

25/07/2022

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RE: Aspect Industrial Estate, Mamre Road Precinct – Modification 2 to State Significant Development Application (SSD 10448)

Dear Daniel,

Ason Group has been commissioned by Mirvac to prepare a Transport Statement (TS) supporting the proposed modification (MOD) to the approved State Significant Development (SSD) 10448. The application relates to development of a warehouse and logistics hub, known as Aspect Industrial Estate, located on Lot 56-58, Mamre Road, Kemps Creek (the Site).

As a result of refining the layout of Warehouse 1 to suit the needs of the future occupier, the proposed MOD seeks to revise the approved Stage 1 development (and subsequently, the Concept Plan). From the outset, it critical to note that the MOD 2 will result in the reduction of the overall warehouse and office space Gross Floor Area (GFA).

In this regard, Ason Group has reviewed all relevant documentation and undertaken an assessment of the proposed MOD, focusing on:

- Parking compliance in accordance with Mamre Road Precinct Development Control Plan 2021 (MRP DCP) and the site-specific Aspect Industrial Estate Development Control Plan (AIE DCP).
- Traffic Assessment to determine the net change in traffic generation of that assumed for the approved development.
- Design compliance in accordance with AS 2890.1, AS 2890.2 and AS 2890.6.

Having regard to the above, the following key documents have been referenced in preparing this TS:

- Ason Group, *Transport and Accessibility Management Plan, Aspect Industrial Estate State Significant Development Application, Lots 54 – 58 Mamre Road, Kemps Creek*, revision 3, dated 13/08/2021 (Ason TMAP);
- Ason Group, *Aspect Industrial Estate, Mamre Road – Request for Further Information*, P1029I03 (Ason RFI);
- SBA Architects, *SSDA ESTATE MASTERPLAN - 19210_AIE - MP02_AL_SSDA Estate Masterplan*, dated 25/02/2022 (Approved Masterplan);
- SBA Architects, *SSDA MOD 1 ESTATE MASTERPLAN - 19210_AIE_MOD 1 - MP02_T_SSDA Estate Masterplan*, dated 11/07/2022 (MOD 1 Masterplan);
- Transport & Urban Planning Pty Ltd, *Road Safety Audit and Risk Assessment Report of Potential Weave Movement in Aspect Estate Road Associated with Potential Future Two Lane Right Turn from Mamre Road*, dated 03/02/2022 (RSA Report).

The findings of our analysis are summarised herewith.

Summary of Approved Development

The original development application included the following:

- A Concept Masterplan for the site comprising 11 industrial buildings, internal road network layout, building locations, gross floor area (GFA), car parking, concept landscaping, building heights, setbacks and built form parameters with the following GFAs:
 - Warehouse: 236,510m²;
 - Office: 10,080m²
 - Dock Office: 1,400m²
 - Café: 122m².
- A Stage 1 development including the construction, fit out and 24 hours a day / 7 days per week use of:
 - Warehouse 1: A total of 36,722m² GFA, including 34,970m² of warehouse GFA, 1,430m² of ancillary office GFA, 200m² of dock office and a 122m² café.
 - Warehouse 3: A total of 21,535m² GFA, including 20,735m² of warehouse GFA, 800m² of ancillary office GFA and 100m² of dock office GFA.
- A new signalised intersection to Mamre Road to accommodate Stage 1 traffic.

The Ason TMAP and Ason RFI were prepared to support the approved development. The primary parking and traffic conclusions achieved within these documents now form the basis of the MOD assessment.

Proposed Development

Summary

As a result of prospective occupiers for Warehouse 1 approved under Stage 1, the MOD seeks to revise the development as necessary. Further detail on the development for which approval is now sought is provided in the Environmental Impact Statement report prepared separately by Urbis. In summary, the MOD seeks approval for:

- A Concept Masterplan for the site comprising 11 industrial buildings, internal road network layout, building locations, car parking, concept landscaping, building heights, setbacks and built form parameters with the following GFAs:
 - Warehouse: 232,381m²;
 - Office: 9,550m²
 - Dock Office: 1,500m²
- A Stage 1 development including:
 - Warehouse 1: A total of 33,886m² GFA, including 32,686m² of warehouse GFA, 900m² of ancillary office GFA and 300m² of dock office GFA.

- Warehouse 3: A total of 21,535m² GFA, including 20,735m² of warehouse GFA, 700m² of ancillary office GFA and 100m² of dock office GFA.
- A new signalised intersection to Mamre Road to accommodate Stage 1 traffic.

A comparison of the Approved Masterplan and the MOD 2 Masterplan is presented in **Figure 1** and **Figure 2**. Larger figures are provided in **Attachment 1** and **Attachment 2**.



Figure 1: Approved Masterplan



Figure 2: Proposed Masterplan

A summary of the key transport-related figures of the approved development and the proposed modification is presented in **Table 1**.

Further details with regard to car parking and traffic generation as a result of the MOD are detailed in the sections below.

TABLE 1: APPROVED DEVELOPMENT (SSD 10448) VS PROPOSED MODIFICATIONS				
Building		SSD 10448	Modification 2	Net change
Stage 1				
Warehouse 1	Warehouse GFA (m²)	34,970	32,686	-2,284
	Office GFA** (m²)	1,630	1,200	-430
	Cafe GFA (m²)	122	0	-122
	Total	36,722	33,886	-2,836
Warehouse 3	Warehouse GFA (m²)	20,735	20,735	0
	Office GFA** (m²)	800	800	
	Cafe GFA (m²)	0	0	
	Total	21,535	21,535	
Concept Masterplan				
Site Total*	Warehouse GFA (m²)	236,510	232,381	-4,129
	Office GFA** (m²)	11,480	11,050	-430
	Cafe GFA (m²)	122	0	-122
	Total	248,112	243,431	-4,716

Car Parking Spaces	1,283	1,187	-96
Morning Peak Hour Trips (veh/ hr)	570	499	-72
Evening Peak Hour Trips (veh/ hr)	595	520	-76
Daily trips (veh)	7,218	6,478	-740

**Inclusive of Warehouses 1 to 11*

***Inclusive of dock office GFA*

Proposed Access Arrangements

The proposed modifications to Stage 1 are shown in more detail by **Figure 3**. As is shown, the access arrangements are proposed to be revised to provide for truck entry via a left-in driveway on Access Road 01, with truck exit and light vehicle access onto the relocated Road 02. This will facilitate circulation around the west, north and eastern sides of the warehouse for heavy vehicles, while reducing the number of access driveways on Road 01.

The future operations of the Site will involve loading of smaller vans of the eastern side, with the loading / unloading activities for trucks occurring on the western side.

Due to the loading activities occurring on either side of the warehouse, an entry driveway is to be provided to west of Warehouse 1, some 100m from the Mamre Road / Road 01 intersection. The entry will be restricted to left-in only, and will be unfettered during operational hours (i.e. security gates will not be closed) allowing for free-flowing movement into the hardstand. Finally, the entry driveway will include a deceleration lane. As such, the entry driveway will not impact the through movements on Access Road 01.

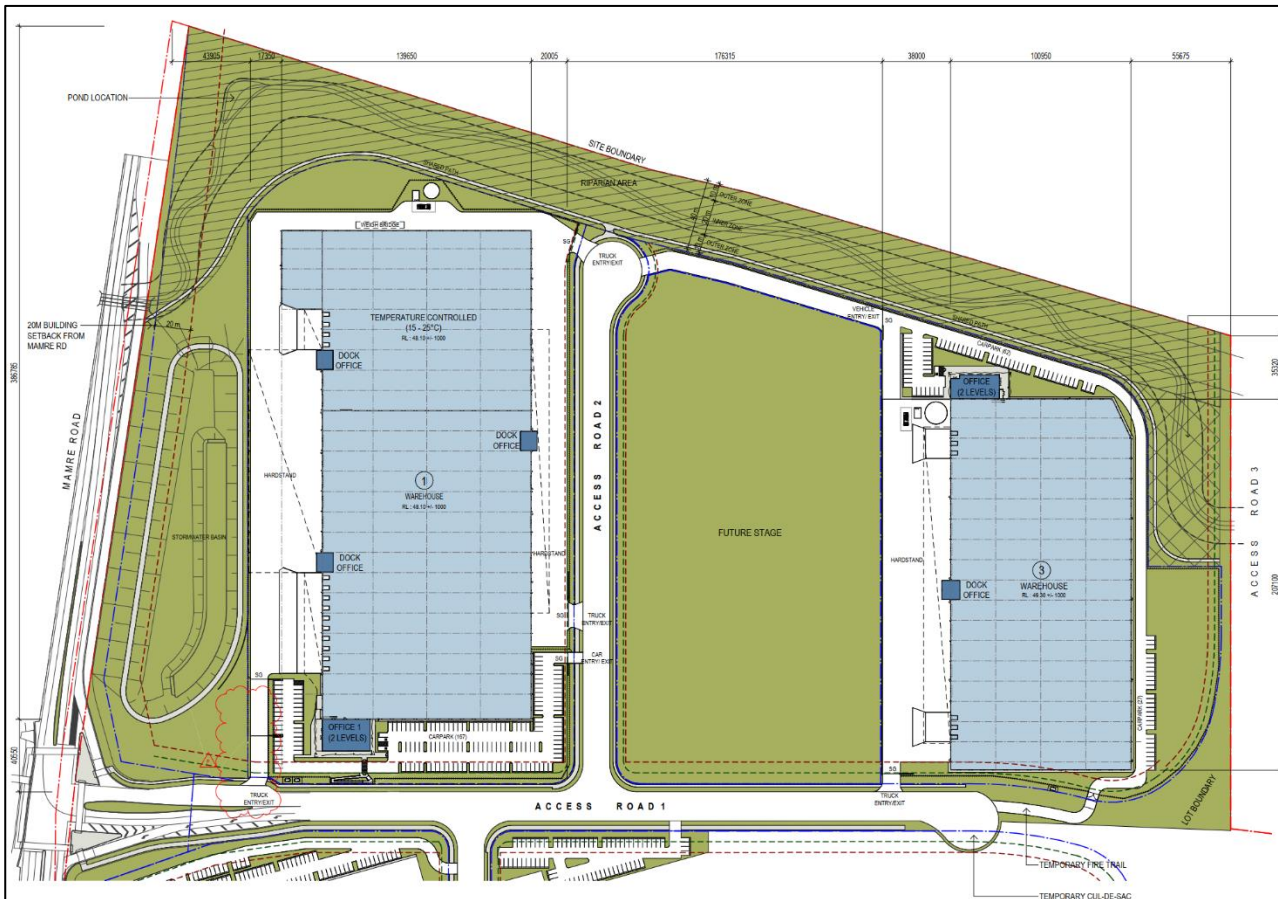


Figure 3: Proposed Stage 1 Development

Following consultation with Transport for New South Wales (TfNSW), the movement of vehicles turning right into Access Road 01 from Mamre Road wanting to access the Site has been considered. This was in particular regards to the current planned layout of the permanent Mamre Road / Access Road 01 intersection. The current planned intersection provides for only a single right-turn movement as the demand is not anticipated to require dual lanes. However, TfNSW requested further consideration to the potential weave movement that may arise, should an additional right-turn lane be added.

It is reiterated that the ultimate intersection planned currently does not require dual right-turn lanes due to the anticipated demand not requiring this level of capacity. Nevertheless, an assessment of the potential weave movement has been undertaken to address TfNSW comments.

Mirvac commissioned Orion Consulting to prepare a concept design of the intersection, which includes a dual lane right-turn into Access Road 01 from Mamre Road. A Road Safety Audit (RSA) was then conducted on the basis of this layout. The RSA Report is provided as **Attachment 3**. The conclusions from the RSA Report are as follows:

We have examined the plans and other information as detailed in Section 1.4 and we have audited this information to evaluate the potential road safety risk associated with a potential weave movement by trucks entering Warehouse 1, if a dual lane right turn is introduced in Mamre Road for the north to east right turn into AIE Road.

The auditors note that the introduction of a dual lane right turn (north to east) is a hypothetical situation as the current planning, traffic modelling for 2036 and Modification 1 application only require a single lane right turn, north to east.

In the event that a dual lane right turn north to east is introduced, the auditors consider that based on Mirvac's driver induction/training program for truck drivers using the estate, as well as the volume of trucks entering Warehouse 1 from the north to east right turn, together with the low total volume of right turn vehicles (north to east), then the road safety risk from any potential weave movements is very low.

As such, it is concluded that the proposed access arrangements are appropriate as it provides for safe and efficient traffic flow around the Site itself, without materially impacting on the operation or safety of the external road network.

Parking Requirements

The Ason TMAP adopted rates which were consistent with the MRP DCP and the AIE DCP. In this regard, the rates applicable to the proposed development are as follows:

- Warehouse: 1 space per 300m²
- Office: 1 space per 40m²

With reference to the parking rates provided in the MRP DCP, **Table 2** details the parking requirement of the overall Proposal.

It is noted that as the prospective occupier of Warehouse 1 is known, the staffing requirements are already understood. Based on the information provided, Warehouse 1 will require 15 office staff and 85 warehouse staff. As such, the proposed provision of 167 spaces will be more than sufficient to accommodate the parking demands of the prospective occupier as well achieving full compliance with the relevant parking rates.

TABLE 2: PARKING REQUIREMENTS PER WAREHOUSE				
Stage	Use	Gross Floor Area	MRP DCP Requirement	Provision
1	Warehouse GFA (m ²)	53,421	179	256
	Office GFA (m ²)	2,000	50	
	Sub Total	55,421	229	
Concept Masterplan Balance**	Warehouse GFA (m ²)	178,960	597	943
	Office GFA (m ²)	9,050	227	
	Sub Total	188,010	824	
Total		243,431	1,053	1,187

* Warehouses 1 and 3

** Warehouses 2 and 4-11

As shown in Table 2, the car parking provision for Stage 1 (256 spaces) generally complies the requirements of the DCP requirements and is in accordance with the accepted methodology for the original DA.

In regard to the Masterplan, compliance with the relevant rates has been achieved.

As such, the Proposal remains supportable on parking grounds and would satisfy the parking demands of the Site.

Traffic Impacts

Traffic Generation

Trip Rates

To determine the traffic generation potential of the MOD, reference is made to the traffic generation rates adopted in the Ason TMAP under the approved development (SSD 10448). In this regard, the relevant rates are as follows:

- AM Road Network Peak (7:00 – 8:00am): 0.23 vehicle trips per hour (vph) per 100m² GFA
- PM Road Network Peak (4:00 – 5:00pm): 0.24 vph per 100m² GFA
- Daily: 2.91 daily vehicle trips per 100m² GFA

Stage 1 Traffic Generation

With further operational information now known for Warehouse 1, a more detailed assessment of the traffic generation can be undertaken for this component of the development.

The following information and assumptions for the operation of Warehouse 1 have been adopted in the updated trip generation assessment:

- Typical warehouse hours: 5:00am – 7:00pm (14 hours).
Note that there will be a minor volume of activity outside of these hours on an “as required” basis only.
- Office hours: 8:00am - 4:00pm.
- On the basis of 2016 Journey to Work data, it is assumed 92% of employees will drive to Site (with the other 8% travelling via other modes, i.e. walking/ cycling/ catching public transport/ car-pooling).
- Warehouse staff: 85 (assumed 2 shifts per day).
- Noting the typical warehouse hours; it is not anticipated that any warehouse staff will travel during the critical road network peak hours. It is expected that staff would arrive onsite prior to 5:00am, with a shift change-over in the middle of the day and all staff departing after 7:00pm.
- Office staff: 15 (assumed 1 shift per day).
- Noting that there are 15 office staff, and assuming a conservative assessment where all will travel to Site during the morning peak hour and leave in the afternoon peak, then there would be 14vph associated with the office component.
- Truck movements: 40 per day (in and out movements conservatively spread over 14 hours per day).
- Assuming truck movements are spread over the course of a 14-hour day, there would be 3 movements during the morning and afternoon peak hours.

On the basis of the above, the trip generation from Warehouse 1 is expected to be:

- 17 trips in the morning peak hour
- 17 trips in the evening peak hour
- 380 daily trips

Table 3 summarises the traffic generation for Warehouse 1 on the basis of the above, and Warehouse 3 on the basis of generic assessment with respect to the previously approved traffic generation.

TABLE 3: STAGE 1 APPROVED DEVELOPMENT (SSD 10448) VS. PROPOSED					
Warehouse	Approved GFA (m ²)	Proposed GFA (m ²)	Period	Approved Traffic Generation	Proposed Traffic Generation
Warehouse 1*	36,600	33,886	AM Peak	85	17
			PM Peak	88	17
			Daily	1,066	380
Warehouse 3**	21,535	21,535	AM Peak	50	50
			PM Peak	52	52
			Daily	627	627

* Based on first principles assessment

** Based on the approved trip rates adopted for SSD 10448 as per the Ason TMAP

As noted, the traffic generation shown in Table 3 for Warehouse 1 has been based on the prospective tenant intended operations. However, application of the trip rate detailed in the Ason TMAP would result in 78vph and 81vph in the AM and PM peak hours respectively for Warehouse 1. Therefore, the proposed MOD would result in a slight decrease in traffic generation associated with Stage 1. This is a result of the decrease in GFA associated with the revised design.

Masterplan Traffic Generation

Table 4 summarises the traffic generation for the whole of the Masterplan based on the traffic generation methodology detailed above for Warehouse 1.

TABLE 4: APPROVED DEVELOPMENT (SSD 10448) VS. PROPOSED						
Stage	Approved GFA (m ²)	Proposed GFA (m ²)	Period	Approved Traffic Generation	Proposed Traffic Generation**	Net Difference
Concept Masterplan	247,990*	243,431	AM Peak	570	499	-72
			PM Peak	595	520	-76
			Daily	7,218	6,478	-740

*Excludes GFA associated with café as it was anticipated trips would be linked to warehouse uses

**Includes Warehouse 1 generation on the basis of the first principles assessment, as per Table 3, with the remainder of the Site adopting the approved trip rates for SSD 10448 as per Ason 2021 Report

With reference to the table above, the proposed changes to the Concept Masterplan (relating to the Stage 1 Proposal) would result in a net reduction in traffic generation for the Site over that previously assessed for the approved development.

Traffic Impact Summary

The Ason TMAP and Ason RFI found that the key intersection of Mamre Road / Road 01 would operate at satisfactory levels of service under the approved development. Noting the MOD will result in a decrease in the forecast traffic generation, it is concluded that the development remains supportable on traffic planning grounds.

Access / Internal Design

The site access, internal circulation and car parking arrangements have been developed with consideration of the requirements of the MRP DCP and the following relevant Australian Standards:

- AS2890.1:2004 for Car parking areas;
- AS2890.2:2018 for Commercial vehicle loading areas;
- AS2890.6:2009 for Accessible (disabled) parking.

In regard to the proposed design, the following is notable:

- A 30m A-double (i.e., 30m Performance Based Standards (PBS) Level 2 Type B vehicle) has been adopted as the design vehicle for site access and circulation. 20m Articulated Vehicles are generally adopted for loading dock parking.
- Swept path analysis demonstrates that the necessary manoeuvres can be accommodated by the revised design. The circulation areas for commercial (heavy) vehicles have been designed having regard for the requirements of AS2890.2:2018 (see **Attachment 4**).
- All access driveways are generally designed in accordance with AS 2890.1:2004 and AS 2890.2:2018. Warehouse 1 requires a Type 2, requiring a combined width of 6-9m
- The proposed design envisages changes to the car parking and layout, with all parking now provided in a consolidated location to the south of the Site. As such all staff and employee parking access and modules are provided in accordance with AS2890.1:2004 for a Class 1A users, which requires a minimum space length of 5.4m, a minimum width of 2.4m and a minimum aisle width of 5.8m.
- The proposed design sees changes to the truck hardstand area, with a recess dock and weighbridge location in accordance with the access requirements of AS2890.1:2004 and AS 2890.2:2018. The proposed weighbridge location, to the north of Warehouse 1, away from hardstand areas ensures that its use would not infringe on the use of the other circulation and loading areas.

Conclusion

In summary:

- The MOD is seeking to revise the layout of Stage 1 of the Concept Masterplan to accommodate the needs of a future tenant. This includes revision of the internal design of Warehouse 1, relocation of Access Road 02 and the relevant modification to the concept for Warehouse 02 as a result.
- The access arrangements to Warehouse 1 have been modified to include for truck entry via a left-in driveway on Access Road 01, with truck exit and light vehicle access onto the relocated Road 02; reducing the number of access driveways on Road 01.
- A RSA has been undertaken of the entry movement for heavy vehicles travelling from the south on Mamre Road, turning right into Access Road 01 and turning into the Site. The RSA was undertaken under a scenario where a dual right-turn lanes exist on Mamre Road. However it is noted that only a single right-turn bay is planned for due to the demand for the right-turn movement into Access Road 01.

The RSA Report has concluded that *Given that it is a hypothetical situation, which may never occur, it is considered that it represents minimal risks in terms of road safety.*

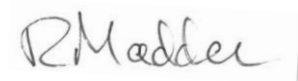
As such, it is concluded that the proposed access arrangements are appropriate as it provides for safe and efficient traffic flow around the Site itself, without materially impacting on the operation or safety of the external road network

- The car parking provision for the Stage 1 development (256 spaces) as well as the Masterplan (1,199 spaces) generally complies with the accepted methodology detailed in the Ason TMAP. As such, the development remains supportable on parking grounds and would satisfy the parking demands of the Site.
- The estimated traffic generation of the MOD results in reduced traffic generation during the peak hour and is therefore supportable on traffic generation grounds.
- The modification seeks to revise the design of the car park access and parking modules, heavy vehicle loading docks, circulation roadways and proposes the addition of a weighbridge within Warehouse 1 (Stage 1). Swept path analysis demonstrates satisfactory operation for each proposed change. The MOD remains consistent with the Australian Standards and MRP DCP design requirements.

Accordingly, it is concluded that the proposed amended design is supported, and the Proposal remains consistent with parking, traffic, and design conclusions of the approved development.

If you have any questions or should you wish to discuss the application further, please contact the undersigned.

Yours sincerely,



Rebecca Butler-Madden

Senior Transport Planner

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Attachment 1 – Approved Masterplan

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*Areas are measured to future Mamre Rd boundary in red
 **All areas subject to survey

Attachment 2 – Proposed Plans


OVERALL SITE DEVELOPMENT DATA	
Total Area	558,323 sq ft
Marine Reserve Area	14,004 sq ft
Marine Reserve Site Area	54,319 sq ft
Access Roads Area	43,953 sq ft
Creek Channel Area	29,718 sq ft
Creek Riparian Area	1,402 sq ft
Restored Riparian Area	18,130 sq ft
Total Developable Area	44,906 sq ft
Total Office Area (inc. site area)	11,050 sq ft
Total Warehouse Area	234,351 sq ft
Total Building Area	234,351 sq ft
Residential on User Area	4,613 sq ft
WAREHOUSE 1	
Site Area	61,039 sq ft
Offices	3,500 sq ft
Warehouse	300 sq ft
Deck Office	300 sq ft
Total GFA	33,856 sq ft
Capex Provided	187
WAREHOUSE 2	
Site Area	40,072 sq ft
Offices	1,559 sq ft
Warehouse	2,556 sq ft
Deck Office	200 sq ft
Total GFA	24,256 sq ft
Capex Provided	150
WAREHOUSE 3	
Site Area	42,855 sq ft
Offices	700 sq ft
Warehouse	20,735 sq ft
Deck Office	100 sq ft
Total GFA	21,535 sq ft
Capex Provided	89
WAREHOUSE 4	
Site Area	41,355 sq ft
Offices	750 sq ft
Warehouse	18,070 sq ft
Deck Office	100 sq ft
Total GFA	18,920 sq ft
Capex Provided	93
WAREHOUSE 5	
Site Area	28,150 sq ft
Offices	650 sq ft
Warehouse	12,050 sq ft
Deck Office	100 sq ft
Total GFA	12,800 sq ft
Capex Provided	60
WAREHOUSE 6	
Site Area	37,371 sq ft
Offices	750 sq ft
Warehouse	22,480 sq ft
Deck Office	200 sq ft
Total GFA	23,340 sq ft
Capex Provided	106
WAREHOUSE 7	
Site Area	37,622 sq ft
Offices	750 sq ft
Warehouse	22,480 sq ft
Deck Office	200 sq ft
Total GFA	22,300 sq ft
Capex Provided	100
WAREHOUSE 8	
Site Area	48,112 sq ft
Offices	1,500 sq ft
Warehouse	200 sq ft
Deck Office	200 sq ft
Total GFA	28,690 sq ft
Capex Provided	190
WAREHOUSE 9	
Site Area	35,145 sq ft
Offices	750 sq ft
Warehouse	17,355 sq ft
Deck Office	100 sq ft
Total GFA	18,205 sq ft
Capex Provided	85
WAREHOUSE 10	
Site Area	33,332 sq ft
Offices	750 sq ft
Warehouse	17,450 sq ft
Deck Office	100 sq ft
Total GFA	18,300 sq ft
Capex Provided	87
WAREHOUSE 11	
Site Area	38,890 sq ft
Offices	750 sq ft
Warehouse	20,340 sq ft
Deck Office	100 sq ft
Total GFA	21,190 sq ft
Capex Provided	90



SBA 750, 650, 550, 450, 350, 250, 150, 100, 50, 25, 10, 5, 2.5, 1.25, 0.625, 0.3125, 0.15625, 0.078125, 0.0390625, 0.01953125, 0.009765625, 0.0048828125, 0.00244140625, 0.001220703125, 0.0006103515625, 0.00030517578125, 0.000152587890625, 0.0000762939453125, 0.00003814697265625, 0.000019073486328125, 0.0000095367431640625, 0.00000476837158203125, 0.000002384185791015625, 0.0000011920928955078125, 0.00000059604644775390625, 0.000000298023223876953125, 0.0000001490116119384765625, 0.00000007450580596923828125, 0.000000037252902984619140625, 0.0000000186264514923095703125, 0.00000000931322574615478515625, 0.000000004656612873077392578125, 0.0000000023283064365386962890625, 0.00000000116415321826934814453125, 0.000000000582076609134674072265625, 0.0000000002910383045673370361328125, 0.00000000014551915228366851806640625, 0.000000000072759576141834259033203125, 0.0000000000363797880709171295166015625, 0.00000000001818989403545856475830078125, 0.000000000009094947017729282379150390625, 0.0000000000045474735088646111895751953125, 0.00000000000227373675443230559478759765625, 0.000000000001136868377216152797393798828125, 0.0000000000005684341886080763986968994140625, 0.00000000000028421709430403819934844970703125, 0.000000000000142108547152019099674224853515625, 0.00000000000007105427357600954983711242677978125, 0.0000000000000355271367880047749185562133890625, 0.00000000000001776356839400238745927810669453125, 0.000000000000008881784197001193729639053347265625, 0.0000000000000044408920985005968648195266736328125, 0.0000000000000022204460492502984324097633368140625, 0.000000000000001110223024625149216204881668407

*Areas are measured to future Mamre Rd boundary in red
**All areas subject to survey




SSDA MOD 1
ESTATE MASTERPLAN
 DATE 11.07.22 SCALE 1:4000 @ A3
 DRAWN BY J.S. CHECKED BY J.S. DATE 20.08.22
 T

The graph shows a step-like function. The Y-axis is labeled 'K' and ranges from 0 to 200 with major ticks at 0, 40, 100, and 200. The X-axis ranges from 0 to 200 with major ticks at 0, 40, 100, and 200. The function starts at (0,0), increases to (40,40), then to (100,100), then to (140,140), and finally to (200,200). The function is constant at each step level for a period of time.

ASPECT INDUSTRIAL ESTATE
LOTS 54-58 (DP259135) MAMRE ROAD, KEMPS CREE

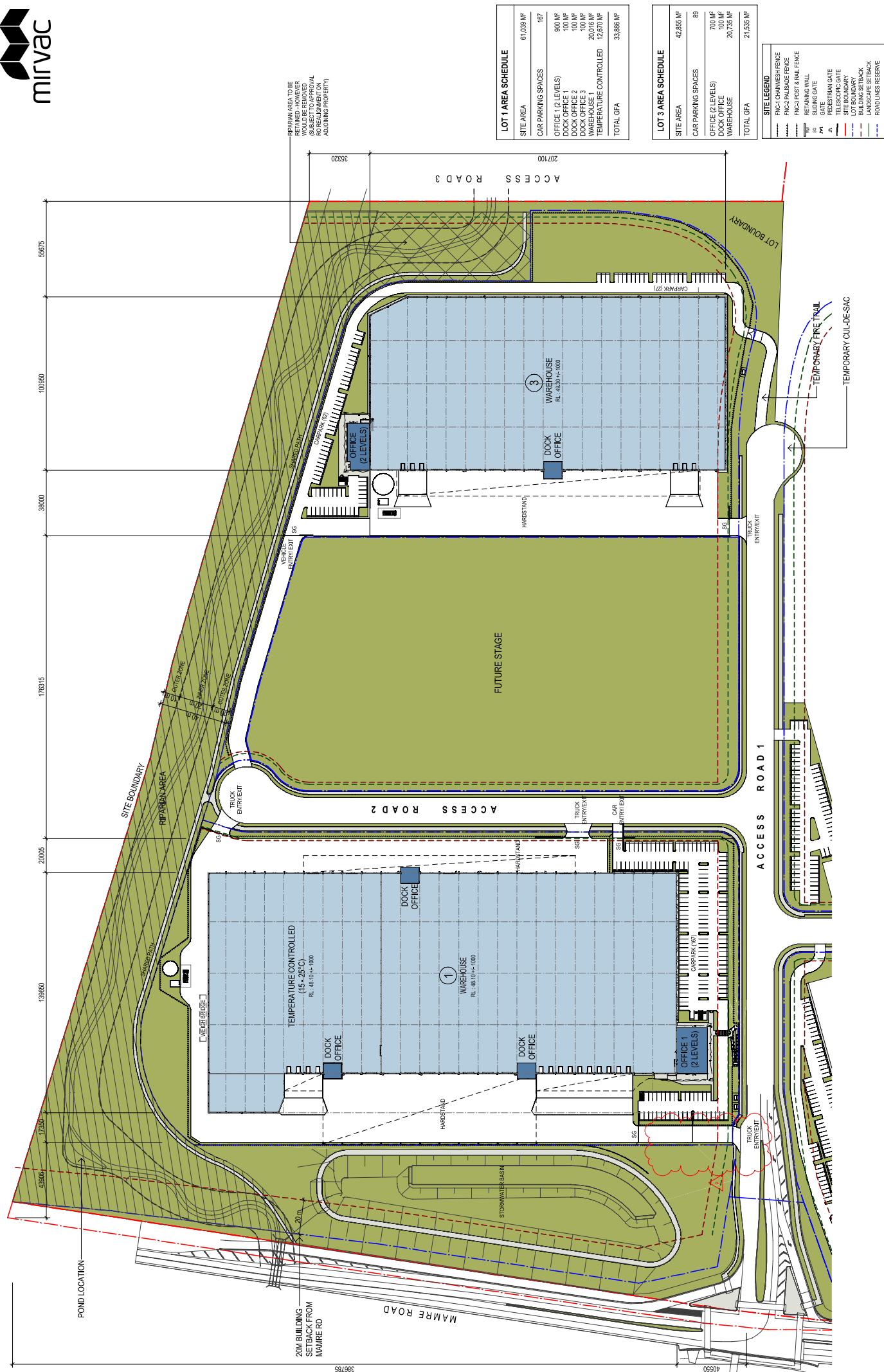
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LOT 1 AREA SCHEDULE		
SITE AREA	61,039 M ²	167
CAR PARKING SPACES		
OFFICE 1 (2 LEVELS)	900 M ²	
DOCK OFFICE 1	100 M ²	
DOCK OFFICE 2	100 M ²	
DOCK OFFICE 3	100 M ²	
WAREHOUSE 1	20,016 M ²	
TEMPERATURE CONTROLLED	12,670 M ²	
TOTAL GFA	33,886 M ²	

LOT 3 AREA SCHEDULE	
SITE AREA	42,855 M ²
CAR PARKING SPACES	89
OFFICE (2 LEVELS)	700 M ²
DOCK OFFICE	100 M ²
WAREHOUSE	20,735 M ²
TOTAL GFA	21,535 M ²

SITE LEGEND	
	FNC-1 CHAINMESH FENCE
	FNC-2 PALISADE FENCE
	FNC-3 POST & RAIL FENCE
	RETAINING WALL
	SLIDING GATE
	GATE
	PEDESTRIAN GATE
	TELESCOPIC GATE
	SITE BOUNDARY
	LOT BOUNDARY
	BUILDING SETBACK
	LANDSCAPE SETBACK
	ROAD LINES RESERVE

Attachment 3 – Road Safety Audit Report

**ROAD SAFETY AUDIT
AND
RISK ASSESSMENT REPORT
OF
POTENTIAL WEAVE MOVEMENT
IN
ASPECT ESTATE ROAD
ASSOCIATED WITH POTENTIAL FUTURE
TWO LANE RIGHT TURN FROM MAMRE
ROAD**

Ref. 22003rsa

3 February 2022

Prepared By



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APPENDICES

Appendix 1	Documents Used during the Audit
Appendix 2	Potential Ultimate Strategic Layout Plan (Beyond 2036) for Mamre Road /AIE Road Kemps Creek

1.0 INTRODUCTION

1.1 Background

Mirvac have previously lodged an SSD application for the Aspect Industrial Estate which is located adjacent Mamre Road at Kemps Creek. A modification (Modification 1) application has also been lodged for Aspect Industrial Estate.

As part of the application an interim widening scheme for Mamre Road together with traffic signals are proposed at the intersection of Mamre Road/Aspect Industrial Estate Road. These interim arrangements if approved will remain in place until future long term widening of Mamre Road is undertaken.

TfNSW has a long term proposal to widen Mamre Road at Kemps Creek including at the intersection of Aspect Industrial Estate Road. There is no timeframe for this widening at the current time. However, a future Concept 2036 Design has been prepared for the intersection based on traffic modelling.

The 2036 Concept Design of this intersection allows for three through lanes in Mamre Road together with left turn slip lanes, as well as a wider median and right turn bays in Mamre Road.

Aspect Industrial Estate Road will form part of the future cross junction intersection on the eastern side of Mamre Road, with a future leg on the western side of Mamre Road. The intersection will be signalised.

Traffic modelling undertaken for 2036 indicates that a single lane right turn lane/bay in the southern approach of Mamre Road would be sufficient to cater for the right turn volumes into Aspect Industrial Estate Road (north to east turn).

The opposing right turn in the northern approach of Mamre Road (i.e. south to west turn) into the western leg of the intersection will require 2 lanes (ie. two lane right turn) based on 2036 volumes and the modelling.

Although the 2036 modelling indicates that a single lane right turn (north to east) would provide adequate capacity, TfNSW in its assessment of Aspect Industrial Estate has noted that for the 2036 Concept Design, space will be provided in the median for a possible dual right turn into Aspect Industrial Estate (AIE) Road (ie. north to east right turn). TfNSW have indicated that the design of Aspect Industrial Estate Road including the location of driveways should not preclude the possibility of providing a dual lane right into Aspect Industrial Estate (AIE) Road in the future. AIE Road will be wide enough to accommodate two departure lanes at the intersection, if required.

Under Modification 1 for Aspect Industrial Estate, Warehouse 1 will have a truck entry driveway on the northern side of the AIE Road which is located 83 metres from Mamre Road (as measured from the stop line in Estate Road).

This driveway is left turn in only and is provided with a left turn deceleration lane, which is 47 metres long.

TfNSW have raised the issue of a potential weave conflict with trucks accessing this driveway, if a dual lane right turn from Mamre Road is introduced. This potential conflict would only occur if the trucks entering Warehouse 1 turned right from the right turn lane closest to the median and then needed to change lanes to enter the truck driveway.

1.2 Scope of the Audit

The report details the results on a Road Safety Audit and Risk Assessment for the potential weave movement in the AIE Road by trucks which have turned right from Mamre Road under a potential future dual two lane right turn arrangement (north to east) at the Mamre Road intersection and who wish to enter the truck driveway for Warehouse 1.

This weave movement would only occur if the trucks turned right from the right turn lane closest to the median.

A Road Safety Audit is a formal assessment of the potential road safety risks associated with a new project or road improvement project conducted by an independent qualified audit team.

The audit/risk assessment has been carried out following the procedures set out in Austroads Guides to Road Safety – Part 6: Managing Road Safety Audits and Part 6A: Implementing Road Safety Audits with reference to AS/NZS 4360:2004 for Risk Management.

Transport and Urban Planning Pty Ltd was engaged by Mark Marsic – Principal Designer – Infrastructure and Industrial for Orion Consulting on behalf of Mirvac.

The audit/risk assessment commenced with an email briefing with Mark Marsic of Orion Consulting.

The plans and other information were audited between 28 January and 2 February 2022 with the audit/risk assessment report prepared concurrently.

1.3 Audit Team

Terry Lawrence Director
Accredited Level 3 Road Safety Auditor (Audit Leader)
Auditor ID: RSA-02-0002

Lisa Tulau Design Manager
Accredited Level 3 Road Safety Auditor
Auditor ID: RSA-02-0443

1.4 Audited Documentation

The following information was examined as part of the audit/risk assessment.

- A plan showing the Potential Ultimate Strategic Layout beyond 2036 with a dual right turn (north to east) in AIE Road, as well as the deceleration lane and the truck driveway for Warehouse 1, as per the Modification 1 proposal;
- Estimated future 2036 right turn volumes into AIE Road (north to east) for the AM, PM peak hours for Modification 1; and
- Estimated future 2036 truck volumes turning right into AIE Road and turning left into the driveway of Warehouse 1 for the AM, and PM peak hours for Modification 1.

Appendix 1 shows the other documents referenced during the audit.

2.0 FUTURE POTENTIAL 2036 RIGHT TURN TRAFFIC VOLUMES WITH MODIFICATION 1 ENTERING AIE ROAD IN AM AND PM PEAK HOURS FROM NORTH TO EAST TURN IN MAMRE ROAD

Ason Group provided traffic volumes for 2036 with Modification 1 forecasted to use the Mamre Road/AIE Road intersection, as well as the traffic volumes generated by Warehouse 1, including the number of heavy vehicles that will use the driveway.

These volumes were extracted from the Aimsun model which informed the DCP and are based on TfNSW trip rates for industrial uses in the AM and PM peak hours.

Total Right Turn Volumes in 2036 for North to East Turn

The total volume in 2036 estimated to turn right from Mamre Road into AIE Road (north to east turn) are;

- 16 vph in the AM peak hour; and
- 37 vph in the PM peak hour.

Based on 120 second cycle length for the intersection (i.e 30 cycles per hour), these volumes are the equivalent of;

- less than one right turn vehicle per cycle in the AM peak hour; and
- 1-2 right turn vehicles per cycle in the PM peak hour.

Trucks Entering Warehouse 1 From North to East Right Turn

The number of trucks that will enter Warehouse 1 from the north to east right turn will be 4 trucks per hour in the AM and PM peak hour.

3.0 CONSIDERATIONS FOR AUDIT/RISK ASSESSMENT

3.1 Future Potential Geometry and Traffic Management

The AIE Road will be designed and constructed to accommodate a future dual lane right turn from Mamre Road (north to east).

The Potential Ultimate Strategic Intersection Layout (beyond 2036) shows that two lanes travelling eastbound in the AIE Road can be accommodated east of the truck entry driveway to Warehouse 1, eliminating the need to merge before the truck entry driveway.

3.2 Location of Entry Driveway to Warehouse 1

The Ultimate Strategic Intersection Layout Plan (beyond 2036) shows the location of the truck entry driveway to Warehouse 1, which is located 83 metres east of the stop line.

A deceleration lane 47 metres long for the driveway is proposed with a 36 metre length (equivalent of 4 seconds of travel time at 30km/h) for observation.

As the dual right turn will be under full traffic signal control (ie no filtering) and right turn vehicles will start from a stationery position (ie zero speed) when the green arrow is introduced, the lengths for observation and deceleration meet Austroads Guidelines.

3.3 Truck Volumes Entering Warehouse 1 From North to East Right Turn

As noted in Section 2, four (4) trucks per hour will turn right from Mamre Road (north to east turn) and enter Warehouse 1 in the AM and PM peak hours. This is the equivalent of one truck every 15 minutes.

The total right turn vehicles (north to east) including the estimated 4 trucks entering Warehouse 1, will number;

- 16 vehicles per hour in the AM peak hour; and
- 37 vehicles per hour in the PM peak hour.

3.4 Need for Future Two Lane Right Turn North to East

As noted in Section 1.1, the 2036 traffic volumes and traffic modelling indicates that a single right turn lane (north to east) would provide adequate capacity for the right turn and a satisfactory level of service at the intersection.

Therefore, based on the current DCP Planning and Modification 1 Application for Aspect Industrial Estate, a two lane right turn (north to east) is not required and is a hypothetical scenario. The timeframe of post 2036, reinforces this conclusion.

The current proposal is for a single lane right turn (north to east) which will be sufficient to 2036 and beyond, based on the current DCP Planning and Modification 1 Application for Aspect Industrial Estate. There is no potential weave conflict associated with the truck entry driveway to Warehouse 1, for the current proposal.

3.5 Truck Driver Induction

Mirvac, who are the developers and the owners of Aspect Industrial Estate have advised that all truck drivers associated with the estate will be inducted with a safety program and code of conduct which will be updated as required.

As part of the risk management plan/strategy for Warehouse 1, in the event that a two lane right turn (north to east) is introduced into AIE Road, the truck drivers will be advised/instructed to use the second right turn lane and not the median right turn lane when turning right from Mamre Road.

This will reinforce the normal truck practice/protocols and reduce the risk of any potential weave movements occurring for trucks entering Warehouse 1.

3.6 Normal Driver Practice/Protocol

Normal driver practice for truck drivers is that on multi lane roads trucks typically use the left lane where they can.

This also occurs where two lanes are turning to and from a road. For two lane right turns, trucks would normally use the second or left side right turn lane, unless they intended to turn right immediately after they have turned into the side road, or the left lane in the side road ended a short distance from the intersection.

It would be expected that all truck drivers that wanted to enter Warehouse 1 would use the left right turn lane from Mamre Road, as a matter of course thereby avoiding the need to undertake a weave movement to enter the truck entry driveway to Warehouse 1.

As all truck drivers using Warehouse 1 will be inducted and advised to use the left right turn lane in Mamre Road as part of Mirvac's risk management plan/strategy, this should eliminate any potential weave movements.

3.7 Risk Associated with Potential Weave Movements for Trucks Entering Warehouse 1 from North to East Right Turn

As noted in Section 3.4, the number of trucks expected to enter Warehouse 1 from the north to east turn is estimated at 4 vehicles per hour in the AM and PM peaks. Based on the proposed driver training induction course, it could be concluded that there will be none and/or minimal potential weave movements associated with a potential future two lane right turn north to east.

In the event that the occasional driver does turn right from the median lane then based on the total volume of right turn vehicles (less than 1 vehicle per traffic signal cycle in the AM peak hour and 1-2 vehicles per traffic signal cycle in the PM peak hour) the potential associated weave movement is considered to be a very low risk. Given that it is a hypothetical situation, which may never occur, it is considered that it represents minimal risks in terms of road safety.

4.0 FORMAL STATEMENT

We have examined the plans and other information as detailed in Section 1.4 and we have audited this information to evaluate the potential road safety risk associated with a potential weave movement by trucks entering Warehouse 1, if a dual lane right turn is introduced in Mamre Road for the north to east right turn into AIE Road.

The auditors note that the introduction of a dual lane right turn (north to east) is a hypothetical situation as the current planning, traffic modelling for 2036 and Modification 1 application only require a single lane right turn, north to east.

In the event that a dual lane right turn north to east is introduced, the auditors consider that based on Mirvac's driver induction/training program for truck drivers using the estate, as well as the volume of trucks entering Warehouse 1 from the north to east right turn, together with the low total volume of right turn vehicles (north to east), then the road safety risk from any potential weave movements is very low.



.....
Terry Lawrence
Lead Road Safety Auditor (Audit Leader)



Road Safety Auditor

3 February 2022

APPENDIX 1

Documents Used During the Audit

- Austroads Guide to Road Safety: Part 1: Road Safety Overview, Part 6: Managing Road Safety Audits and Part 6A: Implementing Road Safety Audits.
- Austroads Guide to Road Design
- RMS Supplements to Austroads Guide to Road Design
- AS/NZS 4360: 2004 Risk Management and HB436: 2004 Risk Management Guidelines

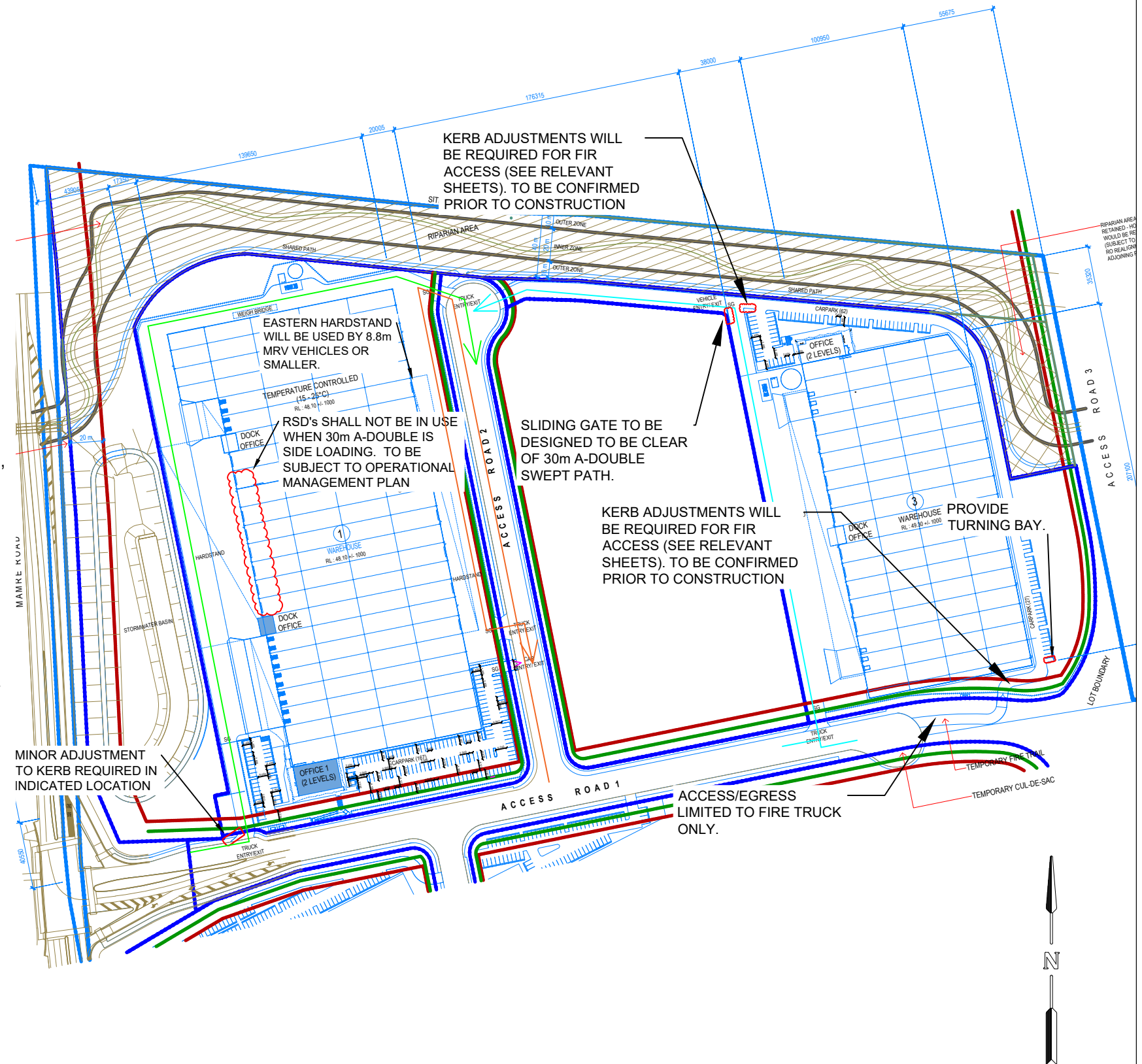
APPENDIX 2

Potential Ultimate Strategic Layout Plan (Beyond 2036) for Mamre Road /AIE Road Kemps Creek

Attachment 4 – Swept Path Analysis

NOTES:

- ACCESS DOES NOT CATER FOR SIMULATENOUS ENTRY & EXIT WITH A 30m A-DOUBLE, OR FACILITATE 36.5m PBS LEVEL 3 ACCESS.
 - REFER TO IMAGE FOR ASSUMED CIRCULATION
 - 30m A-DOUBLE TRUCKS CAN SIDE LOAD INTO WAREHOUSE 1. REFER TO AG02 FOR FURTHER DETAILS. SOME RSDs SHALL NOT BE IN USE WHEN 30.0m A-DOUBLE TRUCKS ARE SIDE LOADING.
- THE EASTERN HARDSTAND OF WAREHOUSE 1 IS TO FACILITATE RSD LOADING OF 8.8m MRVs. REFER TO AG05 FOR FURTHER DETAILS.
 - FIRE TRUCKS WILL BE ABLE TO TURN AROUND WAREHOUSE 1 AND 3 IN BOTH A CLOCKWISE AND COUNTER CLOCKWISE DIRECTION. KERB AND BOUNDARY ADJUSTMENTS MENTIONED IN AG09 HAVE BEEN INDICATED TO PROVIDE EMERGENCY VEHICLE (HRV) ACCESS AND EGRESS TO WAREHOUSE 3.
 - TO FACILITATE FUTURE (ULTIMATE) ACCESS ROAD 1 FIRE TRUCK MOVEMENTS, MINOR KERB AND MEDIAN (INDICATED IN PREVIOUS PLANS) ADJUSTMENTS ARE RECOMMENDED. REFER TO AG10 FOR MORE DETAIL.
 - THE CLASS OF CAR PARKING SPACES ACHIEVES GREATER THAN THE MINIMUM USER CLASS 1A AS REQUIREMENTS. TURNING BAYS ARE REQUIRED IN DEAD-END PARKING MODULES > 15m (~6 SPACE) IN LENGTH, AT THE INDICATED LOCATIONS ON THIS PAGE.
 - USER CLASS 1A PARKING SPACES ARE TO HAVE A MINIMUM WIDTH OF 2.4M AND LENGTH OF 5,4m, WITH A MINIMUM AISLE OF 5.8m (EXCLUDES REQUIRED CLEARANCES).
 - FIRE TRUCK STANDING AREA NEED FURTHER CONSIDERATION DURING DETAILED DESIGN PHASE TO DETAIL OUTLET CONNECTION. IT IS UNDERSTOOD THAT THE CONNECTION MUST BE ORIENTED SUCH THAT A MAXIMUM OF A 45 DEGREE CONNECTION IS MADE TO THE REAR OF THE TRUCK. FURTHER DETAIL SHOULD BE CONFIRMED WITH RELEVANT FIRE CONSULTANT.
 - STAGE 1 HAS BEEN REVIEWED IN DETAIL. THE MASTERPLAN, EXCEPT FOR WAREHOUSE 2, HAS NOT BEEN MODIFIED AND HAS THEREFORE NOT FORMED PART OF THIS REVIEW. HEAVY VEHICLE ACCESS FOR WAREHOUSE 2 IS SHOWN ON AG014 AND AG015. THE DETAILED DESIGN IS TO BE CONSIDERED AT THE RELEVANT FUTURE APPLICATION STAGE.



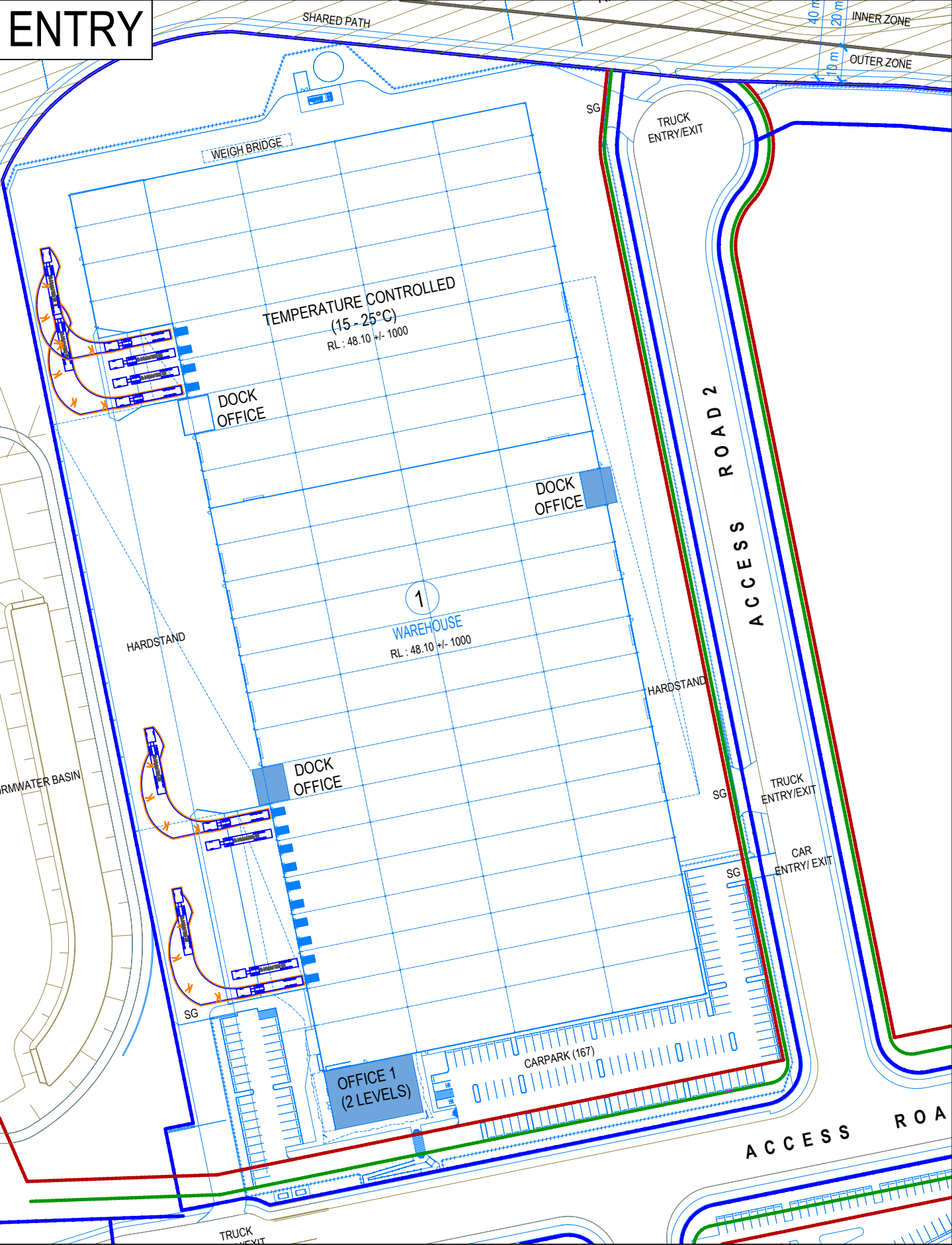
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Swept path assessments completed at 10 km/h and 300mm clearance.

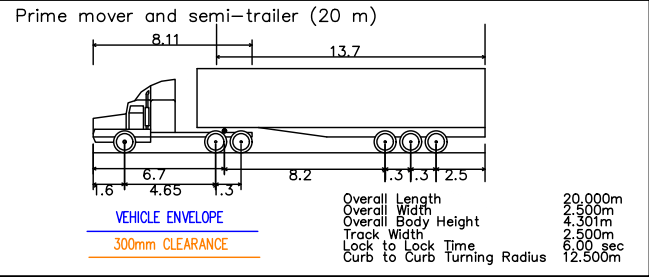
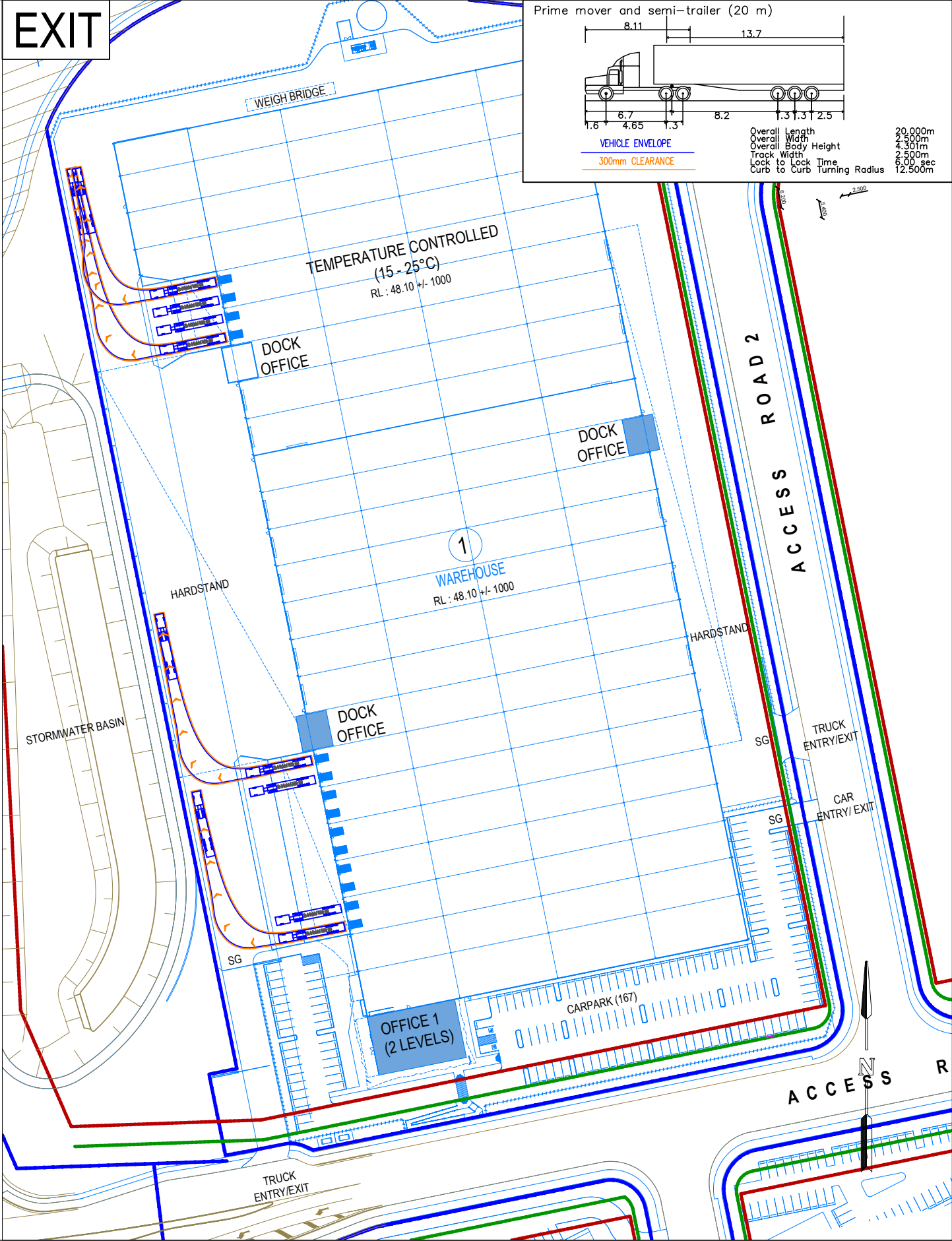
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ENTRY



EXIT



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PROJECT
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Lots 54-58 Mamre Road, Kemps Creek

DOCUMENT INFORMATION

STAGE 1 SWEEP PATH ASSESSMENT

WAREHOUSE 1 20m AV TRUCK

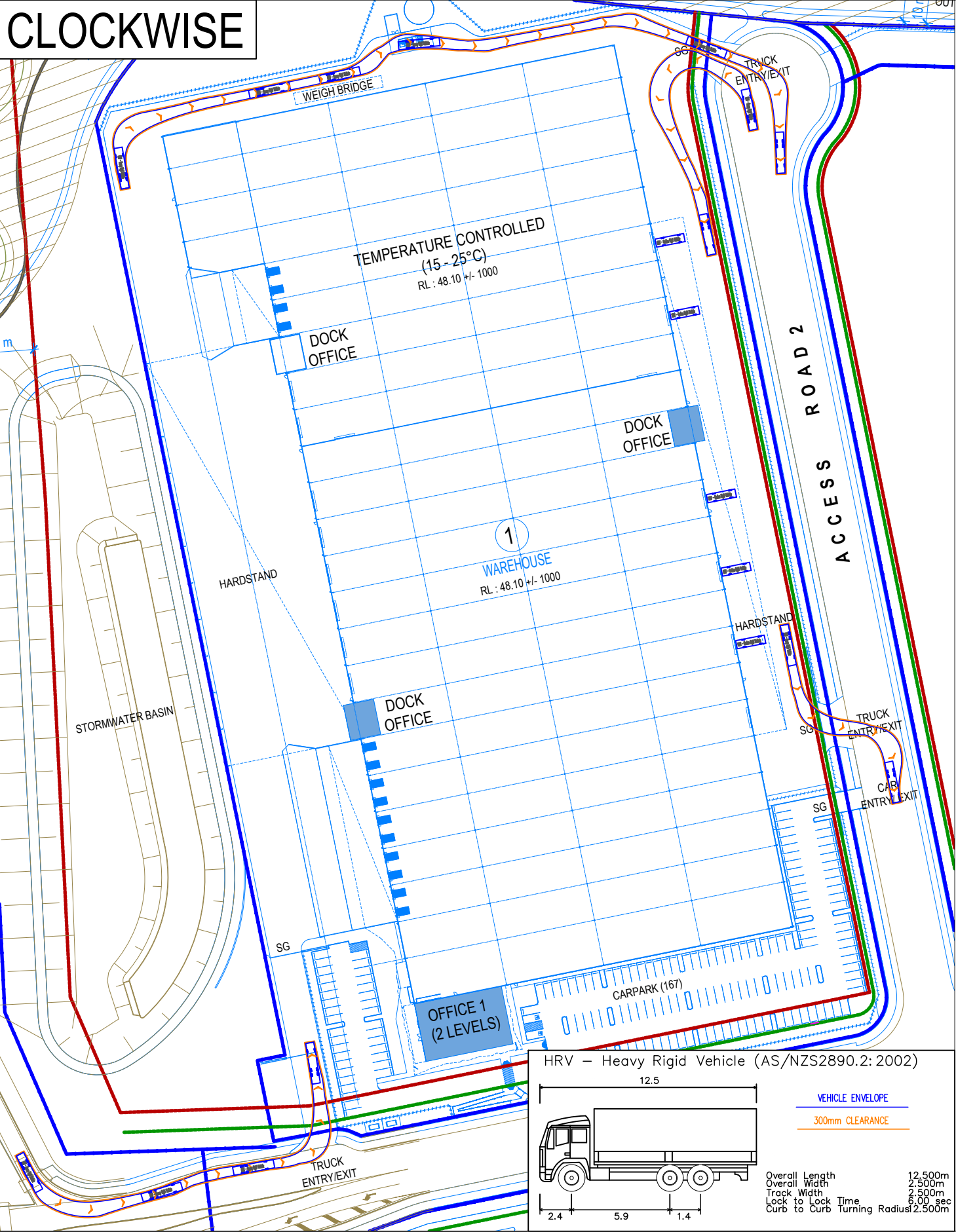
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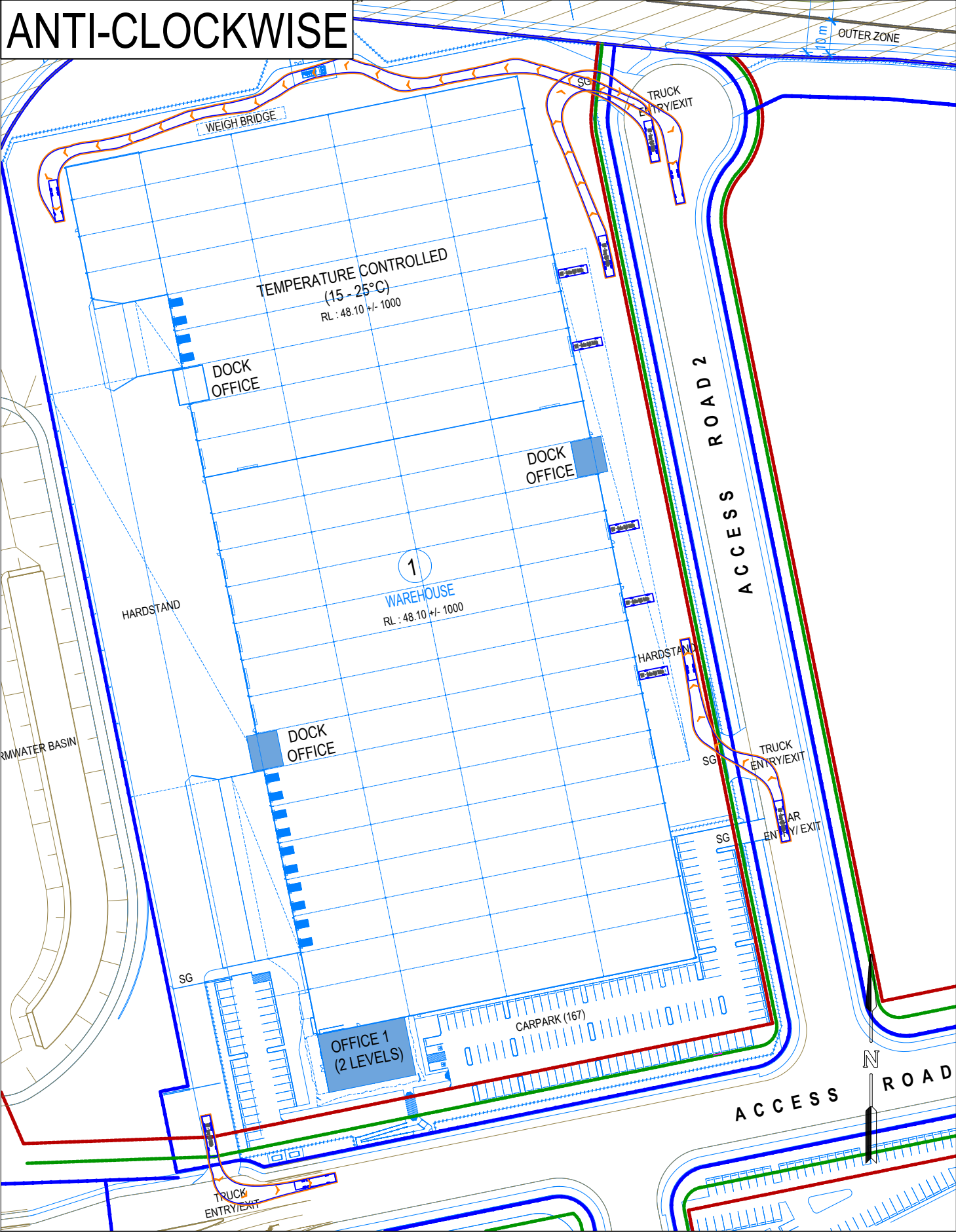
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Mirvac

PROJECT

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Lots 54-58 Mamre Road, Kemps Creek

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12.5m HRV FIRE TRUCK

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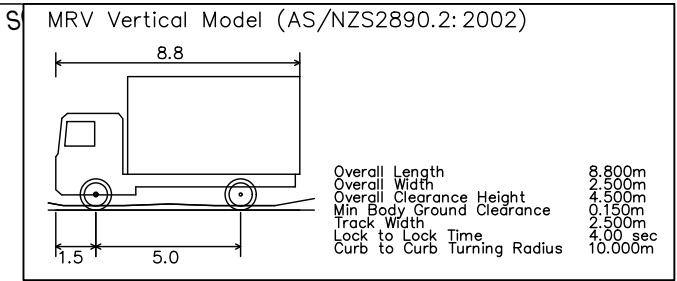
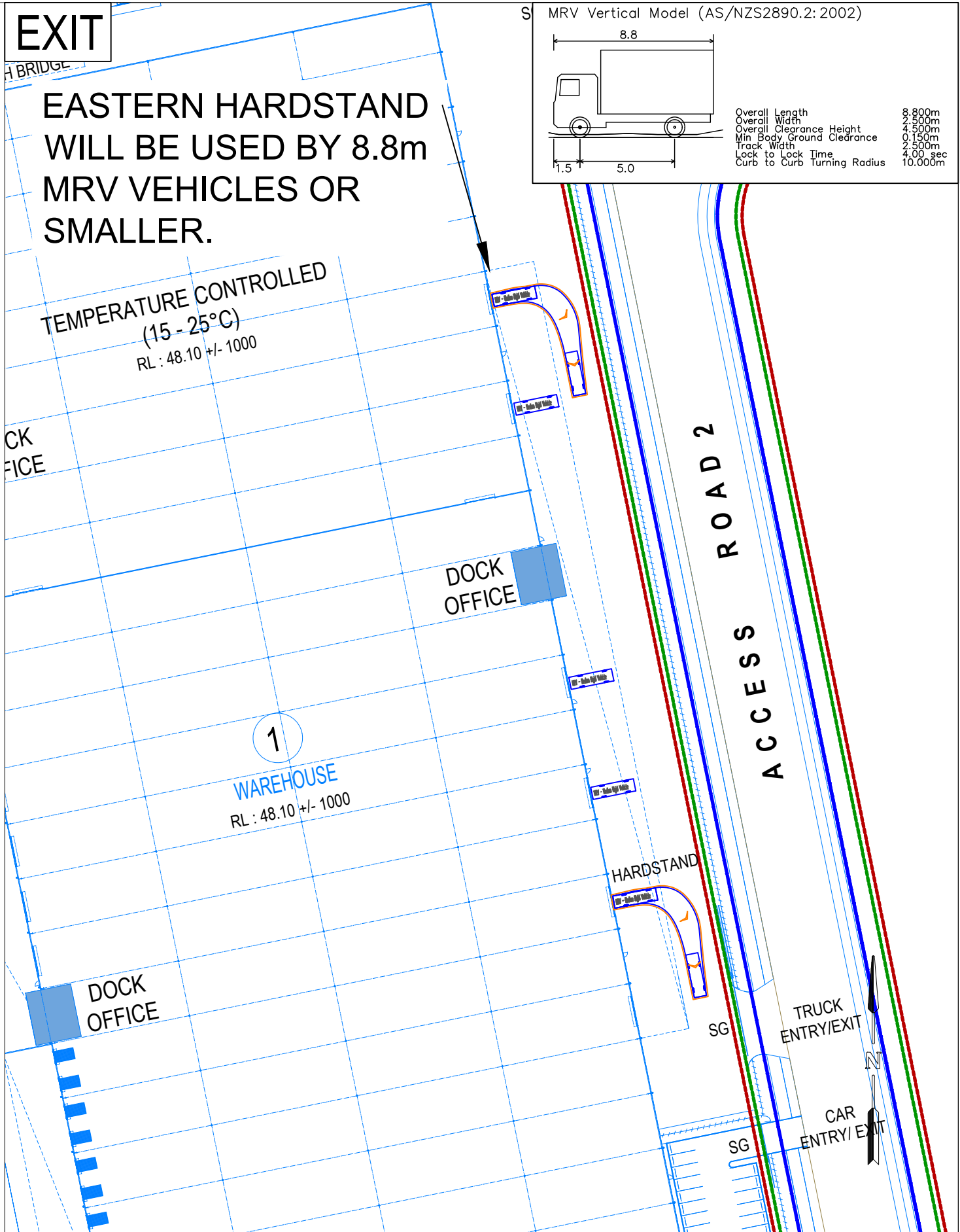
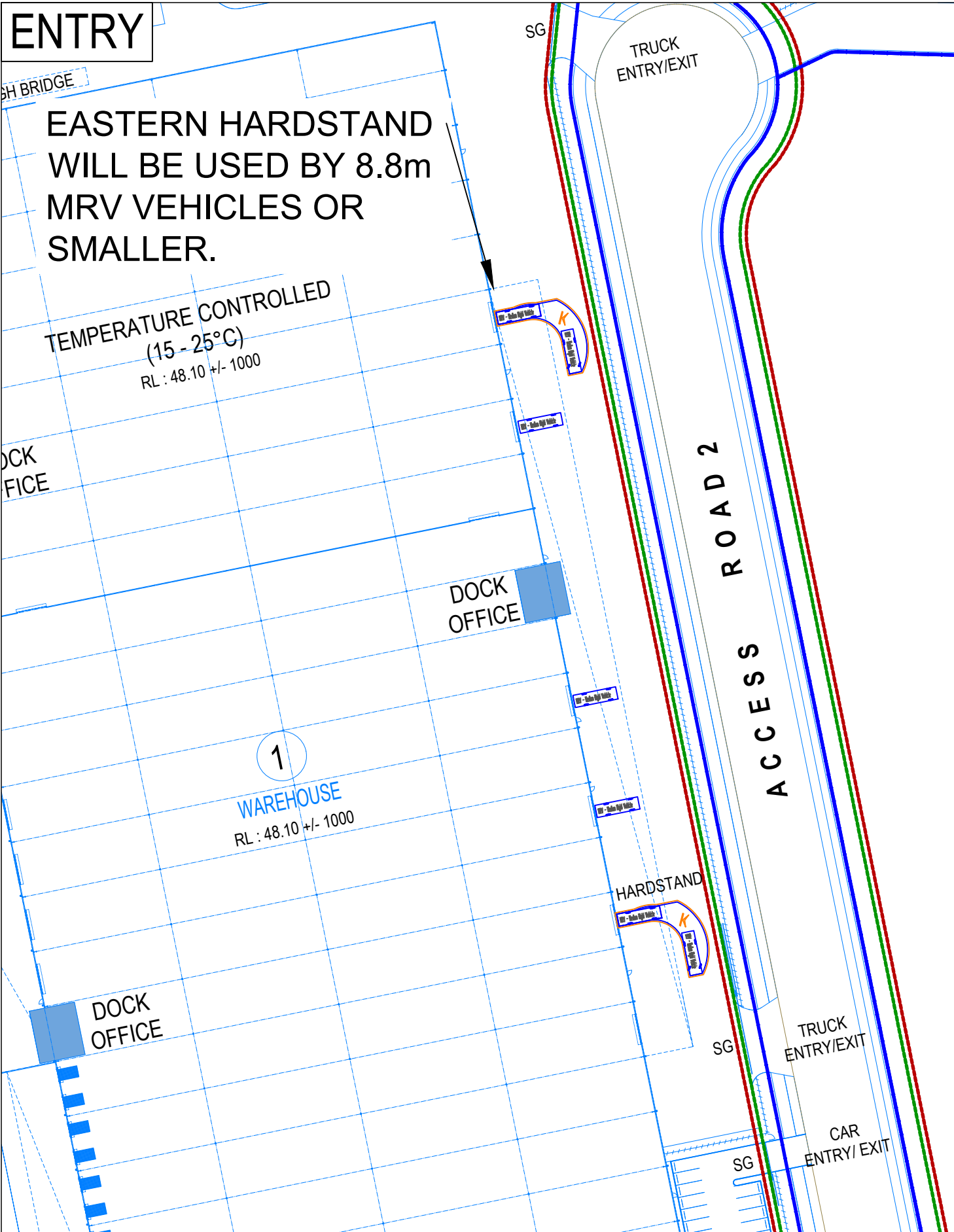
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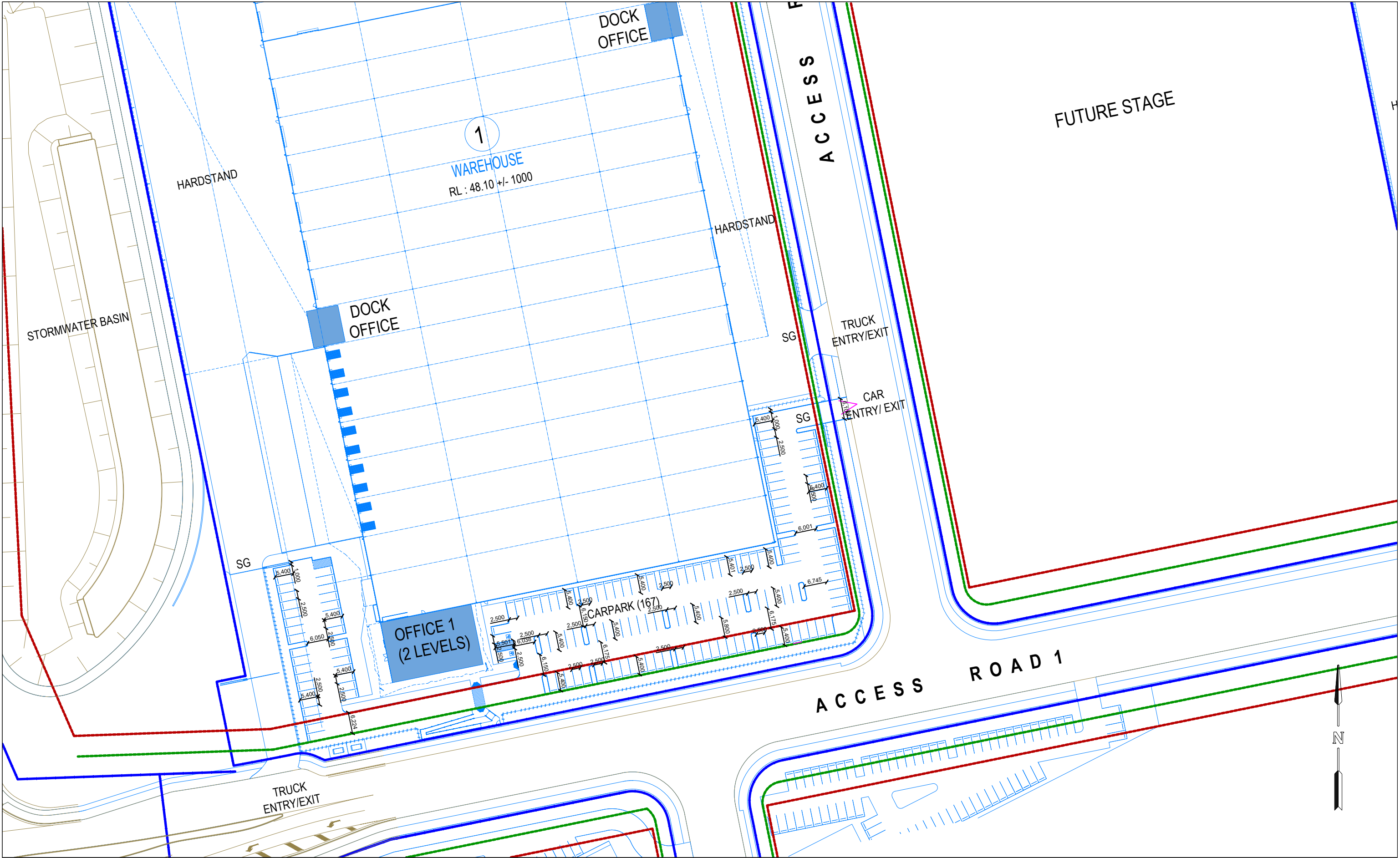
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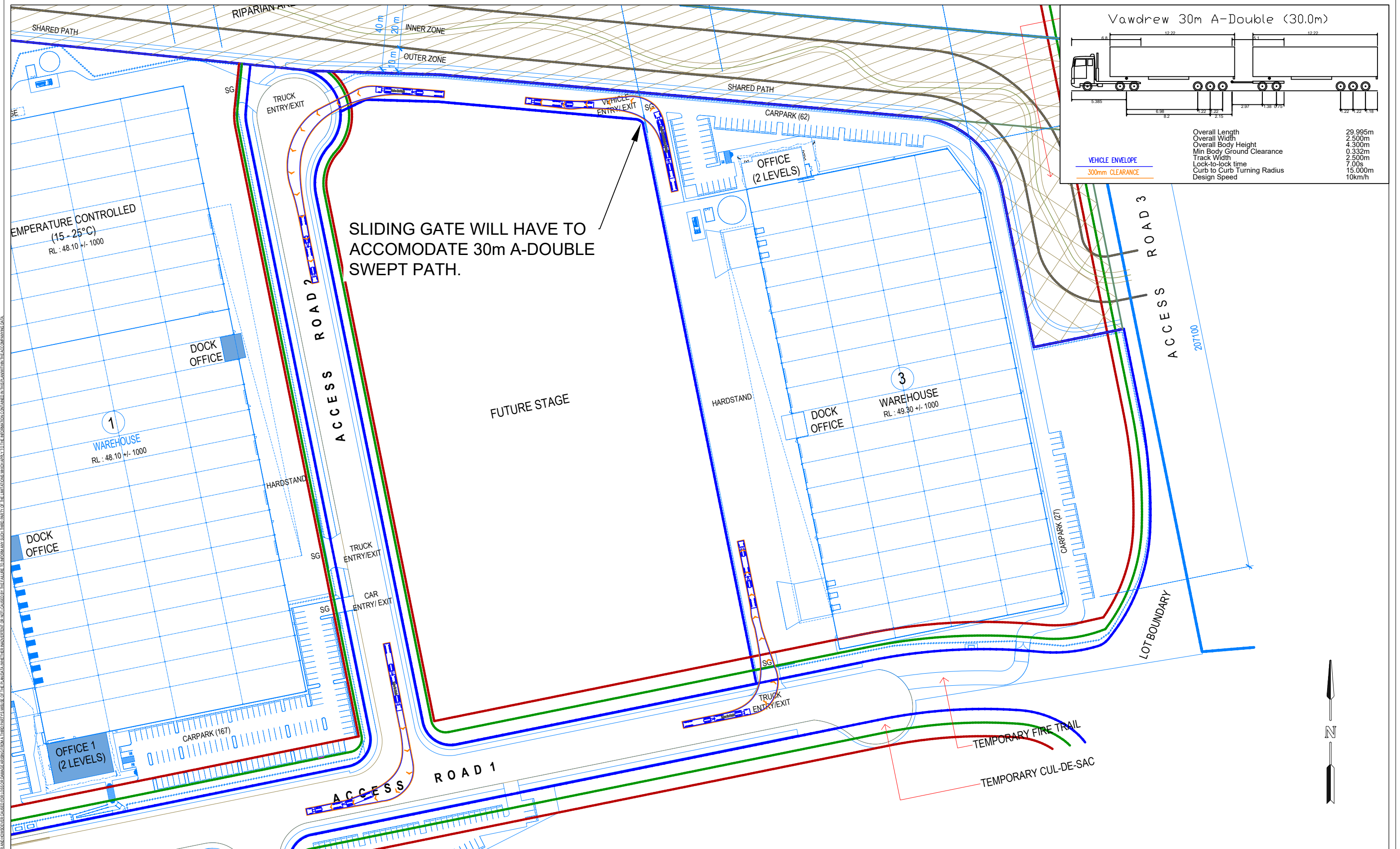


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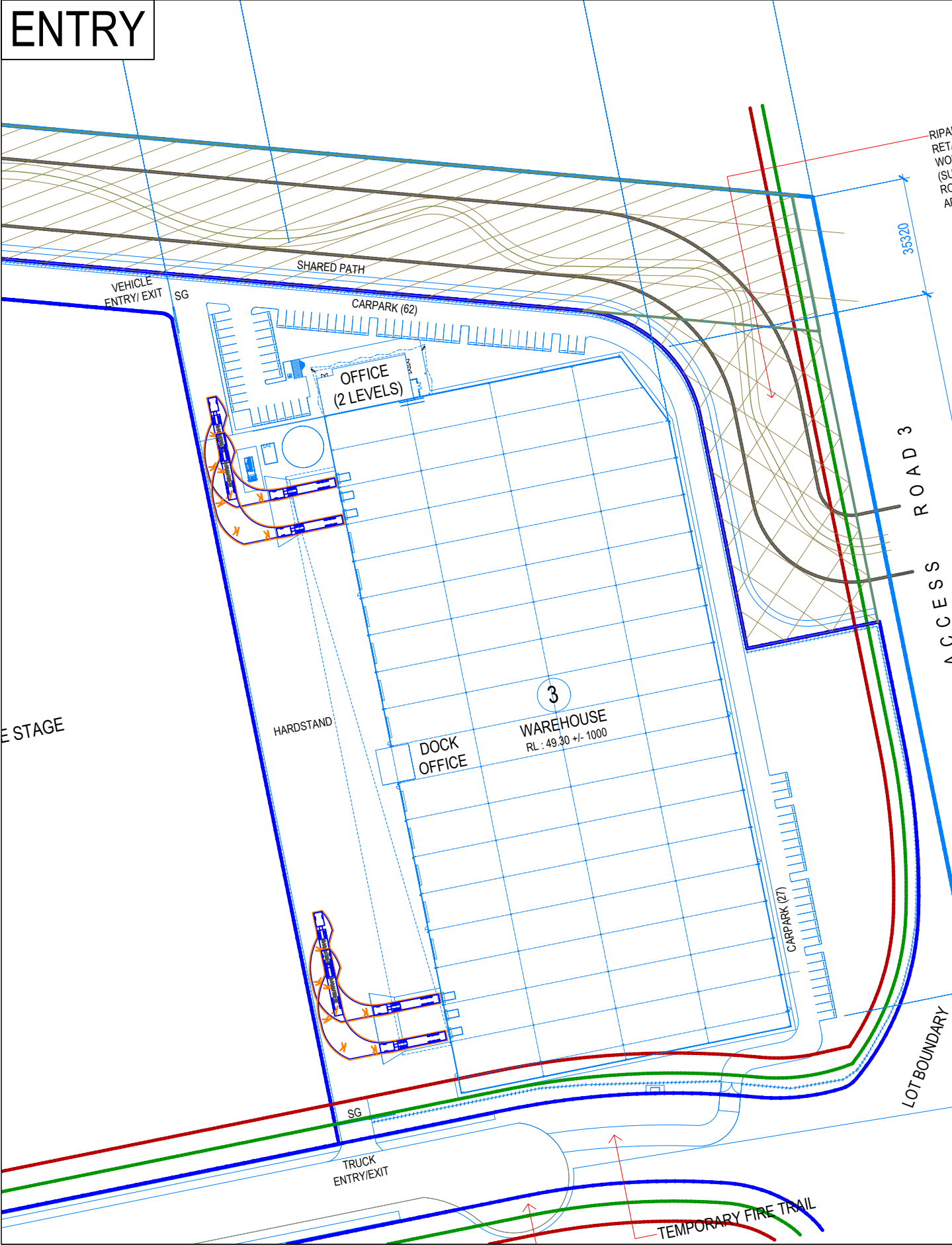
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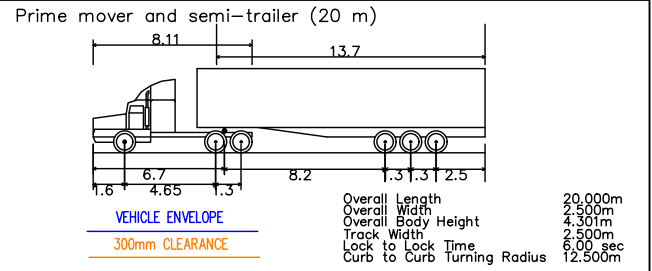
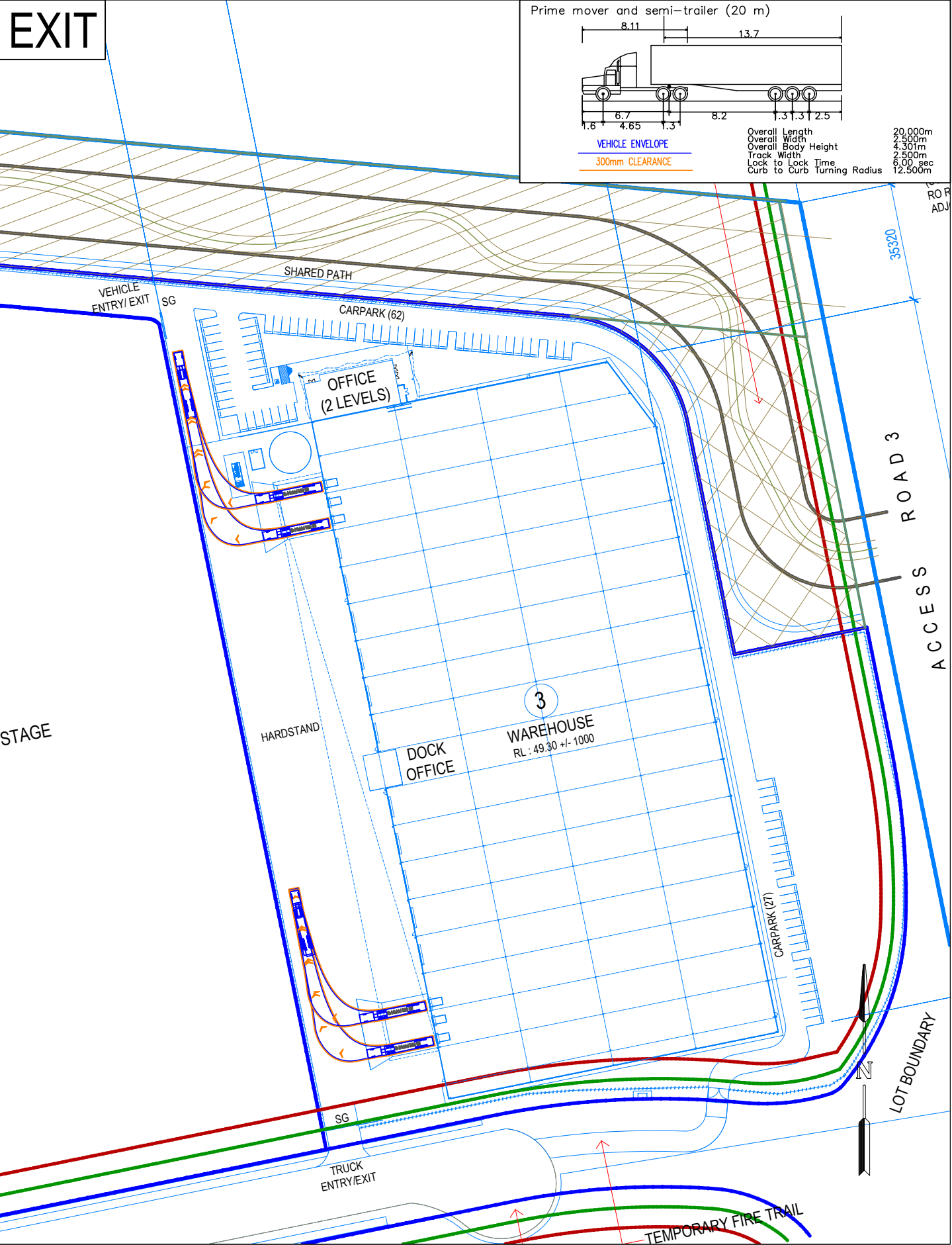


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ENTRY



EXIT



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A3

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PROJECT

1897

Lots 54-58 Mamre Road, Kemps Creek

DOCUMENT INFORMATION

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20m AV TRUCK

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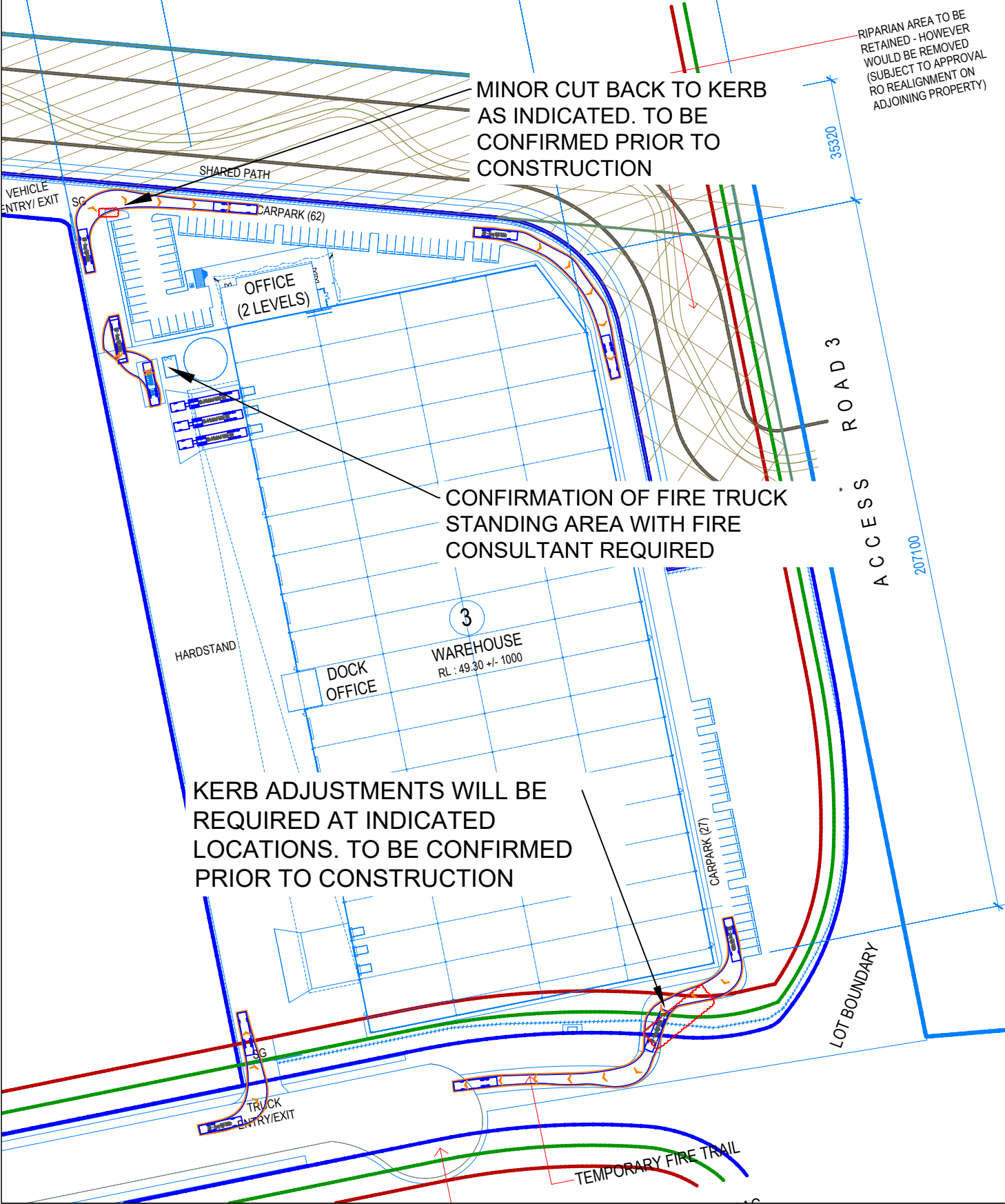
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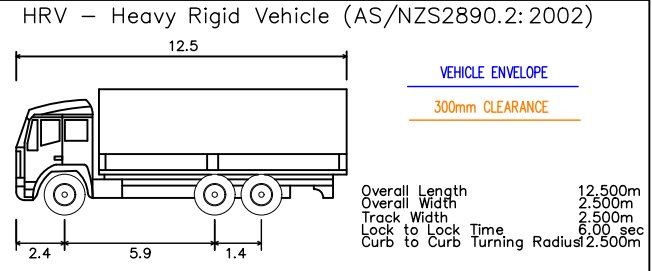
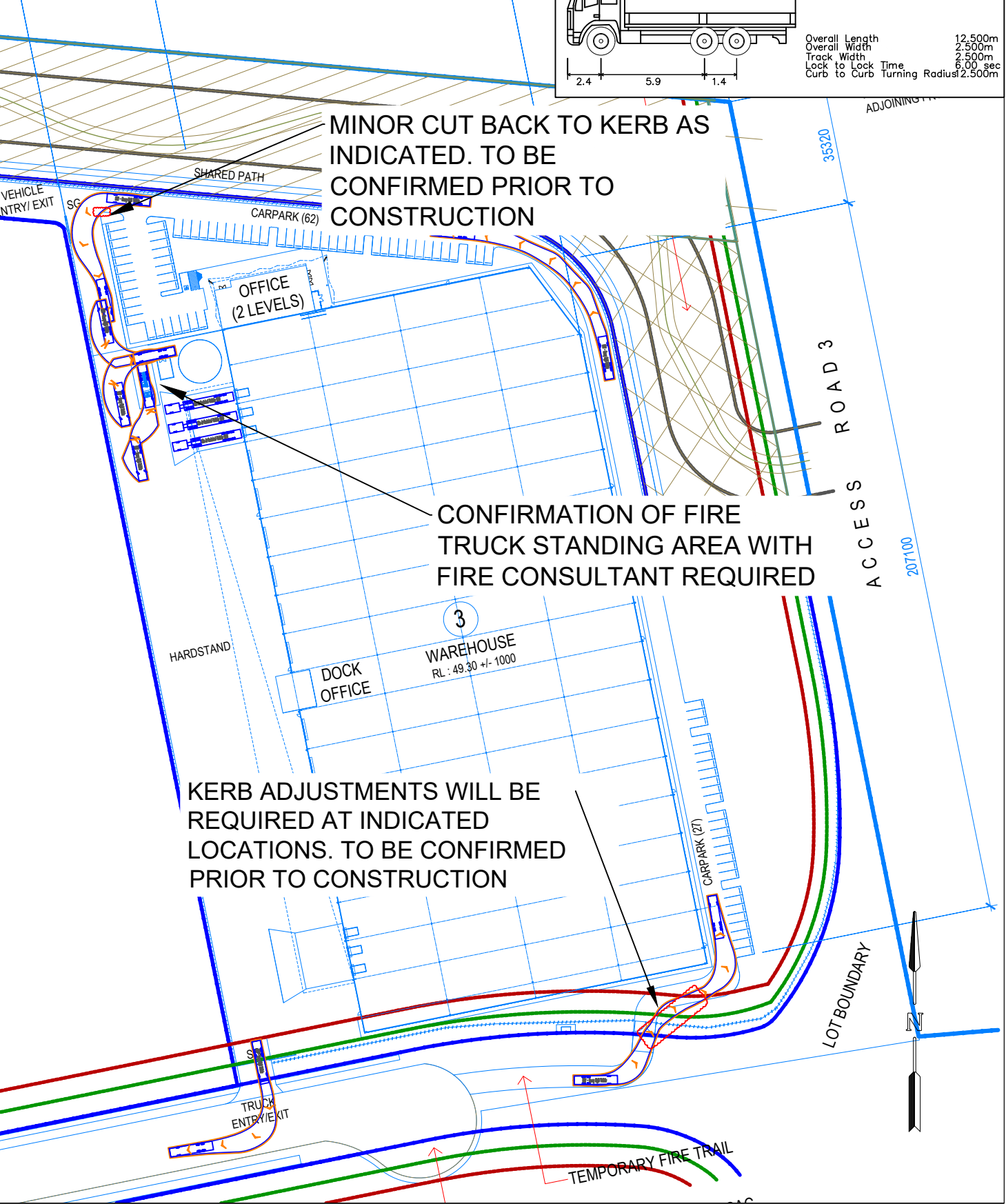
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PROJECT

1897

Lots 54-58 Mamre Road, Kemps Creek

DOCUMENT INFORMATION

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12.5m HRV FIRE TRUCK

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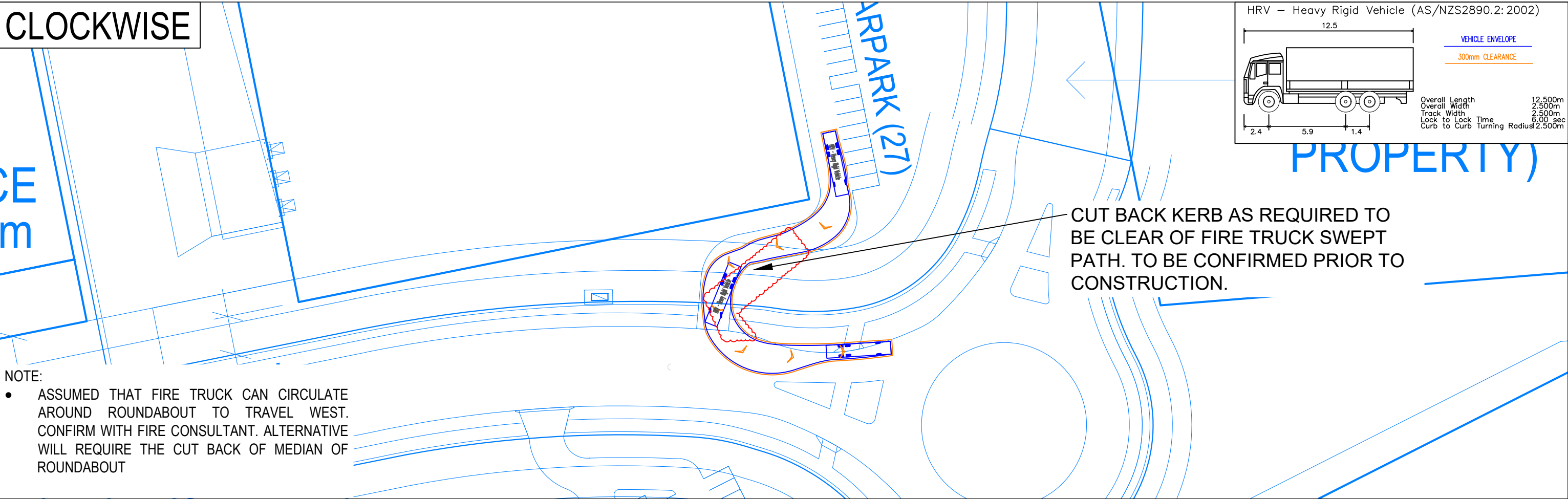
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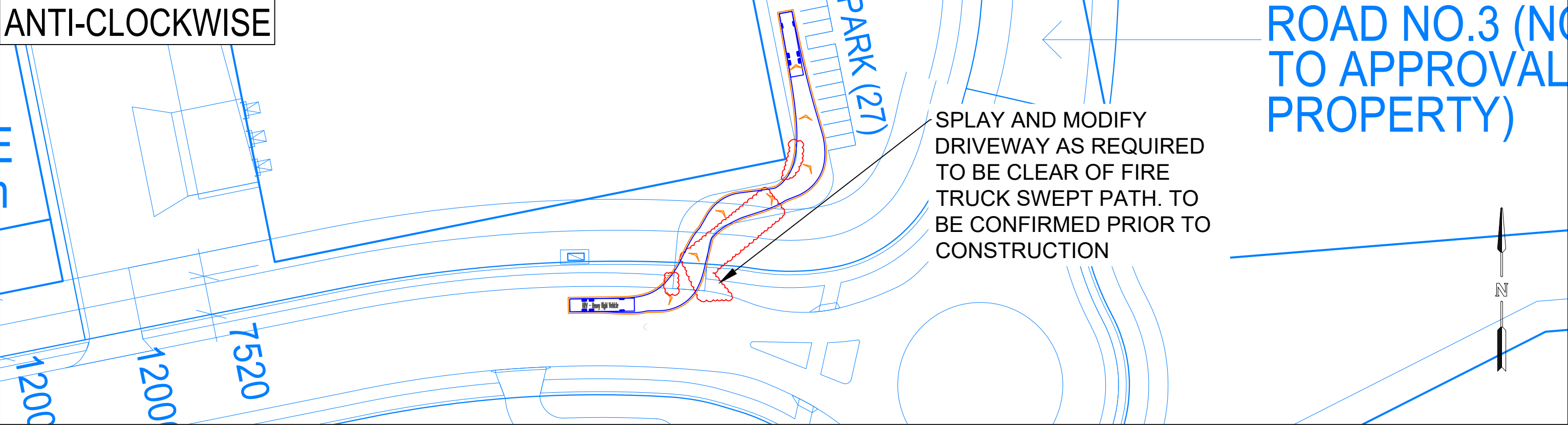
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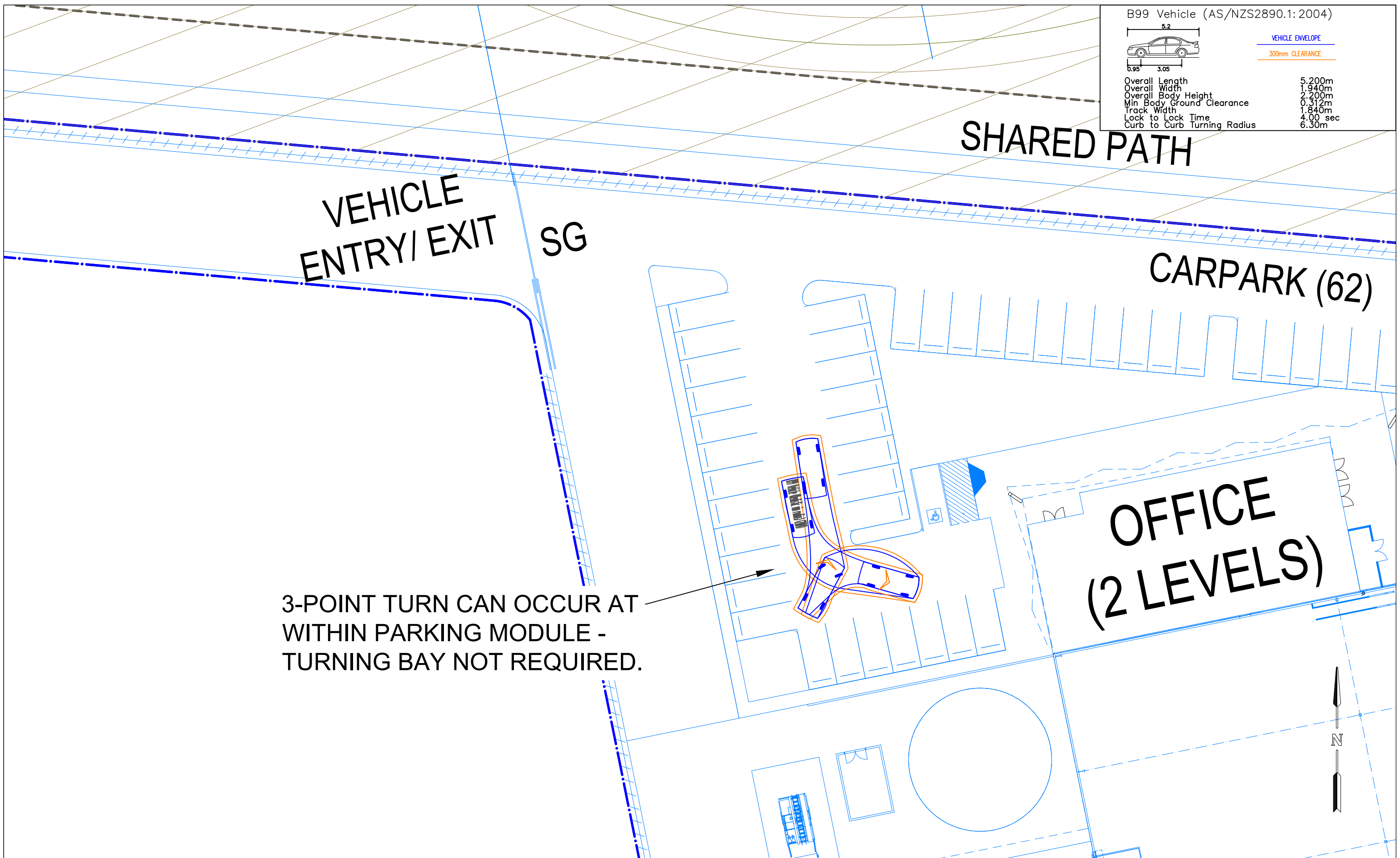


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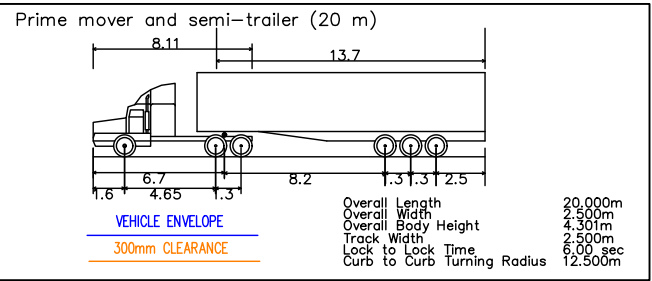
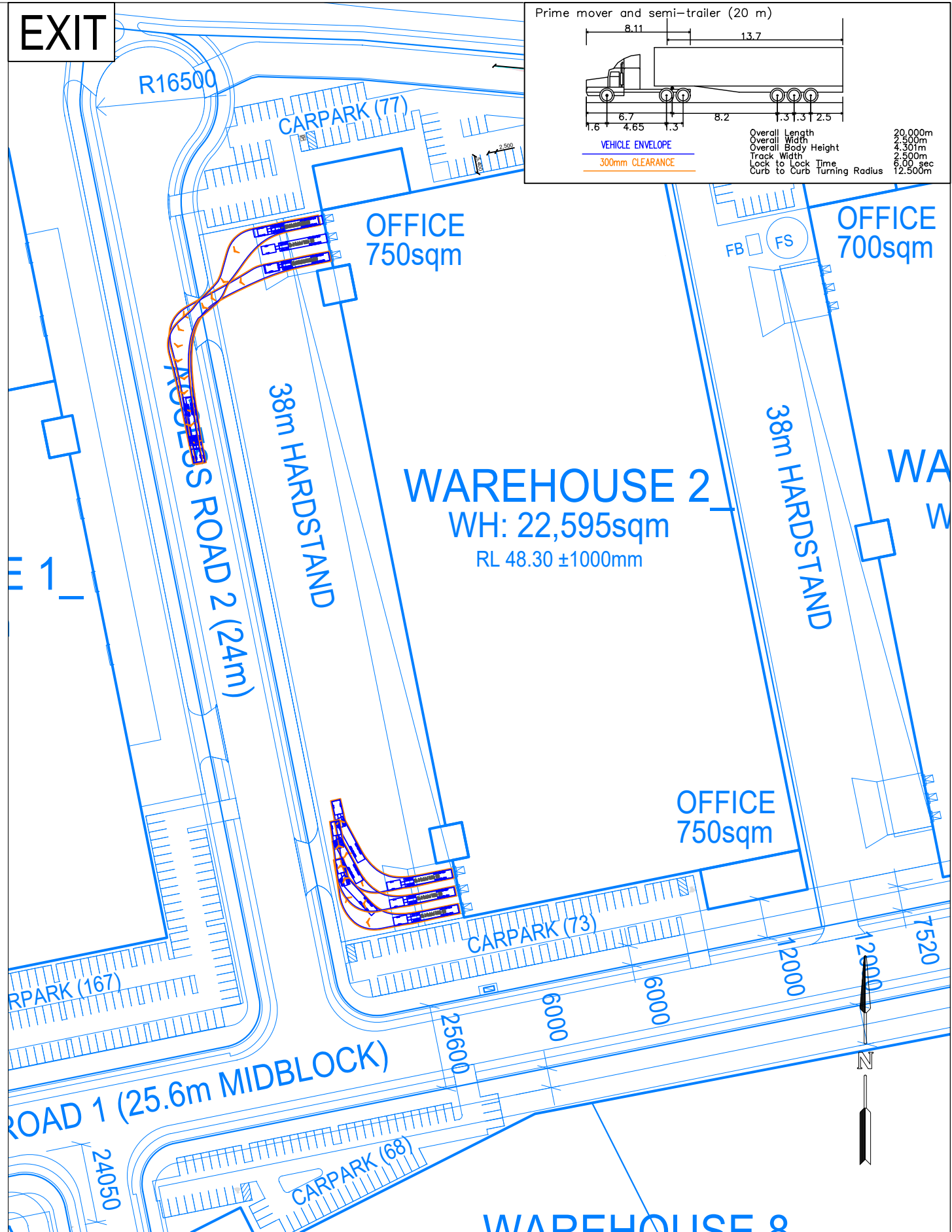
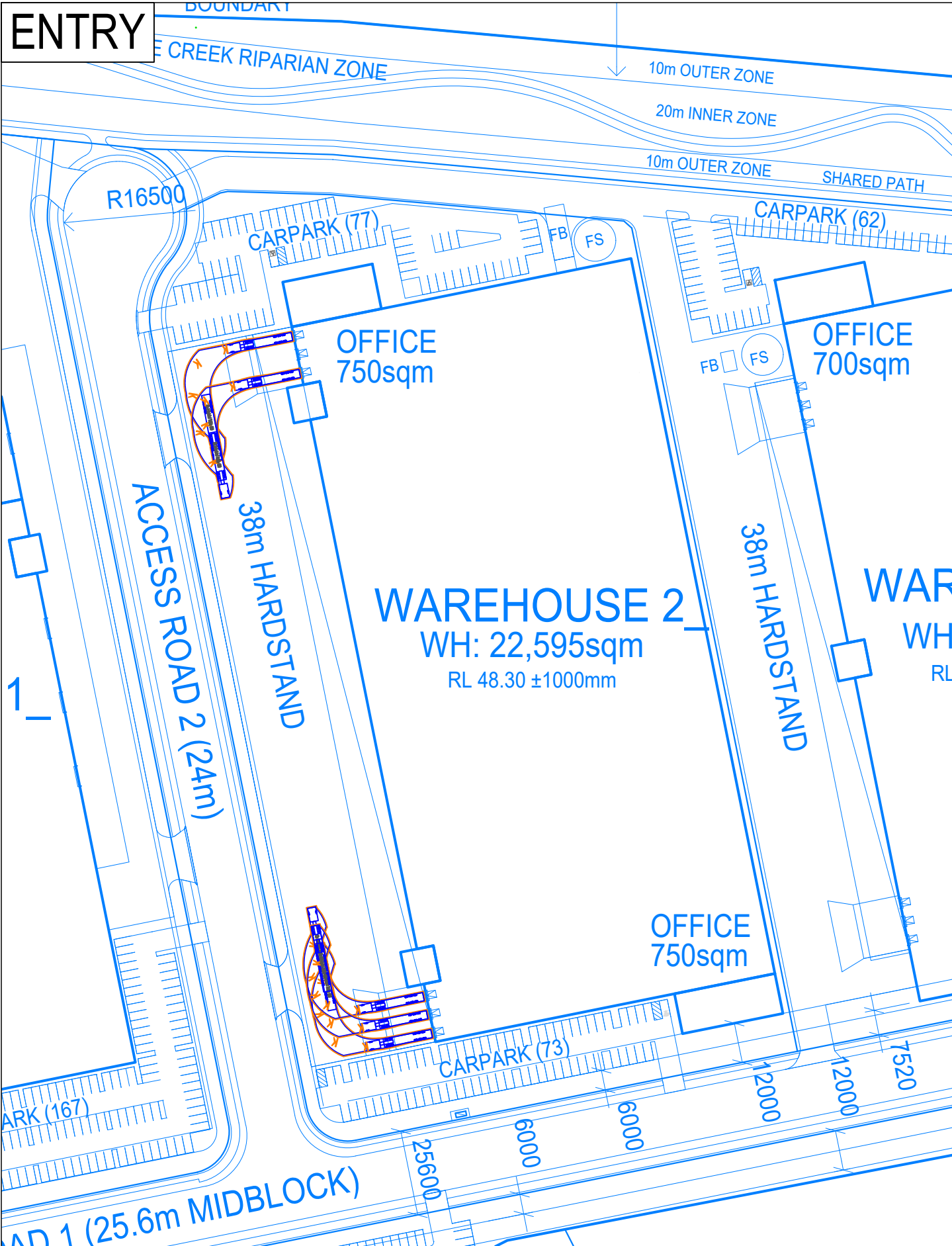


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	APPROVED BY X.XXXX	DATE 03.03.2022	PROJECT 1897		
	SCALE 1:1500	NTS	Lots 54-58 Mamre Road, Kemps Creek	FILE NAME AG1897-01-v05.dwg	SHEET AG015
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