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 **RE Future**

Brewster Wind Farm

Appendix K

Preliminary Traffic Impact Assessment

December 2021



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RE Future

Brewster Wind Farm

Preliminary Traffic Impact Assessment

November 2021

Version History

Version	Author	Reviewer	Date Issued	Description
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2	NL	SS	31/03/2021	Issued as final
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4	CS	SS	03/11/2021	Issued as final

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Table of Contents

Table of Contents.....	iii
1 Introduction	1
2 Over Size Over Mass Access Route	1
3 Traffic Movements	4
3.1 Overall Movements	4
3.2 Movements Per Vehicle Type.....	4
3.4 Post-Construction Traffic Movements	6
4 Road Geometry	7
4.1 Road Widths	7
4.2 Intersections	8
5 Traffic Management Plan.....	8
6 Conclusion	9
Appendix 1 – Swept Path Assessments	10

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1 Introduction

Under the provisions of the Pyrenees Planning Scheme wind farm planning permit applications must consider the proximity of the project site to adequate transport infrastructure and must also provide a concept plan of access road options. Further, as large infrastructure projects located in rural areas that are not always well served by road infrastructure, wind farms have the potential to have a significant impact on roads and traffic movements. Following Clause 52.32 of the Pyrenees Planning Scheme, this report begins by identifying the proposed access route to the site, after which it outlines predicted traffic movements and vehicle types, and then considers the capacity of roads along the delivery route. The report concludes by considering preliminary conditions of the traffic management plan. Swept path assessments carried out by RE Future can be found at the Appendix.

2 Over Size Over Mass Access Route

The site is located directly adjacent to the Western Highway, with the site entrance located on a sealed service lane at 7 Pin Oak Court Trawalla Victoria. Alternative site entrance is located on Trawalla Road south of the Western Hwy For additional information on the site entrance please refer to project description and site plans contained in Volume 1.

Portland is currently the preferred port of entry for turbines and other major imported componentry. On this basis, an over-dimensional (OD) vehicle haulage route has been identified between the Port of Portland and the wind farm site. This route is based on the largest anticipated turbine component, namely the 81 metre long turbine blade, and with a view to leveraging off existing VicRoads transport infrastructure and minimising use of local roads. This route is shown in Figure 1.

Beginning at the Port of Portland, this route is as follows:

- Henty Hwy to Heywood;
- Left turn onto Princes Hwy;
- Right turn onto Portland – Casterton Rd;
- Right turn onto Glenelg Hwy;
- Left turn onto Henty Hwy;
- Continue onto Dunkeld – Cavendish Rd;
- Left turn onto Glenelg Hwy;
- Left turn onto Eurambeen – Streatham Rd;
- Right turn onto Western Hwy;
- Right turn onto Pin Oak Ct; and
- Continue onto Site Entrance. (Site Entry 1)

Continuing from Beaufort access to the western site entry point is as follows:

- From Beaufort, continue onto Western Hwy;
- Left Turn onto Old Western Hwy;
- Right Turn onto Trawalla Rd; and
- Left Turn onto Site Entrance from Trawalla Rd. (Site Entry 2)

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With the exception of Eurambeen – Streatham Rd and Trawalla Rd, all of these roads are OSOM approved VicRoads roads with no height restrictions that will impact the proposal. Eurambeen – Streatham Rd is a B-Double approved sealed rural access road jointly managed by the Ararat Rural City Council and Pyrenees Shire Council. Trawalla Rd is a sealed road, required to access site entrance No. 2. Both roads require no additional improvements for the delivery of turbine components.

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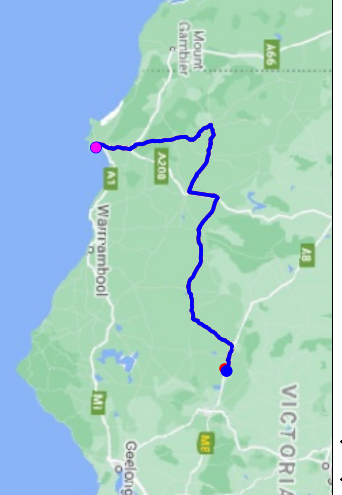
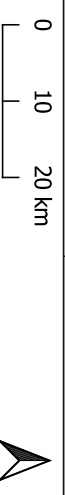
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Brewster Wind Farm

Transport Route

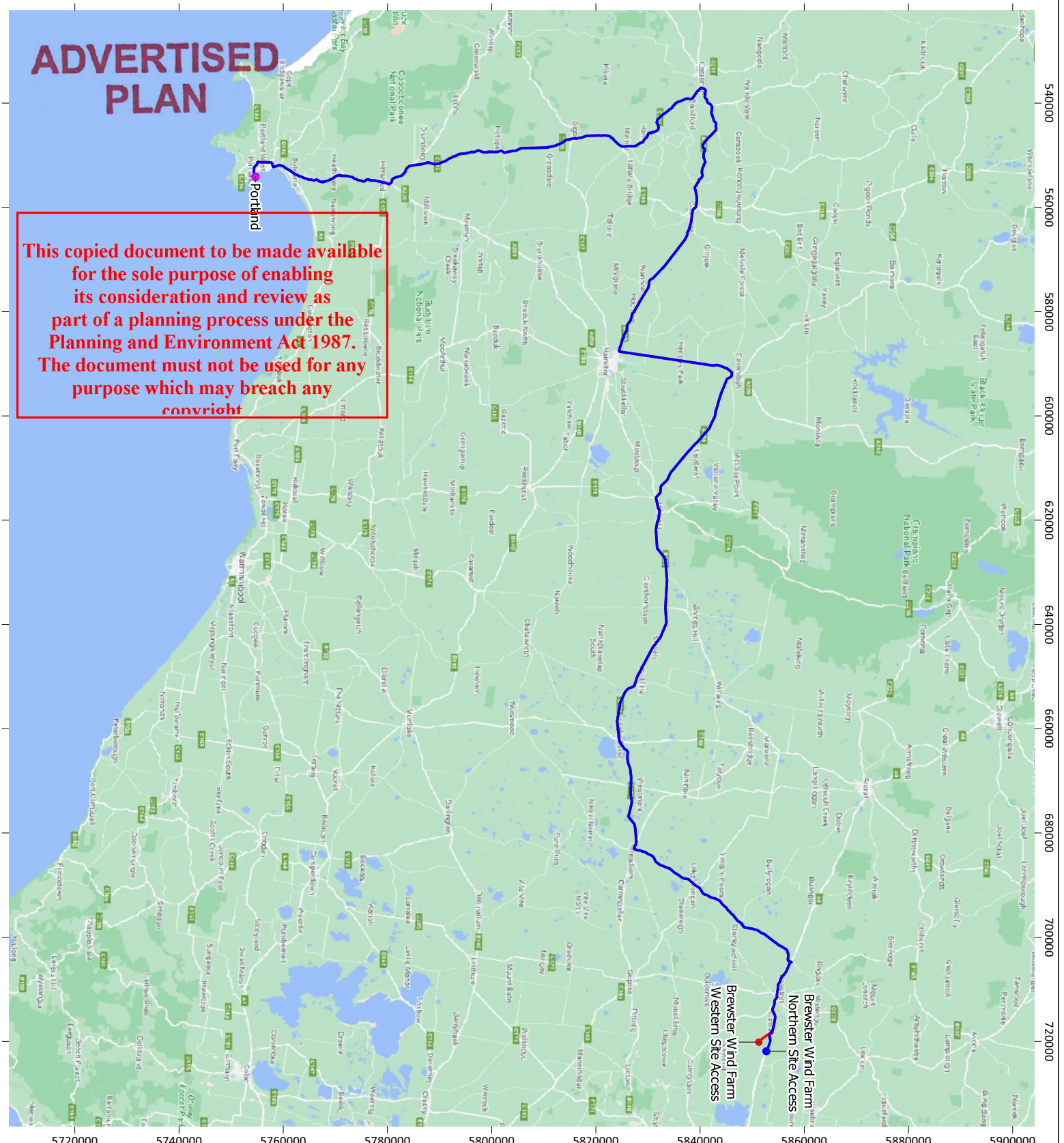
- Legend**
- Portland
 - Northern Site Access
 - Western Site Access
 - Transport Route to Northern Site Access
 - Transport Route to Western Site Access

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Approved	PL	Figure No: Z2



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Brewster Wind Farm
Western Site Access
Northern Site Access

3 Traffic Movements

Construction of the wind farm will require a large array of construction materials. As the project is located on the Western Hwy in between a regional city, namely Ballarat, and a regional town, Beaufort, it is anticipated that the majority of construction materials (including crushed rock and concrete) will be sourced from the regions surrounding Beaufort and Ballarat and will therefore be delivered to the site via the Western Hwy. However, sometimes it will be necessary to have construction materials transported from further afield. Sourcing materials from close to the wind farm has many obvious advantages, including reducing transport costs, minimising potential delays, and reducing impacts to local roads and traffic movements. Thus, though it is impossible to know in advance of finalising construction contracts exactly where materials will be sourced from, all reasonable attempts will be made to source construction materials from the closest source to the project.

3.1 Overall Movements

During construction the project will generate approximately 3300 vehicle movements, with a peak of approximately 200 daily movements. According to data sourced from VicRoads the one-way Annual Average Daily Traffic of the Western Hwy in the vicinity of the project is 4500 vehicles per day, with a maximum one-way hourly volume of approximately 360. Meanwhile, as an unmanaged motorway the lowest possible Maximum Sustainable Flow Rate for the Western Hwy in the vicinity of the project is 2250 vehicles per hour. Accordingly, at its peak of activity (and assuming that all traffic approaches the site from one direction) the proposal will result in an increase in one-way average annual daily traffic (AADT) on the Western Hwy of less than 4.4% in the vicinity of the project, and overall daily and hourly vehicle numbers will remain well below the capacity of the road.

3.2 Movements Per Vehicle Type

Other than standard passenger vehicles, the two vehicle types which will comprise the largest number of traffic movements during construction of the wind farm are concrete delivery trucks and quarry truck and trailers.

It is anticipated that concrete trucks will travel from established concrete batching plants in Ballarat and access the site via the Western Hwy. These vehicles will typically be twin steer trucks with twin rear axles, and the fully loaded weight will be spread across the four axles with approximately 20 tonnes on the two rear axles and 7 tonnes on the two front axles. It is estimated that the number of concrete trucks required to construct the proposed wind farm is approximately 525 (one way loaded trips). It is estimated that these trips will be confined to a four day period during which all seven turbine foundations will be constructed, meaning that the concrete deliveries will be made at a frequency of approximately 132 deliveries per day, or approximately one truck every four minutes.

Trucks transporting road base from established quarries in the vicinity of Ballarat or Beaufort will also access the site via Western Hwy. The typical vehicle to be used will be a truck and trailer (or quad dog) with approximate unloaded weight of 22 tonnes and fully loaded weight of 60 tonnes spread across each of the seven axles with approximately 8 tonnes carried by each axle. It is

estimated that the number of quarry trucks required to construct the proposed wind farm is approximately 1050 (one way loaded trips), and will transport a total of approximately 63,000 tonnes, or 16,800 cubic metres, of material. Unlike the concrete deliveries, these trips will be spread out over a longer period of approximately 3–4 months, with the busiest days requiring up to 20 deliveries in a day, or approximately one truck every 20 minutes, and the quietest days requiring zero deliveries.

Neither of the above vehicle types requires any changes to road intersections or site entrance configuration to gain access to the site. In terms of permits, these vehicles will be PBS registered, which in general removes the need for permits as they are covered under the NHVR.

Apart from the delivery of concrete and base materials, the only other deliveries that have the potential to have major impacts on traffic movements are the over-dimensional loads. These will comprise delivery of construction machinery, the control building and the various turbine components. With the exception of the turbine components the source of these deliveries cannot be known in advance of the finalisation of construction contracts, as the equipment and components in question are provided by businesses located in a number of locations and moreover some major equipment (such as the main crane) often moves from site to site. All over-dimensional deliveries will most likely be delivered to the site from Adelaide, Melbourne or Portland, and will therefore access the site via the Western Hwy. Over-dimensional deliveries will be organised in consultation with VicRoads and the Pyrenees Shire, and will be managed by the transport and logistics company that wins the delivery contract. For more information concerning the delivery route for turbine components refer to Section 2.

Estimated traffic volumes (including over-dimensional loads) associated with the construction works are also shown below.

Table 1: Traffic Movements Associated with the Wind Farm

Load Type	Load Vehicle	O-D Load	Source	Approx. Trips (One Way)
Site offices	Semi-trailer	No	Ballarat	5
Electrical cable & equipment	Semi-trailer	No	Melbourne Adelaide	25
Heavy lift crane 100T+	Heavy lift crane	Yes	Unknown	2
Heavy lift crane 100T+, escort	4WD	No	Unknown	2
Mobile crane 10 to 30T	Mobile crane	Yes	Unknown	14

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Mobile crane 10 to 30T, escort	Mobile crane	No	Unknown	14
Turbine components	Various	Some	Portland	105
Control Building/ Switchyard components	Semi-trailer	Yes	Adelaide	12
Concrete	Concrete truck	No	Ballarat	525
Steel (structural, reinforcing)	Semi-trailer	No	Ballarat	52
Road base, sand & metal	Tandem-tipper	No	Ballarat / Beaufort	1050
Earthworks Machinery	Various	Some	Melbourne, Adelaide or Portland	10
Miscellaneous deliveries	Light truck, ute	No	Various	80
Waste collection	Semi-trailer	No	Ballarat	54
Construction water	Water tanker	No	Ballarat	54
Miscellaneous trips	Car, 4WD, SUV	No	Various	640

3.3 Delivery Times

Prior to construction, a Traffic Management Plan will be prepared in consultation with VicRoads and the Pyrenees Shire Council. As part of this process, schools and school bus operators in the Pyrenees Shire Council area will be contacted and requested to provide route diagrams and timetables for school buses. This information will be incorporated into the contractors' movement protocols to ensure that construction vehicles and OD loads are not present on these routes from 8.00–9.00 am and 3.00–4.00 pm. Outside of these hours, however, it is anticipated that deliveries will be made between 7:00 am and 6:00 pm, weather and season permitting.

3.4 Post-Construction Traffic Movements

Once the turbines have been installed and the cranes removed from the site, no vehicles larger than a light truck will need to visit the wind farm. These final stages of the construction process, during which the wind farm is commissioned, can last a number of months. However, during this time there will be minimal traffic movements to and from the site, as the vast majority of the construction work will have been completed.

Operational impacts on the road network will be negligible, with a maximum of one visit per month required for maintenance activities. On these occasions, a standard passenger vehicle will visit the site over two days to carry out routine maintenance. In total, in an average year, including occasional visits to the site by various stakeholders, it is estimated that the total number of trips to the site will be 50 standard vehicles, or less than one visit per week.

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4 Road Geometry

In order to accommodate the wind farm construction process road widths and intersection capacities along the wind turbine delivery route must be sufficient. In general, roads managed by VicRoads are designed to accommodate heavy traffic and over-dimensional loads, whereas not all local roads are designed to accommodate heavy traffic and over-dimensional loads. It is for this reason that, in designing the delivery route for a wind farm project, all efforts are made to leverage off OSOM approved VicRoads roads.

As discussed in Section 2 and Section 3, all deliveries will be made via the Western Hwy. In the case of the turbine components, deliveries will be made via a route that, with one exception, follows OSOM approved VicRoads roads. The one road used on the delivery route which is not an OSOM approved road are Eurambeen – Streatham Rd and Trawalla Rd. Eurambeen – Streatham Rd is a sealed rural access road which is B-Double approved, and Trawalla Road is a sealed rural access road.

It is also worth noting that a small section of Pin Oak Ct will be crossed for the delivery of turbine components and construction materials. Pin Oak Ct is relatively new sealed service lane that currently accommodates oversize farm machinery and B-Double traffic.

4.1 Road Widths

The primary concern behind providing sufficient road widths is that vehicles passing one another in opposite directions can safely pass one another. Along OSOM approved roads it is assumed that there will be sufficient road width to accommodate OSOM loads, especially in light of the fact that deliveries will be made with the assistance of traffic management escorts. As a B-Double approved road, it is also assumed that the trafficable road width of Eurambeen – Streatham Rd is sufficient, and Trawalla Road is also sufficient to accommodate OSOM deliveries given they will be accompanied by traffic management escorts. Nevertheless, it is proposed that traffic management measures be implemented during construction in order to minimise the potential for accidents to occur as a result of vehicles passing one another on the roads identified above. These measures could include restricting the number of heavy vehicles that can use these roads at any one time, and ensuring that OSOM vehicles do not use these roads during school pick up and drop off times. These measures would be developed as part of the Traffic Management Plan, which will be prepared in accordance with standard permit conditions and in consultation with the Pyrenees Shire Council and VicRoads.

Another reason it is important to ensure sufficient road widths is that heavy vehicles may damage the road shoulder if they are forced to leave the road and re-enter it when passing one another. It is anticipated that the measures adopted to reduce risks to traffic safety, such as the restriction of the number of OSOM vehicles on the roads identified above at any one time, will minimise the potential for damage to be caused to these roads in this way. Moreover, it is anticipated that as part of the Traffic Management Plan the project proponent will commission pre- and post-construction condition surveys of the relevant sections of the roads identified above.

4.2 Intersections

Along the OSOM delivery route there are a number of pinch point intersections that will require temporary works in order to accommodate OSOM deliveries. These intersections have been identified in consultation with VicRoads and RE Future. These are:

- Henty Hwy / Henty Hwy;
- Henty Hwy / Princess Hwy;
- Princess Hwy / Portland Casterton Road;
- Portland Casterton Road / Glenelg Hwy;
- Glenelg Hwy / Henty Hwy;
- Dunkeld-Cavendish Road / Glenelg Hwy;
- Glenelg Hwy / Eurambeen-Streatham Road;
- Eurambeen-Streatham Road / Western Hwy;
- Western Hwy to Pin Oak Crt and site entrance;
- Western Hwy / Old Western Hwy;
- Western Hwy / Trawalla Road; and
- Trawalla Road / site entrance.

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In determining whether an intersection has sufficient capacity to accommodate OSOM deliveries it is sufficient to consider the case of the vehicle with the largest turning circle. Vehicles transporting the turbine blades will have the largest turning circles and all other vehicles will be accommodated by existing or upgraded intersections required for the blade haulage.

RE Future has undertaken swept path assessments for the above listed intersections. This assessment found that by using the Manual Steering - 90 Degree Articulation method, the proposed OSOM deliveries can be accommodated by these with no impact other than the temporary removal of street furniture and minor temporary graveling works. For further information about the results of these swept path assessments refer to Appendix 1.

5 Traffic Management Plan

It is proposed that a Traffic Management Plan be developed in consultation with the Pyrenees Shire Council and VicRoads prior to construction. Among other things, the Traffic Management Plan should consider the following measures designed to reduce impacts on local roads and traffic movements during construction:

- Haulage routes for balance of plant materials and machinery;
- Vehicle restrictions on local roads;
- Restriction of deliveries to times outside the school pick up and drop off periods; and
- Pre and post construction surveys of the condition of local roads used during construction.

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6 Conclusion

This Preliminary Transport Assessment has been undertaken to inform about the potential impact of the project on transport infrastructure and traffic movement. The key findings of this assessment were:

- Operational impacts on the road network will be negligible, with a maximum of one visit per month required for maintenance activities;
- Portland will be the preferred port for receiving turbines and other major components, with the delivery route following OSOM Approved Roads with no height restrictions, and no permanent intersection upgrades required;
- As the project is located on the Western Highway in between a regional city, namely Ballarat, and a regional town, Beaufort, it is anticipated that the majority of construction materials (including crushed rock and concrete) will be sourced from the regions surrounding Beaufort and Ballarat and will therefore be delivered to the site via the Western Highway;
- During construction the project will generate approximately 3300 vehicle movements, with a peak of approximately 200 daily movements. According to data sourced from VicRoads the one-way Annual Average Daily Traffic of the Western Highway in the vicinity of the project is 4500 vehicles per day, with a maximum one-way hourly volume of approximately 360. Meanwhile, as an unmanaged motorway the lowest possible Maximum Sustainable Flow Rate for the Western Hwy in the vicinity of the project is 2250 vehicles per hour. Accordingly, at its peak of activity (and assuming that all traffic approaches the site from one direction) the proposal will result in an increase in one-way AADT on the Western Highway of less than 4.4% in the vicinity of the project, and overall cumulative vehicle numbers will remain well below the capacity of the road; and
- The development of a traffic management plan via standard permit conditions, in consultation with Pyrenees Shire Council and VicRoads, will suitably manage any potential impacts to transport infrastructure and traffic movements during and after construction.

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Appendix 1 – Swept Path Assessments

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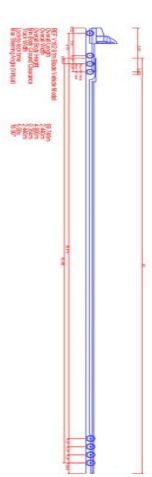
SWEPT PATH ANALYSIS - 81m TURBINE BLADE HENTY HIGHWAY ONTO HENTY HIGHWAY, PORTLAND

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 - Vehicle Body
 - Vehicle
 - Tires Envelope

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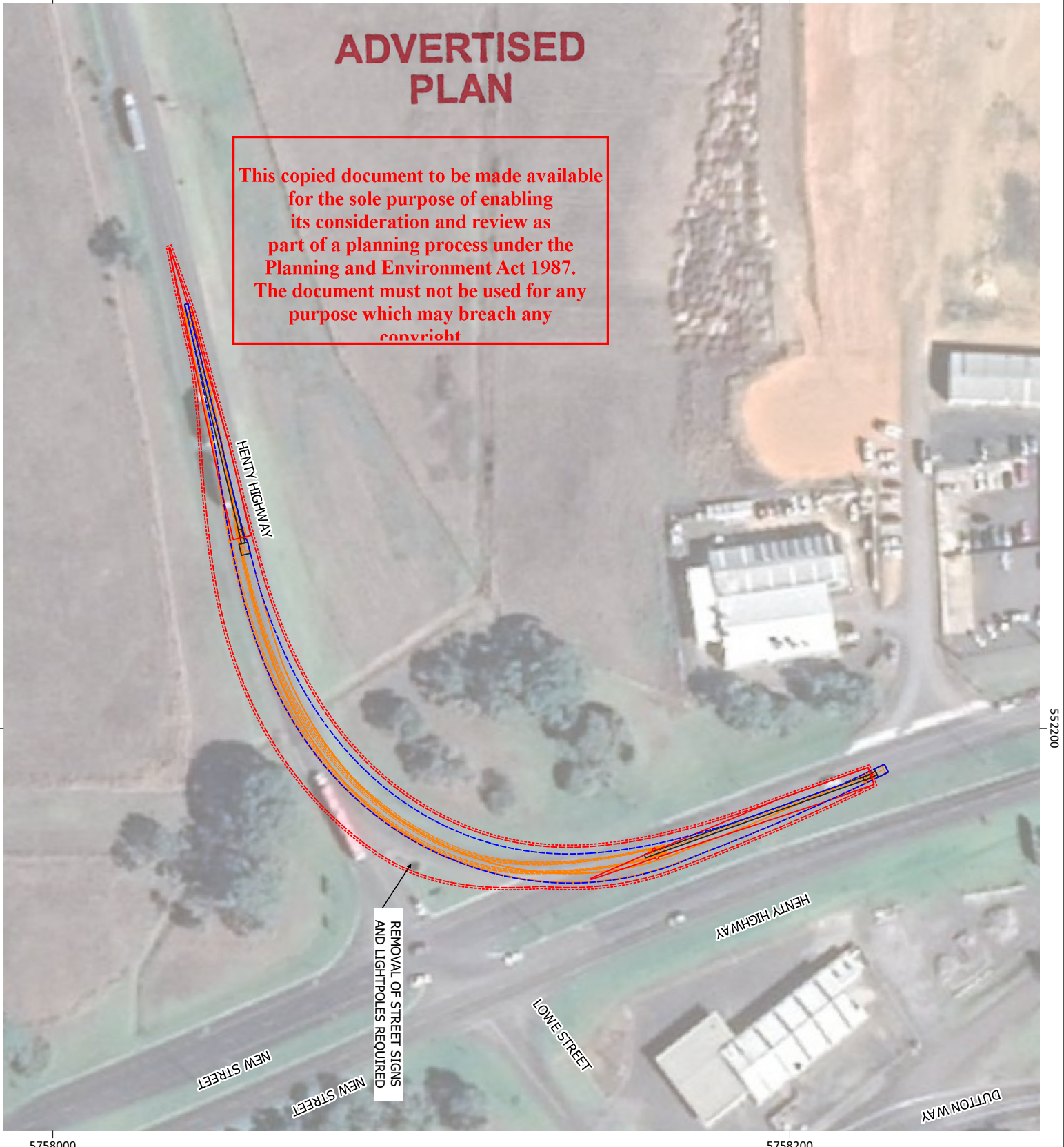


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2. LOCAL ROADS - HENTY HIGHWAY (SPEED ZONE 80KM/H)
 - LOWE STREET (SPEED ZONE 60KM/H)
 - NEW STREET (SPEED ZONE 60KM/H)
3. BASE INFORMATION FROM GOOGLE EARTH AERIAL PHOTOGRAPHY DATED 02/04/2019

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Brewster Wind Farm

SWEPT PATH ANALYSIS - 81m TURBINE BLADE HENTY HIGHWAY ONTO PRINCES HIGHWAY, HAWWOOD

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 - Vehicle
 - Truss Envelope
 - HV Pole

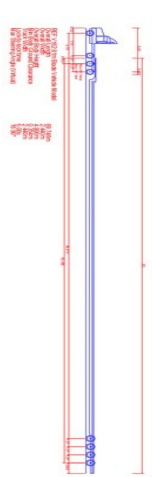
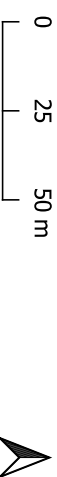
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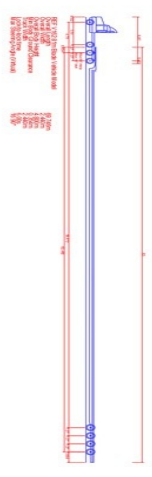
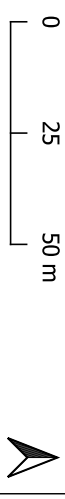
Brewster Wind Farm

SWEPT PATH ANALYSIS - 81m TURBINE BLADE PRINCES HWY
 ONTO PORTLAND-CASTERTON RD., DRUMBORG

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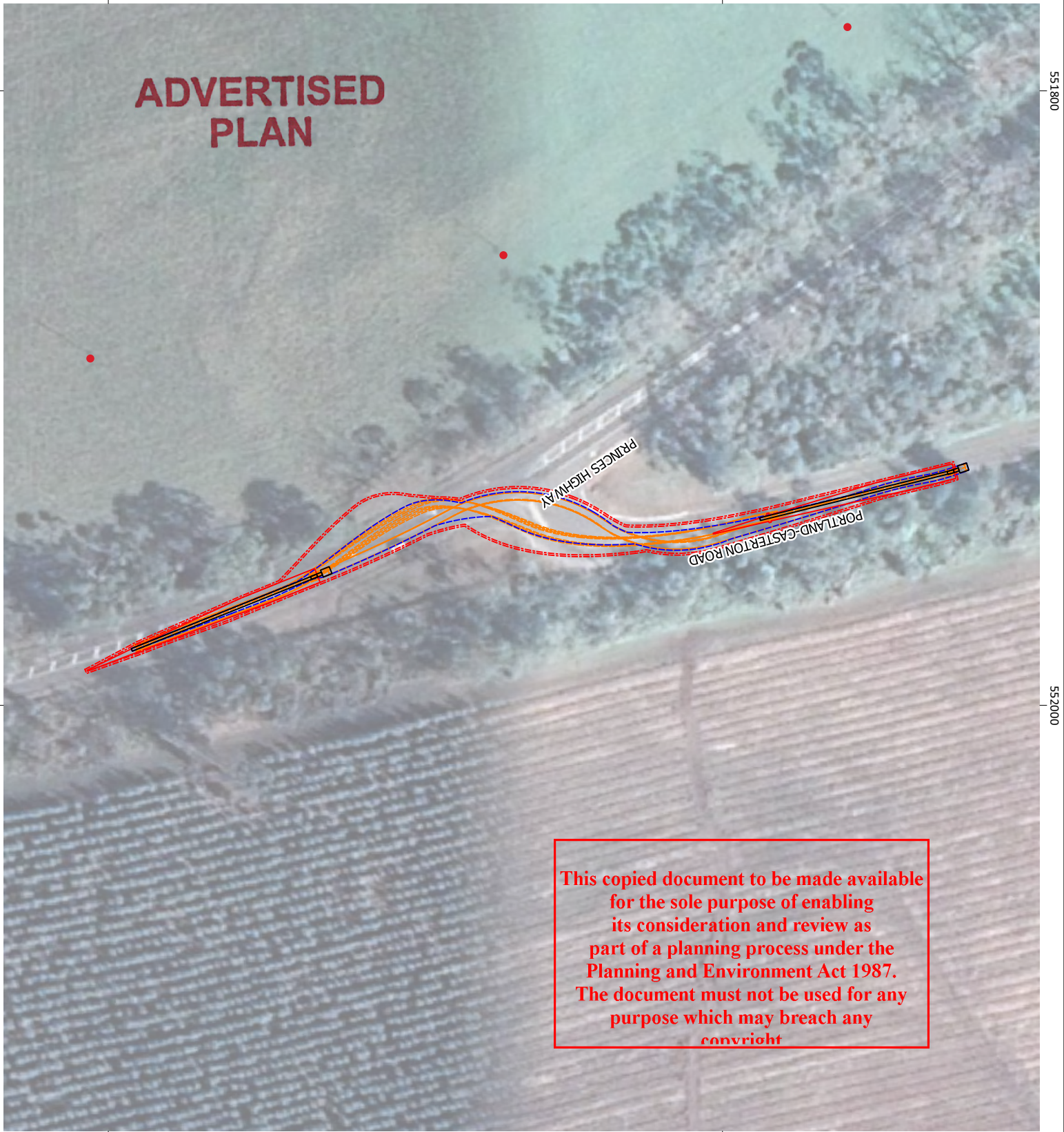


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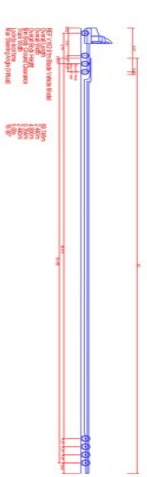
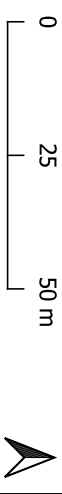
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 - Trees Envelope
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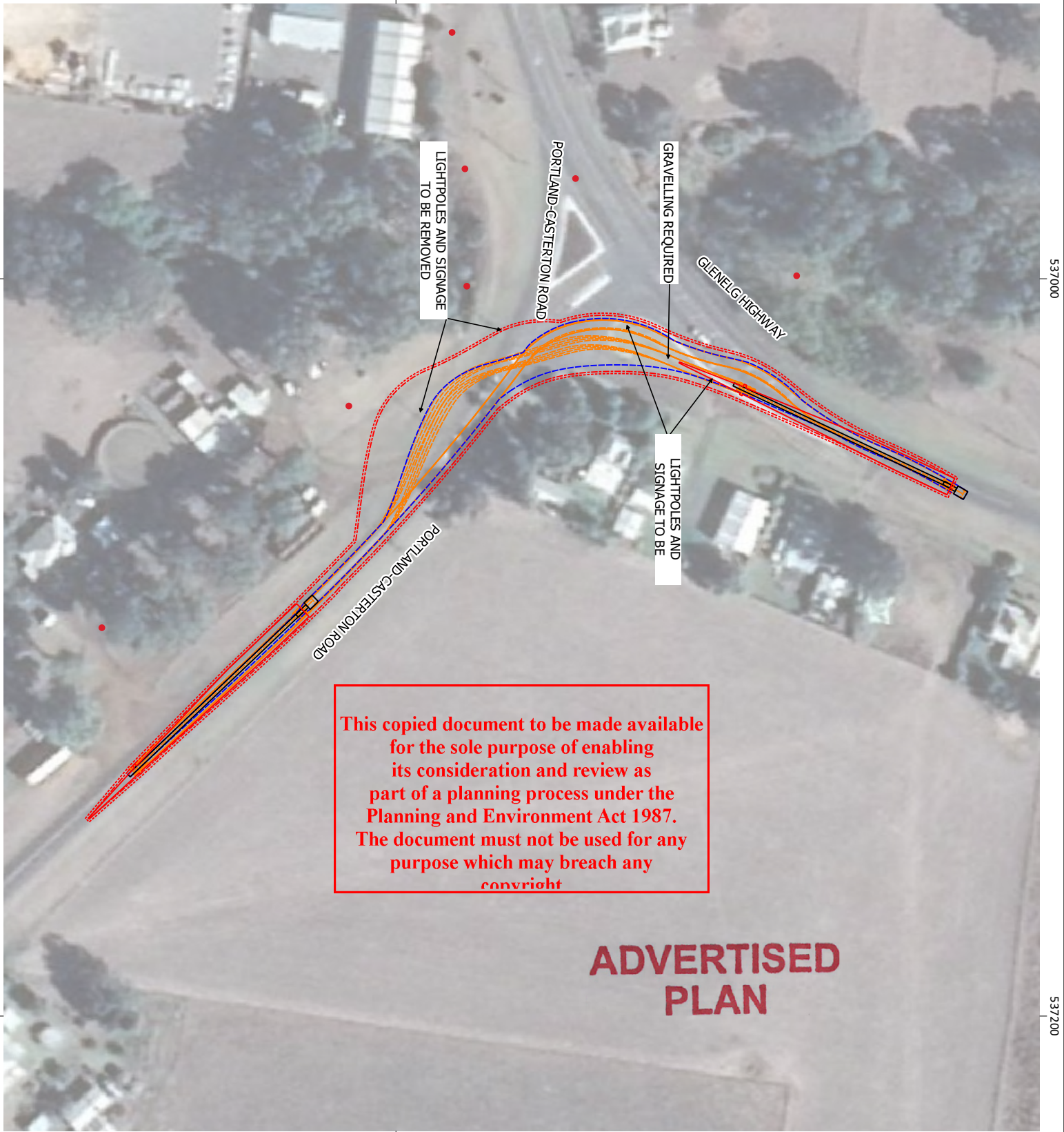


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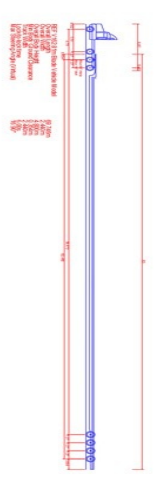
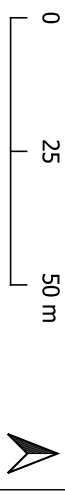
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- Legend**
- Blade Clearance (1m)
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 - HV Pole

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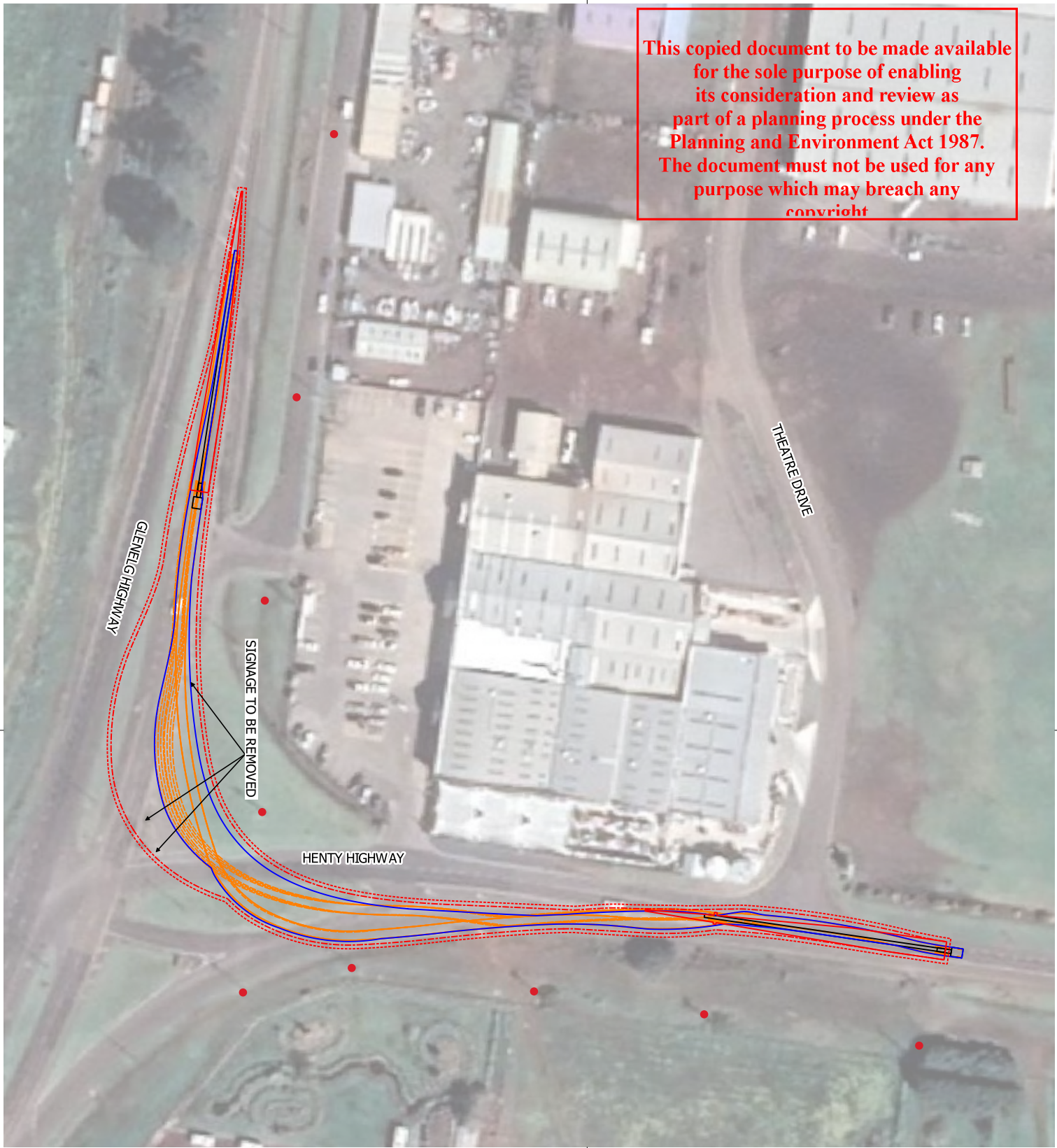
GENERAL NOTES:

1. ALL DIMENSION ARE TO FACE OF KERB AND CHANNEL UNLESS NOTED OTHERWISE.
2. LOCAL ROADS - HENTY HIGHWAY (SPEED ZONE 80KM/H)
 - GLENELG HIGHWAY (SPEED ZONE 80KM/H)
3. BASE INFORMATION FROM GOOGLE EARTH AERIAL PHOTOGRAPHY DATED 22/03/2021

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ADVERTISED PLAN

- Legend**
- Blade Clearance (1m)
 - Blade
 - Blade Envelope
 - Vehicle Body
 - Trues Envelope
 - HV Pole

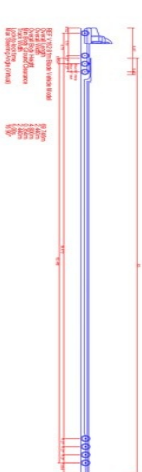
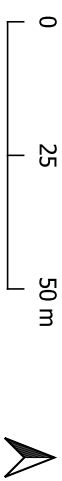
Drawing Number: REF-SP-BRE-06
Revision: A

Shire: GLENELG SHIRE COUNCIL

Drawn: CES
Scale when printed at A3: 1:1,000

Checked: PHS
Date: 27-10-2021

Approved:



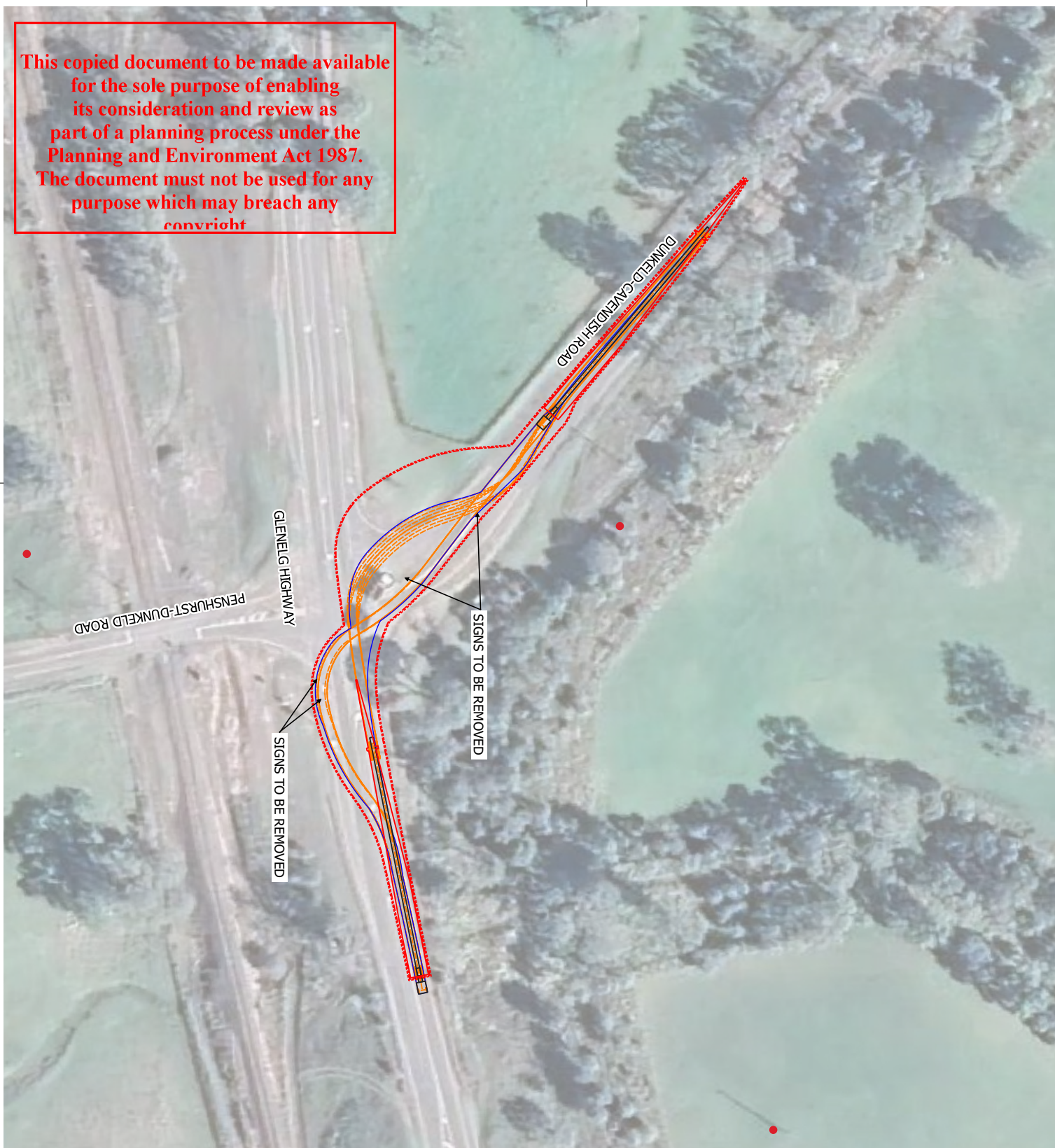
GENERAL NOTES

1. ALL DIMENSION ARE TO FACE OF KERB AND CHANNEL UNLESS NOTED OTHERWISE
2. LOCAL ROADS - DUNKELD-CAVENDISH ROAD (SPEED ZONE 80KM/H)
- GLENELG HIGHWAY (SPEED ZONE 100KM/H)
3. BASE INFORMATION FROM GOOGLE EARTH AERIAL PHOTOGRAPHY DATED 22/03/2021

DWG/SOURCES: 0\vicmapdata\State of Victoria 2021 - REF: June 2021.

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Legend

- Blade Clearance (1m)
- Blade
- Blade Envelope
- Vehicle Body
- Vehicle
- Tires Envelope

ADVERTISED PLAN

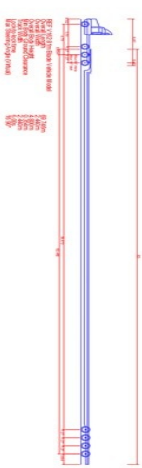
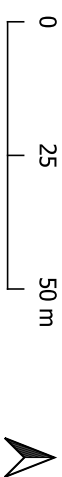
Drawing Number	Revision
REF-SP-BRE-07	A

Shire **ARARAT SHIRE COUNCIL**

Drawn	Scale when printed at A3
CES	1:1,000

Checked	Date
PHS	27-10-2021

Approved	
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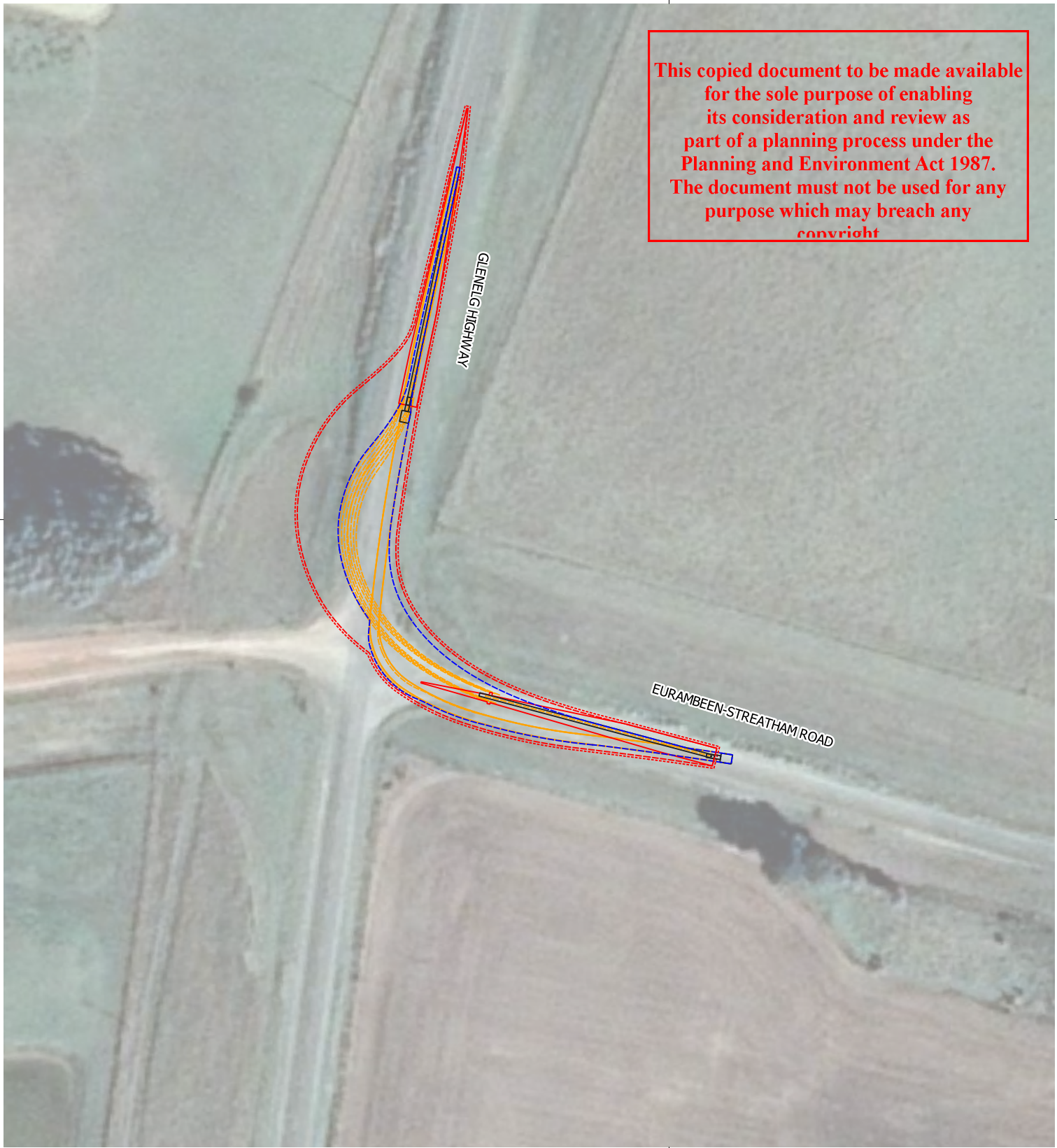
GENERAL NOTES

1. ALL DIMENSION ARE TO FACE OF KERB AND CHANNEL UNLESS NOTED OTHERWISE
2. LOCAL ROADS - EURAMBEEN-STREATHAM ROAD (SPEED ZONE 80KM/H)
 - GLENELG HIGHWAY (SPEED ZONE 80KM/H)
3. BASE INFORMATION FROM GOOGLE EARTH AERIAL PHOTOGRAPHY DATED 30/04/2021

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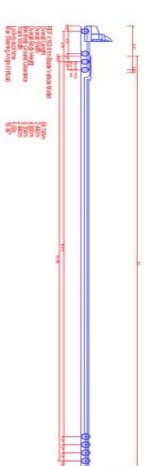
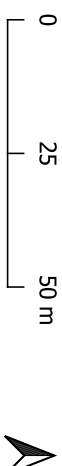
ADVERTISED PLAN

- Legend**
- Blade Clearance (1m)
 - Blade
 - Blade Envelope
 - Vehicle Body
 - Vehicle
 - Tires Envelope

Drawing Number	Revision
REF-SP-BRE-08	A

Shire: ARARAT SHIRE COUNCIL

Drawn	Scale when printed at A3
CES	1:1,000
Checked	Date
PHS	27-10-2021
Approved	

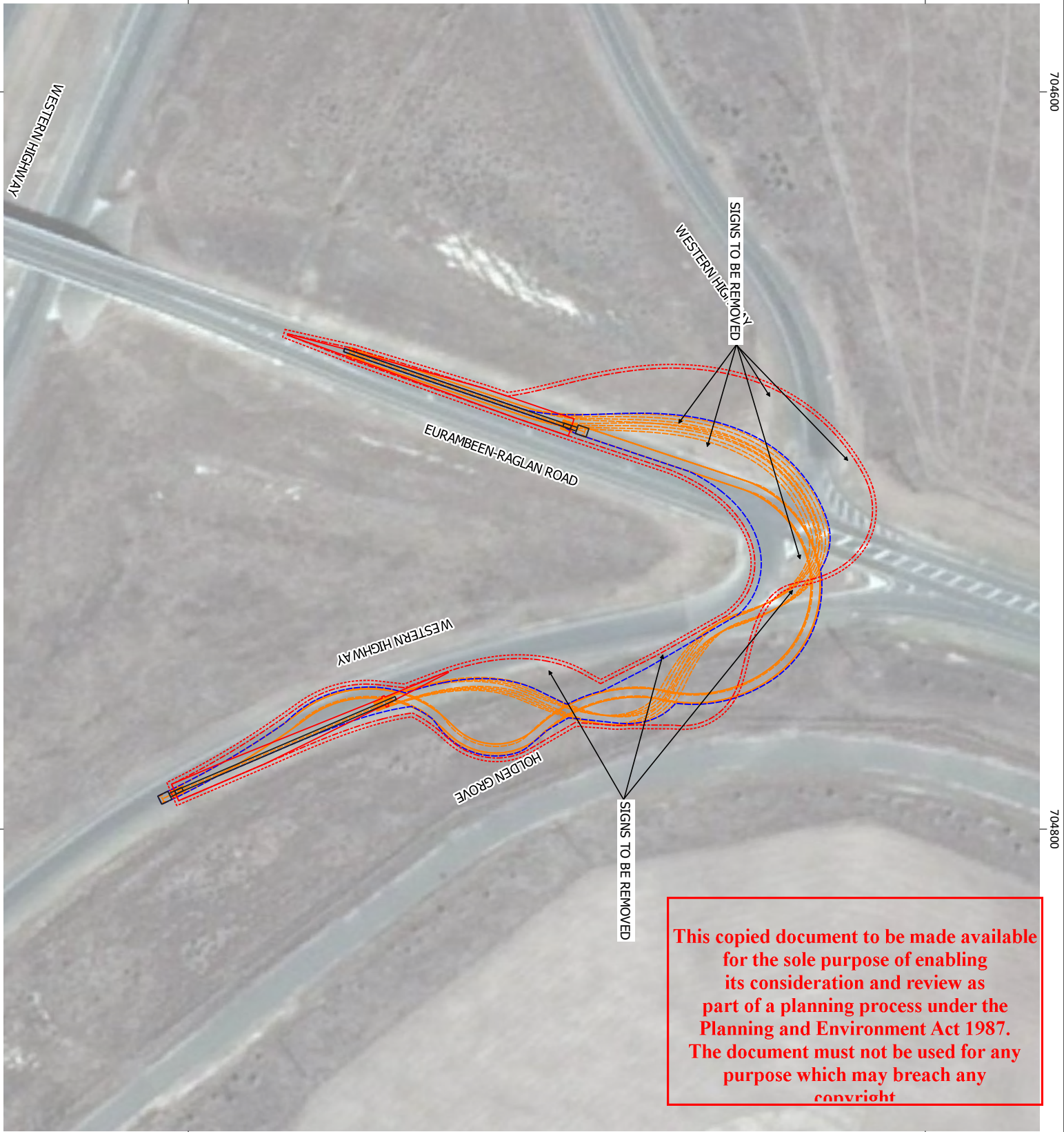


GENERAL NOTES:

1. ALL DIMENSION ARE TO FACE OF KERB AND CHANNEL UNLESS NOTED OTHERWISE.
2. LOCAL ROADS - EURAMBEEN-RAGLAN ROAD (SPEED ZONE 80KM/H)
- WESTERN HIGHWAY (SPEED ZONE 80KM/H)
3. BASE INFORMATION FROM GOOGLE EARTH AERIAL PHOTOGRAPHY DATED 30/04/2021

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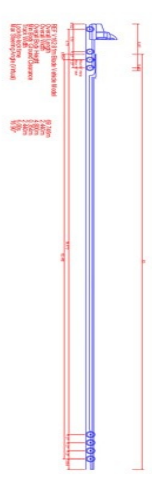
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ADVERTISED PLAN

- Legend**
- Blade Clearance (1m)
 - Blade
 - Blade Envelope
 - Vehicle Body
 - Vehicle
 - Tires Envelope
 - HV Pole

Drawing Number	REF-SP-BRE-09	Revision	A
Shire	PYRENEES SHIRE COUNCIL		

Drawn	CES	Scale when printed at A3	1:1,000
Checked	PHS	Date	27-10-2021
Approved			



GENERAL NOTES

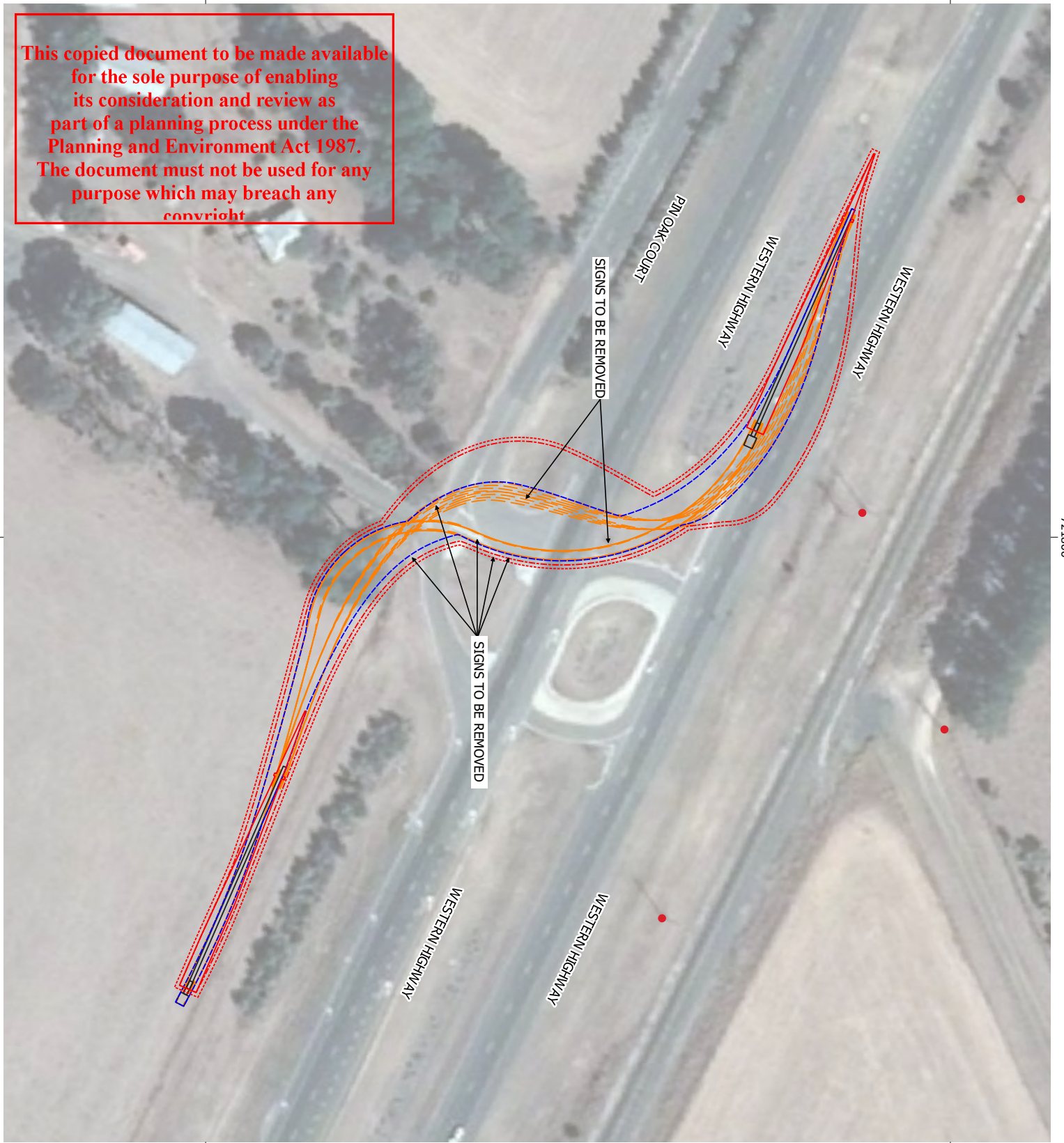
1. ALL DIMENSION ARE TO FACE OF KERB AND CHANNEL UNLESS NOTED OTHERWISE
2. LOCAL ROADS - WESTERN HIGHWAY (SPEED ZONE 110KM/H)
 - PIN OAK COURT (SPEED ZONE 60KM/H)
3. BASE INFORMATION FROM GOOGLE EARTH AERIAL PHOTOGRAPHY DATED 16/03/2021

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721800

5852600

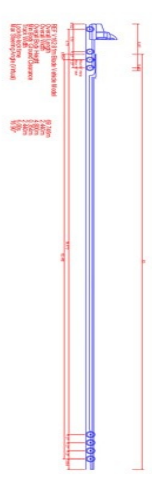
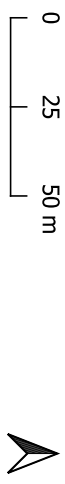
5852800

ADVERTISED PLAN

- Legend**
- Blade Clearance (1m)
 - Blade
 - Blade Envelope
 - Vehicle Body
 - Vehicle
 - Truss Envelope
 - HV Pole

Drawing Number	REF-SP-BRE-10	Revision	A
Shire	PYRENEES SHIRE COUNCIL		

Drawn	CES	Scale when printed at A3	1:1,500
Checked	PHS	Date	27-10-2021
Approved			



GENERAL NOTES

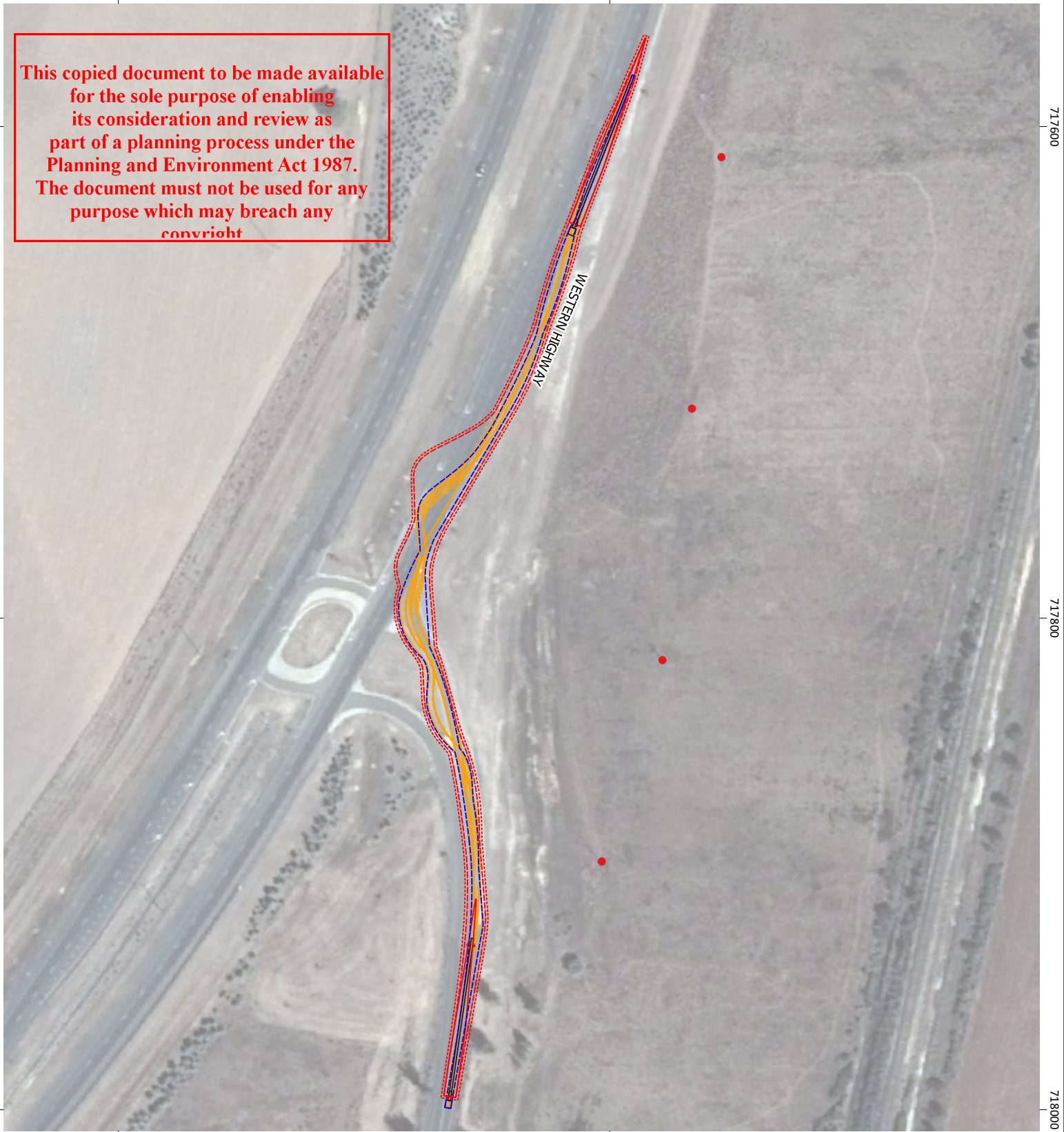
1. ALL DIMENSIONARE TO FACE OF KERB AND CHANNEL UNLESS NOTED OTHERWISE.
2. LOCAL ROADS - WESTERN HIGHWAY (SPEED ZONE 100KM/H)
- OLD WESTERN HIGHWAY (SPEED ZONE 80KM/H)
3. BASE INFORMATION FROM GOOGLE EARTH AERIAL PHOTOGRAPHY DATED 28/02/20

DRAWINGS: 01vemphdha@state.vic.gov.au 2021 REF: June 2021.

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717600

717800

718000

5853800

5854000

Brewster Wind Farm

SWEPT PATH ANALYSIS - 81m TURBINE BLADE OLD WESTERN HIGHWAY ONTO TRAWALLA ROAD

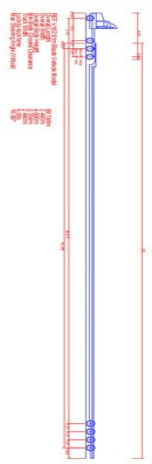
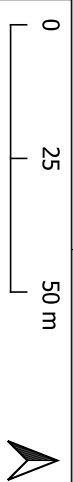
ADVERTISED PLAN

- Legend**
- Blade Clearance (1m)
 - Blade
 - Blade Envelope
 - Vehicle Body
 - Trailer Envelope
 - HV Pole

Drawing Number: REF-SP-BRE-11
Revision: A

Shire: PYRENESS SHIRE COUNCIL

Drawn	CES	Scale when printed at A3	1:1,000
Checked	PHS	Date	27-10-2021
Approved			



GENERAL NOTES

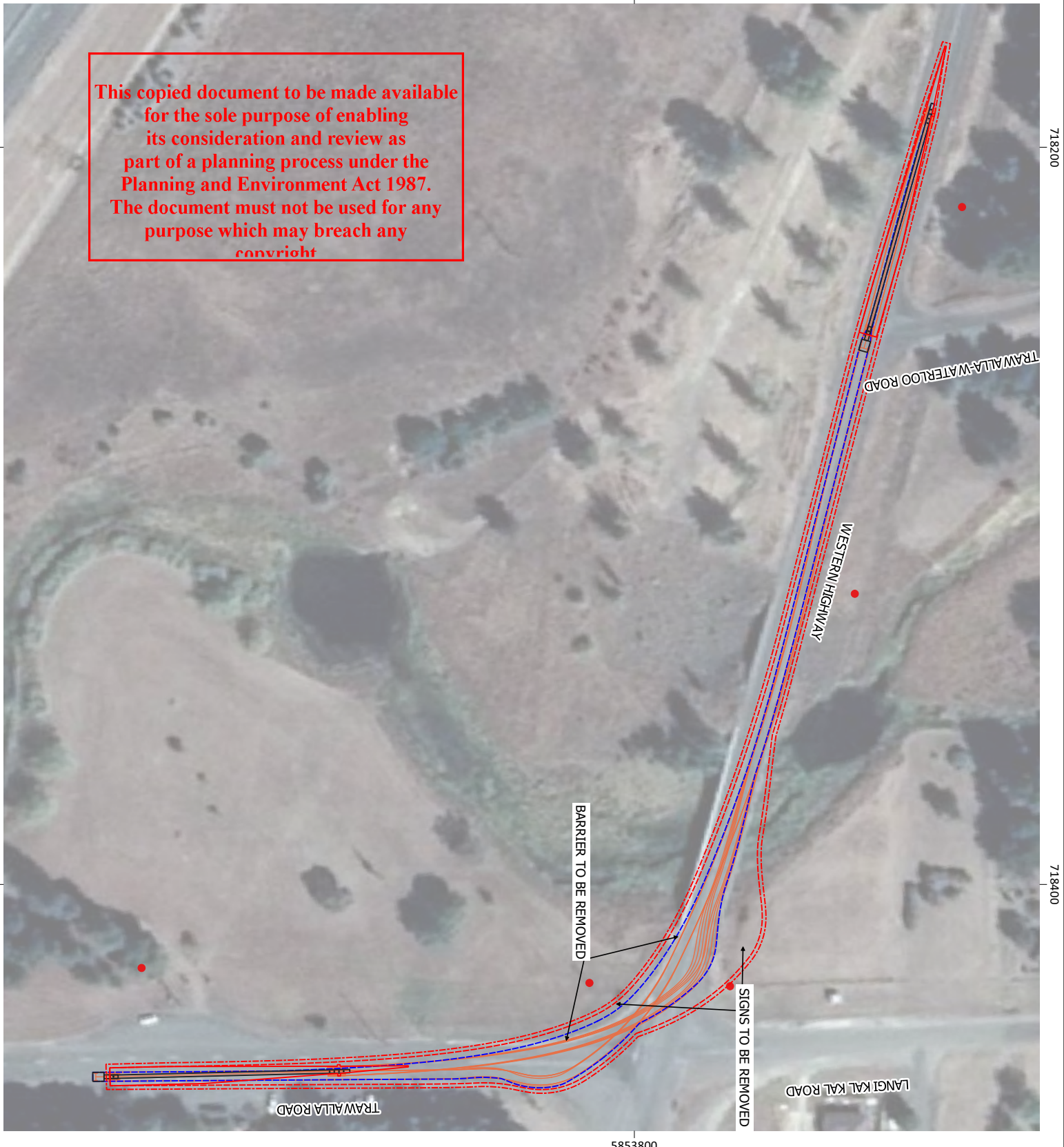
1. ALL DIMENSION ARE TO FACE OF KERB AND CHANNEL UNLESS NOTED OTHERWISE
2. LOCAL ROADS - WESTERN HIGHWAY (SPEED ZONE 80KM/H) - TRAWALLA ROAD (SPEED ZONE 80KM/H)
3. BASE INFORMATION FROM GOOGLE EARTH AERIAL PHOTOGRAPHY DATED 28/02/2019

DANSOURCES: Ovens@phs.vic.gov.au
DANSOURCES: Ovens@phs.vic.gov.au








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Legend

-  Blade Clearance (1m)
-  Blade
-  Blade Envelope
-  Vehicle Body
-  Vehicle
-  Trees Envelope
-  HV Pole

ADVERTISED PLAN

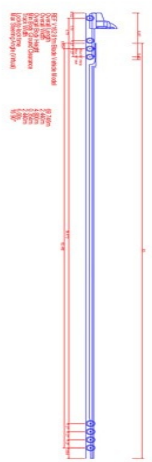
Drawing Number: REF-SP-BRE-12 Revision: A

Shire: PYRENEES SHIRE COUNCIL

Drawn: CES Scale when printed at A3: 1:1,000

Checked: PHS Date: 27-10-2021

Approved: _____

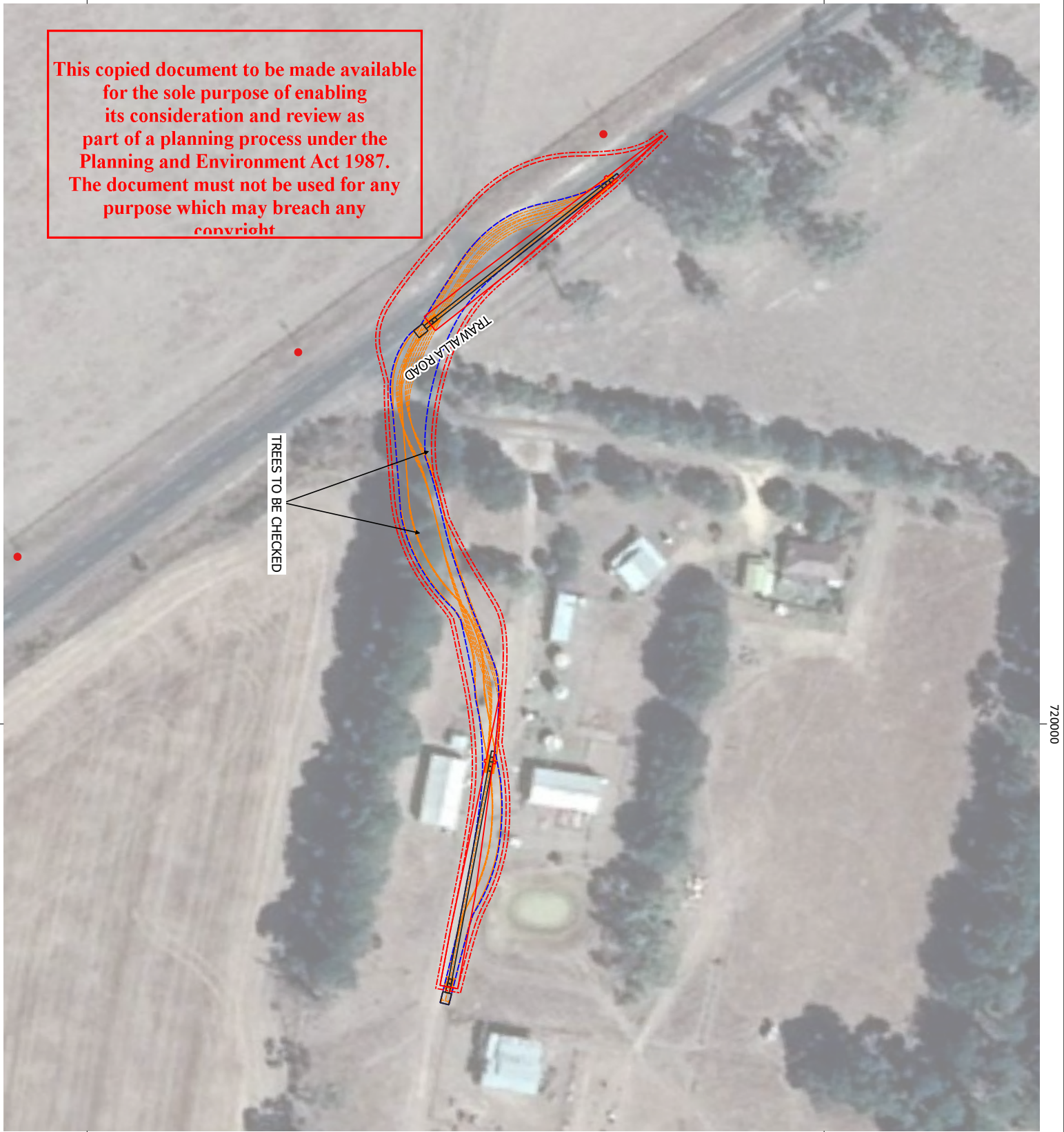


GENERAL NOTES

1. ALL DIMENSION ARE TO FACE OF KERB AND CHANNEL UNLESS NOTED OTHERWISE.
2. LOCAL ROADS - TRAWALLA ROAD (SPEED ZONE 80KM/H)
3. BASE INFORMATION FROM GOOGLE EARTH AERIAL PHOTOGRAPHY DATED 02/02/2019

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