

DMG PROPERTY

**GLEN IRIS ESTATE LOCAL CENTRE
JANDAKOT**

**ENVIRONMENTAL ACOUSTIC ASSESSMENT
DEVELOPMENT APPROVAL SUBMISSION REPORT**

DECEMBER 2024

OUR REFERENCE: 33872-1-24242

DOCUMENT CONTROL PAGE

ENVIRONMENTAL ACOUSTIC ASSESSMENT
GLEN IRIS ESTATE LOCAL CENTRE

Job No: 24242

Document Reference: ?????-1-24242

FOR

DMG PROPERTY

DOCUMENT INFORMATION				
Author:	George Watts	Checked By:	Tim Reynolds	
Date of Issue :	10 December 2024			

REVISION HISTORY				
Revision	Description	Date	Author	Checked

DOCUMENT DISTRIBUTION				
Copy No.	Version No.	Destination	Hard Copy	Electronic Copy
1	1	Windsor Knight Pty Ltd Attn : Tarryn Stain Email : tarryn@windsorknight.com.au		✓

CONTENTS

1.	INTRODUCTION	1
2.	SUMMARY	1
3.	CRITERIA	1
3.1	Environmental Protection (Noise) Regulations 1997	1
4.	PROPOSED DELIVERIES	4
5.	MECHANICAL PLANT	4
6.	METHODOLOGY	5
7.	RESULTS	6

APPENDICES

A	DEVELOPMENT PLANS
---	-------------------

1. INTRODUCTION

Herring Storer Acoustics were commissioned by DMG Property to undertake an acoustic assessment of noise emissions associated with the proposed Glen Iris Local Centre to be located in Jandakot, Lot 1000 Glen Iris Estate, Jandakot.

The objective of this study was to assess noise emissions from delivery vehicles and mechanical services at the noise sensitive premises surrounding the proposed site for compliance with the requirements of the *Environmental Protection (Noise) Regulations 1997*.

The assessment was undertaken to inform the design development team of the store and address a likely development approval condition.

The site plan is attached in Appendix A.

2. SUMMARY

Noise emissions associated with the proposed local centre have been determined to comply with the *Environmental Protection (Noise) Regulations 1997*. on the basis that refrigerated truck deliveries are restricted to occur outside of the night period – between 10pm and 7am (or 9am on Sundays and Public Holidays).

3. CRITERIA

3.1 ENVIRONMENTAL PROTECTION (NOISE) REGULATIONS 1997

The *Environmental Protection (Noise) Regulations 1997* stipulate the allowable noise levels at any noise sensitive premises from other premises. The allowable noise level is determined by the calculation of an influencing factor, which is added to the baseline criteria set out in Table 1 of the Regulations. The baseline assigned noise levels are listed in Table 3.1.

TABLE 3.1 – ASSIGNED NOISE LEVELS

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L _A 10	L _A 1	L _A max
Noise sensitive premises within 15 metres of a dwelling (Highly Sensitive Areas)	0700 - 1900 hours Monday to Saturday	45 + IF	55 + IF	65 + IF
	0900 - 1900 hours Sunday and Public Holidays	40 + IF	50 + IF	65 + IF
	1900 - 2200 hours all days	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays	35 + IF	45 + IF	55 + IF

Note: The L_{A10} noise level is the noise that is exceeded for 10% of the time.
The L_{A1} noise level is the noise that is exceeded for 1% of the time.
The L_{Amax} noise level is the maximum noise level recorded.

It is a requirement that noise from the site be free of annoying characteristics (tonality, modulation and impulsiveness) at other premises, defined below as per Regulation 9.

“impulsiveness” means a variation in the emission of a noise where the difference between L_{Apeak} and $L_{Amax\ Slow}$ is more than 15dB when determined for a single representative event;

“modulation” means a variation in the emission of noise that –

- (a) is more than 3dB $L_{A\ Fast}$ or is more than 3dB $L_{A\ Fast}$ in any one-third octave band;
- (b) is present for more at least 10% of the representative assessment period; and
- (c) is regular, cyclic and audible;

“tonality” means the presence in the noise emission of tonal characteristics where the difference between –

- (a) the A-weighted sound pressure level in any one-third octave band; and
- (b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels 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 $L_{A\ Slow}$ levels.

Where the above characteristics are present and cannot be practicably removed, the following adjustments are made to the measured or predicted level at other premises.

TABLE 3.2 – ADJUSTMENTS FOR ANNOYING CHARACTERISTICS

Where tonality is present	Where modulation is present	Where impulsiveness is present
+ 5 dB	+ 5 dB	+ 10 dB

The following locations have been determined to require an assessment of noise level emissions. It is noted that R3 – R5 are future residential premises, with the zoning understood to likely result in two storey premises in these locations (townhouses), and therefore have been considered as such.

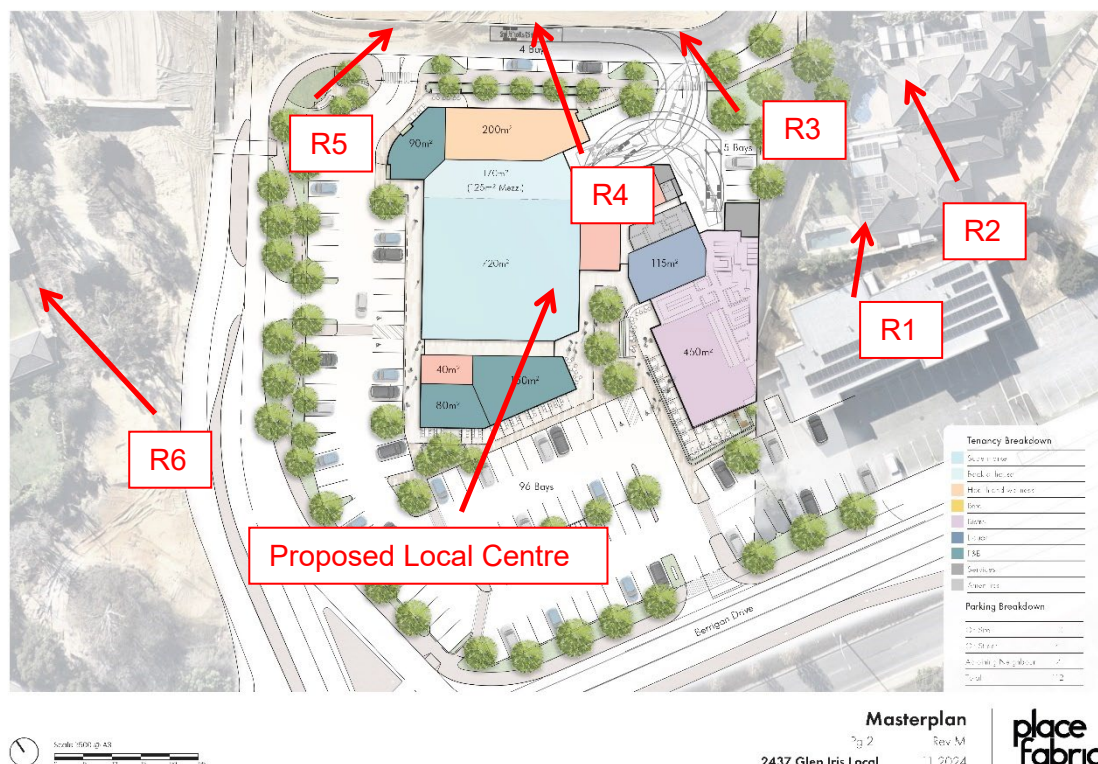


FIGURE 3.1 – RECEIVER POINTS

The influencing factor at the identified noise sensitive premises has been estimated as follows :

Major Road within the inner circle;	
Berrigan Drive	+ 6 dB
Commercial Premises within the inner circle;	
15 %	+ 0.75 dB
Commercial Premises within the outer circle;	
5 %	+ 0.25 dB

Hence, the influencing factor is estimated at 7 dB.

Based on the above influencing factor, the assigned outdoor noise levels are listed in Table 3.3.

TABLE 3.3 - ASSIGNED OUTDOOR NOISE LEVEL FOR R1 TO R7

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L _A 10	L _A 1	L _A max
Noise sensitive premises	0700 - 1900 hours Monday to Saturday (Day)	52	62	72
	0900 - 1900 hours Sunday and Public Holidays (Sundays)	47	57	72
	1900 - 2200 hours all days (Evening)	47	57	62
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	42	52	62

Note: L_{A10} is the noise level exceeded for 10% of the time.
L_{A1} is the noise level exceeded for 1% of the time.
L_{Amax} is the maximum noise level.

4. PROPOSED DELIVERIES

The use of the delivery dock is understood has been assumed to accommodate 19m articulated delivery trucks, and have been assumed to be refrigerated trucks (i.e worst case scenario). In addition to the smaller deliveries a bakery delivery (or similar) occurring in the dock.

On this basis of the loading dock provisions, a 19m truck may not be able to be accommodated within the dock – hence our assessment is conservative as it may assume a larger/noisier truck than would service this store.

It is noted that the carpark area leading to the delivery dock is a public place, hence we have only considered delivery truck noise levels as they enter the dock itself– outside of this space the trucks are in a public area and therefore compliance with the Regulations are not applicable and hence have not been considered.

Preliminary calculations indicated that a loading dock barrier was required, with a 3m high barrier above ground level. The location of the barrier is shown below in Figure 4.1.

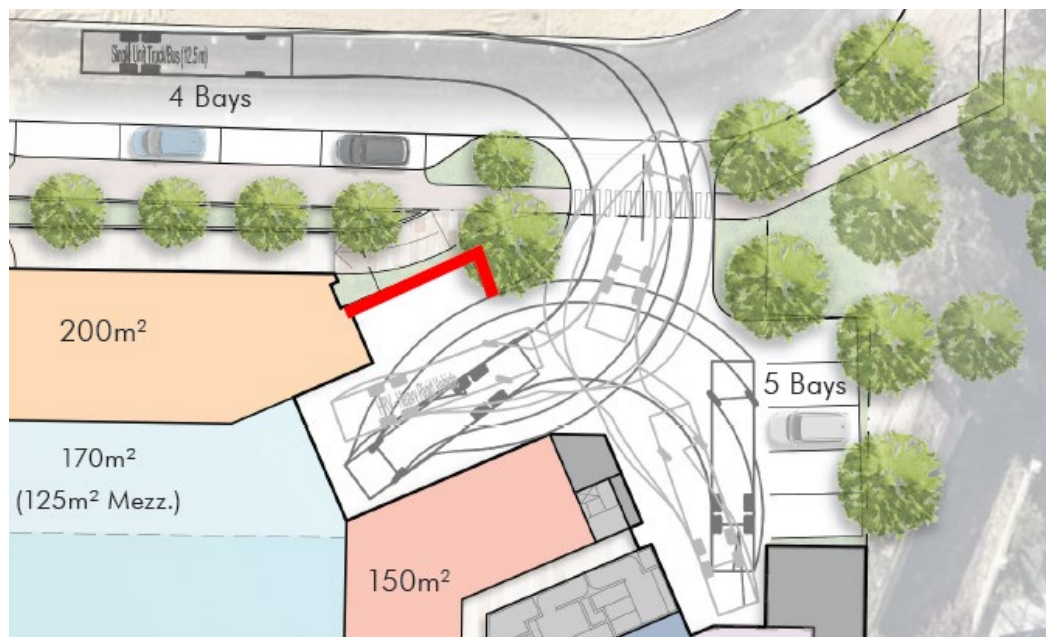


FIGURE 4.1 – LOADING DOCK WALL

The construction of the barrier assumed in the loading dock area is immaterial to the acoustic assessment, provided that the density of the barrier is 12kg/m^2 or greater and of solid construction (i.e. no gaps).

5. MECHANICAL PLANT

Mechanical plant details have been based on information provided for previous, similar projects. Assumed acoustic data is contained in Table 6.3.

6. METHODOLOGY

Noise modelling of the noise propagation from the site was carried out using the environmental noise modelling computer program, "SoundPlan". Single point calculations were undertaken.

Input data for computer modelling included:

- Design of local centre as per drawings in Appendix A.
- EPA standard weather condition for the day and night periods (see Table 6.1).
- Sound power levels, as summarised in Table 6.2- 6.4.

TABLE 6.1 - WEATHER CONDITIONS

Condition	Day Period	Night Period
Temperature	20 °C	15 °C
Relative humidity	50%	50%
Pasquil Stability Class	E	F
Wind speed	4 m/s*	3 m/s*

* From source to receiver

TABLE 6.2 – SOUND POWER LEVELS OF DELIVERY VEHICLES

DESCRIPTION	dB(A)
19m articulated delivery truck with refrigeration unit	97
13m rigid delivery truck	85

TABLE 6.3 – NOISE LEVELS OF MECHANICAL PLANT

DESCRIPTION	dB(A)
Condenser Unit (Daikin RXYQ54TNY1A(E))	67 dB(A) @ 3m
Refrigeration Plant	61 dB(A) @ 3m
R134A Aldi Pack	61.8 dB(A) @ 3m

For the above sound power levels, single point calculations were undertaken for the following scenarios :

Scenario 1 : One large refrigerated truck delivery.

Scenario 2 : One 13m rigid truck delivery (bakery delivery).

Scenario 3 : Mechanical Plant.

Notes :

- 1 For the noise to be less than 10% of the time and be assessed under the L_{A1} assigned noise levels, the truck engines and refrigeration units would need to be turned off while unloading is occurring. This is understood to be able to be accommodated and presents as standard practice in many supermarket delivery docks in Western Australia. The requirement to do so would be expected to be incorporated into the supermarkets operational noise management plan once constructed.
- 2 The L_{A1} assigned noise level would be the pertinent prescribed noise level in this instance (for delivery truck movements) as the duration of time that the noise of the truck manoeuvring is present is less than 10% of a representative time period. The noise associated with the delivery is the manoeuvring of the truck into place, upon which the truck is switched off – hence – even if the delivery takes sometime (i.e. 30 – 60 minutes) the noise level associated with the truck is not present throughout the duration of the delivery.
- 3 The representative time period for deliveries has been considered in this context to be reasonable to be in the order of 1 hour – as this is the typical duration of a delivery.
- 4 It is noted that this also means the noise assessment is more “realistic” as if the L_{A10} parameter was to be used as the noise level associated with the truck is not present for more than 10% of a representative time period, the L_{A10} noise level would be at the ambient noise level of the area, rather than the truck noise.

The meteorological conditions utilised for our assessment are those stipulated by the Department of Water Environment Regulation Noise Branch as being representative of maximum propagation conditions. The wind directions utilised in the model are all directions at once.

Mechanical noise sources have been assumed to be located on the roof of the proposed building. Detailed design of the mechanical plant has not been undertaken at this preliminary stage, and would be considered appropriate to be a condition of development approval to undertake a full assessment during the design development phase of the project. The assumed noise levels have been deliberately selected to ensure a conservative preliminary assessment.

7. RESULTS

Single point calculations were undertaken for all locations shown in Figure 3.1, with the results of the modelling listed in Table 7.1. Noise contour plots are also included in Appendix B for information purposes.

TABLE 7.1 – RESULTANT NOISE LEVEL

Receiver Location	Scenario / Calculated Noise Level, (dB(A))		
	Scenario 1	Scenario 2	Scenario 3
R1	53	41	37
R2	53	41	36
R3	57	44	37
R4	50	38	37
R5	33	21	36
R6	22	10	35

Based on the definitions of tonality, noise emissions from truck movements, being an L_{A1} , being present for less than 10% of the time, would not be considered tonal.

Noise levels associated with mechanical services could contain tonal characteristics, hence, a + 5 dB adjustment would be applicable.

Therefore, the assessable noise levels for each of the noise sources are listed below in Table 7.2.

TABLE 7.2 – ASSESSABLE NOISE LEVELS

Receiver Location	Scenario / Calculated Noise Level, (dB(A))		
	Scenario 1	Scenario 2	Scenario 3
R1	53	41	42
R2	53	41	41
R3	57	44	42
R4	50	38	42
R5	33	21	41
R6	22	10	40

Tables 7.3 and 7.4 compares the assessable noise level for large truck deliveries and small truck deliveries against the relevant L_{A1} Assigned Noise Levels for the day, evening (and Sundays) and night periods. Noise levels that are calculated to exceed the relevant criteria are listed in red.

TABLE 7.3 – ASSESMENT OF NOISE LEVEL – SCENARIO 1 – LARGE TRUCK DELIVERIES

Receiver Location	Assessable Noise Level, dB(A) Scenario 1	Assigned Noise Level, L_{A1} dB		Exceedance to Assigned Noise Level
		Time of Day	L_{A1} dB	
R1	53	Day	62	Complies
		Sundays	57	Complies
		Evening	57	Complies
		Night	52	+ 1 dB
R2	53	Day	62	Complies
		Sundays	57	Complies
		Evening	57	Complies
		Night	52	+ 1 dB
R3	57	Day	62	Complies
		Sundays	57	Complies
		Evening	57	Complies
		Night	52	+ 5 dB
R4	50	Day	62	Complies
		Sundays	57	Complies
		Evening	57	Complies
		Night	52	Complies
R5	33	Day	62	Complies
		Sundays	57	Complies
		Evening	57	Complies
		Night	52	Complies
R6	22	Day	62	Complies
		Sundays	57	Complies
		Evening	57	Complies
		Night	52	Complies

TABLE 7.4 – ASSESSMENT OF NOISE LEVEL – SCENARIO 2 – SMALL TRUCK DELIVERIES

Receiver Location	Assessable Noise Level, dB(A)	Assigned Noise Level, L _{A1} dB		Exceedance to Assigned Noise Level
	Scenario 1	Time of Day	L _{A1} dB	
R1	41	Day	62	Complies
		Sundays	57	Complies
		Evening	57	Complies
		Night	52	Complies
R2	41	Day	62	Complies
		Sundays	57	Complies
		Evening	57	Complies
		Night	52	Complies
R3	44	Day	62	Complies
		Sundays	57	Complies
		Evening	57	Complies
		Night	52	Complies
R4	38	Day	62	Complies
		Sundays	57	Complies
		Evening	57	Complies
		Night	52	Complies
R5	21	Day	62	Complies
		Sundays	57	Complies
		Evening	57	Complies
		Night	52	Complies
R6	10	Day	62	Complies
		Sundays	57	Complies
		Evening	57	Complies
		Night	52	Complies

Table 7.5 the assessable noise level for mechanical against the relevant L_{A10} Assigned Noise Levels for the day, evening (and Sundays) and night periods. Noise levels that are calculated to exceed the relevant criteria are listed in red.

TABLE 7.5 – ASSESMENT OF NOISE LEVEL – SCENARIO 3 – MECHANICAL PLANT

Receiver Location	Assessable Noise Level, dB(A)	Assigned Noise Level, L _{A10} dB		Exceedance to Assigned Noise Level
	Scenario 3	Time of Day	L _{A10} dB	
R1	42	Day	52	Complies
		Sundays	47	Complies
		Evening	47	Complies
		Night	42	Complies
R2	41	Day	52	Complies
		Sundays	47	Complies
		Evening	47	Complies
		Night	42	Complies
R3	42	Day	52	Complies
		Sundays	47	Complies
		Evening	47	Complies
		Night	42	Complies
R4	42	Day	52	Complies
		Sundays	47	Complies
		Evening	47	Complies
		Night	42	Complies
R5	41	Day	52	Complies
		Sundays	47	Complies
		Evening	47	Complies
		Night	42	Complies
R6	40	Day	52	Complies
		Sundays	47	Complies
		Evening	47	Complies
		Night	42	Complies

Refrigerated truck deliveries have been calculated to comply with the relevant assigned noise levels at all times, with the exception of the night period.

Bakery delivery trucks, or smaller rigid trucks, have been calculated to comply at all times.

Noise levels associated with the mechanical plant has also been calculated to comply at all times.

Hence, on the basis of our preliminary assessment, noise level impacts associated with the proposed local centre complies with the relevant Assigned Noise Levels, on the basis that refrigerated truck deliveries are restricted to occur outside of the night period.