Spotto CONSULTING

people-oriented traffic and transport solutions

Traffic Impact Assessment

Solar Project

1268 Oxley Bridge Road
Uranquinty NSW

December 2021

Prepared by:

Spotto CONSULTING

For:

Bison Energy

Ref	Version	Date	Revision Details	Author
P0128	A	02 March 2021	Draft	SWS
	B	29 November 2021	Draft	SWS
	C	07 December 2021	Final	SWS

CONTENTS

1 INTRODUCTION

Spotto Consulting have been engaged by Bison Energy to complete a Traffic Impact Assessment. The study is in response to a proposed development at Lot 43 DP754565, on Oxley Bridge Road, Uranquinty. The development involves construction of a solar facility, with 12,400 solar photovoltaic panels with a total capacity of 5MW, mounted in arrays on frames, cabling from the panels to inverters and transformers with a connection into the local electricity network, ancillary facilities including sheds, staff office/amenities and parking plus perimeter fencing and an internal road network.

The purpose of the assessment is to review the existing conditions in the vicinity of the site, including traffic, parking and servicing, as well as the performance of the surrounding network. An evaluation is then required of the traffic and parking requirements for the proposed development, and the impacts on the surrounding road network.

The assessment concluded that:

- Traffic volume data and assessment of key roads and intersections in the vicinity of the site (including Oxley Bridge Road, Key Street, Ryan Street and the Olympic Highway as well as intersections) shows that they currently operate with low volumes of traffic and good levels of service;
- The proposed development will generate traffic of five vehicle trips per hour in the peak hour and 14 vehicle trips per day during construction, as well as one vehicle trip per hour and two vehicle trips per day during operation, which will not have a significant impact on the performance of the surrounding road network (midblock or intersection);
- Adequate provision has been made for entry and exit to the site for vehicles up to and including a 19m semi-trailer, with all vehicles able to enter and exit the site in a forward direction;
- Space is available off-street for vehicles to travel through the site in a forward direction, and to park safely clear of through traffic;
- Adequate provision has been made for staff, servicing and delivery vehicles; and
- There is no significant impact of the proposed development on pedestrians and cyclists.

The assessment recommended that:

- Construction traffic should be managed through the development and implementation of a Construction Traffic Management Plan (CTMP) written in accordance with the requirements of *Australian Standard AS1742.3 Manual of Uniform Traffic Control Devices – Traffic Control for Works on Roads* and the *RMS (TfNSW) Traffic Control at Work Sites – Technical Manual*; and
- The primary access into the site from Oxley Bridge Road (approximately 1.0km south of Harveys Road) be designed as a typical rural property access (as detailed in Section 7.2.3 of the *Austroads Guide to Road Design Part 4: Intersections and Crossings – General* and shown in RMS (TfNSW) Model Drawing – Typical Rural Property Access Standards (Figure 2 – Articulated Vehicles).

2 EXISTING CONDITIONS

2.1 Site

The site is located on Oxley Bridge Road, approximately 2km south-east of the township of Uranquinty, as shown in Figure 2-1.

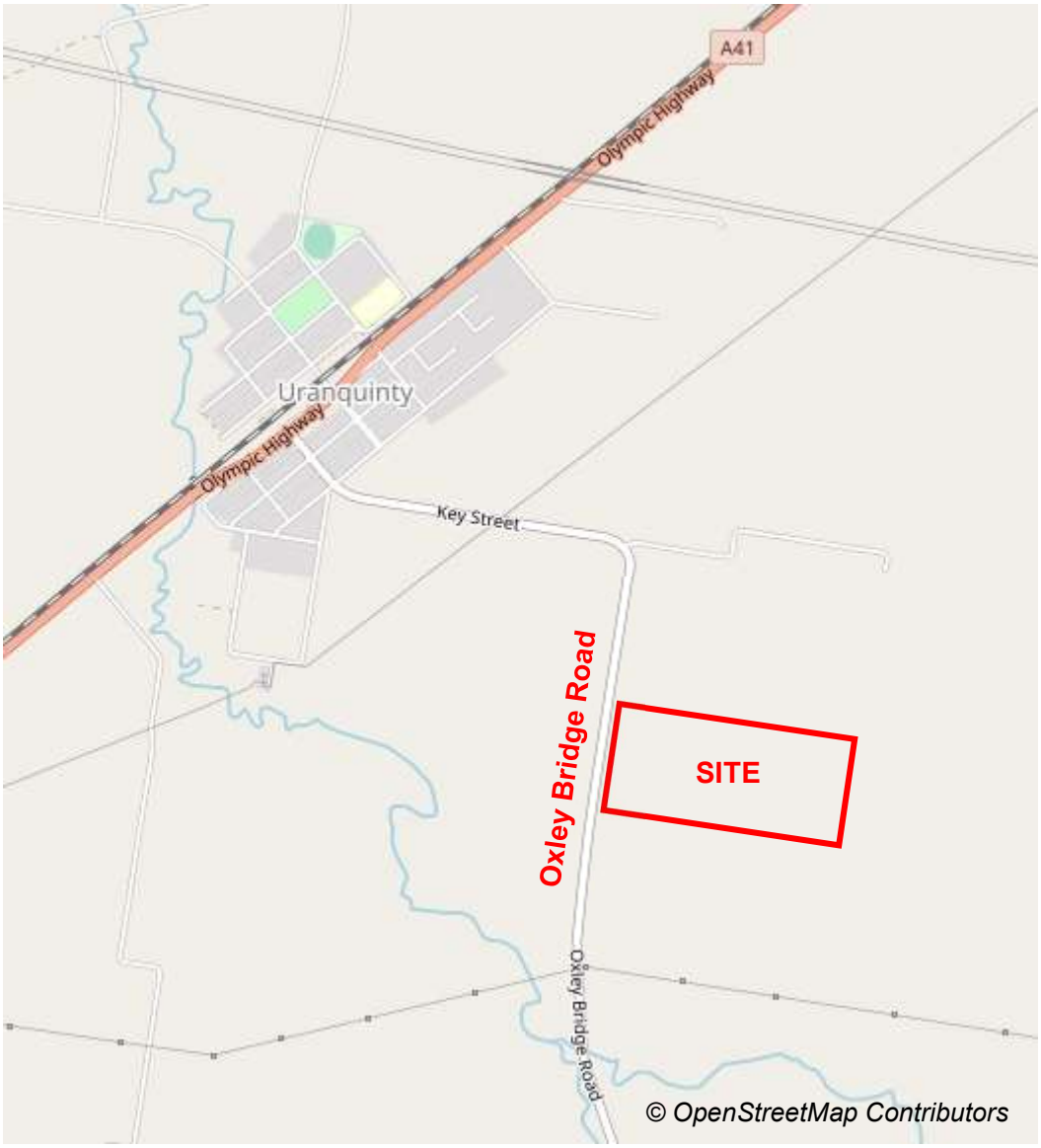


Figure 2-1: Locality Plan

The site's address is listed as 1268 Oxley Bridge Road, Uranquinty. Comprising two lots (Lots 24 and 43 DP754565), it has a total area of approximately 48.3 hectares. The site is bounded by Oxley Bridge Road to the west, with private land to the north, east and south.

Vehicular access to the site is available via farm gate access onto Oxley Bridge Road. The site is currently used for agricultural purposes.

2.2 Surrounding Land Use

The site and immediate surrounds are generally zoned RU1 Primary Production under the Wagga Wagga Local Environmental Plan 2010 (as shown in Figure 2-2, below). Surrounding land uses are predominantly rural and agricultural, with some housing.

Land directly opposite the site is zoned SP2 Infrastructure, and is occupied by a wastewater treatment plant.

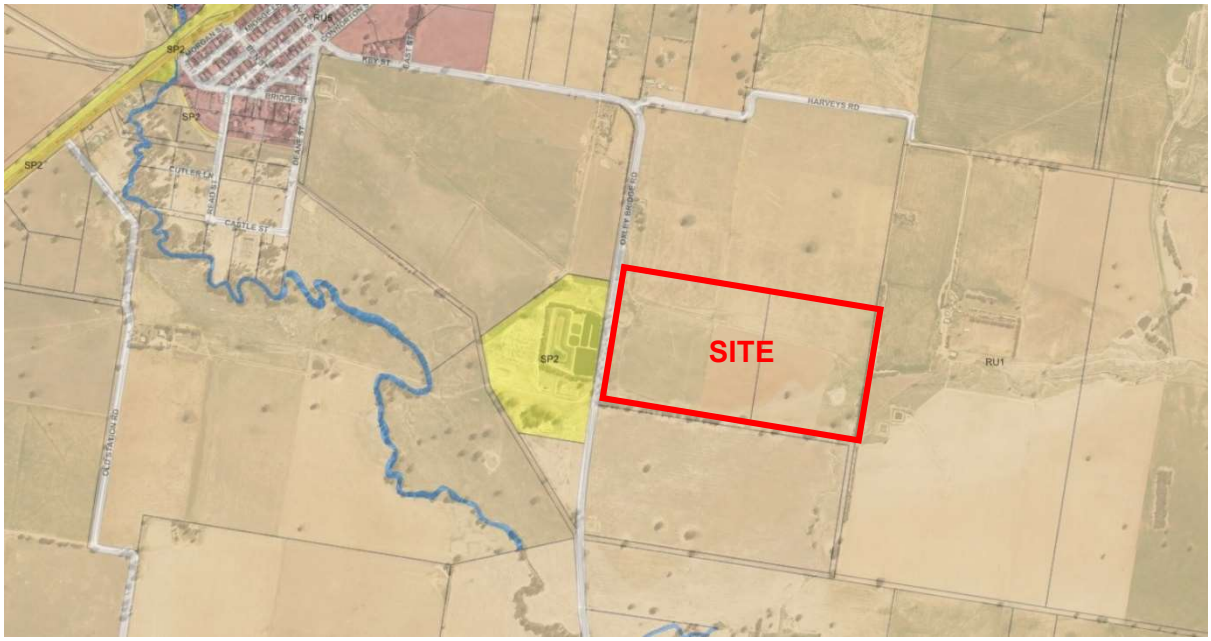


Figure 2-2: Land Zoning (Source: Wagga Wagga LEP 2010)

2.3 Consultation

In preparing this report, consultation has been undertaken with officers from the City of Wagga Wagga and Transport for NSW (TfNSW). Spotto Consulting appreciates the opportunity to discuss key issues relating to the local transport network with these officers, and acknowledges the insights gained through this consultation.

2.4 Road Network

2.4.1 Oxley Bridge Road

Oxley Bridge Road runs for a length of roughly 14km between East Street in Uranquinty to Holbrook Road at Maxwell. In the vicinity of the site, it is a local road under the control of the City of Wagga Wagga, and its role balances through movement with direct property access.

In the vicinity of the site, Oxley Bridge Road is a two-lane, two-way rural sealed road that runs roughly north/south and lies west of the site. Contained within a 20m wide road reserve, the main carriageway consists of a 5.5m-wide seal with no linemarking. No pedestrian or cyclist facilities are present, and there is no street lighting. The speed limit is the default rural speed limit of 100km/h.

Figure 2-3: Looking south along Oxley Bridge Road, with the site on the left hand side

Figure 2-4: Looking north along Oxley Bridge Road, with the site on the right hand side

2.4.2 Ryan Street and Key Street

Ryan Street and Key Street run for a length of approximately 600m, from the Olympic Highway to East Street in Uranquinty. Together with Oxley Bridge Road, they form part of a route connecting the Olympic Highway in Uranquinty to Holbrook Road in Maxwell, under the control of the City of Wagga Wagga. At its western end, the roads provide direct access to properties within the township of Uranquinty, while further east it transitions to a rural road balancing through movement with direct property access.

Ryan Street runs for a length of approximately 250m between the Olympic Highway and Connorton Street. Contained within a 30m-wide road reserve, the main carriageway is 13m wide and defined by upright kerb and gutter. It is an urban road, favouring direct property access while providing through movement. Overhead power and street lighting is present, and the speed limit is the default urban speed limit of 50km/h.

Key Street runs for a length of approximately 350m between Connorton Street and East Street. Contained within an easement of varying width (minimum 17m), the main carriageway is a minimum of 5.5m wide with gravel shoulders and table drains. It changes in nature from a fringe urban road to a rural road, with the speed limit changing from 50km/h to 100km/h approximately 100m west of East Street.

Figure 2-5: Looking south-east along Ryan Street

Figure 2-6: Looking west along Key Street from the intersection with East Street

2.4.3 Olympic Highway

The Olympic Highway is a significant north-south route. Commencing at the Hume Highway just north of Albury, it runs northwards through Uranquinty, Wagga Wagga, Young and Cowra before intersecting with the Great Western Highway in Bathurst. Where it passes through Uranquinty, the Olympic Highway is also known as Morgan Street. Signposted as the A41, it is a State Road under the control of Transport for NSW (TfNSW), and is suitable for travel by vehicles up to and including B-Doubles. The highway's role favours through movement over property access.

In the vicinity of its intersection with Ryan Street in Uranquinty, the Olympic Highway is a two-lane, two-way sealed road that runs roughly north-east/south-west, and lies approximately 2km north-west of the site. Contained within a road reserve of varying width (minimum 30m), the main carriageway has a pavement width of 15.5m, with one 3.5m-wide through lane in each direction plus sealed shoulders of varying width (2.0m on the western side and 6.5m on the eastern side) facilitating vehicle turning at intersections as well as on-street parking. A 1.2m-wide concrete footpath is located on the eastern side of the road, with overhead power and street lighting present. The speed limit is the default urban speed limit of 50km/h, with a 40km/h school zone operating to the north.

Figure 2-7: Looking south along Olympic Highway, with the intersection with Ryan Street on the left hand side

Figure 2-8: Looking north along Olympic Highway

2.4.4 Intersections

The route between the Olympic Highway and the site traverses a number of intersections, as shown in Figure 2-9 and Figure 2-10, below.

Figure 2-9: Site access route intersections (Source: Wagga Intramaps)

Figure 2-10: Site access route intersections (Source: Wagga Intramaps)

Priority is given to vehicles on the Olympic Highway at Ryan Street. East and south of here, priority is given to through vehicles travelling along Ryan Street, Key Street and Oxley Bridge Road. Intersections within the township of Uranquinty generally have Give Way signage and linemarking, while in the rural areas intersections operate under priority rules.

2.5 Existing Traffic Conditions

The following data was sourced for this assessment:

- Turning counts undertaken across the morning and evening peak periods on Tuesday 16 February 2021 at the intersection of the Olympic Highway and Ryan Street, Uranquinty;
- Summary data for historical traffic counts undertaken in 2013 by Council Key Street and Oxley Bridge Road (AADT values only); and
- Transport for NSW Traffic Volume Viewer application, which includes data on the Olympic Highway at The Rock and Moorong (south and north of Uranquinty, respectively) from 2006 and 2010.

No traffic volume data was available for Oxley Bridge Road adjacent to the site, however as this is a local road with limited through movements, it is possible to estimate traffic volumes. Traffic generation levels are typically determined by reference to published standards such as the *RTA (TfNSW) Guide to Traffic Generating Developments*, with the amount of traffic generated depending on the type and scale of land use.

In the case of Oxley Bridge Road, the predominant traffic-generating land use is rural residential dwellings. The total traffic can be determined by counting the total number of dwellings on or near the road, and assuming each dwelling will generate the following traffic (based on figures for residential dwellings in regional areas identified in *TfNSW Technical Direction TDT2013/04a Guide to Traffic Generating Developments – Updated Traffic Surveys*):

- Daily vehicle trips: 7.4 trips per dwelling per day;
- Weekday average morning peak hour vehicle trips: 0.71 trips per dwelling per hour; and
- Weekday average evening peak hour vehicle trips: 0.78 trips per dwelling per hour.

As an example of the use of this data, a total of 16 dwellings have been identified that will use Key Street and Oxley Bridge Road between Connorton Street and Wattle Hills Road/Goldsmiths Road as their primary access route. It is estimated that this would result in a total of 118 vehicles per day on Key Street east of Connorton Street. The 2013 AADT data from Council noted 107 vehicles per day at this location, indicating the average of 7.4 trips per dwelling per day provides a reasonable estimate of the total traffic volumes.

The following dwelling numbers have been identified from aerial photography and site inspections as likely to travel past or near the site:

- Oxley Bridge Road (Harveys Road to Wattle Hills Road/Goldsmiths Road) – 11 dwellings;
- Key Street and Oxley Bridge Road (Connorton Street to Wattle Hills Road/Goldsmiths Road) – 16 dwellings; and
- Ryan Street (east of Olympic Highway) – 52 dwellings.

It is noted that while there are other dwellings on these roads, due to their location, they are likely to use alternative routes. For example, dwellings on Oxley Bridge Road further east are likely to use the shorter and quicker route of Holbrook Road to access areas to the north and south, rather than the Olympic Highway.

A summary of existing traffic volumes on key sections of local roads in the vicinity of the site is shown in Table 2-1, below.

Table 2-1: Midblock traffic data – Local Roads

Location	Dwellings	Daily	AM Peak	PM Peak
		Veh/d	Veh/h	Veh/h
Oxley Bridge Road (south of Harveys Rd)	11	81	8	9
Key Street (east of Connorton St)	16	118	11	12
Ryan Street (east of Olympic Hwy)	52	385	37	41

Traffic volume data on the Olympic Highway in Uranquinty from the turning movement counts can be compared to the data from the RMS Traffic Volume Viewer. For the purposes of this assessment, the traffic volume on the Olympic Highway was assumed to grow at 2% per annum, allowing a comparison to be made between the 2021 turning movement counts and the historical data from the RMS. A summary of the data from these sources is provided in Table 2-2 below.

Table 2-2: Midblock traffic data – Olympic Highway

Location	Daily Traffic Volume Veh/d
50m East of Mangoplah Road, The Rock (RMS Traffic Volume Viewer)	3,825
Northbound	1,925
Southbound	1,900
North of Ryan Street, Uranquinty (Turning Movement Counts)	4,570
Northbound	2,290
Southbound	2,280
180m North of Red Hill Road, Moorong (RMS Traffic Volume Viewer)	5,240
Northbound	2,635
Southbound	2,605

Traffic volumes generally increase along the Olympic Highway closer to Wagga Wagga, with the volume at Uranquinty falling midway between the volume at sites to the north and south. This indicates the turning movement counts represent a reasonable estimate of traffic volumes on the Olympic Highway at Uranquinty.

Based on this data and analysis, a summary of the midblock data for key roads in the vicinity of the site in 2021 is provided in Table 2-3 below.

Table 2-3: Midblock traffic data - 2021

Location	Daily	AM Peak	PM Peak
	Veh/d	Veh/h	Veh/h
Oxley Bridge Road (South of Harveys Rd)	81	8	9
Key Street (East of Connorton St)	118	11	12
Ryan Street (East of Olympic Hwy)	385	37	41
Olympic Highway (North of Ryan St)	4,570	333	399

2.6 Crash Data

Data on crashes was obtained from the Transport for NSW Centre for Road Safety Interactive Crash Statistics database. In the most recent five year period for which data is available, the database showed that there were no crashes along any of the local roads in the vicinity of the site (including at the intersection with the Olympic Highway).

2.7 Parking Supply and Demand

No vehicles were observed parked on-street on Oxley Bridge Road in the vicinity of the site during data collection and site inspections. This is as expected for rural areas, where vehicles are typically parked off-street.

2.8 Public Transport

Uranquinty is serviced by an on-demand bus service that provides connections to Wagga Wagga and Albury. From either of these destinations, bus, coach and rail services may be accessed (providing access to localised services as well as to more distant destinations such as Sydney and Melbourne).

2.9 Pedestrians and Cyclists

There are no dedicated cyclist or pedestrian facilities in the vicinity of the site, which is common in rural areas.

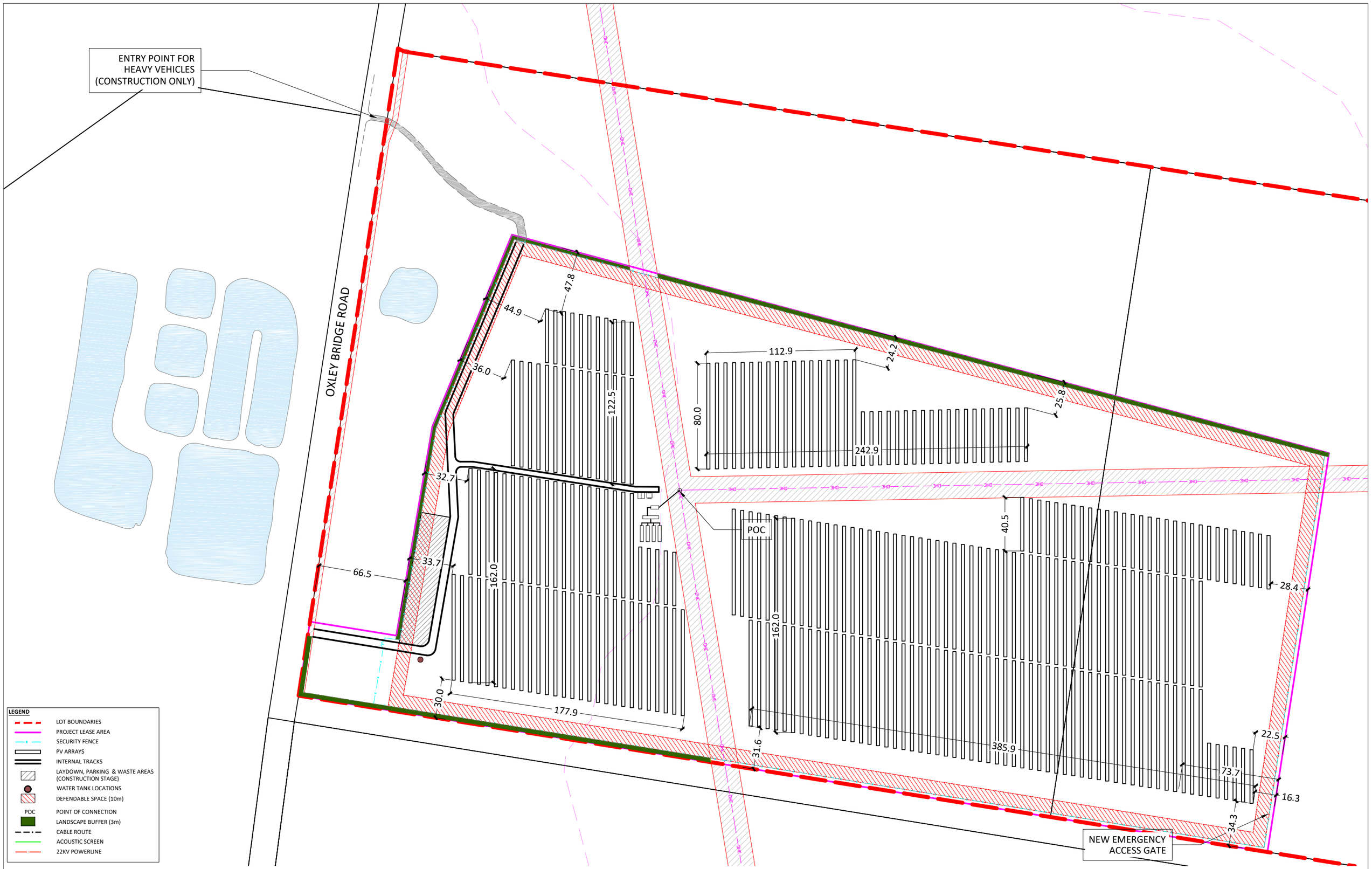
3 PROPOSED DEVELOPMENT

The proposed development is a solar facility capable of collecting solar energy and converting it into electricity to be fed into the local electricity network.

The proposed development consists of the following components:

- Access to the site via an upgraded property access driveway from Oxley Bridge Road (approximately 1.0km south of Harveys Road), with alternative access (during construction only) available from a secondary access from Oxley Bridge Road (approximately 0.7km south of Harveys Road);
- 14,200 solar photovoltaic (PV) panels with a total capacity of 5MW, covering approximately 23 hectares of the site, mounted in arrays on frames capable of adjusting in order to track the sun and maximise solar energy collection efficiency;
- Cabling from PV panels to inverters and transformers, with a connection into the local electricity network;
- Perimeter fencing and internal access road network; and
- Ancillary facilities including sheds, parking, office/staff amenities and water tanks.

Plans of the proposed development are included below.



proposal
Uranquinty 5MW Solar Farm

drawing
Overall Site Layout - 2

scale
1:2500 @ A3

50 0 50 100 150 200 250
SCALE IN METRES
1:2500

revision
S5/DA1

date
APR 2021

habitat planning

4 IMPACT OF PROPOSED DEVELOPMENT

4.1 Traffic Generation and Impact

4.1.1 Traffic Generation During Construction

It is anticipated that construction of the proposed development will take six to nine months from site establishment to completion of works, with works being undertaken between Monday to Saturday. During this period, traffic volumes will vary depending on the scale and type of work being undertaken, however peak traffic volumes (during months 2-3 when the bulk of solar panels are delivered) are anticipated to be:

- Light vehicles – eight vehicle trips per day, primarily for construction workers who will typically arrive in the morning (four vehicles inbound) and depart in the afternoon (four vehicles outbound); and
- Medium and heavy vehicles – six vehicle trips per day, primarily for delivery of plant and equipment associated with the solar facility (eg. Photovoltaic panels and frame materials), but also including some construction workers who will arrive by bus. These vehicles will generally arrive throughout the day (three vehicles inbound plus three vehicles outbound).

It is anticipated that construction activities at the site will generate the following additional traffic:

- 14 vehicles per day, a maximum of six days per week, resulting in 84 vehicles per week;
- Five vehicles per hour in the morning peak period (four light plus one heavy), travelling inbound to the site; and
- Five vehicles per hour in the afternoon peak period (four light plus one heavy), travelling outbound from the site.

Staff and construction traffic will generally travel between Wagga Wagga and the site via the Olympic Highway and Ryan Street/Key Street/Oxley Bridge Road. This should be managed through the development and implementation of a Construction Traffic Management Plan (CTMP). The CTMP should be written in accordance with the requirements of *Australian Standard AS1742.3 Manual of Uniform Traffic Control Devices – Traffic Control for Works on Roads* and the *RMS (TfNSW) Traffic Control at Work Sites – Technical Manual*.

It is anticipated that the majority of deliveries will occur using rigid trucks and semi-trailers, although some deliveries of specialised or heavy equipment may require larger vehicles (which should be managed in accordance with the CTMP).

4.1.2 Traffic Generation During Operation

The principal traffic generated during operation of the site would be movement of staff in light vehicles to and from the site. Vehicles will generally travel between Wagga Wagga and the site via the Olympic Highway and Ryan Street/Key Street/Oxley Bridge Road. There may also be occasional large vehicles delivering parts, plant or equipment, however these will be much less frequent.

No more than two staff would typically be present on-site for activities such as monitoring, inspection and maintenance. Assuming both staff members travel in one vehicle, it is anticipated that operational activities will generate the following additional traffic:

- Two vehicle trips per day, a maximum of three days per week, resulting in six vehicles per week;
- One vehicle per hour in the morning peak period, travelling inbound to the site; and
- One vehicle per hour in the afternoon peak period, travelling outbound from the site.

As with construction, it is anticipated that deliveries will occur using vehicles up to and including 19m semi-trailers. Some deliveries of specialised or heavy equipment may require larger vehicles, however all deliveries are expected to be infrequent, and should be managed using appropriate traffic management planning.

4.1.3 Traffic Impact and Management

Based on the traffic generation detailed in Section 4.1.1 for construction, and Section 4.1.2 for operation, a summary of the midblock data for key roads in the vicinity of the site is provided in Table 4-1 (for construction), and Table 4-2 (for operation), below.

Table 4-1: Midblock traffic data – With proposed development (Construction)

Location	Daily	AM Peak	PM Peak
	Veh/d	Veh/h	Veh/h
Oxley Bridge Road (South of Harveys Rd)			
Existing	81	8	9
With proposed development	95	13	14
Key Street (East of Connorton St)			
Existing	118	11	12
With proposed development	132	16	17
Ryan Street (East of Olympic Hwy)			
Existing	385	37	41
With proposed development	399	42	46
Olympic Highway (North of Ryan St)			
Existing	4,570	333	399
With proposed development	4,584	338	404

Table 4-2: Midblock traffic data – With proposed development (Operation)

Location	Daily	AM Peak	PM Peak
	Veh/d	Veh/h	Veh/h
Oxley Bridge Road (South of Harveys Rd)			
Existing	81	8	9
With proposed development	83	9	10
Key Street (East of Connorton St)			
Existing	118	11	12
With proposed development	120	12	13
Ryan Street (East of Olympic Hwy)			
Existing	385	37	41
With proposed development	387	38	42
Olympic Highway (North of Ryan St)			
Existing	4,570	333	399
With proposed development	4,572	334	400

Table 4-1 and Table 4-2 demonstrate that the additional traffic generated during construction and operation of the proposed development will have a negligible impact on local roads in the vicinity of the site. The impact on the Olympic Highway is also low, being less than 2% in both AM and PM peak periods, and across the day, during both construction and operation.

As vehicles travel further throughout the network, traffic generated by the proposed development becomes more dispersed, and hence has a lower net impact on other roads. Hence if the impact on roads and intersections in the vicinity of the site is within acceptable limits, then beyond these roads the impact will be even lower.

In terms of the preparation of the CTMP, the following key points should be noted:

- Construction traffic should be directed to travel to and from the site via the Olympic Highway and Ryan Street/Key Street/Oxley Bridge Road, with traffic (particularly heavy vehicles) discouraged from using Oxley Bridge Road south of the site;
- The left turn from the Olympic Highway into Ryan Street and the right turn from Ryan Street into the Olympic Highway are adequately dimensioned for the majority of vehicles anticipated during construction;
- Signage and controls should be reinforced at intersections along the route;
- Attention should be paid to the bend in Oxley Bridge Road at the intersection with Harveys Road – given the radius of curvature and width of pavement advisory or regulatory speed controls should be established; and
- Attention should be paid to the approach to the site from the north along Oxley Bridge Road – a crest in the road is located on this section of the road, although it is approximately 600m north of the primary (southern) site access and 300m north of the secondary (northern) site access.

It is concluded that there will be no significant impact on roads in the vicinity of the site or further afield during the operation of the proposed development, and that impacts from construction can be appropriately managed through the development and implementation of an appropriate CTMP.

4.2 Site Access

Primary access into the site is proposed to be from Oxley Bridge Road, approximately 1.0km south of Harveys Road. Alternative access (to be used for entry only, and only during construction) is also proposed from a secondary access from Oxley Bridge Road (approximately 0.7km south of Harveys Road).

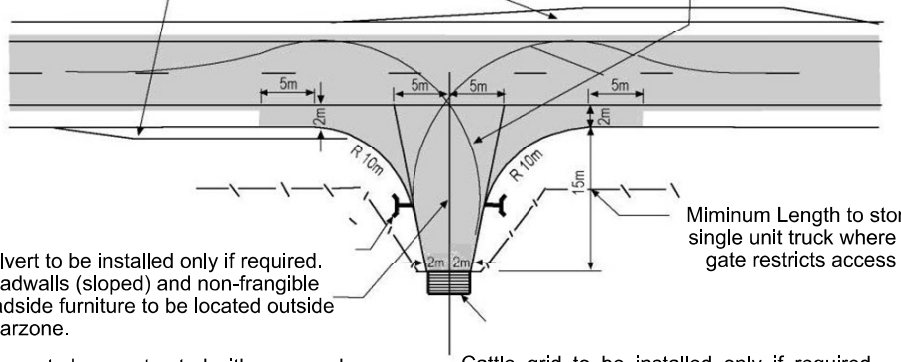
Sight distance along Oxley Bridge Road is excellent in both directions at both access points, exceeding the minimum SISD of 248m for a vehicle travelling at 100km/h under the *Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections* (Table 3.2). It is recommended that the primary access be designed as a typical rural property access, capable of accommodating vehicles up to and including 19m semi-trailers, in line with the requirements of Section 7.2.3 of the *Austroads Guide to Road Design Part 4: Intersections and Crossings – General*. An example of this is shown in the RMS (TfNSW) Model Drawing – Typical Rural Property Access Standards (Figure 2 – Articulated Vehicles), a copy of which is included below.

Typical Rural Property Access Standards

Access to be located where access driveway sight distance is available
Refer to AS2890.1 Table below

OPTION
Provide laybys on departure side of property access to be used as school bus stop/mail service.

Outside front wheel path
19.0m semi-trailer
turning path - R15



Miminum Length to store single unit truck where a gate restricts access

Culvert to be installed only if required. Headwalls (sloped) and non-frangible roadside furniture to be located outside clearzone.

Access to be constructed with approved compacted roadbase material and sealed as per Council specifications and requirements.

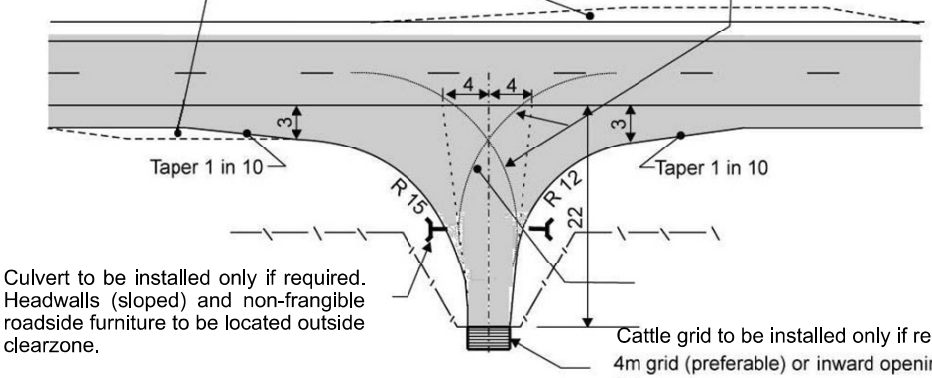
Cattle grid to be installed only if required. An inward opening 3.6m gate set back 15m from edge line is an alternative if access point is to be used by single unit vehicles 12.5m long or less.

1. Single Unit Truck

Access to be located where accesss driveway sight distance is available
Refer to AS2890.1 Table below

OPTION
Provide laybys on departure side of property access to be used as school bus stop/mail service.
The additional area should be sealed.

Outside front wheel path
19.0m articulated vehicle
turning path - R15



Culvert to be installed only if required. Headwalls (sloped) and non-frangible roadside furniture to be located outside clearzone.

Access to be constructed with approved compacted roadbase material and sealed as per Council specifications and requirements.

Cattle grid to be installed only if reqired.
4m grid (preferable) or inward opening 3.6m gate.

Where road train access is required, the desirable width of 8 m should be provided (minimum width is 6 m).

2. Articulated Vehicles

Access Driveway Sight Distance (AS2890.1)

Speed Limit km/h	Sight Distance (rounded to nearest 5m)
50	70
60	85
70	100
80	110
90	125
100	140
110	155

NOTES:

A: Council may require work to be undertaken to Auspec standards www.natspec.com.au

B: All ongoing maintenance to rural propety access is the responsibility of the property owner.

PRODUCED: $DATE$ AT $TIME$ $USER$
FILE PATH: $FILE$
PLOT DRIVER: $PLTDRV$
PEN TABLE: $PENTBL$

No.	Amendment Description	Initials	Date

A3 original | This sheet may be prepared using colour and may be incomplete if copied | Co-ordinate System: MGA Zone 56 | Height Datum: A.H.D.

SCALES
NOT TO SCALE

Transport Roads & Maritime Services

DESIGNED.....
REVIEWED.....

ROADS AND MARITIME SERVICES
MODEL DRAWINGS
TYPICAL RURAL PROPERTY ACCESS STANDARDS

FILE No.	DRAWING	PRINTED DATE	SHEET No.
	27/02/2015		

REGISTRATION NUMBER

The access should also comply with the requirements of Wagga Wagga City Council's *Engineering Guidelines for Subdivisions and Development Standards (2017)* for vehicular access to rural properties.

The primary access driveway provides a connection to an internal road network that links to the solar arrays, inverters and on-site facilities. This is proposed to be a gravel road, capable of catering for vehicles up to and including 19m semi-trailers. This internal road network will allow all vehicles to enter and exit the site in a forward direction.

Should the primary site access be unusable (for example, in an emergency), alternative access to the site is available via internal tracks that link to an access in the north-west of the site.

It is concluded that appropriate site access is available to facilitate safe forward entry to and exit from the site, under conditions of construction, operation and in an emergency.

4.3 Parking Requirements and Impact

The proposed development involves construction on approximately 23 hectares of a total site area of 48.3 hectares. There is therefore ample room to designate areas for parking of light vehicles for staff, as well as areas for heavy vehicle manoeuvring, including set-down and pick-up of materials, plant and equipment. These areas should be designated under the CTMP.

In general on-site parking requirements during regular operation of the site will be limited to staff parking (typically one or two vehicles), as well as servicing and delivery of materials. Staff will be able to park near the office/amenities buildings, or in locations near to where they will be working (for example, near the solar arrays) without obstructing other vehicles. Service and delivery vehicles will be able to do likewise.

It is concluded that the proposed development provides adequate off-street parking spaces and manoeuvring areas to meet the anticipated demand, without any adverse effect on the surrounding road network.

4.4 Pedestrian and Cyclist Impact

It is not proposed to make any change to pedestrian or cyclist infrastructure in the vicinity of the site. Therefore it is not anticipated that there would be any significant impact on pedestrians or cyclists as a result of the proposed development.

5 CONCLUSIONS AND RECOMMENDATIONS

It is concluded that:

- Traffic volume data and assessment of key roads and intersections in the vicinity of the site (including Oxley Bridge Road, Key Street, Ryan Street and the Olympic Highway as well as intersections) shows that they currently operate with low volumes of traffic and good levels of service;
- The proposed development will generate traffic of five vehicle trips per hour in the peak hour and 14 vehicle trips per day during construction, as well as one vehicle trip per hour and two vehicle trips per day during operation, which will not have a significant impact on the performance of the surrounding road network (midblock or intersection);
- Adequate provision has been made for entry and exit to the site for vehicles up to and including a 19m semi-trailer, with all vehicles able to enter and exit the site in a forward direction;
- Space is available off-street for vehicles to travel through the site in a forward direction, and to park safely clear of through traffic;
- Adequate provision has been made for staff, servicing and delivery vehicles; and
- There is no significant impact of the proposed development on pedestrians and cyclists.

It is recommended that:

- Construction traffic should be managed through the development and implementation of a Construction Traffic Management Plan (CTMP) written in accordance with the requirements of *Australian Standard AS1742.3 Manual of Uniform Traffic Control Devices – Traffic Control for Works on Roads* and the *RMS (TfNSW) Traffic Control at Work Sites – Technical Manual*; and
- The primary access into the site from Oxley Bridge Road (approximately 1.0km south of Harveys Road) be designed as a typical rural property access (as detailed in Section 7.2.3 of the *Austroads Guide to Road Design Part 4: Intersections and Crossings – General* and shown in RMS (TfNSW) Model Drawing – Typical Rural Property Access Standards (Figure 2 – Articulated Vehicles).