

Traffic Impact Assessment Report

BESS Development, 438 Lobbs Road, Glenbrae

Project Number 220123

Revision Report 25/05/2023

Client ACENERGY Pty Ltd

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Report title	BESS Development, 438 Lobbs Road, Glenbrae
Project number	220123
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Executive summary

ACENERGY Pty Ltd has engaged Trafficworks to undertake a traffic impact assessment (TIA) for the proposed Battery Energy Storage System - **BESS Development, 438 Lobbs Road, Glenbrae.**

Table 1 below summarises the site and the proposed development, and our conclusions and recommendations.

Table 1: Site details, conclusions and recommendations summary.

Address	438 Lobbs Road, Glenbrae (Lot 1 - 21, PP2597)
Zoning	Farming Zone (FZ)
Proposed development	Battery Energy Storage System (BESS) facility
Road network	<p>Forest Road (managed by Pyrenees Shire Council)</p> <ul style="list-style-type: none"> <100 vpd <p>Sunraysia Highway (B220 managed by DTP)</p> <ul style="list-style-type: none"> Year 2020 AADT – 1,760 vpd (two-way) Year 2023 Peaks – 95 vph (one-way)
Traffic generation	<ul style="list-style-type: none"> Peak construction: 50 vpd (17 vph in AM peak) during weeks 7 to 14 Operation & maintenance: up to 3 vpd on weekdays
Car parking	16 cars on site
Conclusion	<p>We conclude that:</p> <ul style="list-style-type: none"> with no crash history, the access road network in the vicinity of the subject site is considered to operate safely and requires no urgent remedial treatment on-site car parking provision is satisfactory sight lines along Forest Road at the site access are satisfactory and require no further action sight lines are satisfactory at the intersection of Sunraysia Highway with Forest Road and require no further action there are no traffic engineering reasons that would prevent the development from proceeding, subject to implementation of our recommendations.
Recommendations	<p>We recommend that:</p> <ul style="list-style-type: none"> access to the development from Forest Road be constructed in accordance with SD265 from the IDM but catering for left in and right out movements only

- access to the development from the Sunraysia Highway at the intersection with Forest Road be provided with a basic Type BAL left turn treatment and no additional treatment for right turns.

Referenced documents

Technical references used in the preparation of this report include the following:

- RTA Guide to Traffic Generating Developments, Version 2.2, October 2002
- Australian Standard Parking facilities – Off-street parking; (referenced as AS 2890.1-2004)
- Austroads Guide to Road Design
 - Part 3 – Geometric Design 2016 (referenced as AGRD3)
 - Part 4 – Intersections and Crossings, General 2017 (AGRD4)
 - Part 4A – Unsignalised and Signalised Intersections 2017 (AGRD4A)
- Austroads Guide to Traffic Management
 - Part 6: Intersections, Interchanges and Crossings 2017 (AGTM6)
- VicRoads Supplement to Austroads Guide to Road Design, Part 4A (VS AGRD4A)
- Department of Transport & Planning Open Data Portal for casualty crash history and traffic volume data on roads near the proposed development
- The Pyrenees Planning Scheme
- Local Government Infrastructure Design Association's Infrastructure Design Manual (IDM), Version 5.30 released 24 March 2020

The assessment is based on the following information made available by the client (reproduced in Appendix 1):

- Plans titled Glenbrae BESS, prepared by ACEnergy for project 901, as follows:
 - Locality Diagrams, Sheets 1 & 2, dated 05/03/2023
 - Site Plans, Sheets 1 & 2, dated 20/04/2023
- Traffic generation tables for light & heavy vehicles (reproduced in Appendix2).

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1 Introduction

ACENERGY Pty Ltd engaged Trafficworks to undertake a traffic impact assessment (TIA) for the proposed Battery Energy Storage System - **BESS Development, 438 Lobbs Road, Glenbrae**. This report is to accompany a Planning Permit Application to the Department of Transport & Planning (DTP) for the above development.

The TIA was undertaken to:

- estimate the traffic generation and distribution to / from the proposed development
- determine the suitability of the proposed access
- determine the likely traffic impacts on the existing road network
- identify any necessary mitigation works.

For the detail about:

- existing site conditions – see Section 2
- description of the proposed development – see Section 3.1
- traffic impact of the proposed development – see Sections 3.2 & 3.3
- car parking assessment of the proposed development – see Section 4
- assessment of the access to the proposed development – see Sections 5 & 6
- our conclusions and recommendations – see Section 7.

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2 Existing conditions

2.1 Subject site

Although the site address is 438 Lobbs Road, Glenbrae, vehicular access to the BESS site is to be gained from Forest Road, via an existing gate approximately midway along the property's northern frontage.

The subject property and all surrounding land is included in the Farming Zone (FZ) of the Pyrenees Shire Planning Scheme, with land further to the west located in the Rural Conservation Zone (RCZ). The Sunraysia Highway 2.7 km to the east is located in the Transport Zone 2 – Principal Road Network (TRZ2).

The subject site forms part of a farming property with a residence located along the Lobbs Road frontage clear of the BESS development.

Figure 1 shows the location of the site, and the zoning of the site and surrounding area.

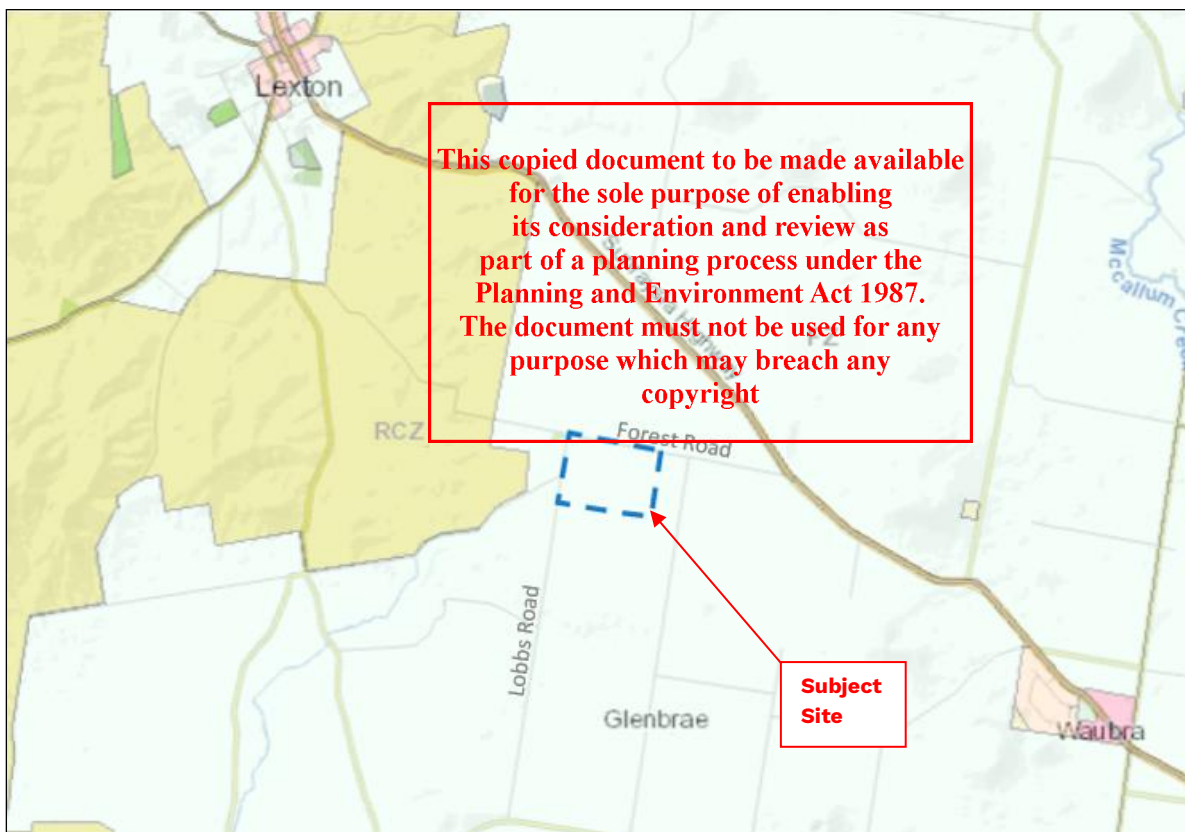


Figure 1: Location and land zoning plan (reproduced from the DELWP website)

2.2 Road network

The road network includes the following:

- **Forest Road** which will provide the primary access to the development site. Forest Road is a Local Access Road in the Pyrenees Shire Council's Road Hierarchy. The first 1.35 km

west of the Sunraysia Highway is sealed 3.6 m wide with the remaining 1.35 km to the subject site access comprising a 5.5 m wide gravel formation (positioned 5 m south of centre of the road reservation at the site) in a 25 m reservation (refer photo in Figure 2).

- **The Sunraysia Highway** (B220) is a State Arterial Road managed by the Department of Transport & Planning (DTP). It will provide the principal means of component delivery access to the development from the Western Highway/Freeway from the southeast. In the vicinity of Forest Road, the Sunraysia Highway is configured as a two-lane two-way carriageway with a 7.0 m wide seal (2 x 3.5 m traffic lanes) bounded by gravel/grass verges in a 60 m reservation on a meandering but flat northwest-southeast alignment. The intersection with Forest Road is located on the outside of a large radius curve (refer photos in Figures 3 & 4).

2.2.1 Road features

Table 2 describes the features of these roads.

Table 2: Road features

Feature	Descriptions:	
	Forest Road	Sunraysia Highway
Road type	Local access road as per Council's road register	State arterial Road (B220) managed by DTP
Access	Farm gate at 850 m west of the property's eastern boundary or 1.3 km west of Glenbrae School Road	No direct access to the property from the highway
Carriageway	5.5 m wide gravel formation	7.0 m wide seal with gravel shoulders
Road reservation	25 m wide	60 m wide
Road cross section	<ul style="list-style-type: none"> – 5.5 m gravel formation offset 5.0 m south of the reserve centre line – bounded by grass verges 	<ul style="list-style-type: none"> – 2 x 3.5 m sealed traffic lanes – bounded by gravel/grass verges
Speed limit	Default 100 km/h rural limit but estimated speeds 60-80 km/h	100 km/h rural speed limit

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The photo in Figure 1



illustrates Forest Road and those in Figure 3 & 4 illustrate the Sunraysia Highway.



Figure 2: View to the east along Forest Road in the vicinity of the proposed site access to the right

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Figure 3: View to the northwest along Sunraysia Highway approaching the Forest Road intersection (to the left)

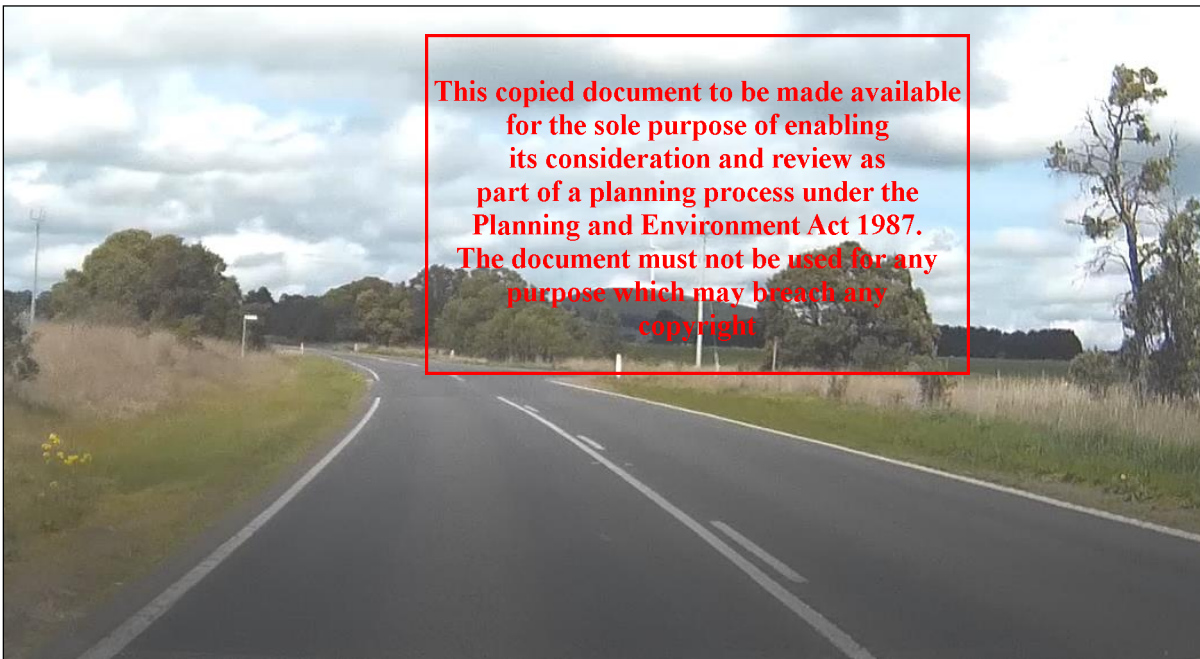


Figure 4: View to the southeast along the Sunraysia Highway at the approach to Forest Road (to the right)

2.3 Traffic volumes

No traffic volumes data is available for Forest Road. Based on observations during the site inspection and the limited number of residences accessed from this road, traffic volumes are estimated to be less than 50 vehicles per day (vpd), equating to 6 vph during the peaks - 3 vph in each direction.

The most recent traffic information obtained from the DTP website indicates 2020 estimated two-way traffic volumes on the Sunraysia Highway of 1,760 vpd, with 360 commercial vehicles (20% CVs). The data indicated a 50/50 directional split of about 880 vpd each way. Assuming

that peak hour traffic can be estimated as approximately 10% of average daily traffic, anticipated one-way peak hour volumes on the Sunraysia Highway are estimated to be in the order of 90 vehicles per hour (vph).

The DTP listing for the Sunraysia Highway indicated a compound growth rate of between 2.0% and 3.0% per annum. Applying a 2.5% growth rate to the above values for the period 2020 to 2023 (anticipated peak construction period for the BESS) would indicate two-way volumes on the Sunraysia Highway in the order of 1,900 vpd, with corresponding peak hour volumes of 95 vph in each direction.

2.4 Crash history

The DTP's *Open Data Portal* provides records of all injury crashes reported to Police in the most recent five years of available data (January 2017 to December 2021). No crashes occurred during this period on Forest Road or on the Sunraysia Highway in the vicinity of Forest Road.

Conclusion 1: with no crash history, the access road network in the vicinity of the subject site is considered to operate safely and requires no urgent remedial treatment.

2.5 Public transport

There are no public transport services that operate along Forest Road or the Sunraysia Highway in the vicinity of the site. This matter is not considered further in this report.

2.6 Pedestrians and cyclists

There is not expected to be any pedestrian or cycle activity on Forest Road or the Sunraysia Highway in the vicinity of this remote rural site. This matter is not considered further in this report.

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3 Traffic assessment of the proposed development

3.1 The proposal

As shown in the Locality Diagram and Site Plans (reproduced in Appendix 1), the development involves the following:

- occupation of 10 ha of vacant farmland in the northwest corner of the property by the battery facility (7 ha) and switching station (3 ha)
- a connection to the existing 220 kv transmission line traversing the property to the south of the BESS installation
- access to the site from Forest Road at an existing gate some 300 m east of Lobbs Road
- an on-site offloading area beside the entry gate (used during the construction period only)
- a designated on-site parking area for construction and maintenance vehicles.

Vehicular access to the proposed development will be from the east, from the Sunraysia Highway via Forest Road.

3.2 Traffic generation

3.2.1 Construction

On-site construction for the proposed BESS facility is largely limited to assembly and connection of components with the typical BESS system delivered to site in shipping containers.

Equipment will mostly be transported to the site via rigid trucks, with the medium voltage power station (MVPS), BESS containers, and transformers required to be delivered to site by 19 m semi-trailers (B-doubles will not be used for transportation).

Detailed vehicle movement estimates have been provided by the client and are provided in the tables in Appendix 2. The typical daily vehicle movements have been extracted from these schedules and summarised in Table 3. These show that the peak activity at the site occurs during weeks 7 to 15, with up to 25 vehicles entering the site each day, comprising 16 light vehicles arriving during the AM pre-work peak and some 9 heavy vehicle arrivals spread through the day.

Based on these estimates, the proposed development is anticipated to generate approximately:

- 50 vehicle trips per day (vpd), 25 entering and 25 departing from the site
- morning and afternoon peaks of 17 vehicles per hour (vph), comprising 16 light vehicles and 1 heavy vehicle.

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Table 3: Daily and peak traffic flow for the proposed development during construction

Period (week)	Activity	Typical Trip Generation (veh/day)		
		Light vehicles	Heavy vehicles	Total
1 - 5	Establishment, drainage, roads & fencing	6	1	7
4 - 9	Footing installation & cabling	7	1	8
7 - 15	Batteries delivery & installation			
9 - 16	Control room, transformer & switchgear delivery & installation	16	9	25
17 - 20	Commissioning & demobilisation	6	2	8

3.2.2 Operation and maintenance

Once operational, the proposed BESS facility will be operated and maintained daily by up to five (5) personnel..

There are expected to be up to 3 light vehicles attend each weekday to undertake general maintenance of the site during the operational phase. Up to one vehicle may attend the site at weekends as required.

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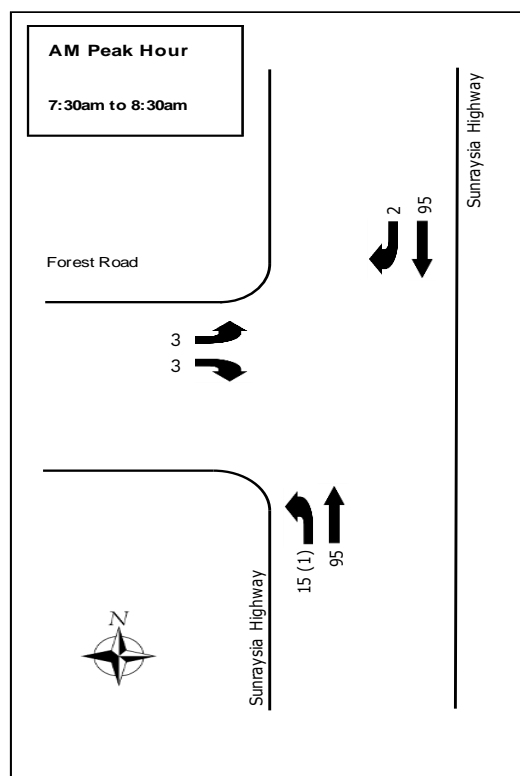
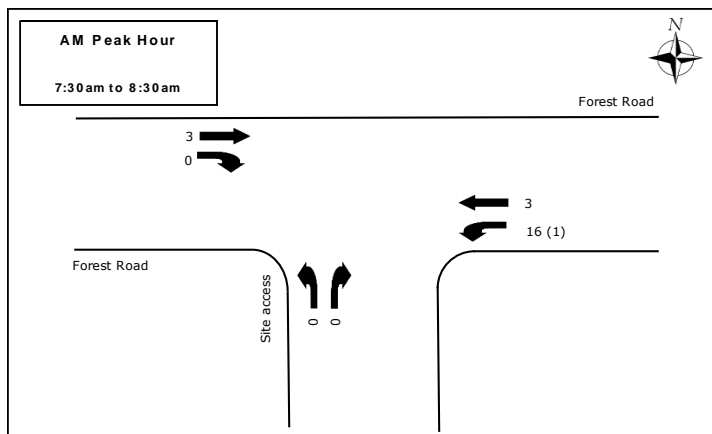
3.3 Traffic distribution assumptions

All traffic will access the site from the east, with components transported along the Western Highway/Freeway then Sunraysia Highway from the southeast. Construction staff are also likely to come from the Ballarat area to the southeast, although some may choose to stay in Lexton or Avoca to the north. All will use Forest Road as the access route between the Sunraysia Highway and the site.

We have assumed that 100% of heavy vehicle traffic and 90% of the light vehicle traffic will access the site to / from Ballarat (the southeast), turning left into Forest Road and entering the site through a left turn from the east. An allowance of 10% of light vehicle right turns has been made at the entry to Forest Road from the Sunraysia Highway.

We have also assumed that, during the AM peak of the construction phase, all light traffic will be inbound, with none leaving the site. During the PM peak of the construction phase all light traffic will be outbound, with none entering the site. Heavy vehicles will arrive and leave throughout the day with allowance for one arrival during the AM peak and one departure during the PM peak.

These AM peak hour traffic distribution assumptions are shown in Figures 5a and 5b.



Figures 5a & 5b: Summary of AM peak traffic volumes for Forest Road at site entry and at Sunraysia highway.

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4 Car parking assessment

The Planning Scheme does not provide indicative parking rates for this type of development.

Section 3.2 indicates a maximum of 50 construction staff on site at the peak of construction. The estimate assumes travel involves car sharing at an average of 3 people per car, giving a total parking demand of 16 spaces to accommodate a maximum workforce of 50 during weeks 7 to 15.

A nominal 40 m x 10 m on-site parking area has been indicated on the concept plans immediately west of the entry gate, which is expected to cater for the 16 vehicles. Additional space available to increase parking supply if required.

Conclusion 2: on-site car parking provision is satisfactory.

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5 Access to the site from Forest Road

5.1 Site access visibility –ESD requirements

The visibility criterion normally used at private property access points to a local road is Entering Sight Distance (ESD). This is described in Section 3.2.4 of AS 2890.1, where the Table in Figure 3.2 specifies a desirable (5 second gap) sight distance along the frontage road of 111 m from a driver's position 2.5 m offset from the edge of the frontage road for a design speed of 80 km/h (refer Figure 6).

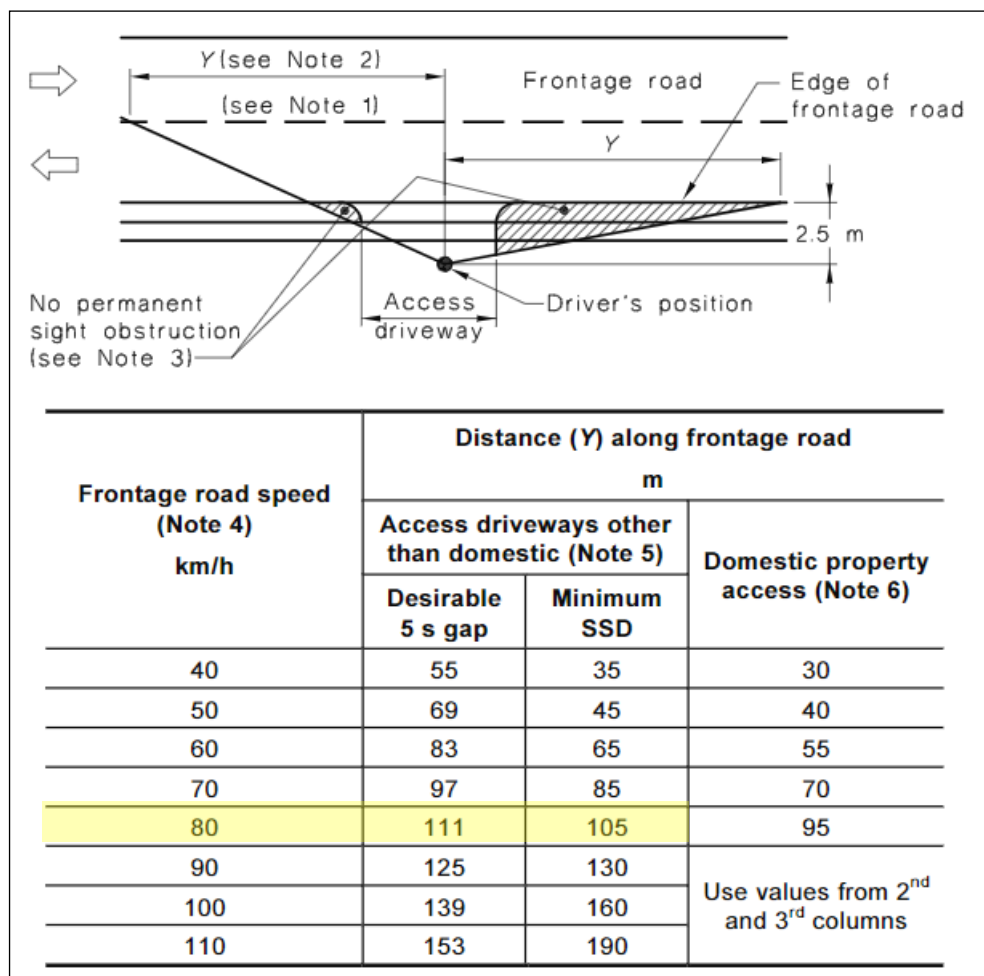


Figure 6: Entering Sight Distance (ESD). Source: Figure 3.2 from AS 2890.1.

The above ESD criterion is satisfied with clear sight lines in excess 300 m available to the east and west from the proposed site driveway (refer photos in Figures 7 & 8).

Conclusion 3: sight lines along Forest Road at the site access are satisfactory and require no further action.

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Figure 7: View to the east from the proposed site driveway showing compliance with ESD criteria.



Figure 8: View to the west from the proposed site driveway showing compliance ESD criteria.

5.2 Site access treatment

For the anticipated truck turns into and out of the site at the driveway onto Forest Road the low levels of through traffic make analysis unnecessary and the minimum treatment specified in Standard Drawing SD 265 of Councils Infrastructure Design Manual (IDM) should be applied (refer Appendix 3.3 for reproduction of SD 265).

The critical dimensions from this drawing are:

- widening of the Forest Road formation opposite the entry driveway to cater for the swept path of entering and departing semi-trailers (note only the east approach requires treatment)
- flaring of the driveway for the swept paths of trucks (again only the left turn from the east needs to be catered for)
- set-back of the gate to permit a semi-trailer to store clear of the through carriageway in the event that the gate is shut
- upgrading of the culvert under the driveway to provide continuity of drainage.

Recommendation 1: that access to the development from Forest Road be constructed in accordance with SD265 from the IDM but catering for left-in and right-out movements only.

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6 Access to Forest Road from Sunraysia Highway

6.1 Intersection visibility –SISD requirements

The visibility criterion normally applied to arterial road intersections by DTP is Safe Intersection Sight Distance (SISD). Figure 9 shows the SISD, which:

- is nominated in the Austroads Guide to Road Design, Part 4A (AGRD4) as the minimum distance that should be provided on a major road at any intersection (refer Section 3.2.2 in AGRD4A)
- provides sufficient distance for a driver of a vehicle on the major road:
 - to observe a vehicle from the minor access approach moving into a collision situation, e.g., in the worst case, stalling across the traffic lanes
 - to decelerate to a stop before reaching the collision point.

The minimum SISD criterion, specified in Table 3.2 of AGRD4A, requires clear visibility for a desirable minimum distance of 285 m, relating to the general reaction time R_T of 2 seconds and a design speed of 110 km/h¹.

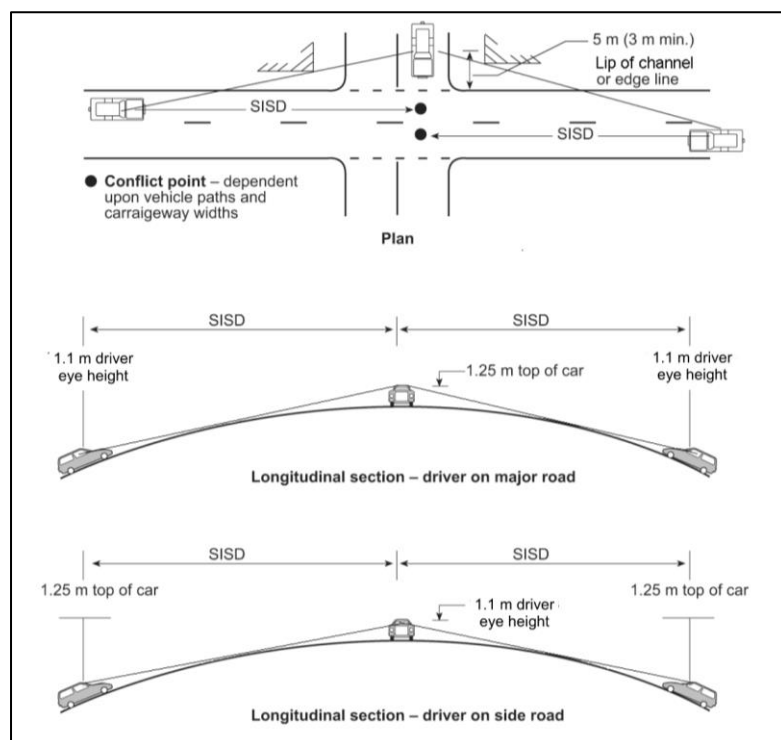


Figure 9: Safe Intersection Sight Distance (SISD) (Source: Figure 3.2 from AGRD4).

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¹ Clause 3.4.2 of the VS to AGRD3 requires adoption of an operating speed of 10 km/h greater than the posted speed limit for high-speed rural roads.

As Forest Road intersects with the Sunraysia Highway on the outside of a large radius curve in the highway alignment, visibility between an exiting driver and through traffic is very good and has been measured to exceed the Austroads minimum requirements noted above, as demonstrated in the photos in Figures 10 & 11.

Conclusion 4: sight lines are satisfactory at this intersection and require no further action.

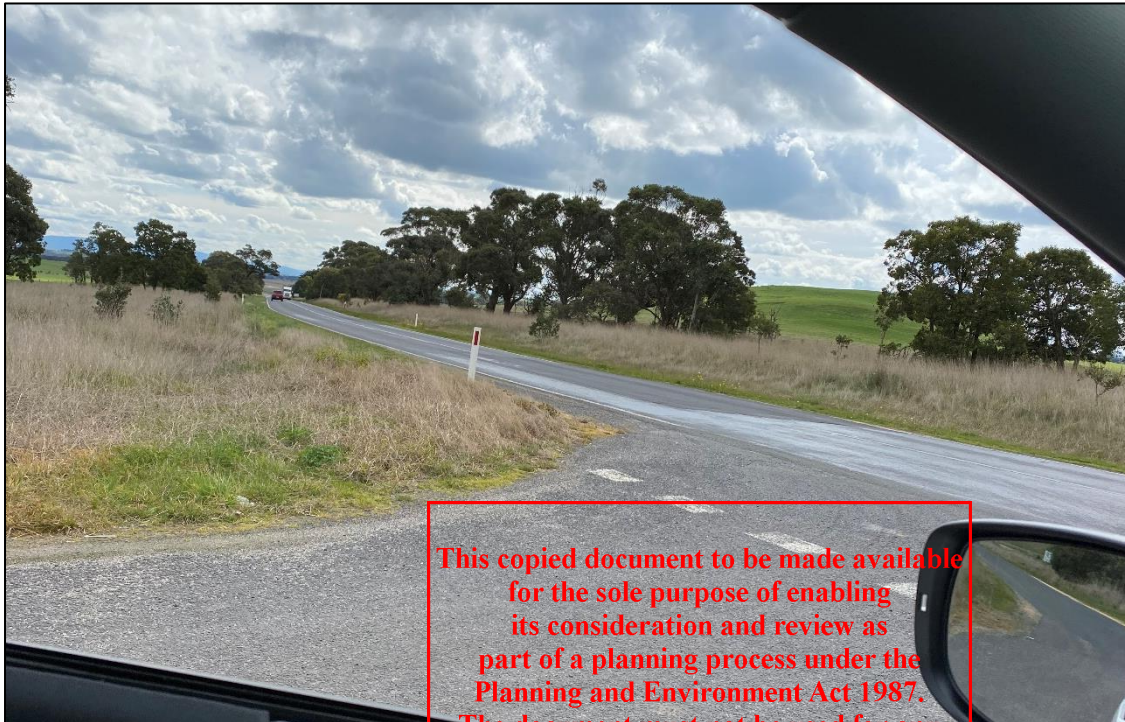


Figure 10: view to the north along Sunraysia Highway from Forest Road showing sight lines in excess of 300 m.



Figure 10: view to the south along Sunraysia Highway from Forest Road showing sight lines in excess of 300 m.

6.2 Intersection treatments

The traffic turning from major roads into minor roads should not delay through traffic. Generally, turn treatments from major roads into minor roads at sign-controlled intersections are provided for safe and efficient operation of the intersection.

Given the existing low turn demand from the Sunraysia Highway into Forest Road, there is currently no turn provision clear of the through traffic lanes at this intersection. With additional vehicle movements generated during the construction phase of this project, turn provision has been assessed at this location. In this respect, reference is made to Figure 3.25(a) of AGTM6 (reproduced in Figure 13) that provides the turn lane criteria at locations with a design speed of 100 km/h or greater.

From Section 2.3 of this report, one-way traffic volumes in the Sunraysia Highway during construction of the development are expected to be in the order of 95 vph during the daily peak hours.

Superimposed over these peak highway traffic flows are entry movements to Forest Road generated by the development. From Section 4.2.1 these are estimated to represent 17 vph entry movements (16 cars + 1 truck), split 15 vph left turns from the southeast and 2 vph right turns from the northwest. These volumes have been used to derive the Q_L and Q_R values in Table 4.

Using Figure 3.26 from the AGTM6 (reproduced in Figure 12), the major road traffic parameters Q_M can be established as set out in Table 4 that reflect conditions during the AM peak period.

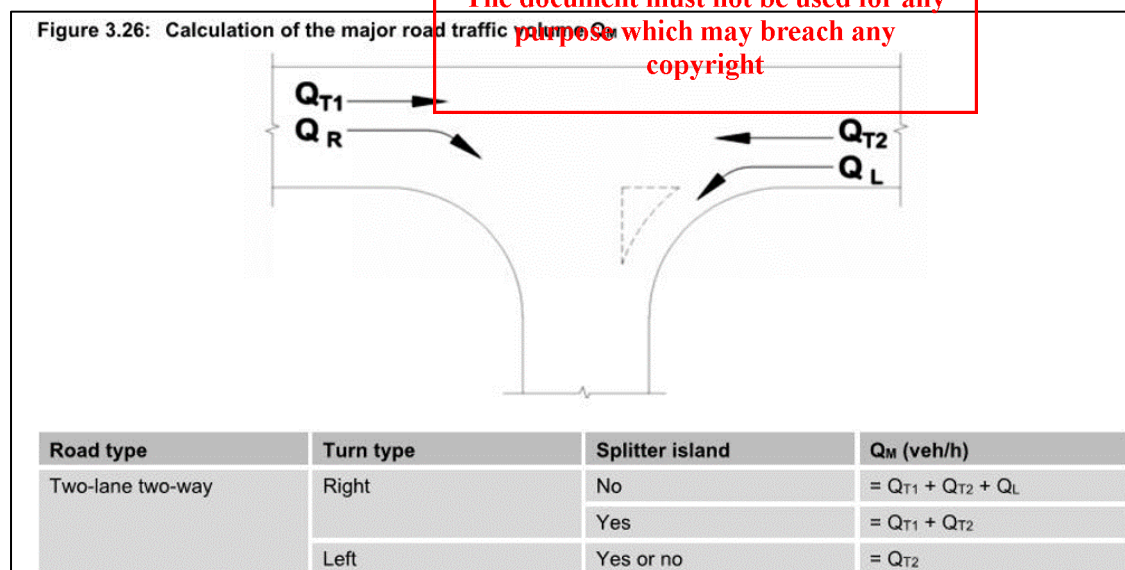


Figure 12: Major Road Traffic parameters (AGTM6, Fig 3.26)

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Table 4: Peak hour turn parameters for use in Figure 11

Major	Minor	Turns		Through	Q _M Left	Q _M Right	Treatment
Road	Road	Left Q _L	Right Q _R	Q _{T1}	Q _{T2}	Q _M =Q _{T2}	Q _M =Q _{T1} +Q _{T2} +Q _L
Sunraysia Highway	Forest Road	15	2	95	95	95	215
							BAL

Applying the values from Table 4 to the graph in Figure 13, it is concluded that the development will require the provision of a basic turn treatment to safely cater for construction traffic turn movements into Forest Road. Note that only turn movements into Forest Road during the AM peak have been assessed as all turns during the PM peak involve departure movements from the site that do not impact on the traffic flow in Sunraysia Highway.

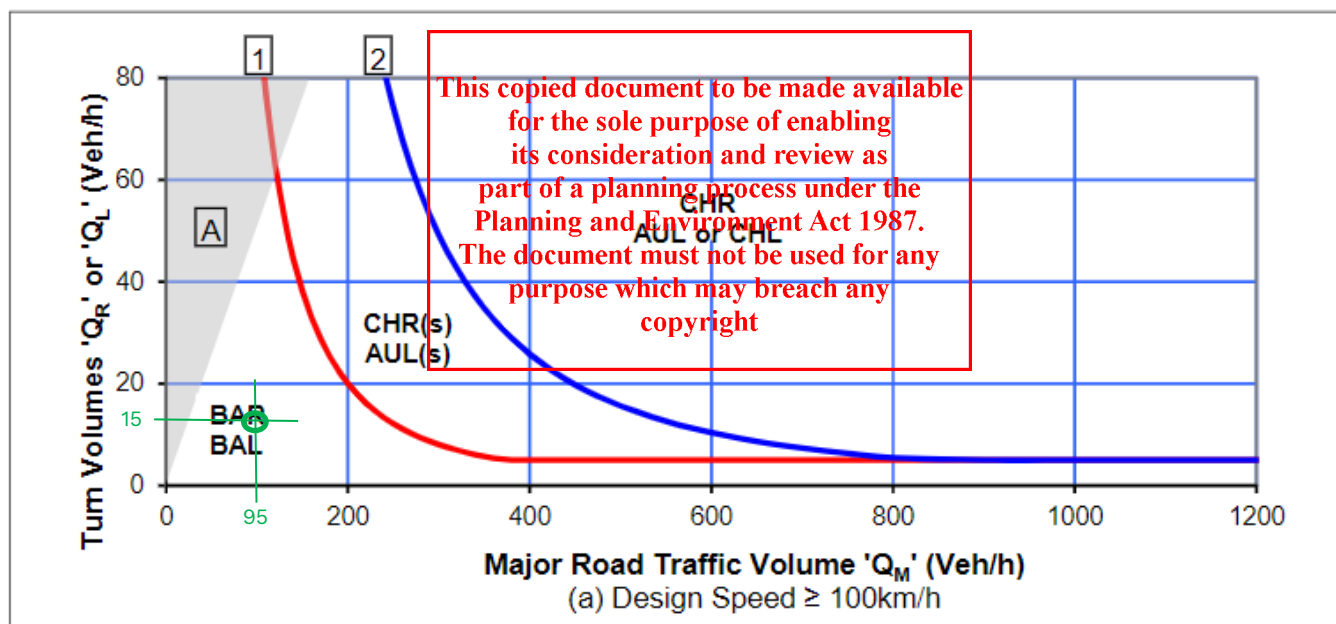


Figure 13: Warrants for turn treatments at intersections with design speed >100km/h (Figure 3.25(a) in AGTM6)

Based on the data gathered and reported in this section, our key observations are that the:

- right turns from Sunraysia Highway into Forest Road during the construction period are likely to involve two cars approaching from the northwest during the morning peak hour. This is deemed to require no treatment.
- left turn movements from the Sunraysia Highway into Forest Road during the morning peak period are likely to meet the warrants for a basic, Type BAL, left turn treatment.

Recommendation 2: that access to the development from the Sunraysia Highway at the intersection with Forest Road be provided with a basic Type BAL left turn treatment and no additional treatment for right turns.

6.2.1 Left-turning lane on Sunraysia Highway

As indicated above, the Sunraysia Highway meets the warrants for a rural Type BAL left turn treatment at the southeast approach to Forest Road. Table 5 summarises the minimum dimensions for such a turn lane treatment, as established from the notes that accompany Figure 8.2 of AGRD4A. Refer to Appendix 3 – Turn treatments that includes an image of the turn lane treatment to which the following dimensions relate.

Table 5: Minimum dimensions of the Type BAL treatment for a design speed of 110 km/h.

Feature	Code on	Requirement
Design speed	V	110m km/h (speed limit + 10 km/h)
Through lane width	W	3.5 m (existing)
Total width	C	6.0 m minimum
Formation widening	F	2.5 m min but increase to 3.5 m for use by trucks
Diverge/deceleration length	A (from $A = 0.5VF/3.6$)	55 m
Length of parallel shoulder widening	P (from Table 8.1)	35 m
Total treatment length	A + P	90 m

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7 Conclusions and recommendations

We conclude there are no traffic engineering reasons that would prevent the development from proceeding, as outlined below:

- with no crash history, the access road network in the vicinity of the subject site is considered to operate safely and requires no urgent remedial treatment
- on-site car parking provision is satisfactory
- sight lines along Forest Road at the site access are satisfactory and require no further action
- sight lines are satisfactory at the intersection of Sunraysia Highway with Forest Road and require no further action.

However, this TIA has identified a number of recommendations that need to be addressed:

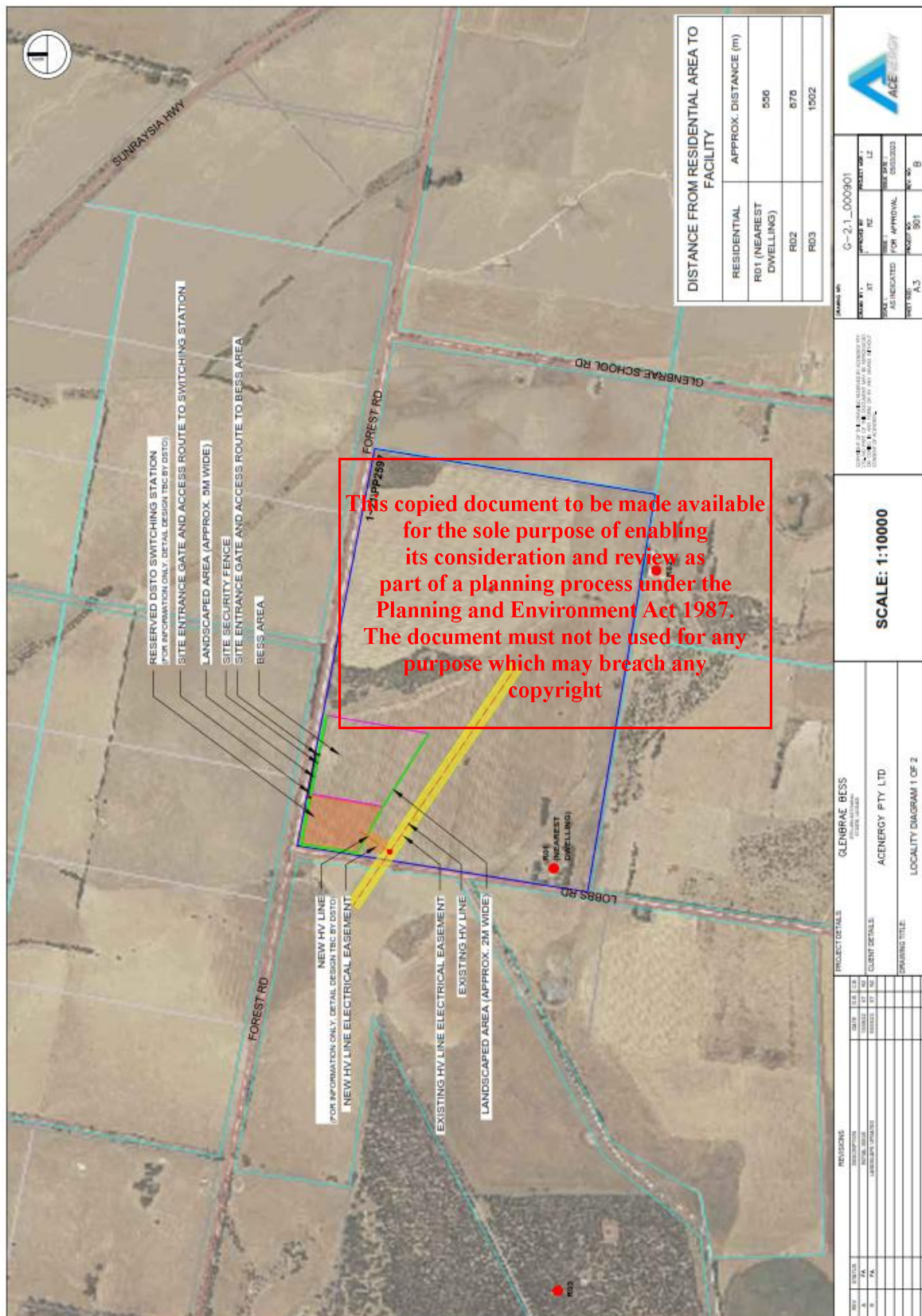
- **Recommendation 1:** that access to the development from Forest Road be constructed in accordance with SD265 from the IDM but catering for left-in and right-out movements only.
- **Recommendation 2:** that access to the development from the Sunraysia Highway at the intersection with Forest Road be provided with a basic Type BAL left turn treatment and no additional treatment for right turns.

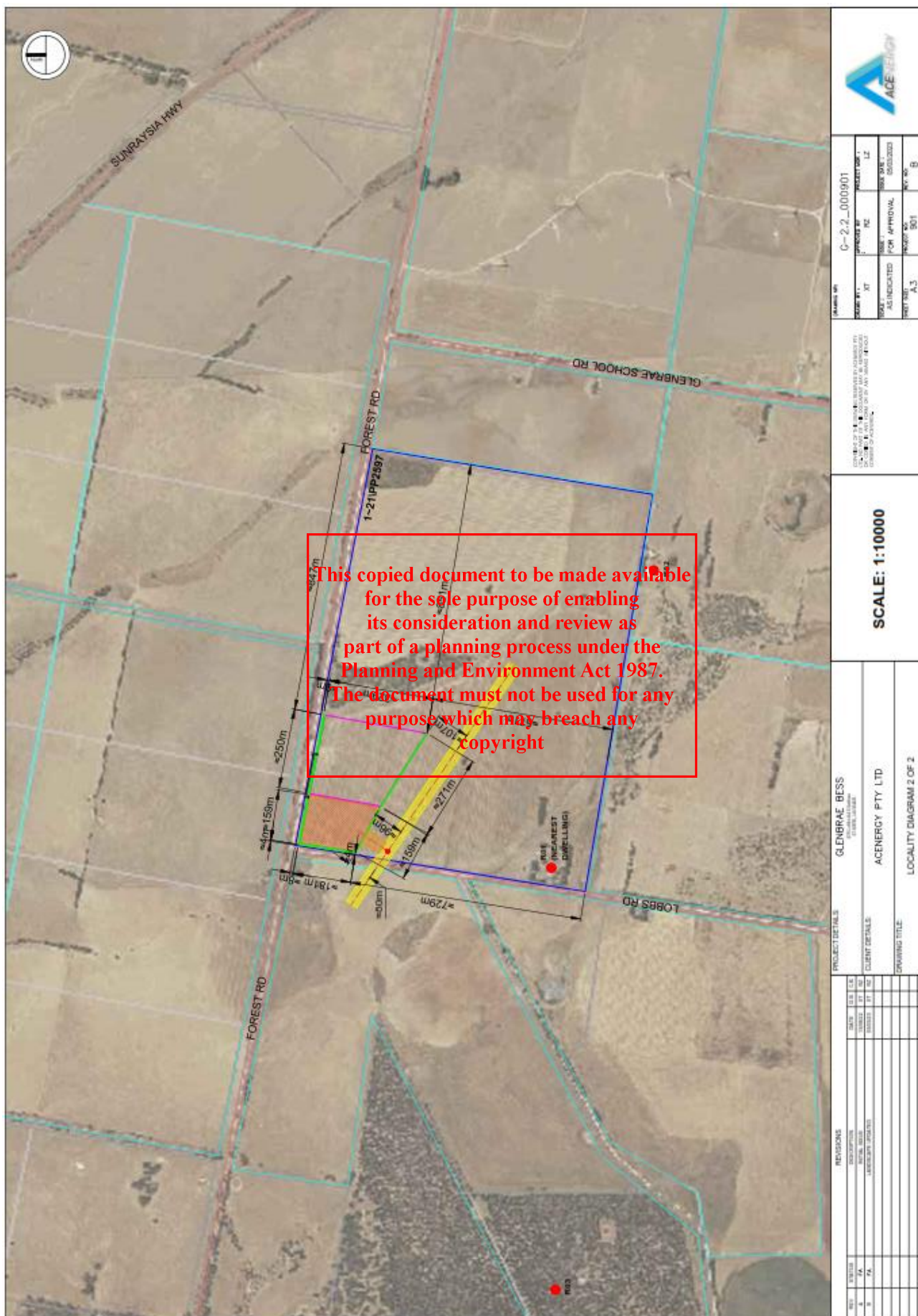
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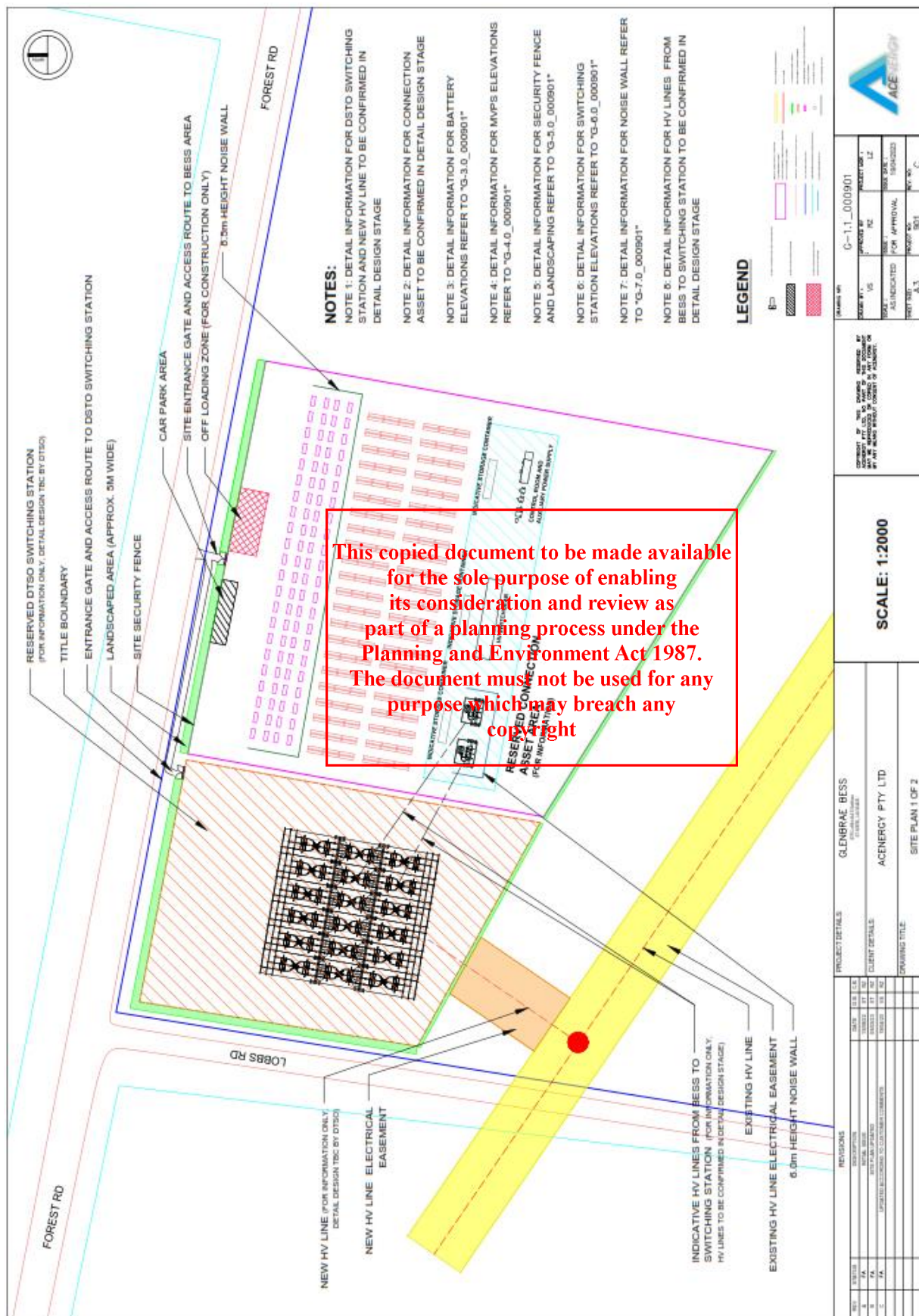
Appendix 1 – Development plans

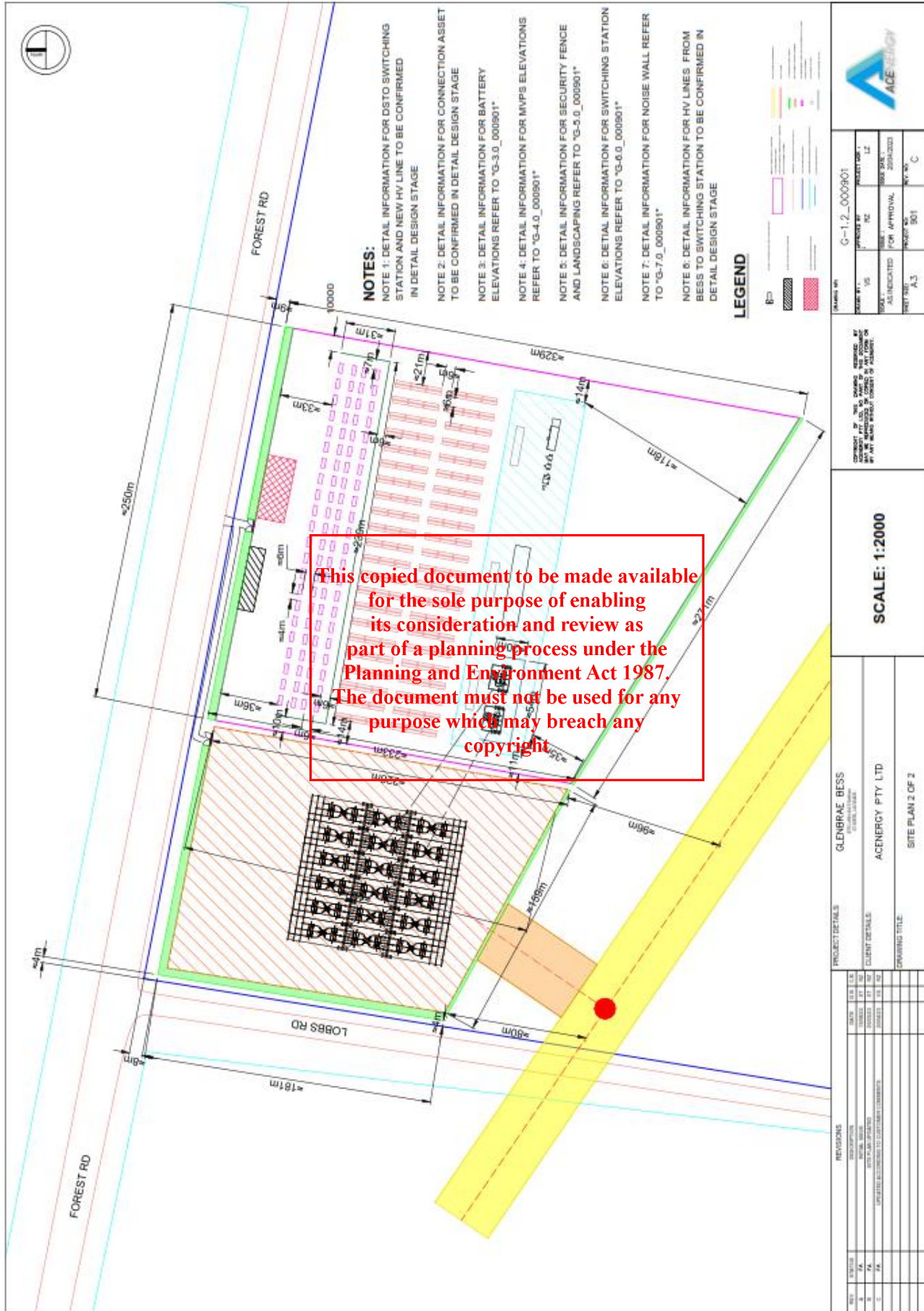
A1.1 – Locality Diagrams





A1.2 – Site plans





Appendix 2 – Traffic Generation Estimates

250MW/550MWH																				
Light vehicle	Construction period (weeks)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Site Mod & demob	20																		10	10
Drainage, Road and fencing works	20	20	20	10	10															
Cable installation						40	40	40	35	30	30									
Installation of concrete footings				20	20	20	20	20	10											
Installation of shipping containers (batteries)							10	20	20	30	30	30	20	20	10					
control room building installation										8	8	8	8							
Electrical installation									10	10	10	20	20	20	20	20				
Commissioning/demobilisation																	20	20	20	
Management/supervisory	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Total light vehicle (per week)	50.0	30.0	30.0	40.0	40.0	70.0	80.0	90.0	85.0	88.0	88.0	68.0	58.0	50.0	40.0	30.0	30.0	30.0	40.0	20.0
Total light vehicle (per day)	9.1	5.5	5.5	7.3	7.3	12.7	14.5	16.4	15.5	16.0	16.0	12.4	10.5	9.1	7.3	5.5	5.5	5.5	7.3	3.6
No. of people (per day)	27.3	16.4	16.4	21.8	21.8	38.2	43.6	49.1	46.4	48.0	48.0	37.1	31.6	27.3	21.8	16.4	16.4	16.4	21.8	10.9

Note: Vehicle generation assumes car sharing of 3 persons per vehicle

Heavy vehicle	Construction period (weeks)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Site Mod & demob	5																			5
Drainage, Road and fencing works	3	5	5	5	1	1	1	1	1	1	1									
Delivery of cable and accessories					5	5	5	5												
Delivery of Battery shipping containers							20	40	40	40	40	40	40	40	20					
Delivery of a control room building									1											
Delivery of transformer and HV switchgear										5	5	5	5							
Misc. Electrical Works												3	3	3	3	2	2	2	2	2
Total Heavy vehicle (per week)	8.0	5.0	5.0	5.0	6.0	6.0	26.0	46.0	42.0	46.0	46.0	48.0	48.0	43.0	23.0	2.0	2.0	2.0	2.0	7.0
Total heavy vehicle (per day)	1.5	0.9	0.9	0.9	1.1	1.1	4.7	8.4	7.6	8.4	8.4	8.7	8.7	7.8	4.2	0.4	0.4	0.4	0.4	1.3

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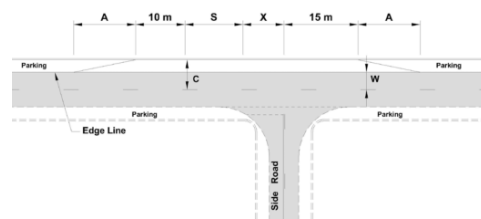
Appendix 3 – Turn treatments

A3.1 – Urban turn treatments

Table 1: Turn Treatment Descriptions (**Urban**) (Source: Section 7.7, 7.8 and 8.3 of Austroads Guide to Road Design Part 4A)

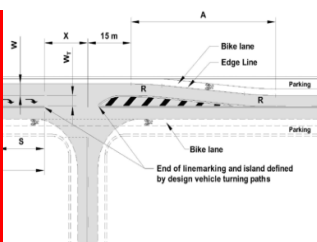
Turn treatment	Description
----------------	-------------

BAR **BA**sic **R**ight turn treatment on the major road, features a widened area (usually in place of parking) on the major road that allows through vehicles to pass to the left of turning vehicles (*Figure 7.6 of Austroads Guide to Road Design Part 4A*).

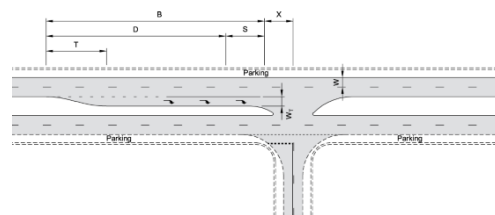


CHR(S) **CH**annelised **R**ight (Short) turn is a shorter version of the Channelised Right turn treatment which is reduced by removing space provided for storage in the right lane. This treatment type can only be used with line marking (*Figure 7.7 of Austroads Guide to Road Design Part 4A*).

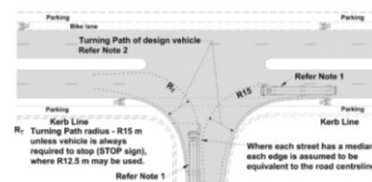
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CHR **CH**annelised **R**ight turn treatment has two vehicle travel paths (through and right turns) separated by physical or painted medians or islands (*Figure 7.8 of Austroads Guide to Road Design Part 4A*).



BAL **BA**sic **L**eft turn treatment on the major road has a radius large enough to accommodate a design vehicle turning left into the minor road without crossing the centre line of the minor road (*Figure A15 of Austroads Guide to Road Design Part 4*).

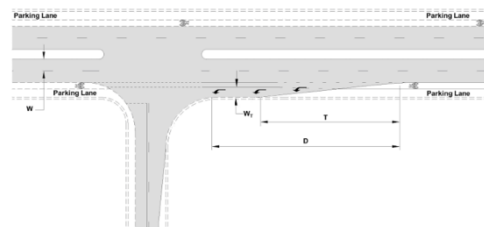


Turn treatment

Description

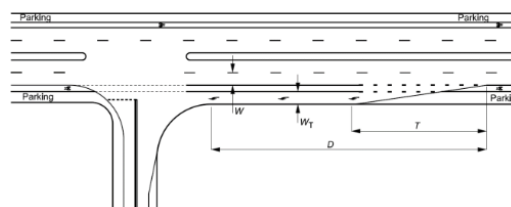
AUL(S)

AUxiliary **L**eft (**S**hort) turn treatment is a shorter version of the Auxiliary Left turn treatment which is reduced by allowing some deceleration to occur in the through lane on the major road. This turn treatment also allows through vehicles to pass to the right of turning vehicles (*Figure A17 of Austroads Guide to Road Design Part 4*).



AUL

AUxiliary **L**eft turn treatment is a left turn lane on the major road that allows through vehicles to pass to the right of turning vehicles (*Figure 8.6 of Austroads Guide to Road Design Part 4A*).



A3.2 – Rural turn treatments

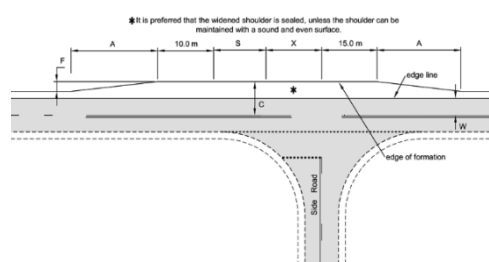
Table 2: Turn Lane Treatment Descriptions (**Rural**) (Source: Section 7.5 and 8.2 of Austroads Guide to Road Design Part 4A)

Turn treatment

Description

BAR

BAsic **R**ight turn treatment on the major road, features a widened area (usually in place of parking) on the major road that allows through vehicles to pass to the left of turning vehicles (*Figure A6 of Austroads Guide to Road Design Part 4*).



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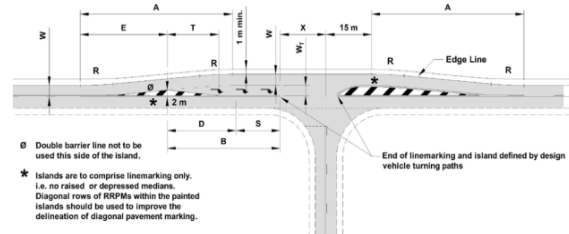
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Turn treatment

Description

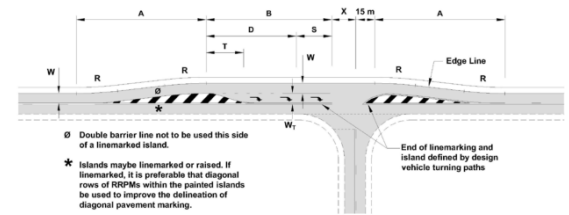
CHR(S)

CHannelised **R**ight (**S**hort) turn is a shorter version of the Channelised Right turn treatment which is reduced by removing space provided for storage in the right lane. This treatment type can only be used with line marking (Figure A7 of Austroads Guide to Road Design Part 4).



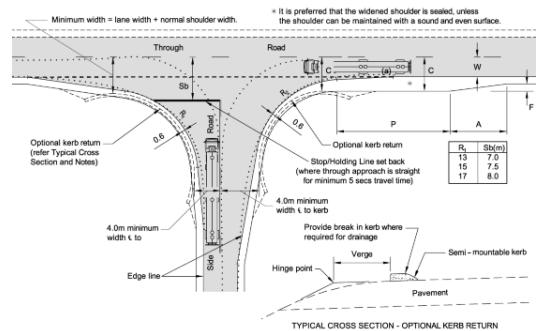
CHR

CHannelised **R**ight turn treatment has two vehicle travel paths (through and right turns) separated by physical or painted medians or islands (Figure A8 of Austroads Guide to Road Design Part 4).



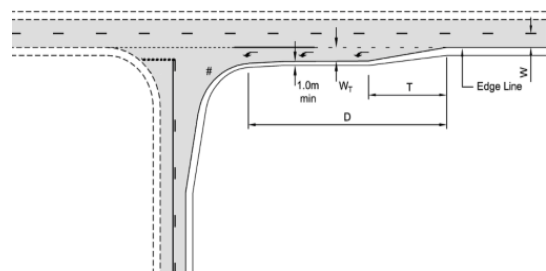
BAL

BAsic **L**eft turn treatment on the major road has a radius large enough to accommodate a design vehicle turning left into the minor road without crossing the centre line of the minor road (Figure 8.2 of Austroads Guide to Road Design Part 4A).



AUL(S)

AUxiliary **L**eft (**S**hort) turn treatment is a shorter version of the Auxiliary Left turn treatment which is reduced by allowing some deceleration to occur in the through lane on the major road. This turn treatment also allows through vehicles to pass to the right of turning vehicles (Figure 8.3 of Austroads Guide to Road Design Part 4A).



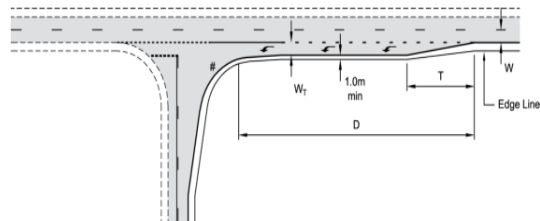
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**Turn
treatment**

Description

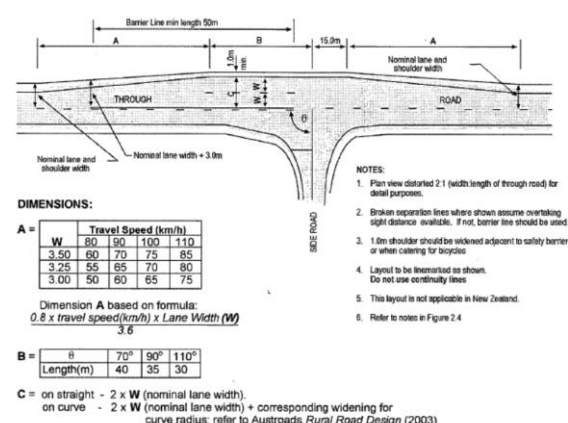
AUL

AUxiliary **L**eft turn treatment is a left turn lane on the major road that allows through vehicles to pass to the right of turning vehicles (*Figure 8.4 of Austroads Guide to Road Design Part 4A*).



AUR

In addition to the above, DoT will allow the use of the rural **Au**xiliary lane **R**ight turn treatment (from GTEP Part 5) in lieu of the CHR(s) treatment, (refer Sections 7.5.2 and 7.7.2 of VicRoads Supplement to AGRD4A)



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A3.3 – IDM rural access requirements

Standard Drawing SD 265, which accompanies the Infrastructure Design Manual (IDM) used by most regional councils in Victoria, should be applied to local road accesses for developments that represent significant traffic generators, particularly those that attract semi-trailer and B-Double use. This layout is shown in Figure 17 below.

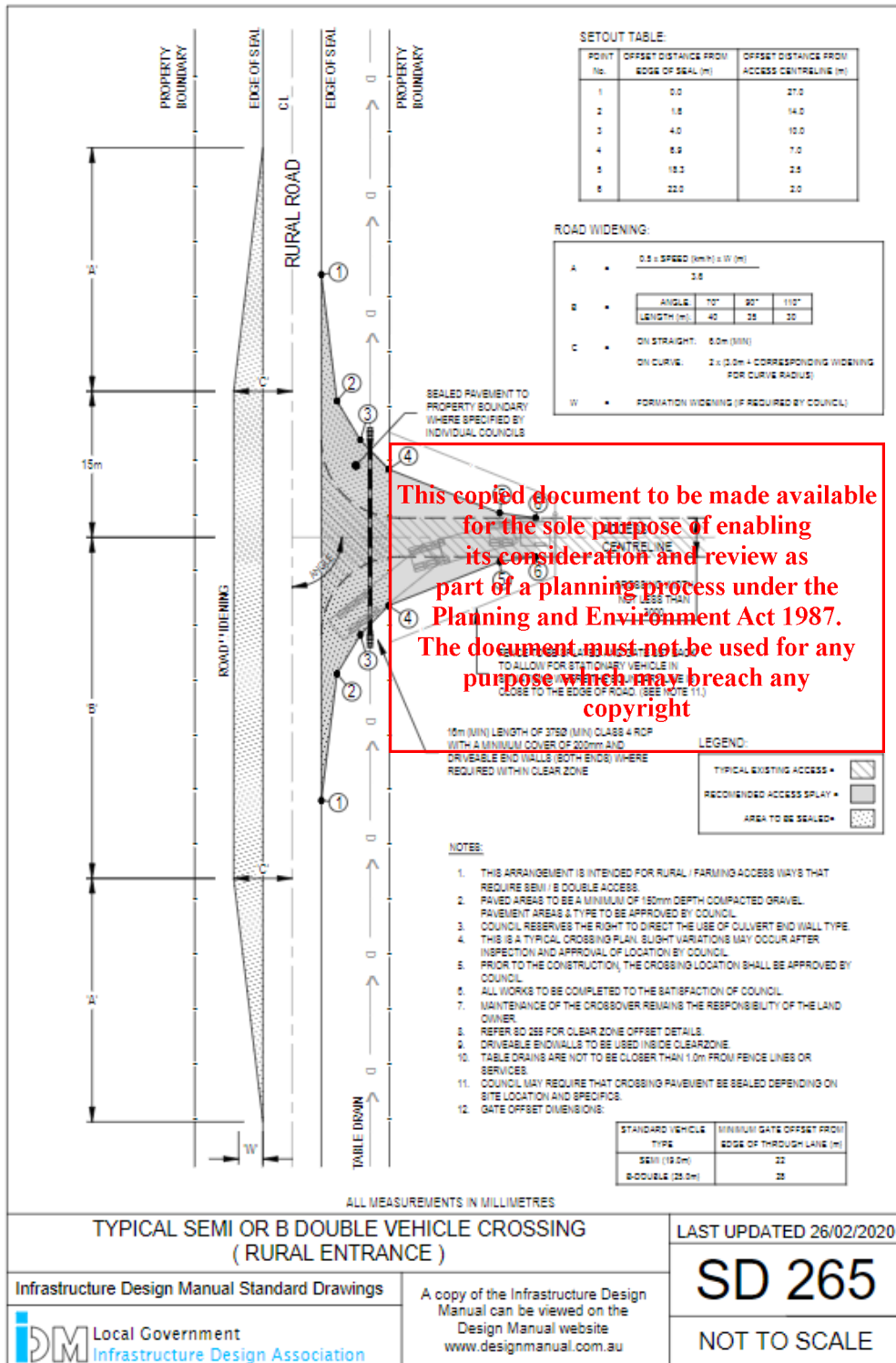


Figure 2: SD 265 from the IDM

Appendix 4 – Acronyms and terms

Acronyms / terms	Definition
AGRD4	Austrroads Guide to Road Design Part 4 – Intersections and crossings
AGRD4A	Austrroads Guide to Road Design Part 4A – Unsignalised and signalised intersections
AGTM6	Austrroads Guide to Traffic Management Part 6 – Intersections, interchanges and crossings management
AGTM8	Austrroads Guide to Traffic Management Part 8 – Local street management
AS/NZS2890.1	Australian Standard / New Zealand Standard 2890.1 Parking facilities Part 1: Off-street car parking
DTP	Department of Transport and Planning (formerly VicRoads)
ESD	Entering site distance
PSP	Precinct structure plan
SIDRA	SIDRA intersection – micro analytical traffic engineering software to model the performance of intersections
SISD	safe intersection sight distance
TIA	traffic impact assessment
vpd	vehicles per day
vph	vehicles per hour
VPA	Victorian Planning Authority

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