

Traffix Group

Traffic Engineering Assessment

Proposed Renewable Energy Facility (Solar Farm)
Hopkins Road, Fulham

Prepared for
Fulham Solar Farm Pty Ltd

November 2021

G28820R-01D

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Appendix A **Concept Plan**

1. Introduction

Traffix Group has been engaged by Fulham Solar Farm Pty Ltd to undertake a Traffic Engineering Assessment for the Proposed Renewable Energy Facility (Solar Farm) at Hopkins Road, Fulham.

This report provides a detailed traffic engineering assessment of the parking and traffic issues associated with the proposed development.

In the course of undertaking this assessment, we inspected the subject site, reviewed development plans and background material, and assessed the car parking and traffic impacts of the proposal.

Our assessment is as follows.

This report has been updated to address Item 7 of the Request for Further Information (RFI) issued by the Department of Environment, Land, Water & Planning (DELWP), in relation to the application (Ref. PA2101365).

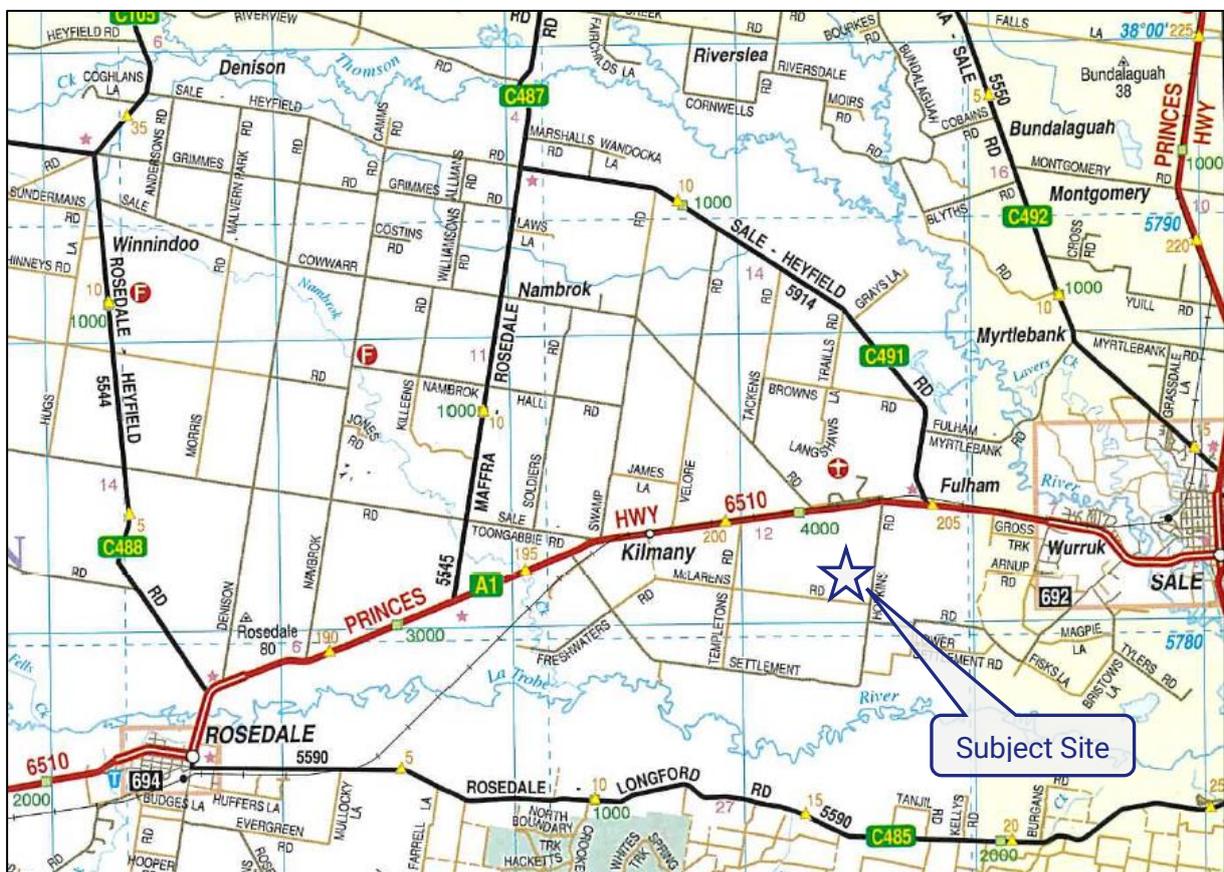
2. Existing Conditions

2.1. Subject Site

The subject land, addressed as Hopkins Road, Fulham, is rectangular in shape and is located on the north-western corner of the intersection of Hopkins Road and McLarens Road.

The site has frontages of approximately 1 kilometre to Hopkins Road along the eastern site boundary and approximately 1.6 kilometres to McLarens Road along the southern boundary.

A locality plan and aerial photograph of the site are provided at Figure 1 and Figure 2, respectively.



Source: RACV VicRoads Country Street Directory

Figure 1: Locality Map



Figure 2: Aerial Photograph of Subject Site - View North-west

Source: SkyPhoto

2.2. Planning Scheme Zones & Surrounding Uses

The subject site is largely vacant farmland and is zoned 'Farming Zone (FZ)' under the Wellington Planning Scheme. Surrounding properties are generally Farming Zone uses with the exception of the Fulham Correctional Centre which is located just north of the site on Hopkins Road.

A planning zone map is provided at Figure 3.

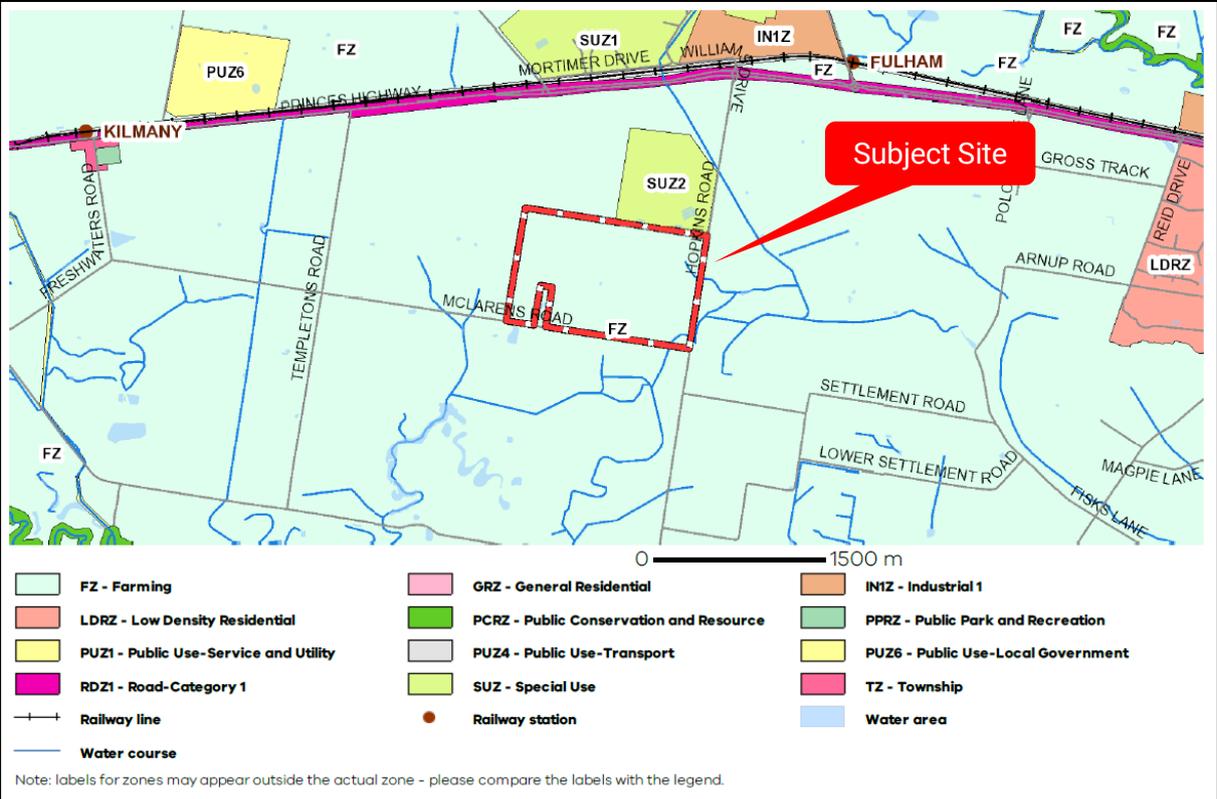


Figure 3: Planning Zone Map - Wellington

2.3. Road Network

Hopkins Road is classified as a ‘Local Access A – Road’ under the Wellington Shire Register of Public Roads. Hopkins Road extends in a north-south direction between Princes Highway to the north and Settlement Road to the south.

In the vicinity of the site, Hopkins Road has a sealed carriageway width of approximately 4 metres which provides for a single lane of two-way traffic, with gravel shoulders of approximately 2 metres in width on both sides. Simultaneous two-way traffic is achieved by vehicles utilising the gravel shoulders.

Approximately 400 metres north of the site, adjacent to the Fulham Correctional Centre access, Hopkins Road has a wider sealed carriageway of approximately 6 metres, accommodating a single lane of traffic in each direction. This configuration continues further north to Princes Highway.

A signed speed limit of 80km/h applies to Hopkins Road in the vicinity of the site.

McLarens Road is classified as a ‘Local Access B – Road’ under the Wellington Shire Register of Public Roads. McLarens Road is generally aligned in an east-west direction between Hopkins Road to the east and Freshwaters Road to the west.

In the vicinity of the site, McLarens Road generally has gravel carriageway with a width of approximately 6 metres which provides for simultaneous two-way traffic. A short 40 metre

long sealed section is provided at the eastern end of McLarens near the intersection with Hopkins Road.

The default rural speed limit of 100km/h applies to McLarens Road in the vicinity of the site.

Hopkins Road and McLarens Road form a T-intersection and the intersection is not controlled by any signage or linemarking.

Figure 4 to Figure 7 provide views of Hopkins Road and McLarens Road.



Figure 4: Hopkins Road - View South



Figure 5: Hopkins Road - View North



Figure 6: McLarens Road - View East



Figure 7: McLarens Road - View West

2.4. Existing Traffic Volumes

We have sourced traffic volume data along Hopkins Road (between Princes Highway and the Fulham Correctional Centre) which was provided by Wellington Shire Council. This data was collected via tube count surveys which were undertaken in November 2005 and July 2009.

The November 2005 traffic counts were undertaken immediately to the north and south of the Fulham Correctional Centre site access and identified the following average daily two-way volumes (vehicles per day - vpd) along Hopkins Road:

- North of entrance to correctional centre: 547 vpd (11% heavy vehicles)
- South of entrance to correctional centre: 130 vpd (13% heavy vehicles)

Based on the November 2005 traffic survey results, it is evident that the Correctional Centre generates a large portion of the traffic along Hopkins Road between Princes Highway and the Correctional Centre site access.

The July 2009 traffic survey was undertaken north of the Correctional Centre entrance, approximately 800 metres south of Princes Highway, and identified the following average two-way volume (vpd):

- 519 vpd (6% heavy vehicles)

Importantly, the July 2009 data demonstrates that volumes along Hopkins Road were generally consistent with the November 2005 data (i.e. no growth).

To the best of our knowledge, we understand over the past decade there has been very minimal changes in nearby land uses and therefore we estimate the existing traffic volumes along Hopkins Road to be relatively consistent to the volumes noted above.

Accordingly, for the purposes of this traffic engineering assessment, we will adopt the November 2005 traffic data to the south of Correctional Centre access as the existing average two-way volume daily volumes. In addition, we will assume that 10% of the daily volumes occur during each of the AM and PM peak hours.

3. Proposal

3.1. General

The application proposes the development of a renewable energy facility (solar farm).

The site is to accommodate solar panel blocks across the majority of the site. A transformer yard, substation and amenities/office building are to be located near the south-eastern corner of the site.

Primary vehicle access for the site is proposed via a new vehicle connection with Hopkins Road located at the north-eastern corner of the site. This access point will be utilised during both the construction phase and the post-construction (ongoing operation) phase.

A secondary vehicle access connection is to be provided with McLarens Road, just east of Lot 379. Furthermore, the existing gravel access connection at the south-west corner of the site is to be retained for emergency vehicle access.

A total of 10 car spaces are to be provided near the south-eastern corner of the site.

An internal perimeter roadway will accommodate vehicle movements around the site. Furthermore, a network of internal accessways will provide vehicle access to each solar panel blocks for servicing/maintenance.

In addition, the application also proposes to widen the sealed carriageway of Hopkins Road to a width of 6 metres for a length of approximately 400 metres between the proposed site access (at the north-east corner of the site) and the existing Fulham Correctional Centre site access.

A concept plan of the proposal, prepared by Ricardo (dated 27/08/21), is attached at Appendix A.

3.2. Day to Day Operations

We have been advised by the applicant that the ongoing operations and maintenance of the renewable energy facility will have up to 3-5 staff on the site at any one time, who will typically utilise standard dual-cab utes (i.e. Toyota Hilux or similar).

We further understand that truck access during day to day operations will be minimal, and likely only associated with intermittent maintenance requirements.

3.3. Construction Phase

Construction of the renewable energy facility is expected to commence in the first quarter of 2022 and take approximately 28 weeks.

The proposed construction works are to be undertaken between 7:00am-5:00pm Monday to Saturday, in line with EPA Guidelines.

We have been advised that an average of 6 truck deliveries are expected per day during the construction period. Specifically, a minimum of 3 trucks and a maximum of 12 trucks per day is anticipated.

In total, approximately 1,000 trucks are expected during the construction period. This will include semi-trailers transporting the solar panels within 40-foot containers. In addition, a small number of deliveries per day via vans/private vehicles are anticipated. An average of approximately 50 staff per day are expected to be working on-site during the construction period.

4. Car Parking Considerations

4.1. Statutory Requirements – Clause 52.06

The proposed use falls within the land-use category of 'renewable energy facility' under Clause 73.03 of the Planning Scheme

The car parking requirements for the proposed development are outlined under Clause 52.06 of the Planning Scheme.

Clause 52.06-5A states the following:

Where a use of land is not specified in Table 1 or where a car parking requirement is not specified for the use in another provision of the planning scheme or in a schedule to the Parking Overlay, before a new use commences or the floor area or site area of an existing use is increased, car parking spaces must be provided to the satisfaction of the responsible authority.

A 'renewable energy facility' is not a specified land-use under Table 1 of Clause 52.06 and therefore car parking must be provided to the satisfaction of the Responsible Authority.

The car parking demands for the site are likely to be limited to staff, with only a minor level of visitor demand associated with equipment maintenance.

We have been advised that up to 5 employees may be on-site at any one time for the ongoing operation of the renewable energy facility. Accordingly, car parking should be provided at a rate of least one car space per employee (i.e. 5 employees car spaces).

The plans illustrate a total of 10 car spaces including 5 car spaces adjacent to the substation and 5 car spaces near the site office at near the south-eastern corner of the site. We are satisfied that the proposed parking provisions will sufficiently accommodate the predicted staff and visitor parking demands.

5. Traffic Considerations

5.1. Day to Day Operations

Traffic generation during general operating hours will primarily be associated with staff arrivals and departures. If we conservatively assume that all 5 staff arrive in the AM peak hour and depart in the PM peak hours (which is unlikely), there would be no more than 5 vehicle movements generated in any one hour, and no more than 10 vehicle movements per day.

Very limited external maintenance vehicles or deliveries are to be generated by the renewable energy facility during ongoing operation. We anticipate in the order of only one truck to visit each month expected to pick-up repairs and replace spare solar panels.

We anticipate generally all traffic generation associated with day to day operations to be generated to/from the north along Hopkins Road. Traffic generation to/from the south along Hopkins Road and McLarens Road is likely to be minimal.

As demonstrated by the historic traffic volume data shown at Section 2.4, between Princes Highway and the Fulham Correctional Centre entrance, Hopkins Road carries in the order of 547 vehicles per day inclusive of in the order of approximately 55 vehicles during both the AM and PM peak hours.

When considering the additional traffic predicted to be generated by the proposal, a post-development daily volume of in the order of 557 vehicles per day anticipated, equivalent to an increase of less than 2% of the existing average daily volumes.

Accordingly, there will be no material traffic impact to the surrounding road network during ongoing operations.

5.2. Construction Phase

5.2.1. Construction Staff

During the construction phase, an average of approximately 50 staff per day are expected to be working on-site at any one time.

We have been advised that the construction hours are to be between 7am-5pm Monday to Saturday. We expect construction staff arrival and departures to be spread throughout the day and to generally occur outside the typical commuter peak hours.

5.2.2. Heavy Vehicles

The anticipated peak hour volumes of truck deliveries to the site during the construction phase is to be an average of 6 semi-trailers per day.

We note that there will also be a small number of vans/private vehicles making deliveries to the site. For the purposes of this analysis, we will assume 5 deliveries will occur from vans/private vehicles per day.

Delivery vehicle arrivals and departures are expected to be generally spread throughout the day.

5.2.3. Total Construction Stage Traffic

Traffic during the construction stage will be temporary only for a period of approximately 28 weeks, with much lower traffic volumes anticipated during the ongoing operation of the renewable energy facility as discussed previously.

In total, during the construction stage there will be an average of approximately 122 vehicle movements per day generated (i.e. 61 entry movements and 61 exit movements). This will result in a total average daily traffic volume on Hopkins Road of approximately 252 vehicles per day adjacent to the site, and less than 700 vehicles per day to the north of the Correctional Centre access.

We are satisfied that the existing configuration of Hopkins Road has sufficient spare capacity to accommodate this level of temporary traffic to be generated during the construction period.

5.2.4. Travel Routes

We have been advised that construction stage truck traffic will primarily be generated to/from metropolitan Melbourne via Princes Highway. Arrival and departure trucks will travel directly between the site and Princes Highway to/from the north via Hopkins Road which is the shortest possible route (approximately 1.5km) to access Princes Highway.

The proposed access route between the subject site and Princes Highway is illustrated at Figure 8.

Princes Highway is a duplicated highway in the vicinity of the site and is a designated B-Double route. Furthermore, Princes Highway has a large high-standard intersection with Hopkins Road which is suitable to accommodate all necessary movements by large trucks.

As noted earlier, Hopkins Road is classified as a 'Local Road Access A' road under the Wellington Shire public roads register. The Wellington Shire Road Management Plan defines a Local Access A road as a major road that accommodates local residential or commercial traffic or public facility, with an indicative daily traffic range of 150-1,500 vehicles movements.

As noted in Section 5.2.3, the projected total average daily traffic volume on Hopkins Road during the construction stage will be approximately 252 vehicles per day adjacent to the site, and less than 700 vehicles per day to the north of the Correctional Centre access.

Accordingly, volumes along Hopkins Road will continue to fall within the range of a Local Access A road, and this is considered acceptable.

Importantly, all sections of the Hopkins Road along the nominated access route for construction traffic are sealed. Based on our on-site observations in August 2020, the existing sealed carriageway of Hopkins Road is in good condition and therefore would be adequate to accommodate the level of construction traffic anticipated as outlined above.

Accordingly, the proposal intends to retain the existing configuration of Hopkins Road during the construction stage. Once construction is near completion, a permanent upgrade of

Hopkins Road between the Correctional Centre access and the northern site access is proposed as described at Section 5.3.

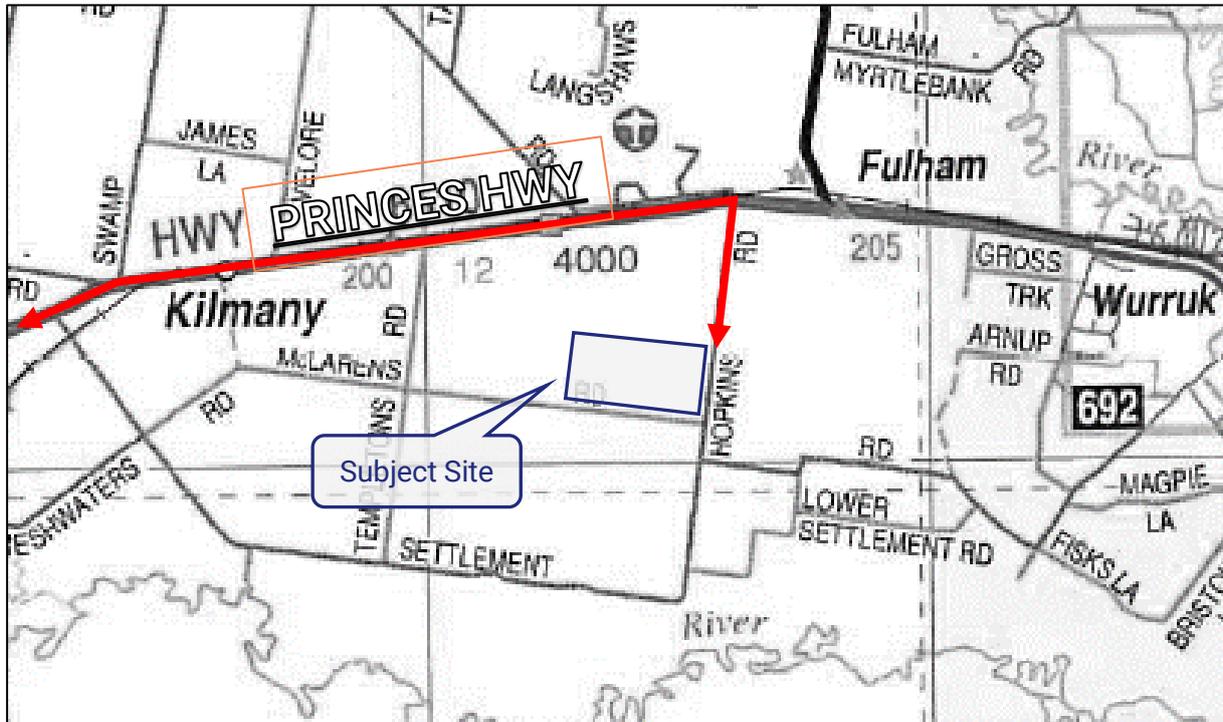


Figure 8: Proposed Construction Access Route

5.3. Hopkins Road Access Considerations

We have undertaken an assessment of the warrants for turning treatments for the Hopkins Road primary access, based on the *Austrroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings* (Austrroads 2017). It is noted that this document technically applies to intersections rather than driveways and therefore provides a conservative assessment for private vehicle access connections such as proposed in this case.

Figure 3.25 at Section 3.2.2 of this document provides guidance on the preferred minimum turning treatments for major roads. A signed speed limit of 80km/h currently applies to Hopkins Road and accordingly it is considered appropriate to apply Figure 3.25(b) of the *Austrroads Guide* which is relevant for rural roads with a speed greater than 70km/h and less than 100km/h.

The warrants for turning treatments during the critical AM peak hour (i.e. when turning movements from Hopkins Road into the site are generated) are shown at Figure 9. This indicates that the proposed site access with Hopkins Road warrants basic right and left-turn treatments (BAR and BAL respectively).

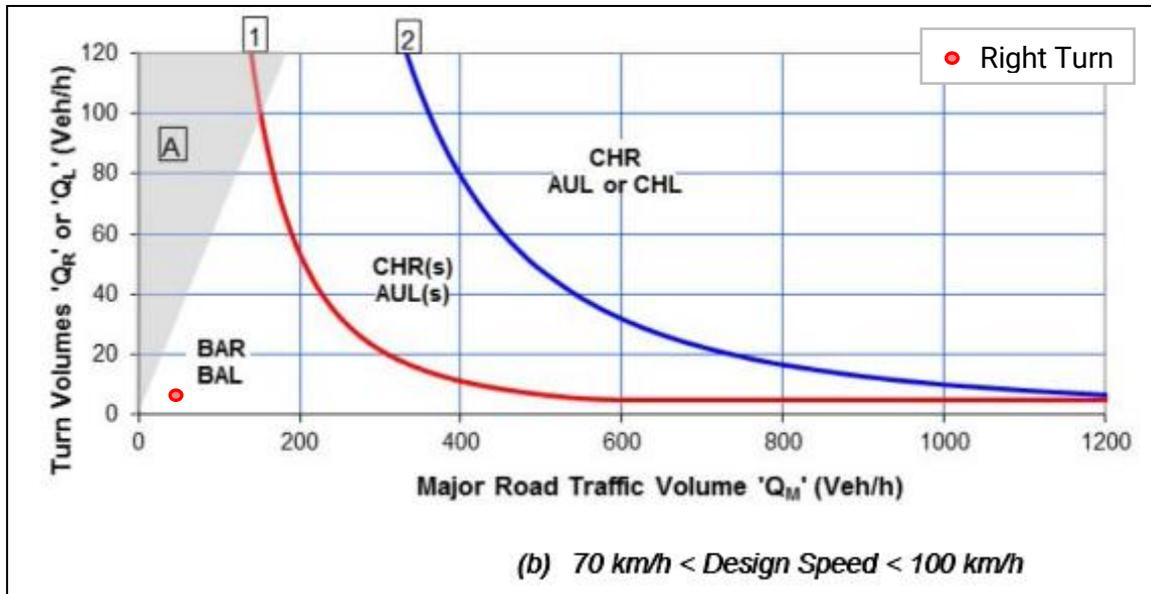


Figure 9: AM Peak Hour Volume - Warrants for Turn Treatments

Although the proposed site access warrants a BAR turning treatment, we are of the view that turn treatments of this nature are not necessary for this proposal.

We note that the Fulham Correctional Centre site access, located approximately 400 metres north of the subject site, currently does not provide any form of turning treatments along Hopkins Road. However, as noted earlier, Hopkins Road is configured with a widened sealed carriageway of approximately 6 metres between Princes Highway and the Correctional Centre site access, accommodating a single lane of traffic in each direction.

Importantly, based on the traffic volume data discussed in Section 2.4, in the order of 75% of the traffic along Hopkins Road is generated to/from the Correctional Centre, equivalent to in the order of an average of 410 vpd.

As noted previously, no more than 10 vehicle movements per day will be generated during typical operations of the proposed facility, which is substantially less than the existing traffic generated to/from the Correctional Centre. Accordingly, we are of the view that it is acceptable to not provide turning lane provisions at the proposed site access connection.

Instead, the development proposes a permanent upgrade Hopkins Road once construction of the Solar Farm is near completion, to provide a 6 metre wide sealed carriageway (similar to the configuration north of the correctional centre site access) between the site's primary access and the existing Correctional Centre access.

5.4. Internal Road Layout

The main access road that connects with Hopkins Road is to be provided with a minimum 7 metres wide carriageway. This will satisfactorily accommodate all service vehicles and also simultaneous two-way movements between 99th percentile design vehicles.

A main service road is to be provided around the perimeter of the site. This service road is to be provided with a minimum carriageway width of 4 metres. Several passing bays are to be provided at intervals along the perimeter service road. The passing bays are to be provided with a minimum 20 metre length and allow for a trafficable width of at least 6 metres.

Solar panel blocks are to be separated by 10 metres to allow service vehicle access for maintenance requirements.

We are satisfied that the proposed internal road network will adequately accommodate relevant service and emergency vehicles.

A concept plan of the proposed internal road network is attached at Appendix A.

6. Loading Considerations

Clause 65.01 of the Planning Scheme states that the responsible authority must consider a number of matters as appropriate including:

- *The adequacy of loading and unloading facilities and any associated amenity, traffic flow and road safety impacts.*

Loading activities for the proposed renewable energy facility associated with equipment/parts transportation during maintenance are anticipated to occur relatively infrequently and will be entirely managed on-site within the internal accessways.

We are satisfied that loading and unloading for the proposal can be appropriately accommodated within the site via the network of internal service roads.

7. Bicycle Considerations

Clause 52.34 of the Wellington Planning Scheme specifies the bicycle parking requirements for new developments.

There is no requirement to provide bicycle parking for a 'renewable energy facility'.

8. Other Considerations

8.1. Clause 53.13 – Renewable Energy Facility

Clause 53.13 of the Planning Scheme sets out application requirements for a renewable energy facility (other than wind energy facility).

This clause outlines that when considering an application for a renewable energy facility is, the responsible authority must consider the following, as appropriate:

- *The impact of a proposal on the local road network.*
- *Solar Energy Facilities Design and Development Guideline (Department of Environment, Land, Water and Planning, August 2019).*

As noted in preceding sections of this report, we are comfortable traffic and vehicle access for the proposal can be appropriately accommodated by the local road network including Hopkins Road. The *Solar Energy Facilities Design and Development Guideline* is considered in the following section.

8.2. Solar Energy Facilities Design and Development Guideline

The *Solar Energy Facilities Design and Development Guideline* (August 2019) provides an overview of statutory planning required for solar energy facilities in Victoria.

In relation to traffic impacts, the guideline requires the following:

A traffic impact assessment (TIA) must be prepared as part of a planning permit application. A TIA should:

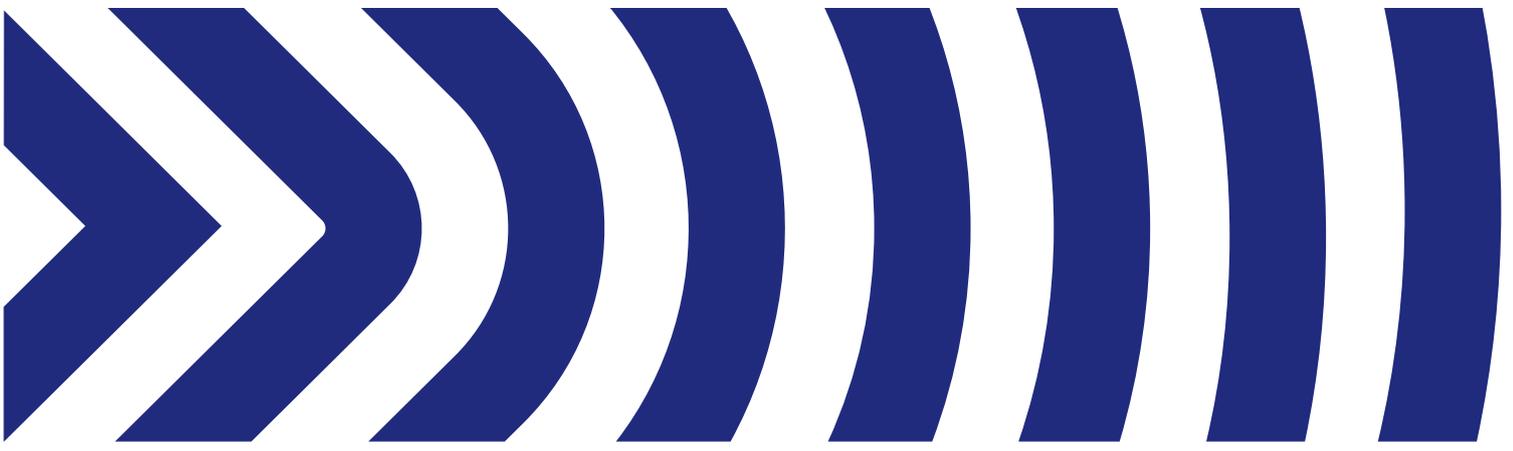
- *Identify access routes and all roads that will be used to transport construction materials.*
- *Identify access routes, types of vehicles and traffic generation when the facility operates.*
- *Specify the timing, type of vehicle, daily volume and scheduled delivery times of construction materials.*
- *Provide timelines for the whole construction stage.*
- *Identify intersection upgrades and any road works required to accommodate access to the site, and specify if these are temporary arrangements.*

We are satisfied this report sufficiently addresses the traffic impact assessment requirements associated with the construction stage of the project for the purposes of town planning approval. Further details regarding the construction period including timelines and scheduling would be provided in the future as part of a Construction Management Plan. This could be appropriately introduced as a condition of Permit. Similarly, a traffic management plan (TMP) outlining temporary measures on Hopkins Road if necessary, could be a condition of a planning permit.

9. Conclusions

Having undertaken a detailed traffic engineering assessment of the proposed renewable energy facility (solar farm) at Hopkins Road, Fulham, we are of the opinion that:

- a. The proposed parking provisions are appropriate and will suitably accommodate the predicted staff parking demands and occasional visitors.
- b. A suitable primary vehicle access connection with Hopkins Road is to be provided.
- c. A secondary and an emergency vehicle access connection are to be provided with McLarens Road near the south-west corner of the site.
- d. Loading activities can be appropriately accommodated within the site via the network of internal service roads.
- e. There is no statutory requirement to provide bicycle parking.
- f. The traffic impact assessment requirements of the Solar Energy Facilities Design and Development Guideline associated with the construction stage of the project have been sufficiently addressed for the purposes of town planning approval with further details to be provided in the future as part of condition(s) of permit.
- g. A permanent upgrade of Hopkins Road between the site's primary access and the existing Correctional Centre access to a 6 metre wide sealed carriageway is proposed at the end of the construction stage.
- h. There are no traffic engineering reasons why a planning permit for the proposed renewable energy facility (solar farm) at Hopkins Road, Fulham, should be refused, subject to appropriate conditions.



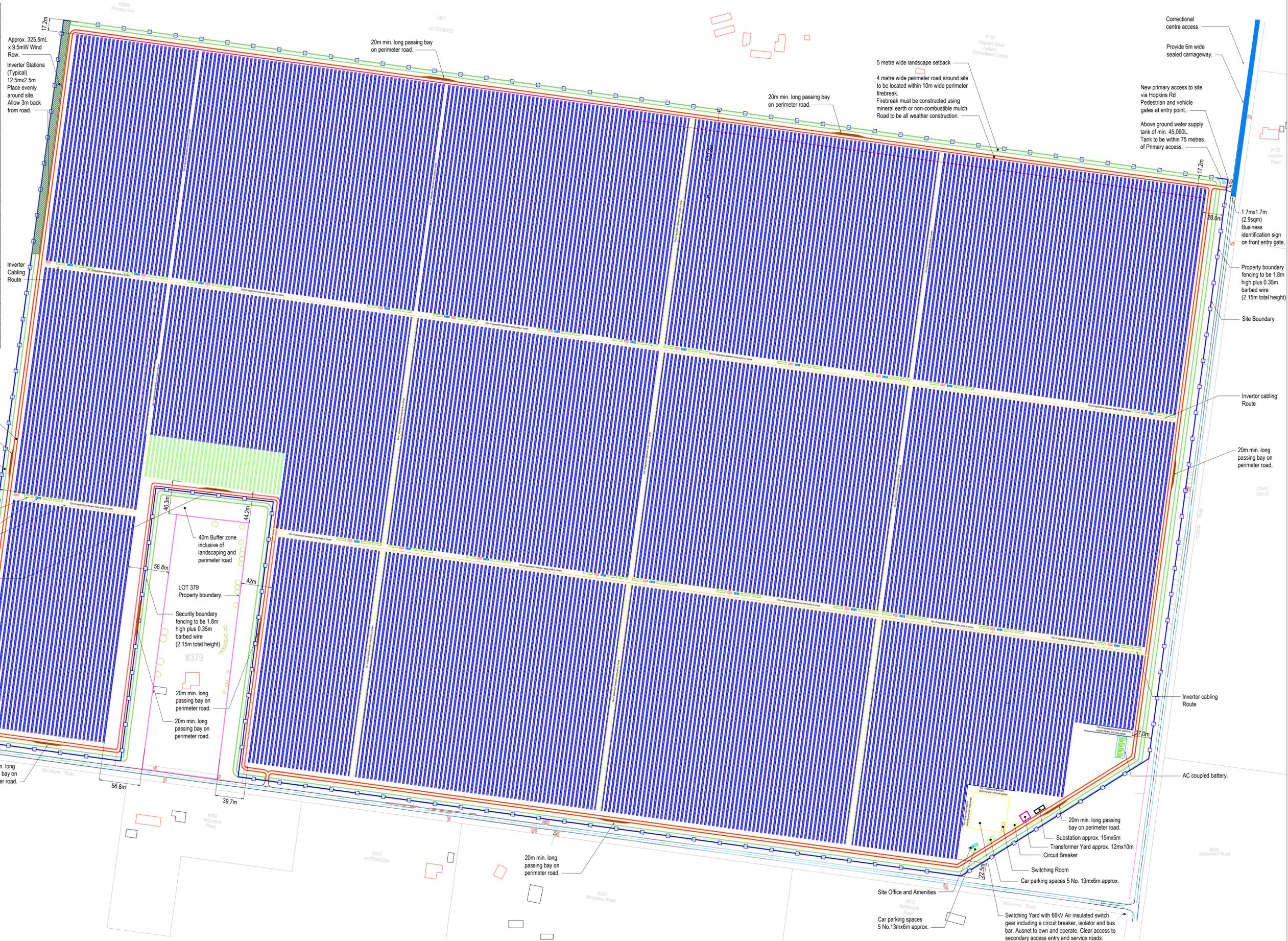
Appendix A

Concept Plan

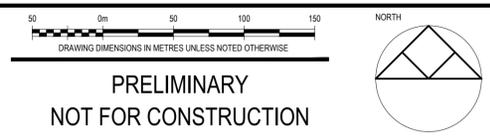
Solar Table					
Type	Wind Zone	Colour	Quant.	Strings per table	Modules per table
Interior/ Exterior	Dark Blue	2336	?	87	
Interior/ Exterior	Green	34	?	58	

Array Information	
PV Modules	
Dimensions	2.256mLx1.133mWx0.035m (Blue)
Quantity	205,204

Legend	
	Perimeter fencing
	5m wide Perimeter landscaping
	4m wide Perimeter access road
	Inverter cabling
	Inverter and battery arrangement
	Dwelling
	Shed



ISSUE	DESCRIPTION	BY	APP	DATE
A	PRELIMINARY ISSUE	DD	-	27.08.21



**PRELIMINARY
NOT FOR CONSTRUCTION**



PROJECT
Fulham Solar Farm

TITLE
SCHEMATIC SITE INFRASTRUCTURE PLAN

CLIENT				
Fulham Solar Farm Pty Ltd				
PROJECT No.	DESIGNED	DRAWN	APPROVED	SCALE
31046	DD/JC	DD	-	1:2500@A1
DRAWING No.				ISSUE/MT
31046TP003				A