

Traffic Impact Assessment

Darlington-Camperdown Road, Bookaar
– Proposed Bookaar Solar Farm

August 2021

ratio:traffic



ratio:consultants

8 Gwynne Street
Cremorne VIC 3121
ABN 93 983 380 225

Prepared for:

Bookaar Renewables Pty Ltd
Our reference 16567T-REP01-F02

ratio:consultants Pty Ltd

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1 Introduction:

1.1 Introduction

Ratio Consultants has been engaged by Bookaar Renewables Pty Ltd (the 'Proponent') to prepare a traffic impact assessment for the proposed Bookaar Solar Farm (the 'Proposal').

The proposed solar farm is located west of Darlington-Camperdown Road and is bisected by Meningoort Road and comprises a total area of approximately 588 hectares (the 'Site').

1.2 Purpose of this Report

The purpose of this report is to assess the traffic and access implications associated with the proposed development of the land for use as a solar farm, with a particular focus on the construction stage.

Access to and from the Site from the broader road network has been assessed, including the localised impacts of the expected traffic generated during and post construction.

1.3 Methodology

The Traffic Impact Assessment was prepared by adopting traffic engineering principles to assess the impacts of the Proposal generated traffic against the existing conditions of the surrounding transport network, and making recommendations to mitigate these impacts.

In this regard, the following key tasks were undertaken in the preparation of this report:

- Review background documentation, including plans for the Site and reports prepared as part of a previous application;
- Critical review of the traffic and access elements of the VCAT determination for the previous application for a solar farm at the same site;
- Consultation with Corangamite Shire and the Department of Transport (DoT) to confirm local conditions and seek advice on local and regional traffic matters relevant to the Proposal;
- Consultation regarding the suitability of the proposed access route with Corangamite Shire Council;
- Assessment of the existing conditions of the surrounding transport network;
- A detailed analysis of the vehicle types, construction methodology and program of works to establish traffic generation;
- Detailed observations on-site and desktop reviews of the Site and surrounding road network;
- Assessment of the potential impacts of the Proposal and the identification of mitigation strategies to address impacts based on the author's professional judgement, industry guidelines and standards; and
- Preparation of this report, and accompanying layout plans.

1.4 References

In the preparation of this report, the following documents have been considered:

- Corangamite Planning Scheme;
- On-site observations during June 2020;
- Concept layout plans for the intersection of Darlington-Camperdown Road and Meningoort Road (16567-CLP-002 Issue D, dated 5/5/2021) prepared by Ratio Consultants;
- Civil design plans to support the concept plans for the intersection of Darlington-Camperdown Road and Meningoort Road, and Meningoort Road (131500RD04 Rev B, dated 22/7/2021) prepared by PEAKURBAN;
- Nearmap aerial imagery (accessed 2/7/2020);

- Traffic volumes obtained from VicRoads / Department of Transport Online Traffic Profile Viewer (accessed 3/7/2020);
- VicRoads / Department of Transport HML and OSOM online network maps (accessed 2/7/2020);
- Site Plan for the Proposal (prepared by NG Electrical 22/06/2021);
- Economic Impact Assessment: Bookaar Solar Farm, Ethos Urban (dated October 2020);
- Acoustic Report: Bookaar Solar Farm, Renzo Tonin & Associates (dated October 2020);
- Bushfire Risk Assessment & Mitigation Plan, Fire Risk Consultants (dated October 2020); and
- Indicative construction program and assumptions provided by the Proponent.

2 Site Context:

2.1 Site Location

The Proposal is located approximately 8 km north west of the centre of the Camperdown township and approximately 4 km to the north of the Princes Highway. By road the Proposal's main site access is 14 km to the centre of Camperdown.

The Site lies to the west of the Darlington-Camperdown Road and is bound by Blind Creek Road to the south. Meningoort Road, a local road bisects the northern part of the Site connecting the Darlington-Camperdown Road with Blind Creek Road.

The Site and surrounding land is zoned as 'Farming Zone' and the current use of the land is rural in nature, reflecting this zoning.

The location of the Site in the broader context of the surrounding area, and the immediately surrounding road network, are shown in Figure 2-1 and Figure 2-2 below.

Figure 2-1: Site Locality



Source: nearmap.com.au

Figure 2-2: Site location in context of the local road network



Source: nearmap.com.au

2.2 Local Road Network

Darlington-Camperdown Road is an arterial road (Class C) under the responsibility of the Department of Transport (DoT, formerly VicRoads). The road extends for approx. 26 km, connecting the Princes Highway (A1) to the south and Hamilton Highway (B140) to the north.

The road has a signed speed limit of 100 kph for its entire length, and traffic volumes obtained from DoT open source data indicate that the road currently carries in the order of 630 vehicles per day including 75 heavy vehicles. Traffic is generally split 50/50 between northbound and southbound traffic. Using the DoT traffic profile viewer, peak hourly volumes are generally in the order of 50-60 vehicles in both the AM (8am-9am) and PM (5pm-6pm) peak hours.

Within the vicinity of the Site, Darlington-Camperdown Road has a carriageway width of approximately 6 metres and accommodates a single trafficable lane in each direction. The shoulders of the road are unsealed.

North of Darceys Lane, Darlington-Camperdown Road reduces to a sealed carriageway of approximately 4.0 metres with unsealed shoulders. Passing vehicles are required to use these shoulders and partially move off the sealed carriageway.

Photographs showing Darlington-Camperdown Road at the intersection with Meningoort Road are shown in Figure 2-3 and Figure 2-4.

Figure 2-3: Darlington-Camperdown Road facing north



Figure 2-4: Darlington-Camperdown Road facing south



Meningoort Road is a local road managed by Corangamite Shire Council. The road initially extends west from Darlington-Camperdown Road before turning south and eventually aligning northwest-southeast. It ends at an intersection with Blind Creek Road in the south.

Meningoort Road, where it bisects the northern part of the Site, will be used to provide direct access to the Proposal both during and post-construction (for clarity, this part of Meningoort Road is referred to as 'Meningoort Road (north)' to distinguish it from the southern part of Meningoort Road (see Figure 2-2). There is also road access to the western boundary of the Site from the southern part of Meningoort Road, however access from the west will only be for emergency purposes.

Meningoort Road (north), in the vicinity of where it crosses the Site and meets the Darlington-Camperdown Road has an unsealed carriageway of approximately 6 metres which accommodates two-way traffic flow. This section of Meningoort Road crosses through a single landholding and as such, the primary users of this road are the landowners and any associated traffic required to support the farming operation on the Property.

Meningoort Road operates with a default speed limit of 100 km/h, however, due to the condition of the road operating speeds are expected to be much lower.

Photographs showing Meningoort Road (north) near the intersection with Darlington-Camperdown Road are shown in Figure 2-5 and Figure 2-6.

Figure 2-5 Meningoort Road (north) facing east



Figure 2-6: Meningoort Road (north) facing west



The intersection of **Meningoort Road** and **Darlington-Camperdown Road** will be the primary access point to the Site both during and post construction. It is located approximately 9 km north of the intersection of Princes Highway. The approach on Meningoort Road (north) is controlled with a stop sign and currently there is no local widening or turning treatments at the intersection.

Views of Darlington-Camperdown Road from the Meningoort Road (north) approach of the intersection facing north and south are shown in Figure 2-7 and Figure 2-8, respectively.

Figure 2-7 Darlington-Camperdown Road from Meningoort Road (north) facing north



Figure 2-8 Darlington-Camperdown Road from Meningoort Road (north) facing south



Blind Creek Road is a local road managed by Corangamite Shire Council. The road is aligned in an east west direction between Darlington-Camperdown Road in the east to Eddington Road in the west.

Within the vicinity of the Site, Blind Creek Road has a sealed carriageway of approximately 6 metres and accommodates two-way traffic flow east of the intersection of Meningoort Road. Towards the west of the intersection with Meningoort Road, Blind Creek Road is unsealed.

In the vicinity of the Site, Blind Creek Road operates with a default speed limit of 100 km/h, however due to the condition of the road, actual operating speeds are expected to be lower.

As outlined above, the section of Meningoort Road directly north of Blind Creek Road runs adjacent to the western boundary of the Site (Meningoort Road (south)). Blind Creek Road will not be used for the Proposal, with the exception of emergency vehicle access to the southern areas of the Site.

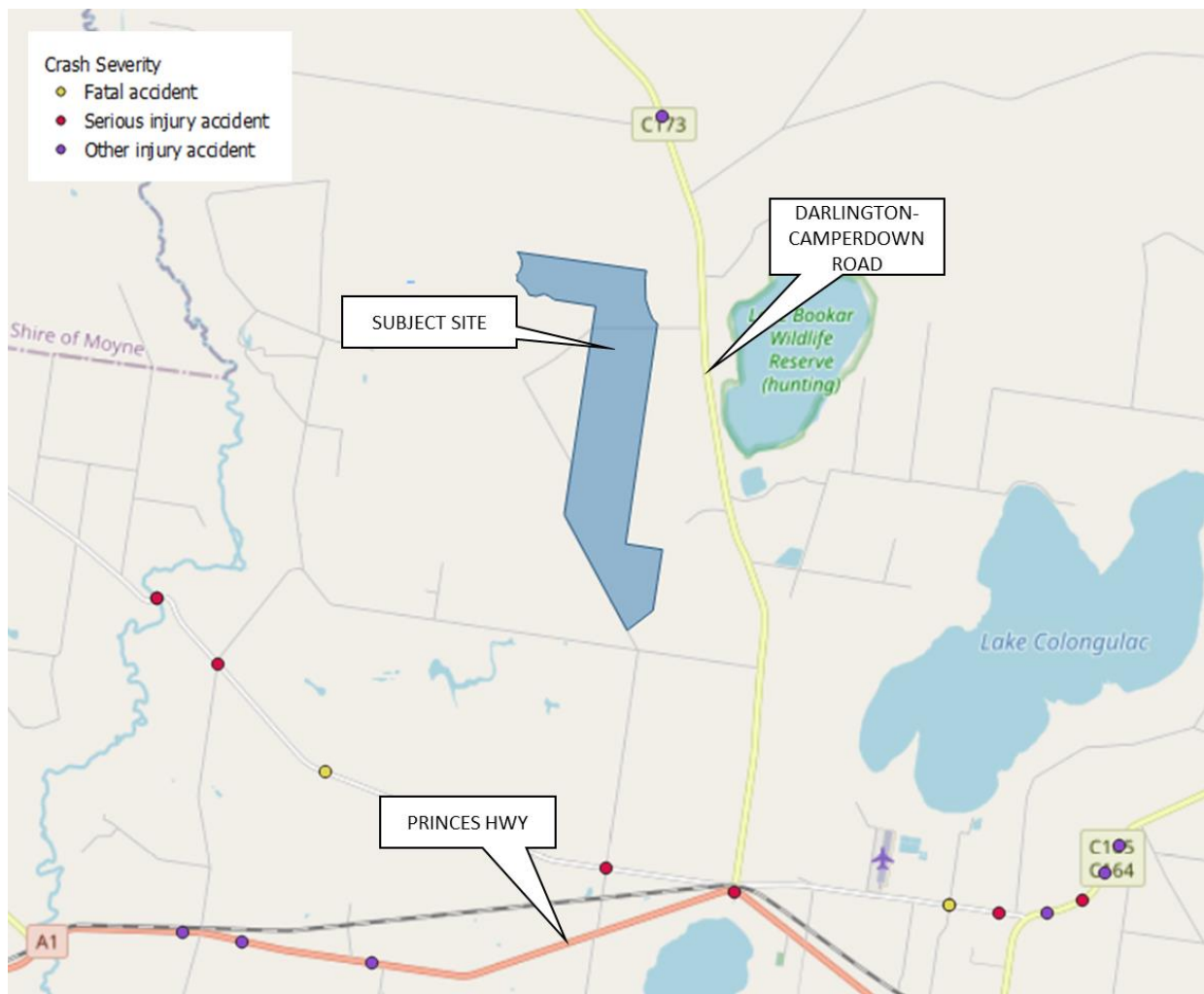
2.3 Accident History

Review of Department of Transport (DoT) CrashStats accident data for the last 5 years for the Darlington-Camperdown Road and local roads (Meningoort Road and Blind Creek Road) in proximity of the Site shows a single incident at the intersection of Princes Highway with Darlington Camperdown Road.

This accident was a single vehicle incident with the driver of the vehicle injured.

Crash locations in proximity of the Site are illustrated in Figure 2-9.

Figure 2-9 Crash Locations – Last 5 Available Years (source Crashstats)



2.4 School Bus Services and Agricultural Traffic

It is understood that local school bus routes extend along the Darlington-Camperdown Road and the Princes Highway for students attending the Camperdown College, St Patricks Primary School, and the Camperdown campus of the Mercy Regional College.

Darlington-Camperdown Road is also routinely used by a range of farm vehicles and agricultural machinery, with Darlington-Camperdown Road a permitted route for Class 0 and Class 1 agricultural vehicles.

2.5 Pedestrian and Cycling Activity

Due to the rural nature of land in the vicinity of the Site, there is no existing provision for pedestrian paths or bicycle infrastructure within the road reserve. Any pedestrian activity would likely be limited to local residents along the shoulders of the road.

Similarly, it is unlikely that bicycle movements occur regularly along Darlington-Camperdown Road due to the nature of the road environment and its rural location. Any bicycle movements would occur within the sealed lanes of the road, shared with other vehicular traffic.

The lack of pedestrian and bicycle infrastructure on Darlington-Camperdown Road is consistent with other rural roads of this kind in the surrounding region.

2.6 Higher Mass / Over Size Road Access

Approved routes which have been gazetted as part of Victoria's High Mass Limit (HML) and Over Size Over Mass (OSOM) road network are shown on the VicRoads website.

These networks support Class 2 & Class 3 accredited heavy vehicles and Class 2 OSOM vehicles (up to 100 tonnes gross and 5.0m wide by 5.0m high by 30.m long).

The HML route is shown in Figure 2-10 in green. The map shows that the full length of the Darlington-Camperdown Road, including the section north of Darceys Lane that has a single width sealed carriageway, is part of the HML route.

Princes Highway and Hamilton Highway are identified OSOM routes (see Figure 2-11). Darlington-Camperdown Road is not included within this network. As such, specific local permission would be required for OSOM access on the Darlington-Camperdown Road.

Figure 2-10: DoT HML Road Network

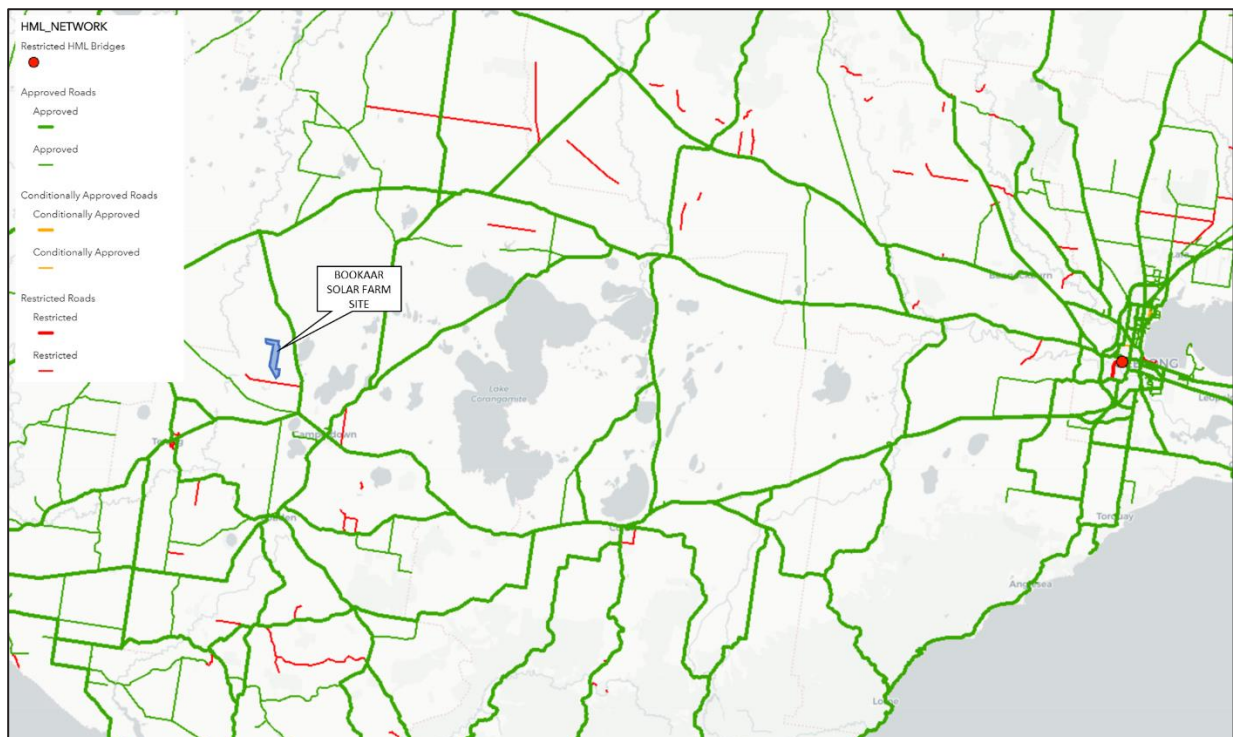
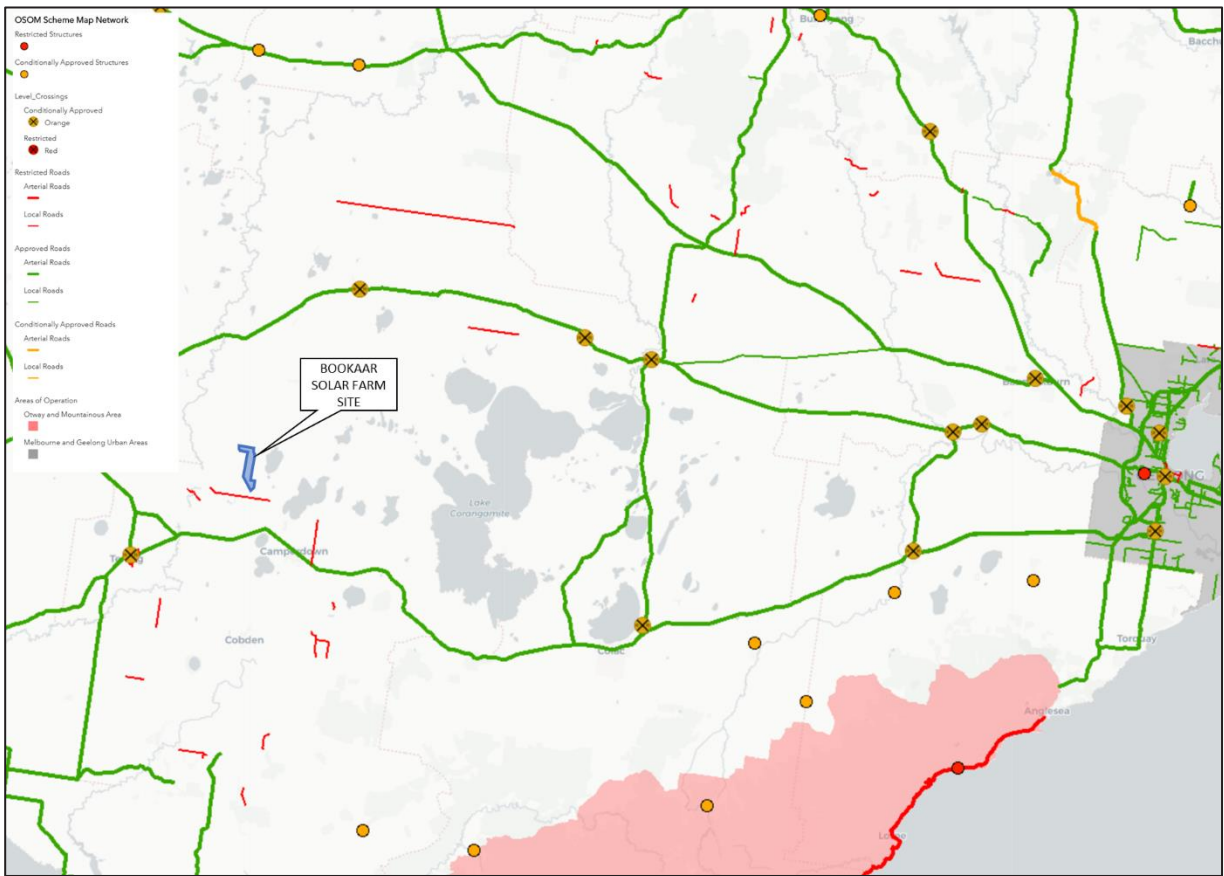


Figure 2-11: DoT OSOM Road Network



3 Bookaar Solar Farm

3.1 Project Description

Bookaar Renewables is proposing to develop a 200MW(ac) solar energy facility (the Proposal) at the Site (Figure 3-1 below).

The Proposal includes the following elements (see the 'Site Plan' that accompanies the 'Planning Report' for the Proposal:

- 'Array Areas', containing Photovoltaic (PV) panels mounted on a single axis tracking system with a maximum height of 4 m above natural ground at maximum tilt. The tracking system would be supported by piles driven into the ground (pile spacing is either 12.75m or 13m);
- 82 inverters located centrally throughout the Site in pairs at 41 locations across the Site (inverter stations). Inverter stations are located at least 170 m from the Site boundary;
- Below ground cabling connecting the PV panels between trackers and inverters;
- Below ground cabling connecting the inverters to the substation;
- An internal track network of all-weather gravel tracks (4 m), including a perimeter track which forms part of a 10 m wide defendable Asset Protection Zone (APZ) that surrounds the Site;
- Four (4) gated main site access points via Meningoort Road;
- Four (4) gated emergency access points along the western boundary of the Site;
- Eight dedicated water tanks for firefighting (maximum of 3.6m high), located adjacent to each access point;
- A perimeter security fence 2.5 m high (chain mesh);
- Perimeter vegetation screens (20 m wide with 4 rows of trees and maintained to a height of at least 4 m), planted on the outside of the security fencing;
- Agricultural style fencing 1.2 m high, around the perimeter of the vegetation screens and the perimeter of the existing vegetation identified on the Site's western boundary;
- A SCADA system that will gather, monitor and analyse data generated through operating the Proposal;
- On-demand, downward facing lighting (restricted to 4m in height); and
- Sensor triggered CCTV security cameras located around the perimeter of the Site and adjacent to key infrastructure.

Substation Area (1.76 ha):

- Substation connecting the Proposal to the onsite 220KV transmission line, via two (2) new high voltage (HV) 220 kV transmission lines;
- A Control building (up to 5 m high);
- Substation Operations and Maintenance building (up to 5 m high);
- A security fence (chain mesh) up to 2.5 m high, enclosing the Substation;
- A 10 m wide defendable APZ around the perimeter of the Substation; and
- Parking for 5 vehicles.

Battery Area (0.91 ha):

- A series of separate containerised battery units, connected by underground cables to the Substation (approximately 2.5 m high);
- A separate transformer adjacent to each battery; and
- A 10m defendable APZ around the perimeter of the Battery Area.

Operations Buildings Area (0.96 ha):

- A Site office building including amenities with a height of 3.6 m;
- A maintenance building and workshop with a height of 5 m;
- 3 Storage sheds with a height of 4.1 m;
- Car parking for twelve (12) vehicles;
- A septic tank and potable water tank;
- A defendable APZ of 20 m, which allows the area to function as the nominated 'Shelter in Place' location (see the 'Bushfire Risk Assessment Report and Mitigation Plan').

In addition to the key components outlined above, there will be a temporary construction compound (1.44 ha) to facilitate the construction phase of the Proposal. The construction compound would include:

- Temporary construction offices (up to 5 m high);
- Car and bus parking areas for construction vehicles (51 workers cars, 5 mini vans; and additional parking space provided for delivery vehicles and construction machinery);
- Staff amenity block including portable toilets, showers and a kitchen, designed for peak staff numbers during the construction period; and
- Laydown areas.

Once the Proposal is operational, the construction compound will be decommissioned and revegetated.

Access to the Site (for construction and operations) is directly from Meningoort Road (north) via the Darlington-Camperdown Road. The access points are gated as shown on the Site Plan. It is proposed to widen the intersection of Meningoort Road and Darlington-Camperdown Road.

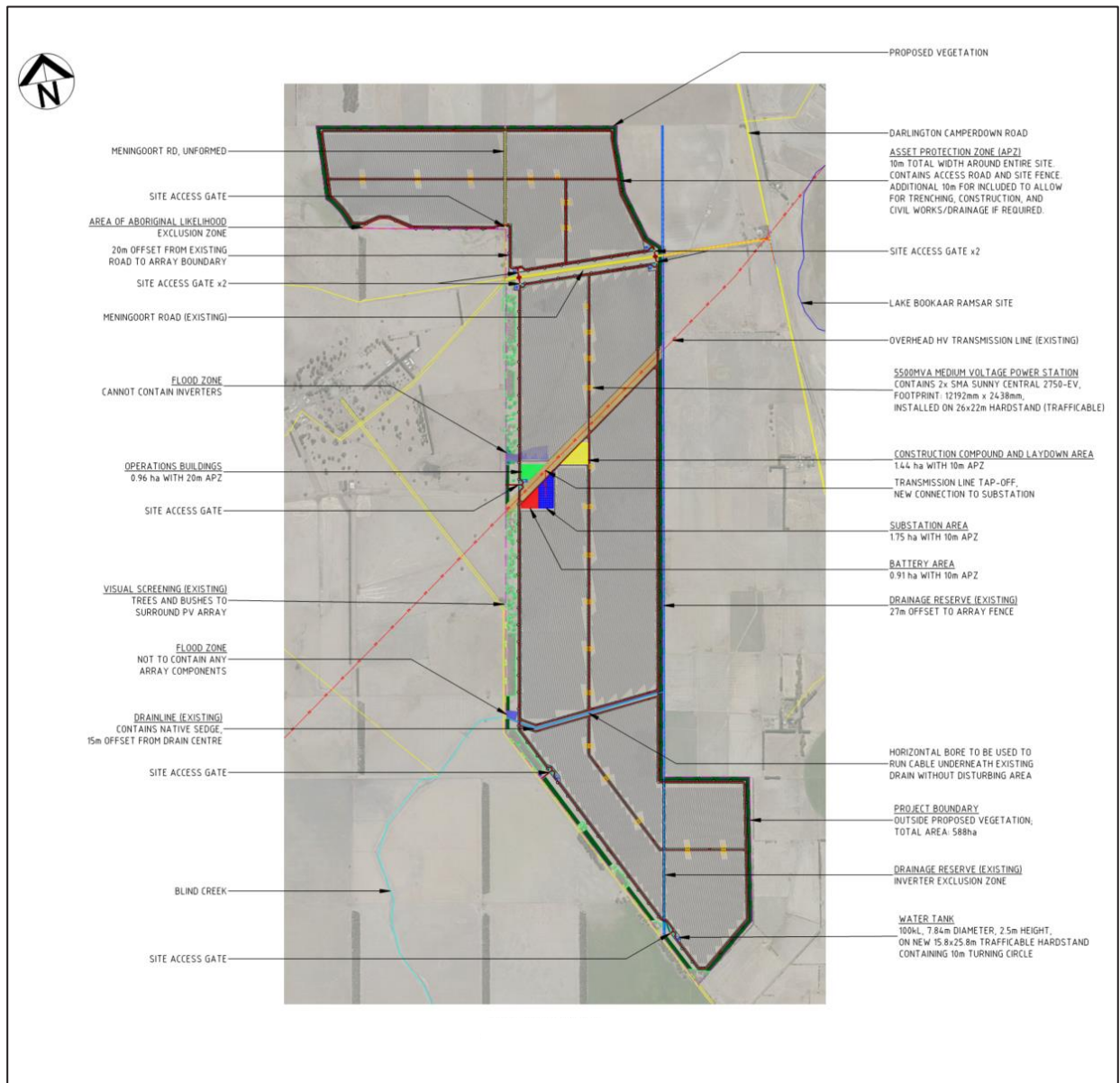
In addition to the operation and construction access, there will be four further gated Emergency Access Points along the new Proposal's western boundary as shown on the Site Plan.

The Proposal has a lifespan of 30 years. The construction phase would take approximately 12 months and require up to 150 full-time staff. The operational phase would be approximately 28 years and will generate between 8 and 12 full time positions nationally, with six full time equivalent positions likely to be based locally.

Decommissioning is expected to take 12 months and would require a similar workforce to the construction period. Following decommissioning all above ground infrastructure associated with the solar farm would be removed from the Site.

The Proposal is shown in Figure 3-1.

Figure 3-1 Bookaar Solar Farm



Note: See the 'Site Plan' accompanying the Planning report which provides full detail at scale

3.2 Access

External Access

Main access to the Site will be via Meningoort Road (north) where it bisects the Site as shown below in Figure 3-4. Four main access points will be installed two on either side of Meningoort Road (north) as shown on the Site Plan. Four additional access points are provided along the western boundary of the Proposal for emergency purposes which will be accessed via the southern section of Meningoort Road.

To provide for vehicular movements from the south on the Darlington-Camperdown Road, improvements will be made to both Meningoort Road (north) and the intersection of Meningoort Road (north) and Darlington-Camperdown Road, including:

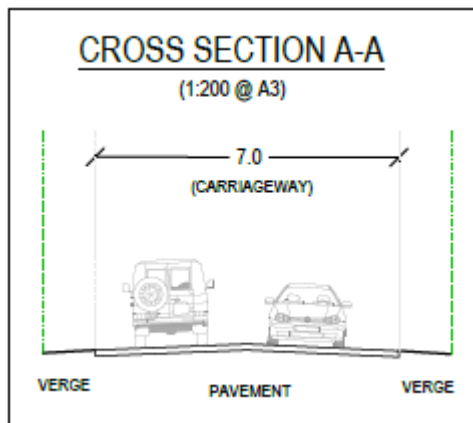
- Construction of Meningoort Road (north) between Darlington-Camperdown Road and the western boundary of the Site as a typical 7.0 metre wide all weather surface carriageway;

- Construction of a channelised left-turn lane from Darlington-Camperdown Road into Meningoort Road (north) (south to west); and
- Sealing the first 30m section of Meningoort Road (north) to facilitate turning movements of heavy vehicles into and out of Meningoort Road (north).

Meningoort Road (north) will be upgraded from the intersection with the Darlington-Camperdown Road to the western boundary of the Site (approximately 1,660 m). The road will be constructed with a gravel surface of a suitable standard for two-way construction traffic to a width of 7 meters. The road will locally narrow to a single lane (4 metres) to cross an existing road culvert. Upgrade works will be to an agreed standard with Corangamite Shire Council and in accordance with the Infrastructure Design Manual.

The recommended road cross section is illustrated below in Figure 3-2.

Figure 3-2: Proposed Meningoort Road Cross Section



The proposed intersection treatment at the Darlington-Camperdown Road / Meningoort Road (north) intersection is limited to a short left turn lane treatment (see Figure 3-3).

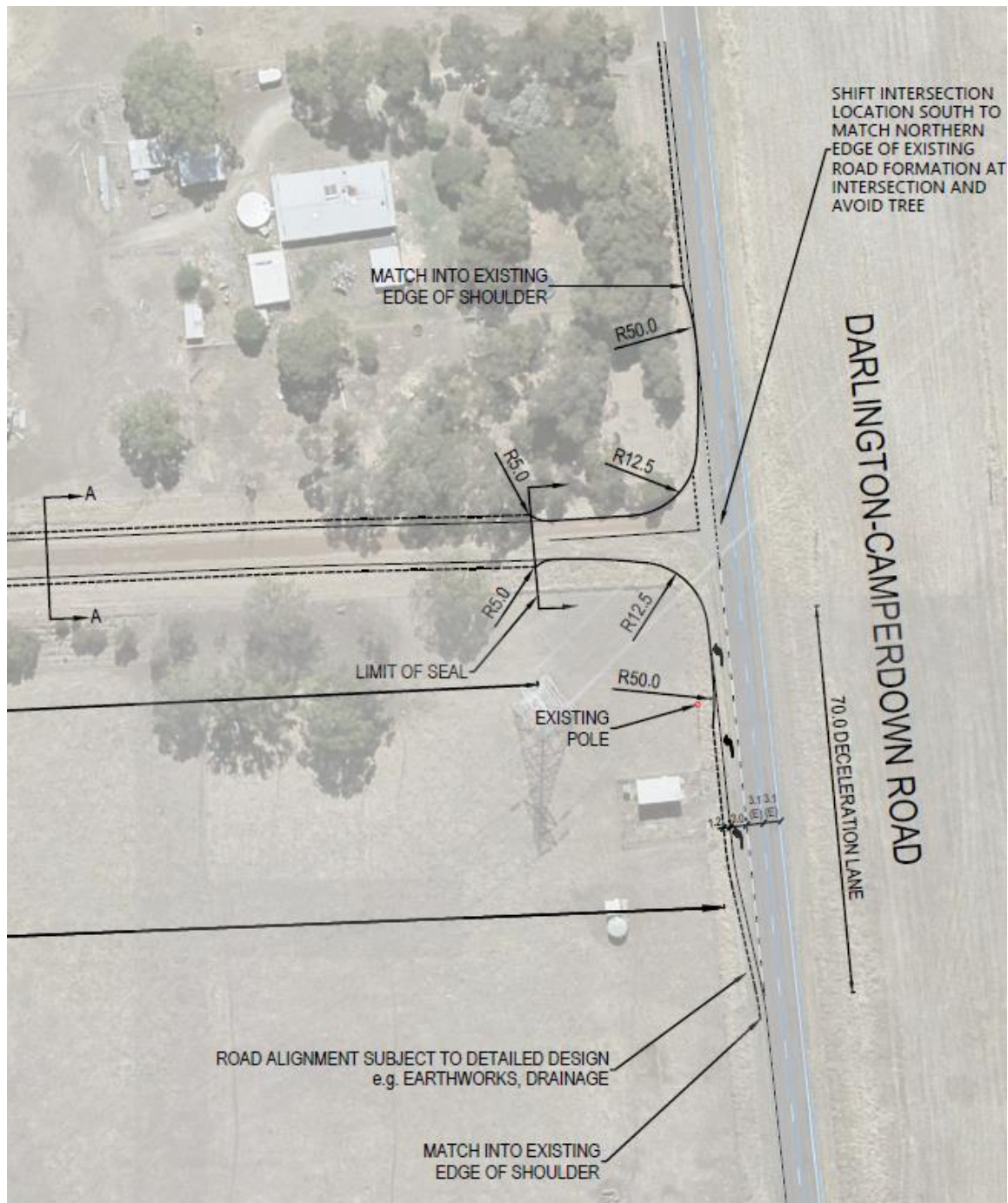
The adequacy of these improvements to facilitate access to and from the Site are discussed further in Section 5 and have been shown in the concept layout plans prepared by Ratio Consultants (16567-CLP-002 Issue D, dated 05/05/2021). Civil design plans that incorporate the concept road design and demonstrate how roadside drainage will be incorporated to ensure that there will not be impacts to local hydrology have been prepared by PEAKURBAN (131500RD04 Rev B, dated 22/07/2021) and are also attached at Appendix A of this report.

Following the completion of the construction phase, the upgraded access roads will continue to be used for ongoing maintenance and servicing of the Proposal.

Meningoort Road will be maintained by the Proponent for the duration of the construction period.

No general traffic during or post construction will use Blind Creek Road or Meningoort Road to the southern end of the Site.

Figure 3-3: Meningoort Road / Darlington-Camperdown Road Intersection Upgrade



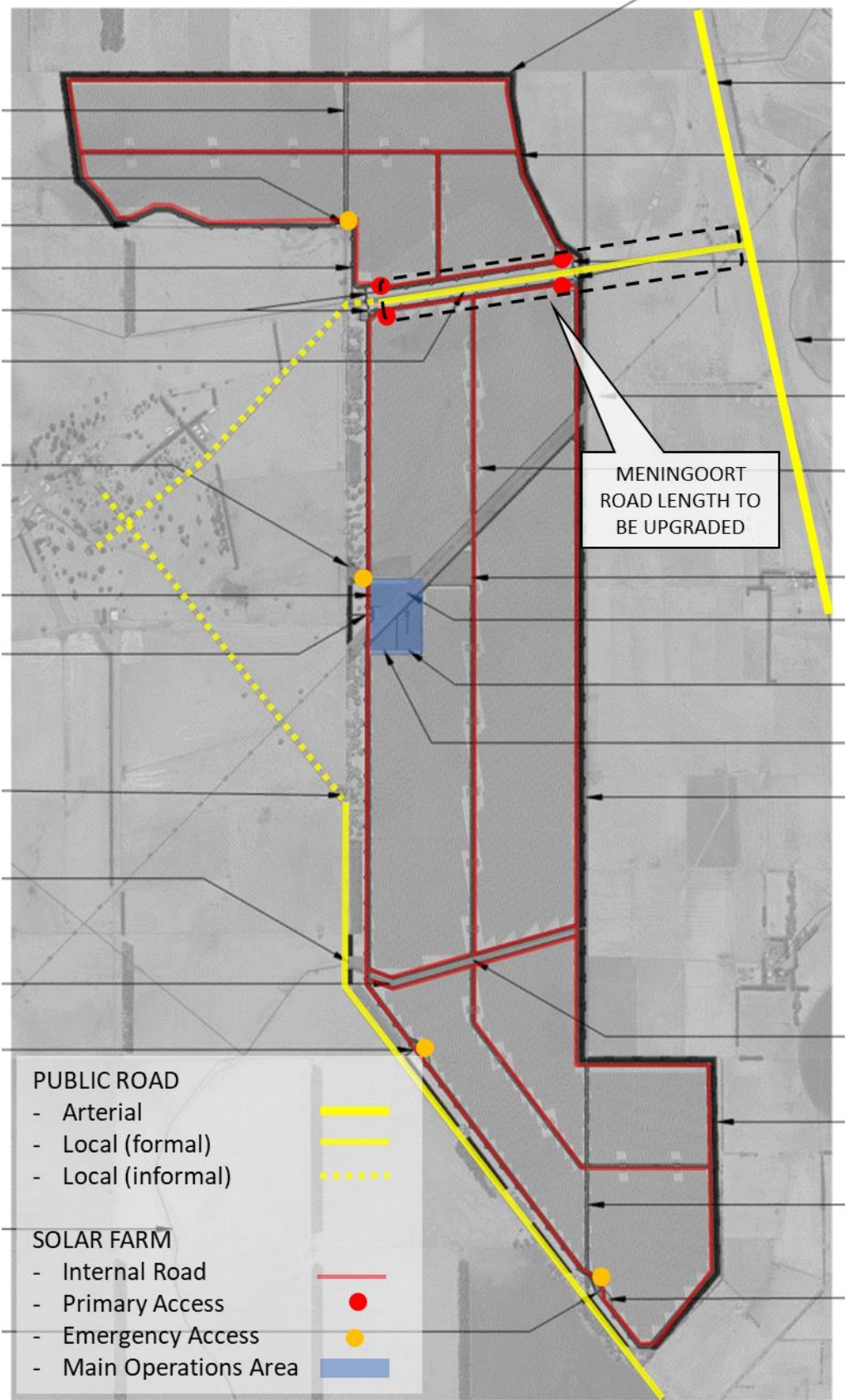
Source: Ratio Consultants (plan 16567-CLP-002, Issue D, dated 5/5/2021)

Internal Track Network

A series of internal unsealed access tracks will be constructed within and around the perimeter of the Proposal to facilitate vehicle movement throughout the Site for construction, maintenance and to allow for emergency vehicle access (for example CFA appliances). Internal tracks will be 4.0 metres wide with regular passing areas (an additional 20 m x 2m every 600m). The tracks will be constructed to align with existing topography to ensure that the tracks do not interfere with water flows across the Site (see the 'Flood Assessment' that accompanies the 'Planning Application').

The layout of the Proposal including internal access roads and proposed access points are illustrated below in Figure 3-4.

Figure 3-4 Solar Farm Access and Internal Roads



Source: NG Electrical, June 2021

3.3 Comparison of access routes with Previous Application

A previous planning application for a solar farm at the Site (the 'Previous Application') proposed vehicular access to the Site via Blind Creek Road and Meningoort Road from the south (the 'southern route'). Safety concerns were raised by the local community regarding this route during a VCAT Hearing and, although these concerns were not upheld by the Tribunal, the Proponent considered it best practice to evaluate if other options could facilitate access to the Proposal in light of the concerns raised.

This southern route was reviewed and assessed against a second access route via Meningoort Road (north). The southern route remains a feasible access route however, on balance, the northern access route has been determined as the preferred access for the Site for the following reasons:

- The length of local road relied on is reduced;
- Meningoort Road (north) is not relied on for access or used by the community, other than as an access route for the host property, meaning that;
 - Proposal traffic is effectively separated from other traffic on the local road network (including a compost facility traffic that relies on Blind Creek Road); and
 - The maintenance and upkeep of Meningoort Road during the construction phase is simplified.
- Darlington-Camperdown Road between Blind Creek Road and Meningoort Road (north) is in good condition and is suitable for the traffic generated by the Proposal; and
- There is no difference in intersection treatments recommended for the Proposal between either access route.

4 Solar Farm Construction

As illustrated in Figure 3-1, the construction compound will be located centrally within the Site, as shown on the 'Site Plan'. It is understood that the compound will incorporate a range of temporary infrastructure including offices, portable toilets, and storage areas for plant and materials. The establishment of the compound will take place concurrently with the construction of access roads within the Site, in preparation for the construction activities to commence.

The Proponent has advised that up to 150 staff would be required on-site throughout peak periods of construction.

We are advised that the construction of the Proposal will occur across a 12 month period (approximately) and include the following key work phases and indicative tasks:

- Site Establishment including creation of the site compound, construction of road improvements to Meningoort Road, construction of internal access roads, delivery of mechanical plant and temporary worksite amenities;
- High voltage trenching works including laying cables;
- Construction of the photovoltaic plant e.g. installation of tracking systems and solar panels; and
- Substation works including delivery of two over-size and over-mass transformers to the site.

4.1 Construction Traffic Access

All construction traffic will travel to the Site from the south using the Princes Highway to access the Darlington-Camperdown Road (which is a sealed two-lane, two-way road that is an HML approved route) and then onto Meningoort Road North where there are four access points designed to facilitate access to all areas of the Solar Farm facility. This access route avoids using parts of the Darlington-Camperdown Road to the north of Darceys Lane which is not considered suitable for construction traffic in its current condition.

Construction Materials Delivery

Quarry materials required for civil works, including construction of access roads within the Site, will be sourced regionally from one or multiple quarry sites. A number of quarries have been identified as potential sources of materials, including Salt Creek and/or Mount Shadwell (near Mortlake), Camperdown Quarry and multiple quarries in the Colac area.

Identified preferred routes from these quarries are as follows:

Salt Lake / Mount Shadwell

- Mortlake-Ararat Road
- Terang-Mortlake Road
- Princes Highway
- Darlington-Camperdown Road
- Meningoort Road (north)

Camperdown

- Princes Highway
- Darlington-Camperdown Road
- Meningoort Road (north)

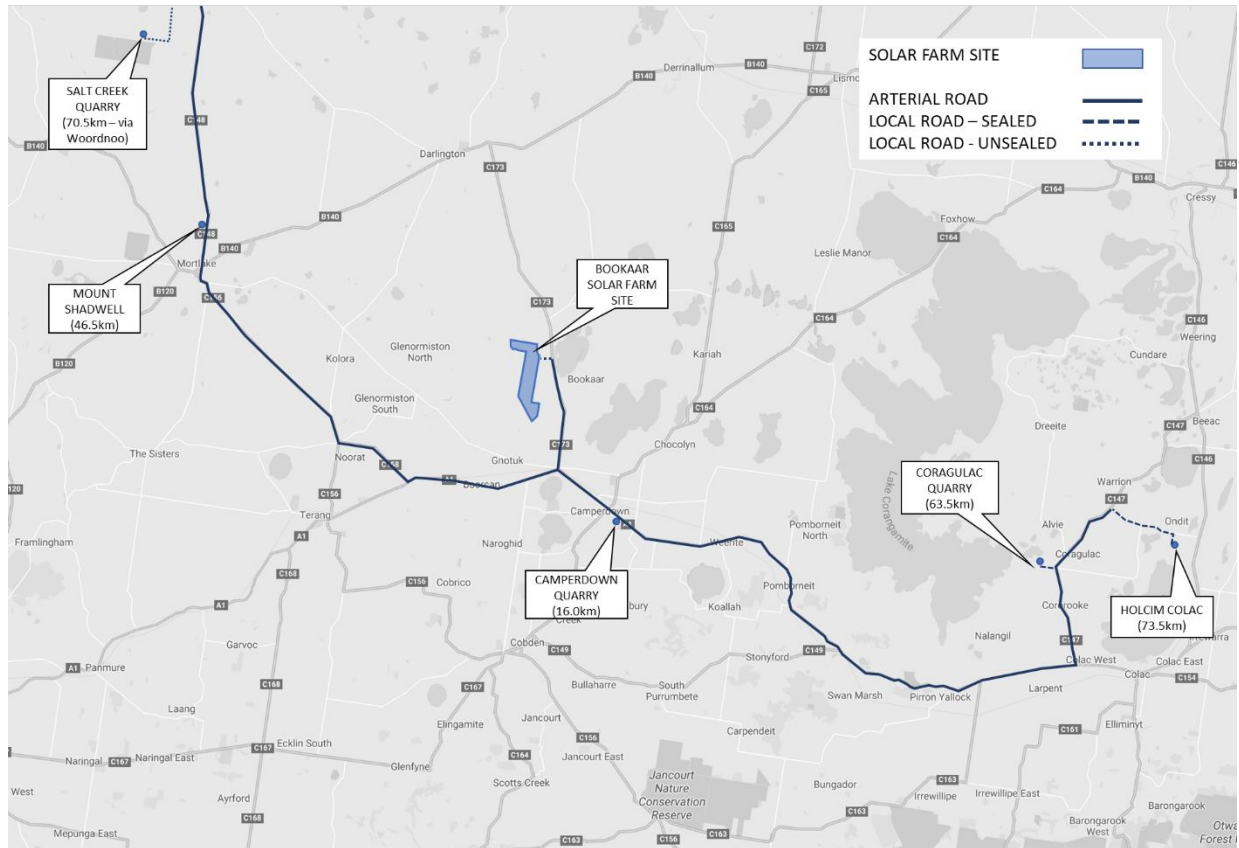
Colac Area

- Lineens Road / Ondit-Warrion Road (local)
- Corangamite Lane Road
- Princes Highway
- Darlington-Camperdown Road
- Meningoort Road (north)

With the exception of Lineens Road and Ondit-Warrion Road, all identified roads are arterial roads with sealed two-lane, two-way pavements and are HML approved routes. Lineens Road and Ondit-Warrion Road are accepted access routes to the Colac quarry sites and are fit for this purpose.

Other construction materials, such as concrete, will be sourced locally wherever practical and would be transported to Site from the south via the Princes Highway, Darlington-Camperdown Road and Meningoort Road, like all construction traffic for the Proposal.

Figure 4-1 Quarry Locations and Recommended Access Routes



Component and Substation Haulage Route

It is understood that Geelong Port will be the likely arrival port for imported components (PV-plant and HV cabling works etc.) and most of the components for the substation. The substation components are likely to include six over-dimensional deliveries.

The delivery of these components from the Port of Geelong will be via Princes Highway, an approved HML and OSOM road, Darlington-Camperdown Road and then onto the upgraded section of Meningoort Road (north) to Site.

OSOM movements on this route will be subject to the standard approval processes from NHVR (National Heavy Vehicle Regulator) and from Regional Roads Victoria (RRV). Subject to the size of vehicles required, specific approval may be required for the section of Darlington-Camperdown Road between Princes Highway and Meningoort Road from RRV.

The indicative route from Geelong to the Site is illustrated in Figure 4-2 below.

The map displays the proposed solar farm site and the OSOM (Ovens-Southern Oceanic Motorway) route. The solar farm site is located near Booka, marked with a blue rectangle and labeled 'BOOKAAR SOLAR FARM SITE'. The OSOM route is shown as a blue line, starting from the solar farm site and extending towards the Geelong area, passing through various towns and regions. The map includes a legend in the top right corner indicating 'SOLAR FARM SITE' (blue rectangle) and 'OSOM ROUTE' (blue line). Numerous towns and regions are labeled, including Booka, Geelong, and various localities in the surrounding areas. The map also shows major roads and highways, such as the A300 and various C-roads.

Further assessment should be undertaken once the size of components and subsequent vehicle dimensions is known.

Based on similar utility-scale renewable energy projects, a 70/30 split between local/non-local workers is assumed for the construction of the Proposal (source: 'Economic Impact Analysis' accompanying the 'Planning Report'). As such, it is expected that the majority of staff will likely travel from, and be accommodated within the Corangamite LGA in the main townships of Camperdown, Cobden and Terang. However, workers may also access the Site from Colac-Otway Shire, and the Moyne Shire, or from further afield. It is understood that where possible, staff will be collected from centrally located points and shuttled to the Site via mini buses. Where this is not practicable, including for staff travelling from outside of Corangamite Shire, or for those travelling with specialist tools which cannot be stored on Site, staff will travel to the Site via private vehicle (e.g. cars, vans).

All staff will be required to arrive to the Site via the Princes Highway to the south.

5 Traffic Assessment:

5.1 Overview

Relevant to traffic activity and the associated traffic impacts of the Booker Solar Farm, key scenarios are

- Early works package
- Solar Farm construction; and
- Solar Farm operation

The Project will also include a future decommissioning phase. However the traffic impacts of this phase have not been considered within this report as any traffic impacts of this phase with subject to road network conditions at the time of decommissioning and cannot be reasonably be assessed.

Traffic generated during the early works package will be that traffic associated with improvements to Meningoort Road (north) and delivery of the Meningoort Road/ Darlington-Camperdown Road intersection works. These works are required to facilitate access to the Site and will be undertaken prior to the main Project construction period.

Traffic generated by the Bookaar Solar Farm during construction will include:

- Traffic generated by staff travelling to/from the Site (i.e. utes, vans, minibuses and private cars)
- Heavy vehicles used for the delivery materials and plant;
- Service vehicle associated with the operation of the on-site compound (e.g. waste collection, fuel delivery and toilet pump out); and
- OD vehicles used for the delivery of substation components

Following the 12-month construction stage, it is understood that once the Solar Farm is operational, only a limited number of vehicles are expected to access the Site each work day 'which will primarily consist of a small number of staff (six full time equivalent staff based locally), and occasional visitors and deliveries.

In the preparation for this assessment, the information provided by the Proponent has been reviewed, including estimated vehicle numbers based on the scale of the Proposal, and an indicative outline of the program of works.

5.2 Early Works Traffic

As outlined in Section 3.2, the following external works will be undertaken to support the construction stage of the project including:

- Meningoort Road (north) will be upgraded to 7.0 metre wide gravel road from the intersection with the Darlington-Camperdown Road to the western boundary of the Site (approximately 1,660 m); and
- Implementation of a channelised left turn lane treatment and deceleration lane at the intersection of Darlington-Camperdown Road and Meningoort Road (north).

The external works will take in the order of 3 weeks to complete (18 days), on the basis that the contractor can construct an average of 100-150 metres of road per day. Based on indicative road base depth of 300mm and average width of 7 metres, a total of 3,563 cubic metres of road construction material will be required.

Based on the assumption that the works will take approximately 18 days to complete and each truck can carry 32 cubic metres, the works will generate in the order of 6-7 trucks per day, or 111 for the duration of the project.

Other plant and machinery may be required including staff vehicles, earth moving, as well as road sealing crews (associated with the sealing of the first 30 metres of Meningoort Road), line marking, and traffic control vehicles.

Given the constrained environment of road construction activities in the road reserve the works, including associated staffing will be significantly lower than what is expected during the construction of the solar farm. As such, traffic associated with the external road works is expected to generate well below the levels of traffic expected during the solar farm construction.

The external works stage of construction will be fully located within the Meningoort Road and Darling-Camperdown Road reservations and as such will be subject to Council and Department of Transport works approval requirements under the Road Management Act 2004 and associated legislation. Traffic impacts associated with the external works will be managed by the contractor in accordance with any works approvals given by Council or Department of Transport, including implementation of a Traffic Management Plan.

5.3 Solar Farm Construction Delivery Timeframes

For the purposes of determining the likely traffic to be generated during construction of the solar farm, the following key activities and timeframes have been adopted based on high-level programming information provided by the Proponent. With the exception of the site establishment and de-establishment, some tasks will occur concurrently, and the ultimate program of works would be developed by the appointed contractor prior to construction and completion of a Traffic Management Plan.

1. Site Establishment	Weeks 1-3
2. Site Set-up/ Access Roads	Weeks 2-10
3. HV Trench	Weeks 8-12
4. PV Plant	Weeks 8-46
5. Substation & Operations Buildings	Weeks 35-49
6. Site Decamp	Weeks 50-52

5.4 Solar Farm Construction Traffic Generation

Site Establishment and Access Roads

The Proponent has advised that the internal network of access tracks will be built to a width of 4.0 metres throughout (plus passing places) with a conservative estimate of a pavement fill of 300mm for a total of 32,500 cubic metres of road base material required to construct the internal access network. In addition, hardstand and compound areas will require an additional 14,000, cubic metres of quarry material (also estimated at 300mm deep across all permanent hardstand areas). Total quarry materials are estimated to be 49,464 cubic metres (which includes an additional 5 % to account for any unexpected ground conditions).

Based on the volumes identified above and assuming a typical truck and dog load can transport 32 cubic metres, it is estimated that the Proposal will require approximately 1522 truck loads of road base and other fill material for this phase of construction. According to the construction program these truck movements would occur during weeks 2 to 10¹.

PV Plant and HV Trenching Materials

The total vehicle trips for deliveries of materials during the PV plant and HV trenching activities are shown in Section 5.5.

Service Construction Traffic

General construction traffic expected across the construction period would include deliveries of water, fuel and waste skips, as well as regular portable toilet pump-outs.

¹. Final pavement and hardstand depth will be determined following geotechnical testing, however 300mm is considered conservative in the interests of presenting a 'worst case' scenario for this assessment.

Over the 12-month period, it is estimated that there will be 312 construction days (6 days per week equivalent). On average, the expected daily visitation of vehicles associated with these activities would be:

- Water Delivery – 1.7 times per day
- Fuel Delivery – 0.8 times per day
- Skip Delivery – 1.4 times per day
- Portable Toilet Pump-out – 0.9 times per day

Working Days

The Traffic Assessment has assumed that construction works will take place within the following standard hours:

- Monday to Friday, 7am to 6pm; and
- Saturday, 8am to 5pm.

In order to limit noise levels associated with heavy vehicle movements, no trucks will be scheduled to arrive or depart outside of construction hours Monday to Friday, or after 1pm on Saturday.

For the purposes of this assessment, it is assumed that on average there will be 6 days of productivity per week.

5.5 Solar Farm Construction Traffic Generation

Traffic generated by the Proposal will be split across three broad categories:

- General traffic generated by staff travelling to/from the Site (i.e. utes, mini-buses, vans and private cars);
- Over Dimensional (OD) deliveries of large components; and
- Other heavy vehicles (HV) which are used for the delivery of smaller components and externally sourced construction materials such as aggregate.

Total Construction Generated Traffic

Further to the material and delivery assumptions outlined in Section 5.3, the total traffic generated during each individual phase of the construction period has been estimated. A summary of the total vehicles generated by each stage, including vehicle type and purpose is outlined in Table 5.1.

Table 5.1: Total Construction Traffic (by phase)

Activity	Stage	Activity	Type of vehicle	Vehicle Length (m)	Vehicle Mass (t)	Total Activity Vehicles
Site Mobilisation	1	Miscellaneous Establishment Deliveries (including delivery of two prefabricated bridges)	L Low Loader	19	27	142
		Earthworks equipment delivery	H Low Loader	19	42.5	12
Site Set-up / Access Roads	2	Imported material for site office and laydown areas, and internal tracks	Truck and Dog	19	27.9	1522
HV Trench	3	Excavator Delivery	H Low Loader	19	42.5	4
		Cable laying equipment	L Low Loader	19	27.9	4
		Cable Bedding Sand	L Low Loader	19	45	167
PV Plant	4	PV Modules	Semi Trailer	19	42.5	1068
		Tracker Systems and Mounting Posts	Semi Trailer	19	42.5	846
		Cabling	Semi Trailer	19	42.5	67
		Inverter Stations	L Low Loader	19	27.9	41
Substation	5	Miscellaneous Movements (building materials etc.)	Semi Trailer	19	42.5	24
		Primary transformers	OD H - Low Loader	TBC	TBC	1
		Modular Substation	OD L - Low Loader	TBC	TBC	2
		Switchboard	L Low Loader	19	27.9	2
		Cabling	L Low Loader	19	27.9	2
		Switchgear Components	Semi Trailer	19	42.5	5
		Battery modules	Semi Trailer	19	42.5	50
Decamp	6	Miscellaneous Establishment Removal	L Low Loader	19	27	142
		Earthworks equipment Removal	H Low Loader	19	42.5	12
General Construction	1-6	Water delivery	Truck tanker	8.9	22.5	258
		Fuel delivery	Truck tanker	8.9	22.5	117
		Skip delivery	SM Flat bed	12.5	9.8	225
		Portaloo Pump out	SM Flat bed	12.5	9.8	142
Total Heavy Vehicles (all activities)						4,852
Daily Cars / Vans (Employee) during construction	1-6	Misc. small tools etc.	Light goods van	5.6m	1.2	25
		Workers and visitors in cars / minibus	Vans, cars, minibus	5.6 – 7.0m	1.2 - 2.0	17,160
Total Light Vehicles (all activities)						17,185

Average Daily Traffic Movements

On this basis, and considering estimated construction timeframes, material delivery requirements and typical vehicle types to be used across the construction period, estimated external daily vehicle movements across the construction phase are summarised in Table 5.2. A detailed analysis provided in Appendix B of this report.

Table 5.2: Daily Traffic Volumes

Phase	Light Vehicles (car / van / minibus)		Medium Rigid Vehicle (8.8- 12.5 metres)		Heavy Vehicles (>19.0 metres)		Total	
	Ave. Vehicles / Day	Ave. Vehicle Movements / Day	Ave. Vehicles / Day	Ave. Vehicle Movements / Day	Ave. Vehicles / Day	Ave. Vehicle Movements / Day	Ave. Vehicles /Day	Ave. Vehicle Movements / Day
Week 1	56	112	4	8	9	18	69	138
Weeks 2-3	56	112	4	8	38	76	98	195
Weeks 4-7	56	112	4	8	29	58	89	177
Week 8	56	112	4	8	50	100	110	219
Weeks 9-10	56	112	4	8	46	91	106	211
Weeks 11-12	56	112	4	8	17	34	77	154
Weeks 13 - 34	56	112	4	8	11	22	71	142
Weeks 35-46	56	112	4	8	16	32	76	152
Weeks 47-49	56	112	4	8	5	10	65	130
Weeks 50-52	56	112	4	8	9	18	69	138

The above analysis shows that the highest average daily traffic volumes will be expected during Week 8, which coincides with the construction of access roads, and the delivery of plant and materials associated with HV Trench and PV Plant activities. During this stage of works, there will be in the order of 220 daily vehicle movements generated by the Proposal, including 100 heavy vehicles movements (19.0 metre long heavy vehicles). The main activities which will generate external traffic will be the delivery of road construction materials, deliveries of machinery and plant, and staff vehicles.

Peak Hour Traffic Volumes

It is anticipated that all staff traffic during construction will arrive at the Site in the AM peak hour and depart in the PM peak hour.

For construction material delivery vehicles, it is expected that approximately 10% of traffic will occur during the respective peak periods, with the remaining traffic spread across the day. During the AM peak hour, it is anticipated that 80% of all traffic will enter, and 20% will leave the Site. The opposite would occur during the PM peak hour.

The expected in and out traffic movements, by vehicle type during the peak stage of the project (Stage 2-4 in week 8) are outlined in Table 5.3.

Table 5.3: Expected Peak Hourly Traffic Volumes (Week 8)

Peak hour	In / Out	Light Vehicles (car / van / minibus)	Medium Rigid Vehicle (8.8- 12.5 metres)	Heavy Vehicles (>19.0 metres)	Total
AM	In	55	<1	10	65
	Out	0	<1	2	2
	Total	55	<1	12	67
PM	In	0	<1	2	2
	Out	55	<1	10	65
	Total	55	<1	12	67

The above analysis indicates that peak hourly volumes of traffic through the intersection of Darlington-Camperdown Road and Meningoort Road will be in the order of 67 vehicles, of which approximately 18% would be heavy vehicles.

5.6 Construction Traffic Impact

Overview

As outlined in the above analysis, during the peak period of the Proposal, the construction related activities will generate in the order of 219 vehicle movements per day, including 107 medium and heavy vehicle movements and 112 light vehicle movements.

During peak hours (AM and PM), the Site will generate approximately 67 vehicle movements through the intersection of Darlington-Camperdown Road and Meningoort Road. The remaining traffic arriving and leaving the Site during construction will be distributed throughout the rest of the day.

Darlington-Camperdown Road

As outlined in Section 2.2 Darlington-Camperdown Road currently accommodates moderately low volumes of traffic for an arterial road, in the order of 630 vehicles per day, including 50-60 vehicles during the peak hour periods.

Darlington-Camperdown Road is an arterial road, with a sealed carriageway supporting two-way traffic flows. The additional traffic associated with the construction traffic generated by the Site will increase daily volumes up to 849 vehicle movements per day to the south of Meningoort Road (north). This total level of traffic is well within the operating capacity of the road and will have little practical impact.

Hourly traffic volumes would increase by 67 vehicle movement up to 127 vehicle movements per hour. This will be a noticeable increase against current traffic volumes, but not unreasonable for a two-lane two-way rural arterial road and by in-large this increase in traffic will be light vehicles associated with worker movements.

Intersection of Meningoort Road and Darlington-Camperdown Road

As discussed, improvement works at the intersection of Meningoort Road with Darlington-Camperdown Road will include:

- Construction of a short channelised left-turn lane (CHL (S)) treatment from Darlington-Camperdown Road into Meningoort Road (south to west); and
- Sealing the first 30 metre section of Meningoort Road to facilitate turning movements of heavy vehicles into and out of Meningoort Road.

All traffic generated by the Proposal will be required to access to/from the south. As such, movements through the Meningoort Road / Darlington-Camperdown Road intersection will be limited to left turns from and right turns onto Darlington-Camperdown Road.

Austrroads Guide to Road Design: Part 4 outlines the warrants for turn lanes.

Against the volume considerations of these warrants, the peak hourly traffic volumes at the intersection would require a basic left (BAL) turn treatment. However, acknowledging the high proportion of heavy vehicles and that traffic to the Site in the AM peak is close to half the current total volume on Darlington-Camperdown Road at this time, a short channelised left turn treatment (CHL (S)) is recommended and has been adopted.

A 'no right turn' treatment on Darlington-Camperdown Road is provided, reflecting the requirement that all construction traffic will approach from and depart to the south and to also avoid the unnecessary removal of native vegetation along the northern side of the intersection. The implementation of a 'no right turn' restriction will be for the duration of the project only.

The first 30 metres of Meningoort Road will be constructed and sealed to accommodate and reduce the impacts on road conditions by turning vehicles, in particular heavy vehicles.

Meningoort Road (north)

Meningoort Road (north) is currently an unmade road that runs west from the Darlington-Camperdown Road directly to the Site. To facilitate traffic from the Proposal, Meningoort Road (north) will be upgraded from the intersection with the Darlington-Camperdown Road to the western boundary of the Site. The road will be constructed to a width of 7 meters to facilitate two way traffic except where it will narrow to a single lane (4 metres) to cross an existing road culvert.

Beyond the limited use of Meningoort Road (north) for existing local access, the Proposal will be the only other operation that will generate traffic on this road. As such, total traffic volumes are unlikely to materially exceed the estimated daily maximum vehicle movements (219 vehicle movements) for the peak construction period during any phase of the development.

These volumes are well within the capacity of the road improvements proposed.

5.7 Over Dimensional Haulage

As outlined in Section 4.1, there will be an estimated 6 over dimensional deliveries of large components for the substation during the construction phase. A preliminary assessment of the DoT (Department of Transport) OSOM (Oversize and Overmass) network shows that the proposed route from the Port of Geelong to the Site is pre-approved with the exception of the short stretches along Darlington-Camperdown Road and Meningoort Road (north).

It is understood that the Princes Highway has previously been used to transport similar components from Geelong to western Victoria. The DoT OSOM network map does not indicate any load limit or height restrictions along the proposed route.

A desktop review of the intersection of Princes Highway and Darlington-Meningoort Road was undertaken which indicated that there would be sufficient room for a right-turn in and left-turn out manoeuvre at this location.

Access to the Site by OSOM vehicles will be subject to a separate approval process and will likely include the provision of traffic management along the route to ensure safety and minimise disruption. All necessary approvals (including those from DoT and NHVR), as well as further route investigations will be responsibility of the Proponent once the final size and origin of the loads have been confirmed.

5.8 Construction Traffic Management

The volume and type of traffic generated by the Proposal during construction, whilst noticeable in the context of the existing road network, will be temporary in nature, and will not exceed the capacity of external roads locally or regionally (where identified as haulage routes). In the immediate vicinity of the Site, the improvement works to Meningoort Road and the Darlington-Camperdown Road and Meningoort Road intersection will effectively manage vehicle movements to/from the Site.

A TMP for the construction of the Proposal should be required as a condition of any Planning Permit and be developed in consultation with the DoT, Corangamite Shire Council and any other relevant stakeholders to ensure the recommendations of this assessment are implemented and responsibilities identified.

In general, the TMP would include:

- Confirmation of the construction timeframes and works stages;
- Confirmation of expected traffic volumes generated by the solar farm for all work stages;
- Identification/qualification of all HV and OD vehicle haulage routes for all work stages;
- Mechanisms/agreements to maintain Meningoort Road during construction works and to reinstate the road to “as built” conditions at the completion of construction;
- Preparation of a “Drivers code of Conduct” that provides clear guidelines on preferred Site access routes, school bus routes and expectations of driver behavior and interaction with local traffic;
- Qualify any requirement for specific work stage construction traffic management; and
- Qualify and identify relevant mechanisms for OD vehicle permits and traffic management requirements.

It is expected that decommissioning would generate similar or slightly lower traffic volumes over the same time frame as the construction stage. Decommissioning would also require a TMP to manage traffic to and from the Site during this period.

Project Parking

During the construction phase of the Proposal, all vehicles will park within the Site. Parking areas will be provided at the temporary construction compound once constructed, and at suitable temporary places along the internal track network as they are constructed.

School Buses

As described in Section 2.4, there are a number of school bus services that operate along Darlington-Camperdown Road in the vicinity of the Proposal. Other than a relatively minor increase in traffic volumes during peak morning and afternoon times when workers enter and leave the Proposal Site during the construction phase, it is considered that the Proposal will have a negligible impact on school bus services on an ongoing basis.

To increase driver awareness and ensure safety, all drivers associated with Project will be made aware of school bus routes, stops, and schedules through the drivers’ code of conduct to be included in the TMP.

Pedestrians and Cyclist Management

Given the surrounding rural environment, low numbers of pedestrian and cyclists, and the distance of the Site from populated areas such as Camperdown, it is considered that the Proposal is unlikely to adversely impact pedestrians or cyclists. However, to increase driver awareness and ensure safety, all drivers associated with Project will be made aware of safe driving practices around pedestrians and cyclists through the drivers’ code of conduct to be included in the TMP.

Dust mitigation

Dust associated with the Proposal is addressed as part of the Amenity Report that accompanies the Planning Application for this Proposal. Specific mitigation measures designed to reduce potential traffic related dust impacts are identified and will be included in stage specific Environmental Management Plans.

5.9 Operational Traffic

Following the delivery phase of the Proposal, it is anticipated that ongoing volumes of traffic will be limited to that associated with approximately 6 staff on-site per day, plus an average of 3 visitors or deliveries. Larger vehicles may be required to visit the Site from time to time to undertake servicing or maintenance works. All operational traffic will access the Solar Farm via Darlington-Camperdown Road and Meningoort Road, with most traffic expected to be/from the south.

In the context of existing traffic, operational traffic generated by the Proposal will have no material impact on the ongoing operation of Darlington-Camperdown Road. The Meningoort Road and Darlington-Camperdown Road/ Meningoort Road improvement works will suitably cater for all ongoing operational traffic.

Project Parking

During the operational phase, parking spaces to accommodate 6 full time equivalent local workers and visitor will be provided at the Operations Buildings (12 spaces) with a further 5 spaces provided at the Substation Area (see the 'Site plan').

5.10 Emergency Vehicle Access

As shown in Figure 3-4, there will be four additional emergency vehicle access points along the western boundary of the Site. These emergency access points will be accessed via Meningoort Road from the south using blind creek road. These dedicated emergency access points will only be used for emergency purposes. The rest of the Site will be accessed via the four main entry points on Meningoort Road (north) which will provide emergency access to the northern parts of the Site. The Proposal includes a network of internal access roads which provide efficient access to all parts of the Site.

6 Summary & Conclusions:

The Bookaar Solar Farm is located approximately 8 kilometres to the north-west of Camperdown, is approximately 588 hectares in size and will have a generation capacity of 200 MW.

The Proposal is expected to be delivered across 12 months and generate up to 220 vehicle movements per day during the peak construction period (Week 8), as a mix of heavy vehicle traffic and staff / general traffic.

The Proposal will rely on Meningoort Road (north) from Darlington-Camperdown Road for access during construction and operation. Approximately 1,660 metres of Meningoort Road (north) and the intersection of Meningoort Road with Darlington-Camperdown Road will be upgraded to facilitate access.

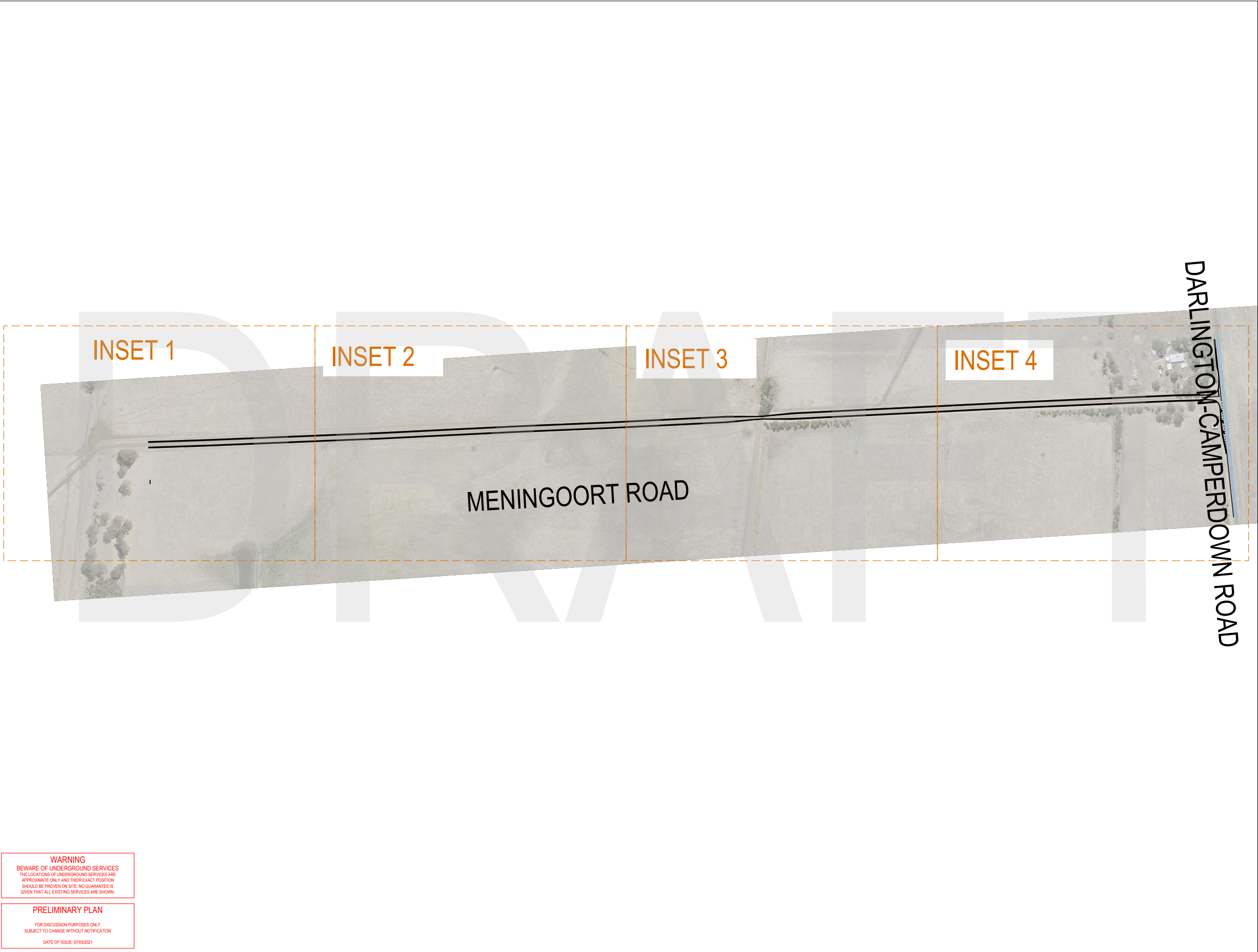
Relevant to the Proposal's construction:

- Solar farm traffic generated to external roads will be limited to staff vehicles, HV traffic associated external bulk materials haulage and OSOM vehicles associated with major component delivery.
- All traffic will access the Site via Meningoort Road approaching from the south on Darlington-Camperdown Road.
- Deliveries of major components associated with the substation will likely occur via the Port of Geelong with parts then transported to Site via existing approved OSOM roads. The haulage of Construction materials will be restricted to arterial roads with vehicles required to access the Site from the south via Darlington-Camperdown Road.
- The peak daily traffic generation will occur during week 8 of the construction phase which is associated with the delivery of plant, construction materials, and quarry materials by truck and dog vehicles (19 metre semi-trailers). During this period, average daily vehicles are expected to be in the order of 238 movements per day. The anticipated peak hour traffic generation during the peak period of the construction phase will result in 67 peak hour vehicle movements (in both the AM and PM peak).
- There will be four emergency vehicle access points along Meningoort Road towards the south accessed via Blind Creek Road, in addition to the general Site access points in the north.

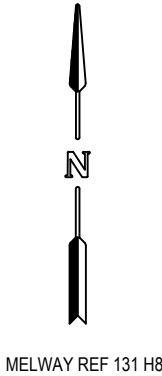
Having assessed the impact of likely traffic generated by the Proposal, it considered that:

- Darlington-Camperdown Road currently experiences in the order of 630 vehicles per day. The road is carrying significantly less than the capacity of this type of road, and the additional traffic generation as a result of the Proposal will be negligible as it relates to capacity.
- The Meningoort Road and Darlington-Camperdown Road / Meningoort Road intersection upgrade works as part of the Proposal will effectively and safely cater for all additional traffic during construction.
- Ongoing traffic generated will be in the order of 6 FTE staff per day, plus an average of 3 visitors or deliveries per day. This traffic will access the Site via the upgraded section of Meningoort Road (north) and the Meningoort Road and the Darlington-Camperdown Road intersection, and will have no material impact on the safe operation of the surrounding road network.

Appendix A Concept Layout and Civil Design Plans



LEGEND	
	EXISTING
	MAJOR CONTOUR
	MINOR CONTOUR
	TITLE BOUNDARY
	ROAD RESERVE
	ELECTRICITY
	TELECOM
	WATER
	DRAIN
	SEWER
	GAS
	TOP OF BANK
	TOE OF BANK
	FUTURE DEVELOPMENT
	EXISTING DEVELOPMENT
	PROPOSED LINE MARKING
	PROPOSED KERB



WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION
DATE OF ISSUE: 07/05/2021

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ISSUE	APP'D	DATE	COMMENTS
D	D.Y.	5/05/2021	Update Intersection Alignment
C	D.Y.	14/10/2020	Updated alignment extension
B	D.Y.	28/07/2020	Updated Road Alignment
A	D.Y.	15/06/2020	Initial Issue

GENERAL NOTES

- ROAD ALIGNMENT BASED ON AERIAL BASE
- ROAD ALIGNMENT SUBJECT TO DETAILED DESIGN E.G. EARTHWORKS, DRAINAGE.
- DARLINGTON-CAMPERDOWN ROAD DESIGN SPEED 100KM/H
- TYPICAL LANE WIDTH 3.5M UNLESS NOTED OTHERWISE

DESIGNED	D.Y.	15/06/2020
CHECKED	B.K.	15/06/2020
AUTHORISED	A.M.	15/06/2020
SCALE	0 60 120	
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RATIO CONSULTANTS PTY LTD
ACN 005 422 104
8 GWYNNE STREET
CREMORNE, VICTORIA 3121
TELEPHONE (03)9429 3111
FACSIMILE (03)9429 3011

Bookaar Solar Farm Shire of Corangamite Concept Layout Plan Overview Inset Plan			
DATE	SHEET NO.	DRAWING NO.	ISSUE
15/06/2020	1 of 6	16567-CLP-002	D

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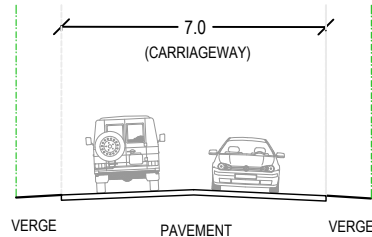


LEGEND

- EXISTING
- MAJOR CONTOUR
- MINOR CONTOUR
- TITLE BOUNDARY
- ROAD RESERVE
- ELECTRICITY
- TELECOM
- WATER
- DRAIN
- SEWER
- GAS
- TOP OF BANK
- TOE OF BANK
- FUTURE DEVELOPMENT
- EXISTING DEVELOPMENT
- PROPOSED LINE MARKING
- PROPOSED KERB

CROSS SECTION A-A

(1:200 @ A3)



WARNING
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PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION
DATE OF ISSUE: 07/05/2021

ISSUE	APP'D	DATE	COMMENTS
D	D.Y.	5/05/2021	Update Intersection Alignment
C	D.Y.	14/10/2020	Updated alignment extension
B	D.Y.	28/07/2020	Updated Road Alignment
A	D.Y.	15/06/2020	Initial Issue

GENERAL NOTES

- ROAD ALIGNMENT BASED ON AERIAL BASE
- ROAD ALIGNMENT SUBJECT TO DETAILED DESIGN E.G. EARTHWORKS, DRAINAGE.
- DARLINGTON-CAMPERDOWN ROAD DESIGN SPEED 100KM/H
- TYPICAL LANE WIDTH 3.5M UNLESS NOTED OTHERWISE

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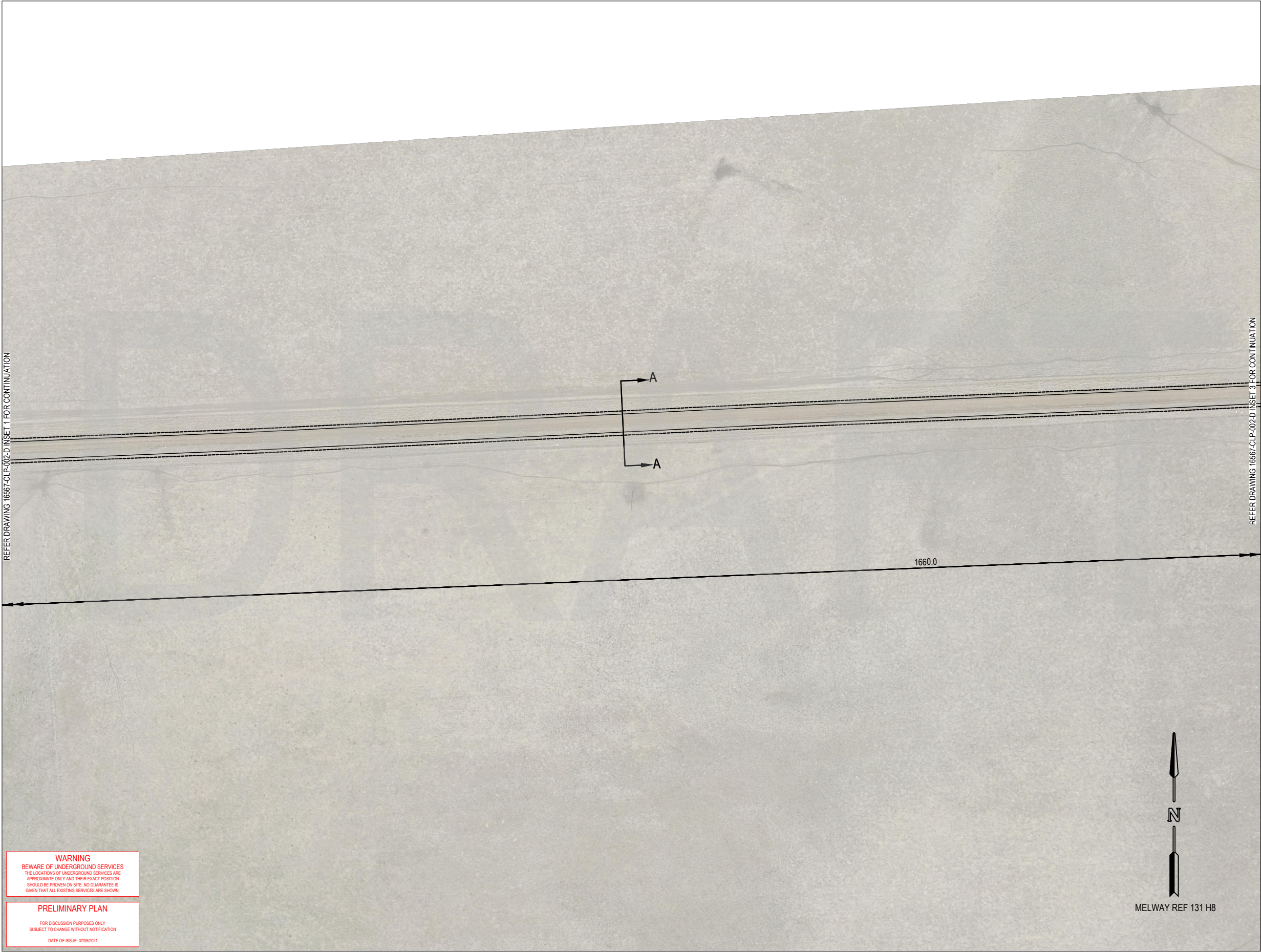
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CREMORNE, VICTORIA 3121
TELEPHONE (03)9429 3111
FACSIMILE (03)9429 3011

Bookaar Solar Farm
Shire of Corangamite
Concept Layout Plan
Inset 1

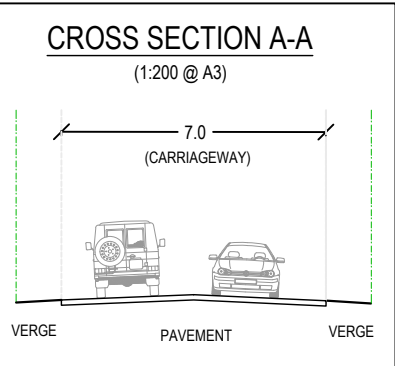
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15/06/2020	2 of 6	16567-CLP-002	D

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- LEGEND**
- EXISTING
 - MAJOR CONTOUR
 - MINOR CONTOUR
 - TITLE BOUNDARY
 - ROAD RESERVE
 - ELECTRICITY
 - TELECOM
 - WATER
 - DRAIN
 - SEWER
 - GAS
 - TOP OF BANK
 - TOE OF BANK
 - FUTURE DEVELOPMENT
 - EXISTING DEVELOPMENT
 - PROPOSED LINE MARKING
 - PROPOSED KERB



WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION
DATE OF ISSUE: 07/05/2021

D	D.Y.	5/05/2021	Update Intersection Alignment
C	D.Y.	14/10/2020	Updated alignment extension
B	D.Y.	28/07/2020	Updated Road Alignment
A	D.Y.	15/06/2020	Initial Issue
ISSUE	APP'D	DATE	COMMENTS

- GENERAL NOTES**
- ROAD ALIGNMENT BASED ON AERIAL BASE
 - ROAD ALIGNMENT SUBJECT TO DETAILED DESIGN E.G. EARTHWORKS, DRAINAGE.
 - DARLINGTON-CAMPERDOWN ROAD DESIGN SPEED 100KM/H
 - TYPICAL LANE WIDTH 3.5M UNLESS NOTED OTHERWISE

DESIGNED	D.Y.	15/06/2020
CHECKED	B.K.	15/06/2020
AUTHORISED	A.M.	15/06/2020
SCALE	0 15 30	
1:1500 @ A3		

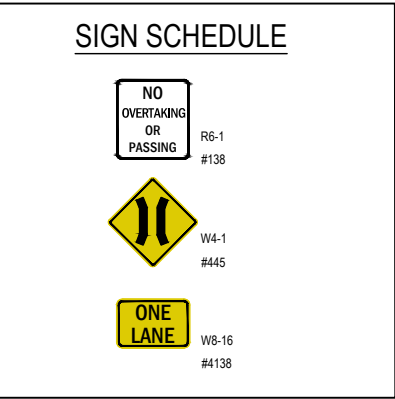
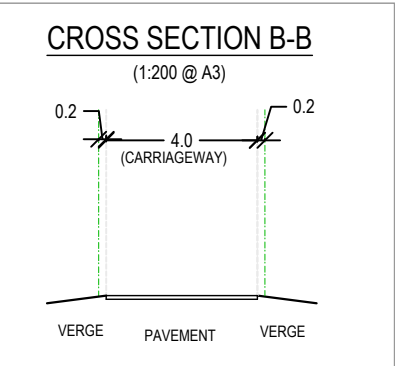
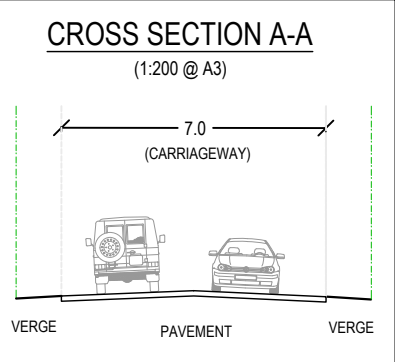
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Bookaar Solar Farm
Shire of Corangamite
Concept Layout Plan
Inset 2

DATE	SHEET NO.	DRAWING NO.	ISSUE
15/06/2020	3 of 6	16567-CLP-002	D



LEGEND	
	EXISTING
	MAJOR CONTOUR
	MINOR CONTOUR
	TITLE BOUNDARY
	ROAD RESERVE
	ELECTRICITY
	TELECOM
	WATER
	DRAIN
	SEWER
	GAS
	TOP OF BANK
	TOE OF BANK
	FUTURE DEVELOPMENT
	EXISTING DEVELOPMENT
	PROPOSED LINE MARKING
	PROPOSED KERB



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PRELIMINARY PLAN

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07/05/2021 4:03:16 PM Y:\16567-17000\165677 - BOOKAAR SOLAR FARM DESIGN\Layouts\16567-CLP-002\16567-CLP-002-D.DWG

ISSUE	APP'D	DATE	COMMENTS
D	D.Y.	5/05/2021	Update Intersection Alignment
C	D.Y.	14/10/2020	Updated alignment extension
B	D.Y.	28/07/2020	Updated Road Alignment
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 - DARLINGTON-CAMPERDOWN ROAD DESIGN SPEED 100KM/H
 - TYPICAL LANE WIDTH 3.5M UNLESS NOTED OTHERWISE

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AUTHORISED	A.M.	15/06/2020
SCALE	1:1500 @ A3	0 15 30

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15/06/2020	4 of 6	16567-CLP-002	D

Bookaar Solar Farm
Shire of Corangamite
Concept Layout Plan
Inset 3

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-
- CROSS SECTION A-A**
(1:200 @ A3)
- 7.0
(CARRIAGEWAY)
- VERGE PAVEMENT VERGE



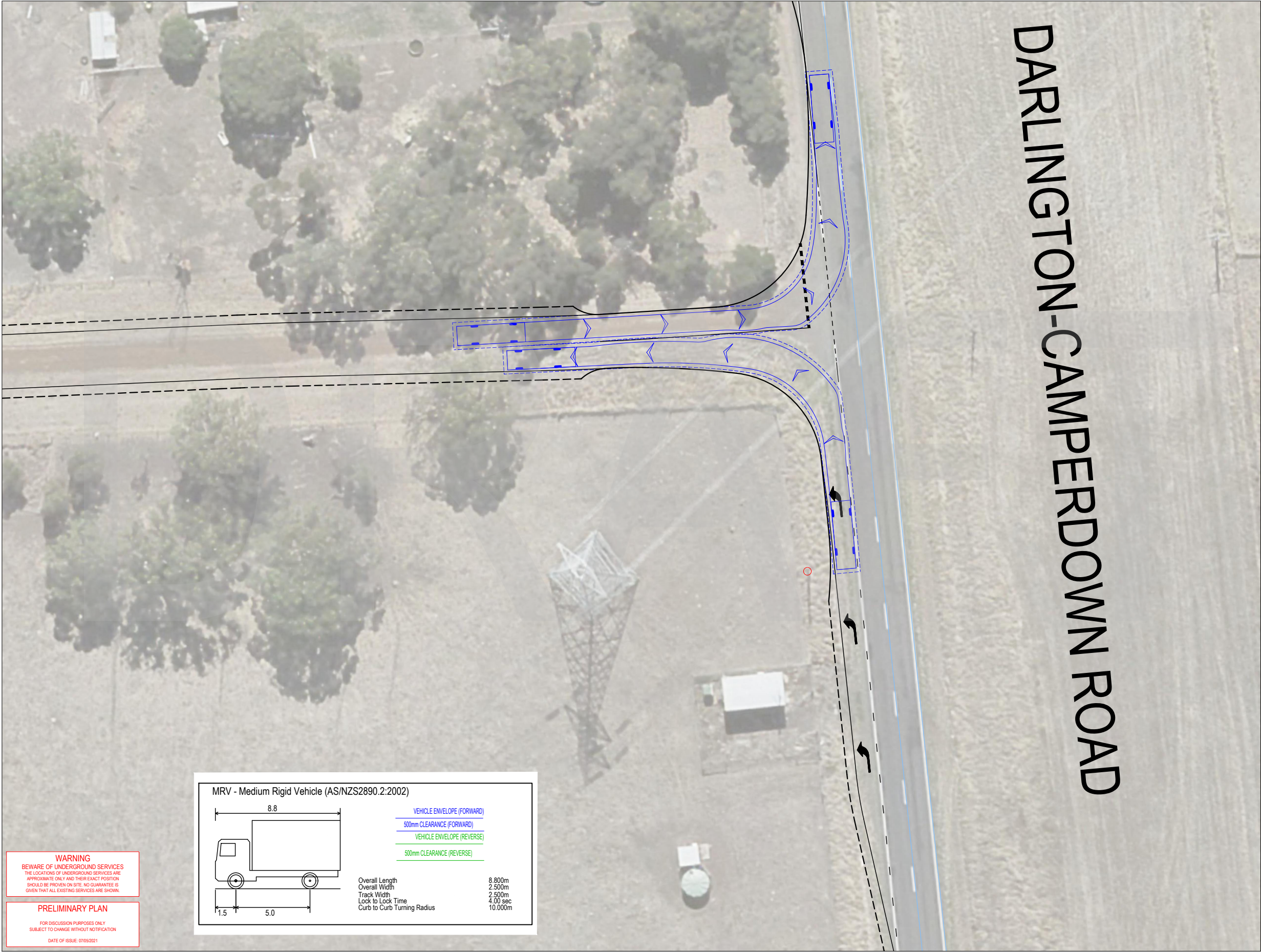
1. ROAD ALIGNMENT BASED ON AERIAL BASE
2. ROAD ALIGNMENT SUBJECT TO DETAILED DESIGN E.G. EARTHWORKS, DRAINAGE.
3. DARLINGTON-CAMPERDOWN ROAD DESIGN SPEED 100KM/H
4. TYPICAL LANE WIDTH 3.5M UNLESS NOTED OTHERWISE

DESIGNED	D.Y.	15/06/2020
CHECKED	B.K.	15/06/2020
AUTHORISED	A.M.	15/06/2020
SCALE 1:1500 @ A3	0	15 30

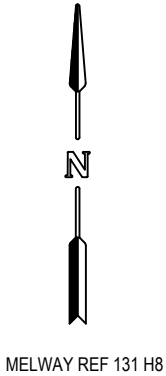
ratio:
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Bookaar Solar Farm
Shire of Corangamite
Concept Layout Plan
Inset 4

DATE	SHEET NO.	DRAWING NO.	ISSUE
15/06/2020	5 of 6	16567-CLP-002	D



LEGEND	
	EXISTING
	MAJOR CONTOUR
	MINOR CONTOUR
	TITLE BOUNDARY
	ROAD RESERVE
	ELECTRICITY
	TELECOM
	WATER
	DRAIN
	SEWER
	GAS
	TOP OF BANK
	TOE OF BANK
	FUTURE DEVELOPMENT
	EXISTING DEVELOPMENT
	PROPOSED LINE MARKING
	PROPOSED KERB



WARNING

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PRELIMINARY PLAN

FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION
DATE OF ISSUE: 07/05/2021

MRV - Medium Rigid Vehicle (AS/NZS2890.2:2002)

VEHICLE ENVELOPE (FORWARD)

500mm CLEARANCE (FORWARD)

VEHICLE ENVELOPE (REVERSE)

500mm CLEARANCE (REVERSE)

Overall Length 8.800m
Overall Width 2.500m
Track Width 2.500m
Lock to Lock Time 4.00 sec
Curb to Curb Turning Radius 10.000m

- GENERAL NOTES
- ROAD ALIGNMENT BASED ON AERIAL BASE
 - ROAD ALIGNMENT SUBJECT TO DETAILED DESIGN E.G. EARTHWORKS, DRAINAGE.
 - DARLINGTON-CAMPERDOWN ROAD DESIGN SPEED 100KM/H
 - TYPICAL LANE WIDTH 3.5M UNLESS NOTED OTHERWISE

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CHECKED	B.K.	15/06/2020
AUTHORISED	A.M.	15/06/2020
SCALE	0 5 10	
Custom @ A3		

ratio:

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Bookaar Solar Farm
Shire of Corangamite
Concept Layout Plan
Swept Path Assessment

DATE	SHEET NO.	DRAWING NO.	ISSUE
15/06/2020	6 of 6	16567-CLP-002	D



B	INTERSECTION ALIGNMENT UPDATED	M.MILLIER	22.07.2021
A	ISSUED FOR INFORMATION	M.MILLIER	30.06.2020
REV.	AMENDMENTS	APP'D	DATE

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PM	M. MILLIER
DESIGNED	12.06.2020
	M. MILLIER
CHECKED	18.06.2020
	K. ROGERS
AUTHORISED	18.06.2020
	M. MILLIER
MELWAYS	### ##
POS No.	PS#####
STATUS:	

BOOKAR SOLAR FARM
OVERALL
NEXT GEN
MENINGOORT RD EARTHWORKS PLAN
SHEET 2 of 4

PRELIMINARY131500RD02

REV.B



B	INTERSECTION ALIGNMENT UPDATED	M.MILLIER	22.07.2021
A	ISSUED FOR INFORMATION	M.MILLIER	30.06.2020
REV.	AMENDMENTS	APPD	DATE

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PM	M. MILLIER
DESIGNED	12.06.2020 M. MILLIER
CHECKED	18.06.2020 K.ROGERS
AUTHORISED	18.06.2020 M. MILLIER
MELWAYS:	### ##
POS No.:	PS#####

BOOKAR SOLAR FARM
OVERALL
NEXT GEN
MENINGOORT RD EARTHWORKS PLAN
SHEET 3 of 14

POS No.: PS#####		SHEET No. 3 OF 4	
STATUS: PRELIMINARY		131500RD03	
		REV.	B



B	INTERSECTION ALIGNMENT UPDATED	M.MILLIER	22.07.2021
A	ISSUED FOR INFORMATION	M.MILLIER	30.06.2020
REV.	AMENDMENTS	APP'D	DATE

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DESIGNED	12.06.2020
CHECKED	M. MILLIER
AUTHORISED	18.06.2020
MEASUREMENTS	K. ROGERS
POS No.	18.06.2020
STATUS	M. MILLIER
	###
	PS#####

BOOKAR SOLAR FARM
OVERALL
NEXT GEN
INTERSECTION CONTOUR PLAN
SHEET 4 of 4

PRELIMINARY	131500RD04	SHEET No.	4 OF 4
REV.	B		

Appendix B Spreadsheet Analysis – Average Daily Traffic Generation

APPENDIX B - Spreadsheet Analysis

Proposed Bookaar Solar Farm - Daily Construction Volumes

[illegible]

[1] Assumed 6 work days per week

	>19 metres HV
	<19 metres HV
	Van / Car / Minibus

[illegible][illegible]

Maximums	No.	Week
Van / Car / Minibus	112	N/A
>19 metres HV	8	N/A
<19 metres HV	99	8
All	219	8