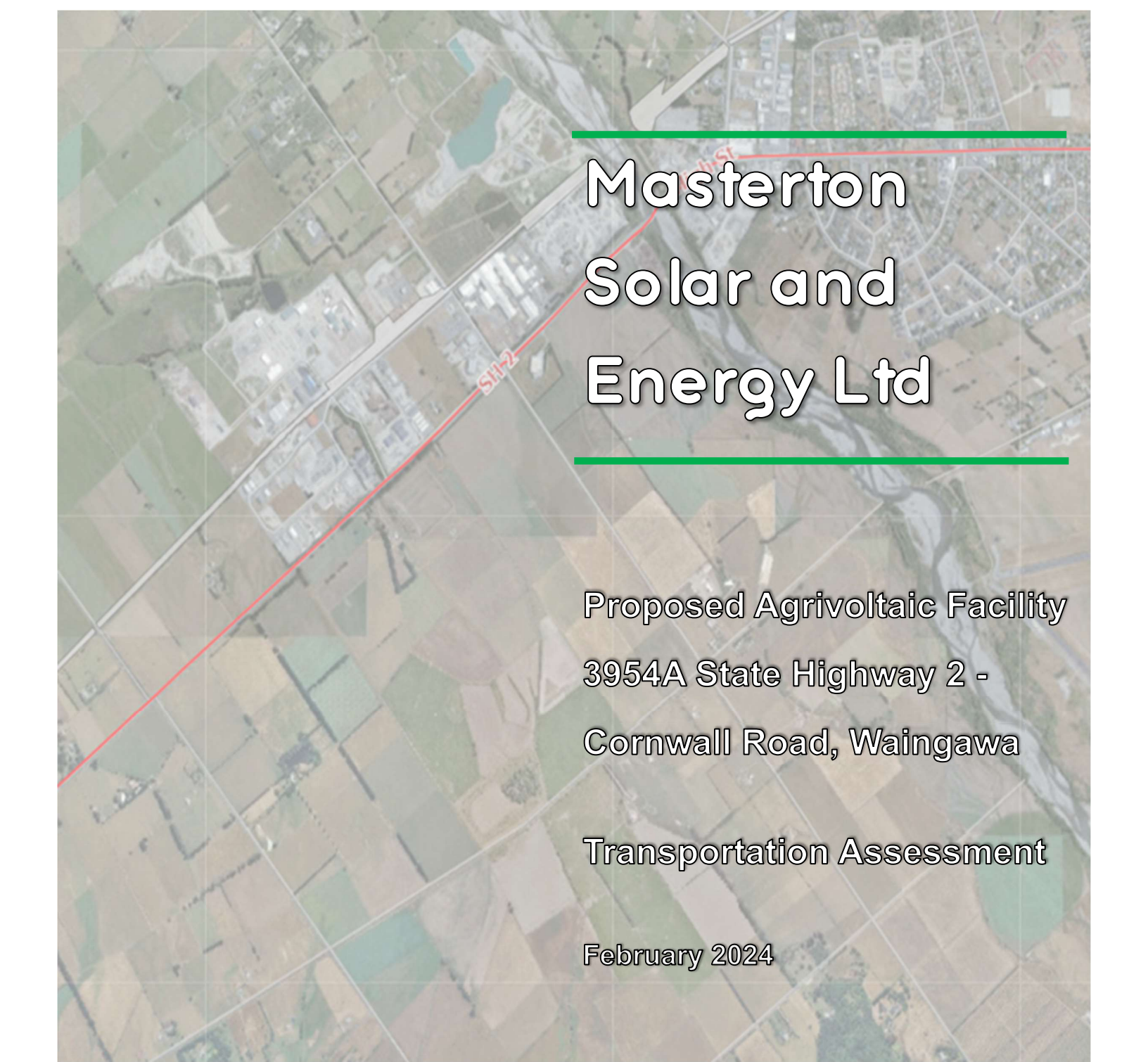




## **APPENDIX 11      TRANSPORTATION ASSESSMENT**



# Masterton Solar and Energy Ltd

Proposed Agrivoltaic Facility  
3954A State Highway 2 -  
Cornwall Road, Waingawa  
Transportation Assessment

February 2024

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**Job Number:** 23044

**Job Title:** Solar Farm, Masterton

### Revision Schedule

Revision Number	Date	Description	Prepared/Approved by
V1			
V2	19/12/23	Near Final	DJM
V3	27/2/24	Final	DJM

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## Executive Summary

This has been commissioned by Masterton Solar and Energy Limited to prepare this Transport Assessment in support of its application to establish and operate of agrivoltaic facility at a site adjacent to Cornwall Road, Waingawa south of Masterton.

The following assessment has considered both operation and construction traffic, with the focus being on the construction-related transport activities of the agrivoltaic facility including the level of overall traffic loading on the adjoining sections of both local and state highway roads near the site. The more notable transportation effects of the proposal are largely related to the construction phase which is expected to comprise of no more than a total of approximately 60 traffic movements (inclusive of light and heavy vehicles) across the course of a day at the peak of the construction phase. During this period the temporary, construction-related activities can be readily accommodated within the surrounding transport network focussed on Cornwall Road and its intersection with SH2 without significant adverse effect on other road users or the surrounding community.

In order to mitigate any potential adverse effect during this construction period it is recommended that

- a Construction Traffic Management Plan be prepared to the satisfaction of District Council prior to the commencement of construction activities within the site, and
- Construction and permanent access connections between the proposed development site and Cornwall Road should be designed and constructed in accordance with the relevant engineering design standards of the District Council.

In summary, it is concluded that the effects of the construction traffic arising from the proposed agrivoltaic facility at Waingawa on Cornwall Road and SH2, and the adjoining sections of routes and intersections surrounding the site can be appropriately accommodated by the current form and extent of these roading connections such that the external effects of the proposal are acceptable.

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# 1 BACKGROUND

## 1.1 Introduction

Don McKenzie Consulting Ltd has been commissioned by New Zealand Clean Energy (“NZCE”) to prepare this Transport Assessment (“TA”) in support of a resource consent application for the establishment and operation of an agrivoltaic facility at a site adjacent to Cornwall Road at Waingawa south of Masterton.

This assessment has considered both operation and construction traffic, with the focus being on the construction-related transport activities as they will generate a higher, albeit temporary, level of overall traffic loading on the adjoining sections of both local and state highway roads. Overall, it is concluded that the effects of the construction traffic on primarily Cornwall Road and SH2, and the adjoining sections of routes and intersections surrounding the site can be appropriately accommodated by the current form and extent of these roading connections such that the external effects of the activity are acceptable. There are accordingly, no grounds from a transportation point of view for consent not to be granted.



## 2 Existing Site Context

### 2.1 Site Location

**Figure 1** depicts the extent of the subject land within the Carton District Council located southwest of the Waingawa River and the Masterton urban area.

The site is bounded by State Highway 2 (“SH2”) to the northwest, Cornwall Road to the northeast, and Hughes Line to the southeast.



*Figure 1: Site Location*

### 2.2 Existing Zoning and Surrounding Land use

The subject land and surrounding areas lie within the Rural General Zone under the Proposed District Plan and Special Rural Zone within the Operative District Plan.

Broadly, the site and adjacent land area to the south and east of SH2 is currently rural production with a small number of rural residential properties including one within the subject land accessed via an existing driveway connection to SH2 along the site frontage. A large industrial area including a variety of activities including timber processing, transport and contractor yards/facilities located to the north and west of SH2 including property frontage to SH2 directly opposite the subject site.

An existing electricity sub-station and adjacent contractors' yard are situated opposite the subject site on the eastern side of Cornwall Road.



## 3 Transport Environment

### 3.1 Strategic Road Network Classifications

The One Network Road Classification (“**ONRC**”) system<sup>1</sup> developed by Waka Kotahi and Territorial Local Authorities for the classification of the national roading network includes the following for the three direct frontages of the subject land:

- SH2 – Regional State highway – these roads make a major contribution to the social and economic wellbeing of a region and connect to regionally significant places, industries, ports or airports. They are also major connectors between regions and in urban areas may have substantial passenger transport movements. Such Regional State Highway routes provide the primary through-traffic movement function with a comparatively lesser expectation for property access.
- Cornwall Road – Secondary Collector Road – road that provide a secondary distributor/collector function, linking local areas of population and economic sites and may be the only route available to some places within this local area. They are intended to cater for a combination of property access as well as through-traffic movement
- Hughes Line (adjacent to the site) – Access Road – roads within this classification effectively form the remainder of the roading network providing primarily an access function, and will generally be low volume roads with little through-traffic function

In this regard, the site is well place to maximise appropriate interconnectivity between the three frontage roads. As will be discussed in subsequent sections, the primary access to and from the site will be via Cornwall Road (defined as a Secondary Collector Road) which then connects to the Regional State Highway route along SH2 catering for the movement of vehicles beyond the site to larger urban areas and centres elsewhere in the Wairarapa.

### 3.2 Frontage Road Details

#### 3.2.1 Cornwall Road

As noted above, Cornwall Road as a Secondary Collector Road provides the access connection between the properties along it (including the subject land) to the wider road network.

It operates as a two-way road with a posted speed limit of 100km/h.

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<sup>1</sup> <https://nzta.maps.arcgis.com/apps/webappviewer/index.html?id=95fad5204ad243c39d84c37701f614b0>

It is generally straight and level across the full length between SH2 and the priority controlled Give Way cross-road intersection with Hughes Line.

It has a typical rural road layout with a carriageway with of approximately 6m providing full two-way traffic movement along the full length of the site frontage. There are grassed berm along both sides of the road with broad swale drains along each side of the road. Power poles are positioned along both boundary lines.

**Figure 2** shows a typical section of Cornwall Road adjacent to the site.



*Figure 2: Cornwall Road near proposed site access*

Between the site (and expected construction and permanent access point) and SH2 to the northwest there are two farm access tracks connecting with Cornwall Road – one at approximately 300m south of SH2/500m north of the proposed site access, and another approximately 500m south of SH2/300m north of the proposed site access. Nearer the proposed access to the site, there are a further two driveway crossing serving both the Masterton sub-station on the eastern side of Cornwall Road, and another crossing accessing a contractor's yard/property along the northern boundary of the sub-station.

Across the Cornwall Road frontage of the sub-station, the eastern shoulder of Cornwall Road has been widened and sealed creating an additional 2.5m of seal width up to a total seal width of approximately 12m.

Cornwall Road connects with Hughes Line at the southern end of the site frontage via a Give Way control with priority afforded to Cornwall Road and Give Way controls on both northern and southern approaches on Hughes Line.

At the north-western end of Cornwall Road it intersects with SH2 by means of a recently-completed roundabout. The Cornwall Road approach to the SH2 roundabout is shown in the following **Figure 3**.



*Figure 3: Cornwall Road on approach to SH2 Roundabout*

### 3.2.2 SH2

The ONRC defines SH2 as a Regional State Highway route. Such routes connect the major settlements and urban areas within the Wairarapa region.

It provides one traffic lane in each direction and has recently been upgraded by Waka Kotahi by way of two new roundabout-controlled intersections at each of the junctions with East Taratahi Road and Cornwall Road. A wire rope median barrier has been installed along the route section between these two roundabouts (and continues further to the south towards Carterton) as part of the wider road safety improvements completed by Waka Kotahi over the past year. The presence of the barrier means that all access to and from properties along this section (including existing residential and farm access driveways within the subject site) are limited to left in/left out. Right turning movements associated with these accesses require diversion to one of the two new roundabouts.



The SH2 route operates with a posted speed limit of 80k/h.

### 3.2.3 Hughes Line

Hughes Line extends along the southern boundary of the subject site. It is classified as a Secondary Collector Road in terms of the ORNC system in which role it is expected to operate for a combination of through movement as well as property access.

In its current form across the site frontage Hughes Line provides a 5.0m sealed width together with wide (0.7 - 1m) gravel shoulders along both sides of the road.

**Figure 4** below shows the cross-section of Hughes Line adjacent to the site.



*Figure 4: Hughes Line*

### 3.3 Traffic Volumes

Traffic volumes presented in Table 1 were obtained using the latest information available from various publicly available sources including the MobileRoads online traffic database, District Council records and from the NZTA | Waka Kotahi Traffic Monitoring System website for SH2.

**Table 1: Traffic Volumes**

Route	Daily Traffic Volume (vpd)	Peak Hour <sup>2</sup> (vph)	%HCV	HCV (HCV/day)
Cornwall Rd	370	56	16%	59
Hughes Line	970	145	12%	116
East Taratahi Rd	1,380	207	16%	220
SH2 (south of Waingawa Bridge)	13,310	1,997	6%	798

As will be clearly evidence from the above data, the SH2 route dominates in terms of the daily and peak period volumes within the road network surrounding the subject site. Each of the traffic volume data represent flows that are broadly consistent with the form and function of the roads around the site.

### 3.4 Road Safety

A search was made of the NZTA Crash Analysis System along Cornwall Road between SH2 and Hughes Line, and including a 30m radius from the intersection of SH2/Cornwall Road. The search addressed the full five-year period from 2018 to 2023 – noting that the SH2/Cornwall Road and SH2/East Taratahi Road roundabouts (and installation of wire road median barrier along SH2) were under construction for the second half of 2022 and early 2023, and operational for about the last six months.

No crashes were reported along Cornwall Road over the entire search period.

The search revealed a total of 28 crashes:

- 12 of them at the SH2/Cornwall intersection;
- seven at the SH2/East Taratahi intersection, and
- two within the local roading network on the northern side of SH2.

A graphical representation of the crash types and locations is presented in **Figure 5**.

<sup>2</sup> Peak hour volumes are estimated at 15% of daily volume

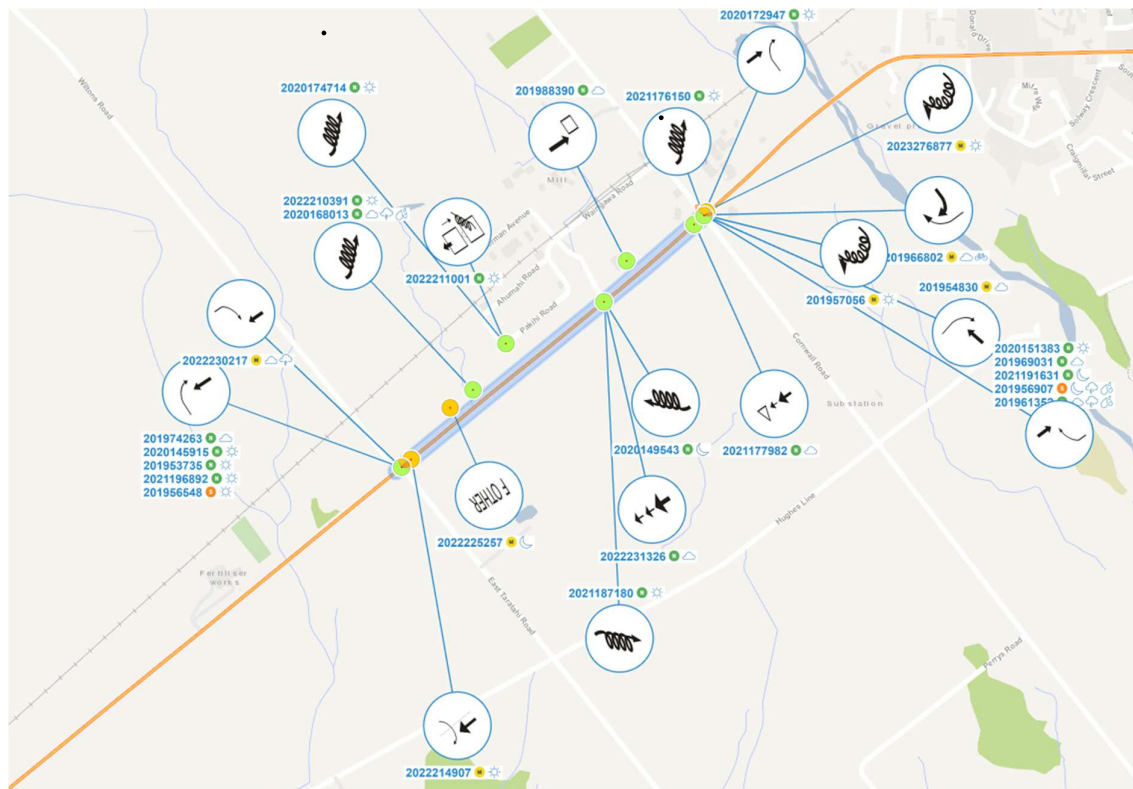


Figure 5: Road Safety Search (2018-2023)

Of the 28 total reported crashes over this period:

- one resulted in a fatal crash involving a right turning vehicle colliding with a through movement at the intersection of Cornwall Road and SH2 (prior to the roundabout being constructed or completed);
- two resulted in serious injuries – one each at the East Taratahi and Cornwall Road intersections and both involving right turns either into or out of the side roads (once again prior to the roundabout forms being completed);
- seven resulted in minor injuries – involving a variety of crash manoeuvres but with a dominance of right turning/turning type manoeuvres, and
- the remaining 18 crashes resulted in no injuries to any road user. The manoeuvres represented were dominated by turns through the intersections, plus loss of control and some queuing events mid-block between the intersections (and including three crashes occurring on local roads and transport yards adjacent to the SH2 route).

There has been only one reported crash within the latest 2023 calendar year at the SH2/Cornwall intersection. The signs are therefore positive that the roundabouts along this local section of SH2 are addressing the previous poor record of this section of SH2. It is considered that the creation of the roundabout (at the SH2/Cornwall intersection) and associated wire-rope barrier along the centreline of SH2 provides a safe and effective network catering for the future operation of transport activity generated by the proposed agrivoltaic facility including the modest numbers of vehicles expected to be generated via Cornwall Road access point.

### **3.5 Committed or Future Network Changes**

There are no infrastructure or other transport network management projects known within the study area that are likely to have a significant effect on travel demand patterns in the vicinity of the proposed site.

### **3.6 Active Modes**

As would be expected on these fringe-urban/rural roads surrounding the site, there are no specific walking and cycling facilities any of the adjoining roads.



## 4 The Proposal

This application seeks to establish an approximately 138ha agrivoltaic development, also known as a solar farm, within the subject site at Waingawa. This will include erecting solar panels (photovoltaic modules), inverters, transformers, battery energy storage system (“BESS”), a substation, and a site office. The proposal will also include establishing security fencing and undertaking landscaping in appropriate places. Site works associated with the construction of the development including earthworks, tree trimming/ removal, will also be required to enable the agrivoltaic development to be established.

From a transportation point of view the key elements of the proposal include:

- Proposed primary access (construction and permanent phase) to Cornwall Road via a new vehicle crossing positioned approximately 760m south of the SH2 roundabout;
- Permanent on-site parking for some six vehicles (catering for car and services trucks) and associated generous manoeuvring;
- Development of a compacted aggregate construction yard, truck laydown area, staff facilities and associated works areas adjacent to Cornwall Road during the construction/site establishment phase that will progressively be developed and formed as the sub-station and BESS areas of the permanent site;
- Establishment of two alternative/emergency access points catering for the needs of FENZ in the case of emergency at positions approximately mid-way along the site’s Hughes Line frontage and at the southwestern corner of the site at the western-most extent of the Hughes Line frontage.

A diagram indicating the proposed site showing the proposed site access connection to Cornwall Road and alternative/emergency access points connecting to Hughes Line is presented in **Figure 6** below.

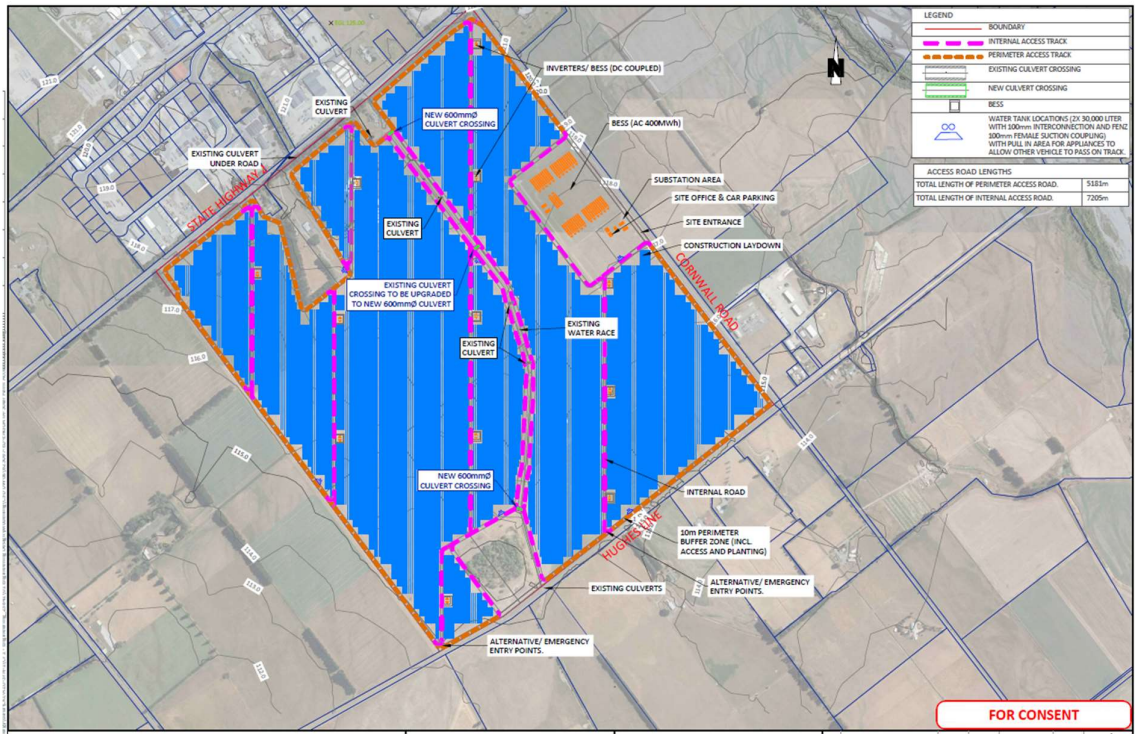


Figure 6: Proposed Site Layout

## 5 Transport Effects

### 5.1 Traffic Generation - Construction

Based on the information provided by the Applicant, construction of the proposed agrivoltaic facility at Waingawa is understood to generate the following peak period traffic movements during the peak of the site establishment and construction activities:

- 20 light vehicle movements (inclusive of inbound and outbound) per day
- 40 heavy vehicle movements (inclusive of inbound and outbound) per day (using standard format heavy commercial vehicles (“HCV”) with the largest of these typically being a 20m semi-trailer)

This equates to a total of up to 60 vehicle movements across the full extent of a typical working day during the busiest or peak periods of construction within the site. At other non-peak periods there will be less intense activity on-site and a comparably reduced external traffic movement intensity

Deliveries of construction materials and equipment associated with the facility are expected to approach the site (via the most direct Cornwall Road/SH2 route into the site driveway) across the course of the day without any particular peak timing or intensity pattern, albeit that some grouping of HCV movements could be expected within the earlier months as equipment and materials are delivered to the site during the set-up of the site. In any event the above maximum of approximately 40 HCV movement/day would apply with an expectation of no more than 10 HCV movements in any one hour at peak.

Such a volumes of both light and heavy traffic is considered low and unlikely to have a noticeable effect on the road network. The available traffic carrying capacity of the surrounding roads including the Cornwall Road route and its intersection with SH2 each have entirely sufficient capacity to accommodate these generated traffic volumes.

It is currently unknown whether construction materials would approach the site from either the south or north via SH2, or whether construction staff would be drawn from residential locations within Masterton (to the north) or parts of the District to the south. As the subsequent sections of this report will show, the transport routes (both local and State Highway routes) have sufficient capacity to readily accommodate the generated traffic movements.

### 5.2 Traffic Generation - Operation

Such agrivoltaic facilities are normally monitored remotely in real-time and accordingly do not generate any notable traffic movements to and from the site. Some limited numbers of staff are however expected on-site from time-to-time for inspection and maintenance activities. It is understood that the Applicant expects that up to two staff plus one technician could be expected on-site at any on-time during such inspection and activities.

On this basis, there are expected to be no more than six (generally light) traffic movements (inclusive of inbound and outbound) per day during the operational periods of the facility.

## 5.3 Effects Assessment

### 5.3.1 Construction Traffic Effects

As discussed earlier, the number and intensity of additional trucks (no more than a 10 per hour at peak construction times) on the surrounding road network during the construction period are considered negligible in terms of network capacity especially along the SH2 route to the north and south of the Cornwall Road roundabout. This also applies to any ongoing maintenance and visitation trips once the facility is operational.

During the peak construction period staff vehicle arrivals and departures in the morning and evening peak hours would be expected along Cornwall Road, through the SH2/Cornwall Road roundabout, and along the SH2 route to either the north (to/from Masterton) or to the south (Carterton or further south). While this additional total traffic movement total would be notable in terms of comparison with the current hourly volumes carried by Cornwall Road, the additional traffic volumes remain well within the available traffic carrying capacity of such a rural, two-way, two-lane sealed road. Once added to the SH2 route with its much higher design standard and carrying capacity – the generated volumes will have an almost negligible effect.

Cornwall Road is assessed as having a practical traffic carrying capacity of at least 800 vph per direction (1600 vph bothways). As already indicated, even accounting for the expected maximum generation of additional traffic during peak construction intensity plus the existing peak hour traffic movements for Cornwall Road, the traffic volumes expected to be carried would be less than about 5-6% of the traffic capacity of the route. As such, Cornwall Road could accommodate the addition of this modest level of generated traffic without any adverse effect to the form, function or safety performance of the route.

It is noted expected that there would be any need for construction staff or delivery vehicles to use any roads other than Cornwall Road and SH2.

In terms of the connection from Cornwall Road onto SH2, the recently completed upgrade in the form of a high-standard, single circulating roundabout would be readily capable of accommodating these additional modest volumes without adverse effect on either safety or capacity of the intersection. Inspection of the Cornwall Road route and the SH2/Cornwall roundabout confirms there is suitable and safe capacity for turns into and out of Cornwall Road via the roundabout to ensure the on-going safety of this junction without adverse effect on other use of the SH2 corridor.



Photographs of the SH2 roundabout and section of SH2 across the northern frontage of the site are provided in the following figures.



**Figure 7: Cornwall Road approach to SH2 roundabout**



**Figure 8: SH2 south of Cornwall Road**

For SH2, the addition of up to 60 light plus heavy traffic movements per day for peak construction phase traffic generation, the facility construction would contribute to a change of less than 1% in respect of both daily and peak hour movements on SH2.

On the basis that the proposed construction/permanent driveway connection to Top Grass Road is constructed to the appropriate standard specified in the District Plan / Engineering Standards (including Rule 5.3.3.2 (g) in relation to visibility at the access points), there is no reason to consider that the current Top Grass Road carriageway cannot safely and effectively accommodate this level of additional demand. It is concluded that standard, generic traffic management measures would be appropriate to support the construction phase activities.

It is apparent that the effect of the proposed construction period traffic movements within these mid-block sections of the likely access routes and SH2 is modest representing just a small additional volume and small proportional changes.

#### 5.3.2 Operational Traffic Effects

As the site will generate no more than about six individual traffic movements to or from the site once operational, there would be no discernible external effect on the effectiveness or efficiency of the surrounding road network.

## 6 Mitigation of Effects

### 6.1 Construction Traffic Management

A Construction Traffic Management Plan (“**CTMP**”) is recommended to manage the potential effects of the construction phase traffic movements especially the heavy traffic deliveries and to ensure the safe and effective on-going operation of Cornwall Road and the intersection with SH2. It is recommended that this be a consent condition to include:

- The overarching objectives of the CTMP;
- CTMP management, ownership and staff training;
- Construction dates and hours of operation, including any specific non-working hours for traffic congestion, noise etc;
- Diagrams identifying which routes trucks will use to travel to and from the site;
- Temporary traffic management signage/details to appropriately manage vehicles and any non-motorised activity in the site vicinity of the construction access on Cornwall Road;
- Details of site access/egress over the entire construction period, with access located such that appropriate visibility is achieved onto Cornwall Road; and
- Monitoring, review and consultation protocols.

A final traffic management solution should be confirmed by the contractor through agreement with the Carterton District Council as part of the CTMP. This agreement should reflect operation conditions within the surrounding road at the time of construction (e.g. co-ordination with any other works in the network both District Council and Waka Kotahi networks) and may include variations from time-to-time, as may be necessary to accommodate significant changes in construction activity, methodology or respond to community concerns. Any such variations will be agreed with the District Council prior to adoption and implementation.

### 6.2 Access Effects

There are a small number of properties which gain access from Cornwall Road between the site and the SH2 roundabout. The positioning of the proposed access has taken account of the access needs for these properties and substation/contractor yard access further along Cornwall Road, as well as the nature and scale of properties and associated traffic movements. Consideration of these access and their ordinary operational needs should be included within the recommended CTMP, however the ordinary operation of Cornwall Road in service of these properties is not expected to be adversely affected by the modest additional traffic movements generated by the construction phase (once the site access is established/upgraded).



### 6.3 Operational Traffic Effects

With the provision of appropriate levels of parking on-site and an appropriately high-quality design for access to Cornwall Road, the operational traffic effects of the proposed agrivoltaic facility at Waingawa are considered to be negligible.

### 6.4 Road Safety Effects

The temporary construction staff and delivery traffic along Top Grass Road (and supporting potential access routes) will be appropriately mitigated through the recommended CTMP and implemented by the proposed condition.

Once construction of the facility is complete, no significant adverse road safety effects are expected from the occasional maintenance vehicle or other vehicle associated with visiting groups to the site.

### 6.5 Parking Effects

As all parking for staff and construction vehicles will be provided on-site including during the construction and operational phases, no adverse parking outcomes are expected. It is accordingly recommended that a condition of the consent should be incorporated into the consent (if granted) requiring all parking to be provided on-site during both construction and operational phases.

## 7 Statutory Assessment

### 7.1 Operative District Plan

An assessment of the agrivoltaic facility proposal has been undertaken against the relevant transport-related standards of the Operative District Plan - Wairarapa Combined District Plan (“ODP”).

**Table 3: Operative District Plan Compliance**

Rule	Requirement	Compliance/Comment
<b>21.1.25 Roads, Access, Parking &amp; Loading Areas</b>		
(a)	All new roads, intersections, access, parking and loading areas shall be provided in accordance with the provisions of Appendix 5 – Requirements for Roads, Access, Parking and Loading.	<b>Complies.</b>
(b)(i) Access	All sites and activities shall have safe and practicable vehicle access from a public road. All vehicle crossings and intersections shall be positioned and constructed in accordance with the standards in Appendix 5.	<b>Complies.</b>
(c)(i) Provision of On-site Parking and Loading	(1) Every activity shall provide off-street parking and loading for vehicles associated with the activity and vehicles expected to visit or be stored on the site in connection with the activity, in accordance with Table 21.1.25.1 below.	<b>Complies.</b> Six on-site parking spaces provide for permanent operation. All staff parking during construction will be
	(2) Where any activity is changed or any building erected or altered, sufficient vehicle parking and loading shall be provided to meet the demands generated by the altered activity or building, in accordance with Table 21.1.25.1 below.	<b>Complies.</b> Practical demands for permanent parking met by proposed provision
	(3) On sites where there are multiple activities, and each activity requires vehicle parking in terms of this Plan, the total parking required shall be the combined total requirement for all activities. The Council will consider reducing parking requirements, where it is demonstrable that parking demands generated by each activity do not occur simultaneously and that operational hours or arrangements of those activities means shared parking will occur.	<b>Complies.</b>
	(4) Loading bays and spaces may be counted as parking space(s) according to the number of parking spaces able to be accommodated	<b>Complies.</b> Sufficient loading/maneuvering space is available for construction and permanent operation of the site
(ii) Number of Vehicle Parking Spaces	(1) Where the calculation of required vehicle parking spaces results in a fraction of a whole space, any fraction less than or equal to one half shall be disregarded; and any fraction over one half shall count as one space.	<b>Complies.</b>

	<p>(2) The area of required spaces, access drives, or aisles provided within a building shall be excluded from the gross floor area (GFA) of the building.</p> <p>(3) Vehicle parking spaces shall be provided for activities in accordance with Table 21.1.25.1. If an activity is not listed, then the standard for the activity listed that is closest in nature to that proposed activity shall be applied. Parking requirements do not apply to temporary activities.</p> <p>Table 21.1.25.1 Parking Requirements - Industrial Activities: 1 per 50m<sup>2</sup> GFA</p>	
(iii) Parking for the Disabled	Any activity shall provide parking for the disabled in accordance with NZS 4121:2001 Design for Access and Mobility – Buildings and Associated Facilities.	<b>Complies.</b> No accessible parking proposed or required
(iv) Vehicle Access and Manoeuvring Space	<p>(1) Each required vehicle park shall have practical access from a public road. Sufficient manoeuvring space shall be provided to enable vehicles to enter and exit the site in a forward direction. Exception: The requirement to exit and enter a site in a forward direction shall not apply to a front lot in the Residential Zone where a garage is attached to a dwelling and that obtains access to a District Arterial, Collector or Local Road. This exception does not apply where access is obtained directly from the State Highway or a Strategic Arterial Road.</p> <p>Note: The hierarchy of roads is identified in Volume 2 of the Plan: Maps.</p>	<b>Complies.</b> Practical and safe access is proposed and will be designed and construction in accordance with District Council standards.
(v) Vehicle Parking Spaces and Access	Aisles to Remain Clear - Dedicated vehicle parking space and access shall remain unobstructed by other activities and shall not be diminished by storage of goods or erection of any structure.	<b>Complies.</b>
	<p>(vi) Design of Vehicle Parking and Loading Spaces</p> <p>(1) Every parking space shall be designed and constructed in accordance with AS/NZS 2890.1:2004 Parking Facilities.</p> <p>(2) Each required loading space shall be of usable shape and have a minimum length of 7.5 metres, minimum width of 3.5 metres, and minimum clear height of 4.5 metres. Sufficient manoeuvring space shall be provided to accommodate a 90 percentile two-axle truck. In the Commercial and Industrial Zones where articulated vehicles are to be used, the layout shall be designed to accommodate such vehicles. .</p>	<b>Complies.</b> Full compliance can be achieved
(vii) Standards of Construction of Vehicle Parking Spaces	All required vehicle parking spaces and access aisles shall be formed, sealed and marked, and shall be provided with surface water drainage	<b>Will Comply</b>

Each of the Operative Plan's transport requirements can be satisfied in full.

## 7.2 Proposed District Plan

It is understood that a Proposed District Plan (“**PDP**”) – the Wairarapa Combined District Plan – has recently been released in draft for public comment and submission. While the weight to be afforded to the PDP is relatively limited given the early stage of the submission process, the following section considers the compliance of the proposed solar facility with the transportation chapter (TRA) standards.

**Table 4: Proposed District Plan Compliance**

Rule	Requirement	Compliance/Comment
<b>TR-S1 Road Design</b>		
1	Any accessway to a site or sites with potential to accommodate more than 15 residential units shall be formed as a road in accordance with the Council’s Engineering Development Standard and vested with Council.	N/A
2	Any shared accessway shall have legally enforceable arrangements for maintenance of the access at the time it is created.	<b>Complies.</b>
3	All roads shall be formed in accordance with the Council’s Engineering Development Standard.	<b>Complies.</b>
<b>TR-S2 Minimum road intersection separation distances</b>		
1	The minimum separation between road intersections shall comply with Table TR-2. <ul style="list-style-type: none"> <li>Posted Speed Limit (km/h) 100kmh/ required minimum intersection separation of 450m.</li> </ul>	<b>Complies.</b> Minimum distance to Hughes Line 600m, distance to SH2 760m
<b>TR-S3 Lighting for parking and loading areas</b>		
1	Lighting shall be provided during the hours of darkness for all: <ol style="list-style-type: none"> <li>non-residential parking areas used in the hours of darkness;</li> <li>residential parking areas with more than 6 spaces; and</li> <li>loading areas used in the hours of darkness.</li> </ol> Note. Refer to Light Chapter for standards relating to lighting.	<b>Complies.</b> Carparking area is to be lit.
<b>TR-S5 Site access</b>		
1	Accessways shall be formed in accordance with the Council’s Engineering Development Standard.	<b>Complies.</b> Access driveway to be formed in accordance with Development Standard.

2

Accessways shall comply with Table TR-3:  
Minimum and maximum widths of accessways

Table TR-3 Minimum and maximum widths of accessways

Activity	Number of residential units	Number of parking spaces provided	Minimum legal width (m)	Minimum formed width (m)	Maximum formed width (m)
Residential	1-3		4.6	3.5	6.0
	4-8		5.0	3.5*	6.0
	9-15		6.5	5.5	6.0
Commercial and Industrial		1-15	8.0	5.5	9.0
		> 15	8.0	6.0	10.0
Rural	1-15		10.0	4.0	8.0

**Complies.** The proposed accessway to Cornwall Road is to be a minimum of 8m in width

#### TR-S6 Vehicle crossing design

1

Vehicle crossings shall comply with the following:

**Complies.** One crossing proposed to Cornwall Road

Table TR-4: Maximum number of vehicle crossings per site road frontage

Table TR-4 Maximum number of vehicle crossings per site road frontage

Frontage length (m)	Road frontage type	
	State Highway, Transit Corridor	All other roads
0 - 16	1	1
> 16 - 60	1	2
> 60 - 200	1	2
> 200	2	3

2

Vehicle crossings shall comply with the following:

**Complies.** Minimum sight distance 300m in both directions from the proposed access to Cornwall Road

Table TR-5: Minimum sight distance requirements;

Table TR-5 Minimum sight distance requirements

Posted speed limit (km/h)	Urban roads	Rural roads
30 or less	50m	
40	70m	
50	100m	
60	125m	
60		160m
70		190m
80		225m
100		300m

3

Vehicle crossings shall comply with the following:

**Complies.** Proposed vehicle crossing to Cornwall Road is a minimum of approximately 760m from SH2 and a minimum of

Table TR-6: Minimum separation between vehicle crossings and from intersections:

approximately 600m to the Hughes Line intersections

Posted speed limit (km/h)	Minimum separation from intersection	Minimum separation from vehicle crossing on the same or opposite side of the road
50 or less	20m	9m
60	30m	20m
70	60m	40m
80	90m	100m
100	200m	200m

- 4 Vehicle crossings shall comply with the following:

**Complies:** No cycle or pedestrian facility in Cornwall Road.

Figure TR-5: Minimum separation distance for a new vehicle crossing from a pedestrian or cycle crossing facility

#### TR-S7 Visibility Splays

- 1 Vehicle accessways shall provide a visibility splay that complies with Table TR-7.

**Complies.** No current user path along Cornwall Road

Path Type	Path User Speed (km/h)	X (m)	Y (m)
Footpaths	5	5*	3
	10	5*	7
Shared Paths	15	5	12
	20	5	18
Cycle Path	25	5	26

#### TR-S8 Vehicle crossing formation

- 2 (rural zones) Any vehicle crossing to a sealed road shall be formed, surfaced with concrete, chip seal or asphaltic concrete, and drained for a minimum distance of 30m from the edge of the road carriageway.

**Complies.** To be confirmed

#### TR-S9 Vehicle crossing alignment

- 1 All vehicle crossing points shall be designed so that:
- The crossing centreline intersects with the property boundary at an angle of between 45° and 90°; and
  - The crossing centreline intersects with the carriageway at an angle of 90° plus or minus 15°.

**Complies.** Crossing connects with the Cornwall Road carriageway and road reserve at a perpendicular angle

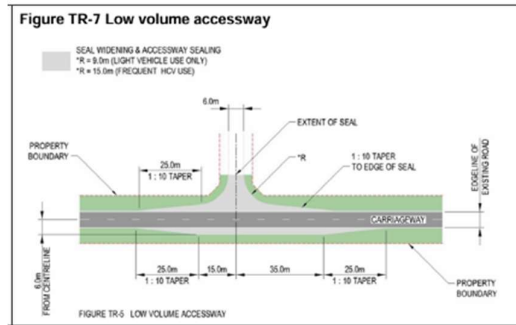
#### TR-S10 Rural Accessway Design

- 1 Any accessway with an average daily volume of vehicle movements of less than 100 shall be formed in accordance with the requirements of Table TR-8.

**Complies.** Once operational the site will generate fewer than 100 movements per day, and the accessway/crossing design will be

Table TR-8 Rural accessway design	
Average volume of vehicle movements using access per day	Access design standard
<= 30	Figure TR-7
31 – 100	Figure TR-8
> 100	Design as intersection

designed in accordance with Figure TR-7 Low Volume Accessway



#### TR-S11 Accessway gradient

1	The maximum gradient for any accessway used for vehicle access shall be 1 in 6.	<b>Complies.</b> Accessway is proposed to be at a gradient of less than 1:6
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#### TR-S12 Turning and passing

1	A turning area suitable for a medium sized rigid truck shall be provided on any accessway that: <ol style="list-style-type: none"> <li>provides access to 3 or more lots; or</li> <li>is longer than 50m.</li> </ol>	<b>N/A</b>
2	Passing opportunities or bays with a minimum width of 5.5m and length of 15m shall be provided at intervals of not more than 50m in urban areas and 100m in rural areas where visibility is available from bay to bay.	<b>N/A</b>

#### TR-S13 Stormwater Management

**Complies.** Discuss/assess by others

#### TR-S14 Firefighting access

**Complies.** Discuss/assess by others

#### TR-S15 Accessible routes

1	For all non-residential activities providing parking an accessible route shall be provided between the main building entrance and any allocated parking for people with disabilities.	<b>N/A</b>
2	Accessible parking bays shall be located as close as practical to the accessible entrance or to an accessible lift to the building or activity.	<b>N/A</b>

#### TR-S16 Minimum number of parking bays (Carterton District)

2	Every activity shall provide sufficient off-street parking for vehicles associated with the activity and vehicles expected to visit or be stored on the site in connection with the activity, in accordance with Table TR-9 below.	<b>Complies.</b> Six parking spaces proposed
4	Vehicle parking bays shall be provided for activities in accordance with Table TR-9. If an activity is not	<b>Complies.</b> specific parking required to support the



	<p>listed, then the standard for the activity listed that is closest in nature to that proposed activity shall be applied. Parking requirements do not apply to temporary activities.</p> <p>Table TR-9 Minimum number of parking bays – Industrial Activities: 1 per 50 sqm GFA</p>	<p>agrivoltaic facility, not reasonably based on GFA of building. Parking provided in based on practical requirements of the facility</p>
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5	<p>Where on-site parking is provided, the minimum number of accessible parking bays shall be provided in accordance with Table TR-10.</p>	<p><b>Does not Complies:</b> no accessible parking spaces proposed or assessed as being required to serve the on-going functional needs of the facility.</p>
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Table TR-10 Minimum number of accessible parking bays	
Total number of parking bays	Number of accessible bays
<20	1
20-50	2
For every additional 50 car parks or part thereof	1

#### TR-S18 Vehicle parking bay dimensions

All parking bays shall have dimensions that meet the minimum requirements of Table TR-11.

**Complies.** All parking spaces will be designed to meet the minimum requirements of Table TR-11

Table TR-11 Minimum parking bay dimensions				
User Type	Parking angle (degrees)	Stall width (m) <sup>a</sup>	Stall depth (m) <sup>b</sup>	Aisle width (m)
All users	Parallel	2.2	5.6 unobstructed 6.5 obstructed	3.0 one-way 6.0 two-way
Long term parking <sup>1</sup>	30	2.5	4.5	2.9
	45	2.5	5.3	3.7
	60	2.5	5.8	4.6
	90	2.5	5.6	5.8
Accessible parking	30	3.6	4.5	3.0
	45	3.6	5.3	4.2
	60	3.6	5.8	4.3
	90	3.6	5.6	6.2

#### TR-S19 Blind aisles

Blind aisles shall be extended by a minimum of 1m beyond the last parking bay and the last parking bay widened by 300mm if it is bounded by a wall or space. Where practical, the end space should be widened by the same amount as the aisle is lengthened.

**Complies.**

#### TR-S20 Parking bay gradients

1	<p>The maximum gradient within a standard parking bay, including motorcycle parking shall be as follows:</p> <ul style="list-style-type: none"> <li>a. 1 in 20 measured parallel to the angle of parking; and</li> <li>b. 1 in 16 measured in any other direction.</li> </ul>	<p><b>Will comply.</b></p>
2	<p>The maximum gradient within any accessible parking bay shall be 1 in 40 in any direction.</p>	

#### TR-S21 Parking bay construction and formation

2	For sites with four or more parking bays, the surface shall be formed, sealed, and drained.	<b>Will comply</b>
3	Parking bays shall be marked on all sealed parking areas.	<b>Will comply</b>
<b>TR-S22 Reverse manoeuvres</b>		
1	Sufficient manoeuvring space shall be provided on site to ensure that no vehicle is required to reverse: a. onto or off any State Highway; b. onto or off any transit corridor; c. onto or off any road with a marked cycle lane; d. across any shared use path; or e. across any cycle path.	<b>Will comply:</b> no reverse manoeuvring proposed to/from Cornwall Road
2	Sufficient manoeuvring space shall be provided on site to ensure that a 99 percentile design vehicle is not required to reverse onto or off any Urban Connector road.	<b>Will comply:</b> adequate on-site manoeuvring is provided
<b>TR-S23 Minimum number of cycle parking spaces</b>		
1	The minimum number of cycle parking spaces shall be provided in accordance with Table TR-12. Table TR-12 – Industrial Activities Long stay/staff minimum 1, 0.1 per (maximum) staff member.	<b>Does Not Comply:</b> no cycle parking proposed
<b>TR-S24 Cycle parking design</b>		
1, 2, 3	All cycle stands shall: a. be securely anchored to an immovable object; b. support the bicycle frame and front wheel; and c. allow the bicycle frame to be secured.  Cycle parking facilities shall be available during the hours of operation and shall not be diminished by the subsequent erection of any structure, storage of goods, landscape planting, or any other use.  Cycle parking facilities shall: a. be easily accessible for users; b. not impede pedestrian thoroughfares including areas used by people whose mobility or vision is restricted; and c. be clear of vehicle parking or manoeuvring areas.	<b>Does Not Comply</b>
<b>TR-S25 Trip-end facilities</b>		
1	For sites with fewer than 25 staff there are no requirements for end of trip facilities	<b>N/A</b>
<b>TR-S26 Loading and standing space dimensions</b>		
1	One loading space per site shall be provided with dimensions suitable for the largest vehicle anticipated on the site and in accordance with Table TR14. Table TR-14 Loading space dimensions: B99 (service van/light truck) – 3.0m width, 6.0m length, 3.5m height clearance	<b>Will comply</b>

2	Where more than one large vehicle is anticipated on a site, then standing space or additional loading spaces for each additional vehicle shall be provided.	N/A						
<b>TR-S27 Loading and standing space access</b>								
1	Circulation accessways to loading spaces shall be designed to accommodate the swept path of the largest vehicle anticipated on site and provide clearances of: <ul style="list-style-type: none"> <li>a. 0.5m between the vehicle body and vertical obstructions; and</li> <li>b. 1m separation between vehicle bodies on two-way accessways.</li> </ul>	Will comply						
2	Any required standing space shall not obstruct any space used for on-site queuing, loading, parking, or manoeuvring space.	Will comply						
3	Accessway gradients shall be in accordance with Table TR-15.	Will comply						
<table border="1"> <caption>Table TR-15 Loading space accessway gradients</caption> <thead> <tr> <th>Vehicle Type</th><th>Maximum Gradient</th><th>Maximum rate of change of gradient</th></tr> </thead> <tbody> <tr> <td>B99</td><td>1:6.5 (15.4%)</td><td>1:12 (8.3%) in 4m of travel</td></tr> </tbody> </table>			Vehicle Type	Maximum Gradient	Maximum rate of change of gradient	B99	1:6.5 (15.4%)	1:12 (8.3%) in 4m of travel
Vehicle Type	Maximum Gradient	Maximum rate of change of gradient						
B99	1:6.5 (15.4%)	1:12 (8.3%) in 4m of travel						
<b>TR-28 Loading and standing spaces - construction and formation</b>								
1	For sites with four or fewer loading and standing areas, the loading and standing areas shall be formed to an all-weather standard, drained, and have a maximum gradient of 1:20 (5%).	Will comply						

Overall, the proposal will comply with the majority of the relevant provisions of the TR Chapter standards from the PDP in respect of general transport matters, access, loading and formation standards. The non-provision of accessible parking and cycle parking are not considered relevant to the establishment of the agrivoltaic facility where there will be no practical need for such facilities.

Standard TR-29 also identifies that a “Basic” Integrated Transport Assessment is required for industrial activities comprising of no more 2,500sqm. Each of the matters set out in Appendix TR-APP1 (Integrated Transport Assessment Requirements) have been addressed in the preparation of this report.

## 8 Conclusions

Based on the assessment undertaken, it is considered that:

- Appropriate access can be arranged to connect to both the local and from there to the primary transport network (SH2) via well-designed and high-capacity intersections;
- The more notable transportation effects of the proposal are largely related to the construction phase which is expected to comprise of no more than a total of 60 traffic movements (inclusive of light and heavy vehicles) across the course of a day at the peak of the construction phase;
- The operation of these temporary construction-related activities can be readily accommodated within the surrounding transport network focussed on Cornwall Road and its intersection with SH2 without significant adverse effect on other road users or the surrounding community;
- In order to mitigate any potential adverse effect during this construction period it is recommended that a Construction Traffic Management Plan be prepared to the satisfaction of District Council roading manager prior to the commencement of construction activities within the site;
- Construction and permanent access connections between the proposed development site should be designed and constructed in accordance with the relevant engineering design standards of the District Council.

In summary, it is concluded that there are no traffic or transportation reasons preventing resource consent from being granted subject to the proposed conditions set out in this report.

***Don McKenzie Consulting Ltd.***