Industrial Warehouse Development: Alspec Warehouse

Traffic Impact Assessment

31 July 2024

HB&B Property

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Traffic Impact Assessment

31 July 2024

Our Ref:

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Acronyms and Abbreviations

Acronym	Definition
AIBP	Alspec Industrial Business Park
EP&A Act	Environmental Planning and Assessment Act 1979
TIA	Traffic Impact Assessment
GTP	Green Travel Plan
HV	Heavy Vehicle
LV	Light Vehicle
DA	Development Approval

1 Introduction

The SSDA application is seeking approval to construct the Alspec Warehouse (Lot 1) within the Alspec Industrial Business Park (AIBP) at 221 Luddenham Rd, Orchard Hills. The site is situated within the larger Alspec Industrial Business Park (AIBP) at the same address.

1.1 Background

HB&B Property Ltd has engaged Arcadis to undertake a Traffic Impact Assessment for the proposed Alspec Warehouse (Lot 1) development at 221 Luddenham Road, Orchard Hills.

The proposal is to develop a 40,411 m^2 warehouse at the above address to accommodate a mix of warehouse, industrial and office land uses. The AIBP development is proposed to be completed by 2027, with various road and other infrastructure works required. In preparing this assessment, the subject site and its surroundings have been inspected, along with development plans. Relevant traffic and parking data have been reviewed and analysed.

1.2 Scope of the report

This report has been structured as follows, to address the traffic requirements of SSDA SEARs. A register of the SEARs requirements relevant to this report has been provided in Appendix D:

- Section 2 describes the existing conditions in relation to the site, including surrounding land uses, the road network and available transport modes.
- Section 3 outlines the key developments and planned transport network changes relevant to the site
- Section 4 outlines the development proposal for the construction of the Alspec warehouse.
- Section 5 outlines the expected traffic generated by the development during the operational and construction phase and their associated impact on the surrounding road network.
- Section 6 outlines the expected parking requirements associated with the proposed development in accordance with local relevant planning policies.
- Section 7 assesses the access and internal design of the warehouse, describing transport movements and identifying any potential issues from the current DA plans.
- Section 8 provides a summary of the TIA.

1.3 Reference documents

In preparing this report, reference has been made to the following documents:

- Schedule of Classified Roads and Unclassified Regional Roads (Roads and Maritime, 2014)
- Development Control Plan (DCP) (Penrith Council, 2021)
- Guide to Traffic Generating Development (Roads and Maritime, 2002)
- Technical Direction (TDT 2013/04a) (Roads and Maritime, 2013)
- 221 Luddenham Road, Orchard Hills –Alspec Industrial Business Park Traffic Impact Assessment (Arcadis, April 2023)

2 Existing conditions

2.1 Site location

The subject site is located on Luddenham Road, south of Patons Lane, in Orchard Hills. Located approximately 30 kilometres west of Parramatta CBD and is part of the larger Alspec Industrial Business Park (AIBP) development. The AIBP site is irregular in shape, with frontages across both Luddenham Road and Patons Lane.

The subject site is broadly rectangular, encompassing a total area of 83,563 m^2. It features frontage to an internal road within the AIBP site, providing access to the broader road network via Patons Lane and Luddenham Road. The site location is shown in Figure 2-1, with the location of the Alspec site within the AIBP development shown in Figure 2-2.

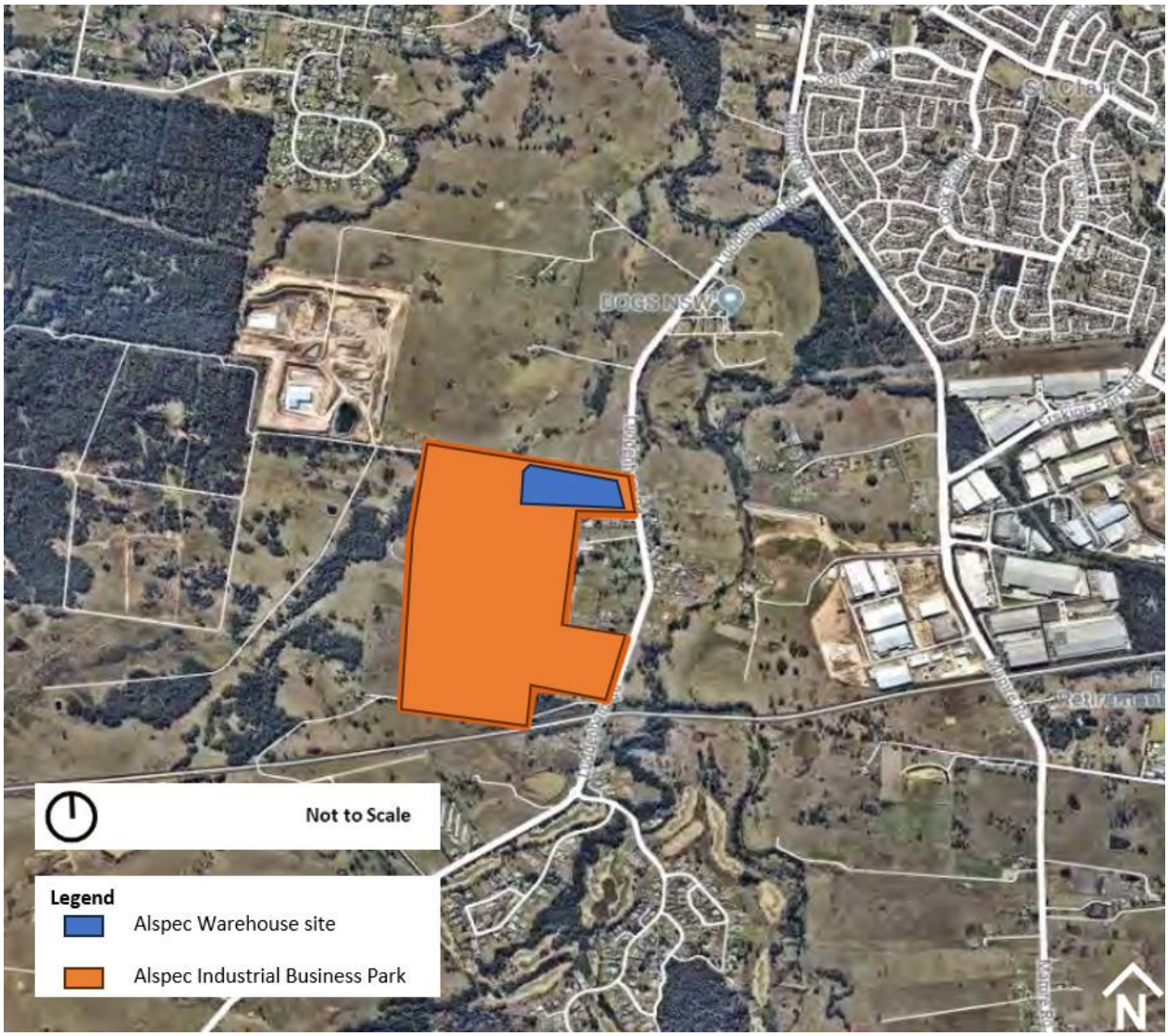


Figure 2-1 AIBP site location

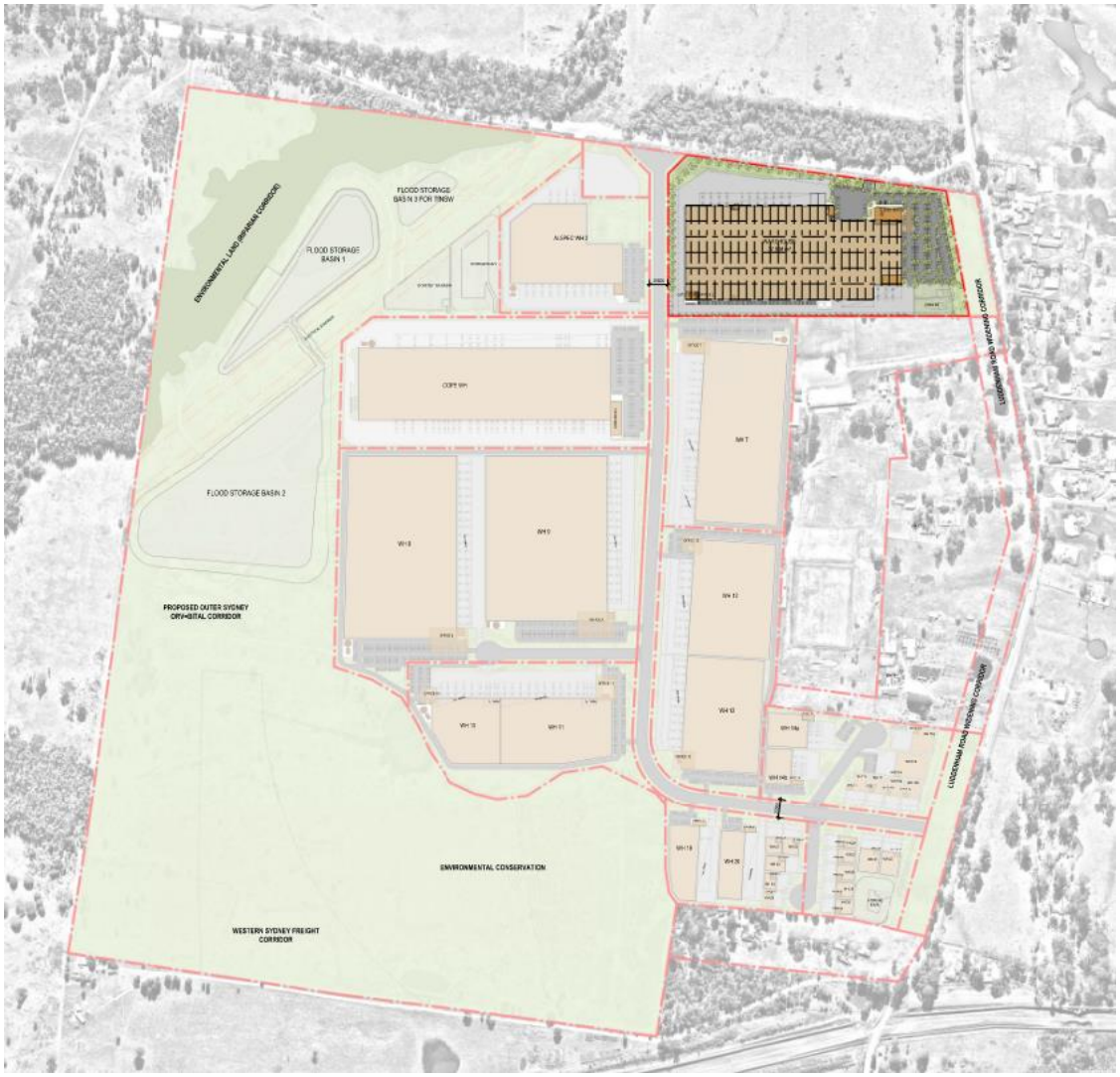


Figure 2-2 Location of the Alspec site within the AIBP development

2.2 Land use

As shown in Figure 2-3, the subject site is in a General Industrial Zone (E4). The region surrounding the site is a mix of Environmental Conservation (C2) and Rural Landscape Zone (RU2). To the east of Mamre Road, the more common land uses are General Industrial (IN1) and Low Density Residential (R2).

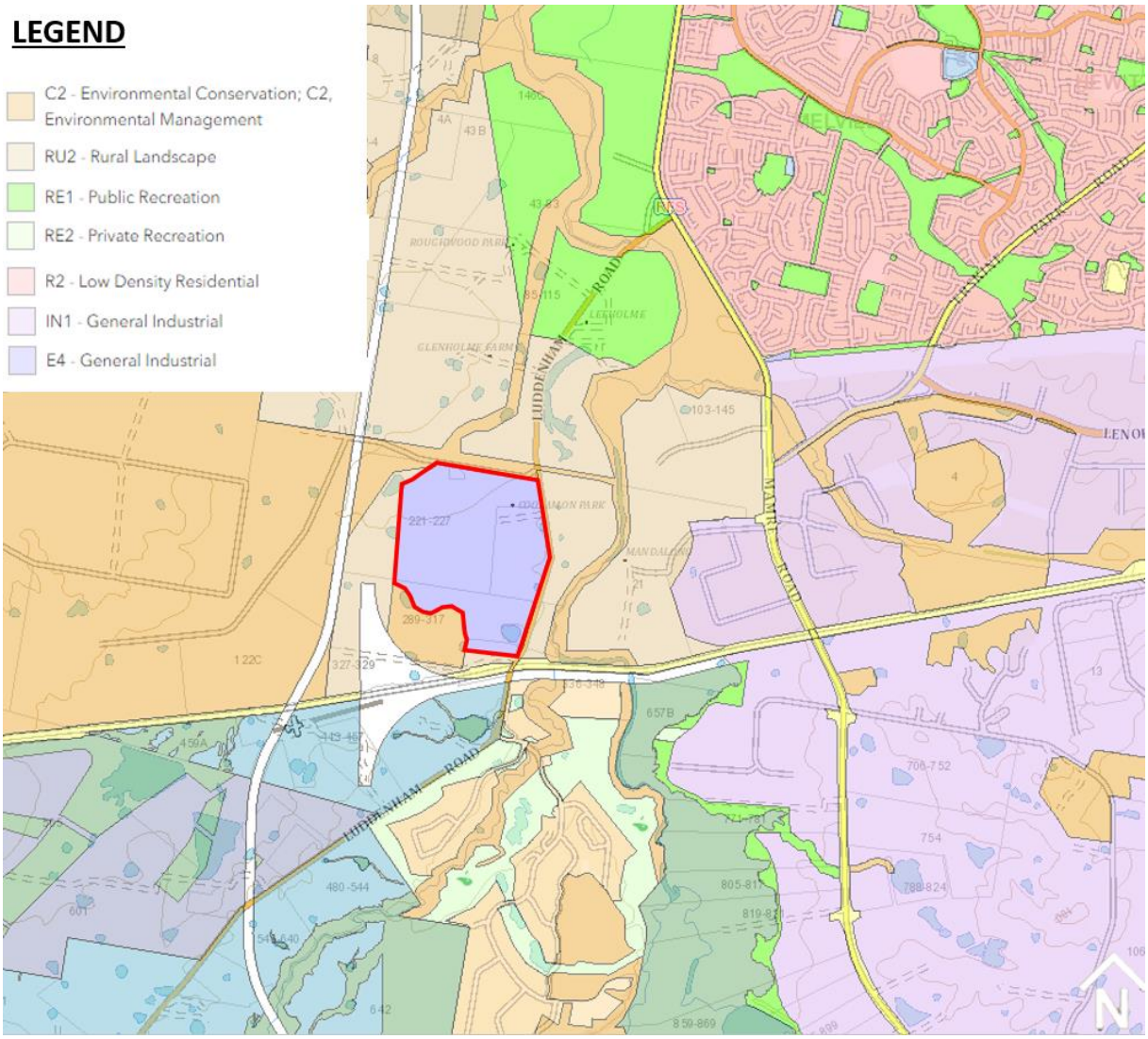


Figure 2-3 Land Zoning Map (Source: ePlanning Spatial Viewer – NSW Planning Portal)

2.3 Road network

The existing roads which will be impacted by the development application are described below:

Luddenham Road

Luddenham Road is a regional road under the control and management of Penrith City Council. Near the site, Luddenham Road is aligned in a general north-east/south-west direction. It is a two-way road configured with a two-lane, seven-metre-wide carriageway, set within an approximately 21-metre-wide road reserve. Luddenham Road carries approximately 3,000 vehicles per day and has a posted speed limit of 80 km/h. Photos of Luddenham Road in the vicinity of the site are provided in Figure 2-4 and Figure 2-5.

Figure 2-4 Luddenham Road, facing north

Figure 2-5 Luddenham Road, facing south

Patons Lane

Patons Lane is a local road under the control and management of Penrith City Council. Near the site, Patons Lane is generally aligned in an east/west orientation. It is a two-way road configured with a two-lane, 6.6- metre-wide carriageway with 1.2-metre-wide sealed shoulders on both sides of the road, set within a road reserve that is approximately 19 metres wide. Patons Lane carries approximately 150 vehicles per day and has a posted speed limit of 50 km/h. Photos of Patons Lane in the vicinity of the site are provided in Figure 2-6 and Figure 2-7.

Figure 2-6 Patons Lane, facing west

Figure 2-7 Patons Lane, facing east

2.4 Public transport network

A review of the public transport available in the vicinity of the site indicates that there are three bus services (Routes 775, 776 and 779) that operate in the St Clair/ Erskine Park area to the northeast of the site. No bus services connect past the site to the south. Overall, the area is currently underserviced by public transport. However, the level of service provision reflects the low travel demands of the locality. Figure 2-8 shows a map of the existing public transport network for the Orchard Hills area.

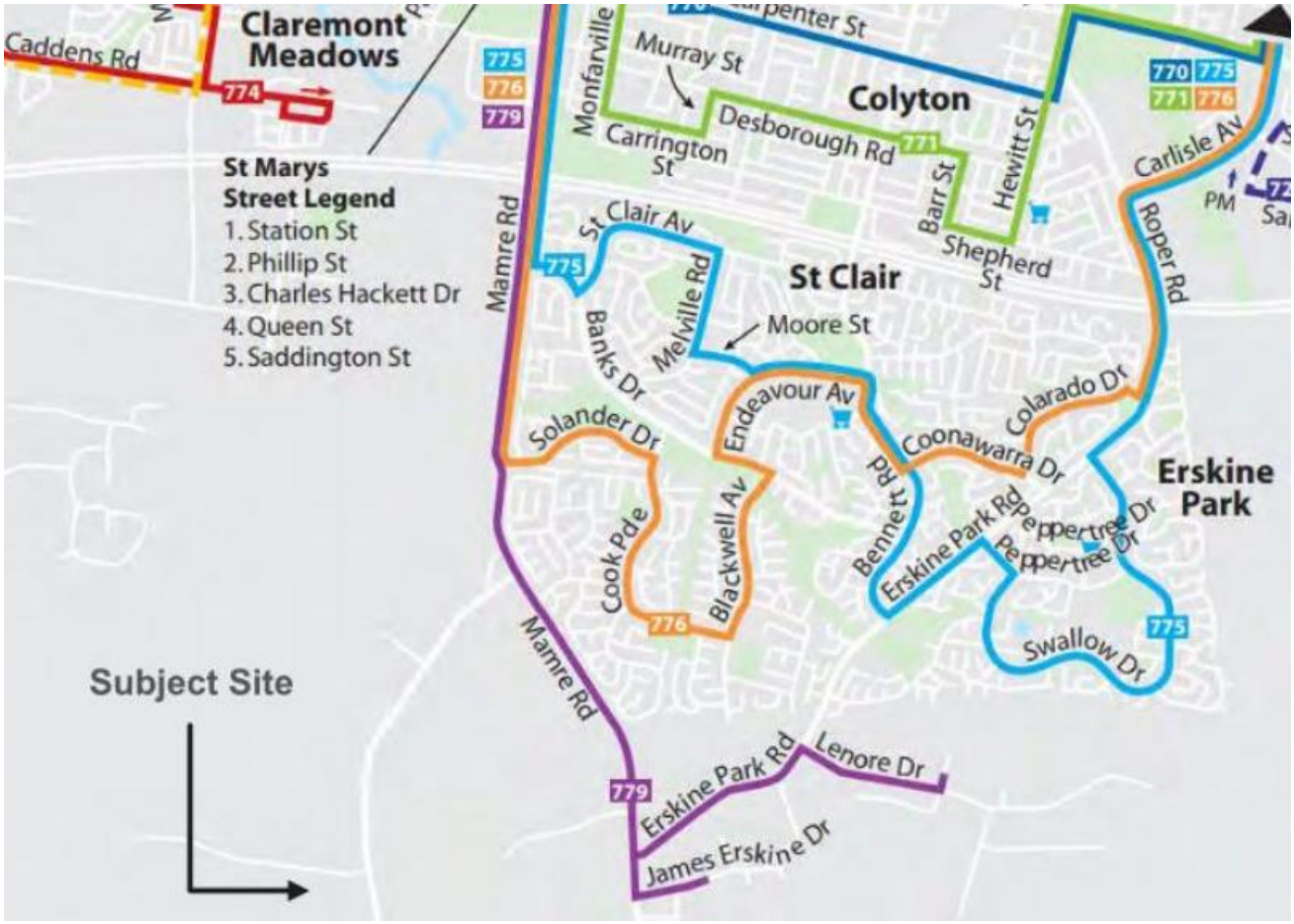


Figure 2-8 Existing Public Transport Network - Orchard Hills area

2.5 Active transport

There is currently limited pedestrian or cyclist infrastructure provided in the vicinity of the site, mainly due to the nature of land use in the vicinity and the limited demand for such facilities at present.

2.6 Road safety

Historical crash data has been evaluated as part of this assessment to obtain an understating of current road safety characteristics and trends for Luddenham Road between Mamre Road and Elizabeth Drive. A summary of the crash statistics for crashes occurring along Luddenham Road is provided in Table 2-1.

Table 2-1 Crash history along Luddenham Road for the five-year period between 2018-2022

Crash Severity	Year				
	2018	2019	2020	2021	2022
Non-casualty	-	1	4	2	1
Minor/other injury	-	-	2	1	-
Moderate injury	3	2	1	1	4
Serious injury	1	-	1	3	1
Fatal	-	-	-	-	-
Total	**4**	**3**	**8**	**7**	**6**

The crash data revealed:

- A total of 28 crashes occurred along the length of Luddenham Road between Mamre Road and Elizabeth Drive over a five-year period between 2018 and 2022, averaging 0.015 per day or 5.6 per year.
- 71 per cent of the crashes resulted in an injury, and there were no fatalities recorded.
- 29 per cent involved vehicles travelling off the road and hitting an object resulted in an injury, and there were no fatalities recorded.
- 0 per cent were multi-vehicle crashes.
- 39 per cent of crashes occurred in dusk or darkness conditions.
- 4 per cent of crashes involved vehicles striking animals while travelling along the roadway.

The crash statistics indicate that a relatively high number of crashes involved vehicles colliding objects after veering off the roadway. Any future upgrade to Luddenham Road should address this trend and related safety issues.

3 FUTURE DEVELOPMENT AND ROAD NETWORK CHANGES

The area and road network around the site are expected to undergo significant changes over the next 20 years to support the growth of the broader Greater Penrith to Eastern Creek (GPEC) Growth Area, Western Sydney Employment Area (WSEA) and the Aerotropolis. This section outlines key transport policy influences, as well as land use and road network changes within proximity to the site.

Figure 3-1 highlights the location of these projects in relation to the subject site.

Figure 3-1 Proposed Transport Network - Orchard Hills area

3.1 State Transport Policy

The Future Transport Strategy

The Future Transport Strategy (The NSW Government) was published in September 2022 and is an update of NSW's Future Transport 2056: Shaping the Future (2018). The Strategy contains a wide range of planning vision, directions, and outcomes on how transport can support the population and economy.

The Future Transport Strategy aims to enable safe, healthy, sustainable, accessible, and integrated passenger and freight journeys in NSW. It outlines the direction for investment, services, and policy to improve connections for people and goods. This will revitalise the six cities and allow people and goods to move seamlessly between the cities.

Existing and potential transit connections, together with new technology and innovation, will make the broader transport network more responsive to demand and better able to manage congestion in the future. For the six

cities identified, more specific outcomes listed as part of the strategy which will benefit the Site's transport context, include:

- C1.1 – Enhance 30-minute metropolitan cities

The proposal will create jobs within Luddenham and provide jobs for residents in proximity to the development. According to the economic analysis conducted by Urbis[1] the development is forecasted to generate up to 3,730 direct jobs. This will enable residents living within future land release areas more job opportunities within 30 minutes of their residence.

- E2.1 – Promote travel behaviour change to manage networks

Attractive infrastructure, appropriate policies, and programs are required to encourage more sustainable travel behaviours and reduce congestion. The development will contain infrastructure such as shared paths, end of trip facilities, and secure bicycle parking to promote more people walking and people cycling. The shared paths within the site should connect to future cycling routes to be located on Luddenham Road.

A Green Travel Plan and Travel Access Guide influenced by Travel Demand Management will influence the policies and encourage a modal shift for more sustainable modes of travel.

- P1.3 – Ensure public transport is available on day one

The future Luddenham station as part of the Sydney Metro Western Sydney Airport line will provide crucial public transport infrastructure required for the site. Rapid bus networks are proposed along Luddenham Road. The provision of rapid bus stops within proximity of the proposal will provide efficient and attractive journeys via public transport.

3.2 Key developments and land use changes

The site is in proximity to a number of region and city shaping development opportunities that will shape economic activity and movement into the future. These will attract significant freight, logistics, advanced manufacturing, health, education and science activities and jobs that will direct investment across the metropolitan area.

Key projects that will influence demands around the subject site include:

- **The Western Sydney Airport** is a committed new international airport in Badgerys Creek. Set to open in 2026, the airport will serve passenger and freight operations and is expected to generate over 30,000 jobs from airport operations by 2060.
- **The Sydney Science Park** is a proposed new specialised centre comprising of a range of research and development, employment, education, retail, and residential uses located at 565-609 Luddenham Road, Luddenham, approximately 2.5 kilometres south of the subject development.

3.3 Transport network improvements and changes

The Australian and NSW Governments are progressively planning for and funding the delivery of a broad range of transport infrastructure improvements across the Greater Western Sydney region. These projects are intended to support an integrated transport solution for the region and capitalise on the economic benefits from developing the new Western Sydney airport and the broader land use changes across the area.

Key infrastructure upgrades in relation to the subject site include:

- **The Sydney Metro – Western Sydney Airport**, a new metro railway connecting the new Western Sydney International Airport with the Greater Western Sydney, which provides connection to the existing Sydney Trains suburban T1 Western Line. The new rail line consists of six stations, including one at Luddenham which is around one kilometre south of the subject site and one at Orchard Hills 3 kilometres north of the

[1] *Economic Analysis to Underpin the Planning Proposal to Rezone 21-227 & 289-317 Luddenham Road, Orchard Hills (Dated 30th of June 2020)*

subject site. The station will serve a future employment, research, and knowledge-based employment precinct, along with a mixed-use residential development. The Luddenham Station will provide an interchange with future bus and active transport networks.

- **The Outer Sydney Orbital**, which will provide for a future north south motorway and freight rail line to support the growth of Western Sydney and the distribution of freight across Sydney and regional NSW. The recommended alignment runs directly adjacent to the subject site, and it is expected that some portion of land would be acquired for Outer Sydney Orbital project in the future.
- **The M12 motorway project** will provide direct access between the Western Sydney Airport at Badgerys Creek and Sydney's motorway network, connecting the M7 Motorway, Cecil Hills, and The Northern Road, Luddenham. The link forms a key part of the Western Sydney Infrastructure Plan, a joint initiative of the Australian and NSW governments to fund a $4.1 billion road and transport program for Western Sydney.
- **The Mamre Road upgrade**, which will provide an additional lane in each direction for the 10-kilometre section between the M4 Motorway and Kerrs Road, as well as a wide central median for the provision of an additional traffic lane in the future. Preliminary designs indicate the intersection of Luddenham Road and Mamre Road, will be converted to traffic signals as part of this project. The NSW Government has committed $220 million to upgrade Stage 1 of these work between the M4 and Erskine Park Road.
- **The Elizbeth Drive Upgrade**, which will provide an additional lane in each direction between the M7 Motorway at Cecil Hills and The Northern Road at Luddenham, with future provision for additional lanes. Preliminary designs indicate the intersection of Luddenham Road and Elizbeth Drive, will be converted to traffic signals as part of this project.
- **The proposed Western Sydney Freight line**, which will be a dedicated freight rail line running from the future Outer Sydney Orbital near Luddenham to the M7 Motorway. This new freight line will allow the transport of goods by rail across Western Sydney, linking growing industrial areas and distribution centres. The current rail alignment is to the south of the subject site.
- **The potential upgrade of Luddenham Road**, which will provide an additional lane in each direction along the length of Luddenham Road between Mamre Road and Elizabeth Drive, with future provision for additional lanes. This initiative has been identified in broader infrastructure planning assessments for the region.

4 Development proposal

The proposal is for the development of an 83,563 m^2 parcel of land as part of the wider Alspec Industrial Business Park development. The Alspec Warehouse (Lot 1) development will comprise of warehouse and office land uses, as well as supporting car parking for both heavy vehicles and cars.

Figure 4-1 shows the plan for the proposed development.

Figure 4-1 Proposed development layout

A summary of the land use mix for the Alspec Warehouse development is provided in Table 4-1.

Table 4-1 Indicative land use mix for Alspec Warehouse development

	Land Use	Total building GFA (m^2)
Alspec Warehouse Proposal	Warehouse	37,836
	Office	2,575
	Carpark – Heavy Duty	17,594
	Carpark – Light Duty	11,191
	Total Building	**40,411**
	Total Carpark	**28,785**
	Total Landscape	**12,041**
	Total Site Area	**83,563**

5 Traffic impact assessment

An assessment of the likely traffic impact has been completed to understand the implications of the proposed development and the associated staging on the performance of the surrounding network.

5.1 Traffic generation rate

Traffic generation rates for the proposed development have been derived from specific data collected as part of the updated RMS *Trip generation surveys: business parks and industrial estates: analysis report* (2012) and associated updates.

The traffic generation rates for the proposed development after completion are sourced from RMS Trip Generation data – Industrial Parks (2023), specifically Table 3.1 and Table 3.2.

A review of the collected data for business parks and industrial estates has identified three sites of similar size and location to the subject sites: Erskine Park, Eastern Creek, and Riverwood. The table below summarizes the AM and PM peaks trip generation rates per site and the average trip generation rate as provided in RMS Trip Generation data – Industrial Parks (2023), Table 3.1 and Table 3.2.

Table 5-1 RMS Trip Generation data – Industrial Parks (2023) (sourced from Table 3.1, Table 3.2)

Location	Site Area (m^2)	Trip generation (vehicles per 100 m^2 of GFA)		
		AM	PM	Daily
Erskine Park Industrial Estate, Erskine	693,605	0.15	0.16	1.89
Wonderland Business Park, Eastern Creek	406,600	0.20	0.19	2.31
Riverwood Business Park, Riverwood	29,983	0.43	0.41	3.74
Av. Trip Generation (> 25,000 m^2)		**0.26**	**0.25**	**2.64**

As identified in the table above, the trip generation rates differ significantly depending on the size of the site. For the purposes of this assessment, a more conservate rate (60 per cent higher than the average for the sites above 25,000 m^2) has been adopted, as detailed below: As identified in Table 5-1, trip generation rates vary significantly based on the site size. For this TIA, a more conservative approach has been taken by adopting a rate that is 60% higher than the average for sites larger than 25,000 m2, as detailed in Table 5-2.

Table 5-2 Operational trip generation rates summary

	Trip generation (vehicles per 100 m2 of GFA)		
	AM PEAK	PM PEAK	Daily
Av. Trip Generation (>25,000 m2)	0.26	0.25	2.64
Factor	1.60	1.60	1.60
Adopted trip generation for this proposal	**0.42**	**0.40**	**4.22**

The heavy vehicle generation rate was determined to be 22 per cent of the warehouse traffic for both the morning and afternoon peak period. The volume of heavy vehicles was averaged from the heavy vehicle generation rates of the business park developments with a GFA over 25,000 m^2 in RMS *Trip generation surveys: business parks and industrial estates: analysis report* (2012).

Table 5-3 below presents the mode split percentage and calculated average per vehicle type for the three sites: Erskine Park, Eastern Creek, and Riverwood. The data is sourced from *RMS Trip Generation data – Industrial Parks (2023), Table 2.1*.

Table 5-3 Operational trip generation mode percentages

% of total trips by principal mode	Erskine Park Industrial Estate, Erskine	Wonderland Business Park, Eastern Creek	Riverwood Business Park, Riverwood	Average by mode
% Car (as driver)	62.5	63.2	68.8	64.8
% Car (as passenger)	8	8.3	12.3	9.5
% Commercial Vehicles	**28.3**	**25.9**	**12.6**	**22.3**
% Bus	**0.8**	**2.1**	**0.5**	**1.1**
% Cycle	0.1	0.3	0.1	0.2
% Motorbike	0.1	0	0	0.0
% On foot	0.1	0.2	5.7	2.0

The data has been used to inform the assumption that **22%** of the operational traffic numbers will consist of heavy vehicles.

5.1.1 Operational traffic generation

Table 5-4 summarises the application of these rates to the Alspec warehouse development.

Table 5-4 Traffic generation summary

Alspec Warehouse (Building GFA 40,411 m2)	AM PEAK	PM PEAK
Light Vehicles (LVs)	124	116
Heavy Vehicles (HVs)	35	33

5.1.2 Construction traffic generation

HBB has not provided Arcadis with expected construction traffic data. Once a construction contractor is engaged for the site, detailed construction traffic volumes can be assessed. Irrespectively, the total volume of construction traffic will be less than the SIDRA modelled traffic volumes, which consider concurrent operations and construction phases of multiple warehouse sites, as per the proposed staging works for AIBP.

The Alspec Warehouse site is currently greenfield, meaning that no demolition works are required for the development. Earthworks phase for the whole AIBP development will be completed in bulk prior to the construction of the proposed development. Please refer to the Traffic Impact Assessment for Bulk Earthworks DA (Arcadis 2024) for the anticipated traffic generations and impacts.

Truck Movements

The assumed truck arrivals to the site during construction will be:

- 15 – 20 vehicle movements per day
- 20 – 25 vehicle movements per day (during concrete pours)

Cranage and Materials

Delivery of materials, equipment, machinery, etc will be always undertaken within the confines of the project site boundary. If the site is required to use a mobile crane (or equivalent), these will also need to be contained within the site, along with any storage of equipment and materials.

Construction Hours

Approved construction hours for the site are as follows:

- Monday – Friday 7:00am – 6:00pm
- Saturday 8:00am – 1:00pm
- Sunday No work

5.2 Broader traffic volumes

Background traffic volumes for Patons Lane and Luddenham Road were derived from TfNSW traffic forecasting modelling for the morning peak period (7am to 9am) and the afternoon peak period (4pm to 6pm) for 2021, 2026 and 2036. These forecasts were provided from a model that was based on land use forecasts from LU2019 and demand matrices from Strategic Transport Model V3.8. These volumes were factored by 0.55 to estimate peak hour volumes. Table 5-5 summarises the peak hour traffic volumes on Luddenham Road.

It is noted that the strategic traffic forecasts predict a decrease in traffic along Luddenham Road in 2036 in comparison to 2026 for both the AM and PM peak periods. This is attributed to a new east-west arterial road located south of the subject site, which provides a new connection between Luddenham Road and Mamre Road. This assessment adopts the decreased traffic volumes in line with the traffic forecast.

Table 5-5 Forecasted background traffic volumes for Luddenham Road determined from STFM inputs

	AM peak		PM peak	
	Northbound	Southbound	Northbound	Southbound
2021	790	510	510	840
2024	850	640	610	870
2025	870	690	640	880
2026	890	730	670	890
2036	760	470	480	650

5.3 Cumulative construction impacts

This section provides an overview of other construction projects near the proposed development that are likely to impact the operation of Patons Lane and Luddenham Road. The information was gathered from various project sites, and details for each project are documented accordingly.

To assess the overall impact of traffic on the performance of Patons Lane and Luddenham Road, cumulative construction traffic generated by other projects within the Orchard Hills district have been included in this assessment. The following nearby project sites that were assessed are:

Sydney Metro – Western Sydney Airport Stabling and Maintenance Facility

The Sydney Metro – Western Sydney Airport stabling and maintenance facility will be located at Orchard Hills, south of Blaxland Creek and north of Patons Lane. Access to the facilities is provided by Patons Lane.

Construction of the facility has commenced, and the facility is expected to be operational by 2026. It is forecasted that traffic will be generated from the stabling and maintenance facility during its construction and operation. Construction traffic volumes for the stabling and maintenance yard is provided in Table 5-6 and were considered as part of the background traffic volumes for the SIDRA traffic modelling.

The AM and PM peak construction hours are 7:30-8:30am and 4:30-5:30pm, respectively.

Table 5-6 Peak construction movements in 2023/2024 for the Sydney Metro – Western Sydney

Vehicle Type*	AM peak			PM peak		
	IN	OUT	Total	IN	OUT	TOTAL
LV Staff	56	0	**56**	0	56	**56**
LV Deliveries	1	1	**2**	1	1	**2**
HV	11	11	**22**	11	11	**22**
Total	**68**	**12**	**80**	**12**	**68**	**80**

Source: Sydney Metro – Western Sydney Airport Environmental Impact Statement Technical Paper 1 Transport

M12 Motorway Project

The M12 Motorway Project expects its peak construction volumes to occur in 2024. However, within the M12 Motorway EIS, Section 6.2.3 of Transport and Traffic describes the site access routes for the project, which is via Elizabeth Drive, Mame Road, The Northern Road and Wallgrove Road (Source: *M12 Motorway Amendment Report, Section 6.2*) The construction traffic assessment did not include Luddenham Road and Patons Lane as an access route during construction. Therefore, the cumulative traffic impact for this CTMP did not consider the expected traffic induced by the M12 Motorway.

Western Sydney Airport

Construction for the Western Sydney Airport (WSA) is underway and expected to be completed by 2026. The WSA EIS report describes the construction traffic accesses the site via Elizabeth Drive, Anton Road, The Northern Road and Badgerys Creek Road. The construction traffic assessment did not include Luddenham Road and Patons Lane as an access route during construction. Therefore, the cumulative traffic impact for this CTMP did not consider the expected traffic induced by WSA.

To account for peak traffic directional flows, the following assumptions were made for traffic generated by the various components of the proposed development, based on STFM outputs:

- In the AM peak, 80 per cent of traffic generated by the proposal travelled inbound to the site, and 20 per cent outbound.
- In the PM peak, 60 per cent of traffic generated by the proposal travelled inbound to the site, and 40 per cent outbound.

The directional distribution and assignment of traffic generated by the proposed development will be influenced by several factors, including:

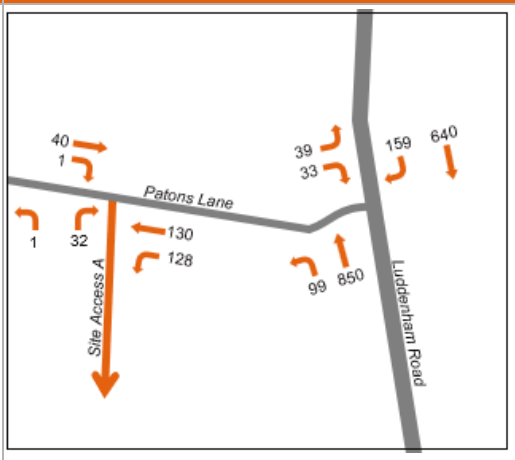
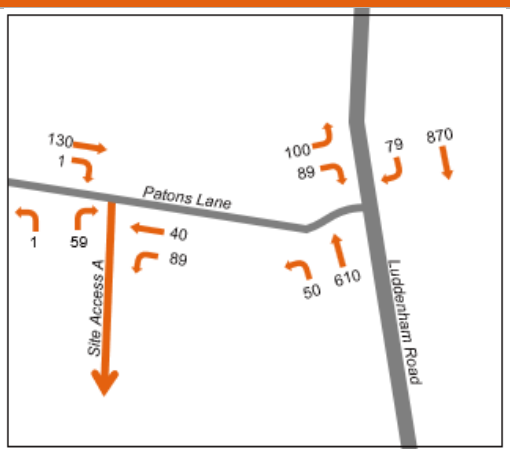
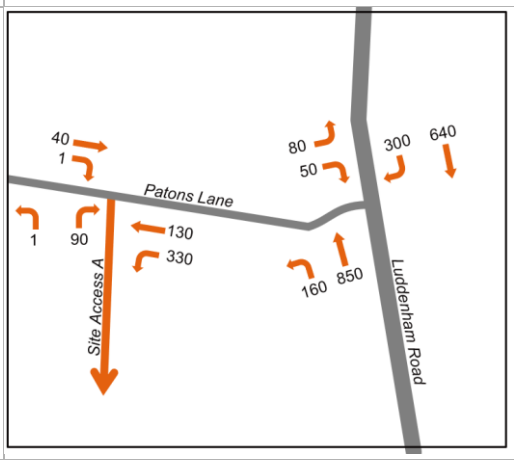
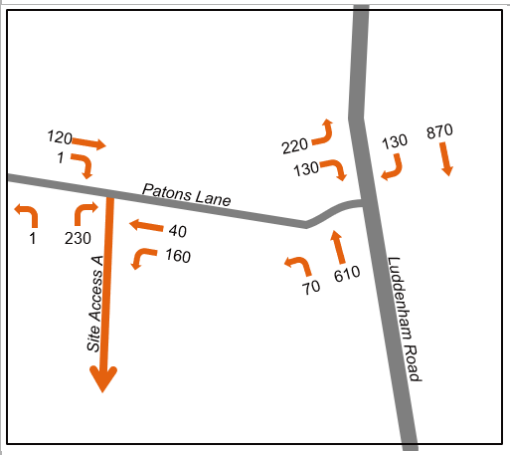
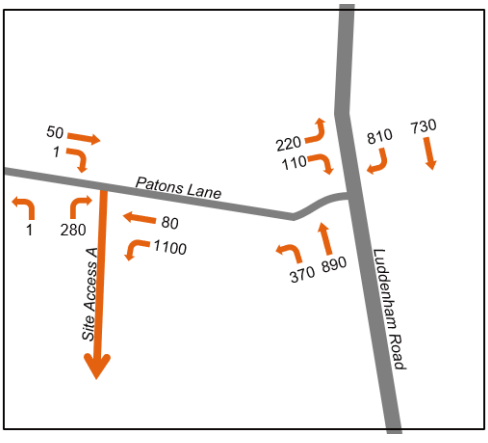
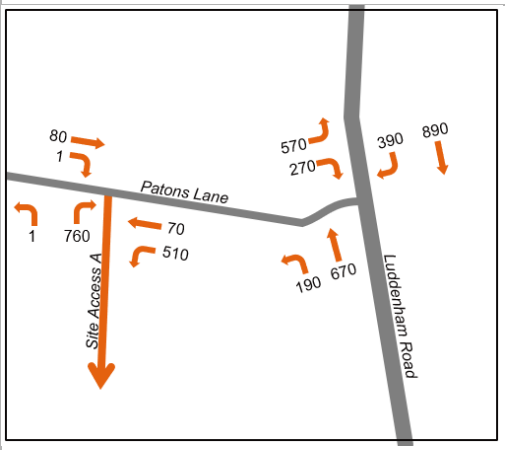
- The future transport and road configuration in the vicinity of the site: the dominant freeway in the area is the M4 in the north, but the importance of the southern areas will be increasing with the proposed M12 and the development of the broader Aerotropolis (Northern Gateway Precinct).
- The distribution of residential, commercial, and other land use development in the surrounding areas.
- The likely distribution of employee's places of residence in relation to the site.
- The configuration and staging of the access points to the site.

In consideration of the above, the following distribution and assignments were adopted in this assessment, based on STFM outputs:

- To/ from Luddenham Road north (towards Mamre Road) = 70 per cent.
- To/ from Luddenham Road south (towards Elizabeth Drive) = 30 per cent.

Table 5-7 summarises the turning movements that result from the generation and distribution of trips during the AM and PM peak periods for Alspec Warehouse Lot 1 development, concurrent warehouse construction of the wider AIBP development (Alspec + other warehouse developments), and the ultimate development state for AIBP.

Table 5-7 Turning movement demands

	AM PEAK	PM PEAK
Alspec Warehouse Lot 1		
Project State (Concurrent warehouse construction of the AIBP development)		
Ultimate State		

5.4 Modelling Approach and Assessment Criteria

The assessment of the performance of the intersections were tested using SIDRA Intersection 9.0. Unless otherwise specified, the default model parameters were adopted for the intersection models. All traffic models were modelled as a 'Network' site in SIDRA 9.0.

The operational performance of the intersection was evaluated by assessing the average vehicle delay and the corresponding **Level of Service** (LoS). The average vehicle delay and level of service were assessed in accordance with the RMS Traffic Modelling Guidelines and is summarised in Table 5-8.

The RMS Traffic Modelling Guidelines recommends that LoS is determined by the critical movement with the highest delay for priority intersections such as roundabout and sign-controlled intersections. With these intersection controls (roundabout, Stop and Give Way sign controls), some movements may experience high levels of delay while others may experience a minimal delay.

The level of service criteria for a signalised intersection is related to the average intersection delay measure in seconds per vehicle.

Table 5-8 LOS Criteria for Intersection Capacity Analysis

Level of Service	Traffic Signals	Description of intersection operation
A	d ≤14	Good operation
B	15 ≤ d ≤ 28	Good with acceptable delays & spare capacity
C	29 ≤ d ≤ 42	Satisfactory
D	43 ≤ d ≤ 56	Operating near capacity
E	57 < d ≤ 70	At capacity, at signals, incidents will cause excessive delays Roundabouts require other control mode
F	d > 70	Unsatisfactory and requires additional capacity.

Source: RMS Traffic Modelling Guidelines, 2013

Degree of Saturation (DoS) is equal to the *demand to capacity ratio* for each traffic movement, with the overall intersection DoS defined as the highest DoS of all individual movements calculated at the intersection. For various intersection controls, the following DoS ratings are defined in Table 5-9.

Table 5-9 Degree of Saturation (SIDRA 9.0)

Degree of Saturation (DoS)	Rating
DoS < 0.6	Excellent
0.6 < X < 0.7	Very good
0.7 < X < 0.8	Good
0.8 < X < 0.9	Acceptable
0.9 < X < 1.0	Poor
X > 1.0	Very poor

The intersection traffic performance targets established for this assessment include:

- An overall intersection level of service (LoS) D or better
- A degree of saturation (DoS) of
  - Less than 0.85 for roundabouts
  - Less than 0.90 for signalised intersections.

5.5 Traffic impact and mitigation

5.5.1 Road Network Impacts

Detailed modelling for the Alspec Industrial Business Park (AIBP), which includes Lot One, was conducted as part of the Traffic Impact Assessment (TIA). The 221 Luddenham Road, Orchard Hills TIA indicated no adverse impact on the traffic distribution of the surrounding road networks.

The Modelling Approach and Assessment Criteria, as well as the intersection capacity assessment, are included in that document. Additionally, the table below summarizes the projected traffic for the entire AIBP and the Alspec Warehouse, along with construction phase traffic.

Table 5-10 Development demand comparison

Assessment		AM peak hour	PM peak hour
AIPB Traffic Impact Assessment (Arcadis, April 2023)	Ultimate development operational demand	**844 vehicles**	**823 vehicles**
Alspec Warehouse assessment (this report)	Operational demand	**167 vehicles**	**161 vehicles**
	Construction demand	**80-95 vehicles**	**80-95 vehicles**

The following intersections were assessed in the ultimate state scenario as part of this traffic impact assessment:

- Luddenham Road and Patons Lane:
  The intersection was modelled as a signalised intersection where Luddenham Road was modelled as two lanes on the north approach and four lanes on the south approach. Patons lane was modelled as two lanes on both east and west approach.

- Patons Lane and Site Access Road:
  The intersection was modelled as a two-lane roundabout with Patons Lane modelled as two lanes on both east and south approaches and 1 lane on the west approach.

The assessed network configuration is provided in Figure 5-1.

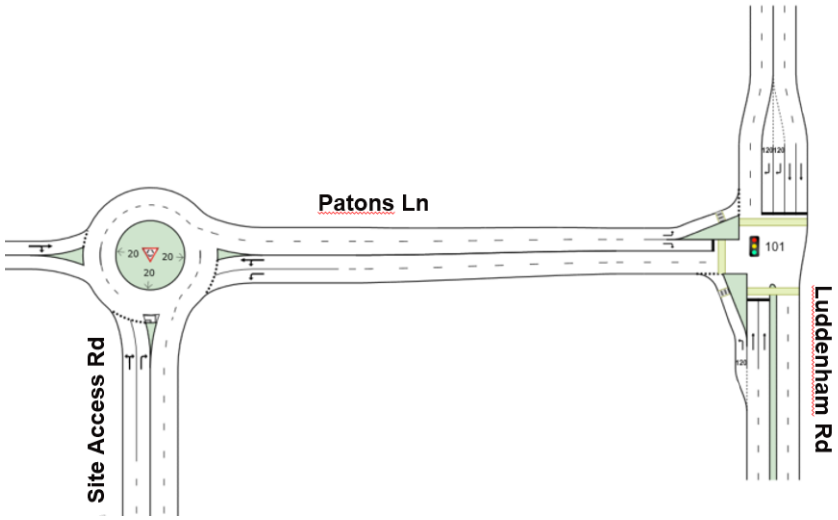


Figure 5-1 Network layout for the ultimate state with a signalised intersection at Luddenham Road and Patons Lane

The AM and PM Peak intersection performance results considering Alspec warehouse (Lot 1) development in isolation is summarised in Table 5-11 and Table 5-12.

Table 5-11 AM Peak Intersection Results for Alspec Warehouse (Lot 1)

Intersection	Stage	Intersection Treatment	Volume	DoS	LoS
Patons Lane / Site Access A Road	Alspec Warehouse Lot 1 Development	Roundabout	349	0.091	A
Luddenham Road / Patons Lane Intersection	Alspec Warehouse Lot 1 Development	Signalised intersection	1916	0.515	B

Table 5-12 PM Peak Intersection Results for Alspec Warehouse (Lot 1)

Intersection	Stage	Intersection Treatment	Volume	DoS	LoS
Patons Lane / Site Access A Road	Alspec Warehouse Lot 1 Development	Roundabout	337	0.120	A
Luddenham Road / Patons Lane Intersection	Alspec Warehouse Lot 1 Development	Signalised intersection	1893	0.391	A

The AM and PM Peak intersection performance results at the ultimate stage of the development is summarised in Table 5-13 and Table 5-14.

Table 5-13 AM Peak Intersection Results for AIBP

Intersection	Stage	Intersection Treatment	Volume	DoS	LoS
Patons Lane / Site Access A Road	Ultimate State	Roundabout	1592	0.419	A
Luddenham Road / Patons Lane Intersection	Ultimate State (Luddenham Road four-lane)	Signalised intersection	2884	0.860	C

Table 5-14 PM Peak Intersection Results for AIBP

Intersection	Stage	Intersection Treatment	Volume	DoS	LoS
Patons Lane / Site Access A Road	Ultimate State	Roundabout	1497	0.295	A
Luddenham Road / Patons Lane Intersection	Ultimate State (Luddenham Road four-lane)	Signalised intersection	2684	0.600	B

The assessment identified that the Patons Lane and Site Access Road intersection meets both the traffic performance criteria for capacity and delay in the ultimate state scenario.

For the Luddenham Road and Patons Lane intersection, the signalised intersection treatments meet the traffic performance criteria for delay in the ultimate state scenario. The signalised intersection meets the criteria for capacity in the ultimate stage with a maximum DoS of 0.778. This is within the acceptable DoS of 0.9 set by the RMS modelling guidelines.

Further development of the ultimate scenario may be required including a review of the forecasted volumes given the likelihood of key road corridor upgrades that may be completed by 2036.

5.5.2 Construction impact

A comparison of the traffic demand generated by the proposal against the broader AIBP traffic impact assessment demonstrates the future road network will accommodate the likely traffic demand during construction. The total traffic demand for this development is less than the modelled demand, with the SIDRA results demonstrating both the Site Access Road / Patons Lane and Patons Lane / Luddenham Road intersections performing at a LoS C or better.

The Alspec warehouse (Lot 1) will be constructed in conjunction with surrounding warehouse lots, as part of the AIBP staging works. These construction sites all follow right-in/left-out turning movements to facilitate smooth traffic flow. Separation is also provided between the access points of the Alspec warehouse and the adjacent proposed construction site (WH 2 - Speculative) west of the development. Both sites have multiple access points within their respective project boundaries, providing adequate separation within the internal road network for the mixture of vehicles requiring access to each individual site.

Furthermore, this separation is consistent with the southern concurrent warehouses being developed, minimising the risk of causing traffic congestion and queuing particularly for multiple heavy vehicles attempting to access the constructions sites and those which may be in operation.

5.5.3 Construction mitigation and management measures

Traffic Management

A range of mitigation and management measures would be needed to manage the impacts to traffic and transport during construction. These include:

- Traffic Guidance Schemes would be prepared and implemented in accordance with the Traffic control at work sites, version 6.1 (TfNSW, 2022) by suitably qualified personnel.
- Dilapidation surveys of roads around the proposal area would be undertaken prior to their use for construction as well as after construction is complete. Any damage to roads will be repaired.
- Direct access at the frontages would be provided with adequate sight distances relating to the posted road speed. This will allow vehicles on the main road to see vehicles emerging from the construction compound and will allow ample room to slow down and stop if necessary. Similarly, it will allow vehicles waiting to emerge from the site access, adequate sight distance to see approaching vehicles and determine acceptable gaps for them to enter the main road traffic.
- All vehicles accessing the site for the purpose of material delivery and construction works would be fitted with safety flashing lights located on the top of the vehicle and functioning reverse beepers. All operators will be licensed for the particular item of plant/ equipment and will demonstrate competence in the use of the plant/ equipment as part of the site management and safety plan.
- Only left-in/ right-out movements would be provided at the site access point.

Site access to Sydney Metro Western Sydney Airport stabling and maintenance facility.

Patons Lane is the sole vehicular access road to the Sydney Metro Western Sydney Airport stabling and maintenance facility. Access to the Sydney Metro facility along Patons Lane must be always maintained as there are no alternative access options.

Stakeholder consultation with Sydney Metro is required to understand the vehicular movements associated with the stabling and maintenance facility to mitigate any negative impacts.

5.6 Operational traffic impact

5.6.1 Operational traffic impact

Based on a comparison of traffic demand against the broader AIBP traffic impact assessment, and the operational traffic generated by the proposed development, the future road network will accommodate the operational traffic in both the project stage and the ultimate stage. The total traffic demand for this proposal is less than the modelled demand, with the SIDRA results demonstrating both the Site Access Road / Patons Lane and Patons Lane / Luddenham Road intersections performing at a LoS C or better in both states.

A swept path analysis has been undertaken for the warehouse hardstand movements to accommodate B-double truck movements. The clearances for the trucks in this area was deemed sufficient and a copy of the swept path diagram is provided in Appendix C of this report.

5.6.2 Operational traffic management measures

To support non-private vehicle access to the site during normal operations, a Green Travel plan has been prepared that outlines the management measures that can be adopted for the development.

A copy of the Green Travel Plan is provided in Appendix B of this report.

6 Car parking assessment

The site has specific provisions with parking outlined in the Penrith Development Control Plan (DCP) E18 Luddenham Road Industrial Business Park. A summary of the rates is outlined in Table 6-1.

Table 6-1 Parking requirements for Luddenham Road Industrial Business Park (Source: Penrith DCP E18 Luddenham Road Industrial Business Park)

Activity	Parking Requirement
Freight transport facilities	1 per transport vehicle present at peak vehicle accumulation plus 1 per 2 employees, or to be determined by a car parking survey of a comparable facility
Industries	1 space per 200 m^2 of gross floor area or 1 space per 2 employees, whichever is the greater
Vehicle body repair workshops/ vehicle repair stations	3 spaces per 100 m^2 of gross floor area or 6 per work bay, whichever is the greater
Warehouses or distribution centres	**1 space per 300 m^2 of gross floor area or 1 space per 4 employees, whichever is the greater.**
Ancillary office space	1 space per 40 m^2 of gross floor area
Neighbourhood shops	1 space per 40 m^2 of gross leasable area
Accessible parking	Accessible car spaces should be in accordance with the Access to Premises Standards, Building Code of Australia and AS2890.
Bicycle parking	1 space per 600 m^2 of gross floor area of office and retail space (over 1200 m^2 gross floor area) 1 space per 1000m^2 of gross floor area of industrial activities (over 2000 m2 gross floor area)
Electric vehicle	1 space per 40 car spaces
Car share	1 space per 40 car spaces
Electric bicycle	A charging station for electric bicycles is provided for the first 5 bicycle spaces within a development, and for every 10 bicycle spaces thereafter
Motorcycle parking	1 space per 10 car spaces

6.1 Proposed parking provisions

The parking provisions for the site are identified in the Penrith DCP E18 Luddenham Road Industrial Park. The minimum requirements stipulated in the Penrith DCP aims to ensure that the development functions efficiently and there is limited impact on street parking and congestion. The car parking requirements for warehouse developments are:

- 1 space per 300 m^2 of warehouse GFA.
- 1 space per 40 m^2 of GFA for ancillary office spaces.

An assessment of the parking requirements for the proposed development is provided in Table 6-2.

Table 6-2 Parking requirements

Land Use	Area (m²)	Parking Rate	Parking Requirement (Spaces)
Alspec Warehouse (Lot 1)	**40,411**		
• Warehouse	37,836	1 space per 300 m² GFA	127
• Office	2,575	1 space per 40 m² GFA	65
		TOTAL	**192**

The current construction plans for the Alspec warehouse facility indicate 388 car spaces will be provided for the development. This exceeds the expected parking demand generated by the proposal.

Electric Vehicle parking

As outlined in the Penrith DCP E18 Luddenham Road Industrial Business Park, electric vehicle parking and charging stations are to be integrated into car park design on the development site. This includes:

- Charging stations to be located within or immediately adjacent to the parking spaces.
- The charging stations to be located clear of pedestrian paths of travel and do not impede desire lines.
- A provision for electric vehicle parking of is identified as one space per 40 car spaces.

To meet the Penrith DCP E18 Luddenham Road Industrial Business Park controls, at least 9 car spaces must be designated for electric vehicles with charging stations. The Penrith DCP E18 Luddenham Road Industrial Business Park controls outline all car parking spaces should be designed to be easily converted into electric charging stations.

Car Share parking

The Penrith DCP E18 Luddenham Road Industrial Business Park outlines car share parking rates for the development. One space per 40 car spaces will be allocated for car share. To meet the requirements outlined in the Penrith DCP, at least 9 car spaces are to be provided for car sharing spaces.

Motorcycle parking

The motorcycle parking requirements are outlined in the Penrith DCP E18 Luddenham Road Industrial Business Park. The site-specific controls outline one motorcycle space per 10 car spaces. To meet the minimum requirements, the site must provide at least 38 motorcycle spaces.

6.2 Accessible parking

As outlined in Part C10 of the Penrith Developmental Control Plan (DCP), accessible parking is to be provided in accordance with the Disability (Access to Premises – Buildings) Standards 2010 from the Building Code of Australia and Australian Standard AS 2890.

The accessible (disabled) parking requirements in the Disability (Access to Premises – Buildings) Standards states for offices (Class 5) and warehouses (Class 7) should be provided at the rate of one space for every 100 car spaces or part thereof.

Accessible (disabled) spaces within the industrial development are to be designed in accordance with the Australian Standard AS 2890.6 for accessible (disabled) parking. These parking spaces shall be designed with minimum dimensions of 2.4-metre width and 5.4-metre length with an aisle width of 5.8 metres.

For the proposal to meet the requirements stipulated in the Penrith DCP, the development will be required to provide at least 3 accessible parking spaces.

6.3 Bicycle parking

Regarding bicycle parking and end-of-trip facilities, the Penrith Development Control Plan (DCP) E18 Luddenham Road Industrial Business Park permits bicycle parking to be in secure, visible, and accessible locations, and provided with weather protection, in accordance with AS2890.3:1993 Bicycle Parking Facilities.

The following associated facilities are to be provided:

- For ancillary office and retail space with a gross floor area over 2500 m^2, at least 1 shower cubicle with ancillary change rooms
- For industrial activities with a gross floor area over 4000 m^2, at least 1 shower cubicle with ancillary change rooms
- Change and shower facilities for cyclists and are to be conveniently located close to the bicycle storage areas.
- Where the building is to be strata-titled, the bicycle storage facilities and shower/ change facilities are to be made available to all occupants of the building.

In terms of overall bicycle parking provision, the Penrith DCP E18 Luddenham Road Industrial Business Park provides the following bicycle parking rates for the site:

- 1 space per 600 m^2 of GFA of office and retail space (over 1200 m^2 GFA)
- 1 space per 1000 m^2 of GFA of industrial activities (over 2000 m^2)

As the proposal is developed, appropriate bicycle parking and storage will be provided in accordance with the Penrith DCP. A total of 40 bicycle parking spaces must be provided on site. Given the size of the site, there is ample area available to cater for the bicycle parking provision.

6.3.1 Electric bicycle parking

Requirements for electric bicycle facilities are set out in the Penrith Development Control Plan (DCP) E18 Luddenham Road Industrial Business Park. Charging stations will be provided on-site at a rate in accordance with the DCP as the proposal is developed. A

Charging station for electric bicycles should be provided for the first 5 bicycles spaces within a development, and for every 10 bicycle spaces afterwards. A total of 5 electric bicycle charging stations will be provided at the completion of the proposal.

6.4 Parking summary

The Alspec warehouse development currently includes a provision of a total of 388 car spaces, which meets the parking requirement of 192 car spaces outlined in Section 5.1. At least 3 accessible parking spaces should be provided from the 388 car spaces proposed. The development should provide at least 9 car spaces with charging stations for electric vehicles. At least 40 spaces should be provided for motorcycles.

The bicycle parking rates required to meet the requirements specified in the Penrith DCP have been outlined in this report and will be accommodated during the proposal development.

In summary, the parking demand generated by the land uses will be met on-site and will meet the requirements set out in the Penrith Development Control Plan (DCP) E18 Luddenham Road Industrial Business Park. Current site plans for the car parking and manoeuvring were deemed to be satisfactory after being assessed against AS 2890 Parts 1, 2 & 6, and the Penrith DCP.

7 Access and internal design assessment

7.1 Site access and internal configuration layout

The development plans show two vehicle access points into the site. The entry and exit point for heavy vehicles is provided along the southern side of the project boundary, within the AIBP's internal road network. For private vehicles and customers, the entry and exit point for lies on the northern side of the project boundary, accessible via a driveway entry/exit along Patons Lane.

The design indicates that a hardstand of 38 m width wraps around the north, west and south sections of the warehouse building and has been designed to accommodate heavy vehicle movements and parking bays for facilitation of delivery and loading of goods in storage.

Majority of the light and passenger vehicle movements are separated from heavy vehicle movements, with the car and customers parking access located on the northern side of the development. There are 60 LV car spots located on the southern hardstand, to be used exclusively for staff during operations. These car spaces share the same access point as heavy vehicles.

7.2 Car parking

A total of 388 parking spaces are available with 328 spaces along the eastern side of the complex and 60 spaces along the southern wall of the warehouse. The design of the parking area complies with the guidance on driveway access into the development, warehouses and car parking spaces shown in *AS 2890.1 Off-street car parking*. Provisions for accessible parking spaces, as identified in Section 5.2, should be considered in accordance with *AS 2890.6 Parking facilities Off-street parking for people with disabilities.*

7.3 Pedestrian access

Along the frontage of the site, the road reserve width is sufficient to accommodate footpaths along both sides of the road in accordance with the requirements of the Penrith DCP. It is anticipated that the frontage onto Luddenham Road and Patons Lane will have footpaths as part of the Luddenham Road widening construction works. Within the site, pedestrian access should be provided to the office and warehouse, by extending the pedestrian pathway along the northern and southern edges of the parking area to the site boundary. This will allow pedestrians clear and delimited access from the building into the broader pedestrian network outside the site.

Within the site, pedestrian pathways have been clearly identified within the warehouse. Based on current practices, delineation of pathways for pedestrians across the hardstand area are not expected to be required, however this should be monitored as operations across the site become active.

8 Summary

The proposal is for the development of an 83,563 m^2 as part of Alspec Industrial Business Park (AIBP) construction. The Alspec warehouse development will comprise of a 37,836 m2 warehouse, a 2,375 m^2 office and a 200 m^2 office as well as supporting car parking for both heavy vehicles and cars.

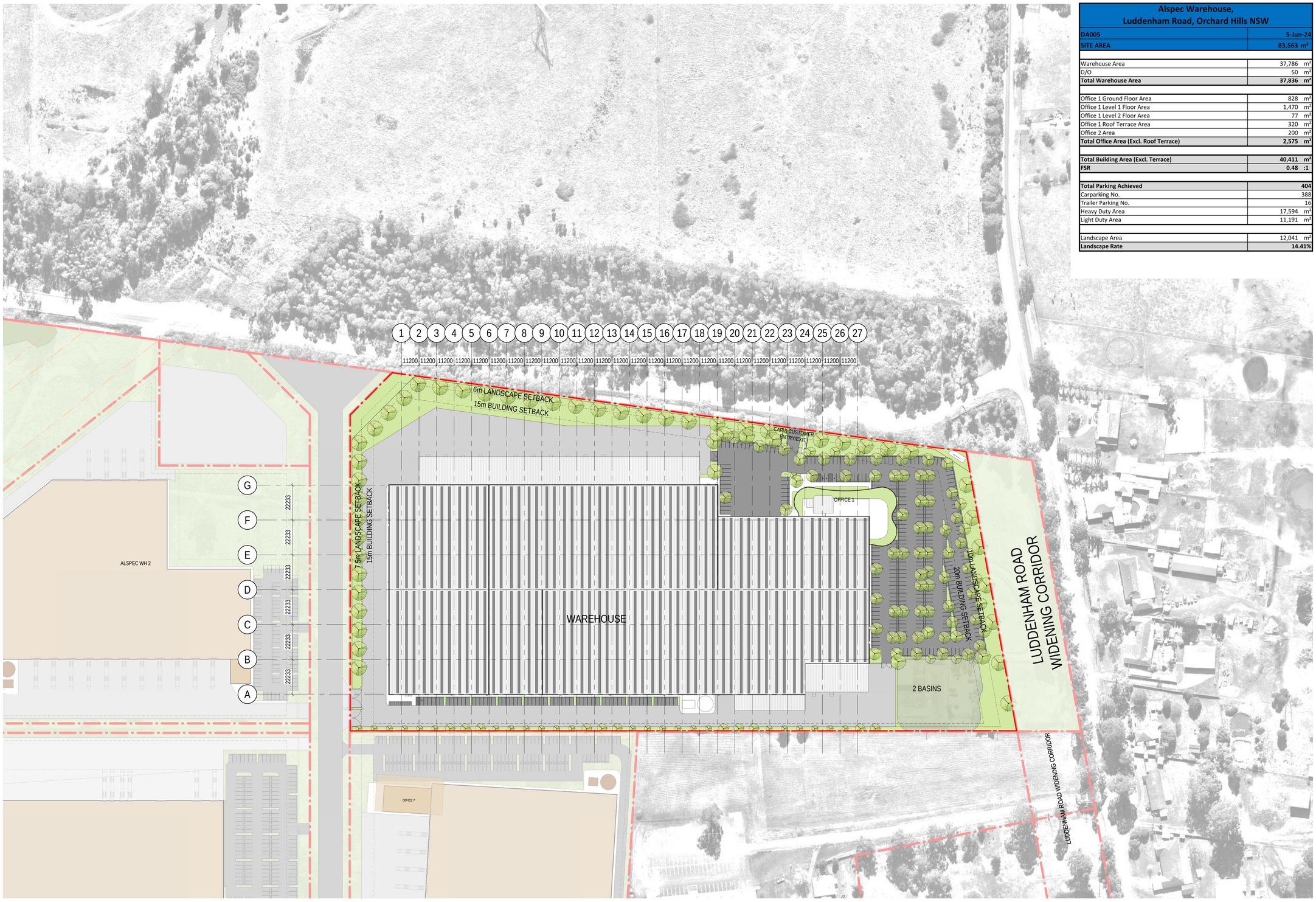
The key findings of this assessment are:

- Access to the site will be provided via a site access road within the AIBP development with access to the broader road network via Patons Lane.
- The traffic demands associated with the potential development during construction and the operation of the site is expected to be accommodated safely.
- The provided car parking meets the anticipated demands generated by the site. Provisions for accessible parking and bicycle parking will be accommodated during further development of the proposal.
- The internal configuration of the site has been designed in accordance with Penrith City Council's DCP and the relevant Australian Standards.

It is therefore concluded that the proposed Alspec Warehouse development at the subject site of 221 Luddenham Road, Orchard Hills, is supportable on traffic planning grounds.

Appendix A - Site Plans

Alspec Warehouse, Luddenham Road, Orchard Hills NSW	
DA005	**5-Jun-24**
SITE AREA	**83,563 m²**
Warehouse Area	37,786 m²
D/O	50 m²
Total Warehouse Area	**37,836 m²**
Office 1 Ground Floor Area	828 m²
Office 1 Level 1 Floor Area	1,470 m²
Office 1 Level 2 Floor Area	77 m²
Office 1 Roof Terrace Area	320 m²
Office 2 Area	200 m²
Total Office Area (Excl. Roof Terrace)	**2,575 m²**
Total Building Area (Excl. Terrace)	**40,411 m²**
FSR	**0.48 :1**
Total Parking Achieved	**404**
Carparking No.	388
Trailer Parking No.	16
Heavy Duty Area	17,594 m²
Light Duty Area	11,191 m²
Landscape Area	12,041 m²
Landscape Rate	**14.41%**



Client

Issue	Description	Date
C	ISSUE FOR SSDA	04/07/2024
B	ISSUE FOR SSDA	04/06/2024
A	ISSUE FOR SSDA	29/05/2024
P9	DRAFT	22/05/2024
P8	DRAFT	01/05/2024
P7	DRAFT	26/03/2024
P6	DRAFT	15/03/2024
P5	DRAFT	26/02/2024
P4	DRAFT	22/02/2024
P3	DRAFT	12/02/2024
P2	DRAFT	01/02/2024
P1	DRAFT	16/01/2024

SSDA

Project Name
ALSPEC WAREHOUSE

Project Address
AIBP, Luddenham Road, Orchard Hills NSW 2748

Key Plan
0 2000 5000

Drawing Title:
SITE PLAN

Author:	Checker:	Sheet Size:	Scale:
MJ	NG	A1	1:1000

Drawing Number: **13241_DA005** Issue: **C**

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Appendix B – Green Travel Plan

Green Travel Plan

Alspec Warehouse, Orchard Hills NSW

31 July 2024

Alspec Warehouse, Orchard Hills NSW

Green Travel Plan

31 July 2024

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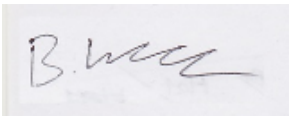

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APPROVER

Version Control

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0.1	11 May 2024	Draft report	B. Williams	B. Byrnes
1.0	31 July 2024	SSDA Submission	B. Williams	B. Byrnes

Contents

Figures

Acronyms and Abbreviations

Acronym	Definition
AIBP	Alspec Industrial Business Park
GTP	Green Travel Plan
TIA	Traffic Impact Assessment
TAG	Transport Access Guide

1 Introduction

1.1 Background

This report has been prepared to accompany a Traffic Impact Assessment (TIA) for the proposed Alspec Warehouse (Lot 1) warehouse development at 221 Luddenham Road, Orchard Hills.

The proposal is to develop an 8.3-hectare warehouse at the above address to accommodate a mix of warehouse, industrial and office land uses. The development is proposed to be completed in three stages, with various road and other infrastructure works required at each stage.

The subject site is located on Luddenham Road, south of Patons Lane, in Orchard Hills. Situated approximately 30 kilometres west of Parramatta CBD, the proposed Alspec warehouse is part of the larger Alspec Industrial Business Park (AIBP) development. The AIBP site is irregular in shape, with the Alspec warehouse making up one of many split frontages across both Luddenham Road and Patons Lane.

The site location is shown in Figure 1-1 and current development plans are given in Figure 1-2.

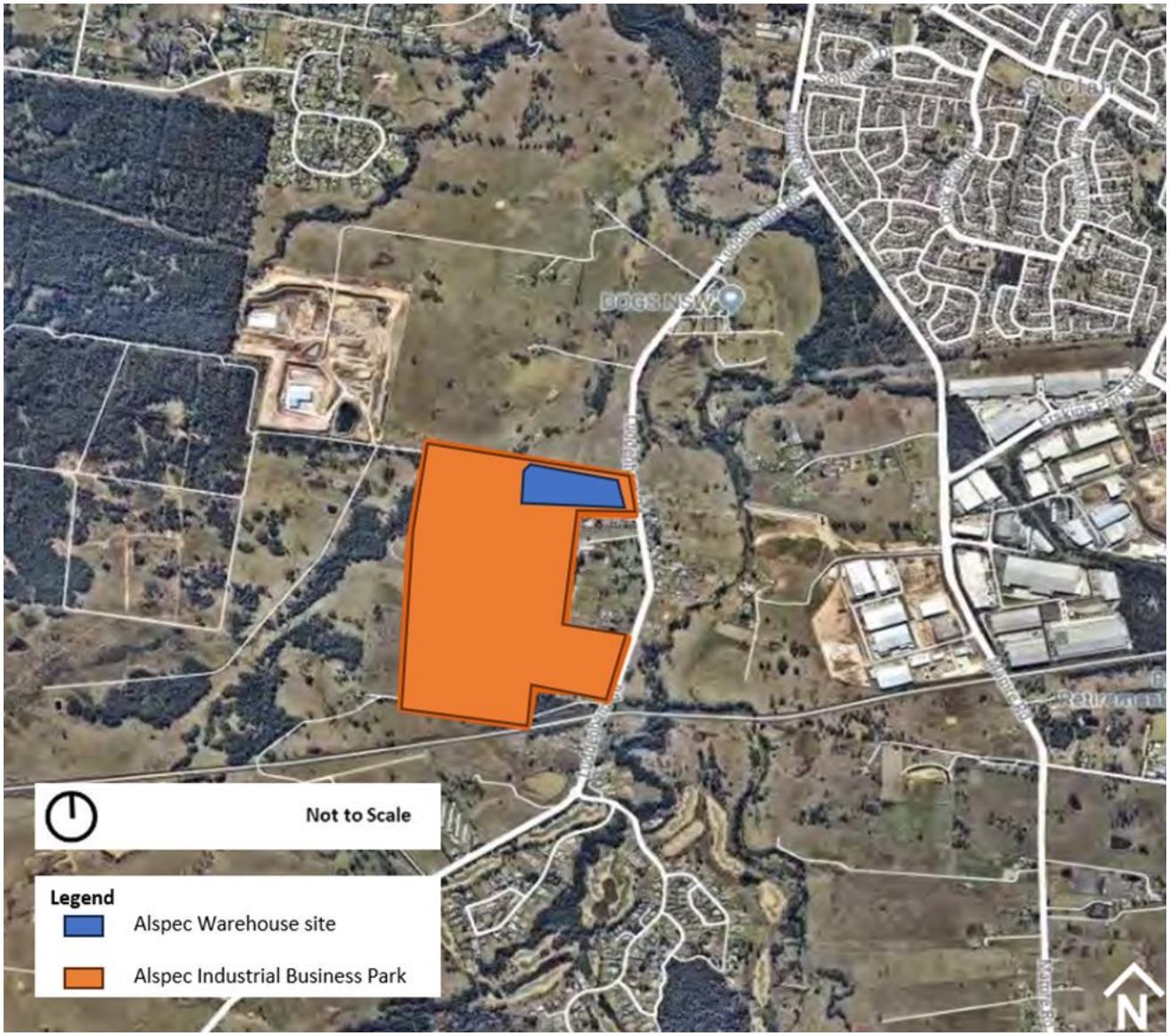

Figure 1-1 AIBP Site Location

Figure 1-2 Alspec warehouse proposal plan

1.2 Report Purpose

The use of private vehicles is a major contributor towards both greenhouse gas emissions and traffic congestion on Sydney's roads, with significant environmental and social costs. As well as delivering better environmental outcomes such as reduced air and noise pollution, the promotion of sustainable travel options will provide both health and social benefits to the community and reduce traffic congestion.

The objective of this Green Travel Plan (GTP) is to provide information and recommendations on potential green travel options for commuters to the development site, and to make apparent, encourage and support the use of sustainable travel options.

1.3 Report Structure

The report is structured as follows:

- **Section 2: Green Travel Plan Measures** – provides an overview of the changes to the existing transport use due to the proposed development and summarises actions to encourage sustainable transport opportunities.
- **Section 3: Monitoring and Review** – provides an overview of ongoing monitoring actions to obtain maximum benefit from the GTP.

2 Green Travel Plan Measures

The following section provides recommendations to encourage the use of sustainable transport modes for the workers and visitors of the Alspec warehouse development. The responsibility of implementing these actions is generally with either the developer or building management depending on the timeframe for the action.

2.1 Transport Access Guide

A Transport Access Guide (TAG) is provided to users of a building or facility, intended to inform of ways to access the site through walking, cycling or public transport. The objective of the TAG is to simplify the process of trip planning for visitors and can assist in increasing the proportion of trips made to the site through public and active transport modes.

Generally, a TAG provides information on:

- The location of bicycle parking and end-of-trip facilities and how to access these facilities.
- Nearest public transport stops and stations
- Bus routes and trains services to the site and the frequency of these services
- Useful applications and travel information websites
- Car share pods near the site.

TAGs are typically updated annually to ensure the information is accurate and up to date.

2.2 General

Potential Measures	Timeframe
Introduce a travel coordinator role to execute the recommendations of this plan. This could potentially be incorporated into the facilities management function.	Prior to occupation
Utilise social media opportunities to inform tenants and visitors of available sustainable transport options and facilities. To increase the use of the social media site this could be combined with other useful information including local events and building maintenance activities.	During operation
Monitor the mode share, use and demand of facilities to inform future updates of the GTP.	During operation

2.3 Walking

Potential Measures	Timeframe
Work with other stakeholders to improve wayfinding signage to public transport (bus stops, future rail networks) between the development and nearby infrastructure hubs such as St Clair and Erskine Park.	Prior to occupation
Maintain a TAG (updated annually) that effectively: • Informs employees and visitors of the walkability of the site to public transport hubs and entertainment centres. • Provides information on safe walking routes and expected trip times to highly frequented destinations in the surrounding area.	Prior to and during operation
As part of building management activities, promote walking for short trips in lieu of using a private vehicle.	During operation

2.4 Cycling

Potential Measures	Timeframe
Supply a communal bicycle repair toolkit for employees and visitors.	Prior to occupation
Supply a communal bicycle repair toolkit for employees and visitors.	Prior to occupation
Maintain a TAG (updated annually) that effectively informs employees and visitors of: • Safe and accessible cycling routes as well as end-of-trip facilities provided by the building. • Cycling clubs and bicycle user groups (BUGs) that may be lobbying for the improvement of cycle facilities in the surrounding area.	Prior to and during operation
Ensure the bicycle parking and end of trip facilities within the building are maintained.	During operation

2.5 Public Transport

Potential Measures	Timeframe
Provide employees and visitors with a TAG (updated annually) that includes map showing public transport stops in the surrounding area, expected walk times needed to access the locations and useful applications and travel information websites.	Prior to and during operation

2.6 Carpooling and Car Share

Potential Measures	Timeframe
Promote the cost savings of car share over commuting via private vehicle to residents of the precinct through the TAG.	Prior to occupation
Allocate additional spaces as required for car-sharing within the Alspec warehouse.	Prior to and during operation

2.7 Car Parking

Potential Measures	Timeframe
Provide electric car charging stations within the site.	Prior to occupation
Provide clear signage for and advertisement (within the TAG) of electric car charging stations within the site.	Prior to occupation

3 Monitoring and Review

For this GTP to be effective, it should be reviewed by building management regularly to ensure that the objectives are being met. Travel surveys should be conducted, and the GTP and TAGs should be updated annually to achieve sustainable travel targets more effectively.

3.1 Responsibility

To ensure that the goals of this GTP are achieved, it is necessary to identify an individual or committee responsible for monitoring and managing various aspects of the plan. This group will monitor travel patterns and the effectiveness of the GTP, conduct ongoing travel surveys, and carry out the initiatives outlined in this plan.

3.2 Travel Surveys

The purpose of a travel survey is to understand the reasons for which commuters to and from the site select their preferred travel modes. In turn, this allows for more effective incentives and initiatives to be developed in increasing the mode share of sustainable travel options.

An example of a travel survey has been provided below.

Q1. Which of the following do you identify as?

- ☐ *Resident*
- ☐ *Employee*
- ☐ *Visitor*

Q2. What is your postcode? _____

Q3. How did you travel here today?

- ☐ *Walk only*
- ☐ *Bicycle*
- ☐ *Bus*
- ☐ *Train*
- ☐ *Light rail*
- ☐ *Combination of public transport*
- ☐ *Car driver*
- ☐ *Car passenger*
- ☐ *Other (please state)* _____

Q4. If you did not arrive via public transport, why not?

_____

4 Conclusion

The Alspec warehouse development is in an industrial area within Orchard Hills NSW, with existing roads being the main access point to the site and limited existing public transport access. Broader transport network plans currently under construction such as Sydney Metro is expected to increase accessibility to the site for other transport modes.

To ensure that the new commuter trips generated by the Alspec warehouse development contribute towards reaching the green travel targets outlined in this GTP, it is necessary to undertake green travel initiatives such as providing information and promoting the benefits of sustainable travel options to workers and visitors. The GTP will contribute towards improved social and personal health of the commuters to the development site, as well as improved environmental outcomes.

About Arcadis

Arcadis is the leading global Design & Consultancy firm for natural and built assets. Applying our deep market sector insights and collective design, consultancy, engineering, project and management services we work in partnership with our clients to deliver exceptional and sustainable outcomes throughout the lifecycle of their natural and built assets. We are 27,000 people, active in over 70 countries that generate €3.3 billion in revenues. We support UN-Habitat with knowledge and expertise to improve the quality of life in rapidly growing cities around the world.

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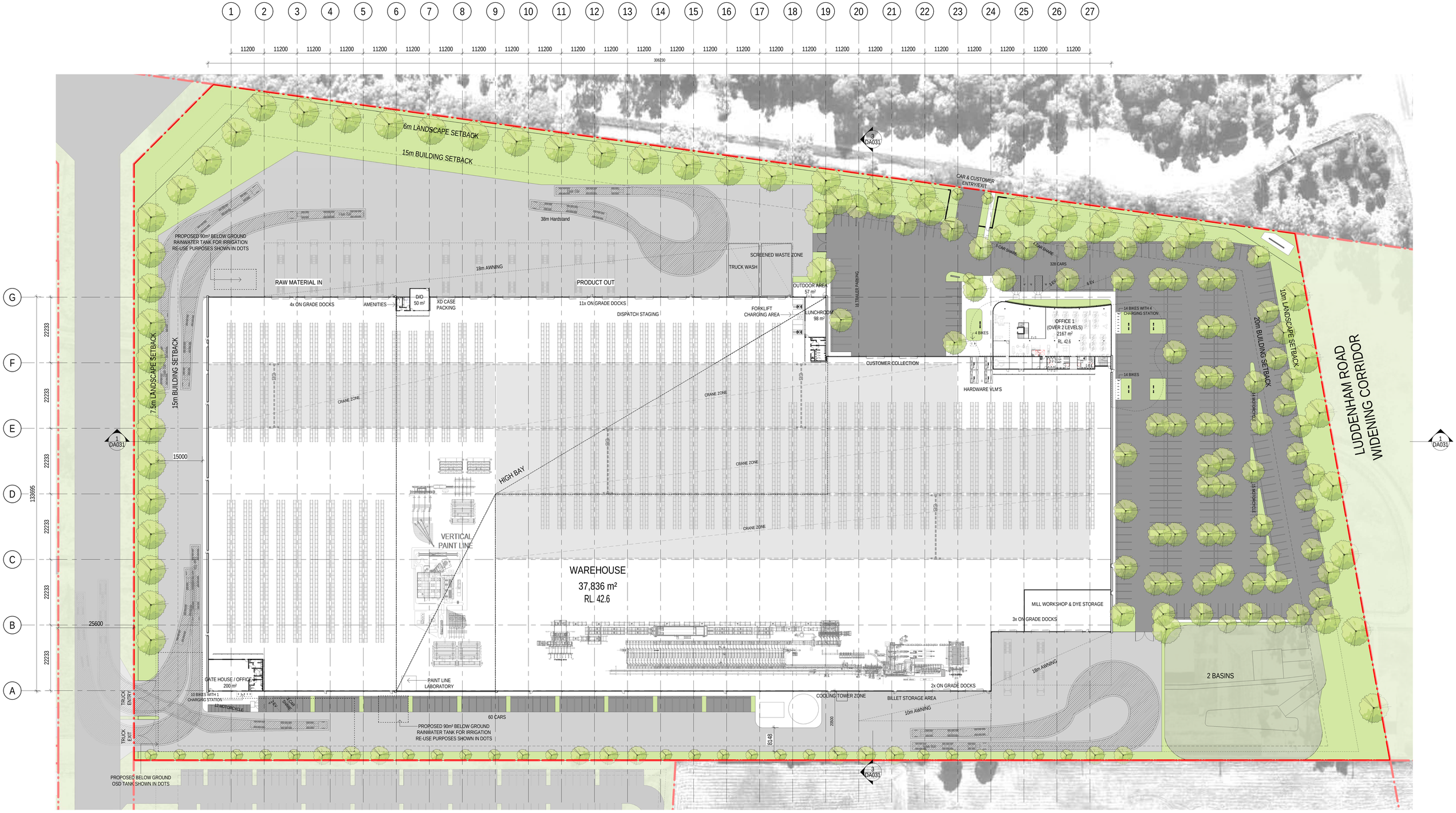
Appendix C – Swept Path Diagram



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Client

Issue	Description	Date
E	ISSUE FOR SSDA	04/07/2024
D	ISSUE FOR SSDA	14/06/2024
C	ISSUE FOR SSDA	04/06/2024
B	ISSUE FOR SSDA	03/06/2024
A	ISSUE FOR SSDA	29/05/2024
P8	DRAFT	29/05/2024
P7	DRAFT	24/05/2024
P6	DRAFT	22/05/2024
P5	DRAFT	13/05/2024
P4	DRAFT	01/05/2024
P3	DRAFT	26/03/2024
P2	DRAFT	15/03/2024
P1	DRAFT	16/01/2024

SSDA

Project Name
ALSPEC WAREHOUSE

Project Address
AIBP, Luddenham Road, Orchard Hills NSW 2748

Key Plan
0 10000 25000

Drawing Title:
GENERAL ARRANGEMENT PLAN - GROUND FLOOR

Author:	Checker:	Sheet Size:	Scale:
MJ	NG	A1	1:500

Drawing Number: **13241_DA010**
Issue: **E**

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Appendix D – SEARs Requirements Register

	Alspec Industrial Business Park - Alspec Warehouse SSDA **SEARs Status**		
Application Number	SSD-69845208		
Project Name	Alspec Manufacturing Warehouse		
Development	Construction and operation of a manufacturing warehouse comprising of aluminium processing through the use of an extrusion press and paint line with a maximum processing capacity of 15,120 tonnes per annum		
Location	Lot 1 DP 1293805, 221-235 Luddenham Road, Orchard Hills		
Applicant	HB+B Property	**Responsible Consultant**	**Actions/Comments/Issues**
Date of Issue	15-May-24		
	• **Traffic and Transport –**		
	• a quantitative traffic impact assessment prepared in accordance with relevant Roads and Maritime Services and Austroads guidelines, that includes:	Traffic Consultant - Arcadis	
	• details of all daily and peak traffic volumes likely to be generated during all key stages of construction and operation, including a description of key access / haul routes, including any vehicles accessing the site via Mamre Road, vehicle types and potential queuing impacts	Traffic Consultant - Arcadis	The reference to Mamre Road is an error, disregard. Included - refer to Section 5 of the TIA
	• 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 on existing performance levels of nearby intersections, using a calibrated SIDRA (or similar) traffic model	Traffic Consultant - Arcadis	Included - refer to Section 5 of the TIA
	• 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	Traffic Consultant - Arcadis	Included - refer to Section 7 of the TIA
	• details and plans of the proposed internal road network, loading docks, pedestrian and cycling facilities and on-site parking in accordance with the relevant Australian Standards	Traffic Consultant - Arcadis	Included - refer to Section 7 of the TIA
	• details of the largest vehicle anticipated to access and move within the site, including swept path diagrams depicting vehicles entering, exiting and manoeuvring throughout the site and at key intersections	Traffic Consultant - Arcadis	Included - refer to Appendix C of the TIA
	• details of road upgrades, infrastructure works or new roads or access points required for the development if necessary.	Traffic Consultant - Arcadis	Included - refer to Section 3 of the TIA

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