



Acoustic Report – SPP5.4 DA

Claremont Terraces – Stage 2

NORUP Pty Ltd

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SLR Report 675.072945.00002-R01

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Revision: 1

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
1	16 December 2025	Louisa Cheung	Luke Zoontjens	Luke Zoontjens
0	28 November 2025	Louisa Cheung	Luke Zoontjens	DRAFT

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with NORUP Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.



Executive Summary

The METRICS and NORUP JV is proposing to develop a multistorey development titled 'the Terraces' Stage 2 at Lot 508 Shenton Road Claremont.

This report has been prepared to address likely development approval requirements for a detailed Acoustic Report. Performance requirements have been developed in accordance with *State Planning Policy 5.4*, and the *Environmental Protection (Noise) Regulations 1997*.

This report has reviewed in detail

- noise ingress to residential spaces from the Fremantle Rail Line and Airport Line against *State Planning Policy 5.4*,
- External noise sources and ingress into nearby sensitive areas.

The review finds that the development can practicably comply with both the *State Planning Policy 5.4*, and the *Environmental Protection (Noise) Regulations 1997*.



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1.0 Introduction

1.1 Background

The NORUP is proposing to develop the Terraces Stage 2 at Lot 508 Shenton Road Claremont.

Architectural drawings (plans, elevations, schedules) dated 5th December 2025 have been reviewed and used in the following assessment.

1.2 Locality

Figure A presents an aerial image of the site locality.

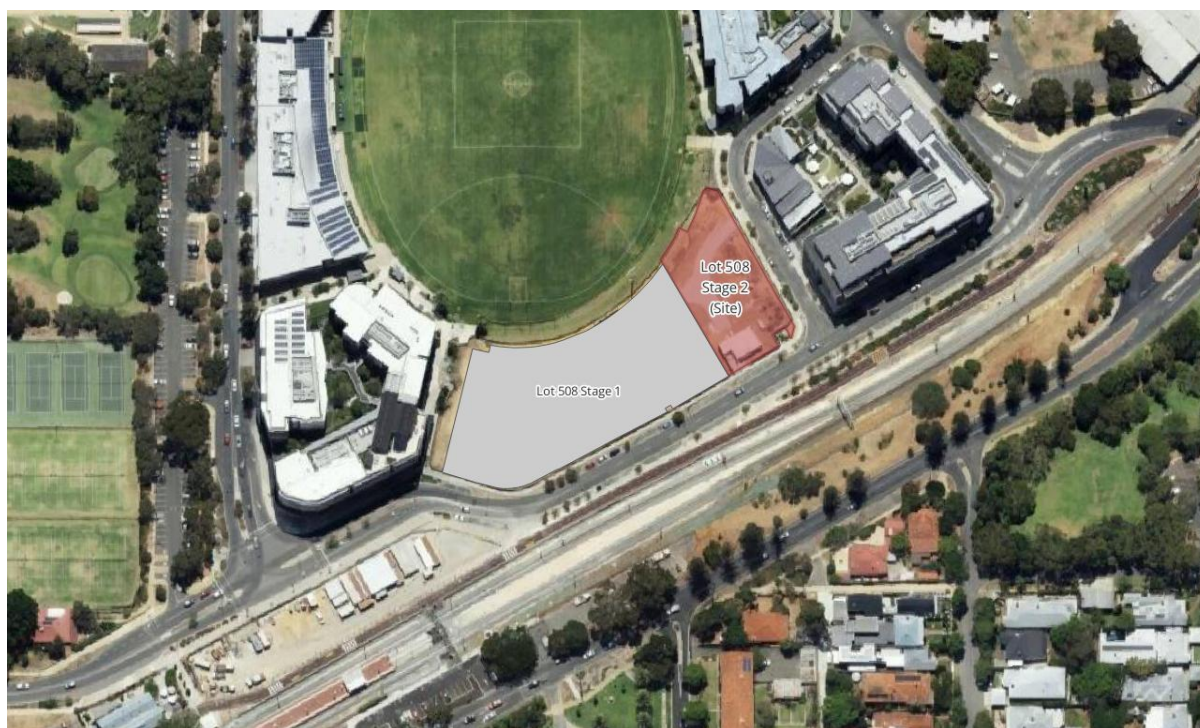


Figure A Aerial image indicating lot boundary (Source: Nearmaps, Google)

Located between the road and railway reserve and Claremont Oval, the site is zoned 'Development' under the Town of Claremont Local Planning Scheme No. 3, and is within the North East Precinct Structure Plan.

The building construction will need to comply with the *National Construction Code (NCC)*. Environmental noise emissions from operation of the building will need to comply with the Assigned Noise Levels listed in the *Environmental Protection Noise Regulations 1997*.

Due to proximity of the site to the Fremantle Rail Line and Airport Line, an assessment according to the *State Planning Policy 5.4 Road and Rail Noise (SPP 5.4)* is also required to inform the development approval process.

Figure B presents an early concept view of the development.





Figure B Architectural render of the development, viewed from Shenton Road.

1.3 Structure of this report

For the purposes of Development Approval, this report addresses the following elements:

- Road and rail noise ingress (**Section 2.0**).
- Environmental noise emissions to surrounding areas (**Section 3.0**).
- Acoustic separation between adjacent multi-residential dwellings (**Section 3.0**).

2.0 Transport noise ingress (SPP 5.4)

2.1 Context

The purpose of *State Planning Policy 5.4 (SPP 5.4)* is to minimise the adverse impact of road and rail noise on noise-sensitive land-use and/or development within the specified trigger distance of strategic freight and major traffic routes and other significant freight and traffic routes.

SPP 5.4 applies to the preparation and assessment of planning instruments, including region and local planning schemes; planning strategies, structure plans; subdivision and development proposals in Western Australia.

Where any part of a proposed noise sensitive lot is within the specified trigger distance, an assessment against *the Policy* is required to determine the likely level of transport noise and management/mitigation required. **Table A** presents a summary of the relevant trigger distances for scheduled roads.



Table A Transport corridor classification and trigger distances

Transport corridor classification	Trigger distance, metres (Note ¹)
Roads - Strategic freight and major traffic routes Roads as defined by Perth and Peel Planning Frameworks and/or roads with either 500 or more Class 7 to 12 Austroads vehicles per day, and/or 50,000 per day traffic volume	300
Roads - Other significant freight/traffic routes These are generally any State administered road and/or local government road identified as being a future State administered road (red road) and other roads that meets the criteria of either >= 100 Class 7 to 12 Austroads vehicles daily or >= 23,000 daily traffic count.	200
Passenger railways	100
Freight railways	200

Note 1 measured from road carriageway edge or railway centreline

Based on the information provided, the nearest significant transport asset is the Fremantle railway line which is around 30 metres away. Being within 100 metres, the proposed development is within the trigger distance for *SPP 5.4*.

2.2 Criteria

Targets from SPP5.4 is provided in **Table B**.

Table B SPP 5.4 Noise Targets

Proposal	New / upgrade	Noise targets		
		Outdoor		Indoor
		Day (L _{Aeq,day} , dB) (6 am – 10 pm)	Night (L _{Aeq,night} , dB) (10 pm – 6 am)	(L _{Aeq} , dB)
Noise-sensitive land-use and/or development	New noise-sensitive land-use and/or development within the trigger distance of an existing / proposed transport corridor	55	50	L _{Aeq,day} 40 (living and work areas) L _{Aeq,night} 35 (bedrooms)
Roads	New	55	50	N/A
	Upgrade	60	55	N/A
Railways	New	55	50	N/A
	Upgrade	60	55	N/A

Based on this table and residential usages facing the railway, the recommended indoor noise targets are

- L_{Aeq} 40 dB within living and work areas, and



- $L_{Aeq,night}$ 35 dB in bedrooms.

2.3 Assessment

To determine future design incident noise level, a detailed 3D model of road and railway noise was created to represent the current and future day period scenario. Key model inputs are listed in **Table C**. The building was included based on the current set of drawings and adjacent development. Assessment points are located at the middle of facades of each residence, at 1.5m above each floors finished floor level. **Figure C** indicates these locations in plan.

To represent the current and future scenario, the rail noise model includes the Fremantle Line and Airport Line at full capacity.

The road traffic noise model includes the design year (2025) with increased road volumes to represent a 20-year design horizon (year 2045). The year 2047 scenario, referencing the traffic forecast in the Stantec’s Traffic Impact Assessment report¹, is also predicted using empirical formula².

Based on these road and rail volumes, the day period is determinative, meaning that if the design is compliant based on day period results, the design will also be compliant with the night period results.

Table C Noise prediction basis

Aspect	Source		Basis / Rationale
	Shenton Road	Rail	
Volume, Day period (per direction)	2025: 335 per hour East Bound 161 per hour West Bound 2045: 470 per hour East Bound 225 per hour West Bound 2047 (peak traffic): 818 per hour East Bound 361 per hour West bound	2025: 130 per day 2045: 130 per day	Recorded volume ³ plus 3% to represent each year growth
Noise emission model	CoRTN (AU)	Kilde 130	Conservative
Modelled emission strength, dB	-2.2	-6.2 @ 96 m length	Relative to standard to match historical data
Speed, km/hr	40	40 to 70	Railway stopping at Claremont Station

¹ Lot 508 Shenton Road, Claremont Terraces-Stage 2, Town of Claremont, Traffic Impact Assessment Report prepared by Stantec, dated 05 December 2025

² The Calculation of Road Traffic Noise (CoRTN) method was used to estimate base noise level during day time peak.

³ Traffic Signal LM01154 dated 2023, https://reportingcentresources.mainroads.wa.gov.au/public/data/traffic_map/TL/LM01154.xlsx



Figure C Locations of modelled sensitive receivers



Table D lists the results for each scenario. From this table it can be seen that the future incident design level is typically over $L_{Aeq,day}$ 60 dB. The highest incident level assessed is $L_{Aeq,day}$ 66 dB at two apartments, which is 11 dB above the relevant outdoor design target and aligns to Noise Exposure Category C in the SPP 5.4 Guidelines.

Detailed predicted noise levels are included in **Appendix A**. Whilst the most exposed apartments are predicted to have this Noise Exposure Category, levels across the façade will vary and minimum façade noise reduction requirements will be lower at the less exposed locations.

Table D Predicted $L_{Aeq,day}$ design noise levels by scenario, dB


Sensitive Receivers	Rail	Design year 2025		Design year 2045		Design year 2047	
		Road	Sum	Road	Sum	Road*	Sum
N1	47	51	52	58	58	60	60
N2	49	51	53	58	58	60	60
N3	51	53	55	58	59	60	61
N4	57	59	61	61	62	63	64
N5	57	62	63	63	64	66	66
N6	57	62	63	63	64	65	66
Maximum	57	62	63	63	64	66	66

*Road traffic noise levels predicted using traffic forecast in this Project's Traffic Impact Assessment Report prepared by Stantec. (Stantec reference: 301252508, dated 05 December 2025)



Practicable construction options are available to comply with SPP 5.4 noise ingress requirements. Subject to further optimisation, some examples are provided in **Table E**.

Table E Performance requirements for managing noise ingress

Aspect	Parameter	Construction	
		Generally	Facing railway
Walls	Minimum Weighted sound reduction performance (R_w), dB	45	51
	Sketch (Note ¹)		
	Example arrangement	<ul style="list-style-type: none"> Internal 1x13mm EC08 92mm stud with 100mm 14kg/m³ glasswool insulation and 10mm rockwool thermal break strips to external façade of stud framing 13mm Siniat Weather defence 70mm cross battened top hat ventilated cavity 9mm FC cladding External 	<ul style="list-style-type: none"> Internal 2x13mm EC08 92mm stud with 100mm 14kg/m³ glasswool insulation and 10mm rockwool thermal break strips to external façade of stud framing 13mm Siniat Weather defence 70mm cross battened top hat ventilated cavity 9mm FC cladding External
Windows	Minimum weighted sound reduction performance (R_w), dB	32	34
	Example arrangement	Minimum 6.38mm laminate single glazed panes in airtight awning / casement frames	Double glazed insulating glass unit (DGU) 6-12-6 mm in airtight awning / casement frames
Balcony doors	Minimum Weighted sound reduction performance (R_w), dB	29	32
	Example arrangement	Toughened single glazing with weatherproof seals	Double glazed insulating glass units (DGU) 6-12-6 mm with weatherproof seals

Note 1 Image sourced from https://media.siniat.com/pd47641/original/1031430004/siniat-weather-defence_brochure_march24_final.pdf



3.0 Internal separation (NCC)

We understand that the development would be assessed as mostly Class 2 under the 2022 National Construction Code (NCC).

Detailed design of internal partition is yet available at this early stage. However, a preliminary review of the internal arrangements finds that compliance with relevant acoustic separation requirements in the NCC would be practicable.

4.0 Noise emissions (Regulations)

Project noise emissions are addressed by state noise policy in the form of the Western Australia *Environmental Protection (Noise) Regulations 1997* (EPNR, 'Regulations'). To achieve compliance with this policy, noise levels at nearby residential areas are not to exceed defined limits referred to as Assigned Levels. These limits are determined from consideration of prevailing background noise levels and 'influencing factors' (IFs) that considers the level of commercial and industrial zoning in the locality.

The influencing factor considers zoning and road traffic around the nearest sensitive receiver of interest, within 100 and 450 m distance. A summary of the applicable noise limits is provided in **Table F**.

Table F Assigned Levels summary

Part of premises receiving noise	Time of day	Assigned Level, dB		
		L _{A10}	L _{A1}	L _{Amax}
Noise Sensitive premises at locations within 15 metres of a building directly associated with a noise sensitive use	0700 to 1900 hours Monday to Saturday ('Day')	53	63	73
	0900 to 1900 hours Sunday and public holidays ('Sundays')	48	58	73
	1900 to 2200 hours all days ('Evening')	48	58	63
	2200 hours on any day to 0700 Monday to Saturday and 0900 hours Sunday and public holidays ('Night')	43	53	63
Noise Sensitive premises at locations further than 15 metres from a building directly associated with a noise sensitive use.	All hours	60	75	80
Commercial premises	All hours	60	75	80
Industrial and utility premises	All hours	65	80	90

If noise emitted from any premises when received at any other premises cannot reasonably be free of intrusive characteristics of tonality, modulation and impulsiveness, then a series of adjustments must be added to the emitted levels (measured or calculated) and the adjusted level must comply with the Assigned Level.

The adjustments are detailed in **Table G** and are further defined in Regulation 9(1) of the Environmental Protection (Noise) Regulations 1997.



Table G Table of adjustments

Noise characteristic	Definition	Adjustment if present (Note ¹)
Tones	Where the difference between the A weighted sound pressure level in any one third octave band and the arithmetic average of the A weighted sound pressure levels in the two adjacent one third octave bands is greater than 3 dB in terms of LAeq,T where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as LASlow levels.	+5 dB
Modulation	A variation in the emission of noise that – Is more than 3 dB LAFast or is more than 3 dB LAFast in any one third octave band; Is present for at least 10% of the representative assessment period; and, Is regular, cyclic and audible.	+5 dB
Impulsiveness	Present where the difference between the LAPeak and LAmix is more than 15 dB when determined for single representative event.	+10 dB

Note 1 where noise emission is not music, these adjustments are cumulative to a maximum of 15 dB.

The following subsections provide assessment of various aspects identified, by source type.

4.1 Vehicle noise

Noise from movements of vehicles within private car parking areas is regulated. However, the frequency and positions of such vehicle movements are such that noise emissions are predicted to be compliant at noise sensitive receptors on floors above.

Bin storage is provided at ground level inside the carpark. The bins will be transferred to Stage 1 for collection. No bin truck will be travelling in and out of the site.

4.2 Mechanical plant

4.2.1 Fire pump

The fire pump is proposed to be installed at the fire services pump room at ground floor carpark. **Figure D** shows the location of the fire pump room at ground level.

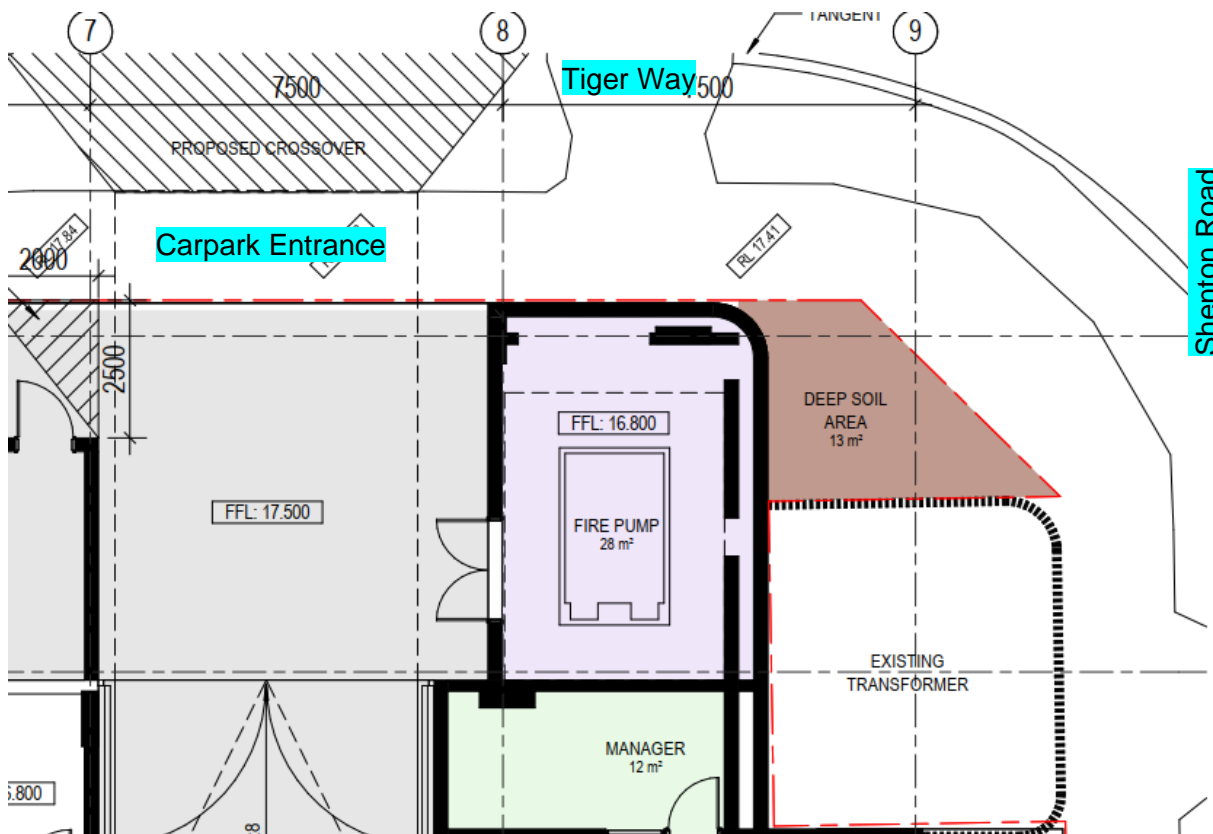
The room will be fully enclosed with fire rated walls and door typically rated to at least R_w 55 and R_w 30 respectively.

Any doors, and openings for exhaust, air inlet/outlet for the pump room should be located off Shenton Road, facing southward and away from residential development opposite Tiger Way.

Periodic testing is recommended to be carried out between 7am to 7pm Monday to Friday. Therefore, noise egress from the fire pump to the surrounding is expected to be minimal and permitted under Regulation 14.



Figure D Fire pump room at ground level carpark



4.2.2 Car park ventilation

Car parking areas should ideally be naturally ventilated but may use mechanical services to assist. Noise emissions from these services are required to comply with the noise emission criteria in **Table F**. **Table H** presents the modelled arrangement of mechanical ventilation.

Table H Modelled car park ventilation

Noise Sources	Location	Quantity	Sound power level L _{WA} per item, dB
Carpark ventilation (SLR database)	Carpark entrance (3 metres from floor level)	4	70

It is understood that the design in this respect is subject to change and would need to be reviewed further if the positions, operating profile and/or noise emissions change. However, compliance with applicable Assigned Noise Levels is predicted based on the currently indicated fan locations, ventilation openings and wall partitions.

4.2.3 Residential condenser units

A service space is designed on roof. Most mechanical plant is assumed to be located on the rooftop. Mechanical outdoor condensers (including those located on individual balconies) would need to comply with **Table F**. Rooftop mechanical plant have been modelled as per **Table I**. **Figure E** shows the location of the rooftop AC plant.



Table I Modelled roof mechanical plant

Noise Sources	Location	Quantity	Sound power level L_{WA} per item, dB
AC outdoor units (reference catalogue)	Roof Service Plant	61	76

Figure E Location of Roof top AC plant

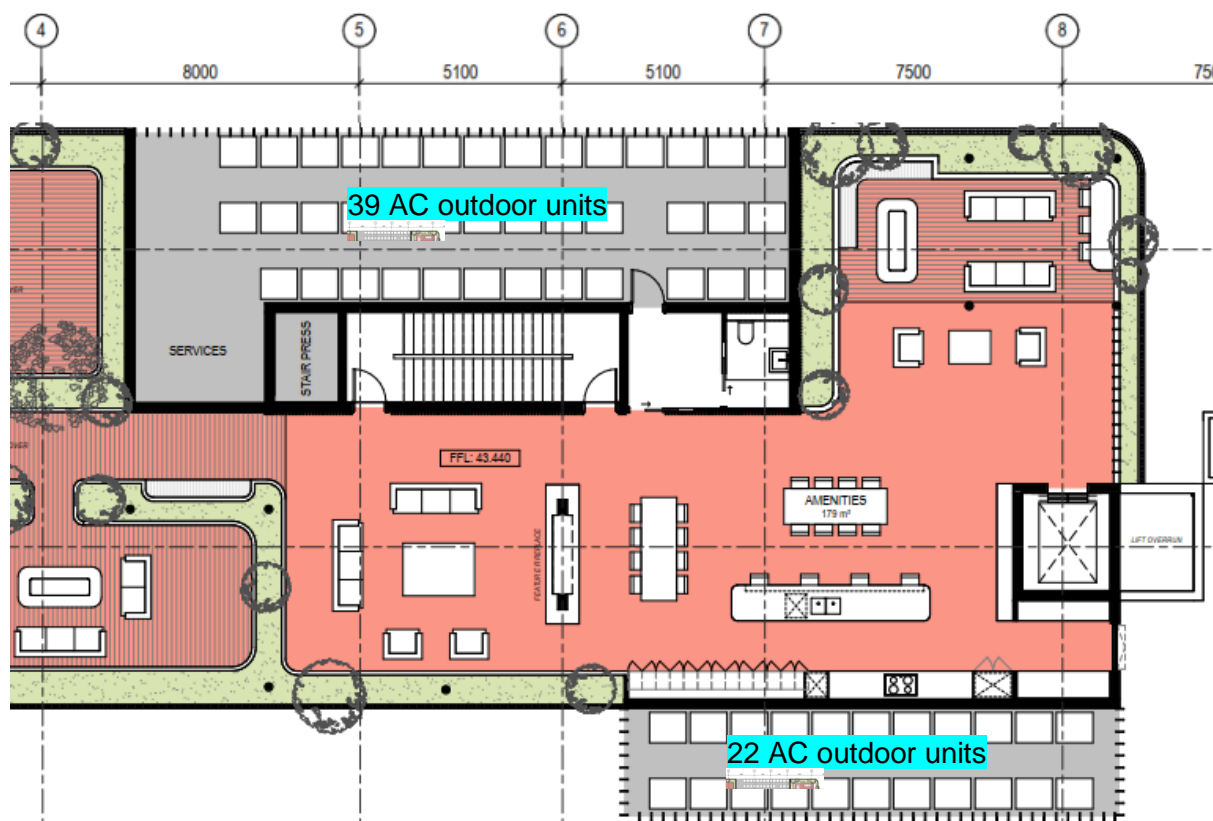


Table J summarised the predicted noise level from mechanical plants and carpark ventilation.

Table J Predicted mechanical noise from the site

Sensitive Receptors	Description	Predicted L_{A10} noise level at 1m from façade, dB
Level 7 PH1 (This development)	Directly under roof service plant	42
Top floor/Level 4, the Queenslea	Opposite to car park entrance and service plant	40
Level 1, the Queenslea	Opposite to car park entrance and service plant	42
Nagala Early Learning	Northeast of the development, across Tiger Way	36

The predicted levels are lower than the relevant assigned level of L_{A10} 43 dB. On this basis, noise emissions from mechanical services can comply with the Regulations.





Appendix A Predicted Transport Noise Levels

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A.1 Year 2025

A.1.1 Road Traffic Noise

Sensitive Receiver	Predicted L _{Aeq,day}							
	F 1	F 2	F 3	F 4	F 5	F 6	F 7	Max
N1	51	50	50	49	49	48	48	51
N2	51	51	50	50	50	49	49	51
N3	53	53	53	52	52	51	51	53
N4	59	59	58	57	57	56	55	59
N5	62	61	60	59	59	58	57	62
N6	62	61	60	59	59	58	57	62
Max	62	61	60	59	59	58	57	
Max exceedance	6	6	5	4	3	3	2	

A.1.2 Railway Noise

Sensitive Receiver	Predicted L _{Aeq,day}							
	F 1	F 2	F 3	F 4	F 5	F 6	F 7	Max
N1	46	46	47	47	47	46	46	47
N2	48	48	49	48	49	47	47	49
N3	50	50	51	51	51	51	51	51
N4	56	56	56	56	57	55	55	57
N5	56	57	57	57	57	57	57	57
N6	56	57	57	57	57	57	57	57
Max	56	57	57	57	57	57	57	
Max exceedance	1	1	1	2	2	2	1	

A.1.3 Overall

Sensitive Receiver	Predicted L _{Aeq,day}							
	F 1	F 2	F 3	F 4	F 5	F 6	F 7	Max
N1	52	52	52	51	51	50	50	52
N2	53	53	53	52	52	51	51	53
N3	55	55	55	55	54	54	54	55
N4	61	61	60	60	60	59	58	61
N5	63	62	62	61	61	60	60	63
N6	63	62	62	61	61	60	60	63
Max	63	62	62	61	61	60	60	
Max exceedance	7	7	6	6	5	5	5	



A.2 Year 2045

A.2.1 Road Traffic Noise

Sensitive Receiver	Predicted $L_{Aeq,day}$							
	F 1	F 2	F 3	F 4	F 5	F 6	F 7	Max
N1	58	57	56	55	54	54	53	58
N2	58	57	56	55	55	54	53	58
N3	58	58	57	56	56	55	54	58
N4	61	61	60	59	59	58	57	61
N5	63	63	62	61	60	59	59	63
N6	63	62	61	61	60	59	59	63
Max	63	63	62	61	60	59	59	
Max exceedance	8	7	6	5	5	4	3	

A.2.2 Railway Noise

Sensitive Receiver	Predicted $L_{Aeq,day}$							
	F 1	F 2	F 3	F 4	F 5	F 6	F 7	Max
N1	46	46	47	47	47	46	46	47
N2	48	48	49	48	49	47	47	49
N3	50	50	51	51	51	51	51	51
N4	56	56	56	56	57	55	55	57
N5	56	57	57	57	57	57	57	57
N6	56	57	57	57	57	57	57	57
Max	56	57	57	57	57	57	57	
Max exceedance	1	1	1	2	2	2	1	

A.2.3 Overall

Sensitive Receiver	Predicted $L_{Aeq,day}$							
	F 1	F 2	F 3	F 4	F 5	F 6	F 7	Max
N1	58	57	56	56	55	54	54	58
N2	58	57	57	56	56	55	54	58
N3	59	58	58	57	57	56	56	59
N4	62	62	61	61	61	60	59	62
N5	64	63	63	62	62	61	61	64
N6	64	63	63	62	62	61	61	64
Max	64	63	63	62	62	61	61	
Max exceedance	9	8	7	7	6	6	5	



A.3 Year 2047

A.3.1 Road Traffic Noise

Sensitive Receiver	Predicted $L_{Aeq,day}$							
	F 1	F 2	F 3	F 4	F 5	F 6	F 7	Max
N1	60	59	58	57	57	56	55	60
N2	60	59	58	58	57	56	56	60
N3	60	60	59	59	58	57	57	60
N4	63	63	62	62	61	60	59	63
N5	66	65	64	63	62	62	61	66
N6	65	65	64	63	62	62	61	65
Max	66	65	64	63	62	62	61	
Max exceedance	10	9	9	8	7	6	6	

A.3.2 Railway Noise

Sensitive Receiver	Predicted $L_{Aeq,day}$							
	F 1	F 2	F 3	F 4	F 5	F 6	F 7	Max
N1	46	46	47	47	47	46	46	47
N2	48	48	49	48	49	47	47	49
N3	50	50	51	51	51	51	51	51
N4	56	56	56	56	57	55	55	57
N5	56	57	57	57	57	57	57	57
N6	56	57	57	57	57	57	57	57
Max	56	57	57	57	57	57	57	
Max exceedance	1	1	1	2	2	2	1	

A.3.3 Overall

Sensitive Receiver	Predicted $L_{Aeq,day}$							
	F 1	F 2	F 3	F 4	F 5	F 6	F 7	Max
N1	60	59	59	58	57	56	56	60
N2	60	59	59	58	58	57	56	60
N3	61	60	60	59	59	58	58	61
N4	64	64	63	63	62	61	61	64
N5	66	65	65	64	63	63	62	66
N6	66	65	65	64	63	63	62	66
Max	66	65	65	64	63	63	62	
Max exceedance	11	10	9	9	8	8	7	





Appendix B Noise contour maps

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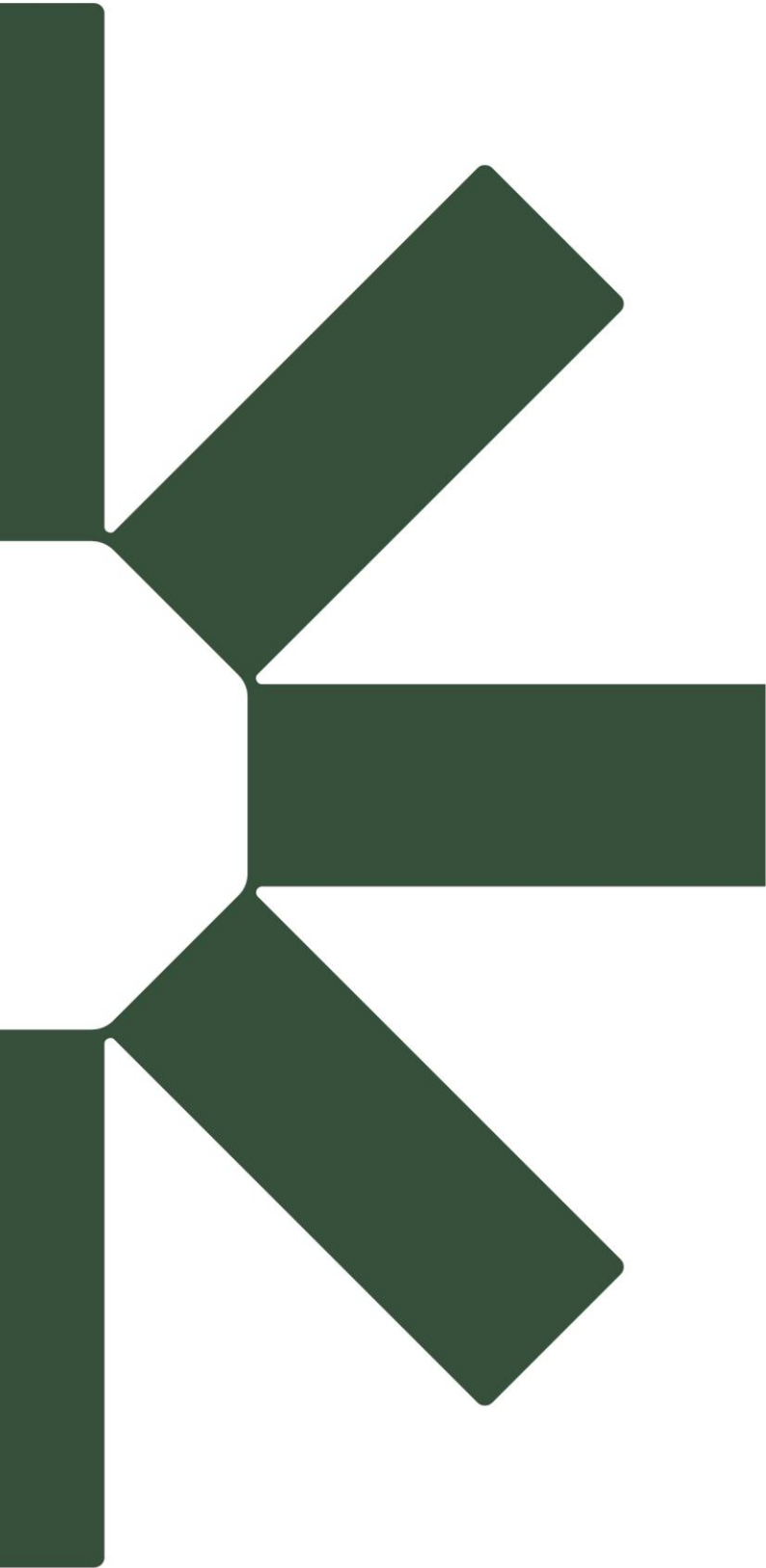
16 December 2025

Figure A- 1 Predicted mechanical noise from site, L_{Aeq} dB



Note: Noise contours are calculated at 1.5 metres above local floor level.





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