required	UG transmission line route
Cut Out Dam Road	Unsealed, gravel, condition TBC*	Localised grading and shaping may be required	
Jennings Road	Unsealed, gravel, condition TBC*	Localised grading and shaping may be required	
Coffeys Lane	Sealed, condition TBC*	Localised grading and shaping may be required	
Jarretts Road	Unsealed, gravel, condition TBC*	Localised grading and shaping may be required	
Meaghers Road	Sealed, gravel, condition TBC*	Localised grading and shaping may be required	
Rifle Range Road	Unsealed, gravel, condition TBC*	Localised grading and shaping may be required	Heywood Terminal Station

Notes:
* Road condition and geometry to be confirmed during further development of project and traffic management plan

8.0 Traffic generation and Road Capacity Impact Analysis

8.1 Wind Farm – traffic generation

8.1.1 Stage 1 - construction

The estimates detailed herein for the construction stage traffic generation for the Project are likely to change once a nominated contractor is commissioned later in the Project process and a subsequent TMP is developed.

The volumes have been calculated to represent a conservative estimate of the maximum traffic generated by the project's construction at any given point. It is noted that these estimates are considered conservative as some works are unlikely to occur simultaneously following further refinement of the construction program for the Project.

The traffic generation estimations have been based on the following:

- AECOM's experience preparing TIA/TMPs and other services for wind farm projects.
- Information provided by Neoen.
- Advice and review by a potential wind turbine supplier for the Project.
- Assuming a 24-month construction program, 11-hour (7am to 6pm) working weekday and 24 working days in a month (noting the final working hours for the Project are yet to be determined).

A summary of the estimated construction traffic generation over the project lifecycle by task is provided in Appendix **B**. This information has been utilised to summarise the traffic generation for the construction stage from internal (local roads) and external sources to inform the possible traffic impacts of the Project. The Project will aim to prioritise the use of internal roads for inter-site movements to minimise the impact on Portland-Nelson Road as far as practicable.

8.1.1.1 External traffic generation

An estimate of the total external construction related vehicles to and from the wind farm construction sites are provided in Table 11 by vehicle type and origin. This includes vehicle generation associated with the delivery of WTG and crane parts as well as any externally sourced material. Note that this assumes a 24-month construction program.

Table 11 Estimate of external traffic generated for wind farm construction

Vehicle Type	One-way trips	Origin	Comments / Assumptions
OD Trailer	2,129	Port of Portland	WTG parts etc.
Truck and Dog Trailer	4,180	Portland-Nelson Road	Cement, concrete aggregate and sand
Rigid trucks	354	Portland-Nelson Road	Fuel Delivery
Other Heavy Vehicles	2,381	Portland-Nelson Road	Support vehicles required for turbine erection and parts delivery
Light vehicle	44,000	Portland-Nelson Road	Workforce
Total OD vehicle trips	**2,129**		
Total heavy vehicle trips	**6,915**		
Total light vehicle trips	**44,000**		

8.1.1.2 Internal (or inter-site) traffic

A quarry and two concrete batch plants are proposed to be located on the Project site as outlined below:

- **Quarry:** It is understood a new quarry is to be constructed on North Livingston Road opposite the existing quarry, which is internal to the wind farm. Neoen will not use the existing GTFP quarry, and nor would GTFP use Neoen's quarry. Where practicable, trucks will be restricted to the internal access tracks, supplying the concrete batching plants and localised areas of cut and fill as required. Portland-Nelson Road will need to be accessed by vehicles supplying the southern batching plant for worksite Areas 1 and 2 (which are detailed later in this TIA).

  At this stage of the Project this quarry is the only source identified. In the case where this supply is insufficient, other quarries utilised for other wind farm Projects would be considered at the TMP stage. Regardless all trips would travel via Portland-Nelson Road and access the worksite(s) and are unlikely to change the assessment findings.

- **Concrete batch plants:** Two temporary batch plants are expected to be located on site. One will be accessed via a new access road north of Sandy Hill Road and the other will be accessed via Nine Mile Road. They will produce concrete for hardstands and road upgrades but will not be used for turbine foundations.

Traffic originating from the batching plants will travel either via Portland-Nelson Road or via the access tracks towards the relevant WTGs.

An estimate of the total internal vehicles to and from the wind farm WTG sites via Portland-Nelson Road is provided in Table 12 by vehicle type and origin.

Table 12 Estimate of internal traffic generation during construction of the wind farm

Vehicle Type	One-way trips	Origin	Comments
Concrete agitator	10,500	Batch plants on site	WTG foundations, substation foundation
Truck and Dog Trailer	6,875	Quarry on site	Aggregate, gravel delivery for access road upgrades
Rigid Trucks	1,870	On site bores	Water cartage
Total heavy vehicle trips	**19,245**		

8.1.2 Stage 2 – operational

The ongoing operation of the wind farm would be monitored by staff onsite. It is estimated that approximately 14 permanent staff will be on site who would commute to and from the site every day.

Typical duties of staff are likely to include:

- Site track reviews and minor maintenance if required.
- Routine wind farm component maintenance (turbine, generators, etc.)
- Other general repairs and monitoring.

It is likely that service vans will travel around the wind farm site on a daily basis to attend to any project requirements. Minor additional traffic generation of approximately 1 truck per week may also be required for the delivery of items to aid in maintenance activities (such as deliveries or waste removal).

Major works are not typically required in the first 5 years of wind farm operations, however in the event of major works being required then an OD vehicle delivery maybe required. As an example, replacement or repair of a blade may require OD component removal and delivery, as well as delivery of a crane.

8.1.3 Stage 3 - re-powering or de-commissioning

Traffic generation for any of these potential stage 3 works are likely to be similar or less than the construction stage. Given such activities occur at the end of the wind farm's lifecycle (approximately 25

to 30 years from opening), an updated impact and traffic management assessments would be required at this time.

8.2 Wind Farm – peak hour frequency and traffic impact

8.2.1 Stage 1 – construction

To estimate the worst-case traffic impacts expected at each of the proposed Project site access intersections the following has been assumed:

- The contractor will typically operate during normal construction hours from Monday to Friday between 7.00am to 6.00pm, with Saturday operations occurring between 7:00am till 4:00pm. During the peak construction period, peak trips are expected to occur in a one-hour period between 6:00am and 7:00am.
- At its peak the Project is estimated to provide direct employment to 253 full time equivalent workers. As such, with an average of 1.5 passengers per vehicle, workforce commute is expected to generate up to 170 light vehicle trips within the morning peak. It is estimated that:
    - 60% of the workforce is expected to arrive along Portland-Nelson Road from the east, equating to 102 light vehicle trips.
    - 40% of the workforce is expected to arrive along Portland-Nelson Road from the west, equating to 68 light vehicle trips.
    - The final distribution of workforce trips would be verified once the nominated contractor has been commissioned, however impacts regardless of direction of travel are likely to remain minor given the rural road network and times of travel.
- With regards to construction works the peak traffic generation task is likely to occur during the pouring of foundations at each WTG site over the course of a single day per WTG. A concrete agitator can carry up to 7m^3 of concrete, therefore it is estimated that 98 vehicle trips are required for each respective WTG foundation pour. Assuming 100m^3 of concrete is poured per hour, approximately 17 one-way trips per hour are predicted.

Adopting a worse-case scenario where vehicles are predicted to both arrive and depart from a site during the AM peak period under the above peak worker arrivals with a single WTG foundation pour, the predicted traffic impacts for each of the site intersections has been predicted and is summarised in Table 13. Noting these tables shows the worst case per intersection in isolation during a single WTG foundation pour. There may be some ad-hoc other tasks occurring via other access points which will have a cumulative effect on Portland-Nelson Road, however such works will be negligible given construction will typically be sequential in construction tasks completed.

As shown from Table 13 the predicted worst-case construction stage traffic impacts along Portland-Nelson road is 294 two way vehicle movements, an increase of 174 two-way movements on existing volumes. As a typical two-way road capacity is 1700 vehicles per hour, the predicted construction traffic is relatively low and the impact of construction is predicted to be negligible. Accordingly, even if more intensive usage is required during certain stages of the project there will be ample mid-block road operational capacity to accommodate construction traffic.

It should be noted that although particular construction windows exist in some locations due to biodiversity, surface water and bushfire constraints, there is no intention to escalate construction effort and resulting traffic, and instead construction will shift to other parts of the Project during these windows. As such, these construction windows should not have an impact on peak traffic frequencies.

The increase in turning movements at a site access point level may trigger intersection improvements and a review of this has been conducted in Chapter 10.0.

Table 13 Predicated worst-case construction stage traffic impacts by intersection during morning peak

Site area	Access point	Public road	Portland-Nelson Road		Site Access	
			Existing Peak Two Way Traffic Volume*	Predicted Peak Two-Way Traffic Volume with wind farm development**	Estimated Increase in Intersection Use^	
					Left Turns	Right Turns
SE1	Sandy Hill Road	Portland-Nelson Road	120	233	10	3
SE2	New site entrance (opposite Sandy Hill Road)	Portland-Nelson Road	120	262	12	33
SE3	Wilson Lower Road	Portland-Nelson Road	120	250	27	0
SE4	Windmill Road	Portland-Nelson Road	120	250	27	0
SE5	Cowlands Lower Road	Portland-Nelson Road	120	294	106	64
SE6	Nine Mile Road	Portland-Nelson Road	120	191	13	0
SE7	Lightbody Road	Portland-Nelson Road	120	208	10	0
SE8	New site entrance	Portland-Nelson Road	120	208	0	30
SE9	Unnamed Road	Portland-Nelson Road	120	208	13	0
SE10	Nelson No. 1 Road	Portland-Nelson Road	120	208	0	30

Notes: * *Assumed to be equal to 10% of Two Way AADT. Two Way AADT volumes can be found* in Table 6.

** *Includes existing traffic volumes, heavy vehicles and light vehicles.*

^ *Increase in intersection use only considers turning movements made from main road into access road. It is assumed that the opposite movement from the access track to the main road is made at an off-peak time or concentrated to a single PM peak period when the working day finishes.*

There are a number of internal access roads which may be used for the project which do not intersect with Portland-Nelson Road and instead intersect with some of the access points listed above. These have been listed in Section 7.2.1. Due to the low existing volumes at these locations, the impact of construction is predicted to be negligible.

8.2.2 Stage 2 – operational

It is predicted that up to 14 staff vehicles per day will commute to and from the site each day. These are expected to arrive during the morning peak between 8am and 9am and depart when works are complete.

Given the low operational traffic generation no detrimental impacts to the local traffic operations are expected given the existing capacity of Portland-Nelson Road.

8.2.3 Stage 3 - re-powering or de-commissioning

Traffic impacts for any of these potential stage 3 works are likely to be similar or less than the construction stage. Given such activities would occur at the end of the wind farms lifecycle (approximately 30 years from opening), an updated traffic impact assessment would be required to also take into consideration any increases in background traffic due to both nominal traffic growth and potential land use changes over time.

8.3 Transmission line and substation construction – traffic generation

The estimates detailed of the construction stage traffic generation for the final transmission line and substation construction option are likely to change once a nominated contractor is commissioned later in the Project process and a subsequent TMP is developed.

The volumes have been calculated to represent a conservative estimate of the maximum traffic generated by the project's construction at any given point. At this stage the traffic generation estimations have been informed by:

- AECOM's experience of past transmission line and substation construction elements for wind farm projects.
- Information provided by Neoen.
- Assumed working hours for transmission line and substation construction. Construction methods could change these initial estimations, such as subsequent concrete pours, and method of transmission line construction, e.g. in sections).
- Underground line construction would be provided over an approximate distance of 26.6 kilometres. At peak the number of workers is estimated to be approximately 30 workers (30 light vehicles assuming worst case no car sharing), with on average 3 trucks per day associated with conduit deliveries, concrete delivery, and miscellaneous deliveries.

8.4 Transmission line and substation construction – peak hour frequency and traffic impact

8.4.1 Stage 1 - construction

Based on the traffic volume input information outlined in Section 8.3 above, the following subsections summarise the increase in peak traffic volumes for each of the proposed access points, including expected impacts resulting from the increased traffic. Existing peak two-way traffic volumes were assumed to be equal to 10% of two wat AADT for major roads and assumed to be negligible (< 1 vehicle per hour) for minor roads, based on a desktop analysis.

The estimated increased in peak vehicle movements due to the construction of the proposed underground transmission line is 17 additional vehicle movements per hour, which is a combination of heavy and light vehicle movements. Until further information is provided regarding construction methodology, the peak volumes were assumed for each of the proposed access points, as a conservative assessment of the potential impacts. Table 14 summarises the increased traffic volumes to each of the respective local roads.

Where there are multiple access routes to a single road, for example Coffeys Lane and Jarretts Road, estimates for traffic volume increases have been estimated conservatively, assuming the entire peak increase may use either access option.

Table 14 Estimated peak traffic volumes for transmission line

Public road	Major Road Access	Minor Road Access	Existing Peak Two Way Traffic Volume (Major Road)	Predicted Peak Two-Way Traffic Volume with wind farm development(Major Road)**	Estimated Increase in Intersection Use^	
					Left Turns	Right Turns
New Site Entrance/Blacks Road	Portland-Nelson Road	N/A	120*	153	0	33
Mt Kincaid Road	N/A	Blacks Road	0	33	33	0
Boiler Swamp Road	N/A	Blacks Road	0	33	0	33

Public road	Major Road Access	Minor Road Access	Existing Peak Two Way Traffic Volume (Major Road)	Predicted Peak Two-Way Traffic Volume with wind farm development(Major Road)**	Estimated Increase in Intersection Use^	
					Left Turns	Right Turns
Cut Out Dam Road	N/A	Blacks Road	0	33	0	33
Coffeys Lane	Henty Highway	Jennings Road	400*	433	33^^	33^^
Jarretts Road	Henty Highway	Jennings Road	400*	433	33^^	33^^
Meaghers Road	Henty Highway	N/A	400*	433	0	33
Rifle Range Road	Meaghers Road	Meaghers Roads	0	33	33	0

Notes: * *Assumed to be equal to 10% of Two Way AADT for major roads only. Two Way AADT volumes can be found in* Table 6.

** *Includes existing traffic volumes, heavy vehicles and light vehicles.*

^ *Increase in intersection use only considers turning movements made from main road into access road. It is assumed that the opposite movement from the access track to the main road is made at an off-peak time.*

^^ *Assumes full peak volume increase uses either access point.*

As shown in Table 14 the predicted worst-case construction stage traffic impacts are negligible, with the local roads having ample mid-block road operational capacity to facilitate, given a typical one-way road capacity is 900 vehicles per hour.

The increase in turning movements at a site access point level may trigger intersection improvements and a review of this has been conducted in Chapter 10.0.

Existing road intersections in the National Park and Forest Park are appropriate for construction vehicle turnaround locations. These intersections are large, cleared areas which would not require any vegetation removal to facilitate turning of Project construction vehicles.

The proposed transmission line route along Boiler Swamp Road also has no sharp turns. A potential cable installation contractor has advised that the integrated trenching wheel vehicles would be accommodated within the existing width of Boiler Swamp Road and that impacts would not occur outside the 6.5 m-wide construction corridor

8.4.2 Stage 2 - operational

During operations an average of two light vehicles and a single heavy vehicle will visit the transmission lines and substation per day. During peak operational times a maximum of 14 staff would be on-site at any one time with this number of car parking spaces provided near the auxiliary services building.

8.4.3 Stage 3 - re-powering or de-commissioning

Traffic impacts for any of these potential stage 3 works are likely to be similar or less than the construction stage. Given such activities would occur at the end of the wind farms lifecycle (approximately 30 years from opening), an updated traffic impact assessment would be required to also take into consideration any increases in background traffic due to both nominal traffic growth and potential land use changes over time.

8.5 Recommended mitigation measures

Mitigation measures are detailed and discussed in more detail in Chapter 12.0.

It is recommended with regards to the findings for this traffic generation and road capacity analysis that the mitigation measures outlined as part of *MM-T01 – Stakeholder consultation* and *MM-T02 – Traffic Management Plan* be undertaken.

9.0 Preliminary Construction Traffic Route Assessments

9.1 Wind farm

9.1.1 Potential OD transport routes – port assessment

At this stage the delivery port for materials and turbine components has not been selected. It has been noted that Neoen has indicated a preference for the Port of Portland to be used as the delivery port for large components due to its proximity to the site, however this needs to be further investigated given the required accessibility and storage requirements for the proposed WTG components as part of this Project.

Discussions with relevant ports and detailed route assessments by the nominated transport contractor will be required so that these can be captured in any subsequent TMPs for the project.

Accordingly, at this stage AECOM have undertaken a high-level desktop analysis of the available port delivery route options via the Port of Portland and Port of Geelong, to provide greatest flexibility for delivery of WTG components. Noting any OD route assessment would be undertaken in more detail during the development of the Project TMP, with such assessment undertaken by the nominated OD transport contractor. It should also be noted that OSOM/OD deliveries will only be undertaken from Port of Portland and not from the Port of Geelong.

Port of Melbourne could also be an option however distance to the site may be an issue. Port of Melbourne could be used for containerised shipments which can utilise the network without any additional OD route assessments or permits.

The routes associated with each have been summarised in terms of initially identified major constraints for any OD transportation of components to the Project site. These proposed OD routes are shown in Figure 11.

The OD routes have been assessed and derived at this stage as follows:

- Port of Portland: consultation was undertaken with Rex J Andrews to verify known OD routes for current and past wind farm projects. A total of two routes were confirmed based on height restrictions and that a storage yard was located at 211 Portland-Nelson Road.

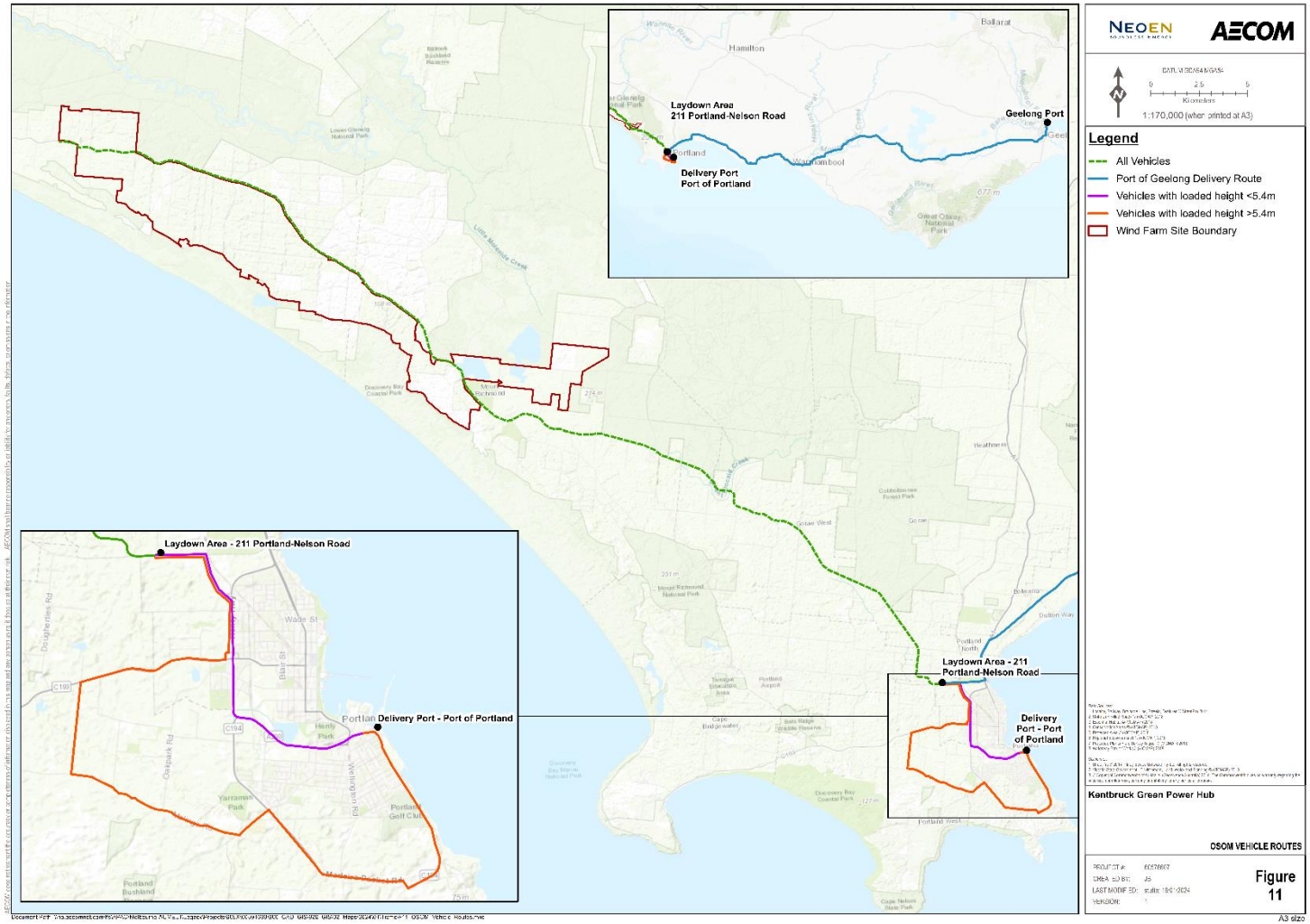


Figure 11 Delivery vehicle routes

9.1.2 Port of Portland

There are two potential OD route options from the Port of Portland to the Rex J Andrews storage yard located at 211 Portland-Nelson Road, depending on the height of WTG components to be delivered due to local overhead clearance restrictions. Route options are summarised below:

- Route 1 for components less than 5.4 metres in height:
  - Depart Port of Portland and head westbound via Madeira Packet Road and Henty Highway
  - Continue via Henty Highway northbound
  - Turn left into Portland-Nelson Road
  - Continue onwards on Portland-Nelson Road to site or enter the storage yard at 211 Portland-Nelson Road.
- Route 2 for components more than 5.4 metres in height:
  - Depart Port of Portland and head southbound on No. 2 Quay Road
  - Turn right onto Maderia Packet Road
  - Turn left at the roundabout onto Cape Nelson Road
  - Turn right onto Mailings Road
  - Turn right onto Thorns Road
  - Turn right onto Bridgewater Road
  - Turn left onto the Henty Highway
  - Turn left onto Portland-Nelson Road
  - Continue onwards on Portland-Nelson Road to site or enter the storage yard at 211 Portland-Nelson Road. See Figure 11 for the OD routes discussed above.

9.1.3 Port of Geelong

Vehicles depart Port of Geelong via Corio Quay Road onto Latrobe Terrace before merging onto Settlement Road. From there, vehicles will travel southbound and merge onto the Princes Freeway (M1) where they will travel west. At Portland East, vehicles will merge onto the Henty Highway (A200) and then turn right onto Portland-Nelson Road before continuing directly to site, or the component storage yard at 211 Portland-Nelson Road. This is expanded on in Appendix D.

9.1.4 Proposed OD transportation route – local access assessment

9.1.4.1 OD Vehicle route assessment process

The local access assessment for the proposed OD vehicle transportation component delivery has been undertaken from Portland-Nelson Road to the proposed site access points. The purpose of the analysis was to determine possible conflicts and constraints for OD vehicles accessing the site, including likely extents of native vegetation / significant tree removal, impacts to road furniture, utilities, and privately-owned property. No review of road grades has been undertaken and assessments are subject to review during subsequent design stages of the Project.

The assessment has been undertaken for planning purposes only at this stage and is based on several assumptions. Further analysis will be required once the nominated port(s) have been chosen for component delivery and a transportation contractor has been hired (whom will conduct a more detailed OD transport assessment). This can then be considered further as part of the subsequent TMP for the project.

The following methodology and assumptions have been adopted in this local access OD route assessment:

- Swept path analysis was undertaken using AutoTurn for an in-bound blade delivery vehicle, which is considered a conservative case swept path (see Section 9.1.4.1.1 for design vehicle dimensions).

- The vehicle swept paths were undertaken at select locations and identified visually, against available aerial imagery and site observations.
- Vehicles leaving the site have been assumed to exit using similar paths to the entering blade delivery vehicle, but with a reduced turning path. It is understood that the OD delivery vehicles will have a reduced footprint once components have been offloaded as the trailers are compacted. It is noted that should fully loaded blade delivery vehicles be required to travel in the out-bound direction, such as in the case of blade replacement, additional OD swept path impacts may result. Mitigation measures associated with out-bound OD vehicles have not been investigated within this report and would need to be considered should removal or replacement of OSOM components be required.
- The swept path analysis was completed in coordination with a site visit, to identify any additional local features and constraints that were not identified in the available aerial imagery. The site visit was also used to identify any other constraints that may affect OSOM deliveries.
- It should be noted that the OD swept path analysis was completed only at specific key locations along the delivery route and at each of the proposed site entrances. There may be additional areas along the delivery route with constraining geometry or features, which may not have been highlighted. These will need to be considered by the nominated transport contractor once appointed. Further consideration of the impacts associated with any limitations of this assessment will be conducted during the TMP stage. A worst-case scenario for the native vegetation removal has been used in the biodiversity impact assessment to address this risk

9.1.4.1.1 Design vehicle

The largest delivery vehicle requiring access to the wind farm will be the OD blade delivery vehicles, with three blades to be delivered to each WTG site. It is noted that the turbine model is expected to include blades of approximately 90 metres in length

AECOM have developed a custom OD blade delivery vehicle based on indicative vehicle templates provided by Rex J Andrews. The OD blade delivery vehicle has been modelled with active rear-wheel steering. A minimum turning radius adopted for the design vehicle was varied between 15 metres and 40 metres depending on the turning angle.

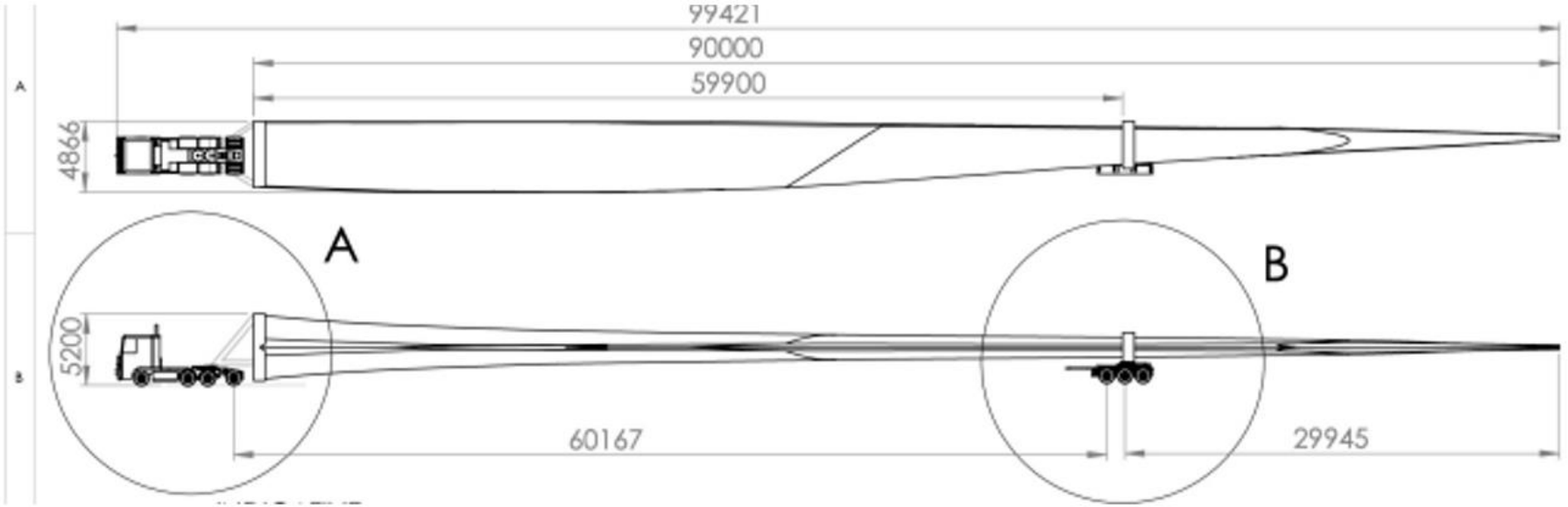


Figure 12 Modelled OD blade delivery vehicle

9.1.4.2 Identified horizontal pinch points

Following the OD blade delivery vehicle swept path analysis, pinch points (either relating to potential existing pavement or vegetation constraints) were identified along the delivery route between the Port of Portland, in addition to each of the site access points along Portland-Nelson Road. Swept path analysis was only completed along the primary and secondary delivery routes, originating at the Port of Portland. No swept path review from the Port of Geelong route has been completed as all roads along the road are B-Double approved, and OD/OSOM vehicles are proposed on this route.

It is anticipated that modifications to each of the pinch points will be required, based on the nominated delivery vehicle used to complete this review. It should be noted however, that upon appointment of the preferred delivery contractor, specific OSOM vehicles and turning performance may vary from what has been documented in this report. This could result in a reduced (or increased) vehicle footprint and a reduction in potential upgrade works. Swept path assessments for each pinch point are attached in Appendix **C**, with a summary of the constraints noted in Table 15. Illustrated below in Figure 13 are the locations for pinch points along the main traffic route to site.

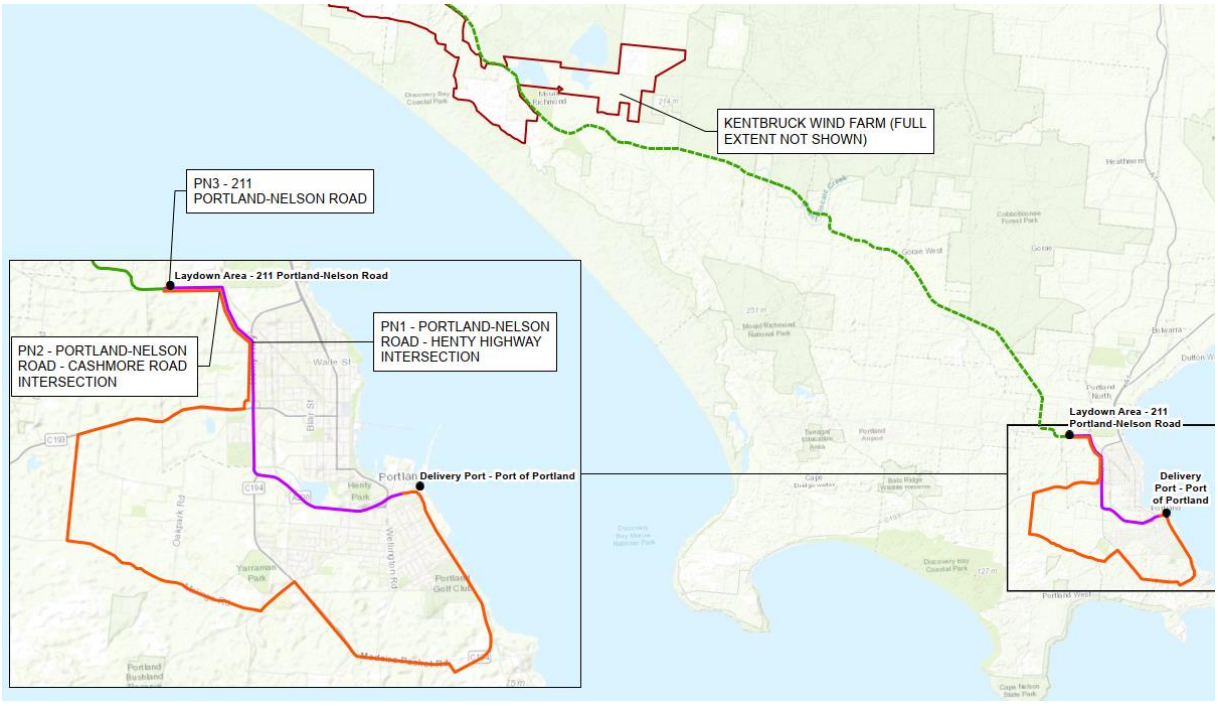


Figure 13 Horizontal Pinch Points for Blade Delivery Vehicles

Table 15 Swept path analysis – identified conflicts summary (refer to Appendix C for swept paths at each identified pinch point)

Pinch Point*	Location	Identified conflicts
PN1	Portland-Nelson Road – Henty Highway intersection	• Road signage either side of Henty Highway. • Roadside trees on east side of road. • Property boundary on east side of road.
PN2	Portland-Nelson Road and Cashmore Road intersection	• Power poles on east side of road. • Street light poles either side of road. • Raised traffic island with signage. • Roadside trees on east side of road.
PN3	211 Portland-Nelson Road	• Property boundary fences on either side of school road (across the road from laydown area). • Roadside trees either side of laydown driveway entrance/exit.
SE1	Sandy Hill Road	• Road widening required for OSOM turning path.

Pinch Point*	Location	Identified conflicts
SE2	New site entrance	• Road widening required for OSOM turning path. • Roadside trees at proposed site entrance. • Landowner boundary fence and gate.
SE3	Wilson Lower Road	• Road widening required for OSOM turning path.
SE4	Windmill Road	• Road widening required for OSOM turning path. • Roadside trees to south-east of intersection.
SE5	Cowlands Lower Road	• N/A – not used for OSOM access.
SE6	New site entrance	• New intersection to be constructed for OSOM vehicles. • Roadside trees to north, across the road from the proposed intersection.
SE7	Lightbody Road	• Road widening required for OSOM turning path. • Roadside trees either side of Portland-Nelson Road at intersection. • Existing pipe culvert and end wall under Lightbody Road. • Swale drain to west pf Lightbody Road. • Give way sign to west of Lightbody Road.
SE8	New site entrance (adjoining Dewars Road)	• New intersection to be constructed for OSOM vehicles. • Wooden street marker post.
SE9	Unnamed Road	• Road widening required for OSOM turning path. • Water storage tank
SE10	New site entrance (adjoining Nelson No. 1 Road)	• New intersection to be constructed for OSOM vehicles. • Roadside trees at proposed site entrance.

*Refer Appendix C for associated swept path diagrams

9.2 Transmission line and substation

A desktop assessment of available aerial imagery was completed for the proposed construction traffic routes for the proposed transmission line option – a detailed site investigation and swept path analysis has not been completed. Based on the findings of the desktop review, the existing local road network generally appears suitable for vehicles servicing the proposed transmission line works although some modifications and/or traffic management may be required to accommodate prime movers and up to 25 metre semi-trailers. The relevant approvals or permits for this vehicle type may need to be sought from the NHVR and relevant road authorities prior to commencement. This should be investigated further during the TMP phase when the maximum vehicle size is known.

9.3 Approvals and Control measures

Additional approvals and control measures need to be considered with regards to construction transportation routes to the Project work sites. These will be considered in more detail with relevant stakeholder co-ordination as part of a subsequent TMP for the Project.

9.3.1 Transport

9.3.1.1 TMP and transport approvals

A Transport Impact Assessment (TIA) has been undertaken for the Project to identify potential traffic-related impacts associated with construction and operation of the Project. Primary construction access to the underground transmission line was determined to be from Portland-Nelson Road and Blacks Road, at the western end of the transmission line corridor. Side roads such as Wrights Swamp Road, T and W Road, and Fish Hole Road could also be used by light vehicles. Any vehicles coming from the east would use Jarretts Road or Coffeys Lane and Jennings Road.

Emergency vehicle access would be maintained at all times along Boiler Swamp Road during transmission line construction. It is anticipated that up to 1 km of the road per day would be closed to the public, with detours implemented along Wrights Swamp Road, T and W Road, Fish Hole Road and Cut Out Dam Road. This detour will result in an additional 5-10 minutes of travel time for road users. There is a low number of existing road users along Boiler Swamp Road and as such, there is likely to be negligible impact due to this detour.

When any works are planned on a road, lane, street or footpath, a TMP needs to be submitted to the relevant road authority (Department of Transport and local councils) for review. This requirement is in accordance with the Road Management Act 2004, the Road Safety Act 1986 and the Australian Standard AS 1742.3 2009 Traffic control devices for works on roads.

During the development of the TMP and associated sub-plans (worksite TMPs), consultation with key stakeholders will have to be undertaken to meet subsequent planning condition obligations. At this stage, the necessary approvals would be discussed and agreed, including:

- **Road works permits:** Typically, functional, and detailed design plans would be submitted to the road authority for approval prior to the commencement of any upgrade. A ‘works within the road reserves permit’, ‘road opening permits’ and ‘vehicle crossing permits’ will be sought as required.
- **Memorandum of Authorisation (MoA):** DTP (RRV) and Glenelg Shire Council will require MoAs to be completed for implementation of traffic management measures.
- **Overhead constraints:** Powercor commissioned to undertake overhead constraints assessments. The total ground clearance should be confirmed of the largest WTG component. Overheads that must have sufficient clearance include wires, structures and trees, this also applies to ground clearance at rail level crossings. A request for raising overhead cables is to be made with the relevant asset owner who will perform these works for a fee should there be insufficient clearance for passage of the OD vehicles.
- **Over-size vehicle permits:** The National Heavy Vehicle Regulator (NHVR) issues permits for oversized vehicles. DTP (RRV), on behalf of NHVR, will require at least 28 days to assess any route. Local councils will also be consulted, and agreements sought during this process.

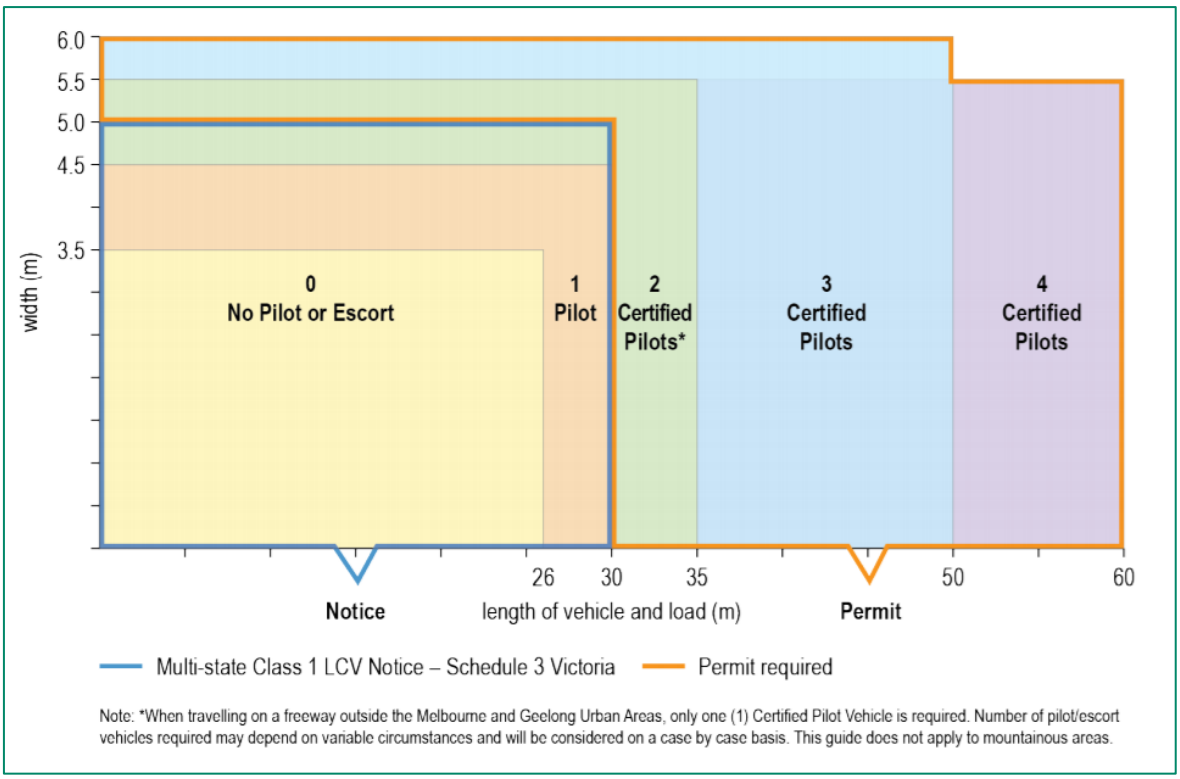
  OD loads are likely to be used to transport large equipment and plant to the Project area, as part of the construction stage of the Project.

  The NHVR outlines requirements for the movement of oversize loads and provides dimensional limits depending on vehicle types. Where the dimensions or mass limits exceed those outlined on NHVR guidelines, a specific permit must be requested from the road authority. DTP (RRV), on behalf of NHVR, will require at least 28 days to assess any route.
- **Bridge and culvert condition / weight bearing assessments:** These may be required to ensure any construction vehicles do not have any adverse impacts to any bridges or culverts on route to the Project sites. Co-ordination with the local authority will be required to understand any historical data on such assets and need for any additional assessments.

- **Rail track crossings:** DTP (RRV) will need to give permission (provide necessary staff on site) for any such over-dimensional vehicles crossing or travelling across train tracks. A permit is required when an over-dimensional vehicle crossing the railway line is greater than 4.9 metres in height, three metres wide or 26.0 metres in length.
- **National Parks Act:** Parks Victoria approval will need to be sought for works within a designated National Park area.

It will be necessary that all relevant stakeholders are involved at the outset of obtaining necessary permits to ensure that no delays to the Project are experienced, and the above information should be used as a guide only in relation to those discussions.

In addition to the above, pilot and escort vehicles ensure the safe movement of OD vehicles on the road. Pilot vehicles, certified pilot vehicles and escort vehicles typical requirements are shown in Figure 14.



Source: NHVR, 2017

Figure 14 Pilot and escort graph guide

The above typical requirements are dependent on several parameters to ensure safe and efficient movement of oversize loads:

- vehicle and load width and length
- location of movement
- traffic volumes and variations
- other associated risks such as road congestion or crash risk.

9.3.1.2 Driver induction training

Prior to commencing construction activities, regular and returning drivers of semi-trailers, rigid vehicles and/or B-Double and OD vehicles who will access and egress the site for pick-up and delivery of material will be required to undertake a driver induction. The induction course will need to be developed early to ensure it is ready prior to construction activity (including any site preparation works)

commencing. Irregular and one-off drivers of pick-ups and deliveries would be considered exempt to this induction requirement.

The induction course would be intended to cover:

- Suitable routes to and from the site.
- Suitable times of travel (i.e. outside of school bus times as outlined in TMP).
- Applicable traffic management procedures that will need to be in place prior to approaching or departing the site (if required).
- Communications and notification procedures.
- Speed restrictions (on the road network and the site).
- Safety procedures (during transportation and in the evident of an accident / emergency).

9.3.1.3 Construction staging and parking

It is proposed to provide all car parking within the confines of the site and will therefore not encroach on the local road network.

It is considered that there will be sufficient area within the site during differing stages of construction to accommodate vehicle parking, including construction traffic deliveries and on-site manoeuvring as and when required.

The site manager will continually monitor parking provisions within the site boundary, as well as the staging of construction vehicles into and out of the site, to ensure no impact on the local road network occurs. If required, the day-to-day vehicle parking demands can be reduced via the promotion and consideration of car sharing of workers to/from the site and mini-bus service transporting workers to/from the site.

9.3.1.4 Signage and speed limits

Signage

The safety of traffic (both construction and general background) should be managed at the access points through the installation of appropriate construction vehicle signage. Australian Standard AS 1742 defines the signage layout required for entering or crossing construction vehicles. The signage requirements at all intersections will involve similar signage, an example of such signage includes:

- ‘Give Way’ (R1-2)
- ‘Trucks (crossing or entering)’ (T2-25)
- ‘T-intersection’ with ‘Driveway’ supplementary (W2-4 with TM1-V100-2 supplementary)
- ‘Windfarm Construction Traffic’ with ‘70km/hr supplementary (W9090 with W8-2 supplementary)
- Depending upon the vehicle access wayfinding strategy additional signage may be required for the following:
    - Informing visitors / tourists of permitted access roads onwards to local camp sites or ad-hoc areas of interest.
    - No truck entry signs to inform drivers of access locations where access is not permitted.

Speed limits

Given the proposed project lifecycle increases in heavy construction vehicles, the crash history (see 6.3.4) and intersection visibility deficiencies at some of the proposed site access locations (see subsequent section 10.1.3.1, it is considered that reduced speed limits at either all or just key site access locations be considered by DTP (RRV). It is likely that these should be applied along Portland-Nelson Road on approach to the site access locations and not the entirety of the Project site access frontage which extends over approximately 30 kilometres.

It is considered that if safe system principles were adopted in suggesting what the reduced speed limit should be, that at 70km/hr speed limit would be preferential as the likelihood of death from a head-on

collision, see Figure 15, is significantly reduced (noting crash analysis highlighted four such fatal crashes along Portland-Nelson Road).

Other areas for the Project to consider in terms of speed will be internally on access tracks if any pedestrian interactions may occur and at intersections (side impact).

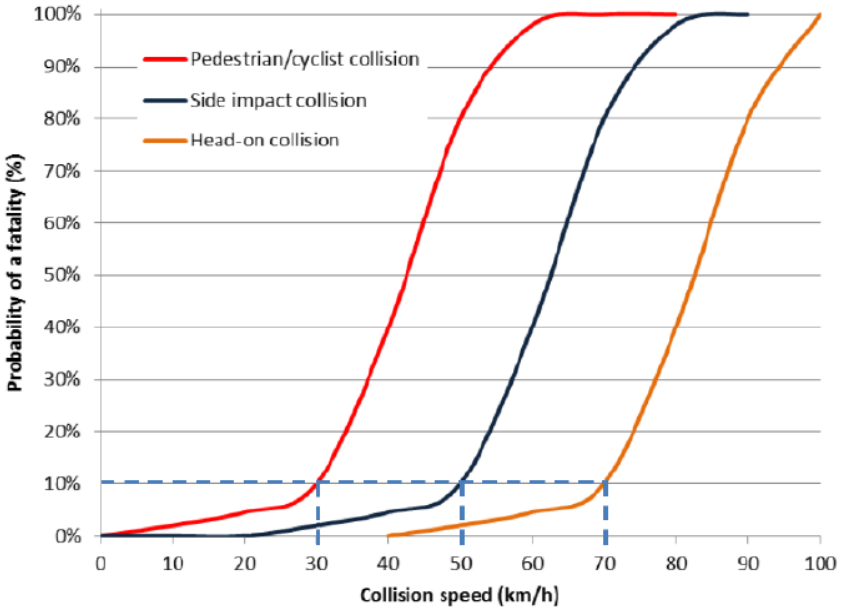


Figure 15 Relationship between collision speed and probability of a fatality – Source: Austroads (2018b)

The speed at which OD vehicles will be able to operate will be contingent upon the vehicle configuration, size of the load and any restrictions imposed (whether by the delivery operator or any authority). As such, it is expected that OD vehicles will travel significantly slower than the posted speed limit, with the escort arrangement being configured as to remain near the OD vehicle.

There will be occasions where intersections will need to be shutdown to allow for safe passage and manoeuvrability of OD vehicles. During these times the appropriate warning signage, along with temporary reductions in speed limits, will be in place for all affected intersection approaches. The temporary reductions in speed limits are to only be in place while the OD movements are taking place and must not be visible to traffic at all other times (Worksite TMPs may be required for these specific circumstances).

9.3.2 Operating and working hours

The normal standard working hours for the proposed construction of the project are as follows:

- 11-hour (7am to 6pm) working weekday and 24 working days in a month (noting final working hours for the project will be determined when a contractor has been commissioned, it is likely that in additional to the working weekday, that specific construction or transport delivery tasks would also occur on a weekend when impacts to local community and business can be reduced)
- Activities within the site compounds and other site facilities are expected outside the normal working hours to facilitate pre-starts, safety inductions and toolbox talks.
- In addition, certain circumstances, such as the delivery of turbine components and construction material along with certain work activities which require completion that day (for example, large concrete pours and turbine erection) may be conducted outside the normal standard hours of operations. This may occur even when work is scheduled for completion during normal standard hours of operations, due to the continuous nature or requirements of the work, such as ongoing concrete delivery. Safety reasons may also dictate that the delivery of turbine components is required to travel outside of normal hours of operation to reduce road network impacts. In this situation, local authorities will be notified as appropriate.

Nonetheless, the timings indicated will be adhered to wherever possible to minimise the impact to the local road network, users and local residents. Typical vehicle access times are provided in Table 16.

Table 16 Typical vehicle access times to/from site (final working hours to be confirmed)

Vehicle Type	Typical Travel Times	Vehicle Speeds	Comment
General workers vehicles / Medium Rigid Vehicle's and below	6:00am-7:00pm Monday to Saturday	As posted on local road network.	
Heavy Rigid and Articulated Vehicles	6:30am- 7:00pm and in consultation with school bus operators.	As posted on local road network. Speed on site will be dictated by nominated contractors HSMP.	Occur only outside of typical local road network peak operational times in order to minimise disruption.
Over-Dimensional Vehicles	TBC by NHVR permit approval (in consultation with DTP-RRV, Council and DEDJTR).	Usually undertaken with convoy at controlled speeds of 20kph and lower.	Access as considered in Chapter 7.0 (subject to contractor review).

School bus routes operate throughout the area and OD and construction vehicles must not interfere with their operation. Any school bus routes should not be used by construction and OD vehicles during bus operating times.

9.3.2.1 Public consultation, advertising and complaints

Public communication will need to be undertaken by a nominated project team member with regards to any traffic matters causing disruption to local business or residents in accordance with a developed Community Engagement Plan. This plan sets out relevant stakeholders and means of communication with local residents, property owners and road users in relation to traffic deliveries, timeframes, and any traffic related activities with potential to disturb or disrupt local traffic. An underlying principle of the plan is that early and frequent communication with local stakeholders will reduce potential for complaints.

Complaints will be managed in accordance with the Complaints Investigation and Response Plan developed for the project. The plan applies on a whole of project basis, including quarry activities and operations, and outlines how complaints will be received, administered, investigated, and managed.

In the event of unexpected impacts, the relevant Site Manager will need to be contacted and reference to the Complaints Investigation and Response Plan be undertaken to resolve such impacts in a timely and safe manner.

9.3.2.2 Road authority notifications

DTP (RRV) and GSC will have specific road authority notifications what will need to be conducted and adhered to. Such measures might typically include:

- VMS or additional signage erection as part of road works to be put in place to inform local road users of works or closures to be informed 2 weeks prior to the construction works and/or closure occurring.
- Directly affected business / residents to be notified (letter drop or other means), also see above subsection.
- 24-hour public complaints hotline or website that allows public to raise concerns and issues directly with the nominated contractor.

9.4 Local business/resident/visitor/tourist and access impacts

9.4.1 Local impacts

9.4.1.1 Wind farm – GTFP

The site access strategy to the wind farm will require co-ordination with GTFP to ensure that their required operations and the impacts of construction traffic can be managed in a safe manner. Notable considerations include:

- Main harvest activity at Kentbruck occurs between April and September during harvest operations (depending on the seasons), with some operations over the summer, with peak volumes of 150 truck movements per week envisaged for the 2021-22 season.
- GTFP advised that they usually adopt a one-way system around the site access tracks during operations. At this stage construction access per access point is assumed to be two-way, however this could be a good option during construction to maintain consistent way-finding and reduce the number of access conflicts with Portland-Nelson Road.
- Speed limits on access tracks are advised to be 60 km/hr by GTFP, it is likely that this should be reduced during construction of the wind farm.
- Maintenance requirements and protocols will need to be co-ordinated and agreed. Expected that inspection prior to construction would occur and any issues fixed as required.
- Agree measures to control work sites and protocols to deal with ad-hoc people entering the site area. Including safety protocols for a range of events including fire.
- Visitors and tourists to local camp sites and other attractions will need to be informed and notified of potential impacts due to the construction of the Project. Parks Victoria will also need to be consulted with to derive a way-finding and access strategy as part of the Project during TMP development.

  Lake Mombeong Road provides access near the wind farm onwards to the Discovery Bay Coastal Park and associated camp sites and walking trails. It is not proposed to use Lake Mombeong Road as an access point from Portland-Nelson Road for the Project. However, there may be a requirement to cross this access road internally, consequently appropriate warning signage and traffic management would need to be implemented.

9.4.1.2 Transmission/substation

The proposed alignment is along Boiler Swamp Road which travels through the Cobboboonee National Park. The usage of the national park by hikers and tourists will need to be managed and closed during works to prevent vulnerable user entry.

Construction of the underground transmission line could cause disruption to public land uses and infrastructure within the Parks. Access to the public land and recreational infrastructure would be disrupted by closures of sections of Boiler Swamp Road. Segments of Boiler Swamp Road would be closed to the public during transmission line installation in those sections. Traffic diversions would be implemented to divert members of the public along alternative routes through the parks. By limiting the extent of road closures, disruption to public access of horse trails and the Wood, Wine and Roses Forest Drive would also be minimised.

The GSWW crosses Boiler Swamp Road at one location in Cobboboonee National Park. The proposed construction methodology for the underground transmission line has a 50 m-long work area. The machinery would therefore only obstruct the GSWW crossing for a short amount of time (around 20 minutes). People attempting to cross Boiler Swamp Road when the construction machinery is nearby will be encouraged to wait until the machinery has passed as directed by traffic management workers. A temporary marquee and seating area will be provided on both sides of the road to allow for this. Alternatively, traffic management personnel can guide hikers around the construction zone to continue on their way. Signage to notify GSWW users of a possible delay will be placed 1 km along the trail before the Boiler Swamp Road crossing, and the Visitors Centre will be kept informed of the dates and times of disruption.

A detour for the GSWW along alternative roads is not considered necessary due to the short period during which hikers would be delayed (minutes), and the length of the detour that would be needed (over 1 km; at least 10-15 minutes of hiking).

During upgrade of the Heywood Terminal Station, access will need to be managed between existing operations and construction, with traffic access and management co-ordinated.

9.4.2 Wider impacts

Emergency vehicle access protocols will need to be developed and agreed between relevant stakeholders, with unrestricted access always maintained, especially given the location of the project worksites, with fire being a potential key risk.

During the summer on extreme hot days, GTFP have advised that they may close the plantation to all operations due to fire risk. This would include any wind farm related activities. Based on past operations this has occurred on average 6 days per summer.

Emergency access and evacuation plans will need to be developed in consultation with key stakeholders for all worksites as part of this project.

Road closures would not apply to emergency service vehicles. Neoen will develop procedures for managing two-way traffic in consultation with relevant stakeholders. These will be documented in the TMP and communicated to all staff involved in construction of the transmission line.

There will be occasions where intersections will need to be shutdown to allow for safe passage and manoeuvrability of OD vehicles. During these times the appropriate warning signage, along with temporary reductions in speed limits, will be in place for all affected intersection approaches. The temporary reductions in speed limits are to only be in place while the OD movements are taking place and must not be visible to traffic at all other times (Worksite TMPs may be required for these specific circumstances).

OD vehicles will travel under convoy at speeds typically around 20km/hr. To reduce road closures on two-way road sections, vehicles can traverse road shoulders or be stopped in designated zones to allow for safe passage of the OD vehicle before proceeding on their respective journey.

As advised in this chapter an accumulation of the control measures will be required during OD transportation and reduce impacts to the wider road network and its users. This will be considered further once the nominated transport contractor is hired and assessments completed as part of the associated TMP which would be reviewed and verified by NHVR (in consultation with relevant road authorities).

9.5 Recommended mitigation measures

Mitigation measures are detailed and discussed in more detail in Chapter 12.0.

It is recommended with regards to the findings for the preliminary construction traffic route assessments and including approvals / control measures that the following mitigation measures are undertaken:

- *MM-T01 – Communications Plan*
- *MM-T02 – Traffic Management Plans*
- *MM-T03 – Road Safety Audits*
- *MM-T04 – OD/OSOM transport route assessments*

MM-T05 – Access strategy and design

10.0 Site access and road section upgrades

10.1 Wind Farm

10.1.1 Site access point upgrades

Ten access points are proposed for the Project. Each of the intersections provide access and egress for construction vehicles throughout the duration of the Project. It is recommended that all access points intersect the public road network as a T-intersection, with intersection angles between 70-90 degrees, which is in accordance with Austroads guidance.

A summary of the requirements for each of the site access points is provided in Table 17. Access requirements for each site entrance have been developed based on the following assumptions:

- All OSOM vehicles access the site from the south-west, from Portland-Nelson Road.
- Following delivery of components, OSOM vehicle trailers compact before turning around and returning to original component pickup site in the reverse direction.
- OSOM deliveries are required to each WTG site.
- Light vehicles may access site from all directions, i.e., from Portland or Mt Gambier as examples.
- 12.5 metre HRV vehicles utilised for concrete delivery and sourced from the batching plant via Portland-Nelson Road.
- No OSOM vehicles enter or exit from Cowlands Lower Road intersection (SE4). This is only used by light/smaller heavy vehicles accessing the quarry.
- Blacks Road acts as an alternate access to the wind farm for light vehicles only.

The location of site access points is illustrated in Figure 9, in section 7.2 of this TIA report.

Table 17 Construction vehicle site access point requirements

Access Point No.	Design Vehicle			
	Left-in	Left-out	Right-in	Right-out
SE1	OSOM	LV	LV	OSOM (shortened)
SE2	LV	OD (shortened)	OSOM	LV
SE3	OSOM	LV	LV	OSOM (shortened)
SE4	OSOM	12.5 metre HRV	12.5 metre HRV	OSOM (shortened)
SE5	LV	LV	LV	LV
SE6	OSOM	LV	LV	OSOM (shortened)
SE7	OD	lV	LV	OD (shortened)
SE8	LV	OD (shortened)	OSOM	LV
SE9	OSOM	12.5 metre HRV	12.5 metre HRV	OSOM (shortened)
SE10	LV	OD (shortened)	OSOM	LV

10.1.2 Over-dimensional upgrades to public intersections

The critical turning movements along the primary and secondary OSOM routes between the Port of Portland and the Project are at the Portland-Nelson Road – Henty Highway and Portland-Nelson Road – Cashmore Road intersections. Table 18 summarises the proposed intersection upgrade measures for each of the intersections based on the constraints identified through swept path analysis in section 9.1.4.2.

It should be noted that operational controls such as temporary speed reductions, potential OSOM delivery time restrictions and additional signage may be required, in addition to the physical measures

outlined below. It is expected that these measures would be developed by the commissioned transport contractor during TMP development, reviewed by the NHVR in consultation with key stakeholders.

Table 18 Identified intersection mitigation measures

Pinch Point ID	Intersection	Location	Intersection upgrade requirements for OSOM deliveries
PN1	Portland-Nelson Road – Henty Highway-Portland-Nelson Road	South of intersection	• Remove vegetation within blade swept path. • Temporary pavement to be constructed along OSOM wheel-path. • Road signs to be made removeable. • Remove and reinstate property boundary fence (if required).
		West of intersection	• Temporary pavement to be constructed along OSOM wheel-path. • Road signs to be made removeable.
PN2	Portland-Nelson Road and Cashmore Road	East of intersection	• Remove vegetation within blade swept path. • Temporary pavement to be constructed along OSOM wheel-path, including diversion of swale drain. • Power poles to be protected.
		West of intersection	• Temporary pavement to be constructed along OSOM wheel-path. • Street light poles to be protected (or removed if required).
		Splitter island	• Traffic island to be made driveable. • Road signs to be made removeable.
PN3	211 Portland-Nelson Road	North of intersection	• Remove vegetation within blade swept path. • Remove and reinstate property boundary fence (if required).
		West of intersection	• Remove vegetation within blade swept path. • Temporary pavement to be constructed along OSOM wheel-path.
SE1	Portland-Nelson Road – Sandy Hill Road	South of intersection	• Temporary pavement to be constructed along OSOM wheel-path.
SE2	Portland-Nelson Road – New site entrance (opposite Sandy Hill Road)	East of Portland-Nelson Road	• Remove vegetation within blade swept path. • Temporary pavement to be constructed along OSOM wheel-path.

Pinch Point ID	Intersection	Location	Intersection upgrade requirements for OSOM deliveries
			• Remove and reinstate property boundary fence and gate (if required).
SE3	Portland-Nelson Road – Wilson Lower Road	South of intersection	• Temporary pavement to be constructed along OSOM wheel-path.
		East of intersection	• Temporary pavement to be constructed along OSOM wheel-path.
SE4	Portland-Nelson Road – Windmill Road	South of intersection	Temporary pavement to be constructed along OSOM wheel-path.
SE5	Portland-Nelson Road – Cowlands Lower Road	N/A	N/A – not used for OSOM access.
SE6	Portland-Nelson Road – Nine Mile Road	North of Portland-Nelson Road	• Remove vegetation within blade swept path. • Temporary pavement to be constructed along OSOM wheel-path.
SE7	Portland-Nelson Road – Lightbody Road	North of intersection	• Remove vegetation within blade swept path. • Temporary pavement to be constructed along OSOM wheel-path.
		East of intersection	• Remove vegetation within blade swept path. • Temporary pavement to be constructed along OSOM wheel-path. • Extend pipe culvert to suit new intersection (remove and replace if necessary).
SE8	Portland-Nelson Road – New site entrance (adjoining Dewars Road)	East of proposed intersection	• Temporary pavement to be constructed along OSOM wheel-path. • Remove and reinstate wooden street marker post.
		South of proposed intersection	• Temporary pavement to be constructed along OSOM wheel-path.
SE9	Portland-Nelson Road – Unnamed Road	North-east of intersection	• Temporary pavement to be constructed along OSOM wheel-path.
		East of intersection	• Temporary pavement to be constructed along OSOM wheel-path.
		South-west of intersection	• Temporary pavement to be constructed along OSOM wheel-path. • Remove existing water storage tank, if required.

Pinch Point ID	Intersection	Location	Intersection upgrade requirements for OSOM deliveries
SE10	Portland-Nelson Road – New site entrance (adjoining Nelson No. 1 Road)	East of proposed intersection	• Remove vegetation within blade swept path. • Temporary pavement to be constructed along OSOM wheel-path.

Temporary pavement widening is proposed to be provided at all intersections (where required) to safely accommodate the movement of OD vehicles, as outlined in Table 18.

It is noted that in the project context, temporary pavement refers to a pavement widening constructed to a lower standard than the adjacent carriageway pavement (typically unsealed crushed rock) and used for OSOM vehicles to complete turning movements. These intersections shall be maintained for the life of the project, in accordance with the project-specific maintenance guidelines, in the case where turbine component replacements are required. The temporary pavement is typically protected by removeable bollards or flexible barriers during the operational stage of the project to restrict use to OSOM vehicles only.

10.1.3 Austroads design guideline requirements

In addition to the access point and OD vehicle turning movement requirements detailed above, there are a number of design considerations outlined in Austroads Guide To Road Design Part 4 (AGRD4): Intersections and Crossings, and Austroads Guide to Road Design Part 4a (AGRD4a): Unsignalised Intersections. Key considerations include safe intersection sight distance and warrants for turning treatments – both of which are outlined below.

10.1.3.1 Sight distance

AGRD4a provides three sight distance requirements for vehicles at intersections, which are outlined below:

- **Approach sight distance (ASD)** - the minimum level of sight distance which must be available on a minor road for cars to be aware of the presence of an intersection, and for vehicles approaching the intersection at the 85th percentile of the operating speed to stop safely.
- **Safe intersection sight distance (SISD)** – the minimum sight distance which must be provided on the major road at any intersection which provides sufficient distance for a driver of a vehicle on the major road to observe a vehicle on a minor road approach moving into a collision situation, and to decelerate to a stop before reaching the collision point.
- **Minimum gap sight distance (MGSD)** – the minimum sight distance corresponding to the critical acceptance gap that drivers are prepared to accept when undertaking a crossing or turning manoeuvre at intersections.

Preliminary checks for the above sight distance requirements have been undertaken at all site access points and key public road intersections against aerial imagery suitable for planning purposes. The results of which are given in Table 19.

Table 19 Sight distance checks overview at wind farm site access intersections

Site Access Reference	Intersection / Access	Distance between accesses (km)^	Sight distances achieved?			Notes / Potential mitigations (if required)
			ASD	SISD	MGSD	
SE1	Sandy Hill Road	3	Yes	No	Yes	SISD is achieved if temporary speed reduction to 70km/hr is implemented at intersection along Portland-Nelson Road.

Site Access Reference	Intersection / Access	Distance between accesses (km)^	Sight distances achieved?			Notes / Potential mitigations (if required)
			ASD	SISD	MGSD	
SE2	New site entrance to WTG167	3	Yes	No	Yes	SISD is achieved if temporary speed reduction to 70km/hr is implemented along Portland-Nelson Road.
SE3	Wilson Lower Road	3	Yes	No	Yes	SISD is achieved if temporary speed reduction to 70km/hr is implemented along Portland-Nelson Road. Tree removal south of intersection would increase SISD, potentially removing requirement for reduced speed zone.
SE4	Windmill Road	3	Yes	Yes	Yes	
SE5	Cowlands Lower Road	3	Yes	Yes	Yes	
SE6	New site entrance to WTG127	3	Yes	Yes	Yes	
SE7	Lightbody Road	2	Yes	No	Yes	SISD is achieved to right hand side of intersection, if temporary speed reduction to 70km/hr is implemented along Portland-Nelson Road. Additional vegetation removal may improve SISD to left hand side of intersection.
SE8	New site entrance to WTG113	2	Yes	Yes	Yes	
SE9	Unnamed Road to WTG129	2	Yes	Yes	Yes	
SE10	Unnamed Road to WTG94	2	Yes	No	Yes	SISD is achieved if temporary speed reduction to 70km/hr is implemented at intersection along Portland-Nelson Road.

^Approximate chainage along Portland-Nelson Road, where Portland is Chainage CH 0.

10.1.3.2 Turning treatment warrants

Austroads Guide to Road Design Part 4: Intersections and Crossings details the warrants for turning treatments on major roads at unsignalised intersections. These guidelines compare the number of turning vehicles into an intersecting road with the total number of vehicles on the major through road and provide a recommendation for basic left or right turn treatments (BAL / BAR), short channelised left or right turns (CHL(S)/CHR(S), shortened auxiliary left turns (AUL(S)), and full auxiliary or channelised turn treatments (AUL / CHL /CHR).

Due to the existing low volumes of through movements on Portland-Nelson Road, the majority of site accesses do not trigger warrants for significant turning treatment upgrades, however are times during peak construction activities where the threshold for additional turning treatments is exceeded. The warrants for turning treatments at each site intersection in accordance with AGRD4 are given in the Table 20. The table also summarises the warranted treatment should the speed limit at the intersection be reduced below the current speed of 100km/hr (e.g. 70km/hr as part of site access safety TMP control measures).

Table 20 Turning treatment warrants (AGRD4)

Site Access Reference	Intersection / Access	Distance between accesses (km)^	Treatments Required (100km/hr)	Treatments required (<100km/hr)
SE1	Sandy Hill Road	3	BAL	BAL
SE2	New site entrance to WTG167	3	CHR(S)	CHR(S)
SE3	Wilson Lower Road	3	AUL(S)	BAL
SE4	Windmill Road	3	AUL(S)	BAL
SE5	Cowlands Lower Road	3	AUL/CHL & CHR	AUL(S) & CHR(S)
SE6	New site entrance to WTG127	2	BAL	BAL
SE7	Lightbody Road	2	BAL	BAL
SE8	New site entrance to WTG113	3	CHR(S)	BAL
SE9	Unnamed Road to WTG129	3	BAL	BAL
SE10	Unnamed Road to WTG94	2	CHR(S)	BAL

It is noted that at each of the intersections, the threshold traffic volumes for upgrades to channelised or auxiliary lane turning treatments are only exceeded for short periods of time corresponding with peak construction activities such as foundation pours. As such, traffic management measures may be preferable to new turning treatments at each site access intersection.

10.2 Transmission line and substation construction

Primary construction access to the underground transmission line would be from Portland-Nelson Road and Blacks Road, at the western end of the transmission line corridor. Side roads such as Wrights Swamp Road, T and W Road, and Fish Hole Road could also be used by light vehicles. Any vehicles coming from the east would use Jarretts Road or Coffeys Lane and Jennings Road. No roads associated with the transmission line and substation construction require OD or OSOM deliveries. Materials or equipment needed for construction of the underground transmission line can be transported using standard heavy vehicles (e.g. B-Double trucks).

The requirement for road upgrades to accommodate construction vehicles will be determined during development of the TMP. Prior to construction, road condition (dilapidation) surveys will be undertaken to ensure public and private roads are in a suitable condition to accommodate construction vehicles. These surveys will also provide a baseline of pavement conditions to determine any future impacts that may require upgrades or remediation of road assets.

Consultation with road asset owners (including DTP (the transport section), Glenelg Shire Council (GSC), Parks Victoria and DEECA) will be undertaken to agree on the following (see mitigation measure MM-T01):

- The extent and form of dilapidation surveys required prior to commencement of works, through either photographic or detailed survey vehicle techniques
- A road maintenance methodology, which typically involves a monthly drive-over inspection. Procedures and intervention criteria, treatments and response timeframes would be subject to agreement based on pavement distress type
- Post-construction review, identification and hand-back protocols, which will also be documented.

Any upgrades or 'make-good' provisions required with respect to the use of roads within the Parks (or elsewhere) would be completed at the same time as the TMP is prepared (see MM-T01).

Temporary or partial closure of roads or traffic lanes would be managed through the TMP to maintain existing connectivity for local access, pedestrians and cyclists, in accordance with relevant road design standards and in consultation with landholders and any other relevant third parties.

Works will be undertaken during standard business hours (7 am – 6 pm on weekdays), with very exceptional circumstances triggering the need for work after hours or on weekends or public holidays. This will ensure that construction of the transmission line reduces traffic disruption during peak visitation days (typically on the weekend), further minimising the impact on traffic in the area.

It is expected that each of the proposed site access points utilised during the construction of the new transmission line would be reviewed in further detail as the Project progresses, likely during the development of the project TMP.

10.3 Road section upgrades

At this stage of assessment road section upgrades have not been considered since there are several further design (project cost), wayfinding, contractor and stakeholder input considerations that need to be co-ordinated to derive a final solution.

Many of the local access roads are GSC owned and consequently any upgrades and hand-back agreements will be required and be considered during subsequent design phases.

Whilst rural single lane access roads are expected to have very low traffic demands there are two concerns with regards to safety risk and reliability of the local road network:

1. The number of vehicles generated by the development travelling along a road of an inadequate width increases the likelihood of a fatal or serious injury crash. This is further emphasised with the large number of heavy vehicles and OD vehicles generated during the construction stage.
2. The increased number of heavy vehicles poses a potential durability and reliability issue to the performance of the existing pavement, which is unlikely to have been designed for the proposed construction vehicles. This risk is further increased during and following a wet weather period.

There are many options that may be employed to mitigate the above factors, including:

- Development of a Project way-finding strategy to remove/reduce conflicts
- Temporary one-way traffic routes
- Widening of the road along key routes
- Providing passing bays at specific key locations
- Traffic management measures
- Reduced speed limits

- Upgrade of road pavements
- Regular inspections and maintenance operations
- Installation of advanced warning signs (both static and VMS)
- Driver's code of conduct

Further to the advice from the appropriate road authority, the adoption of an independent road safety audit (pre-qualified by the Department of Transport) could assist with determining the appropriate treatments.

It is recommended that the mitigation measures adopted be determined on a case-by-case basis considering localised constraints and the duration and impact of construction activities, in close consultation with the key project stakeholders during development of the project's TMP.

If upgrades or 'make-good' provisions are required with respect to the use of GSC roads within the pine plantation (or elsewhere) this should be completed at the same time as the TMP is prepared.

10.4 Recommended mitigation measures

Mitigation measures are detailed and discussed in more detail in Chapter 12.0.

It is recommended with regards to the findings for the preliminary construction traffic route assessments and including approvals / control measures that the following mitigation measures are undertaken:

- *MM-T01 – Communications Plan*
- *MM-T02 – Traffic Management Plans*
- *MM-T03 – Road Safety Audits*
- *MM-T04 – OD/OSOM transport route assessments*
- *MM-T05 – Access strategy and design*

11.0 Other Project Mitigation Measures

11.1 Road condition and maintenance

Road conditions and maintenance is important during wind farm construction to ensure that:

- Pre-road conditions are in a suitable state to access and perform construction activities. Whilst surveys provide a baseline for any triggers for immediate / future impacts for upgrade or remediation of road assets.
- Both public and private access roads are in a suitable condition to transport WTG components to the site in a safe manner.
- Agreeing with road asset owners (includes DTP, GSC and GTFP with regards to external access tracks) the following:
    - Agreeing extent and form of dilapidation surveys prior to works commencing, either by way of photographic or more detailed survey vehicle techniques. This will provide a fair and accurate baseline of pavement conditions at the commencement of construction.
    - Road maintenance methodology, typical this involves a drive-over inspection at a minimum frequency of 1 inspection per month. The checking procedures would need to be agreed along with the intervention criteria, treatments and response timeframes based on the pavement distress type identified (e.g. potholes, surface treatment, cleaning etc.).
    - Post construction review and identification and hand-back protocols will need to be agreed and documented.
- A key discussion between parties will be the identification of whom impacts have been caused by and whom should ratification requirements be undertaken by. Past wind farm projects have much contention with this area and therefore should be highlighted as a key risk for all parties to come to a uniform agreement (either by way of formal contract of specific triggers or a bond may be preferable to cover the construction stage of the project).

11.1.1 Recommended mitigation measures

Mitigation measures are detailed and discussed in more detail in Chapter 12.0.

It is recommended with regards to road condition and maintenance that the mitigation measures outlined in *MM-T01 – Stakeholder consultation* and *MM-T02 – Traffic Management Plan*.

11.2 Environmental measures

Environmentally sensitive construction measures will be considered and outlined in the Environmental Management Plan for the Project. Typically, the following will need to be considered:

Dust / Sedimentation

The following measures to be considered for adoption to reduce the impact of dust from the construction of the Project:

- Keeping vehicles to defined haul roads and minimise vehicle movements on exposed surfaces.
- Enforce vehicle speed limits on quarry sites and road network.
- Minimise soil deposit on the surrounding public roads (utilise rumble grids and wheel washing facility if required).

Noise and Vibration

The following measures to be considered for adoption to reduce the impact on noise and vibration from the construction of the Project:

- Vehicle movements (deliveries) to and from the site are to be undertaken during normal working hours whenever practicable.
- No construction vehicles should be left idling with their engine running, especially if near to residential properties.

11.2.1 Recommended mitigation measures

Mitigation measures are detailed and discussed in more detail in Chapter 12.0.

It is recommended with regards to environmental measures that these are outlined once confirmed as part of the subsequent Project TMPs, therefore as part of *MM-T02 – Traffic Management*.

Given the rural area there are no dedicated pedestrian or bicycle infrastructure provided via or near the road network, notably Portland-Nelson Road.

Portland-Nelson Road is known to be used by recreational (including tourist, Great Southern Bike Trail nominated) and sport training bicycle route users.

11.3 Vulnerable road and site users

The following is noted with regards to impacts to vulnerable road and site users for the Project:

- **General**: given the rural road network there are no dedicated pedestrian or bicycle facilities found on the immediate road networks to the project sites. Reduced speed limits and general construction signage warning of the movement of heavy vehicles should be considered on Portland-Nelson Road, as this is utilised by recreational and sport training cyclists who ride with traffic along this road.
- **Wind farm site**: as advised by GTFP some illegal entry occurs, including access by 4WD vehicles, trail bike riding, illegal hunting. Tourists also use parts of the site during summer months via public roads (and pine tracks at times) to access the National Park to the south of the Kentbruck plantation. The exact quantum of activity is difficult to measure; however, Parks Victoria may be a useful source of information on the National Park usage.

  Lake Mombeong provides access near the wind farm onwards to the Discovery Bay Coastal Park and associated camp sites and walking trails. It is not proposed to use Lake Mombeong Road as an access point from Portland-Nelson Road for the Project. However, there may be a requirement to cross this access road internally. To manage this impact co-ordination between the project team, GFTP and other stakeholders will be required to help avoid conflicts and control accessibility to the area.

  Measures may include:

  - Increased site security

- Signage on approach and within the site
- Way-finding strategy into and out of the development site (e.g. GTFP advised of one-way movement strategies during works)
- Communications planning
- Traffic Management Plan considerations, including way-finding, adopted speeds, operation times etc.

- **Transmission line:** Construction of the underground transmission line could cause disruption to public land uses and infrastructure within the Parks. Access to the public land and recreational infrastructure would be disrupted by closures of sections of Boiler Swamp Road. Segments of Boiler Swamp Road would be closed to the public during transmission line installation in those sections. Traffic diversions would be implemented to divert members of the public along alternative routes through the parks. By limiting the extent of road closures, disruption to public access of horse trails and the Wood, Wine and Roses Forest Drive would also be minimised.

  The GSWW crosses Boiler Swamp Road at one location in Cobboboonee National Park. The proposed construction methodology for the underground transmission line has a 50 m-long work area. The machinery would therefore only obstruct the GSWW crossing for a short amount of time (around 20 minutes). People attempting to cross Boiler Swamp Road when the construction machinery is nearby will be encouraged to wait until the machinery has passed as directed by traffic management workers. A temporary marquee and seating area will be provided on both sides of the road to allow for this. Alternatively, traffic management personnel can guide hikers around the construction zone to continue on their way. Signage to notify GSWW users of a possible delay will be placed 1 km along the trail before the Boiler Swamp Road crossing, and the Visitors Centre will be kept informed of the dates and times of disruption.

  A detour for the GSWW along alternative roads is not considered necessary due to the short period during which hikers would be delayed (minutes), and the length of the detour that would be needed (over 1 km; at least 10-15 minutes of hiking).

  Other mitigation measures may include:

  - Increased site security
  - Signage on approach and within the site
  - Way-finding strategy into and out of the development site
  - Communications planning
  - Investigation and implementation of potential diversions

11.3.1 Recommended mitigation measures

Mitigation measures are detailed and discussed in more detail in Chapter 12.0.

The following mitigation measures are recommended with regards to vulnerable road and site users as part of the Project:

- *MM-T01 – Stakeholder consultation*
- *MM-T02 – Traffic Management Plan*
- *MM-T03 – Road safety audit(s)*
- *MM-T05 – Access strategy and design*

11.4 Public / school bus route impacts

Public and school bus route locations are detailed in section 6.2.2 of this TIA report.

No bus routes travel directly along Portland-Nelson Road within the wind farm site area, however there are bus services which travel along the proposed OD transport routes, notably along:

- Portland-Nelson Road (between Henty Highway and Stanleys Road)
- Henty Highway
- Madeira Packet Road

These roads will be used by construction vehicles to and from the Project sites, however conflicts are expected to be minimal given the frequency of bus services and with no bus stops present within the proximity of site access locations.

Any construction or over-dimensional vehicle movements associated with the wind farm will need to either not operate during these time periods or suitable plan with operator's mitigation measures to reduce impacts if conflicts cannot be suitably managed.

11.4.1 Recommended mitigation measures

Mitigation measures are detailed and discussed in more detail in Chapter 12.0.

The following mitigation measures are recommended with regards to vulnerable road and site users as part of the Project:

- *MM-T01 – Stakeholder consultation*
- *MM-T02 – Traffic Management Plan*

Wider OD transportation impacts outside of project area

At this stage of the Project the source of WTG components has been left open as it is subject to logistics, storage and relevant stakeholder discussions. The preference would be to utilise Port of Portland however the Ports of Geelong and Melbourne could also be used.

The use of these other Ports creates greater risk in terms of distance to travel and required mitigation measures and approvals to safe delivery WTG components to the project site. The following would need to be considered and undertaken:

- Agreement and finalisation of final Port WTG delivery options.
- Commission of the transport contractor and undertaking of relevant OD Transportation Traffic Management Plan(s), with liaison and review/input and potential works by key stakeholders to facilitate safe OD travel (e.g. road authorities, utilities etc.)
- Relevant permits from NHVR and Department for travel and any significant areas of travel that may need to be traversed (e.g. rail lines).
- Depending on the OD route reviews associated bridge assessments may be required also.

11.5 Emergency vehicle access

Emergency vehicle access protocols will need to be developed and agreed between relevant stakeholders, with unrestricted access always maintained, especially given the location of the project worksites, with fire being a potential key risk.

During the summer on extreme hot days, GTFP have advised that they may close the plantation to all operations due to fire risk. This would include any wind farm related activities. Based on past operations this has occurred on average 6 days per summer.

Emergency access and evacuation plans will need to be developed in consultation with key stakeholders for all worksites as part of this project.

Road closures would not apply to emergency service vehicles. Neoen will develop procedures for managing two-way traffic in consultation with relevant stakeholders. These will be documented in the TMP and communicated to all staff involved in construction of the transmission line.

11.5.1 Recommended mitigation measures

Mitigation measures are detailed and discussed in more detail in Chapter 12.0.

The following mitigation measures are recommended with regards to vulnerable road and site users as part of the Project:

- *MM-T01 – Stakeholder consultation*
- *MM-T02 – Traffic Management Plan*

12.0 Recommended Mitigation Measures

This section outlines the recommended mitigation measures in relation to transport to avoid, minimise and manage the potential impacts during the Project, these have been informed by the preceding TIA report chapters.

The recommended mitigation measures are applicable to the construction, operation, and decommissioning phases and, if implemented, would ensure that the project minimises adverse impacts on local and wider transport networks.

Table 21 outlines mitigation measures recommended to be applied.

Table 21 Recommended mitigation measures

Mitigation measure ID	Mitigation measure	Implementation stage

MM-T01	**Communication Plan**
	
	A Communications Plan will be developed and will contain consultation requirements relating to potential traffic and transport impacts for the lifetime of the Project. The plan will consider the findings from the TIA prepared for the EES and subsequently the TMP (see MM-T02).
	
	The plan will ensure construction, operations and decommissioning related information is shared with the local community, including updates on road closures, collaborating with other road users to negotiate road access and potential impacts, and ensuring the impact of construction on access to other infrastructure in communicated to affected stakeholders. This will include providing the Project schedule, anticipated traffic implications and the volume of construction activities.
	
	Aims of the plan include:
	
	• To proactively communicate the impact of activities that may lead to traffic disruption.
	
	• To provide a mechanism for collaborating with other road users to manage cumulative impacts on the region.
	
	Stakeholder consultation, including but not limited to, DTP (specifically the transport section), GSC, GTFP, Parks Victoria, DEECA, Port of Portland (and any other ports to be used) and other freight industries where appropriate, will be undertaken to develop the plan.Key notifications and agreements may include:
	
	• Pre-construction stage:
	  ○ TMP agreement
	  ○ Dilapidation surveys.
	
	• Construction, operation and decommission or re-power stages:
	  ○ TMP measures and controls
	  ○ Construction traffic monitoring.
	  ○ Road network monitoring, remediation protocols and maintenance requirements.
	
	• Prior to operation:
	  ○ Construction close-out meeting.
		Pre-construction

Mitigation measure ID	Mitigation measure	Implementation stage
	Infrastructure hand-back criteria.	
MM-T02	**Traffic Management Plans (TMPs)** Prior to the commencement of construction (excluding preparatory works), two TMPs will be developed (one each for the wind farm and transmission line) and implemented to minimise disruption (to the extent practicable) to affected local landowners, traffic, car parking, on-road public transport, pedestrian and bicycle movements and existing public facilities during construction and maintenance activities. The TMPs will be developed in consultation with the relevant road management authorities and be informed and supported by an appropriate level of transport analysis. The TMPs will be developed against any relevant planning conditions and in association with key stakeholders for endorsement. Evidence of this endorsement will be documented within the TMPs. If it is decided that the Port of Geelong will be used for the project, the TMP inclusions and control measures shall also consider the Port of Geelong. Each TMP will include: • A review of relevant policy, regulatory and protocol requirements which have informed the TMP • A review of existing conditions at the time of TMP development to verify conditions identified in the TIA. Those provided as part of the TIA can be used as a baseline • Approved Project scope, including finalised details on construction extents, staging, vehicle types, final material sources (e.g. quarry and concrete), and peak construction impacts (at this stage of the Project, unknowns are usually verified via multi-disciplinary assessments and when construction/transport contractors are onboarded) • Consideration of cumulative impacts of other major projects operating concurrently in the local area, such as the traffic movements associated with pine plantations located within the study area • Verification of the site access strategy, including site access points (see MM-T05) • Verification of the port(s) to be used for delivery of major wind turbine and transmission line components • Final OD/OSOM route assessments completed by the nominated transport contractor (see MM-T04) • Mitigation measures to be implemented, including site access point requirements (e.g. swept paths and Austroads intersection type requirements according to traffic demands) and any requirements for OD/OSOM delivery along transport routes. This would also identify road section upgrades required and the nature of the upgrade works.	Pre-construction Construction Operational Decommission or re-power

Mitigation measure ID	Mitigation measure	Implementation stage

	• Design drawings for the above, which will be sent for review and agreement with the relevant road authorities during detailed design
	• Road condition and maintenance requirements, such as:
	  ○ Dilapidation surveys to provide an existing survey of public roads that may be used for access and designated for construction vehicle routes
	  ○ Consultation with road asset owners to agree on the extent and requirements of dilapidation surveys, road maintenance criteria, treatments and response timeframes, and post construction survey and asset hand-back agreements
	  ○ Depending on stakeholder requirements, other considerations may include specific traffic monitoring (maximum daily truck volumes) and bond payments for remedial works
	• Access requirements by vehicle type, including any regulator or stakeholder permits
	• Road closure requirements for the management of any temporary or partial closure of roads and traffic lanes to maintain connectivity for local access, pedestrians and cyclists, in accordance with relevant road design standards and in consultation with landholders and any other relevant third parties. Traffic counts may be conducted to investigate suitable times for road and lane closures. Road closures will occur in off-peak periods when demands are low where possible (notably for OD/OSOM vehicle deliveries). The number and duration of road closures will be minimised
	• Suitable measures to ensure emergency service access (notably for bushfire management) is not restricted due to Project construction or operation activities, especially regarding any road closures on the public road network and within Cobboboonee National Park and Forest Park. These measures will be agreed upon in consultation with emergency services and relevant road authorities including DEECA.
	• Construction staging and car parking requirements to ensure no car parking occurs outside of the Project Area and affects local land use or accessibility. If required, car share or shuttle bus provisions will be considered to reduce the need for single vehicle worker occupancy
	• Signage requirements with reference to Australian Standard series AS 1742. Notably for this Project this would include notification of:
	  ○ Movement of trucks from site access points to/from major road connections
	  ○ No-truck access signage to ensure vehicles do not access restricted areas and to aid with wayfinding (notably to the Lower Glenelg National Park to the south of the wind farm site)	

Mitigation measure ID	Mitigation measure	Implementation stage

	• Speed limit reductions to be implemented during Project construction. A temporary reduced speed limit in the vicinity of site access points to 70 km/hr is recommended which will allow SISD non-conforming site access points to be safer to utilise. This will be investigated further as part of the TMP in consultation with relevant stakeholders
	• Confirmation of working hours during construction. These will need be agreed with key stakeholders with a remit for the construction contractor to verify local and school bus routes/timings to ensure no conflicts occur
	• Other environmental measures to be implemented, such as for dust/sedimentation and noise and vibration
	• Monitoring, inspection and auditing requirements, including:
	  ○ Addendum TMP triggers
	  ○ Monitoring and inspection protocols to ensure the integrity of the TMP given it should be viewed as a live document for the duration of the Project. Reviews are typically undertaken on a monthly basis with relevant stakeholders informed of any significant changes
	  ○ Auditing can include compliance and road safety audits
	Control measures provided in the TMPs will cover the following aspects:
	• Roles and responsibilities, including project management, co-ordination, public consultation, advertising and complaint procedures
	• Road authority notification requirements
	• Training and site induction requirements
	• Contractor liaison protocol
	  ○ Roadside native vegetation requirements, including identification protocols and approvals (if required).	

MM-T03	**Road safety audits** Road safety audits (RSAs) will be undertaken at various stages of Project development in accordance with Austroads Guide to Road Safety Part 6: Road Safety Audit, such as: • Existing condition audit. • Preliminary/functional design stage audit. • Detailed design stage audit. • Pre-opening or post-opening stage audit. Existing condition RSAs will be undertaken on all roads utilised by the project for access or haulage where no upgrade works are proposed. Preliminary/functional, detailed design and pre or post opening stage audits will be undertaken for roads where an upgrade is proposed.	Pre-construction Construction Decommission or re-power

Mitigation measure ID	Mitigation measure	Implementation stage
	RSAs will be completed by accredited DTP RSA auditors and be independent of the Project team.	
MM-T04	**OD/OSOM transport route assessments** Formal OD/OSOM transport route assessments will be completed by the transport contractor engaged by Neoen. Impacts of the final routes can then be verified (e.g. removal/clearance of obstructions such as powerlines, structures (bridges and culverts), railway infrastructure and vegetation), and relevant stakeholders will be engaged to facilitate the safe delivery of materials to the construction sites. Prior to mobilising any over size and over mass vehicles from the Port of Portland to the project site, temporary infrastructure works must be designed in consultation with, and completed to the satisfaction of, the Department of Transport and Planning (Regional Roads Victoria).	Pre-construction Construction Decommission or re-power
MM-T05	**Access strategy and design** A site access strategy will be developed and finalised following detailed design, in consultation with all stakeholders, particularly affected landowners. The strategy will consider traffic access and movement requirements and restrictions to local facilitates and amenities (such as tourism locations). The number of site access points to be used for construction of the wind farm may be investigated further to utilise internal access tracks and limit movements between the site and Portland-Nelson Road. Speed limits along Portland-Nelson Road and the Henty Highway in proximity to the Project site entrances will be reviewed during detailed design to verify the need to reduce speed limits to ensure that SISDs can be achieved and the site can be accessed safely by construction vehicles. Site access gates would be designed and constructed in accordance with VicRoads' Guideline Drawing GD4010 – 'Typical Access to Rural Properties', unless otherwise agreeed by the relevant road authority. Once detailed design has been completed, the designs will be subject to RSAs, as described in MM-T03. It is expected that stormwater drainage management systems including swale drains and pipe culverts may be required as part of any proposed intersection upgrade works, as there is currently no infrastructure in place to divert runoff near the site entrances. This will be reviewed as part of the detailed design process. See also MM-SW08.	Pre-construction Construction Operational Decommission or re-power

13.0 Conclusion

13.1 Assessment objective

The purpose of this report is to assess the potential traffic and transport impacts associated with the Kentbruck Green Power Hub to inform the preparation of the EES that is required for the project.

The assessment was carried out using desktop studies and a field visit to determine the potential impacts of the project on the local road network and surrounding communities. The assessment addresses the specific matters noted to be investigated in the scoping requirements in the context of the *Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978*.

13.2 Existing Conditions and Vehicle Access

The major arterial roads to access the wind farm and transmission line options, via Portland-Nelson Road and Henty Highway are lightly trafficked with estimated peak hour two-way traffic volumes of 120 (51% heavy) and 720 (31% heavy) vehicles respectively. Both roads are sealed with good delineation provided and no apparent pavement defects. Given a typical one-way road capacity is 900 vehicles per hour (two-way 1,800 vehicles per hour) there is spare network capacity to facilitate traffic demand associated with the Project.

All site access roads that form a priority intersection with Portland-Nelson Road and are proposed to serve the wind farm are unsealed. These intersections lead into a network of internal access tracks through the Kentbruck plantation. These roads were observed to have no traffic during site observations but are estimated to have 150 vehicles per week during clear-felling operations which would typically occur during winter months, as advised by GTFP.

A total of ten vehicle access points (site entrances) are proposed to the Project wind farm site from the public road network. Each of the site entrances intersect with Portland-Nelson Road and are considered major access points to the project, with all but one entry servicing several WTGs.

The transmission line would be underground and travel east onwards to the Heywood Terminal Station via Boiler Swamp Road. Blacks Road will act as the main transmission line entrance on the western end. Other side roads such as Mt Kincaid Road could be utilised during construction of the underground transmission line. There are a total of ten vehicle access points which are proposed to service the construction of the underground transmission line.

There are several formal and informal walking trails in the vicinity of the Project. Notably the Great South West Walk, which is a 250-kilometre walking track which passes through Lower Glenelg National Park, the Cobboboonee National Park, the Discovery Bay Coastal Park, the Mount Richmond National Park and the Cape Nelson State Park.

13.3 Key Traffic and Transport Impacts

The key findings of the construction stage impact assessment for the project are as follows:

- Mid-block and intersection capacity: the analysis included anticipated traffic generated by the project construction across daily, morning peak and afternoon peak. Projected life cycle traffic generation was estimated with construction comparisons and worst-case derived movement of construction volumes at the nominated major site access points. The capacity analysis shows that construction traffic impact is negligible along Portland-Nelson Road.
- Preliminary routes assessment: Over Dimensional (OD) and Oversize Overmass (OSOM) vehicles routes have been established based on the restrictions of the study area roads. OD swept paths have been assessed and pinch points derived to understand the geometric constraints and required road section upgrades. Traffic management would be required and should be investigated as part of a TMP.
- Preliminary site access and road upgrades: a review was undertaken of the access points and roads to be used by the project during construction. Access road sections which will require upgrades or alterations due to OD movements have been identified. A site access strategy is to be

completed to ensure that each of the access point intersections provide safe access and egress for construction vehicles.

Overall, impacts to the transport network during turbine and transmission line construction are expected to be relatively minor given the low traffic volumes and limited local population, and can be suitably managed through measures outlined in a TMP for the project, with the road network found to be sufficient to accommodate anticipated traffic volumes.

13.4 Recommended mitigation measures

Many of the potential surface water impacts would be mitigated through compliance with the CEMP, SWMP and by adopting the controls presented in various best practice guidance for construction and environmental management. These guidelines include the IECA Best Practice Erosion and Sediment Control Guidelines, EPA Publication 1834; Civil Construction, Building and Demolition Guide and EPA Publication 1896: Working within or adjacent to waterways.

Mitigation measures have been developed in response to the identified Project impacts to minimise these during the Project stages. The traffic and transport impacts identified in this report can be avoided, minimised or mitigated through the appropriate application of the strategies and plans listed below:

- *MM-T01 – Communications Plan*
- *MM-T02 – Traffic Management Plans*
- *MM-T03 – Road Safety Audits*
- *MM-T04 – OD/OSOM transport route assessments*

*MM-T05 – Access strategy and design*The Project will be required to seek the relevant permits and approvals from the Department of Transport and Planning (DTP) and Glenelg Shire Council. These include roadworks, oversize vehicles and rail track crossing permits, as well as Memorandum of Authorisation and other approvals.

Appendix A

Site visit photos

Appendix A

Glenelg Shire Council road assets

Sandy Hill Road

Sandy Hill Road is an unsealed road that provides access to part of the Kentbruck pine plantation, see below. The road is primarily a north-south road, approximately 7 metres wide and permits two-way travel. It is understood that Spring Road is primarily utilised by traffic associated with the plantation.

Sandy Hill Road site entrance (Source: Umwelt photo taken 23/08/2022)

Wilsons Lower Road

Wilsons Lower Road is a north-south road that is bound by the Kentbruck pine plantation, see below. The road is unsealed and approximately 5 metres wide, allowing for one-way vehicle travel. However, there are areas of unvegetated verge where opposing vehicles may pass. It is understood that Wilsons Lower Road is primarily utilised by traffic associated with the plantation.

Wilsons Lower Road intersection, facing north (Source: AECOM photo taken 30/07/2020)

Windmill Road

Windmill Road is an east-west road that is bound by the Kentbruck pine plantation, see below. The road is unsealed and approximately 5 metres wide, allowing for one-way vehicle travel. However, there are areas of unvegetated verge where opposing vehicles may pass. It is understood that Windmill Road is primarily utilised by traffic associated with the plantation.

Windmill Road site entrance (Source: AECOM photo taken 30/07/2020)

Cowlands Lower Road

Cowlands Lower Road is an unsealed north-south road which services the existing pine plantation – see below. The road is unsealed and approximately 7 metres wide, permitting two-way travel. It is understood that Windmill Road is primarily utilised by traffic associated with the plantation.

Cowlands Lower Road intersection, facing south (Source: AECOM photo taken 30/07/2020)

Nine Mile Road

Nine Mile Road is an unsealed north-south road which services the existing pine plantation, see below. The road is unsealed and approximately 7 metres wide, permitting two-way travel.

Nine Mile Road intersection, facing north (Source: AECOM photo taken 30/07/2020)

Lightbody's Road

Lightbody's Road is a north-south road that is bound by the Kentbruck pine plantation, see below. The road is unsealed and approximately 5 metres wide, allowing for one-way vehicle travel. However, there are areas of unvegetated verge where opposing vehicles may pass. It is understood that Lightbody's Road is primarily utilised by traffic associated with the plantation.

Lightbody's Road

(Source: AECOM photo taken 30/07/2020)

Slip road onto Lightbody's Road, facing north

Other public road assets

Dewars Road

Dewars Road is a north-south road that is bound by the Kentbruck pine plantation, see below. The road is unsealed and approximately 5 metres wide, allowing for one-way vehicle travel. However, there are areas of unvegetated verge where opposing vehicles may pass. It is understood that Dewars Road is primarily utilised by traffic associated with the plantation.

Dewars Road, facing north (Source: AECOM photo taken 30/07/2020)

Unnamed Road (opposite Dewars Road)

Unnamed Road is a north-south road that is bound by the Kentbruck pine plantation, see below. The road is unsealed and approximately 5 metres wide, allowing for one-way vehicle travel. However, there are areas of unvegetated verge where opposing vehicles may pass. It is understood that this road is primarily utilised by traffic associated with the plantation.

Unnamed Road, facing south, taken from Dewars Road (Source: AECOM photo taken 30/07/2020)

Nelson No. 1 Road

Nelson No.1 Road is a north-south road that is bound by the Kentbruck pine plantation, see below. The road is unsealed and varies in width, in excess of 7 m wide, allowing for two-way vehicle travel. There are also areas of unvegetated verge where opposing vehicles may pass. It is understood that this road is primarily utilised by traffic associated with the plantation.

Nelson No. 1 Road (Source: AECOM photo taken 30/07/2020)

Appendix B

Project lifecycle traffic generation

Item	Vehicles per month (One-way)																															Vehicle Type (Austroads Vehicle Classification)
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	TOTAL	
Underground Line (26.6KM)																																		
Mobilsation (moving earthmoving/drilling equipment to site)							30												20															
Conduit Delivery										23	23	23	23	23	18	18	18																	
								65	65	65	65	65																						
Pre-cast pits										4	4	4	4	4	4	4																	
Misc. Deliveries (inlcuding sand / gravel)								30	70	70	70	70	70	70	70	70	70																
Light vehicles (per month)								550	900	900	900	900	900	900	900	900	900																
Terminal Station (Heywood Terminal Station Extention)																																		
Civil Mobilisation / De-mobilisation					20																20													
Civil Plant Mobilisation / De-mobilisation					20																20													
Construction Vehicles (5 x reduction from full terminal station in Option 2)						203	277	431	505	307	307	307	307	411	311	311	311	187	187	116														
Workers Vehicles (5 x reduction from full terminal station in Option 2)						128	196	390	288	189	189	189	189	174	174	174	166	155	155	140														
Other OD for Terminal Station										8																								
Wind Farm																																		
Civil Mobilisation / De-mobilisation					50																	50						110	110				**320**	Class 9
Civil Plant Mobilisation / De-mobilisation					50																	50						55	55				**210**	Class 9
External Quarry Product Delivery (Pavement Materials)					100	500																											**600**	Class 10
Concrete Delivery from On-Site Batch Plant - Internal Route								750	750	750	750	750	750	750	750	750	750	750	750	750	750												**10500**	Class 10
Concrete Delivery from On-Site Batch Plant - External Route								750	750	750	750	750	750	750	750	750	750	750	750	750	750												**10500**	Class 10
On-Site Quarry Product Delivery - Internal Route							500	500	500	500	500	500	500	500	500	500	500	500	500	250	125												**6875**	Class 10
On-Site Quarry Product Delivery - External Route							500	500	500	500	500	500	500	500	500	500	500	500	500	250	125												**6875**	Class 10
External Quarry Product Delivery (Concrete Aggregate)							250	250	250	250	250	250	250	250	250	250	250	250	250	250													**3500**	Class 10
General Deliveries						20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20												**320**	Class 9
WTG Reinforcing Delivery							50	50	50	50	50	50	50	50	50	50	50	50	50	50													**700**	Class 9
Water Cartage (On-Site Bores TBC)					25	60	60	60	60	120	120	120	120	120	120	120	120	120	120	120	120	25	25	25	25	25	25	5	10				**1870**	Class 7
Drainage Materials Delivery						5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5												**80**	Class 9
Conduit Delivery						3	3	3	3	3	3	3	3	3	3	3																	**33**	Class 9
Electrical Works						30	30	30	30	30	30	30	30	25	25	25	25	25	25	10	10												**410**	Class 9
Fuel Delivery					6	20	20	20	20	20	20	20	20	20	20	20	20	15	15	15	15	6	6	6	6	6	6	6	6				**354**	Class 9
Electrical Site Mobilisation / De-mobilisation					20																	20						55	55				**150**	Class 9
Electrical Plant Mobilisation / De-mobilisation					20																	20						55	55				**150**	Class 9
Transformer Delivery OSOM									4																								**4**	Over Size Over Mass
Transformer Equipment									8																								**8**	Class 9
Control Building OSOM									4																								**4**	Over Size Over Mass
Tower Sections OSOM									63	63	63	63	63	56	56	56	56	56	56	56	56	56	56	56	56	56	56						**1099**	Over Size Over Mass
Blades OSOM									36	36	36	36	36	32	32	32	32	32	32	32	32	32	32	32	32	32	32						**628**	Over Size Over Mass
Hubs OSOM									9	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8						**157**	Over Size Over Mass
Nacelle OSOM									9	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8						**157**	Over Size Over Mass
Container deliveries									83	83	83																						**249**	Class 9
Container returns																			83	83	83												**249**	Class 9
Crane mobilisation and de-mobilisation – OSOM									20	20																20	20						**80**	Over Size Over Mass
Crane mobilisation and de-mobilisation									20	20										20	20												**80**	Class 9
Total HV per month	**0**	**0**	**0**	**0**	**271**	**638**	**1438**	**2938**	**3194**	**3238**	**3198**	**3115**	**3115**	**3097**	**3097**	**3097**	**3094**	**3089**	**3172**	**2657**	**2107**	**275**	**135**	**135**	**135**	**175**	**175**	**286**	**291**	**0**	**0**	**0**	**46162**	
Average HV per day	**0**	**0**	**0**	**0**	**12**	**29**	**65**	**134**	**145**	**147**	**145**	**142**	**142**	**141**	**141**	**141**	**141**	**140**	**144**	**121**	**96**	**13**	**6**	**6**	**6**	**8**	**8**	**13**	**13**	**0**	**0**	**0**		

On-site workforce per day	20	20	20	20	40	90	100	125	170	240	240	240	240	240	240	240	205	155	130	105	80	55	55	55	55	55	35	15	15	0	0	0	**3300**	
Light vehicles estimate per day	13	13	13	13	27	60	67	83	113	160	160	160	160	160	160	160	137	103	87	70	53	37	37	37	37	37	23	10	10	0	0	0	**2200**	Class 1
Total HV + LV	13	13	13	13	39	89	132	217	259	307	305	302	302	301	301	301	277	244	231	191	149	49	43	43	43	45	31	23	23	0	0	0	**4298**	

Kaban Scale up Factor 5.5

Truck Types	**Capacity (t)**	**Utilization**
Rigid Truck	13.5	Water cartage, fuel delivery
Semi Trailer	16.5	Container deliveries and other non material deliveries
Truck and Dog	30.5	Quarry and material product delivery
Concrete agitator	22.4	Concrete deliveries

Appendix C

Swept path assessments

REX J ANDREWS
ENGINEERED TRANSPORTATION

ROUTE SURVEY: NEOEN
KENTBRUCK WIND FARM:
EX PORT OF PORTLAND

22/08/2022 REV 01

Rev.	Date	Change	Responsible	Checked
00	11/08/22	Route Assessed	A Smith	✓
00	11/08/22	Report compiled	C Ewin	✓
00	22/08/22	Report completed	W Andrews	✓

Index:

1.0 Introduction

This document describes observations and previous experience on route and explains the Transport of Wind turbine equipment from Port of Portland to the Kentbruck wind farm.

This Route survey took place on 11-08-22.

2.0 Evaluation

1	No work
2	Some amount of work
3	Moderate amount of work
4	Extreme amount of work

(Mark below boxes with an X)

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

3.0 Project data.

Date of latest Route Assessment. 11/08/2022
Survey undertaken by. (Rex J Andrews P/L)
Project name. Kentbruck Windfarm
Location. Portland (VIC) to Kentbruck (VIC)
Turbine type. TBC (Up to 118 x turbines with max HH of 174m)

4.0 Transport combinations (Examples)

TURBINE EXAMPLES:

Blades (90.0 x 4.5w x 4.0h x 30.0T)
Configuration. Prime mover with 2x4 dolly 3x4 Jinker
Overall dimension: 100.0l x 4.5w x 4.7h x 67.5T

Nacelles (15.1l x 4.2w x 4.2h x 130T)
Configuration. Prime mover with 12x8 Platform trailer + Backup truck.
Overall dimensions: 46.0l x 4.3w x 5.2h x 204.5T + Backup truck.

Drive train/Power train/Generator (8.0l x 5.5w x 4.0h x 110T)
Configuration. Prime mover with 10x8 Platform trailer + Backup truck.
Overall dimensions: 39.9l x 5.5w x 5.0h x 199.5T + Backup truck.

Hubs (5.5l x 5.0w x 4.2h x 70.0T)
Configuration. Prime mover with 2x8 dolly and 5x8 Low loader.
Overall dimensions: 26.0l x 5.0w x 5.2h x 106.5T.

149 METRE TOWER EXAMPLE:

Base Towers (10.1l x 6.0 x 5.5 x 91T)
Configuration. Prime mover with 5x8-5x8 Bookend.
Overall dimension: 42.0l x 5.85w x 6.1h x 164.5T (+ Push truck)

Section 2 Towers (14.1l x 5.5 x 5.5 x 89T)
Configuration. Prime mover with 5x8-5x8 Bookend.
Overall dimension: 44.0l x 5.5w x 5.7h x 164.5T (+ Push truck)

Section 3 Towers (16.5l x 5.5 x 4.95 x 89T)
Configuration. Prime mover with 5x8-5x8 Bookend.
Overall dimension: 46.0l x 5.5w x 5.7h x 164.5T (+ Push truck)

Section 4 Towers (17.2l x 4.95 x 4.65 x 86T)
Configuration. Prime mover with 8x8 low platform.
Overall dimension: 35.0l x 5.0w x 5.9h x 154.5T (+ Push truck)

Section 5 Towers (20.5l x 4.65 x 4.65 x 84T)
Configuration. Prime mover with 10x8 platform trailer.
Overall dimension: 38.0l x 4.7w x 5.7h x 164.5T (+ Push truck)

Section 6 Towers (29.9l x 4.65w x 4.65 x 87T)
Configuration. Prime mover with 5x8-5x8 Extending platform trailer.
Overall dimension: 45.0l x 4.7w x 5.7h x 164.5T (+ Push truck)

Top Towers (35.5l x 4.65w x 3.97h x 74T)
Configuration. Prime mover with 4x8-4x8 Extending platform trailer.
Overall dimension: 54.0l x 5.1w x 5.7h x 152.5T (+ Push truck

ERECTION CRANES:

LG1750 carrier (19.2l x 3.0 x 4.0 x 96T)
Configuration. Prime mover with 10x8 Platform trailer + Backup truck
Overall dimensions: 36.0l x 4.2w x 5.2h x 174.5T + Backup truck

LTM1500 carrier (21.0l x 3.0 x 4.0 x 96T)
Configuration. Prime mover with 10x8 Platform trailer + Backup truck
Overall dimensions: 36.0l x 5.0w x 5.2h x 174.5T + Backup truck

TRANSFORMER:

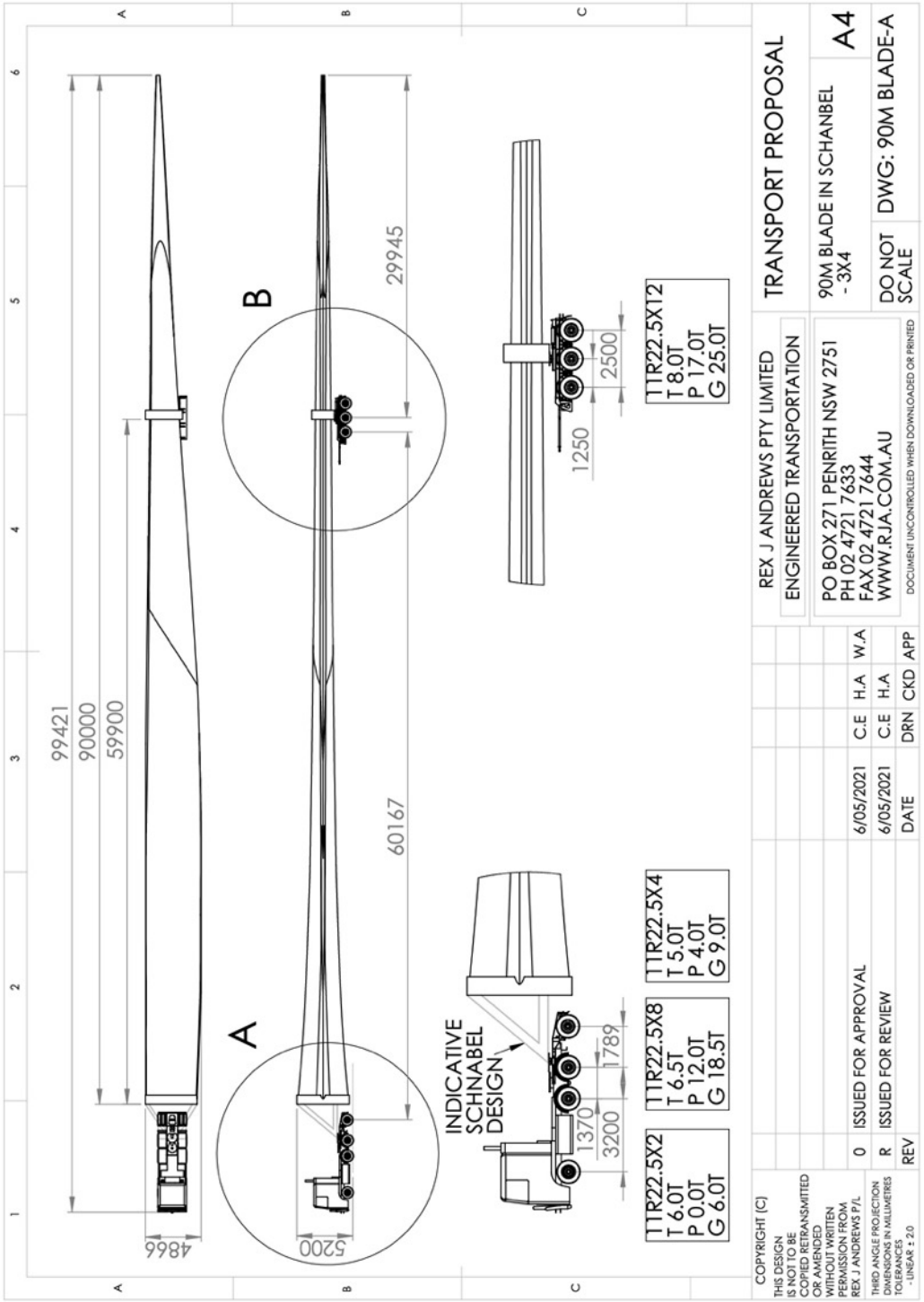
Possible Transformer size (9.2l x 4.0 x 4.35 x 167T)
Configuration. Prime mover with 10x8-10x8 Beamset + 4 x Backup trucks
Overall dimensions: 45.0l x 4.3w x 5.4h x 324.5T + 4 x Backup trucks
Or
Configuration. Prime mover with 16x8 Platform trailer + 3 x Backup trucks
Overall dimensions: 45.0l x 4.3w x 5.4h x 256.5T + 3 x Backup trucks

SWITCHROOM:

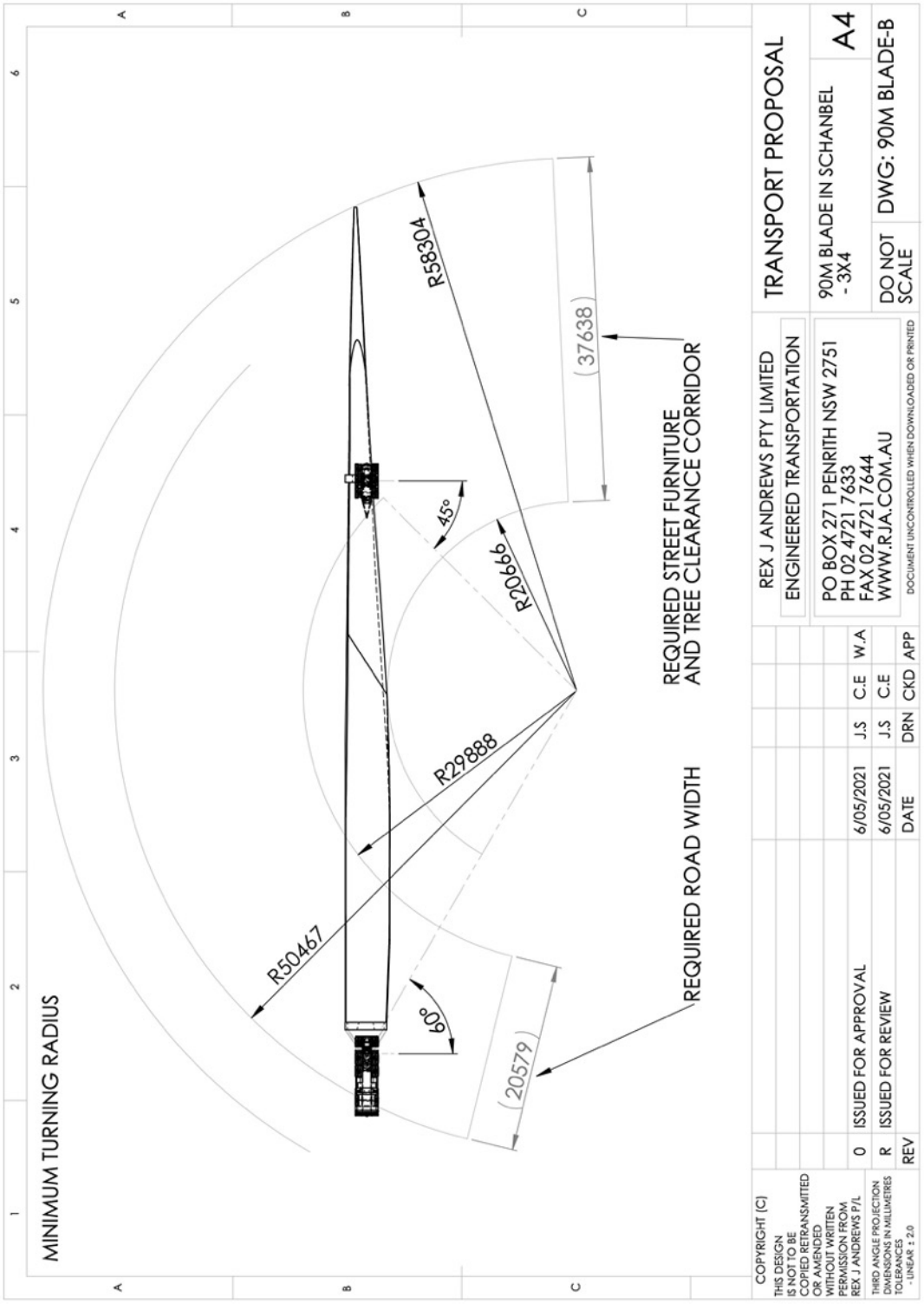
The largest switchroom size that is recommended for this site would be as follows.
Switchroom dimensions: 30.0l x 6.0w x 4.4h x 90.0T

5.0 Transport drawings (Possible combinations)

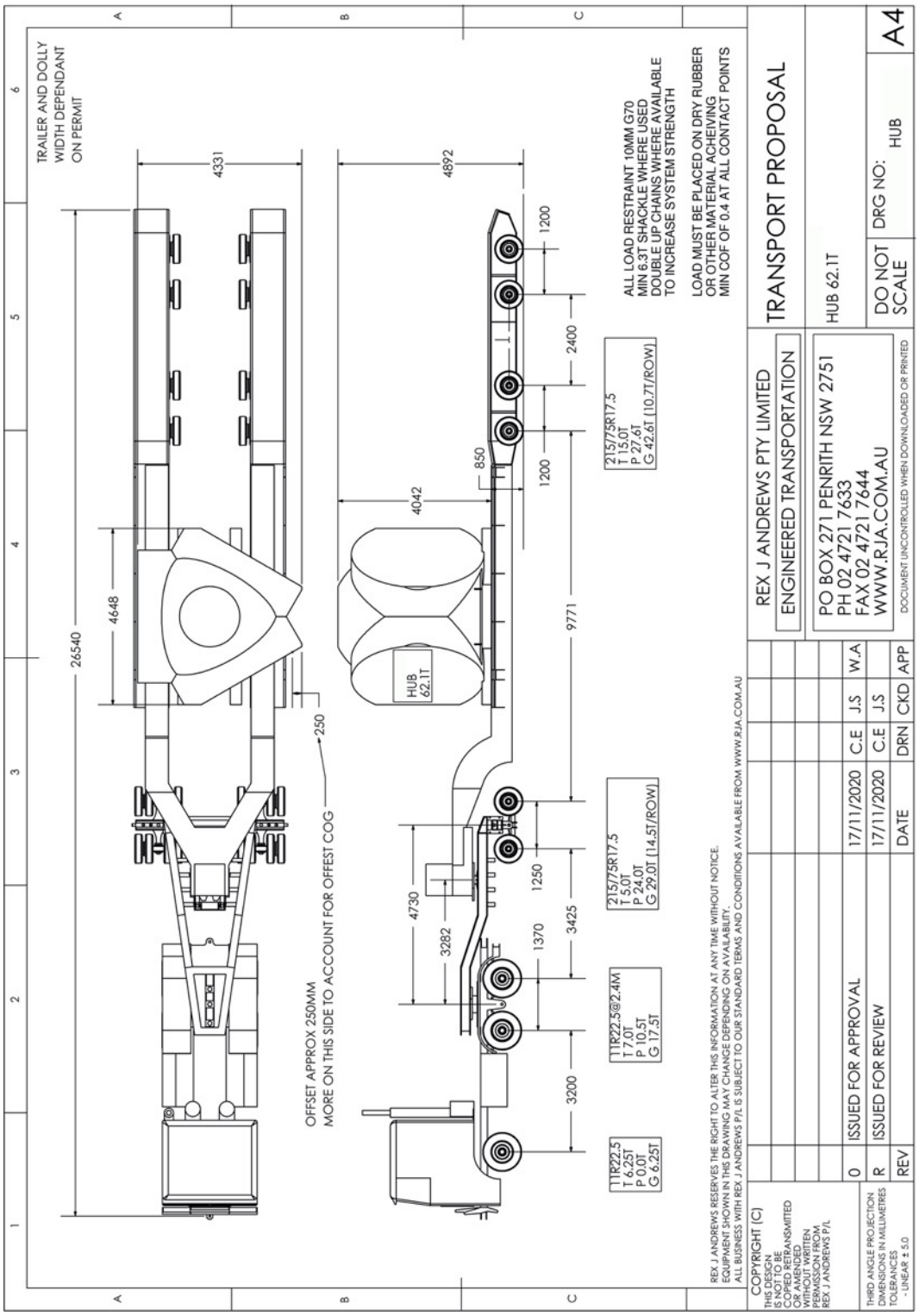
Blade diagram (90 Metre blade case study).



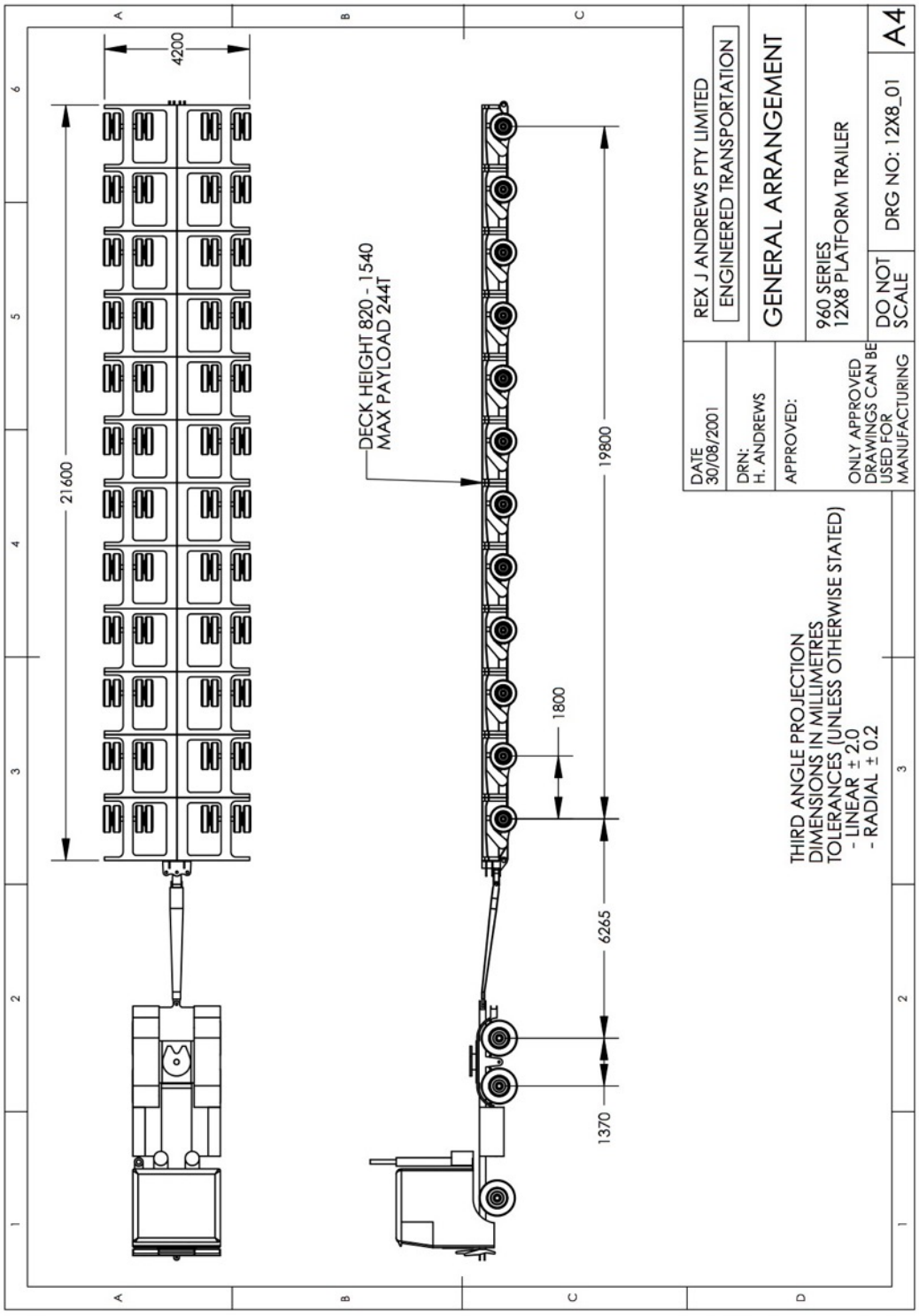
Blade diagram (90 Metre blade case study): Swept path



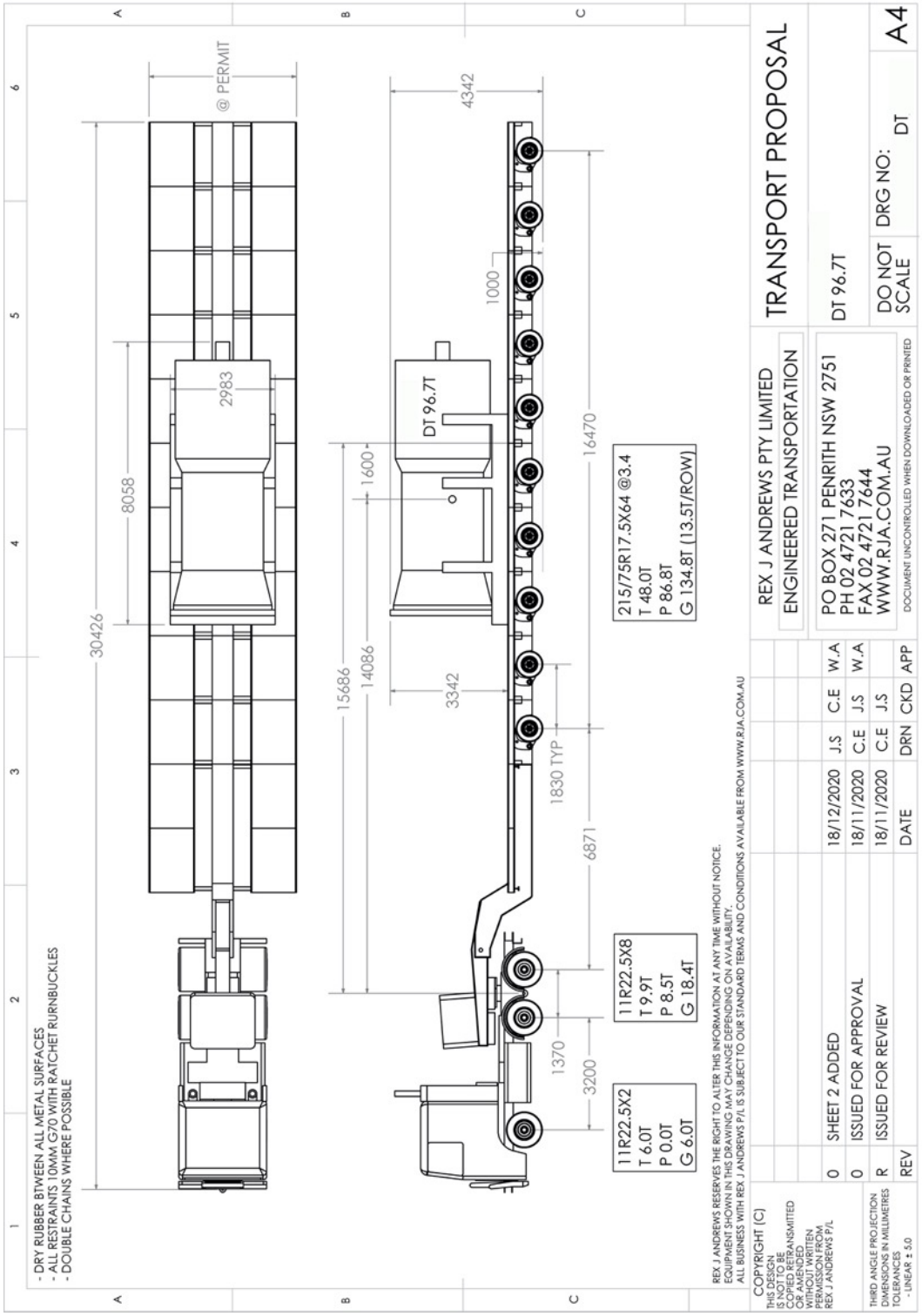
Hub combination example:



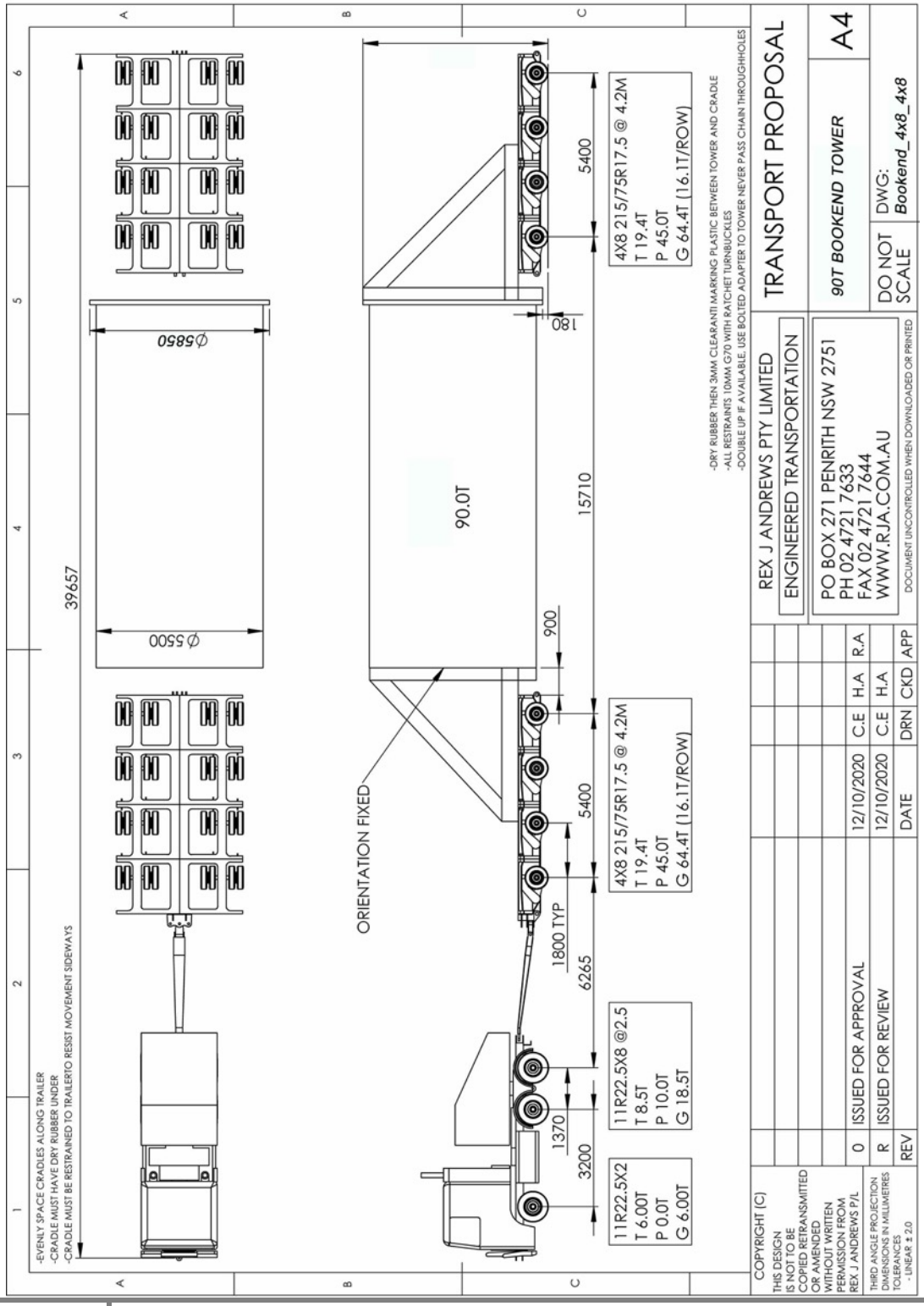
Nacelle combination example:



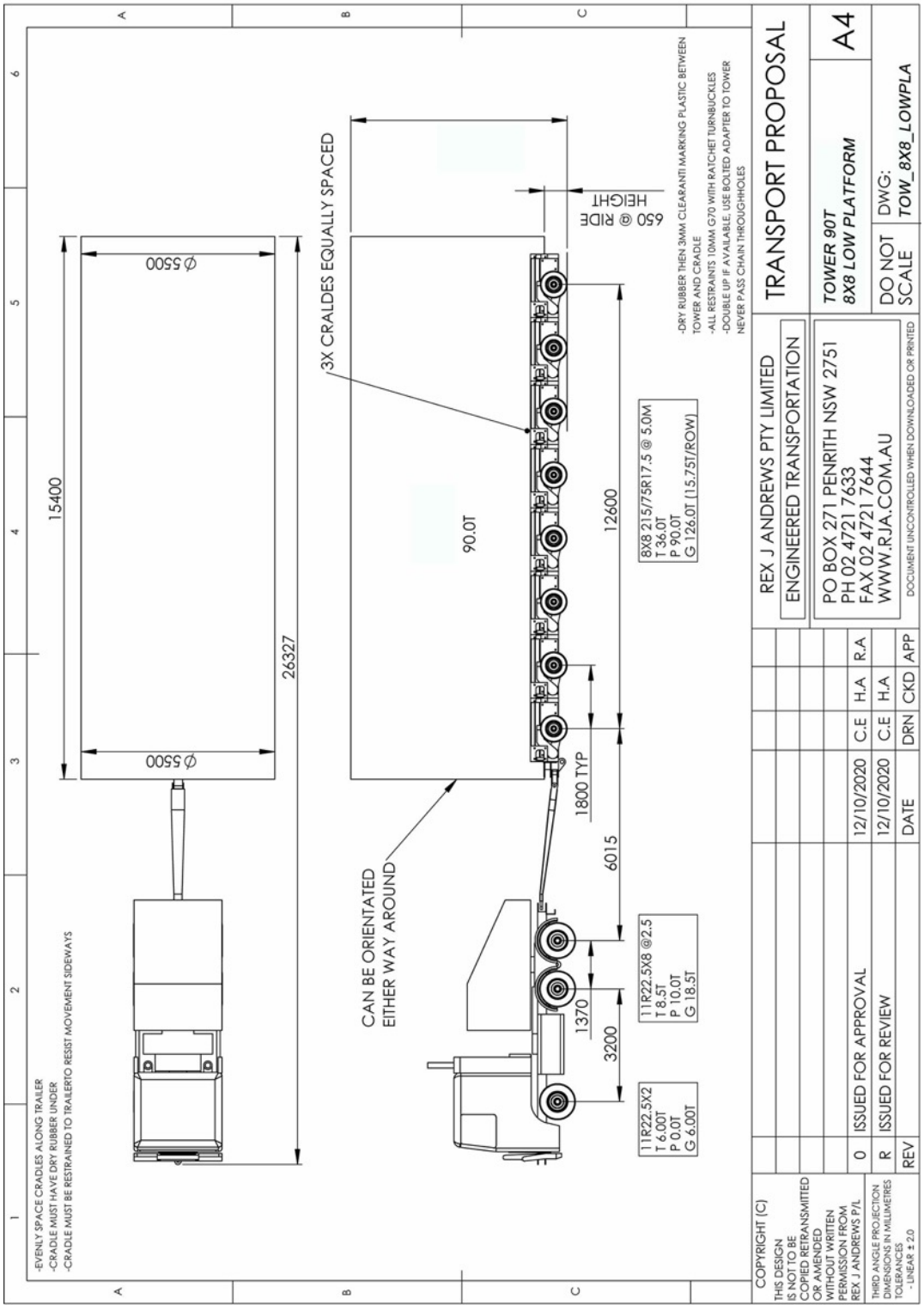
Drivetrain combination example:



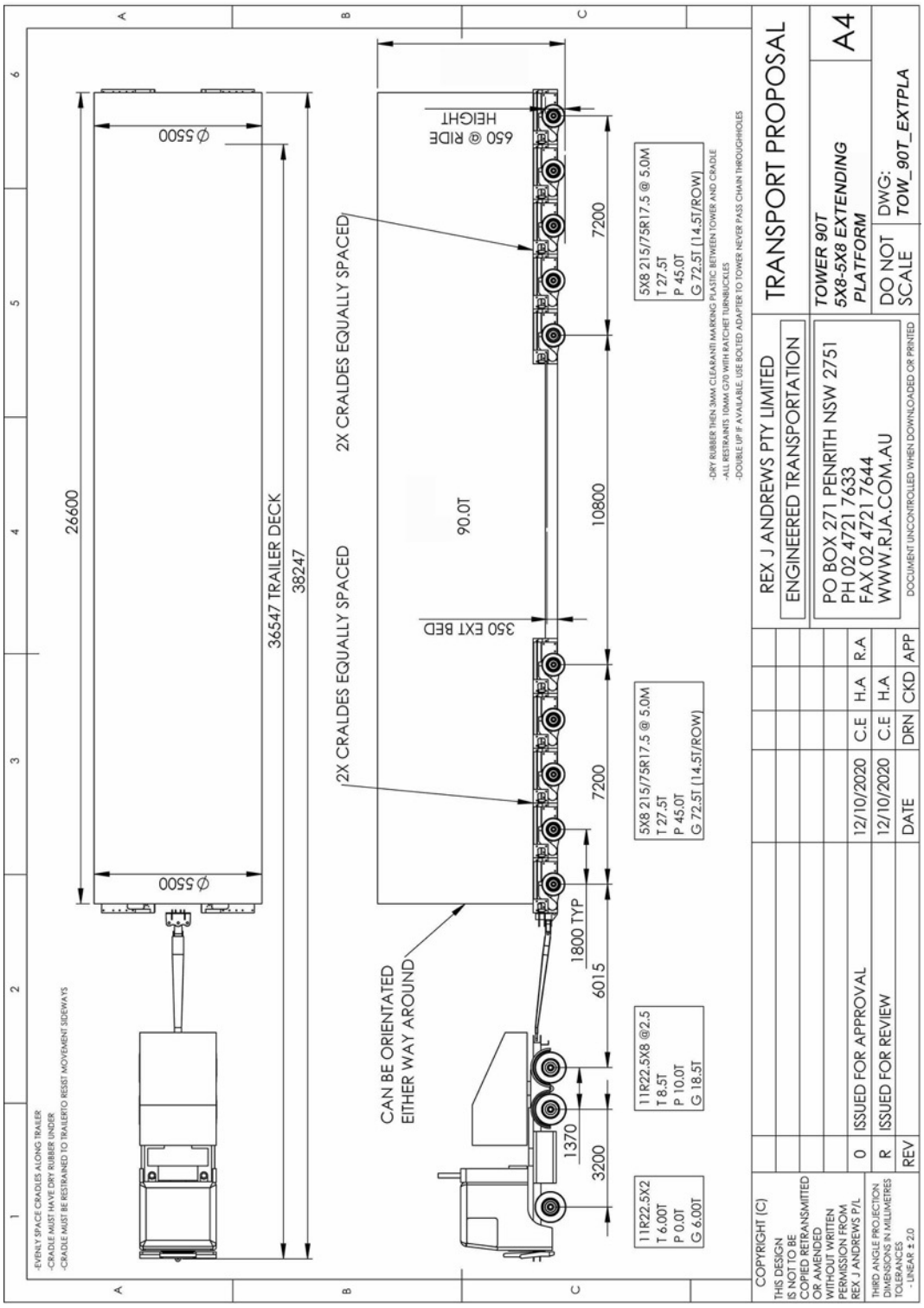
Tower Trailer Bookend:



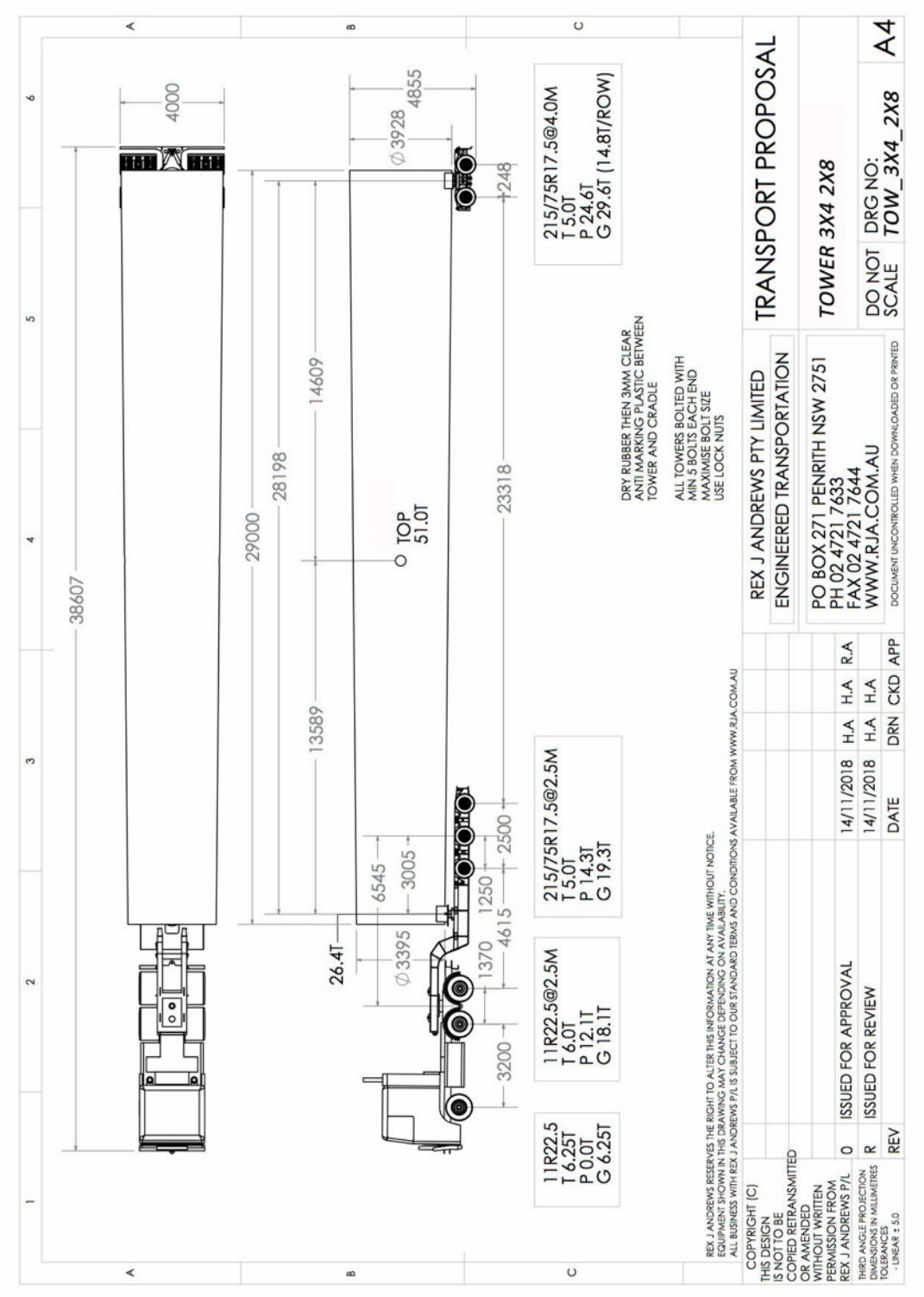
Tower trailer 8x8:



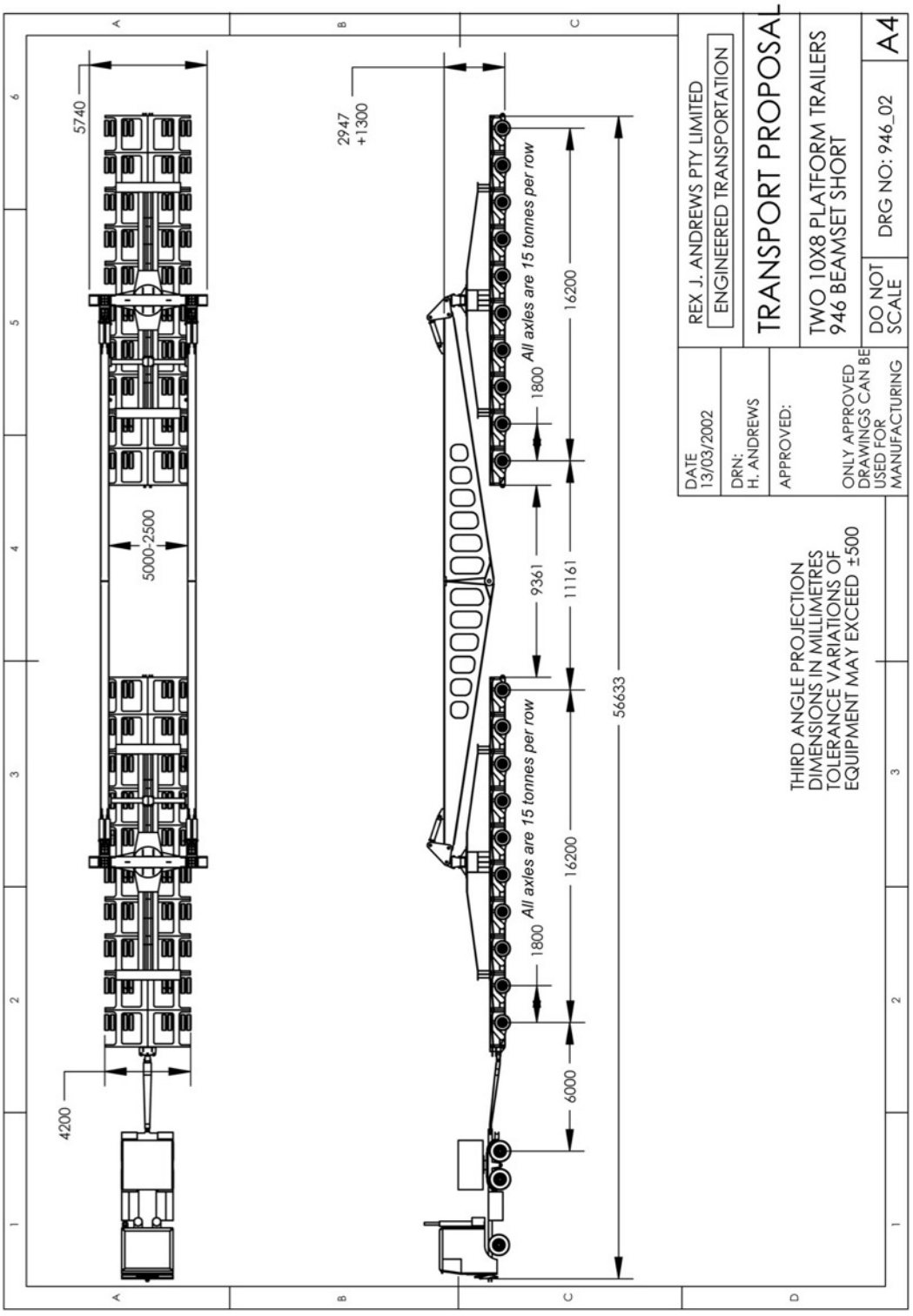
Tower trailer extending 5x8_5x8:



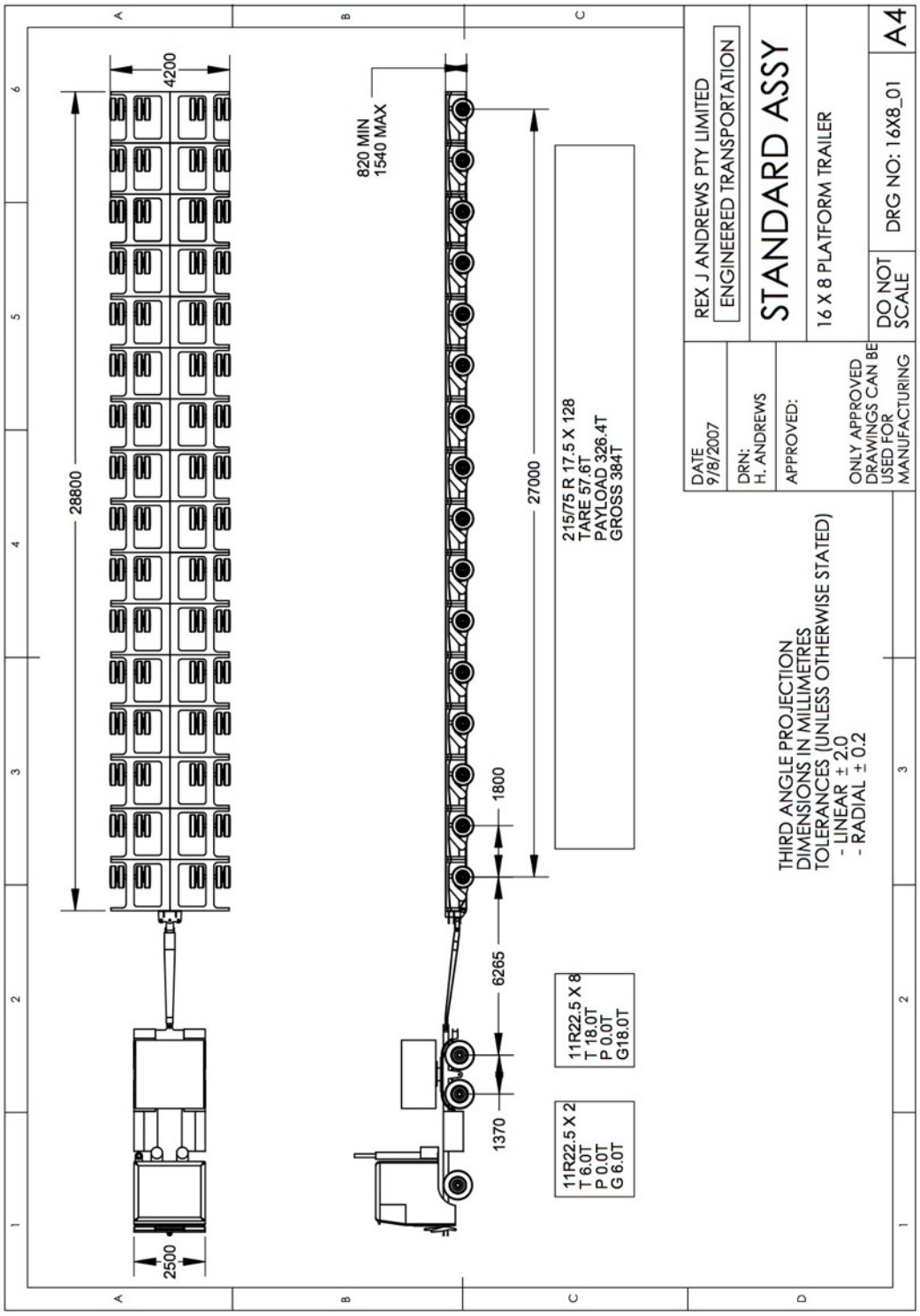
Tower trailer Dolly and Jinker:



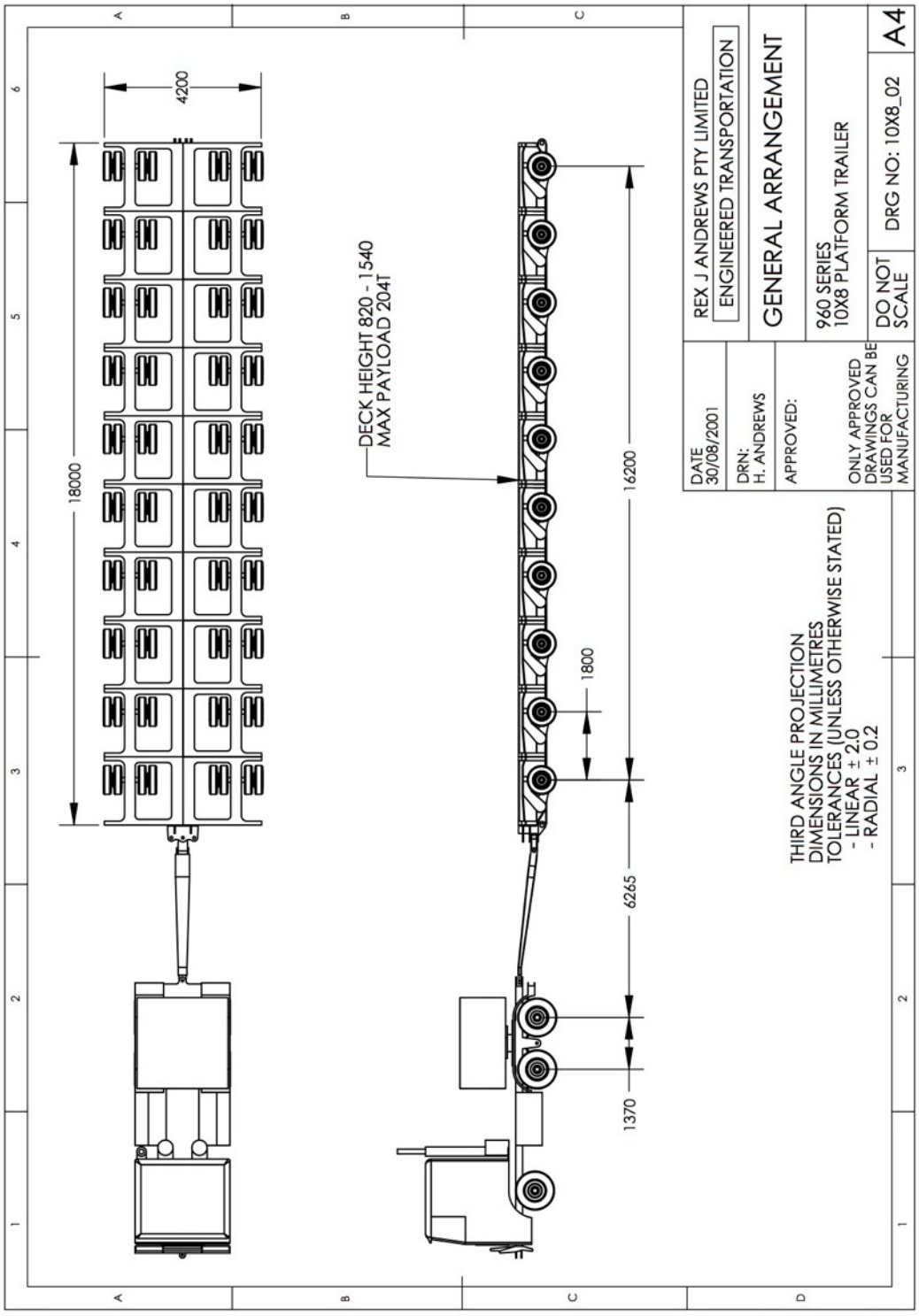
Transformer trailer 10x8-10x8 beamset:



Transformer trailer 16x8 Platform:



Crane trailer 10x8 Platform:



6.0 Site Location and layout.

The Kentbruck Windfarm would be mostly located in an actively managed and harvested pine plantation in southwest Victoria, between Portland and Nelson, in the Glenelg LGA. The Project would extend along the southern coast of the Glenelg LGA. The Project Area is predominantly (78%) located within an area used for commercial radiata pine forestry operations which has been heavily modified. The remaining approximately 22% of land in the Project Area is freehold land that is primarily used for grazing (with around 0.1% of the Project Area covering public land).

Image 1: Site Location

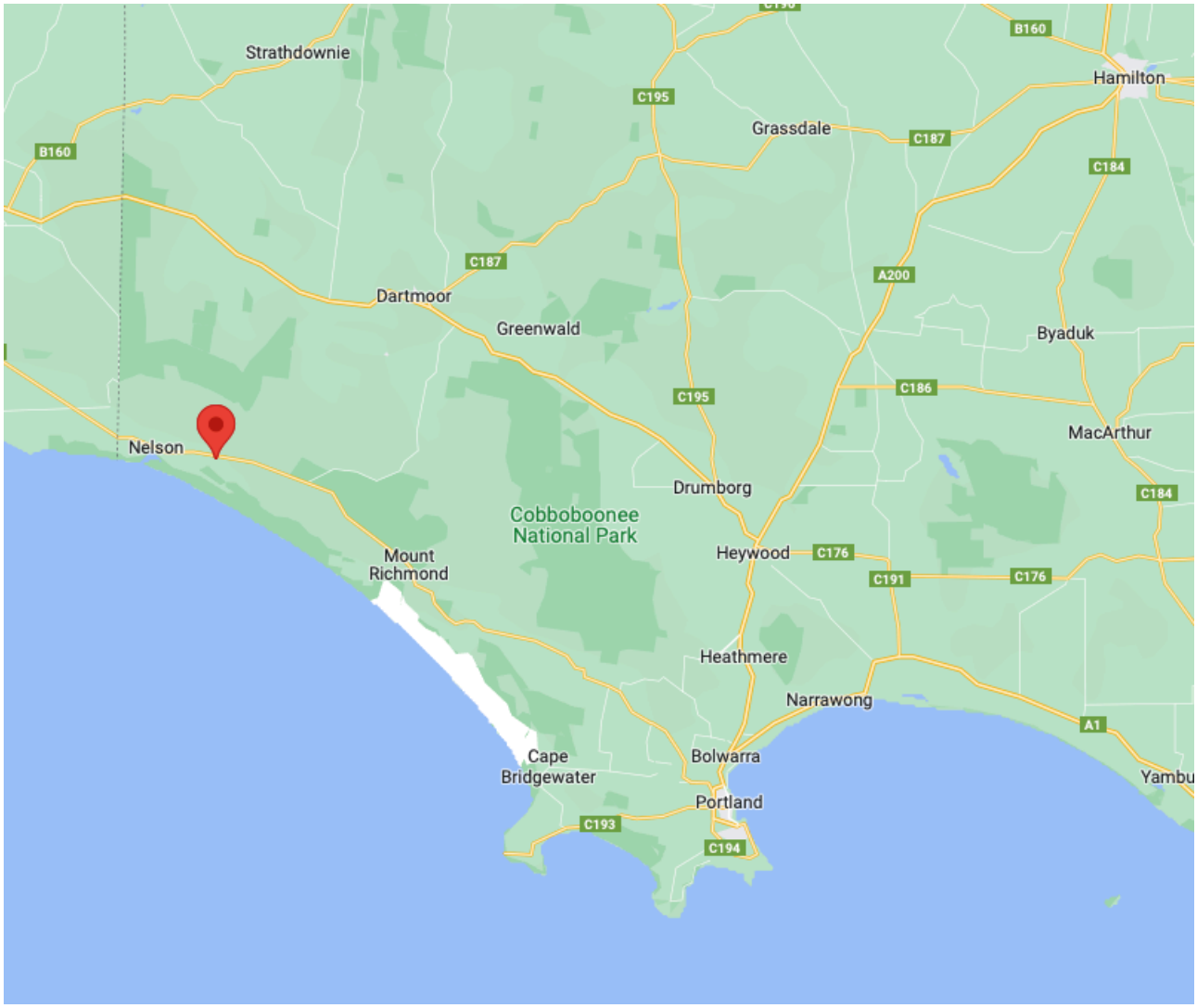


Image 2: Site Layout

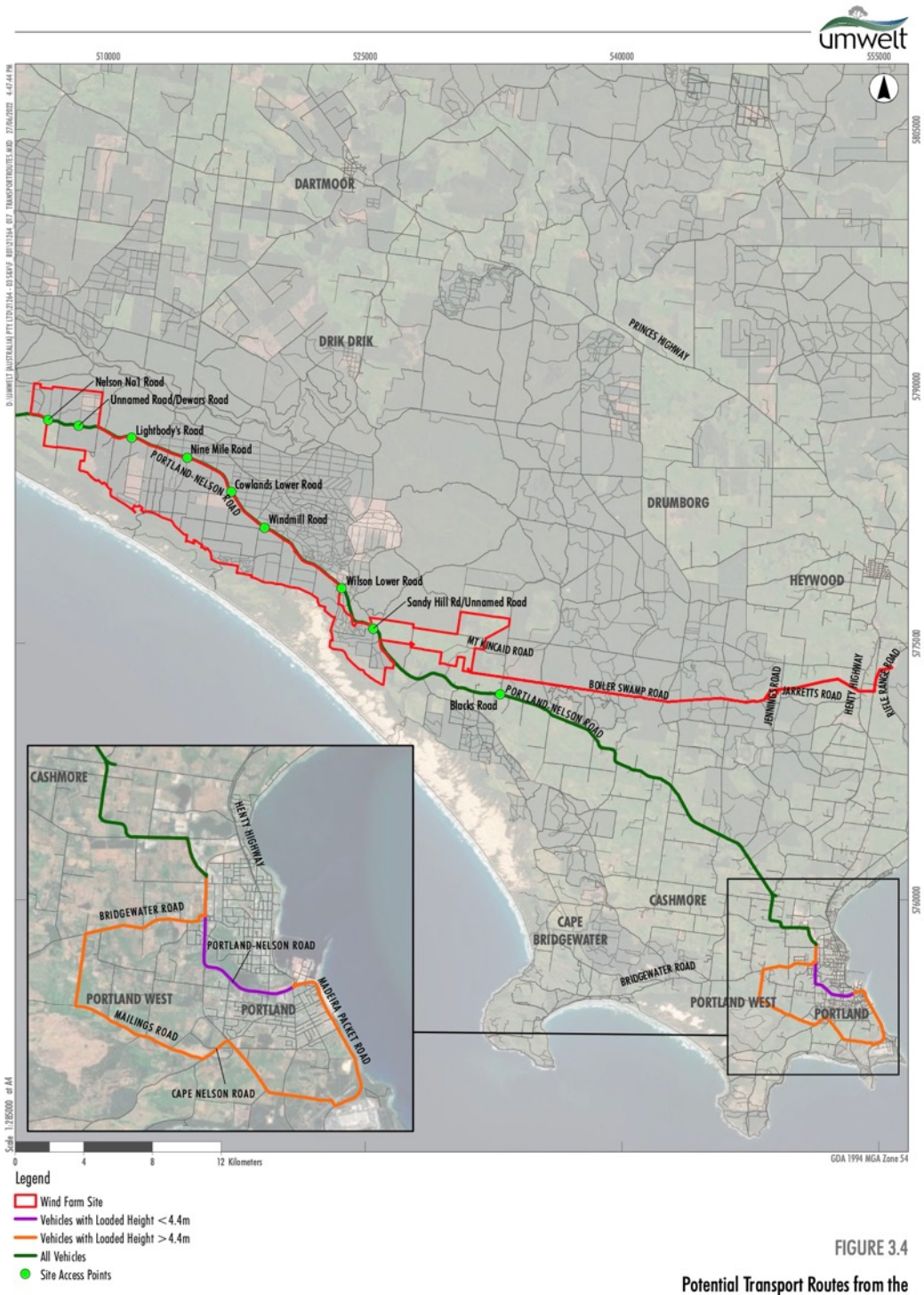


FIGURE 3.4

Potential Transport Routes from the Port of Portland to the Wind Farm Site

7.0 Port of Import (Port of Portland).

The ideal berth for discharge would be the #5 Berth. This berth is situated in Portland harbour, and has road access via Madeira Packet Road Portland.

This berth has handled various wind farm projects in South-West Victoria and has accommodated blades of up to 80 metres in length in the past.

Storage at the port may be available for short-term lease of up to 10,000 S/Q metres; alternatively, Rex J Andrews Pty Ltd currently has 60,000 s/q metres of Hardstand and Keppel Prince has 40,000 s/q metres of hardstand.

This study will be based on using the RJA storage yard.

PORT IMAGE:

RJA STORAGE YARD IMAGE:

8.0 Transport summary.

We have based this study on the turbine components, and all imported towers entering Australia via the Port of Portland (Berth #5) Local towers may also be sourced from Keppel Prince, Portland (VIC). The wind farm has multiple site entrances. The route in this survey is to the western most entrance.

ROUTE SURVEY A: Port of Portland to RJA storage (loads under 5.3m loaded height)

(7.4 kilometres): After completing this route survey, we believe the following is the most suitable option.

This route took us via Quay Road, Madeira Packet Way, Henty Highway, Portland-Nelson Road.

GPS Link: https://goo.gl/maps/NDGHdqba9sz3KJCw5

ROUTE SURVEY B: Port of Portland to RJA storage (loads over 5.3m and less than 6.0m loaded height)

(20.4 kilometres): After completing this route survey, we believe the following is the most suitable option for towers loads that exceed an overall height of 5.4 metres.

This route took us via No 2 Quay Road, Madeira Packet Road, Cape Nelson Road, Mailings Road, Thorns Road, Bridgewater Road, Henty Highway, Portland-Nelson Road.

GPS Link: https://goo.gl/maps/VTpyHtcD7Y5Nuq4y9

ROUTE SURVEY C: RJA Storage to Kentbruck (all components)

(58 kilometres): After completing this route survey, we believe the following is a possible option.

This route took us via Portland-Nelson Road

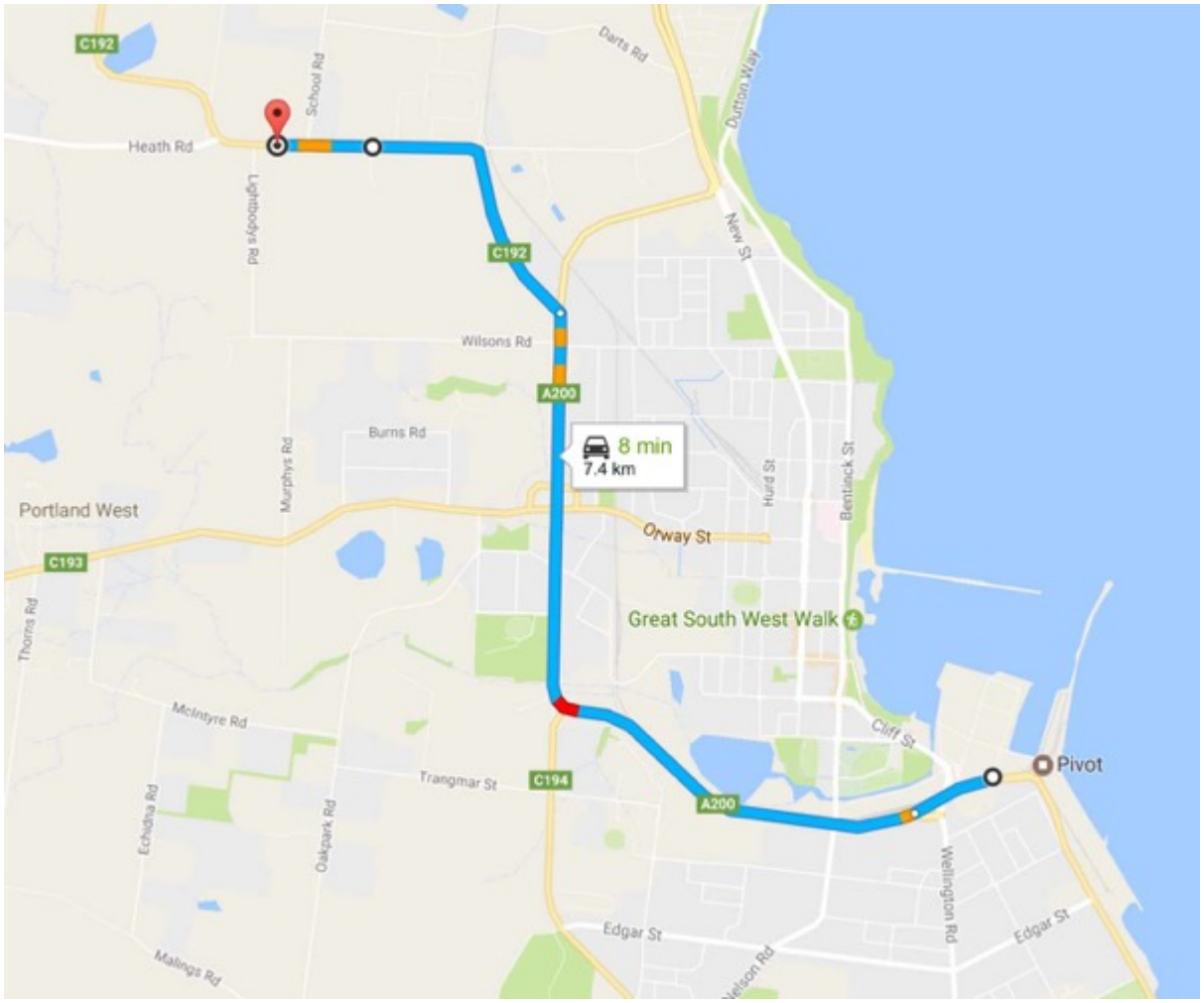
GPS Link: https://goo.gl/maps/xkJYm5o3vtT5zykf6

9.0 Route Survey A: Port of Portland to RJA storage "Loads under 5.3 metres loaded height".

ROUTE: Port of Portland to RJA storage (7.4 kilometres):

GPS LINK: https://goo.gl/maps/tGkVQPUu7Yu

This route took us via Quay Road, Madeira Packet Way, Henty Highway, Portland-Nelson Road.

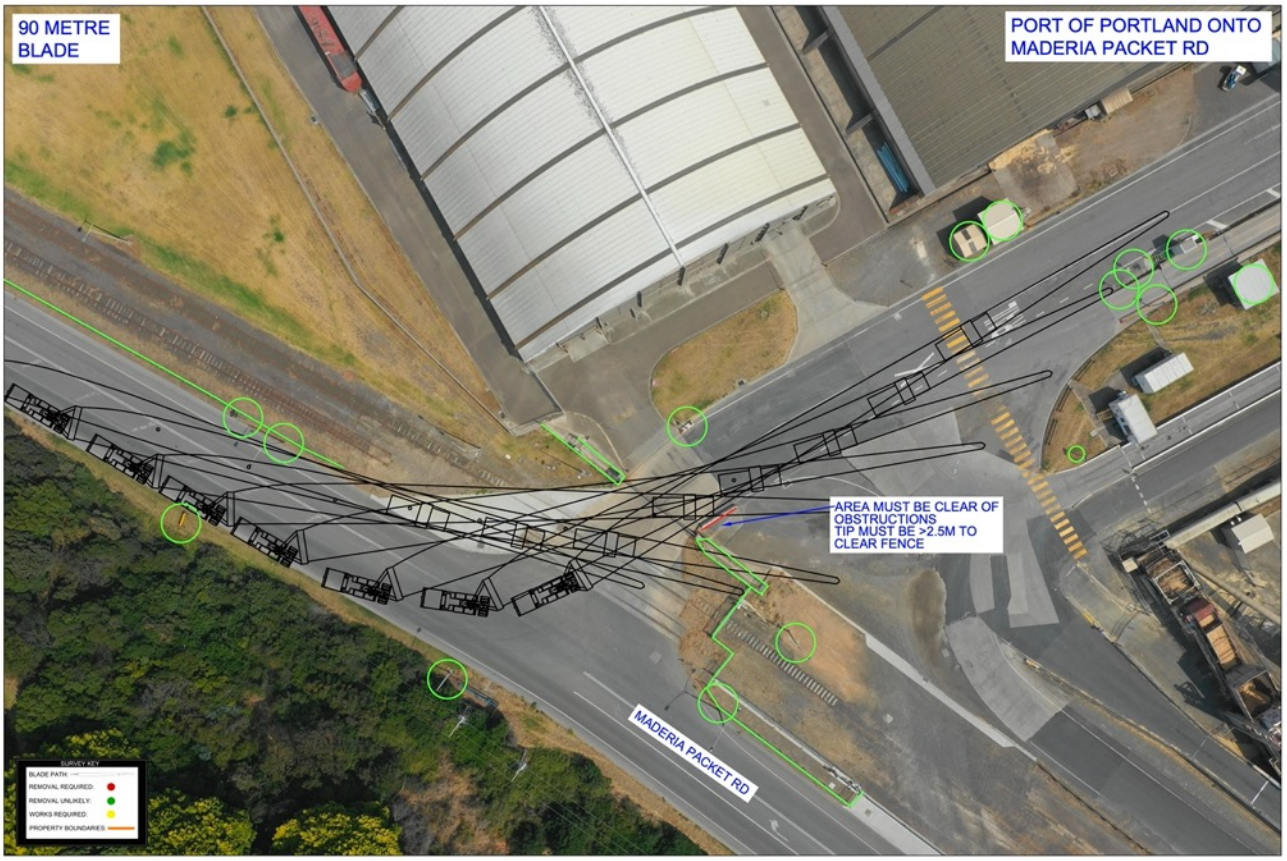


KEY	
MODIFICATIONS REQUIRED	
PINCH POINT	

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
0.0	Portland	Port of Portland onto Madeira Packet Road GPS Link: https://goo.gl/maps/Dmb15XGtrSK2	Length: 75 metres Width: 9.0m at the gate	Right hand turn	The corner will required all obstacles on the eastern side of the exit gate to be removed. The blade tip must be >2.5m to avoid clashing with the exit gate. A spotter will need to assist with the loads as they exit the gate.
0.2	Portland	Madiera Packet Road under Cliff Street GPS Link: https://goo.gl/maps/RWN8fJMUcpt	Height: 5.5 metres	Travel directly under the overbridge	The Bridge has a clearance of 5.5 meters high in the right lane. Loads can stay in the right-hand lane if the exceed 5.2 meters.
4.0	Portland	Henty Highway under Bridgewater Road GPS Link: https://goo.gl/maps/boWmnu6TuUo	Height: Left lane: 5.2 metres Centre lane: 5.3 metres Right lane: 5.45 metres	Travel directly under the overbridge	The Bridge has a clearance of 5.2 meters high in the right lane. However, if the loads travel on the far-right hand side of the bridge, they can pass under at up to 5.45 meters high. Loads that exceed 5.3 meters will need to use the detour.
5.1	Portland	Henty Highway onto Portland-Nelson Road GPS Link: https://goo.gl/maps/unep2nCFK7J2	Length: 75.0 Metres	Slight left-hand turn	Some bushed on the outside of the corner along the Henty Highway may require trimming. The blades will need to cross from the incorrect side to the incorrect side. Spotter to guide load through the corner.
6.2	Portland	Portland-Nelson Road at the intersection of Cashmore Road GPS Link: https://goo.gl/maps/PQNj2mqLGhm	Length: 75.0 Metres	Left hand turn	A new hardstand road alignment to the inside of the corner is proposed. This will avoid the need to remove 2x light poles. Spotter to guide load through this corner. Spotter to guide load through the corner.
7.4	Portland	Portland-Nelson Road into RJA storage. GPS Link: https://goo.gl/maps/LMkBd4NyBZ82	Length: 75.0 Metres Width: 9.0 Metres	Left hand turn	Some hardstand will need to be added and several trees will need to be removed on the inside of the corner. The fence and gate will also need to be modified. Spotter to guide load through the corner.

0.0 Km's: Exiting Portland Port.

Image 1:



Procedure: Exit port heading south and turn right onto Madiera Packet Road.

GPS link: https://goo.gl/maps/DGyXgynapAH2

Comments: The corner will require all obstacles on the eastern side of the exit gate to be removed. The blade tip must be >2.5m to avoid clashing with the exit gate. Spotter to guide the load through this section of road.

Road modifications: Minor works required.

4.0 Km's: Henty Highway Bridge Water Road over pass at Portland.

Image 1:

Procedure: Pass under overhead bridge.

GPS link: https://goo.gl/maps/yR5syUkJJyP2

Comments: The Bridge has a clearance of 5.23 metres high in the left lane and 5.45 metres in the right lane. Care to be taken. It would be advisable to pass under this structure in the right-hand lane. Loads that exceed 5.3 metres are to take the tower detour route.

Road modifications: Loads that exceed 5.3 metres in height will need to detour this bridge.

5.1 Km's: Henty Highway onto Portland-Nelson Road.

Image 1:

Procedure: Left hand turn from the Henty Highway onto Portland Nelson Road.

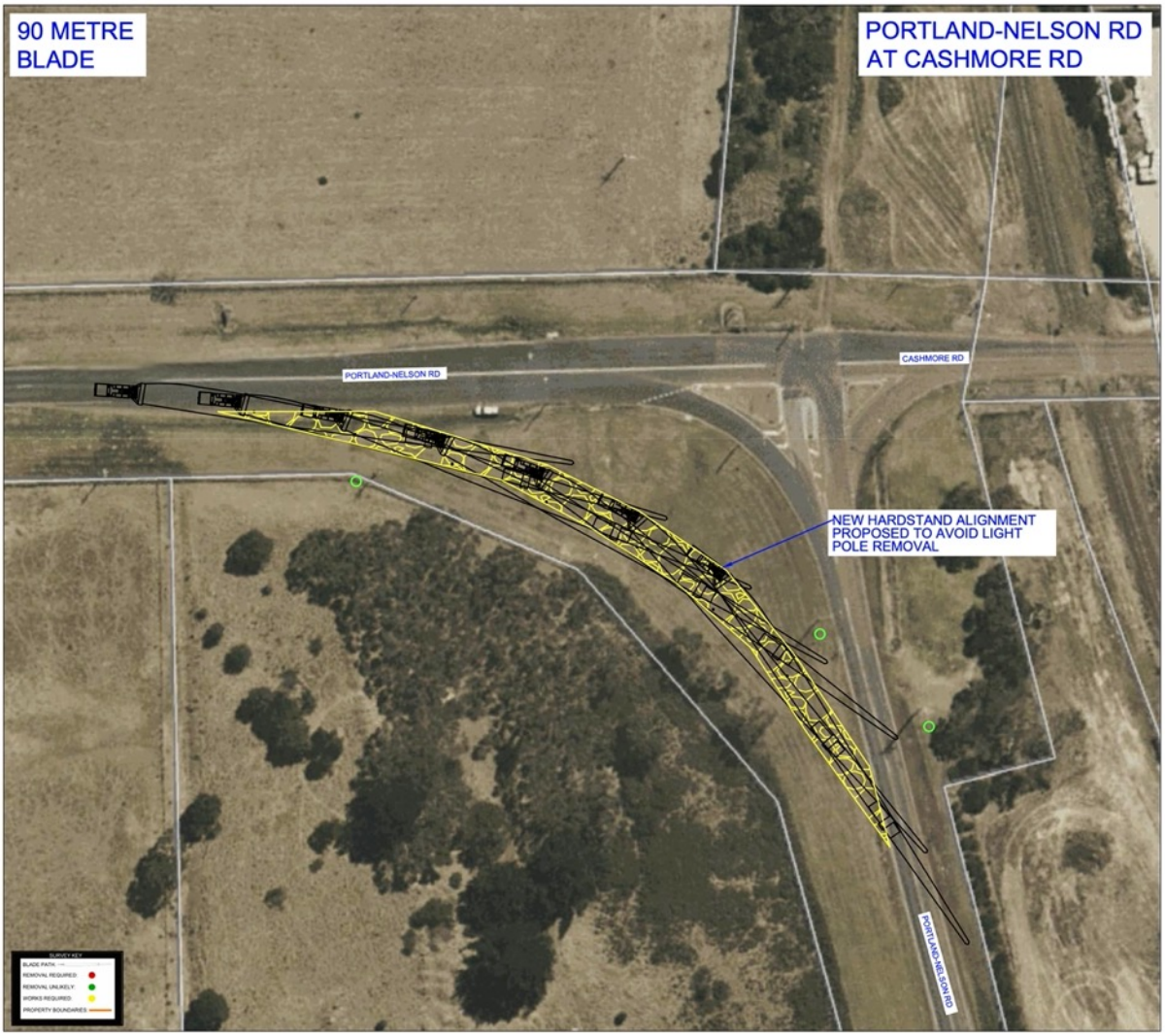
GPS link: https://goo.gl/maps/unep2nCFK7J2

Comments: Loads to turn from the incorrect side to the incorrect side of the road. Some bushed on the outside of the corner along the Henty Highway may require trimming.

Road modifications: Minor works required.

6.2 Km's: Portland-Nelson Road intersection of Cashmore Road.

Image 1:



Procedure: Left hand turn from Portland Nelson Road and remain on Portland-Nelson Road.

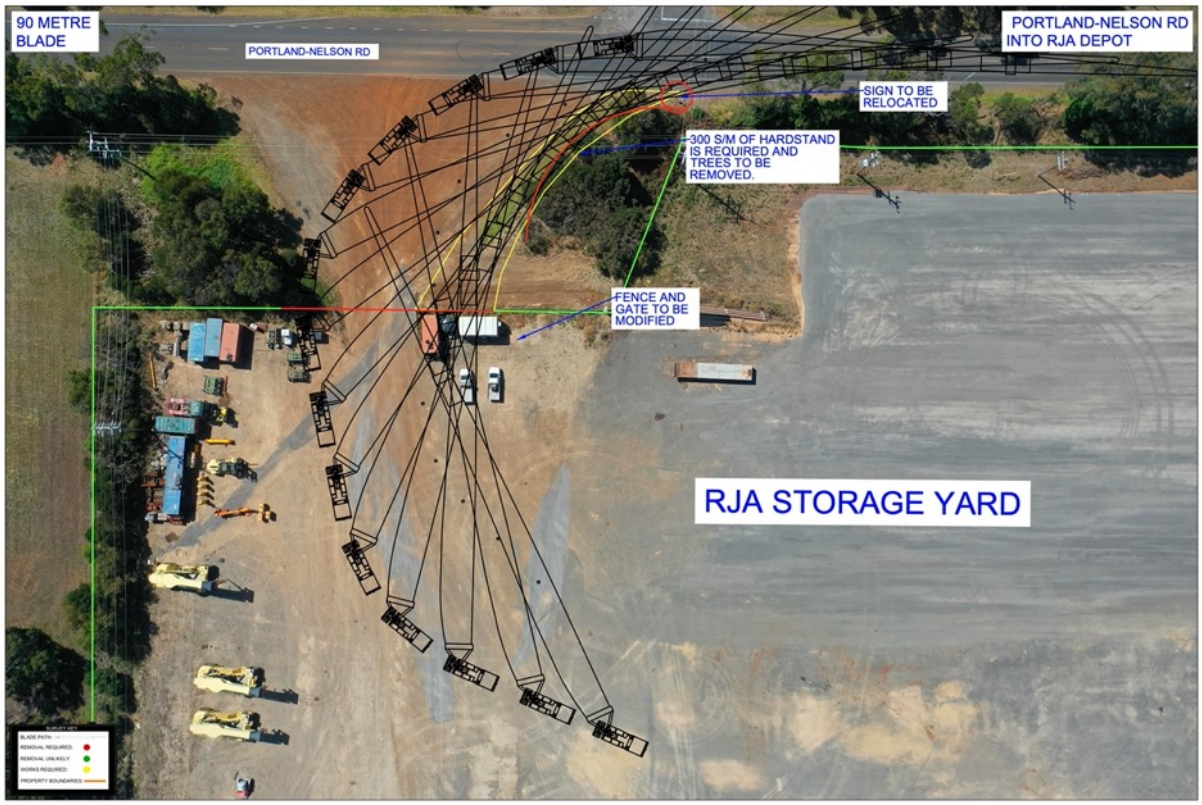
GPS link: https://goo.gl/maps/PQNj2mgLGhm

Comments: A new hardstand road alignment to the inside of the corner is proposed. This will avoid the need to remove 2x light poles. Spotter to guide load through this corner.

Road modifications: A large amount of work is required.

7.4 Km's: Portland-Nelson Road into RJA storage yard

Image 1:



Procedure: Left hand turn from Portland-Nelson Road into RJA storage area.

GPS link: https://goo.gl/maps/LMkBd4NyBZ82

Comments: Some hardstand will need to be added and several trees will need to be removed on the inside of the corner. The fence and gate will also need to be modified.

Road modifications: A moderate amount of work is required.

Conclusion Route A:

After studying all options and undertaking a route survey, we believe the loads could be transported from the Port to the RJA storage yard after a moderate number of upgrades.

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

PORT OF PORTLAND TO RJA STORAGE:

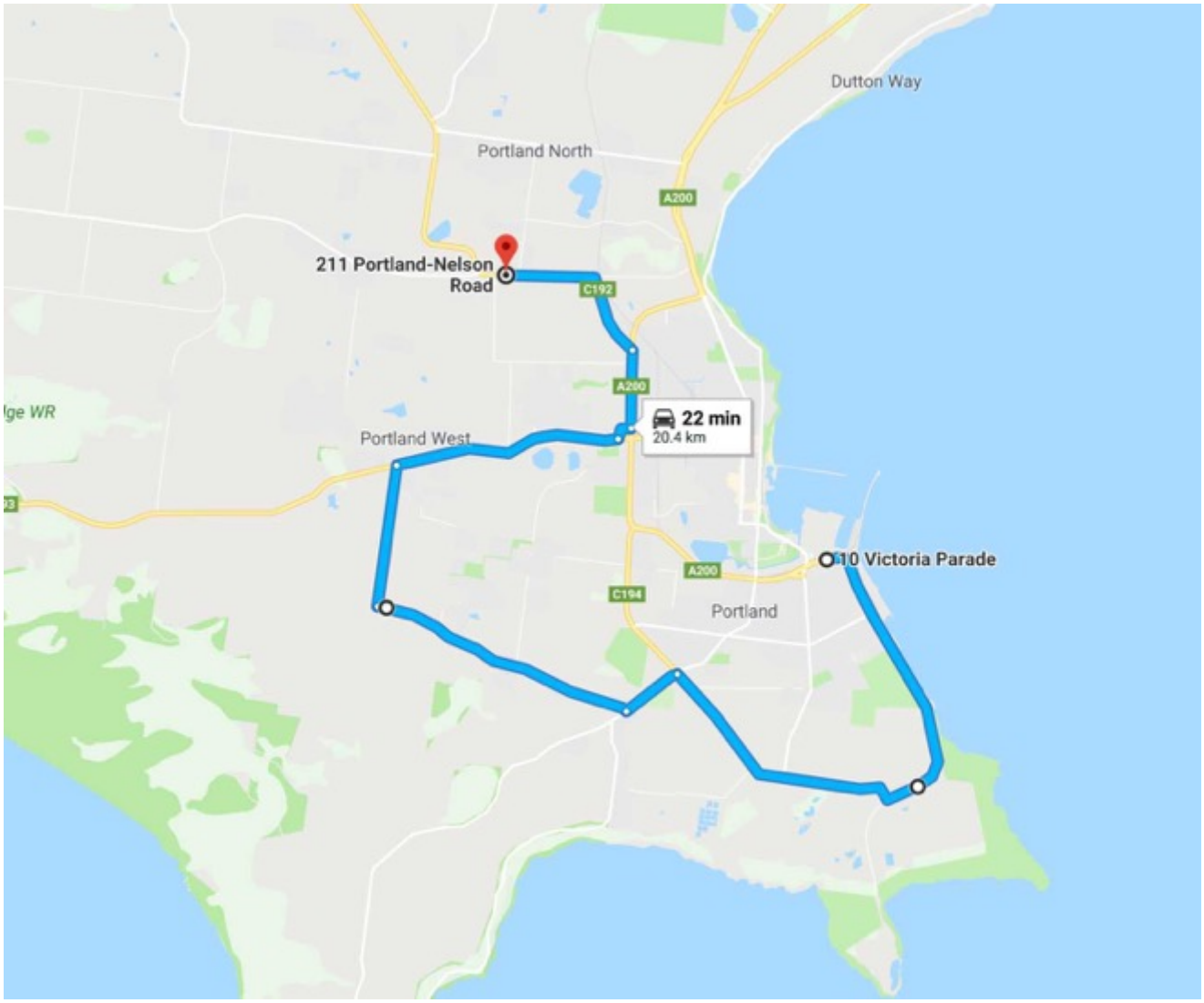
- The blades, Nacelles, Hubs and smaller components will use this route.
- All loads that exceed a loaded height of 5.3 metres are to use Route B, between the Port and storage yard.
- Route A currently has power approvals for loads up to 5.3 metres in height.
- Blades will need to be rotated at the port prior to departing if they are shipped upright.

10.0 Route survey B: Port of Portland to RJA Storage "Loads exceeding 5.3 metres high".

ROUTE: Port of Portland to RJA storage (20.4 kilometres):

GPS LINK: https://goo.gl/maps/sdqypxEdnV32

This route took us via Quay Road, Madeira Packet Way, Cape Nelson Road, Mailings Road, Thorns Road, Bridgewater Road, Henty Highway, Portland-Nelson Road.



KEY	
PINCH POINT	
CAUTION	

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
0.0	Portland	Port access Road onto Madiera Packet Road GPS Link: https://goo.gl/maps/Dmb15XGtrSK2	Length: 75.0 Metres Width: 9.0 Metres	Left hand turn	No Problems with this section of road.
0.2	Portland	Madiera Packet Road GPS Link: https://goo.gl/maps/5q7JLgBymao	Height: 8.5 metres	Travel under pipe	No problems with this section of road.
4.1	Portland	Madiera Packet Road, corner of Quarry Road GPS Link: https://goo.gl/maps/WVU9NqB8Utu	Length: 50.0 Metres Width: 8.0 Metres	Right than left hand turn	No problems with this section of road.
7.5	Portland	Madiera Packet Road onto Cape Nelson Road. GPS Link: https://goo.gl/maps/wQ39hnCqzxK2	Length: 40.0 Metres Width: 6.5 Metres	Left hand turn	Spotter to guide load through the corner.
8.4	Portland	Cape Nelson Road onto Mailings Road. GPS Link: https://goo.gl/maps/eM6FTqeoiyE2	Length: 45.0 Metres Width: 7.0 Metres	Tight right-hand turn	Spotter to guide load through the corner.
9.3 to 12.8	Portland	Mailings Road. GPS Link: https://goo.gl/maps/9ynH1BDn1US2	Width: 6.0 Metres	Travel directly ahead	No problems with this section of road.
12.0	Portland	Mailings Road onto Thorns Road. GPS Link: https://goo.gl/maps/bqigsYLCQDK2	Length: 40.0 Metres Width: 6.0 Metres	Right hand turn	Spotter to guide load through the corner.
13.9	Portland	Thorns Road onto Bridgewater Road. GPS Link: https://goo.gl/maps/r525dg63MKr	Length: 45.0 Metres Width: 7.0 Metres	Right hand turn	Spotter to guide load through the corner.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
15.5	Portland	Bridgewater Road onto Henty Highway GPS Link: https://goo.gl/maps/z2ZGQsSWbG42	Length: 45.0 Metres Width: 8.0 Metres	Left hand turn	No problems with this section of road.
16.3	Portland	Henty Highway onto Portland-Nelson Road GPS Link: https://goo.gl/maps/unep2nCFK7J2	Length: 75.0 Metres Width: 8.0 Metres	Left hand turn	No problems with this section of road.
19.2	Portland	Portland-Nelson Road, intersection of Cashmore Road. GPS Link: https://goo.gl/maps/PQNj2mgLGhm	Length: 75.0 Metres Width: 8.0 Metres	Left hand turn	Spotter to guide load through the corner.
20.4	Portland	Portland-Nelson Road into RJA storage. GPS Link: https://goo.gl/maps/LMkBd4NyBZ82	Length: 75.0 Metres Width: 9.0 Metres	Left hand turn	No problems with this section of road.

Conclusion Route B:

After studying all options and undertaking a route survey, we believe the loads that exceed a loaded height that of 5.3 metres could be transported from the Port to the RJA storage yard in its current condition.

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

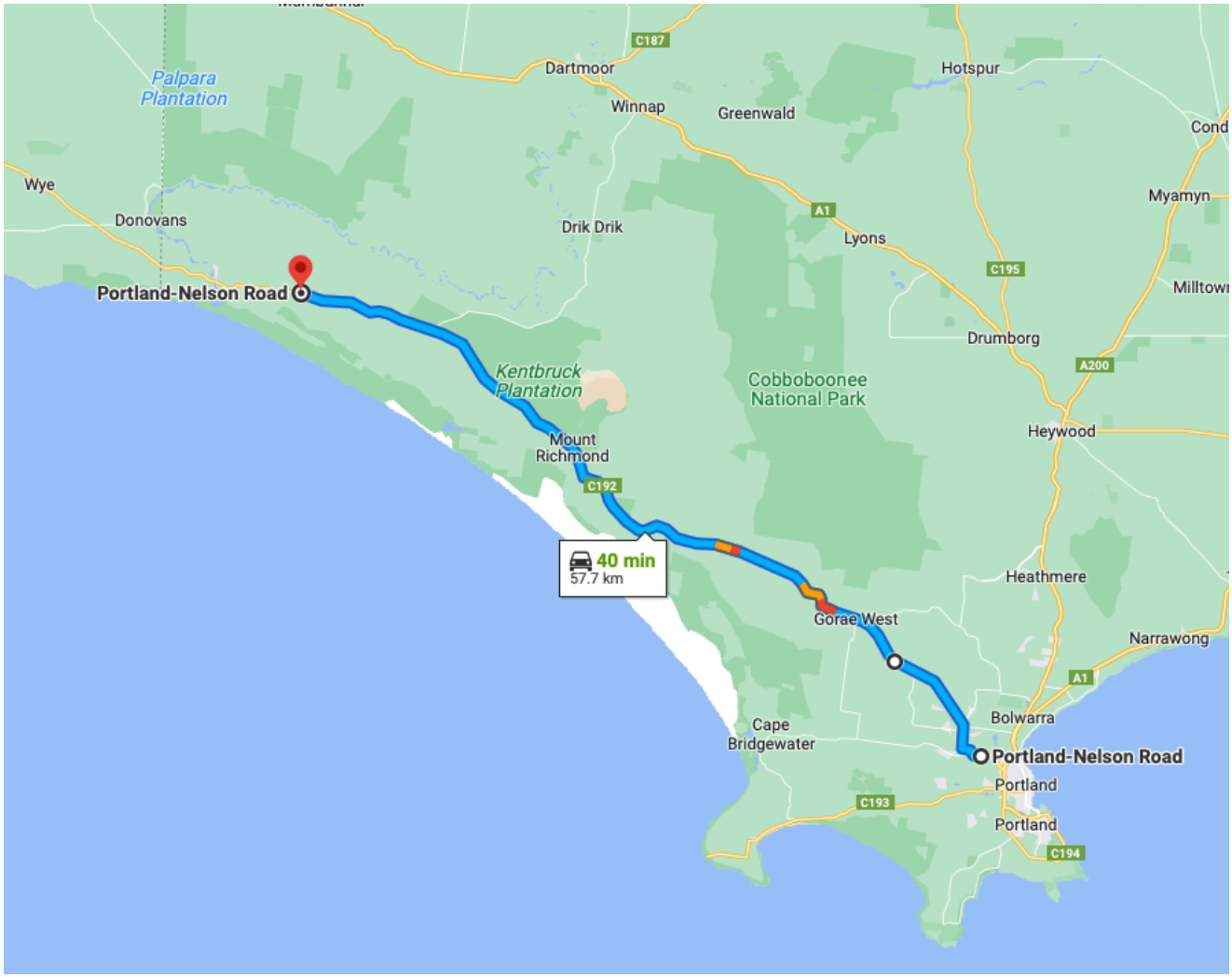
PORT OF PORTLAND TO RJA STORAGE: High load route, Max height 6.0m

- Route A currently has power approvals for loads up to 6.0 metres in height.
- No travel on this route on schooldays between 7:00am-9:00am and 3:00pm-5:00pm.
- Mailings Road to be Watered daily during ship discharges.
- Trucks to travel at no more than 40 kilometres per hour on Mailings Road, and to limit the use of Exhaust or Jake brakes.

11.0 Route Survey C: RJA Portland storage to Kentbruck "All Components"

ROUTE: RJA Storage to Kentbruck (all components)
(58 kilometres)

This route took us via Portland-Nelson Road



GPS link for the proposed route: https://goo.gl/maps/xkJYm5o3vtT5zykf6

KEY	
CRITICAL	
CAUTION	
EMERGENCY PARKING	

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
0.0	Portland	RJA storage onto Portland-Nelson Road GPS Link: https://goo.gl/maps/LMkBd4NyBZ82	Length: 75.0 Metres Width: 9.0 Metres	Left hand turn	Hardstand is required at the entrance to the storage yard and several trees will need to be removed along the edge of Portland-Nelson Rd. The fence and gate will also need to be modified. Spotter to guide load through the corner.
0.5	Portland	Portland-Nelson Road GPS Link: https://goo.gl/maps/7VBSmZwbkhVBEdwi6	Length: 100.0 Metres	Right then left-hand sweeping bends	No issues with this section
16.1	Gorae West	Portland-Nelson Road GPS Link: https://goo.gl/maps/mT2tzamyue88FGzSA	Length: 100.0 Metres	Left hand sweeping bends	No issues with this section
23.8	Mount Richmond	Site entrance: Blacks Road. GPS Link: https://goo.gl/maps/ZcDVKCY92ccJicTP9	35.0 Metres long	Right hand turn	This intersection will need to have hardstand added and trees removed.
33.1	Mount Richmond	Site entrance: Sandy hills/unnamed road GPS Link: https://goo.gl/maps/KxiMNq99hUqhph836	30.0 Metres long	Left hand turn	The site entrance will need to be made suitable for the swept path of the largest load.
36.5	Mount Richmond	Site entrance: Wilsons Lower road GPS Link: https://goo.gl/maps/AZXBGzq9Ubq3Rj8H7	40.0 Metres long	Left hand turn into site	A large amount of hardstand is required on either side of the road.
42.2	Nelson	Site entrance: Windmill Road GPS Link: https://goo.gl/maps/nHL3NvikRbkVXS8S7	40.0 Metres long	Left hand turn into site	A large amount of hardstand is required on either side of the road.
45.3	Nelson	Site entrance: Cowlands Road GPS Link: https://goo.gl/maps/DXUydT4zXDqbQDdw9	30.0 Metres long	Left hand hairpin turn into site	This is a tight hairpin turn that will require a large amount of hardstand is required on either side of the road and some trees removed.

KM index	Location	Section of road	Critical Measurement	Procedure	Notes
48.6	Nelson	Site entrance: Nine Mile Road GPS Link: https://goo.gl/maps/XrifqTDxeiXVQGH36	40.0 Metres long	Left hand turn into site	A large amount of hardstand is required on either side of the road. A large number of trees will also need to be removed.
52.0	Nelson	Site entrance: Lightbody Road GPS Link: https://goo.gl/maps/2ba8wkN4UenqZvCJ8	40.0 Metres long	Left hand turn into site	A large amount of hardstand is required on the inside of the corner. Several trees will need to be removed in the tailswing.
55.3	Nelson	Site entrance: Dewars Road/Unnamed Road GPS Link: https://goo.gl/maps/aA1xC9RCSRx7vxWp7	30.0 Metres long	Right and left hand turn into site access locations	Hardstand is required and a large number of trees will need to be removed.
58.0	Nelson	Site entrance: Nelson Road No1 GPS Link: https://goo.gl/maps/4HexfTJMkRxrW2b99	30.0 Metres long	Right hand turn into site	A large amount of hardstand is required on the inside of the corner. Several trees will need to be removed on the inside of the corner.

0.0 Km's: Storage yard onto Portland-Nelson Road.

Image 1:

Image 2:

Procedure: Left hand turn from storage yard onto Portland-Nelson Road.

GPS link: https://goo.gl/maps/LMkBd4NyBZ82

Comments: Hardstand is required at the entrance to the storage yard and several trees will need to be removed along the edge of Portland-Nelson Rd. The fence and gate will also need to be modified.

Road modifications: A moderate amount of work is required.

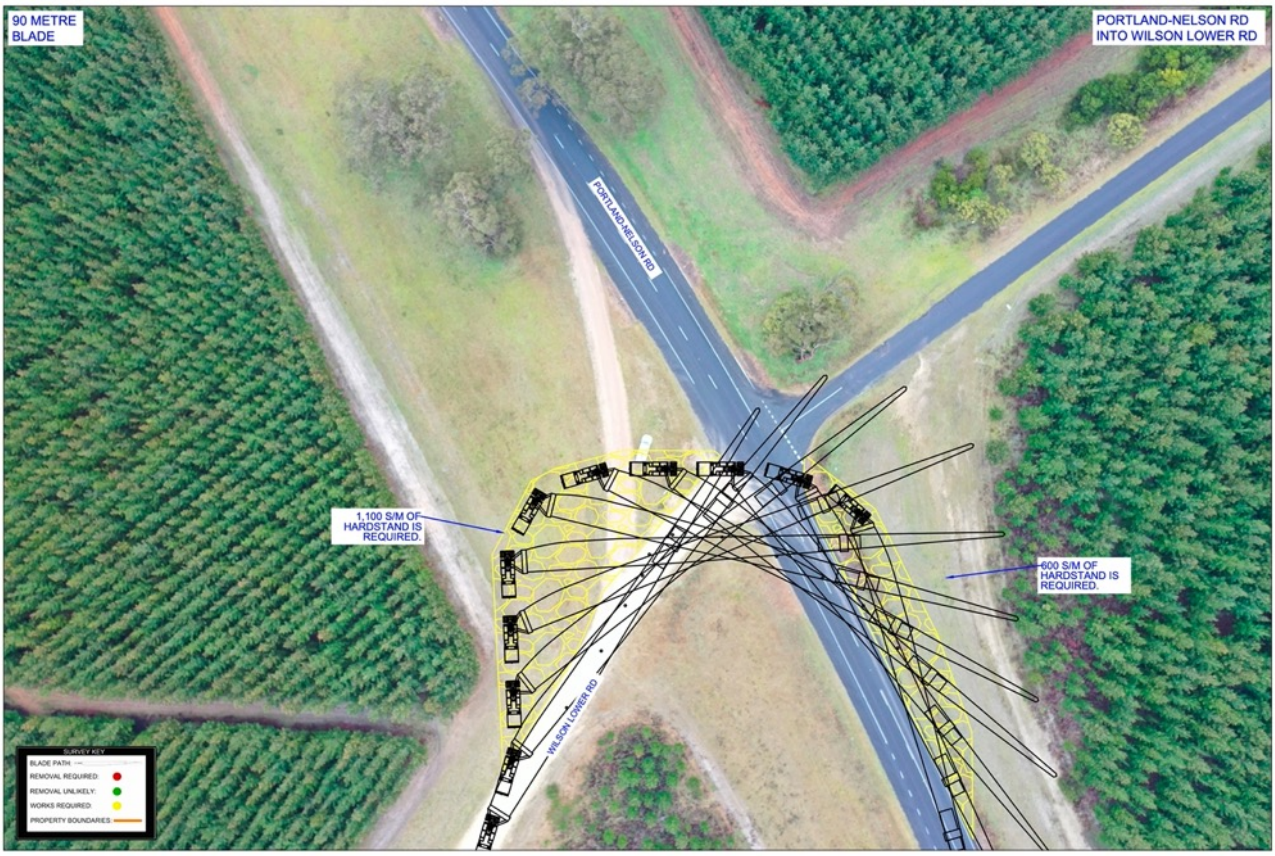
23.8 Km's: Portland-Nelson Road onto Blacks Road.

Image 1:

Procedure: Right hand turn from Portland-Nelson Road onto Blacks Road.
GPS link: https://goo.gl/maps/ZcDVKCY92ccJieTP9
Comments: This intersection will need to have hardstand added and trees removed.
Road modifications: A large amount of work is required.

36.5 Km's: Portland-Nelson Road onto Wilson Lower Road.

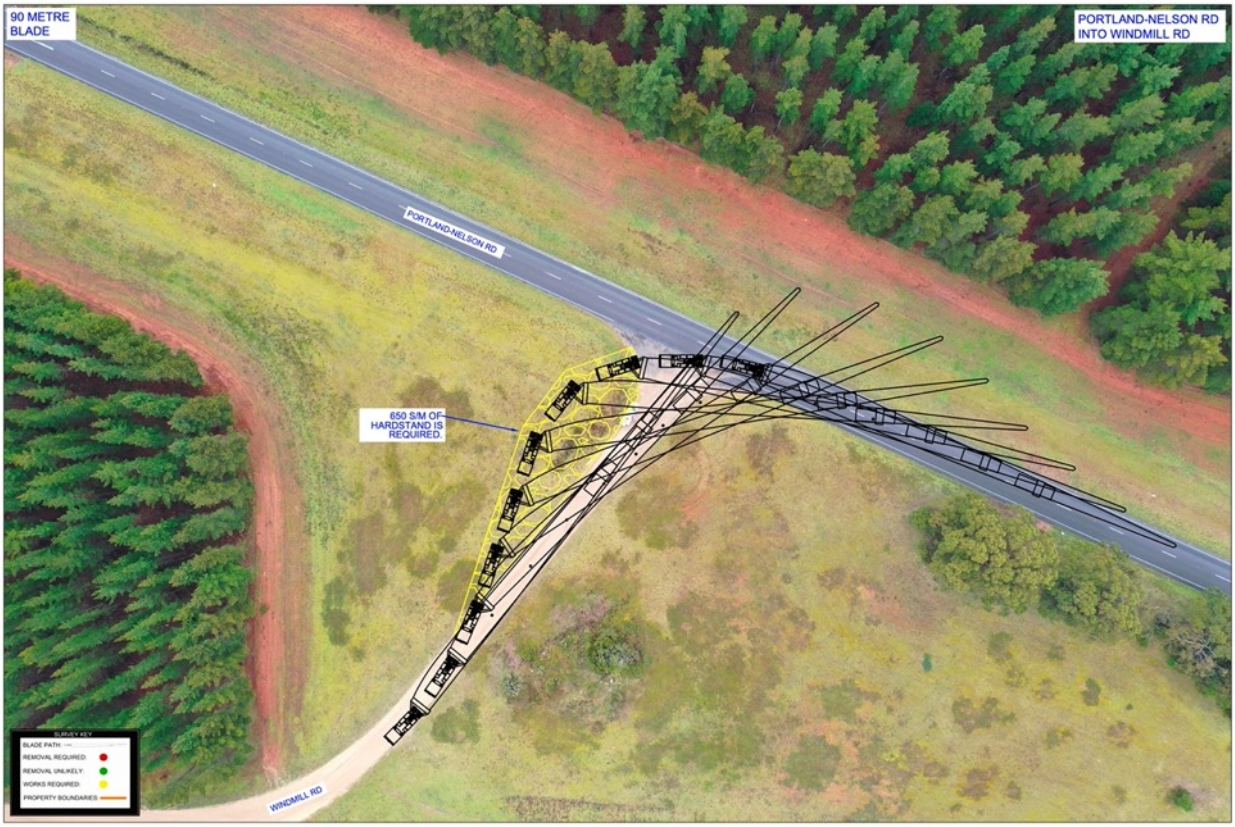
Image 1:



Procedure: Left hand turn from Portland-Nelson Road onto Wilson Lower Road.
GPS link: https://goo.gl/maps/AZXBGzq9Ubg3Rj8H7
Comments: A large amount of hardstand is required on either side of the road.
Road modifications: A large amount of work is required.

42.2 Km's: Portland-Nelson Road onto Windmill Road.

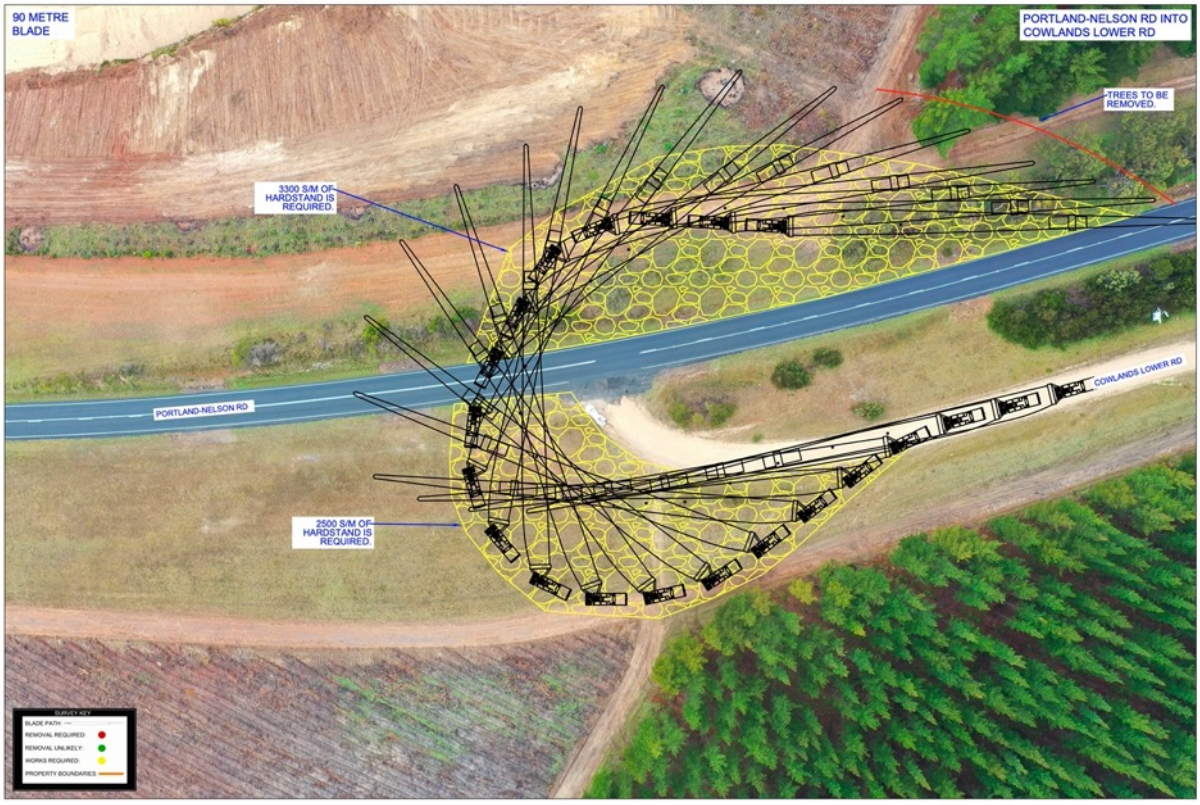
Image 1:



Procedure: Left hand turn from Portland-Nelson Road onto Windmill Road.
GPS link: https://goo.gl/maps/nHL3NvjkRbkVXS8S7
Comments: A large amount of hardstand is required on either side of the road.
Road modifications: A large amount of work is required.

45.3 Km's: Portland-Nelson Road onto Cowlands Road.

Image 1:



Procedure: Left hand turn from Portland-Nelson Road onto Cowlands Road.

GPS link: https://goo.gl/maps/DXUydT4zXDqbQDdw9

Comments: This is a tight hairpin turn that will require a large amount of hardstand is required on either side of the road and some trees removed.

Road modifications: A large amount of work is required.

48.6 Km's: Portland-Nelson Road onto Nine Mile Road.

Image 1:

Procedure: Left hand turn from Portland-Nelson Road onto Nine Mile Road.
GPS link: https://goo.gl/maps/XrifgTDxeiXVQGH36
Comments: A large amount of hardstand is required on either side of the road.
A large number of trees will also need to be removed.
Road modifications: A large amount of work is required.

52.0 Km's: Portland-Nelson Road onto Lightbody's Road.

Image 1:

Procedure: Left hand turn from Portland-Nelson Road onto Lightbody's Road.
GPS link: https://goo.gl/maps/2ba8wkN4UenqZvCJ8
Comments: A large amount of hardstand is required on the inside of the corner. Several trees will need to be removed in the tailswing.
Road modifications: A large amount of work is required.

55.3 Km's: Portland-Nelson Road onto Unnamed Road.

Image 1: (Right hand turn)

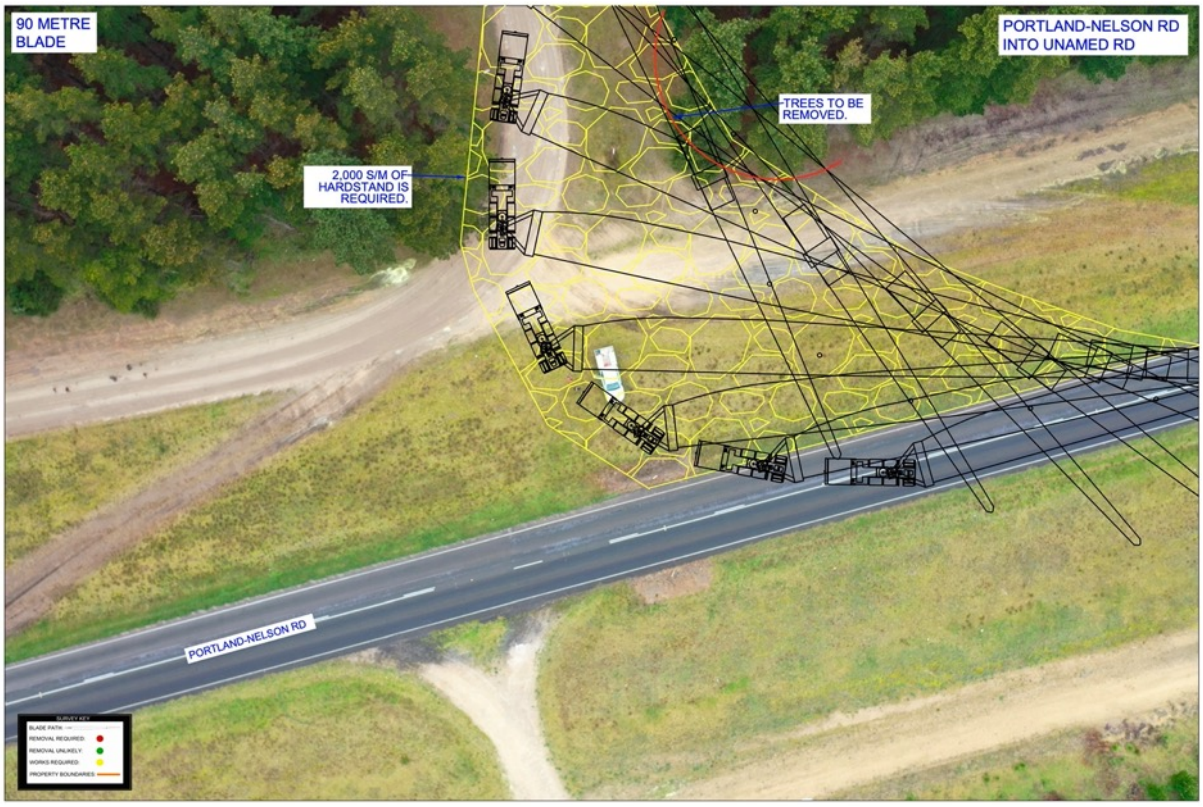
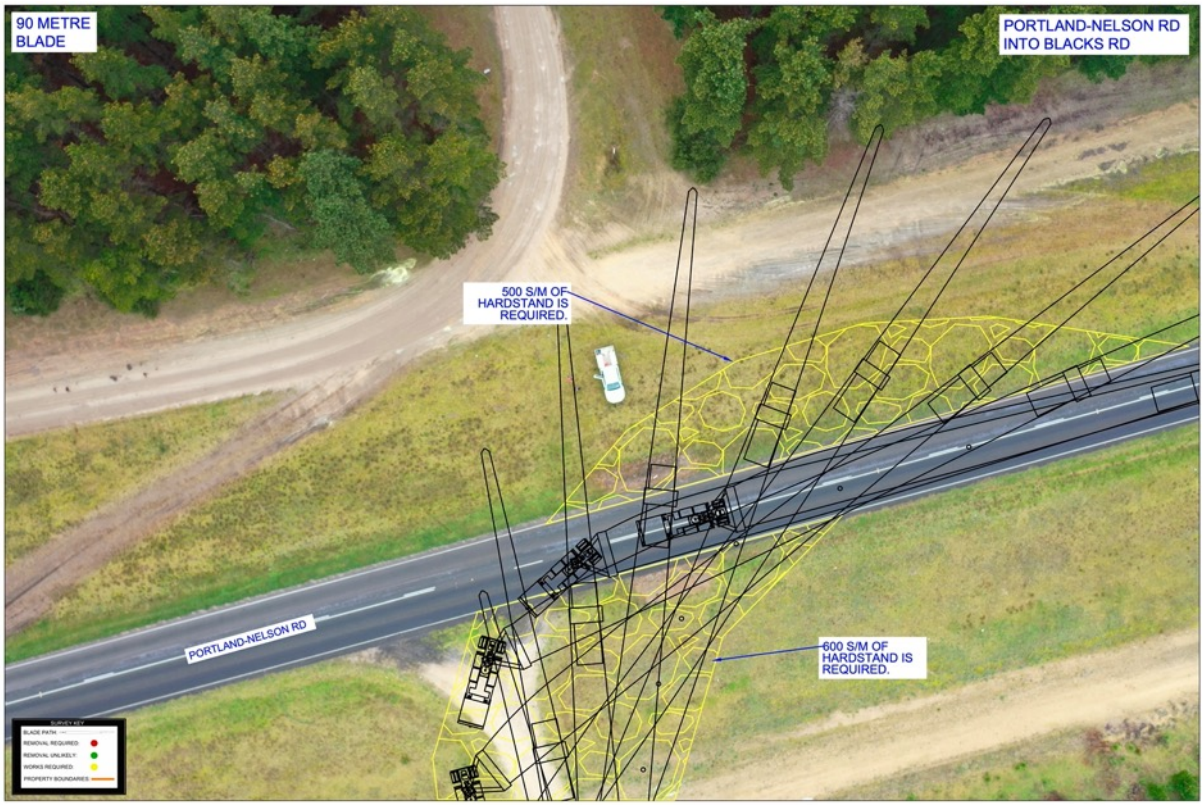


Image 2: (Left hand turn)



Procedure: Loads will turn right or left from Portland-Nelson Road onto Unnamed Road depending on which section of the windfarm the load will be heading too.

GPS link: https://goo.gl/maps/aA1xC9RCSRx7vxWp7

Comments: A large amount of hardstand is required and several trees will need to be removed.

Road modifications: A large amount of work is required.

58.0 Km's: Portland-Nelson Road onto Nelson #1 Road.

Image 1:

Procedure: Loads will turn from Portland-Nelson Road onto Nelson #1 Road.
GPS link: https://goo.gl/maps/4HexfTJMkRxrW2b99
Comments: A large amount of hardstand is required on the inside of the corner. Several trees will need to be removed on the inside of the corner.
Road modifications: A large amount of work is required.

Conclusion Route C:

After studying all options and undertaking a route survey, we believe the loads could be transported on this route in its current condition, with a large number of upgrades.

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

PORTLAND:

- RJA Storage yard will need to be modified for the larger blades.

KENTBRUCK:

- All site access roads will need to have modifications to enable the swept path of the largest loads.

DIMENSION-LENGTH:

- Likely to be okay on this route, if upgrades are completed.

DIMENSION-WIDTH:

- The route in its current form is suitable for the width of towers of 6.0 metres. However, it is recommended that roadwork's be checked prior to departing.

DIMENSION-HEIGHT UNDER STRUCTURES:

- There are no structures between the storage area and site.

DIMENSION-WEIGHT OVER STRUCTURES:

- Bridge structures to be assessed by VIC Roads and local councils.

OVERHEAD UTILITIES:

- An additional assessment is required for this route for a loaded height of 6.5 metres.

RAIL CROSSINGS:

- No rail crossings on this route.

VEGETATION:

- A large amount of vegetation will need to be removed.

ROADWORKS:

- To be checked closer to the date of movement.

ROAD PAVEMENT:

- The Portland-Nelson Road is of a highway grade asphalt and is suitable in its current form.
- All site access roads are gravel and will need to be made suitable for the wind turbine loads.

12.0 References:

Rex Andrews Engineered Transportation Pty. Ltd.
Neoen
Route Survey LL358
Google Earth/Maps
NHVAS Maintenance Management (NHVAS21193)
NHVAS Basic Fatigue Management (NHVAS21193)

Disclaimer: This route study is a guide only; government approvals would be required before these routes could be deemed suitable for transporting the components over the listed routes.

This study was undertaken using data supplied by Rex J Andrews P/L. Equipment and swept paths might vary if using transport methodology other than the data supplied by Rex J Andrews.

Appendix D

Port of Geelong Assessment

1.0 Background

As set out in the main body of the Transport Impact Assessment, the Port of Portland is the preferred source for WTG component delivery. However, the Project is prepared to consider Port of Geelong as an alternative for delivery of WTG components which do not require OD/OSOM vehicle movements. Accordingly, a high-level desktop analysis has been undertaken to assess this alternate route between Port of Geelong and the wind farm site.

Specifically, this assessment will focus on identifying the existing conditions and traffic impact associated with the Project on the delivery route from the Port of Geelong up to Portland-Nelson Road. The traffic impact assessment documented in the body of this report will then apply to the rest of the route between Portland-Nelson Road and the WTG sites.

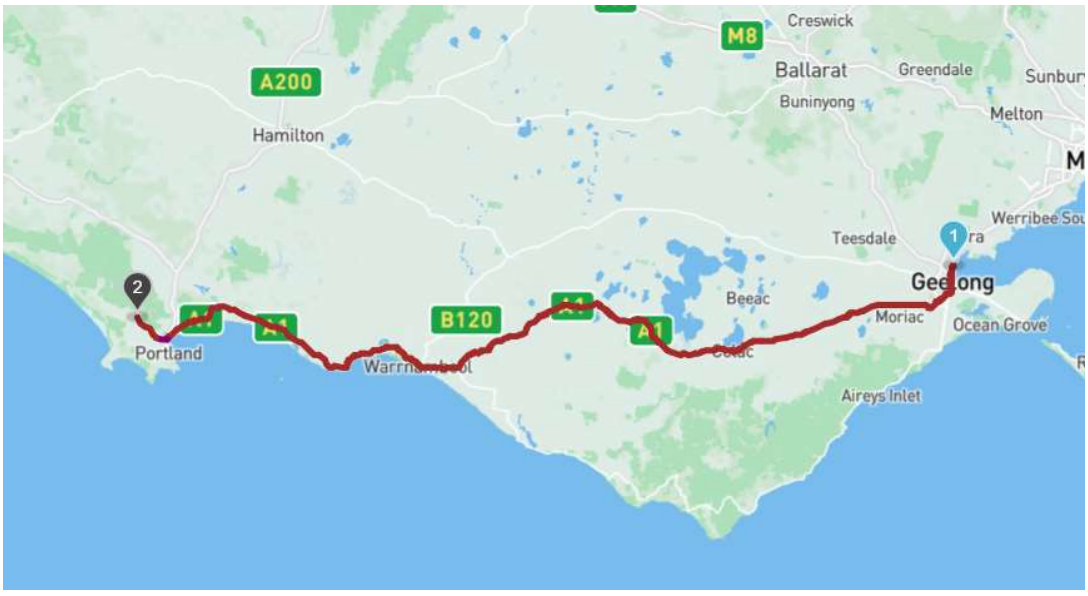
2.0 Port of Geelong Delivery Route

The delivery route between the Port of Geelong and Portland-Nelson Road is as follows:

- Corio Quay Road (C115)
- Princes Highway and Geelong Ring Road (A10/M1/A1)
- Henty Highway (A200)
- Westlakes Road
- Portland-Nelson Road (C192)

This route is illustrated in Figure 1 below.

Figure 1 Delivery route between Port of Geelong and Portland-Nelson Road



3.0 Existing Conditions Assessment

Table 1 provides a summary of the key transport elements of the existing road network along this route. The road network is comprised of a combination of Department of Transport and Planning (Regional Roads Victoria), Glenelg Shire Council (GSC) and other public road assets. The exact traffic route is to be verified and assessed after the preferred construction methodology and transport contractor is nominated at the TMP stage.

Table 1 Existing Road Conditions Port of Geelong Delivery Route

Transport element	Corio Quay Road (C115)	Princes Highway/Melbourne Road/Latrobe Terrace (A10)	Geelong Ring Road/Princes Freeway (M1)	Princes Highway (A1)	Westlakes Road[1]	Henty Highway (A200)
Speed Limit (kph)	50	100	100	100	80	100
Classification	Declared Arterial	Highway	Freeway	Highway	Local	Highway
Managed by	DTP	DTP	DTP	DTP	GSC	DTP
Approx. carriageway width (m)	7-25	25	25	45	6	7
Road surface	Sealed	Sealed	Sealed	Sealed	Sealed	Sealed
Total number of lanes	Two	Four, Six or Eight	Four	Four	Two	Two
Traffic Control	Priority	Signalised	Priority	Priority	Priority	Priority
Approved for B-Double Use	Yes	Yes	Yes	Yes	Yes	Yes
Two Way AADT	8,000	67,000	12,000	9,100	Not available	8,900
Two Way Trucks AADT	980	5,800	1,900	1,600	Not available	1,300
Percent Trucks AADT (%)	12.3	8.7	15.8	17.6	Not available	14.6

[1] Two Way AADT volumes were taken from DoT Opendata. Where roads stretched multiple segments within opendata, a best effort was taken to use the largest two way AADT volumes.
[2] Traffic volumes on Westlakes Road are not publicly available in DTP's Traffic Volume viewer.

A number of existing sustainable transport options can be found along the Princes Highway within the Geelong area. These include multiple sections of shared user path, a section of on-road bicycle lane and several public bus routes that operate along different sections of the highway.

4.0 Road capacity and condition assessment

If Port of Geelong is selected as the preferred delivery route for WTG components, the number of expected containers required to be delivered is expected to be approximately 45 a month. Assuming a typical B-double can accommodate two of these 24 tonne containers, the frequency of operational traffic movements is expected to be approximately 23 monthly two-way movements, or conservatively a single daily two-way movement. Given the existing capacity of the nominated route, it is not expected that this small increase in vehicle volume would noticeably impact network operations.

5.0 Proposed mitigation measures

The final delivery route is to be verified as part of the TMP (MM-T03), which is expected to be undertaken prior to the Project commencement. The assessment would consider potential impacts to, but not limited to, road surface, bridge and culvert structures.

The relevant approvals and control measures will need to be considered with regards to the delivery route. Engagement between the proponent, relevant transport authorities (Glenelg Shire Council, DTP/RRV, NHVR, PTV, Port of Geelong) should be undertaken to establish and agree on any necessary approvals.

The Project should consider appropriate traffic management measures to ensure safe pedestrian (including school children in vicinity of school bus stops) and cyclist passage on nominated routes during construction, in accordance with relevant road design standards and in consultation with relevant road authorities.

Heavy vehicle movements associated with the Project would likely operate during bus operating times. Therefore, the Project must consider reducing potential impact if conflicts are unable to be suitably managed. Consultation with local councils and bus operators during the development of the TMP to ensure any affected school routes have appropriate diversions in place that still service necessary stakeholders and deliver acceptable travel time changes should be considered. It is recommended that ongoing consultation with relevant stakeholders would be undertaken to manage the potential disruptions on bus services.

Implementation of these measures would reduce any adverse impacts on transport infrastructure and operations as any road damage would be identified and rectified early through stakeholder communication during the operational phase of the Project. Residual impacts are expected to be insignificant with the road network expected to be in similar conditions than prior to the commencement of the Project.

Mitigation measures are detailed further in Section 14.0 of the TIA report.

Appendix E

Alternate Transmission Line Assessment

1.0 Background

Section 3.4 of the Scoping Requirements for Kentbruck Green Power Hub Environment Effects Statement requires that the Project's EES document the likely environmental effects of the Project's feasible alternatives, including routes and configurations for the transmission line. The depth of investigation should be proportionate to the potential of the alternatives to minimise potentially significant adverse effects and to meet the Project objectives.

This appendix describes the feasible transmission line alternatives that have been considered by Neoen for this Project, and the potential traffic impacts of each alternative. The preferred option for the Project, referred to as "Option 1B", has been assessed in detail in this report, so is not subjectto any further assessment in this Appendix. Instead, this Appendix considers the potential environmental effects of the following transmission line alternatives (see Figure 1E):

- Option 1A ("Heywood Underground-Overhead Combined"): Follows the same route as Option 1B (the preferred option) underground through Cobboboonee National Park / Forest Park, however it then transitions to an overhead transmission line for the remained of the alignment.
- Option 2A ("Portland Overhead"): A wholly overhead option that connects to the existing Heywood-Portland 500 kV line north of Portland. Runs southeast from the wind farm site through rural landholdings. No final route was determined for this option as landowner agreements were unable to be secured for the entire length of transmission line. This option therefore includes several route options.
- Option 2B ("Portland Underground"): Follows the same route as Option 2A but is wholly underground.

A full description of each option is provided in Section 3.0.

2.0 Transmission line Project objectives

The fundamental objective of the Project is to provide a source of clean, renewable energy to help power homes and businesses in Victoria and throughout eastern Australia that are connected to the National Electricity Market (NEM). Neoen's environmental and social objectives for the Project, as described in Section 2.2 of the EES, stem from the need to develop the Project in accordance with the principles of ecologically sustainable development. Neoen's objectives relating specifically to the transmission line component of the Project are to:

- Deliver renewable electricity from the Project to the NEM
- Seek opportunities to co-locate infrastructure with existing compatible land uses such as existing easements and transport routes
- Avoid or minimise potential adverse impacts on the natural environment
- Avoid or minimise potential adverse impacts on Aboriginal and historical heritage
- Avoid or minimise potential adverse impacts on nearby residents associated with visual amenity, noise, traffic, and air quality
- Avoid impacts to business and commercial operations
- Avoid or minimise potential impacts on productive agricultural land
- Avoid or minimise the risk of bushfire
- Ensure an appropriate land use outcome by avoiding areas of sensitivity and potential land use conflicts
- Be able to obtain necessary agreements with landowners and land managers to install and operate infrastructure
- Be able to obtain planning and environmental approvals from all necessary authorities

- Provide a constructable and cost effective grid connection.

Umwelt (2023) has prepared a Transmission Line Options Assessment which describes all the transmission line options considered by Neoen to date, including those which were not found to be viable and were removed from the Project before the EES process commenced or very early in the EES process. The Options Assessment uses an objective, criteria-based approach to assessing each option. The assessment criteria and scoring metrics were developed in accordance with the transmission line objectives provided above.

This Appendix describes the potential traffic impacts of the feasible transmission line options identified in the options assessment report, providing information for use by Umwelt in the options assessment in relation to the traffic-related criteria.

3.0 Description of the alternative transmission line options

The Project being pursued by Neoen, and subject to full impact assessment in this report, comprises a preferred transmission line route and configuration as described in Section 1.4 of this report underground through Cobboboonee National Park and Forest Park, and farmland to the Heywood Terminal Station – Option 1B). An alternative configuration to this option has also been considered by Neoen, which follows the same route as Option 1B however it involves an overhead section between Cobboboonee Forest Park and the Heywood Terminal Station.

Two other options which were identified as feasible in the Transmission Line Options Assessment, but are nolonger being pursued by the Project due to a lack of landowner and community support, are Options 2A and 2B which run southeast from the wind farm site and connect to the Heywood-Portland 500 kV line north of Portland. Option 2A is wholly overhead, while Option 2B is wholly underground.

The three transmission line options are described as follows:

- Option 1A: The underground transmission line would extend east from the main wind farm substation and traverse Cobboboonee National Park and Forest Park beneath an existing road. From there, the transmission line would transition to an overhead line as it travels through freehold land to reach Heywood Terminal Station.
- Option 2A: The overhead transmission line would extend southeast from the main wind farm substation and traverse several freehold rural landholdings used primarily for grazing. This option would require development and construction of a new terminal station adjacent to the existing Heywood-Portland 500 kV line north of Portland.
- Option 2B: The underground transmission line would extend southeast from the main wind farm substation and traverse several freehold rural landholdings used primarily for grazing. This option would require development and construction of a new terminal station adjacent to the existing Heywood- Portland 500 kV line north of Portland.

The three options are shown in Figure 1E.

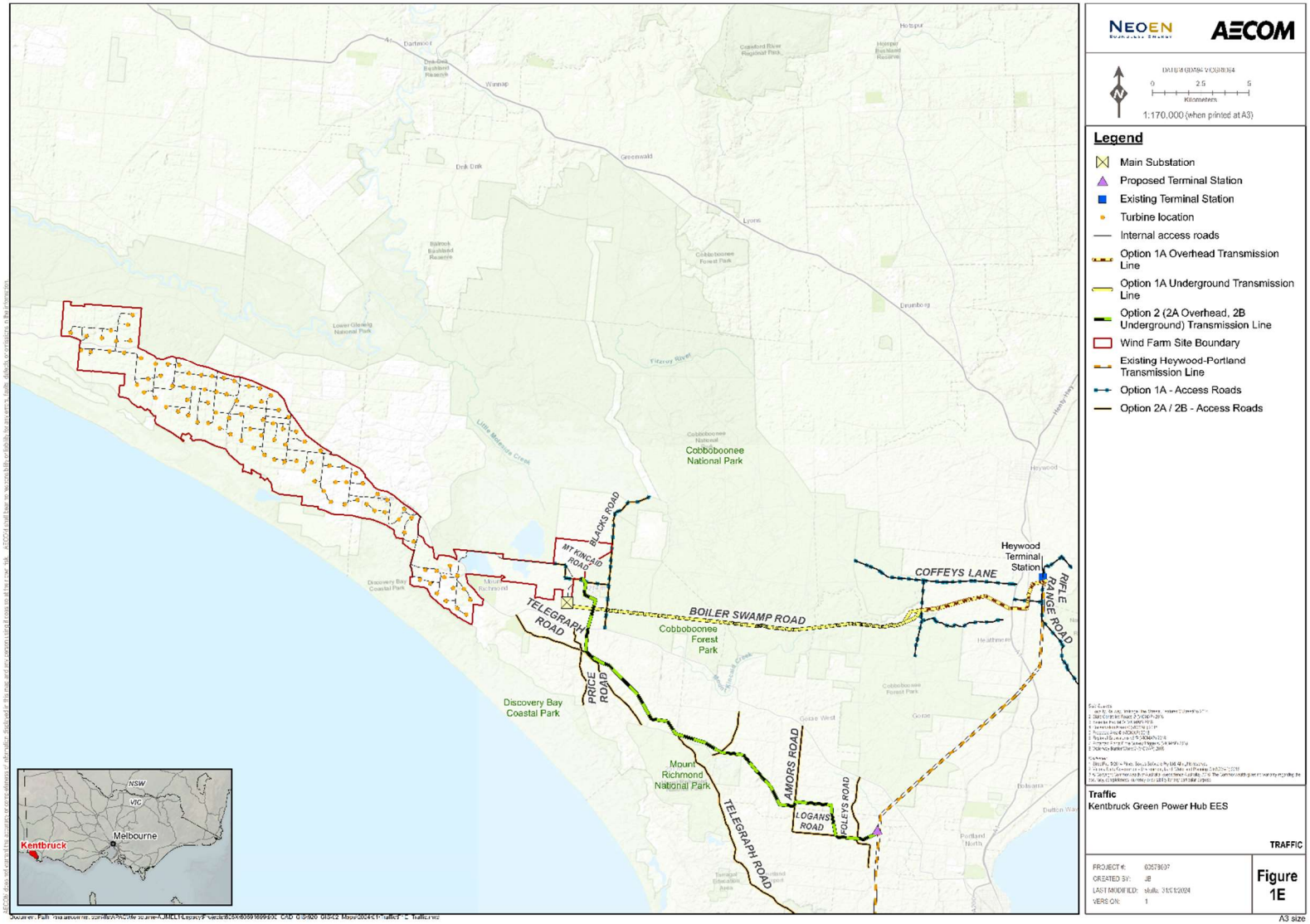


Figure 1E Kentbruck Green Power Hub Alternate Transmission Line Access Routes

4.0 Summary of the assessment methodology

This section describes how the transmission line traffic impact assessment was conducted to understand the existing environment and potential impacts of the project.

4.1 Existing conditions assessment

The existing transport conditions assessment comprised of:

- An initial desktop study of the study area and available VicRoads (DTP) HV and Oversize/Over mass (OSOM) network information.
- Analysis of available traffic data (sourced from DTP and Councils).
- Review of relevant policies and legislation.

The existing conditions assessment can be found in Section F-5.0.

4.2 Preliminary vehicle access strategy

The preliminary vehicle access strategy has been developed as follows:

- The access points to the transmission line and substation development options have been informed solely from a desktop assessment at this stage. Preferred access points have been determined as the most logical points of access for the purposes of transmission line construction.

The existing conditions assessment can be found in Section F-5.2.

4.3 Traffic generation and distribution

A review of the transmission line options was undertaken for the construction stage and the transport specific elements of the Project were extracted and used to form the basis of the impact assessment.

For each option, plant and equipment (including the size and volumes of vehicles), and workforce numbers have been determined.

The traffic generation and distribution assumptions discussed throughout Section F-7.0 have been based on the following data sources:

- Information and knowledge of previously derived estimations from other wind farm developments, notably the Kaban Wind Farm in Queensland (AECOM completed the TIA for Neoen for this project).
- Estimations have been cross checked with the project team, including Neoen.

The traffic generation and distribution assessment can be found in Section F-7.0.

4.4 Traffic impact assessment

Following identification of the magnitude of impacts on the site access and traffic routes to and from the worksites that would be impacted by the transmission line options, an assessment was undertaken that considered:

- Network capacity, both road link and intersection.
- Intersection safety.
- Network infrastructure.
- Over-dimensional loads.

The traffic impact assessment can be found in Section F-7.0.

5.0 Existing conditions

5.1 Local road network

Table 1 and Table 2 provide a summary of the key transport elements of the existing road network providing connections to the proposed alternative transmission lines. The surrounding road network is comprised of a combination of Department of Transport and Planning (Regional Roads Victoria), Glenelg Shire Council (GSC) and other public road assets.

Table 1 Existing Road Conditions Option 1b

Transport element	Portland-Nelson Road	Henty Highway	Blacks Road	Mt Kincaid Road	Meaghers Road	Rifle Range Road	Cut Out Dam Road	Boiler Swamp Road	Jennings Road	Jarretts Road	Coffeys Lane
Speed Limit (kph)	100	100	60	60	60	60	60	60	60	60	60
Classification	Arterial	Highway	Local	Local	Local	Local	Local	Local	Local	Local	Local
Managed by	DTP (RRV)	DTP (RRV)	GSC	GSC	GSC	GSC	GSC	DEECA	GSC	GSC	GSC
Approx. road width (m)	7.0	7.0	6.0	5.0	6.0	5.0	5.0	6.0	5.0	5.0	5.0
Road surface	Sealed	Sealed	Unsealed	Unsealed	Sealed	Unsealed	Unsealed	Unsealed	Unsealed	Unsealed	Sealed
Total number of lanes	Two	Two	Two	One	Two	One	One	Two	One	One	One
Traffic Control	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority
Heavy vehicle use	Approved route for B-Double and Higher Mass Limit vehicles					Partially approved route for B-Double and Higher Mass Limit vehicles	Primarily used by members of the public, DEECA and Parks Vic.	Primarily used by members of the public, DEECA and Parks Vic.	Primarily used by members of the public, DEECA and Parks Vic.	Partially approved route for B-Double and Higher Mass Limit vehicles	Partially approved route for B-Double and Higher Mass Limit vehicles

**Assumed private as there was no mention of the road when checked against GSC road register*

Table 2 Existing Road Conditions Option 2a and 2b

Transport element	Portland-Nelson Road	Blacks Road	Mt Kincaid Road	Collivers Road	Amors Road	Foleys Road	Logans Road	Price Road	Telegraph Road
Speed Limit (kph)	100	60	60	60	60	60	60	60	60
Classification	Arterial	Local	Local	Local	Local	Local	Local	Local	Local
Managed by	DTP (RRV)	GSC	GSC	GSC	GSC	GSC	GSC	GSC	GSC
Approx. road width (m)	7.0	6.0	5.0	4.0	4.0	4.0	5.0	5.0	6.0
Road surface	Sealed	Unsealed	Unsealed	Unsealed	Sealed	Sealed	Unsealed	Unsealed	Unsealed
Total number of lanes	Two	Two	One	One	One	One	One	Two	Two
Traffic Control	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority
Heavy vehicle use	Approved route for B-Double and Higher Mass Limit vehicles								

5.2 Existing sustainable modes of transport

Existing sustainable modes of transport discussed in Section 6.2 of the main body of this report are relevant to the transmission line routes discussed in this Appendix.

Notably, The Great South West Walk is in especially close proximity to each of the alignments. The Great South West Walk is a 250-kilometre walking track which passes through Lower Glenelg National Park, the Cobboboonee National Park, the Discovery Bay Coastal Park, the Mount Richmond National Park and the Cape Nelson State Park. The walk was designed as a long-distance walking track, with the option for short and day walks. It can be accessed from roads in and near the towns of Portland and Nelson. The walk contains 14 camp sites along the track; all supplied with fresh water, cleared tent sites and bush toilets. All overnight stays at 14 campsites require an online booking.

An extract of the walking trail in the vicinity of the Project site area is provided in Figure 2.

Source: Extract taken from https://greatsouthwestwalk.com/

Figure 2 Great South West Walk

6.0 Preliminary vehicle access strategy

Due to the limited information available and uncertainty around the potential construction methodology for the alternative options(e.g. staging, extents of work and construction right of way, impacts from other studies etc.), a desktop review was completed of the local road network to understand potential access points.

6.1 Option 1a

A summary of the construction vehicle access points identified via a desktop assessment for Option 1a are outlined below and considered further in Table 3 with regards to road conditions and potential upgrades:

- The initial construction site for the main on-site substation and commencement works of the transmission line can be accessed via a new access road opposite Sandy Hill Road which is accessed via Portland-Nelson Road.

- From the main wind farm substation, the proposed underground line travels south-east to Boiler Swamp Road.
- Mt Kincaid Road may be utilised as a service road for this initial section of the underground line as it inter-connects with the internal access track network adjoining the substation. Mt Kincaid Road can also be accessed by turning left from Blacks Road, which runs north-south intersecting with Portland-Nelson Road.
- Boiler Swamp Road would be expected to be used as a dedicated access track for the construction of the underground line. This road runs east-west and is accessed via Blacks Road (which also forms a priority intersection with Portland-Nelson Road).
- Boiler Swamp Road is an unsealed public road that extends from Blacks Road at Mount Richmond in the west to the intersection with Cut Out Dam Road at Gorae in the east. The roadway (i.e. the trafficable section of the road) is generally between 5 and 6 m wide. Managed shoulders on each side of the road are between 1 and 1.5 m wide
- Unlike the preferred Option 1b, Option 1a will be combined overhead and underground, involving the installation of overhead cabling through freehold agricultural land between Cobboboonee Forest Park and the Heywood Terminal Station.
- At the eastern end of the underground transmission line alignment, the construction traffic can utilise Jennings Road, accessed from the wider road network via the Henty Highway, Coffeys Lane or Jarretts Road.
- The line would connect into the existing Heywood Terminal Station east of Rifle Range Road, at the western boundary of Narrawong Flora Reserve. Works at the Heywood Terminal Station would consist of limited augmentation works that would not require the footprint of the terminal station to be expanded.
- Members of the public would not be permitted access through construction areas and would be diverted along alternative routes through Cobboboonee National Park / Forest Park, utilising Wrights Swamp Road, T and W Road, Fish Hole Road and Cut Out Dam Road. Sections of Boiler Swamp Road with a length of approximately 1 km would only be closed when construction is underway for cable installation.
- Road closures would not apply to emergency service vehicles. Neoen will develop procedures for managing two-way traffic in consultation with relevant stakeholders. These will be documented in the TMP and communicated to all staff involved in construction of the transmission line.

Table 3 Construction vehicle access roads Option 1a

Public Road	Road condition	Upgrades	Features
Unnamed Road (opposite Sandy Hill Road) via Portland-Nelson Road	Unsealed, gravel, good condition	To permit OSOM access	28 WTGs accessed.
Blacks Road	Unsealed, gravel, condition TBC*	Localised grading and shaping may be required	Access to UG transmission line and alternative access to eastern corner WF. Main access to UG transmission line. Not for OD and OSOM access
Mt Kincaid Road	Unsealed, gravel, condition TBC*	Localised grading and shaping may be required	Wind Farm internal road
Boiler Swamp Road	Unsealed, gravel, condition TBC*	Localised grading and shaping may be required	
Jennings Road	Unsealed, gravel, condition TBC*	Localised grading and shaping may be required	

Public Road	Road condition	Upgrades	Features
Coffeys Lane	Sealed, condition TBC*	Localised grading and shaping may be required	
Jarretts Road	Unsealed, gravel, condition TBC*	Localised grading and shaping may be required	
Meaghers Road	Sealed, gravel, condition TBC*	Localised grading and shaping may be required	
Rifle Range Road	Unsealed, gravel, condition TBC*	Localised grading and shaping may be required	Heywood Terminal Station

** Road condition based on aerial imagery and may not be accurate*

6.2 Option 2a and 2b

A summary of the construction vehicle access points identified via a desktop assessment for Option 2a and 2b are outlined below and considered further in Table 4 with regards to road conditions and potential upgrades:

- Option 2a is a wholly overhead option whilst Option 2b is a wholly underground option. These two options follow the same route discussed below.
- The initial construction site for the main on-site substation and commencement works of the transmission line can be accessed via Blacks Road which is accessed via Portland-Nelson Road.
- From the collector substation, the proposed line travels south towards Telegraph Road.
- Mt Kincaid Road may be utilised as a service road for this initial section of the transmission line as it inter-connects with the internal access track network adjoining the substation. Mt Kincaid Road can also be accessed by turning left from Blacks Road, which runs north-south intersecting with Portland-Nelson Road.
- Telegraph Road would be expected to be used as a dedicated access track for the construction of the transmission line as the road runs parallel to it. Telegraph Road can be accessed from Portland-Nelson Road via Price Road.
- As the proposed alignment of the transmission line does not run wholly along Telegraph Road, new access tracks may be required at points to access line proposed within the freehold rural landholdings. No final route for Option 2a and 2b has been determined as landowner agreements were unable to be secured for the entire length of the transmission route.
- At the eastern end of the transmission line alignment, the construction traffic can utilise Amors Road and Logans Road, accessed from the wider road network via Portland-Nelson Road.
- The line would connect into a newly built terminal station adjacent to the existing 500kV line at the cut-in location.

Table 4 Construction vehicle access roads Option 2a and 2b

Public Road	Road condition	Upgrades	Features
Unnamed Road (opposite Sandy Hill Road) via Portland-Nelson Road	Unsealed, gravel, good condition	To permit OSOM access	28 WTGs accessed. Main access to UG transmission line
Blacks Road	Unsealed, gravel, condition TBC*	Localised grading and shaping may be required	Access to UG transmission line and alternative access to eastern corner WF. Not for OD and OSOM access

Public Road	Road condition	Upgrades	Features
Mt Kincaid Road	Unsealed, gravel, condition TBC*	Localised grading and shaping may be required	Wind Farm internal road
Price Road	Unsealed, gravel, condition TBC*	Localised grading and shaping may be required	
Telegraph Road	Unsealed, gravel, condition TBC*	Localised grading and shaping may be required	Transmission line route
Collivers Road	Unsealed, gravel, condition TBC*	Localised grading and shaping may be required	
Amors Road	Sealed, condition TBC*	Localised grading and shaping may be required	
Logans Road	Unsealed, gravel, condition TBC*	Localised grading and shaping may be required	
Foleys Road	Sealed,, condition TBC*	Localised grading and shaping may be required	Terminal substation

** Road condition based on aerial imagery and may not be accurate.*

7.0 Traffic generation and distribution

The estimates detailed of the construction stage traffic generation for the final transmission line and substation construction option are likely to change once a nominated contractor is commissioned later in the Project process and a subsequent TMP is developed. Alternative transmission line routes noted in this Appendix are no longer being pursued and as such, will not be addressed at the TMP stage.

The volumes have been calculated to represent a conservative estimate of the maximum traffic generated by the project's construction at any given point. At this stage the traffic generation estimations have been informed by the assumptions noted in Section 8.3 in the main body of the report. Importantly, the following has been used to inform the traffic generation and distribution estimates:

- AECOM's experience of past transmission line and substation construction elements for wind farm projects.
- Information provided by Neoen.
- Assumed working hours for transmission line and substation construction. Construction methods could change these initial estimations, such as excavation depths required for overhead poles, subsequent concrete pours, and method of pole construction, e.g. in sections.
- A basis of concept design was prepared for the underground transmission line based on a single cable per phase solution for cable sizing calculations and design of the cable route layout and cable trench sections (Downer, 2022).
- At peak the number of workers is estimated to be approximately 30 workers (30 light vehicles assuming worst case no car sharing), with on average 3 trucks per day with miscellaneous requirements (noting any section of road would be fully closed as subsequently discussed in the proceeding chapter). This applies to both overhead and underground line works.

Based on the traffic volume input information outlined above, the following subsections summarise the increase in peak traffic volumes for each of the proposed access points, including expected impacts resulting from the increased traffic.

7.1 Option 1a

Table 5 summarises the increased traffic volumes to each of the respective local roads. Existing peak hour volumes were assumed as 10% of AADT, which can be found in Chapter 8 in the main body of the report. Where minor access road volumes did not have any publicly available volume data, it was assumed that existing volumes on these roads were negligible. Until further information is provided regarding construction methodology, the peak volumes were assumed for each of the proposed access points, as a conservative assessment of the potential impacts.

Where there are multiple access routes to a single road, for example Coffeys Lane and Jarretts Road, estimates for traffic volume increases have been estimated conservatively, assuming the entire peak increase may use either access option.

Table 5 Option 1a traffic generation and distribution

Public road	Major Road Access	Minor Road Access	Existing Peak Two Way Traffic Volume (Major Road)	Predicted Peak Two-Way Traffic Volume with transmission line development (Major Road)*	Estimated Increase in Intersection Use^	
					Left Turns	Right Turns
New Site Entrance/Blacks Road	Portland-Nelson Road	N/A	120	153	0	33
Mt Kincaid Road	N/A	Blacks Road	0	33	33	0
Boiler Swamp Road	N/A	Blacks Road	0	33	0	33
Cut Out Dam Road	N/A	Blacks Road	0	33	0	33
Coffeys Lane	Henty Highway	Jennings Road	400	433	33^^	33^^
Jarretts Road	Henty Highway	Jennings Road	400	433	33^^	33^^
Meaghers Road	Henty Highway	N/A	400	433	0	33
Rifle Range Road	Meaghers Road	Meaghers Roads	0	33	33	0

Notes: * *Includes existing traffic volumes, heavy vehicles and light vehicles.*

^ *Increase in intersection use only considers turning movements made from main road into access road. It is assumed that the opposite movement from the access track to the main road is made at an off-peak time.*

^^ *Assumes full peak volume increase uses either access point.*

As shown in Table 5 the predicted worst-case construction stage traffic impacts are low, with the local roads having ample mid-block road operational capacity to facilitate, given a typical one-way lane capacity is 900 vehicles per hour.

7.2 Option 2a and 2b

Table 6 summarises the increased traffic volumes to each of the respective local roads. Existing peak hour volumes were assumed as 10% of AADT, which can be found in Chapter 8 in the main body of the report. Where minor access road volumes did not have any publicly available volume data, it was assumed that existing volumes on these roads were negligible. Until further information is provided regarding construction methodology, the peak volumes were assumed for each of the proposed access points, as a conservative assessment of the potential impacts.

Table 6 Option 2a and 2b traffic generation and distribution

Public road	Major Road Access	Minor Road Access	Existing Peak Two Way Traffic Volume (Major Road)	Predicted Peak Two-Way Traffic Volume with wind farm development(Major Road)*	Estimated Increase in Intersection Use^	
					Left Turns	Right Turns
New Site Entrance/Blacks Road	Portland-Nelson Road	N/A	120	153	0	33
Mt Kincaid Road	N/A	Blacks Road	0	33	33	0
Price Road	Portland-Nelson Road	N/A	120	153	33	0
Telegraph Road	N/A	Price Road	0	33	33	0
Collivers Road	Portland-Nelson Road	N/A	120	153	33	0
Amors Road	Portland-Nelson Road	N/A	120	153	33	0
Foleys Road	Portland-Nelson Road	N/A	120	153	33	0
Logans Road	N/A	Foleys Road	0	33	0	33

Notes: * *Includes existing traffic volumes, heavy vehicles and light vehicles.*

^ *Increase in intersection use only considers turning movements made from main road into access road. It is assumed that the opposite movement from the access track to the main road is made at an off-peak time.*

As shown in Table 6 the predicted worst-case construction stage traffic impacts are negligible, with the local roads having ample mid-block road operational capacity to facilitate, given a typical one-way lane capacity is 900 vehicles per hour.

Whilst the capacity of the traffic generation and capacity of the two options are similar. The exact vehicle types used will differ as OD vehicles would likely be required for Option 2a to facilitate the overhead transmission line construction. The implications of this are further discussed in Chapter 8 of this Appendix.

8.0 Traffic impact assessment

The following section notes the likely traffic impact of the Option 1a, 2a and 2b transmission line routes.

As shown in Chapter 7.0 of this Appendix the predicted worst-case construction stage traffic impacts are negligible, with the local roads having ample mid-block road operational capacity to facilitate, given a typical one-way lane capacity is 900 vehicles per hour.

The increase in turning movements at a site access point level may trigger intersection improvements. Based on the current understanding of the Project and information available, risk mitigation measures associated with construction vehicle transportation would primarily consist of temporary pavement widenings at select intersections to accommodate OSOM deliveries via the new access road opposite Sandy Hill Road and any other proposed OSOM delivery access roads. If these options were to be

considered, turning treatments will need to be considered further, noting those access points via the Henty Highway already provide basic turning lanes.

Many of the local access roads are GSC owned and consequently any upgrades and hand-back agreements would be required and be considered during subsequent design phases if these options were to be considered.

Whilst rural single lane access roads are expected to have very low traffic demands there are two concerns with regards to safety risk and reliability of the local road network:

1. The number of vehicles generated by the development travelling along a road of an inadequate width increases the likelihood of a fatal or serious injury crash. This is further emphasised with the large number of heavy vehicles and OD vehicles generated during the construction stage.
2. The increased number of heavy vehicles poses a potential durability and reliability issue to the performance of the existing pavement, which is unlikely to have been designed for the proposed construction vehicles. This risk is further increased during and following a wet weather period.

The proposed alignments travel through the Cobboboonee National Park and/or the Great South West Walk. The usage of the national park by hikers and tourists will need to be managed and closed during works to prevent vulnerable user entry.

There are school bus routes which travel along Portland-Nelson Road within the transmission site area, including services which travel along the proposed OD transport routes, notably along:

- Portland-Nelson Road (between Henty Highway and Stanleys Road)
- Henty Highway
- Madeira Packet Road

These roads will be used by construction vehicles to and from the Project sites, however conflicts are expected to be minimal given the frequency of bus services and with no bus stops present within the proximity of site access locations.

Any construction or over-dimensional vehicle movements associated with the transmission line will need to either not operate during these time periods or suitable plan with operator’s mitigation measures to reduce impacts if conflicts cannot be suitably managed.