TRAFFIC IMPACT ASSESSMENT

PINE RIDGE SOLAR FARM
SOLAR PHOTOVOLTAIC (PV) POWER GENERATING FARM
& ASSOCIATED SUPPORTIVE INFRASTRUCTURE

LOTS 209, PART LOT 219 & PART LOT 270 DP 750615
CARTWRIGHTS LANE, WYALONG

PREPARED FOR: PROVIDENCE ASSET GROUP

MAY 2021

21/029

TRAFFIC IMPACT ASSESSMENT
PROVIDENCE ASSET GROUP

PINE RIDGE SOLAR FARM
SOLAR PHOTVOLTAIC (PV) POWER FARM
LOT 209, PART LOT 219 & PART LOT 270 DP750615
CARTWRIGHTS LANE, WYALONG

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Issue	Date	Description	By
A	17/02/21	Draft	JG
B	19/02/21	Edit	JG
C	05/05/21	Final Proof	JG
D	05/05/21	Approved	JG
E	21/05/21	Final Plans / Client comments/ Approved	JG
F	31/05/21	Additional Client Comments / Approved	JG

This document has been authorised by

Date 31st May 2021

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CONTENTS

ATTACHMENTS

FIGURES

PHOTOGRAPHS

TABLES

1.0 INTRODUCTION

Intersect Traffic Pty Ltd (Intersect Traffic) has been engaged by Providence Asset Group to prepare a traffic impact assessment report for a proposed Solar Photovoltaic (PV) Power Farm (up to 5MW) on the 'Pine Ridge' property at Lot 209, Part Lot 219 and Part Lot 270 DP750615, Cartwrights Lane, Wyalong.

The proposed development involves installation of solar panel banks, off-load area, inverter and AC combiner area, HV switchboard area, MV power station area, direct connection to a suitable existing power line near the site, on-site car parking and temporary construction office. Vehicular access to the site will be via a new access road with turnaround area off Wargin Road, immediately south of Cartwright's Lane and approximately 1 km south of Neeld Street (Newell Highway). The development concept plans are shown in ***Attachment A.***

This report is required to support a development application to Bland Shire Council and allow the Council to assess the proposal in respect of its impact on the local and state road network.

This report presents the findings of the traffic and parking assessment and includes the following:

1. An outline of the existing situation near the site.
2. Assessment of the additional traffic generated by the proposal, identification of a preferred delivery route and the additional traffics impact on the local road network.
3. Review of the adequacy of the proposed vehicular access to the site.
4. Review of the suitability and provision of on-site car parking through assessment against Council and Australian Standards requirements.
5. Presentation of conclusions and recommendations.

2.0 SITE DESCRIPTION

The subject site is shown in ***Figure 1*** below. It is located on the eastern side of Wargin Road immediately south of an adjoining laneway known as Cartwright's Lane, Wyalong and approximately 3.5 km south-east of the West Wyalong CBD. The site currently contains vacant rural pasture used for agricultural purpose.

The property has the formal title of Lot 209, Part Lot 219 and Part Lot 270 DP 750615, Cartwrights Lane, Wyalong with road frontage access directly off Cartwright's Lane which is an unformed crown road. The development area for the proposal is part of the Pine Ridge rural property with an area of approximately 15 hectares. The site is currently zoned RU1 – Primary Production pursuant to the Bland LEP (2011).

The proposed vehicular access to the site will be provided off Wargin Road immediately south of Cartwright's Lane and through adjoining Lots 284 and 285 DP 750615, both of which are also part of the Pine Ridge property. The access will be approximately 1 km south of Neeld Street (Newell Highway). ***Photograph 1*** below shows the existing development site from adjoining lane while ***Photograph 2*** shows the proposed vehicular access off Wargin Road for the internal access road and turnaround area.

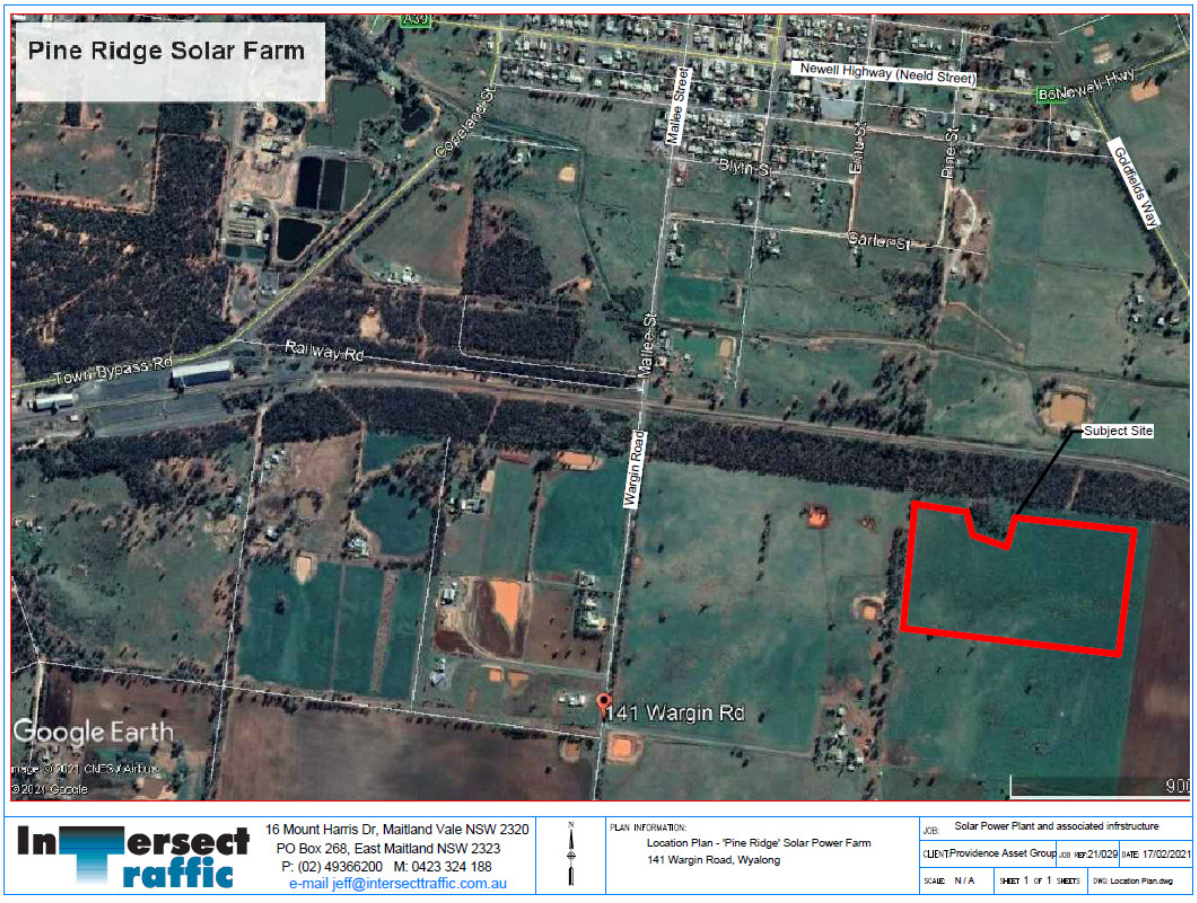


Figure 1 – Site Location

Photograph 1 – Development site from Cartwrights Lane.

Photograph 2 – Proposed access location – south of Cartwrights Lane.

3.0 DEVELOPMENT TRANSPORTATION ROUTE

Deliveries to the site will use the identified delivery road shown in ***Figure 2*** below being via the Hume Highway from Albury and Sydney and then via Burley Griffin Way, Goldfields Highway (Temora), Newell Highway (Neeld Street), Mallee Street, and Wargin Road (both Wyalong). All roads on the delivery route including Mallee Street and Wargin Road are approved B-Double roads although Neeld Street (Newell Highway) through Wyalong has special travel conditions. Therefore it is considered these roads are suitable to carry the proposed heavy vehicle construction traffic for the development.

Figure 2 – Site Deliveries Transportation Route

4.0 EXISTING ROAD NETWORK

4.1 Newell Highway

The Newell Highway is a classified state highway (HW17) with its primary function to connect the Victorian border at Tocumwal to the Queensland border at Goondiwindi through Finley, Jerilderie, Narrandera, Mirrool, West Wyalong, Wyalong, Marsden, Forbes, Parkes, Peak Hill, Dubbo, Gilgandra, Coonabarabran, Narrabri, Bellata, Gurley, Moree, Camurra and Boggabilla. As such it is an arterial road and a major north-south NSW transport route through the Riverina, NSW Central West and North-West areas. As a sealed rural arterial road the Newell Highway is under the care and control of Transport for NSW (TfNSW).

Through Wyalong the Newell Highway is a two-lane two-way sealed urban road generally with a 22-metre wide sealed carriageway between upright kerb and gutter consisting of two 3.5 metre

wide travel lanes (one in each direction) and 7.5 metre wide breakdown / parking lanes along both sides of the road as well as turning lanes at major intersections. Through Wyalong and West Wyalong the speed zoning is 60 km/h and 80 km/h while 110 km/h speed zones exist both east of Wyalong and south of West Wyalong. At the time of inspection the Newell Highway was observed to be in good condition as shown in ***Photograph 3*** below. It is considered suitable for use by heavy vehicle traffic. The Newell Highway is a designated B-Double route though travel conditions apply through Wyalong.

Photograph 3 – Newell Highway through Wyalong

4.2 Goldfields Way

Goldfields Way is a classified state road (MR57) with its primary function to connect the Olympic Highway south of Old Junee to the Newell Highway at Wyalong via Temora and Barmedman. As such it is an arterial road and a major north-south NSW transport route through the Riverina. As a sealed rural arterial road the Newell Highway is under the care and control of Transport for NSW (TfNSW).

Near Wyalong the Goldfields Way is a two-lane two-way sealed rural road generally with a 12-metre wide sealed carriageway consisting of two 3.5 metre wide travel lanes (one in each direction) and 2.5 metre wide breakdown lanes / sealed shoulders along both sides of the road. Near the Newell Highway an 80 km/h speed zone exists though south of Wyalong a 110 km/h speed zone is in place. At the time of inspection the Goldfields Way was observed to be in good condition and it is considered suitable for use by heavy vehicle traffic. The Goldfields Way is a designated B-Double route.

4.3 Mallee Street / Wargin Road

Mallee Street and Wargin Road is the local road connection to the development site access. Both are local roads though Mallee Street would be considered an urban road in Wyalong while Wargin Road is a rural road. The primary function of both roads is to provide vehicular access to properties along their length and connect them to the arterial road network (Newell Highway) at Wyalong. As local roads Mallee Street and Wargin Road are both under the care and control of Bland Shire Council.

Near the Newell Highway at Wyalong Mallee Street has a sealed carriageway width of 15 metres between upright kerb and gutter while south of Cassin Street it becomes a rural road construction with a 13 metre wide seal and minimal unsealed shoulders and table drains. This comfortably provides a single lane of travel in each direction with parking lanes on both sides of the road in the urban areas and breakdown areas on the rural section of road.

Wargin Road connects to Mallee Street south of the at-grade railway crossing approximately 880 metres south of the Newell Highway with the site access another 160 metres south of the railway line. Wargin Road in this location has a sealed carriageway width of 13 metres with minimal gravel shoulders and table drains, comfortably providing a travel lane in each direction as well as breakdown / stopping areas on the road.

A 50 km/h speed zoning applies to Mallee Street and Wargin Road up to the proposed site access, while a 100 km/h speed zoning would apply south of the site on Wargin Road. Both roads are already designated B-Double routes and considered suitable to carry the heavy vehicle traffic generated by the development. At the time of inspection Mallee Road and Wargin Road were found to be in good condition as shown in ***Photographs 4, 5 & 6*** below.

Photograph 4 – Mallee Street – near Newell Highway

Photograph 5 – Mallee Street south of Cassin Street.

Photograph 6 – Wargin Road near site access.

5.0 ALTERNATE TRANSPORT MODES

Here are generally no public transport (bus) services in Wyalong or West Wyalong, though NSW Trainlink does provide limited services to Wagga Wagga and Condobolin. Kelly's Coaches provides bus charters and school services in the area while the local Lake Cowell mine provides bus transport for their staff to West Wyalong and Wyalong.

As a rural area, there are no pedestrian footpaths or on / off road cycleways within the local road network near the site, though a limited pedestrian footpath network does exist along the Newell Highway within the Wyalong commercial area and local parks / schools. Generally near the site, pedestrians are required to utilise the grass verges and road shoulders / pavement, while cyclists are required to utilise the road shoulders or share the travel lanes with other vehicles.

6.0 DEVELOPMENT PROPOSAL

The proposed development involves the construction of a Solar Photovoltaic (PV) Power Farm on the site. The development concept plans are shown in ***Attachment A*** with the specific works involved in the construction are listed below:

- Installation of temporary construction office and amenities.
- Installation of Solar Panel arrays.
- Earthworks for construction lay-down area, hardstand areas and internal roads.
- Installation of inverters, transformers and switchgear.
- Construction of unsealed access crossing and access road from Wargin Road to the construction site through the Pine Ridge property.
- Construction of security fence and entrance gate; and
- Drainage and landscaping to Bland Shire Council requirements.

The development will require a team of 30 construction employees for a period of up to 6 months working 7am to 5pm Monday to Friday and 8am – 1pm on Saturdays. The majority of traffic movements associated with the development will occur during the construction of the solar farm. Traffic movements generated by the operation of the development would include staff light vehicle movements associated with maintenance inspections as required and specific maintenance work which would be short term and infrequent. Deliveries during construction works would be expected to be within rigid and articulated vehicles. More detail on construction traffic is provided later in this report.

7.0 TRAFFIC IMPACTS

7.1 – Traffic Generation and Trip Distribution

The TfNSW publication "*RTA's Guide to Traffic Generating Developments (2002)*" provides advice on the traffic generating potential of different land uses. However this document does not cover solar farms therefore determining traffic generation is reliant on advice from the applicant regarding construction and operation of the development.

From an operational perspective traffic generation is expected to be minimal with only regular daily maintenance inspections carried out when necessary. Therefore based on 1 visit per day per week, a peak hour traffic generation of 2 vehicle trips per hour (vtph) has been assumed for this assessment. There may be times when specific maintenance tasks have to be undertaken but these will be infrequent, short-term and undertaken under a construction traffic management plan. Construction traffic estimates for the development are as follows based on the information provided in ***Attachment C***.

- Construction employees on-site – Maximum 30 transported in up to 10 light vehicles per day arriving between 6 am and 7 am and departing between 5 pm and 6 pm.
- Deliveries – Mainly heavy rigid vehicles and articulated vehicles (AV). Maximum – 8 per day but average of 5 per day between 10 am and 4 pm. Whilst these are likely to mostly arrive outside the peak hour traffic generation periods associated with the arrival and departure of employees, logistically there could be unforeseen occurrences when a delivery arrives during the peak hour periods.
- Other vehicles – Some earthworks plant may be required on-site as well as concrete agitators and road base material deliveries during construction of the access. It would be expected a maximum frequency of 3 deliveries within a peak hour is assumed.
- Construction period – up to 6 months

The likely peak hour traffic generation which will occur in the AM peak coinciding with employees arriving on site and in the PM peak coinciding with employees leaving the site is calculated below. It is also noted that deliveries involve an inbound trip and an outbound trip.

AM peak = 10 inbound employees + 3 x 2 roadworks and other plant + 1 x 2 deliveries = 18 vtph (14 inbound and 4 outbound).
PM peak = 10 outbound employees + 3 x 2 roadworks and other plant + 1 x 2 deliveries = 18 vtph (14 outbound and 4 inbound).

It is expected that the distribution of trips will be 80% west towards West Wyalong for employee and locally sourced material delivery and 20 % east to the Goldfields Way for the Solar Panel components being delivered from Sydney or Albury. In accessing the site, the proposed transportation route for the solar panel components as envisaged is shown on ***Figure 2.***

Existing traffic volumes in the area were recorded by Intersect Traffic at the Newell Highway (Neeld Street) / Mallee Street intersection during the likely PM peak hour traffic period (3 pm to 4 pm – Tuesday 16th February 2021) and the AM peak hour traffic period (8 am to 9 am – Wednesday 17th February 2021). The data sheets for these counts are provided in ***Attachment B***.

These traffic counts determined that the relevant peak hour two-way mid-block traffic volumes on the state and local road network in the AM and PM periods during this period were.

- Newell Highway (Neeld Street) east of Mallee Street - 236 vtph in the AM peak and 290 vtph in the PM peak.
- Newell Highway (Neeld Street) west of Mallee Street – 269 vtph in the AM peak and 321 vtph in the PM peak;
- Mallee Street / Wargin Road south of Newell Highway (Neeld Street) – 36 vtph in the AM peak and 29 vtph in the PM peak.

The counts show that for traffic on the Newell Highway the PM peak is the most critical while traffic volumes on Mallee Street where higher in the AM period but still relatively low. Therefore, based on the traffic data collected, the following existing traffic volumes have been adopted in the report;

- Newell Highway – 269 vtph in the AM peak and 321 vtph in the PM peak.
- Mallee Street – 36 vtph in the AM peak and 29 vtph in the PM peak.

Given the construction will be completed within a 6 month period and the peak operational traffic volume from the site is only 2 vtph, there is no need to undertake a 2030 (10 year horizon period) assessment of this development.

7.2 – Road Capacity

Table 4.3 of the TfNSW publication "*RTA's Guide to Traffic Generating Developments"* provides some guidance on likely mid-block capacity of two-lane two-way urban roads for a desirable level of service (LoS) C. This table is reproduced below as ***Table 1*** below. Within Wyalong, the Newell Highway is considered of urban construction and has a speed zoning less than 80 km/h therefore the urban road capacity table is considered the relevant reference table for assessment.

Table 1 – Urban Road Mid-Block Capacity Table

Table 4.3
Typical mid-block capacities for urban roads with interrupted flow

Type of Road	One-Way Mid-block Lane Capacity (pcu/hr)	
Median or inner lane:	Divided Road	1,000
	Undivided Road	900
Outer or kerb lane:	With Adjacent Parking Lane	900
	Clearway Conditions	900
	Occasional Parked Cars	600
4 lane undivided:	Occasional Parked Cars	1,500
	Clearway Conditions	1,800
4 lane divided:	Clearway Conditions	1,900

Source: - RTA's Guide to Traffic Generating Developments (2002)

Noting that the Newell Highway (Neeld Street) and Mallee Street are two-way undivided roads, wide enough to accommodate parking lanes, the one-way mid-block lane capacity is considered to be 900 vtph and the two-way mid-block road capacity is 1,800 vtph and this would be the technical two-way mid-block road capacity for both the Newell Highway (Neeld Street) and Mallee Street:

Mallee Street and Wargin Road with 50 km/h speed limits and primarily providing vehicular access to residents, would also be subject to the environmental capacity goals listed Table 4.6 of the TfNSW publication "*RTA's Guide to Traffic Generating Developments"* to maintain suitable levels of residential amenity in the area. This table is reproduced below as ***Table 2***. This table suggests a desirable two-way mid-block capacity of 200 vtph for local roads.

Therefore the two-way mid-block capacity thresholds for the local and state road network adopted in this assessment are;

- Newell Highway (Neeld Street) – 1,800 vtph; and
- Mallee Street / Wargin Road – 200 vtph

As the combination of the two-way mid-block peak hour traffic data and traffic generation figures reported in ***Section 6.1*** in the AM and PM peak hour traffic volumes on the local and state road network during construction will be well below the existing capacity thresholds determined above, then the local and state road network has sufficient spare two-way mid-block capacity to cater for the construction and operation of the solar farm. The addition of up to 18 vtph will not cause the capacity thresholds determined above to be reached. Therefore it can be concluded that the proposed development will not adversely impact on the local and state road network mid-block efficiency.

Table 2 – Environmental Road Capacity Table

Table 4.6
Environmental capacity performance standards on residential streets

Road class	Road type	Maximum Speed (km/hr)	Maximum peak hour volume (veh/hr)
Local	Access way	25	100
	Street	40	200 environmental goal
			300 maximum
Collector	Street	50	300 environmental goal
			500 maximum

Note: Maximum speed relates to the appropriate design maximum speeds in new residential developments. In existing areas maximum speed relates to 85th percentile speed.

Source: - RTA's Guide to Traffic Generating Developments (2002)

7.3 – Intersection Capacity

The main intersection impacted by the construction of the development is the Newell Highway (Neeld Street) / Mallee Street priority controlled give way controlled cross intersection. However traffic volumes at this intersection is below the thresholds sourced from Austroads *Guide to Traffic Management Part 6 – Intersections, Interchanges and Crossings (2010),* reproduced below in ***Table 3*** of this report**.** The Guide states that if traffic volumes are not above these thresholds, then uninterrupted flow conditions can be assumed and little or no delay will be experienced by motorists at these intersections. No further intersection analysis is then required.

Table 3 – Uninterrupted flow condition thresholds at an intersection

Major road type[1]	Major road flow (vph)[2]	Minor road flow (vph)[3]
Two-lane	400	250
	500	200
	650	100
Four-lane	1000	100
	1500	50
	2000	25

Source: - Austroads Guide to Traffic Management – Part 6: Intersections, Interchanges and Crossings (2010)

With traffic flows on the Newell Highway (Neeld Street) being less than 300 vtph and traffic flows on Mallee Street being less than 50 vtph, then it is clearly seen from the table above that the intersection is currently operating with uninterrupted flow conditions, confirmed by observation on site during the traffic counts. The additional 18 vtph generated by the construction of the Solar Farm will not result in the thresholds within the above table being reached. Therefore it can be concluded that during construction and post development, the Newell Highway (Neeld Street) / Mallee Street priority controlled give way cross-intersection will continue to operate with uninterrupted flow conditions. Therefore it is reasonable to conclude that the development does not adversely impact on the operation of this intersection or any other intersection on the local and state road network.

7.4 Access Assessment

In terms of width providing access to a user class 1 (long term) car parking facility with less than 25 car spaces fronting a local road is required to be a category 1 access (Table 3.1 of the Standard). Table 3.2 of the Standard then specifies a category 1 access facility as a combined entry / exit between 3.0 to 5.5 metres wide. However the proposed entrance width at the combined entry / exit access at Wargin Road will need to be a minimum 12.5 metres wide to cater for the swept turning paths for delivery vehicles during the construction stage and satisfy the requirements of Australian Standard *AS2890.1-2004 Parking Facilities – Part 1 Off-street car parking* and Australian Standard *AS2890.2-2002 Parking Facilities – Part 2 Off-street commercial vehicle facilities.*

Sight distance at the proposed access off Wargin Road was observed to be in excess of 250 metres in each direction which therefore complies with the requirements of Figure 3.2 of Australian Standard *AS2890.1-2004 Parking Facilities – Part 1 Off-street car parking (160 metres minimum SSD for 100 km/h*) as well as Austroads *Guide to Road Design – Part 4A – Unsignalised and signalised intersections - Table 3.2 (248 metres for 100 km/h)* for safe intersection sight distance.

It is therefore concluded that the proposed site access is suitably located and satisfactory for use for the solar farm as it complies with the requirements of Australian Standard *AS2890.1-2004 Parking Facilities – Part 1 Off-street car parking* and Australian Standard *AS2890.2-2002 Parking Facilities – Part 2 Off-street commercial vehicle facilities.*

The main issue with access for construction vehicles to the site is the suitability of the local road network to safely cater for heavy vehicle deliveries. In this regard it is noted that Mallee Street and Wargin Road have a sealed pavement approximately 6 metres wide and therefore comply with Austroads Standards for Urban Roads and for Rural Roads with less than 500 vtph. It would therefore allow two heavy vehicles to pass each other at normal speed. Further, Mallee Street and Wargin Road is an approved B-Double route. Therefore, it is considered the proposed transportation route to the site is suitable to carry heavy vehicles and is thus suitable to cater for the construction traffic from the solar farm construction.

8.0 ON-SITE CAR PARKING

On-site car parking for the proposal is required to comply with the Industrial Development controls of the Bland Shire Council's Development Control Plan (2012) – Chapter 11. The rates contained in the DCP are;

- *1 space per 2 staff employed, or 1 space per 100 square metres of gross leasable floor area (whichever is the greater).*

With no building proposed for the solar farm the development and only 1 employee employed for the site, the DCP requirement for the development is 1 car space, which is considered appropriate for the development. However it is also the responsibility of the applicant to provide sufficient on-site car parking for construction employees during the duration of the construction of the development for the development to comply with the car parking objectives of the DCP. Construction employee car parking will be provided on the hard stand area identified as the construction lay down area, and this is large enough to cater for the expected storage requirements during construction as well as the provision of at least 10 on-site car parks for construction employees which is the expected traffic generation from employees to the site as well as being in excess of the industrial land use requirements of the Bland Shire Council Development Control Plan (2012). With significant overflow parking areas also on site it is considered reasonable to conclude the development provides sufficient on-site car parking that complies with the objectives and controls related to car parking required within Bland Shire Council's Development Control Plan.

The employee car parking area would need to comply with the requirements of Australian Standard *AS2890.1-2004 Parking Facilities – Part 1 Off-street car parking* with parking bay sizes 2.4m x 5.4m and aisle widths of 5.8m. There is sufficient room on-site to ensure compliance with this requirement which could be covered by a suitable condition of consent. Overall it is considered suitable on-site car parking can be provided for the development ensuring all vehicle movements to and from the site off Wargin Road will be undertaken in a forward direction.

9.0 ALTERNATE TRANSPORT MODES

The proposed development will not generate any increase in public transport demand during both the construction and operational phases of the development particularly given the site is not currently serviced by convenient public transport. Therefore there is no nexus for the provision of new services or improved infrastructure resulting from the development. Similarly, the development will not generate any additional pedestrian or cycle traffic during both the construction and operation phases of the development therefore no nexus exists for the provision of additional pedestrian paths or cycle ways near the site.

10.0 CONCLUSIONS

This traffic and parking assessment for the proposed Solar Photovoltaic (PV) Farm on Lot 209, Part Lot 219 and Part Lot 270 DP750615, 141 Wargin Road, Wyalong has determined the following:

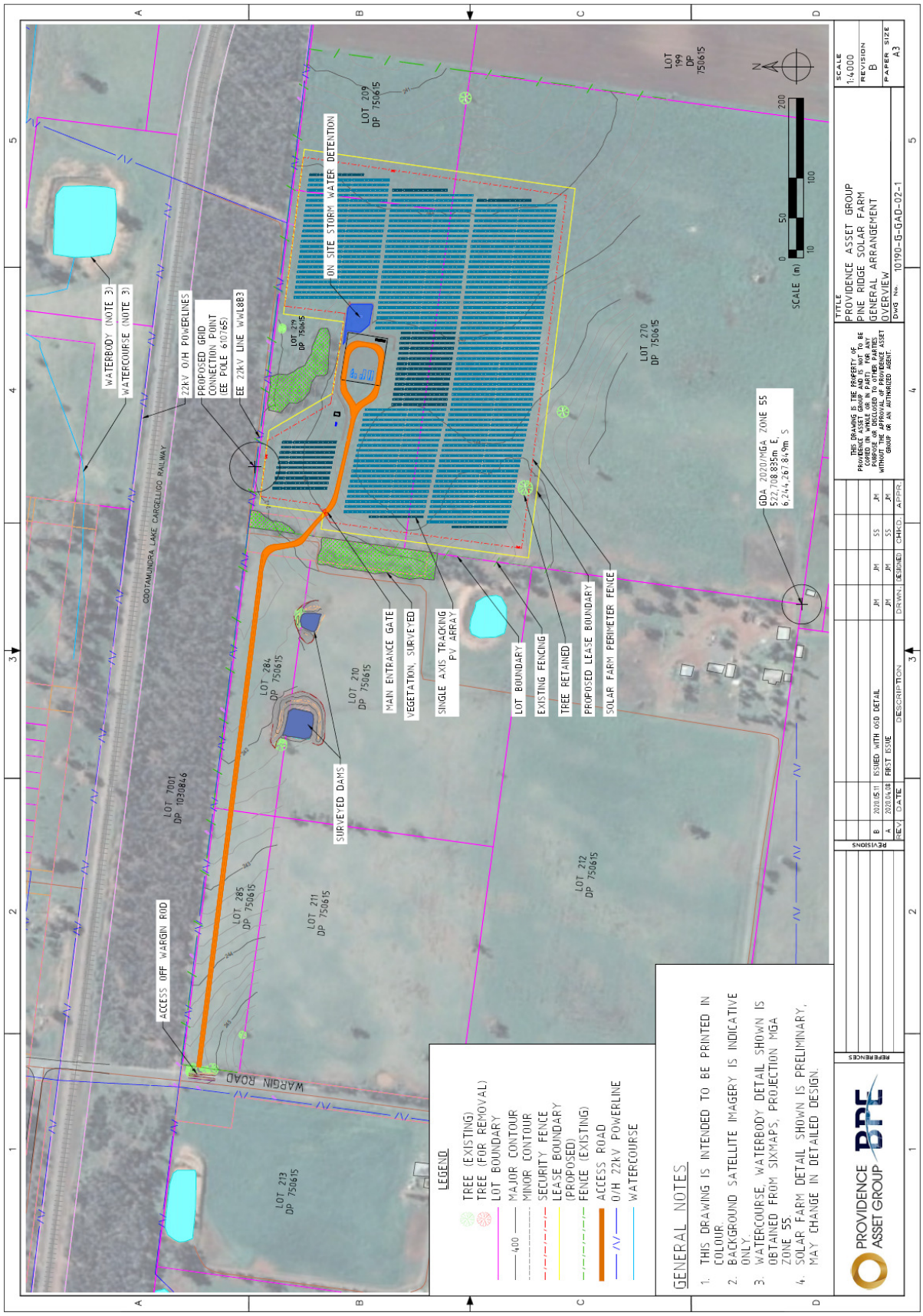
- The development during construction will generate up to an additional 18 vehicle movements to and from the site during the weekday AM and PM peak periods but only 2 vtph during the operation of the solar farm.
- The existing peak traffic volumes on the local road network are well below the two-way mid-block capacity thresholds for the local and state road network (LoS C). Traffic volumes will remain below these thresholds during the construction and operation of the development.
- The Newell Highway (Neeld Street) / Mallee Street priority controlled give way cross intersection will continue to operate with uninterrupted flow conditions during and post construction of the solar farm with little if any impact on the operation of this intersection resulting from the development.
- It is also reasonable to conclude the development will not adversely impact on the intersections on the wider local and state road network given the high levels of intersection control on the major intersections and the relatively low traffic generation from the development.
- Therefore, the additional construction and operational traffic generated by this development will not adversely impact on the efficiency or effectiveness of the local and state road network.
- The proposed site access is suitable for use for construction and operation of the development being compliant with Australian Standard and Austroads requirements.
- As the transportation route to the site is already an approved B-Double route, it is considered the local and state road network would be suitable to cater for the expected construction traffic associated with the development.
- There is sufficient area on-site to accommodate the expected peak parking demand generated by the development during both construction and operation with the provision of an AS2890.1-2004 compliant car park within the construction laydown area for a minimum 10 spaces as well as the provision of numerous overflow parking areas on the site.
- The proposed development will not generate any increase in public transport demand therefore no nexus exists for the provision of new services or improved infrastructure resulting from the development. Similarly, the development will not generate any additional pedestrian or cycle traffic. Therefore no nexus exists for the provision of additional pedestrian paths or cycle ways near the site.

11.0 RECOMMENDATION

Having carried out this traffic and parking assessment for the proposed Solar Photovoltaic (PV) Farm on Lot 209, Part Lot 219 and Part Lot 270 DP750615, 141 Wargin Road, Wyalong, it is recommended that the proposal can be supported from a traffic perspective as the development will not adversely impact on the local and state road network and complies with all relevant requirements of Bland Shire Council, Austroads, Australian Standards and TfNSW.

JR Garry BE (Civil), Masters of Traffic
Director
Intersect Traffic Pty Ltd

ATTACHMENT A
DEVELOPMENT PLANS


LEGEND
TREE (EXISTING)
TREE (FOR REMOVAL)
LOT BOUNDARY
400 MAJOR CONTOUR
MINOR CONTOUR
SECURITY FENCE
LEASE BOUNDARY (PROPOSED)
FENCE (EXISTING)
ACCESS ROAD
O/H 22kV POWERLINE
WATERCOURSE
GENERAL NOTES
1. THIS DRAWING IS INTENDED TO BE PRINTED IN COLOUR.
2. BACKGROUND SATELLITE IMAGERY IS INDICATIVE ONLY.
3. WATERCOURSE, WATERBODY DETAIL SHOWN IS OBTAINED FROM SIXMAPS, PROJECTION MGA ZONE 55.
4. SOLAR FARM DETAIL SHOWN IS PRELIMINARY, MAY CHANGE IN DETAILED DESIGN.
WARGIN ROAD
ACCESS OFF WARGIN RD
WATERBODY (NOTE 3)
WATERCOURSE (NOTE 3)
22kV O/H POWERLINES
PROPOSED GRID CONNECTION POINT (EE POLE 6107165)
EE 22kV LINE WWL8B3
ON SITE STORM WATER DETENTION
SURVEYED DAMS
MAIN ENTRANCE GATE
VEGETATION, SURVEYED
SINGLE AXIS TRACKING PV ARRAY
LOT BOUNDARY
EXISTING FENCING
TREE RETAINED
PROPOSED LEASE BOUNDARY
SOLAR FARM PERIMETER FENCE
GDA 2020/MGA ZONE 55
522,708.835m E,
6,244,267.849m S
SCALE (m)
COOTAMUNDRA LAKE CARGELLIGO RAILWAY
LOT 7001 DP 1030846
LOT 284 DP 750615
LOT 285 DP 750615
LOT 211 DP 750615
LOT 213 DP 750615
LOT 210 DP 750615
LOT 212 DP 750615
LOT 279 DP 750615
LOT 209 DP 750615
LOT 270 DP 750615
LOT 199 DP 750615
PROVIDENCE ASSET GROUP
PINE RIDGE SOLAR FARM
GENERAL ARRANGEMENT
OVERVIEW
DWG No 10190-G-GAD-02-1
SCALE 1:4000
REVISION B
PAPER SIZE A3
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A 2020.04.08 FIRST ISSUE JM JM SS JM
B 2020.05.11 ISSUED WITH GSD DETAIL JM JM SS JM
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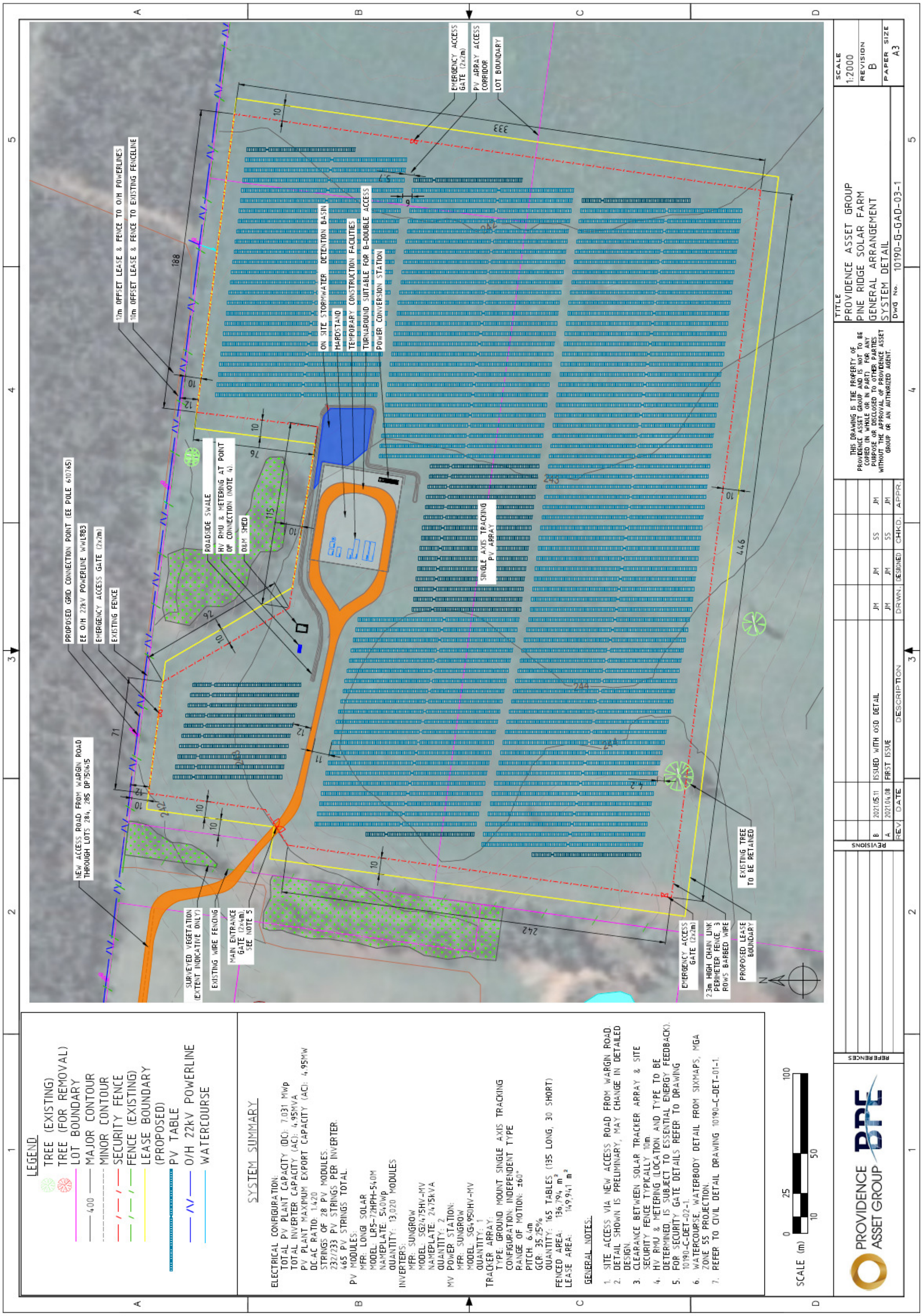
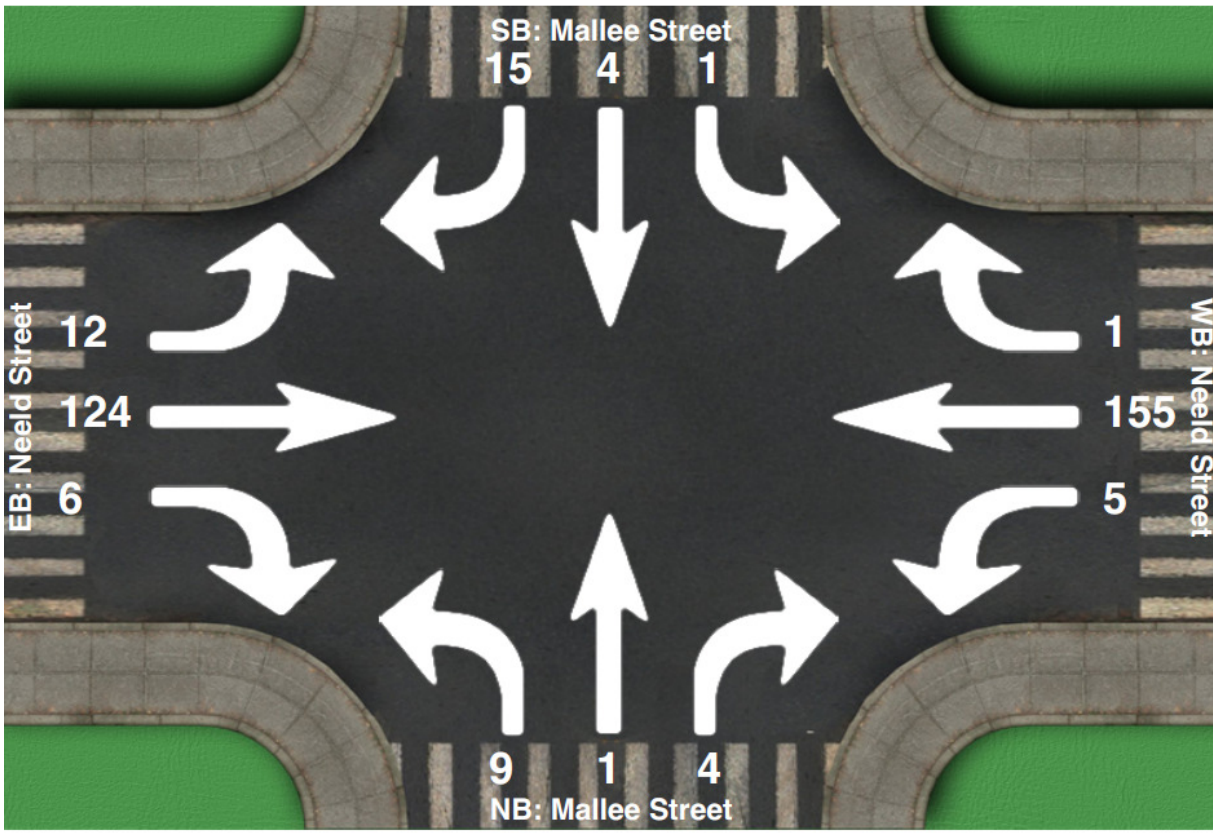

LEGEND
TREE (EXISTING)
TREE (FOR REMOVAL)
LOT BOUNDARY
MAJOR CONTOUR
MINOR CONTOUR
SECURITY FENCE
FENCE (EXISTING)
LEASE BOUNDARY (PROPOSED)
PV TABLE
O/H 22kV POWERLINE
WATERCOURSE
SYSTEM SUMMARY
ELECTRICAL CONFIGURATION:
TOTAL PV PLANT CAPACITY (DC): 7.031 MWp
TOTAL INVERTER CAPACITY (AC): 4.95MVA
PV PLANT MAXIMUM EXPORT CAPACITY (AC): 4.95MW
DC:AC RATIO: 1.420
STRINGS OF 28 PV MODULES
232/233 PV STRINGS PER INVERTER
465 PV STRINGS TOTAL
PV MODULES:
MFR: LONGI SOLAR
MODEL: LR5-72HPH-540M
NAMEPLATE: 540Wp
QUANTITY: 13,020 MODULES
INVERTERS:
MFR: SUNGROW
MODEL: SG2475HV-MV
NAMEPLATE: 2475kVA
QUANTITY: 2
MV POWER STATION:
MFR: SUNGROW
MODEL: SG4950HV-MV
QUANTITY: 1
TRACKER ARRAY:
TYPE: GROUND MOUNT SINGLE AXIS TRACKING
CONFIGURATION: INDEPENDENT TYPE
RANGE OF MOTION: ±60°
PITCH: 6.4m
GCR: 35.25%
QUANTITY: 165 TABLES (135 LONG, 30 SHORT)
FENCED AREA: 136,194 m²
LEASE AREA: 149,941 m²
GENERAL NOTES:
1. SITE ACCESS VIA NEW ACCESS ROAD FROM WARGIN ROAD
2. DETAIL SHOWN IS PRELIMINARY, MAY CHANGE IN DETAILED DESIGN
3. CLEARANCE BETWEEN SOLAR TRACKER ARRAY & SITE SECURITY FENCE TYPICALLY 10m
4. HV RMU & METERING (LOCATION AND TYPE TO BE DETERMINED, IS SUBJECT TO ESSENTIAL ENERGY FEEDBACK).
5. FOR SECURITY GATE DETAILS REFER TO DRAWING 10190-C-DET-02-1.
6. WATERCOURSE, WATERBODY DETAIL FROM SIXMAPS, MGA ZONE 55 PROJECTION.
7. REFER TO CIVIL DETAIL DRAWING 10190-C-DET-01-1.
SCALE (m)
PROVIDENCE ASSET GROUP
BPE
NEW ACCESS ROAD FROM WARGIN ROAD THROUGH LOTS 284, 285 DP750415
PROPOSED GRID CONNECTION POINT (EE POLE 610765)
EE O/H 22kV POWERLINE WWL983
EMERGENCY ACCESS GATE (2x2m)
EXISTING FENCE
12m OFFSET LEASE & FENCE TO O/H POWERLINES
10m OFFSET LEASE & FENCE TO EXISTING FENCELINE
ROADSIDE SWALE
HV RMU & METERING AT POINT OF CONNECTION (NOTE 4)
O&M SHED
ON SITE STORMWATER DETENTION BASIN
HARDSTAND
TEMPORARY CONSTRUCTION FACILITIES
TURNAROUND SUITABLE FOR B-DOUBLE ACCESS
POWER CONVERSION STATION
SINGLE AXIS TRACKING PV ARRAY
EMERGENCY ACCESS GATE (2x2m)
PV ARRAY ACCESS CORRIDOR
LOT BOUNDARY
SURVEYED VEGETATION (EXTENT INDICATIVE ONLY)
EXISTING WIRE FENCING
MAIN ENTRANCE GATE (2x4m) SEE NOTE 5
2.3m HIGH CHAIN LINK PERIMETER FENCE, 3 ROWS BARBED WIRE
PROPOSED LEASE BOUNDARY
EXISTING TREE TO BE RETAINED
THIS DRAWING IS THE PROPERTY OF PROVIDENCE ASSET GROUP AND IS NOT TO BE COPIED IN WHOLE OR IN PART, FOR ANY PURPOSE OR DISCLOSED TO OTHER PARTIES WITHOUT THE APPROVAL OF PROVIDENCE ASSET GROUP OR AN AUTHORIZED AGENT.
B 2021.05.11 ISSUED WITH OSD DETAIL
A 2021.04.08 FIRST ISSUE
REV DATE DESCRIPTION DRWN DESIGNED CHKD APPR
TITLE
PROVIDENCE ASSET GROUP
PINE RIDGE SOLAR FARM
GENERAL ARRANGEMENT
SYSTEM DETAIL
DWG No. 10190-G-GAD-03-1
SCALE 1:2000
REVISION B
PAPER SIZE A3

ATTACHMENT B
TRAFFIC COUNT DATA

Intersection Peak Hour

Location: Mallee Street at Neeld Street, Wyalong
GPS Coordinates:
Date: 2021-02-16
Day of week: Tuesday
Weather:
Analyst: Jeff



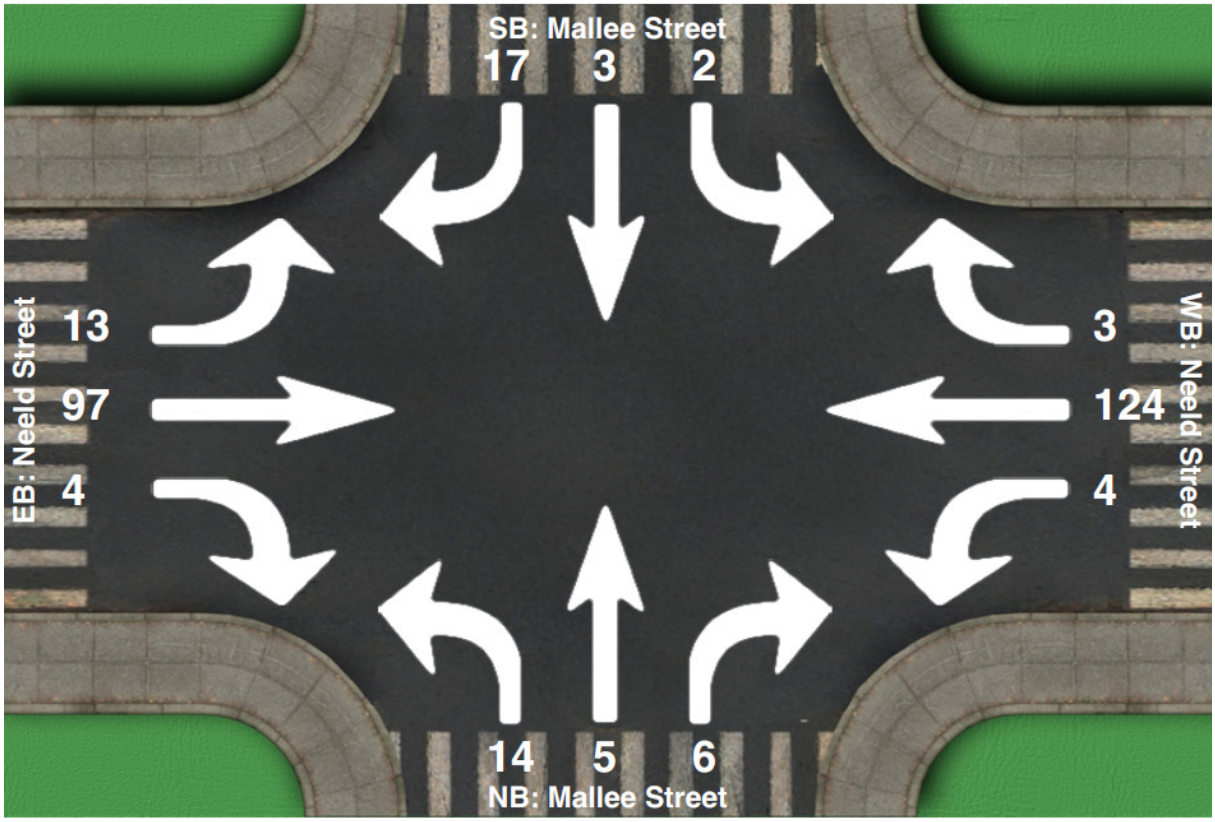
Intersection Peak Hour

15:00 - 16:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	1	4	15	5	155	1	9	1	4	12	124	6	337
Factor	0.25	0.33	0.31	0.62	0.73	0.25	0.56	0.25	0.50	0.50	0.79	0.50	0.79
Approach Factor	0.31			0.73			0.70			0.79			

Intersection Peak Hour

Location: Mallee Street at Neeld Street, Wyalong
GPS Coordinates:
Date: 2021-02-17
Day of week: Wednesday
Weather:
Analyst: Jeff



Intersection Peak Hour

08:00 - 09:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	2	3	17	4	124	3	14	5	6	13	97	4	292
Factor	0.50	0.38	0.71	0.50	0.82	0.25	0.58	0.62	0.50	0.65	0.76	0.50	0.87
Approach Factor		0.79			0.86			0.62			0.75		

ATTACHMENT C
TRAFFIC GENERATION INFORMATION

PROVIDENCE ASSET GROUP

Preliminary Solar Farm Vehicle Movement Guidance

27/03/2020

1 Traffic Generated by Construction Works

During the construction of the solar farm, it is estimated that approximately 50 x 40 ft containers will be transported to site. Added to these containers are waste traffic, equipment, temporary installations and workforce transport to and from site. A logistics agent will be engaged to manage the freight from the delivery port [TBC] to the solar farm site.

An estimation of the traffic created by the worksite is provided in Figure 1, below.

The vehicular traffic for the transport vehicles is based on a 3-axle rigid truck. The General Mass Limit (GML) for a 3-axle load is assumed to be 20 tonnes based on The Australian Trucking Association's 'Technical Advisory Procedure for Truck Configurations' [24]. Depending on the availability of vehicles it may be possible that a conventional B-doubles will transport equipment to site. The GML for this vehicle is 40 tonnes. In this case the vehicular traffic for the container loads will reduce by a factor of 2 for each B-double transporting equipment to site.

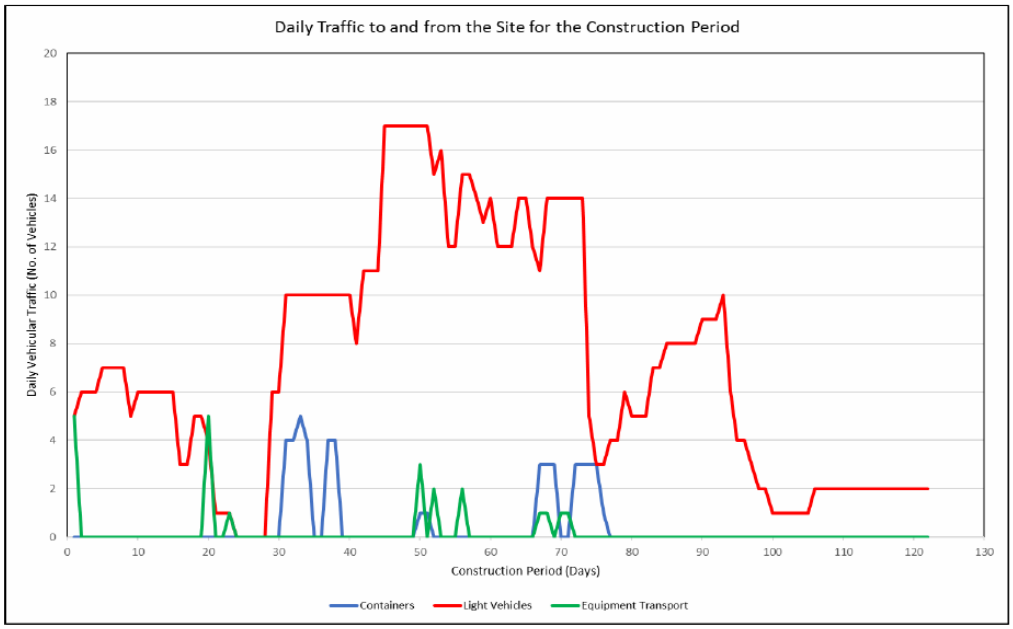


Figure 1 - Daily Traffic to and from Site for the Construction Period

At the peak of the equipment supply, the number of transport vehicles entering and leaving the solar farm site will be 4 to 5 daily for a period of just over a month into the construction period. There will be another busy week midway through the construction period where there will be approximately 3 transport vehicles entering and leaving the site daily.

All heavy transport to and from the site will predominantly be on standard working days between 8am and 4pm.

It is anticipated that there will be up to 30 personnel working on the site during the construction period that will generate the anticipated light vehicle traffic.

The light traffic will be concentrated at the beginning and the end of the day around 6-7am and 4-5pm. The container transport will be concentrated between 10am and 3pm.

2 Impact on Existing Traffic

With a maximum of eight to ten light vehicles and six to eight heavy vehicles travelling to and from the site daily, it is not anticipated that the increased traffic due to construction works will have any significant impact on the existing traffic.

3 Additional Road Signage of Existing Road

It is suggested that road signage is provided for the proposed site entrance on Manilla Road. The recommended locations of the warning signs be placed at distances of 200 metres approaching the intersection to the north and south. The warning signs will indicate that it is a construction site entrance. The entrance to the site on Mannum Road will be designed for the anticipated heavy transport loads volumes during the construction period that are detailed in Section 1. A Traffic Control Plan will be submitted to the DPTI Traffic Management Centre for approval, with all signage to be placed and maintained to the satisfaction of the Commissioner of Highways.

4 Parking

All parking for site personnel will be on site. This will be sign posted at the site entrance. Balance will not permit parking on Mannum Road and will incorporate this in the site induction.

5 O&M Traffic

Once the solar farm has been constructed and has entered the “operations and maintenance” stage the traffic onto site will consist of light vehicles, with few exceptions, at a frequency of 1 to 5 visits per fortnight.

5MW Solar Farm - Typical Vehicle Movements			
Construction - Major Equipment	Load	Quantity	Comments
Piling & Tracker Components	40' Container / Trailer	24	Doubles if permitted / practical
PV Modules	40' Container / Trailer	26	Doubles if permitted / practical
Switchgear	20' Container / Trailer	1	
Inverters	20' Container / Trailer	2	
Cranes	~50T	3	
Cables	40' Container / Trailer	2	Doubles if permitted / practical
Balance of Plant (BOP)	40' Container / Trailer	3	
Civil Plant	Float or Drop Deck	8	4ea at mob / demob
Piling Plant	Float or Drop Deck	4	2ea at mob / demob
Site Facilities	Float/Drop Deck/40' Trailer	8	4ea at mob / demob
Light trucks - 6 wheelers	local deliveries - sand, gen fteight etc	10	
Light trucks - 4 wheelers	local deliveries - sand, gen fteight etc	10	
		101	
Construction - Light Vehicles / Other	Load	Quantity	Comments
Light Vehicle - 4WD ute or similar	Personell / tools	384	Average 4 per day
Light Vehicle - ?	Workforce private vehicles	576	Average 6 per day - depends on engagement of workforce
		960	
O&M	Load	Quantity	Comments
Light Vehicle - 4WD ute or similar	fortnightly inspection	30	1 per fortnight, plus additional
Light Vehicle - 4WD ute or similar	3 monthly Inspections	8	2 visits, 4 times per year
Light Vehicle - 4WD ute or similar	Faults	4	
Light trucks - 4 wheelers	PV Module cleaning	2	Once per Year
		44	