Lot 208, 209 & 210 Automated Distribution Centre

SSD-10549995 - Noise and Vibration Impact Assessment

Prepared for Urbis Ltd

June 2026

Lot 208, 209 & 210 Automated Distribution Centre

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Urbis Ltd

E260070 RP1

June 2026

Version	Date	Prepared by	Reviewed by	Comments
1	20 April 2026	Rick Scully	Carl Fokkema	Final
2	8 May 2026	Rick Scully	Carl Fokkema	Final for test of adequacy
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Approved by



Carl Fokkema
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16 June 2026

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Executive Summary

ES1 Overview

This Noise and Vibration Impact Assessment (NVIA) has been prepared by EMM Consulting Pty Ltd (EMM) to accompany a detailed State Significant Development Application (SSDA) for the construction of a warehouse and distribution facility (as defined), referred to throughout this report as an automated distribution centre (ADC).

The land to which this report relates is referred to as 475 Badgerys Creek Road, Bradfield, which has direct interface with the Western Sydney International Airport (WSI), legally described as part Lot 102 and Lot 105 in DP 1316278. It is noted that the ADC will be located on future lots within the 475 Badgerys Creek Road landholding. For the purpose of this Report, reference to 'the site' will relate primarily to the area within the broader lot proposed to be developed for the ADC, unless otherwise specified.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the project (SSD-105499958).

This report concludes that the proposed development is suitable and warrants approval subject to the implementation of the following mitigation measures:

- The warehouse is constructed as per architectural plans (Appendix A) and treated as per details in Section 4.2.1.
- Operational scenarios including plant, equipment and projected traffic movements are consistent with the assumptions detailed in Section 4.2.
- Broadband ambient level adjusting movement alarms to be installed on all moving plant.

Following the implementation of the above mitigation measures, the remaining impacts are appropriate.

ES1.1 Declaration

I, Rick Scully, confirm this Noise and Vibration Impact Assessment addresses the requirement of SEARs No SSD-105499958: Noise and Vibration and relevant State and local legislation, policies, and guidelines including the NSW Noise Policy for Industry (EPA, 2017) and NSW Interim Construction Noise Guideline (DECC, 2009). I further confirm that none of the information contained in the Noise and Vibration Impact Assessment is false or misleading.

Table ES.1.1 Assessment requirements relating to noise and vibration

Item	Description of requirement	Section reference
Noise and vibration – a quantitative noise and vibration impact assessment undertaken by a suitably qualified acoustic consultant in accordance with the relevant Environment Protection Authority guidelines and Australian Standards which includes:	The identification of impacts associated with construction, site emission and traffic generation at noise affected sensitive receivers, including the provision of operational noise contours and a detailed sleep disturbance assessment.	Chapter 3
	Details of noise monitoring survey, background noise levels, noise source inventory and 'worst case' noise emission scenarios.	Chapter 4
	Consideration of annoying characteristics of noise and prevailing meteorological conditions in the study area.	Sections 4.1 and 5.1.1
	A cumulative impact assessment inclusive of impacts from other developments.	Section 3.1.5

Item	Description of requirement	Section reference
	Details and analysis of the effectiveness of proposed management and mitigation measures to adequately manage identified impacts, including a clear identification of residual noise and vibration following application of these mitigation measures and details of any proposed compliance monitoring programs.	Chapter 6



Rick Scully

Associate Acoustic Consultant, Team Leader

16 June 2026

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1 Introduction

This report has been prepared to accompany a State Significant Development Application (SSDA) for the construction of a warehouse and distribution facility (as defined) by an e-retailer at 475 Badgerys Creek Road, Bradfield (the site).

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 2 March 2026. Specifically, this report has been prepared to respond to the SEARs requirements identified in Table 1.1.

Table 1.1 Assessment requirements relating to noise and vibration

Item	Description of requirement	Section reference
Noise and vibration – a quantitative noise and vibration impact assessment undertaken by a suitably qualified acoustic consultant in accordance with the relevant Environment Protection Authority guidelines and Australian Standards which includes:	The identification of impacts associated with construction, site emission and traffic generation at noise affected sensitive receivers, including the provision of operational noise contours and a detailed sleep disturbance assessment.	Chapter 5
	Details of noise monitoring survey, background noise levels, noise source inventory and 'worst case' noise emission scenarios.	Chapter 4
	Consideration of annoying characteristics of noise and prevailing meteorological conditions in the study area.	Sections 4.1 and 5.1.1
	A cumulative impact assessment inclusive of impacts from other developments.	Section 3.1.5
	Details and analysis of the effectiveness of proposed management and mitigation measures to adequately manage identified impacts, including a clear identification of residual noise and vibration following application of these mitigation measures and details of any proposed compliance monitoring programs.	Chapter 6

1.1 Site description

The land to which this report relates is referred to as 475 Badgerys Creek Road, Bradfield, which has direct interface with the Western Sydney International Airport (WSI). It is noted that the proposed ADC will be located on Lots 208, 209 and 210 within the broader 475 Badgerys Creek Road, Bradfield landholding. These lots are not yet formally registered.

The broader landholding has an area of approximately 184 hectares (ha) and is subject to an approved Master Plan prepared by Inghams Property Group (IPG) – IPG Badgerys Creek Road – Master Plan (WSA_MP01). The proposed ADC will be located in Stage 2 of the IPG Master Plan site. The application site has an area of approximately 172,000 metres squared (m^2). The location of the application site is shown in Figure 1.1, with the proposed site layout provided in Figure 1.2.

The broader master plan site was formerly used for intensive poultry farming and previously contained a series of sheds and ancillary structures and associated internal road network, which have now been demolished. Earthworks and other site establishment works have commenced across the broader IPG Master Plan site.



Figure 1.1 Application site location

1.2 Project description

It is the e-retailers intent to construct and operate a new ADC. The ADC will be a distribution centre for goods storage and distribution direct to offsite third-party sortation service providers.

The proposed description of development is as follows:

> Construction, fit-out and operation of a warehouse and distribution facility (automated distribution centre) with associated car parking, landscaping, driveway accesses, utility service connection, bulk earthworks and other related works.

1.3 Assessment guidelines

The following policies, guidelines, standards and site specific documents have been considered as part of this assessment:

- NSW Environmental Protection Authority (EPA) *Noise Policy for Industry (NPfI)* 2017
- NSW Department of Environment and Climate Change (DECC) *Interim Construction Noise Guideline (ICNG)* 2009
- NSW Department of Environment, Climate Change and Water (DECCW) *Road Noise Policy (RNP)* 2011
- NSW Department of Environment and Conservation (DEC) *Assessing Vibration: A Technical Guideline (AVTG)* 2006

- Australian Standards (AS) 1055:2018 *Acoustics – Description and measurement of environmental noise*
- NSW Department of Planning, Housing and Infrastructure (DPHI) *Cumulative Impact Assessment Guidelines for State Significant Projects (CIAG)* 2022
- IPG Badgerys Creek Road - Master Plan (WSA_MP01)
- NSW Department of Planning, Housing and Infrastructure (DPHI) *Western Sydney Aerotropolis Development Control Plan (WSADCP)* 2022
- Automated Distribution Centre Lot 208, Lot 209, Lot 210 Architectural Development Application Drawings, Project No 25234, Revision DA01 dated 08 May 2026
- Lot 208, Lot 209, Lot 210 Automated Distribution Centre Transport Assessment, ASON Pty Ltd (P1492Gr01 SSDA TA).

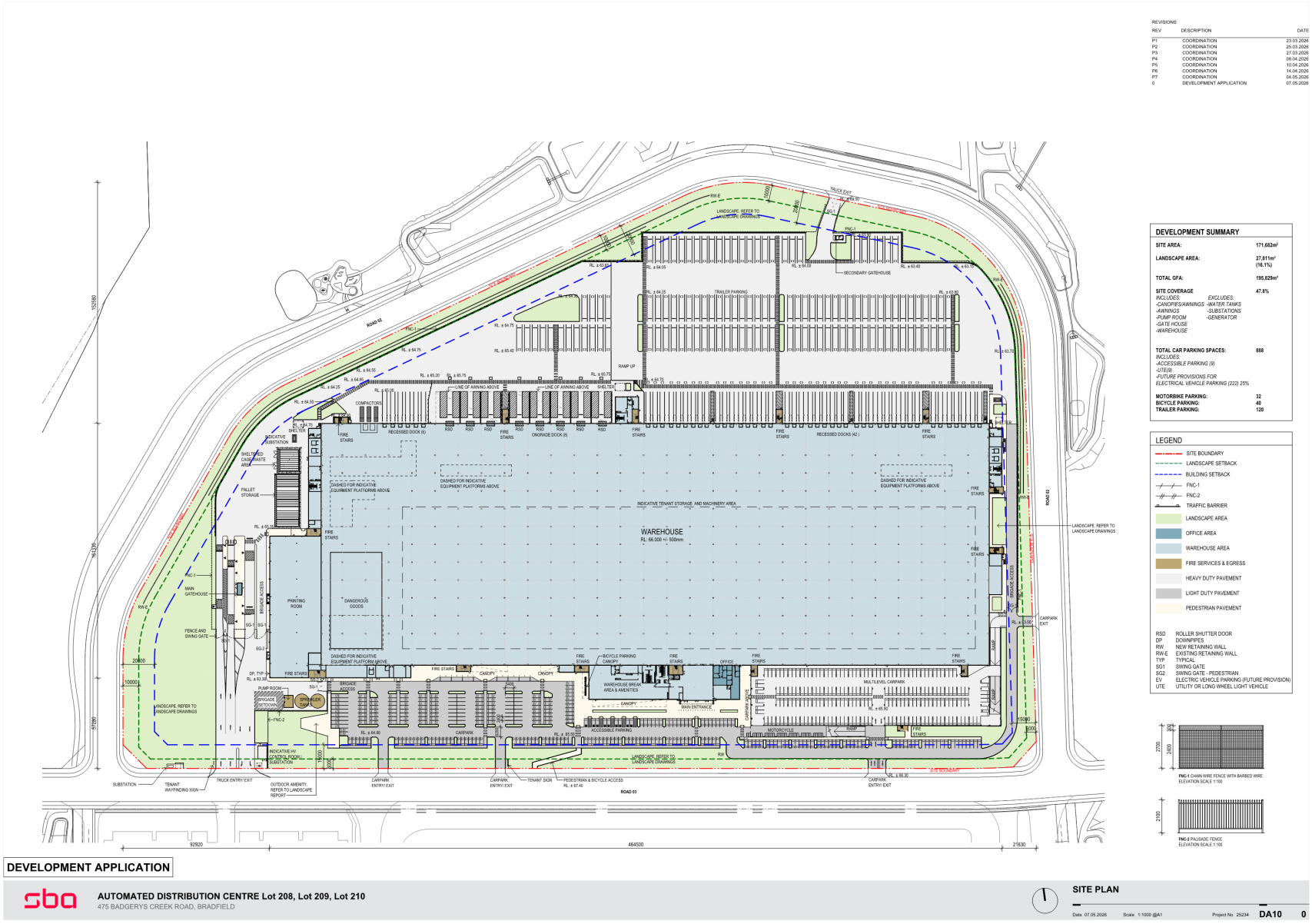


Figure 1.2 Site plan

2 Existing environment

2.1 Site and surrounding area

The site is located within an Enterprise zoning with the greater IPG Master Plan, envisaging a large industrial and commercial precinct with large warehouses and distribution centres to be developed across the nominated lots. The site is surrounded by a range of zoning and permitted uses; Special Purpose Zone – Infrastructure (Western Sydney International Airport – WSI) to the west and north and Mixed Use. Potentially sensitive land uses surrounding the site include residential properties to the east and isolated rural properties to the southwest and north beyond the CSR site.

It is noted that the existing residential area (RU4 Primary Production Small Lots) to the east (approximately 1.7 kilometres (km)) across the South Creek (Wianamatta) and broadly identified as Rossmore - comprises Rossmore to the south of Fifteenth Avenue and Kemps Creek north of Fifteenth Avenue and is planned for intensification of residential land use to medium density residential development. The boundary between these suburbs is proposed to be relocated from its current separation at Fifteenth Avenue, further north beyond the eastern boundary of the IPG site.

Existing isolated rural receivers to the south, west and north (nearest is approximately 600 m to the east) along Badgerys Creek Road, are located within the Enterprise zone and will transition to industrial, commercial or retail land uses. Additionally, a Mixed Use area is proposed on the land adjoining the IPG Master Plan to the south-east of the site within the Greenland Development Company (GDC) site that has the potential to incorporate residential development under its mixed-use zoning.

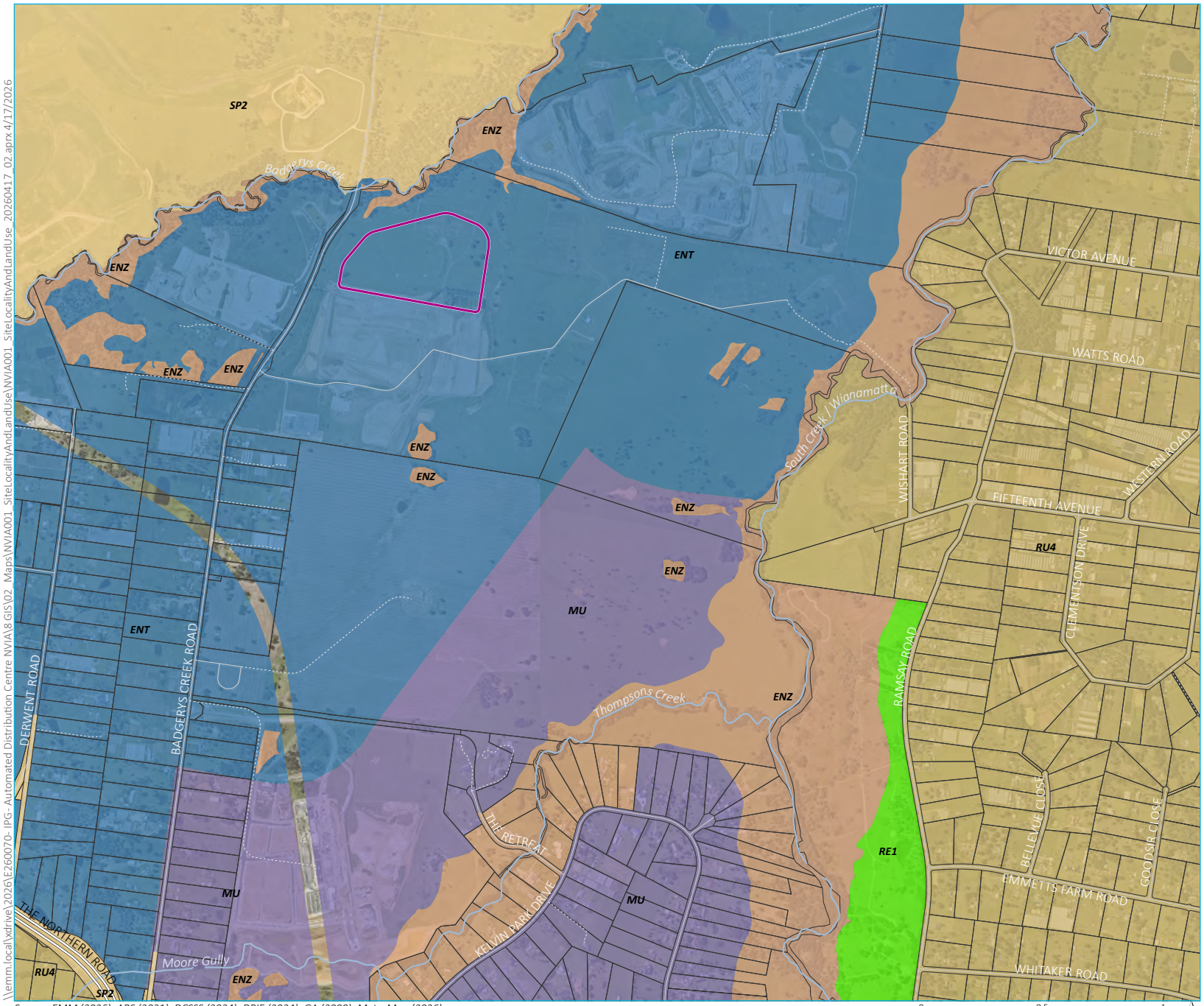
The surrounding land is in transition, noted by the construction and commissioning of the WSI and operation of M12 Motorway. However, there is the expectation that all land developers would consider the existing and future noise environment.

To this end, it is considered appropriate that future residential to the east and mixed use to the south-east would consider the current zoning, permitted land use, hours of operation and expected noise exposure and incorporate a level of noise control within their developments to maintain a satisfactory level of internal noise amenity taking account potential noise intrusion road traffic and industrial/commercial land use. The noise lot allowances contained in the IPG Master Plan considered these sensitive receivers and adjacent future land uses in this context.

The site and IPG Master Plan locations and surrounding zoning is presented in Figure 2.1.

2.2 Background noise levels

Background noise monitoring for the site was undertaken as part of the IPG Noise Planning Assessment (NPA) prepared by EMM (E230493_R1_V5 9 April 2024) and has been considered in this assessment. As assessment procedures are clearly set out within the Master Plan NPA, no updated background noise measurements were deemed necessary.





KEY

- Site boundary

Land zoning

SEPP (Western Sydney Aerotropolis) 2020

- ENT | Enterprise
- ENZ | Environment and recreation
- MU | Mixed use
- SP2 | Infrastructure

Liverpool Local Environmental Plan 2008

- RE1 | Public Recreation
- RU4 | Primary Production Small Lots

Existing environment

- Major road
- Minor road
- Vehicular track
- Named watercourse
- Cadastral boundary

INSET KEY

- Major road
- NPWS reserve
- State forest

Source: EMM (2026); ABS (2021); DCSSS (2024); DPIE (2024); GA (2009); MetroMap (2026)

0 0.5 1 km

GDA2020 MGA Zone 56

N

Site locality and land use zoning

Lot 208, 209 & 210
Automated Distribution Centre
Noise and Vibration Impact Assessment
Figure 2.1

EMM creating opportunities

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2.3 Noise catchment areas

The assessment has considered three key noise catchment areas (NCAs) surrounding the site, comprising:

- NCA1 – East – Residential:
  - Existing rural primary production properties, earmarked for medium density residential expansion at Rossmore and Kemps Creek and will be separated from the enterprise area by a riparian corridor, with the subject site separated by multiple future developments within the IPG Master Plan.
- NCA2 – Southeast – Mixed Use – Future Development:
  - Comprising buildings up to 52.5 m in height subject to current planning restrictions with the subject site separated by multiple future uses within the IPG Master Plan.
- NCA3 – South/Southwest/West/North – Residential/Enterprise:
  - Existing isolated rural residential properties within the enterprise zone and will transition to permitted uses under the enterprise zoning guidelines including light industrial, commercial, and other non-residential uses.

NCA boundaries are presented in Figure 2.2.

2.4 Assessment locations

Assessment locations have been identified consistent with the IPG NPA.

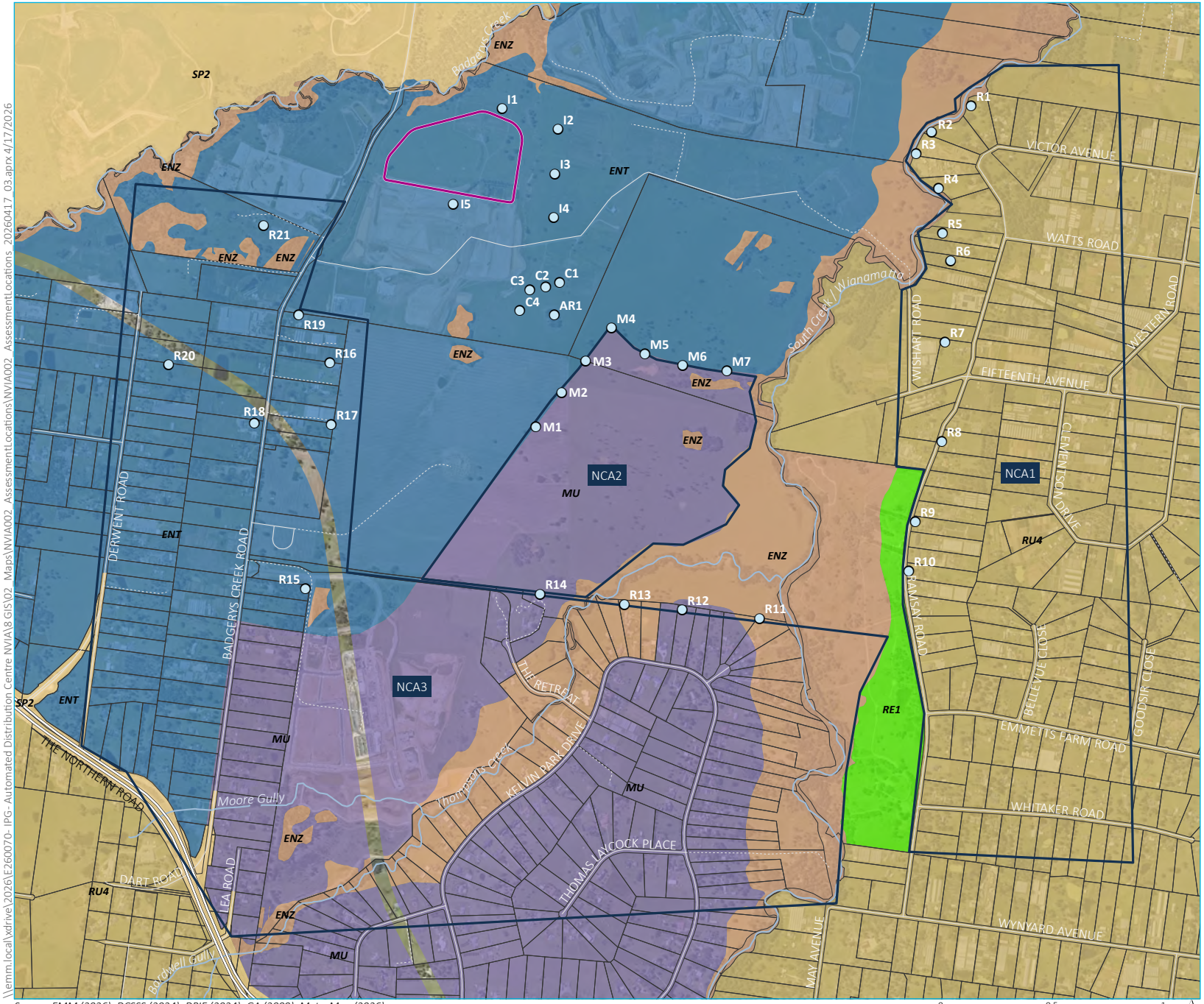
Additionally, approved and proposed commercial, industrial and active recreational assessment locations within the IPG Master Plan have been assessed.

Assessment locations are detailed in Table 2.1 and presented in Figure 2.2.

Table 2.1 Assessment locations

Assessment location	NCA	Coordinates (MGA Grid 56)	
		Eastings	Northings
R1	NCA1 – East – Residential	293420	6246666
R2		293242	6246549
R3		293173	6246451
R4		293273	6246295
R5		293291	6246093
R6		293328	6245970
R7		293302	6245605
R8		293288	6245158
R9		293169	6244798
R10		293140	6244577

Assessment location	NCA	Coordinates (MGA Grid 56)	
		Eastings	Northings
M1	NCA2 – South East – Mixed Use – Future Development	291465	6245224
M2		291581	6245378
M3		291689	6245519
M4		291805	6245669
M5		291955	6245552
M6		292124	6245500
M7		292323	6245475
R11	NCA3 – South/Southwest/West – Residential/Enterprise	292470	6244363
R12		292123	6244402
R13		291863	6244426
R14		291484	6244473
R15		290430	6244497
R16		290540	6245513
R17		290546	6245233
R18		290201	6245242
R19		290400	6245727
R20		289816	6245503
R21		290243	6246129
I1	Industrial – within IPG Master Plan	291314	6246654
I2		291565	6246561
I3		291550	6246360
I4		291545	6246165
I5		291094	6246224
C1	Commercial – within IPG Master Plan	291572	6245873
C2		291510	6245852
C3		291438	6245840
C4		291393	6245747
AR1	Active Recreation – within IPG Master Plan	291548	6245727



KEY

- Site boundary
- Noise catchment area
- Receiver location

Land zoning

SEPP (Western Sydney Aerotropolis) 2020

- ENT | Enterprise
- ENZ | Environment and recreation
- MU | Mixed use
- SP2 | Infrastructure

Liverpool Local Environmental Plan 2008

- RE1 | Public Recreation
- RU4 | Primary Production Small Lots

Existing environment

- Major road
- Minor road
- Vehicular track
- Named watercourse
- Cadastral boundary

Source: EMM (2026); DCSSS (2024); DPIE (2024); GA (2009); MetroMap (2026)

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Assessment locations

Lot 208, 209 & 210
Automated Distribution Centre
Noise and Vibration Impact Assessment
Figure 2.2

EMM
creating opportunities

3 Assessment guidelines

3.1 Operational noise

Noise from development in NSW is regulated by the local council, Department of Planning, Housing and Infrastructure (DPHI) and/or the EPA, and sites generally have development consent conditions or a licence stipulating noise limits. These limits are typically derived from project specific trigger or operational noise levels predicted at assessment locations. They are based on local government policy, EPA guidelines (e.g. NPfI) or noise levels that can be achieved by a specific site following the application of all reasonable and feasible noise mitigation.

The objectives of noise trigger levels established in accordance with the NPfI are to protect the community from excessive intrusive noise and preserve amenity for specific land uses. It should be noted that the audibility of a noise source does not necessarily equate to disturbance at an assessment location.

To ensure these objectives are met, the EPA provides project specific noise trigger levels, namely intrusiveness and amenity.

3.1.1 Intrusiveness noise levels

The NPfI intrusiveness noise triggers require that $L_{Aeq,15min}$ noise levels (energy average noise level over a 15 minute period) from the project do not exceed the rated background level (RBL) by more than 5 dB during the relevant operational periods. The intrusiveness noise levels are only applicable at residential assessment locations. Intrusiveness noise levels for residential receivers are reproduced in Table 3.1.

Table 3.1 Intrusiveness noise levels

NCA	Intrusiveness noise level, dB $L_{Aeq,15min}$		
	Day	Evening	Night
NCA1	40	35	35

Notes: 1. Day: 7:00 am to 6:00 pm Monday to Saturday; 8:00 am to 6:00 pm Sundays and public holidays; evening: 6:00 pm to 10:00 pm; night: 10:00 pm to 7:00 am Monday to Saturday; 10:00 pm to 8:00 am Sundays and public holidays.
2. Minimum RBLs assumed in accordance with the NPfI and IPG NPA.

Due to the nature of the rezoning and redevelopment of these precincts adjacent pre-existing residential properties that are also rezoned enterprise, the intrusive noise triggers do not typically apply, and noise from projects are normally assessed under the amenity noise level guidelines, in accordance with the NPfI, hence no intrusiveness noise levels are defined for NCA2 and NCA3.

3.1.2 Amenity noise levels

The assessment of amenity is based on noise levels specific to the land use. Where the measured existing industrial noise approaches recommended amenity noise levels, it needs to be demonstrated that noise levels from new development will not contribute to existing industrial noise such that amenity noise levels are exceeded.

To ensure that industrial noise levels remain within the recommended amenity noise levels for an area and address potential for cumulative noise, the project amenity noise level for a new industrial development is the recommended amenity noise level (outlined in Table 2.2 of the NPfI) minus 5 dB. It is noted that this approach is based on a receiver being impacted by multiple industrial sites (or noise sources), typically three to four of equal noise contribution.

The project amenity noise levels for the identified assessment locations are presented in Table 3.2.

Table 3.2 Amenity noise levels

Assessment location	Time period[1]	Indicative area	Project amenity noise level[2] dB,$L_{Aeq,Period}$
NCA1, NCA2 and NCA3	Not Applicable – Refer to Section 3.1.3 for IPG Master Plan lot allowances		
Industrial premises	When in use	All	65 (70–5)
Commercial premises	When in use	All	60 (65–5)
Active recreation area	When in use	All	50 (55–5)

Source: NPfI (EPA 2017)

Notes:

1. Day: 7:00 am to 6:00 pm Monday to Saturday; 8:00 am to 6:00 pm Sundays and public holidays; evening: 6:00 pm to 10:00 pm; night: 10:00 pm to 7:00 am Monday to Saturday; 10:00 pm to 8:00 am Sundays and public holidays.
2. Project amenity noise level is Amenity noise level (Table 2.2 of NPfI) -5 dB in accordance with NPfI Section 2.4.2 assuming three to four industrial sites contributing to noise levels.

However the IPG Master Plan has a range of new proposed industrial developments, accordingly the IPG NPA derived noise allowances per lot to address the potential cumulative industrial noise for residences within NCA1, NCA2 and NCA3 (see Section 3.1.3). This assessment has assumed these lot allowances in accordance with the requirements of the SEARs.

3.1.3 IPG Master Plan lot allowances

The IPG NPA and subsequent approved Master Plan presented derived recommended noise allowances per lot to address the potential cumulative noise impacts from the IPG Master Plan. As required by the SEARs, to address cumulative noise this assessment is required to demonstrate compliance with these allowances.

The noise allowances relevant for this assessment (defined as Lots 8, 9 and 10 in the Master Plan, referred to as 208, 209 and 210 within this report) are presented in Table 3.3 for each NCA. A cumulative allowance has been calculated for the site, given it will occupy three lots within the IPG Master Plan.

Table 3.3 IPG Masterplan lot noise allowances

Lot	Noise allowance at the receiver, dB $L_{Aeq,period}$		
	Day	Evening	Night
NCA 1 – Residential (Rural)			
Lot 8 (208)	31	26	21
Lot 9 (209)	34	29	24
Lot 10 (210)	33	28	23
Cumulative Lots 8, 9, 10	**38**	**33**	**28**
NCA 2 – Mixed use (Urban)			
Lot 8 (208)	41	31	26
Lot 9 (209)	43	33	28

Lot	Noise allowance at the receiver, dB $L_{Aeq,period}$		
	Day	Evening	Night
Lot 10 (210)	43	33	28
Cumulative Lots 8, 9, 10	**47**	**37**	**32**
NCA 3 – Commercial			
Lot 8 (208)		46	
Lot 9 (209)		48	
Lot 10 (210)		48	
Cumulative Lots 8, 9, 10		**52**	

Source: IPG NPA (EMM 2024).

3.1.4 Project noise trigger levels

In accordance with the NPfI, IPG NPA and approved Master Plan, the project noise trigger levels (PNTLs) for the site are presented in Table 3.4.

Table 3.4 Project noise trigger levels

Receiver	Project noise trigger level, dB $L_{Aeq,15min}$		
	Day	Evening	Night
NCA1 (Residential)	41 (38+3)	36 (33+3)	31 (28+3)
NCA2 (Mixed use - Urban)	50 (47+3)	40 (37+3)	35 (32+3)
NCA3 (Commercial)		55 (52+3)	
Industrial premises		68 (65+3)	
Commercial premises		58 (55+3)	
Active recreation area		53 (50+3)	

Notes: 1. Day: 7:00 am to 6:00 pm Monday to Saturday; 8:00 am to 6:00 pm Sundays and public holidays; evening: 6:00 pm to 10:00 pm; night: 10:00 pm to 7:00 am Monday to Saturday; 10:00 pm to 8:00 am Sundays and public holidays.

2. Project amenity LAeq,15min noise level is the recommended amenity noise level LAeq,period +3 dB as per the NPfI.

3.1.5 Cumulative industrial noise

The DPHI Cumulative Impact Assessment Guidelines for State Significant Projects (CIAG) detail the requirements for managing the incremental, sustained and combined effects of cumulative impacts. Section 3.5 of that document detailed the assessment approach requirements for cumulative impact assessments.

Requirements of the DPHI CIAG are addressed through the implementation of the NPfI. The NPfI amenity noise levels (see Section 3.1.2) aims to protect against cumulative noise impacts from industry and maintain amenity for particular land uses. Potential cumulative noise impacts have been considered in this assessment through the implementation of criteria in accordance with the NPfI and the specific IPG Master Plan noise lot allowances established for WSA_MP01.

Cumulative noise impacts at residential receivers will be addressed through compliance with the lot noise allowances in accordance with the IPG NPA and WSA_MP01 (see Section 3.1.3). Cumulative noise impacts at other sensitive receivers will be addressed through compliance with the PNTLs (see Section 3.1.4).

3.1.6 Sleep disturbance

The NPfI suggests that a detailed maximum noise level event assessment should be undertaken where night-time noise levels at a residential location exceed screening levels of:

- $L_{Aeq,15minute}$ 40 dB or the prevailing RBL plus 5 dB (whichever is the greater).
- L_{Amax} 52 dB or the prevailing RBL plus 15 dB (whichever is the greater).

Guidance regarding potential for sleep disturbance is also provided in the RNP. The RNP calls upon numerous studies that have been conducted into the effect of maximum noise levels on sleep. The RNP acknowledges that, at the current (2011) level of understanding, it is not possible to establish absolute noise level criteria that will correlate to an acceptable level of sleep disturbance.

Additional information is outlined in WHO [World Health Organization] Night Noise Guidelines for Europe (WHO 2009) and the Environmental Noise Guidelines for the European Region: A Systematic Review on Environmental Noise and Effects on Sleep (Basner and McGuire 2018). Further guidance is also provided in the NSW RNP with reference to Health "as a rule for planning for short-term or transient noise events, for good sleep over 8 hours the indoor sound pressure level measured as a maximum instantaneous value should not exceed approximately 45 dB(A) L_{Amax} more than 10 or 15 times per night". It is commonly accepted by acoustic practitioners and regulatory bodies (i.e. EPA) that a facade including a partially open window will reduce external noise levels by 10 dB. Therefore, external noise levels in the order of 55 dB calculated at the facade of a residence is unlikely to impact sleep according to the RNP.

If noise levels over the screening criteria are identified, then additional analysis will consider factors such as:

- how often the events will occur
- the time the events will occur
- whether there are times of day when there is a clear change in the noise environment (such as during early morning shoulder periods)
- current scientific literature available regarding the impact of maximum noise level events at night.

Table 3.5 provides the noise level event screening criteria for the residential assessment locations within NCA1 and for consideration of future mixed use at NCA2, in accordance with the IPG NPA, which considered current research, guidelines, existing ambient levels and anticipated increase in background and ambient noise levels following commencement of WSI operations and development and operation of the Aerotropolis enterprise precinct including this site.

Sleep disturbance for residual residences within the rezoned land in NCA3 has not been considered due to the transitional of land use and consistent with outcomes of consultation with DPHI and approval of noise assessments and projects for other sites within the greater Aerotropolis and Mamre Road Precinct.

Table 3.5 Sleep disturbance screening criteria at residences

Assessment location	Night-time maximum noise level event screening criteria, dB L_{Amax}
NCA1 (existing residential)	55
NCA2 (future mixed use)	60

Notes: Night-time is 10:00 pm to 7:00 am.

3.1.7 Development Control Plan

The WSADCP specifies performance outcomes and benchmark solutions for industrial developments within the WSA, with Section 3.7 of the WSADCP referring to noise and amenity, which is reproduced in Table 3.6.

Table 3.6 WSADCP Performance outcomes and benchmark solutions

Performance outcome		Benchmark solution
PO1	To ensure noise and vibration do not adversely impact human health and amenity. To ensure building design adequately protects workers and surrounding receivers from noise and vibration.	1. Any machinery or activity considered to produce noise emissions from a premise shall be adequately sound-proofed so that noise emissions are in accordance with the provisions of the *Protection of the Environment Operations Act 1997.* 2. Noise should be assessed in accordance with Noise Policy for Industry (EPA, 2017) and NSW Road Noise Policy (Department of Environment, Climate Change and Water, 2011). 3. An Acoustic Report by a qualified acoustical engineer must be submitted where proposed development, including traffic generated by that development, will create noise and/or vibration impacts, either during construction or operation, that impacts on adjoining developments or nearby rural-residential areas. The Acoustic Report should outline the proposed noise amelioration strategies and management methods. 4. Acoustic Reports for individual developments must assess cumulative noise impacts, including likely future noise emissions from the development and operation of the Precinct. The consultant should liaise with the relevant consent authority to determine acceptable amenity goals for individual industrial developments and background noise levels. 5. The use of mechanical plant and equipment may be restricted in areas close to sensitive receivers, such as adjoining rural-residential development and educational establishments. 6. Building design is to incorporate noise amelioration features. Roof elements are to control potential breakout noise, having regard to surrounding topography. 7. Boundary fences are to incorporate noise amelioration features and control breakout noise having regard to developments adjoining rural-residential areas

The requirements of the WSADCP have been addressed through the application of suitable noise criteria, assessment methodologies and mitigation measures as detailed throughout this report.

3.2 Road traffic noise

The principal guidance to assess the impact of road traffic noise on assessment locations is in the *NSW Road Noise Policy* (RNP) (EPA 2011).

Table 3.7 presents the road noise assessment criteria for residential land uses (i.e. assessment locations), reproduced from Table 3 of the RNP for road categories relevant to construction and use of the site.

All traffic would access or depart the site via Badgerys Creek Road either to/from Elizabeth Drive or The Northern Road (A9), until such time as the Eastern Ring Road is delivered. Elizabeth Drive and A9 are considered arterial roads, whilst under the definitions of the NSW RNP, Badgerys Creek Road is a sub-arterial road.

Table 3.7 Road traffic noise assessment criteria for residential land uses

Road category	Type of project/development	Assessment criteria – dBA	
		Day (7:00 am to 10:00 pm)	Night (10:00 pm to 7:00 am)
Freeway/arterial/ sub-arterial roads	Existing residences affected by additional traffic on existing freeway/arterial/sub-arterial roads generated by land use developments.	$L_{eq,15hr}$ 60 (external)	$L_{eq,9hr}$ 55 (external)

Additionally, the RNP states that where existing road traffic noise criteria are already exceeded, any additional increase in total traffic noise level should be limited to an increase of up to 2 dB.

In addition to meeting the assessment criteria in any significant increase in total traffic noise at the relevant residential assessment locations must be considered. Residential assessment locations experiencing increases in total traffic noise levels above those presented in Table 3.8 should be considered for mitigation.

Table 3.8 Road traffic relative increase criteria for residential land uses

Road category	Type of project/development	Total traffic noise level increase – dBA	
		Day (7:00 am to 10:00 pm)	Night (10:00 pm to 7:00 am)
Freeway/arterial/ sub-arterial roads and transit ways	New road corridor/redevelopment of existing road/land use development with the potential to generate additional traffic on existing road.	Existing traffic $L_{eq(15\text{-}hr)}$+12 dB (external)	Existing traffic $L_{eq(9\text{-}hr)}$+ 12 dB (external)

Appendix B of the RNP, states that noise levels shall be rounded to the nearest integer, whilst difference between two noise levels are to be rounded to a single decimal place.

3.3 Construction noise

The *Interim Construction Noise Guideline* (ICNG) (DECC 2009) has been jointly developed by NSW Government agencies, including the NSW Environment Protection Authority (EPA) and Department of Planning (DoP) (now DPHI). The objectives of the guideline relevant to the planning process are to promote a clear understanding of ways to identify and minimise noise from construction and to identify 'feasible' and 'reasonable' work practices.

The guideline recommends standard construction hours where noise from construction activities is audible at residential premises (i.e. assessment locations), as follows:

- Monday to Friday 7:00 am to 6:00 pm
- Saturday 8:00 am to 1:00 pm
- no construction work is to take place on Sundays or public holidays.

The ICNG acknowledges that works outside standard hours may be necessary, however, justification should be provided to the relevant authorities.

The ICNG provides two methodologies to assess construction noise emissions. The first is a quantitative approach, which is suited to major construction projects with typical durations of more than three weeks. This method requires noise emission predictions from construction activities at the nearest assessment locations and assessment against ICNG recommended noise levels.

The second is a qualitative approach, which is a simplified assessment process that relies more on noise management strategies. This method is suited to short-term infrastructure and maintenance projects of less than three weeks.

This assessment has adopted a quantitative approach. The qualitative aspects of the assessment include identification of assessment locations, description of works involved including predicted noise levels and proposed management measures that include a complaints handling procedure.

3.3.1 Works outside of standard construction hours

The ICNG identifies that there are five categories of work that typically may be required to be carried out outside of the standard construction hours:

1. The delivery of oversized plant or structures that police or other authorities determine require special arrangements to transport along public roads.
2. Emergency work to avoid imminent injury or the loss of life or damage to property, or to prevent environmental harm.
3. Maintenance and repair of public infrastructure where disruption to essential services and/or considerations of worker safety do not allow work within standard construction hours.
4. Public infrastructure works that shorten the length of the project and are supported by the affected community.
5. Works where a proponent demonstrates and justifies a need to operate outside the recommended standard construction hours.

In the last two categories, the proponent should provide the relevant authority with clear justification for reasons other than convenience, why work is necessary outside standard construction hours, such as to sustain operational integrity of road, rail and utility networks.

Where out of hours works (OOHW) are proposed to take place, an assessment of noise and vibration impacts and identification of feasible and reasonable mitigation measures will be required. To complete this assessment, the project specific noise management levels (NMLs) derived in Section 3.3.4 should be adopted.

3.3.2 Construction noise management levels - residents

Table 3.9 provides ICNG noise management levels (NML) which apply to residential assessment locations.

Table 3.9 ICNG construction noise management levels for residences

Time of day	NML $L_{Aeq,15min}$	Application
Recommended standard hours: Monday to Friday 7:00 am to 6:00 pm, Saturday 8:00 am to 1:00 pm, no work on Sundays or public holidays	Noise-affected RBL + 10 dB	The noise-affected level represents the point above which there may be some community reaction to noise: • Where the predicted or measured $L_{Aeq,15min}$ is greater than the noise-affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dBA	The highly noise-affected level represents the point above which there may be strong community reaction to noise: • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences). 2. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise-affected RBL + 5 dB	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dBA above the noise-affected level, the proponent should negotiate with the community. • For guidance on negotiating agreements see Section 7.2.2 of the ICNG.

Source: ICNG (EPA 2009).

3.3.3 Construction noise management levels – other noise sensitive land uses

Table 3.10 summarises the ICNG recommendations and provides NML for other land uses.

Table 3.10 ICNG noise levels at other land uses

Land use	Management level, $L_{Aeq,15min}$ dB
Industrial premises	External noise level 75 dB (when in use)
Offices, retail outlets	External noise level 70 dB (when in use)

Land use	Management level, $L_{Aeq,15min}$ dB
Hotels[1]	External noise level 65 dB (7:00 am to 10:00 pm) 60 dB (10:00 pm to 7:00 am)
Classrooms at schools and other educational institutions	Internal noise level 45 dB (when in use)
Hospital wards and operating theatres	Internal noise level 45 dB (when in use)
Places of worship	Internal noise level 45 dB (when in use)
Active recreation areas	External noise level 65 dB (when in use)
Passive recreation areas	External noise level 60 dB (when in use)

Source: ICNG (DECC 2009).

1. NML based on AS2017 recommend maximum internal noise level and the premise that windows and doors for such development would typically remain closed, providing 20 dB of outdoor to indoor construction noise level reduction.

3.3.4 Project specific construction noise management levels

The project construction NMLs for recommended standard and out of hour periods are presented in Table 3.11. Construction activities associated with the project have been assessed based on standard construction hours; however, a full range of OOH has been provided for completeness and potential construction activity flexibility. This assessment has conservatively adopted the NPfI minimum baseline background noise levels for residential assessment locations.

Table 3.11 Construction noise management levels – all assessment locations

Assessment location	Period	NML $L_{Aeq,15min}$ dB
Residential (NCA1 - NCA3)	Day (standard ICNG hours)	45
	Day (OOH)	40
	Evening (OOH)	35
	Night (OOH)	35
Commercial premises	When in use	70
Industrial premises	When in use	75

3.4 Construction vibration

3.4.1 Human perception of vibration

Humans can detect vibration levels which are well below those causing any risk of damage to a building or its contents.

The actual perception of motion or vibration may not in itself be disturbing or annoying. An individual's response to that perception, and whether the vibration is "normal" or "abnormal", depends very strongly on previous experience and expectations, and on other connotations associated with the perceived source of the vibration. For example, the vibration that a person responds to as "normal" in a car, bus or train is considerably higher than what is perceived as "normal" in a shop, office, or dwelling.

Human tactile perception of random motion, as distinct from human comfort considerations, was investigated by Diekmann and subsequently updated in German Standard DIN 4150 Part 2 1999. On this basis, the resulting degrees of perception for humans are suggested by the vibration level categories given in Table 3.12.

Table 3.12 suggests that people will just be able to feel floor vibration at levels of approximately 0.15 millimetres per second (mm/s) and that the motion becomes “noticeable” at a level of approximately 1 mm/s.

Table 3.12 Peak vibration levels and human perception of motion

Approximate vibration level	Degree of perception
0.10 mm/s	Not felt
0.15 mm/s	Threshold of perception
0.35 mm/s	Barely noticeable
1 mm/s	Noticeable
2.2 mm/s	Easily noticeable
6 mm/s	Strongly noticeable
14 mm/s	Very strongly noticeable

Note: These approximate vibration levels (in floors of building) are for vibration having a frequency content in the range of 8 Hertz (Hz) to 80 Hz.

3.4.2 Assessing vibration - a technical guideline

Environmental Noise Management – Assessing Vibration: a technical guideline (DEC 2006) (the guideline) is based on BS 6472 – 2008, Evaluation of human exposure to vibration in buildings (1–80 Hz).

The guideline presents preferred and maximum vibration values for the use in assessing human responses to vibration and provides recommendations for measurement and evaluation techniques. At vibration values below the preferred values, there is a low probability of adverse comment or disturbance to building occupants. Where all feasible and reasonable mitigation measures have been applied and vibration values are still beyond the maximum value, it is recommended that the operator negotiate directly with the affected community.

The guideline defines three vibration types and provides direction for assessing and evaluating the applicable criteria. Table 2.1 of the guideline provides examples of the three vibration types and has been reproduced in Table 3.13.

Table 3.13 Examples of types of vibration

Continuous vibration	Impulsive vibration	Intermittent vibration
Machinery, steady road traffic, continuous construction activity (such as tunnel boring machinery).	Infrequent: Activities that create up to three distinct vibration events in an assessment period, e.g. occasional dropping of heavy equipment, occasional loading and unloading. Blasting is assessed using ANZEC (1990).	Trains, intermittent nearby construction activity, passing heavy vehicles, forging machines, impact pile driving, jack hammers. Where the number of vibration events in an assessment period is three or fewer these would be assessed against impulsive vibration criteria.

Continuous vibration associated with compaction of road base for new site access (within the site boundaries) and hard stand areas is most relevant to the construction of the ADC.

Intermittent vibration (as defined in Section 2.1 of the guideline) is assessed using the vibration dose concept which relates to vibration magnitude and exposure time. Intermittent vibration is representative of heavy vehicle pass-bys and construction activities such as impact hammering, rolling, or general excavation work.

Section 2.4 of the guideline provides acceptable values for intermittent vibration in terms of vibration dose values (VDV) which requires the measurement of the overall weighted rms (root mean square) acceleration levels over the frequency range 1 Hz to 80 Hz.

To calculate VDV the following formula is used (refer to Section 2.4.1 of the guideline):

$$VDV = \left[\int_0^T a^4(t)dt\right]^{0.25}$$

Where VDV is the vibration dose value in $m/s^{1.75}$, *a (t)* is the frequency-weighted rms of acceleration in m/s^2 and *T* is the total period of the day (in seconds) during which vibration may occur.

The acceptable VDV for intermittent vibration are reproduced in Table 3.14.

Table 3.14 Acceptable vibration dose values for intermittent vibration

Location	Daytime		Night time	
	Preferred value, $m/s^{1.75}$	Maximum value, $m/s^{1.75}$	Preferred value, $m/s^{1.75}$	Maximum value, $m/s^{1.75}$
Critical areas	0.10	0.20	0.10	0.20
Residences	0.20	0.40	0.13	0.26
Offices, schools, educational institutions, and places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

1. Daytime is 7:00 am to 10:00 pm and night time is 10:00 pm to 7:00 am.
2. These criteria are indicative only, and there may be a need to assess intermittent values against continuous or impulsive criteria for critical areas.

There is a low probability of adverse comment or disturbance to building occupants at vibration values below the preferred values. Adverse comment or complaints may be expected if vibration values approach the maximum values. The guideline recommends that activities should be designed to meet the preferred values where an area is not already exposed to vibration.

3.4.3 Structural vibration

i Australian Standard AS 2187.2 – 2006

In terms of the most recent relevant vibration damage criteria, Australian Standard AS 2187.2 – 2006 *Explosives – Storage and Use – Use of Explosives* recommends that the frequency dependent guideline values and assessment methods given in BS 7385 Part 2-1993 *Evaluation and measurement for vibration in buildings Part 2* be used as they are "applicable to Australian conditions".

The standard sets guide values for building vibration based on the lowest vibration levels above which damage has been credibly demonstrated. These levels are judged to give a minimum risk of vibration induced damage, where minimal risk for a named effect is usually taken as a 95% probability of no effect.

Sources of vibration that are considered in the standard include demolition, blasting (carried out during mineral extraction or construction excavation), piling, ground treatments (e.g. compaction), construction equipment, tunnelling, road and rail traffic and industrial machinery.

The recommended limits (guide values) for transient vibration to manage minimal risk of cosmetic damage to residential and industrial buildings are presented numerically in Table 3.15 and graphically in Figure 3.1.

Table 3.15 Transient vibration guide values – minimal risk of cosmetic damage

Line[1]	Type of building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
1	Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s	50 mm/s
2	Unreinforced or light framed structures Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Note: Refers to the "Line" in Figure 3.1.

The standard notes that the guide values in Table 3.15 relate predominantly to transient vibration which does not give rise to resonant responses in structures and low-rise buildings.

Where the dynamic loading caused by continuous vibration is such as to give rise to dynamic magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values in Table 3.15 may need to be reduced by up to 50%.

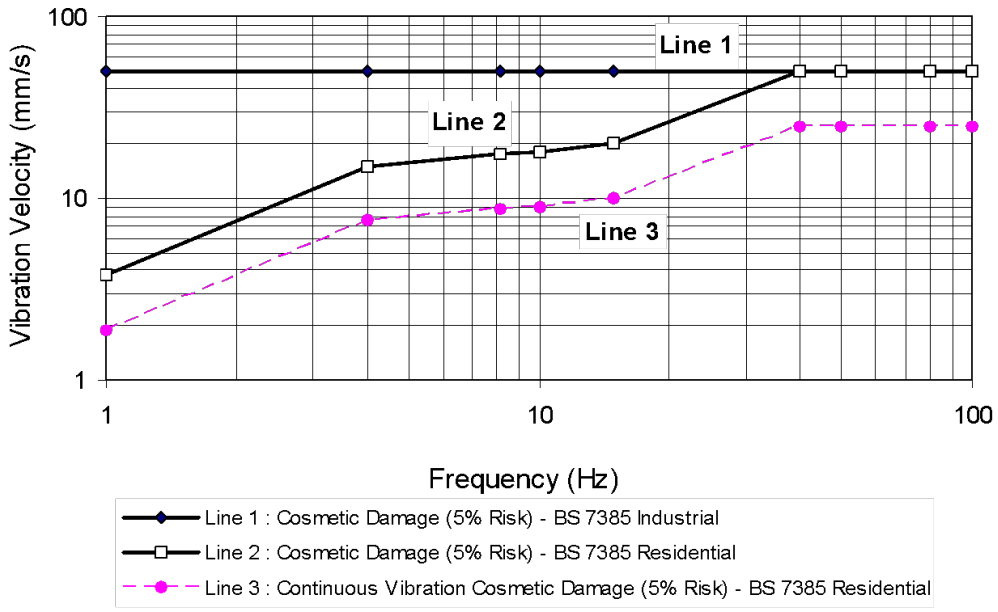


Figure 3.1 Graph of transient vibration guide values for cosmetic damage

In the lower frequency region where strains associated with a given vibration velocity magnitude are higher, the guide values for building types corresponding to Line 2 are reduced. Below a frequency of 4 Hz where a high displacement is associated with the relatively low peak component particle velocity value, a maximum displacement of 0.6 mm (zero to peak) is recommended. This displacement is equivalent to a vibration velocity of 3.7 mm/s at 1 Hz (as shown in Figure 3.1).

Fatigue considerations are also addressed in the Standard and it is concluded that unless calculation indicates that the magnitude and number of load reversals is significant (in respect of the fatigue life of building materials) then the guide values in Table 3.15 should not be reduced for fatigue considerations.

In order to assess the likelihood of cosmetic damage due to vibration, AS2187 specifies that vibration measurements should be undertaken at the base of the building and the highest of the orthogonal vibration components (transverse, longitudinal and vertical directions) should be compared with the criteria curves presented in Table 3.15.

It is noteworthy that in addition to the guide values nominated in Table 3.15 the Standard states that:

> Some data suggests that the probability of damage tends towards zero at 12.5 mm/s peak component particle velocity. This is not inconsistent with an extensive review of the case history information available in the UK.

4 Noise assessment approach

4.1 Overview

This section presents the methods and base parameters used to model operational and construction noise and vibration emissions from the construction and operation of the project.

Operational and construction noise levels were predicted using DGMR Software proprietary modelling software, iNoise 2026. The model allows prediction under the ISO9613-2 *Acoustics – Attenuation of Sound during Propagation Outdoors – general method* algorithm.

It was selected acknowledging the general terms of accuracy of 1,000 m (currently under review) on the basis that the closest and most exposed sensitive receivers are well within 1,000 m zone, accounts for building reflections and considers adverse meteorological effects. This algorithm is accepted by the EPA. It is noted that ISO 9613 meteorological conditions are favourable to the propagation of noise. These conditions are for downwind propagation, as specified in 5.4.3.3 of ISO 1996-2:1987 or, equivalently, propagation under a well-developed moderate ground-based temperature inversion, such as commonly occurs at night. This is consistent with the noise modelling conducted for the IPG NPA.

Features which affect the predicted noise level that are considered in the noise modelling include:

- equipment sound power levels and locations
- screening from structures
- receiver locations
- ground topography
- noise attenuation due to geometric spreading
- ground absorption
- atmospheric absorption.

The model was populated with 3-D topography of the project and surrounding area, extending past the nearest assessment locations.

Plant and equipment representing the range of proposed operation and construction scenarios was modelled at locations representing the worst-case noise levels for assessment locations. For construction, the whole site was considered as an area source.

No future buildings within the IPG Master Plan were included in the model, this is considered conservative given there is now shielding provided from potential future developments within the precinct. The exception is the warehouse currently under construction to the south of site, occupying Lots 5, 6 and 7 inclusive.

4.2 Operational noise

The assessment was based on the site layout (Figure 1.2 and Appendix A), plant and equipment (Section 4.2) and vehicle movements outlined in the Traffic Impact Assessment (TIA) prepared by Ason Group (dated April 2026). The site is proposed to operate 24 hours per day, seven days per week.

4.2.1 Warehouse design

The assessment of noise emissions from within the warehouse building assumes the following based on construction and design materials outlined in the architectural drawings package prepared by SBA Pty Ltd and provided in Appendix A.

The warehouse consists of three levels:

- Ground floor:
  - Consists of delivery loading/unloading bays to the north where trucks will enter/exit the building via eight on-grade docks or reverse to the 48 recessed docks to be unloaded.
  - Southern portion of the floor is reserved for automated robotic (AR) field operations.
  - A Print-On-Demand (POD) facility is located to the west of the building on the ground floor consisting of numerous conveyors and mechanical printing processes.
- Levels 1 and 2:
  - Consist of a conveyor network linking the levels together around the perimeters of the building.
  - The majority of these floors is reserved for AR field operations.

The warehouse is proposed to be constructed of the following:

- Walls and roof:
  - Kingspan K-ROC Panels 75 mm.
- Dock roller doors:
  - Fastrax High Speed Roller Doors.

The sound transmission loss of the proposed construction elements are presented in Table 4.1.

Table 4.1 Minimum sound transmission loss of warehouse construction elements

Element	Description	Octave band centre frequency (Hz), minimum transmission loss (dB)							Rw	Rw + Ctr
		63	125	250	500	1 k	2 k	4 k		
Kingspan K-ROC Panels (75 mm) t	In principle performance	12	16	21	24	23	28	42	26	23
Fastrax High Speed Roller Door	In principle performance – equivalent to 3 mm Rubber	1	5	9	14	20	25	30	19	14

4.2.2 External plant and equipment

i Vehicle movements

To model vehicle movements (both light and heavy vehicles), the hourly traffic generation projection for the project was used to establish a worst-case 15 minute period to model. The hour with the highest projected traffic generation for both light and heavy vehicles was used, then divided by four to convert from hourly to a 15-minute scenario (as detailed in Section 4.2.2.iii). The hourly traffic generation projection is provided in Table 4.2, numbers in bold demonstrate the peak hour of movements per light and heavy vehicles assumed per period.

Heavy vehicle movements were modelled as a line source along the entry and exit route, with a longer line source around the trailer parking area in order to account for additional time spent manoeuvring, parking, unloading and loading/offloading trailers.

Light vehicles were modelled as an area source spread across the ground floor car parking area and the mutli-storey carpark on the eastern portion of site.

Table 4.2 Projected hourly traffic generation

Hour (24-hour)	Light vehicle movements		Heavy vehicle movements	
	In	Out	In	Out
0:00			18	16
1:00			14	13
2:00			**19**	**18**
3:00			4	14
4:00		**525**	1	19
5:00			0	4
6:00			0	1
7:00	**588**		14	0
8:00			25	0
9:00			11	14
10:00			**16**	**25**
11:00			19	11
12:00			14	16
13:00			19	19
14:00			12	14
15:00			9	19
16:00			9	12
17:00		588	8	9
18:00	**525**		9	9
19:00			13	8

Hour (24-hour)	Light vehicle movements		Heavy vehicle movements	
	In	Out	In	Out
20:00			14	9
21:00			**19**	**13**
22:00			16	14
23:00			13	19

Notes: No shading = Day (7:00 am to 6:00 pm).

Blue shading = Evening (6:00 pm to 10:00 pm).

Light grey shading = Night (10:00 pm to 7:00 am).

ii Loading docks and trailer parking

To account for noise from activities within the loading dock and trailer parking areas, the following activities are assumed for each area:

- **Recessed docks:** Heavy vehicles reverse into the recessed docks with high speed roller door, to be unloaded within the warehouse facility.
- **At-grade docks:** Heavy vehicles reverse into position along the at-grade docks, electric fork trucks then load or unload the heavy vehicles. Fork trucks are modelled as an area source across the dock area.
- **Trailer parking:** Heavy vehicle movements are modelled as a line source across the access route and trailer parking area to account for additional time reversing, manoeuvring and attaching/detaching trailers.

iii Summary

Plant and equipment of acoustic significance and associated sound power levels for the project are associated with heavy vehicles (semi-trailers and b-doubles) entering and traversing the site, electric fork trucks around the hardstand adjacent the loading docks and truck manoeuvring area on the north side of buildings, light vehicles for staff and carpark movements and mechanical plant. The external equipment list has been developed in consultation with the intended occupant, mechanical services consultant (Fusion) and traffic consultant (ASON), and is presented in Table 4.3 along with sound power levels and number of each equipment during a worst-case 15 minute period. Architectural drawings are provided in Appendix A, with mechanical drawings provided in Appendix B.

Table 4.3 External plant and equipment

Equipment	Sound power level, dB $L_{Aeq,15min}$	Number of equipment during worst-case 15-minute period		
		Day	Evening	Night
Electric Forklifts (Raymond Model 4750)	80	7	7	7
Heavy vehicles (Semi-Trailer or B-Double) (10 km/h)	106	11	8	10
Light vehicles (10 km/h)	75	147	132	132
Packaged AC Units (TemperZone OPA1710) *Yellow in Figure 4.1*	92	20	20	20
Heat Reclaimed AC Units (Fusion Modulair Units with Basket Diffuser) *Blue in Figure 4.1*	64	41	41	41

Figure 4.1 and Figure 4.2 show screenshots of the noise model to demonstrate the locations of noise producing equipment within the model and demonstrate the modelling methodology.

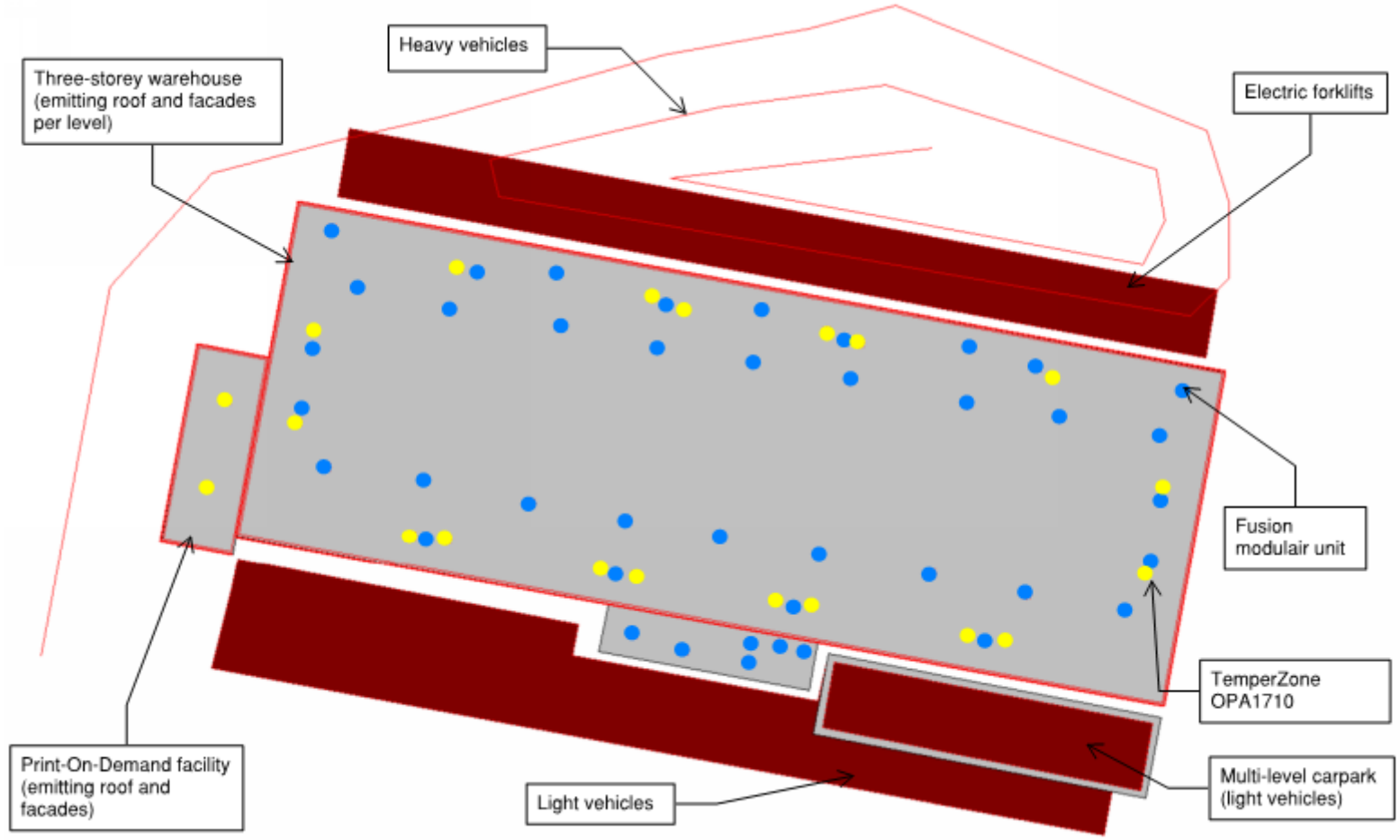


Figure 4.1 **Annotated noise model**

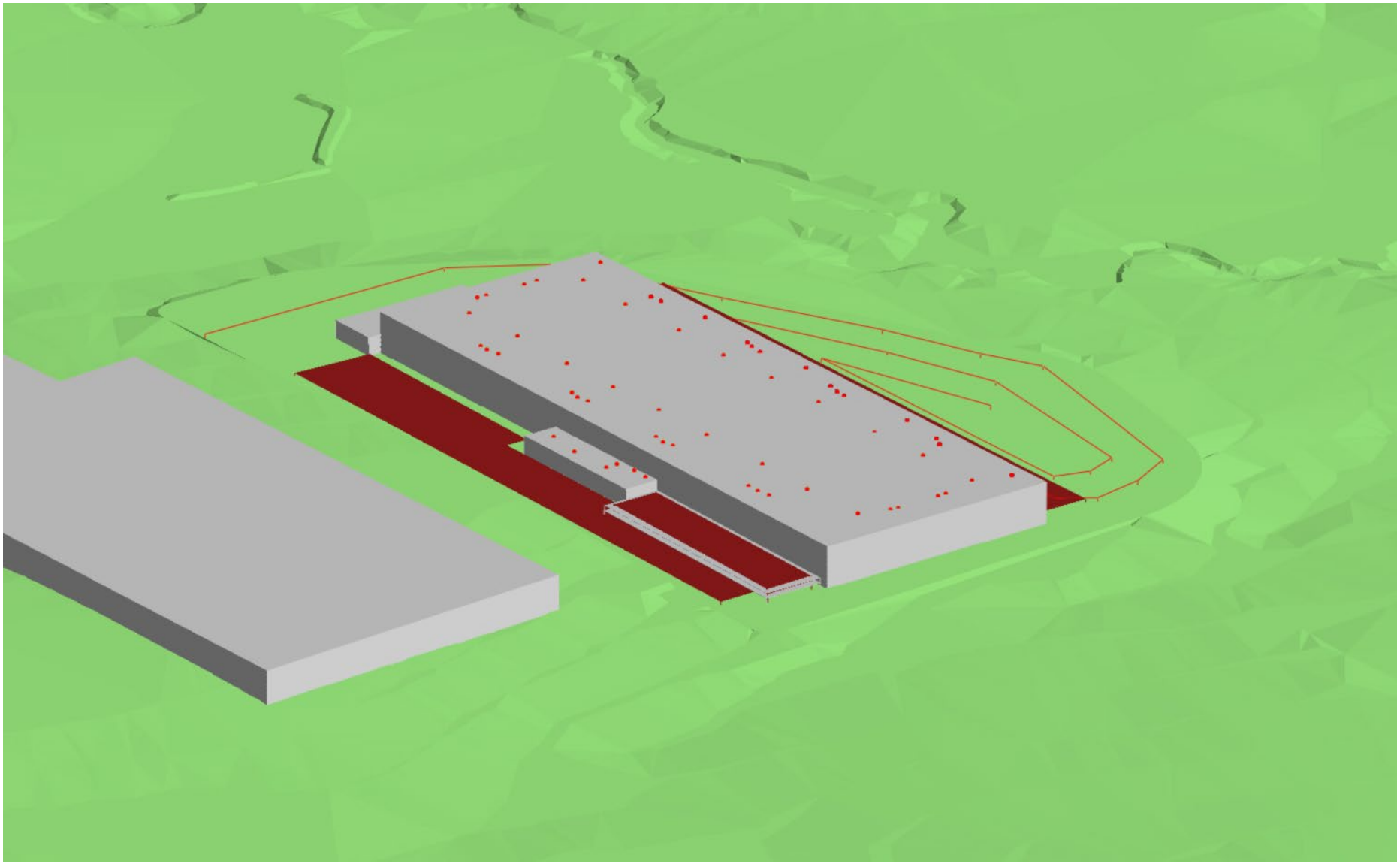


Figure 4.2 3D view of noise model

4.2.3 Internal plant and equipment

To model breakout noise from the warehouse operations, EMM conducted a site visit at an existing facility owned and operated by the proponent. This facility's operations and layout were acknowledged to be similar to the proposed site. During the site visit, EMM noted three distinct zones of differing use and noise levels:

- Delivery Docks – Consists of numerous electric forklifts and pallet jacks operating unloading trucks that are coming and going within the warehouse.
- AR Field – Consists of numerous robotic powered industrial trucks traversing the floor.
- Conveyor Operations – Consists of numerous conveyor lines distributed across the floor space, with worker packing stations dispersed throughout and Print on Demand area.

A reverberant sound pressure level was measured within each of these spaces, which has been assumed within the noise model for the relevant corresponding spaces. It is assumed within the models that each floor is operating at these levels consistently throughout all assessment periods. The reverberant sound pressure levels assumed within the noise model are presented in Table 4.4.

Table 4.4 Internal reverberant sound pressure levels

Zone	Applicable zones on site	Reverberant sound pressure level, dBA $L_{Aeq,15min}$
Delivery Docks	Ground Floor – Northern portion of warehouse	76
Conveyor	Ground Floor – Western portion of warehouse Print-On-Demand Facility	82
AR Field	Ground Floor – Southern portion of warehouse Level 1 and 2 – All facades	65

4.2.4 Meteorological conditions

The model considered default ISO9613 noise enhancing meteorological conditions and the following temperature and humidity conditions:

- **Day** – 20°C, 60% humidity.
- **Evening** – 10°C, 90% humidity.
- **Night** – 10°C, 90% humidity.

4.3 Emergency mechanical plant

In case of emergency, the development will be fitted with 10 smoke exhaust fans (SEF) on the roof. Details of the smoke exhaust fans are provided below:

- **Model** – Pacific Ventilation LR12KC21A-4MFF.
- **Sound power level** – 106 dBA.

As the SEFs are only to operate during an emergency (such as a fire), these have not been assumed to be part of normal operations. However, noise predictions at all assessment locations during the operation of the SEFs have been provided for completeness.

Figure 4.3 shows the locations of the emergency mechanical plant within the noise model. This layout is based on the mechanical markup provided in Appendix B.

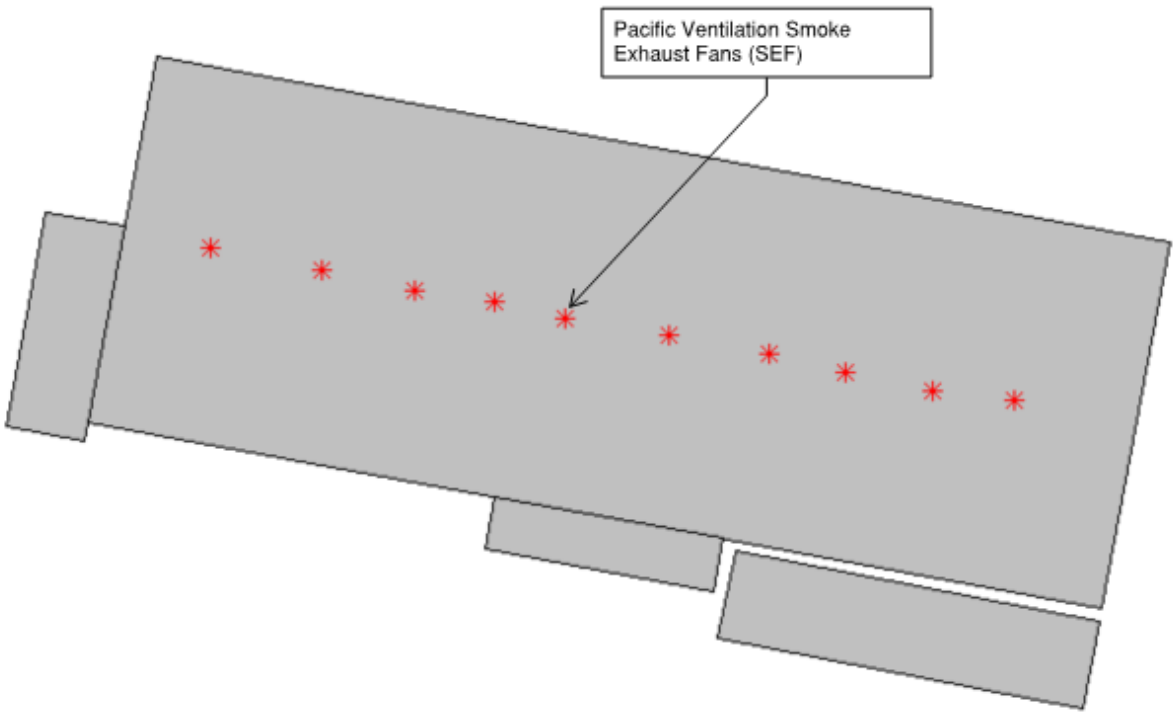


Figure 4.3 Annotated noise model for emergency mechanical plant

4.4 Sleep disturbance

For the purpose of the sleep disturbance assessment, a heavy vehicle airbrake with a sound power level of 120 dBA has been assumed, with point sources planed along the heavy vehicle route to establish a maximum noise level at receivers.

4.5 Road traffic noise

4.5.1 Projected traffic volumes

Projected traffic generation volumes for the site are presented in Table 4.5, extracted from the TIA prepared for the project by ASON Pty Ltd (P1492Gr01 SSDA TA). Traffic generation is presented as an hourly breakdown per light and heavy vehicles within the TIA, for comparison with RNP criteria, EMM has summarised these as Day and Night period totals, as defined within the RNP. Vehicles will access site via the south from The Northern Road, turning onto Badgerys Creek Road before entering site, until such time as the Eastern Ring Road is delivered.

Table 4.5 Projected traffic volumes

Period	Projected traffic generation volumes (in/out combined)	
	HV	LV
Day (7:00 am to 10:00 pm)	389	1701
Night (10:00 pm to 7:00 am)	203	525

Notes: LV = Light vehicles.
HV = Heavy vehicles.

4.5.2 Existing traffic volumes

Existing average daily traffic movements for Badgerys Creek Road were calculated from intersection counts conducted in March 2026 as part of the TIA (ASON) and are presented in Table 4.6.

Table 4.6 Annual average daily traffic volumes (two-way)

Road segment	Year	Day 7:00 am to 10:00 pm				Night 10:00 pm to 7:00 am			
		LV	HV	Total	HV%	LV	HV	Total	HV%
Badgerys Creek Road, south of site	2026	2114	779	2893	26.9	617	212	829	25.6

Notes: LV = Light vehicles.
HV = Heavy vehicles.

4.5.3 Assessment methodology

Given the Aerotropolis precinct is under significant development, with roadway upgrades underway including upgrades to Badgerys Creek Road and the construction of the future Eastern Ring Road, assessment of road traffic noise from a single site compared to the existing road traffic volumes on Badgerys Creed Road is not considered appropriate. Given the significant upgrades and changing nature of Badgerys Creek Road, road traffic noise impacts need to be assessed cumulatively – as this one site is only one of the sites to generate increases in road traffic on the road. This approach is consistent with the approved development on Lots 205, 206 and 207 within the Master Plan.

Once the Eastern Ring Road is constructed, vehicles will access the site via the Eastern Ring Road. Road traffic noise impacts from the Eastern Ring Road are out of the scope of this site specific noise impact assessment. Cumulative road traffic noise impacts from the wider Aerotropolis and will be addressed in cumulative traffic assessments for those road projects accordingly.

4.6 Construction noise

4.6.1 Times

Construction activities associated with the project have been assessed based standard construction hours.

4.6.2 Plant and equipment

Three stages of construction have been assessed, deemed to be representative of the loudest activities involved with constructing the site; earthworks, warehouse construction and fit-out. It is noted that the majority of bulk earthworks will have been completed prior to the handover of the site from IPG, however additional earthworks will be required and are included under Stage 1 – Site specific earthworks.

Equipment sound power levels have been taken from EMM database of attended noise measurements and *Update of Noise Database for Prediction of Noise on Construction and Open Sites* (DEFRA 2005), where unavailable.

Acoustically significant fixed and mobile equipment items were considered in the model for the site with 100% utilisation represent a key range of activities likely to be undertaken during the main construction works. A summary of the construction phases, number of plant and cumulative sound power levels (Lw) are presented in Table 4.7. The model considered the cumulative plant and equipment sound power level as an area source across the project site providing a potential worst-case scenario.

Table 4.7 Construction equipment sound power levels

Equipment/activity	Number of items (per 15 minutes)	Equipment sound power level, dBA	Scenario sound power level, dBA
Stage 1 – Project specific earthworks (not including CDC4 works)			
Tracked excavator with bucket	2	105	126
Excavator with medium rock hammer (15t)^	2	120	
Powered hand tools	4	107	
Tipper truck	2	104	
Non-powered hand tools	4	98	
Water cart	1	100	
Jackhammer^	1	113	
Bulldozer (D8R)	2	114	
Truck and Dog	1	108	
Chainsaw^	1	118	
Concrete saw^	1	119	
Vacuum truck	1	108	
Elevated work platform	2	95	
Smooth drum roller (12t)	1	114	
Franna crane	1	99	
Plate compactor	1	105	
Concrete pump	2	103	
Concrete vibrator	4	99	
Concrete agitator	2	108	
Bored piling rig	1	112	

Equipment/activity	Number of items (per 15 minutes)	Equipment sound power level, dBA	Scenario sound power level, dBA
Stage 2 – Warehouse construction			
Concrete agitator	1	108	116
Semi-trailer truck (or delivery truck)	1	108	
Concrete pump	1	103	
Concrete vibrator	2	99	
Mobile crane (300t)	1	105	
Tracked excavator with bucket	3	105	
Powered hand tools	4	107	
Bobcat	2	107	
Elevated work platform	2	95	
Franna crane	2	99	
Hand tools (non-powered)	4	98	
Truck and Dog	1	108	
Stage 3 – Building, services and operational fit-out			
Powered hand tools	4	107	114
Mobile Crane (300T)	1	105	
Delivery truck	1	108	
Forklift	1	100	
Bobcat	1	107	
Elevated work platform	1	95	
Franna crane	1	99	
Hand tools (non-powered)	4	98	

^ includes 5dB penalty for annoying characteristics as per ICNG.

4.6.3 Noise predictions

To assess a potential worst-case construction scenario, the assessment has considered the identified plant and equipment in Table 4.7 operating continuously over a 15 minute period. Construction noise levels were predicted to the assessment locations listed in Table 2.1 and identified in Figure 2.2.

4.7 Construction vibration

Minimum working distances for typical items of vibration intensive plant that may be used on the project are listed in Table 4.8. The minimum working distances are quoted for both structural vibration (refer AS2187.2 and BS 7385) and human comfort (refer AVTG).

Table 4.8 Recommended minimum working distances for vibration intensive plant

Plant Item	Rating/Description	Minimum working distance	
		Structural vibration (BS 7385)	Human comfort (Assessing Vibration: A technical guideline)
Small hydraulic hammer	300 kg on 5 t to 12 t excavator	2 m	7 m
Medium hydraulic hammer	900 kg hammer on 12 t to 18 t excavator	7 m	23 m
Large hydraulic hammer	1600 kg hammer on 18 t to 34 t excavator	22 m	73 m
Jackhammer	Hand-held	1 m (nominal)	Avoid contact with structure
Vibratory Rollers	<50 kN (Typically 1–2 t)	5 m	15 to 20 m
	<100 kN (Typically 2–4 t)	6 m	20 m
	<200 kN (Typically 4-6 t)	12 m	40 m
	<300 kN (Typically 7–13 t)	15 m	100 m
	>300 kN (Typically 13–18 t)	20 m	100 m
	>300 kN (>18 t)	25 m	100 m

Source: From Construction Noise and Vibration Guideline, July 2023.

Safe work distances relate to continuous vibration. For most construction activity, vibration emissions are intermittent in nature. The minimum working distances are therefore conservative.

The minimum working distances presented in Table 4.8 are indicative and will vary depending on the item of plant and local geotechnical conditions. In relation to human comfort response, the safe working distances in Table 4.8 relate to continuous vibration and apply to residential assessment locations. For most construction activities, vibration emissions are intermittent in nature and for this reason, higher vibration levels, occurring over shorter periods may be allowed without exceeding VDV criteria.

The minimum working distances are to be used to assess the potential for construction vibration impacts based on proposed activities.

5 Impact assessment

5.1 Operational noise

Predicted single point operational noise levels are provided for all proposed periods of operation (day, evening and night) in Table 5.1. Predicted noise levels are assessed against the PNTLs established in Section 3.1.4.

Noise contour figures are provided in Appendix C for operational scenarios during all periods.

5.1.1 Annoying characteristics

Fact Sheet C of the NPfI provides procedures for determining whether a modifying factor should be applied to predicted noise levels to account for instances where the character of the noise is considered annoying. These annoying characteristics are tonality, low frequency noise and intermittent noise.

i Tonality

On review of measured noise levels at a similar facility and spectral content of specified plant and equipment, no noise sources proposed for operation at the site are deemed to be tonal in nature.

Tonal reverse alarms have the potential to be tonal at assessment locations. It is recommended that all vehicles and plant be installed with broadband ambient level adjusting movement alarms.

On review of predicted at receiver noise contributions, no adjustment for tonality is required to be applied to predicted noise levels from site in accordance with Fact Sheet C of the NPfI.

ii Low frequency

On review of measured noise levels at a similar facility and spectral content of specified plant and equipment, it is not expected that the site would result in excessive low-frequency noise at assessment locations, whilst analysis of receiver noise contributions and comparison of predicted C-weighted minus A-weighted noise levels confirmed that there was not a difference of 15 dB or more. Accordingly, adjustments are not considered to be applicable to predicted noise levels.

iii Intermittent noise

On review of measured noise levels at a similar facility and the typical operating rhythm proposed for the site, it is not expected that the site would result in intermittent noise at assessment locations, hence adjustments are not considered to be applicable to predicted noise levels.

Table 5.1 Predicted noise levels – operations

Receiver	PNTL, dB $L_{Aeq,15min}$			Predicted noise levels, dB $L_{Aeq,15min}$			Exceedance, dB		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
R1	41	36	31	25	25	26	-	-	-
R2	41	36	31	26	26	27	-	-	-
R3	41	36	31	27	27	28	-	-	-
R4	41	36	31	26	26	27	-	-	-
R5	41	36	31	25	26	27	-	-	-
R6	41	36	31	25	25	26	-	-	-
R7	41	36	31	24	24	25	-	-	-
R8	41	36	31	22	23	23	-	-	-
R9	41	36	31	22	22	23	-	-	-
R10	41	36	31	21	22	22	-	-	-
M1	50	40	35	28	28	29	-	-	-
M2	50	40	35	29	30	30	-	-	-
M3	50	40	35	31	31	31	-	-	-
M4	50	40	35	32	32	33	-	-	-
M5	50	40	35	29	29	30	-	-	-
M6	50	40	35	28	28	29	-	-	-
M7	50	40	35	27	27	28	-	-	-
R11		55		22	22	23	-	-	-

Receiver	PNTL, dB $L_{Aeq,15min}$			Predicted noise levels, dB $L_{Aeq,15min}$			Exceedance, dB		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
R12		55		23	23	24	-	-	-
R13		55		21	21	22	-	-	-
R14		55		23	24	24	-	-	-
R15		55		23	23	24	-	-	-
R16		55		30	30	30	-	-	-
R17		55		28	28	28	-	-	-
R18		55		29	29	30	-	-	-
R19		55		35	35	36	-	-	-
R20		55		30	30	31	-	-	-
R21		55		39	39	39	-	-	-
I1		68		61	60	61	-	-	-
I2		68		54	53	54	-	-	-
I3		68		51	50	50	-	-	-
I4		68		44	43	44	-	-	-
I5		68		48	48	48	-	-	-
C1		58		37	37	37	-	-	-
C2		58		37	37	37	-	-	-
C3		58		37	36	37	-	-	-
C4		58		35	35	35	-	-	-
AR1		53		35	35	35	-	-	-

Results of the modelling confirm compliance with the PNTLs for all assessment locations during all periods and operational scenarios. No further investigation of mitigation or management measures is required given no exceedances are predicted.

5.2 Emergency mechanical plant

Predictions during the operation of the emergency mechanical plant are provided in Table 5.2.

Table 5.2 Predicted emergency mechanical plant noise levels

Receiver	PNTL, dB $L_{Aeq,15min}$			Predicted noise levels, dB $L_{Aeq,15min}$	Exceedance, dB		
	Day	Evening	Night		Day	Evening	Night
R1	41	36	31	25	-	-	-
R2	41	36	31	26	-	-	-
R3	41	36	31	27	-	-	-
R4	41	36	31	26	-	-	-
R5	41	36	31	26	-	-	-
R6	41	36	31	25	-	-	-
R7	41	36	31	25	-	-	-
R8	41	36	31	23	-	-	-
R9	41	36	31	23	-	-	-
R10	41	36	31	22	-	-	-
M1	50	40	35	35	-	-	-
M2	50	40	35	36	-	-	1
M3	50	40	35	37	-	-	2
M4	50	40	35	38	-	-	3
M5	50	40	35	36	-	-	1
M6	50	40	35	34	-	-	-
M7	50	40	35	32	-	-	-
R11		55		24		-	
R12		55		25		-	
R13		55		26		-	
R14		55		27		-	
R15		55		27		-	
R16		55		37		-	
R17		55		34		-	
R18		55		32		-	

Receiver	PNTL, dB $L_{Aeq,15min}$			Predicted noise levels, dB $L_{Aeq,15min}$	Exceedance, dB		
	Day	Evening	Night		Day	Evening	Night
R19		55		38		-	
R20		55		31		-	
R21		55		39		-	
I1		68		50		-	
I2		68		48		-	
I3		68		47		-	
I4		68		48		-	
I5		68		55		-	
C1		58		43		-	
C2		58		43		-	
C3		58		44		-	
C4		58		42		-	
AR1		53		41		-	

During the operation of emergency mechanical plant (smoke extraction fans), noise levels are predicted to exceed the PNTLs at up to four receivers within NCA2 (representative of future Mixed-use zoning), by up to 3 dB during the night period only. This is considered negligible given the equipment is only to operate in case of emergencies (particularly during a fire), it is not typical that operation of emergency services needs to comply with PNTLs. It is noted that these predictions are calculated with no intervening buildings within the IPG Masterplan (except for the approved ALDI structure to the south of site), which are likely to provide shielding as development in the IPG Master Plan and greater Aerotropolis progresses, particularly to the representative receivers within NCA2.

5.3 Sleep disturbance

Modelling of intermittent maxima noise events at night considered a typical worst-case event for air brake release and a source sound power level of L_{Amax} 120 dB. Potential for these events were considered within truck manoeuvring, driveway and loading/unloading area and predicted to the identified residential assessment locations and potential future mixed uses in NCA2. The results of the predictions under noise enhancing conditions are presented in Table 5.3.

Table 5.3 Predicted L_{Amax} noise levels

Assessment location	Screening level, dB	Predicted maximum noise level, dB L_{Amax}	Exceedance, dB
R1	55	32	-
R2	55	33	-
R3	55	34	-
R4	55	33	-
R5	55	33	-
R6	55	32	-
R7	55	32	-
R8	55	30	-
R9	55	29	-
R10	55	29	-
M1	60	36	-
M2	60	38	-
M3	60	41	-
M4	60	42	-
M5	60	40	-
M6	60	39	-
M7	60	37	-

Predicted noise levels confirm compliance with the L_{Amax} sleep disturbance screening criterion for all residential assessment locations.

In terms of the $L_{Aeq,15min}$ noise level contributions, Table 5.3 confirms all residential assessment locations comply with the strictest night period limit of 40 dB.

5.4 Feasible and reasonable mitigation

Given there are no predicted exceedances of PNTLs or sleep disturbance criteria, no additional operational mitigation measures are recommended for the site.

5.5 Construction noise

Predicted noise levels for the scenarios detailed in Section 4.6 are summarised in Table 5.4 for standard construction hours. Predicted noise levels are provided for representative receivers in NCA1 and NCA3. No predictions for future Mixed-Use receivers in NCA2 are provided given they are unlikely to be present (developed) to be impacted by construction noise. Similarly, construction noise is only predicted to I5 within the IPG Master Plan, as it is the only lot with development likely to be present to be impacted by construction noise.

Table 5.4 Construction noise predictions, $L_{Aeq,15minute}$

Assessment location	Standard daytime hours NML, dB	Highly affected level	Predicted construction noise level, dB $L_{Aeq,15min}$			Exceedance, dB		
			Stage 1	Stage 2	Stage 3	Stage 1	Stage 2	Stage 3
R1	45	75	37	27	24	-	-	-
R2	45	75	38	28	26	-	-	-
R3	45	75	38	29	26	-	-	-
R4	45	75	38	28	26	-	-	-
R5	45	75	37	28	25	-	-	-
R6	45	75	37	27	25	-	-	-
R7	45	75	36	27	24	-	-	-
R8	45	75	35	26	23	-	-	-
R9	45	75	34	25	22	-	-	-
R10	45	75	34	24	22	-	-	-
R11	45	75	35	26	23	-	-	-
R12	45	75	37	27	25	-	-	-
R13	45	75	37	28	25	-	-	-
R14	45	75	38	29	26	-	-	-
R15	45	75	38	29	26	-	-	-
R16	45	75	46	36	34	1	-	-
R17	45	75	44	34	32	-	-	-
R18	45	75	43	34	31	-	-	-
R19	45	75	48	39	36	3	-	-
R20	45	75	43	33	31	-	-	-

Assessment location	Standard daytime hours NML, dB	Highly affected level	Predicted construction noise level, dB $L_{Aeq,15min}$			Exceedance, dB		
			Stage 1	Stage 2	Stage 3	Stage 1	Stage 2	Stage 3
R21	45	75	50	40	38	5	-	-
I5	75	75	64	55	52	-	-	-

Predicted noise levels demonstrate that there is the potential for noise from site construction activity to exceed the standard hours NML during Stage 1 – Site specific earthworks at up to three receivers by 1 to 5 dB. It is noted that these receivers are residual residences within the rezoned Aerotropolis and have been subject to noise exposure from construction of WSI and main bulk earthworks for IPG Master Plan.

The construction noise assessment is conservative in that it presents an absolute worst-case, assuming that all equipment detailed in Table 4.7 are operating concurrently and for a full 15 minute period, this is highly uncommon in practice and unlikely to occur. No exceedances of NML are predicted for Stages 2 and 3.

In accordance with the assessment methodology provided in the ICNG, the proponent is required to inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as provide relevant site-contact details. Further, all feasible and reasonable work practices should be implemented with the aim of reducing construction noise levels to below the NMLs. These feasible and reasonable measures will be determined when there is more certainty regarding construction scheduling and the plant and equipment required to complete the works.

It is noted that construction noise is predicted to remain below the highly noise affected level at all assessment locations for the duration of the proposed construction activity.

5.6 Construction vibration

In relation to human comfort response, the safe working distances in Table 4.8 relate to continuous vibration and apply to residential assessment locations. For most construction activities, vibration emissions are intermittent in nature and for this reason, higher vibration levels occurring over shorter periods are acceptable, as discussed in BS 6472-1.

The nearest residential assessment locations including residual residences within Aerotropolis are more than 600 m to the closest proposed construction activities. This assessment location is well beyond the safe working distances for human response (Table 4.8). Vibration impacts from construction at residential assessment locations are therefore highly unlikely.

The nearest structure will be the warehouse located on the IPG site on Lots 5, 6 and 7 (currently under construction). No exceedances of structural vibration safe working distances are predicted at the neighbouring warehouse.

6 Mitigation and management

6.1 Operation

Noise modelling has predicted that operational noise contributions from the project satisfy the PNTLs for all reference assessment locations (Section 5.1).

Assessment of potential sleep disturbance from operation of the project has confirmed compliance for all residential assessment locations in terms of L_{Amax} 52 dB (Table 5.3) and $L_{Aeq,15min}$ 40 dB (Section 5.1) under the procedures of the NPfI. No additional mitigation measures are therefore required to satisfy noise targets.

The project will need to be constructed in accordance with the general assumptions and modelling parameters outlined in Section 4.2. Alternative designs are permitted but should be assessed and noise modelled to confirm noise goals can be satisfied.

It should be noted that noise from the site to sensitive receivers is largely controlled by HV movements and logistics activities, minor changes to fixed plant and equipment and building design and material specifications is unlikely to significantly alter the overall noise level emission.

It is recommended that broadband (non-tonal) ambient level adjusting movement alarms be installed on all fleet to avoid any potential instances of tonal noise impacts.

6.1.1 Noise monitoring

It is recommended that verification monitoring be completed once the site is fully operational, to confirm the accuracy of predicted noise levels at the most affected receivers and that no unexpected exceedances of PNTLs is occurring.

6.2 Construction

6.2.1 General

The EPA's NSW ICNG requires that construction noise levels are assessed against NMLs.

Compliance with daytime standard hours NMLs has been predicted for all refence assessment locations during Stages 2 and 3. Exceedance of NMLs is predicted during Stage 1 of 1 to 5 dB at up to three receivers that are residual residences within the rezoned Aerotropolis. The construction noise assessment is conservative in that it presents an absolute worst-case, assuming that all equipment detailed in Table 4.7 are operating concurrently and for a full 15 minute period, this is highly uncommon in practice and unlikely to occur.

All feasible and reasonable work practices should be implemented with the aim of reducing construction noise levels to below the NMLs. The following sections detail typical work practices and mitigations measures for consideration.

6.2.2 Work practices

Feasible and reasonable mitigation measures to reduce construction noise levels will be reviewed and implemented where complaints are received and validated by exceedance of NML.

Work practice methods may include:

- Regular reinforcement (such as at toolbox talks) of the need to minimise noise and vibration.
- Avoiding the use of portable radios, public address systems or other methods of site communication that may unnecessarily impact upon nearby residents.

- Develop routes for the delivery of materials and parking of vehicles to minimise noise.
- Where possible, avoid the use of equipment that generates impulsive noise.
- Notify residents prior to the commencement of intensive and OOH works (if required).

6.2.3 Plant and equipment

Additional measures for plant and equipment may include:

- Where possible, choose quieter plant and equipment based on the optimal power and size to most efficiently perform the required task.
- Operate plant and equipment in the quietest and most efficient manner.
- Minimise the number of plant and equipment operating simultaneously while still meeting processing requirements.
- Switch off idle plant.
- Regularly inspect and maintain plant and equipment to minimise noise and vibration level increases, to ensure that all noise and vibration reduction devices are operating effectively.

6.2.4 Noise management levels

As discussed in Section 6.2.2, residents will be notified prior to works commencing. Noise monitoring during the initial stages of construction will be undertaken to confirm actual construction noise levels. If NMLs are exceeded, Contractor will identify feasible and reasonable mitigation measures that reduce construction noise levels to at or below NMLs where practical.

6.2.5 Quantifying noise reductions

Approximate noise reductions provided by some of these measures are provided in Table 6.1.

Table 6.1 Relative effectiveness of various forms of noise control

Noise control	Nominal noise reduction possible, in total A-weighted sound pressure level, dB
Increase source to receiver distance[1]	Approximately 6 dB for each doubling of distance
Reduce equipment operating times or turn off idling machinery[2]	Approximately 3 dB per halving of operating time
Operating training on quiet operation[2]	Up to 3 to 5 dB
Screening (e.g. noise barrier)[1]	Normally 5 dB to 10 dB, maximum 15 dB
Enclosure (e.g. shed/building)[1]	Normally 15 dB to 25 dB, maximum 50 dB
Silencing (e.g. exhaust mufflers) [1]	Normally 5 dB to 10 dB, maximum 20 dB

1. Sourced from AS2436-2010
2. Based on EMM's measurement experience at construction and mining sites.

7 Conclusion

This assessment has been prepared to consider the noise and vibration impacts of the site on both residential and non-residential assessment locations in terms of site operations and construction.

7.1 Operations

Assessment of operational noise associated with the site has confirmed adherence with NPfI requirements, along with the assessment procedures outlines in the IPG Master Plan Noise Planning Assessment and project SEARs. Operational noise is predicted to satisfy all assessment criteria during all periods. No exceedance of sleep disturbance screening criteria is predicted.

No residual exceedances are predicted; hence, no consideration of site mitigation measures or at-receiver treatments are to be considered.

During the operation of emergency mechanical plant (smoke extraction fans), noise levels are predicted to exceed the PNTLs at up to four receivers, by up to 3 dB during the night period only. This is considered negligible given the equipment is only to operate in case of emergencies (particularly during a fire), it is not typical that operation of emergency services needs to comply with PNTLs.

Road traffic noise impacts associated with the project are beyond the scope of this assessment, given the significant upgrades and development in the IPG Master Plan and greater Aerotropolis. Road traffic noise impacts of the proposed road developments will be assessed cumulatively as part of those assessments.

With the effective management and incorporation of mitigation and management measures listed in Section 6.1, operational noise emissions from the project can be managed to minimise impacts.

7.2 Construction

Construction noise levels from the project are predicted to comply with NMLs at all assessment locations, with the exception being during Stage 1 – Site specific earthworks, where exceedances by up to 1 to 5 dB are predicted at up to three receivers during standard daytime construction hours. It is noted that these receivers are residual residences within the rezoned Aerotropolis and have been subject to noise exposure from construction of WSI and main bulk earthworks for IPG Master Plan.

The construction noise assessment is conservative in that it presents an absolute worst-case, assuming that all equipment detailed in Table 4.7 are operating concurrently and for a full 15 minute period, this is highly uncommon in practice and unlikely to occur. No exceedances of NML are predicted for Stages 2 and 3. No exceedances of the highly affected noise level are predicted during any stage.

In accordance with the assessment methodology provided in the ICNG, the proponent is required to inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as provide relevant site-contact details. Further, all feasible and reasonable work practices should be implemented with the aim of reducing construction noise levels to below the NMLs. These feasible and reasonable measures will be determined when there is more certainty regarding construction scheduling and the plant and equipment required to complete the works.

7.3 Closing

Following the implementation of the mitigation measures detailed throughout this report, there are predicted to be no residual noise impacts exceeding relevant trigger levels. Thus, the proposed development is confirmed to be acceptable from a noise and vibration impact perspective.

Glossary

G.1 Glossary of acoustic terms

A number of technical acoustic descriptions are used in this report. A list of terms and a brief explanation are provided in Table G.1.

Table G.1 Glossary

Abbreviation or term	Definition
ABL	The assessment background level (ABL) is defined in the INP as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured L_{A90} statistical noise levels.
Amenity noise criteria	The amenity noise criteria relate to the overall level of industrial noise. Where existing levels of industrial noise (excluding the subject development) approach the acceptable amenity noise criteria, then noise levels from new industries need to demonstrate that they will not be an additional contributor to existing industrial noise.
A-weighting	There are several different weightings utilised for describing noise, the most common being the 'A-weighting'. This attempts to closely approximate the frequency response of the human ear.
C-weighting	There are several different weightings utilised for describing noise, with the 'C-weighted' scale typically used to assess low frequency noise and is also utilised in the assessment of occupational noise.
Day period	Monday–Saturday: 7:00 am to 6:00 pm, on Sundays and public holidays: 8:00 am to 6:00 pm.
dB	Noise is measured in units called decibels (dB).
DPHI	Department of Planning, Housing and Infrastructure
EPA	The NSW Environment Protection Authority (formerly the Department of Environment, Climate Change and Water).
Evening period	Monday–Saturday: 6:00 pm to 10:00 pm, on Sundays and public holidays
Intrusive noise criteria	The intrusive noise criteria refers to noise that intrudes above the background level by more than 5 dB. The intrusiveness criterion is described in detail in Section 3.1.1.
L_{A1}	The A-weighted noise level exceeded for 1% of the time.
L_{A10}	The A-weighted noise level which is exceeded 10% of the time. It is roughly equivalent to the average of maximum noise level.
L_{A90}	The A-weighted noise level that is exceeded 90% of the time. Commonly referred to as the background noise level.
L_{Aeq}	The A-weighted energy average noise level. This is the equivalent continuous sound pressure level over a given period. The $L_{Aeq,15min}$ descriptor refers to an L_{Aeq} noise level measured over a 15 minute period.
L_{Amax}	The maximum A-weighted sound pressure level received during a measurement interval.
Night period	Monday–Saturday: 10:00 pm to 7:00 am, on Sundays and public holidays: 10:00 pm to 8:00 am.
RBL	The rating background level (RBL) is an overall single value background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the average background levels.
RtS	Response to Submissions
SEARs	Secretary's environmental assessment requirements

Abbreviation or term	Definition
Sound power level (L_w)	A measure of the total power radiated by a source. The sound power of a source is a fundamental property of the source and is independent of the surrounding environment.
Temperature inversion	A meteorological condition where the atmospheric temperature increases with altitude.

G.2 Common noise levels

It is useful to have an appreciation of decibels (dB), the unit of sound measurement when reading this assessment. Table G.2 gives some practical indication of what an average person perceives about changes in noise levels.

Table G.2 Perceived change in noise

Change in sound level (dB)	Perceived change in noise
3	Just perceptible
5	Noticeable difference
10	Twice (or half) as loud
15	Large change
20	Four times as loud (or quarter) as loud

Examples of common noise levels are provided in Figure G.1.

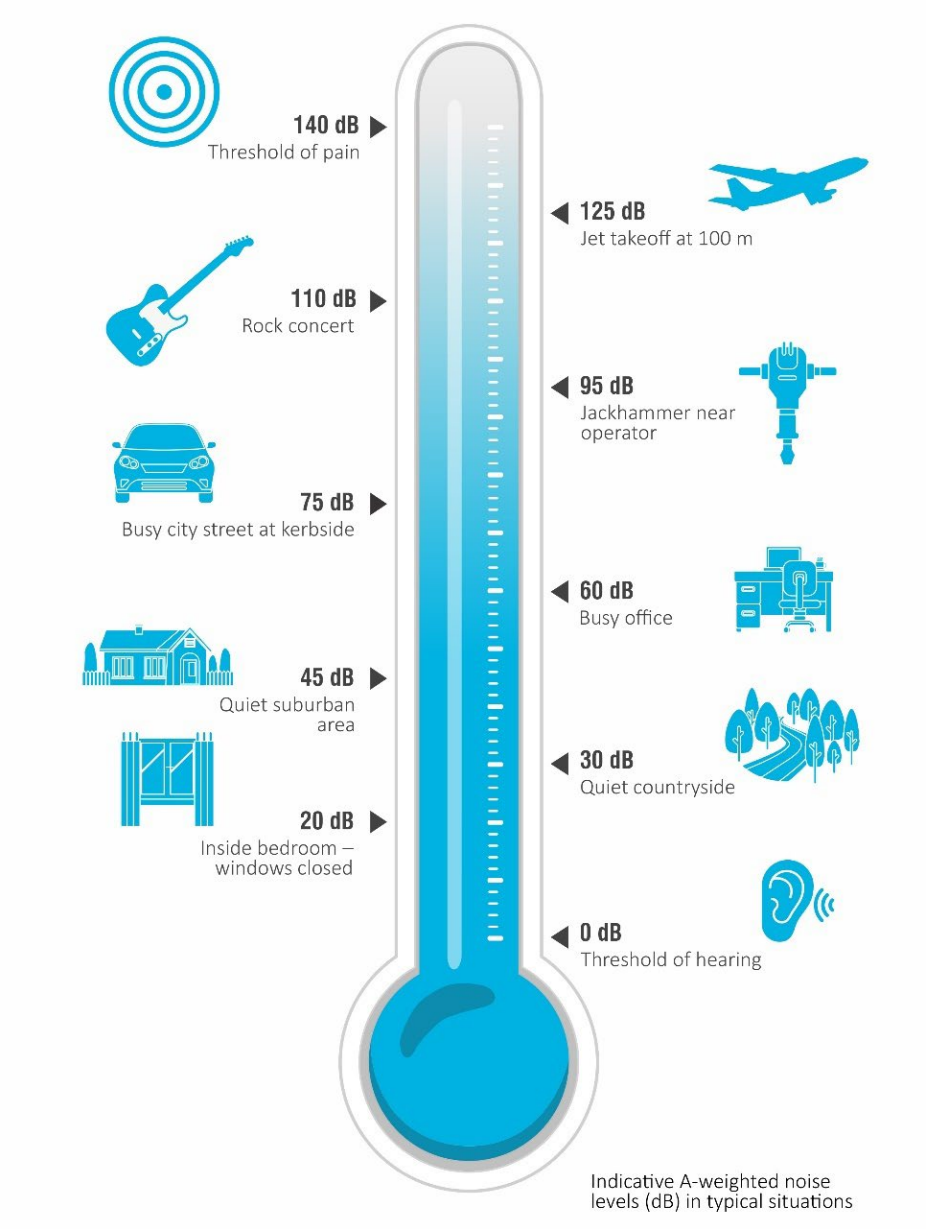


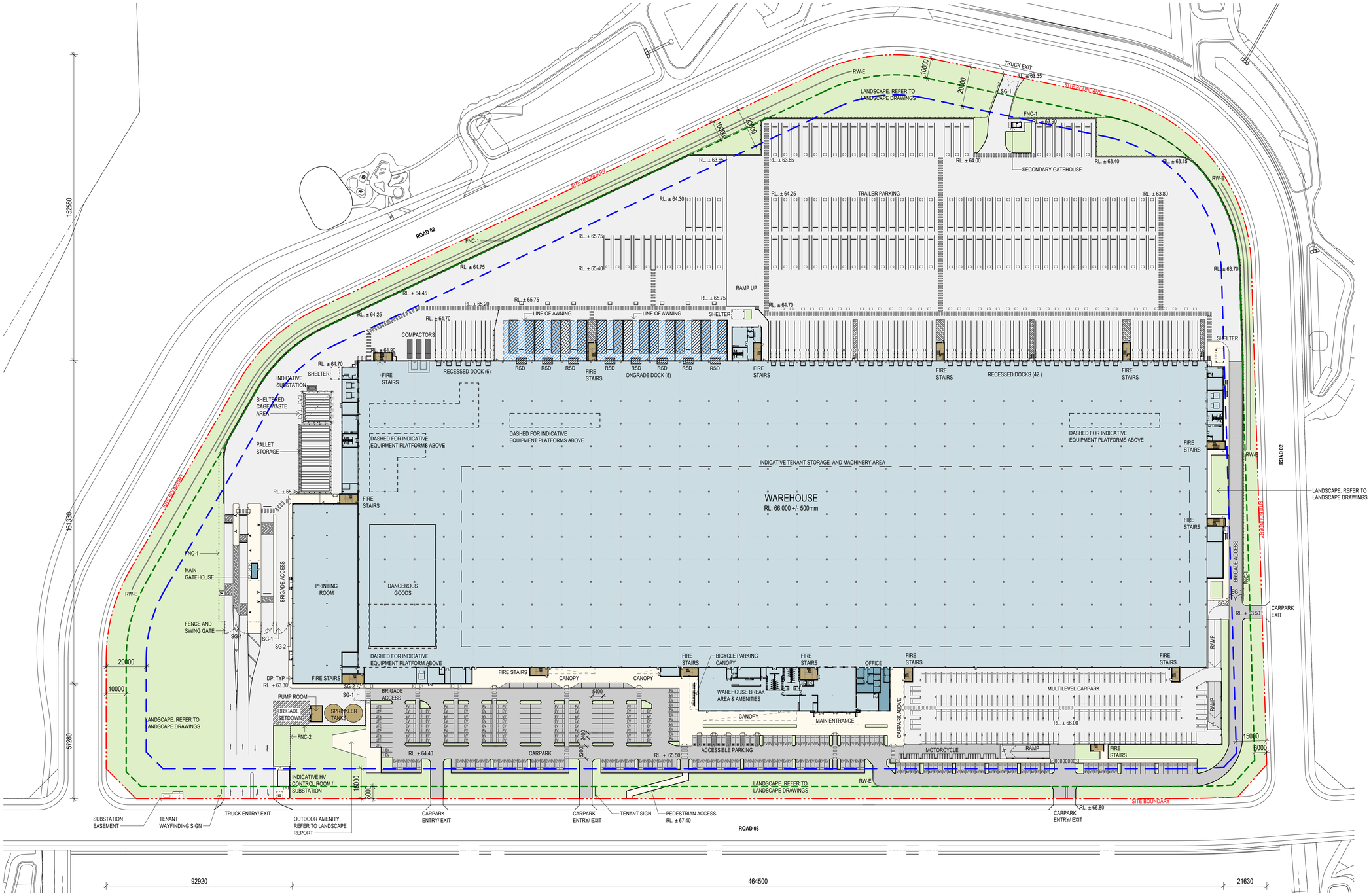
Figure G.1 Common noise levels

Appendix A
Architectural drawings

EMM
creating opportunities

REVISIONS

REV	DESCRIPTION	DATE
P1	COORDINATION	23.03.2026
P2	COORDINATION	25.03.2026
P3	COORDINATION	27.03.2026
P4	COORDINATION	08.04.2026
P5	COORDINATION	10.04.2026
P6	COORDINATION	14.04.2026
0	DEVELOPMENT APPLICATION	16.04.2026



DEVELOPMENT SUMMARY

SITE AREA:	**171,682m²**
LANDSCAPE AREA:	**26,725m² (15.5%)**
TOTAL GFA:	**195,829m²**
SITE COVERAGE	**47.8%**

INCLUDES:
-CANOPIES/AWNINGS
-AWNINGS
-PUMP ROOM
-GATE HOUSE
-WAREHOUSE

EXCLUDES:
-WATER TANKS
-SUBSTATIONS
-GENERATOR

TOTAL CAR PARKING SPACES:	**888**

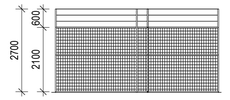
INCLUDES:
-ACCESSIBLE PARKING (9)
-UTE(9)
-FUTURE PROVISIONS FOR ELECTRICAL VEHICLE PARKING (222) 25%

MOTORBIKE PARKING:	**32**
BICYCLE PARKING:	**40**
TRAILER PARKING:	**120**

LEGEND

- SITE BOUNDARY
- LANDSCAPE SETBACK
- BUILDING SETBACK
- FNC-1
- FNC-2
- TRAFFIC BARRIER
- LANDSCAPE AREA
- OFFICE AREA
- WAREHOUSE AREA
- FIRE SERVICES & EGRESS
- HEAVY DUTY PAVEMENT
- LIGHT DUTY PAVEMENT
- PEDESTRIAN PAVEMENT
- AWNING ABOVE

RSD	ROLLER SHUTTER DOOR
DP	DOWNPIPES
RW-E	EXISTING RETAINING WALL
TYP	TYPICAL
SG1	SWING GATE
SG2	SWING GATE - PEDESTRIAN
EV	ELECTRIC VEHICLE PARKING (FUTURE PROVISION)
UTE	UTILITY OR LONG WHEEL LIGHT VEHICLE



FNC-1 CHAIN WIRE FENCE WITH BARBED WIRE
ELEVATION SCALE 1:100



FNC-2 PALISADE FENCE
ELEVATION SCALE 1:100

DEVELOPMENT APPLICATION

sba

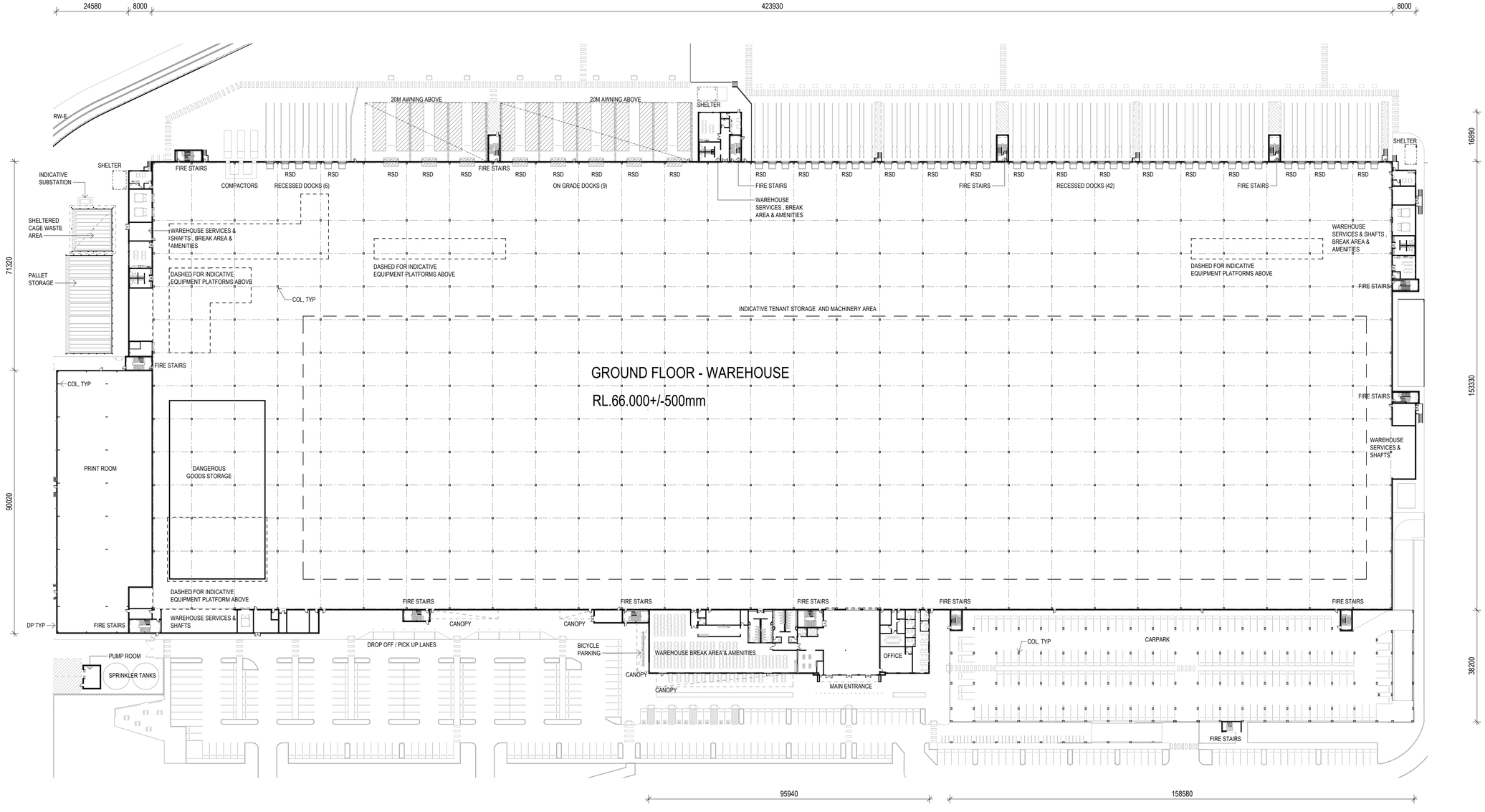
AUTOMATED DISTRIBUTION CENTRE Lot 208, Lot 209, Lot 210
475 BADGERYS CREEK ROAD, BRADFIELD

SITE PLAN

Date 16.04.2026 Scale 1:1000 @A1 Project No 25234 **DA10** **0**

REVISIONS

REV	DESCRIPTION	DATE
P1	COORDINATION	25.03.2026
P2	COORDINATION	10.04.2026
P3	COORDINATION	14.04.2026
0	DEVELOPMENT APPLICATION	16.04.2026



LEGEND

COL	COLUMN
RSD	ROLLER SHUTTER DOOR
DP	DOWNPIPES
RW-E	EXISTING RETAINING WALL
TYP	TYPICAL
MDR	METAL DECK ROOFING
EG	EAVES GUTTER
BG	BOX GUTTER
EJ	EXPANSION JOINT

DEVELOPMENT APPLICATION

sba

AUTOMATED DISTRIBUTION CENTRE Lot 208, Lot 209, Lot 210

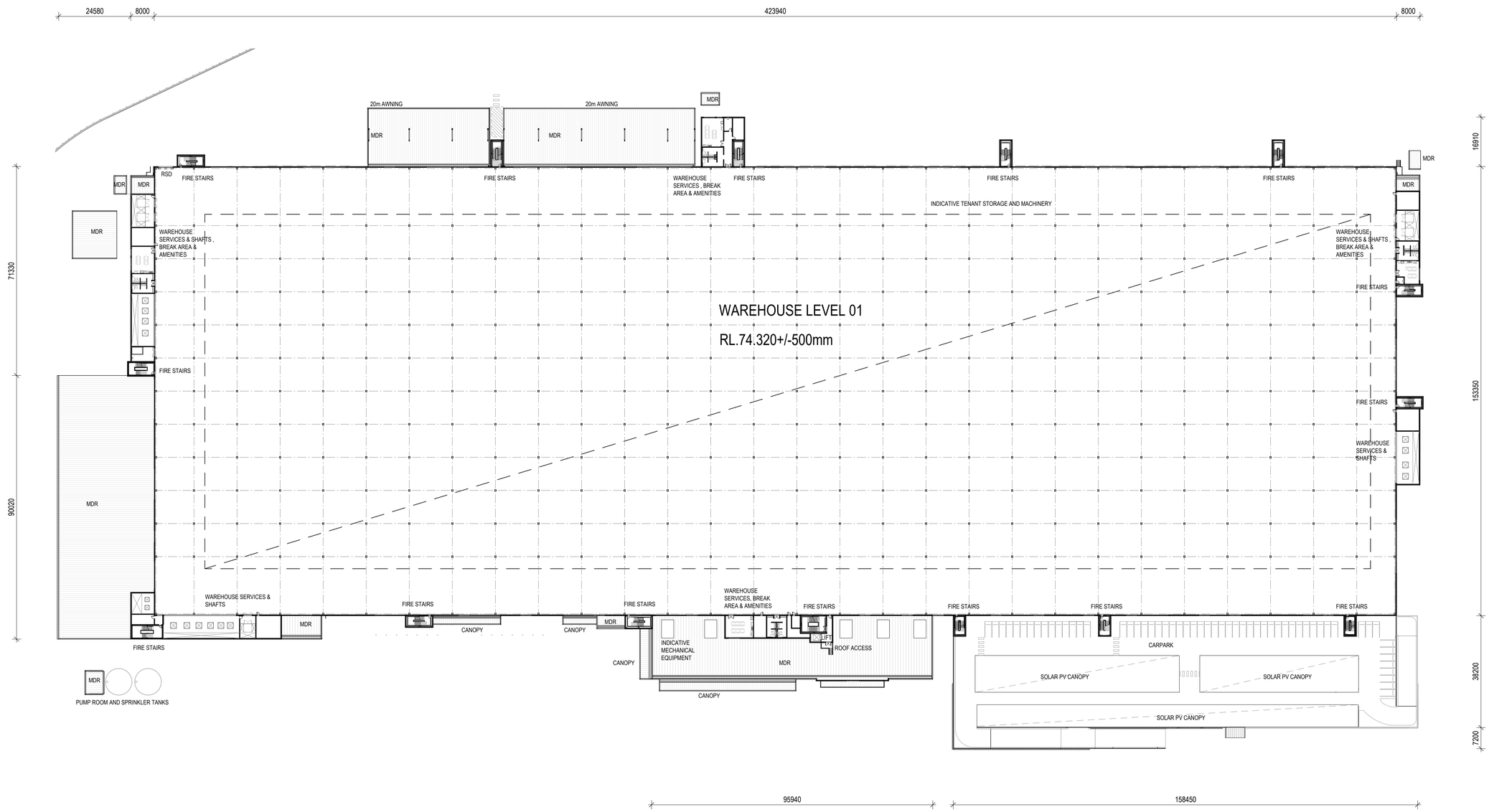
475 BADGERYS CREEK ROAD, BRADFIELD

GROUND FLOOR PLAN

Date 16.04.2026 Scale 1:750 @ A1 Project No 25234 **DA11** **0**

REVISIONS

REV	DESCRIPTION	DATE
P1	COORDINATION	25.03.2026
P2	COORDINATION	10.04.2026
P3	COORDINATION	14.04.2026
0	DEVELOPMENT APPLICATION	16.04.2026



LEGEND

COL	COLUMN
RSD	ROLLER SHUTTER DOOR
DP	DOWNPIPES
RW-E	EXISTING RETAINING WALL
TYP	TYPICAL
MDR	METAL DECK ROOFING
EG	EAVES GUTTER
BG	BOX GUTTER
EJ	EXPANSION JOINT

DEVELOPMENT APPLICATION

sba

AUTOMATED DISTRIBUTION CENTRE Lot 208, Lot 209, Lot 210

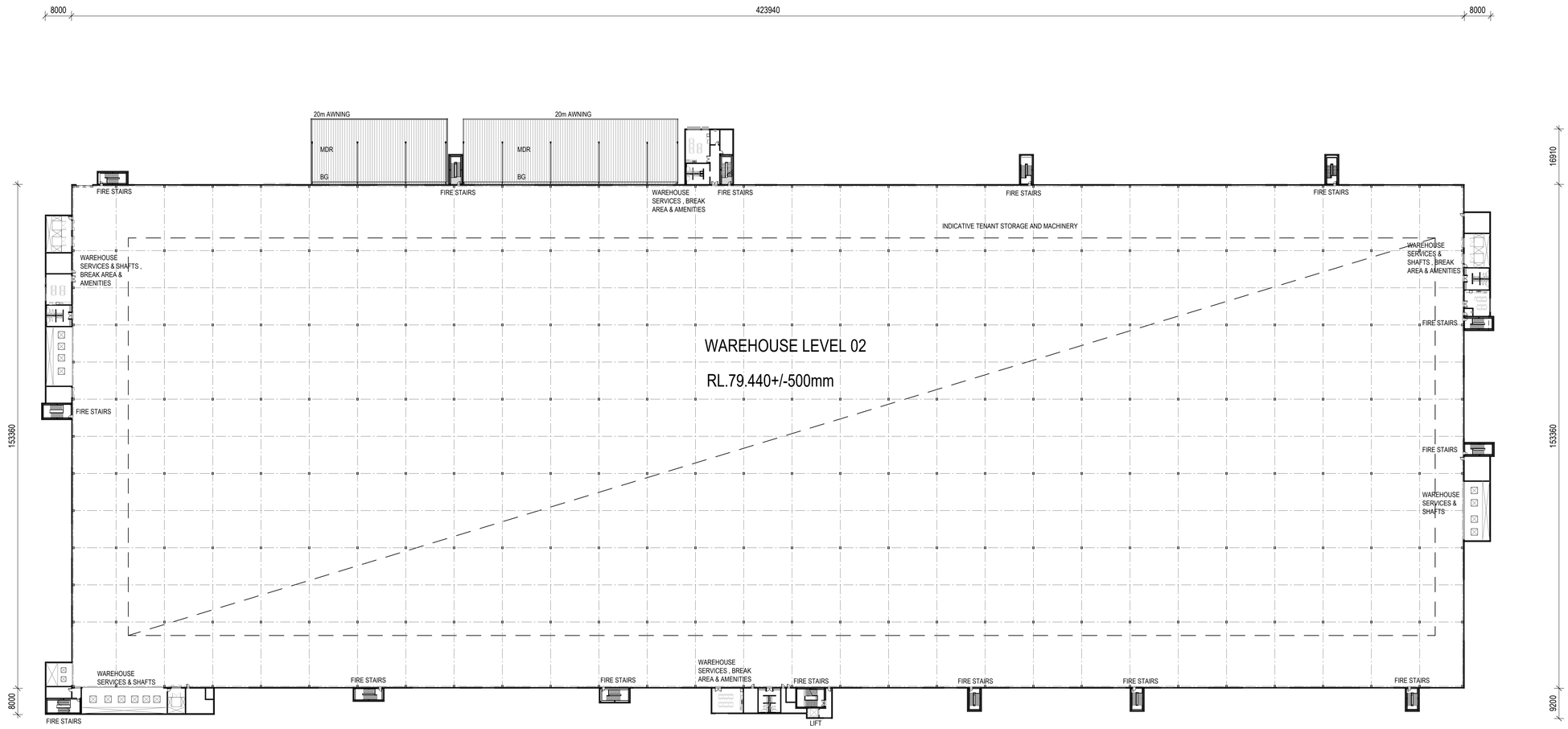
475 BADGERYS CREEK ROAD, BRADFIELD

LEVEL 1 PLAN

Date 16.04.2026 Scale 1:750 @ A1 Project No 25234 **DA12** **0**

REVISIONS

REV	DESCRIPTION	DATE
P1	COORDINATION	25.03.2026
P2	COORDINATION	10.04.2026
P3	COORDINATION	14.04.2026
0	DEVELOPMENT APPLICATION	16.04.2026



LEGEND

COL	COLUMN
RSD	ROLLER SHUTTER DOOR
DP	DOWNPIPES
RW-E	EXISTING RETAINING WALL
TYP	TYPICAL
MDR	METAL DECK ROOFING
EG	EAVES GUTTER
BG	BOX GUTTER
EJ	EXPANSION JOINT

DEVELOPMENT APPLICATION

sba

AUTOMATED DISTRIBUTION CENTRE Lot 208, Lot 209, Lot 210

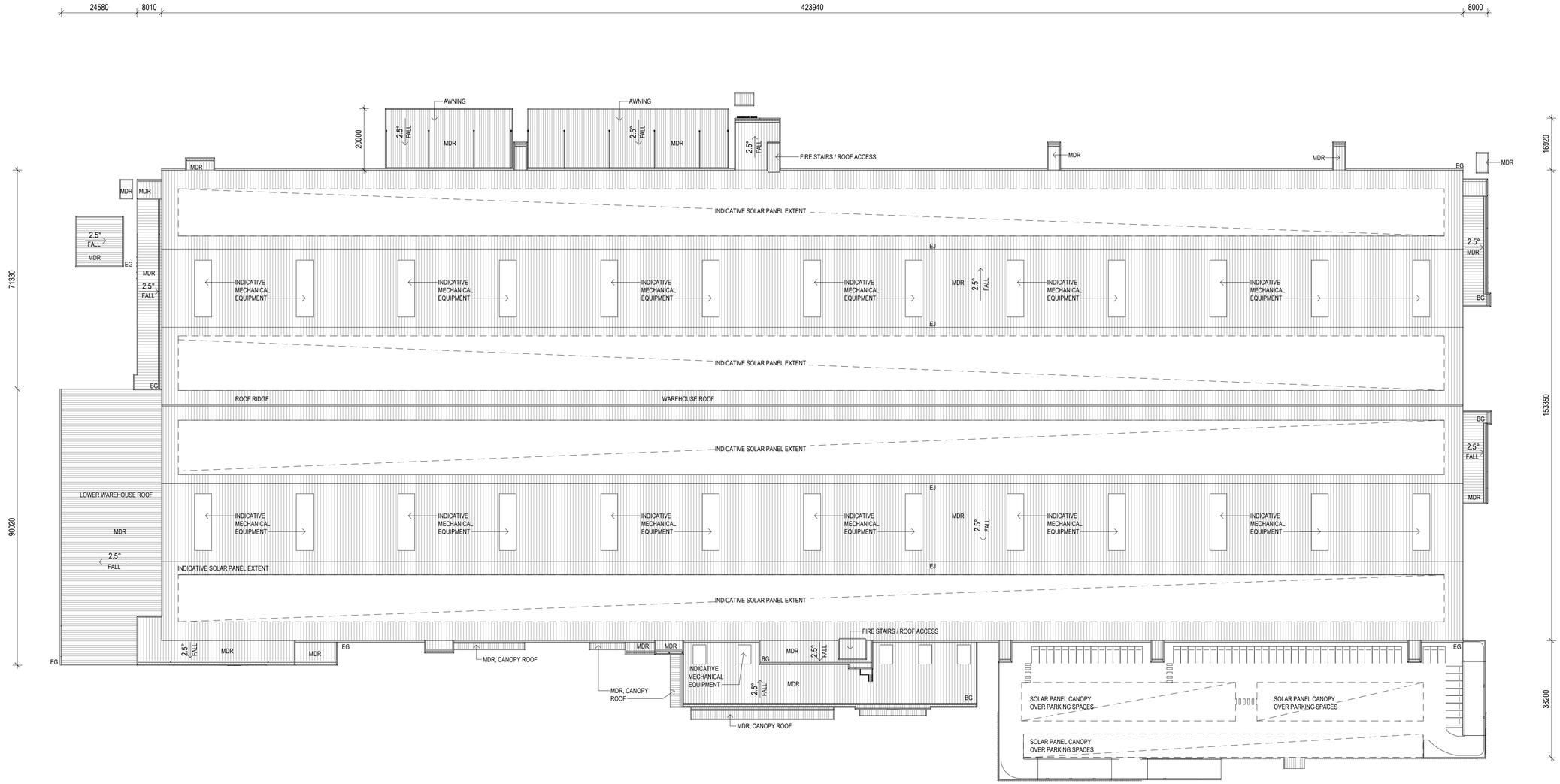
475 BADGERYS CREEK ROAD, BRADFIELD

LEVEL 2 PLAN

Date 16.04.2026 Scale 1:750 @ A1 Project No 25234 **DA13** **0**

REVISIONS

REV	DESCRIPTION	DATE
P1	FOR COORDINATION	18.03.2026
P2	COORDINATION	23.03.2026
P3	COORDINATION	25.03.2026
P4	COORDINATION	10.04.2026
P5	COORDINATION	14.04.2026
0	DEVELOPMENT APPLICATION	16.04.2026



LEGEND

COL	COLUMN
RSD	ROLLER SHUTTER DOOR
DP	DOWNPIPES
RW-E	EXISTING RETAINING WALL
TYP	TYPICAL
MDR	METAL DECK ROOFING
EG	EAVES GUTTER
BG	BOX GUTTER
EJ	EXPANSION JOINT

DEVELOPMENT APPLICATION

sba

AUTOMATED DISTRIBUTION CENTRE Lot 208, Lot 209, Lot 210

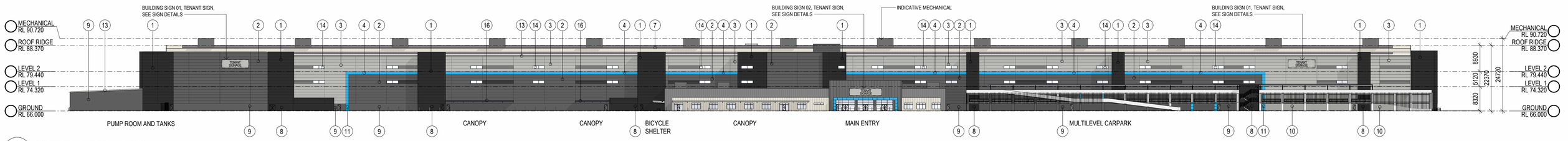
475 BADGERYS CREEK ROAD, BRADFIELD

ROOF PLAN

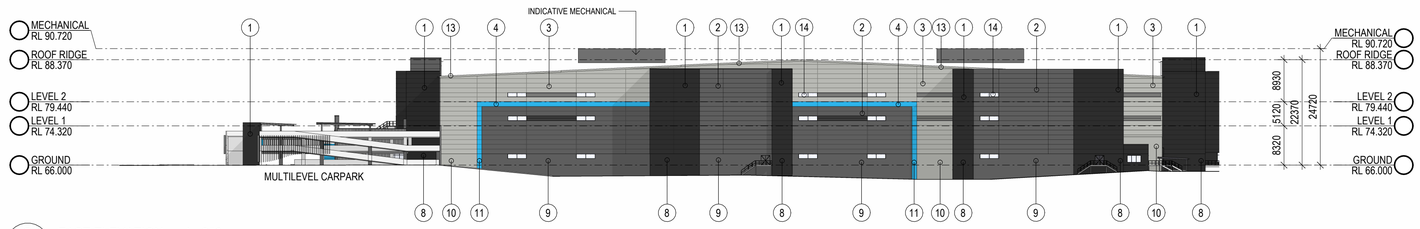
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REVISIONS

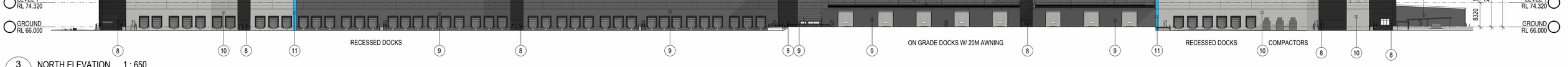
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P2	COORDINATION	25.03.2026
P3	COORDINATION	27.03.2026
P4	COORDINATION	14.04.2026
0	DEVELOPMENT APPLICATION	16.04.2026



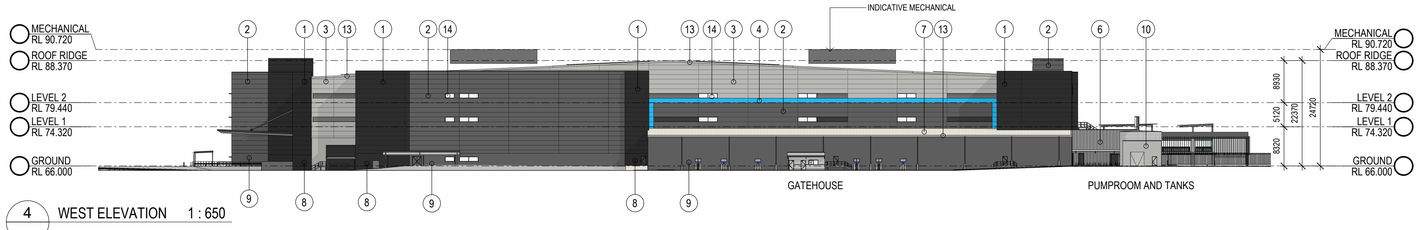
1 SOUTH ELEVATION 1 : 650



2 EAST ELEVATION 1 : 650



3 NORTH ELEVATION 1 : 650



4 WEST ELEVATION 1 : 650

INDICATIVE EXTERNAL FINISHES *FINISHES SUBJECT TO AUTHORITY AND CLIENT APPROVAL*

1. KINGSPAN MICRO RIB PANEL OR EQUIVALENT - MONUMENT FINISH
2. KINGSPAN MICRO RIB PANEL OR EQUIVALENT - BASALT FINISH
3. KINGSPAN MICRO RIB PANEL OR EQUIVALENT - SHALE GREY FINISH
4. KINGSPAN MICRO RIB PANEL OR EQUIVALENT - BLUE
5. KINGSPAN MICRO RIB PANEL OR EQUIVALENT - SURFMIST FINISH
6. KINGSPAN MICRO RIB PANEL OR EQUIVALENT - WINDSPRAY FINISH
7. METAL ROOF - DOVERWHITE
8. CONCRETE WALL - PAINT FINISH - MONUMENT
9. CONCRETE WALL - PAINT FINISH - BASALT
10. CONCRETE WALL - PAINT FINISH - SHALE GREY
11. CONCRETE WALL - PAINT FINISH - BLUE
12. METAL FASCIA / WINDOW FIN - COLORBOND - WINDSPRAY
13. FASCIA / GUTTERS - COLOURBOND - SHALE GREY
14. GLAZING - WINDOW - DOUBLE GLAZED GREY TINT
15. METAL FASCIA / DOWNPIPES/GUTTER - COLORBOND - BASALT
16. METAL FASCIA / DOWNPIPES/GUTTER - COLORBOND- MONUMENT

DEVELOPMENT APPLICATION

sba

AUTOMATED DISTRIBUTION CENTRE Lot 208, Lot 209, Lot 210

475 BADGERYS CREEK ROAD, BRADFIELD

ELEVATIONS - WAREHOUSE

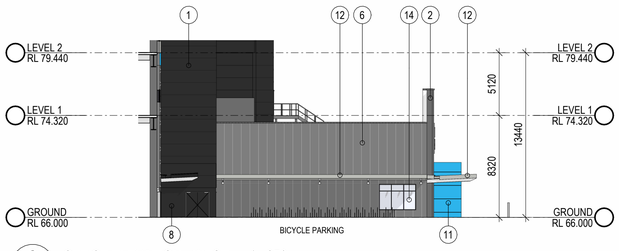
Date 16.04.2026 Scale As indicated@A1 Project No 25234 **DA20** **0**

REVISIONS

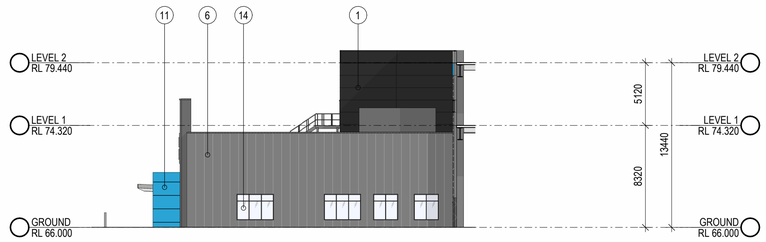
REV	DESCRIPTION	DATE
P1	FOR COORDINATION	18.03.2026
P2	COORDINATION	25.03.2026
P3	COORDINATION	27.03.2026
P4	COORDINATION	14.04.2026
0	DEVELOPMENT APPLICATION	16.04.2026



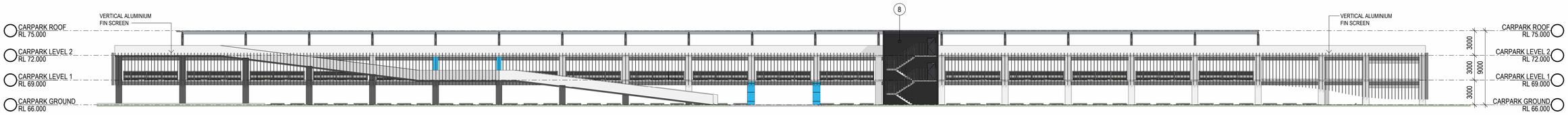
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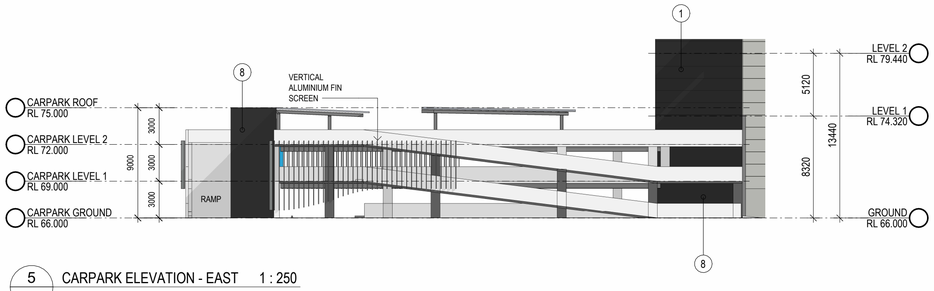
2 OFFICE ELEVATION - WEST 1 : 250



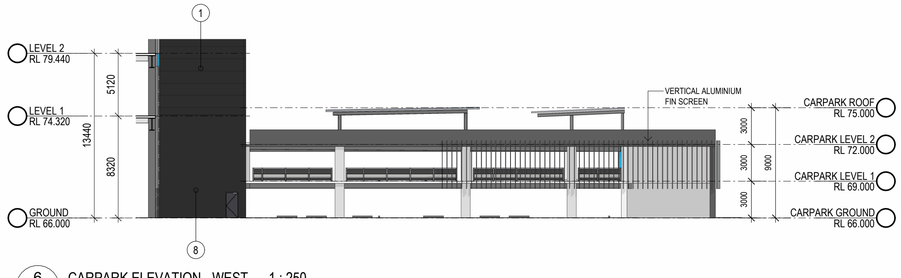
3 OFFICE ELEVATION - EAST 1 : 250



4 CARPARK ELEVATION - SOUTH 1 : 250



5 CARPARK ELEVATION - EAST 1 : 250



6 CARPARK ELEVATION - WEST 1 : 250

INDICATIVE EXTERNAL FINISHES *FINISHES SUBJECT TO AUTHORITY AND CLIENT APPROVAL*

1. KINGSPAN MICRO RIB PANEL OR EQUIVALENT - MONUMENT FINISH
2. KINGSPAN MICRO RIB PANEL OR EQUIVALENT - BASALT FINISH
3. KINGSPAN MICRO RIB PANEL OR EQUIVALENT - SHALE GREY FINISH
4. KINGSPAN MICRO RIB PANEL OR EQUIVALENT - BLUE
5. KINGSPAN MICRO RIB PANEL OR EQUIVALENT - SURFMIST FINISH
6. KINGSPAN MICRO RIB PANEL OR EQUIVALENT - WINDSPRAY FINISH
7. METAL ROOF - DOVERWHITE
8. CONCRETE WALL - PAINT FINISH - MONUMENT
9. CONCRETE WALL - PAINT FINISH - BASALT
10. CONCRETE WALL - PAINT FINISH - SHALE GREY
11. CONCRETE WALL - PAINT FINISH - BLUE
12. METAL FASCIA / WINDOW FIN - COLORBOND - WINDSPRAY
13. FASCIA / GUTTERS - COLOURBOND - SHALE GREY
14. GLAZING - WINDOW - DOUBLE GLAZED GREY TINT
15. METAL FASCIA / DOWNPIPES/GUTTER - COLORBOND - BASALT
16. METAL FASCIA / DOWNPIPES/GUTTER - COLORBOND- MONUMENT

DEVELOPMENT APPLICATION

sba

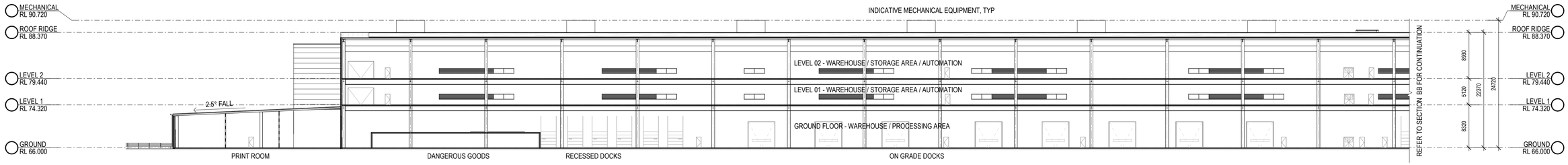
AUTOMATED DISTRIBUTION CENTRE Lot 208, Lot 209, Lot 210
475 BADGERYS CREEK ROAD, BRADFIELD

ELEVATIONS - OFFICE & CARPARK

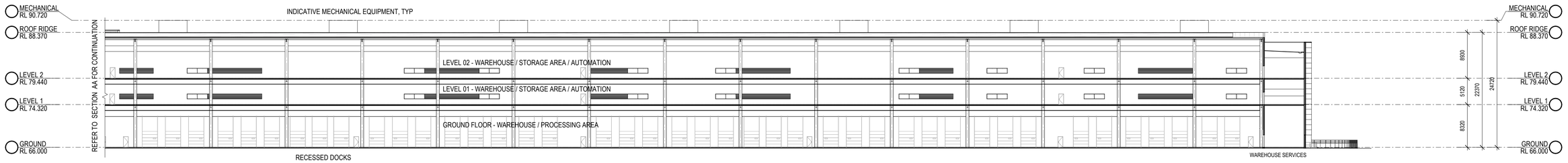
Date 16.04.2026 Scale As indicated@A1 Project No 25234 **DA21** **0**

REVISIONS

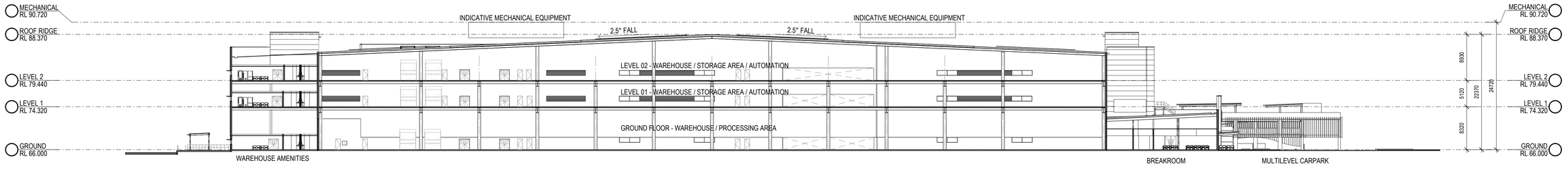
REV	DESCRIPTION	DATE
P1	FOR COORDINATION	18.03.2026
P2	COORDINATION	23.03.2026
P3	COORDINATION	25.03.2026
P4	COORDINATION	14.04.2026
0	DEVELOPMENT APPLICATION	16.04.2026



1 SECTION AA 1 : 400



2 SECTION BB 1 : 400



3 SECTION CC 1 : 400

DEVELOPMENT APPLICATION

sba

AUTOMATED DISTRIBUTION CENTRE Lot 208, Lot 209, Lot 210

475 BADGERYS CREEK ROAD, BRADFIELD

SECTIONS - WAREHOUSE

Date 16.04.2026 Scale As indicated@ A1 Project No 25234 **DA30** **0**

Appendix B
Mechanical drawings

EMM
creating opportunities

REVISIONS

REV	DESCRIPTION	DATE
P1	FOR COORDINATION	18.03.2026
P2	COORDINATION	23.03.2026

FUSION MODULAIR UNITS WITH BASKET DIFFUSER SERVING LEVEL 2

DUCTED FUSION MODULAIR UNITS SERVING LEVEL 1

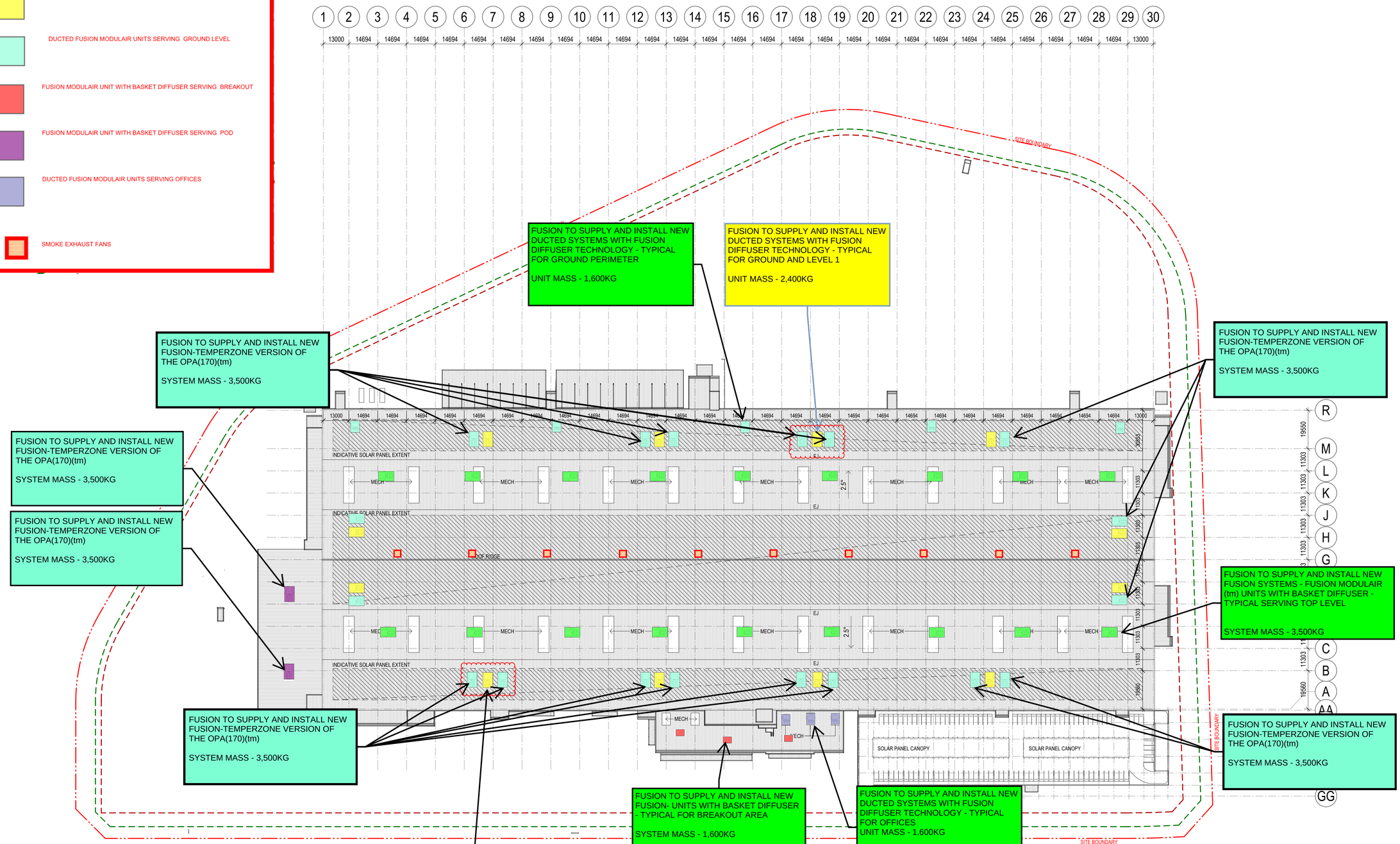
DUCTED FUSION MODULAIR UNITS SERVING GROUND LEVEL

FUSION MODULAIR UNIT WITH BASKET DIFFUSER SERVING BREAKOUT

FUSION MODULAIR UNIT WITH BASKET DIFFUSER SERVING POD

DUCTED FUSION MODULAIR UNITS SERVING OFFICES

SMOKE EXHAUST FANS



Fusion HVAC Australia Pty Ltd / Fusion Modulair (TM)

PROJECT REFERENCE: **AU1126**
DATE: **21 APRIL 2026**
REVISION: **1**

REFER: **GUS MERTEN**

<><><> NOT APPROVED FOR CONSTRUCTION <><><>

DENTIALITY Fusion HVAC Australia Pty Ltd / Fusion Modulair (TM)

Fusion's design & construct solutions, drawings and specification are given in the strictest confidence. They contain our intellectual property and copyright, information covered by various Patents and Trademarks and registered designs, and must not be released to any other mechanical HVAC / refrigeration contractor. These documents are to assist the developers and main contractors with their understanding of the fusion HVAC design solution and requirements for their tender submission.
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THESE DRAWINGS ARE FOR THE EXCLUSIVE AUTHORISED USE OF AMAZON & FUSION HVAC

THEY ARE NOT TO BE PROVIDED TO ANY OTHER MECHANICAL CONTRACTOR / DESIGNER

Appendix C
Operational noise contours

EMM
creating opportunities



\\emm.local\xdrive\2026\E260070- IPG- automated distribution centre NVIA\8 GIS\02_Maps\NVIA003_NoiseContoursTypicalDay\NVIA003_NoiseContoursTypicalDay_20260616_03.aprx 16/06/2026

Source: EMM (2026); DCSSS (2024); GA (2009); MetroMap (2026)

Operational noise contours
Day

Lot 208, 209 & 210
Automated Distribution Centre
Noise and Vibration Impact Assessment
Figure C1

EMM
creating opportunities



\\emm.local\xdrive\2026\E260070- IPG- automated distribution centre NVIA\8 GIS\02_Maps\NVIA004_NoiseContoursTypicalEvening\NVIA004_NoiseContoursTypicalEvening_20260616_03.aprx 16/06/2026

Source: EMM (2026); DCSSS (2024); GA (2009); MetroMap (2026)

Operational noise contours
Evening

Lot 208, 209 & 210
Automated Distribution Centre
Noise and Vibration Impact Assessment
Figure C2

EMM
creating opportunities



KEY

- Site boundary
- Receiver location

Operational noise contour (LAeq,15min)

- 30 dB
- 35 dB
- 40 dB
- 45 dB
- 50 dB
- 55 dB

Existing environment

- Major road
- Minor road
- Vehicular track
- Named watercourse
- Cadastral boundary

Source: EMM (2026); DCSSS (2024); GA (2009); MetroMap (2026)

0 0.5 1 km

GDA2020 MGA Zone 56

N

Operational noise contours
Night

Lot 208, 209 & 210
Automated Distribution Centre
Noise and Vibration Impact Assessment
Figure C3

EMM
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