38°00'07.8"S
145°13'44.5"E

Warehouse Development: 7 Princes Hwy, Dandenong South

Traffic and Transport Assessment

17 June 2024
Prepared for Aliro

IMP2203006TTA03F03

Impact

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Contents

Tables

Figures

Appendices

1 IMPACT® Snap Shot

Development Proposition		
Location	38°00'07.8"S 145°13'44.5"E	7 Princes Highway, Dandenong South
Use		Warehouse & Ancillary Offices
Yield		Eight (8) Warehouse Tenancies Total GFA of 67,120. Total NFA of 65,629 sq.m
Car Parking		516 car parking spaces
Bicycle Parking		80 bicycle parking spaces

Statutory Controls

Particular Provisions

Clause 52.06 - Car Parking

Requirement vs Provision	997 spaces required. 516 spaces provided Warehouse parking provisions equate to a range of 0.58-1.47 spaces / 100 sqm which is below the statutory requirement.
Adequacy of Provision	Smaller single unit warehouse tenancies will generate a higher car parking demand rate when compared to larger single unit warehouses. Studies undertaken by **IMPACT**® of varying warehouse sizes indicates the proposed car parking provision rate exceeds the expected provision rate for each warehouse tenancy.
Design	The proposed car parking layout and accessways have been assessed and determined to have satisfied the relevant guidelines contained within Clause 52.06 and AS2890.1:2004

Clause 52.29 - Land Adjacent to the Principal Road Network

Requirement	The proposed development on the subject land contemplates an increase in traffic to a road in a Transport Zone 2 (Princes Highway), and the modification of the access intersection to accommodate B-Double truck combinations. A permit is therefore required.
Response	**The SIDRA analysis reveals that Princes Highway and its intersection with the site access will continue to operate within acceptable parameters once the proposed development is in operation.** Note: This assessment allows for the future development of the balance land. In total, an approximate gross floor area of 75,000sq.m for warehouse / industrial use is likely. **The assessment reveals that the proposal will have manageable impacts on the operation of the road and on public safety. Accordingly, the proposal satisfies the purpose of Clause 52.29, specifically:** — To ensure appropriate access to the Principal Road Network or land planned to form part of the Principal Road Network.

Clause 52.34 - Bicycle Facilities

Requirement vs Provision	No spaces required. 80 spaces provided
Design Consideration	The proposed bicycle parking layout has been assessed and determined to have satisfied the relevant design guidelines contained within Clause 52.34.

Clause 65.01 - Approval of an Application or Plan

Design Considerations (Loading Facilities)	The proposed development has been designed to cater for a combination of vehicles up to 26m in length (Equivalent to a 26m B-Double Combination). Access to hardstands for each individual tenancy may be restricted to smaller design vehicles as detailed in Section 4.4. The proposed loading arrangements have been assessed and determined to have satisfied the relevant design guidelines / principles contained within Clause 65.01 and AS 2890.2:2018 **Accordingly, it is considered that the proposal:** Provides adequate vehicle loading and unloading facilities, which will not result in associated amenity, traffic flow and road safety impacts.

Traffic Considerations

Traffic Generation	The subject site is expected to generate up to 350 vehicle trips in the AM and PM peak periods, respectively. The contemplated redevelopment of the balance of the subject site has also been considered and is expected to generate an additional 25 vehicle movements through the local road network.
Traffic Impact	The SIDRA analysis of the immediate road network was undertaken to assess post development conditions. The analysis revealed that the immediate road network is expected to operate under 'fair' conditions, with a D.O.S no greater than 0.84 Importantly: At the location of the proposed site access, there is ample capacity to comfortably accommodate the number of movements generated by the proposed development with ample spare capacity. The results confirm that the impact of the proposed development retains, within practical limitations, the level of safety and operational efficiency that would have existed without the development.

Conclusion

- The proposed development satisfies relevant statutory requirements as they relate to technical design of accessways, car parking spaces, and loading areas.
- Where the statutory requirements are not explicitly met, specifically in relation to the provision of car parking spaces, the development satisfies decision guidelines that allow for a reduction of car parking, with case studies validating the reduction sought.
- An assessment of the road network capacity reveals that the proposed development will have minimal impacts to the adjacent road network.
- We are satisfied that there are no traffic and transport grounds that should prohibit the issue of a permit.

2 Introduction

2.1 Engagement

IMPACT® have been engaged by Aliro to undertake a Transport Impact Assessment for the proposed warehouse development at 7 Princes Highway, Dandenong South.

2.2 Scope of Engagement

This Transport Impact Assessment has been prepared to accompany a town planning submission.

In preparing this assessment we have referenced the following:

- Development plans prepared by Concept Y Architecture;
- Greater Dandenong Planning Scheme, specifically:
  - Clause 52.06 - Car Parking
  - Clause 52.29 - Land Adjacent to the Principal Road Network
  - Clause 52.34 - Bicycle Facilities
  - Clause 65.01 - Approval of an Application or Plan
- Australian Standards AS2890.1:2004, AS2890.2:2018, AS2890.3:2015 & AS2890.6:2022

3 Existing Conditions

3.1 Location

The subject site is located on the southern side of Princes Highway as illustrated in Figure 1 and Figure 2.

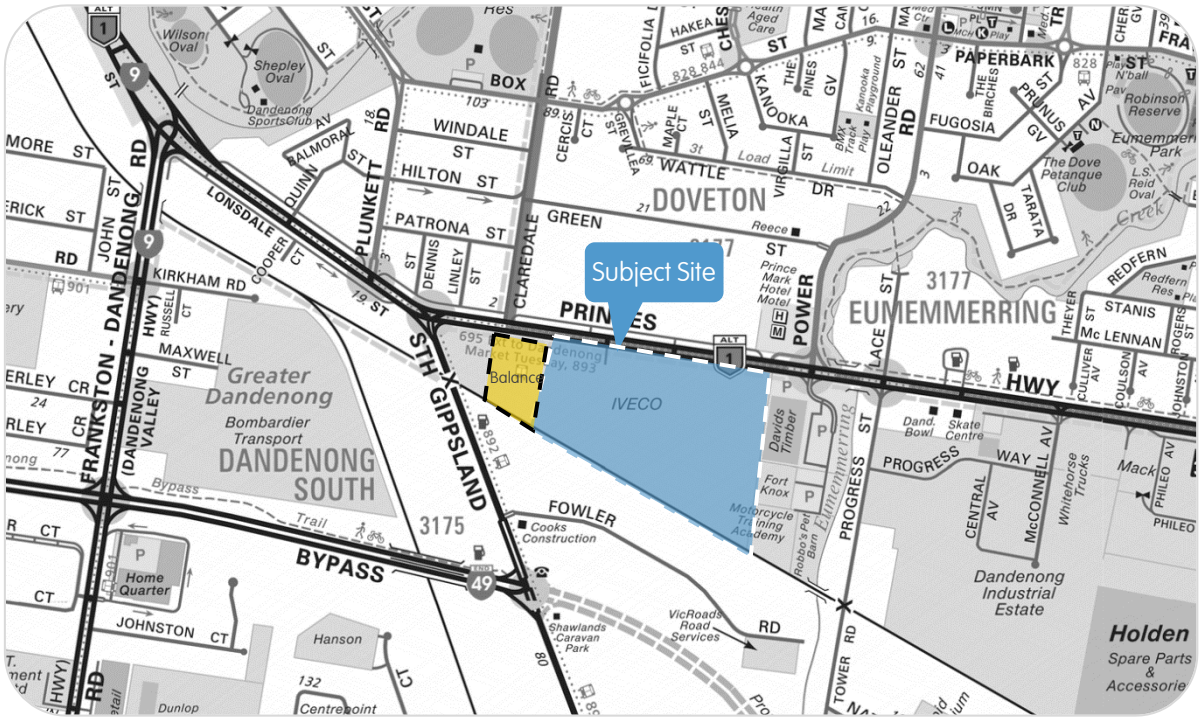


Figure 1 Location of Subject Site

Figure 2 Aerial View of Subject Site

The site is irregular in shape. Land uses surrounding the subject site are primarily industrial in nature.

The subject land currently sits within a broader site, addressed as 1-27 Princes Highway, Dandenong South, which operates as an industrial facility, owned by Iveco.

3.2 Planning Zone

The subject site is located within the Commercial Zone (C2Z) as illustrated in Figure 3.

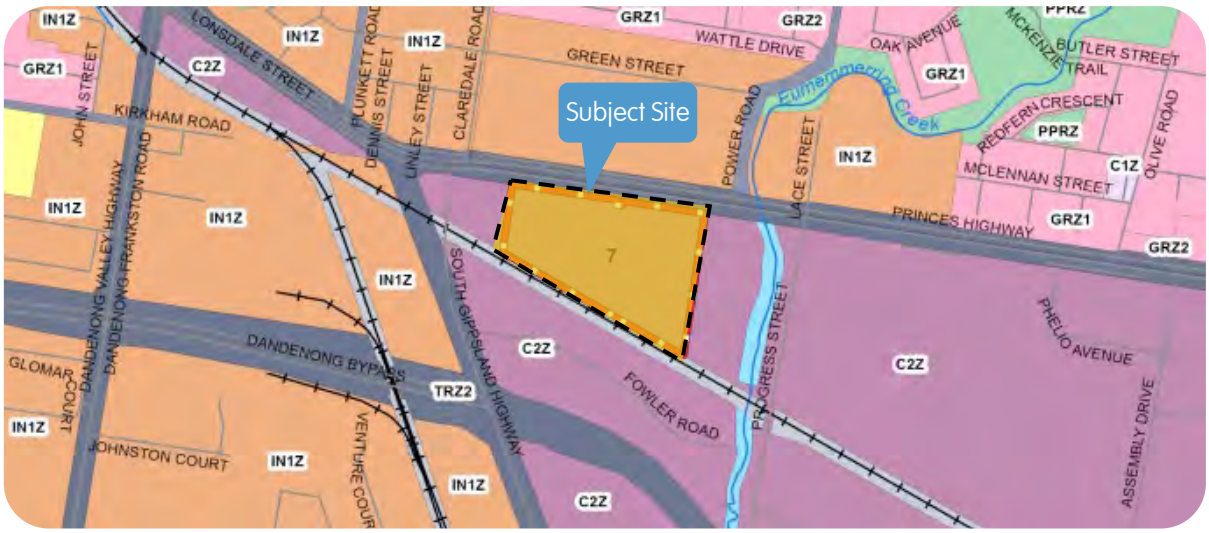


Figure 3 Land Use Planning Zone

The purpose of this zone is to, among other things, encourage commercial areas for offices, appropriate manufacturing and industries, bulky goods retailing, other retail uses, and associated business and commercial services.

3.3 Road Network

3.3.1 Princes Highway

Princes Highway is classified as a Road in Transport Zone 2 in the principal road network and is managed by the Department of Transport (DoT). A posted speed limit of 80km/hr applies to this section of road.

Adjacent the subject site, Princes Highway is aligned in an east-west direction and notably intersects with South Gippsland Freeway to the east and South Gippsland Highway to the west.

Along the site's frontage, Princes Highway consists of two (2) carriageways, each supporting three (3) lanes of vehicular traffic in each direction, with a bike lane on the southern (westbound) carriageway. A two-way service road is provided immediately adjacent the site.

Its typical cross-section is illustrated in Figure 4.

Figure 4 View of Princes Highway facing west adjacent the subject site

3.4 Public Transport

The site has convenient access to public transport, with bus route 893 operating along Princes Highway. A bus stop is located directly adjacent the subject site along Princes Highway.

The 893 bus route provides access to the Dandenong Transport Interchange where a broader selection of transport modes is available including heavy rail.

This interchange is located approximately 2km northwest of the subject site as shown in Figure 5.

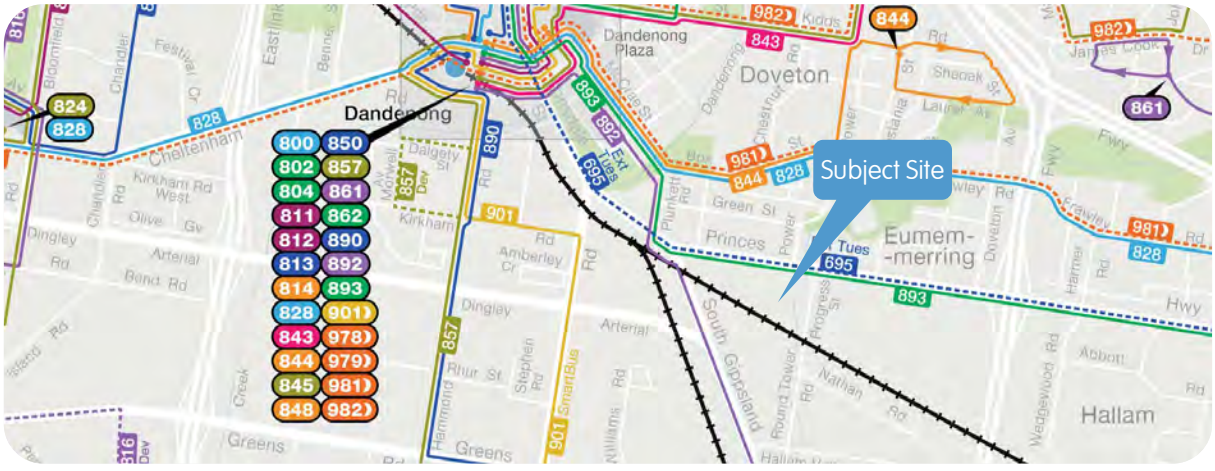


Figure 5 Public Transport Services

3.5 Bicycle Network

The site is easily accessible via Victoria's Strategic Cycling Corridors (SCC).

These corridors are important transport routes for cycling and are a subset of the Principal Bicycle Network (PBN). They are intended to support the needs of commuter trips (to work or education) and other important trips, such as to stations, shops or schools.

As demonstrated in Figure 6, a primary route exists along the rail corridor to the west and south of the site.

Figure 6 Strategic Cycling Corridors

Primary Cycling Routes provide the core network of Strategic Cycling Corridors that connect places of state significance - the central city, Metropolitan Activity Centres (MACs) and National Employment and Innovation Centres (NEICs) within metropolitan Melbourne.

This route will be accessible and in part supplemented by formal on-road bike lanes along Princes Highway which provide direct access to the subject site.

3.6 Existing Traffic Volumes

IMPACT® commissioned Trans Traffic Survey to undertake traffic movement counts for the intersections of Princes Highway and South Gippsland Highway, and the southern Service Lane at the site access point 1-27 Princes Highway on 17th March 2023.

Additional traffic movement data from the same day was sourced from the Department of Transport and Planning (DTP) SCATS database for the intersection of Princes Highway and Power Road.

This data revealed the following AM and PM peak traffic volumes as illustrated in Figure 7.

The peak periods were observed to occur at:

AM Peak: 7:30am - 8:30am;

PM Peak: 2:45pm - 3:45pm.

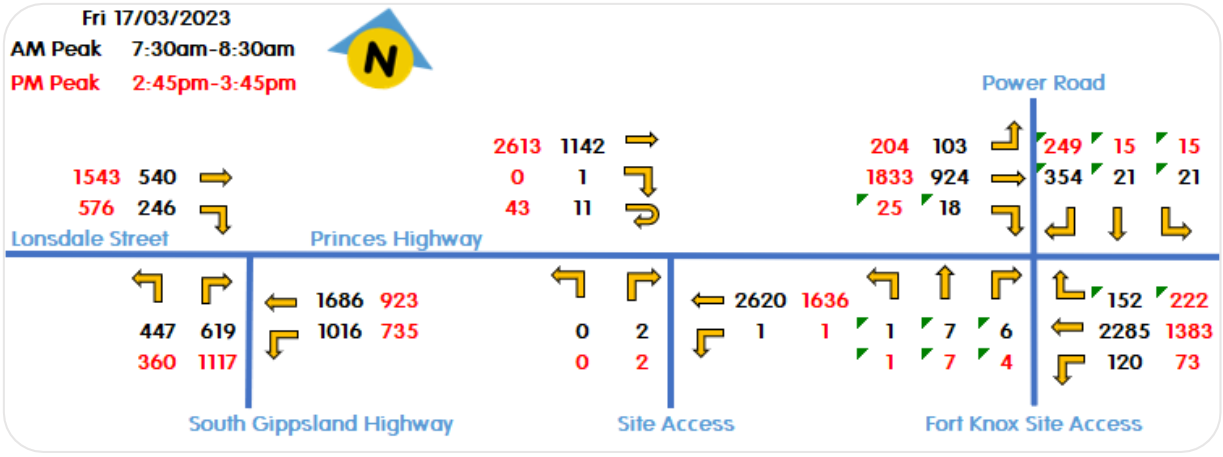
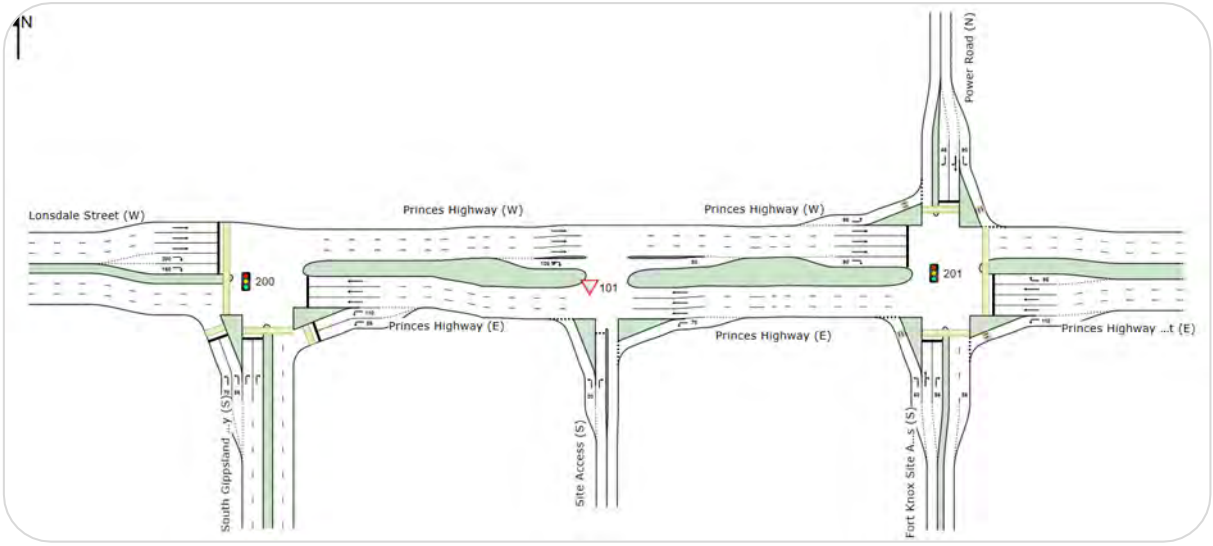


Figure 7 Princes Highway Intersections - Turning Movement Volumes

3.7 Intersection Analysis

The existing operation of nearby intersections along Princes Highway in the vicinity of the subject site was analysed using SIDRA Intersection 9.0. The modelled intersection configuration is shown below.



Critical outputs of this network analysis software are:

Degree of Saturation (D.O.S.) - Defined as the ratio of the volume of traffic observed making a movement compared to the maximum capacity for that movement. These are rated as follows:

D.O.S.	Rating
Up to 0.6	Excellent
0.6 to 0.7	Very Good
0.7 to 0.8	Good
0.8 to 0.9	Fair
0.9 to 1.0	Poor
Above 1.0	Very Poor

A Degree of Saturation (DoS) greater than 1.0 indicates oversaturated conditions.

When undertaking capacity analysis, consideration is best given to the practical degree of saturation, which is stated by Author of the SIDRA software as ranging between 0.8 to 0.95, specifically:

- At a signalised intersection: **0.90 to 0.95**
- At Unsignalised Intersection: **0.80 to 0.85**

95th Percentile (95%ile) Queue - Defined as the maximum queue length, in metres, that can be expected in 95% of observed queue lengths in the peak hour; and

Average Delay - Defined as the delay time, in seconds, which can be expected over all vehicles making a movement in the peak hour.

The result of the assessment of the performance of the corridor are summarised at Table 1 overleaf.

Table 1 Existing Intersection Performance

Peak	Approach	Leg	DoS	95th%ile Queue (m)	Delay (s)
Princes Highway / South Gippsland Highway					
AM Peak	South Gippsland Hwy	South	0.69	136	40
	Princes Highway	East	0.68	130	10
	Princes Highway	West	0.67	56	28
	Intersection		**0.69**	**136**	**20**
PM Peak	South Gippsland Hwy	South	0.82	250	38
	Princes Highway	East	0.80	144	33
	Princes Highway	West	0.83	170	36
	Intersection		**0.83**	**250**	**35**
Princes Highway / Site Access 1-27 Princes Highway					
AM Peak	Site Access	South	0.03	1	31
	Princes Highway	East	0.49	0	0
	Princes Highway	West	0.22	1	0
	Intersection		**0.49**	**1**	**0**
PM Peak	Site Access	South	0.02	1	27
	Princes Highway	East	0.31	0	0
	Princes Highway	West	0.49	2	0
	Intersection		**0.49**	**2**	**0**
Princes Highway / Power Road					
AM Peak	Fort Knox Site Access	South	0.08	3	61
	Princes Highway	East	0.91	403	51
	Power Road	North	0.94	109	83
	Princes Highway	West	0.35	88	14
	Intersection		**0.94**	**403**	**44**

Peak	Approach	Leg	DoS	95th%ile Queue (m)	Delay (s)
PM Peak	Fort Knox Site Access	South	0.08	3	59
	Princes Highway	East	0.81	157	39
	Power Road	North	0.57	60	55
	Princes Highway	West	0.77	238	25
	Intersection		**0.81**	**238**	**29**

The analysis reveals that the network of intersections is currently operating within the acceptable performance range, with the Princes Highway / Power Road observed as operating at the higher end of the saturation range during the AM peak, with a Degree of Saturation of 0.94.

A graphical representation of the above results is presented below.

AM PEAK - EXISTING

PM PEAK - EXISTING

4 Development Proposition

4.1 Use and Yield

It is planned to redevelop the subject site as a warehouse development.

The proposed development contemplates to provide eight (8) separate warehouse tenancies, with ancillary offices, with a total gross floor area (GFA) of 67,120 sq.m. A development summary is presented in Table 2.

Table 2 Development Summary

Warehouse Tenancy	Warehouse Net Floor Area (sqm)*	Ancillary Office Floor Area (sqm)	Total Net Floor Area (sqm)
Warehouse 1A	1,270	770	2,040
Warehouse 1B	3,180	260	3,440
Warehouse 2	1,200	230	1,430
Warehouse 3A	16,594	890	17,484
Warehouse 3B	6,127	490	6,617
Warehouse 3C	4,937	490	5,427
Warehouse 4	14,634	860	15,494
Warehouse 5	12,807	890	13,697
Total	**60,749**	**4,880**	**65,629**

*Areas associated with loading bays have been deducted from the GFA to obtain the net floor areas (NFA) presented above.

4.2 Parking

A total of **516 car parking spaces** are proposed, including eight (8) DDA spaces, at an average rate of 0.79 spaces per 100 sqm. The car parking allocation per tenancy is summarised below in Table 3.

Table 3 Car Parking Allocation

Warehouse Tenancy	Proposed Number of Car Spaces	Total NFA (sqm)	Spaces / 100sqm
Warehouse 1A	26	2,040	1.27
Warehouse 1B	33	3,440	0.96
Warehouse 2	21	1,430	1.47
Warehouse 3A	123	17,484	0.70
Warehouse 3B	64	6,617	0.97
Warehouse 3C	50	5,427	0.92
Warehouse 4	90	15,494	0.58
Warehouse 5	109	13,697	0.80
Overall	**516**	**65,629**	**0.79**

4.3 Bicycle Parking

A total of 80 bicycle parking spaces are proposed within the development, with 10 spaces proposed for each tenancy.

Bicycle parking spaces shall be provided in the form of horizontal spaces, designed to manufacturer standards.

In addition, each office tenancy is to be fitted with at least one (1) shower and change room area.

4.4 Loading Arrangements

Each warehouse tenancy's hardstand area is contemplated to comprise a series of at-grade roller shutter doors.

The hardstand area for warehouses 1a, 1b and 2 is designed to accommodate for vehicles up to 12.5 metres.

The hardstand area for warehouses 3, 4 and 5 is designed to accommodate for vehicles up to 26 metres.

4.5 Access Arrangements

The proposal development will utilise a shared private road to provide internal access to warehouses on the subject site.

In addition, it is proposed for Warehouse 1A to be provided separate entry and exit points to Princes Highway Service Lane, immediately west of the primary access point..

The access arrangements are illustrated in Figure 8.

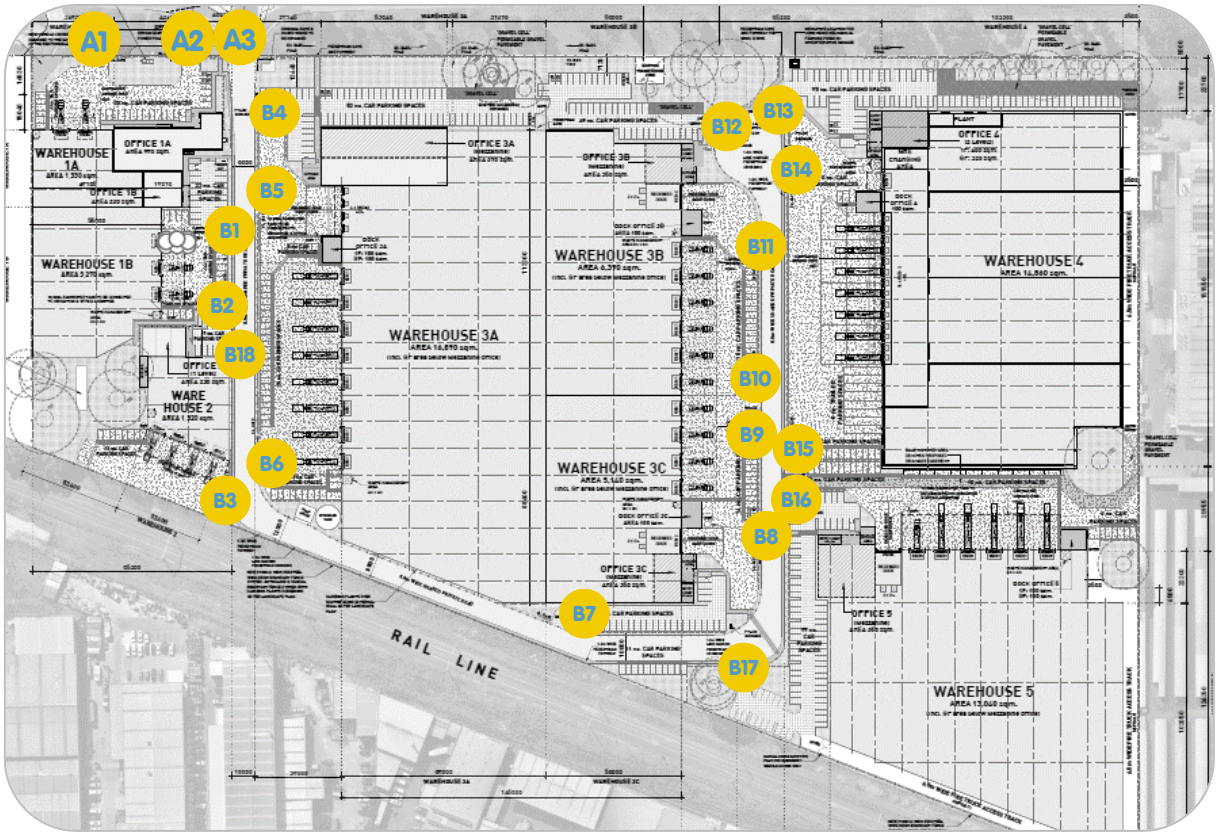


Figure 8 Site Access Arrangements

The access points from the road network will operate as follows:

- **Access A1** Entry for commercial & passenger vehicles to the Warehouse 1A from Princes Highway Service Lane;
- **Access A2** Exit for commercial & passenger vehicles to the Warehouse 1A from Princes Highway Service Lane; and
- **Access A3** Entry and Exit for commercial & passenger vehicles to the private internal shared road from Princes Highway.

The access points from the private internal shared road operate as follows:

- **Access B1** Entry for commercial & passenger vehicles to the hardstand and carpark for Warehouse 1B;
- **Access B2** Exit for commercial & passenger vehicles to the hardstand and carpark for Warehouse 1B; and
- **Access B3** Entry and exit for commercial & passenger vehicles to the hardstand area and car parking for Warehouse 2.
- **Access B4** Entry and exit for passenger vehicles to the car park for Warehouse 3A;
- **Access B5** Exit for large commercial vehicles from the hardstand area for Warehouse 3A;
- **Access B6** Entry for large commercial vehicles to the hardstand area for Warehouse 3A;
- **Access B7** Entry and exit for passenger vehicles to the car park for Warehouse 3C;
- **Access B8** Entry for large commercial vehicles to the hardstand area for Warehouse 3C;
- **Access B9** Exit for large commercial vehicles from the hardstand area for Warehouse 3C;
- **Access B10** Entry for large commercial vehicles to the hardstand area for Warehouse 3B;
- **Access B11** Exit for large commercial vehicles from the hardstand area for Warehouse 3B;
- **Access B12** Entry and exit for passenger vehicles to the carpark for Warehouse 3B;
- **Access B13** Entry and exit for passenger vehicles to the carpark for Warehouse 4;
- **Access B14** Exit for large commercial vehicles from the hardstand area for Warehouse 4;
- **Access B15** Entry for large commercial vehicles to the hardstand area for Warehouse 4;
- **Access B16** Entry for large commercial vehicles to the hardstand area for Warehouse 5;
- **Access B17** Entry and exit for passenger vehicles to the carpark for Warehouse 5.
- **Access B18** Entry and exit for passenger vehicles to the carpark for Warehouse 2.

Modifications are proposed to the primary site access point and existing road infrastructure along Princes Highway to accommodate for a 26m B-double design vehicle. Functional layout plans are attached in Appendix B.

The functional layout plan has undergone a road safety audit (RSA) process. The RSA and responses are also included in Appendix B.

5 Statutory Controls

The relevant traffic and transportation Statutory Controls are:

Particular Provisions

- Clause 52.06 - Car Parking
- Clause 52.29 - Land Adjacent to the Principal Road Network
- Clause 52.34 - Bicycle Facilities
- Clause 65.01 - Approval of an Application or Plan

5.1 Clause 52.06 - Car Parking

5.1.1 Purpose

The purpose of Clause 52.06 is:

- To ensure that car parking is provided in accordance with the Municipal Planning Strategy and Planning Policy Framework.
- To ensure the provision of an appropriate number of car parking spaces having regard to the demand likely to be generated, the activities on the land and the nature of the locality.
- To support sustainable transport alternatives to the motor car.
- To promote the efficient use of car parking spaces through the consolidation of car parking facilities.
- To ensure that car parking does not adversely affect the amenity of the locality.
- To ensure that the design and location of car parking is of a high standard, creates a safe environment for users and enables easy and efficient use.

5.1.2 Provision and Design Requirements

To satisfy the above purpose, Clause 52.06 of the Greater Dandenong Planning Scheme specifies requirements relating to the provision and design of car parking as follows:

5.1.3 Car Parking Provision Requirements - Clause 52.06-5

Table 1 to Clause 52.06-05 of the Greater Dandenong Planning Scheme provides rates for various land uses. The following rates apply to the uses contemplated on the site:

Warehouse **2 spaces to each premise**, plus **1.5 space to each 100 sqm** of net floor area.

Note: Clause 73.01 defines Net Floor area as:

> The total floor area of all floors of all buildings on a site. It includes half the width of any party wall and the full width of all other walls. It does not include the area of stairs, loading bays, accessways, or car parking areas (Our Emphasis)

Accordingly, in calculating the net floor area for the purpose of parking calculation, all loading bays have been deducted from the building area, the resulting total area being, 65,629.m

Application of the above rate reveals a requirement for a total of **997 spaces,** specifically:

- **Warehouse 1A** 32 spaces
- **Warehouse 1B** 53 spaces
- **Warehouse 2** 23 spaces
- **Warehouse 3A** 264 spaces

- **Warehouse 3B** 101 spaces
- **Warehouse 3C** 83 spaces
- **Warehouse 4** 234 spaces
- **Warehouse 5** 207 spaces

5.1.4 Proposed Provision

A total of **516 spaces** are proposed for the development. A breakdown of the parking provision is presented at Table 4.

Table 4 Car Parking Provision

Warehouse	Net Floor Area (sq.m)	Parking Required	Parking Provided	Parking rate / 100 sq.m
1A	2,040	32	26	1.27
1B	3,440	53	33	0.96
2	1,430	23	21	1.47
3A	17,484	264	123	0.70
3B	6,617	101	64	0.97
3C	5,427	83	50	0.92
4	15,494	234	90	0.58
5	13,697	207	109	0.80

The proposed car parking provision for each tenancy is below the statutory requirement.

This proposal therefore seeks approval to reduce the number of parking spaces required for each tenancy under Clause 52.06-5.

5.1.5 Application Requirements and Decision Guidelines to Reduce Car Parking Requirement

An application to reduce (including reduce to zero) the number of car parking spaces required under Clause 52.06-5 must be accompanied by a Car Parking Demand Assessment.

The Car Parking Demand Assessment must assess the car parking demand likely to be generated by the proposal and must also address the following matters, to the satisfaction of the responsible authority.

- The likelihood of multi-purpose trips within the locality which are likely to be combined with a trip to the land in connection with the proposed use.
- The variation of car parking demand likely to be generated by the proposed use over time.
- The short-stay and long-stay car parking demand likely to be generated by the proposed use.
- The availability of public transport in the locality of the land.
- The convenience of pedestrian and cyclist access to the land.
- The provision of bicycle parking and end of trip facilities for cyclists in the locality of the land.
- The anticipated car ownership rates of likely or proposed visitors to or occupants (residents or employees) of the land.
- Any empirical assessment or case study.

Before granting a permit to reduce the number of spaces, the responsible authority must consider the following, as appropriate:

- The Car Parking Demand Assessment.
- Any relevant local planning policy or incorporated plans.

- The availability of alternative car parking in the locality of the land, including:
  - Efficiencies gained from the consolidation of shared car parking spaces.
  - Public car parks intended to serve the land.
  - On-street parking in non-residential zones.
  - Streets in residential zones specifically managed for non-residential parking.
- On-street parking in residential zones in the locality of the land that is intended to be for residential use.
- The practicality of providing car parking on the site, particularly for lots of less than 300 square metres.
- Any adverse economic impact a shortfall of parking may have on the economic viability of any nearby activity centre.
- The future growth and development of any nearby activity centre
- Any car parking deficiency associated with the existing use of the land.
- Any credit that should be allowed for car parking spaces provided on common land or by a Special Charge Scheme or cash-in-lieu payment.
- Local traffic management in the locality of the land.
- The impact of fewer car parking spaces on local amenity, including pedestrian amenity and the amenity of nearby residential areas.
- The need to create safe, functional and attractive parking areas.
- Access to or provision of alternative transport modes to and from the land.
- The equity of reducing the car parking requirement having regard to any historic contributions by existing businesses.
- The character of the surrounding area and whether reducing the car parking provision would result in a quality/positive urban design outcome.
- Any other matter specified in a schedule to the Parking Overlay.
- Any other relevant consideration.

Considering the foregoing, we have undertaken the following car parking demand assessment which outlines our expectations of likely parking demand.

5.1.6 Car Park Demand Assessment

5.1.6.1 Empirical Assessment

The planning scheme at Clause 52.06 provides guidance on suitable parking provision rates to accommodate motorised transport to / from the site.

Studies undertaken by **IMPACT**® reveal that the nominated rates are significantly higher than actual demand as recorded at a number of warehouse and industrial uses in the locality of the site.

These studies reveal that Warehouse developments have been delivered and operate successfully with parking provided at discounts of between 20% - 78%.

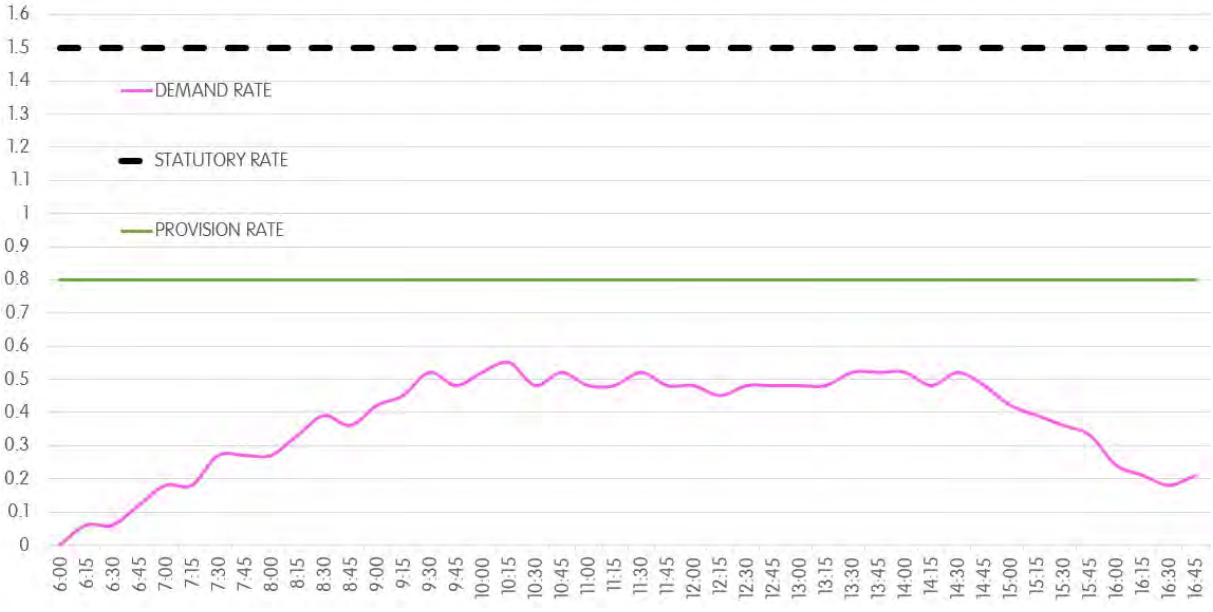
Importantly, recorded demand is regularly recorded at rates that are between 75% - 88% of the statutory rate.

One of these studies is provided overleaf.

5.1.6.2 Case Study Sites: Metropolitan Melbourne

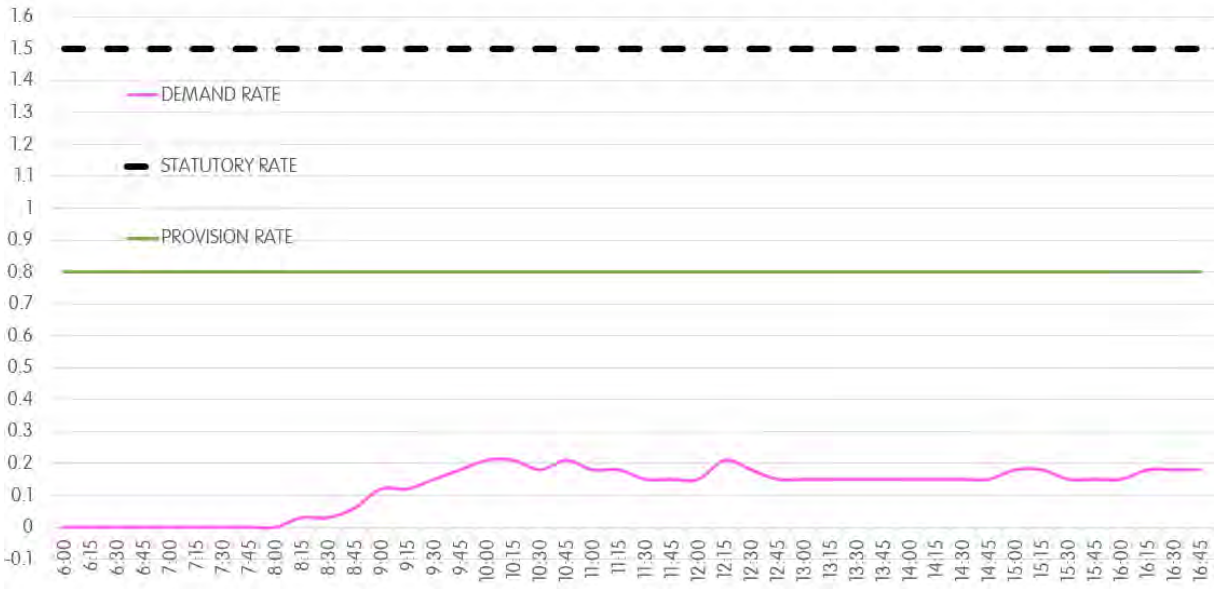
30 JAYCO DRIVE, DANDENONG SOUTH	WAREHOUSE

Floor Area	3,300 sq.m	
Statutory Requirement	1.5 spaces per 100 sq.m,	
PROVIDED Rate	0.80 spaces per 100 sq.m	47% Less than Statutory Rate
AVERAGE DEMAND RATE	0.38 spaces per 100 sq.m	75% Less than Statutory Rate



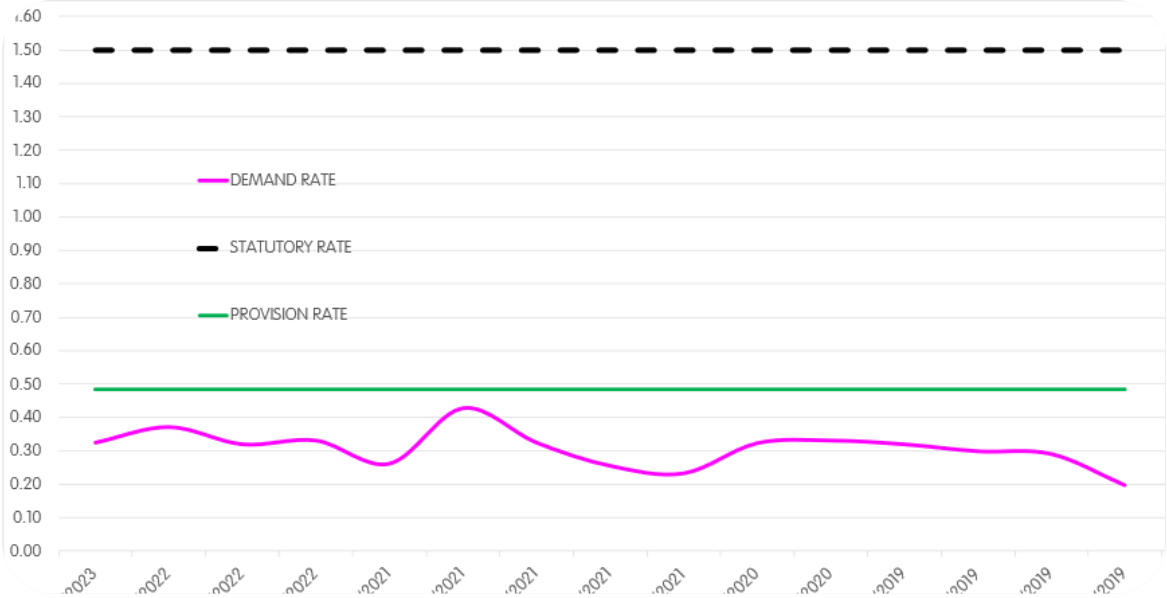
36 JAYCO DRIVE, DANDENONG SOUTH	WAREHOUSE

Floor Area	3,300 sq.m	
Statutory Requirement	1.5 spaces per 100 sq.m,	
PROVIDED Rate	0.80 spaces per 100 sq.m	47% Less than Statutory Rate
AVERAGE DEMAND RATE	0.12 spaces per 100 sq.m	92% Less than Statutory Rate

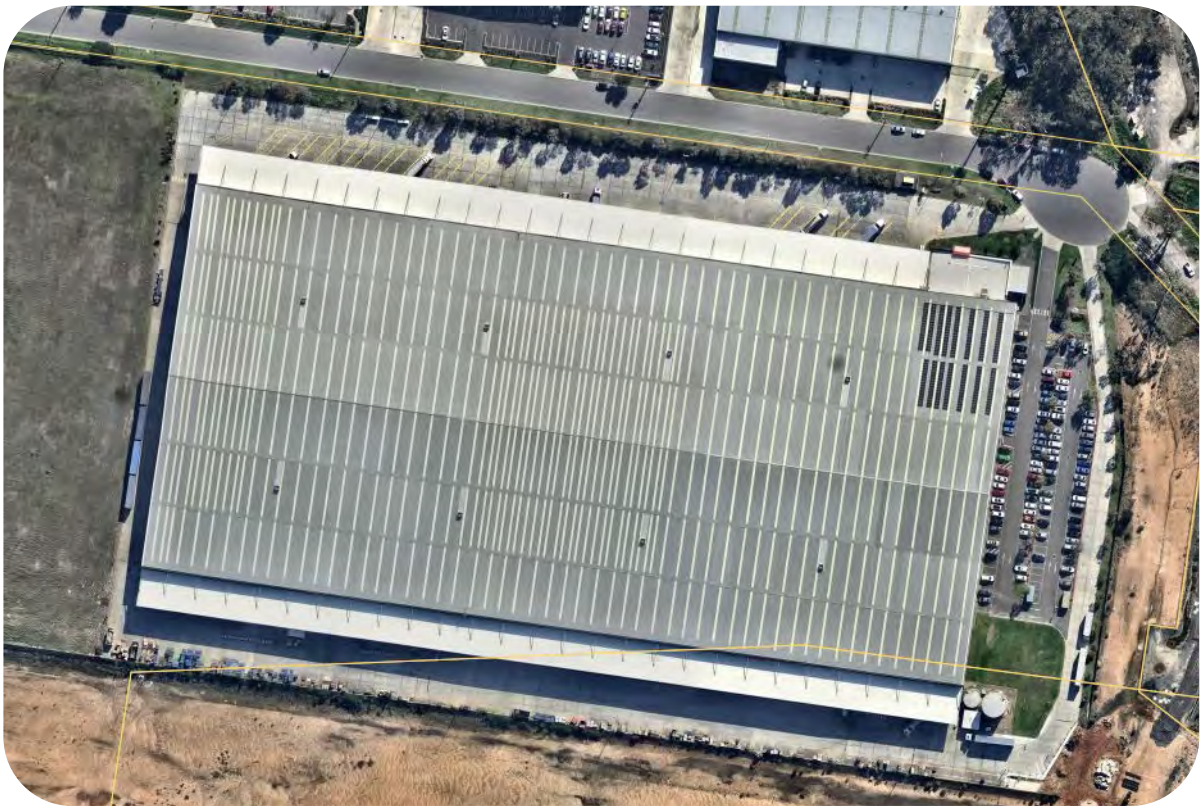


WOOLWORTHS DISTRIBUTION CENTRE, DANDENONG	WAREHOUSE

Floor Area	62,000 sq.m	
Statutory Requirement	1.5 spaces per 100 sq.m,	
PROVIDED Rate	0.48 spaces per 100 sq.m	68% Less than Statutory Rate
AVERAGE DEMAND RATE	0.31 spaces per 100 sq.m	80% Less than Statutory Rate



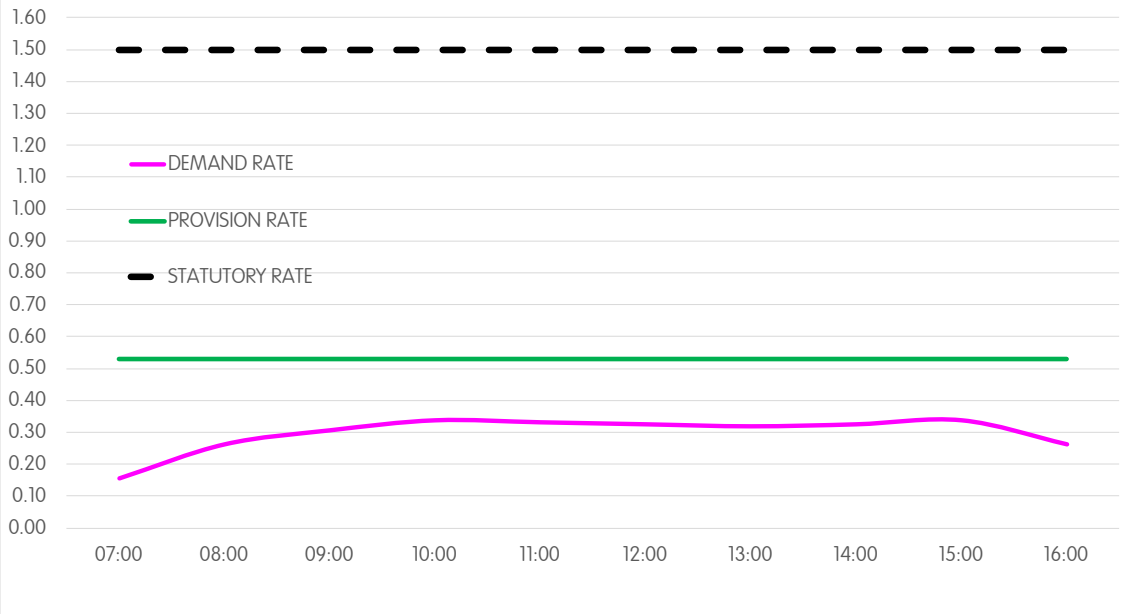
BUNNINGS DISTRIBUTION CENTRE, DANDENONG	WAREHOUSE



Floor Area	43,500 sq.m	
Statutory Requirement	1.5 spaces per 100 sq.m,	
PROVIDED Rate	0.33 spaces per 100 sq.m	78% Less than Statutory Rate
AVERAGE DEMAND RATE	0.20 spaces per 100 sq.m	87% less than Statutory Rate

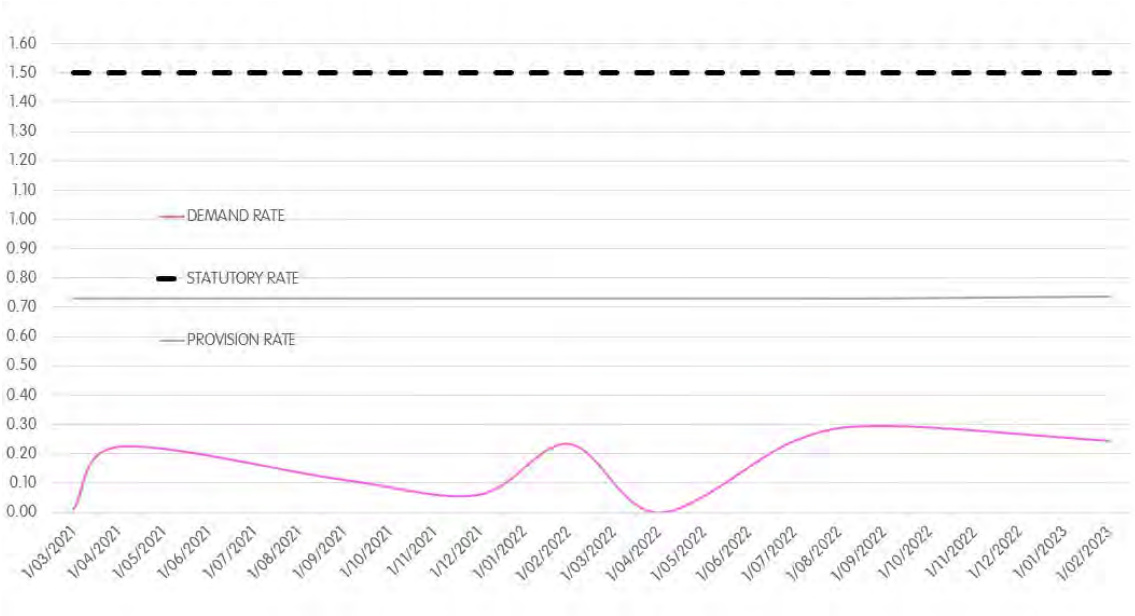
1 HUDSON COURT, KEYSBOROUGH	WAREHOUSE

Floor Area	16,000 sq.m	
Statutory Requirement	1.5 spaces per 100 sq.m,	
PROVIDED Rate	0.53 spaces per 100 sq.m	65% Less than Statutory Rate
AVERAGE DEMAND RATE	0.30 spaces per 100 sq.m	80% less than Statutory Rate



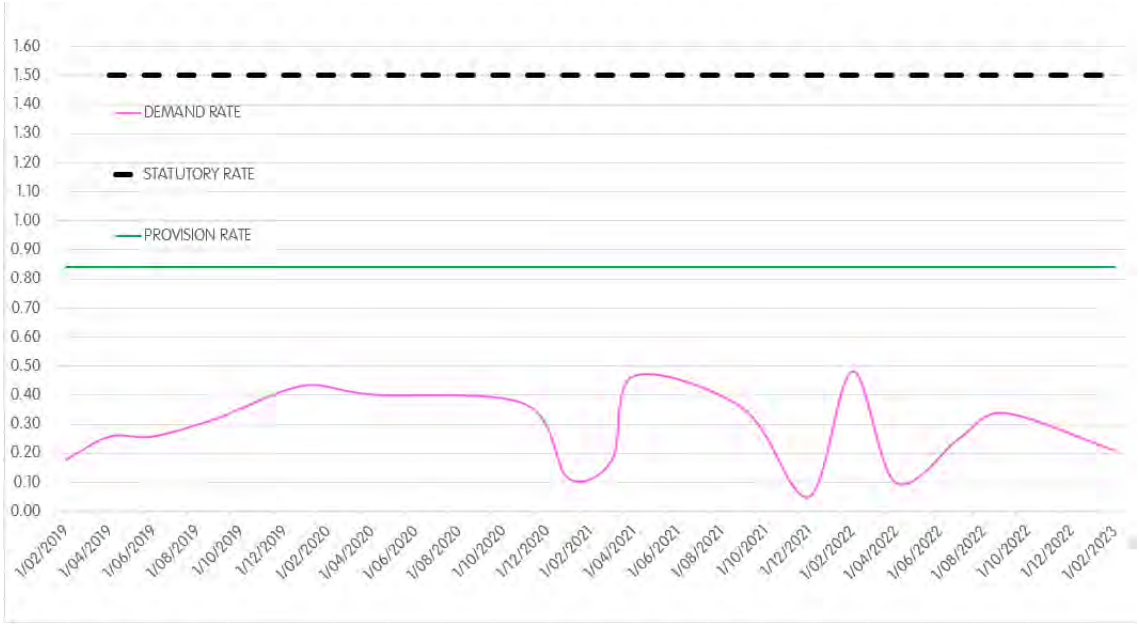
85 Portlink Drive (South), Dandenong South	WAREHOUSE

Floor Area	9,800 sq.m	
Statutory Requirement	1.5 spaces per 100 sq.m,	
PROVIDED Rate	0.73 spaces per 100 sq.m	51% Less than Statutory Rate
AVERAGE DEMAND RATE	0.21 spaces per 100 sq.m	86% less than Statutory Rate



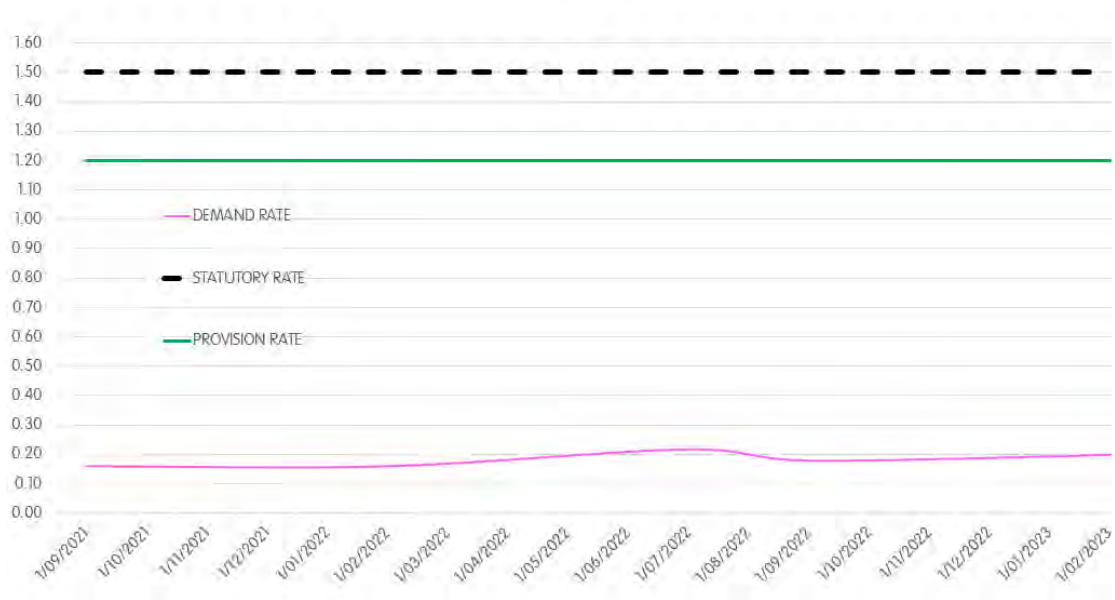
146 ATLAS BOULEVARD, DANDENONG SOUTH	WAREHOUSE

Floor Area	6,232 sq.m	
Statutory Requirement	1.5 spaces per 100 sq.m,	
PROVIDED Rate	0.84 spaces per 100 sq.m	44% Less than Statutory Rate
AVERAGE DEMAND RATE	0.28 spaces per 100 sq.m	81% less than Statutory Rate



105 PORTLINK DRIVE (NORTH), DANDENONG SOUTH	WAREHOUSE

Floor Area	5,050 sq.m	
Statutory Requirement	1.5 spaces per 100 sq.m,	
PROVIDED Rate	1.2 spaces per 100 sq.m	20% Less than Statutory Rate
AVERAGE DEMAND RATE	0.18 spaces per 100 sq.m	88% less than Statutory Rate



Considered more broadly, and shown diagrammatically within Figure 9, there is clear evidence of a downward trend in relation to car parking provision rate as warehouse floor area increases.

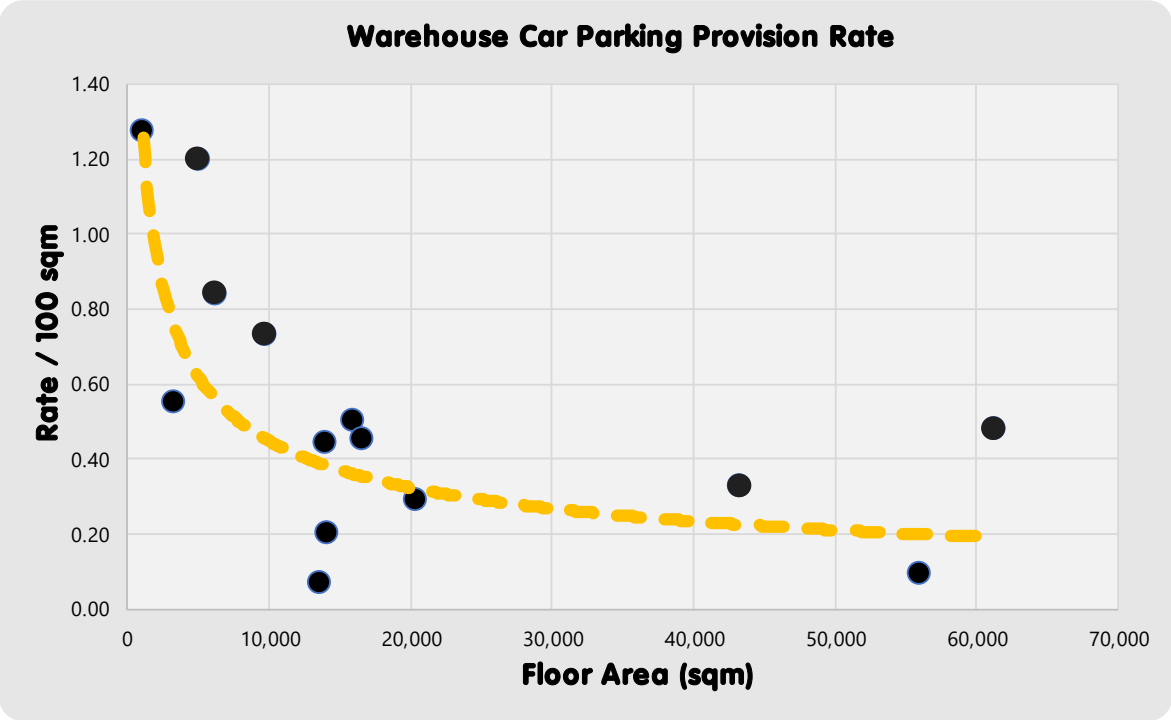


Figure 9 **Warehouse Car Parking Provision Rates Comparison**

A comparison between the RMS (NSW) case studies and results derived from the **IMPACT**® case studies reveal consistent rates in all but the median rate, which is lower in the **IMPACT**® case studies.

	RMS (NSW) Case Studies	**IMPACT**® case studies
Highest Rate	1.25 spaces per 100 sq.m	1.27 spaces per 100 sq.m
Average Rate	0.30 spaces per 100 sq.m	0.35 spaces per 100 sq.m
Lowest Rate	0.10 spaces per 100 sq.m	0.09 spaces per 100 sq.m
Median Rate	0.33 spaces per 100 sq.m	0.22 spaces per 100 sq.m

The **IMPACT**® case studies drawn from various locations in Metropolitan Melbourne, and as demonstrated in the comparison with the RMS (NSW) rates, there is consistency in the outputs which enhances the confidence in the results. It is the intention that whilst parking for each warehouse or industrial tenancy will be assessed on its merits, that parking provision will be provided at a rate lower than the statutory requirements.

5.1.7 Adequacy of Proposed Provision

A comparison of the proposed parking provision per tenancy against the forecast demand is shown below.

	NFA (sq.m)	Parking	Rate / 100 sq.m	Case Study Rate / 100 sq.m
Warehouse 1A	2,040	26	1.27	~1.0 spaces per 100 sq.m
Warehouse 1B	3,440	33	0.96	~0.80 spaces per 100 sq.m
Warehouse 2	1,430	21	1.47	~1.0 spaces per 100 sq.m
Warehouse 3A	17,484	123	0.70	~0.35 spaces per 100 sq.m
Warehouse 3B	6,617	64	0.97	~0.55 spaces per 100 sq.m
Warehouse 3C	5,427	50	0.92	~0.60 spaces per 100 sq.m
Warehouse 4	15,494	90	0.58	~0.35 spaces per 100 sq.m
Warehouse 5	13,697	109	0.80	~0.40 spaces per 100 sq.m

Accordingly, the parking provision for each warehouse tenancy exceeds the anticipated car parking demand of a warehouse commensurate with the proposal. We are therefore satisfied that an adequate number of parking spaces are proposed.

5.1.8 Conclusion - Car Parking Provision

We can conclude that an adequate number of spaces are provided to cater for the projected demand.

Accordingly, the development proposition satisfies the purpose of Clause 52.06, specifically:

- To ensure the provision of an appropriate number of car parking spaces having regard to the demand likely to be generated, the activities on the land and the nature of the locality.

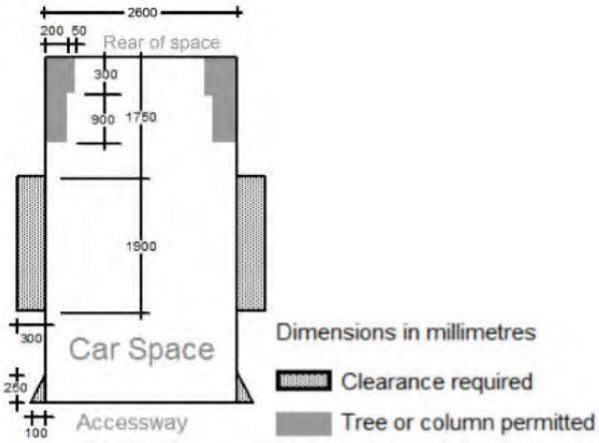
5.1.9 Design Standard for Car Parking - Clause 52.06 - 9

We have assessed the proposed car parking design and access arrangements against the requirements of Clause 52.06-9 of the Greater Dandenong Planning Scheme. Our findings are as follows:

5.1.9.1 Design Standard 1 - Accessways

Requirements		Design Response	Status
Accessways Must:			
1	Be at least 3 metres wide.	Accessways are at least 6.4m wide throughout.	**Comply**
2	Have an internal radius of at least 4 metres at changes of direction or intersection or be at least 4.2 metres wide	Intersections are at least 4.2m wide at changes of directions.	**Comply**
3	Allow vehicles parked in the last space of a dead-end accessway in public car parks to exit in a forward direction with one manoeuvre.	Vehicles parking in the last space of a dead-end accessway are able to exit in a forward direction with one manoeuvre.	**Comply**
4	Provide at least 2.1 metres headroom beneath overhead obstructions, calculated for a vehicle with a wheel base of 2.8 metres.	Overhead obstructions exceed 2.1m	**Comply**
5	If the accessway serves four or more car spaces or connects to a road in a Transport Zone 2 or Transport Zone 3, the accessway must be designed so that cars can exit the site in a forward direction.	Vehicles can exit the site in a forward direction.	**Comply**
6	Provide a passing area at the entrance at least 6.1 metres wide and 7 metres long if the accessway serves ten or more car parking spaces and is either more than 50 metres long or connects to a road in a Transport Zone 2 or Transport Zone 3.	Accessways are at least 6.4m wide throughout.	**Comply**
7	Have a corner splay or area at least 50 percent clear of visual obstructions extending at least 2 metres along the frontage road from the edge of an exit lane and 2.5 metres along the exit lane from the frontage, to provide a clear view of pedestrians on the footpath of the frontage road. The area clear of visual obstructions may include an adjacent entry or exit lane where more than one lane is provided, or adjacent landscaped areas, provided the landscaping in those areas is less than 900mm in height.	Corner splay to be provided adjacent the exit lanes at each tenancies site frontage.	**Comply**
8	If an accessway to four or more car parking spaces is from land in a Transport Zone 2 or Transport Zone 3, the access to the car spaces must be at least 6 metres from the road carriageway.	Access to car spaces are at least 6m from the road carriageway.	**Comply**

5.1.9.2 Design Standard 2 - Car Parking Spaces

<table>
<tr><th colspan="2">Requirements</th><th>Design Response</th><th>Status</th></tr>
<tr><td>1</td><td>Car parking spaces and accessways must have the minimum dimensions in Table 2 of Clause 52.06-9.
<table>
<tr><th>Angle of car parking spaces to access way</th><th>Accessway width</th><th>Car space width</th><th>Car space length</th></tr>
<tr><td>Parallel</td><td>3.6 m</td><td>2.3 m</td><td>6.7 m</td></tr>
<tr><td>45°</td><td>3.5 m</td><td>2.6 m</td><td>4.9 m</td></tr>
<tr><td>60°</td><td>4.9 m</td><td>2.6 m</td><td>4.9 m</td></tr>
<tr><td>90°</td><td>6.4 m</td><td>2.6 m</td><td>4.9 m</td></tr>
<tr><td></td><td>5.8 m</td><td>2.8 m</td><td>4.9 m</td></tr>
<tr><td></td><td>5.2 m</td><td>3.0 m</td><td>4.9 m</td></tr>
<tr><td></td><td>4.8 m</td><td>3.2 m</td><td>4.9 m</td></tr>
</table></td><td>Car parking spaces are designed in accordance with Table 2. Specifically, car spaces are designed with the following dimensions:
— 2.6m wide
— 4.9m long
— 6.4m wide aisle</td><td>Comply</td></tr>
<tr><td>2</td><td>A wall, fence, column, tree, tree guard or any other structure that abuts a car space must not encroach into the area marked 'clearance required' on Diagram 1 other than:
A column, tree or tree guard, which may project into a space if it is within the area marked 'tree or column permitted' on Diagram 1 of the design standard
A structure, which may project into the space if it is at least 2.1 metres above the space.
 
</td><td>Appropriate clearances are provided for car spaces.</td><td>Comply</td></tr>
<tr><td>3</td><td>Car spaces in garages or carports must be at least 6 metres long and 3.5 metres wide for a single space and 5.5 metres wide for a double space measured inside the garage or carport.</td><td>No garages proposed.</td><td>N/A</td></tr>
<tr><td>4</td><td>Where parking spaces are provided in tandem (one space behind another) an additional 500mm in length must be provided between each space.</td><td>No tandem spaces proposed.</td><td>N/A</td></tr>
<tr><td>5</td><td>Where two or more car parking spaces are provided for a dwelling, at least one space must be under cover.</td><td>No dwellings proposed.</td><td>N/A</td></tr>
<tr><td>6</td><td>Disabled car parking spaces must be designed in accordance with AS 2890.6-2009 (disabled) and the Building Code of Australia. Disabled car parking spaces may encroach into an accessway width specified in Table 2 by 500mm.</td><td>Disabled car parking has been designed in accordance with AS2890.6-2009.</td><td>Comply</td></tr>
</table>

5.1.9.3 Design Standard 3 - Gradients

No notable gradients are proposed along the accessways.

5.1.10 Conclusion - Car Park Design

The proposed car park and accessways have been assessed and determined to have satisfied the relevant design guidelines.

Accordingly, the proposal satisfies the purpose of Clause 52.06, specifically:

- To ensure that the design and location of car parking is of a high standard, creates a safe environment for users and enables easy and efficient use.

5.2 Clause 52.29 - Land Adjacent to the Principal Road Network

5.2.1 Purpose

The purpose of Clause 52.29 is to:

- Ensure appropriate access to the Principal Road Network or land planned to form part of the Principal Road Network; and
- Ensure appropriate subdivision of land adjacent to the Principal Road Network or land planned to form part of the Principal Road Network.

5.2.2 Permit Requirement

A permit is required to:

- Create or alter access to:
  - A road in a Transport Zone 2;
  - Land in a Public Acquisition Overlay if a transport manager (other than a municipal council) is the acquiring authority and the acquisition is for the purpose of a road.
- Subdivide land adjacent to:
  - A road in a Transport Zone 2;
  - Land in a Public Acquisition Overlay if a transport manager (other than a municipal council) is the acquiring authority and the acquisition is for the purpose of a road.

In response to the above, it is noted that:

- The proposal seeks to alter access to a road in a Transport Zone 2

Specifically,

- The proposal contemplates an increase in the volume of traffic accessing the subject site directly from Princes Highway / Princes Highway Service Lane.
- The proposal seeks the modification of kerbs to accommodate a B Double vehicle to / from the site.

A permit under Clause 52.29 is therefore required.

5.2.3 Decision Guidelines

Before deciding on an application, in addition to the decision guideline in Clause 65, the responsible authority must consider:

- The Municipal Planning Strategy and the Planning Policy Framework;
- The view of the relevant road authority;
- The effect of the proposal on the operation of the road and on public safety; and
- Any policy made by the relevant road authority pursuant to Schedule 2, Clause 3 of the Road Management Act 2004 regarding access between a controlled access road and adjacent land.

5.2.4 Response to Decision Guidelines

5.2.4.1 Effect of the Proposal on the Operation of the Road

As shown in Section 6, a SIDRA analysis of the immediate road network has been undertaken, including the site access intersection.

The SIDRA analysis reveals that Princes Highway and its intersection with the site access will continue to operate within acceptable parameters once the proposed development is in operation.

Note: This assessment allows for the future development of the balance land. In total, an approximate gross floor area of 75,000sq.m for warehouse / industrial use is likely.

Accordingly, the effect of the proposal on the operation of the road is within the acceptable range.

5.2.4.2 Effect of the Proposal on Public Safety

As part of the development, the proposal contemplates a modified access arrangement to Princes Highway Service Lane. This design outcome will allow the access to conform to the relevant design guidelines set out in Clause 52.06, specifically:

Requirement	Design Response
If the accessway serves four or more car spaces or connects to a road in a Transport Zone 2 or Transport Zone 3, the accessway must be designed so that cars can exit the site in a forward direction	The accessways are designed so that cars can exit the site in a forward direction.
Provide a passing area at the entrance at least 6.1 metres wide and 7 metres long if the accessway serves ten or more car parking spaces and is either more than 50 metres long or connects to a road in a Transport Zone 2 or Transport Zone 3.	Accessways are at least 6.4m wide throughout, allowing for suitable opportunities to pass.
Have a corner splay area at least 50 percent clear of visual obstructions extending at least 2 metres along the frontage road from the edge of an exit lane and 2.5 metres along the exit lane from the frontage, to provide a clear view of pedestrians on the footpath of the frontage road	Adequate pedestrian sight splays are provided on each side of the egress lanes. Landscaping and structures within the pedestrian sight triangle areas is to remain below 900mm in height
If an accessway to four or more car parking spaces is from land in a Transport Zone 2 or Transport Zone 3, the access to the car spaces must be at least 6 metres from the road carriageway.	Access to the car spaces will be at least 6 metres from the road carriageway.

5.2.5 Conclusion - Access to the Principal Road Network

The proposed access arrangements and intensity of development traffic has been assessed. The assessment reveals that the proposal will have manageable impacts on the operation of the road and on public safety.

Accordingly, the proposal satisfies the purpose of Clause 52.29, specifically:

- To ensure appropriate access to the Principal Road Network or land planned to form part of the Principal Road Network.

5.3 Clause 52.34 - Bicycle Facilities

5.3.1 Purpose

The purpose of Clause 52.34 is to encourage cycling as a mode of transport, and provide secure, accessible and convenient bicycle parking spaces and associated shower and change facilities.

5.3.2 Provision Requirements - Clause 52.34.3

To satisfy the above purpose, Clause 52.34-3 of the Greater Dandenong Planning Scheme specifies the bicycle parking provision requirements for a variety of different uses within Table 1. It does not however, specifically refer to bicycle parking requirements for warehouse uses.

Therefore, the proposal will not generate a requirement for bicycle parking spaces for the proposal.

5.3.2.1 End of Trip Facilities: Shower / Change Rooms

Clause 52.34 requires that If 5 or more employee bicycle spaces are required, 1 shower should be provided for the first 5 employee bicycle spaces, plus 1 to each 10 employee bicycle spaces thereafter.

Given the proposal will not generate a requirement for bicycle parking spaces, no shower and change room facilities are required.

5.3.3 Design Requirements

Bicycle spaces should:

- Provide a space for a bicycle of minimum dimensions of 1.7 metres in length, 1.2 metres in height and 0.7 metres in width at the handlebars.
- Be located to allow a bicycle to be ridden to within 30 metres of the bicycle parking space.
- Be located to provide convenient access from surrounding bicycle routes and main building entrances.
- Not interfere with reasonable access to doorways, loading areas, access covers, furniture, services and infrastructure.
- Not cause a hazard.
- Be adequately lit during periods of use.

5.3.4 Decision Guidelines

Before deciding on an application, in addition to the decision guidelines in Clause 65, the responsible authority must consider, as appropriate:

- Whether the proposed number, location and design of bicycle facilities meets the purpose of this clause.
- The location of the proposed land use and the distance a cyclist would need to travel to reach the land.
- The users of the land and their opportunities for bicycle travel.
- Whether showers and change rooms provided on the land for users other than cyclists are available to cyclists.
- The opportunities for sharing of bicycle facilities by multiple uses, either because of variation of bicycle parking demand over time or because of efficiencies gained from the consolidation of shared bicycle facilities.
- Australian Standard AS 2890.3 2015 Parking facilities Part 3: Bicycle parking facilities.
- Any relevant bicycle parking strategy or equivalent.

5.3.5 Proposed Provision

Notwithstanding the above, the development contemplates a total of **80 bicycle spaces** on-site.

In addition to the bicycle spaces, each office tenancy shall be provided with at least one (1) shower/change room area.

5.3.5.1 Design

The bicycle spaces are to be provided in the form of proprietary horizontal bicycle spaces designed to satisfy the relevant standards.

5.3.6 Conclusion - Bicycle Parking

We can conclude that bicycle parking provided as part of this development satisfies the purpose of Clause 52.34, specifically:

- To encourage cycling as a mode of transport, and provide secure, accessible and convenient bicycle parking spaces.

5.4 Clause 65.01 - Approval of An Application or Plan

5.4.1 Loading Requirements and Objectives

To address the adequacy of loading for new developments, the Greater Dandenong Planning Scheme specifies the following:

- The responsible authority must consider, as appropriate, the adequacy of loading and unloading facilities and any associated amenity, traffic flow and road safety impacts.

5.4.2 Adequacy of Proposed Loading Facilities

The warehouse tenancies make suitable provision for loading, noting that:

- The hardstand area for warehouses 1a, 1b and 2 can accommodate for vehicles up to 12.5 metres.
- The hardstand area for warehouses 3A, 3B, 3C, 4 and 5 can accommodate for vehicles up to 26 metres.

Swept path assessments have been prepared and attached in Appendix A of this report demonstrate that:

- Loading vehicles up to 26m in length will be able to comfortably enter the subject site from Princes Highway without any corrections required upon ingress and no corrections on egress.
- The proposed shared internal driveway is capable of accommodating circulation for vehicles up to 26m in length, including the proposed courtbowl in the north-eastern corner of the site.
- 20m semi-trailer vehicles are capable of reversing up to recessed and at-grade loading docks for warehouses 3A, 3B, 3C, 4 and 5.
- 12.5m heavy rigid vehicles are capable of entering and exiting the hardstand area for warehouses 1a, 1b and 2.
- 26m B-double vehicles are capable of entering and exiting each hardstand area in a forward direction for warehouses 3A, 3B, 3C, 4 and 5.

All truck entries allow all proposed loading docks to be accessed without any excessive reverse movements required.

5.4.3 Conclusion - Loading Arrangements

The proposed loading arrangements have been assessed and determined to have satisfied the relevant design guidelines / principles contained within Clause 65.01 and AS2890.2:2018.

Accordingly, it is considered that the proposal:

- Provides adequate vehicle loading and unloading facilities, which will not result in associated amenity, traffic flow and road safety impacts.

6 Traffic Considerations

6.1 Assessment Framework

VicRoads Guidelines for Transport Impact Assessment Reports (TIAR) - For Major Land Use and Development Proposals (2006) at Section 5.1 (Performance Objectives of a TIAR), sets out the Performance Objectives as follows:

For existing road infrastructure:

- Any potential adverse effects from land use development proposals on road safety and operational efficiency are identified and, where necessary, developers provide mitigating road improvement works as part of the development costs to minimise these effects and retain, within practical limitations, the level of safety and operational efficiency that would have existed without the development.

In section 5.3 (Proposed Vehicle Access Arrangements), The VicRoads Guideline states that:

- A principal objective is to ensure that any disruption to through traffic is minimised and that safety is not compromised. Therefore, design of the permitted access should take into account the volume and type of traffic generated by the proposed development, as well as the speed environment for through traffic on the abutting road'.

In Section 5.7 (Post Development Analysis), the guideline requires that:

a. The extent of the road network to be analysed should not necessarily be confined to that in the immediate vicinity of the proposed development site. It should generally include all intersections and all mid-block locations where any traffic movement is increased by an amount of 10% or greater as a result of traffic generated by the proposed development/land use and/or resultant changes in travel patterns brought about by the proposal, and/or at any other location identified as necessary by the relevant road authority.

b. A comparison of the traffic performance (level of service) of the road network between the Base Case and Post Development scenarios should be carried out to identify the land use/development impacts and the required mitigating works (and any appropriate staging of the works).

c. Each of the identified affected elements of the road network, including proposed intersections providing site access, should be analysed for safety and traffic capacity using an appropriate and agreed methodology. Capacity analysis of signalised intersections should be carried out using a recognised or agreed analysis tool (e.g., SIDRA).

d. The assessment should identify required improvements to intersections in order to retain, within practical limitations, the degree of saturation, safety and operational efficiency at levels that would have existed without the proposed land use/development (i.e Base Case).

e. Where the degree of saturation for part of the road network is estimated to be in excess of 0.9 (approximately) it may be necessary in the analysis to distribute traffic across the network to recognise the diversion of traffic to alternative routes or to recognise the spreading of any peak periods. This may depend on the environment (urban or rural) and relative congestion on the remainder of the surrounding road network.

f. The TIAR should also demonstrate that the proposed site access arrangements (as compared to any mitigating works to existing road network) will operate satisfactorily for an appropriate future time period after full development (i.e., at least 10 years).

6.2 Traffic Generation

6.2.1 RMS (NSW) Case Study

The RTA (NSW) Guide to Traffic Engineering Developments lists the daily and peak hour traffic generation rates for industrial developments.

The Guide identifies traffic generation as 5 trips per 100 square metres gross floor area (GFA) or between 0.8 - 1 trip per 100 square metres GFA in the peak hour.

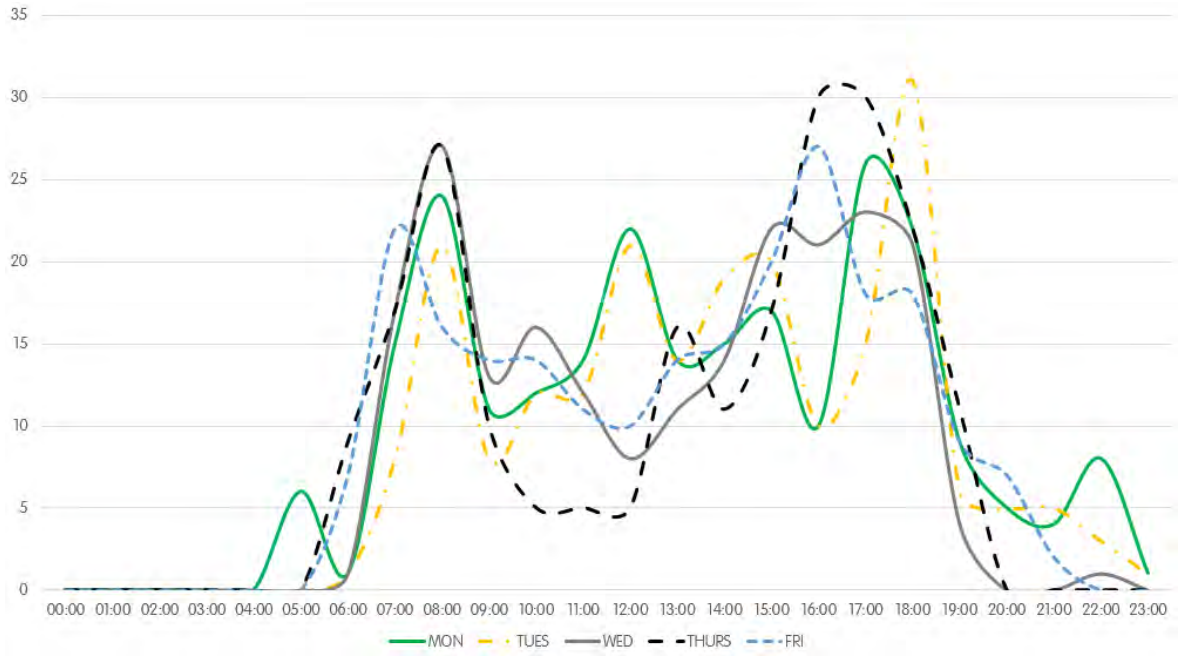
It is considered that these rates are applicable to single stand-alone developments, comprising of relatively small floor areas.

6.2.2 IMPACT® Case Studies

IMPACT® has commissioned studies at numerous warehouse developments of varying sizes in Metropolitan Melbourne. Studies undertaken within the City of Greater Dandenong indicate that warehouse developments in generate their peak hour volumes at rates that are substantially lower than the rates adopted by RMS (NSW).

These case studies are reproduced as follows.

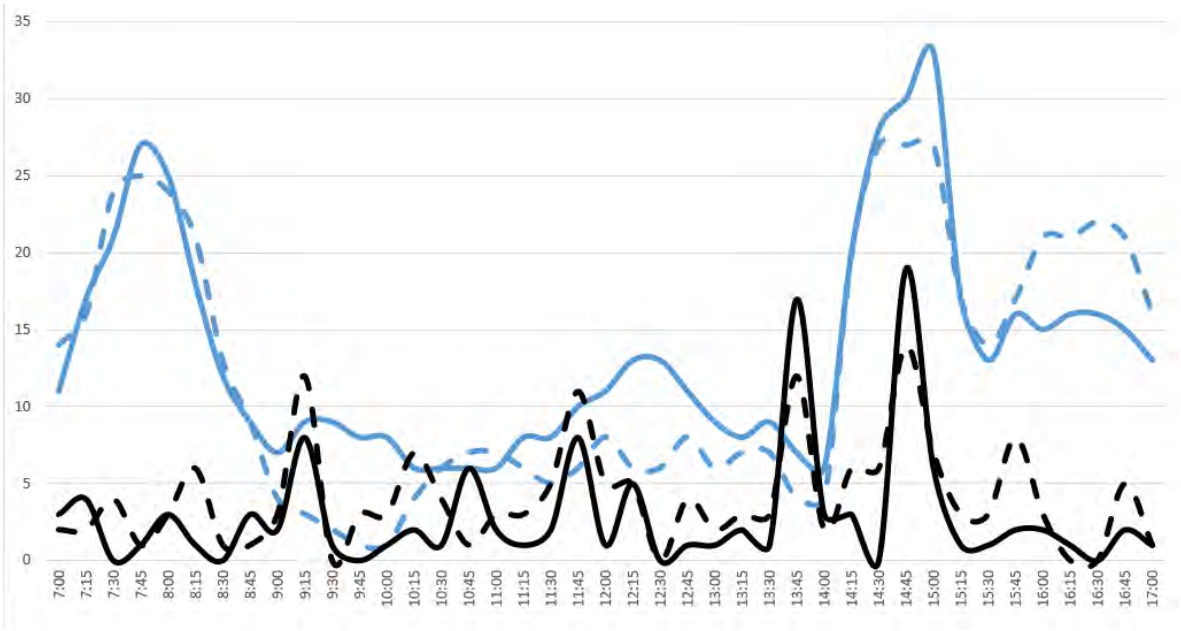
1 Hudson Court, Keysborough	
	
Floor Area	16,000 sq.m
Study	Pneumatic tube counters (5 Days)
Peak Traffic Volumes	31 trips



Peak Hour Rate	0.19 trips / 100 sq.m

68 Atlantic Drive, Keysborough & 7-9 Naxos Way, Keysborough

Floor Area	Site 1: 11,9367 Sq.m Site 2: 7,357 Sq.m
Study	Camera (2 Days)
Peak Traffic Volumes	Site 1: 33 trips Site 2: 19 trips



Rate	Site 1: 0.28 trips / 100 sq.m Site 2: 0.26 trips / 100 sq.m

The case studies suggest that an average peak hour rate in the order of 0.3 trips per 100 sq.m would be a more appropriate rate for assessment.

6.2.3 Adopted Traffic Generation Rate

Notwithstanding the expectation that traffic will be generated at an average a rate of 0.3 trips per 100 sq.m, we have adopted a rate of **0.5 trips per 100 square metres** for both the AM and PM peaks.

The adoption of this conservatively high rate provides a robust assessment.

6.3 Traffic Distribution

Ther foregoing studies have revealed directional trip distribution splits that are generally consistent with those identified in the RMS (NSW) study.

The RMS (NSW) distribution splits are presented at Table 5.

Table 5 Directional Trip Distribution Splits

Period	Arrivals	Departures
AM PEAK	69%	31%
PM PEAK	34%	66%

For the purpose of this assessment, we have adopted a 70% / 30% split for both the AM and PM peak periods.

6.4 Traffic Generation Forecast

6.4.1 7 Princes Highway

A total net floor area of 70,000sqm has conservatively been assumed for development on the subject site.

Adopting a rate of 0.5 trips per 100 sq.m, the balance land has the potential to generate 350 trips during each peak period.

Table 6 Directional Trip Distribution - Balance Land, 1-27 Princes Highway

AM PEAK	Total	
	350	
	Arrivals	Departures
	245	105
PM PEAK	Total	
	350	
	Arrivals	Departures
	105	245

6.4.2 Proposed Development - Balance Land: Lot 1, 1 - 27 Princes Highway

Redevelopment of the subject site at Lot 1, 1-27 Princes Highway, Dandenong South is being contemplated.

Adopting a rate of 0.5 trips per 100 sq.m, the proposal industrial development with a net floor area of 4,970 sqm is anticipated to generate 25 trips during each peak period.

Table 7 Directional Trip Distribution - Lot 1, 1-27 Princes Highway

AM PEAK	Total	
	25	
	Arrivals	Departures
	17	8
PM PEAK	Total	
	25	
	Arrivals	Departures
	8	17

6.5 Post Development Traffic Forecast

For the purpose of this assessment, it is anticipated that:

- Traffic arriving / departing the subject site will be distributed in a pattern similar to the existing conditions outlined in Section 3.6

To account for the impacts of the proposed level crossing removal along Progress Street (to the east of the site) adjustments have been made to the base volumes to allow for the changes.

These works involve:

- Creation of a new connection between Progress Street and Fowler Road;
- Upgrading the existing connection between Fowler Road and South Gippsland Hwy to a signalised intersection; and
- Truncation of Progress Street at a location north of the rail corridor.

These works are to begin in 2023 with access changes occurring along Progress Street in late 2023.

We envisage that the completion of these works will result in a re-distribution of traffic.

Specifically, we anticipate that with Progress Street connecting to Fowler Road, and Progress Street being truncated, there will a reduction in traffic volumes along Princes Highway, eastbound and westbound.

These volumes will instead travel along Fowler Road and South Gippsland Highway.

We have reflected a modest change in traffic diversion through the proposed traffic splits allocated in the eastbound and westbound traffic along Princes Highway.

Adopting the distribution assumptions for both the subject site and the balance lane, the post development volumes have been illustrated at Figure 10 and Figure 11.

These figures provide a summary of the post development distribution of traffic during the AM peak and PM peak, respectively.

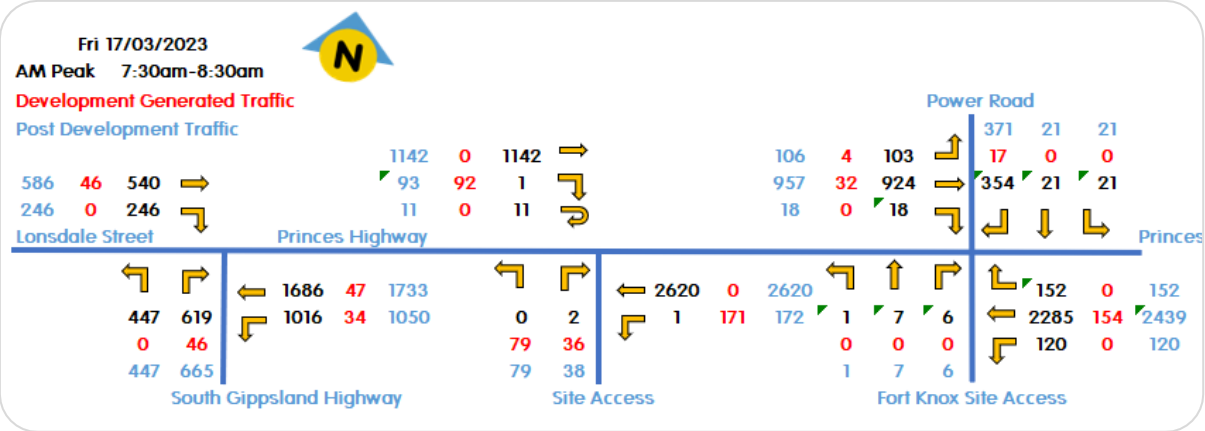


Figure 10 **Post Development Traffic Distribution - AM Peak**

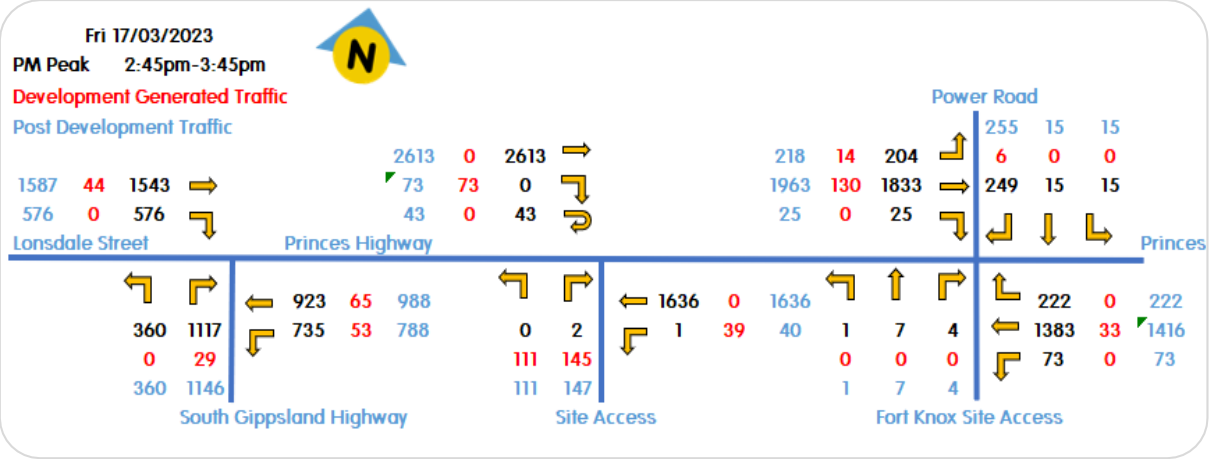


Figure 11 **Post Development Traffic Distribution - PM Peak**

6.6 Intersection Analysis - Post Development

The post development operation of the nearby intersections along Princes Highway in the vicinity of the subject site was analysed using SIDRA Intersection 9.0. The post development results area at Table 8.

Table 8 **Post Development Conditions Intersection Performance**

Peak	Approach	Leg	DoS	95th%ile Queue (m)	Delay (s)
Princes Highway / South Gippsland Highway					
AM Peak	South Gippsland Hwy	South	0.72	147	40
	Princes Highway	East	0.71	151	12
	Princes Highway	West	0.67	56	27
	Intersection		**0.83**	**151**	**21**

Peak	Approach	Leg	DoS	95th%ile Queue (m)	Delay (s)
PM Peak	South Gippsland Hwy	South	0.84	267	40
	Princes Highway	East	0.86	162	35
	Princes Highway	West	0.83	176	36
	Intersection		**0.86**	**267**	**37**
Princes Highway / 1-27 Princes Highway					
AM Peak	Site Access	South	0.02	5	12
	Princes Highway	East	0.31	4	1
	Princes Highway	West	0.49	9	3
	Intersection		**0.49**	**9**	**2**
PM Peak	Site Access	South	0.53	14	12
	Princes Highway	East	0.31	1	0
	Princes Highway	West	0.49	7	1
	Intersection		**0.49**	**14**	**1**
Princes Highway / Power Road					
AM Peak	Fort Knox Site Access	South	0.08	3	62
	Princes Highway	East	0.81	532	74
	Power Road	North	0.57	120	90
	Princes Highway	West	0.77	94	15
	Intersection		**0.81**	**532**	**60**
PM Peak	Fort Knox Site Access	South	0.08	3	59
	Princes Highway	East	0.81	162	30
	Power Road	North	0.58	62	55
	Princes Highway	West	0.84	285	31
	Intersection		**0.84**	**285**	**32**

As shown in the table above, the SIDRA analysis indicates that each of the intersections will operate within the acceptable range. Specifically, the results show that:

- Princes Highway / South Gippsland Highway intersection will operate with a D.O.S no greater than 0.86;
- Princes Highway / 1-27 Princes Highway intersection will operate with a D.O.S no greater than 0.49; and
- Princes Highway / Power Road intersection will operate with a D.O.S no greater than 0.84;

A graphical representation of the above results is presented below.

AM PEAK - POST DEVELOPMENT

PM PEAK - POST DEVELOPMENT

6.7 Conclusion - Traffic Impact

The foregoing assessment confirms that the proposed development will have minimal impacts to the adjacent road network.

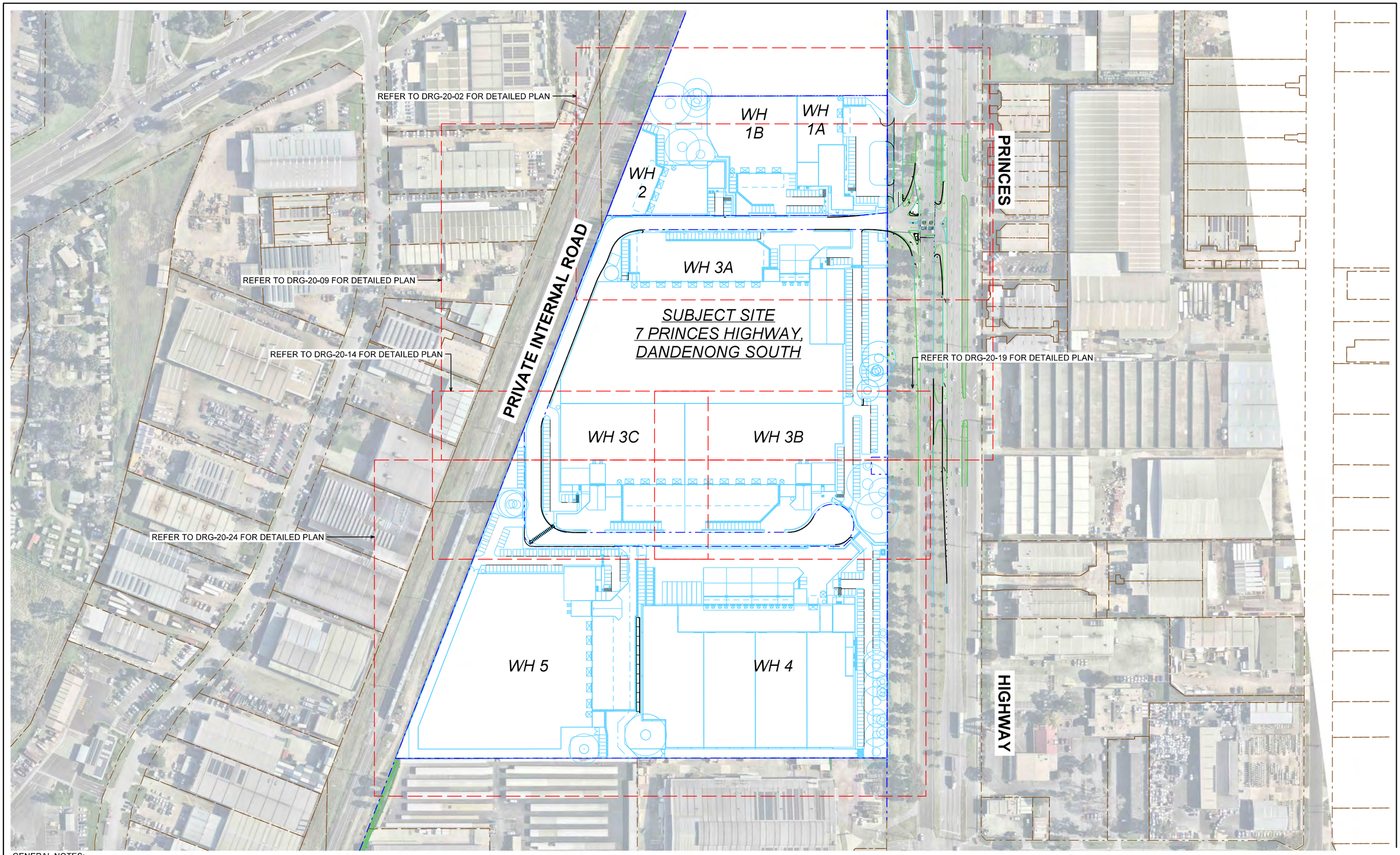
Importantly:

- At the location of the proposed site access, there is ample capacity to comfortably accommodate the number of movements generated by the proposed development with ample spare capacity.
- The results confirm that the impact of the proposed development retains, within practical limitations, the level of safety and operational efficiency that would have existed without the development.

APPENDIX A
Swept Path Analysis

Design Vehicles:

- 26m B-Double
- 20m Articulated Vehicle
- 12.5m Heavy Rigid Vehicle



GENERAL NOTES:
1. ALL DIMENSIONS ARE TO FACE OF KERB AND CHANNEL UNLESS NOTED OTHERWISE.
2. DECLARED ROADS - PRINCES HIGHWAY (SPEED ZONE 80KM/H).
3. BASE INFORMATION FROM NEARMAP AERIAL PHOTOGRAPHY DATED 26.05.2023 AND 2108-374-DA-004-ESTATE(O).dwg RECEIVED 04.06.2024 AND 13174S-4D.dwg RECEIVED 01.03.2024

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Title
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SITE LAYOUT PLAN

Status
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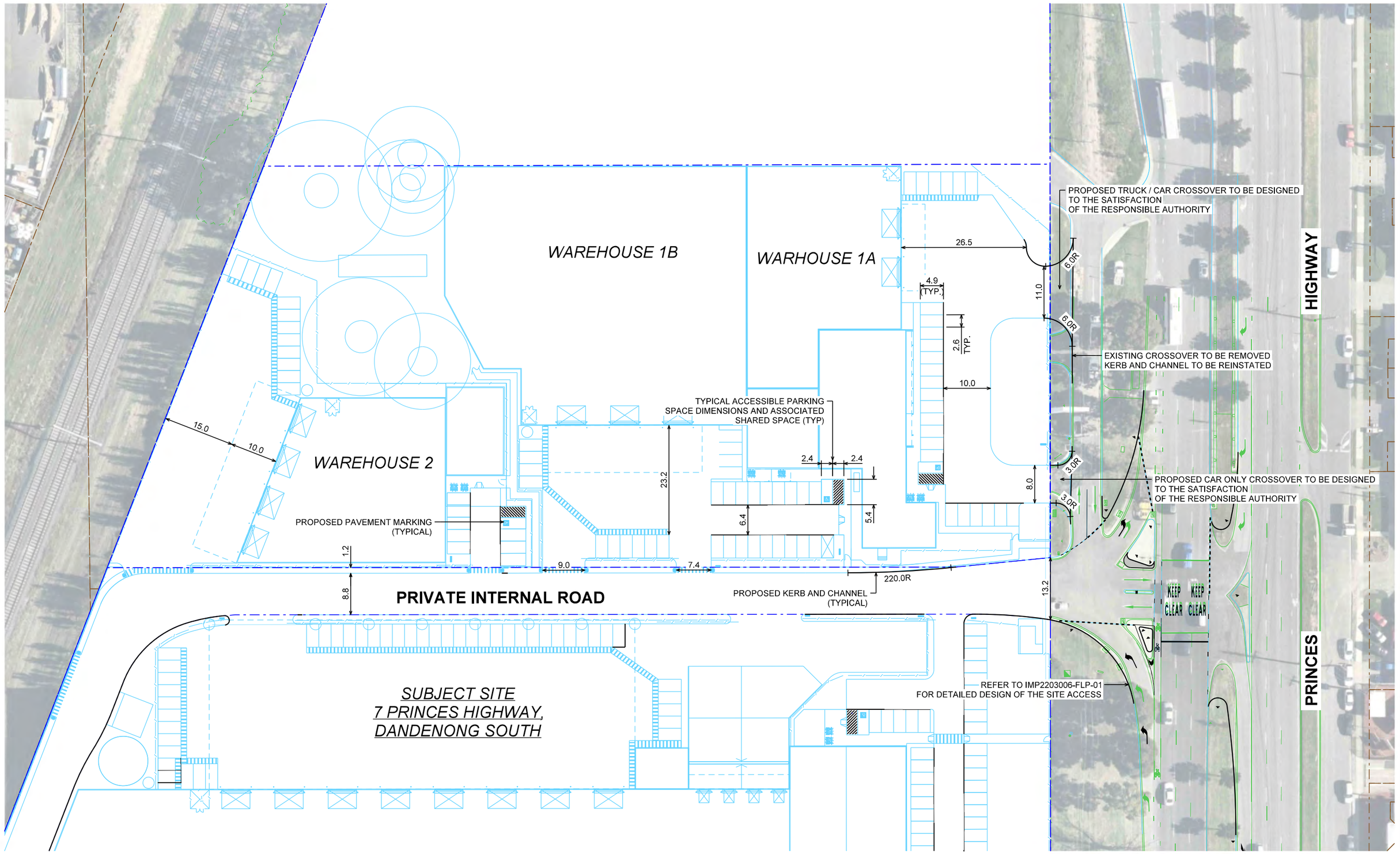

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7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

Title
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WAREHOUSE 1A, 1B & 2

Status
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Drawing Number
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Revision
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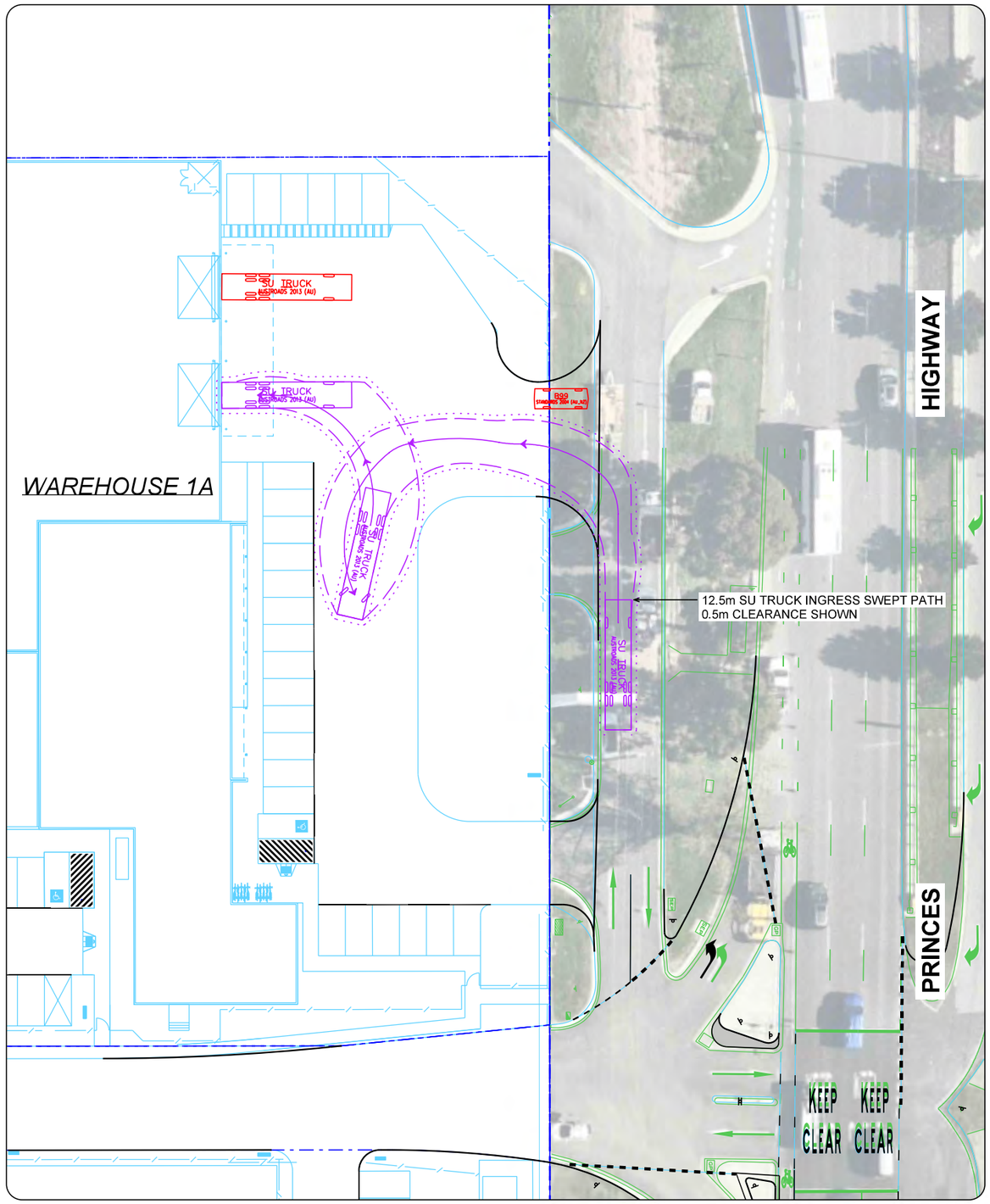

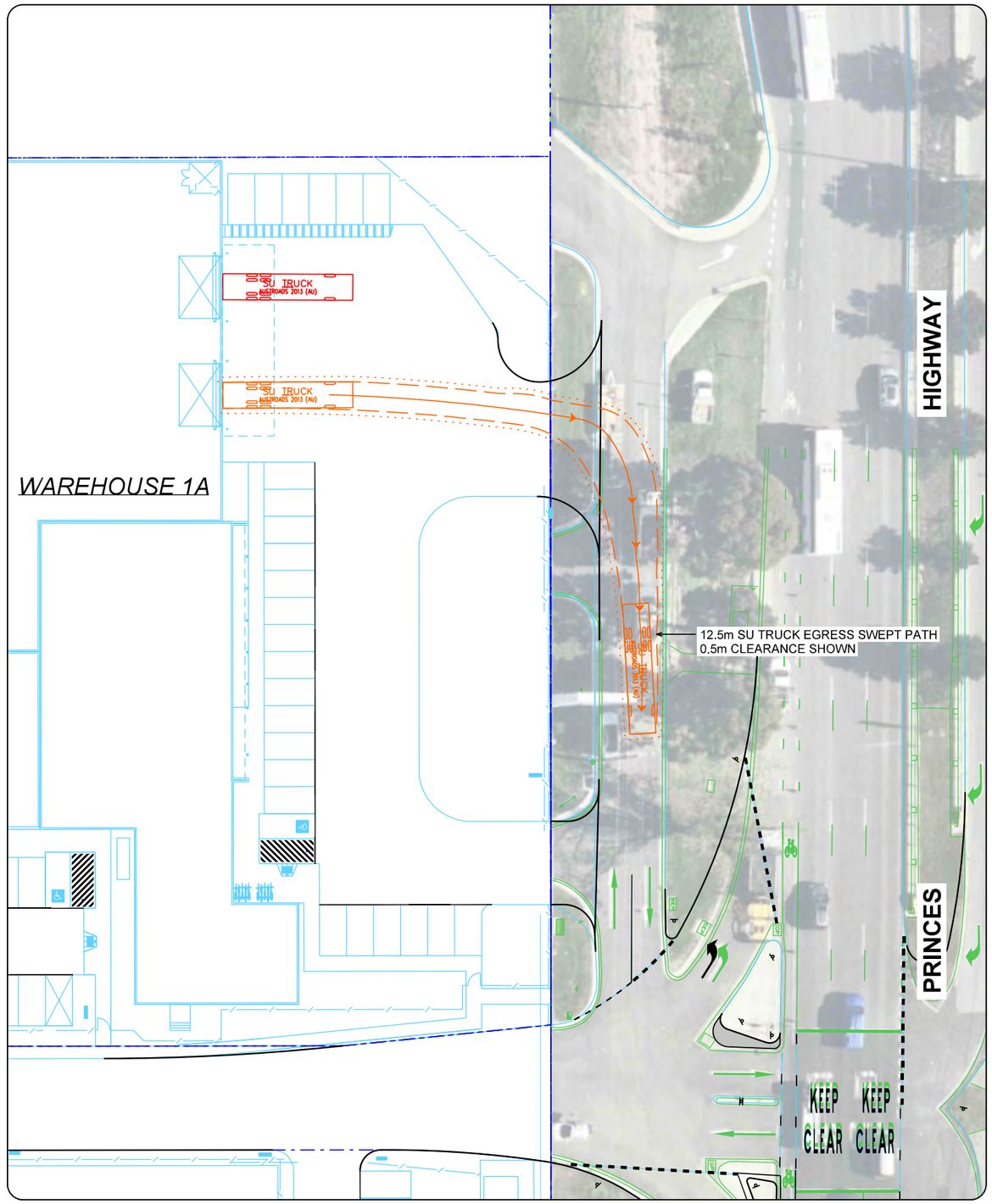

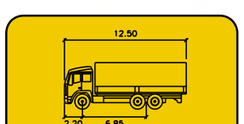

12.5m SU TRUCK

	METERS
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TRACK	: 2.50
LOCK TO LOCK TIME	: 6.0
STEERING ANGLE	: 36.6

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12.5m SU TRUCK DESIGN VEHICLE

Status
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Drawing Number
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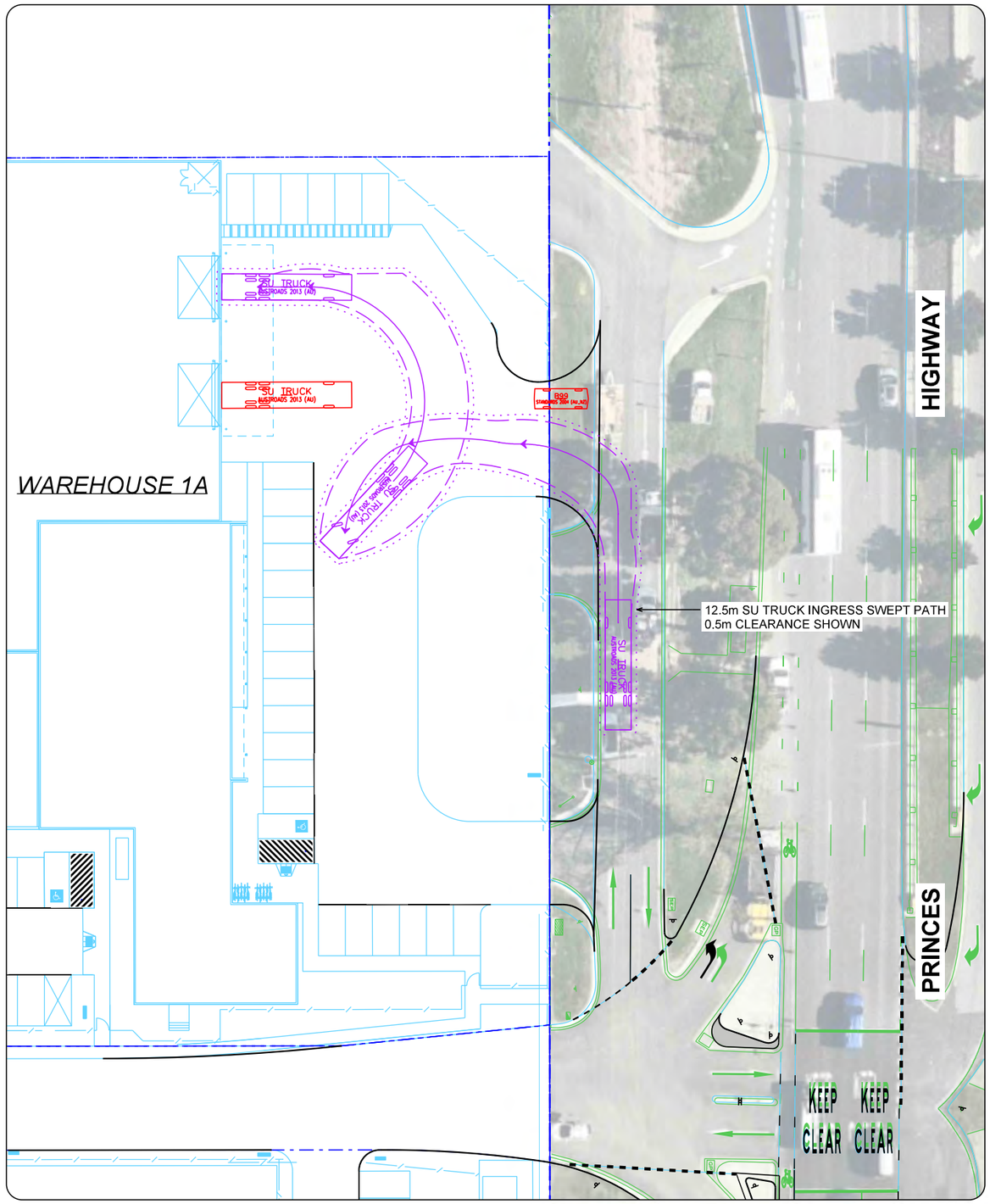

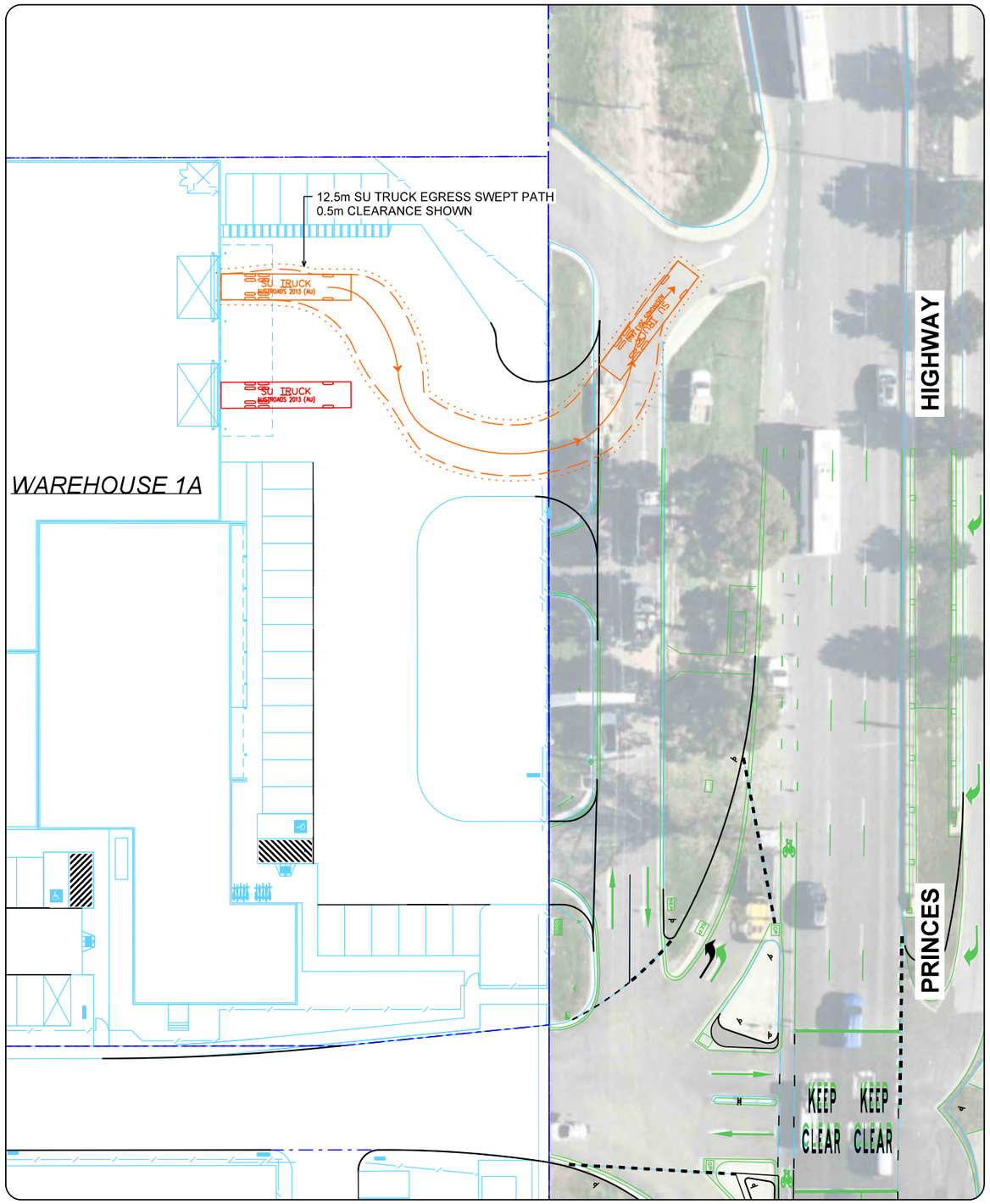

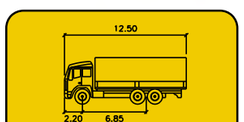

12.5m SU TRUCK

	METERS
WIDTH	: 2.50
TRACK	: 2.50
LOCK TO LOCK TIME	: 6.0
STEERING ANGLE	: 36.6

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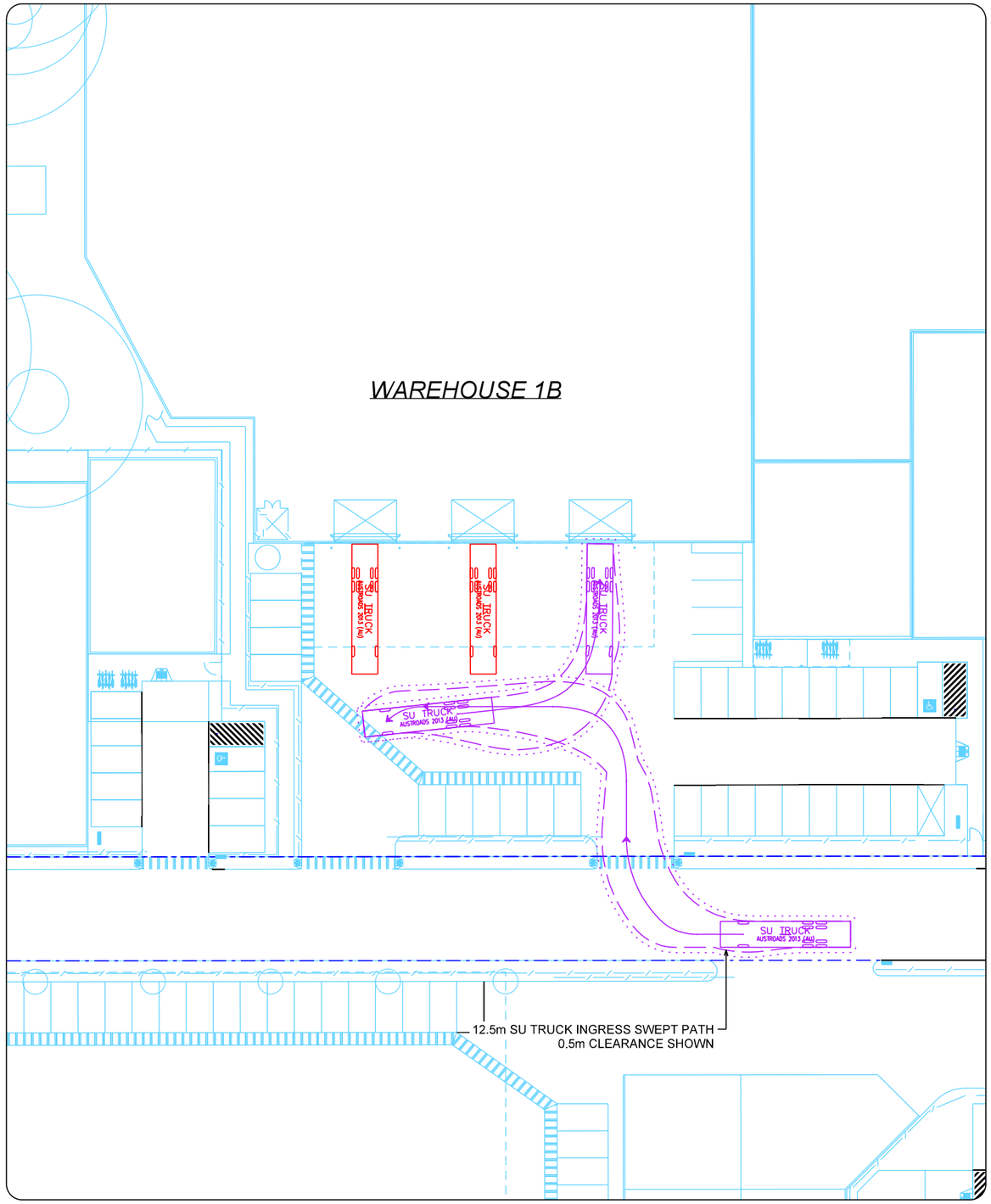

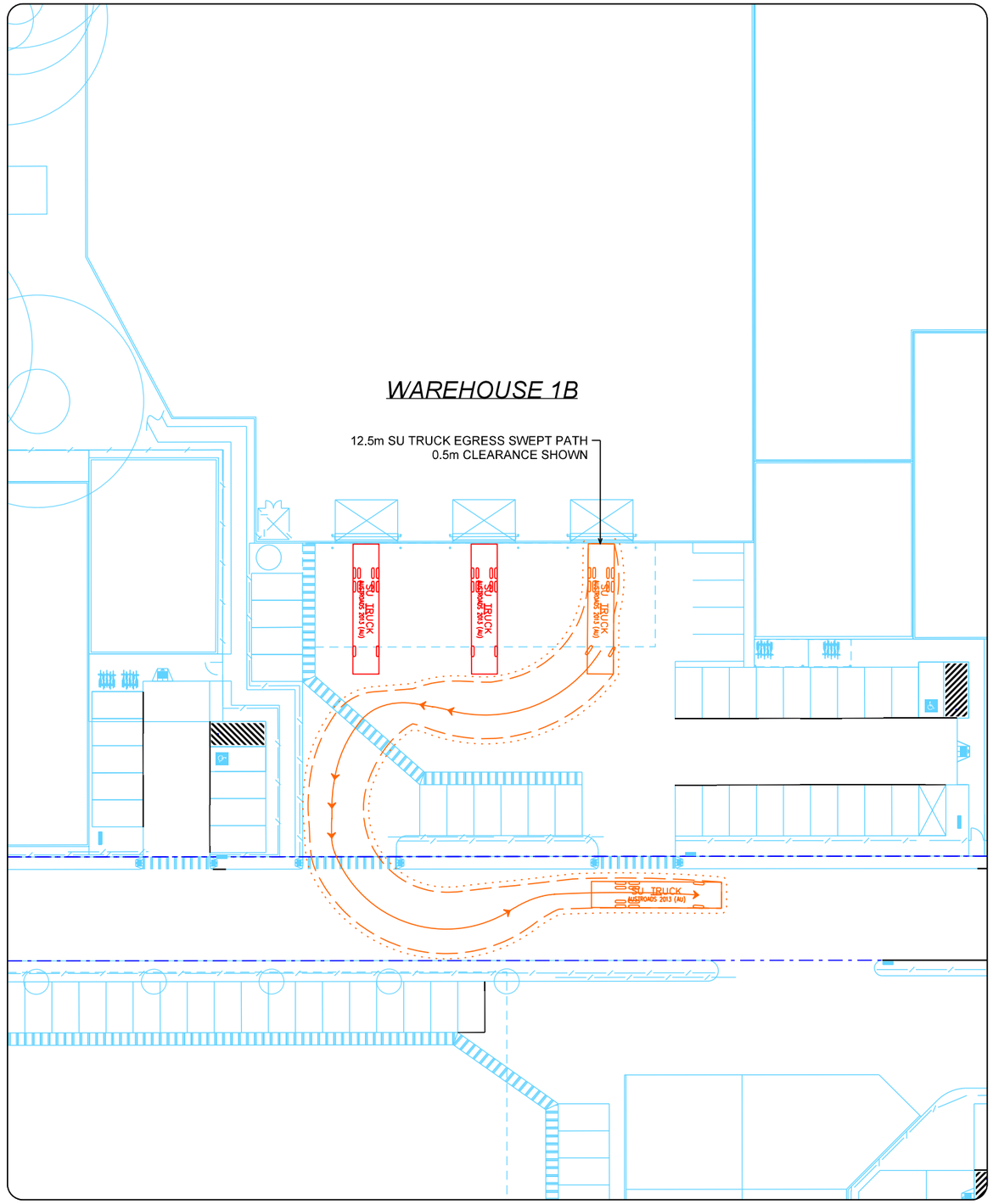

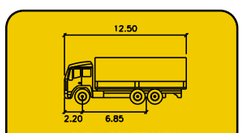

12.5m SU TRUCK

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TRACK	: 2.50
LOCK TO LOCK TIME	: 6.0
STEERING ANGLE	: 36.6

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12.5m SU TRUCK DESIGN VEHICLE

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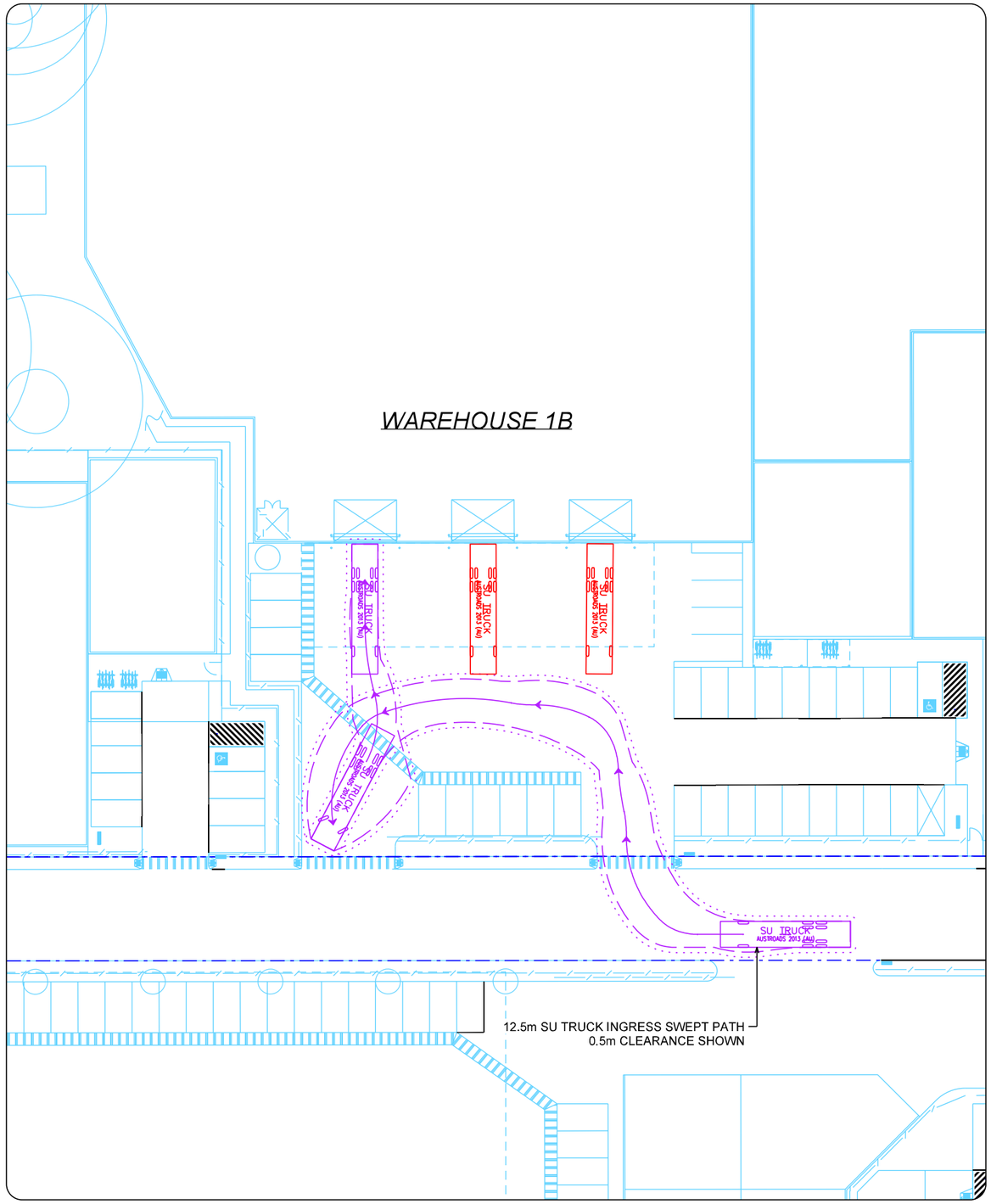

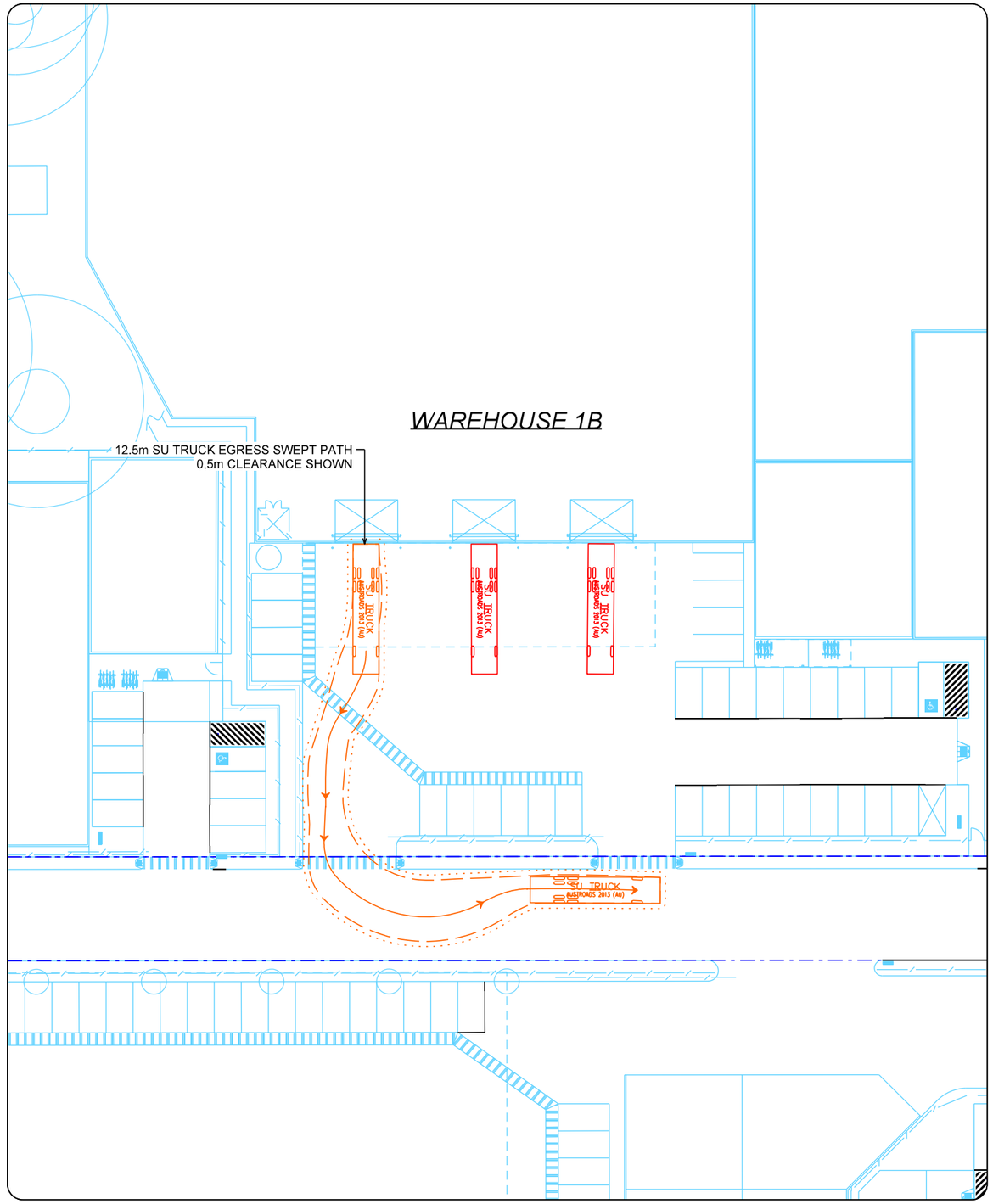

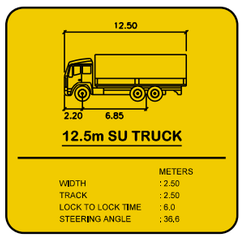

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12.5m SU TRUCK DESIGN VEHICLE

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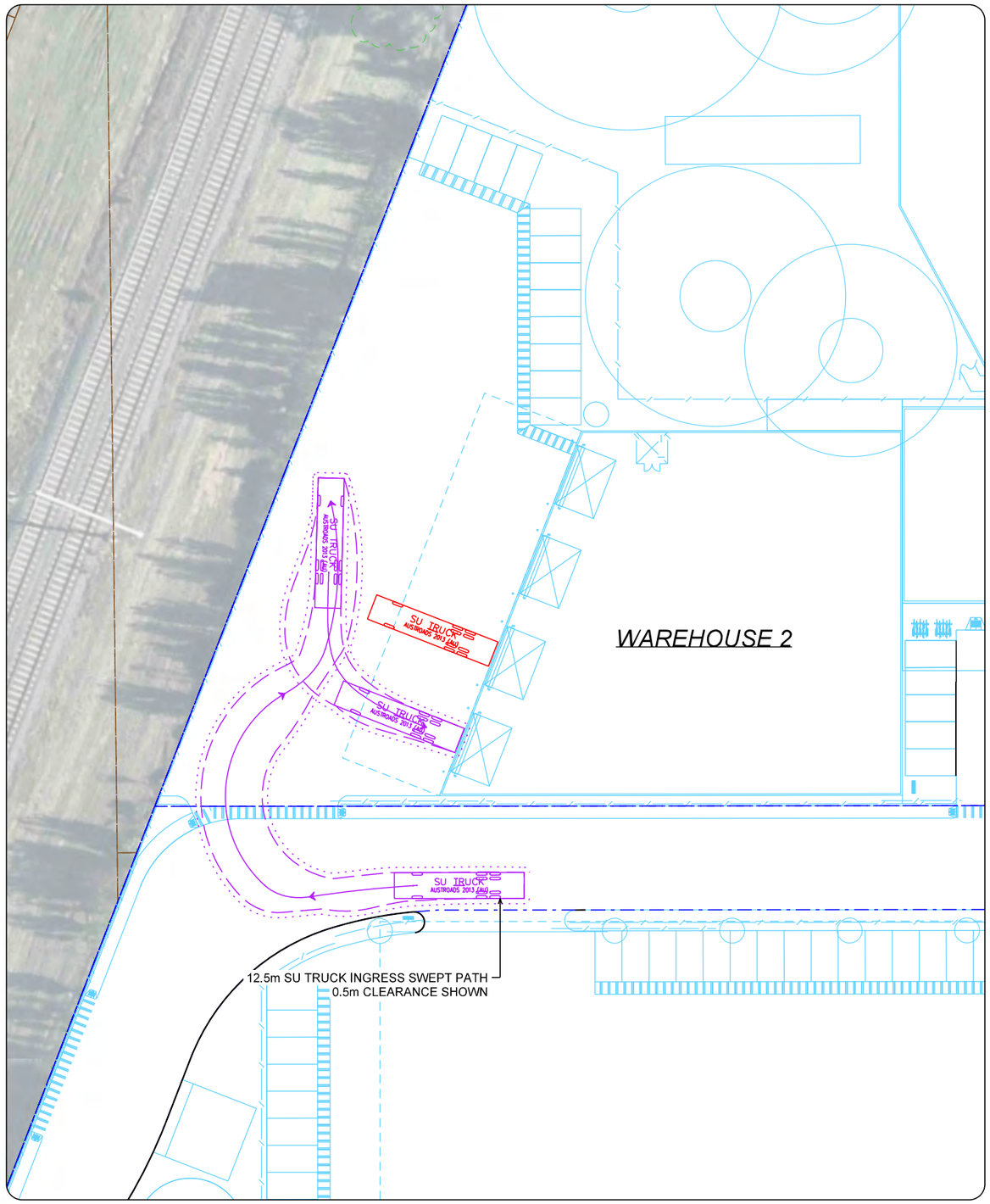

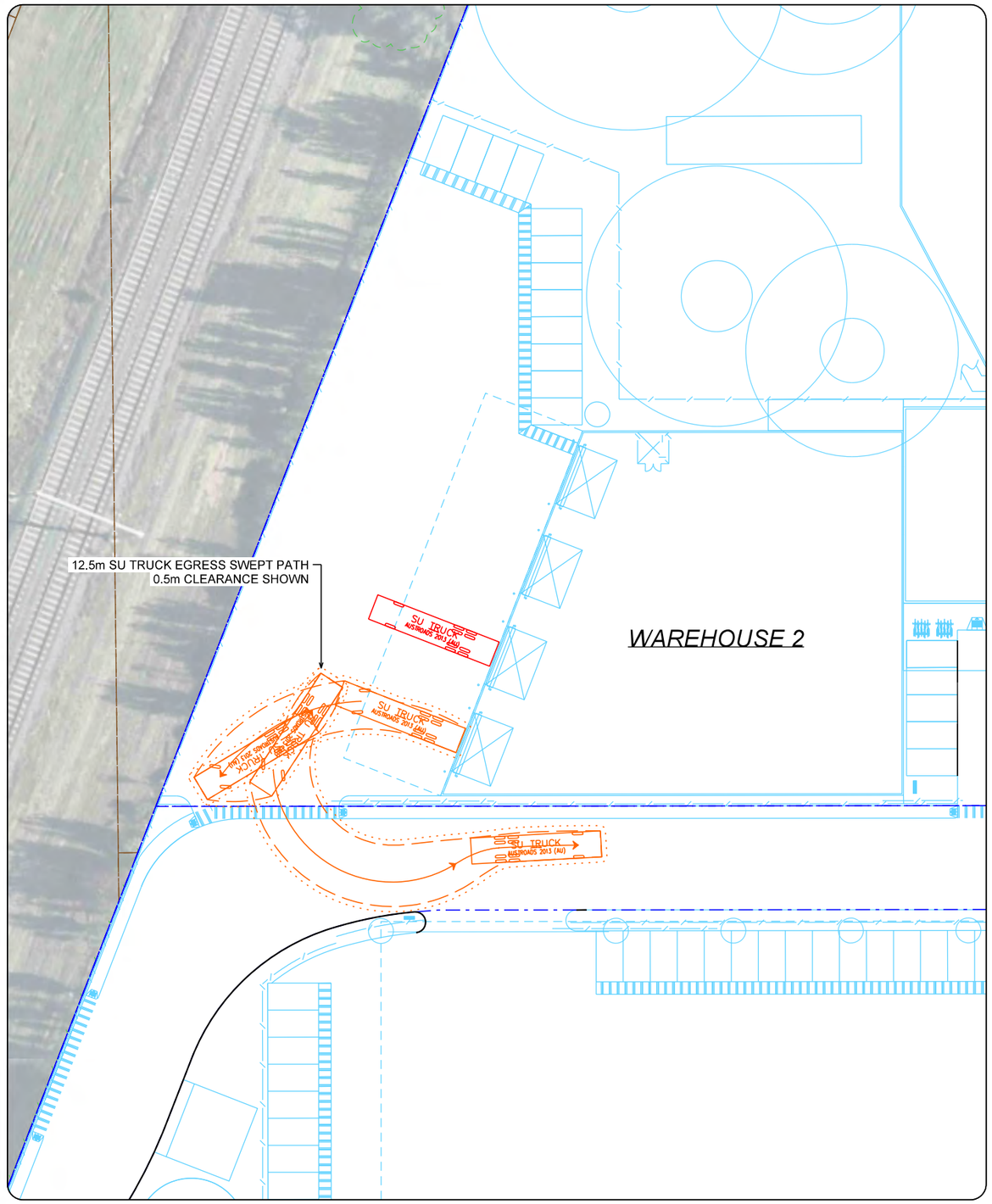

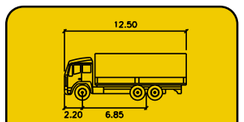

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12.5m SU TRUCK DESIGN VEHICLE

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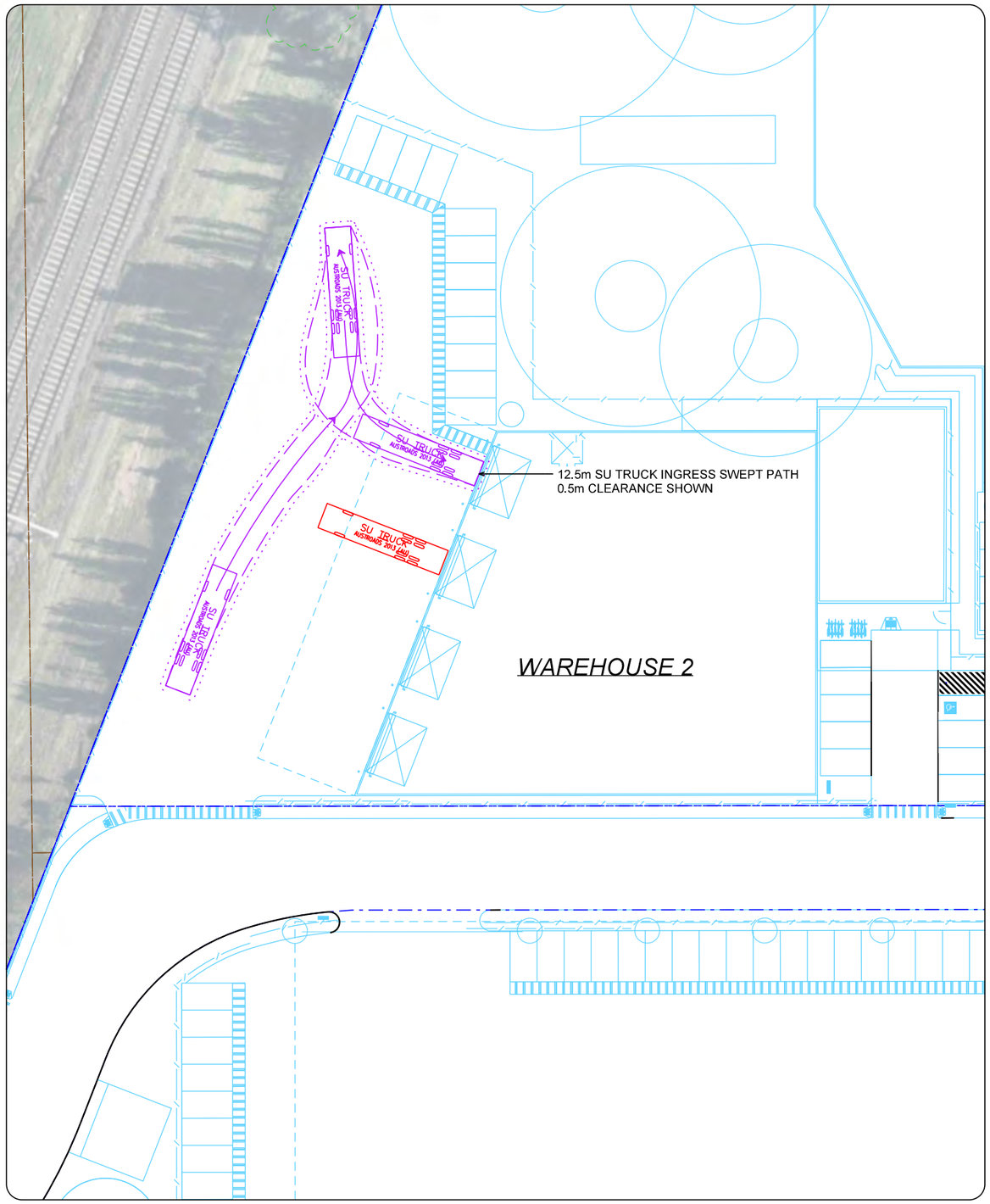

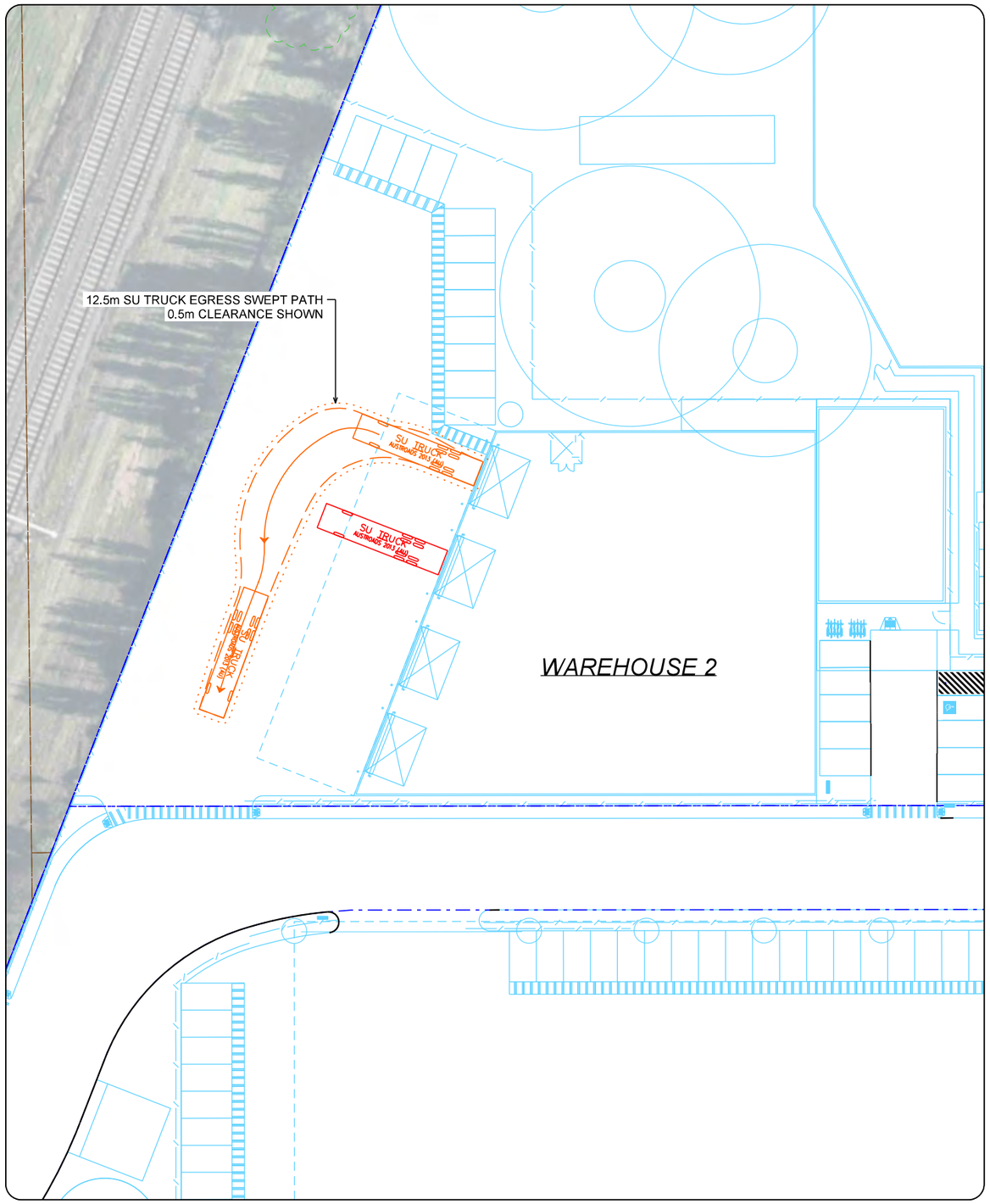

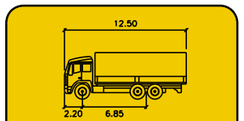

12.5m SU TRUCK

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WIDTH	: 2.50
TRACK	: 2.50
LOCK TO LOCK TIME	: 6.0
STEERING ANGLE	: 36.6

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12.5m SU TRUCK DESIGN VEHICLE

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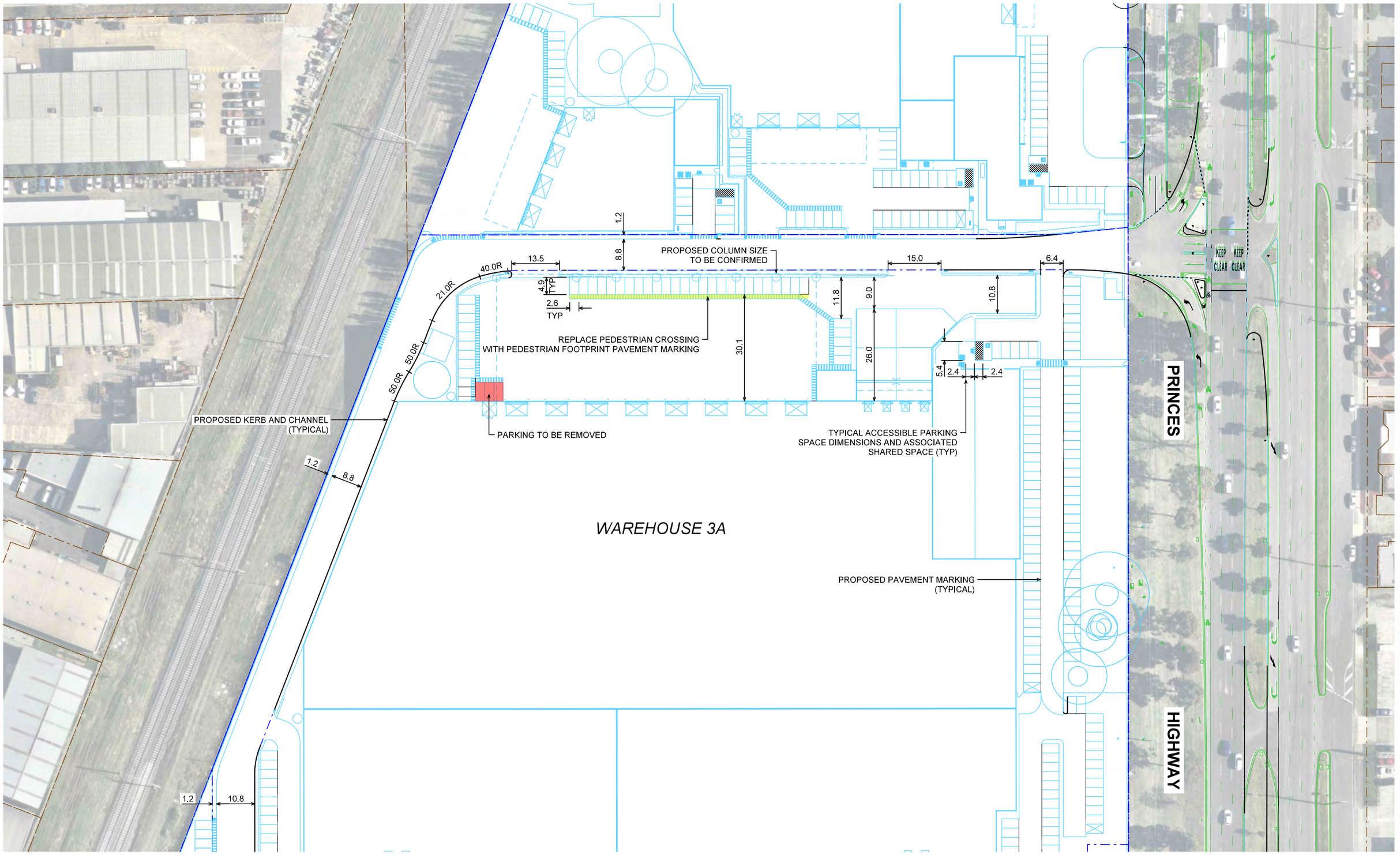

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Title
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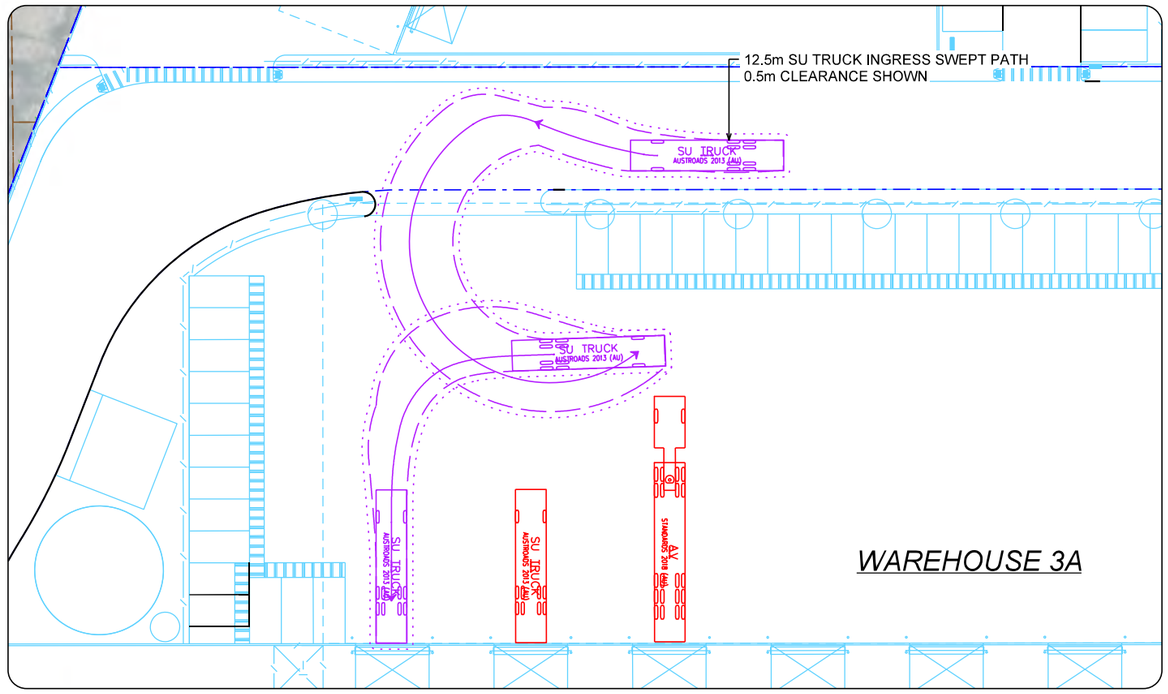

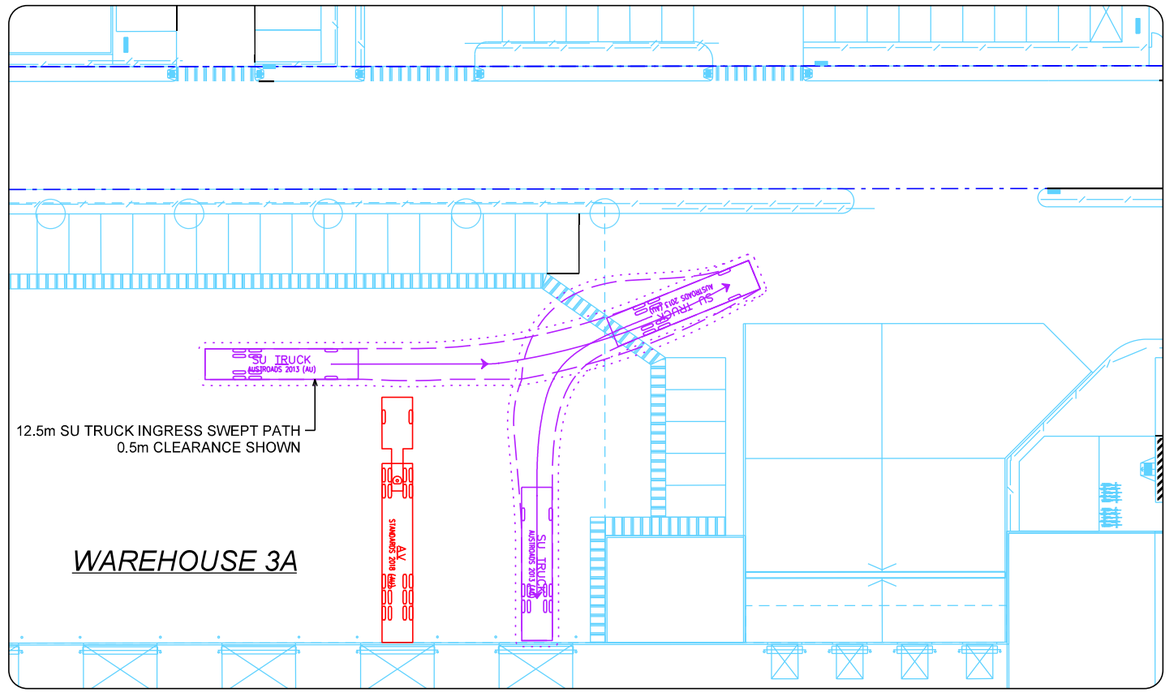

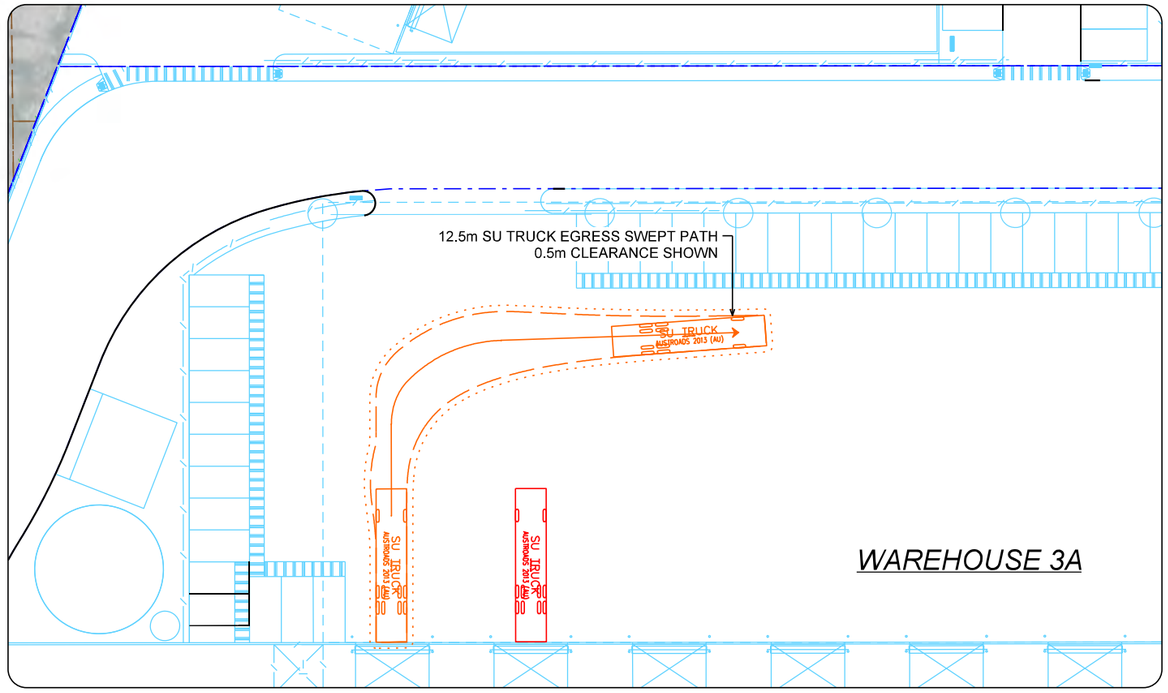

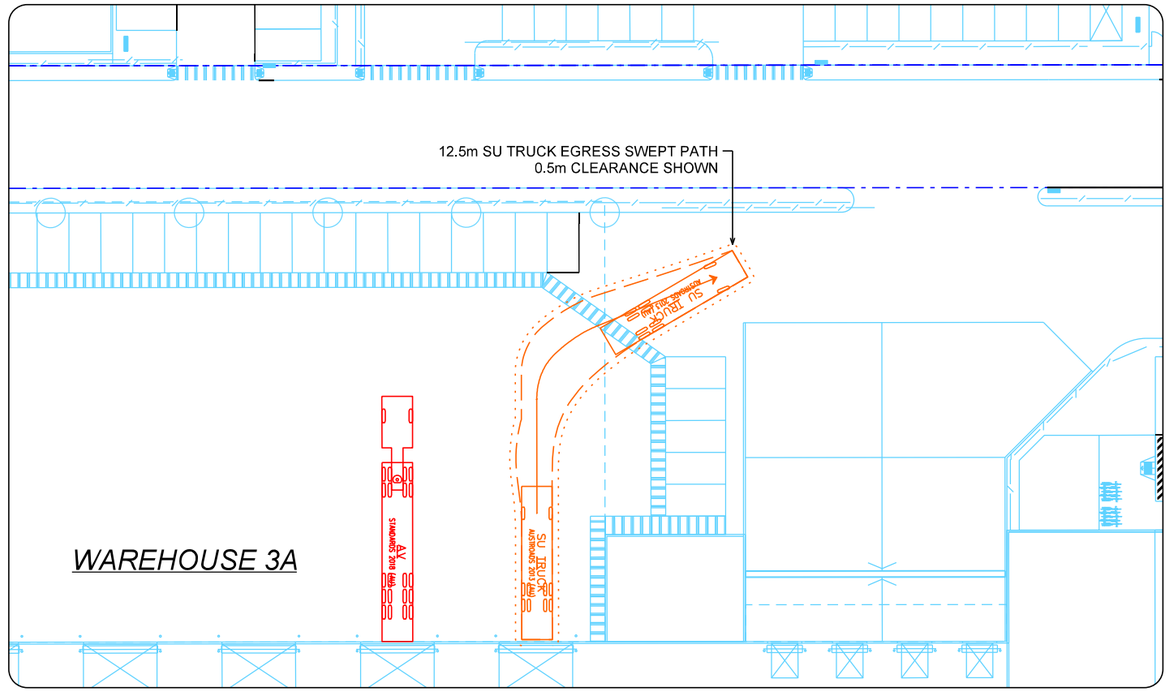

12.50

2.20 6.85

12.5m SU TRUCK

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TRACK	: 2.50
LOCK TO LOCK TIME	: 6.0
STEERING ANGLE	: 36.6

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Title
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12.5m SU TRUCK - DESIGN VEHICLE

Status
PRELIMINARY

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Revision
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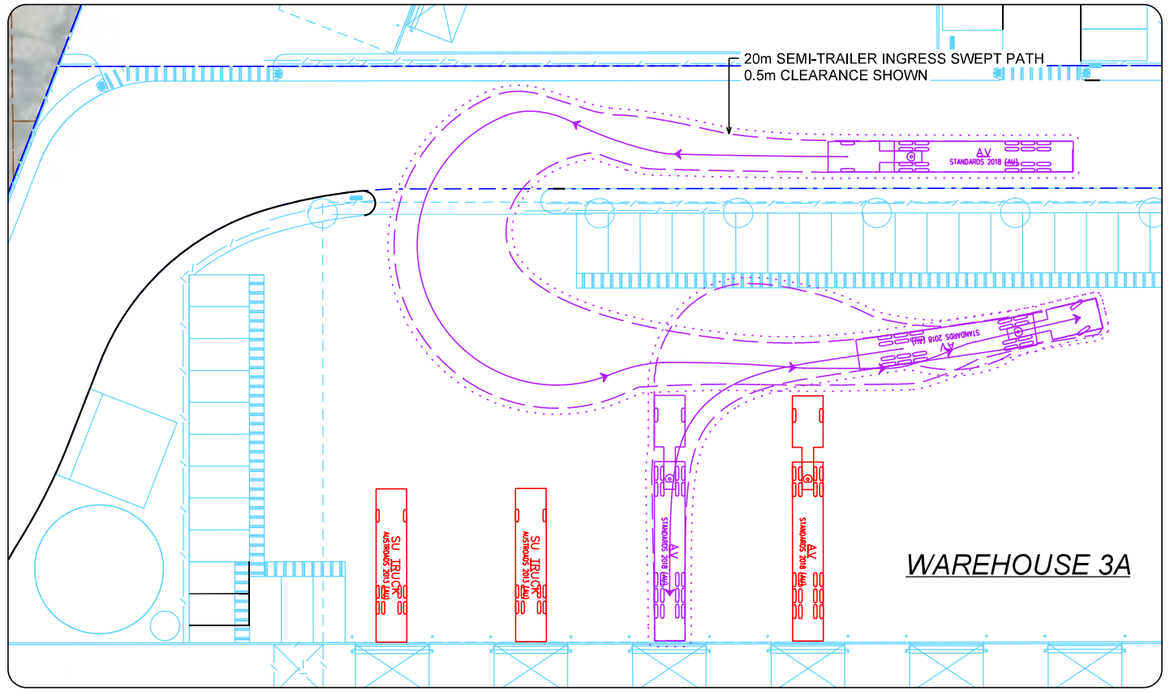

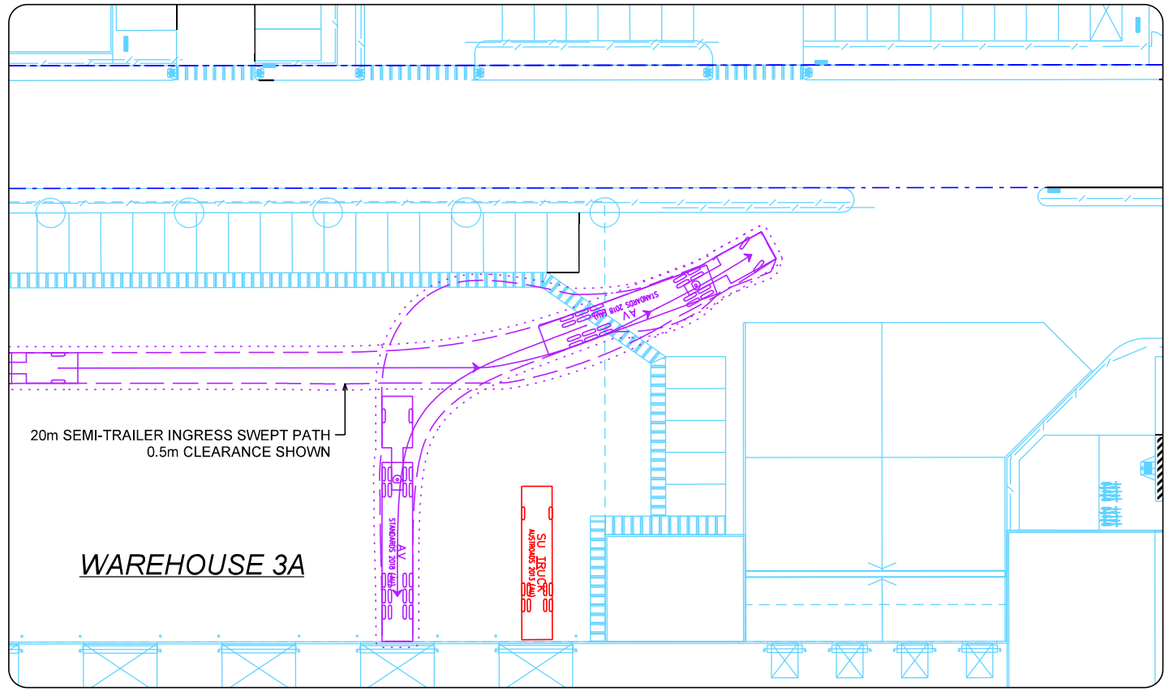

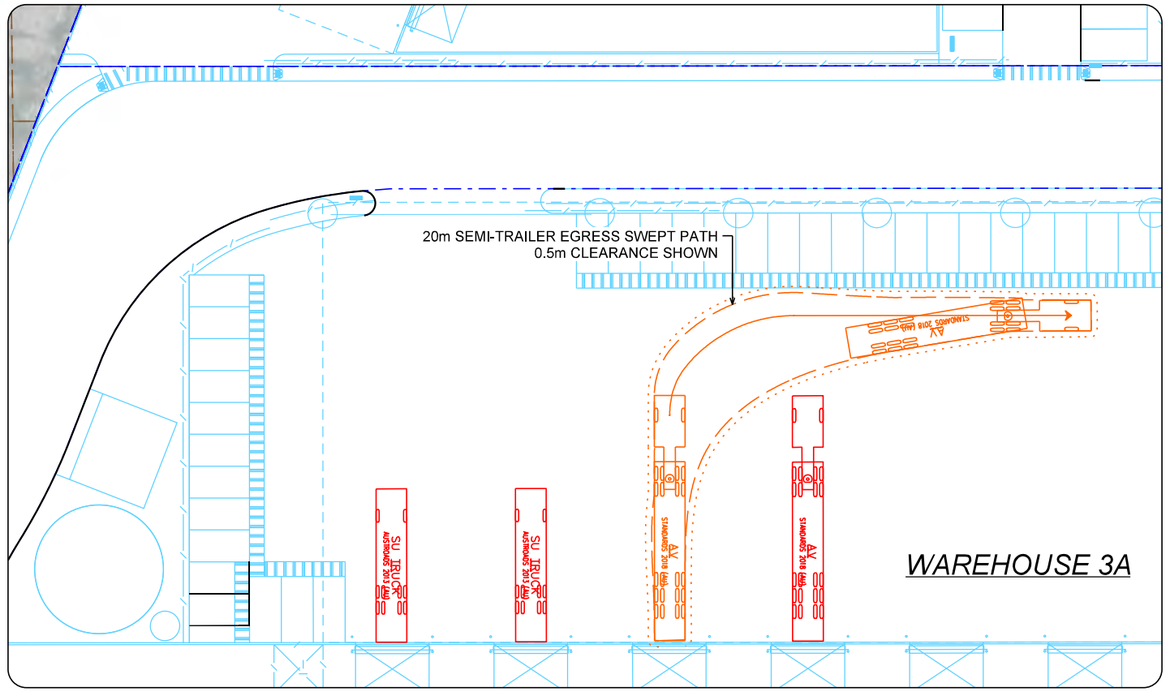

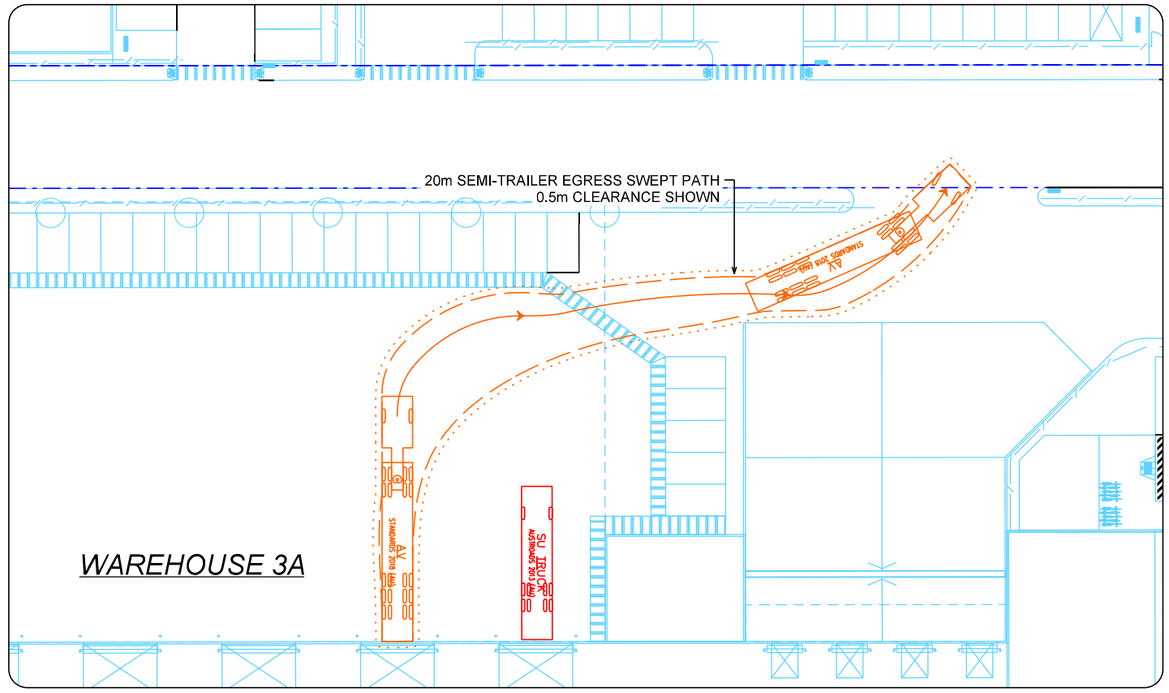

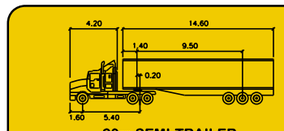

20m SEMI-TRAILER

METERS			
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TRAILER WIDTH	: 2.50	STEERING ANGLE	: 28,3
TRACTOR TRACK	: 2.50	ARTICULATING ANGLE	: 72,0
TRAILER TRACK	: 2.50		

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Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

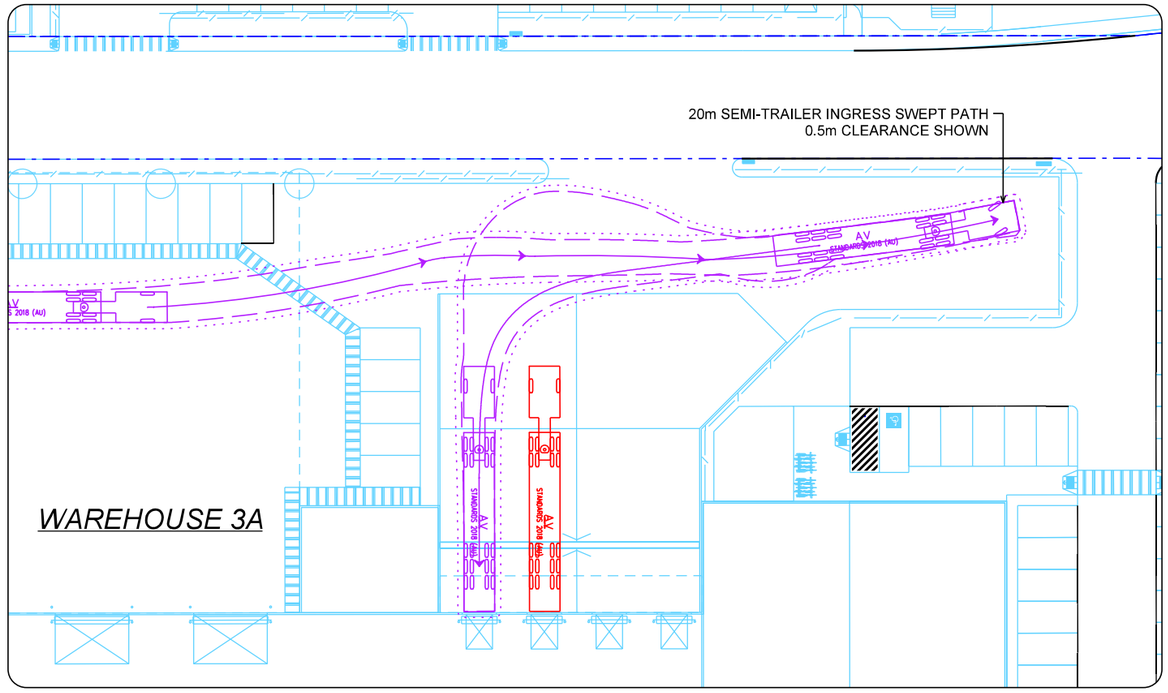
Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
20m SEMI-TRAILER - DESIGN VEHICLE

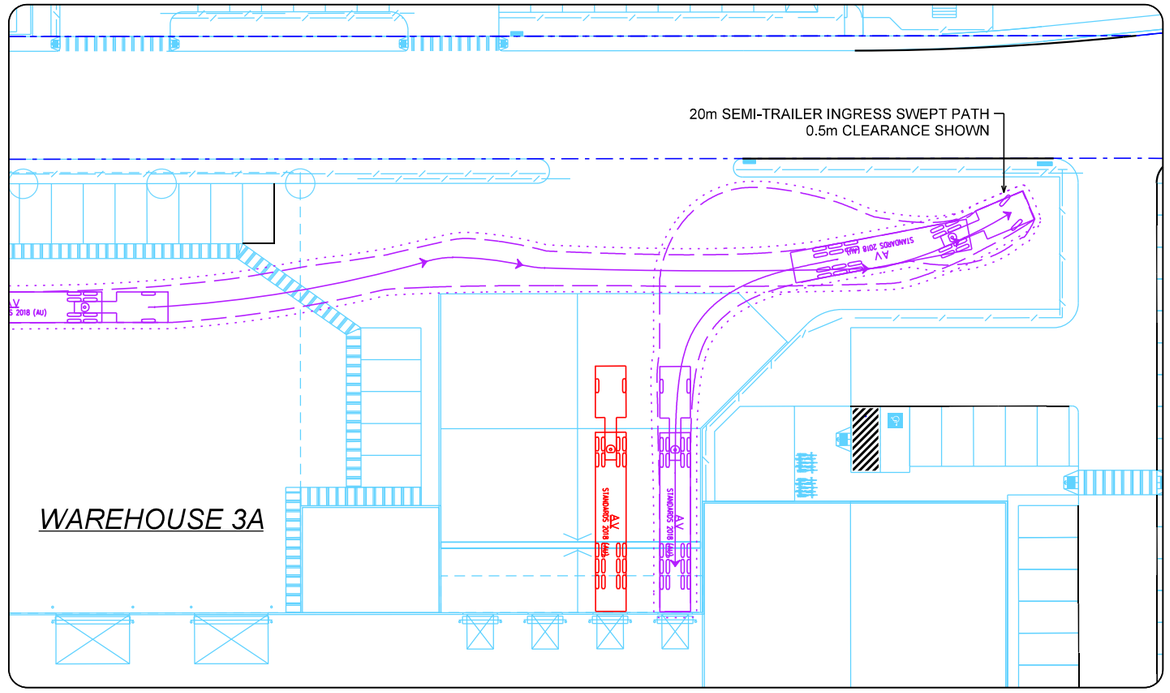
Status
PRELIMINARY

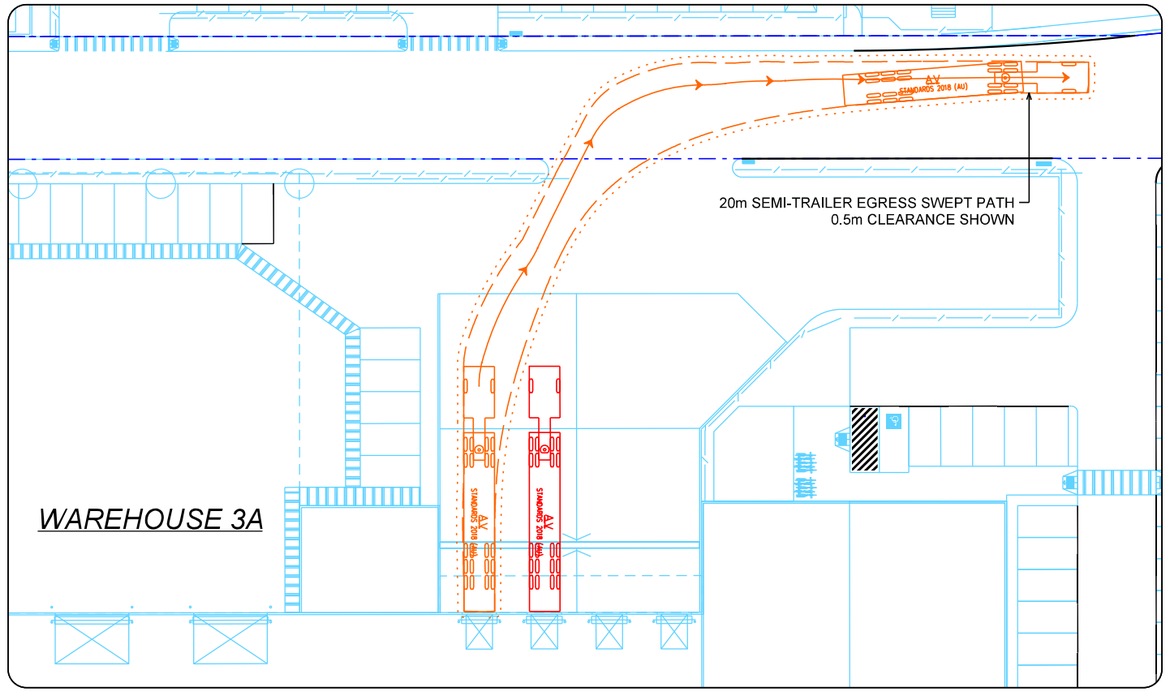
Drawing Number
IMP2203006 - DRG-20-11

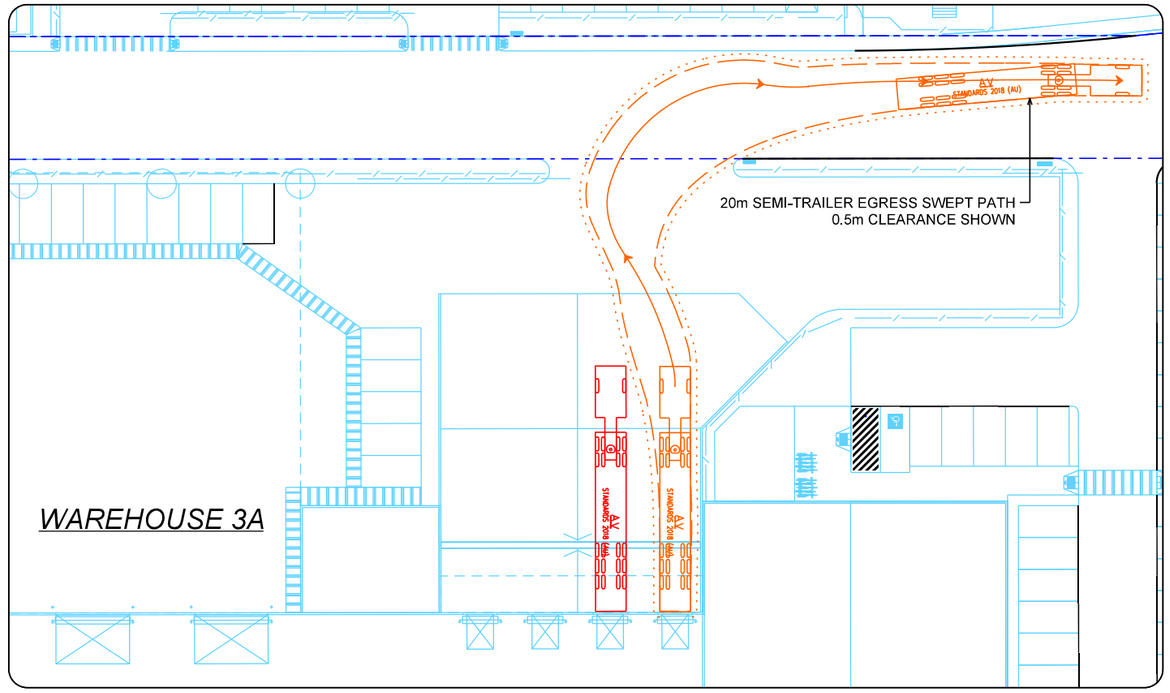
Revision
D

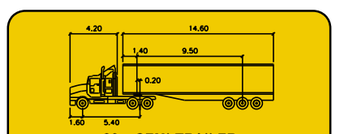
7/06/2024 2:11:55 PM











20m SEMI-TRAILER

METERS			
TRACTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 28.3
TRACTOR TRACK	: 2.50	ARTICULATING ANGLE	: 72.0
TRAILER TRACK	: 2.50		

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IMPACT TRAFFIC ENGINEERING PTY LTD
ABN 78 611 424 107
LEVEL 17, 31 QUEEN STREET, MELBOURNE VIC 3000
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impactaustralia.com.au

MELWAY ONLINE REF:MAP 90 G11

SCALE
1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

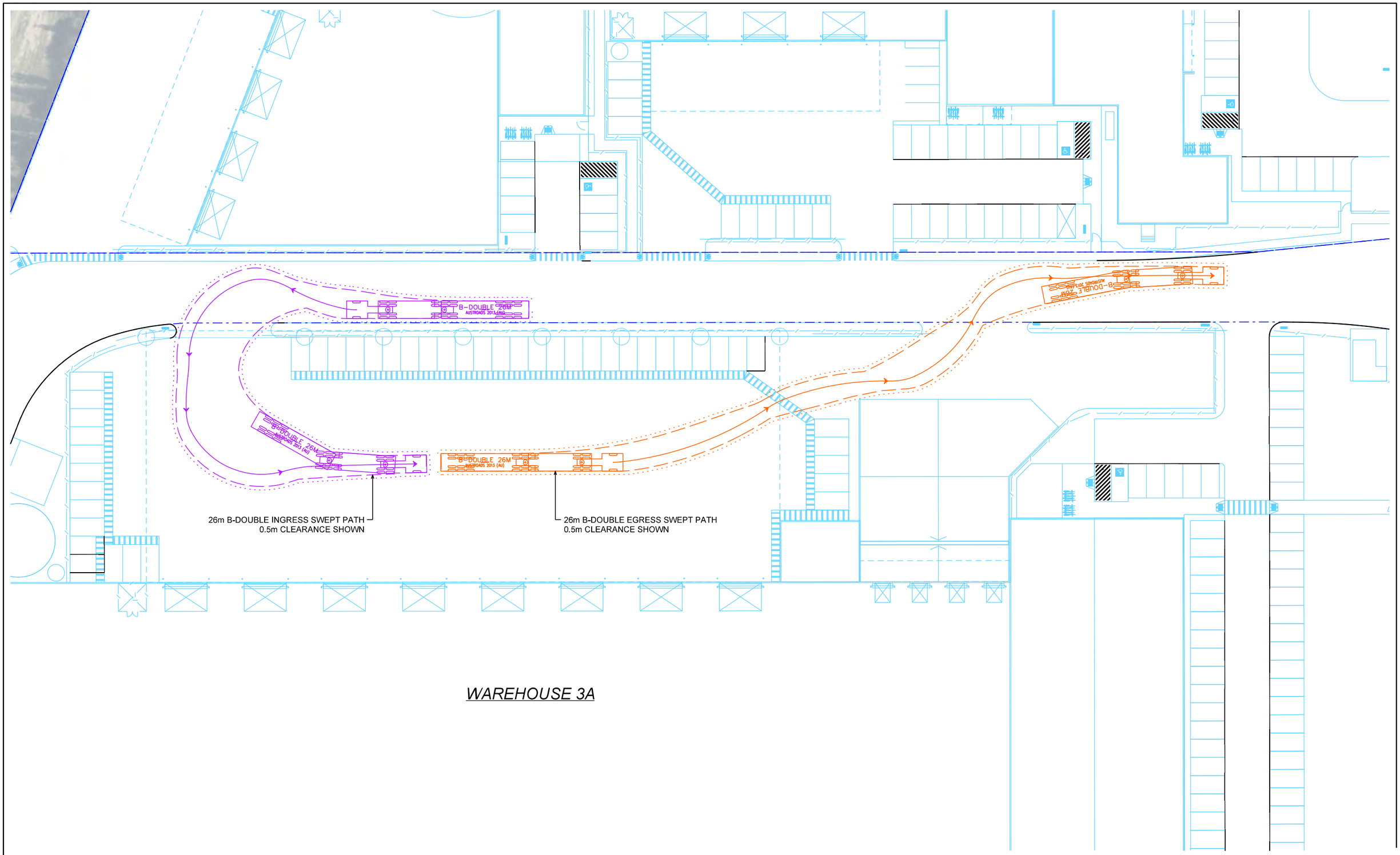
Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
20m SEMI-TRAILER - DESIGN VEHICLE

Status
PRELIMINARY

Drawing Number
IMP2203006 - DRG-20-12

Revision
D

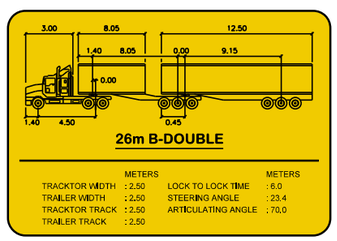
7/06/2024 2:11:59 PM



26m B-DOUBLE INGRESS SWEPT PATH
0.5m CLEARANCE SHOWN

26m B-DOUBLE EGRESS SWEPT PATH
0.5m CLEARANCE SHOWN

WAREHOUSE 3A



26m B-DOUBLE

	METERS		METERS
TRACKTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 23.4
TRACKTOR TRACK	: 2.50	ARTICULATING ANGLE	: 70.0
TRAILER TRACK	: 2.50		

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MELWAY ONLINE REF:MAP 90 G11

SCALE
1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

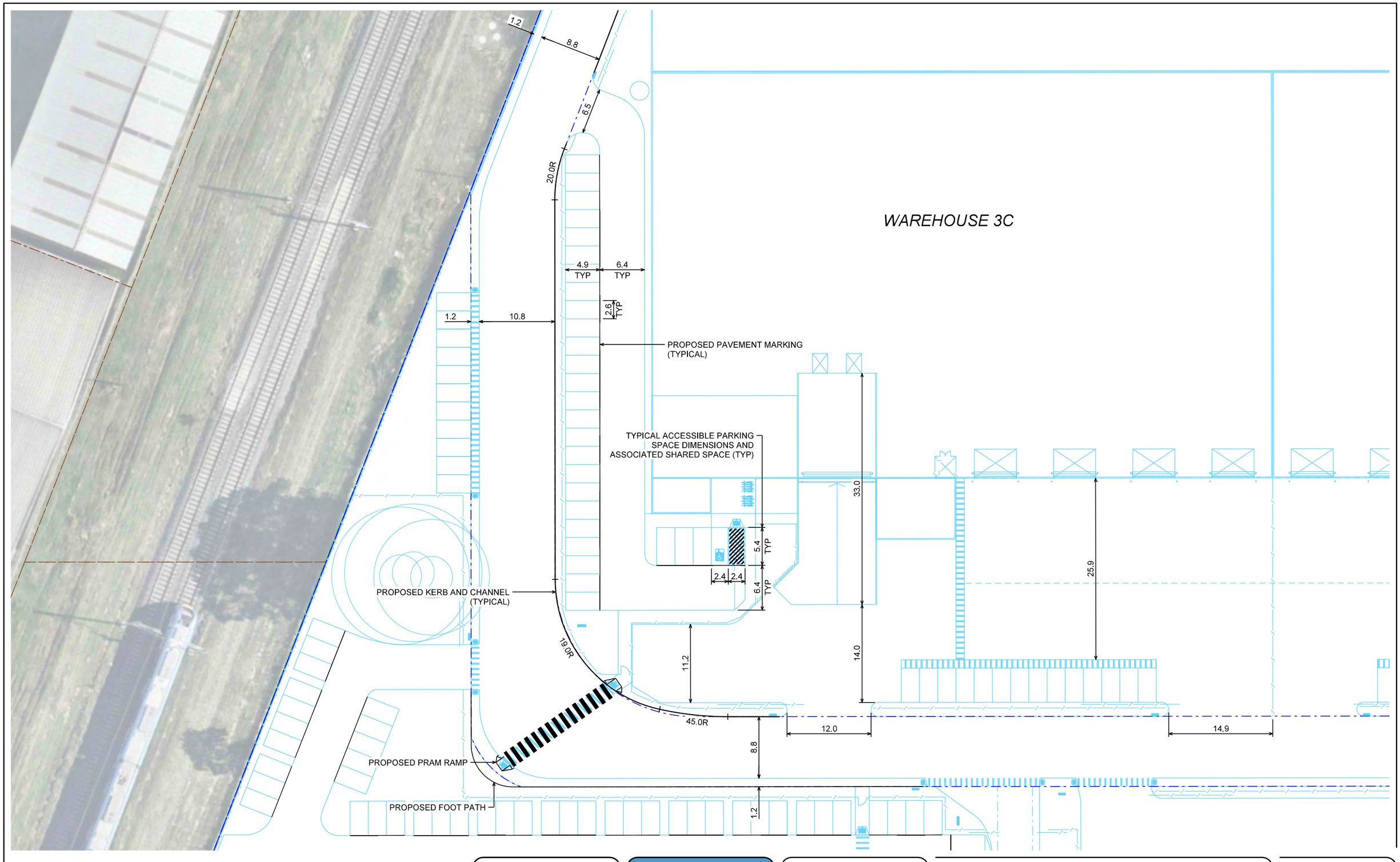
Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
26m B-DOUBLE - CHECK VEHICLE

Status
PRELIMINARY

Drawing Number
IMP2203006 - DRG-20-13

Revision
D

7/06/2024 2:12:04 PM



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MELWAY ONLINE REF:MAP 90 G11

SCALE
1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

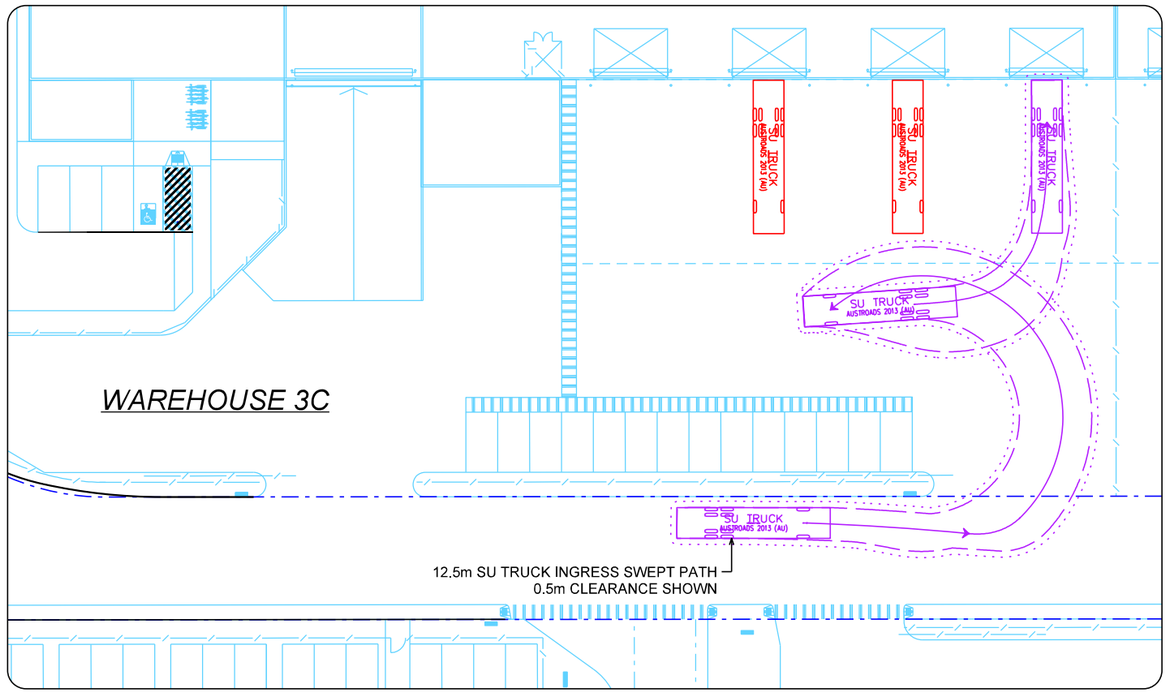
Title
TRAFFIC AND TRANSPORT ASSESSMENT
WAREHOUSE 3C

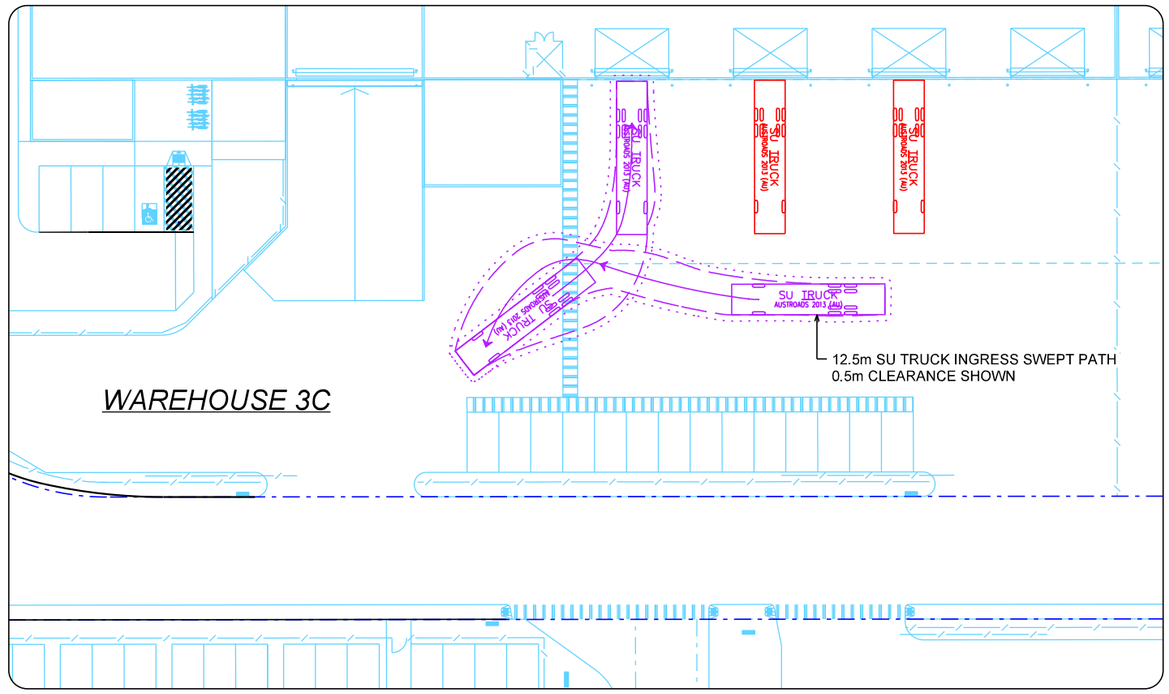
Status
PRELIMINARY

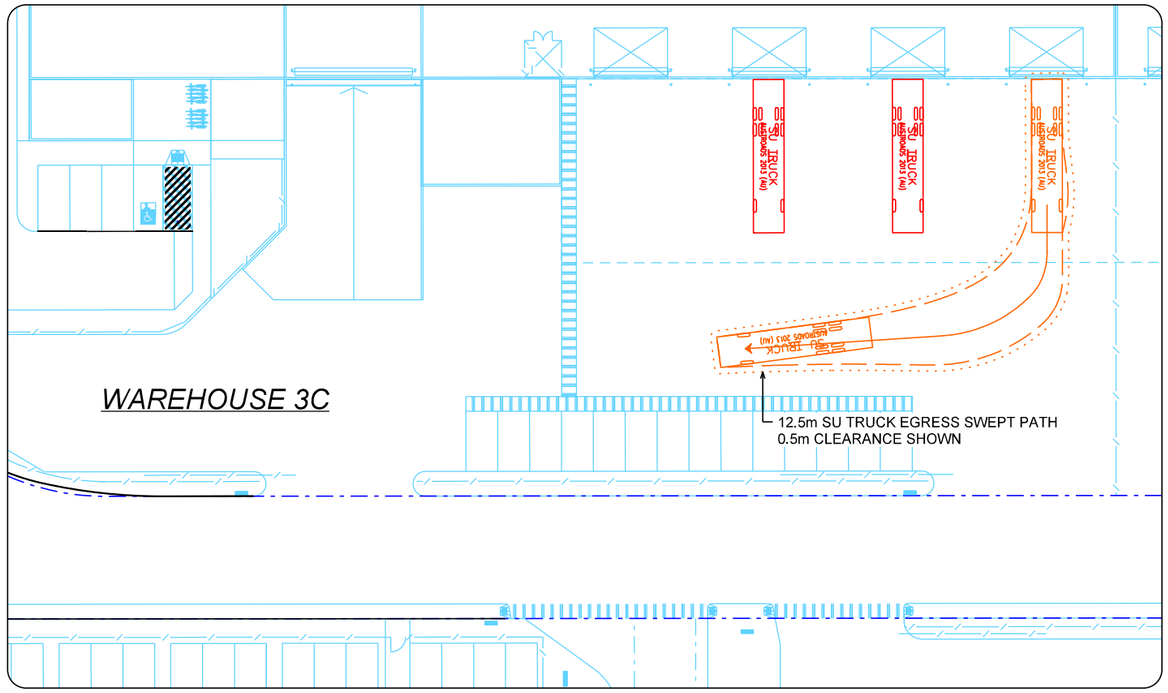
Drawing Number
IMP2203006 - DRG-20-14

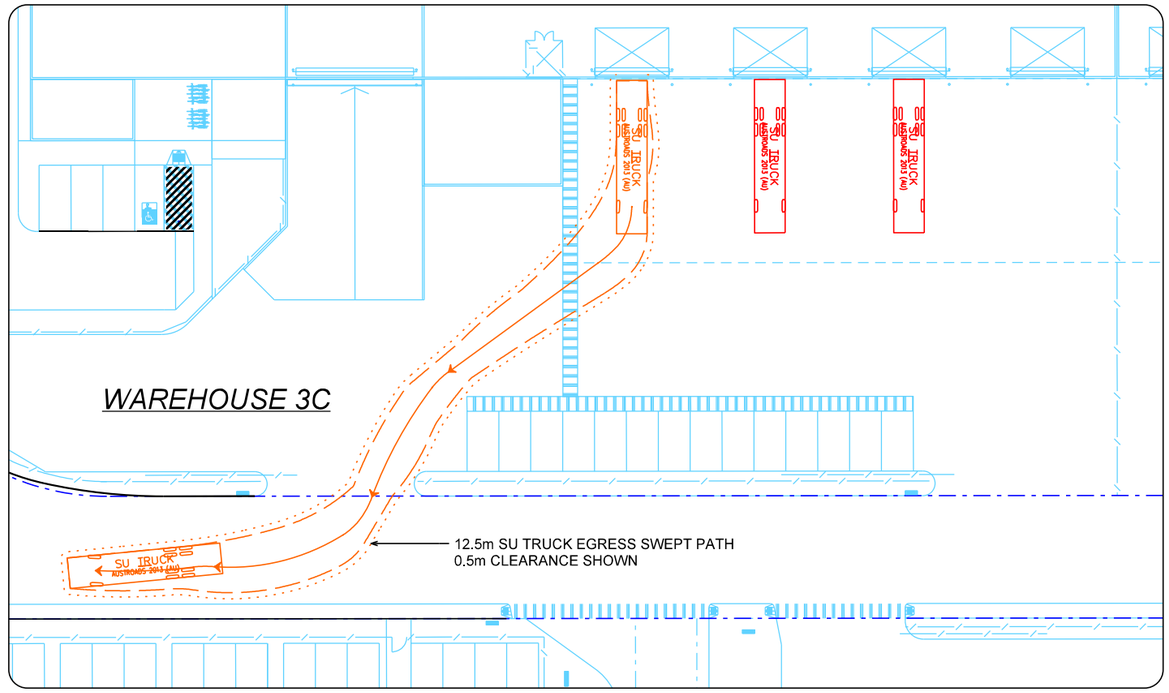
Revision
D

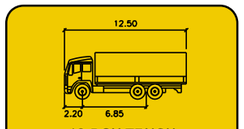
7/06/2024 2:12:09 PM











12.5 SU TRUCK

	METERS
WIDTH	: 2.50
TRACK	: 2.50
LOCK TO LOCK TIME	: 6.0
STEERING ANGLE	: 36.6

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Impactaustralia.com.au

MELWAY ONLINE REF:MAP 90 G11

SCALE

1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

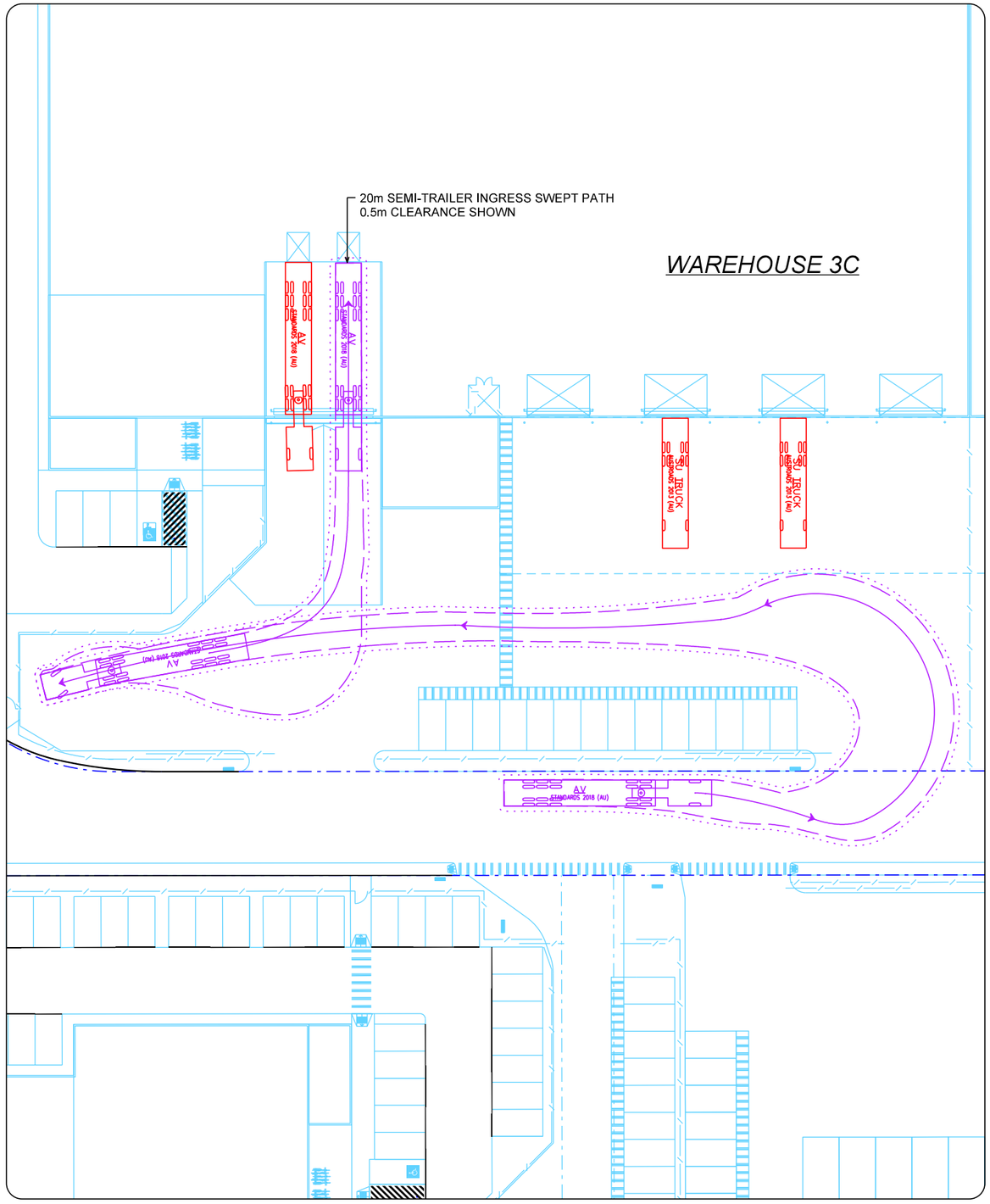
Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
12.5m SU TRUCK - DESIGN VEHICLE

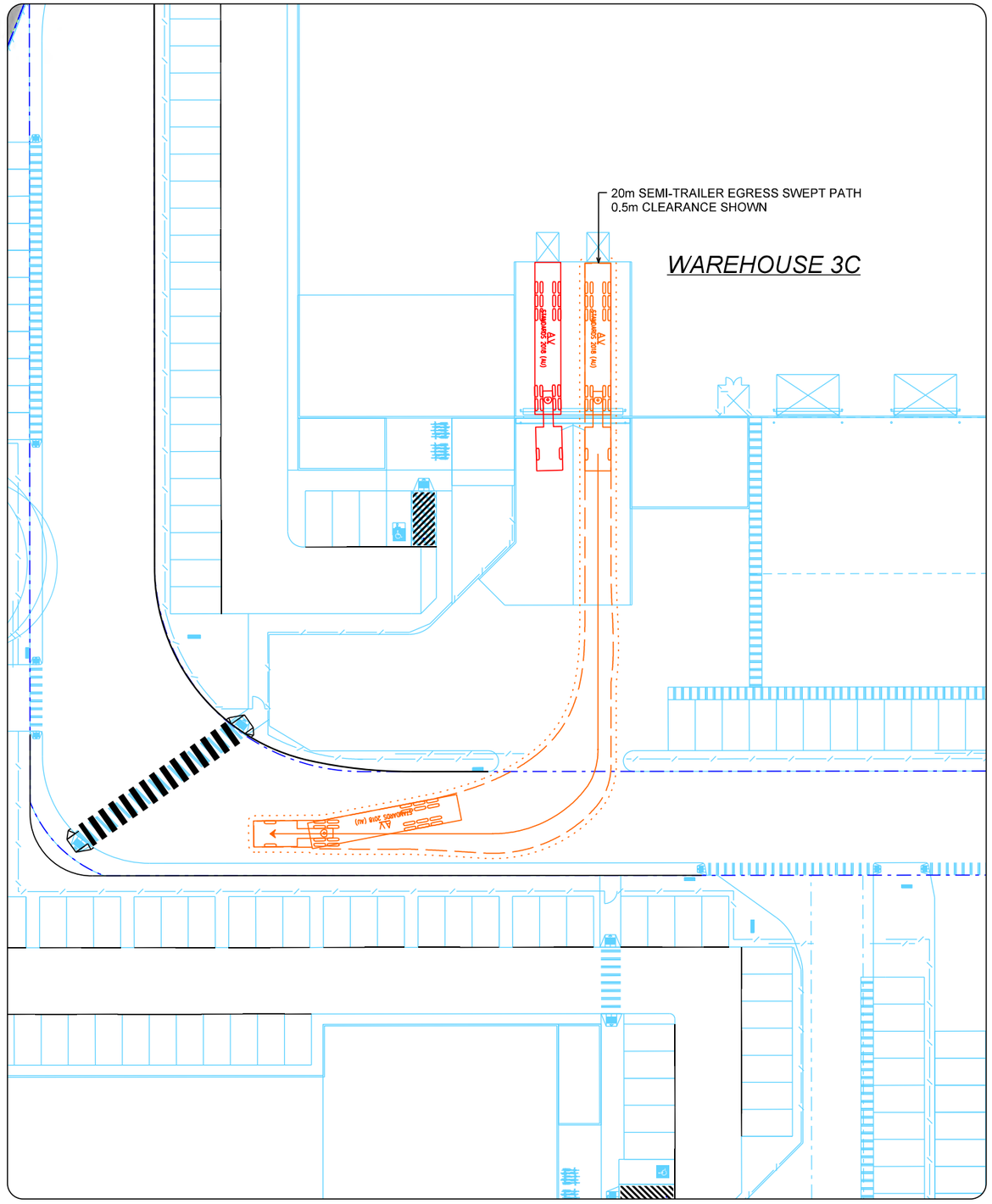
Status
PRELIMINARY

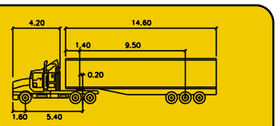
Drawing Number
IMP2203006 - DRG-20-15

Revision
D

7/06/2024 2:12:16 PM







20m SEMI-TRAILER

	METERS		
TRACTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 28.3
TRACTOR TRACK	: 2.50	ARTICULATING ANGLE	: 72.0
TRAILER TRACK	: 2.50		

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MELWAY ONLINE REF:MAP 90 G11

SCALE

1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

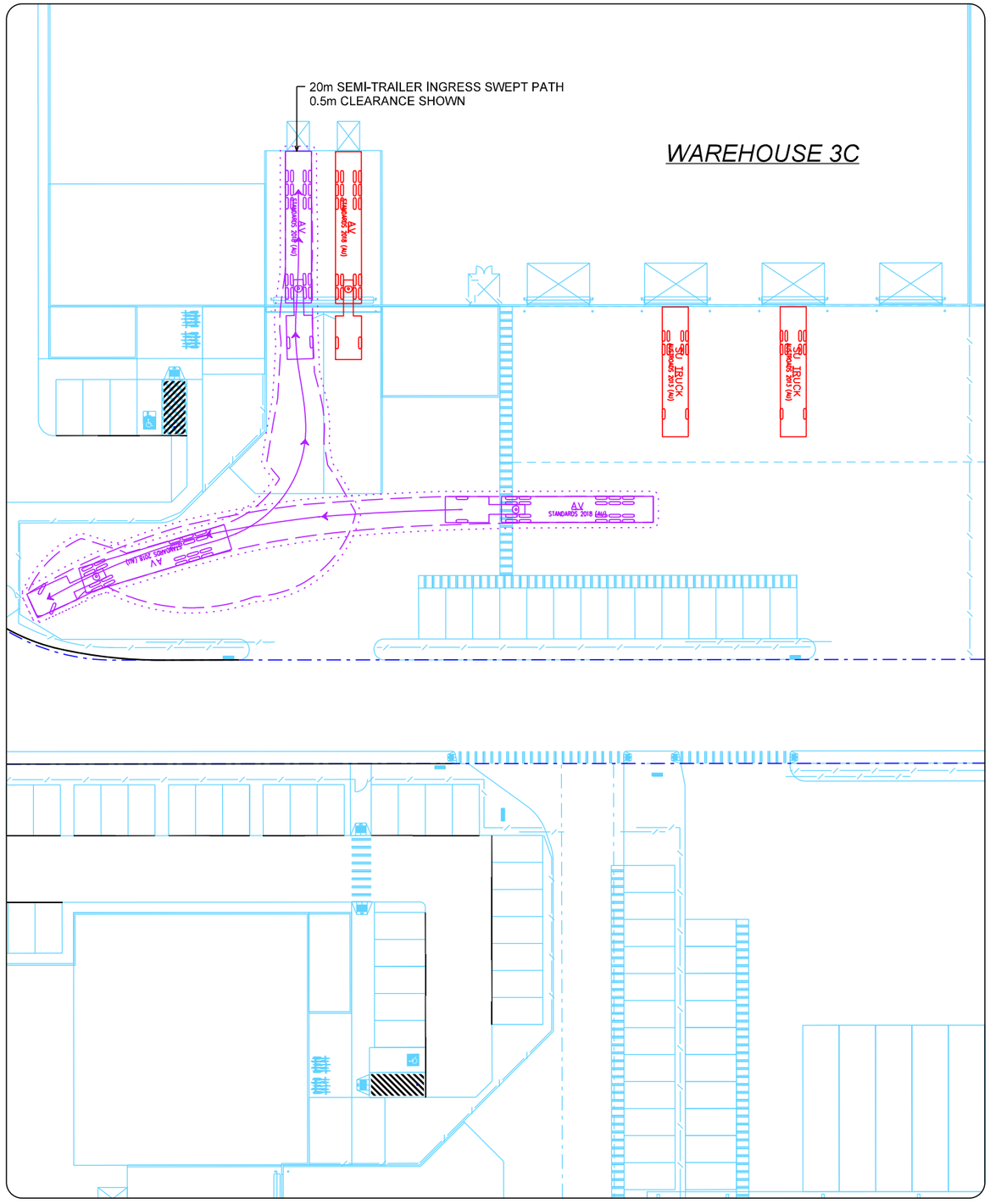
Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
20m SEMI-TRAILER - DESIGN VEHICLE

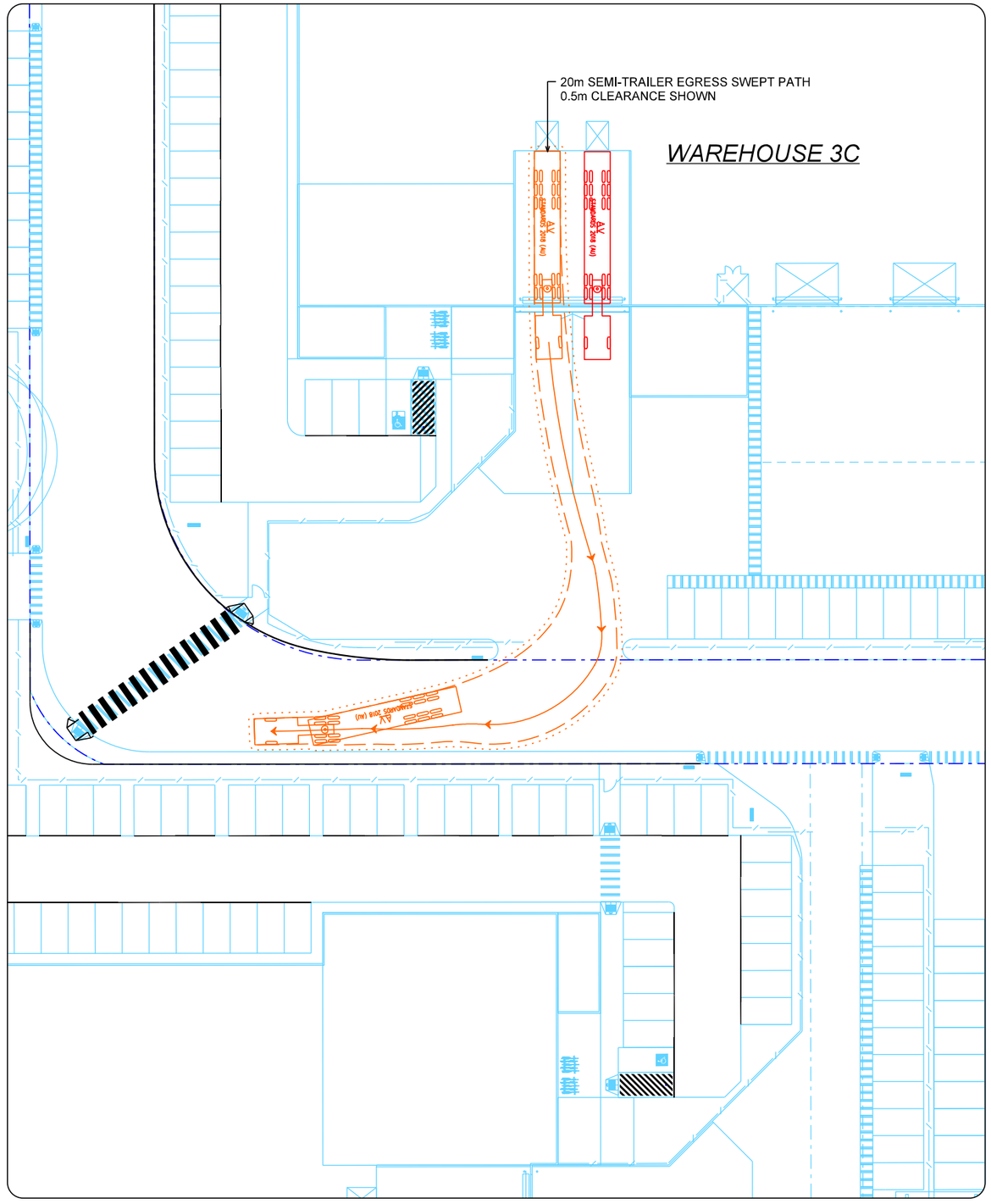
Status
PRELIMINARY

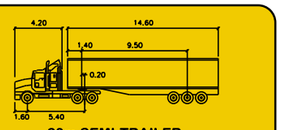
Drawing Number
IMP2203006 - DRG-20-16

Revision
D

7/06/2024 2:12:22 PM







20m SEMI-TRAILER

	METERS		
TRACTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 28.3
TRACTOR TRACK	: 2.50	ARTICULATING ANGLE	: 72.0
TRAILER TRACK	: 2.50		

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MELWAY ONLINE REF:MAP 90 G11

SCALE

1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

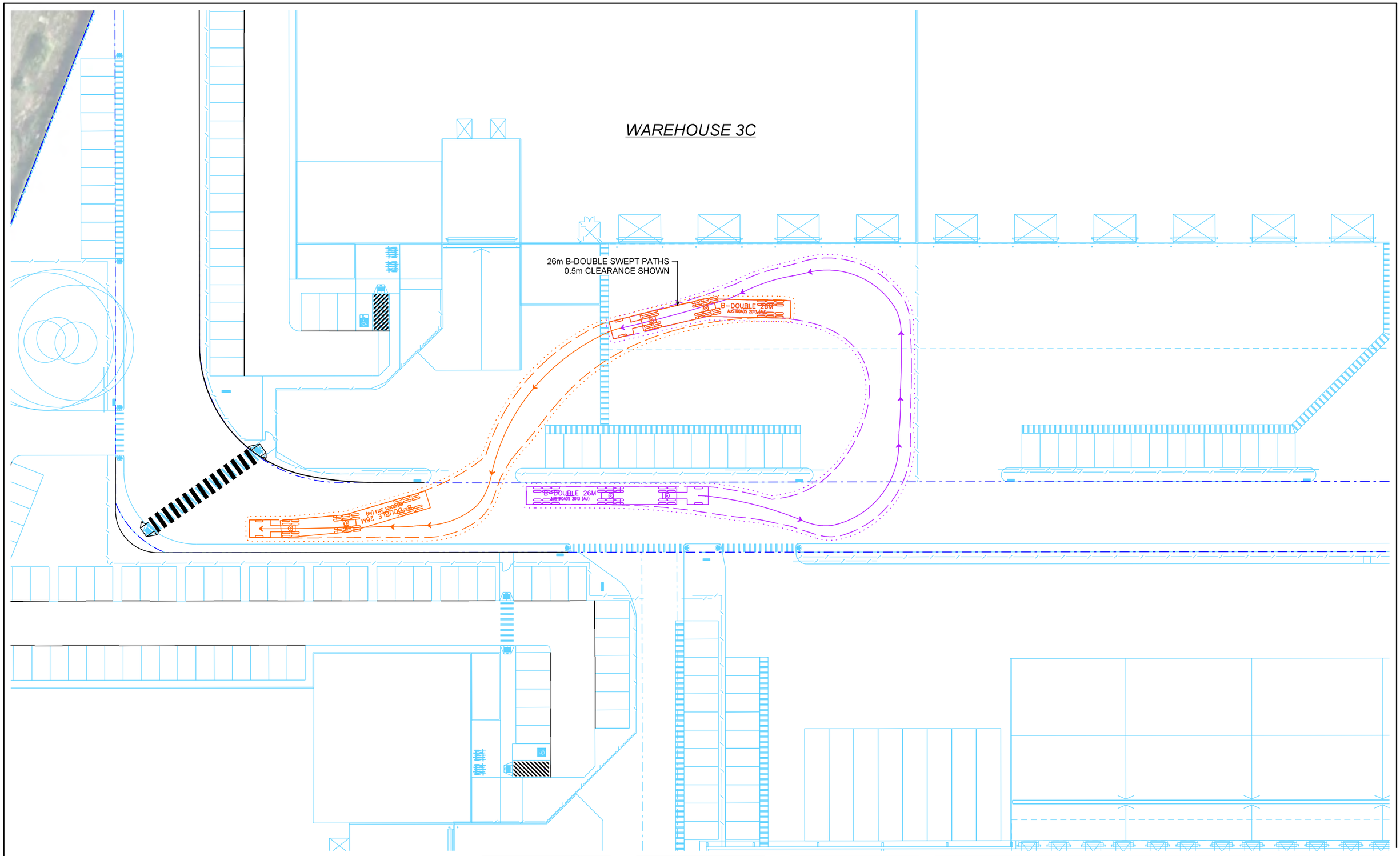
Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
20m SEMI-TRAILER - DESIGN VEHICLE

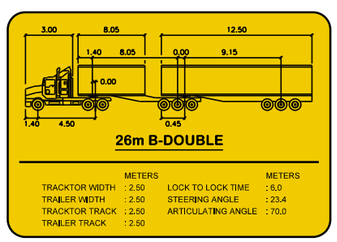
Status
PRELIMINARY

Drawing Number
IMP2203006 - DRG-20-17

Revision
D

7/06/2024 2:12:28 PM





26m B-DOUBLE

	METERS		METERS
TRACKTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 23.4
TRACKTOR TRACK	: 2.60	ARTICULATING ANGLE	: 70.0
TRAILER TRACK	: 2.50		

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ABN 78 611 424 107
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MELWAY ONLINE REF:MAP 90 G11

SCALE

1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

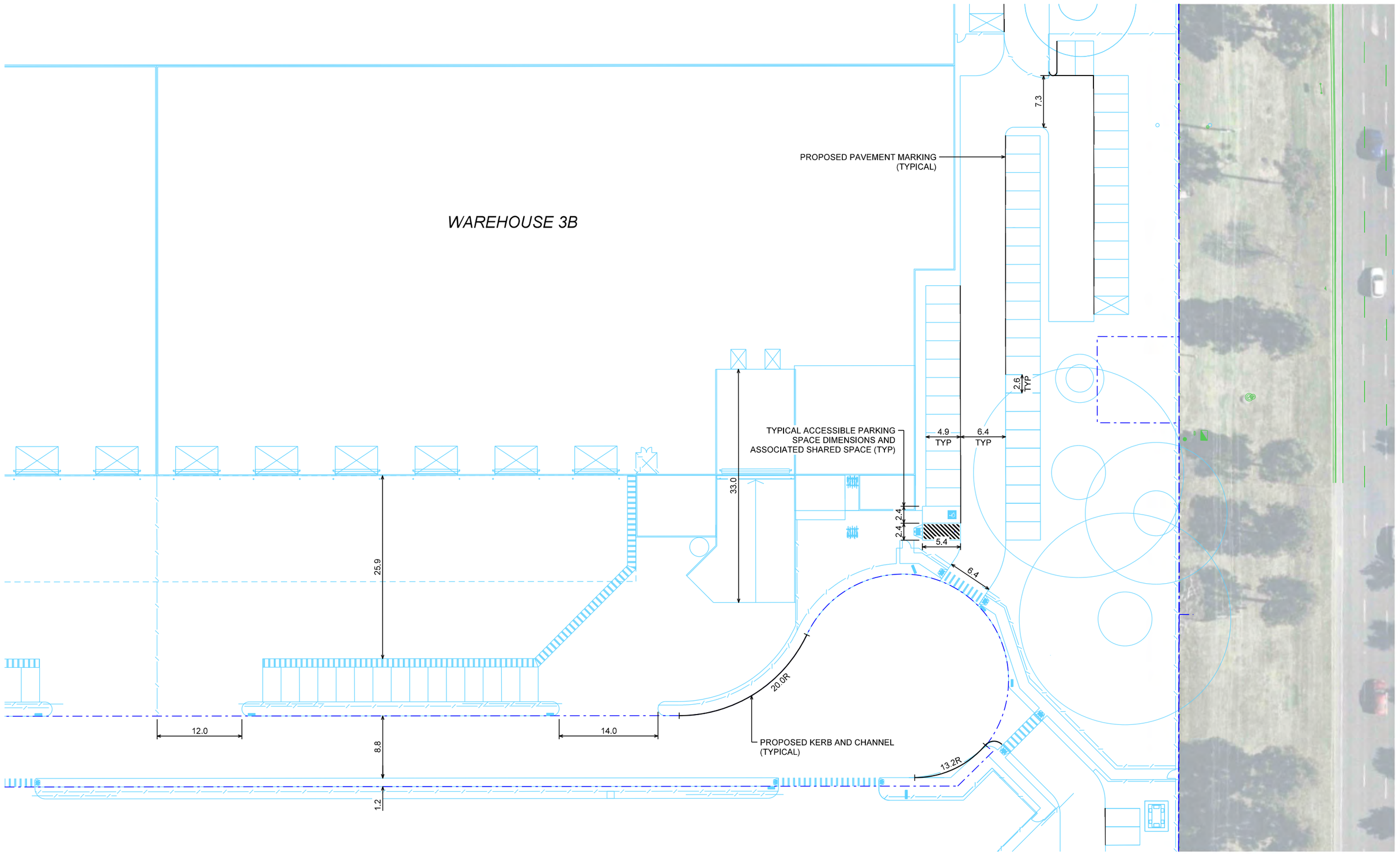
Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
26m B-DOUBLE - CHECK VEHICLE

Status
PRELIMINARY

Drawing Number
IMP2203006 - DRG-20-18

Revision
D

7/06/2024 2:12:34 PM



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ABN 78 611 424 107
LEVEL 17, 31 QUEEN STREET, MELBOURNE VIC 3000
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MELWAY ONLINE REF:MAP 90 G11

SCALE
1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

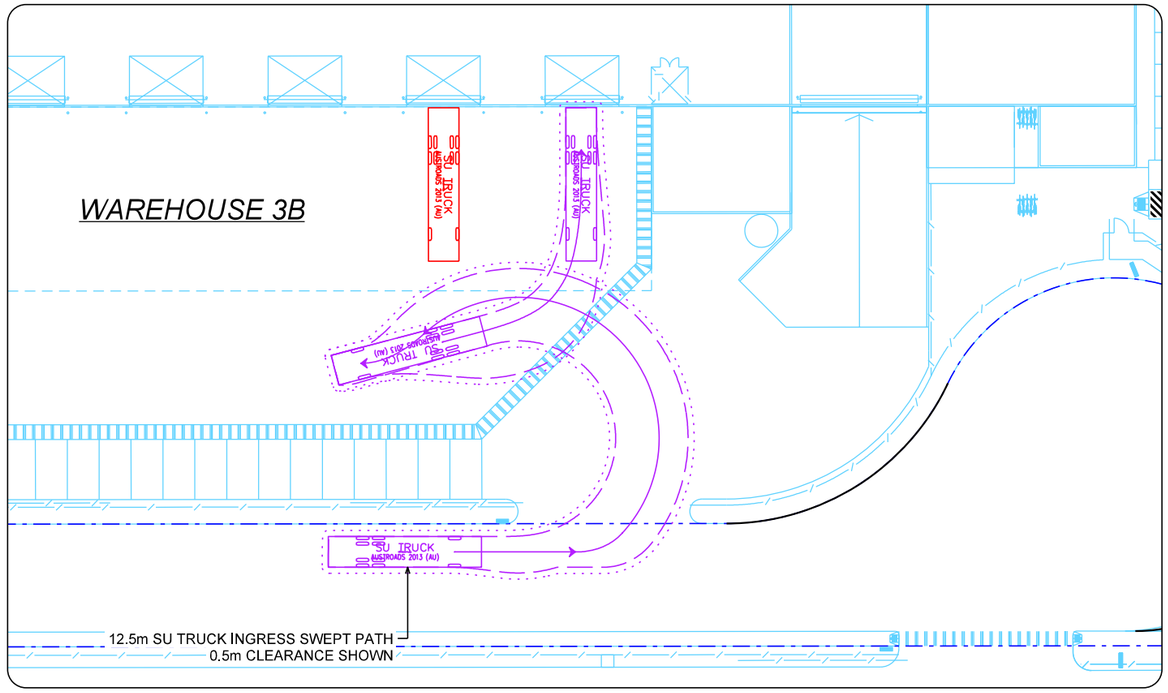
Title
TRAFFIC AND TRANSPORT ASSESSMENT
WAREHOUSE 3B

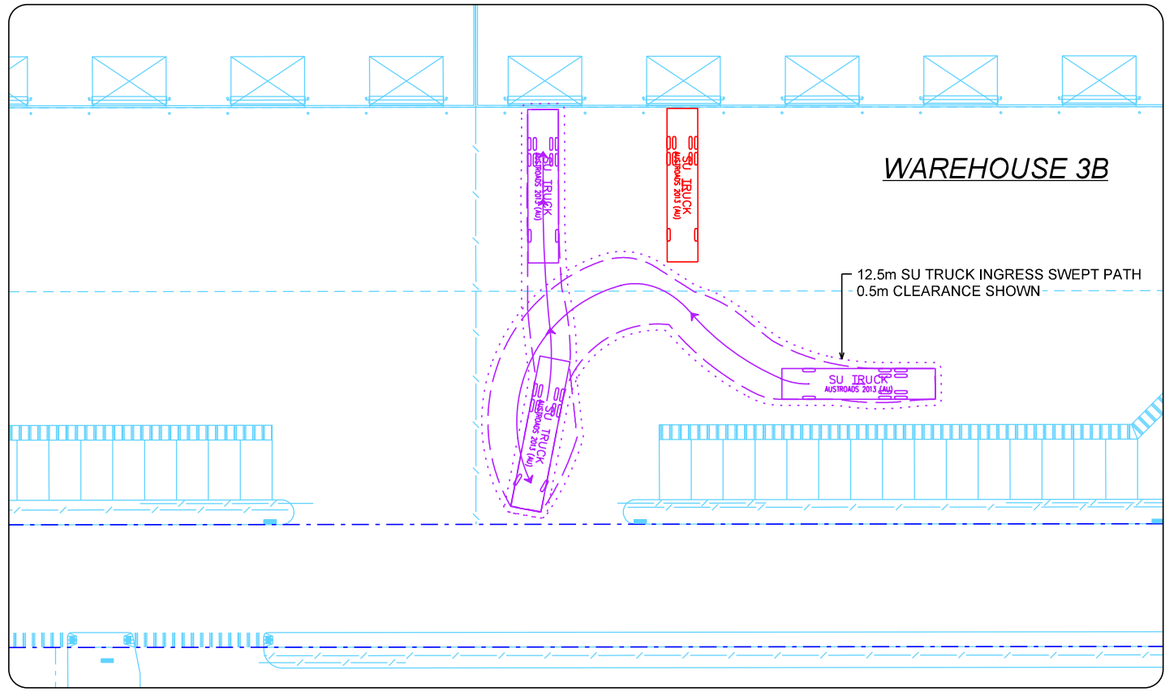
Status
PRELIMINARY

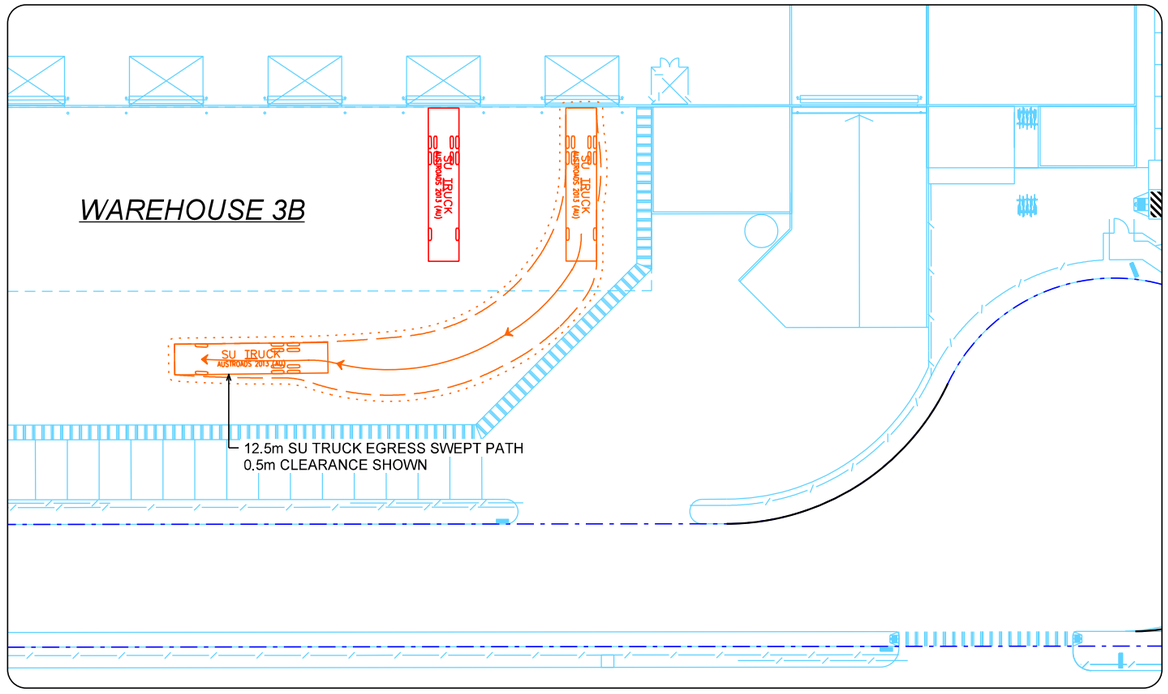
Drawing Number
IMP2203006 - DRG-20-19

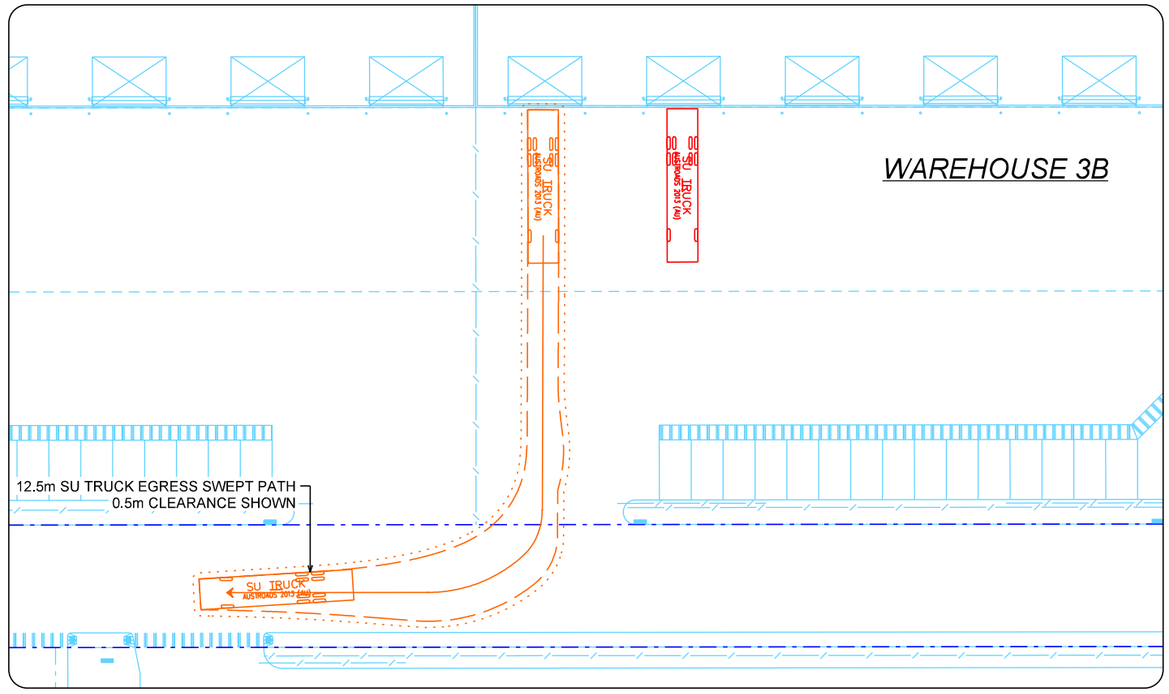
Revision
D

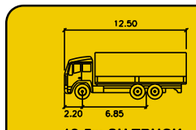
7/06/2024 2:12:39 PM











12.5m SU TRUCK

	METERS
WIDTH	: 2.50
TRACK	: 2.50
LOCK TO LOCK TIME	: 6.0
STEERING ANGLE	: 36.6

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MELWAY ONLINE REF:MAP 90 G11

SCALE

1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
12.5m SU TRUCK - DESIGN VEHICLE

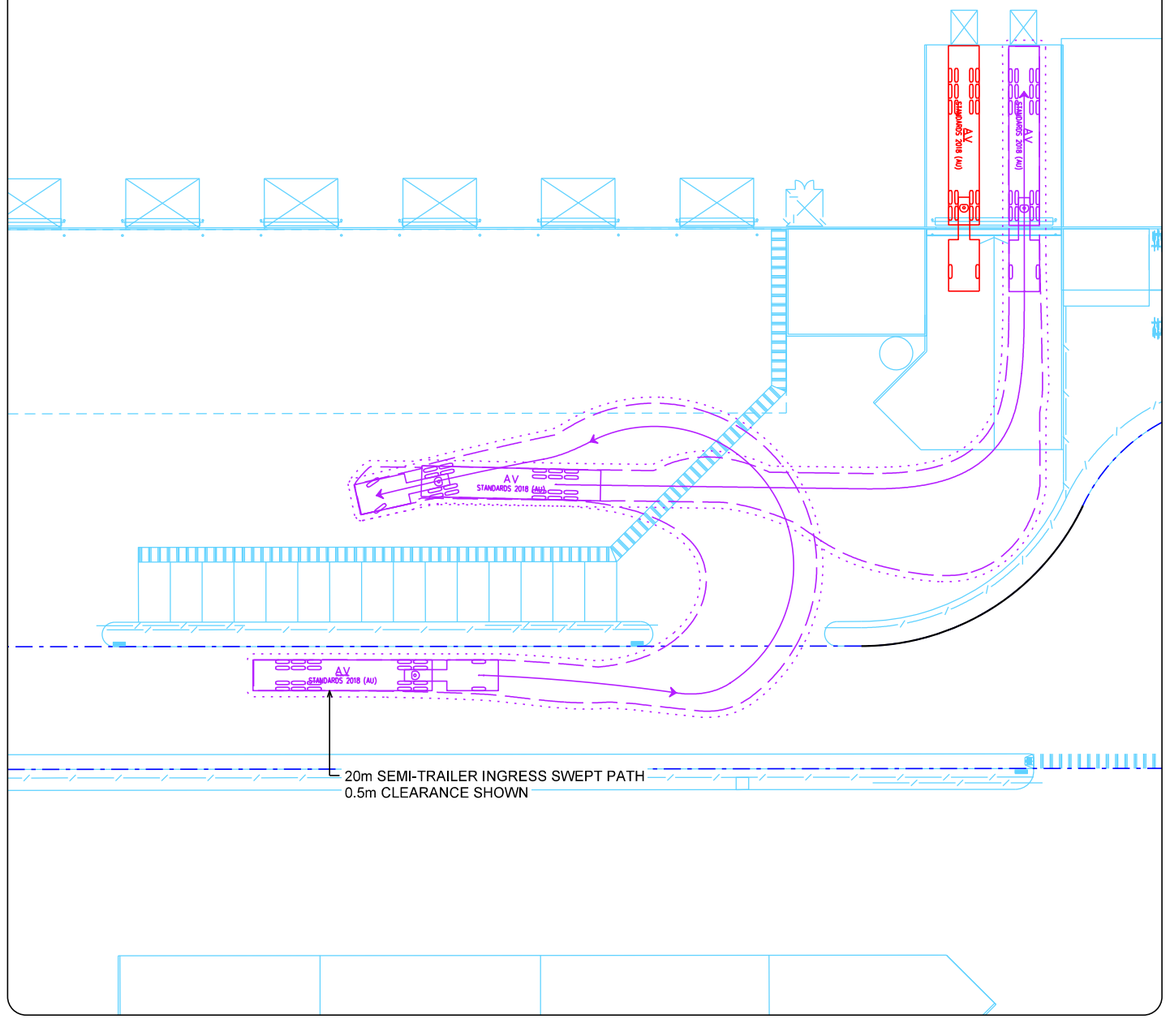
Status
PRELIMINARY

Drawing Number
IMP2203006 - DRG-20-20

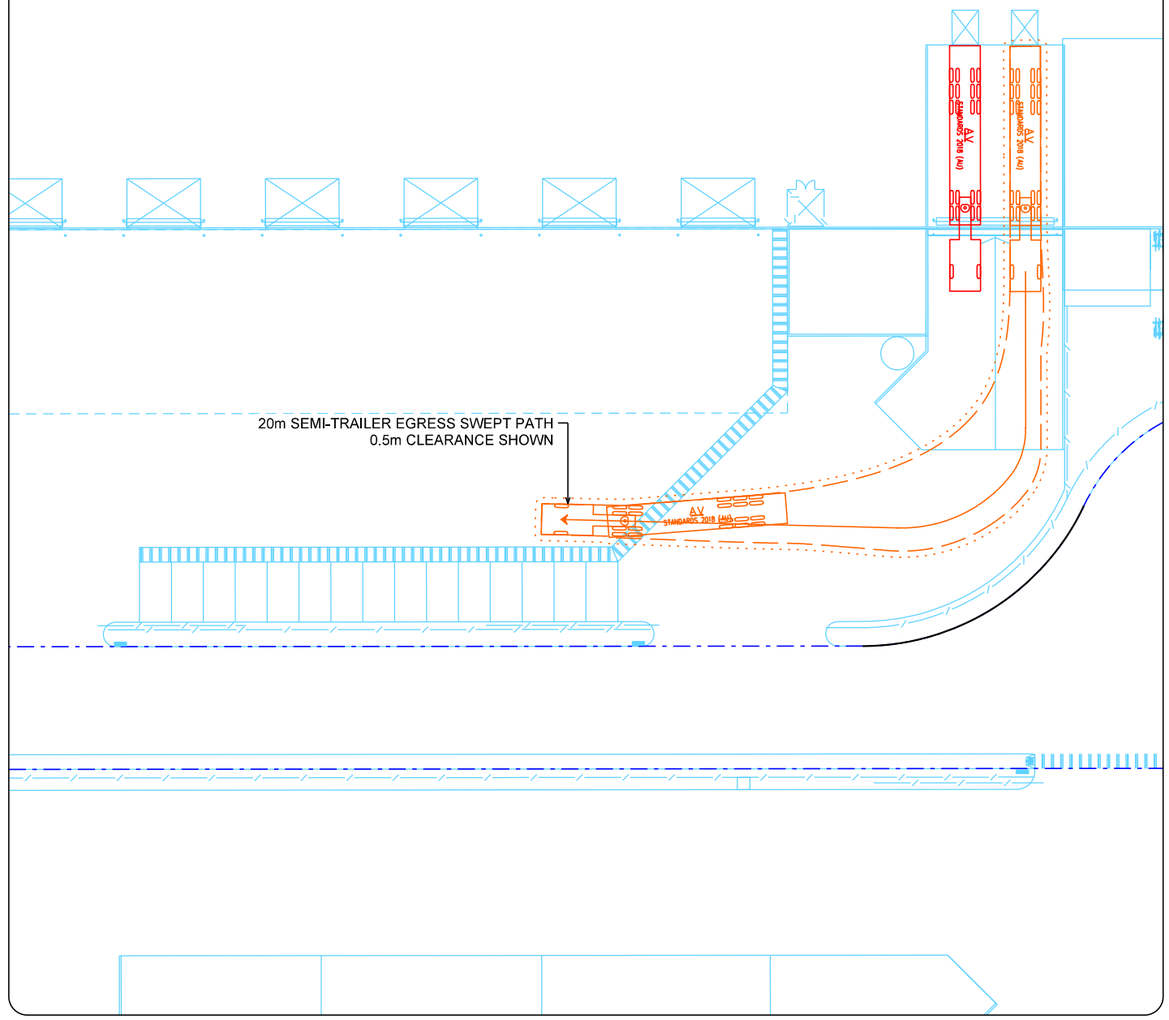
Revision
D

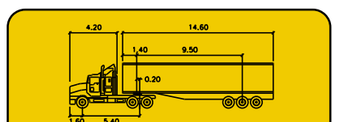
7/06/2024 2:12:44 PM

WAREHOUSE 3B



WAREHOUSE 3B





20m SEMI-TRAILER

METERS			
TRACTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 28.3
TRACTOR TRACK	: 2.50	ARTICULATING ANGLE	: 72.0
TRAILER TRACK	: 2.50		

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impactaustralia.com.au

MELWAY ONLINE REF:MAP 90 G11

SCALE

1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

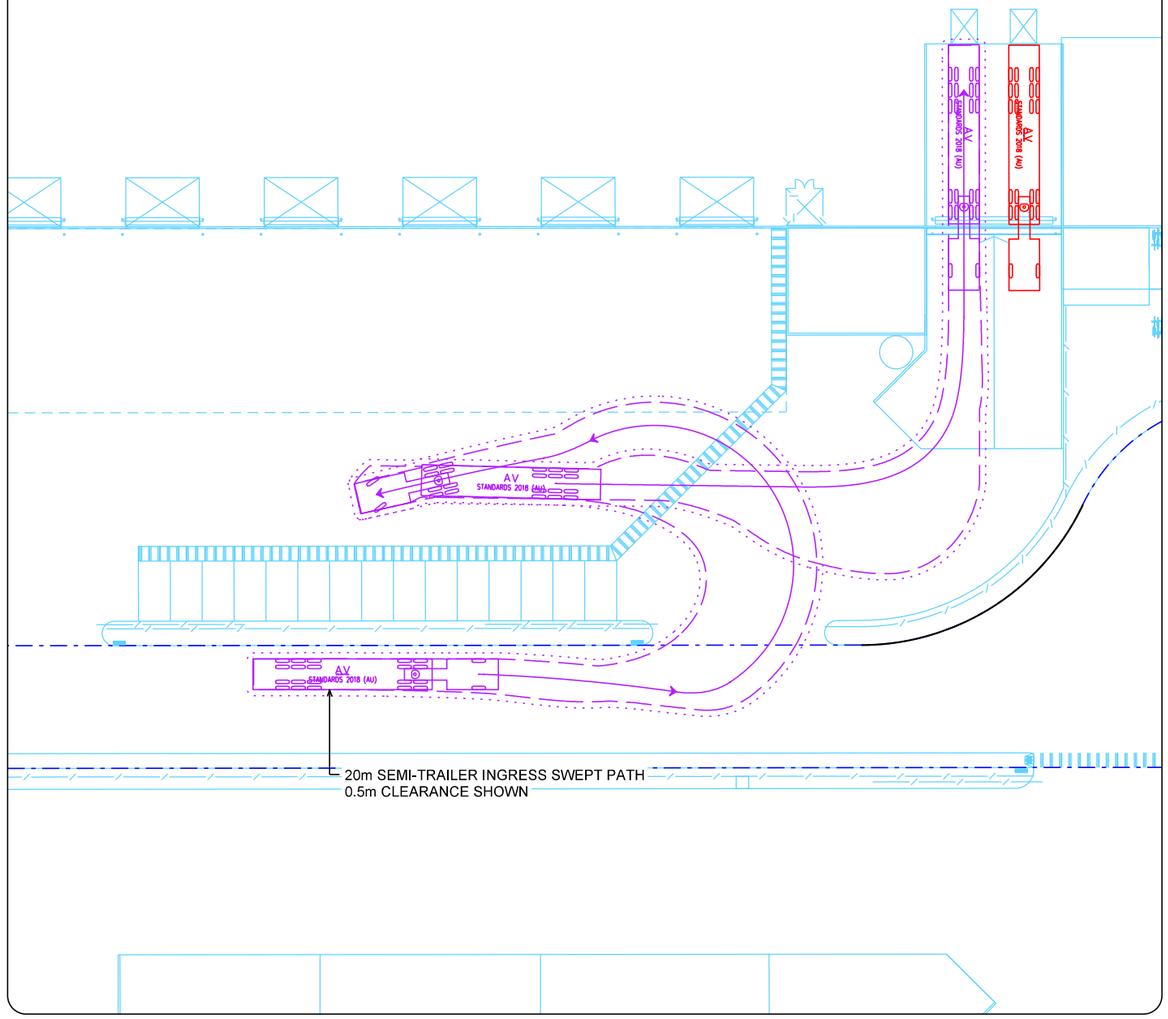
Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
20m SEMI-TRAILER - DESIGN VEHICLE

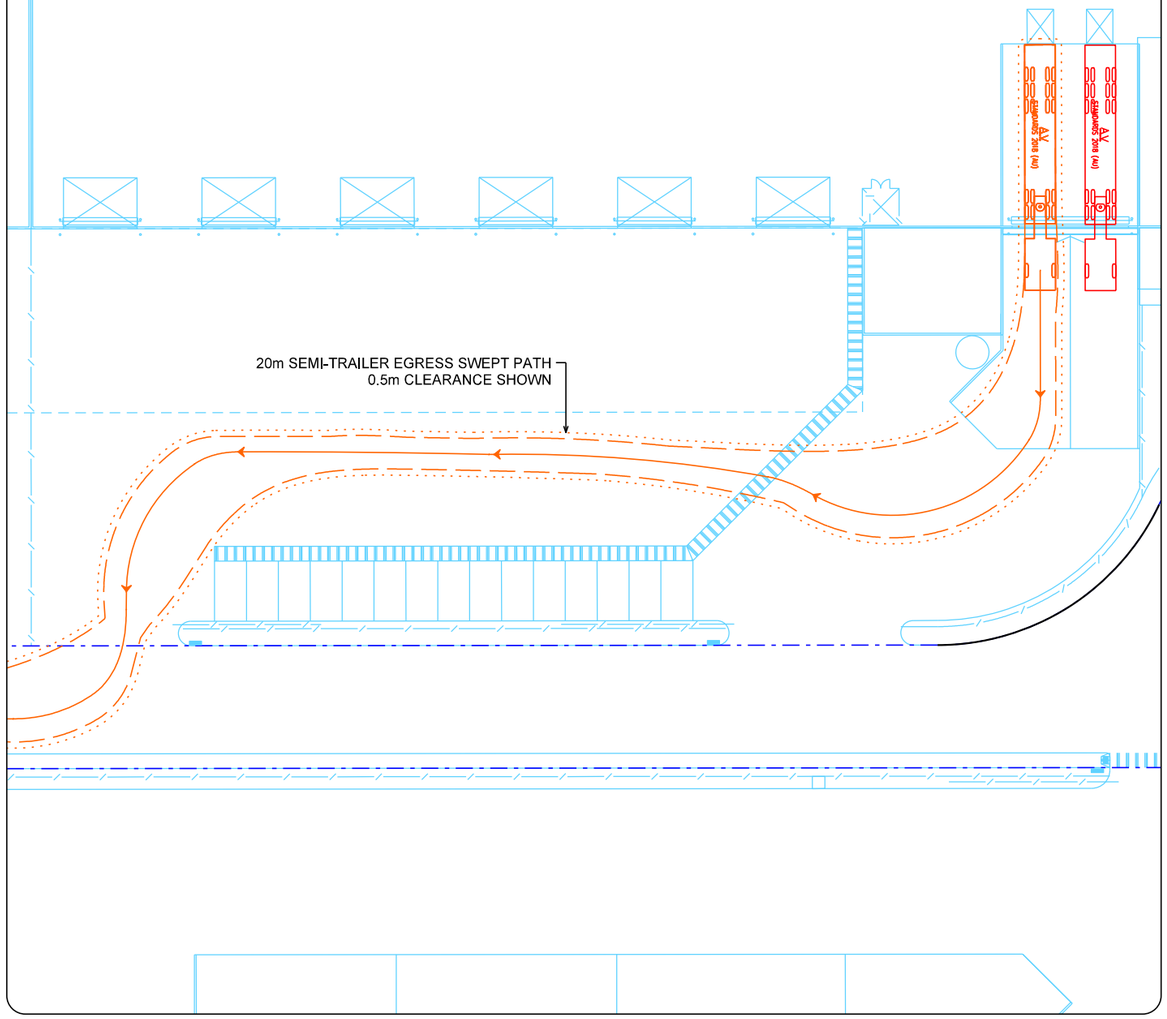
Status
PRELIMINARY

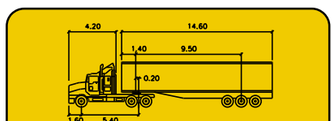
Drawing Number
IMP2203006 - DRG-20-21

Revision
D

7/06/2024 2:12:50 PM







20m SEMI-TRAILER

METERS

TRACTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 28.3
TRACTOR TRACK	: 2.50	ARTICULATING ANGLE	: 72.0
TRAILER TRACK	: 2.50		

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MELWAY ONLINE REF:MAP 90 G11

SCALE

1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
20m SEMI-TRAILER - DESIGN VEHICLE

Status
PRELIMINARY

Drawing Number
IMP2203006 - DRG-20-22

Revision
D

7/06/2024 2:12:58 PM

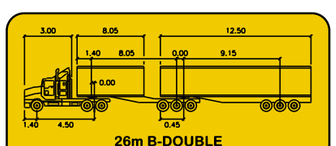
WAREHOUSE 3B

26m B-DOUBLE SWEPT PATHS
0.5m CLEARANCE SHOWN

B-DOUBLE 26M
AUSTROADS 2013 (AV)

B-DOUBLE 26M
AUSTROADS 2013 (AV)

B-DOUBLE 26M
AUSTROADS 2013 (AV)



26m B-DOUBLE

	METERS		METERS
TRACKTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 23.4
TRACKTOR TRACK	: 2.50	ARTICULATING ANGLE	: 70.0
TRAILER TRACK	: 2.50		

IMPACT TRAFFIC ENGINEERING PTY LTD
ABN 78 611 424 107
LEVEL 17, 31 QUEEN STREET, MELBOURNE VIC 3000
create@impactaustralia.com.au
Impactaustralia.com.au

MELWAY ONLINE REF:MAP 90 G11

SCALE
1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

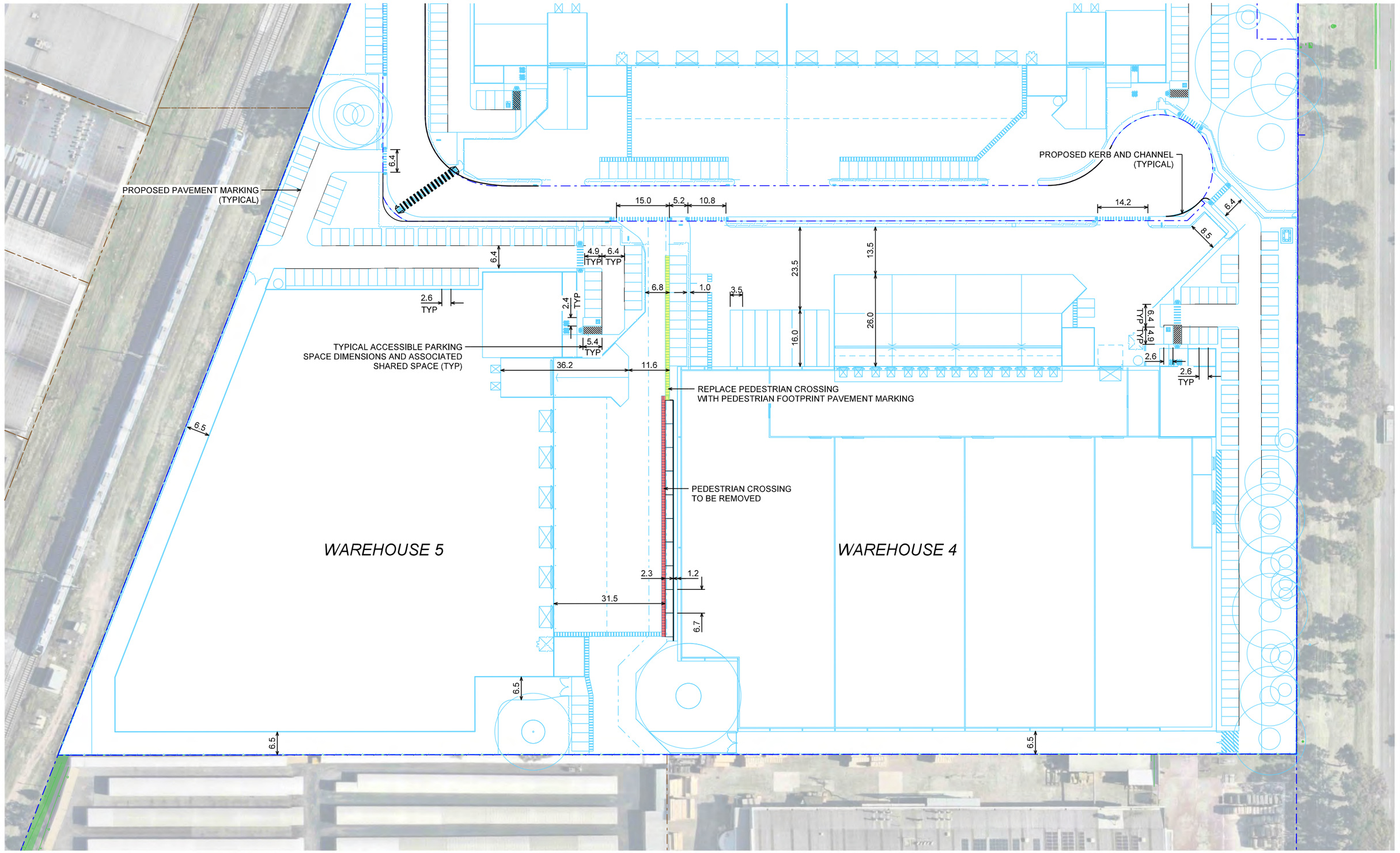
Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
26m B-DOUBLE - CHECK VEHICLE

Status
PRELIMINARY

Drawing Number
IMP2203006 - DRG-20-23

Revision
D

7/06/2024 2:13:04 PM



IMPACT TRAFFIC ENGINEERING PTY LTD
ABN 78 611 424 107
LEVEL 17, 31 QUEEN STREET, MELBOURNE VIC 3000
create@impactaustralia.com.au
impactaustralia.com.au

MELWAY ONLINE REF:MAP 90 G11

SCALE
1:1000 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

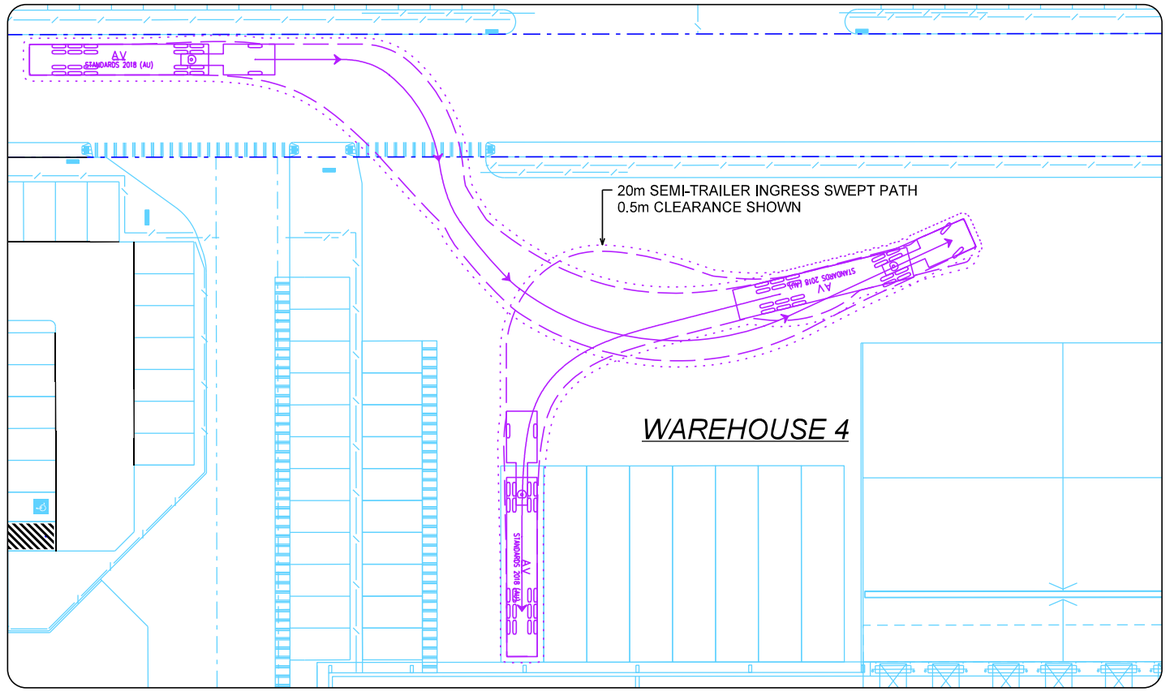
Title
TRAFFIC AND TRANSPORT ASSESSMENT
SITE LAYOUT PLAN
WAREHOUSE 4 & WAREHOUSE 5

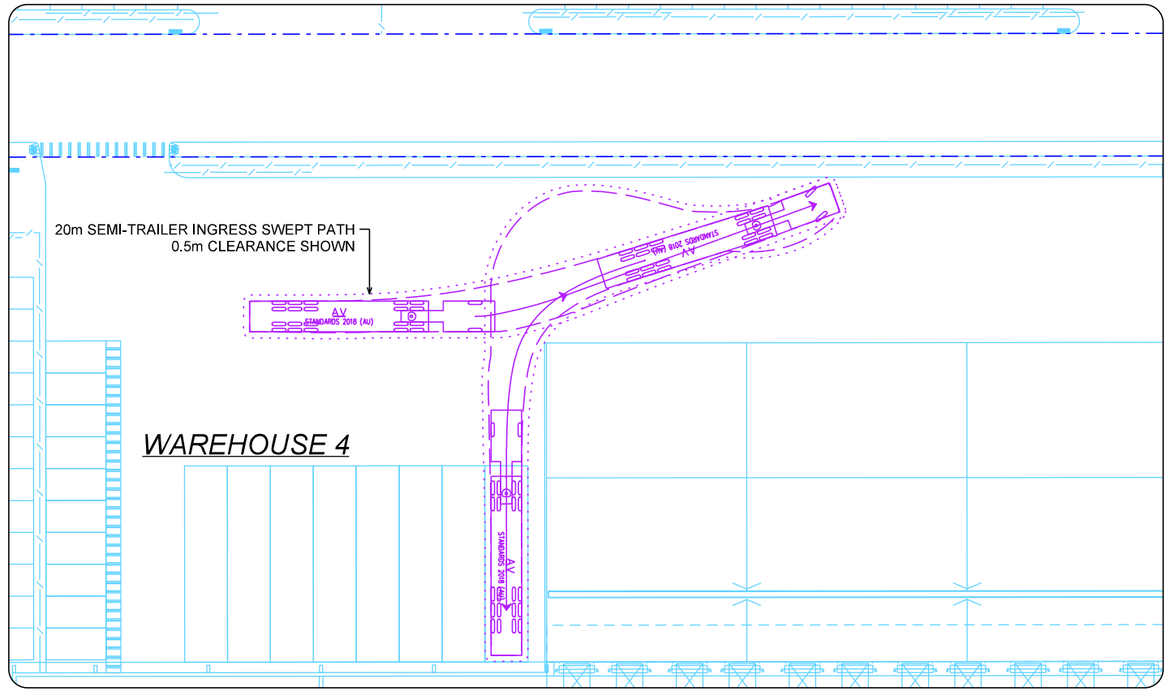
Status
PRELIMINARY

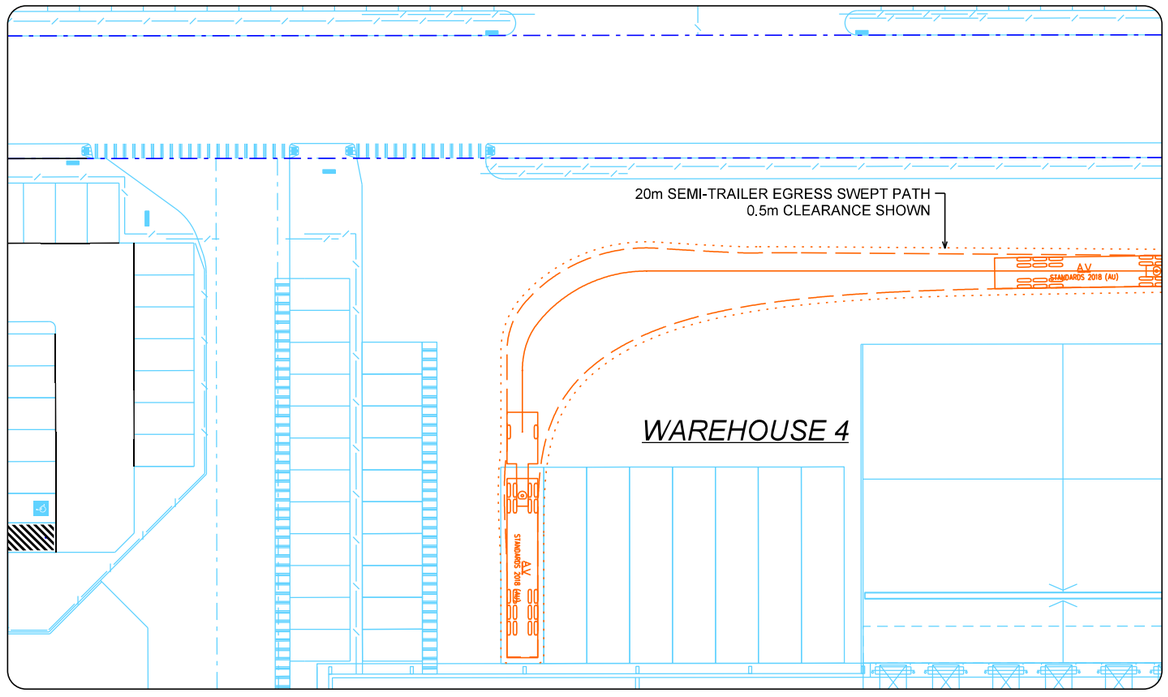
Drawing Number
IMP2203006 - DRG-20-24

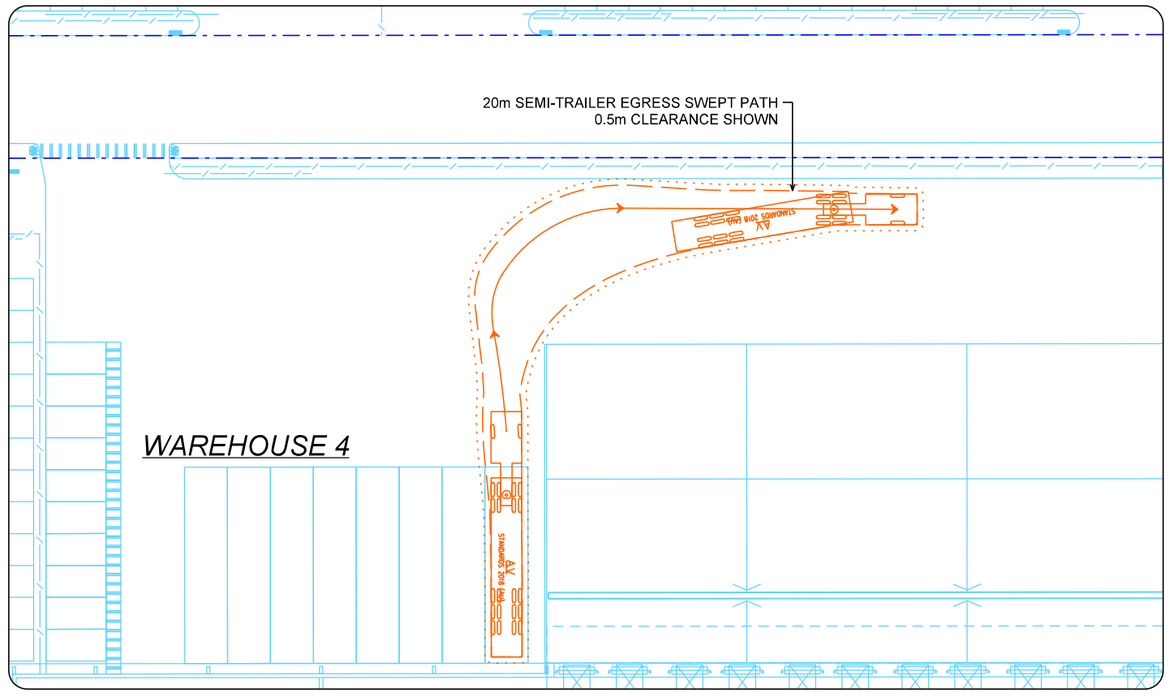
Revision
D

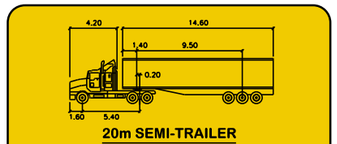
7/06/2024 2:13:08 PM











20m SEMI-TRAILER

METERS

TRACTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 28.3
TRACTOR TRACK	: 2.50	ARTICULATING ANGLE	: 72.0
TRAILER TRACK	: 2.50		

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MELWAY ONLINE REF: MAP 90 G11

SCALE
1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

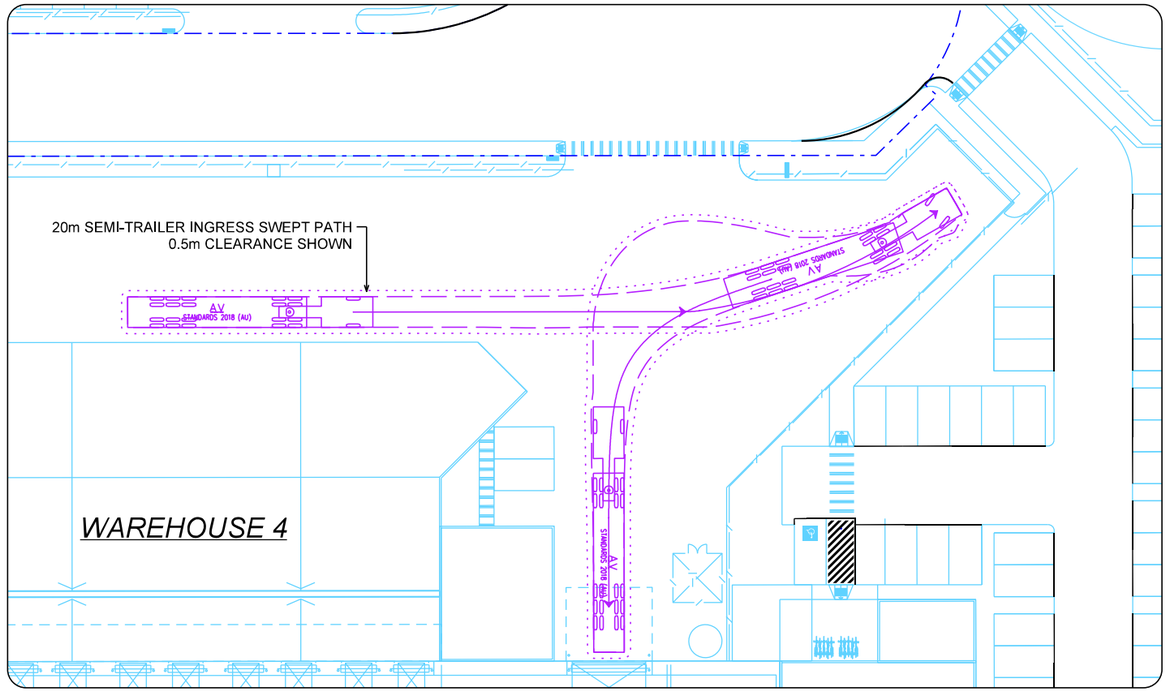
Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
20m SEMI-TRAILER - DESIGN VEHICLE

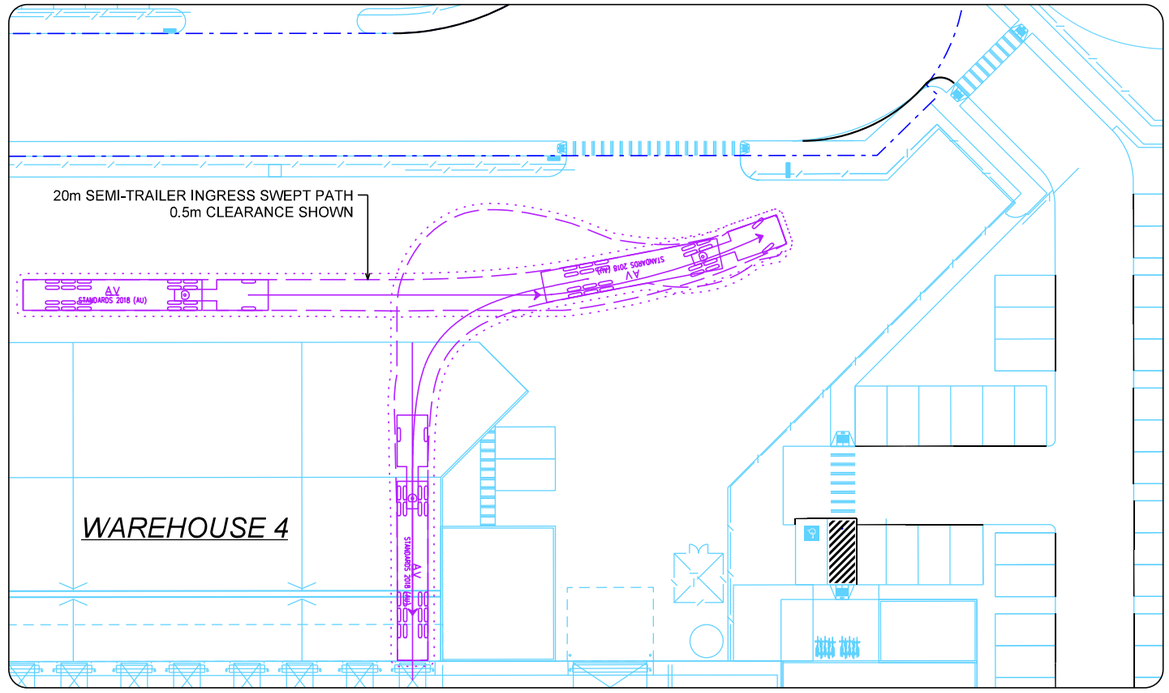
Status
PRELIMINARY

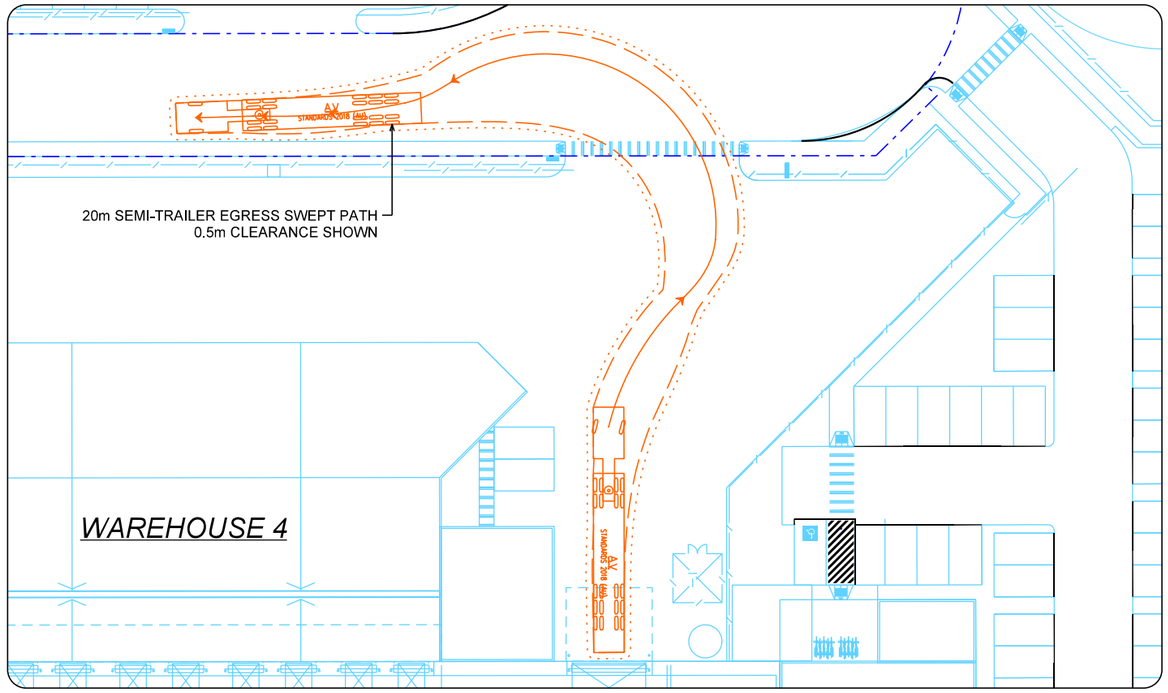
Drawing Number
IMP2203006 - DRG-20-25

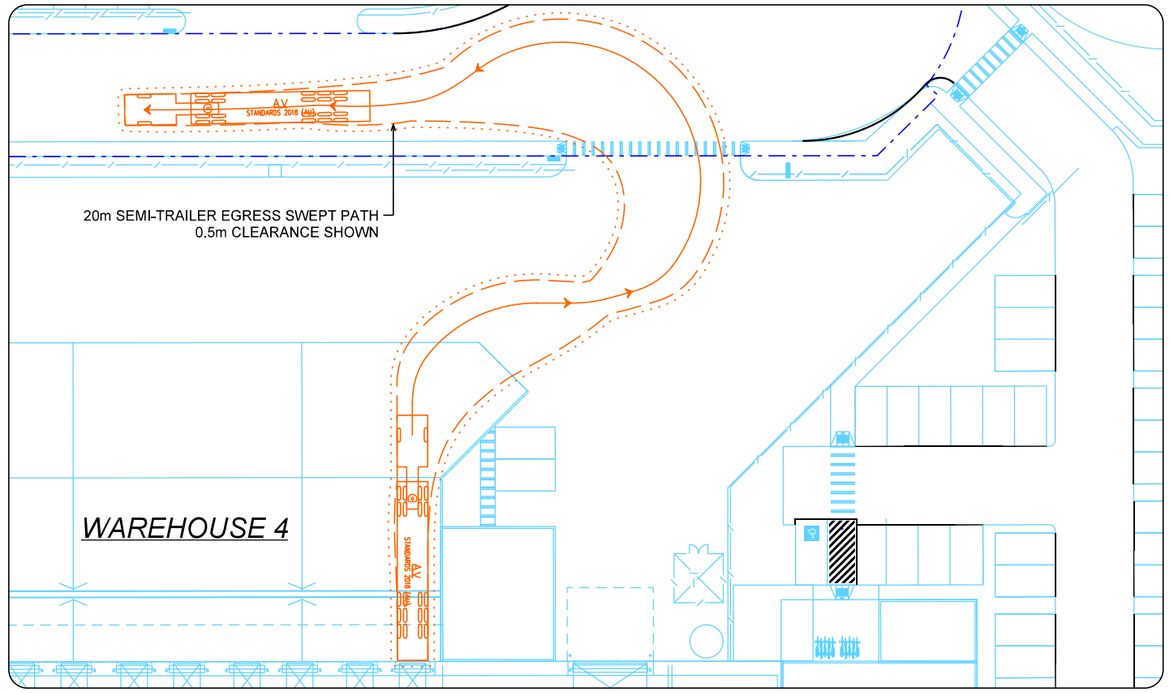
Revision
D

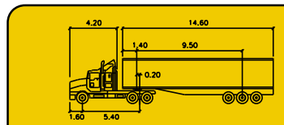
7/06/2024 2:13:11 PM











20m SEMI-TRAILER

METERS			
TRACTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 28.3
TRACTOR TRACK	: 2.50	ARTICULATING ANGLE	: 72.0
TRAILER TRACK	: 2.50		

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MELWAY ONLINE REF: MAP 90 G11

SCALE

1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
20m SEMI-TRAILER - DESIGN VEHICLE

Status
PRELIMINARY

Drawing Number
IMP2203006 - DRG-20-26

Revision
D

7/06/2024 2:13:42 PM

B-DOUBLE 26M
AUSTROADS 2013 (AU)

B-DOUBLE 26M
AUSTROADS 2013 (AU)

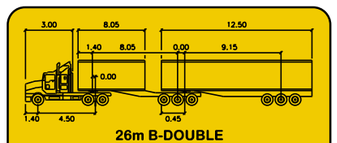
B-DOUBLE 26M
AUSTROADS 2013 (AU)

B-DOUBLE 26M
AUSTROADS 2013 (AU)

26m B-DOUBLE INGRESS SWEPT PATH
0.5m CLEARANCE SHOWN

26m B-DOUBLE EGRESS SWEPT PATH
0.5m CLEARANCE SHOWN

WAREHOUSE 4



26m B-DOUBLE

	METERS		METERS
TRACKTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 23.4
TRACKTOR TRACK	: 2.50	ARTICULATING ANGLE	: 70.0
TRAILER TRACK	: 2.50		

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MELWAY ONLINE REF:MAP 90 G11

SCALE
1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

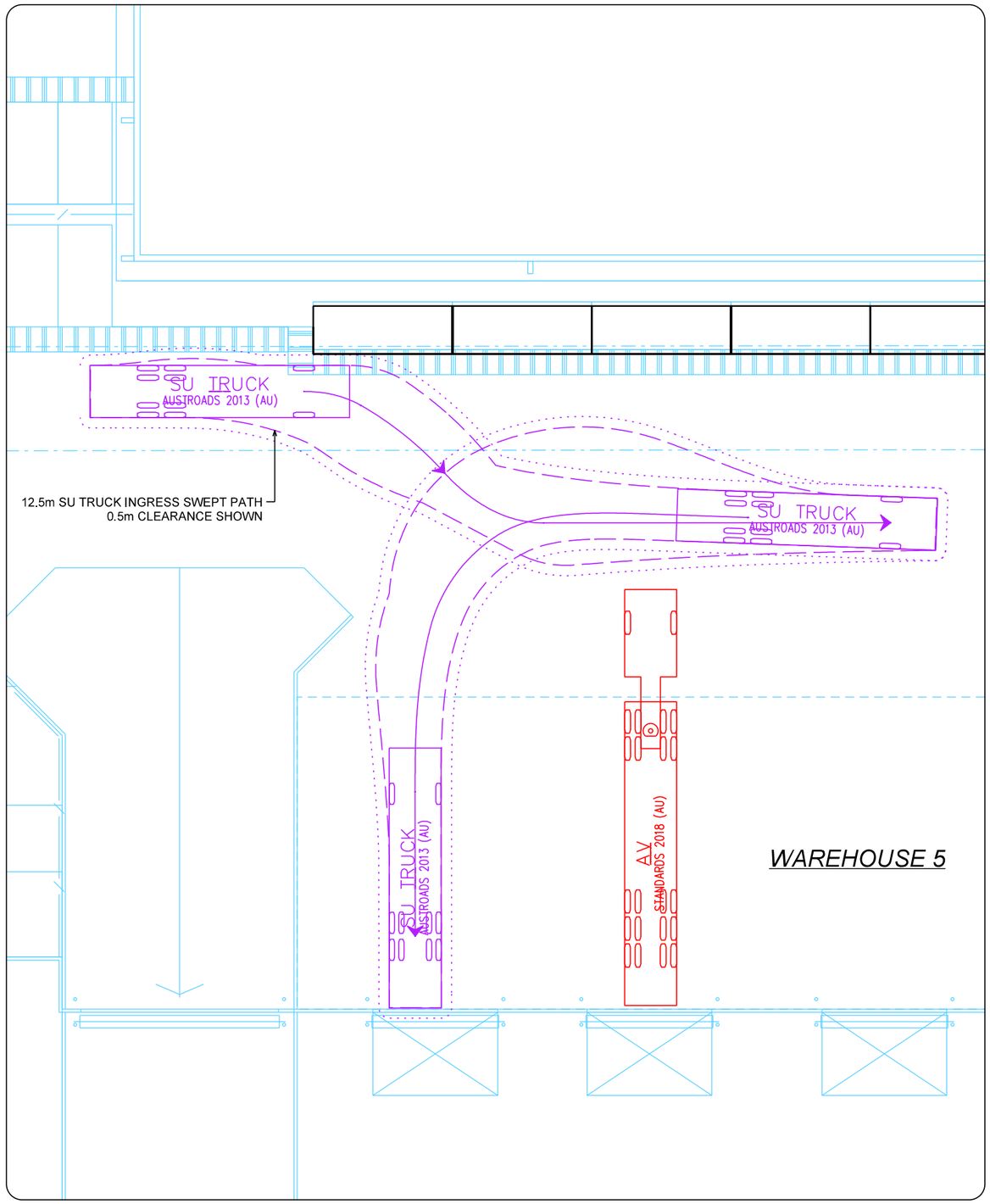
Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
26m B-DOUBLE - CHECK VEHICLE

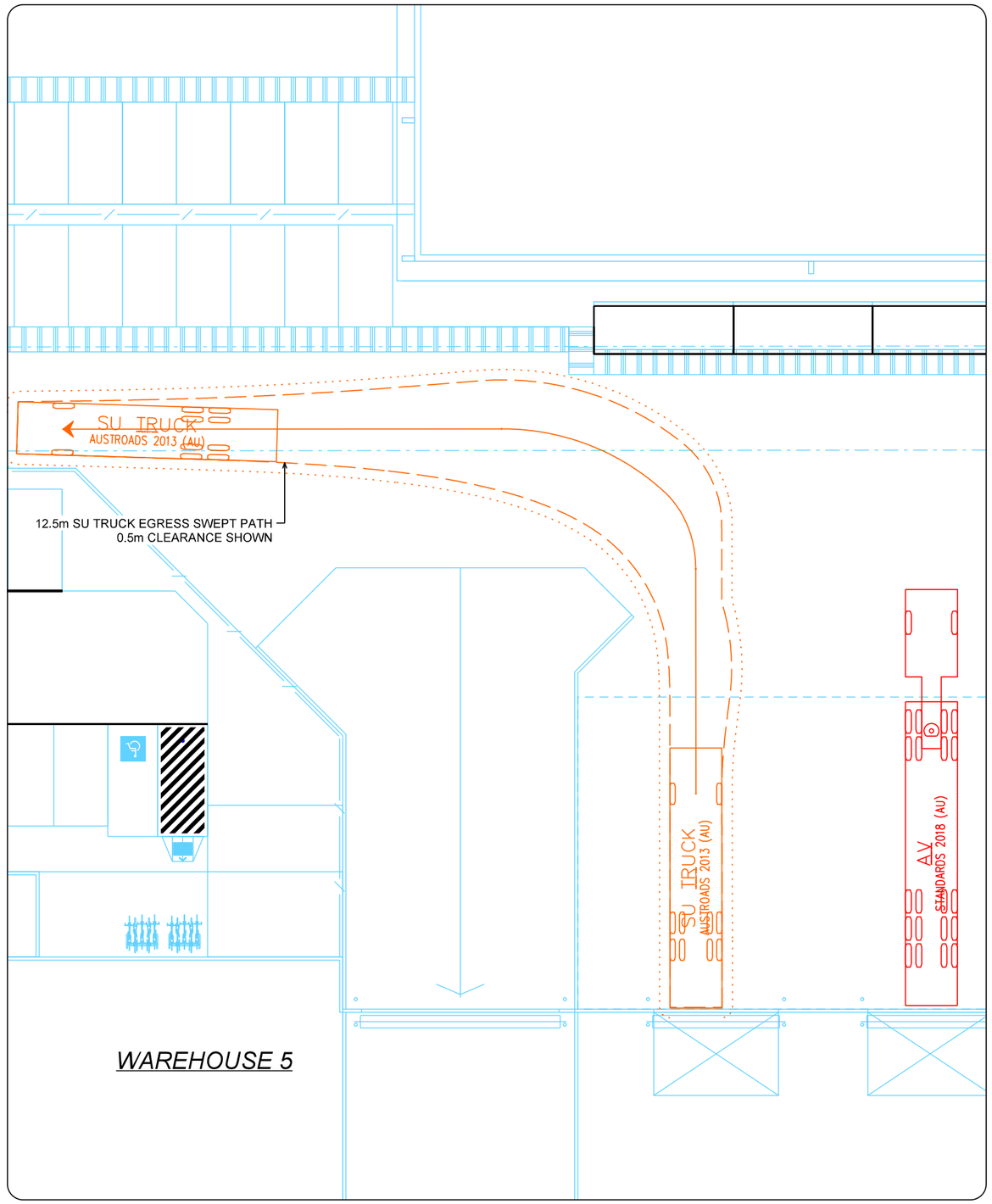
Status
PRELIMINARY

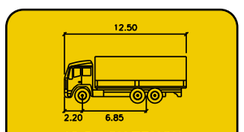
Drawing Number
IMP2203006 - DRG-20-27

Revision
D

7/06/2024 2:13:54 PM







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MELWAY ONLINE REF:MAP 90 G11

SCALE
1:250 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

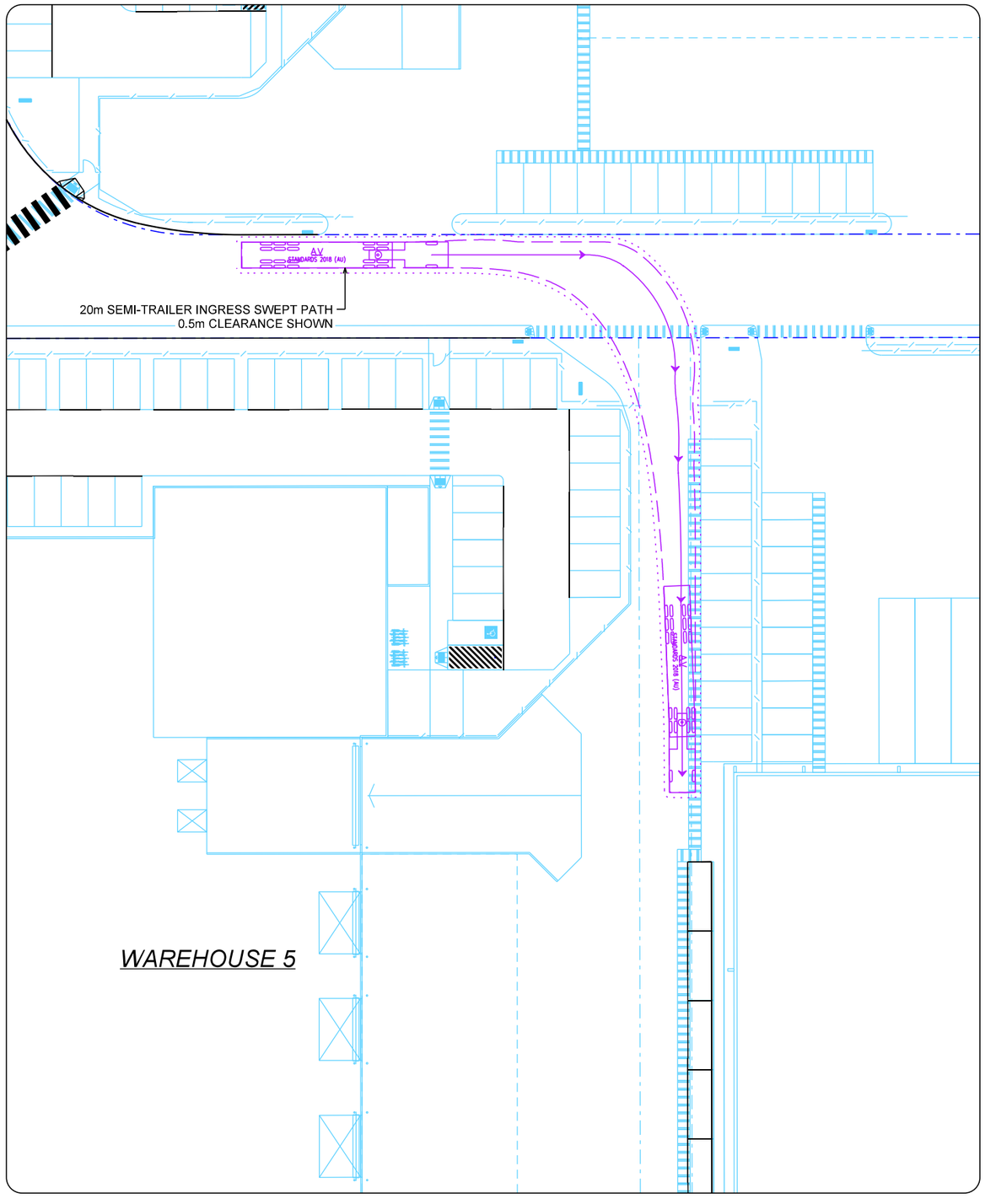
Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
12.5m SU TRUCK - DESIGN VEHICLE

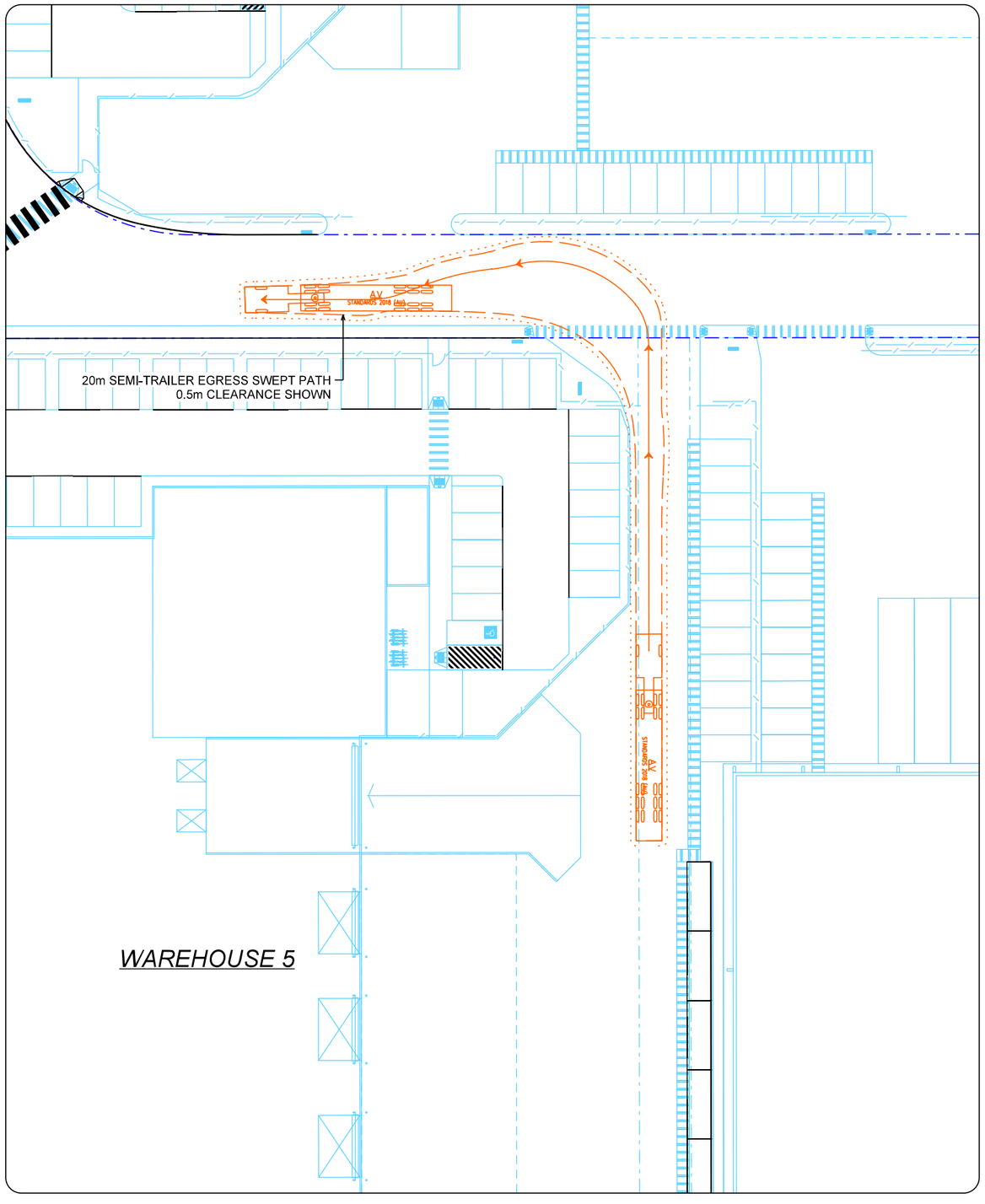
Status
PRELIMINARY

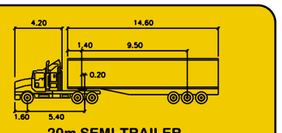
Drawing Number
IMP2203006 - DRG-20-28

Revision
D

7/06/2024 2:13:59 PM







20m SEMI-TRAILER

METERS

TRACTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 28.3
TRACTOR TRACK	: 2.50	ARTICULATING ANGLE	: 72.0
TRAILER TRACK	: 2.50		

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ABN 78 611 424 107
LEVEL 17, 31 QUEEN STREET, MELBOURNE VIC 3000
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MELWAY ONLINE REF:MAP 90 G11

SCALE
1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

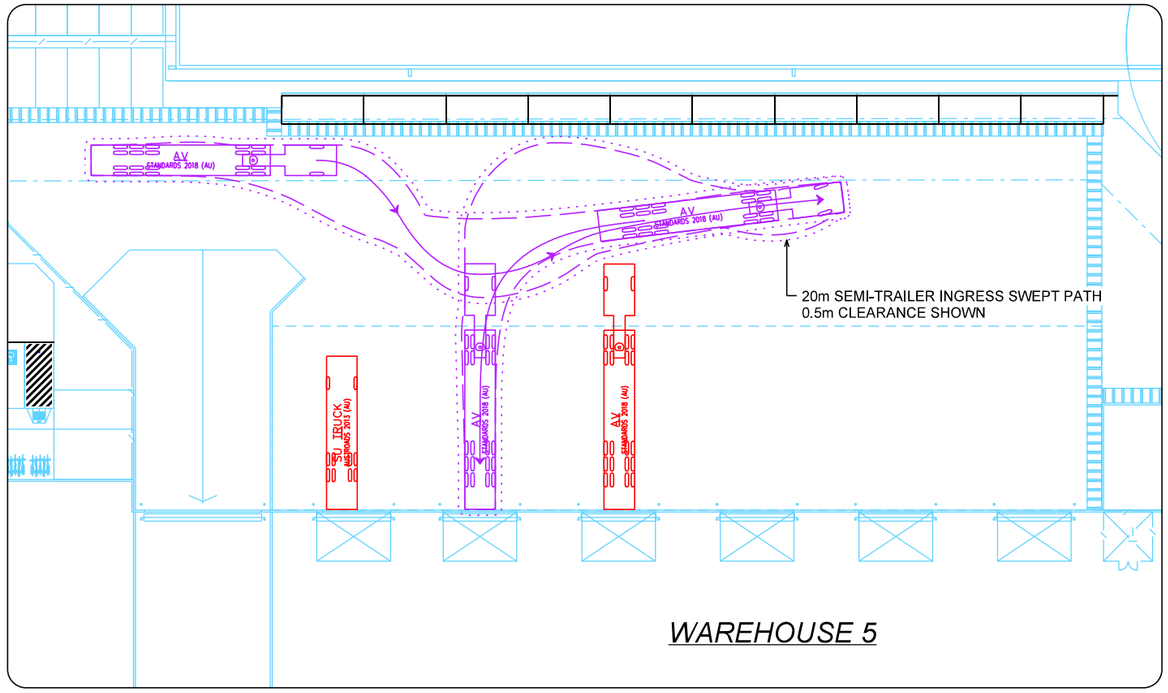
Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
20m SEMI-TRAILER - DESIGN VEHICLE

Status
PRELIMINARY

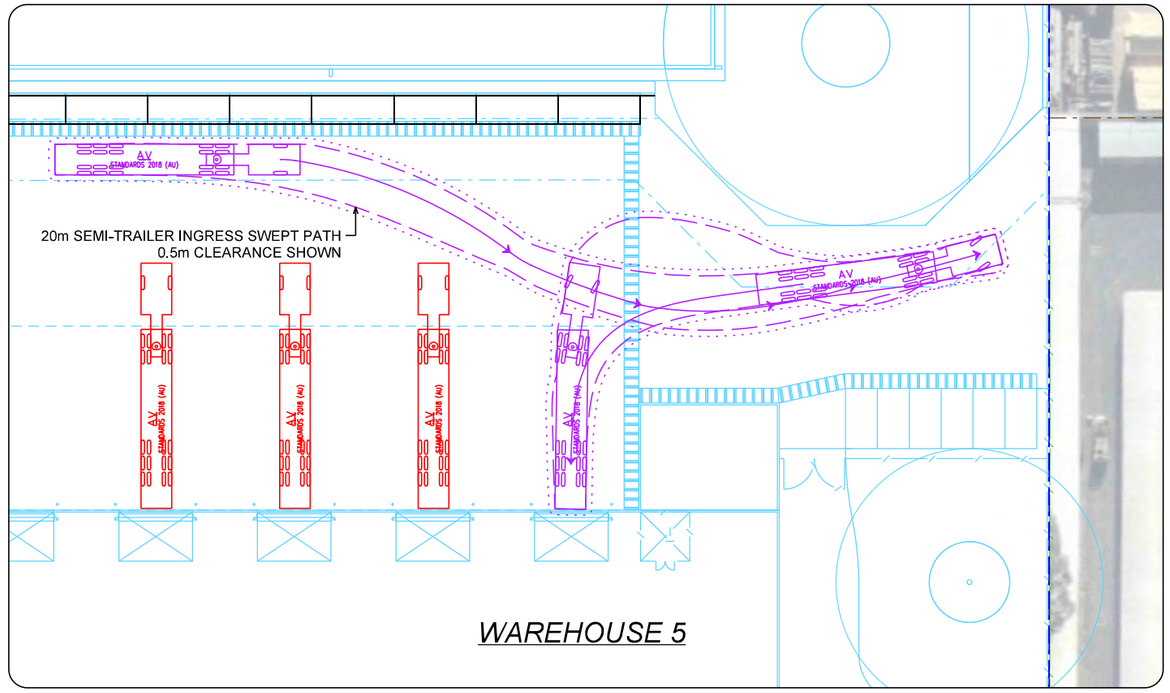
Drawing Number
IMP2203006 - DRG-20-29

Revision
D

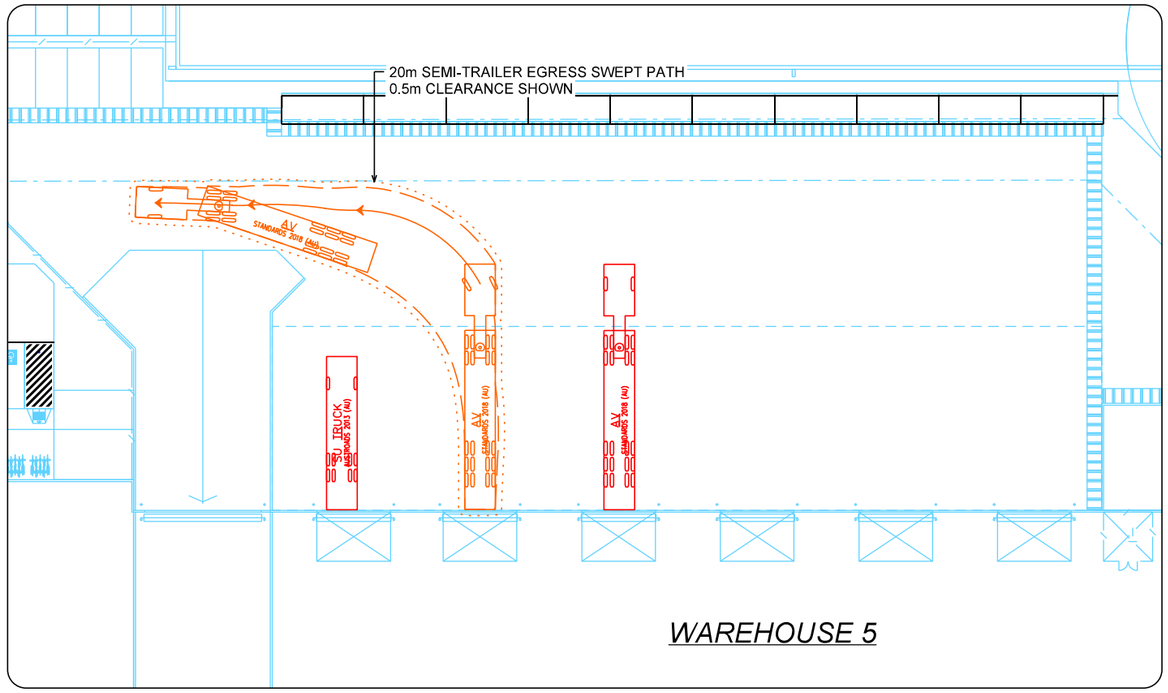
7/06/2024 2:14:04 PM



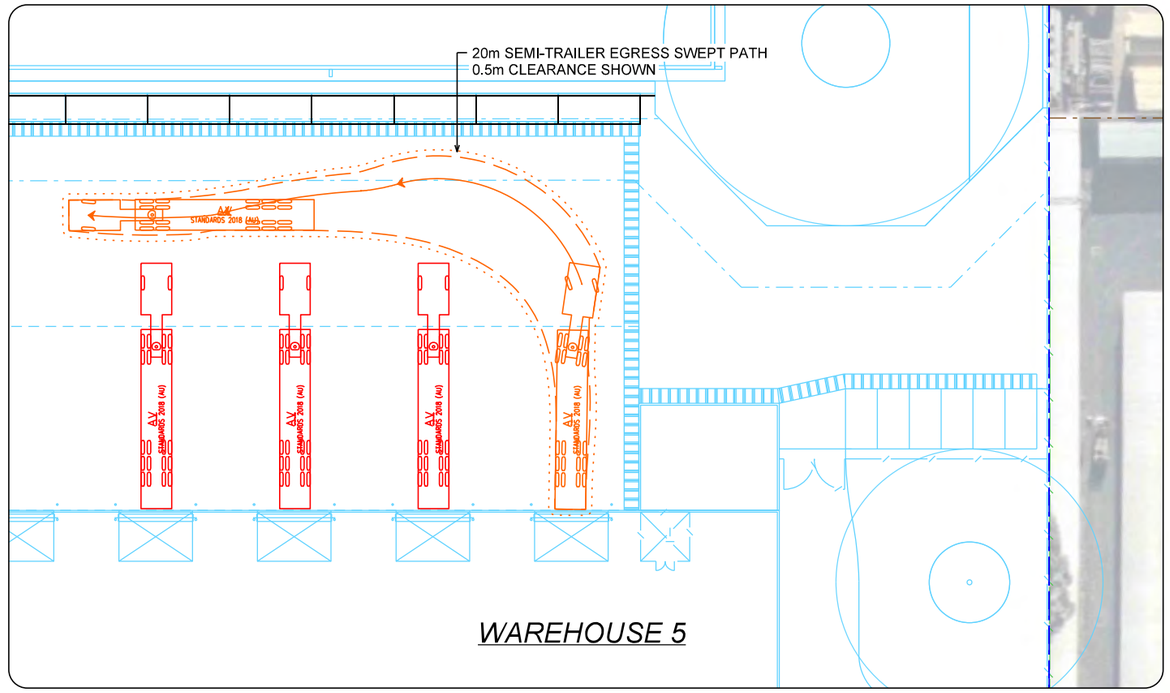
WAREHOUSE 5



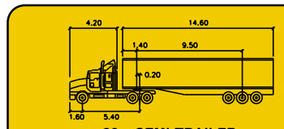
WAREHOUSE 5



WAREHOUSE 5



WAREHOUSE 5



20m SEMI-TRAILER

METERS			
TRACTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 28.3
TRACTOR TRACK	: 2.50	ARTICULATING ANGLE	: 72.0
TRAILER TRACK	: 2.50		

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MELWAY ONLINE REF:MAP 90 G11

SCALE

1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

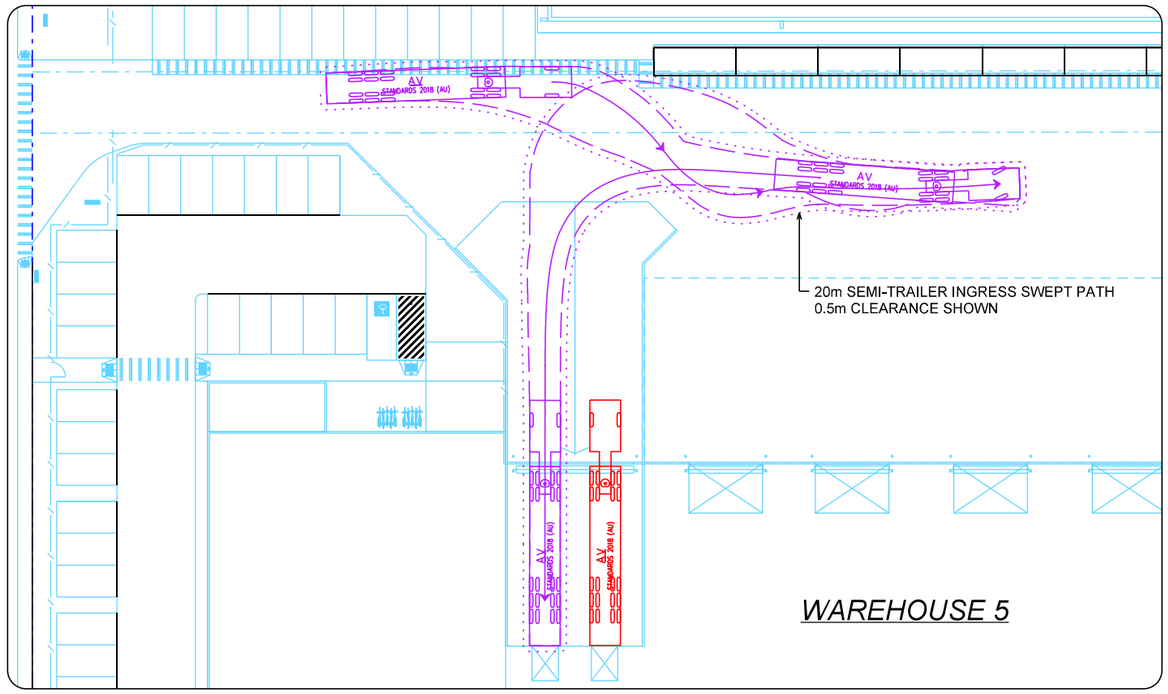
Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
20m SEMI-TRAILER - DESIGN VEHICLE

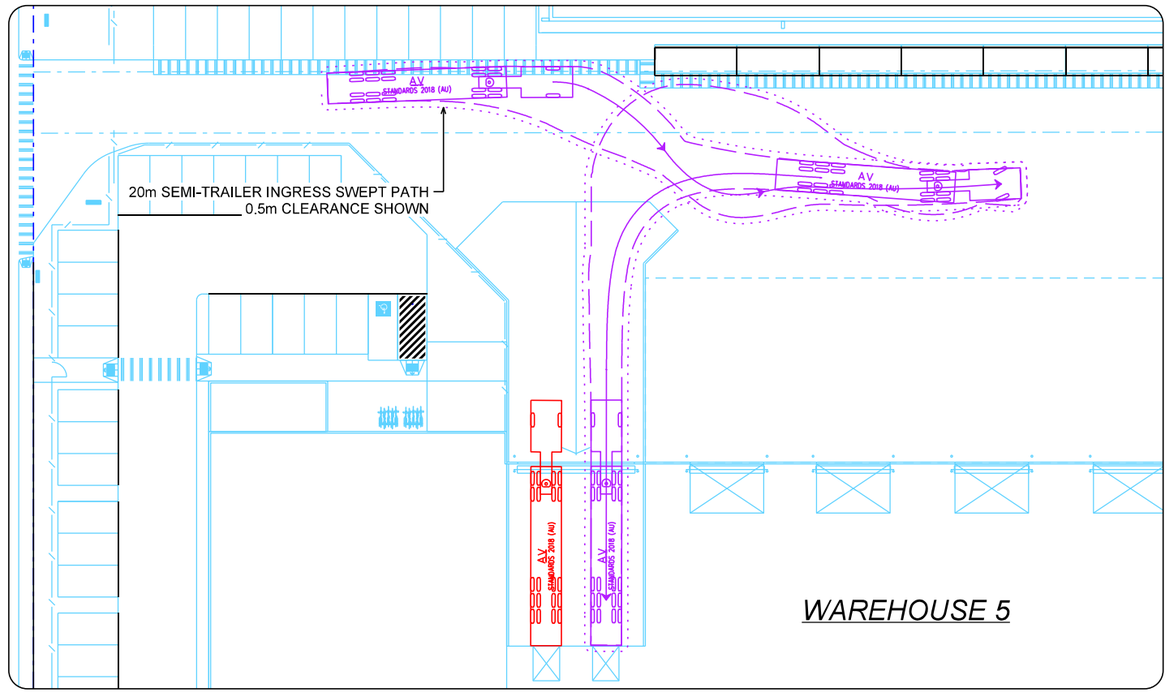
Status
PRELIMINARY

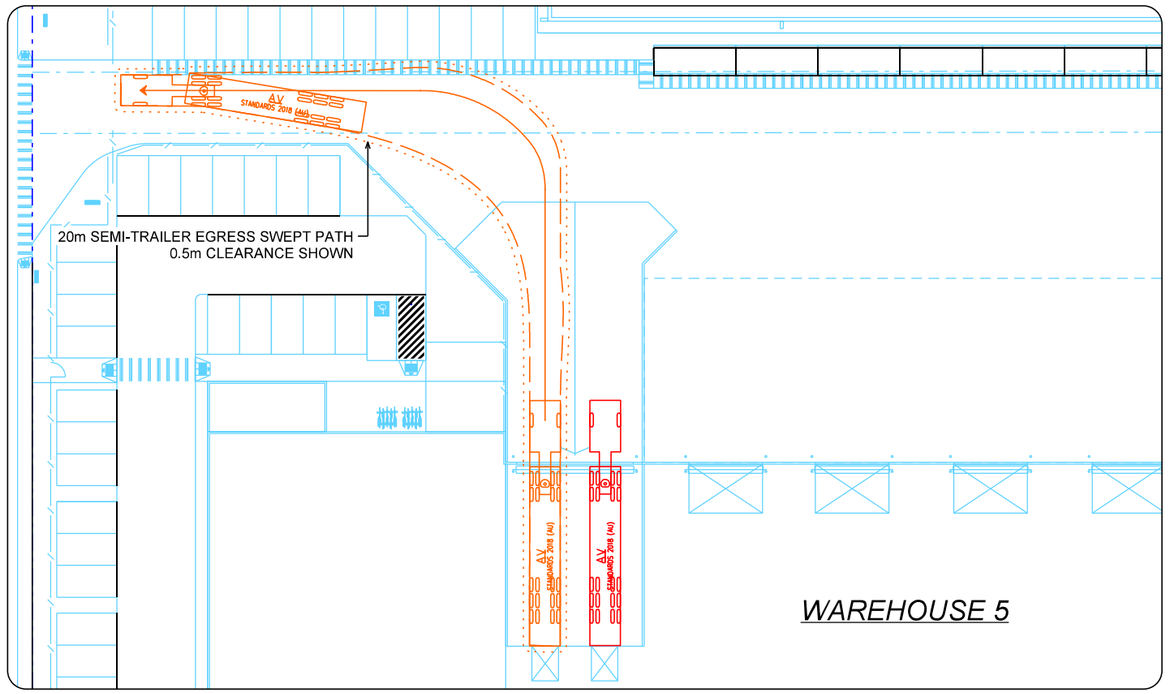
Drawing Number
IMP2203006 - DRG-20-30

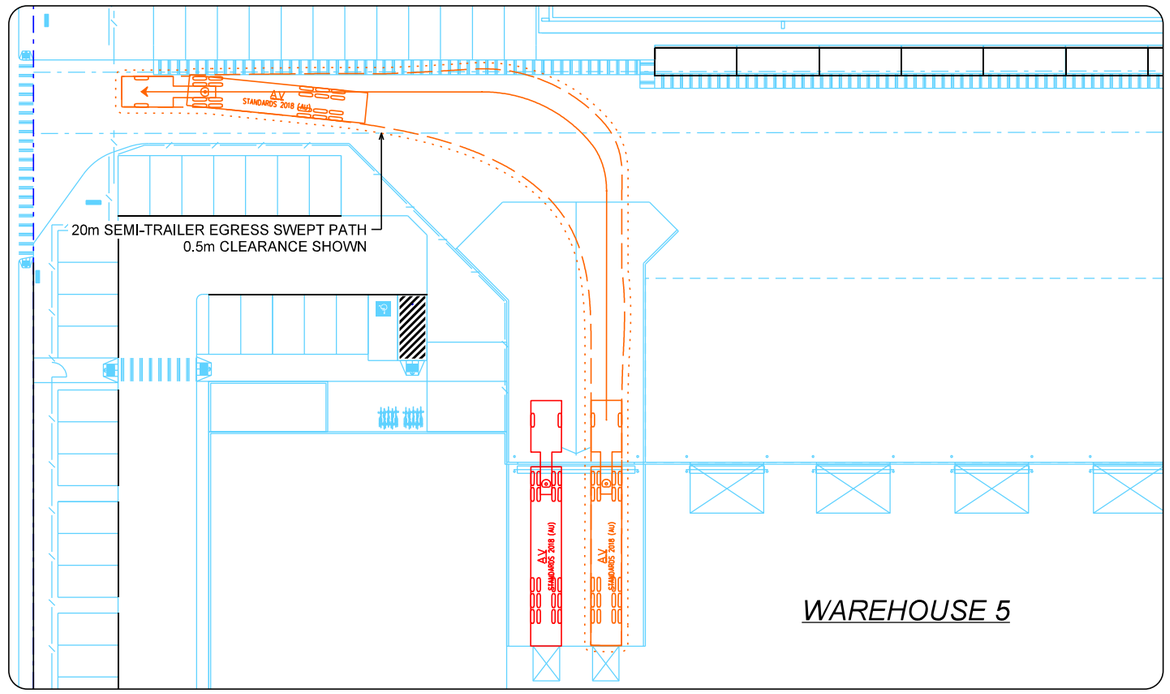
Revision
D

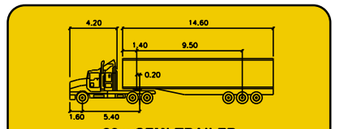
7/06/2024 2:14:10 PM











20m SEMI-TRAILER

METERS

TRACTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 28.3
TRACTOR TRACK	: 2.50	ARTICULATING ANGLE	: 72.0
TRAILER TRACK	: 2.50		

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MELWAY ONLINE REF:MAP 90 G11

SCALE

1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

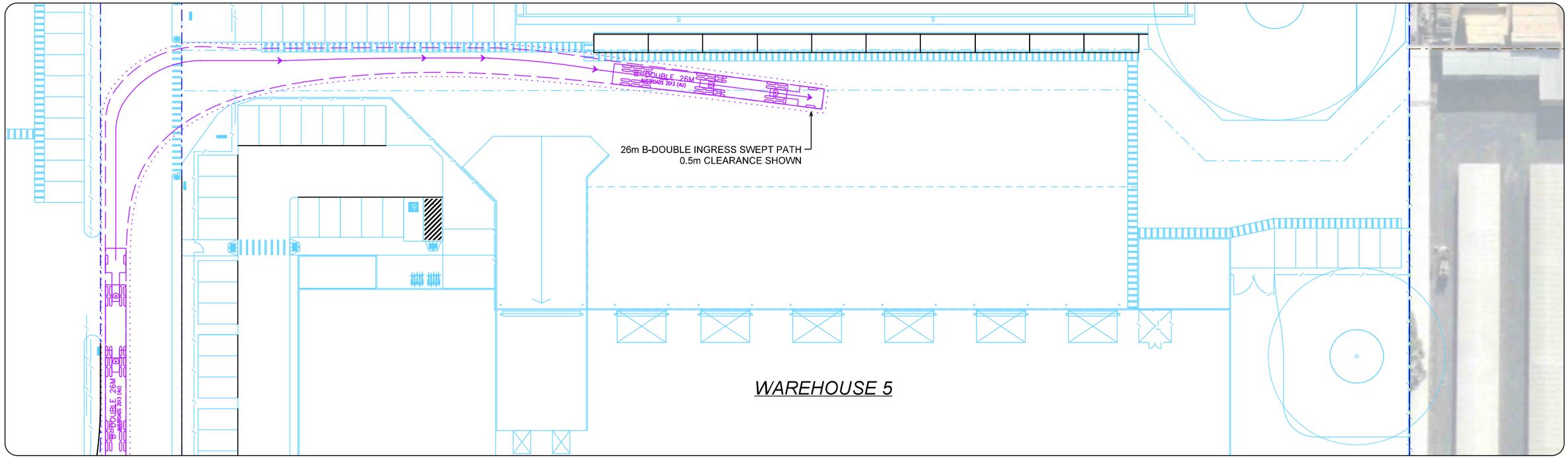
Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
20m SEMI-TRAILER - DESIGN VEHICLE

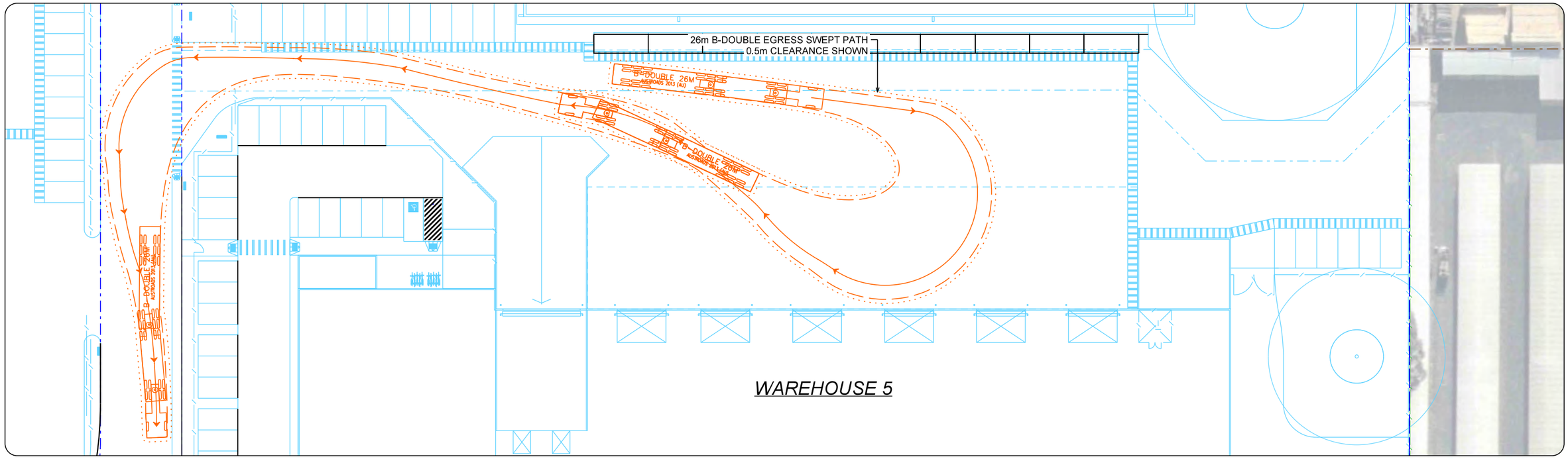
Status
PRELIMINARY

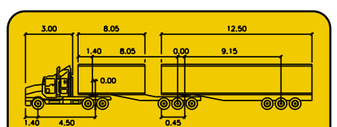
Drawing Number
IMP2203006 - DRG-20-31

Revision
D

7/06/2024 2:14:17 PM







26m B-DOUBLE

	METERS		METERS
TRACKTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 23.4
TRACKTOR TRACK	: 2.50	ARTICULATING ANGLE	: 70.0
TRAILER TRACK	: 2.50		

Aliro

Impact

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LEVEL 17, 31 QUEEN STREET, MELBOURNE VIC 3000
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MELWAY ONLINE REF:MAP 90 G11

SCALE

1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

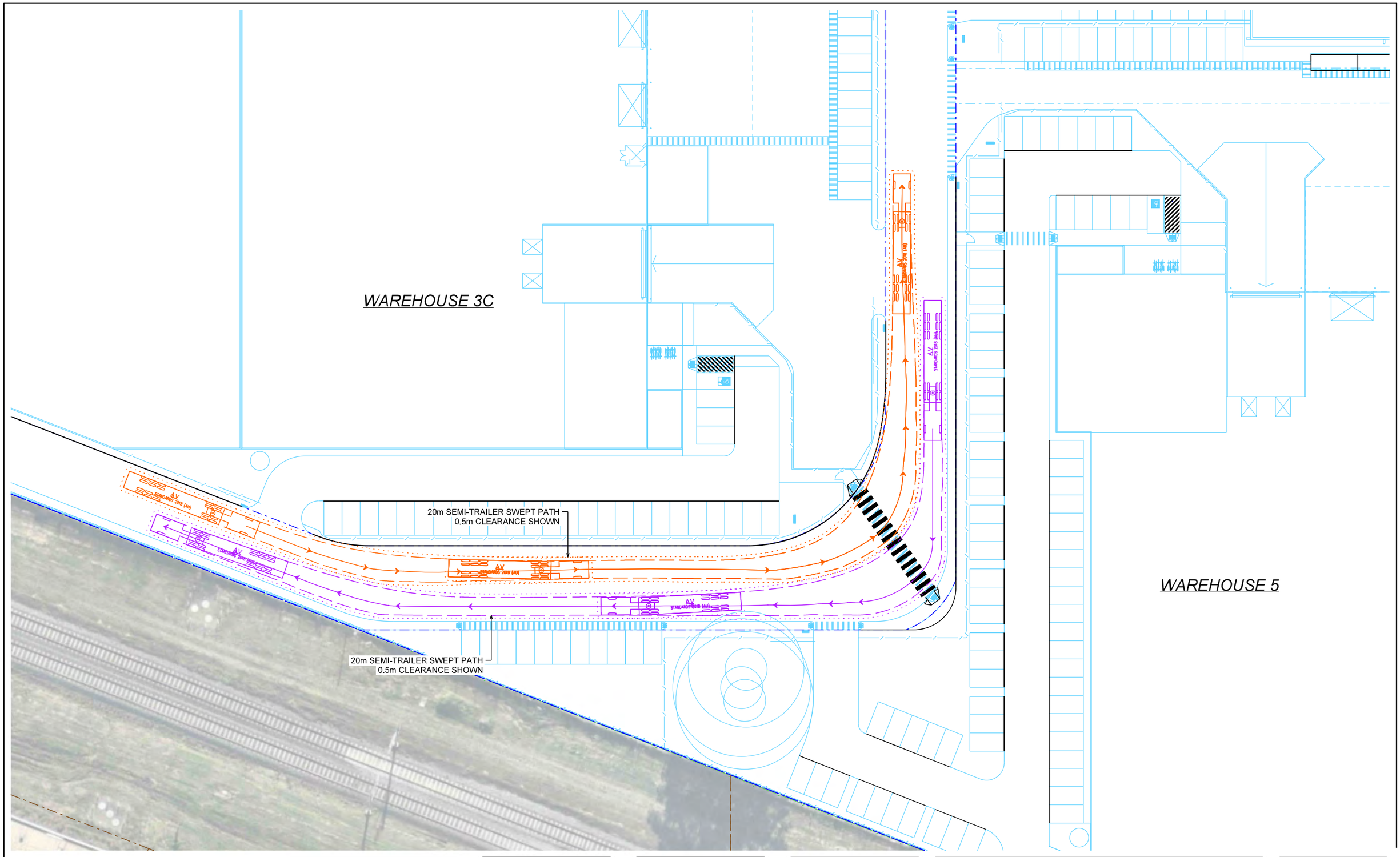
Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
26m B-DOUBLE - CHECK VEHICLE

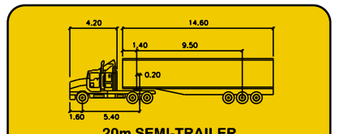
Status
PRELIMINARY

Drawing Number
IMP2203006 - DRG-20-32

Revision
D

7/06/2024 2:14:23 PM





METERS			
TRACTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 28.3
TRACTOR TRACK	: 2.50	ARTICULATING ANGLE	: 72.0
TRAILER TRACK	: 2.50		

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N

MELWAY ONLINE REF:MAP 90 G11

SCALE

1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
20m SEMI-TRAILER - DESIGN VEHICLE

Status
PRELIMINARY

Drawing Number
IMP2203006 - DRG-20-33

Revision
D

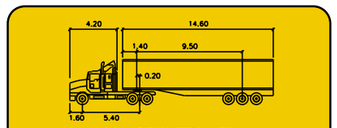
7/06/2024 2:14:27 PM

WAREHOUSE 2

WAREHOUSE 3A

20m SEMI-TRAILER SWEPT PATH
0.5m CLEARANCE SHOWN

20m SEMI-TRAILER SWEPT PATH
0.5m CLEARANCE SHOWN



20m SEMI-TRAILER

METERS

TRACTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 28.3
TRACTOR TRACK	: 2.50	ARTICULATING ANGLE	: 72.0
TRAILER TRACK	: 2.50		

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MELWAY ONLINE REF:MAP 90 G11

SCALE

1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
20m SEMI-TRAILER - DESIGN VEHICLE

Status
PRELIMINARY

Drawing Number
IMP2203006 - DRG-20-34

Revision
D

7/06/2024 2:14:32 PM

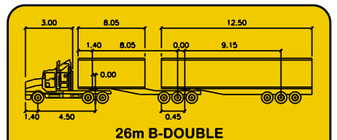
WAREHOUSE 3C

WAREHOUSE 5

26m B-DOUBLE SWEPT PATH
0.5m CLEARANCE SHOWN

26m B-DOUBLE SWEPT PATH
0.5m CLEARANCE SHOWN

B-DOUBLE 26M
AUSTROADS 2013 (NU)



26m B-DOUBLE

	METERS		METERS
TRACKTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 23.4
TRACKTOR TRACK	: 2.50	ARTICULATING ANGLE	: 70.0
TRAILER TRACK	: 2.50		

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SCALE
1:500 @ A3

Client
ALIRO GROUP

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
26m B-DOUBLE - CHECK VEHICLE

Status
PRELIMINARY

Drawing Number
IMP2203006 - DRG-20-35

Revision
D

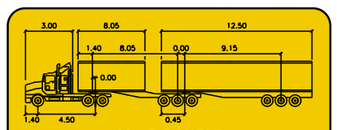
7/06/2024 2:14:37 PM

WAREHOUSE 2

WAREHOUSE 3A

26m B-DOUBLE SWEPT PATH
0.5m CLEARANCE SHOWN

26m B-DOUBLE SWEPT PATH
0.5m CLEARANCE SHOWN



26m B-DOUBLE

	METERS		METERS
TRACKTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 23.4
TRACKTOR TRACK	: 2.50	ARTICULATING ANGLE	: 70.0
TRAILER TRACK	: 2.50		

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SCALE
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Client
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Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
26m B-DOUBLE - CHECK VEHICLE

Status
PRELIMINARY

Drawing Number
IMP2203006 - DRG-20-36

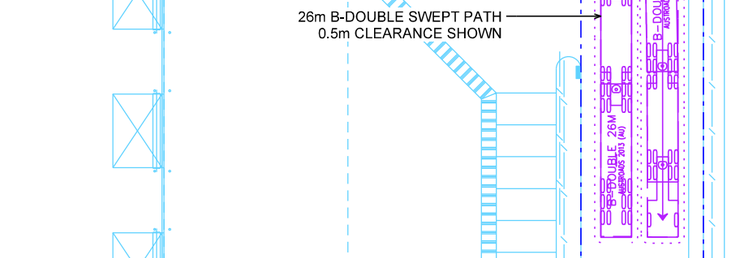
Revision
D

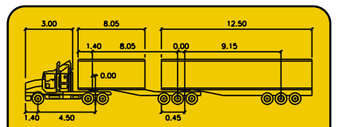
7/06/2024 2:14:42 PM

WAREHOUSE 3B

WAREHOUSE 4

26m B-DOUBLE SWEPT PATH
0.5m CLEARANCE SHOWN





26m B-DOUBLE

	METERS		METERS
TRACKTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 23.4
TRACKTOR TRACK	: 2.50	ARTICULATING ANGLE	: 70.0
TRAILER TRACK	: 2.50		

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Client
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Date **2024-06-07**
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Project
WAREHOUSE DEVELOPMENT
7 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

Title
TRAFFIC AND TRANSPORT ASSESSMENT
SWEPT PATH ANALYSIS
26m B-DOUBLE - CHECK VEHICLE

Status
PRELIMINARY

Drawing Number
IMP2203006 - DRG-20-37

Revision
D

7/06/2024 2:14:46 PM

APPENDIX B
Site Access Functional Layout Plan & Road Safety Audit

37°50'12"S 144°58'33"E

CONSULTANT ADVICE NOTICE

To:	Will Kitchen	From:	Jake Townley
Company	**Aliro**	Company:	**IMPACT®**
Email	wkitchen@aliro.com.au	Email:	Jake@impactaustralia.com.au
CC	Department of Transport & Planning, John-Paul Maina		
PROJECT:	1-27 Princes Highway, Dandenong South	Reference:	IMP2203006CAN02F02
Subject	Response To Functional Access Road Safety Audit (RSA)		

IMPACT® engaged **Road Safety Audits®** to undertake an RSA (reference no. 15795) of the proposed functional layout plan of the access design to the proposed development at 1-27 Princes Highway. Specifically, drawing number IMP2203006-FLP-01-A.

The audit revealed the following findings and recommendations:

1. *Give-way control*
   The existing left turn site egress towards westbound Princes Highway has no 'give-way' control and gives the impression of a free left with minor pavement widening to accelerate and merge. Egressing vehicles (especially heavy vehicles) may find it difficult to merge safely in this high-speed environment, increasing the risk of various traffic conflicts.
2. *Trees*
   The site ingress left slip lane along westbound Princes Highway is widened on the southside (red line) to accommodate heavy vehicle movements. The low hanging branches on the left side tree may create nuisance impact issues with the turning vehicles.
3. *Lighting*
   There are no street lights in the immediate vicinity of the subject site. The area was poorly illuminated at night. Vehicles ingressing/egressing from the site may not be conspicuous at night, increasing the risk of various conflicts.

In summary, the functional layout plan has been updated to reflect the recommendations given in item 1 and item 2. Lighting concerns, as mentioned in item 3, is accepted and deferred to be handled by others in the detailed design stage.

Updated drawings (Revision D) and a tabulated response to the RSA findings are attached as an annex to this note.

Naturally, should you have any queries or require any additional information, please contact the undersigned.

KIND REGARDS,

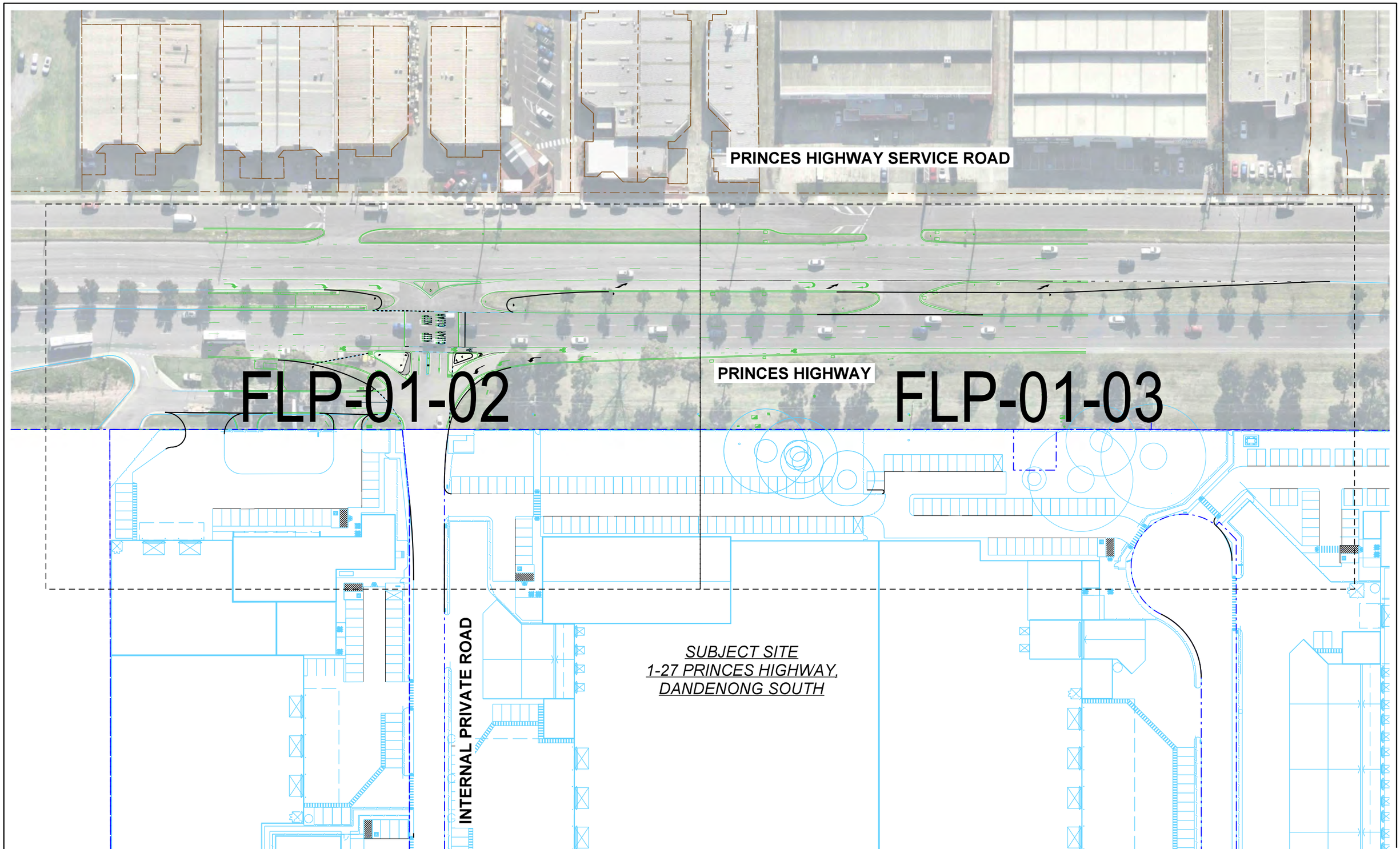
Jake Townley
Senior Engineer
M: 0411019786

ROAD SAFETY AUDIT RESPONSE TABLE

RSA Reference: 15795			**(1-27 Princes Highway , Dandenong South)**	
			Responder: Jake Townley	Date: 14/05/2024
Point	**RSA Risk Rating**	**FSI***	**Response**	Accept / Reject
1.	L	☐	Drawings updated to include give-way treatment and widen intersection to facilitate simultaneous truck movements	Accept
2.	L	☐	Trees to be maintained during operation.	Accept
3.	M	☐	Appropriate lighting to be installed. To be investigated by others in detailed design	Accept

***FSI** = Fatal or serious injury / exceeds safe system crash outcome threshold

Risk rating priorities for mitigation
N/A – not applicable
N Negligible – no action required
L Low – should be corrected or the risk reduced if the treatment cost is low
M Medium – should be corrected or the risk significantly reduced, if the treatment cost is moderate, but not high
H High – should be corrected or the risk significantly reduced, even if the treatment cost is high
E Extreme – must be corrected regardless of cost



GENERAL NOTES:

1. ALL DIMENSIONS ARE TO FACE OF KERB AND CHANNEL UNLESS NOTED OTHERWISE.
2. LOCAL ROADS - PRINCES HIGHWAY SERVICE ROAD (SPEED ZONE 50KM/H).
   - EXISTING SITE ACCESS (SPEED ZONE TBC).
   DECLARED ROADS - PRINCES HIGHWAY (SPEED ZONE 80KM/H).
3. BASE INFORMATION FROM NEARMAP AERIAL PHOTOGRAPHY DATED 26.04.2023, 2108-374-DA-004-ESTATE(O).dwg FROM ALIRO DATED 04.06.2024 AND 13174S-4D.dwg FROM HELLIER McFARLAND DATED 01.03.2024.
4. INSTALL ALL SIGNS AND LINE MARKING IN ACCORDANCE WITH AUSTROADS GUIDE TO TRAFFIC MANAGEMENT VOLUME 10, AS1742 AND RELEVANT VICROADS SUPPLEMENTS AND REMOVE ANY REDUNDANT SIGNS.

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MELWAY ONLINE REF:MAP 90 H11

SCALE
1:1000 @ A3

Client
ALIRO

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
1-27 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

Title
FUNCTIONAL LAYOUT PLAN
SITE ACCESS DESIGN
SITE LAYOUT PLAN

Status
PRELIMINARY

Drawing Number
IMP2203006 - FLP-01-01

Revision
D

PRINCES HIGHWAY SERVICE ROAD

EXISTING BARRIER TO BE INVESTIGATED TO ENSURE WAS NOT IMPACTED BY CHANGES IN CENTRAL MEDIAN

235m ACCELERATION LANE (4 SECS OBSERVATION TIME INCLUDED)
(80m MERGE TAPER INCLUDED)

4.3 (E)
3.0 (E)
3.4 (E)
2.9 (E)

MATCH TO EXISTING

70.0R

2.0R

#2

#16(E)

EXISTING SIGN #4 TO BE RELOCATED AS SHOWN

200.0R

2.0R

#20
#21

#19(E)

MATCH TO EXISTING

3.6 (E)
3.2 (E)
3.2 (E)

1.4 (E)

KEEP CLEAR

EXISTING SIGN #3 TO BE REMOVED

MATCH TO EXISTING

7.8

#2

#22

4.5 (E)

6.6

#22

#15

#2

#2

60.0R

#2

PROPOSED PAVEMENT MARKING (TYPICAL)

#15

#2

#18 (E)

MATCH TO EXISTING

EXISTING MOUNTABLE ISLAND

22.0R

MATCH TO EXISTING

EXISTING TREES TO BE TRIMMED TO ALLOW VEHICLE ACCESS

REDUNDANT PAVEMENT MARKING TO BE REMOVED (TYPICAL)

PRINCES HIGHWAY

PROPOSED MOUNTABLE APRON

#17(E)

13.3

#2

PROPOSED KERB AND CHANNEL (TYPICAL)

FOR CONTINUATION, SEE IMP2203006-FLP-01-03

100.0R

INTERNAL PRIVATE ROAD

SUBJECT SITE
1-27 PRINCES HIGHWAY, DANDENONG SOUTH

SIGN SCHEDULE

#2	GIVE WAY	R1-2	#16	KEEP RIGHT	R2-3(R)	#20	RIGHT LANE ENDS W4-9
#3	KEEP LEFT	R2-3(L)	#17		R2-11	#21	MERGE LEFT W8-15
#4		D4-1-2(L)	#18		R5-35-1(L)	#22	KEEP LEFT
#15		D4-V105	#19		R2-5		

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SCALE
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Client
ALIRO

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
1-27 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

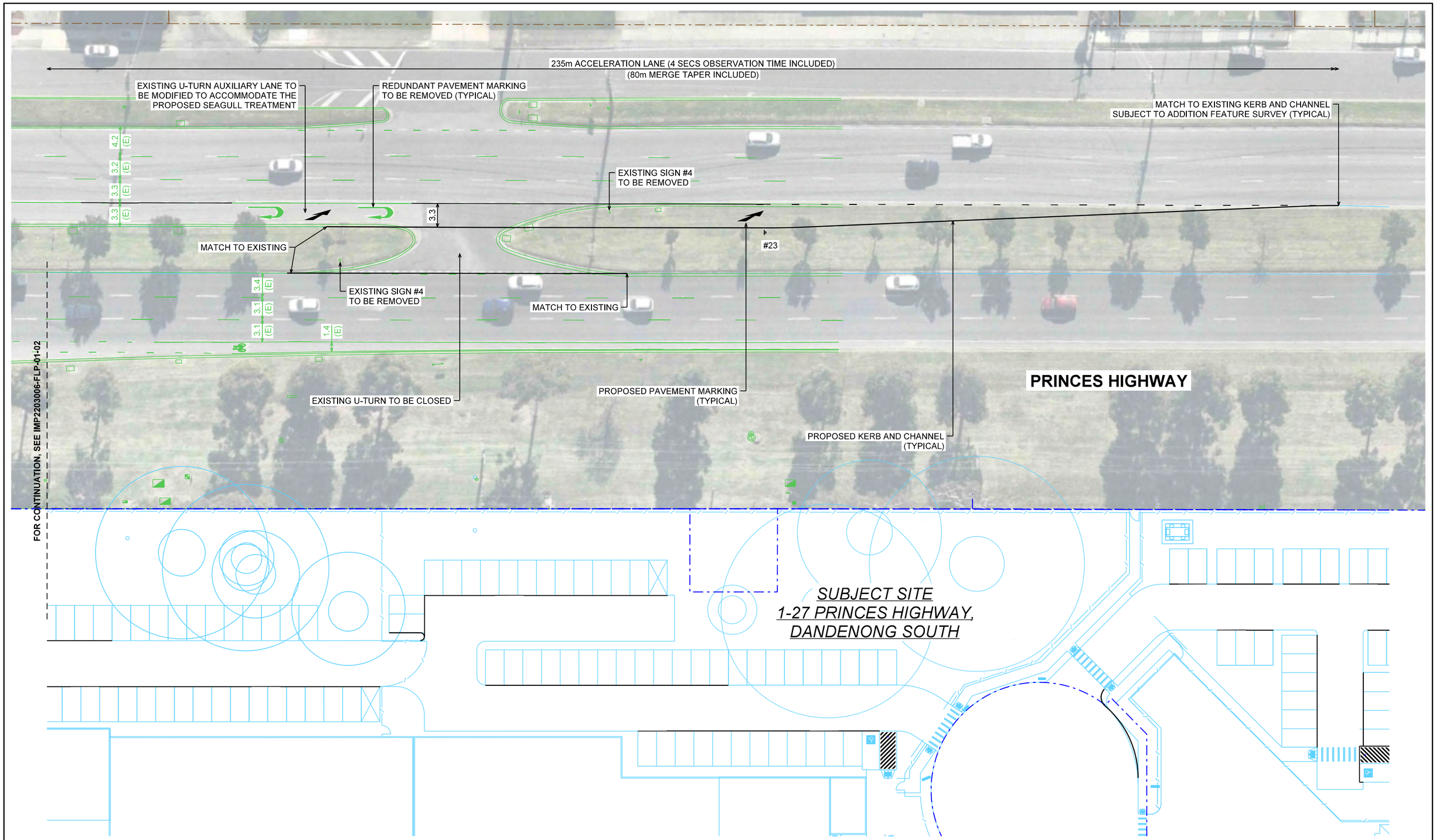
Title
FUNCTIONAL LAYOUT PLAN
SITE ACCESS DESIGN

Status
PRELIMINARY

Drawing Number
IMP2203006 - FLP-01-02

Revision
D

7/06/2024 2:22:58 PM



SIGN SCHEDULE

#4		D4-1-2(L)
#23		G9-73(L)

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SCALE
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Client
ALIRO

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
1-27 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

Title
FUNCTIONAL LAYOUT PLAN
SITE ACCESS DESIGN

Status
PRELIMINARY

Drawing Number
IMP2203006 - FLP-01-03

Revision
D

7/06/2024 2:23:01 PM

PRINCES HIGHWAY SERVICE ROAD

26m B-DOUBLE SWEPT PATH (INGRESS)
0.5m CLEARANCE SHOWN

B-DOUBLE 26M
AUSTROADS 2013 (4D)

KEEP CLEAR

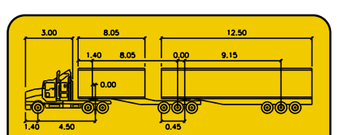
PRINCES HIGHWAY

B-DOUBLE 26M
AUSTROADS 2013 (4D)

INTERNAL PRIVATE ROAD

26m B-DOUBLE SWEPT PATH (EGRESS)
0.5m CLEARANCE SHOWN

SUBJECT SITE
1-27 PRINCES HIGHWAY,
DANDENONG SOUTH



26m B-DOUBLE

	METERS		METERS
TRACKTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 23.4
TRACKTOR TRACK	: 2.50	ARTICULATING ANGLE	: 70.0
TRAILER TRACK	: 2.50		

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MELWAY ONLINE REF:MAP 90 H11

SCALE
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Client
ALIRO

Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
1-27 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

Title
FUNCTIONAL LAYOUT PLAN
SWEPT PATH ANALYSIS
26m B-DOUBLE (DESIGN VEHICLE)

Status
PRELIMINARY

Drawing Number
IMP2203006 - FLP-01-04

Revision
D

7/06/2024 2:23:06 PM

PRINCES HIGHWAY SERVICE ROAD

26m B-DOUBLE SWEPT PATH (EGRESS)
0.5m CLEARANCE SHOWN

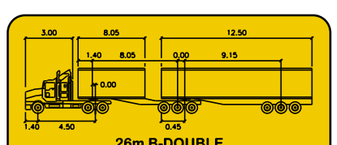
KEEP CLEAR

PRINCES HIGHWAY

26m B-DOUBLE SWEPT PATH (INGRESS)
0.5m CLEARANCE SHOWN

INTERNAL PRIVATE ROAD

SUBJECT SITE
1-27 PRINCES HIGHWAY,
DANDENONG SOUTH



26m B-DOUBLE

	METERS		METERS
TRACKTOR WIDTH	: 2.50	LOCK TO LOCK TIME	: 6.0
TRAILER WIDTH	: 2.50	STEERING ANGLE	: 23.4
TRACKTOR TRACK	: 2.50	ARTICULATING ANGLE	: 70.0
TRAILER TRACK	: 2.50		

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Client
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Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
1-27 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

Title
FUNCTIONAL LAYOUT PLAN
SWEPT PATH ANALYSIS
26m B-DOUBLE (DESIGN VEHICLE)

Status
PRELIMINARY

Drawing Number
IMP2203006 - FLP-01-05

Revision
D

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PRINCES HIGHWAY SERVICE ROAD

12.5m SU TRUCK SWEPT PATH (EGRESS)
0.5m CLEARANCE SHOWN

KEEP CLEAR

PRINCES HIGHWAY

INTERNAL PRIVATE ROAD

SUBJECT SITE
1-27 PRINCES HIGHWAY,
DANDENONG SOUTH

12.50
2.20 6.85
12.5m SU TRUCK

	METERS
WIDTH	: 2.50
TRACK	: 2.50
LOCK TO LOCK TIME	: 6.0
STEERING ANGLE	: 36.6

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Client
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Date **2024-06-07**
Drawn / Approved **TD / JT**

Project
WAREHOUSE DEVELOPMENT
1-27 PRINCES HIGHWAY, DANDENONG SOUTH
CITY OF GREATER DANDENONG

Title
FUNCTIONAL LAYOUT PLAN
SWEPT PATH ANALYSIS
12.5m SU TRUCK (DESIGN VEHICLE)

Status
PRELIMINARY

Drawing Number
IMP2203006 - FLP-01-06

Revision
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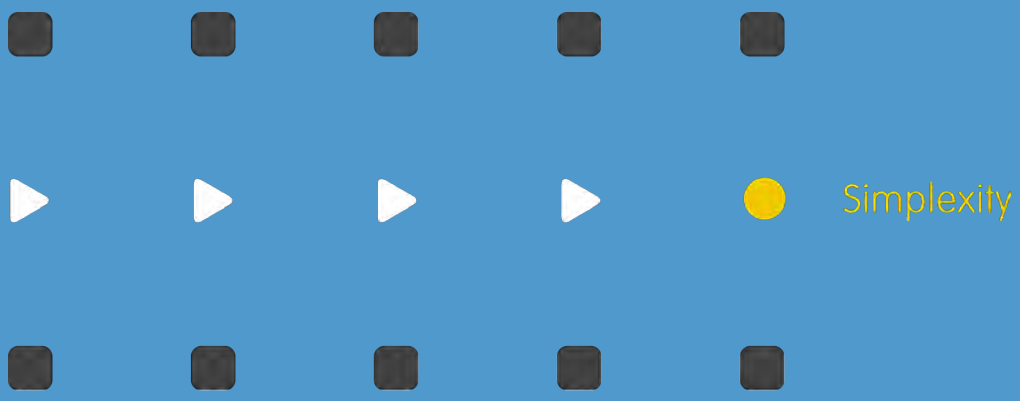
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