17 June 2025

info@asongroup.com.au
+61 2 9083 6601
Suite 17.02, Level 17,
1 Castlereagh Street,
Sydney, NSW 2000
ABN: 81 168 423 872

Mirvac
Level 28, 200 George Street
Sydney NSW 2000

Attn: Susan Paul; Development Manager

RE: Warehouse 8, Aspect Industrial Estate SSD-10448 (MOD 10) & SSD-80331959 – Transport Assessment

Dear Susan,

Mirvac engaged Ason Group to prepare a transport assessment to support a concurrent Concept Proposal modification application to SSD-10448 (forming MOD 10 of the current approval) and new State Significant Development Application (SSD-80331959) for Warehouse 8, Lot 8 at 4 Pemul Place within Aspect Industrial Estate (AIE), Kemps Creek.

The proposed MOD 10 seeks to modify the approved development to meet the specific requirements of the future tenant, IVE Group, while the new SSD seeks to change the approved land use from warehousing to industrial/ manufacturing.

Background and Existing Context

The AIE was originally granted development consent under SSD-10448 in May 2022. It is legally described as Lot 301 DP1305254, Lot 105 DP1305965, Lot 305, DP1305254 and Lot 104, DP1305965, 788-882 Mamre Road Kemps Creek and is located within Penrith Local Government Area. AIE covers an area of 56.3 hectares and includes a 950-metre frontage to Mamre Road along the western boundary.

In total, AIE incorporates more than 240,000m^2 of warehouse and ancillary office space with vehicle access via the Mamre Road/ Darrabarra Avenue intersection. This new signalised intersection opened to general traffic on 27 October 2024. The location of Warehouse 8 within the broader AIE is shown in **Figure 1** and **Figure 2**.

Warehouse 8 is centrally located within AIE and bound by Mamre Road to the west, Darrabarra Avenue to the north and Pemul Place to the east. Preceding this application was the base build modification SSD-10448 (MOD 9), which comprised a yield of 42,630m^2 GFA with 197 on-site parking spaces. All vehicle access was approved to be via Pemul Place, including a single light vehicle access in the north-east corner and two separated heavy vehicle accesses further to the south.

Source: SBA, drawing no. MP6-02, issue C, dated 02 Apr 2024

Figure 1: Approved AIE Masterplan (SSD-10448-Mod-6)

Source: Nearmap

Figure 2: Site Location

Proposal Overview

The proposal relates to a concurrent modification application to the Concept Approval (forming MOD 10 of SSD-10448) and SSD-80331959 for the fit-out and use of the approved Warehouse 8 building for the purposes of printing operations as a form of 'other manufacturing industries'. The proposed modification and SSD seeks to facilitate the specific requirements of IVE Group packaging and print operations in Warehouse 8. This includes the two project components as described below.

- Concept Modification to SSD-10448 (MOD 10)
  - Modify the Estate wide concept plan, including site layout, parking and landscaping. This includes an increase in the parking supply to 360 spaces to meet the necessary operational requirements of IVE Group.
- Fit-Out and Use (SSD-80331959)
  - Approval for 'printing' operations as a form of 'other manufacturing industries'.
  - Approval for fit-out works to facilitate the IVE Group packaging and print operations.

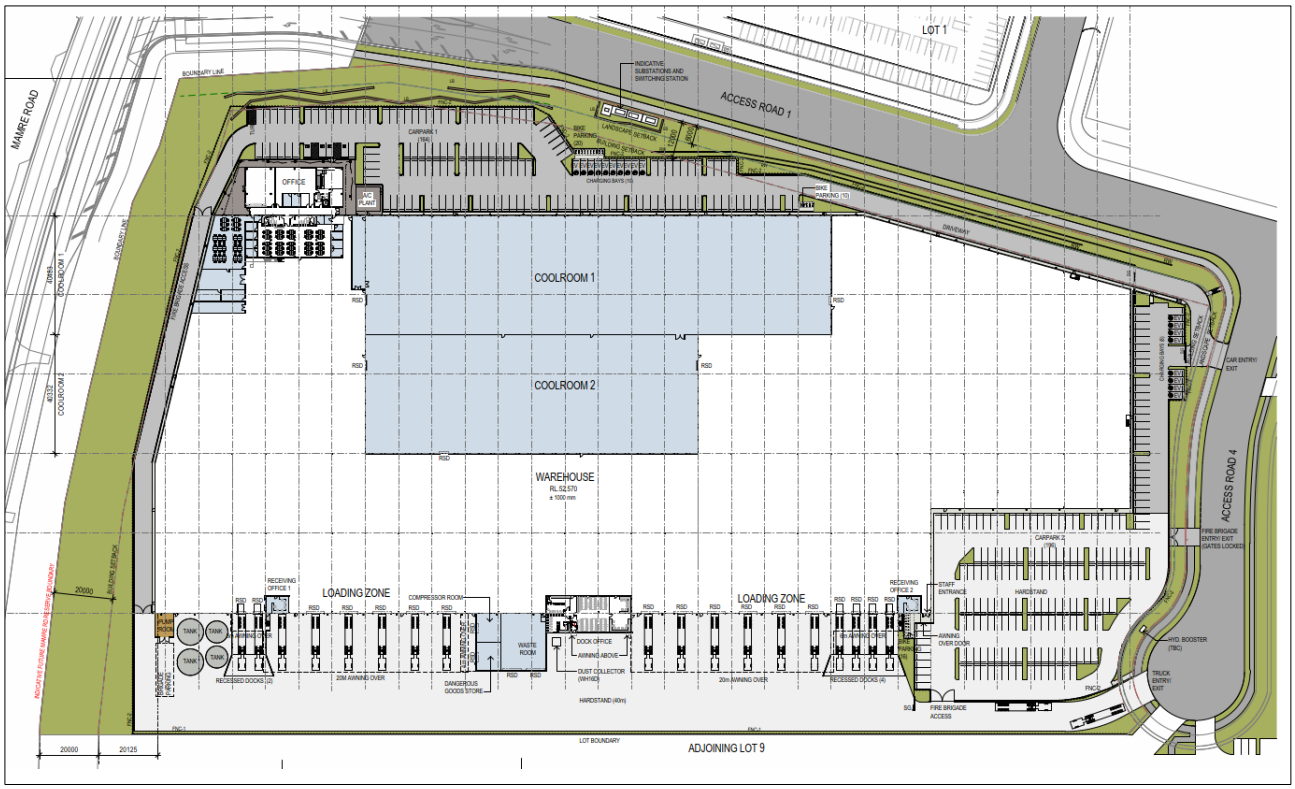
With respect to traffic generation, Warehouse 8 was approved by adopting vehicle trip rates consistent with those detailed in the Transport for NSW endorsed Land Owners Group East (LOG-E) traffic model. In this regard, the applicable trip rates are 0.23 trips per 100m^2 in the road network weekday AM peak hour (7:00am to 8:00am) and 0.24 trips per 100m^2 in the PM peak hour (4:00pm to 5:00pm). On this basis, the approved development was estimated to generate 95 and 98 vehicle trips during the road network peak hours.

A summary of the approved development and proposed modification is provided in **Table 2,** with the proposed site layout plan shown in **Figure 3** and proposed masterplan in **Figure 4**.

TABLE 1: APPROVED AND PROPOSED DEVELOPMENT YIELD

Component	MOD9/ MOD2 [1]	Approved	Proposed (MOD10)	Net Change from current approval
Warehouse	40,260m^2	40,200m^2	18,540m^2	-21,660m^2
Factory	0m^2	0m^2	21,626m^2	+21,626m^2
Office	2,370m^2	1,150m^2	2,464m^2	+1,314m^2
Total	**42,630m^2**	**41,350m^2**	**42,630m^2**	**+1,280m^2**
Car parking supply	197 spaces	181 spaces	360 spaces	+179 spaces

[1] currently under assessment (application no.:SSD-10448-Mod-9 and SSD-60513208-Mod-2)



Source: SBA, drawing no. DA2801, issue H, dated 15 April 2025

Figure 3: Proposed Warehouse 8 Layout

Source: SBA, drawing no. MP01, issue B, dated 03 April 2025

Figure 4: Proposed Masterplan Layout

Parking Appraisal

In determining the most appropriate parking requirements associated with the proposal, it is important to reference the Mamre Road Precinct Development Control Plan 2021 (MRP DCP) while recognising the unique operational requirements of IVE Group.

In this regard, application of the below applicable MRP DCP car parking rates for the proposed land uses results in the need to provide a minimum 232 parking spaces.

- Warehouse: 1 space per 300m^2
- Industrial/ manufacturing: 1 space per 200m^2
- Ancillary office: 1 space per 40m^2

This parking supply would not be sufficient to accommodate IVE Group daily operations. This includes the need to accommodate office staff, shift workers and visitors across the day and night, including shift changeover periods given the 24/7 operational requirements. Provision of an appropriate supply to cater for such variations is key and removes any such risk of queuing or on-street parking, informal or otherwise.

The estimated demand profiles unique to IVE Group are detailed in **Table 2** and is based on forecasting information provided by IVE Group, including a detailed breakdown of staff numbers and shift times. The following travel-based assumptions are key to this assessment:

- 95 per cent of all staff would travel to the site by private car with an average occupancy of 1.05 people per car
- 5 per cent would use other transport modes (mostly bus and cycle)
- 70 per cent of office staff would be on-site working each day due to formal work from home arrangements
- 5 per cent of office staff estimated to be on leave (sick leave, annual leave, parental leave, etc.) on any given day
- 70 per cent of office staff working on any given day are estimated to arrive or depart 30 minutes prior to and following the office hours 8am start and 5pm end
- no reduction in shift worker numbers have been applied.

To ensure a detailed understanding of the anticipated operational parking demand across the day and night, a cumulative parking demand profile has been developed based on the above and is shown in **Figure 5**.

TABLE 2: IVE GROUP STAFF NUMBERS AND SHIFT TIMES

Shift type	Shift time	Staff numbers	Associated vehicles
1st day shift	6am-2pm	77	70
2nd day shift	7am-3pm	46	42
1st afternoon shift	2pm-10pm	61	55
2nd afternoon shift	3pm-11pm	11	10
Partial afternoon shift	12pm-8pm	4	4
Night shift	10pm-6am	20	18
Office	8am-5pm	151	108
Total		**370**	**307**

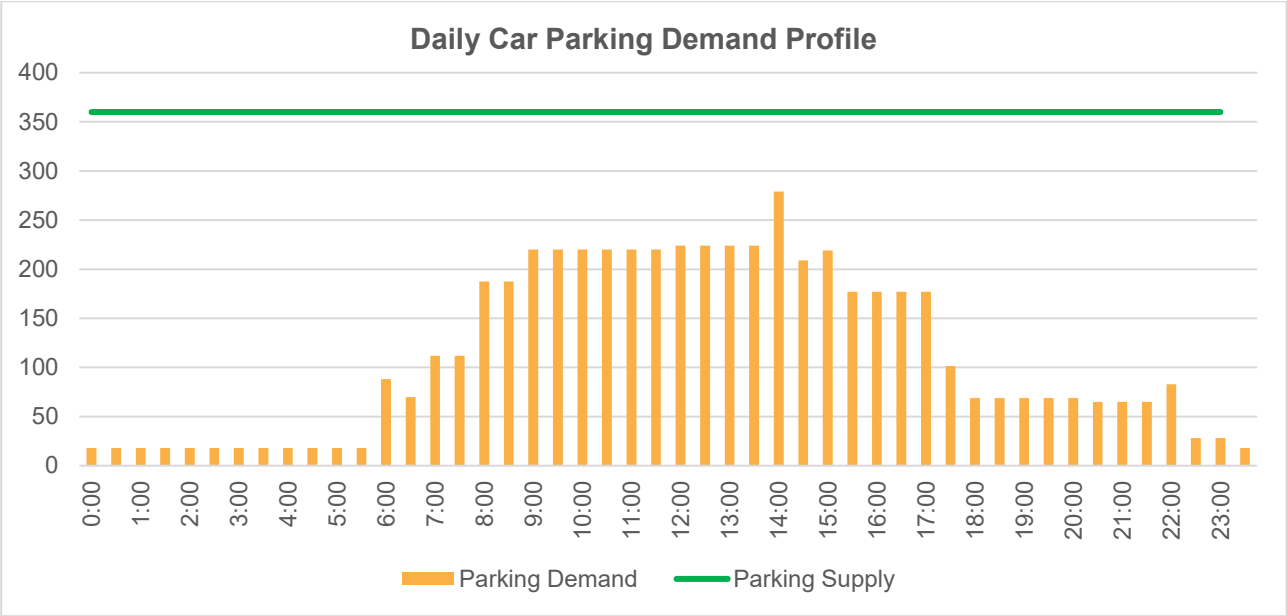


Figure 5: Daily parking demand profile – IVE Group

Figure 5 indicates that peak parking demand is expected to occur at 2pm with demand for 280 spaces. This equates to a daily average demand of about 80 per cent of the proposed supply of 360 spaces and would appropriately accommodate IVE Group requirements. This also allows flexibility with respect to changes to office staff work from home arrangements, major meetings and events, visitor demand and small deliveries. The spread of parking across the site, with separate office and factory staff parking areas also aids IVE Group operations and minimises light vehicle movements and opportunity for conflict.

On this basis, the proposed parking supply is appropriate and supported as it meets the unique operational requirements of IVE Group while ensuring no risk of impact to on-street parking within AIE.

Other Parking Requirements

The MRP DCP requires accessible parking to be provided in accordance the National Construction Code (NCC). The NCC requires accessible parking for warehouse uses to be provided at a rate of one space per 100 car parking spaces or part thereof. This is met with provision of four accessible spaces across the site.

As per Condition B8 of the existing development consent, a minimum five per cent of parking spaces must also be provided for electric vehicle (EV) charging, with a further five per cent constructed as readily adaptable. The modification includes 18 EV charging spaces with a further 18 spaces able to be readily adapted for EV use.

Bicycle Parking and End-of-Trip Facilities

The MRP DCP requires bicycle parking and end-of-trip facilities to be provided based on the following rates:

Bicycle parking

- Warehouse/ industrial: 1 space per 1,000m^2
- Office: 1 space per 600m^2

End of trip facility

- Warehouse/ industrial: at least 1 shower cubicle with ancillary change rooms
- Office: not applicable as GFA is less than 2,500m^2.

The modification includes 46 bicycle spaces and one shower cubicle with ancillary change rooms and is therefore compliant.

Traffic Generation

Ason Group has worked with TfNSW to ensure agreement on vehicle trip rates for general warehousing developments within the Mamre Road Precinct. It is important to note that these rates are conservative and higher than typical warehousing. The rates were requested by TfNSW at the time and agreed for adoption across the precinct. The conservative nature of the rates is evident in the Guide to Transport Impact Assessment (GTIA, released in November 2024) which specifies a rate of 0.14 trips per 100m^2 in the road network AM and PM peak hours.

The following are the approved vehicle trip rates applicable to the site and have been adopted for the purposes of this assessment:

- AM peak hour: 0.23 trips per 100m^2
- PM peak hour: 0.24 trips per 100m^2
- Daily: 2.91 trips per 100m^2.

A comparison between the approved and proposed traffic generation with consideration to the TfNSW endorsed rates is provided in **Table 3**.

TABLE 3: ESTIMATED TRAFFIC GENERATION

Component	Approved	Proposed	Net change from current approval
GFA	41,350m^2	42,630m^2	+1,280m^2
Road network AM peak	95 trips	98 trips	+3 trips
Road network PM peak	99 trips	102 trips	+3 trips

Table 3 indicates that based on the previously endorsed TfNSW trip rates, there would be a nominal increase of three vehicle trips in any peak hour. This effectively reflects no meaningful change from that previously approved.

Given IVE Group operations, it is similarly important to assess traffic generation based on office and factory staff movements (and heavy vehicle demand) across the day and night. Documenting a daily traffic profile is important to identify any such periods in which the anticipated traffic volumes may exceed the previously approved Warehouse 8 peak period traffic volumes.

It is important to note that this approach is consistent with the Benchmarking method and First Principles method as defined in the GTIA. The data used to for the assessment has been informed by existing IVE Group facilities, and used to determine mode split, arrival/ departure profiles and distribution. The GTIA states that the First Principles method is '*useful to supplement benchmarking approach or for land uses with a lack of survey data or comparable land uses, such as uncommon or special land use developments'*. It is also noted that GTIA states that '*in order to reduce the likelihood of overestimating or underestimating trip generation rates, it is preferrable to use robust, evidence-based and context-specific methods to calculate appropriate trip generation estimates*.' On this basis, and given the unique nature of IVE Group operations, the use of the First Principles method is appropriate and accordance with the GTIA.

The daily profile considers the estimated light vehicle trips associated with the staff shift times as detailed in **Table 2**, together with the estimated heavy vehicle volumes based on those included in **Table 4**. A breakdown of the traffic volumes is included in **Table 5** and resultant daily traffic profile in **Figure 6**.

TABLE 4: IVE GROUP HEAVY VEHICLE MOVEMENTS

Truck Type	5am-8am	8am-11am	11am-2pm	2pm-5pm	5pm-8pm	8pm-11pm	Veh/ day
Rigid Truck	11	17	17	11	2	0	58
Semi-trailer	4	5	2	1	1	0	13
B-Double	0	2	1	0	0	0	3
Hook Bin	5	2	0	0	0	1	8
Container	4	2	1	0	0	0	7
Courier (van/ ute)	5	9	10	10	2	0	36

TABLE 5: TRAFFIC VOLUME ESTIMATES

Hour Commencing	Light Vehicles	Heavy Vehicles	Total	Approved Volumes	Net Change
0:00	0	0	0	10	-10
1:00	0	0	0	9	-9
2:00	0	0	0	10	-10
3:00	0	0	0	12	-12
4:00	0	0	0	36	-36
5:00	70	16	86	68	18
6:00	60	16	76	93	-17
7:00	**75**	**16**	**91**	**92**	**-1**
8:00	37	19	56	85	-29
9:00	6	19	25	73	-48
10:00	6	19	25	69	-44
11:00	10	14	24	72	-48
12:00	7	14	21	80	-59
13:00	60	14	74	95	-21
14:00	84	8	92	104	-12
15:00	47	8	55	88	-33
16:00	**7**	**8**	**15**	**73**	**-58**
17:00	73	2	75	61	14
18:00	1	2	3	36	-33
19:00	1	2	3	21	-18
20:00	3	1	4	15	-11
21:00	0	1	1	20	-19
22:00	70	1	71	26	45
23:00	10	0	10	18	-8
Total [1]	**627**	**180**	**807**	**1266**	**-459**

[1] accounts for minor rounding errors

It is noted that the traffic volumes for warehouse 8 have been obtained from the traffic report submitted as part of the approved SSD-60513208-Mod-2 submission (report reference: P2169r01). The profile is based on data across six surveys conducted by Ason Group to inform the Aimsun modelling in consultation with TfNSW. It is acknowledged that the surveyed road network peak hours do not directly correlate with the trip rates endorsed by TfNSW. Notwithstanding and as discussed, the TfNSW rates are conservatively high, and the discrepancy has been recognised and accepted by stakeholders across AIE and the broader MRP.

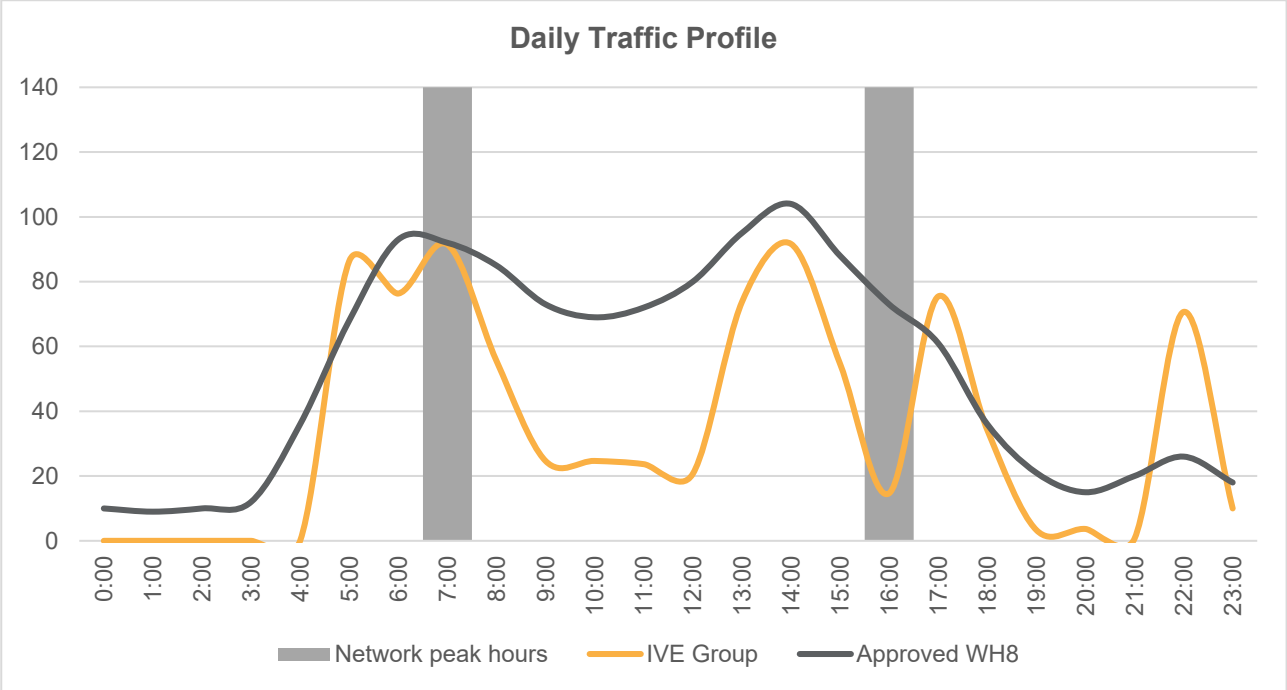


Figure 6: Estimated daily traffic profile

As shown in **Figure 6**, the estimated light and heavy vehicle traffic volumes are generally lower than the volumes previously approved on the site. There are minor exceedances at 5:00am (18 trips) and 10:00pm (45 trips), however these periods are well outside the road network peaks and not expected to have a material impact on intersection operation. There is also a minor exceedance of 14 trips at 5:00pm and equates to about one trip every four to five minutes. These periods are also mostly due to light vehicle arrivals and departures associated with office and factory staff with few heavy vehicle movements during these periods.

Overall, there is no real change in traffic generation during the road network AM peak hour and a noticeable reduction of 58 trips in the 4pm to 5pm period. On this basis, IVE Group operations would benefit traffic conditions at this time and contribute proportionately less traffic through the Mamre Road/ Darrabarra Avenue signalised intersection.

Traffic Impact Assessment

Notwithstanding the above, SIDRA Intersection (SIDRA) modelling has been completed and benchmarked against approved modelling outputs to determine the impact of the additional traffic at 5:00pm. In May 2024, Ason Group completed SIDRA modelling in response to comments raised by Department of Planning, Housing and Infrastructure (DPHI) as it relates to midblock capacity. As part of the Ason Group response, the endorsed SIDRA base model was revised to include the traffic generated by the following approved developments:

- Mamre South Precinct, 657-769 Mamre Road, Kemps Creek
- Yiribana Logistics Estate, 772-786 Mamre Road, Kemps Creek
- Aspect Industrial Estate, 788-882 Mamre Road, Kemps Creek

- Access Logistics Park, 884-928 Mamre Road, Kemps Creek
- 200 Aldington Road Estate
- Westlink Stage 1
- BAPS Temple, 232 Aldington Road.

The details of the modelling assessment are included in the Ason Group response, which was approved on 11 November 2024 as part of SSD-60513208 and included as **Attachment 1**.

Given that this modelling formed the basis for the approval of AIE Stage 4 Development (Warehouse 8) (SSD-60513208), and all parameters were agreed with TfNSW and DPHI, this model has been adopted as the base in which to assess this proposed modification against. The traffic assessment adopts same assumptions of the endorsed model, including cumulative traffic volumes, background growth, directional distribution etc. The approved modelling results for the key intersection of Mamre Road/ Darrabarra Avenue are included in **Table 6**.

TABLE 6: APPROVED 2026 REVISED MODEL

Intersection	Control	Period	Degree of saturation (DOS)	Delay (sec)	Level of service (LOS)
Mamre Rd/ Darrabarra Ave	Signals	5pm-6pm	0.58	20.6	B

The anticipated performance of the Mamre Road/ Darrabarra Avenue intersection with the proposal included is summarised in **Table 7**.

TABLE 7: APPROVED 2026 REVISED MODEL + DEVELOPMENT TRAFFIC

Intersection	Control	Period	Degree of saturation (DOS)	Delay (sec)	Level of service (LOS)
Mamre Rd/ Darrabarra Ave	Signals	5pm-6pm	0.59	22.2	B

The results confirm that the proposal would have a minor impact on the operation of the Mamre Road/ Darrabarra Avenue intersection when compared with the current approval. Specifically, the intersection would continue to operate at LOS B in both critical road network peak hours and remains consistent with the approved modelling outputs, with no changes to Level of Service and only minor increases to delay and Degree of Saturation. There is also a minor increase of less than 10 metres in the 95th percentile queue on the Darrabarra Avenue approach (65m to 74m). This is minor and equates to approximately less than two cars. With more than 350 metres between the Mamre Road hold line at the traffic signals and Pemul Place, there is ample queuing capacity on Darrabarra Avenue. The SIDRA movement summaries are included in **Attachment 2**.

On this basis, the proposed new use is supported on traffic grounds with no discernible changes expected in traffic conditions in and around the site compared to the current approval.

Site Layout and Design

The site access arrangements, on-site car parking, loading docks and hardstand areas have been designed to comply with relevant Australian Standards. This includes specific reference to the following:

- Australian Standard 2890.1:2004 – Parking Facilities – Off Street Car Parking.
- Australian Standard 2890.2:2018 – Parking Facilities – Off Street Commercial Vehicle Facilities.
- Australian Standard 2890.6:2022 – Parking Facilities – Off Street Parking for People with Disabilities.

Full compliance with the above Australian Standards would be expected to form a standard condition of consent to any approval. The at-grade car park has been designed as a User Class 1A facility with 2.4-metre-wide and 5.4-metre-long spaces with minimum 5.8-metre-wide circulation aisles. It is compliant with the requirements of AS2890.1. All accessible spaces are designed to be 2.4 metres wide with an adjacent shared area (with central bollard) with the same dimensions, in accordance with AS2890.6.

Vehicle swept paths have been completed and included in **Attachment 3**. These show access to and from the site and demonstrate appropriate design and layout with regard to site access arrangements, internal circulation, car parking, loading bays and hardstand area layout. This includes capacity for 20 metre articulated vehicles (in accordance with AS2890.2:2018) and up to 30 metre A-Double vehicles (30 metre Performance Based Standards (PBS) Level 2 Type B vehicle) to enter the site, manoeuvre as required and exit in a forward direction.

Construction Traffic Management Plan

Ason Group has prepared a Construction Traffic Management Plan[1] (CTMP) separately. The CTMP was issued to DPHI and approved on 2 December 2024 (reference: SSD-60513208-PA-9 (CTMP).

The modification would not result in changes to the approved CTMP as it relates to staging, vehicle sizes, timing etc. The approved CTMP therefore remains valid and would not require updating.

Summary

- The proposed modification seeks a total of 360 car parking spaces appropriately distributed across the site. This requirement is based on a detailed assessment of IVE Group operational requirements to establish a daily demand profile and identify the peak period.
- With a first principles assessment indicating an average peak demand of about 280 spaces, about 80 per cent of spaces are expected to be occupied at the busiest time each day. This allows some flexibility with respect to office staff work from home arrangements, major meetings and events, and visitor and small deliveries and is considered appropriate to ensure no risk of queuing or on-street parking impacts.
- The proposed parking provision also meets the minimum parking requirements of the Mamre Road Precinct DCP.
- The modification is not expected to materially change the traffic impacts when compared with that previously approved. there is no real change in traffic generation during the road network AM peak hour and a noticeable reduction of 58 trips in the 4pm to 5pm period. On this basis, IVE Group operations would benefit traffic conditions at this time and contribute proportionately less traffic through the Mamre Road/ Darrabarra Avenue signalised intersection.
- Any increase in traffic generation occurs outside peak and shoulder peak periods with no material impact on intersection operation. SIDRA modelling (using the base model endorsed by TfNSW and DPHI) confirms that the modification would not have a noticeable impact on the operation of the surrounding road network.
- The revised site layout and design has been designed appropriately in regard to the relevant Australian Standards (AS2890 series), with vehicle swept paths also confirming the suitability of site access and vehicle circulation.

[1] *Ason Group, 2169r04v2 CTMP_WH8, Mamre Rd, Kemps Creek, 06 November 2024*

We trust the above is of assistance. If you have any queries, please do not hesitate to contact the undersigned.

Yours sincerely,

Rhys Hazell

Principal Lead

Attachment 1: Ason Group RFI for SSD-60513208

Attachment 2: SIDRA Outputs

Attachment 3: Vehicle Swept Paths

Attachment 1: Ason Group RFI for SSD-60513208

23 May 2024

Mirvac
Level 28, 200 George Street
Sydney NSW 2000

Attn: Daniel Brook | Senior Development Manager

info@asongroup.com.au
+61 2 9083 6601
Suite 17.02, Level 17,
1 Castlereagh Street,
Sydney, NSW 2000
ABN: 81 168 423 872

RE: Stage 4, Warehouse 8, Aspect Industrial Estate [SSD-60513208] – Response to DPHI

Dear Daniel,

We have reviewed the comments included in the letter dated 12 April 2024 from Department of Housing Planning and Infrastructure (DPHI).

DPHI is not satisfied that the Transport Assessment addresses Condition A14 and B1 of the Concept Plan:

- Condition A14 – Future Infrastructure Requirements
  - to demonstrate the surrounding road infrastructure can accommodate the relevant stage and other approved developments in the MRP.
  - demonstrate the road network has sufficient capacity to accommodate the proposed stage of the Concept Proposal, and if the proposed stage would trigger the need for any road upgrades, including those identified in the traffic modelling for the MRP.
  - if road upgrades are required to support the proposed stage, identify the timing and mechanisms to contribute to the delivery of the required road upgrades.
- Condition B1 – Traffic Impact Assessment
  - assess the impacts on the safety and capacity of the surrounding road network and access points during construction and operation of the relevant stage in accordance with relevant TfNSW guidelines.

For reference, all the requirements detailed by Condition A14 and Condition B1, with a direct response as to how the assessments undertaken have responded to them, is provided in **Attachment 1**.

A response is provided within this letter to the subsequent relevant matter to address DPHI key comments:

The Transport Assessment by ASON does not consider the mid-block capacity on Mamre Road, with the analysis limited only to intersection performance at Mamre Road and Access Road 1.

A response to these queries is provided below.

Cumulative Analysis

An updated assessment has been undertaken to address DPHI's request in regard to midblock capacities (see below). The updated assessment is detailed further within this letter.

SIDRA Assessment

Intersection performance is considered the more critical aspect when assessing traffic impacts of development. Therefore, following an up to date review of the currently approved developments in the MRP, the SIDRA modelling assessment has also been updated.

The volumes associated with the approved developments alongside Warehouse 2 and Warehouse 8 are shown by the below figure.

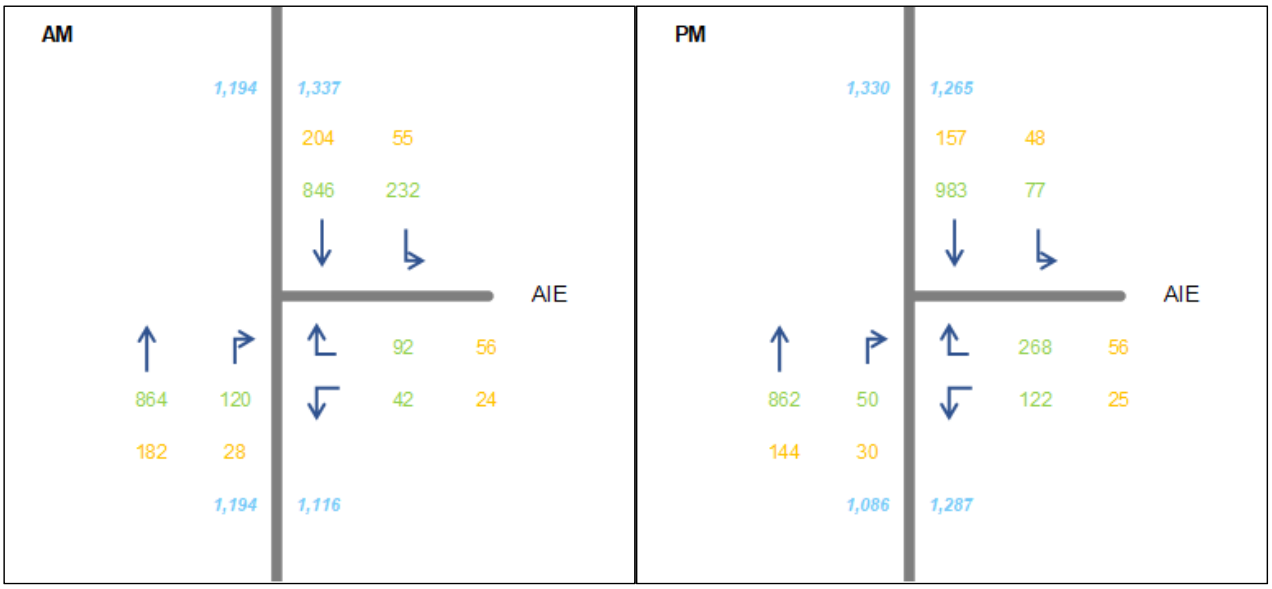


Figure 1: 2026 Base plus Approved Development Volumes at the AIE Access Intersection

The revised SIDRA modelling analysis results are summarised below and detailed SIDRA outputs are annexed in **Attachment 2**.

TABLE 1: REVISED MODELLING SUMMARY

Intersection	Configuration	Year	Peak Period	DOS	LOS	Delay
Mamre Road / AIE Access Road 01	Signals	2026	AM	0.591	B	17.7
			PM	0.621	B	21.9

As shown, the Mamre Road / Access Road 01 intersection is anticipated to operate with satisfactory level of performance.

Midblock Capacity

Context

Mamre Road Upgrade Stage 2

Of relevance to this submission, and the MRP more broadly, is the Stage 2 upgrade to Mamre Road.

The assessment of Warehouse 2 and Warehouse 8 has been undertaken on the basis of the existing Mamre Road configuration. Nevertheless, as a committed project, it is deemed appropriate to consider the upgrade in appreciation of any new development within the MRP. Key features of the project include:

- Upgrades to two existing intersections (James Erskine Drive and Bakers Lane);
- Upgrades to two future intersections (Abbotts Road and Aspect Industrial Estate);
- Road widening to a minimum of four lanes (two in each direction) with the potential for six lanes;
- Shared user path on eastern side of the carriageway; and
- Footpath on western side of carriageway.

Approved Developments

Condition A14 requires the consideration of approved developments in the assessment of the road network. The following applications have been considered in this assessment, and confirmed separately with DPHI.

TABLE 2: APPROVED DEVELOPMENTS

Reference Number	Site Address	Application Number	Status
1	Mamre South Precinct 657-769 Mamre Road, Kemps Creek	SSD-9522	Approved: 21/12/2020
		SSD-10101987	Approved: 13/07/2023
		SSD-25725029	Approved: 29/09/2022
		DA22/0671	Approved: 22/07/2022
		DA22/1172	Approved: 09/12/2022
2	Yiribana Logistics Estate – 772-786 Mamre Road, Kemps Creek	SSD-10272349	Approved: 22/09/2023
3	Aspect Industrial Estate – 788-882 Mamre Road, Kemps Creek	SSD-10488	Approved: 24/05/2022
		SSD-46516461	Approved: 02/03/2023
4	Access Logistics Park – 884-928 Mamre Road, Kemps Creek	SSD-17647189	Approved: 18/12/2023
5	200 Aldington Road Estate	SSD-10479	Approved: 05/05/2023

6	Westlink Stage 1	SSD-9138102	Approved: 21/04/2023
7	BAPS Temple 232 Aldington Road	DA17/1247	Approved: 23/09/2019

Midblock Capacity Thresholds

As it relates to midblock capacity thresholds, we note that the analysis below, is predicated on a single lane assessment of Mamre Road. In relation to the Mamre Road Stage 2 project, we anticipate this analysis is temporary in its nature and would only apply in advance of completion of the Stage 2 upgrade works.

Midblock capacity thresholds are outlined in the RTA Guide to Traffic Generating Developments (Guide) and Austroads. For the purpose of this analysis, consideration to the limits provided in Table 4.4 of the Guide have been considered and summarised below:

- 600 veh/hr per lane – Level of Service (LOS) C;
- 900 veh/hr per lane – LOS D;
- 1400 veh/hr per lane – LOS E.

The Guide also acknowledges that the figures provided above are for strategic planning purposes only, and are not intended as a substitute for intersection analysis.

This is similarly reflected in Part 3 of the Austroads Guide to Traffic Management, which notes that peak period mid-block capacity on a road can increase under certain network conditions, including:

- Adequate flaring at major upstream intersections
- Uninterrupted flow from wider carriageway upstream
- Absence of crossing or entering traffic,
- Control or absence of parking
- Absence or control of right turns at difficult intersections
- High-volume flows of traffic from upstream intersections

It is evident that the conditions that influence midblock capacity are therefore varied, and in considering the guidance both in Austroads and the current RTA Guide, midblock volumes should not be the critical element when assessing new developments but a consideration in a more holistic approach. Whilst these thresholds exist, it does not mean that roads cannot operate above them.

To provide context there are numerous roads in Western Sydney that currently operate at these thresholds, with recent survey data recording the following volumes:

- Chandos Road / Wallgrove Road (4:30-5:30pm): North approach = 1,412 veh/hr
- Redmayne Road / Wallgrove Road (4:30-5:30pm): North approach = 1,354 veh/hr

- Wallgrove Road / The Horsley Drive (4:30-5:30pm): North approach = 1,387 veh/hr
- The Horsley Drive / Ferrers Road (8:00-9:00am): West approach = 1,317 veh/hr.

To further highlight this, spit road Mosman operates with **1,600veh/hr** (based on TfNSW surveys from 2023) in a single lane during the morning peak period. Whilst delays along the corridor are noted, it does still demonstrate that road network operation above the thresholds in Austroads and the RTA Guide are still possible.

Midblock Capacity Assessment

Mamre Road Volumes

The baseline midblock volumes are provided below. The below volumes have been extracted from an August 2022 survey, to exclude peak hour construction traffic associated with AIE. The volumes are shown diagrammatically in **Attachment 3** (**Figure 3**).

TABLE 3: BASE VOLUMES

Location	Direction	Veh/hr/lane	
		AM	PM
Mamre Road, Outside AIE	Northbound	778	777
	Southbound	817	925

The trip generation for each of the approved developments (Table 2) has been adopted from the respective traffic reports. The analysis suggests that the midblock volumes could increase by approximately 400-500 veh/hr following completion of the approved developments. The below table demonstrates the approved development near the Site, with the flows through the network shown at a diagrammatic level in Attachment 3 (**Figure 4**).

TABLE 4: APPROVED DEVELOPMENT VOLUMES

Location	Direction	Veh/hr/lane	
		AM	PM
Mamre Road, North of AIE	Northbound	381	478
	Southbound	454	312
Mamre Road, South of AIE	Northbound	381	290
	Southbound	284	327

Table 5 provides the volumes anticipated on Mamre Road on the basis of the anticipated baseline volumes and the approved developments in an assessment year of 2026. The below volumes are shown at a diagrammatic level in Attachment 3 (**Figure 5**).

TABLE 5: 2026 BASE PLUS APPROVED DEVELOPMENT VOLUMES			
Location	Direction	Veh/hr/lane	
		AM	PM
Mamre Road, North of AIE	Northbound	1,159	1,255
	Southbound	1,271	1,237
Mamre Road, South of AIE	Northbound	1,159	1,067
	Southbound	1,101	1,252

Table 6 demonstrates that the midblock capacity of the approved developments currently sits below the 1,400veh/hr LOS E threshold, that is LOS D.

Mirvac are currently seeking approval for both Warehouse 8 (subject of this letter) and Warehouse 2, which provides for a combined GFA of 65,645m^2. The associated traffic generation of these developments is as follows:

- AM Peak: Warehouse 2: 56veh/hr
  Warehouse 8: 96veh/hr
  Total: 152veh/hr
- PM Peak: Warehouse 2: 58veh/hr
  Warehouse 8: 100veh/hr
  Total: 158veh/hr

The below table demonstrates the midblock volumes associated with the Warehouse 2 and Warehouse 8 traffic generation, and are shown at a diagrammatic level in Attachment 3 (**Figure 6**). The same trip distribution has been applied as previously applied in the MRP modelling for this assessment.

TABLE 6: WAREHOUSE 2 & 8 TRAFFIC GENERATION			
Location	Direction	Veh/hr/lane	
		AM Peak	PM Peak
Mamre Road, North of AIE	Northbound	34	76
	Southbound	67	29
Mamre Road, South of AIE	Northbound	34	18
	Southbound	16	34

The table below provides the midblock volumes following addition of Warehouse 2 and Warehouse 8 traffic generation. Volumes are shown at a diagrammatic level in Attachment 3 (**Figure 7**).

TABLE 7: 2026 BASE PLUS APPROVED DEVELOPMENT AND WAREHOUSES 2 & 8			
Location	**Direction**	**Veh/hr/lane**	
		AM	**PM**
Mamre Road, North of AIE	Northbound	1,194	1,330
	Southbound	1,337	1,265
Mamre Road, South of AIE	Northbound	1,194	1,086
	Southbound	1,116	1,287

The analysis shows that the addition of the Warehouse 2 and Warehouse 8 volumes would not materially change the midblock volumes, and remains below the LOS E threshold. Equally relevant however, is that the intersection capacity also remains within acceptable thresholds, with a LOS B in both the morning and evening peak periods.

Mamre Road Background Traffic Redistribution

It is important to note, that this exercise is completely theoretical in its nature. In practice, midblock capacity thresholds are rarely exceeded due to the ability for road users to change their behaviour including route choice and time of travel.

This theory is fundamental to traffic planning and traffic modelling principals. In practice, traffic modelling is predicated on the analysis of a route in comparison to other available routes, and dynamically redistributes traffic on the basis of time (delay) and cost functions.

On this basis, and having consideration to the current function of Mamre Road, which generally distributes traffic between the M4 motorway and Elizabeth Drive, multiple alternate routes are available for road users, including The Northern Road, Wallgrove Road, and The M7 Motorway (**Figure 2**).

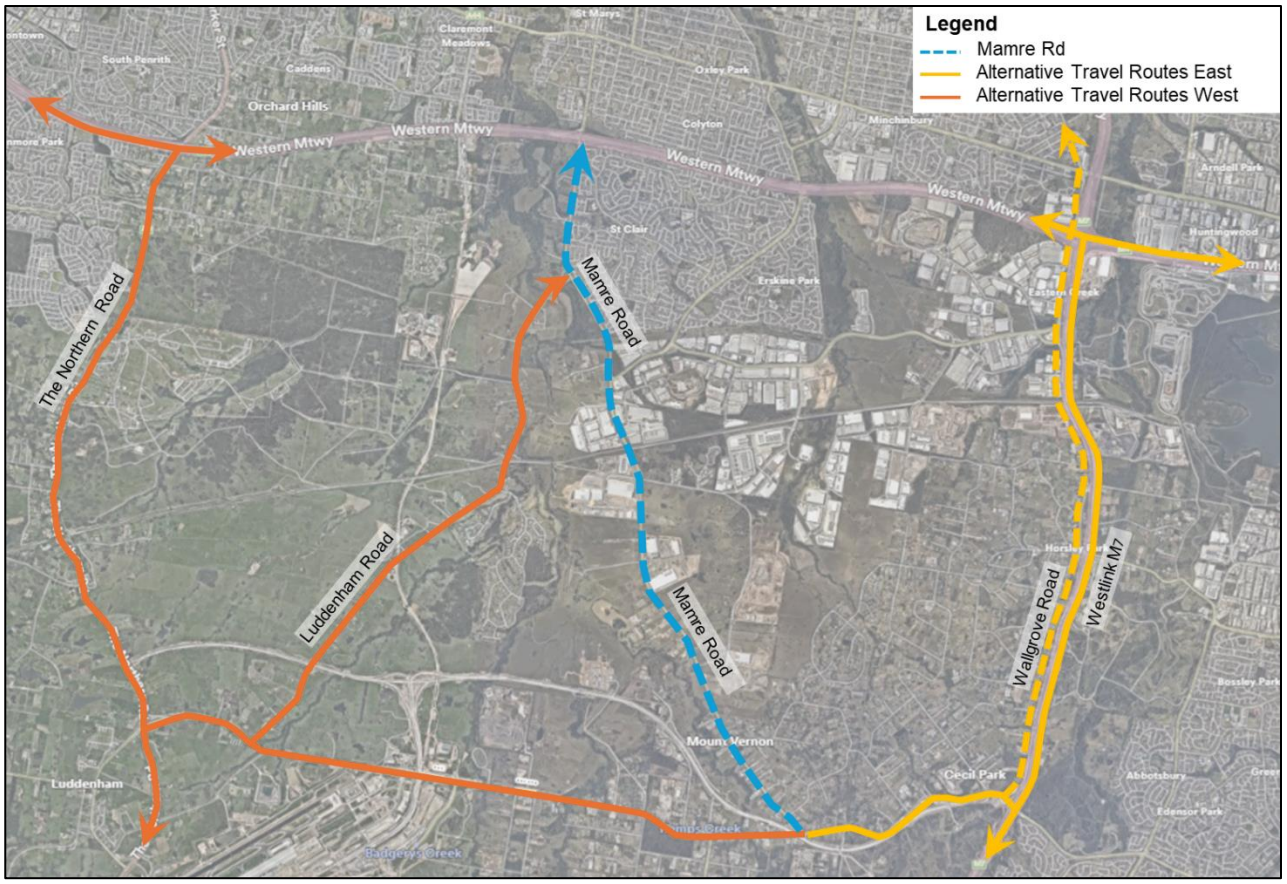


Figure 2: Travel Routes

In this regard, delays are anticipated on Mamre Road due to the Mamre Road Stage 1 works and increased construction activity relating to the development of the MRP and Aerotropolis more generally which would result in some redistribution of background traffic.

Having consideration to high proportion of background traffic on Mamre Road (~925veh/hr) a relatively minor 10% redistribution of this traffic to the alternate available routes would off-set the additional traffic generated by the development.

Conclusion

The Concept Masterplan Conditions of Consent, specifically require the assessment of the future road network operation and the infrastructure requirements to support any development applications. Further, the Conditions require any assessment to have regard to the approved developments, and *if road upgrades are required to support the proposed stage, identify the timing and mechanisms to contribute to the delivery of the road upgrades*.

In this regard the analysis to support this stage has been completed having consideration to the approved developments and demonstrates:

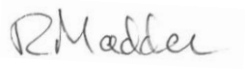
- That the future intersection performance of Mamre Road with Aspect Industrial Estate, will operate with acceptable delays and operation (LoS B) during both the AM and PM peak period.
- The midblock operation of Mamre Road, will operate at a LoS D and below the 1,400veh/hr LoS E threshold. Notwithstanding this, it is noted that:
  - There are multiple examples of midblock flows within Western Sydney and Sydney more generally with flows above the midblock thresholds nominated in the RTA Guide.
  - Transport planning principles are predicated on route choice of road users, that take into account prevailing road network conditions and adapt driving behaviour and route choice assumptions in response to these conditions. Therefore, it is wholly reasonable to expect that there will be some redistribution of background traffic due to the delays associated with the Stage 1 roadworks, regardless of what is occurring in the Precinct itself.
- The Concept Masterplan approval included the delivery of a critical component of infrastructure that supports the Precinct in the form of the signalised intersection. Any further upgrades to support the Mamre Road Precinct more generally, relies on upgrades that fall outside the responsibility and commercial realties of a single developer.

  With consideration to the Mamre Road Stage 2 project, the timing for delivery is also unable to be reasonably affected by a proponent. However, it is expected that should all the developments currently approved actually be realised in advance of the upgrade, that it would not be for an extended period. With the alternative routes available for redistribution of through traffic, it is not anticipated that the midblock capacity of Mamre Road would operate above the thresholds acceptable for this location.

On this basis, it is concluded that the requirements of the conditions have been adequately addressed. That is, the proposed stage would not directly trigger the need for upgrades, and the mechanisms in which the required Precinct-wide upgrades will be delivered have been identified.

We trust the above is of assistance and please don't hesitate to contact the undersigned or to discuss further.

Yours sincerely,



Rebecca Butler-Madden

Principal Transport Planner

E: rebecca.bmadden@asongroup.com.au

Attachment 1 – Response to Conditions

The below details the response to each of the requirements for Condition A14.

CONDITION A14. FUTURE INFRASTRUCTURE REQUIREMENTS

<table>
<tr><th>Item</th><th>Condition</th><th>Response</th></tr>
<tr><td>(a)</td><td>detail traffic volumes from all operating stages of the Concept Proposal;</td><td>Warehouse 1 recently became operational (occupied by CEVA Logistics). A survey undertaken of the operational Warehouse 1 demonstrated that the traffic generation is currently only at 58% and 32% in the AM and PM peak hours of that assessed for the development consent. The daily volumes are at 24%.
Warehouse 1 Traffic Volumes<table><tr><th>Period</th><th>Assessed for DA</th><th>Current CEVA Volumes</th></tr><tr><td>AM</td><td>78</td><td>33</td></tr><tr><td>PM</td><td>81</td><td>55</td></tr><tr><td>Daily</td><td>986</td><td>238</td></tr></table></td></tr>
<tr><td>(b)</td><td>include background traffic volumes from key roads within the MRP, including Mamre Road;</td><td>In terms of the Site, Mamre Road is the key road. Baseline volumes are provided below.
Baseline Traffic Volumes<table><tr><th>Direction</th><th>AM</th><th>PM</th></tr><tr><td>Mamre Road Northbound</td><td>778</td><td>777</td></tr><tr><td>Mamre Road Southbound</td><td>817</td><td>925</td></tr></table></td></tr>
<tr><td>(c)</td><td>assess the operating performance of key intersections in the MRP, including Mamre Road and Access Road 1;</td><td>The modelling assessment undertaken for the approved Concept Masterplan has been updated following approval of developments within the MRP. As detailed within this letter, the intersection is still anticipated to operate at a LOS B (i.e. demonstrating acceptable performance and spare capacity).</td></tr>
<tr><td>(d)</td><td>detail the current level of approved development within the MRP, including total approved GFA;</td><td>The approved developments are detailed in Table 2. The total GFA associated with the approved warehouse developments is 684,446m^2 GFA.</td></tr>
<tr><td>(e)</td><td>consider consistency with the latest approved Concept Proposal traffic volumes;</td><td>The Warehouse 4 Proposal provides for a decrease in GFA of approximately 4,000m^2 under the approved SSD-10448 MOD-3[1] Masterplan and, as such, the traffic generation will also reduce with that previously assessed for the current MOD-3 Masterplan.</td></tr>
<tr><td>(f)</td><td>demonstrate the road network has sufficient capacity to accommodate the proposed stage of the Concept Proposal, and if the proposed stage would trigger the need for any road upgrades, including those identified in the traffic modelling for the MRP;</td><td>As detailed in this letter, the key intersection is expected to continue to operate satisfactorily.
Further, Warehouse 8 is not anticipated to materially impact the midblock capacity of Mamre Road. The analysis demonstrates that midblock capacities are expected to remain within the thresholds identified by the relevant guidance. Further, noting that there are alternative routes in the network for background traffic, it can reasonably be expected that there would be some redistribution of traffic seeking to avoid the Stage 1 upgrade works (i.e. background volumes through the Precinct would reduce).
Finally, the Mamre Road Stage 2 upgrade project is already proposed by TfNSW. Therefore, one of the key upgrades required to support development of the wider MRP (and broader growth in the WSEA) has already been identified.</td></tr>
<tr><td>(g)</td><td>if road upgrades are required to support the proposed stage, identify the timing and</td><td>As detailed in this letter, no further upgrades are required to support the Proposal specifically.</td></tr>
</table>

[1] https://www.planningportal.nsw.gov.au/major-projects/projects/aspect-industrial-estate-modification-3

	mechanisms to contribute to the delivery of the required road upgrades.	The stage 2 upgrade to Mamre Road is being planned for by TfNSW, which provides for the future upgrades required to support the MRP (and broader growth in the WSEA). It is concluded that the requirements of the conditions have been adequately addressed. That is, the proposed stage would not directly trigger the need for upgrades, and the mechanisms in which the required Precinct-wide upgrades will be delivered have been identified.

The below details the response to each of the requirements for Condition B1.

CONDITION B1. TRAFFIC IMPACT ASSESSMENT

Item	Condition	Response
B1	Future DAs shall be accompanied by a traffic impact assessment (TIA). The TIA must:	Provided in the previously submitted document: • Ason Group, *Transport Assessment, Warehouse 8 – Aspect Industrial Estate, 804-882, Mamre Road, Kemps Creek*, Version 6, 04/04/2024 (Ason WH8 TA)
(a)	assess the impacts on the safety and capacity of the surrounding road network and access points during construction and operation of the relevant stage in accordance with relevant TfNSW guidelines;	The Ason WH8 TA provided an assessment of the surrounding road network. The assessment has been updated following the Request for Information from DPHI within this letter to include the updated list of approved developments.
(b)	include traffic monitoring data collected under Condition D3 and incorporate the relevant findings into this assessment;	As detailed in the above table, recent surveys of the Warehouse 1 (CEVA) development demonstrates that the current operational traffic generation is less than previously assessed. Therefore, the conclusions previously reached remain valid.
(c)	demonstrate internal roads and car parking complies with relevant Australian Standards and the car parking rates in Condition B2;	See Section 5 of the Ason WH8 TA.
(d)	demonstrate the Mamre Road/Access Road 1 intersection can accommodate operational traffic associated with the relevant stage;	As per the updated assessment detailed within this letter, the volumes associated with the approved developments alongside Warehouse 2 and the proposed Warehouse 8, can be accommodated by the intersection.
(e)	detail the scope and timing of any required road or intersection upgrades to service the relevant stage if the assessment under sub-clause (d) identifies that additional upgrades are required; and	As per the above, no further upgrades are considered necessary to support Warehouse 8.
(f)	detail measures to promote non-car travel modes, including a Sustainable Travel Plan identifying pedestrian and cyclist facilities to service the relevant stage of the development.	See Appendix G of the Ason WH8 TA.

Attachment 2 – SIDRA Summaries

MOVEMENT SUMMARY

Site: 2 [[ID: 1] Mamre x Mirvac Access - AM (Site Folder: 2026)]

Mamre Road x Mirvac Access
Site Category: Proposed Interim
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Mamre Rd														
2	T1	1046	182	1101	17.4	0.414	5.8	LOS A	9.8	78.7	0.34	0.30	0.34	76.0
3	R2	148	28	156	18.9	* 0.571	57.8	LOS E	8.6	69.9	0.97	0.81	0.97	32.7
Approach		1194	210	1257	17.6	0.571	12.2	LOS A	9.8	78.7	0.41	0.37	0.41	68.9
East: Mirvac Access														
4	L2	66	24	69	36.4	0.110	15.3	LOS B	1.2	10.9	0.36	0.64	0.36	47.4
6	R2	148	56	156	37.8	* 0.584	67.0	LOS E	4.7	43.1	1.00	0.80	1.03	39.2
Approach		214	80	225	37.4	0.584	51.1	LOS D	4.7	43.1	0.80	0.75	0.83	40.7
North: Mamre Rd														
7	L2	287	55	302	19.2	0.236	9.3	LOS A	3.1	25.4	0.24	0.66	0.24	64.8
8	T1	1052	206	1107	19.6	* 0.591	19.4	LOS B	20.8	170.2	0.70	0.64	0.70	64.9
Approach		1339	261	1409	19.5	0.591	17.2	LOS B	20.8	170.2	0.60	0.64	0.60	64.9
All Vehicles		2747	551	2892	20.1	0.591	17.7	LOS B	20.8	170.2	0.54	0.53	0.54	63.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Mamre Rd												
P1	Full	10	11	54.2	LOS E	0.0	0.0	0.95	0.95	240.4	223.5	0.93
East: Mirvac Access												
P2	Full	10	11	17.1	LOS B	0.0	0.0	0.53	0.53	197.9	217.0	1.10
North: Mamre Rd												
P3	Full	10	11	54.2	LOS E	0.0	0.0	0.95	0.95	240.8	224.0	0.93
All Pedestrians		30	32	41.8	LOS E	0.0	0.0	0.81	0.81	226.4	221.5	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 2 [[ID: 2] Mamre x Mirvac Access - PM (Site Folder: 2026)]

Mamre Road x Mirvac Access
Site Category: Proposed Interim
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Mamre Rd														
2	T1	1006	144	1059	14.3	0.429	9.7	LOS A	12.4	97.7	0.44	0.40	0.44	73.1
3	R2	80	30	84	37.5	* 0.581	66.1	LOS E	5.0	46.1	1.00	0.80	1.02	30.3
Approach		1086	174	1143	16.0	0.581	13.8	LOS A	12.4	97.7	0.48	0.43	0.48	68.7
East: Mirvac Access														
4	L2	147	25	155	17.0	0.221	17.8	LOS B	3.2	25.5	0.43	0.67	0.43	50.0
6	R2	324	56	341	17.3	* 0.616	58.7	LOS E	9.5	76.2	0.98	0.82	0.98	42.2
Approach		471	81	496	17.2	0.616	45.9	LOS D	9.5	76.2	0.80	0.77	0.80	43.7
North: Mamre Rd														
7	L2	120	43	126	35.8	0.108	8.9	LOS A	0.9	8.4	0.18	0.63	0.18	64.8
8	T1	1142	159	1202	13.9	* 0.621	20.9	LOS B	23.5	183.6	0.73	0.66	0.73	64.2
Approach		1262	202	1328	16.0	0.621	19.8	LOS B	23.5	183.6	0.68	0.66	0.68	64.3
All Vehicles		2819	457	2967	16.2	0.621	21.9	LOS B	23.5	183.6	0.62	0.59	0.62	61.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Mamre Rd												
P1	Full	10	11	54.2	LOS E	0.0	0.0	0.95	0.95	240.4	223.5	0.93
East: Mirvac Access												
P2	Full	10	11	17.6	LOS B	0.0	0.0	0.54	0.54	198.4	217.0	1.09
North: Mamre Rd												
P3	Full	10	11	54.2	LOS E	0.0	0.0	0.95	0.95	240.8	224.0	0.93
All Pedestrians		30	32	42.0	LOS E	0.0	0.0	0.81	0.81	226.6	221.5	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Attachment 3 – Flow Diagrams

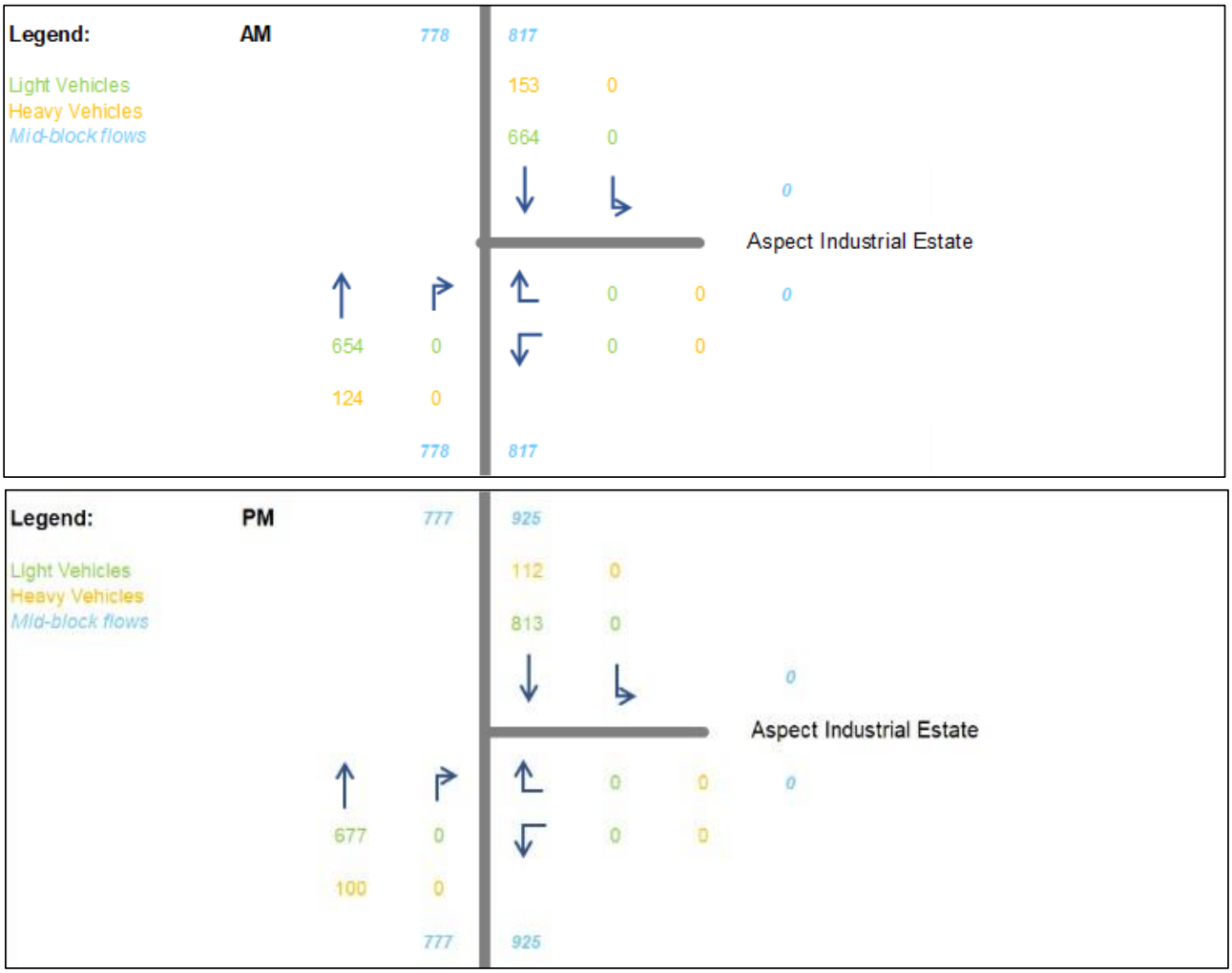


Figure 3: 2022 Baseline Midblock Volumes

Figure 4: Approved Development Traffic Volumes

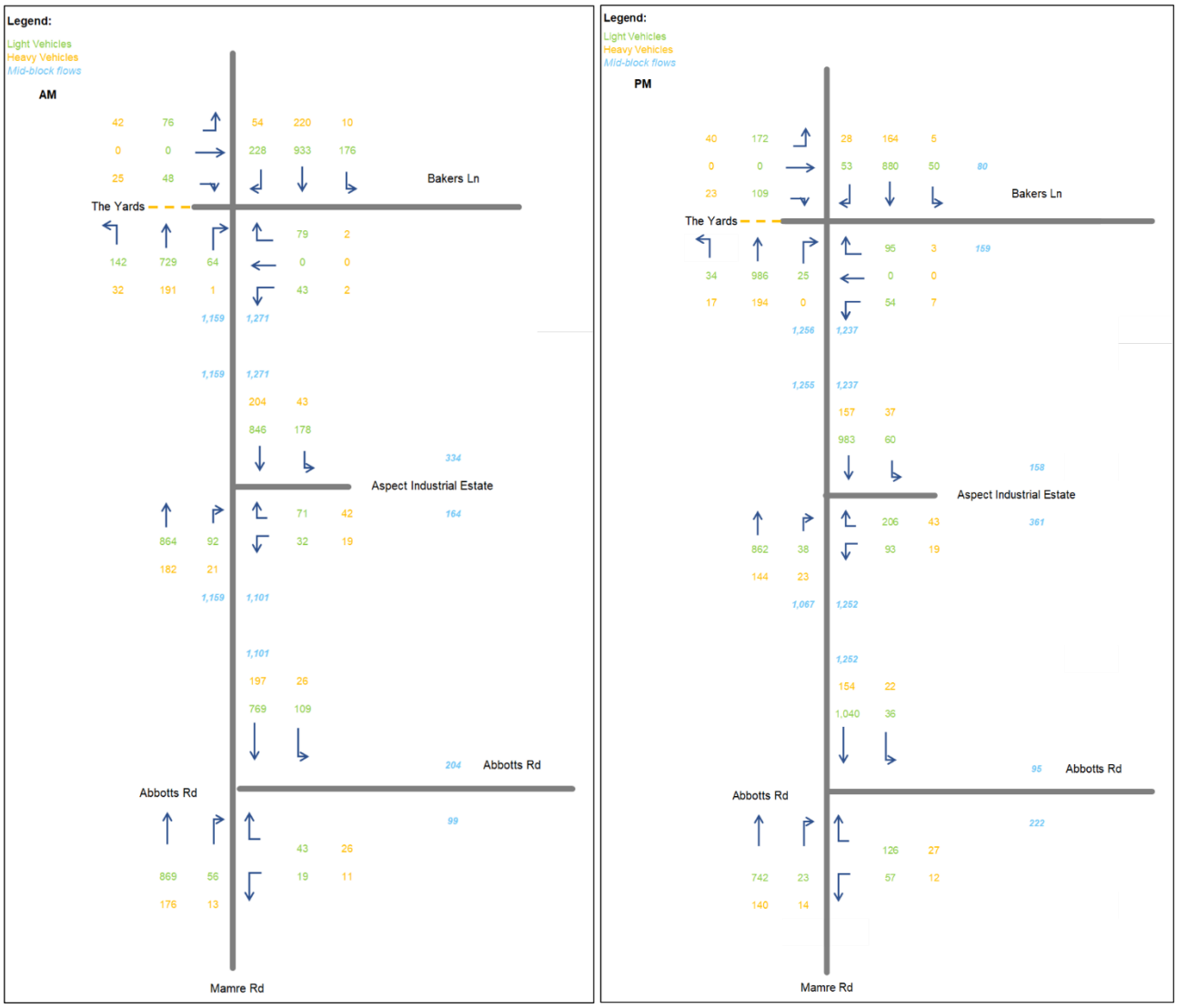


Figure 5: Base Volumes plus Approved Developments (as per Table 2)

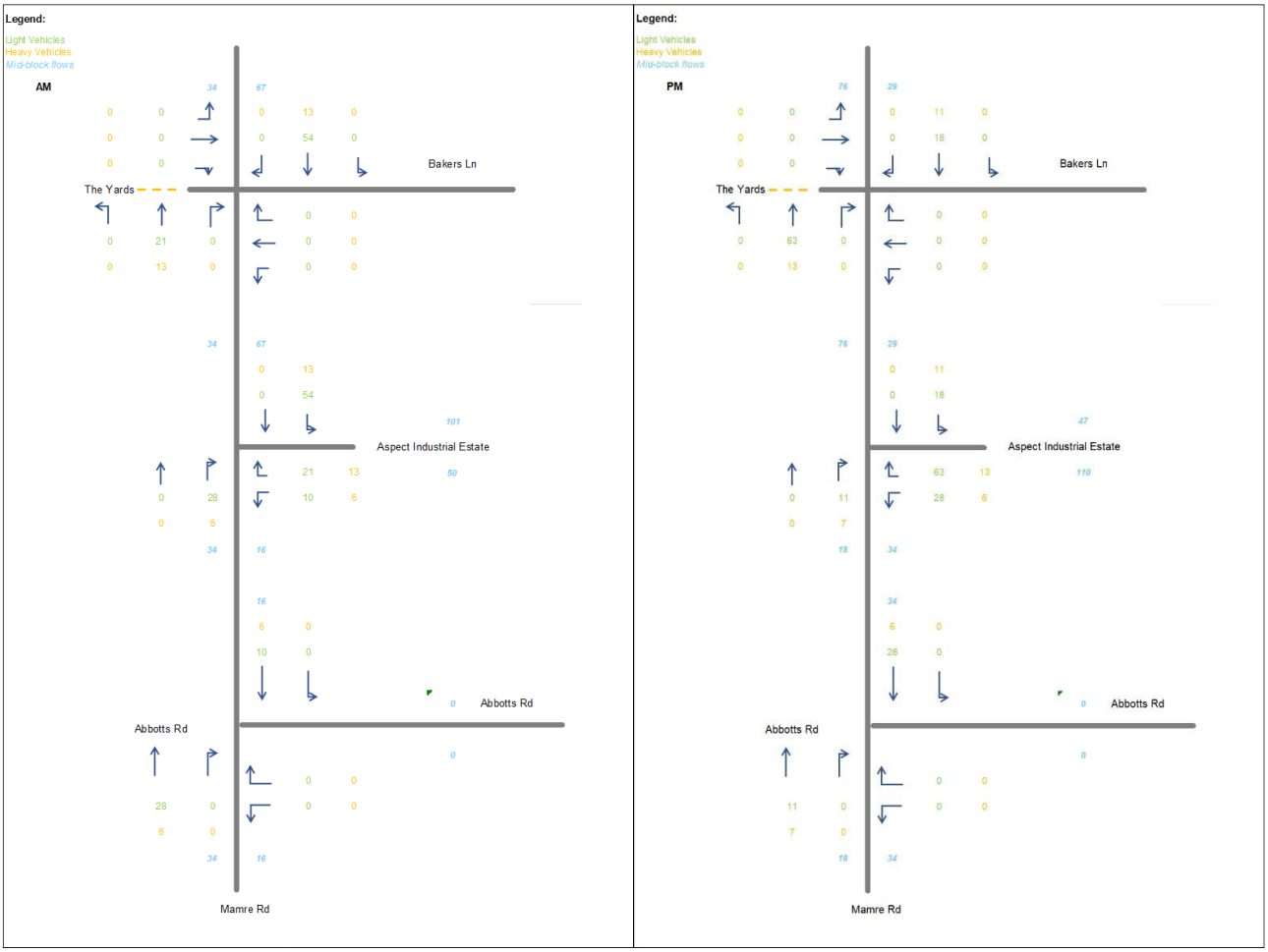


Figure 6: Warehouse 2 and Warehouse 8 Traffic Volumes

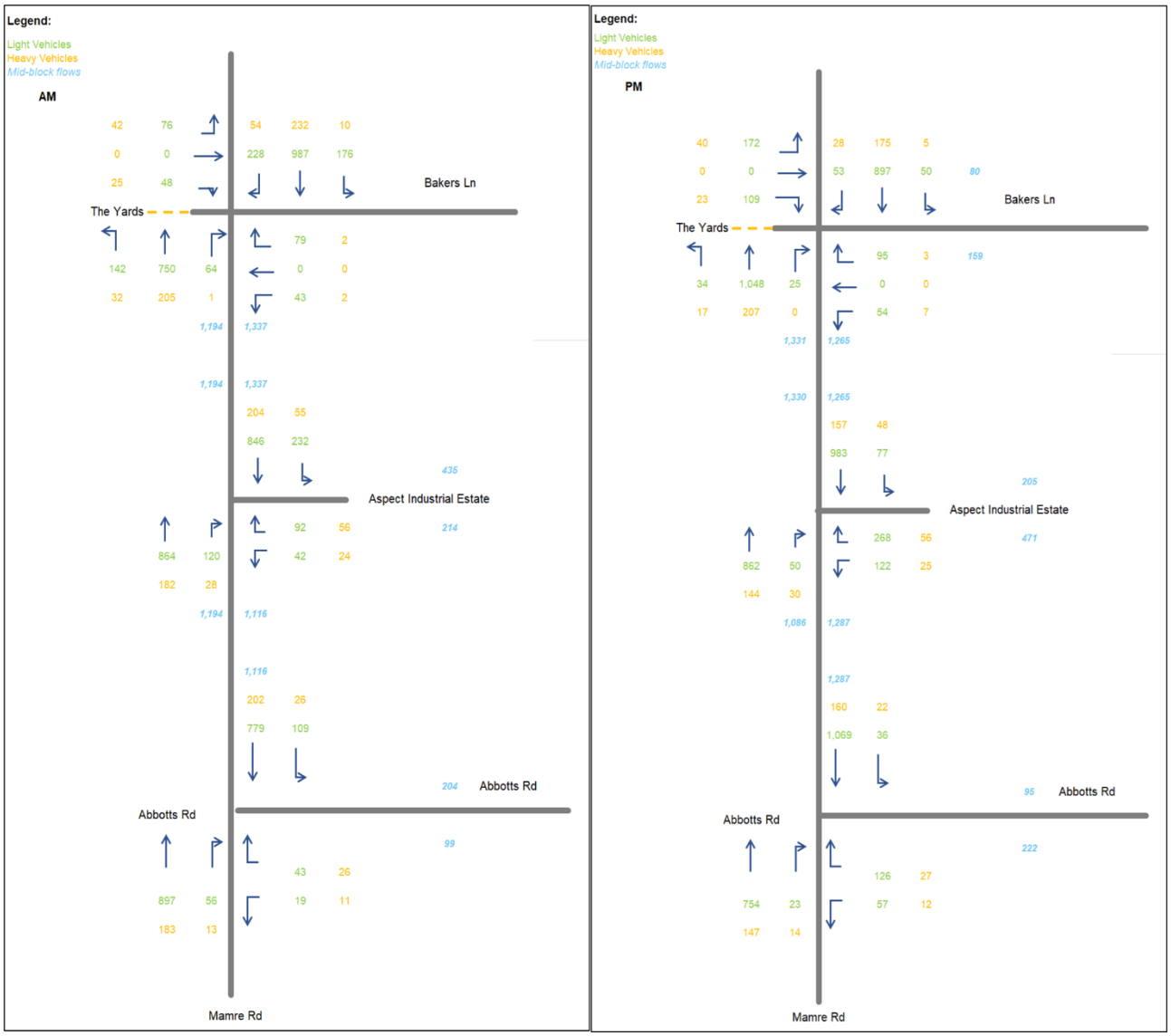


Figure 7: Total Future Mamre Road Traffic Flows

Attachment 2: SIDRA Outputs

MOVEMENT SUMMARY

Site: 2 [[ID: 2] Mamre x Mirvac Access - 0500 PM (Site Folder: 2026 - Warehouse 8, Aspect Industrial Estate – 2026 Baseline)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Mamre Road x Mirvac Access
Site Category: Proposed Interim
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Mamre Rd															
2	T1	All MCs	972	13.8	972	13.8	0.387	9.0	LOS A	10.7	83.3	0.41	0.37	0.41	73.7
3	R2	All MCs	72	38.2	72	38.2	* 0.538	66.6	LOS E	4.2	39.3	0.99	0.78	0.99	29.8
Approach			1043	15.4	1043	15.4	0.538	12.9	LOS A	10.7	83.3	0.45	0.40	0.45	69.4
East: Mirvac Access															
4	L2	All MCs	128	17.2	128	17.2	0.185	17.6	LOS B	2.3	18.8	0.38	0.66	0.38	50.1
6	R2	All MCs	292	17.3	292	17.3	* 0.553	58.9	LOS E	8.1	64.8	0.97	0.81	0.97	42.0
Approach			420	17.3	420	17.3	0.553	46.3	LOS D	8.1	64.8	0.79	0.76	0.79	43.5
North: Mamre Rd															
7	L2	All MCs	114	38.0	114	38.0	0.099	8.6	LOS A	0.8	7.0	0.16	0.63	0.16	63.9
8	T1	All MCs	1174	11.5	1174	11.5	* 0.576	19.4	LOS B	21.5	165.0	0.69	0.62	0.69	65.5
Approach			1287	13.8	1287	13.8	0.576	18.5	LOS B	21.5	165.0	0.64	0.62	0.64	65.3
All Vehicles			2751	15.0	2751	15.0	0.576	20.6	LOS B	21.5	165.0	0.59	0.56	0.59	62.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Mamre Rd												
P1	Full	10	11	54.2	LOS E	0.0	0.0	0.95	0.95	220.8	200.0	0.91
East: Mirvac Access												
P2	Full	10	11	16.5	LOS B	0.0	0.0	0.53	0.53	183.2	200.0	1.09
North: Mamre Rd												
P3	Full	10	11	54.2	LOS E	0.0	0.0	0.95	0.95	220.8	200.0	0.91
All Pedestrians		30	32	41.6	LOS E	0.0	0.0	0.81	0.81	208.3	200.0	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 2 [[ID: 2] Mamre x Mirvac Access - 0500 PM (Site Folder: 2026 - Warehouse 8, Aspect Industrial Estate – IVE Group Fitout SSD MOD)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Mamre Road x Mirvac Access
Site Category: Proposed Interim
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Mamre Rd															
2	T1	All MCs	972	13.8	972	13.8	0.396	10.1	LOS A	11.3	88.4	0.44	0.39	0.44	73.0
3	R2	All MCs	75	36.6	75	36.6	* 0.555	66.8	LOS E	4.4	40.7	1.00	0.78	1.01	29.8
Approach			1046	15.4	1046	15.4	0.555	14.2	LOS A	11.3	88.4	0.48	0.42	0.48	68.6
East: Mirvac Access															
4	L2	All MCs	154	15.1	154	15.1	0.214	18.3	LOS B	3.0	23.5	0.41	0.67	0.41	50.1
6	R2	All MCs	341	15.1	341	15.1	* 0.576	57.7	LOS E	9.3	73.8	0.96	0.81	0.96	42.5
Approach			495	15.1	495	15.1	0.576	45.5	LOS D	9.3	73.8	0.79	0.77	0.79	43.9
North: Mamre Rd															
7	L2	All MCs	118	36.6	118	36.6	0.102	8.6	LOS A	0.8	7.2	0.16	0.63	0.16	63.9
8	T1	All MCs	1174	11.5	1174	11.5	* 0.593	20.9	LOS B	22.3	171.6	0.71	0.64	0.71	64.5
Approach			1292	13.8	1292	13.8	0.593	19.8	LOS B	22.3	171.6	0.66	0.64	0.66	64.5
All Vehicles			2833	14.6	2833	14.6	0.593	22.2	LOS B	22.3	171.6	0.62	0.58	0.62	61.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

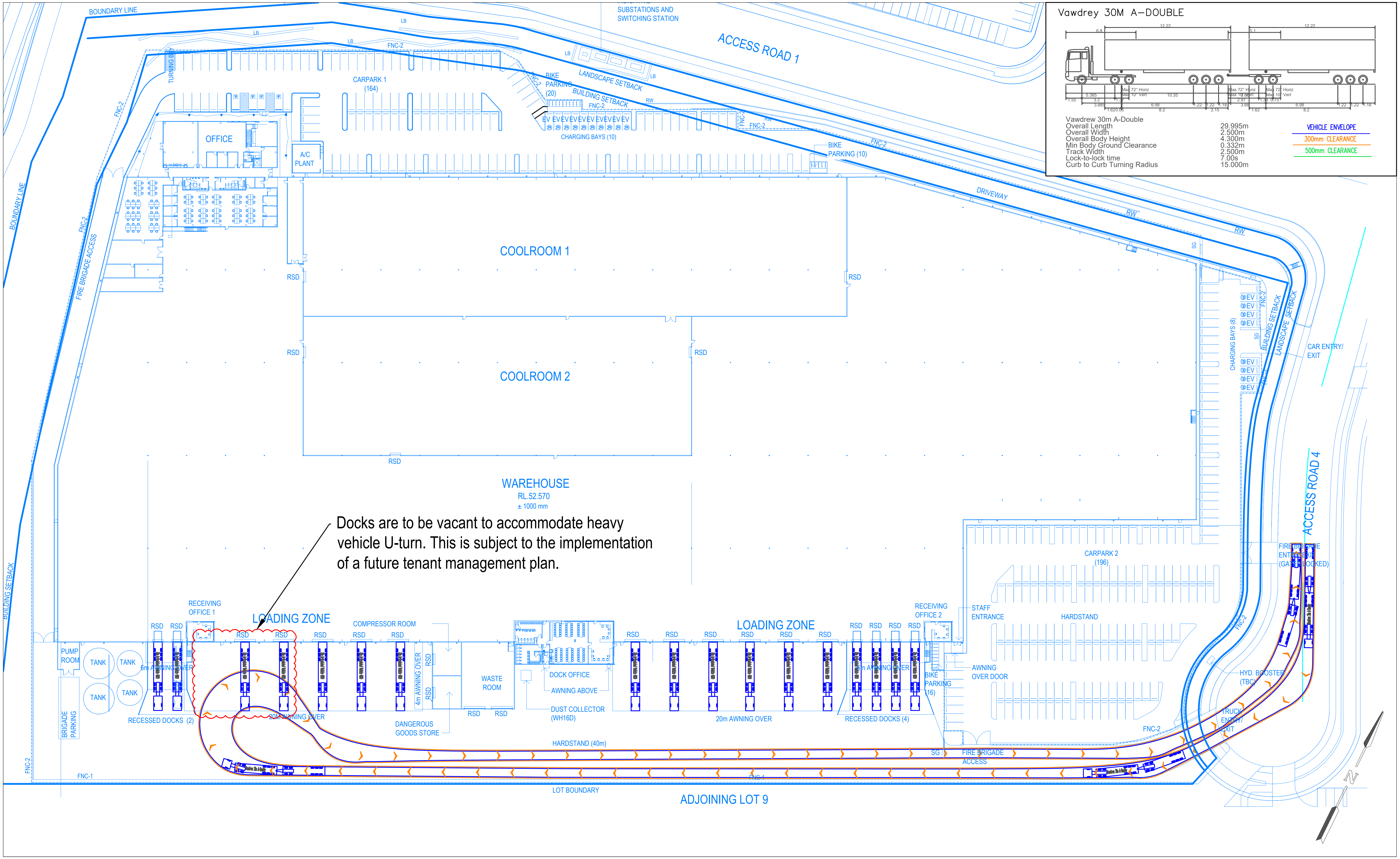
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Mamre Rd												
P1	Full	10	11	54.2	LOS E	0.0	0.0	0.95	0.95	220.8	200.0	0.91
East: Mirvac Access												
P2	Full	10	11	17.6	LOS B	0.0	0.0	0.54	0.54	184.3	200.0	1.09
North: Mamre Rd												
P3	Full	10	11	54.2	LOS E	0.0	0.0	0.95	0.95	220.8	200.0	0.91
All Pedestrians		30	32	42.0	LOS E	0.0	0.0	0.81	0.81	208.7	200.0	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Attachment 3: Vehicle Swept Paths



GENERAL NOTES

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DESIGNED	Alan Tan
PAPER SIZE	A3
APPROVED BY	R. Hazell
DATE	16.04.2025
SCALE	1:1000

0 10 20

CLIENT

Mirvac

PROJECT

2169

Warehouse 8, 804-882, Mamre Road, Kemps Creek

DOCUMENT INFORMATION

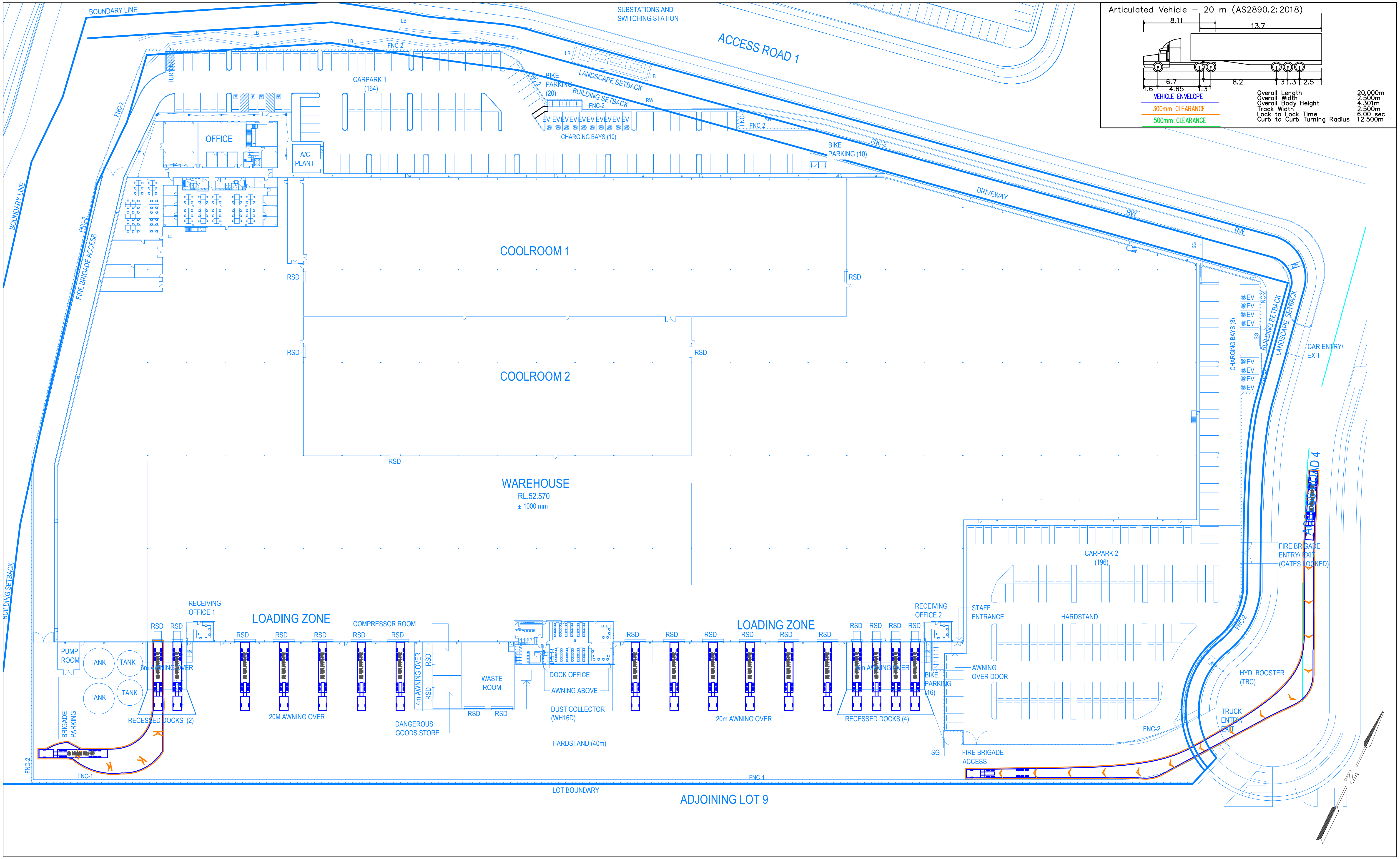
Swept Path Assessment

30m A-Double Circulation

FILE NAME	SHEET
AG2169-05-v04.dwg	AG01

asongroup
Suite 17.02, Level 17, 1 Castlereagh St
Sydney NSW 2000
info@asongroup.com.au

PLOT DATE: 16/04/2025 8:20:10 PM | CAD REFERENCE: C:\Users\Alan Tan\Ason Group\Ason Group Team Site - 2169\Projects\Design\AG2169-05-v04.dwg | Alan Tan |



Articulated Vehicle – 20 m (AS2890.2: 2018)
8.11
13.7
6.7
4.65
1.3
8.2
1.3 1.3 2.5
1.6
VEHICLE ENVELOPE
300mm CLEARANCE
500mm CLEARANCE
Overall Length 20.000m
Overall Width 2.500m
Overall Body Height 4.301m
Track Width 2.500m
Lock to Lock Time 6.00 sec
Curb to Curb Turning Radius 12.500m
BOUNDARY LINE
SUBSTATIONS AND SWITCHING STATION
ACCESS ROAD 1
LANDSCAPE SETBACK
BUILDING SETBACK
CARPARK 1 (164)
BIKE PARKING (20)
CHARGING BAYS (10)
OFFICE
A/C PLANT
BIKE PARKING (10)
DRIVEWAY
TURNING BAY
FIRE BRIGADE ACCESS
COOLROOM 1
COOLROOM 2
WAREHOUSE
RL.52.570
± 1000 mm
RSD
CHARGING BAYS (8)
CAR ENTRY/ EXIT
ACCESS ROAD 4
CARPARK 2 (196)
FIRE BRIGADE ENTRY/ EXIT (GATES LOCKED)
RECEIVING OFFICE 1
LOADING ZONE
COMPRESSOR ROOM
RECEIVING OFFICE 2
STAFF ENTRANCE
HARDSTAND
PUMP ROOM
TANK
6m AWNING OVER
BRIGADE PARKING
RECESSED DOCKS (2)
20M AWNING OVER
4m AWNING OVER
DANGEROUS GOODS STORE
WASTE ROOM
DOCK OFFICE
AWNING ABOVE
DUST COLLECTOR (WH16D)
HARDSTAND (40m)
20m AWNING OVER
RECESSED DOCKS (4)
BIKE PARKING (16)
AWNING OVER DOOR
HYD. BOOSTER (TBC)
TRUCK ENTRY/ EXIT
FIRE BRIGADE ACCESS
LOT BOUNDARY
ADJOINING LOT 9
BUILDING SETBACK

GENERAL NOTES

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Alan Tan	A3
APPROVED BY	DATE
R. Hazell	16.04.2025
SCALE	0 10 20
1:1000	

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PROJECT

2169

Warehouse 8, 804-882, Mamre Road, Kemps Creek

DOCUMENT INFORMATION

Swept Path Assessment

20m articulated vehicle entry

FILE NAME	SHEET
AG2169-05-v04.dwg	AG02

asongroup

Suite 17.02, Level 17, 1 Castlereagh St
Sydney NSW 2000
info@asongroup.com.au

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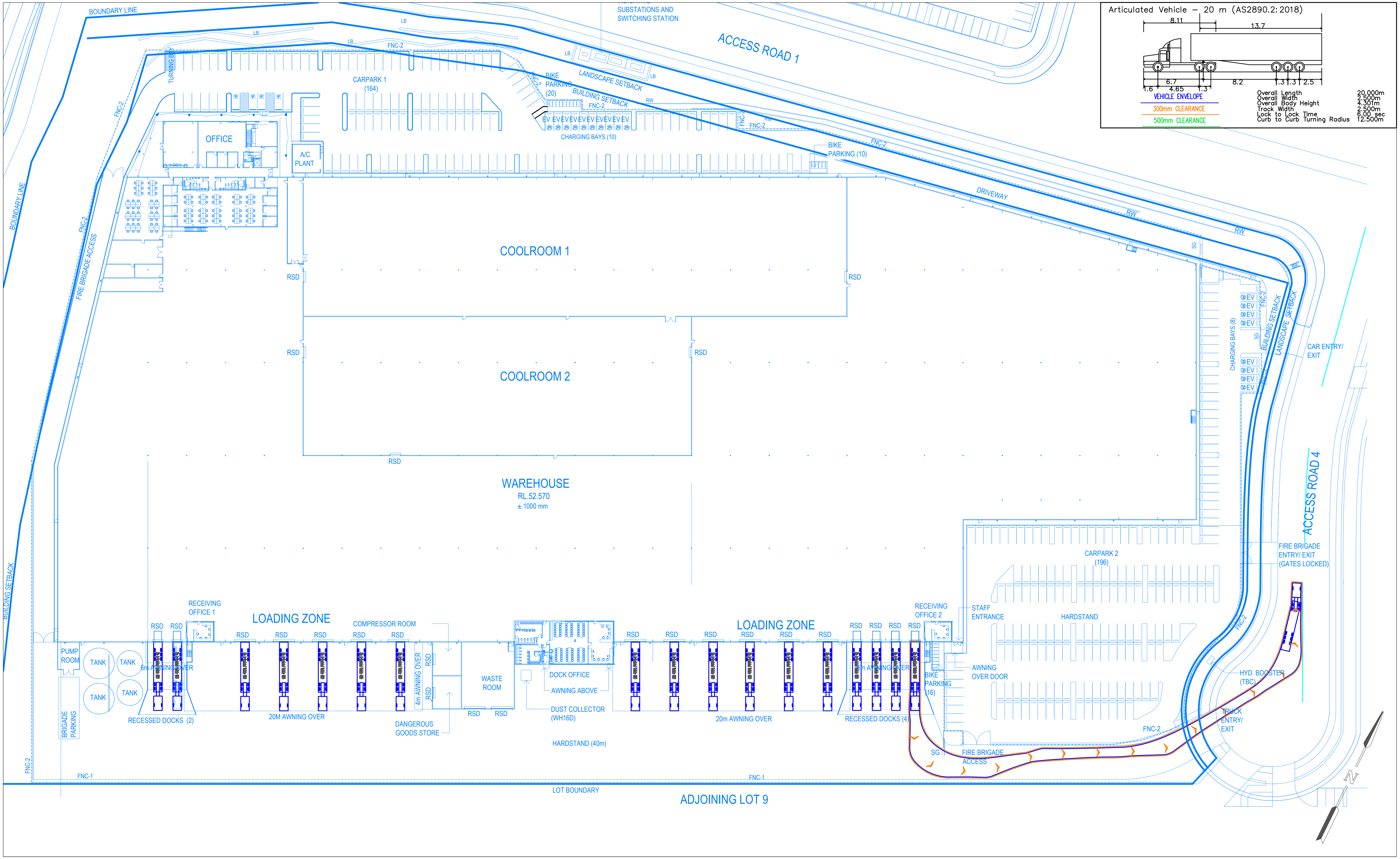

Articulated Vehicle – 20 m (AS2890.2:2018)
8.11
13.7
1.6
6.7
4.65
1.3
8.2
1.3 1.3 2.5
VEHICLE ENVELOPE
300mm CLEARANCE
500mm CLEARANCE
Overall Length 20.000m
Overall Width 2.500m
Overall Body Height 4.301m
Track Width 2.500m
Lock to Lock Time 6.00 sec
Curb to Curb Turning Radius 12.500m
BOUNDARY LINE
SUBSTATIONS AND SWITCHING STATION
ACCESS ROAD 1
LANDSCAPE SETBACK
BUILDING SETBACK
BIKE PARKING (20)
CARPARK 1 (164)
CHARGING BAYS (10)
OFFICE
A/C PLANT
BIKE PARKING (10)
DRIVEWAY
FIRE BRIGADE ACCESS
TURNING BAY
COOLROOM 1
COOLROOM 2
RSD
WAREHOUSE
RL.52.570
± 1000 mm
CHARGING BAYS (8)
CAR ENTRY/ EXIT
ACCESS ROAD 4
FIRE BRIGADE ENTRY/ EXIT (GATES LOCKED)
CARPARK 2 (196)
HARDSTAND
STAFF ENTRANCE
RECEIVING OFFICE 1
RECEIVING OFFICE 2
LOADING ZONE
COMPRESSOR ROOM
PUMP ROOM
TANK
6m AWNING OVER
4m AWNING OVER
20M AWNING OVER
20m AWNING OVER
RECESSED DOCKS (2)
RECESSED DOCKS (4)
BRIGADE PARKING
DANGEROUS GOODS STORE
WASTE ROOM
DOCK OFFICE
AWNING ABOVE
DUST COLLECTOR (WH16D)
HARDSTAND (40m)
BIKE PARKING (16)
AWNING OVER DOOR
HYD. BOOSTER (TBC)
TRUCK ENTRY/ EXIT
FIRE BRIGADE ACCESS
BUILDING SETBACK
LOT BOUNDARY
ADJOINING LOT 9
FNC-1
FNC-2
N

GENERAL NOTES

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Alan Tan	A3
APPROVED BY	**DATE**
R. Hazell	16.04.2025
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1:1000	0 10 20

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PROJECT

2169

Warehouse 8, 804-882, Mamre Road, Kemps Creek

DOCUMENT INFORMATION

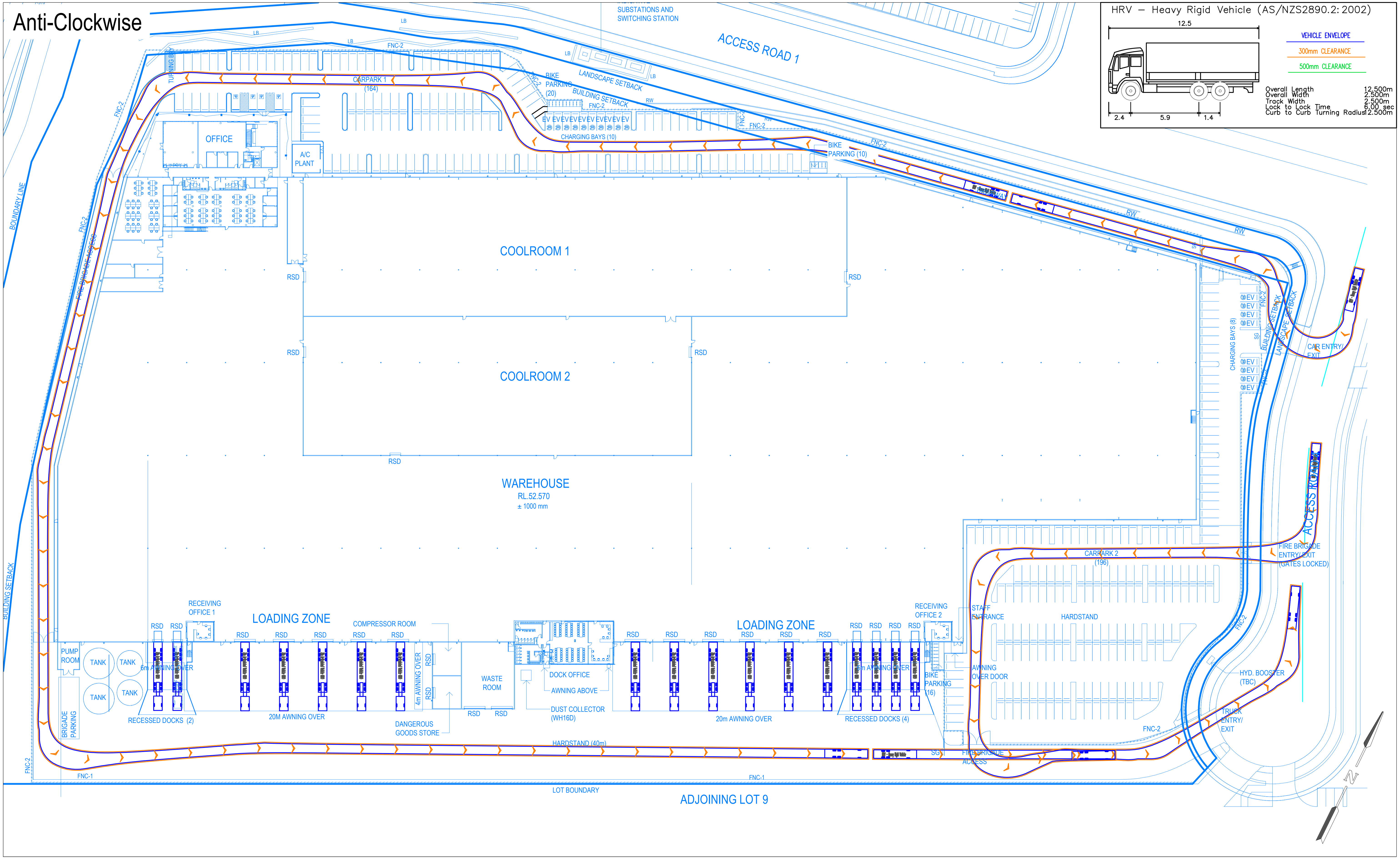
Swept Path Assessment

20m articulated vehicle exit

FILE NAME	SHEET
AG2169-05-v04.dwg	AG03

asongroup

Suite 17.02, Level 17, 1 Castlereagh St
Sydney NSW 2000
info@asongroup.com.au



GENERAL NOTES

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Alan Tan	A3	Mirvac
APPROVED BY	DATE	PROJECT
R. Hazell	16.04.2025	2169
SCALE	0 10 20	Warehouse 8, 804-882, Mamre Road, Kemps Creek
1:1000		

DOCUMENT INFORMATION

Swept Path Assessment

Fire Truck Circulation

FILE NAME	SHEET
AG2169-05-v04.dwg	AG04

asongroup
Suite 17.02, Level 17, 1 Castlereagh St
Sydney NSW 2000
info@asongroup.com.au

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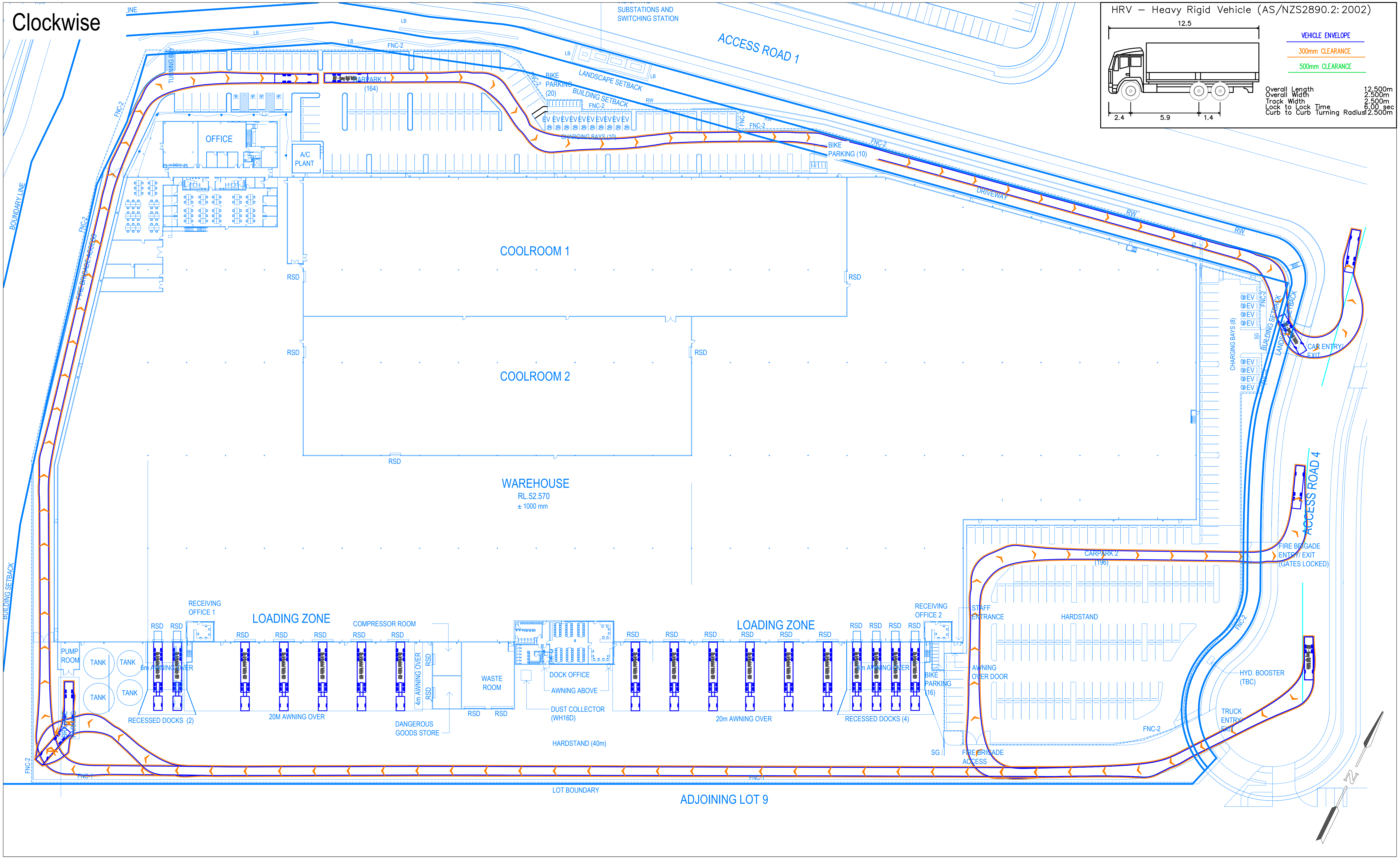

GENERAL NOTES	DESIGNED	PAPER SIZE	CLIENT	DOCUMENT INFORMATION	
This drawing is provided for information purposes only and should not be used for construction.	Alan Tan	A3	Mirvac	Swept Path Assessment	
	APPROVED BY	DATE	PROJECT	Fire Truck Circulation	
	R. Hazell	16.04.2025	2169		
	SCALE	0 10 20	Warehouse 8, 804-882, Mamre Road, Kemps Creek	FILE NAME	SHEET
	1:1000			AG2169-05-v04.dwg	AG05

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info@asongroup.com.au

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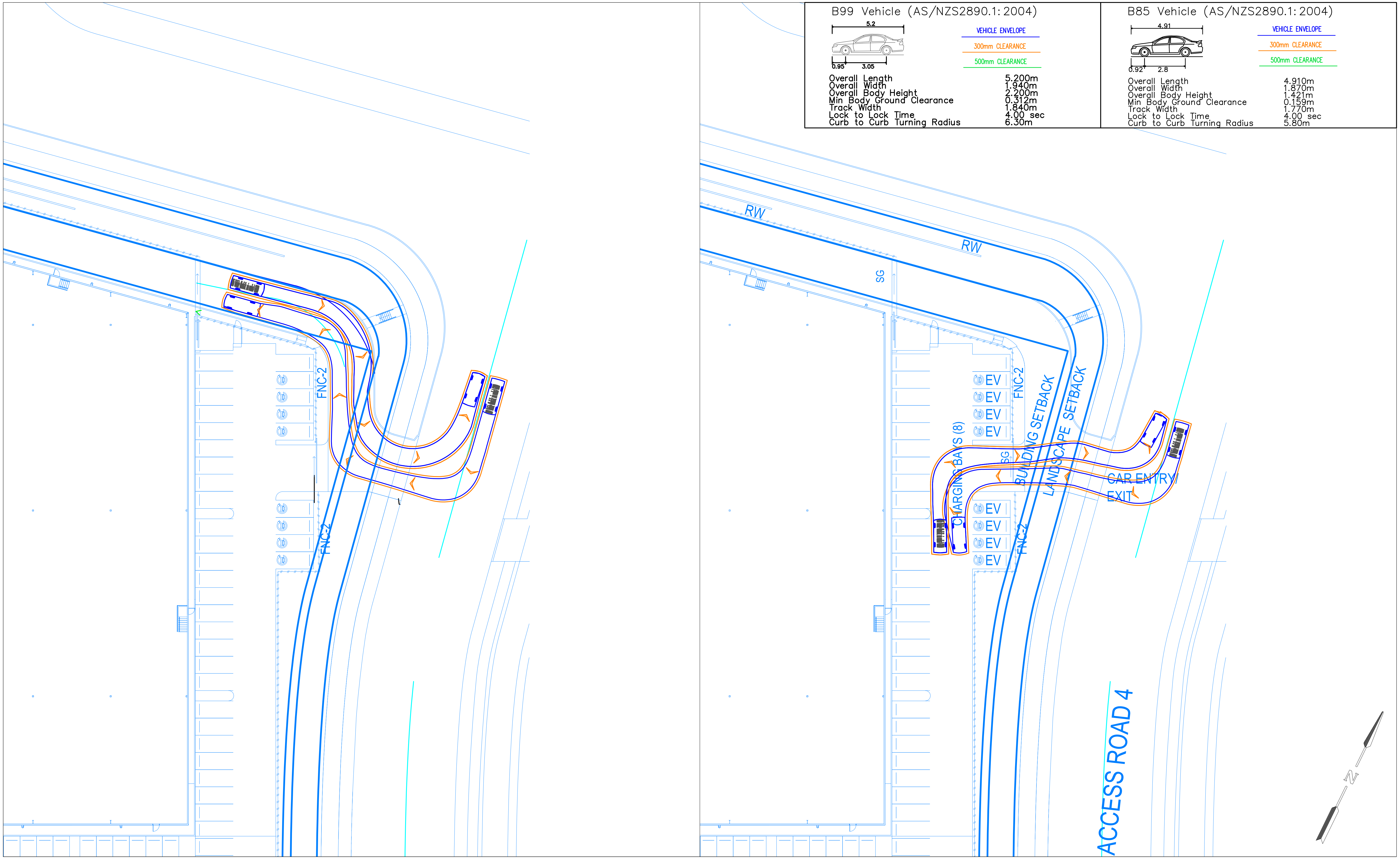

B99 Vehicle (AS/NZS2890.1: 2004)

5.2 / 0.95 / 3.05

VEHICLE ENVELOPE
300mm CLEARANCE
500mm CLEARANCE

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	2.200m
Min Body Ground Clearance	0.312m
Track Width	1.840m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	6.30m

B85 Vehicle (AS/NZS2890.1: 2004)

4.91 / 0.92 / 2.8

VEHICLE ENVELOPE
300mm CLEARANCE
500mm CLEARANCE

Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	5.80m

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Alan Tan	A3
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R. Hazell	16.04.2025
SCALE	0 10 20
1:500	

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2169

Warehouse 8, 804-882, Mamre Road, Kemps Creek

DOCUMENT INFORMATION

Swept Path Assessment

B99 and B85

FILE NAME	SHEET
AG2169-05-v04.dwg	AG06

asongroup

Suite 17.02, Level 17, 1 Castlereagh St
Sydney NSW 2000
info@asongroup.com.au