PSA CONSULTING

Traffic Impact Assessment Report

Pace Farm – Warrah Ridge Farm 3

16 March 2023

pace farm
the enjoyable egg

Document Control

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Revision History

VERSION	DATE	DETAILS	AUTHOR	AUTHORISATION
V1	16 March 2023	DRAFT	Hamish Flett	Hannah Richardson RPEQ: 17016

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LIST OF ACRONYMS

BAL	Basic Left Turn
BAR	Basic Right Turn
DCP	Development Control Plan
DPI	Department of Primary Industries
HML	Higher Mass Limit
NSW	New South Wales
PSA	PSA Consulting
RAV	Restricted Access Vehicle
RTA	Roads and Traffic Authority
SISD	Safe Intersection Sight Distance
TIA	Traffic Impact Assessment

1 INTRODUCTION

PSA Consulting (PSA) has been engaged by Pace Farm Pty Ltd to undertake a Traffic Impact Assessment (TIA) to accompany a development application for the proposed poultry layer farm development on Lot 52 DP1168698, Lot 170 & 171 DP751033 and Lot 1 DP576340, Warrah Ridge, NSW. The development involves construction of eight (8) layer sheds each with a capacity of 31,000 birds, equating to a total capacity of 248,000 across the property. These eight sheds will be separated into two separate lots of four, each accompanied by a packing shed (two on site total). The site will also allow for a farm manager residence. The proposed site will be accessed via Warrah Ridge Road, the location of which is shown below in Figure1.

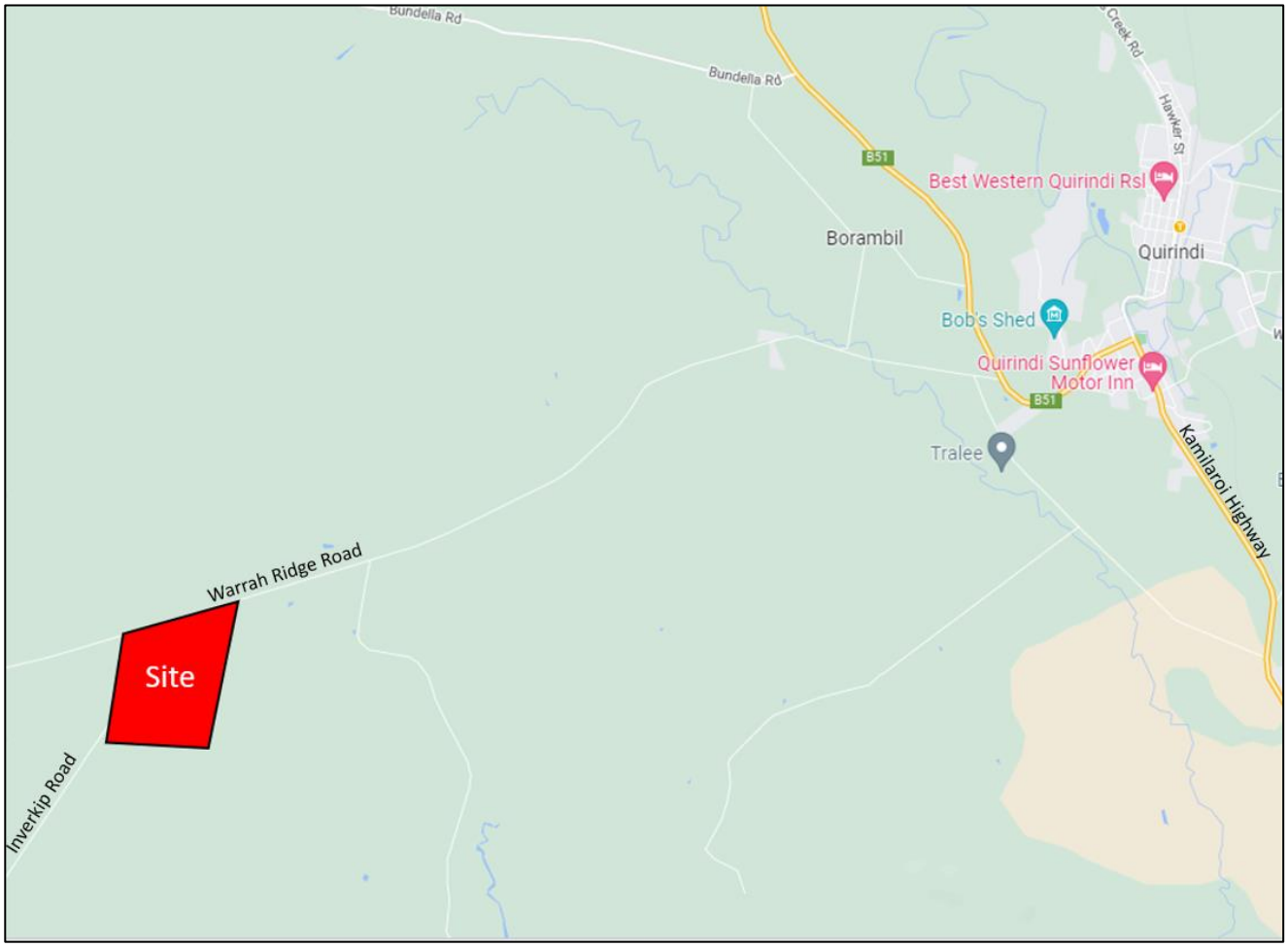

Figure 1: Site Locality Plan

A TIA for Farm 1 and Farm 2 at Warrah Ridge was completed by PSA in October 2021 and January 2022. Farm 1 is located approximately 5km south of the development site, accessed via Inverkip Road. Farm 2 is located directly below the current development site.

2 EXISTING CONDITIONS

2.1 ROAD NETWORK

The proposed development is located at south-east corner of Warrah Ridge Rd and Inverkip Rd, approximately 13Km south-west of the town of Quirindi, and approximately 12km west of the Kamilaroi Highway. Warrah Ridge Road is a two-lane, two-way road. The road surface is sealed from the intersection of Inverkip Rd towards the east and unsealed towards the west. The road has an approximate width of 7.5m. Warrah Ridge Road is classified as a Local Road under Transport for NSW Road Network Classifications, as shown in Figure 2. The speed limit for Warrah Ridge Road is 100km/h. Access to and from the site for heavy vehicles will be via Warrah Ridge Road.

Figure 2: Road Classification (Source: Transport for NSW)

Access to the farm will be gained through an internal driveway which will connect to Warrah Ridge Road, which is classified as a local road which intersects with Inverkip Road to the south-west, which is a two-lane unsealed Local Road. Warrah Ridge Road continues west connecting to Cattle Lane which is a single lane unsealed Local Road and to the east of the site continues to the Kamilaroi Highway which is a State controlled road. Inverkip Road, Warrah Ridge Road and Cattle Lane all fall under the "Approved Area with Traffic Conditions" as per the Transport for NSW Combined Higher Mass Limits (HML) and Restricted Access Vehicle (RAV) Map, (Highlighted in Figure 3), which for B-Doubles require the following operating guidelines:

- It is the responsibility of the driver of the B-Double transport to satisfy themselves that the proposed route is suitable for use under the conditions existing at the time and undertake a risk assessment of the route prior to traveling route to assess the sustainability of travel along the route.
- Temporary route restrictions may be imposed when routes become impassable for heavy vehicles.
- Following rainfall, the driver of a B-Double transport must check with the Liverpool Plains Shire Council, or the RTA Area Office, regarding possible road closures.
- Extreme care must be taken on the route especially during west weather or during school hours.

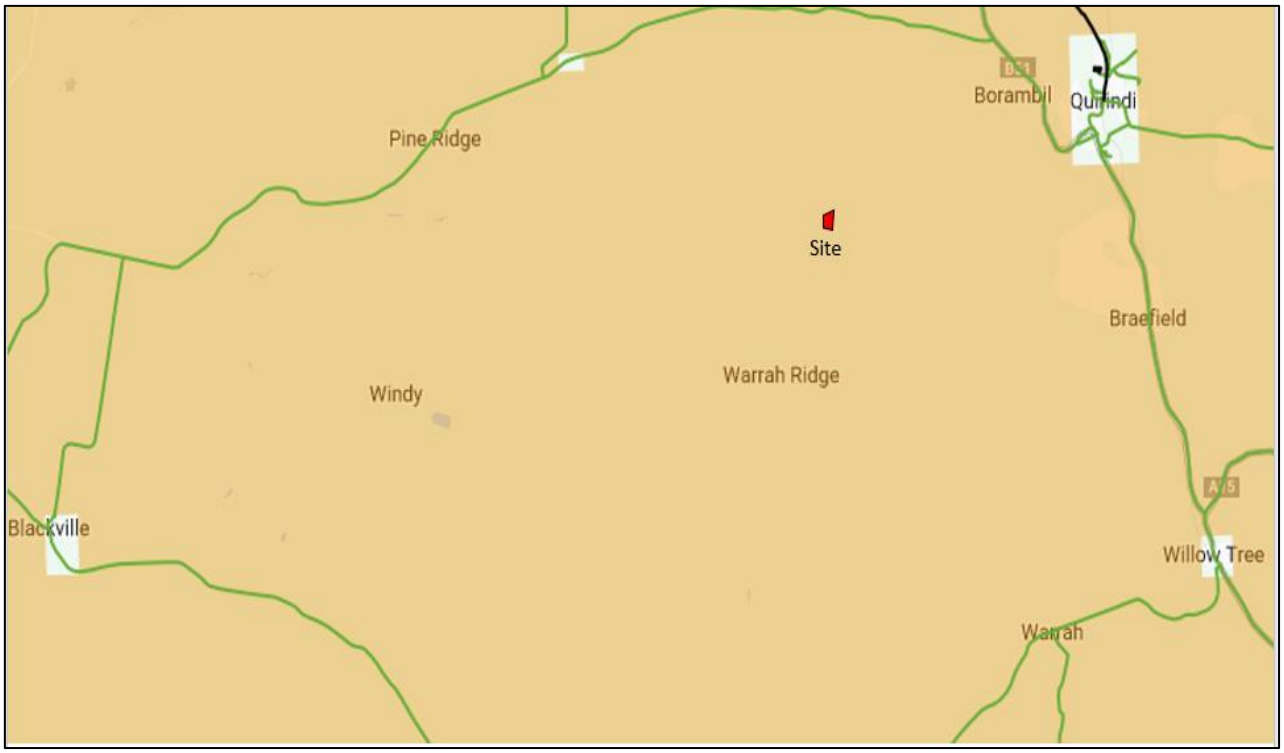

Figure 3: NSW Combined Higher Mass Limits (HML) and Restricted Access Vehicle (RAV) Map (Source: Transport for NSW)

2.2 EXISTING SITE

The proposed development site is located across Lot 52/DP1168698, Lot 171/DP751033, Lot 170/DP751033 with site entry coming from Warrah Ridge Road. The land space is currently vacant rural property.

3 DEVELOPMENT PROFILE

The proposed development involved the construction of a single farm consisting of a total of eight (8) Free Range Layer Sheds and two (2) Packing Sheds. These are encompassed by surrounding free range areas. The farm managers residence is located at the entrance to the site. A site layout plan is shown in Figure 4.

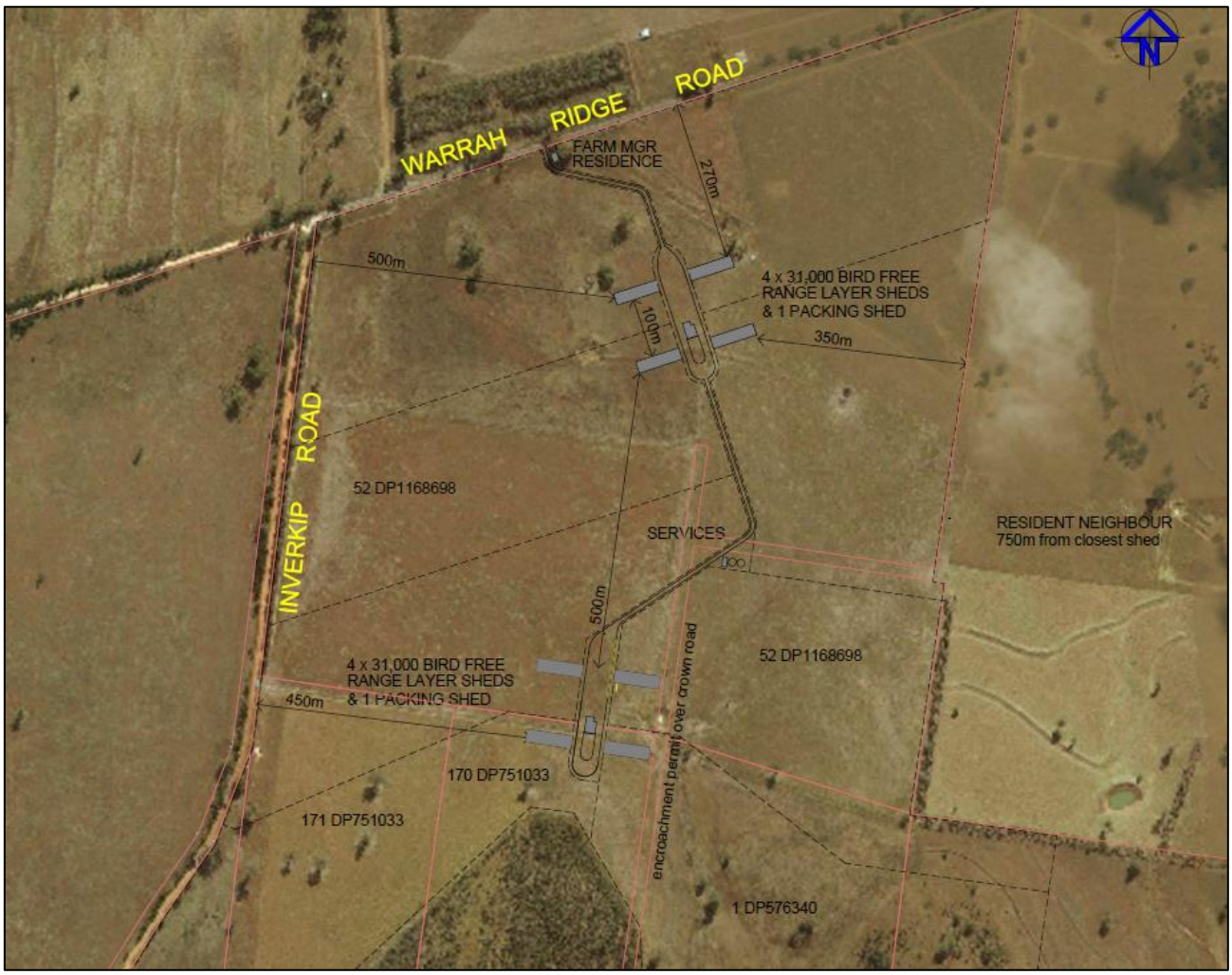

Figure 4: Proposed Site Layout Plan (Source: Pace Farm)

As shown in Figure 4, site access will be undertaken from Warrah Ridge Road and enter through the Northern boundary of lot 52. It is assumed that all light and heavy development traffic will access the site from this location. Operation is expected to commence in the year 2026.

4 IMPACT ASSESSMENT

4.1 ASSESSMENT PARAMETERS

It is a standard requirement when analysing traffic impacts to adopt a 10-year design horizon from the year of opening/full operation of the proposed development. Intrinsically, the following development parameters have been adopted for the purpose of this assessment:

- Existing traffic count 2021
- Year of full operation 2026
- 10-year design horizon 2036

4.2 EXISTING AND FUTURE YEAR BACKGROUND TRAFFIC VOLUMES

Owing to the remote nature of the development and limited number of entry/exit points along Warrah Ridge Road, current traffic counts were not obtained for the site. While traffic has been observed to be incredibly light, as a highly conservative estimate it will be assumed that the bidirectional light vehicle traffic on Warrah Ridge Road will be 50 vehicles (assuming an additional 10% will be heavy vehicles) in the AM and PM peak traffic flow periods. Additionally, the development traffic from Farm 2 will be assumed to form part of the background traffic. It is expected that the AM and PM peak traffic flow hours will align with staff arrival and departure in the morning and afternoon (8:00AM-9:00AM) and 4:00PM-5:00PM respectively). Hence the impacts of the development generated traffic on the road network will be assessed for AM and PM peak hours.

Assumed background traffic volumes during these peak times are shown below in Figure 5,

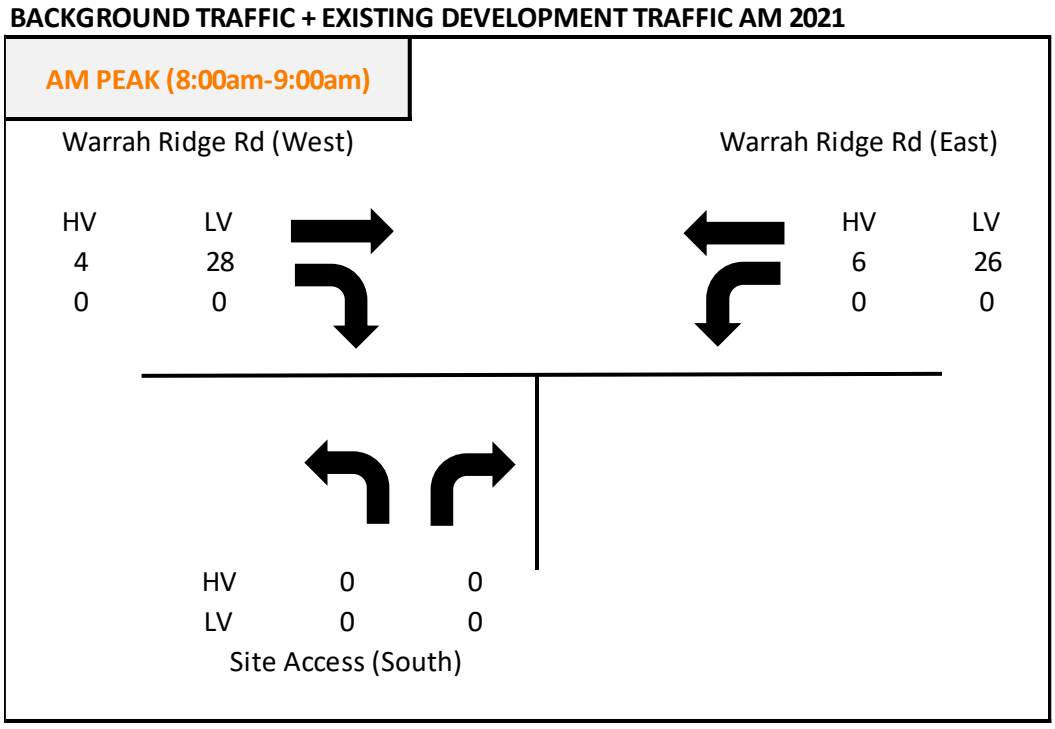

Figure 5: Background 2021 AM Peak Hour Traffic Volumes (Source: PSA Consulting)

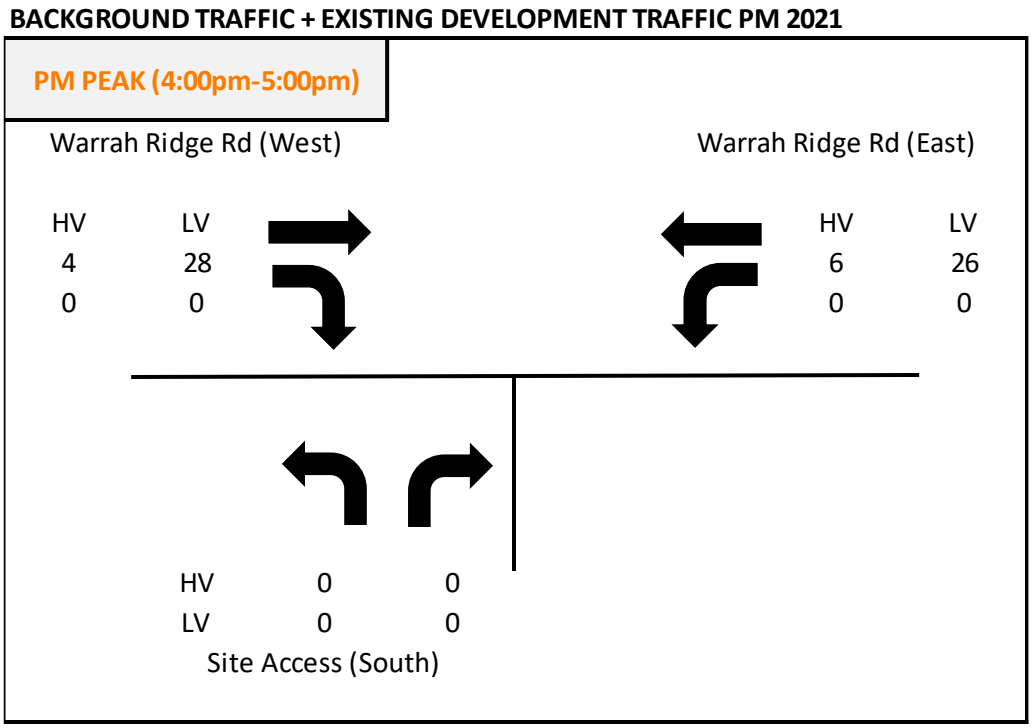

Figure 6: Assumed Background 2021 PM Peak Hour Traffic Volumes (Source: PSA Consulting)

4.3 DEVELOPMENT TRAFFIC GENERATION AND DISTRIBUTION

Traffic generated by the development is based on similar sized farms PSA has analysed in past. Average traffic generated by the development is shown below in Table 1.

Table 1: Total Traffic Generation (Source: PSA Consulting)

VEHICLE TYPE	AVERAGE DAILY TRIPS*
Light Vehicles (Staff)	24
Heavy Vehicles	4

*For the purpose of this assessment, a vehicle is defined as a vehicle entering or exiting the development.

Heavy Vehicle movements at the site are expected to be compromised of the following

- Delivery of hens at the beginning of the laying cycle;
- Delivery of clean bedding material at the beginning of the cycle;
- Regular deliveries of feed;
- Daily dispatch of fresh eggs;
- Removal of material from manure conveyers; and
- Collection of eggs at the end of laying cycle.

An estimate of the daily traffic movements entering and exiting the development is shown below in Table 2

Table 2: Daily Traffic Generation (Source: PSA Consulting)

VEHICLE TYPE	VEHICLES ENTERING DEVELOPMENT	VEHICLES EXITING DEVELOPMENT	TOTAL VEHICLE TRIPS
Light Vehicles	12	12	24
Heavy Vehicles	2	2	4
TOTAL	14	14	28

A conservative estimate of the traffic entering and exiting the development during the identified peak hours is shown below in Table 3. Again, to be conservative it has been assumed that all Light Vehicles and Heavy Vehicles will enter and exit the development site during the AM and PM Peak hours respectively, where in reality these trips will be spread across the day.

Table 3: AM and PM Peak Hour Traffic Generation (Source: PSA Consulting)

VEHICLE TYPE	AM PEAK		PM PEAK	
	VEHICLES ENTERING DEVELOPMENT	VEHICLES EXITING DEVELOPMENT	VEHICLES ENTERING DEVELOPMENT	VEHICLES EXITING DEVELOPMENT
Light Vehicles	12	0	0	12
Heavy Vehicles	2	0	0	2
TOTAL	14	0	0	14

The above estimates assume the following, which are considered to be conservative given the remote location:

- It is assumed that all light vehicles and heavy vehicles will enter the development site during the AM Peak and will leave during the PM peak.
- Based on the information provided and road network structure, it has been assumed that 100% of heavy Vehicles will enter/exit the site from the east.
- For Light vehicles, 100% will access the site to/from the east.
- A background traffic growth rate of 3% per year has been applied to the forecasted background traffic.

The distribution of development traffic has been displayed in Figure 7.

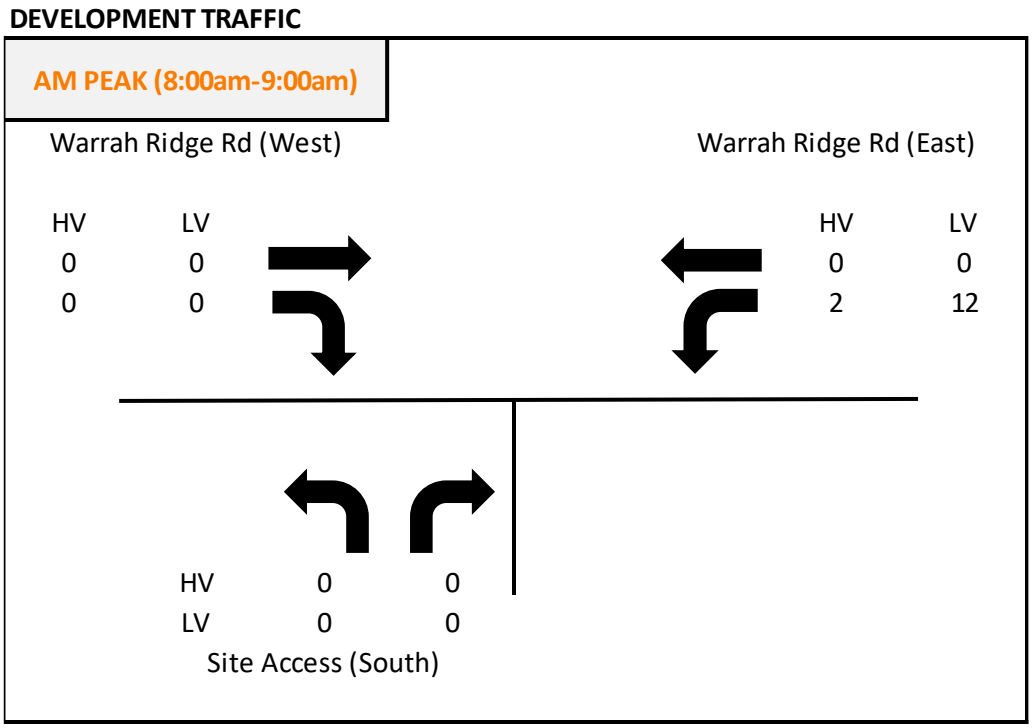

Figure 7: Site Development Peak Hour Traffic (Source: PSA Consulting)

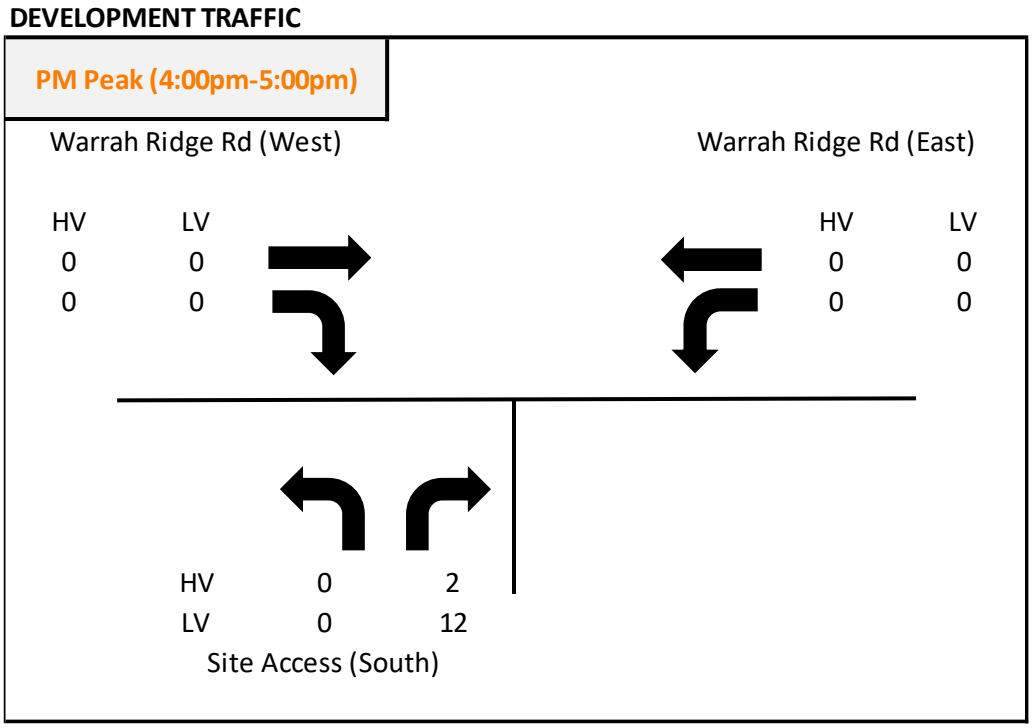

Figure 8: Site Development Peak Hour Traffic (Source: PSA Consulting)

Construction traffic is not anticipated to exceed the volume that will be expected during full operation of the site. Hence, it is not necessary to conduct an investigation into the impacts of construction specific traffic.

4.4 TRAFFIC IMPACT ASSESSMENT

Using the assumptions above, and a conservative background traffic growth rate of 3%, future year background traffic volumes have been calculated and combined with the development generated traffic volumes to obtain the design traffic volumes for this assessment. The scenarios analysed for this assessment are the year of opening and the 10-year design horizon.

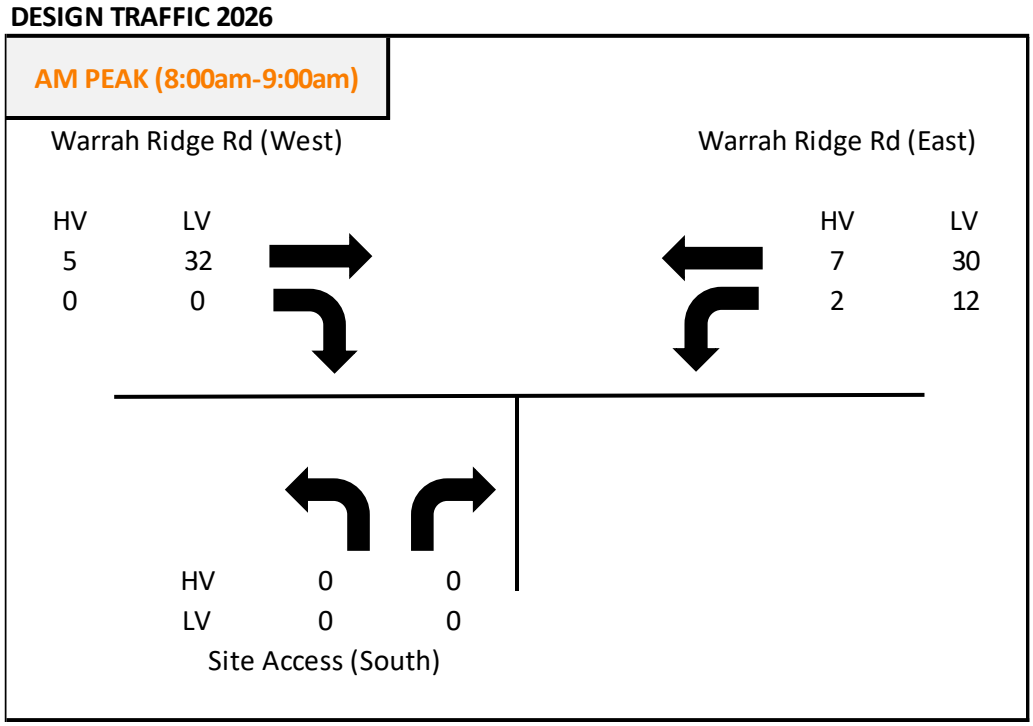

Figure 9: 2026 Year of Opening Design Traffic AM (Source: PSA Consulting)

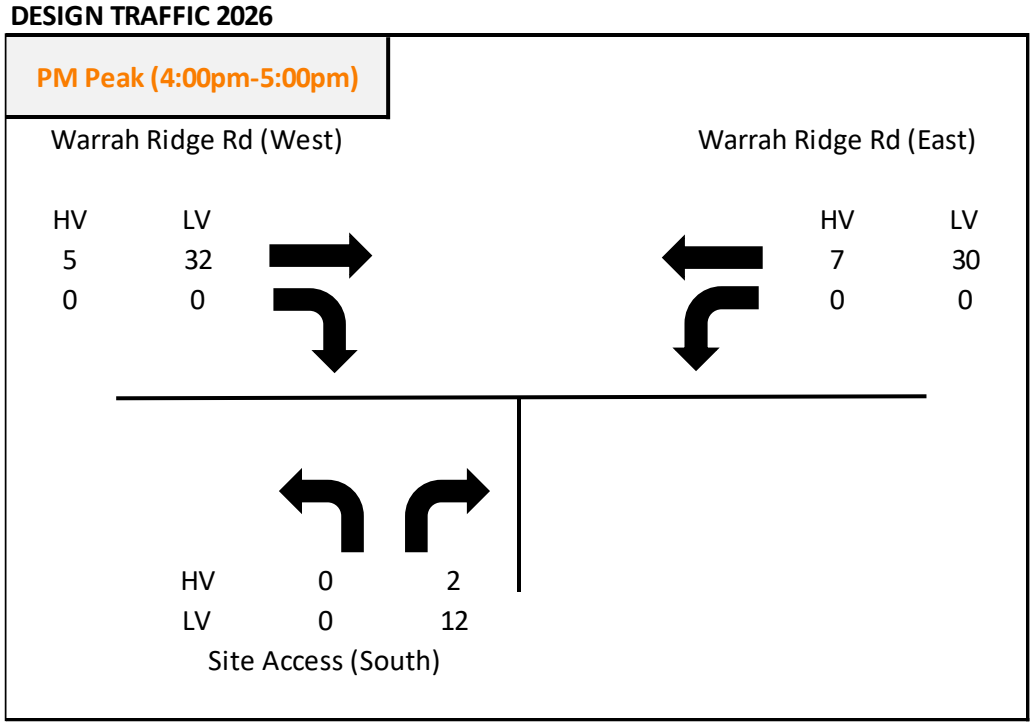

Figure 10: 2026 Year of Opening Design Traffic PM (Source: PSA Consulting)

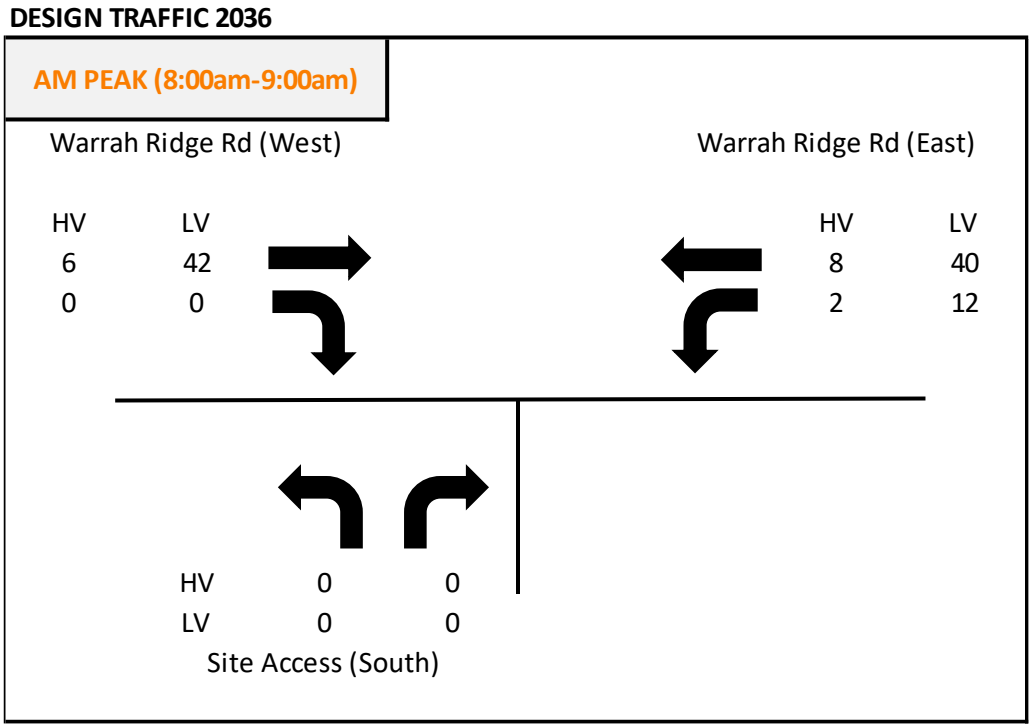

Figure 11: 2036 10-Year Design Horizon Traffic AM (Source: PSA Consulting)

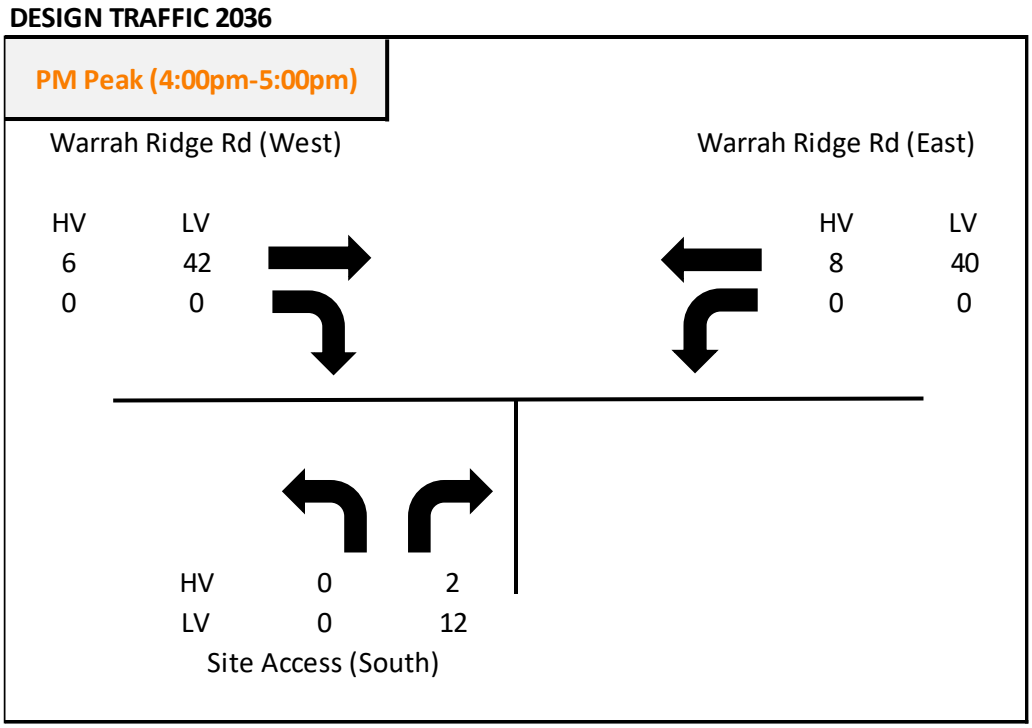

Figure 12: 2036 10-Year Design Horizon Traffic PM (Source: PSA Consulting)

Austroads Guide to Traffic Management Part 3: Traffic Study and Analysis Methods (2009) lists the intersection capacity – uninterrupted flow conditions for a range of traffic volumes for unsignalized intersections. This table is shown on Figure 13

Major Road Types[1]	Major Road Flow (vph)[2]	Minor Road Flow (vph)[3]
Two-Lane	400	250
	500	200
	650	100
Four-Lane	1000	100
	1500	50
	2000	25

Notes
1. Major road is through road i.e. has priority
2. Major road design volumes include through and turning movements
3. Minor road design volumes include through and turning volumes

Figure 13: Intersection Capacity - Uninterrupted Flow Conditions (Source: Austroads)

As the year of opening and 10-year design horizon traffic volumes are less than those in the table, it is deemed unnecessary to carry out an intersection analysis.

4.4.1 Assessment of Turn Warrants

A turn warrants assessment has been carried out for the Warrah Ridge Road and Site Access T-Intersection. Both the year of opening (2026) and 10-year design horizon (2036) traffic volumes have been analysed. The turn warrants have been assessed using Figure 4A-10b – Warrants for turn treatments on the major road at unsignalized intersection from Austroads Guide to Road Design Part 4: Intersections and Crossings. This figure has been reproduced in Figure 14, Figure 15 (2026) and Figure 16, Figure 17 (2036).

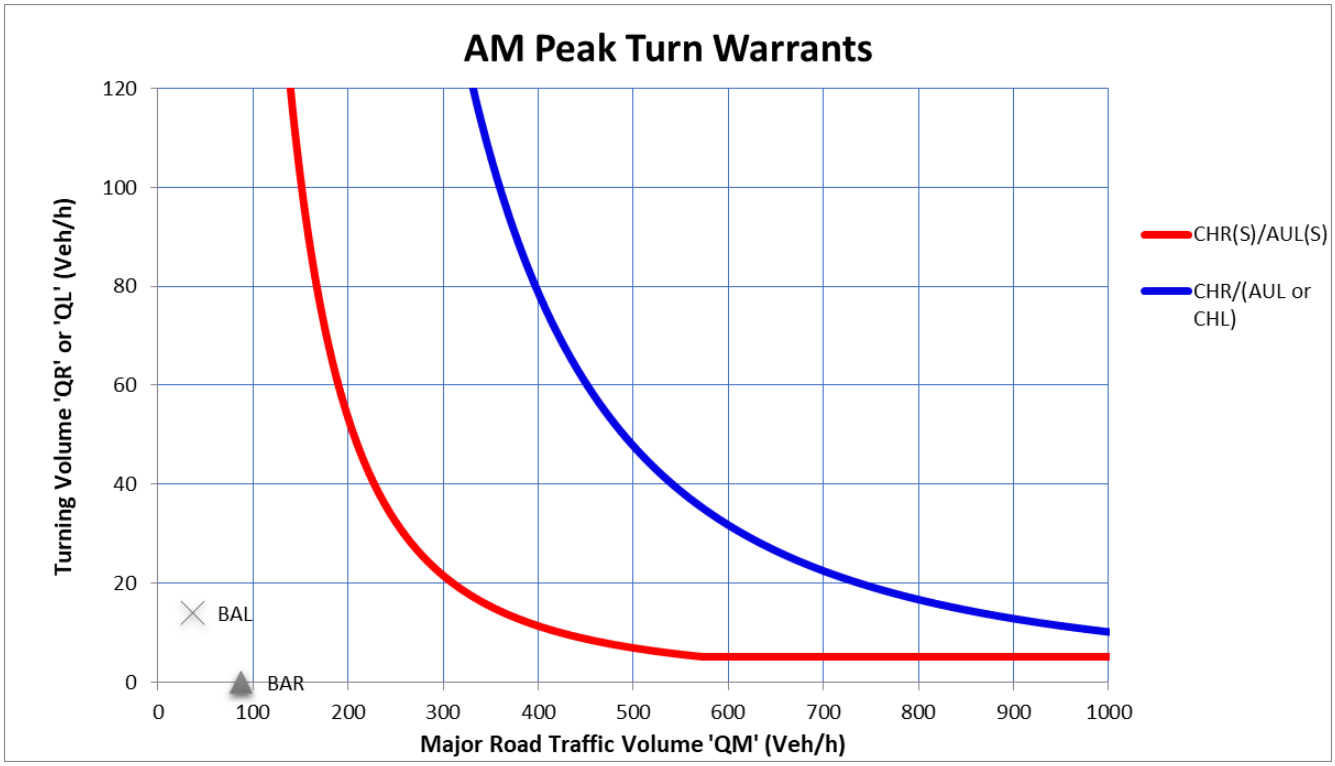

Figure 14: Turn Warrants Assessment 2026 Year of Opening AM (Source: Austroads & PSA Consulting)

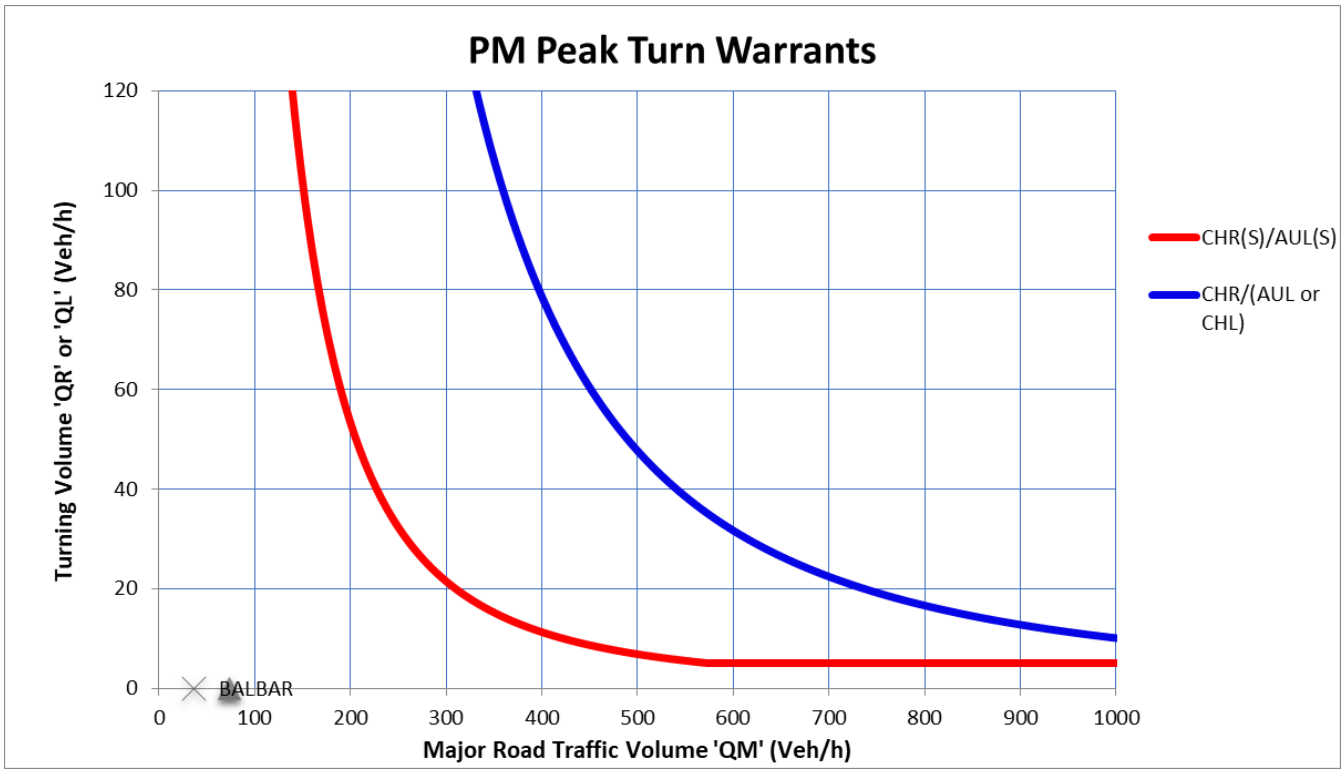

Figure 15: Turn Warrants Assessment 2026 Year of Opening PM (Source: Austroads & PSA Consulting)

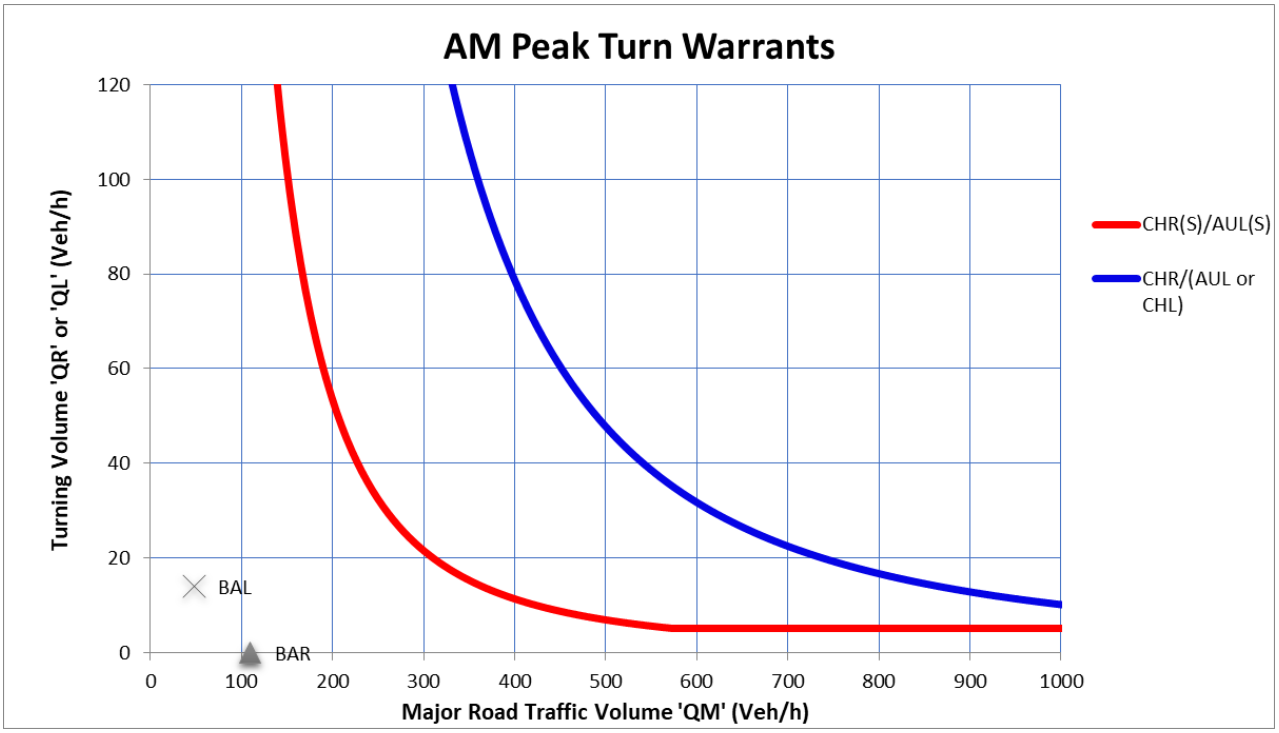

Figure 16: Turn Warrants Assessment 2036 Design Horizon AM (Source: Austroads & PSA Consulting)

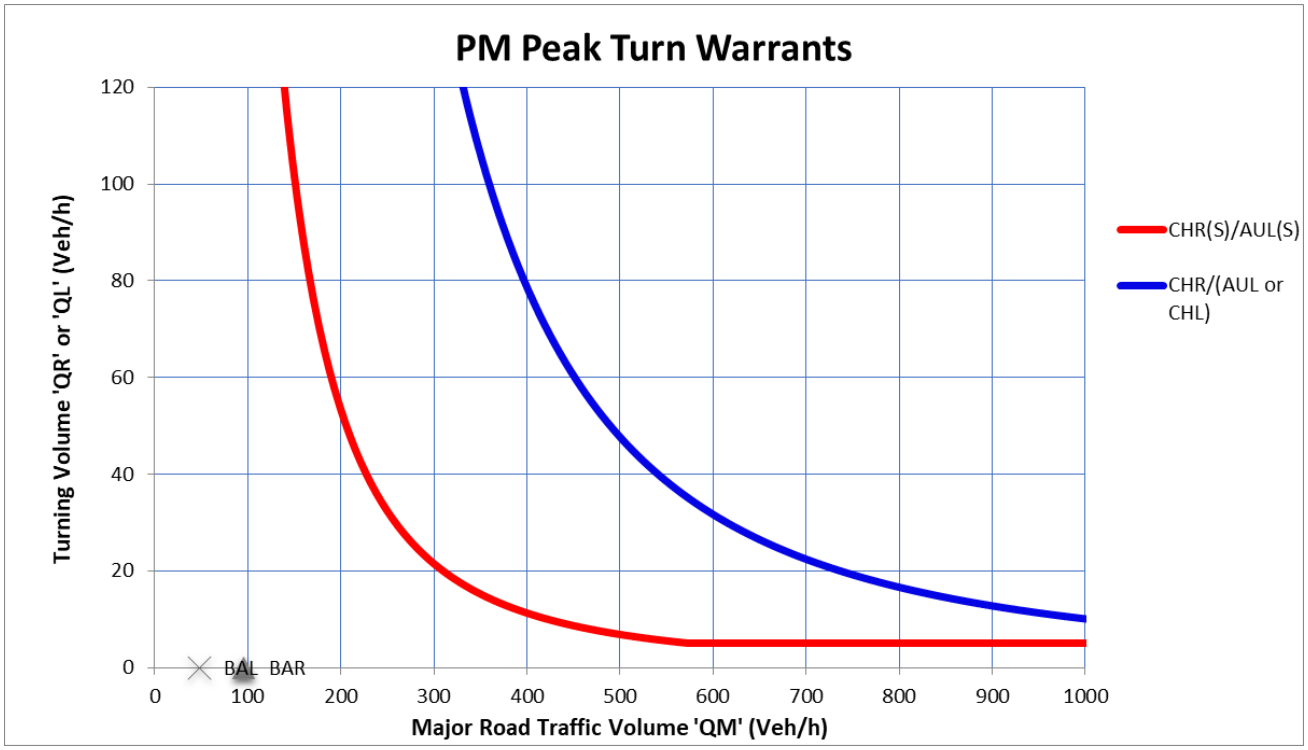

Figure 17: Turn Warrants Assessment 2036 Design Horizon PM (Source: Austroads and PSA Consulting)

As shown in the above figures, the turning volumes for both AM and PM Peak Traffic Flow for the year of opening and the 10-year design horizon warrant the construction of both a Basic Right (BAR) and Basic Left (BAL) at the intersection of Warrah Ridge Road and the development site access.

The features of a Basic Right and Basic Left turn treatments, as per Chapter 4A (Unsignalised and Signalised Intersections) of Austroads Guide to Road Design are shown in Figure 18.

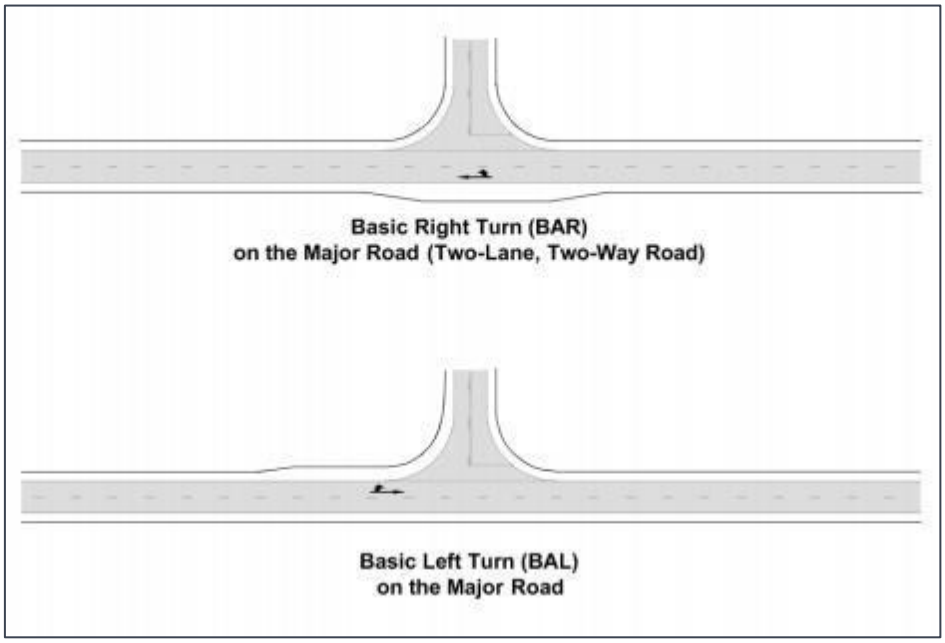

Figure 18: Rural Basic BA Turn Treatments (Source: Austroads)

5 ON-SITE PARKING REQUIREMENTS

The Liverpool Plains Shire Council Development Control Plan (DCP) does not require specific parking rates for intensive animal industries. For Intensive Agriculture, the DCP refers to the NSW Government Department of Primary Industries (PDI) Guidelines with regards to industry-specific farm management practices. The DPI *Best Practice Management for Meat Chicken Production in NSW* requires "adequate provision for the parking of vehicles anticipated to be using the farm. Hence it is expected that the proposed development will suitably provide parking for each staff member on site at any one time, while also providing an additional allowance for visitors and contractors. There is sufficient space on the site for parking and manoeuvring to be provided for all staff and visitors.

6 SITE ACCESS

The main considerations for safety as a result of the proposed development is the Warrah Ridge Road / Site access intersections, as all the light and heavy vehicles will access through the northern site access point through Lot 52. A desktop assessment has been carried out on its safety to ensure it is in a satisfactory condition to accommodate the proposed additional traffic volumes.

As per Austroads Guide to Road Design Chapter 4A, a safe intersection sight distance (SISD) for a 100km/h posted road is 285m. Figure 19 highlights the Warrah Ridge Road / Site Entrance intersection with accompanying sight distance triangles.

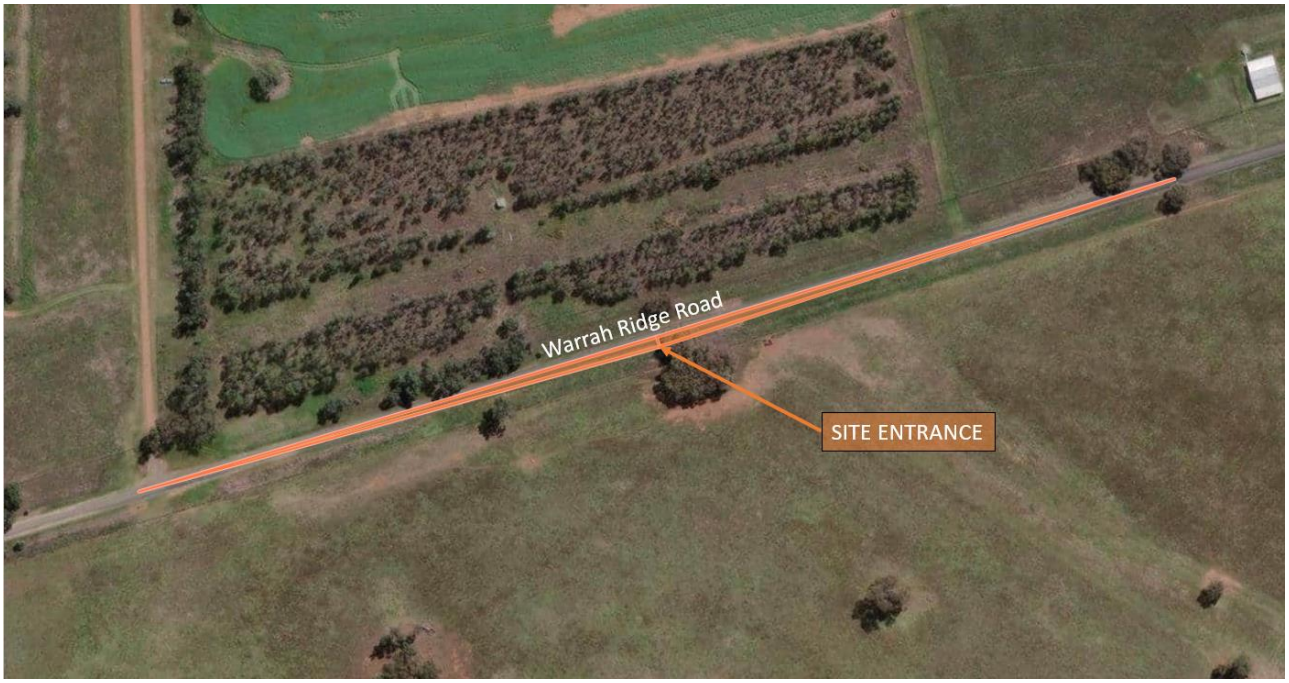

Figure 19: Farm 3 Access Sight Lines (Source: PSA Consulting)

As displayed in Figure 19, a desktop assessment demonstrates there is sufficient sight distance to satisfy the requirements stated in Austroads.

Site entrance photos (Figure 20 and Figure 21), supplied by Pace Farm support the desktop assessment. The figures highlight no potential obstructions within the Austroads safe intersection sight distance. Figure 20 looking east measures 1400m to top of the peak. Figure 21 is looking west of the site entrance, measuring 400m to Inverkip Road Intersection and 900m to top of peak.

Figure 20: Looking East from Site Entrance (Source: Pace Farm)

Figure 21: Looking West from Site Entrance (Source: Pace Farm)

Due to the nature of Warrah Ridge Road and the assessment completed it can be clarified that there are no sight distance related issues with this intersection.

7 SWEPT PATH ASSESSMENT

Swept path analysis has been undertaken for the site access, as well as for manoeuvring on all turning points within the farm. Traffic generation and distribution information has been obtained through consultation with Pace Farm, which listed a B-Double accessing and manoeuvring through the site. The following locations have been assessed through AutoCAD and AutoTURN modelling software:

- Site access to and from Warrah Ridge Road Lot 51. (Entering and Exiting to the east).
- Free Range Layer Sheds and around Packing Shed.
- Turning points along the access road through the site.

A 25m long B-Double vehicle template was used for the swept path analysis for each of the above locations. It was found that the B-Double could manoeuvre throughout the site. Assuming the unsealed width of 6.5m, the site access driveway will require widening to enable access into the roadway for B-Doubles safely. Should larger vehicles need to access the site in the future, it is recommended that the driveway access to the site be widened further to accommodate the longer vehicles.

Refer to Appendix 1 for each swept path movement undertaken.

8 PUBLIC AND ACTIVE TRANSPORT LINKAGES

There are no public or active transport facilities within the vicinity of the development site. It is expected that all staff will utilise private vehicles to access site.

9 SUMMARY

PSA Consulting has prepared this Traffic Impact Assessment report for the proposed Poultry Layer Farm development on Lot 52 DP1168698, Lot 170 & 171 DP751033 and Lot 1 DP576340, Warrah Ridge. The proposed development intends to involve construction of eight (8) layer sheds, these eight sheds will be separated into two separate lots of four, each accompanied by a packing shed (two on site total). The site plans also allow for a farm manager residence. In summary it is not expected that the proposed development will have an adverse impact to the surrounding road network:

- This finding has been supported by the forecasted traffic volumes entering and exiting the site access, located on Warrah Ridge Road.
- No upgrades to existing intersection or other road infrastructure are required or proposed because of the proposed development.
- Access location provided is in a location where sufficient sight distance is available.
- Advise on site entry and exit cannot be made due to the supplied site plans, however based on the location of the proposed site entrance Swept Paths modelled highlight the area available for of a B-Double to access the site safety.
- Service requirements of the proposed development has been provided and sufficient space for the necessary design vehicles to manoeuvre throughout the site and exit the development in forward gear without impacting on Warrah Ridge Road.

APPENDIX 1: SWEPT PATHS

AP01

B-DOUBLE 25M

meters

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 20.7
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

MARK UP ONLY
NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	BY	DATE
1	WARRAH RIDGE FARM 3 - SWEPT PATH ENTER SITE	H.F	16.01.2023
2	WARRAH RIDGE FARM 3 - SWEPT PATH ENTER SITE - UPDATED PLANS	H.F	06.02.2023

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TOWN PLANNING | TRAFFIC ENGINEERING | TRANSPORT PLANNING | PROGRAM MANAGEMENT | INFRASTRUCTURE

DRAWING TITLE: WARRAH RIDGE FARM 3 - SWEPT PATH ENTRY
CLIENT: PACE FARMS
PROJECT: WARRAH RIDGE FARM 3
LOCATION: Lot 52 - WARRAH RIDGE ROAD, QUIRINDI

DRAWING DATE: FEBRUARY 2023
ORIGINAL SIZE: A1 SCALE A3: 1:1000
SCALE: 0 10 20 30m
SCALE 1:500 (A1)

DRAWN BY: H.F
CHECKED BY: H.R
APPROVED BY: H.R

PROJECT NO.: 1502
DRAWING NO.: SK01
REVISION: 2

B-DOUBLE 25M

meters

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 20.7
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

MARK UP ONLY
NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	BY	DATE
1	WARRAH RIDGE FARM 3 - SWEPT PATH SITE EXIT	H.F	16.01.2023
2	WARRAH RIDGE FARM 3 - SWEPT PATH SITE EXIT - UPDATED PLANS	H.F	06.02.2023

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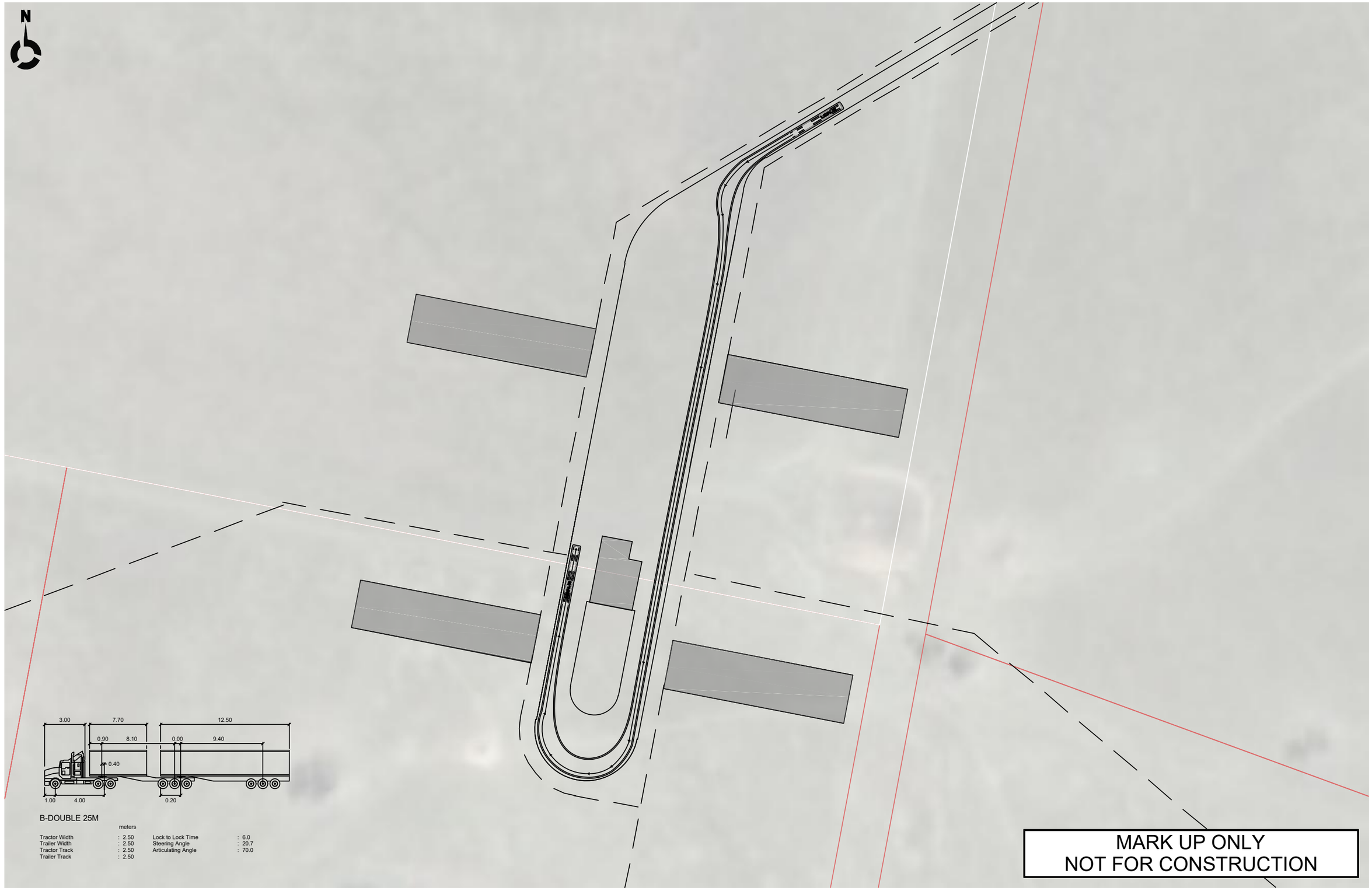
DRAWING TITLE: WARRAH RIDGE FARM 3 - SWEPT PATH EXIT
CLIENT: PACE FARMS
PROJECT: WARRAH RIDGE FARM 3
LOCATION: Lot 52 - WARRAH RIDGE ROAD, QUIRINDI

DRAWING DATE: FEBRUARY 2023
ORIGINAL SIZE: A1 SCALE A3: 1:1000
SCALE: 0 10 20 30m
SCALE 1:500 (A1)

DRAWN BY: H.F
CHECKED BY: H.R
APPROVED BY: H.R

PROJECT NO.	DRAWING NO.	REVISION
1502	SK02	2



REVISION	DESCRIPTION	BY	DATE
1	WARRAH RIDGE FARM 3 - SWEPT PATH SITE MANEUVERING	H.F	16.01.2023
2	WARRAH RIDGE FARM 3 - SWEPT PATH SITE MANEUVERING - UPDATED PLANS	H.F	06.02.2023

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DRAWING TITLE: WARRAH RIDGE FARM 3 - SWEPT PATH SITE MANEUVER 1
CLIENT: PACE FARMS
PROJECT: WARRAH RIDGE FARM 3
LOCATION: Lot 52 - WARRAH RIDGE ROAD, QUIRINDI

DRAWING DATE: FEBRUARY 2023
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SCALE: 0 15 30 45m
SCALE 1:750(A1)

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CHECKED BY: H.R
APPROVED BY: H.R

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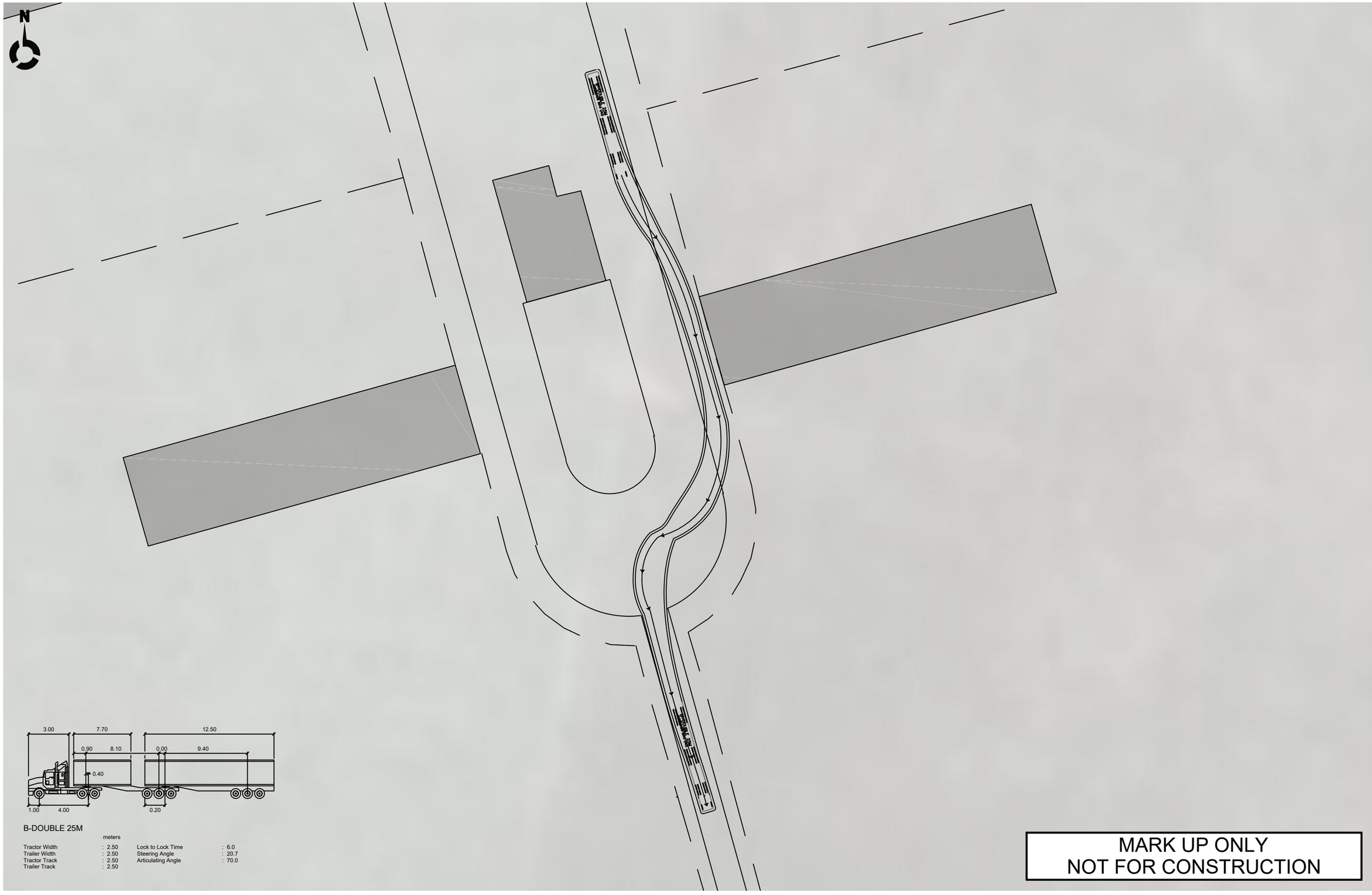
1502	SK03	2



B-DOUBLE 25M

meters

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 20.7
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

MARK UP ONLY
NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	BY	DATE
1	WARRAH RIDGE FARM 3 - SWEPT PATH SITE MANEUVERING	H.F	16.01.2023
2	WARRAH RIDGE FARM 3 - SWEPT PATH SITE MANEUVERING - UPDATED PLANS	H.F	06.02.2023

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Adelaide Street, Brisbane Qld 4000
Website: www.psaconsult.com.au

TOWN PLANNING | TRAFFIC ENGINEERING | TRANSPORT PLANNING | PROGRAM MANAGEMENT | INFRASTRUCTURE

DRAWING TITLE: WARRAH RIDGE FARM 3 - SWEPT PATH SITE MANEUVER 2
CLIENT: PACE FARMS
PROJECT: WARRAH RIDGE FARM 3
LOCATION: Lot 52 - WARRAH RIDGE ROAD, QUIRINDI

DRAWING DATE: FEBRUARY 2023
ORIGINAL SIZE: A1 SCALE A3: 1:800
SCALE: 0 8 16 24m
SCALE 1:400 (A1)

DRAWN BY: H.F
CHECKED BY: H.R
APPROVED BY: H.R

PROJECT NO.	DRAWING NO.	REVISION
1502	SK04	2