ARUP

SSD

Project Echidna

Traffic and Transport Technical Report

Reference:

Final | 13 March 2023

Job number 288255-02

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Document Verification

Project title Project Echidna

Document title Traffic and Transport Technical Report
Job number 288255-02

Document ref

File reference Report Ref

Revision	**Date**	**Filename**	SYD057_Y-R-XXXX.docx		
Revision 1	7 June 2022	**Description**	Draft Issue		
			Prepared by	**Checked by**	**Approved by**
		Name	James Glenn Craigie	James Turner	James Turner
		Signature			
Revision 2	18 August 2022	**Filename**	Final Issue		
		Description			
			Prepared by	**Checked by**	**Approved by**
		Name	James Glenn Craigie	James Turner	James Turner
		Signature			
Final	13 March 2023	**Filename**			
		Description			
			Prepared by	**Checked by**	**Approved by**
		Name	James Glenn-Craigie		
		Signature			

Issue Document Verification with Document ✓

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1. Introduction

This report that been prepared to support the State Significant Development Application for Project Echidna. This report describes the traffic and transport impacts associated with the construction, operation and maintenance of the data centre at Lot 4001 DP 1243178, 10 Eastern Creek Drive, Eastern Creek NSW.

1.1 Background

The study area for the traffic and transport assessment of the proposal is outlined in Figure 1-1. In addition to the site, this report captures the road network that connects the site to Eastern Creek Drive including the intersection with Old Wallgrove Road.

Figure 1-1: Traffic and Transport assessment study area.

The proposal (shown in blue) is the subject proposal area of the overall site located within the 10 Eastern Creek Drive site (area shown in red). The site area consists of two data centres: Building 1 (under construction) and Building 2 (Echidna) as well as an associated substation (future phase) and a small-scale data centre (labelled subject building and known as Building 1a). The site components can be seen in more detail in

Figure 1-2.

The Development Application (DA) (PPSSCC-45-Blacktown-SPP-19-00013) prepared in 2019, for Building 1 and 1a was granted approval and is currently under construction, due to be completed by Q4 2022. Building 1 and 1a DA area encompasses the site area within the red line in

Figure 1-2. This area includes the site entrances from Eastern Creek Drive as well as the car park for the site, which was designed with enough car parking spaces so that it could be shared with the proposal once built.

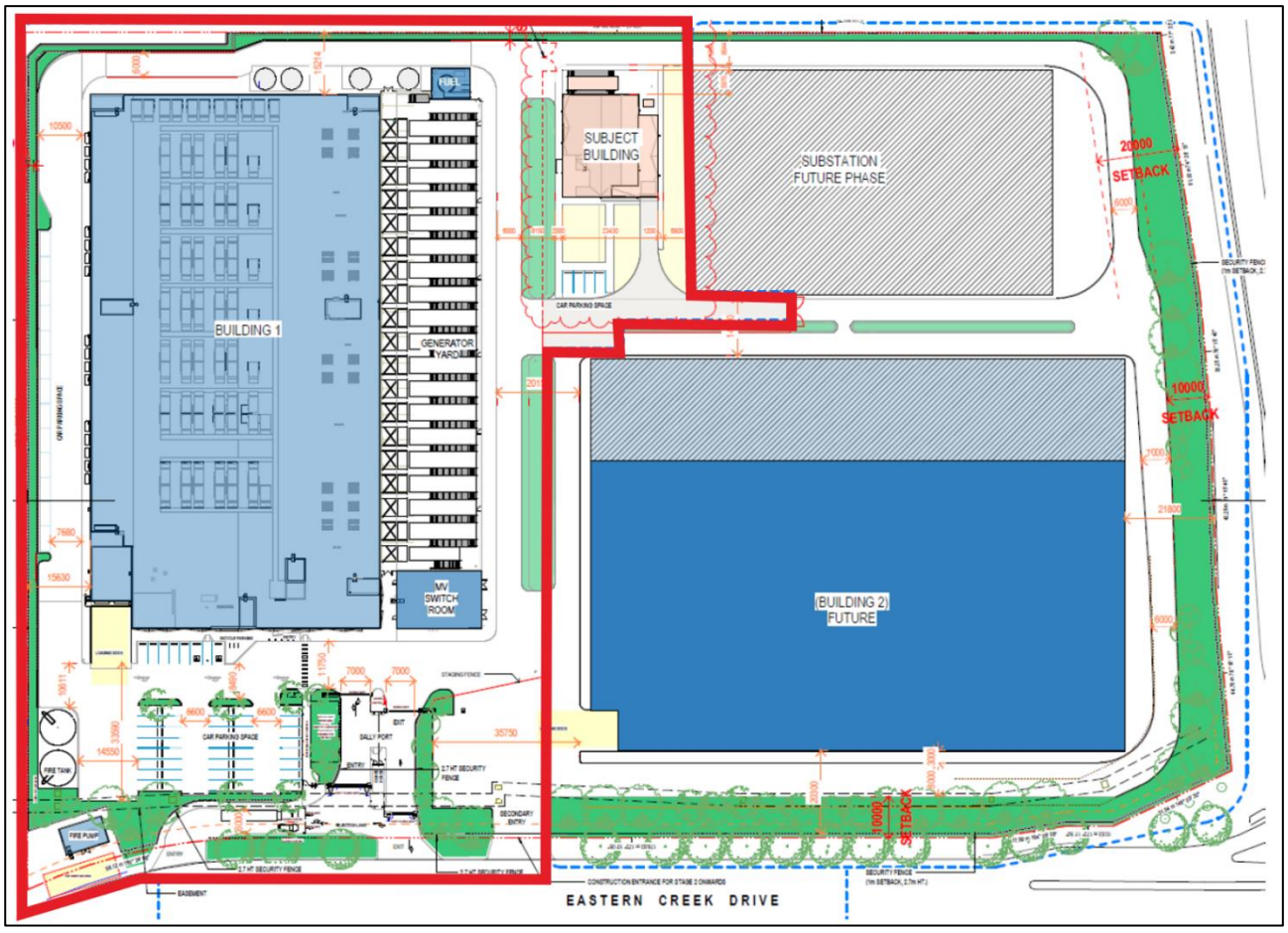


Figure 1-2: Area of previous Building 1 and 1a DA

Arup was provided with the Traffic Impact Assessment (2019) with adjoining modifications Technical Note (2021) prepared by Aurecon for the DA for Building 1 and 1a and associated site works adjacent to the proposal. The Aurecon report outlines the expected traffic generation of Building 1 and 1a as well as setting access and parking requirements. For the assessment in this report, the traffic generated as part of this development will be added on to the background traffic volume as cumulative developments.

1.2 Overview of Proposal

Arup on behalf of the Proponent is seeking development consent to construct a data centre (the proposal) at 10 Eastern Creek Drive, Eastern Creek NSW, legally described as Lot 4001 DP 1243178 (the site). The proposal involves the construction of a two-storey data centre comprising of data halls, mechanical and electrical equipment rooms, offices, other ancillary support spaces, and external/rooftop mechanical and electrical equipment. The site is situated within the Blacktown Local Government Area (LGA) on the corner of Eastern Creek Drive and Old Wallgrove Road.

The parcel of land is currently vacant, and the site gross floor area (GFA) is of approximately 9,225 square metres. The design of the Data Centre is based on the end-client's reference design as well as applicable Australian Standards and will deliver capacity for approximately 35.2MW of IT equipment. Utility power will be delivered via a dedicated on-site electricity substation (subject to a separate development application), with emergency backup power provided by a combination of lithium-ion battery systems and standby generators. Cooling will be delivered by highly efficient fresh air free-cooling systems in the Winter and evaporative cooling in the Summer to ensure energy consumption is minimised as far as practical.

The two (2) level facility will reach a building height of approximately 25m including all significant plant and rooftop equipment. The facility will include two (2) levels of data hall space and supporting plantrooms, and supporting administrative spaces incorporating secure entry facilities, loading dock, storage, staff offices, etc. The standby generators will occupy an external equipment yard to the west of the main building, and some mechanical equipment will be located at roof level. The site will be served from a private on-site substation, located to the west of the proposed data centre building and subject to a separate development application.

Landscaped areas are also proposed, where mature local trees will be used to improve aesthetics and amenity for local businesses.

On-site car parking spaces will be provided for staff and visitors, including disabled and electric vehicle parking within the adjacent site area already approved.

Figure 1-3 shows the site and the proposal.

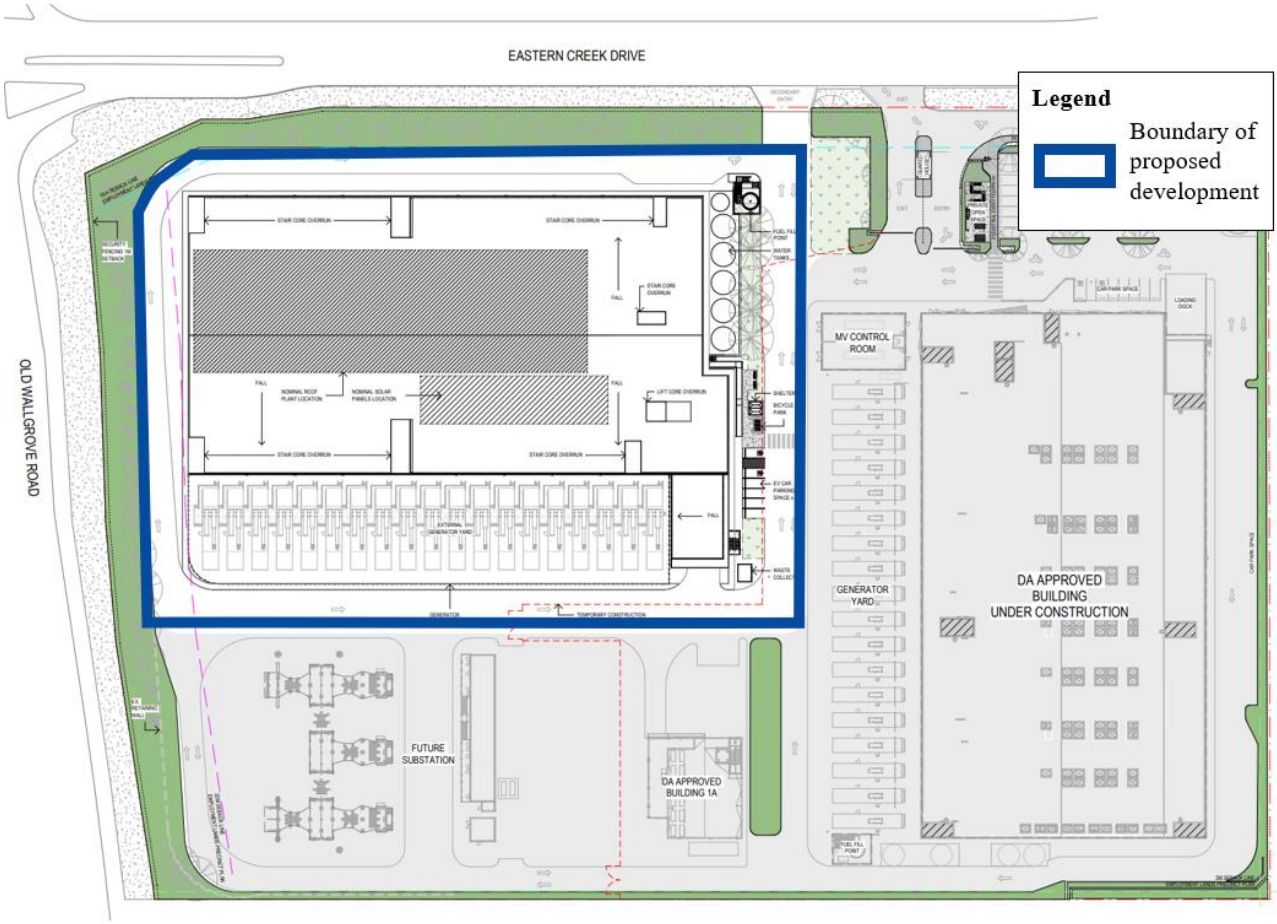


Figure 1-3: The site and proposal

Figure 1-4: Site context

1.3 Reference Documents

Specific documents referred to in this report include:

- Roads Act 1993;
- State Environmental Planning Policy (Infrastructure) 2007;
- Guide to Traffic Generating Development (RTA, 2002 as updated) and associated TDT (2013/04a);
- Road Design Guide (RMS, 2015-2017);
- Guide to Traffic Management – Part 12: Traffic Impacts of Development (Austroads, 2016);
- Guidelines for Planning and Assessment of Road Freight Access in Industrial Areas (Austroads, 2014);
- Australian Standards, Parking Facilities AS2890.1 to AS2890.3 and AS2890.6 ;
- Future Transport Strategy 2056 (TfNSW, 2018);
- Greater Sydney Services and Infrastructure Plan (TfNSW, 2018);
- NSW Freight & Ports Plan 2018-2023 (TfNSW, 2018);
- Blacktown DCP (Blacktown City Council, 2015);
- Traffic Impact Assessment and modification Technical Note (Aurecon, 2021)
- State Environmental Planning Policy - Eastern Creek Precinct Plan, Blacktown City Council (2005)

1.4 SEARs and DCP relevant to this report

Table 1-1 identifies the Traffic and Transport Secretary's environmental assessment requirements (SEARs), agency responses which are relevant to this technical assessment.

Table 1-1: SEARs requirements for Traffic and Transport.

SEARs relevant to this technical report	Where addressed in this technical report
Details of all traffic types and volumes likely to be generated during construction and operation, including a description of key access and haul routes.	Construction – Refer to Section 3 Operation – Refer to Section 4
An assessment of the predicted impacts of this traffic on road safety and the capacity of the road network, including consideration of cumulative traffic impacts at key intersections (using industry standard modelling).	Construction – Refer to Section 3.4 Operation – Refer to Section 4.4
Plans demonstrating how all vehicles likely to be generated during construction and operation and awaiting loading, unloading or servicing can be accommodated on the site to avoid queuing in the street network.	Refer to Section 4.5
Details and plans of any proposed internal road network, loading dock provision and servicing, on-site parking	Refer to Section 4.6

SEARs relevant to this technical report	Where addressed in this technical report
provisions, and sufficient pedestrian and cyclist facilities, in accordance with the relevant Australian Standards.	
Swept path analysis for the largest vehicle requiring access to the development.	Refer to Appendix 1
Details of road upgrades, infrastructure works, or new roads or access points required for the development if necessary.	Refer to Section 1.2
Provide a Construction Traffic Management Plan detailing predicted construction vehicle movements, routes, access and parking arrangements, coordination with other construction occurring in the area, and how impacts on existing traffic, pedestrian and bicycle networks would be managed and mitigated.	Refer to Section 5
Reports to be provided: • Transport and Accessibility Impact Assessment • Construction Traffic Management Plan (CTMP) • Green Travel Plan (GTP) or equitant	This report is the Transport and Accessibility Impact Assessment Refer to Section 5 for CTMP Refer to Section 6 for GTP

2. Existing environment

This Chapter provides information relevant to the existing traffic and transport environment in the vicinity of the study area as shown in Figure 2-1.

Figure 2-1: Existing traffic and transport context

2.1 Road Network

2.1.1 Westlink M7 Motorway

Westlink M7 is a tolled motorway that runs north-south approximately 1 kilometre east of the site with a direct connection from Old Wallgrove Road. The M7 connects to the M2 and M4 motorways to the north, and to the M5 motorway to the south. It forms part of the Sydney Orbital Network and Restricted Access Vehicle network, accommodating vehicles up to 26m B-Doubles in size. The Light Horse interchange between the M4 and M7 is located approximately 2 kilometres north-east of the site, providing access to Sydney CBD and the Western Suburbs. Near the site, the M7 has a four-lane, two-way divided carriageway and has a speed limit of 100km/h. It carries in the order of 70,000 vehicles per day.

2.1.2 Old Wallgrove Road / Lenore Drive

Old Wallgrove Road is a state arterial road that runs east-west along the southern frontage of the site, connecting Westlink M7 and Wallgrove Road at its eastern end and then continuing as Lenore Drive to Erskine Park Road in the west beyond the site. Near the site, Old Wallgrove Road is a four-lane, two-way divided carriageway and can accommodate vehicles up to 26m B-Doubles in size with speeds posted at 80km/h.

2.1.3 Eastern Creek Drive

Eastern Creek Drive is a local access road that runs north-south along the western frontage of the site, connecting to Old Wallgrove Road at its southern end. The road ends approximately 700m to

the site's northwest, with a turning head provided. It is signed at 60km/h with no stopping restrictions along both sides.

2.2 Walking Environment

Old Wallgrove Road has suitable walking infrastructure on both sides of the road and at the intersection with Eastern Creek Drive. Eastern Creek Drive has no walking infrastructure on either side of the road, however, there is space available so that infrastructure could be installed in the future. The bus stops in the local vicinity are accessible along Old Wallgrove Road but the lack of footpaths on Eastern Creek Drive means the site cannot be accessed using footpaths.

There are small number of shops and other amenities located within a reasonable walking distance from the site to the south and west of the site.

2.3 Cycling Environment

Old Wallgrove Road has a two-way shared use cycle path on the northern side of the road that runs from the intersection of Old Wallgrove Road with the M7 to the east. The shared path continues along Lenore Drive to the west, as shown in Figure 2-2. Eastern Creek Drive lacks a cycling infrastructure link to the proposal site. Similarly to the walking infrastructure, there is space available for this infrastructure be installed in the future.

Figure 2-2: Existing cycling infrastructure surrounding the site (Source: TfNSW, July 2022)

2.4 Public Transport

There are two bus stops located adjacent to the site on Old Wallgrove Road, as shown in Figure 2-1. These bus stops serve two bus routes being the 835 and 738. Route 835 also stops on Lenore Drive and route 738 stops on Roberts Road. There are no bus lanes along the links, however there are priority bus jump lanes at the intersections. The service frequency of these routes is shown in Table 2-1.

Table 2-1: Local Bus Services

Bus Services and Routes	AM Peak frequency		PM Peak frequency	
	Eastbound	Westbound	Eastbound	Westbound
835 WSU Penrith to Prairiewood	2	2	2	1
738 Mount Druitt to Eastern Creek via Rooty Hill (Loop Service)	2	2	2	2

2.5 Mode Share

The existing mode share for the site was approximated based on the 2016 travel to work Census data for the Statistical Area Level 2 – Prospect Reservoir, the results are presented in Table 2-2. Due to the location of the proposal being outside any reasonable walking or cycling distance from any residential area coupled with a lack of good public transport links has cause a high mode share for private vehicles.

Table 2-2: Existing mode share for Prospect Reservoir area

Mode of Travel	Mode Share
Public Transport	3%
Private Vehicle	97%
Bicycle	<1%
Walk	<1%

2.6 Traffic Surveys

A traffic count survey was undertaken on the 21 July 2022 for the AM (07:00-10:00) and PM (15:00-19:00) peak periods to understand the traffic volumes on the surrounding road network. One intersection was surveyed at the Old Wallgrove Road/Eastern Creek Drive intersection.

2.6.1 Old Wallgrove Road/Eastern Creek Drive Intersection

Table 2-3 and Table 2-4 below summarises the results of the traffic count survey. The results are shown in total vehicle numbers and the numbers of heavy vehicles are displayed the brackets.

Table 2-3: Old Wallgrove Road/Eastern Creek Drive Intersection AM peak hour (07:00-08:00) traffic volumes

AM peak Vehicles (HGV's)		Exit		
		Eastern Creek Drive	Old Wallgrove Road East	Old Wallgrove Road West
Approach	Eastern Creek Drive	-	31 (13)	5 (2)
	Old Wallgrove Road (East)	127 (14)	-	1,170 (264)
	Old Wallgrove Road (West)	37 (11)	724 (311)	-

Table 2-4: Old Wallgrove Road/Eastern Creek Drive Intersection PM peak hour (15:00-16:00) traffic volumes

PM peak Vehicles (HGV's)		Exit		
		Eastern Creek Drive	Old Wallgrove Road (East)	Old Wallgrove Road (West)
Approach	Eastern Creek Drive	-	148 (21)	32 (9)
	Old Wallgrove Road (East)	33 (19)	-	605 (233)
	Old Wallgrove Road (West)	13 (7)	976 (218)	-

2.7 Modelling

This section describes the results of traffic modelling analysis undertaken for the existing 2022 scenario. Old Wallgrove Road/Eastern Creek Drive Intersection has been assessed using TfNSW approved SIDRA 9 software.

The intersection performance has been assessed using the following metrics:

- Degree of Saturation (DoS);
- Average Delay (Seconds per vehicle);
- Level of Service; and
- 95th percentile queue length.

A common measure of intersection performance is the degree of saturation (DoS), which provides an overall measure of the capability of the intersection to accommodate additional traffic. A DoS of 1.0 indicates that an intersection is operating at capacity. The desirable maximum degree of saturation for an intersection is 0.9 (or 90%).

In urban areas, the traffic capacity of the major road network is generally a function of the performance of key intersections. This performance is quantified in terms of Level of Service (LoS), which is based on the average delay per vehicle. LoS ranges from A = very good to F = unsatisfactory. A full breakdown is shown in Table 2-5.

Table 2-5: Intersection Level of Service

Level of Service	Average delay per vehicle (seconds)	Operation
A	<15	Good Operation
B	15 – 28	Good with acceptable delays and spare capacity
C	29 – 42	Satisfactory
D	43 – 56	Operating near capacity
E	57 – 70	At capacity
F	>70	Over capacity

The SIDRA model for the Old Wallgrove Road/Eastern Creek Drive intersection was developed using traffic survey data presented in Section 2.6. The results of the modelling are presented in Table 2-6.

Table 2-6: SIDRA modelling results – 2022 Base – Existing Traffic Impact

Scenario	AM Peak (07:00-08:00)				PM Peak (15:00-14:00)			
	Dos	Delay (sec)	LoS	95th percentile queue (m)	Dos	Delay (sec)	LoS	95th percentile queue (m)
2022 Base	0.46	12	A	130	0.50	13	A	116

The modelling indicates that the intersection operates at a Level of Service A in both the AM and PM peak hours which is considered acceptable.

The full model outputs from the SIDRA modelling are presented in Appendix 2 of this report.

3. Assessment of potential construction impacts

This Chapter details the Traffic and Transport assessment in relation to construction stage impacts.

3.1 Construction Traffic Generation

The traffic generation of the construction stage of the proposal has been considered, so its impact on the surrounding transport network can be assessed. The peak year for construction activity is expected to occur in 2023.

For the purposes of the assessment, the AM peak hour was assumed to be 07:00-08:00 and the PM peak hour was assumed to be 15:00-16:00 to align with the network peaks identified in the 2022 traffic data.

3.1.1 Construction Vehicles

Based on previous experience from other data centres it is estimated that there will be a maximum of 75 construction vehicles per day associated with the peak construction phase. It is anticipated that there may be up to 18 two-way truck movements (9 trucks inbound and 9 trucks outbound) during peak hours. It should be noted that all construction vehicles are assumed to be classified as heavy vehicles and exit the site within the hour they arrive.

3.1.2 Construction Workers

In addition to construction vehicles, workers will generate additional traffic to the site in the form of cars, vans and utility vehicles. A maximum workforce of approximately 100 personnel could be expected in the peak construction phase.

Construction workers generally start earlier and finish earlier than the commuter peak periods, however, to ensure the assessment is robust, it has been assumed 50% of construction workers would arrive in the AM peak hour and 50% of workers depart in the PM peak hour. Construction workers would therefore contribute an additional 50 vehicle trips inbound in the AM peak hour and outbound in the PM peak hour. All construction worker parking is assumed to occur within the site to avoid impacts to surrounding roads. Parking arrangements will be addressed in more detail in the Construction Traffic Management Plan when a Contractor is engaged.

3.1.3 Overall traffic generation

Table 3-1 contains the combined construction vehicle and worker traffic generation.

Table 3-1: Trip Generation due to Peak Construction

Type	AM Peak (07:00-08:00)		PM Peak (15:00-16:00)	
	In	Out	In	Out
Construction Vehicles	9	9	9	9
Construction Workers	50	-	-	50
Total	**59**	**9**	**9**	**59**

3.2 Cumulative Developments Traffic Generation

As mentioned in Section 1, a previous DA application for a data centre that is currently under construction on the site is due to be completed and operational by Q4 2022 (application number: SPP-19-00013). The trips generated by this adjacent data centre development will be assessed as a cumulative development and the traffic volumes have been added onto the base traffic volumes collected in the traffic count survey (noting there are likely construction trips already accounted for in this count). The traffic volumes generated by Building 1 and 1a have been noted from the TIA

and modification Technical Note prepared by Aurecon. The number of trips generated are shown in Table 3-2.

Table 3-2: Cumulative Development Trips

Type	AM Peak		PM Peak	
	In	Out	In	Out
Staff Vehicles	28	8	8	28
Visitors Vehicles	2	2	2	2
Service Vehicles	1	1	1	1
Total	**31**	**11**	**11**	**31**

A total of 42 vehicle movements are expected during the AM and PM peak hours during the construction of the proposed development.

3.3 Construction Traffic Trip Distribution

Construction vehicles and workers travelling to and from the site will originate from a variety of locations. The following assumptions have been made around the distribution of traffic.

The traffic has been distributed as per Table 3-3. A 30:70 directional split has been assumed due to the location of the M7 Motorway to the east of the site which would provide access to the rest of the road network.

Table 3-3: Traffic Distribution – Origin/Destination

Origin/Destination	% Split
Old Wallgrove Road (east)	~70%
Old Wallgrove Road (west)	~30%

3.4 Network Impacts

This impact assessment has focused on the Old Wallgrove Road/Eastern Creek Drive intersection as it is a key connection from the site to the State Road network. The Old Wallgrove Road/Eastern Creek Drive intersection configuration is not expected to change in the future.

3.4.1 Traffic Modelling

3.4.1.1 Old Wallgrove Road/Eastern Creek Drive

This section describes the results of the traffic modelling analysis undertaken for the construction stage scenario in 2023, considering cumulative developments. Old Wallgrove Road/Eastern Creek Drive intersection has been assessed using SIDRA.

The results of the modelling are presented in Table 3-4.

Table 3-4: SIDRA modelling results -2023 Base +Cumulative Developments +Development Construction -Traffic Impact

Scenario	AM Peak (07:00-08:00)				PM Peak (15:00-14:00)			
	Dos	Delay (sec)	LoS	95th percentile queue (m)	Dos	Delay (sec)	LoS	95th percentile queue (m)
2023 Base + Cumulative + Construction	0.514	15	B	153	0.581	18	B	150

The modelling indicates that the intersection operates at a Level of Service B in both the AM and PM peak hours. This is a reduction from a LoS A in the existing scenario model from Section 2.7, but is still considered within an acceptable operating range.

The full model outputs from the SIDRA modelling are presented in Appendix 2 of this report.

3.4.1.2 Old Wallgrove Road/Wallgrove Road & Mini Link Road/Wallgrove Road

The intersection between Old Wallgrove Road and Wallgrove Road has not been assessed using SIDRA as the anticipated increase in traffic volumes at this intersection is expected to be very small and therefore will have minimal impact on the LoS of the intersection.

70% of the vehicles generated by the construction of the proposed development are expected to come from east of the site via the Westlink M7 motorway. This equates to approximately 47 vehicles in the AM and PM peak hours. The access/egress to the M7 is split between two intersections depending on the direction of travel you are arriving/departing from. 50% of the vehicles (24 vehicles) are expected to use the intersection of Old Wallgrove Road and Wallgrove Road and the other 50% are expected to use the intersection to the south, Mini Link Road and Wallgrove Road. This is an increase in vehicles that would equate to an average of one vehicle every two and a half minutes at each intersection.

As an indicative comparison, traffic volumes have been reviewed from Table 4-1 of the Sydney Metro Precast Facilities Transport and traffic assessment (Jacobs, 2020), and have been utilised to understand the increase in volumes at each of the intersections. The assessment estimated that Old Wallgrove Road/Wallgrove Road & Mini Link Road/Wallgrove Road would carry between 2,100-3,400 vehicles per hour in the AM and PM peak hours in 2022. Therefore, an increase of 24 vehicles would calculate to approximately a 1% increase, which is considered to be negligible.

4. Assessment of potential operational impacts

This Chapter details the Traffic and Transport assessment in relation to operational impacts.

4.1 Operational Traffic Generation

The operational traffic generation of the proposal has been considered to assess its impacts on the surrounding transport network.

Information provided by the client as well as the TIA and modification Technical Note prepared by Aurecon for Building 1 and 1a has been used to inform the traffic generation for the proposal.

In operation, the proposal will generate traffic due to a range of different users. These can be aggregated into three categories:

- Staff;
- Visitors; and
- Servicing vehicles.

4.1.1 Staff Traffic Generation

From information provided by the client it is known that 50 full-time staff will be required on site on a typical day, consisting of 26 office staff and 24 non-office staff (non-office staff are split equally between the two shifts). The development will have a 24-hour operation, consisting of two 12-hour shifts. Shift changeover will occur at 06:00 and 18:00. Office hours will be between 09:00-17:00. However, for the purposes of the assessment it has been assumed that the office workers will arrive to the site during the AM peak hour and depart during the PM peak hour, and that shift change overs will happen during these AM and PM peak hours, to align with the network peak hours outlined in the 2022 traffic surveys.

The mode share developed in Section 2.5 using 2016 travel to work Census data was applied to the 50 staff to calculate the multimodal trip generation. This is presented in Table 4-1.

Table 4-1: Model Split

Mode of Travel	Mode Share	Office Workers	Non-Office Workers
Public Transport	3%	1	1
Private Vehicle	97%	25	23
Bicycle	<1%	0	0
Walk	<1%	0	0

After applying the mode share to the staff numbers, it is assumed that 48 staff will travel to the site by private vehicles.

4.1.2 Visitor Traffic Generation

A maximum of 10 visitors are expected to access the site per day. Given the location and to ensure the traffic assessment is robust, all visitors are expected to drive to the site.

A linear profile has been assumed for the arrival distribution of visitors to the site throughout the office hours operational day. This results in two visitor two-way trips in each of the peak hours. All visitors are assumed to exit the site within the hour they arrive.

For of the assessment, it has been assumed that two visitor trips will happen during the AM and PM network peak hours recorded in the 2022 traffic survey.

4.1.3 Service Vehicle Traffic Generation

A maximum of nine service vehicles are expected to access the site per day during periods of heavy maintenance.

A linear profile has been assumed for the arrival distribution of service vehicles to the site throughout an eight-hour day. This profile leads to one service vehicle accessing the site in each of the peak hours on average. All servicing vehicles are assumed to exit the site within the hour they arrive. There will be a range of servicing vehicles accessing the site predominantly comprising of vans but less regularly 19m Articulated Vehicles (AVs). When testing the site layout, an AV has been considered as the largest design vehicle.

For robustness of the assessment, it has been assumed that one service vehicle two-way trip will happen during the AM and PM network peak hours recorded in the 2022 traffic survey.

4.1.4 Overall Traffic Generation

Combining the traffic generation described in Section 4.1 for staff, visitors and services, it is estimated the site would generate 54 vehicle movements during both the AM and PM peak hours, these movements are broken down in Table 4-2.

Table 4-2: Traffic Generation – Operational

Type	AM Peak (07:00-08:00)		PM Peak (15:00-16:00)	
	In	Out	In	Out
Staff Vehicles	37	11	11	37
Visitors Vehicles	2	2	2	2
Service Vehicles	1	1	1	1
Total	**40**	**14**	**14**	**40**

The traffic generated during the peak operational stage will be slightly higher than that generated during the construction stage, however the construction stage will generate more truck movement. Therefore both scenarios have been modelled.

4.2 Cumulative Developments Traffic Generation

As mentioned in Section 1 and in Section 3.2, a previous DA application for a data centre that is currently under construction on the site is due to be completed and operational by Q4 2022 (application number: SPP-19-00013). The trips generated by this adjacent data centre development will be assessed as a cumulative development and the traffic volumes have been added onto the base traffic volumes collected in the traffic count survey (noting there are likely construction trips already accounted for in this count). The traffic volumes generated by Building 1 and 1a have been noted from the TIA and modification Technical Note prepared by Aurecon. The number of trips generated are shown in Table 4-3.

Table 4-3: Cumulative Development Trips

Type	AM Peak		PM Peak	
	In	Out	In	Out
Staff Vehicles	28	8	8	28
Visitors Vehicles	2	2	2	2
Service Vehicles	1	1	1	1
Total	**31**	**11**	**11**	**31**

A total of 42 vehicles movement is expected during the AM and PM peak hours during the construction of the proposed development.

4.3 Trip Distribution

Operational traffic vehicles travelling to and from the site will originate from a variety of locations. The following assumptions have been made around the distribution of traffic.

The traffic has been distributed as per Table 4-4. A 30:70 directional split has been assumed due to the location of the M7 Motorway to the east of the site which would likely provide most of the access to the rest of the road network.

Table 4-4: Traffic Distribution – Origin/Destination

Origin/Destination	% Split
Old Wallgrove Road (east)	~70%
Old Wallgrove Road (west)	~30%

4.4 Network impacts

This impact assessment has focused on the Old Wallgrove Road/Eastern Creek Drive intersection as it is a key connection from the site to the State Road network. The Old Wallgrove Road/Eastern Creek Drive intersection configuration is not expected to change in the future.

4.4.1 Traffic Modelling

4.4.1.1 Old Wallgrove Road/Eastern Creek Drive

This section describes the results of the traffic modelling analysis undertaken for the opening year of the proposed development in 2024, considering cumulative developments. Old Wallgrove Road/Eastern Creek Drive intersection has been assessed using SIDRA.

The results of the modelling are presented in Table 3-4.

Table 4-5: SIDRA modelling results - 2024 Base + Cumulative Developments + Development Operation

Scenario	AM Peak (07:00-08:00)				PM Peak (15:00-14:00)			
	Dos	Delay (sec)	LoS	95th percentile queue (m)	Dos	Delay (sec)	LoS	95th percentile queue (m)
2024 Base + Cumulative + Operation	0.502	14	A	150	0.575	16	B	135

The modelling indicates that the intersection operates at a Level of Service A in the AM peak hour and Level of Service B in the PM peak hour. This is a reduction from a LoS A in both peaks in the existing scenario model from Section 2.7, but is still considered within an acceptable operating range.

The full model outputs from the SIDRA modelling are presented in Appendix 2 of this report.

The operational stage impact on the road network is slightly less than the impact of the construction stage even though the operational stage even though the operational stage has a bigger trip generation. This is likely due to the to signal timing optimisations as a result of a change in traffic patterns at the intersection between scenarios and there being a higher number of trucks traveling to and from the site during the construction stage. As they have a bigger impact on the road network then smaller vehicles.

The accesses to the site were not modelled as the traffic volumes on Eastern Creek Drive are within the theoretical capacity of this road. The future flows relating to the site were not expected to impact this operation given there will be sufficient gap seeking opportunities for vehicles exiting the site.

4.4.1.2 Old Wallgrove Road/Wallgrove Road & Mini Link Road/Wallgrove Road

The intersection between Old Wallgrove Road and Wallgrove Road has not been assessed using SIDRA as the anticipated increase in traffic volumes at this intersection is expected to be very small and therefore have minimal impact on the LoS of the intersection.

70% of the vehicles generated by the operation of the proposed development are expected to come from east of the site via the Westlink M7 motorway. This equates to approximately 38 vehicles in the AM and PM peak hours. The access/egress to the M7 is split between two intersections depending on the direction of travel you are arriving/departing from. 50% of the vehicles (19 vehicles) are expected to use the intersection of Old Wallgrove Road and Wallgrove Road and the other 50% are expected to use the intersection to the south, Mini Link Road and Wallgrove Road. This is an increase in vehicles that would equate to an average of one vehicle every three minutes at each intersection.

As an indicative comparison, traffic volumes have been reviewed from Table 4-1 of the Sydney Metro Precast Facilities Transport and traffic assessment (Jacobs, 2020) and have been utilised to understand the increase in volumes at each of the intersections. The assessment estimated that Old Wallgrove Road/Wallgrove Road & Mini Link Road/Wallgrove Road would carry between 2,100-3,400 vehicles per hour in the AM and PM peak hours in 2022. Therefore, an increase of 19 vehicles would calculate to less than a 1% increase, therefore that impact which is considered to be negligible.

4.5 Site Access

The site accesses are located on Eastern Creek Drive and were constructed as part of the approved DA for Building 1 and 1a. There are two vehicle access points to the site, as shown in Figure . The primary access/egress (shown in blue) and the secondary access/egress (shown in pink).

A protected pedestrian and cyclist entry (shown in red) is provided to the north of the of the site's vehicle entrances, separating pedestrians and cyclists from driveway traffic.

During the construction of Echidna, the primary access will be used by light and heavy vehicles associated with the operation of Buildings 1 and 1a. The secondary access will be used for construction vehicles during the construction and fit out stages of Building 2 (Echidna) . There will be no mixing of operational and construction vehicles.

During the operation of Echidna, the primary access will be used by light and heavy vehicles as all buildings will be operational by that stage. The secondary access will not be used on a regular basis but will remain for infrequent servicing by larger vehicles when required.

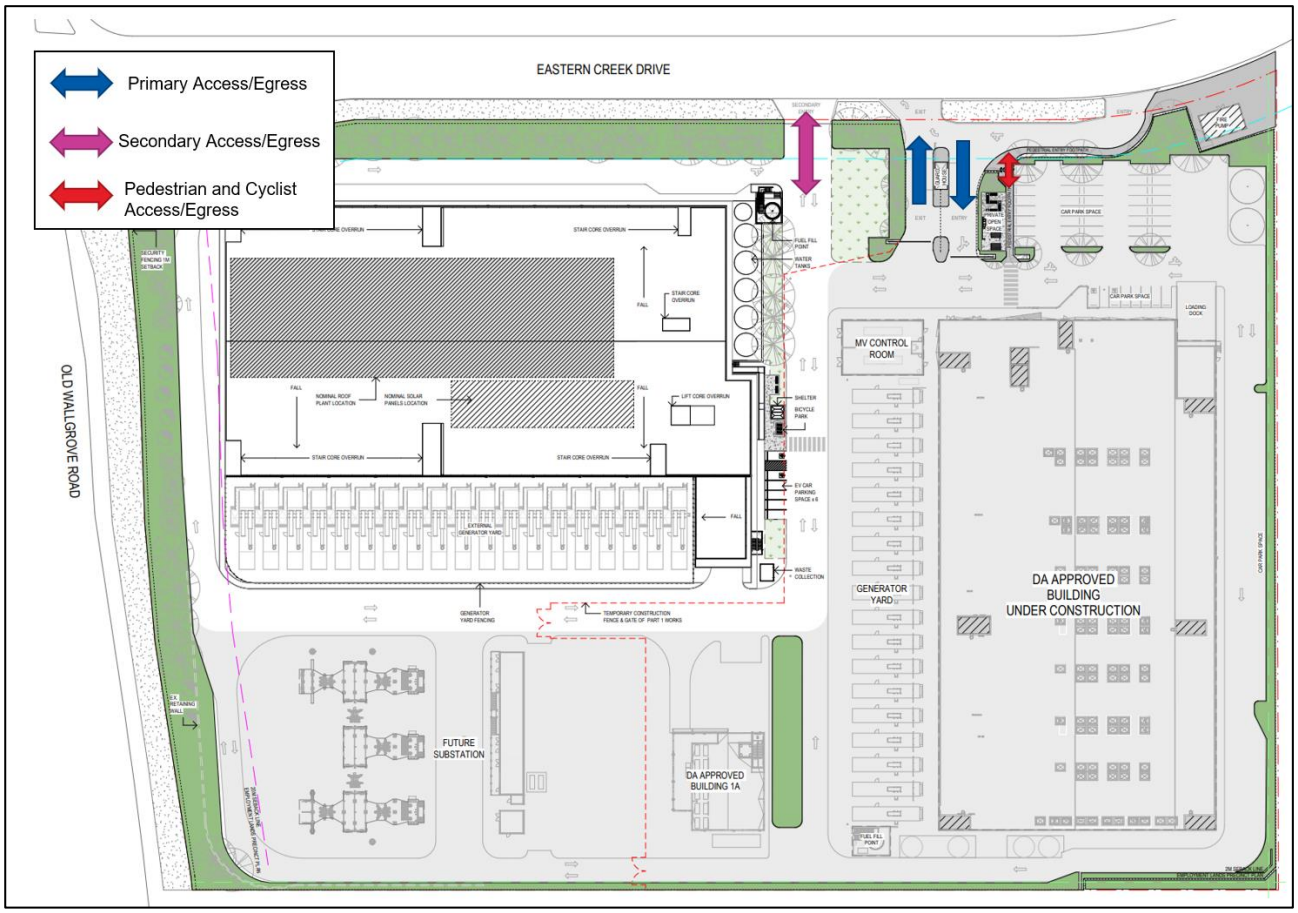


Figure : Site Access/Egress

The primary site access will have double security checks for deliveries, prolonging the time required for heavy vehicles to enter the site. . The primary access provides a queuing length of 35 m before the first security check, which allows for a queue of approximately 5-6 light vehicles or 1 heavy vehicle without overflow.

Queues involving heavy vehicles are unlikely, due to their low arrival frequency. However, it is recommended that the operator schedule deliveries, so they do not overlap with key periods of staff movements, reducing the likelihood of heavy and light vehicle conflict at the driveway. Adequate signage should also be implemented at the driveway to avoid such conflicts, and adequately informing staff about potential risks regarding passing heavy vehicles on the left side at the driveway is recommended.

Queues involving only light vehicles will occur primarily during the AM peak, with the arrival of 46 office staff (from Buildings 1, 1a and 2), though it is unexpected that a queue exceeding five vehicles will occur. The risk of overflow queueing could be further minimised if operator to schedule office employee start times such that their arrivals times are staggered throughout the morning peak.

Conflicts between heavy and light vehicles at the driveways are likely to be minimal as there is expected to only be two heavy vehicles on site during the peak hours. It is also unlikely that volumes of light vehicles accessing the site during the peak hours will be high. This is because the shift patterns vary (6:00 and 18:00) and the office work hours (9:00-17:00) will occur outside the times when heavy vehicles will be on site. In order to provide a robust assessment all vehicles were assessed at the same peak hour. Therefore it is expected that any potential conflicts between light and heavy vehicles at the shared driveway will be minimal and easily managed.

4.6 Site layout

The site layout is presented in Figure 4-1. Servicing vehicles will enter the site via the western entrance on Eastern Creek Drive. Vehicles entering the site will undergo an initial security check at a boom gate approximately 25m into the driveway. Vehicles which pass the initial security check will proceed along the driveway and undergo a further security check under the sally port, between two sliding gates. Rejected vehicles will exit the site via the provided rejection lane. The proposed access arrangement permits entry and exit to and from the site in a forward direction.

Paved paths will be provided between all car parks and buildings to allow workers and visitors to gain access to the admin blocks and operational facilities within the site. Where walking routes cross vehicle circulation paths appropriate crossing facilities will be provided.

Technical drawings showing the swept paths of 12.5m heavy rigid vehicles (HRV)s and AVs using the internal road network are presented in Appendix 1 of this report.

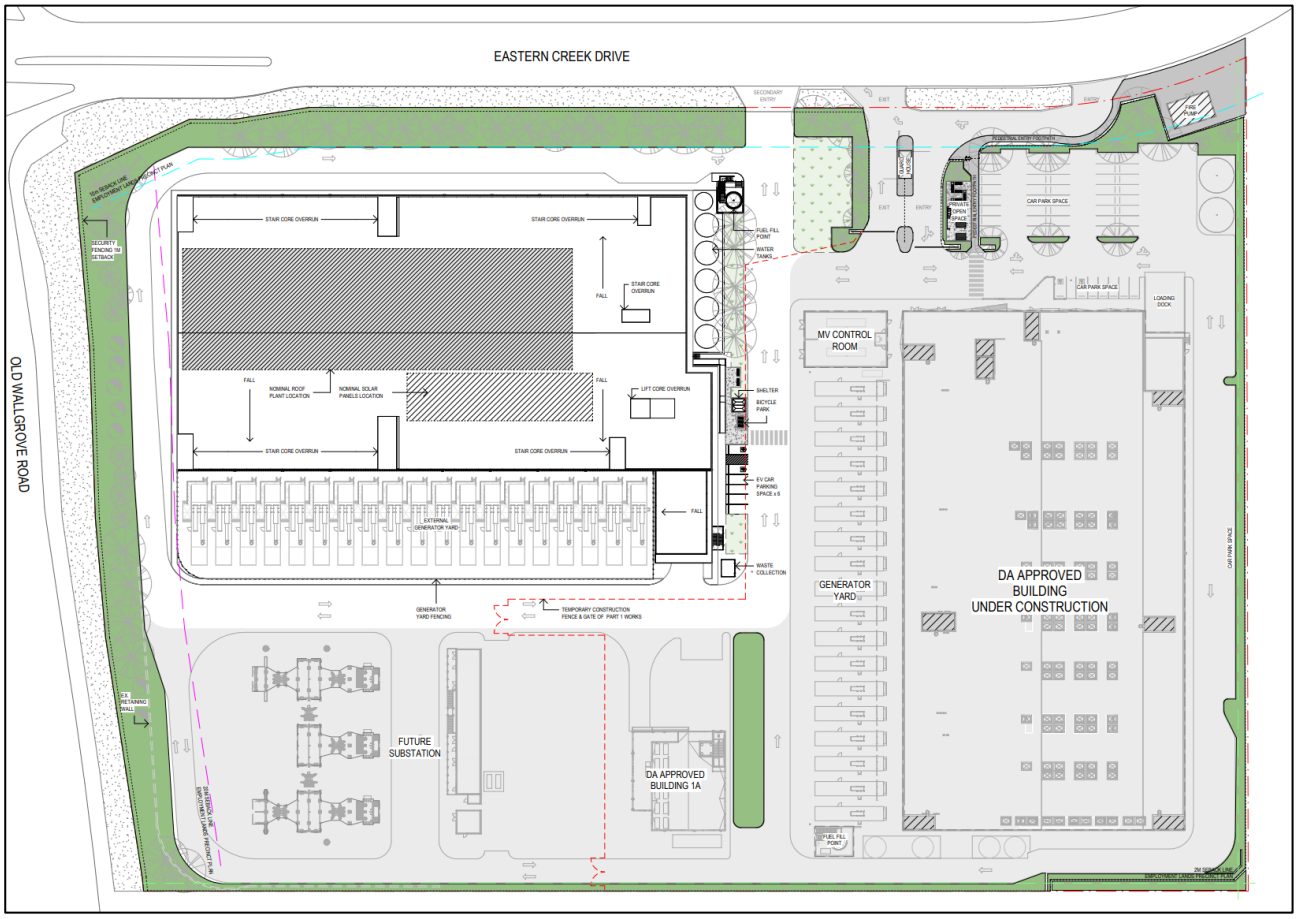


Figure 4-1: Site Layout

4.6.1 Loading docks

The proposed development will have a single loading dock, shown in blue in Figure 4-2, with capacity to accommodate vehicles as large as an AV. The site layout provides sufficient space for these vehicles to safely reverse into designated loading bays from which they can load/unload.

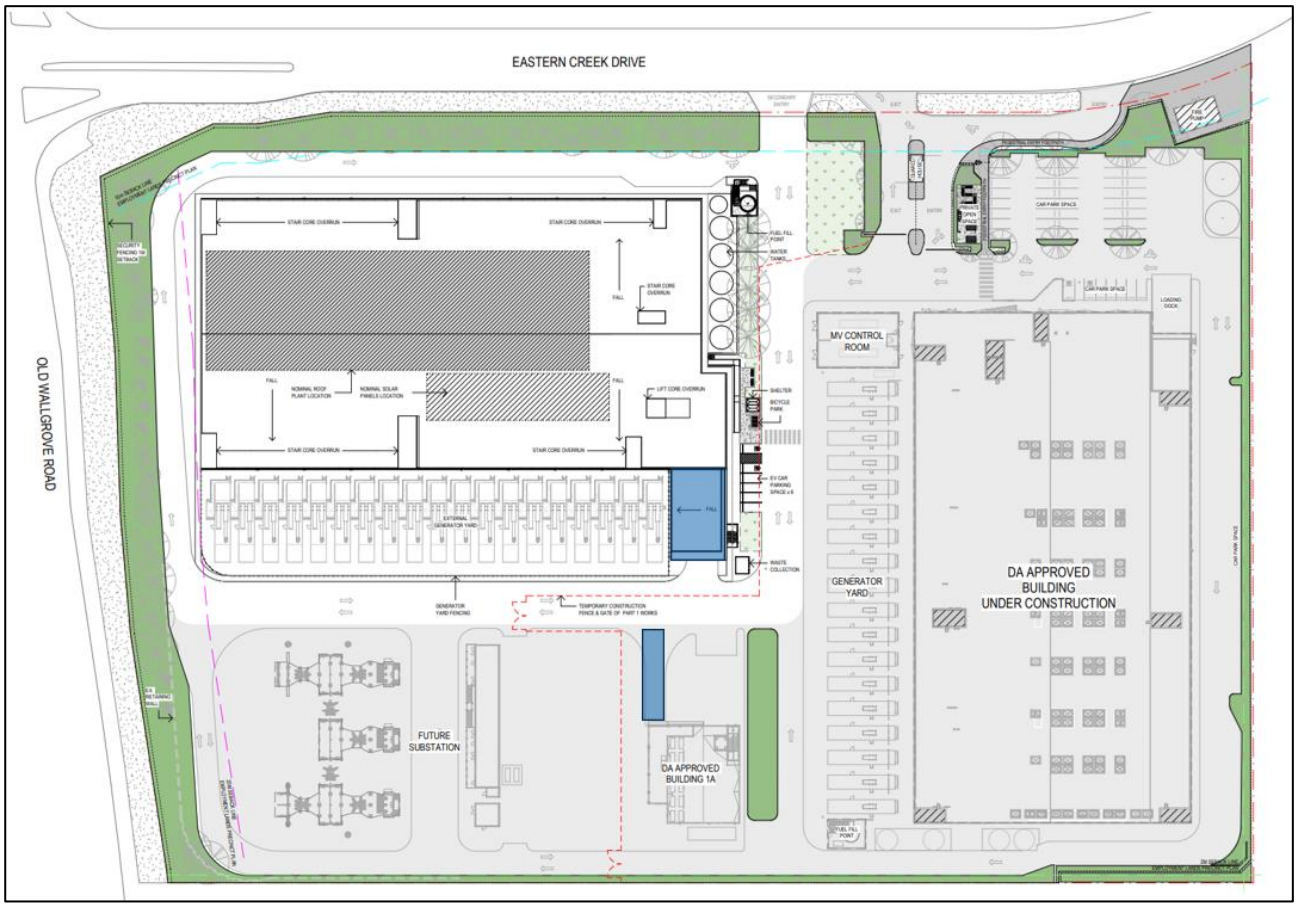


Figure 4-2: Location of Loading Dock

Technical drawings showing the swept paths of HRVs and AVs using the loading area are presented in Appendix 1 of this report.

4.6.2 Road Safety

Appropriate signage and line marking will be implemented that is compliant with Australian Standards. Where walking routes cross vehicle circulation paths, appropriate crossing facilities will be provided.

4.6.3 Vehicle Parking

The State Environmental Planning Policy (SCPP) - Eastern Creek Precinct Plan (ECPP) sets out parking standards for Industrial buildings. The parking requirement for Building 2 (Echidna) has been calculated as set out in the SCPP. This is presented in Table 4-6, and outlines the maximum parking requirement for the site. It suggests that 84 car parking spaces would be required for the proposed development.

Table 4-6: Car Parking Requirements

Building	Land Use	GFA	Parking Rate	Parking Requirement
Building 2 (Echidna)	Industrial Buildings < 7,500m^2	9,211.2m^2	1 space per 100m^2 of GFA	75
	Industrial Buildings > 7,500m^2		1 space per 200m^2 of GFA, for the areas exceeding 7,500m^2	9
			Echidna Total	84

Due to the low staff requirements to operate Building 2 (Echidna), 84 car parking spaces is considered to be excessive, therefore it is more prudent to assess car parking requirements on an empirical assessment of parking demand. This assessment has been based on the staff numbers and operational characteristics of the development under its proposed using information provided by the operator.

As outlined in Section 4.1, 50 full-time staff will be required on site on a typical day, with a maximum of 36 staff being present at any one time and requiring a parking space. Additionally, it is expected there will be up to 10 visitors arriving throughout the working day, with two visitors on site at any one time. Therefore, car parking spaces for approximately 38 vehicles is required for Building 2 (Echidna). Since the submission of the DA for Buildings 1 and 1a there has been an increase in the number of staff required to operate Building 2 (Echidna).

The DA submission for Buildings 1 and 1a which has been granted permission and is currently under construction will provide 64 car parking spaces for the site. The location of these spaces are shown in red in Figure 4-3. As set out in the TIA and modifications Technical Note prepared by Aurecon, 32 of the 64 car parking spaces will be used by staff working in Building 1 and 1a. The remaining 32 spaces will be utilised by Building 2 (Echidna).

Six additional car parking spaces will be provided as part of the proposed development to meet the additional need of Building 2 (Echidna). The location of these spaces are shown in purple in Figure 4-3.

Table 4-7: Car Parking Provided

Building	Parking Spaces Provided as part of original DA	Parking Spaces Provided as part of SSDA
Building 1	28	-
Building 1a	4	-
Building 2 (Echidna)	32	6
Total	70	

Four of the car parking spaces will be designated for parking for people with disabilities and are DDA compliant (minimum of 2% of car parking spaces).

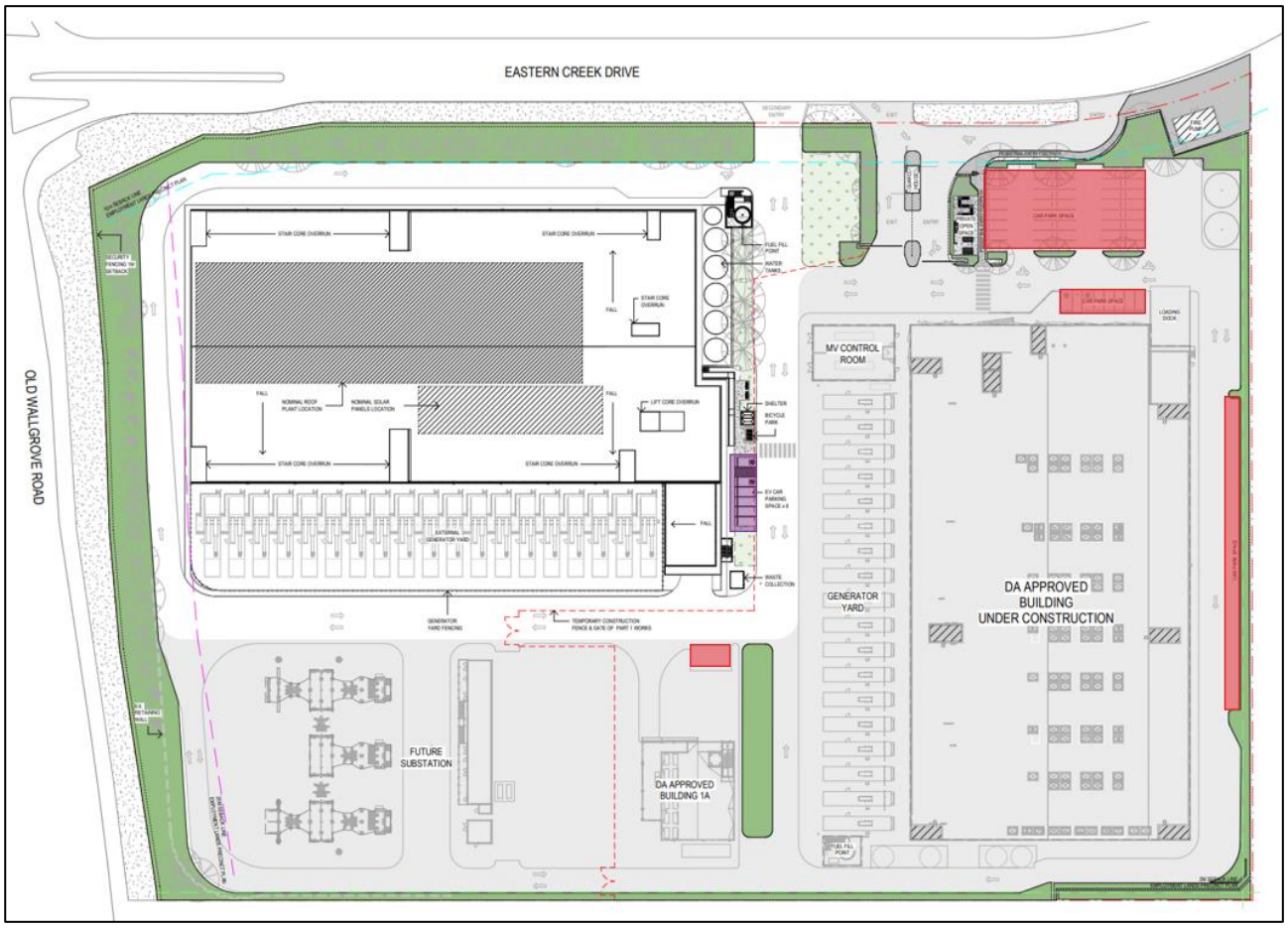


Figure 4-3: Car Parking

All car parking has been designed in accordance with AS/NZS 2890.1 and AS/NZS 2890.6 where applicable, with the following considered noteworthy:

- Car parking spaces are designed with a width of 2.5 metres, and a minimum aisle width of 5.8 metres.
- Accessible parking spaces will be located adjacent to each building entry and include the 2.4 metre ‘Shared Area’ on one side of the bay.

4.6.3.1 Car parking access

Pedestrians will be able to access the main car park via the route shown in orange in Figure 4-4. Two pedestrian crossings will be provided, one that connects Building 1 and 2 and the other connects the main car park and Building 1. Building 1 will also have a pedestrian footpath running the whole way around the building, which will link the two pedestrian crossings, providing a safe way for pedestrians to access the car park.

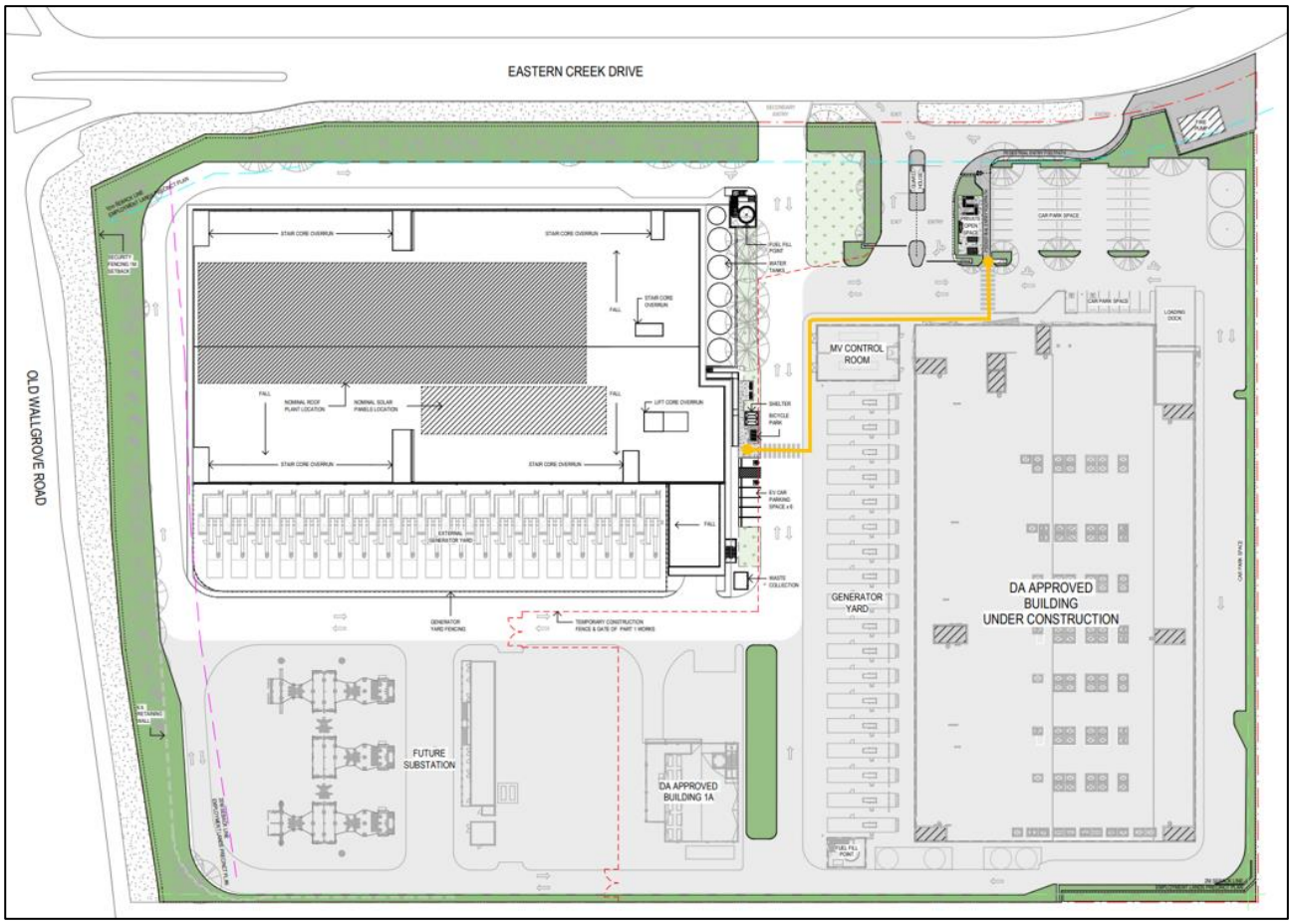


Figure 4-4: Safe route for pedestrians to walk between the Building 2 (Echidna) and the car park

4.6.4 Bicycle parking

A total of six bicycle parking spaces will be provided as part of the proposed development. In addition to facilitate those that use active modes to get to work, showering facilities will be provided, satisfying the requirements of the ECCP. The provision of additional bicycle spaces aims to encourage staff to use active transport and alleviate pressures on on-site parking. The location of the bicycle parking spaces is shown in pink in Figure 4-5.

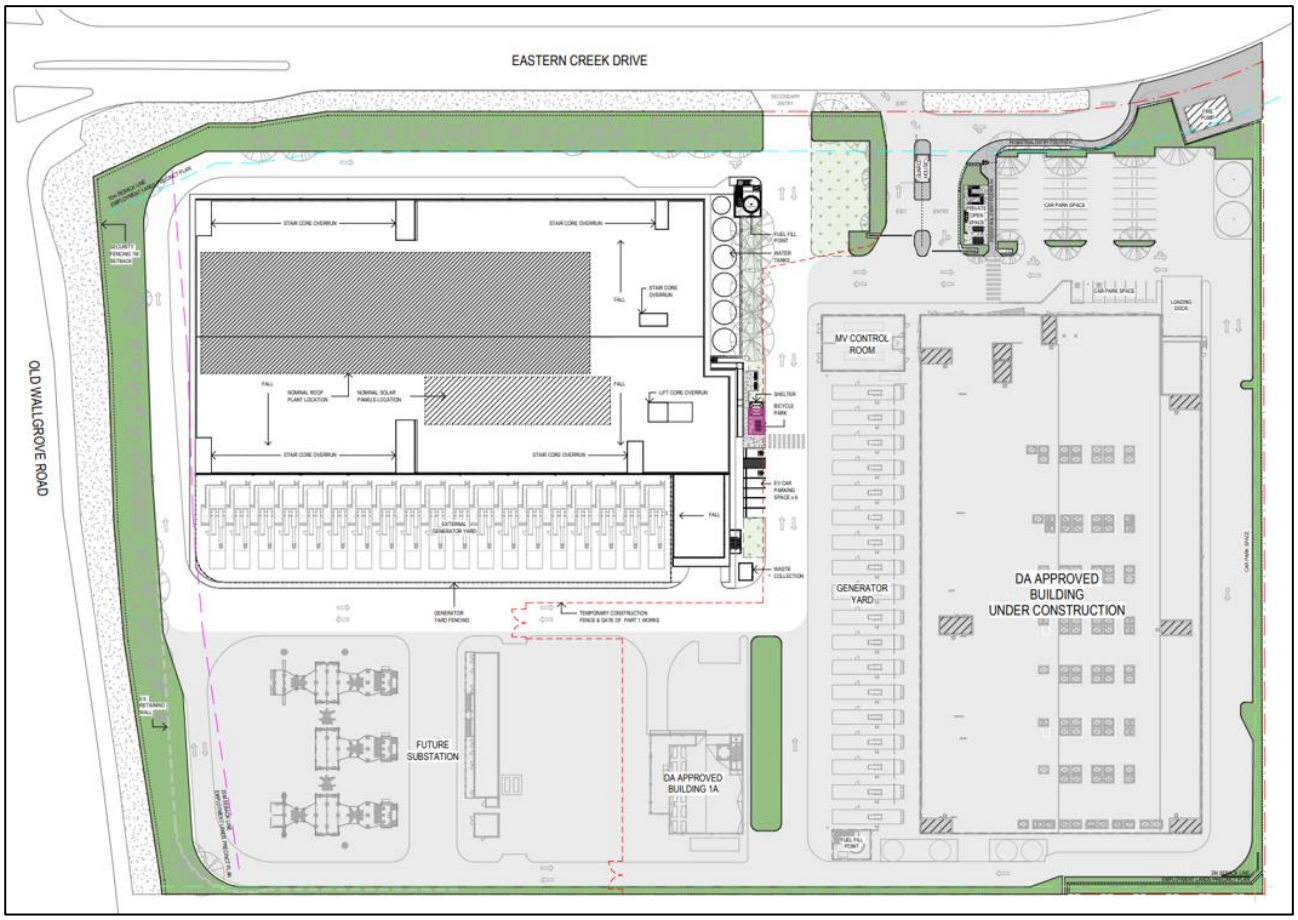


Figure 4-5: Bicycle Parking Location

4.7 Emergency vehicle access

Emergency vehicles such as ambulances and fire trucks will be able to access the site via either entrance shown in Figure . Once entering the site, sufficient width is provided for emergency vehicles to circulate around the development to gain access to various parts of the site. In the event of an emergency, servicing vehicles within the site will be directed to areas where they would not obstruct the circulation loop for any emergency vehicles.

Technical drawings showing the swept paths of HRVs and AVs using the internal road network are presented in Appendix 1 of this report. These vehicles will be bigger than any emergency vehicle used, therefore emergency vehicles will be able access all part of the development that HRVs and AVs can get to.

Figure 4-6 shows the locations of the various point that emergency vehicles will need to access in the event of a fire. This includes the hydrant booster (1) at the site entrance, the sprinkler booster and the fire pump (2) located outside the boundary of the development on Eastern Creek Drive. Fire trucks will also need to be able to circulate the proposed development building (3).

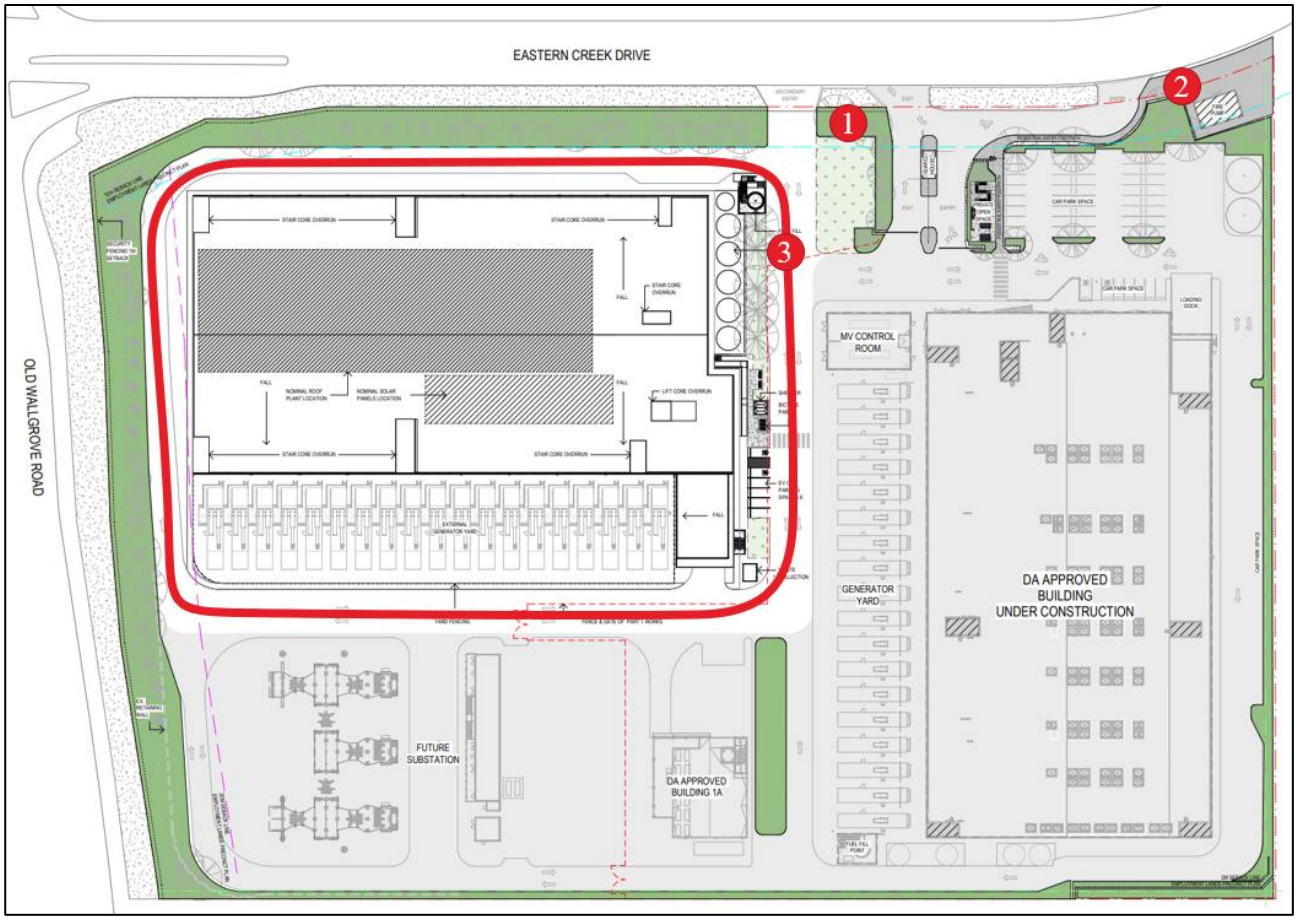


Figure 4-6: Emergency Vehicle Access Points

4.8 Sustainable travel initiatives

The traffic assessment considers all visitors using private vehicles to ensure the impact assessment was robust. In operation, a variety of measures will be used to encourage sustainable travel patterns to and from the Proposal including:

- Producing a detailed Green Travel Plan and appointing a coordinator;
- Shared car travel for staff with parking bays prioritised for employees choosing to car share; and
- Adequate cycle parking and end of trip facilities.

This is discussed in Chapter 6 in more detail.

5. Outline Construction Pedestrian Traffic Management Plan (CPTMP)

The following proposed traffic management principles should be adopted during the construction period:

- Disruption to all road users during the construction period would be kept to a minimum.
- Traffic control would need to be provided to manage and regulate traffic movements during construction.
- Construction and delivery vehicles entering or leaving the site compound and/or stockpile sites would use arterial roads. These movements would be restricted to non-peak traffic periods.
- The property access would be maintained throughout the construction period with suitable alternative access arrangements provided otherwise.
- Clear signage and alternate pedestrian routes should be organised if footpaths are affected.
- It is recommended that a detailed CPTMP is developed as part of the detailed design stage.

5.1 Proposed Working Hours

Depending on the construction stage, the workforce which includes both construction and design personnel will vary. The operational hours of the construction site will be 24 hours a day, seven days a week as required.

In some cases, it may be necessary to undertake night works to minimise disruption to/from traffic. Further assessments of these requirements would be undertaken once the detailed design stage is undertaken, and the requirements are known. All night works would be undertaken in accordance with the TfNSW Environmental Noise Management Manual (2001): Practice Note vii – Roadworks outside normal working hours, as well as the Office of Environment and Heritage Interim Construction Noise Guideline (DECC 2009).

5.2 Truck routes and controls

Construction vehicles would be mostly restricted to the state road network for access to the site and vehicles will likely originate from this network. However due to the location of the site within an industrial area, it is unlikely that any restrictions will be put in place for heavy vehicles.

A detailed CPTMP will need to be prepared for the works following approval of the DA.

5.3 Staging

While a contractor is not yet appointed, it will be important to understand construction methodology so that the vehicle access constraints can inform this discussion.

6. Framework Green Travel Plan

A Green Travel Plan (GTP) is a package of measures put in place by the development occupants to try and encourage more sustainable travel. It is a means for a development to demonstrate a commitment and take a pro-active step towards improving the environmental sustainability of its activities. More generally, the principles of a GTP are applied to all people travelling to and from a site. Government authorities are placing increasing emphasis on the need to reduce the number and lengths of motorised journeys and in doing so encourage greater use of alternative means of travel with less negative environmental impacts than the private car.

6.1 Objectives

The main objectives of the GTP are to reduce the need to travel and promote sustainable means of transport. The more specific objectives include:

- Higher mode shares for public transport, cycling and walking to work journeys;
- Ensuring adequate facilities are provided at the site to enable the tenants and visitors of the development to commute by sustainable transport modes;
- Reduced number of private vehicle journeys associated with business travel;
- Facilitating the sustainable and safe travel of occupants; and
- Raised awareness of sustainable transport amongst residents of the development.

6.2 Potential Measures

Table 19 outlines a suite of potential measures to be implemented as part of the GTP, which can be developed further as the development progresses.

Action	Responsibility
Cycling	
Provide sufficient cycle parking to meet needs, which is easily accessible and secure	Developer
Provide adequate cycle parking facilities for visitors	Developer
Ensure cycle parking is clearly visible or provide signage to direct people to cycle facilities	Developer
Provide adequate showering and locker facilities for active travel users	Developer
Produce a map showing cycle routes and bike stands in the area	Operator
Walking	
Produce a map showing safe walking routes to and from the site with times, distances to local facilities, such as shops and bus stops	Operator
Public Transport	
Develop a map showing public transport routes in the area	Operator
Put up a noticeboard with leaflets and maps showing the main public transport routes to and from the site	Operator
Display public transport maps and timetable boards in prominent locations.	Operator
General Actions	
Promotion including: • An events calendar – 3-4 events per year. Best in conjunction with state-wide events such as National Bike Week and Bike2Work Day, National Walk to Work Day.	Operator

6.3 Monitoring and review

In order for the GTP to be effective, it must be reviewed on a regular basis and be championed by a travel coordinator. It is important to ensure that the GTP is meeting its objectives and having the intended impact on car use and transport choices. The GTP should initially be reviewed at least 18 months after occupation, to allow activity levels to settle at the site. It could then be reviewed on a yearly (or as needed) basis by undertaking travel surveys of staff and other users.

7. Conclusion

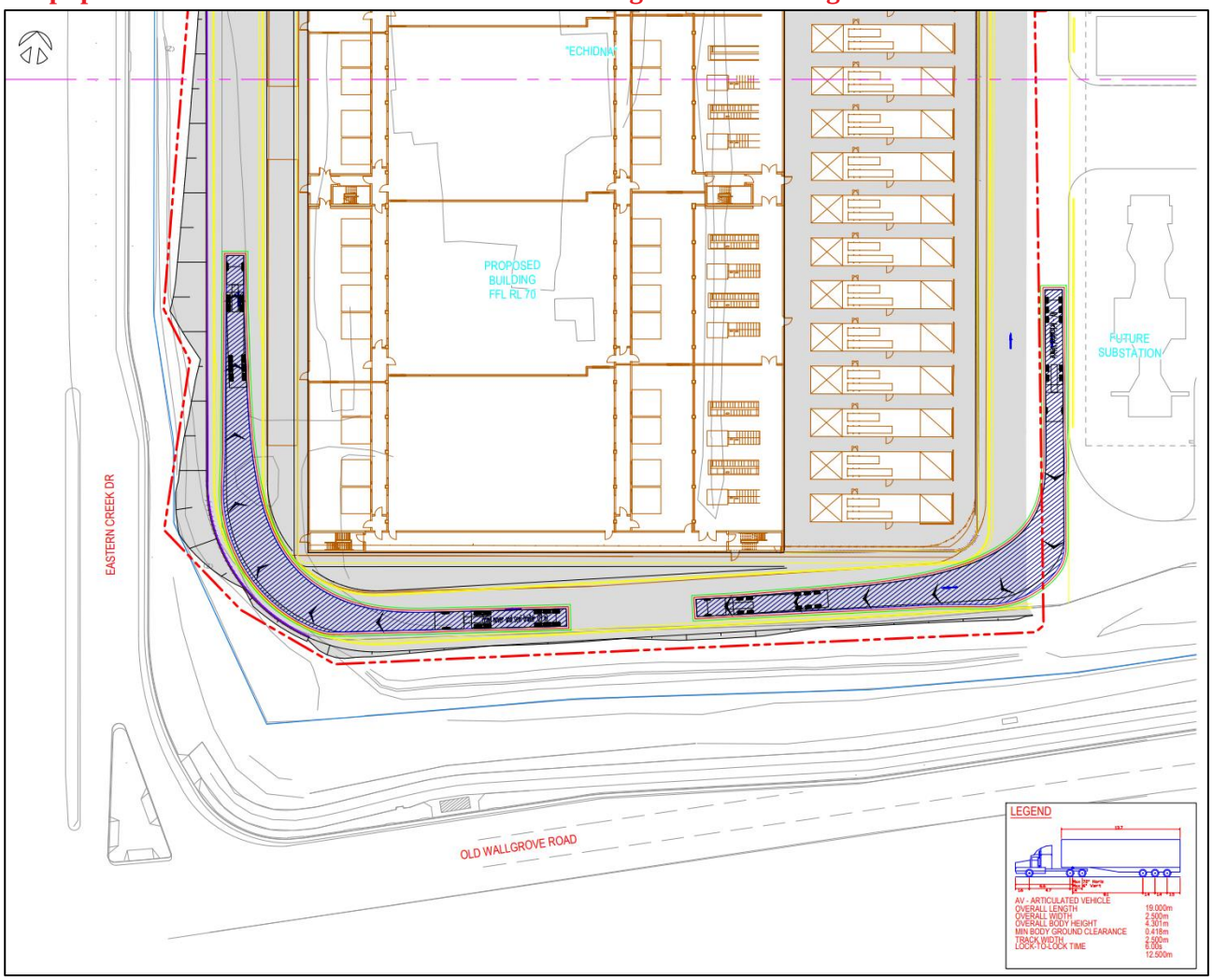
This assessment has described the potential traffic and transport impacts of the proposed data centre development at 10 Eastern Creek Drive, Eastern Creek NSW. Key findings of the review are as follows:

- The development is anticipated to have minimal impacts on the road and public transport networks during both the operation and construction of the proposed development.
- The site is located Blacktown City Council Local Government Area along Old Wallgrove Road.
- An analysis of existing workers, travel to work census data indicate that 97% of workers in the area use private vehicles to get to work.
- It is expected that the proposal will generate approximately 54 trips during the AM and PM peak hours during operation and the construction stage of the prosed development is expected to generate approximately 68 trips during the AM and PM peak hours.
- The SIDRA modelling results show that in the existing scenario the Old Wallgrove Road/Eastern Creek Drive intersection operates with a LoS A and then during the construction stage it operates with an LoS B, taking into account the traffic generation from cumulative developments. It functions similarly at LoS B during both peak hours in the construction scenario.
- The site is expected to require 38 parking spaces to facilitate all staff and visitors that will be on site at one time. This parking requirement will be catered for in the existing 64 spaces that are already provided on the site and there will be an additional six parking bays provided by this proposal.
- The proposal is subject to a minimum bike parking provision of six spaces, and notes challenges in sustainable transport access externally.
- While an outline Green Travel Plan and Construction Pedestrian and Traffic Management Plan have been prepared, detailed versions of these plans will be required to be prepared at a later stage.

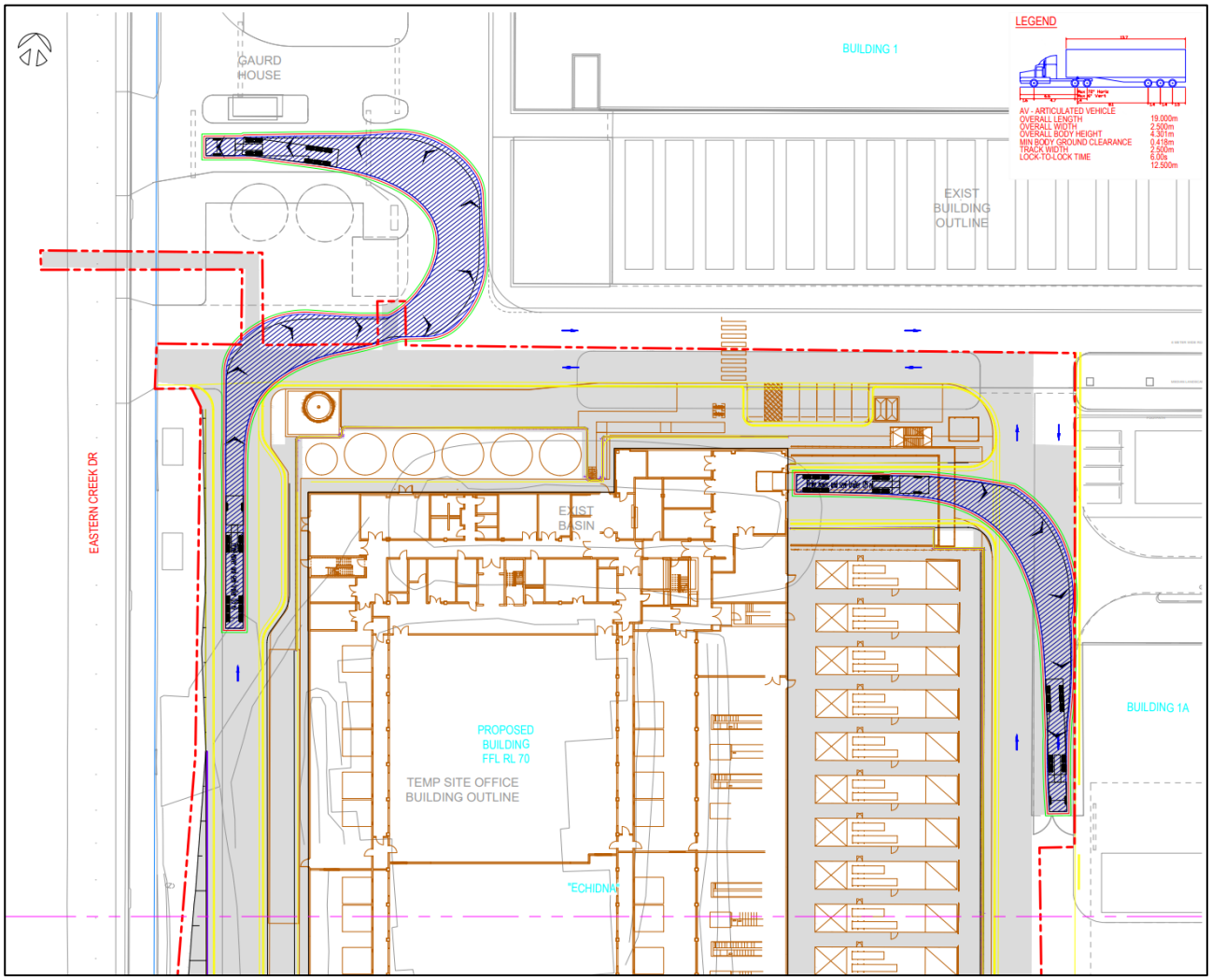
In summary, the proposal is considered to have a small impact on the local transport network.

Appendix 1 – Swept Path Analysis

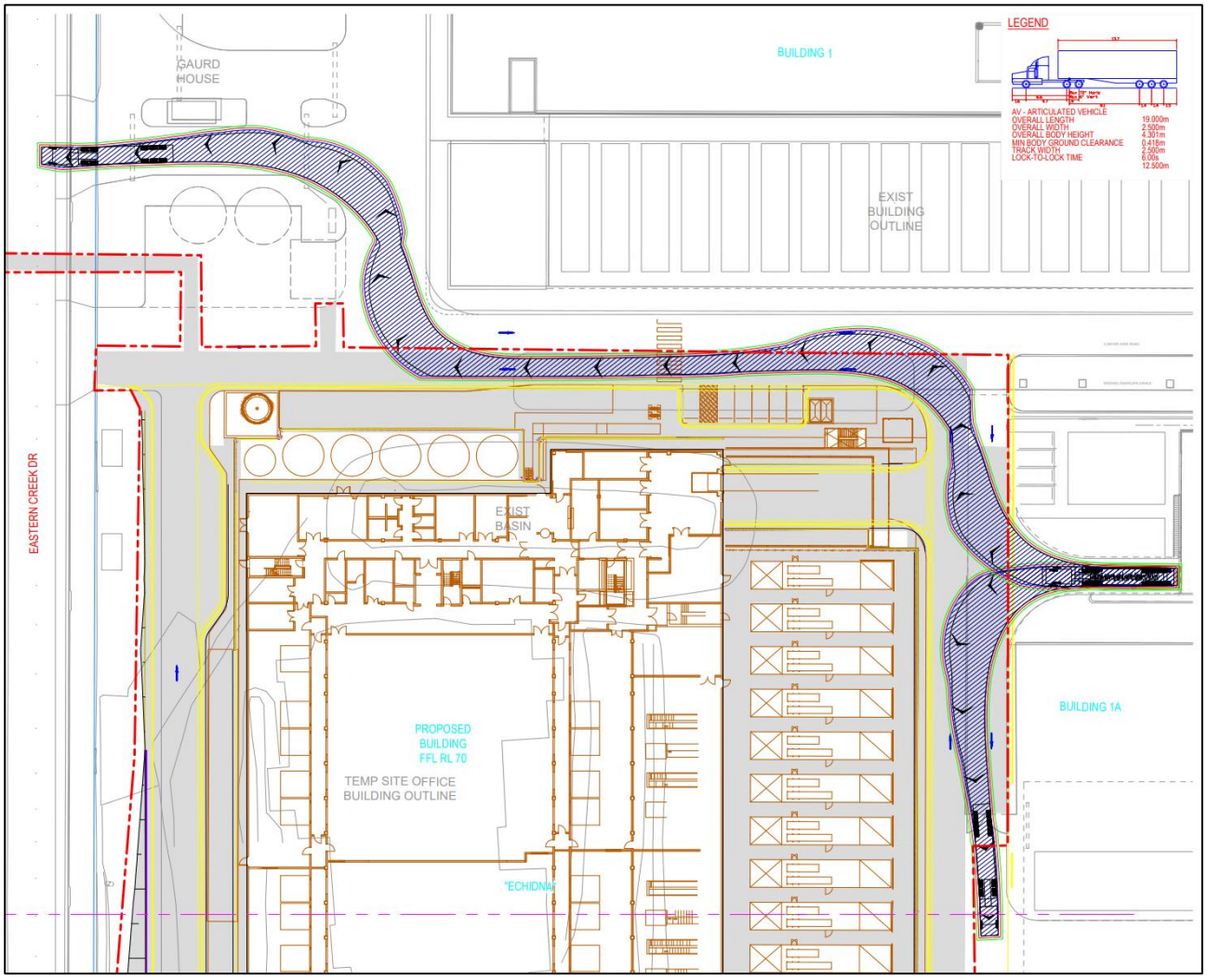
Swept path for 19-metre articulated vehicle circulating around building



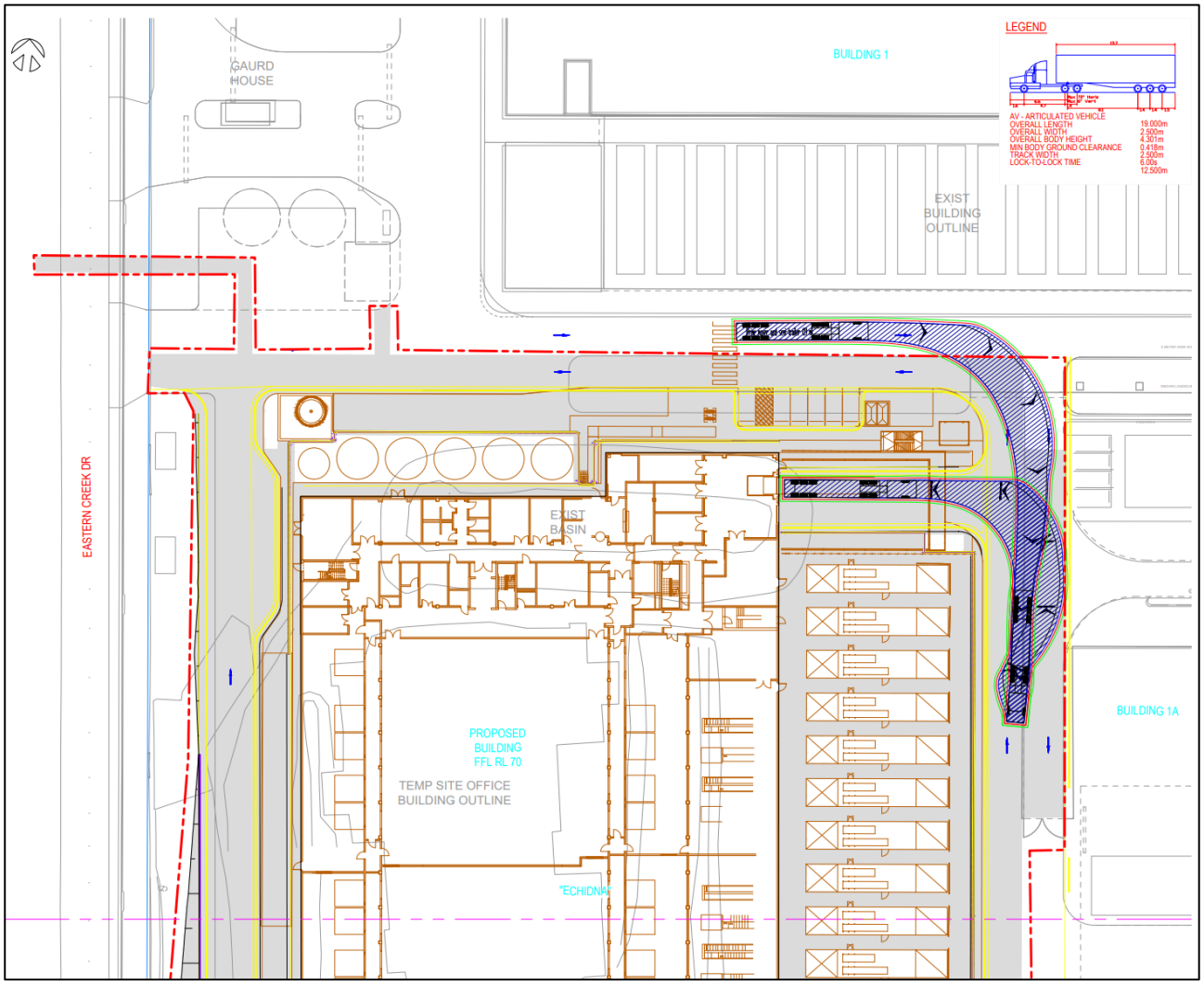
Swept path for 19-metre articulated vehicle exiting site from circulation road and exiting from loading bay



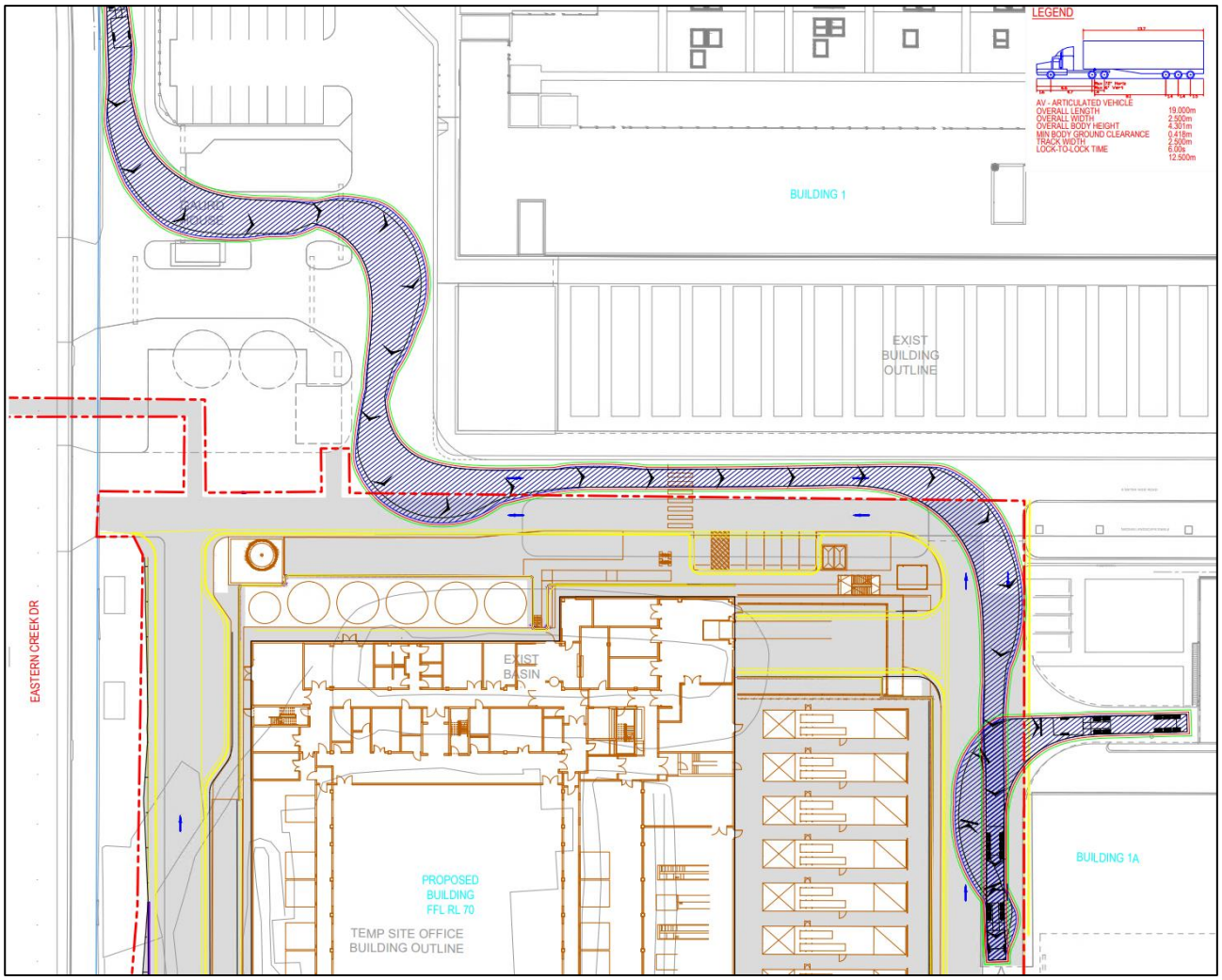
Swept path for 19-metre articulated vehicle exiting site and exiting from loading bay



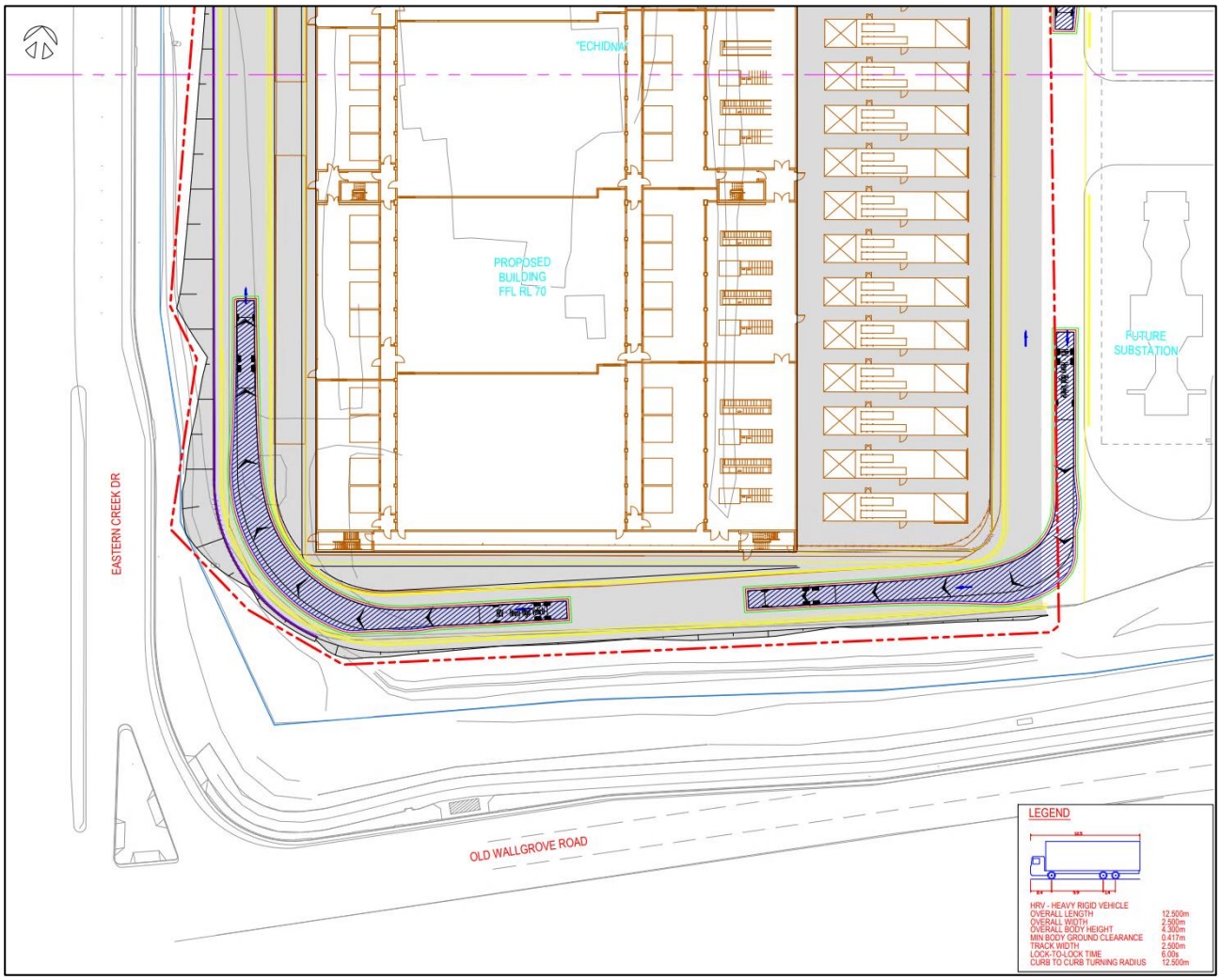
Swept path for 19-metre articulated vehicle circulating and then reversing into loading bay



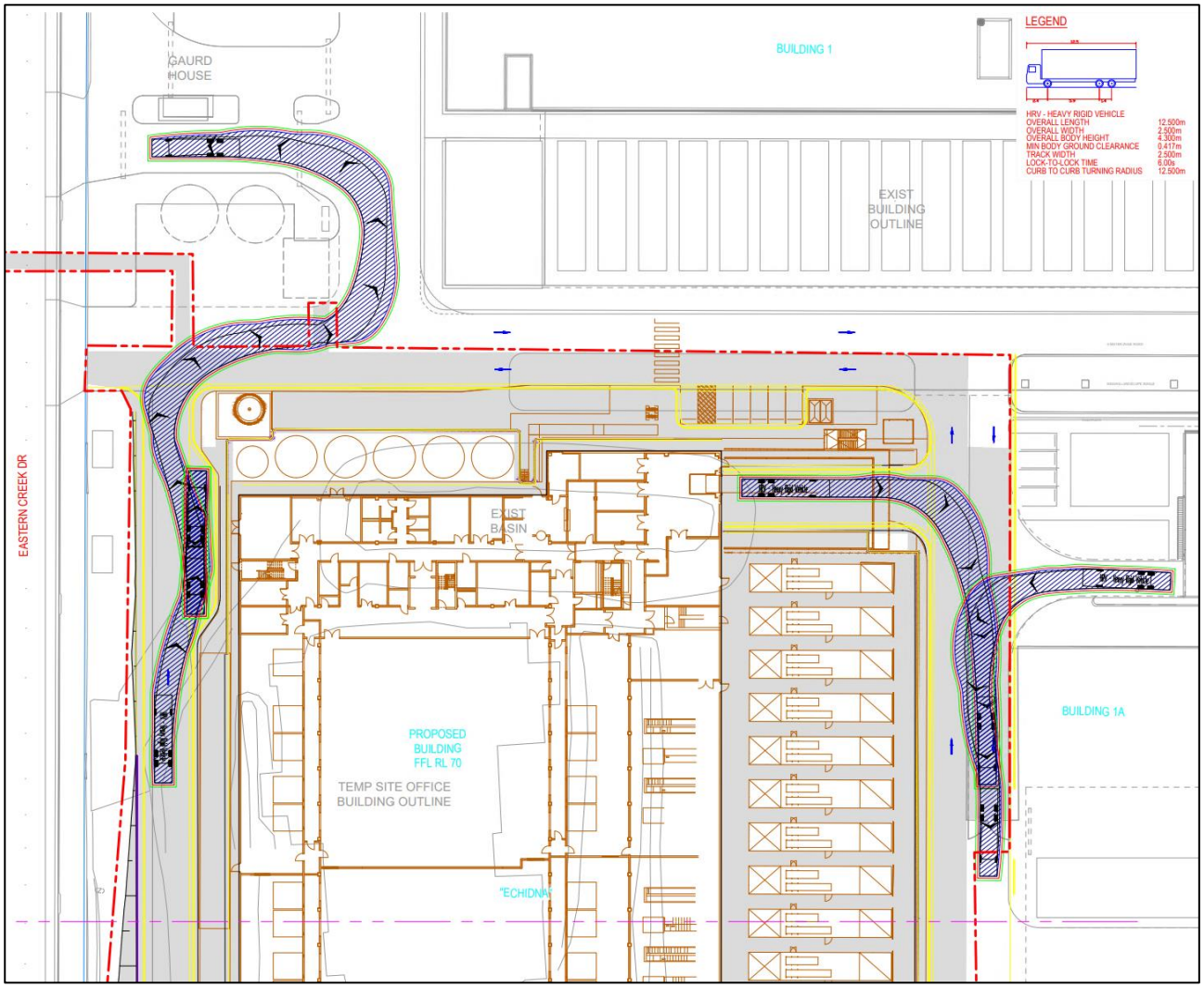
Swept path for 19-metre articulated vehicle entering the site, circulating and then reversing into the loading bay



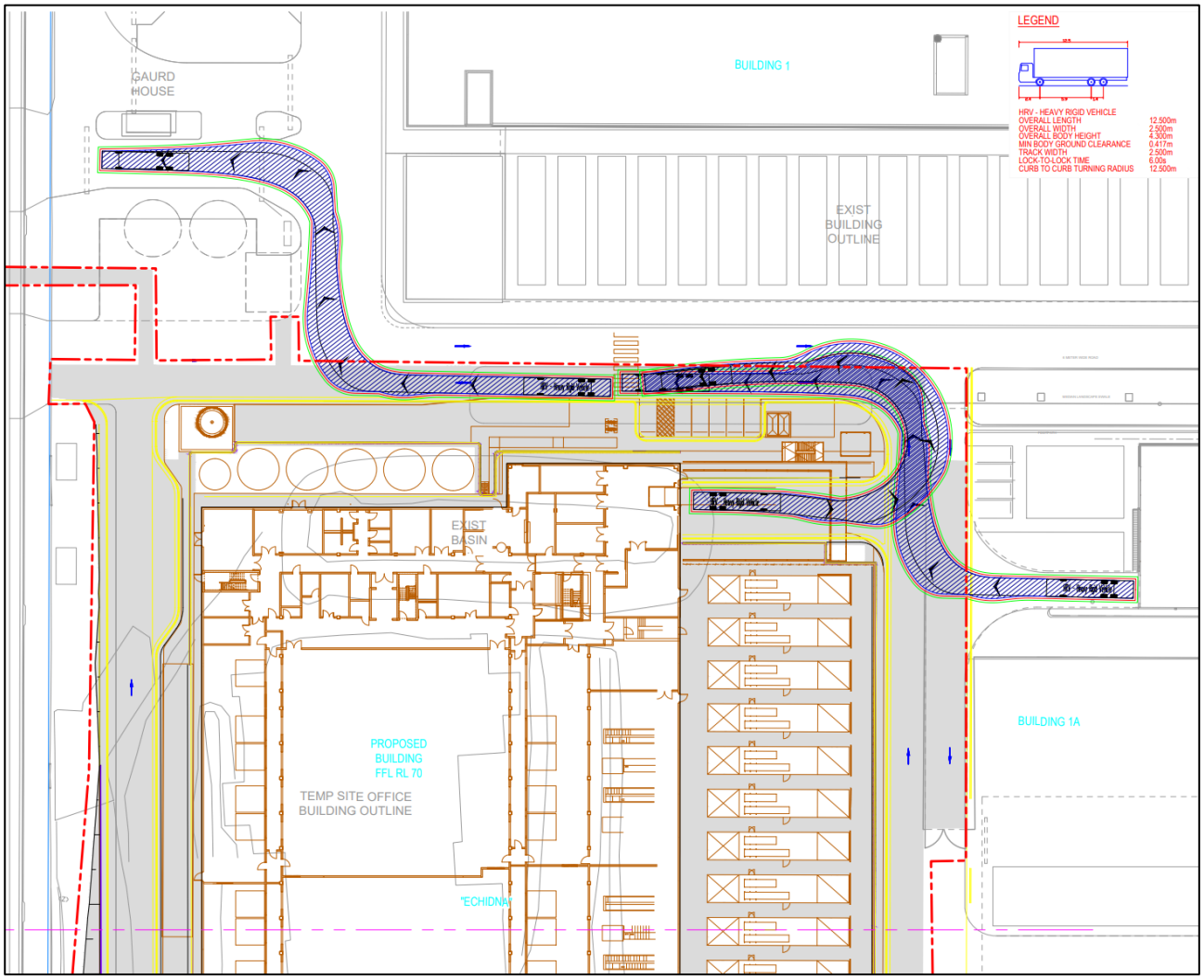
Swept path for 12.5-metre heavy rigid vehicle circulating around building



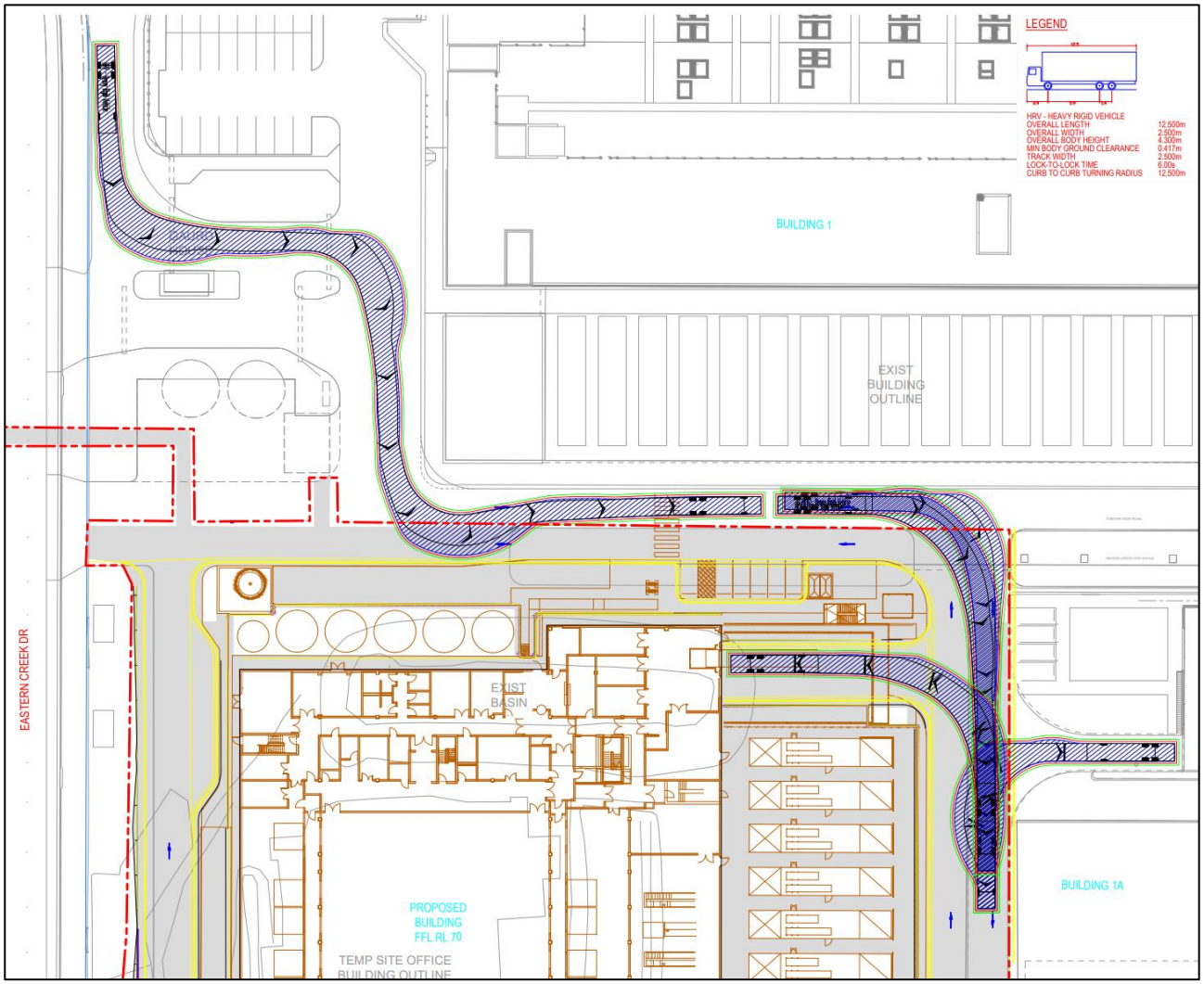
Swept path for 12.5-metre heavy rigid vehicle exiting the site from circulation road, entering and exiting the set down bay and exiting from both loading bay



Swept path for 12.5-metre heavy rigid vehicle exiting the site and exiting from both loading bays



Swept path for 12.5-metre heavy rigid vehicle entering the site, circulating and then reversing into both loading bays



Appendix 2 – Old Wallgrove Road-Eastern Creek Drive Intersection SIDRA Modelling Results