

Traffic Impact Assessment Report

Proposed Solar Farm 47R Wellington Road Dubbo

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date

10.03.2021

Dear Jane,

reference

36004-TIA01_1

receiver
ACEnergy
Attn: Jane Bai

Suite 305-306, 685 Burke Road, Camberwell, VIC 3124 Traffic Impact Assessment Report Proposed Solar Farm 47R Wellington Road Dubbo NSW 2830

With reference to the above, please find the following Traffic Impact Assessment report regarding the proposed solar farm.

If you have any further enquiries regarding this matter, please contact the undersigned.

Yours faithfully BARNSON PTY LTD

Eden Gliksman B.Eng (Hons)

CIVIL ENGINEER



Disclaimer

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Project Name:	Traffic Impact Assessment Report – Proposed Solar Farm
Client:	ACEnergy Pty Ltd
Project No.	36004
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APPENDICES

Appendix A – Wellington Road Traffic Counts

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Appendix C – Existing Intersection Plan



EXECUTIVE SUMMARY

Barnson has been engaged by ACEnergy to prepare a Traffic Impact Assessment (TIA) for the proposed solar farm development at 47R Wellington Road, Dubbo. This TIA has been prepared as part of the Development Application (DA) and should be read in conjunction with the DA.

The subject site is located 4km south-east of Dubbo and has an area of approximately 180 ha. Most of the site is currently used for agricultural purposes, with a small residential portion towards the south-east of the site. The existing driveway faces Wellington Road.

The proposed development is a 4.950MVa "micro" solar farm, with construction works including site clearing and preparation, internal access roads, installation of PV solar panels and associated equipment, and site landscaping.

The following conclusions have been drawn as a result of this assessment:

- During its construction stage, the proposed development will generate no more than 17vph at any given time.
- Traffic generated by the development during its operational stage will be negligible, consisting of 1-2 light vehicle movements per quarter and additional trips as required for repair and maintenance. It will not exceed traffic volumes generated during construction.
- It is recommended that the proponent develops a Traffic Management Plan to be communicated to field crew and delivery drivers prior to arrival on site.
- On-site parking is proposed to accommodate all traffic relating to the development, and the driveway is of sufficient length to accommodate any vehicle queuing without impacting public roads.
- Wellington Road is currently operating at an acceptable level of service and will continue to do so during the construction and operational phases of the development.
- It is recommended that deliveries be scheduled outside of existing peak traffic hours on Wellington road, being 8:00am-9:00am and 4:00pm-6:00pm.
- The observed traffic volumes and projected future traffic on Wellington Road and Basalt Road warrant CHR and AUL turn treatments in accordance with the *Austroads Guide to Road Design, Part 4*.
- The existing intersection of Wellington Road and Basalt Road generally complies with the dimensions for CHR/AUL treatments as prescribed by the Austroads guidelines. Line marking works should be undertaken to meet the requirements.
- With the implementation of the recommendations provided, the development is unlikely to have any significant impacts on the traffic operations of the existing road network.



1 INTRODUCTION

1.1 Project Outline

ACEnergy are proposing to construct a 4.950MVa "micro" solar farm at 47R Wellington Road, Dubbo. Construction works will include site clearing and preparation, construction of internal access roads, installation of PV solar panels and associated equipment, and site landscaping.

1.2 Purpose and Scope

This report has been commissioned by the applicant as part of a DA for the subject site and provides an assessment of the traffic implications of the proposed development on surrounding traffic, transport and local road infrastructure.

This TIA has been prepared in accordance with the RTA Guide to Traffic Generating Developments (2002) and Dubbo Regional Council's Policies & Plans.



2 EXISTING CONDITIONS

2.1 Location and Site

The subject site has an overall area of approximately 180ha and is primarily used for agricultural purposes, with a small residential portion towards the south-eastern corner of the lot. The site is located within the Dubbo Regional Council LGA, on the southern side of Wellington Road (AKA Mitchell Highway, A32) at the intersection with Basalt Road, around 4km south-east of the city of Dubbo.



Source: SIX Maps e-Topo, NSW Spatial Information Exchange, 2019

Figure 1 Site aerial photograph

Entry is gained into the site via an existing driveway off Wellington Road, pictured in Figure 2. At the site frontage, Wellington Road is in good sealed condition with one lane in each direction, sealed shoulders towards the east, and vegetated table drains to both sides.

Lanes are clearly marked, the road is straight and flat, and sight distances when exiting the driveway exceed 300m in both directions. The speed limit on Wellington Road adjacent to the site is 110km/h.





Figure 2 Existing driveway to Wellington Road

Approximately 1km north-west of the driveway, Wellington Road forms a 'T' intersection with Basalt Road. Basalt Road is a local road servicing several residential properties and forms part of the site access for the proposed development.

Basalt Road is in fair sealed condition without line marking. At the intersection, Wellington Road features lane widenings forming a slip lane for eastbound traffic to overtake any right-turning vehicles, as well as a deceleration lane for left-turning vehicles. Sight distances exceed 300m in both directions.



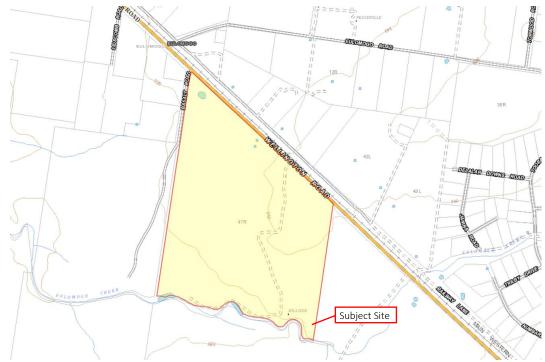
Figure 3 Existing intersection of Wellington Road and Basalt Road



Aerial imagery of the intersection of Basalt Road and Wellington Road has been analysed against the Austroads Guide to Road Design, concluding that the existing intersection generally complies with the recommended lane widths and lengths associated with Channelised Right / Auxiliary Left type turn treatments. The annotated image is provided in Appendix C.

2.2 Existing Traffic Hierarchy

The subject site is bordered by Wellington Road to the north and Basalt Road to the west. Wellington Road forms part of the Mitchell Highway (A32), a classified state road that runs from Bathurst through to the Queensland border at Barringun. Basalt Road is a local road running perpendicular to Wellington Road and servicing several residential properties.



Source: SIX Maps e-Topo, NSW Spatial Information Exchange, 2021

Figure 4 Site road hierarchy

2.3 Traffic Volumes

2.3.1 Wellington Road Traffic

Traffic counts were conducted by Dubbo Regional Council in 2016 on Wellington Road, 250m east of Blueridge Drive. The data obtained is attached in Appendix A.

In order to account for population and traffic growth since 2016, the data has been indexed at a cumulative rate of 5% pa, and the final volumes for the purposes of analysis are given in Table 1 below. The data collection point is located around 2.8km away from the site towards the city of Dubbo, giving a conservatively high estimate of the traffic environment. Volumes are provided in units of vehicle per day (vpd) and vehicles per hour (vph).



Table 1 Summary of existing traffic volumes on Wellington Road

Daily Average (vpd)	Hourly Peak (vph)
9,436	827

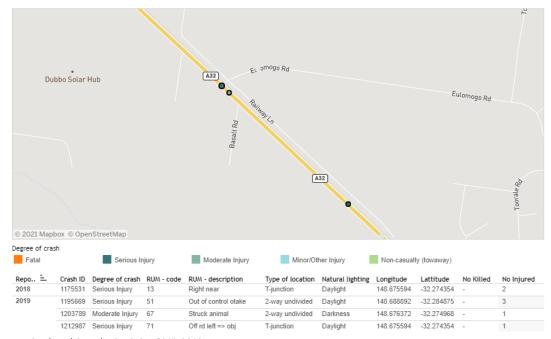
Vehicle rates shown are for movements in both directions.

2.4 Public Transport

Transport for NSW operate a number of weekly train link services that utilise Wellington Road on their routes and pass the subject site.

2.5 Traffic Safety

Traffic accident history of the area has been obtained from the TfNSW website. In the five years between 2015 and 2019, there were four crashes recorded in the vicinity of the subject site, none of which involved the existing site driveway or Basalt Road. Details are provided in Figure 5 below.



Source: Crash and Casualty Statistics, RMS, 2019 $\,$

Figure 5 Accident history map



3 PROPOSED DEVELOPMENT

As outlined in Section 1.1, the proposed development is a 4.950MVa "micro" solar farm, with site works including:

- Site levelling/compaction as required (up to 17ha);
- Installation of security fencing and gates;
- Construction of road and crossing for access track, carpark, unloading area & site access;
- Landscaping;
- Installation of single-axis trackers for PV solar panels;
- Installation of an inverter station container;
- Installation of the DC battery containers;
- Installation of all required cable and cable tray; and
- Installation of an HV switchgear Kiosk.

Traffic impacts have been assessed for two key periods during the life of the project, being the construction phase and the operational phase. The construction phase is expected to span six months, with hours of operation between 7am-7pm Monday — Sunday. Once construction activities have been completed, the development will transition to the operational phase for the remainder of its design life.

3.1 Traffic Generation

3.1.1 Construction Phase

During construction, two main sources for traffic generation are anticipated:

- Field crew travelling to and from the site:
 - A maximum of 50 field crew workers are expected on site during peak construction activities;
 - o Majority of field crew enter the site within one hour of site opening and exit the site within one hour of site closing each day;
 - Mini vans are to be made available to transport crew to and from the site towards Dubbo throughout the peak of construction activities during PV panel installation;
 - Workers who do not utilise the mini van services will drive private vehicles to the site;
 - o From the client's estimates, the maximum number of vehicle movements expected to/from the site during peak activity is 15vpd, or 12vph.



Material deliveries:

- Materials will be collected from Sydney Port and transported to the Wellington central warehouse where they are to be stored until delivery can be made to site;
- Up to 60 total site delivery trips are anticipated throughout the construction period;
- o Major deliveries to site will originate in Wellington, hence will approach the site via Wellington Road from the south-east;
- A maximum of five trucks may access the site on any given day; and
- o The largest delivery vehicle entering the site is a semi-trailer.

It is noted that peak traffic on Wellington Road is currently observed between 8:00am-9:00am and 4:00pm-6:00pm on weekdays. The majority of field crew travelling to and from work should land outside of these peak times, due to the site opening hours outlined in Section 3. It is recommended that deliveries also be scheduled outside of these hours, to minimise impact on through traffic as well as delays to the trucks.

To facilitate the safe and efficient flow of traffic on site during the construction period, it is also recommended that the proponent establishes a Traffic Management Plan to be communicated to field crew and delivery drivers prior to arriving on site.

3.1.2 Operational Phase

Once the development is operational, there will be no permanent staff based on site and therefore no regular site traffic is anticipated. Inspections will be conducted at quarterly intervals and will require one or two private vehicle movements at a time, which is considered to have negligible impact on the existing Wellington Road traffic or the Basalt Road intersection.

Occasionally as the need arises, some additional vehicle movements including semi-trailers may be required for repair and maintenance work. This is expected to be very rare (less than once per year) and the traffic trips during these times will be far less than the volumes generated during the construction phase.

3.2 Parking Provision Assessment

3.2.1 Construction Phase

During construction, the contractor shall provide a designated, clearly signposted area for vehicle parking and delivery unloading. The parking and unloading zones are to be located within the area of works as indicated in the site plans, such that any vehicle queuing may occur on the site driveway without impacting traffic on Wellington Road or Basalt Road.

3.2.2 Operational Phase

The completed development will include a car parking area with dimensions of 10m x 40m, capable of accommodating around 16 private vehicles or two semi-trailers. This is considered more than sufficient for the traffic expected as outlined in Section 3.1.2.



3.3 Wellington Road Analysis

Based on Section 3.1, the peak traffic generated by the development will be an absolute maximum of 55vph at any given time, and on average will be much less. With an existing traffic volume of 827vph on Wellington Road, and peak project traffic of 17vph (12 light vehicles + 5 heavy vehicles), this gives a projected maximum of 844vph on Wellington Road. This is a conservative estimate used for the purpose of analysis, as generally peak construction traffic would not overlap with peak through traffic times, and trucks are highly unlikely to arrive all within one hour.

The RTA Guide to Traffic Generating Developments provides guidelines for traffic flows on midblock roads and recommends that a minimum Level of Service C is achieved in peak traffic.

Hence from the available traffic counts the following Levels of Service (LoS) apply:

• Existing traffic: 413vph per direction, LoS = B; and

• Proposed traffic: 422vph per direction, LoS = B.

Therefore, no upgrades are required to Wellington Road.

3.4 Proposed Site Access

The proposed development will require a new driveway onto Basalt Road, as illustrated in the site plans provided in Appendix B. This driveway will be in addition to the existing residential driveway with the aim of separating the two land uses, primarily for the safety and comfort of the residents of the existing dwelling. A separate driveway eliminates potential traffic conflicts between residents and site traffic; as well as preventing any damage to the residential access way from heavy vehicles and plant.

It is therefore considered that an additional, separate access point from Basalt Road to the proposed development is appropriate in this instance.

3.4.1 Intersection Analysis: Wellington Road & Basalt Road

From Sections 3.1 and 3.2, peak traffic flows are summarised below:

Table 2 Peak hour turning traffic volumes

Existing traffic total	Existing traffic eastbound	Existing traffic westbound	Proposed left turning traffic (max) ²	Traffic volume parameter Q _{ML} ³	Proposed right turning traffic (max) ²	Traffic volume parameter Q _{MR} ³
827	414	413	17	413	17	827

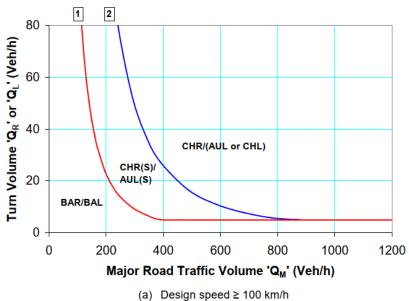
^{1.} All figures given in vehicles per hour (vph)

^{2.} Maximum left and right turning traffic scenarios do not coincide

^{3.} Traffic volume parameters Q_{ML} and Q_{MR} have been calculated as prescribed by Figure A 11 of the Guide to Road Design Part 4, Austroads, 2017



With consideration to the heavy vehicles accessing the site regularly during the construction period, the volumes summarised in Table 2, and the warrants illustrated in Figure 6 below; the expected traffic conditions warrant a Channelised Right (CHR) / Auxiliary Left (AUL) type arrangement at the intersection of Wellington Road and Basalt Road.



Source: Figure A 10, Guide to Road Design Part 4, Austroads, 2017

Figure 6 Warrants for turn treatments at unsignalised intersections

As outlined in Section 2.1, the existing intersection already satisfies the CHR/AUL treatments in terms of lane widths and lengths of storage, tapers, and deceleration. It is recommended the proponent undertake line marking works to bring the intersection to compliance with the Austroads guidelines.

In accordance with Figure A13 of the Austroads Guide to Road Design Part 4A, the minimum safe intersection site distance for trucks at a T-intersection with a speed limit of 110km/h is 302m. Due to the straight, flat nature of Wellington Road at the intersection, actual site distances far exceed 302m to both directions.

3.5 Cumulative Impacts

There are no known developments planned in the vicinity of the subject site that could contribute to significant cumulative impact.



4 CONCLUSION

The subject site is located 4km south-east of Dubbo and has an area of approximately 180 ha. The majority of the site is currently used for agricultural purposes, with a small residential portion towards the south of the site. The existing driveway faces Wellington Road.

The proposed development is a 4.950MVa "micro" solar farm, with construction works including site clearing and preparation, internal access roads, installation of PV solar panels and associated equipment, and site landscaping.

The following conclusions have been drawn as a result of this assessment:

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- With the implementation of the recommendations provided, the development is unlikely to have any significant impacts on the traffic operations of the existing road network.



Should you require further information or assistance, please contact the undersigned.

Yours faithfully BARNSON PTY LTD

Eden Gliksman

B.Eng (Hons)

CIVIL ENGINEER



Appendix A - Wellington Road Traffic Counts

Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-225

Site:

423.0F

Description: Filter time:

Mitchell Hwy 110/70 zone change (East of Blueridge development) 0:00 Sunday, 17 January 2016 => 11:40 Wednesday, 3 February 2016

Scheme:

Vehicle classification (AustRoads94)

Filter:

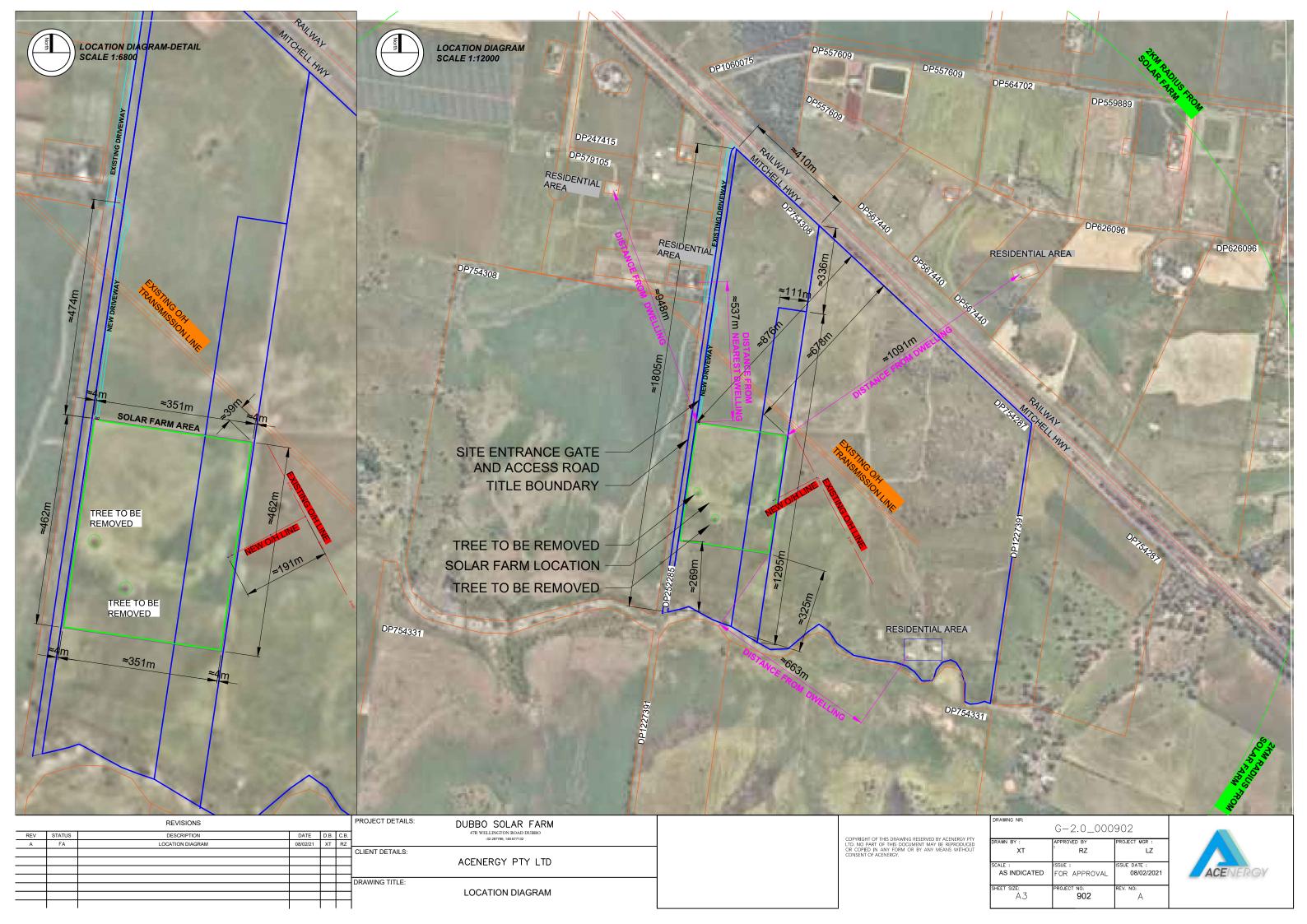
Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

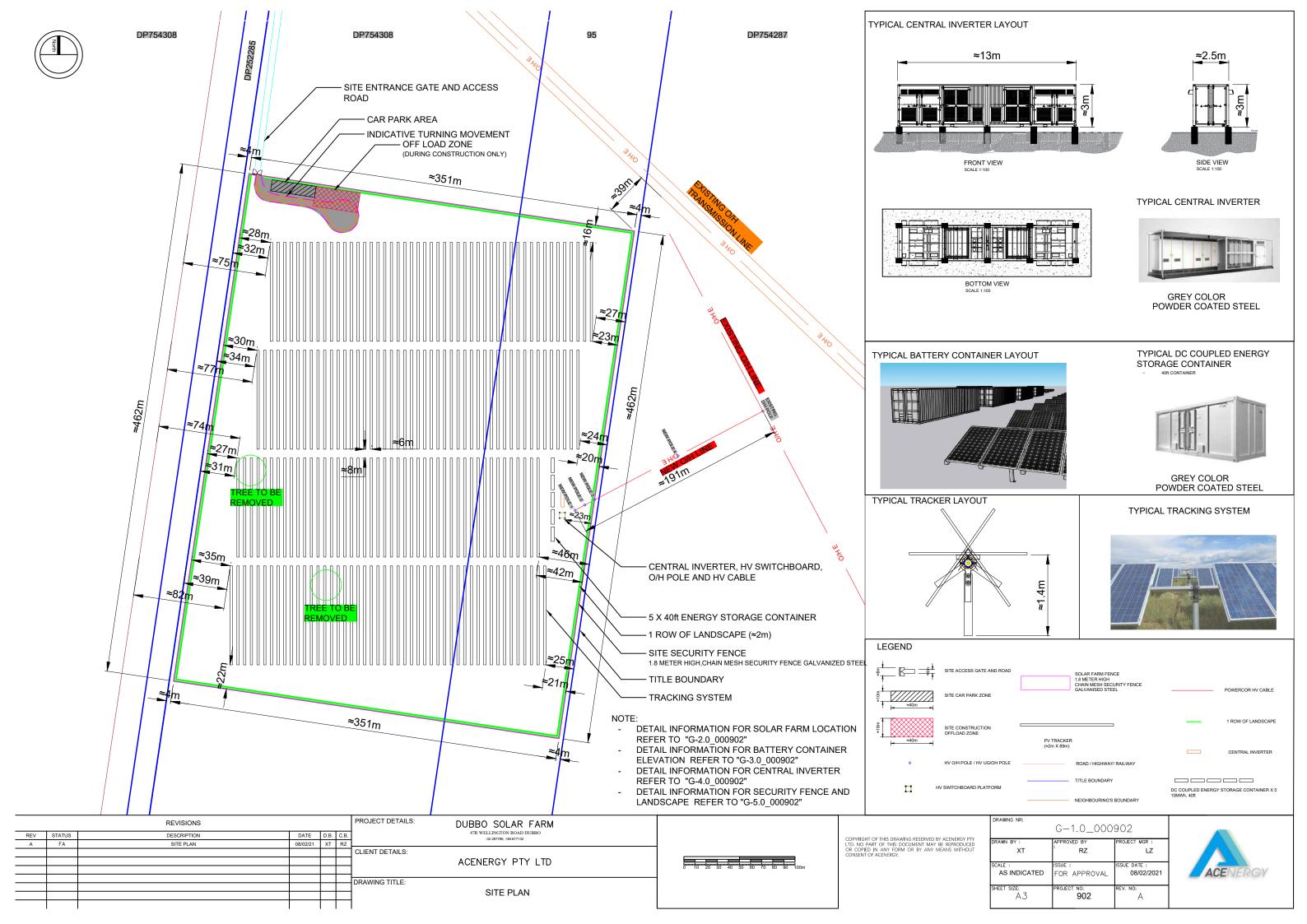
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Average 1 - 5	s 1 - 7
Hour							1		
0000-0100	30.7	33.0	28.7	37.0	32.0	48.0	36.7	31.9	34.5
0100-0200	11.7	20.7	18.7	24.0	25.0	23.0	31.3	19.3	21.7
0200-0300	11.7	15.3	18.7	19.5	24.0	24,5	17.7	17.2	18.1
0300-0400	24.7	18.0	24.7	21.0	30.5	23.5	15.3	23.5	22.1
0400-0500	34.0	34.7	36.3	35.5	38.0	27.5	15.3	35.5	31.3
0500-0600	102.0	71.7	107.0	89.0	102.5	54.5	33.3	94.2	79.7
0600-0700	254.3	202.0	231.3	250.0	240.0	129.5	65.7	234.1	194.4
0700-0800	413.0	341.7	288.3	436.5	415.5	189.0	118.0	371.8	309.2
0800-0900	593.0<	476.0<	401.3<	613.0<	648.0<	314.5	210.3	533.3<	455.2<
0900-1000	446.0	396.7	300.3	456.0	497.0	413.5	332.0	410.4	397.7
1000-1100	420.0	391.3	283.3	450.0	439.0	500.0	393.0	389.4	402.3
1100-1200	361.7	391.0	268.0	428.0	428.5	526.0<	428.7<	367.3	395.2
1200-1300	411.3	370.0	382.5	435.5	433.5	528.0<	426.0	403.9	422.4
1300-1400	391.7	374.0	398.0	423.0	490.0	495.5	420.0	409.9	421.8
1400-1500	435.0	382.7	441.5	465.0	489.5	443.0	424.7	437.1	435.6
1500-1600	499.0	427.3	451.5	530.5	591.5	417.5	433.3<	493.8	474.2
1600-1700	539.7	493.0	566.0	587.0	622.5<	397.0	413.0	554.1	510.7
1700-1800	607.7<	535.3<	607.5<	637.0<	611.5	410.0	345.3	595.1<	529.2<
1800-1900	367.3	331.7	343.5	414.5	433.5	303.0	261.7	373 3	345.4
1900-2000	222.0	202.0	223.5	260.5	274.5	228.5	171.7	232.4	221.2
2000-2100	162.7	163.3	154.5	185.0	171 . 0	169.0	166.7	166.6	166.9
2100-2200	105.0	117.0	120.0	127.0	165.0	128.0	112.7	124.2	122.6
2200-2300	88.7	77.3	88.5	76.5	102.5	92.0	75.0	86.1	84.8
2300-2400	52.0	51.7	41.5	57.0	88.0	67.0	48.3	57.0	56.6
Totals									
0700-1900	5485.3	4910.7	4731.8	5876.0	6100.0	4937.0	4206.0	5339.4	5098.7
0600-2200	6229.3	5595.0	5461.2	6698.5	6950.5	5592.0	4722.7	6096.6	5803.8
0600-0000	6370.0	5724.0	5591.2	6832.0	7141.0	5751.0	4846.0	6239.7	5945.2
0000-0000	6584.7	5917.3	5825.2	7058.0	7393.0	5952.0	4995.7	6461.4	6152.6
AM Peak	0800	0800	0800	0800	0800	1100	1100		
	593.0	476.0	401.3	613.0	648.0	526.0	428.7		
PM Peak	1700	1700	1700	1700	1600	1200	1500		
	607.7	535.3	607.5	637.0	622.5	528.0	433.3		

^{* -} No data.



Appendix B - Site Plans







Appendix C - Existing Intersection Plan







BARNSON PTY LTD

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ACENERGY PROPOSED SOLAR FARM 47R WELLINGTON ROAD

DUBBO NSW 2830 Drawing Title: **EXISTING INTERSECTION PLAN**

WELLINGTON ROAD AND BASALT ROAD

Rev Date Amendment 0 10.03.2021 ISSUED TO CLIENT

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