HERRING STORER ACOUSTICS

FRANK'S GYM

GYM TENANCY
BURSWOOD

NOISE IMPACT ASSESSMENT

SEPTEMBER 2023

OUR REFERENCE: 31649-1-23276

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ACOUSTIC ASSESSMENT

GYM TENANCY – 22 TEDDINGTON ROAD, BURSWOOD

Job No: 23276

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FOR

PLANNING SOLUTIONS

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EXECUTIVE SUMMARY AND REQUIRED MANAGEMENT MEASURES

Herring Storer Acoustics have been commissioned to undertake a noise impact assessment of the gym tenancy of 22 Teddington Road, Burswood.

Based on our assessment, the noise impact associated with the proposed gym is considered to be in compliance with the *Environmental Protection (Noise) Regulations 1997* at all times.

Management /noise control measures that are required to be implemented are as follows:

- Music not to exceed 55 dB(A) when measured within the gym.

The above noise control implemented ensures that compliance at all times is considered to be achieved.

Any complaints will be dealt with by the designated business owners, this would take the form of the following:

- Upon receipt of a complaint the business owners will make contact with the complainant to understand what their concerns are and if the business is in breach of the approved Noise Management Plan;

- A copy of the Noise Management Plan to which the business will adhere to will be provided to the complainant to articulate and explain the management measures and noise levels to which the business is required to comply with; and

- Should a breach be identified the business owners will endeavour to ensure staff and patrons adhere to the management measures noted in the approved Noise Management Plan.

1. INTRODUCTION

Herring Storer Acoustics were commissioned to undertake an acoustic review of the gym tenancy "Frank's Gym" at 22 Teddington Road, Burswood.

This report ascertains the expected noise impact of the gym tenancy upon the adjacent commercial and residential tenancies and surrounding area and compares the measured results against the relevant criteria.

This report provides the acoustic criteria, and recommendations based on the inspection/testing of the tenancy carried out on 15th September 2023 and the 27th September 2023.

2. ENVIRONMENTAL NOISE IMPACT

2.1 CRITERIA

The allowable noise level at the surrounding locales is prescribed by the *Environmental Protection (Noise) Regulations 1997*. Regulations 7 & 8 stipulate maximum allowable external noise levels determined by the calculation of an influencing factor, which is then added to the base levels shown below. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern. In this instance, the neighbouring premises are commercial, hence, the Assigned Noise Levels are as specified below in Table 1.

TABLE 1 - ASSIGNED OUTDOOR NOISE LEVEL

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
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
Commercial Premises	All Hours	60	75	80

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.

It is a requirement that received noise be free of annoying characteristics (tonality, modulation and impulsiveness), 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 15 dB 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 3 dB $L_{A\ Fast}$ 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 3dB 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 noise emission is not music, if the above characteristics exist and cannot be practicably removed, then any measured level is adjusted according to Table 2 below.

TABLE 2 - ADJUSTMENTS TO MEASURED LEVELS

Where **tonality** is present	Where **modulation** is present	Where **impulsiveness** is present
+5 dB(A)	+5 dB(A)	+10 dB(A)

Note: These adjustments are cumulative to a maximum of 15 dB.

Where the noise emission is music, then any measured level is adjusted to Table 3 below.

TABLE 3 - ADJUSTMENTS TO MEASURED MUSIC NOISE LEVELS

Where **impulsiveness** is not present	Where **impulsiveness** is present
+10 dB(A)	+15 dB(A)

The allowable noise levels are external to premises. When measurements are recorded/calculated inside a premise, the resultant noise level measurements are to be adjusted in accordance with Table 4 below.

TABLE 4 – INSIDE MEASUREMENTS

Where external windows and doors are **open**	Where external windows and doors are **shut**
+10 dB(A)	+15 dB(A)

The locations considered in our assessment are shown below in Figure 1.

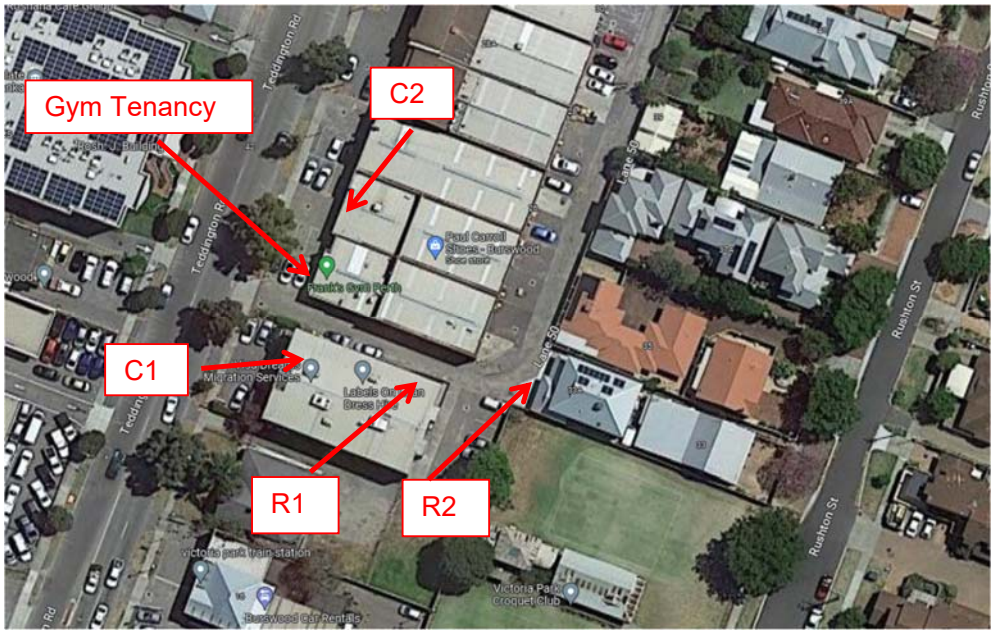

FIGURE 1 – RECEIVER LOCATIONS

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

Major Road within the inner circle;
Shepperton Road + 6 dB

Industrial Premises within the inner circle;
57 % + 5.7 dB

Industrial Premises within the outer circle;
21 % + 2.1 dB

Commercial Premises within the outer circle;
15 % + 0.8 dB

Hence, the influencing factor is estimated at **+15 dB.**

Based on the above influencing factor, the assigned outdoor noise levels are listed in Table 5.

TABLE 5 - ASSIGNED OUTDOOR NOISE

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises within 15 metres of a dwelling (Highly Sensitive Areas)	0700 - 1900 hours Monday to Saturday	60	70	80
	0900 - 1900 hours Sunday and Public Holidays	55	65	80
	1900 - 2200 hours all days	55	65	70
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays	50	60	70
Commercial Premises	All Hours	60	75	80

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.

2.2 NOISE SOURCES

Noise emissions associated with the proposed development have been based on discussions with the prospective tenant and onsite testing.

The tenancy is an existing gym.

To ascertain the potential noise impact of the gym tenancy at the identified nearby premises, testing was undertaken of the structural re-radiated noise of a barbell drop (from hip height, simulating a deadlift drop) upon the 80mm thick matting used within the gym. Additionally, similar testing was undertaken with atlas stone drops.

Measurements were also undertaken with music playing at typical levels of operation, both within the gym and at surrounding premises.

The deadlift drops from hip height were undertaken for a weight of 100kg. Based on discussions on site, this would be representative of "worst case" as it is understood the dropping of weights would not be a regular occurrence due to the style of training that is to be employed as well as gym policy.

Atlas stone drop noise was also recorded (using a stone with a mass of 70 kg). These drops are understood to occur infrequently as part of training. These drops are undertaken in a dedicated area with specialised cushion matting on top of the existing 80mm matting.

2.3 MEASURED NOISE LEVELS – DEADLIFT DROPS

Noise levels associated with deadlifts are listed below in Table 6, the relevant parameter is the L_{Amax}.

At two of the measurement locations, deadlift drop noise was inaudible, while it was just audible at the other two.

TABLE 6 – MEASURED DEADLIFT DROP NOISE LEVELS

Location	Measured Noise Level, L_{Amax} dB
C1	51 (Inaudible)
C2	50 (Inaudible)
R1	45 (Audible)
R2	55 (Audible)

Note: From an inspection of the noise level measurements, the weight drops would not be considered impulsive. Thus, no penalties would be applicable for these events.

2.4 MEASURED NOISE LEVELS – MUSIC

The speaker system within the gym consists of two wall-mounted speakers positioned on the rear (east) wall of the gym.

Music levels ranged from 48 dB(A) to 53 dB(A) when measured within the gym space.

Noise levels were then measured within the space of the commercial tenancy next door with music playing through the speakers as well as at the façade of all the other premises.

Music was inaudible at all locations, background noise being dominant.

The results are summarised in Table 7 below.

TABLE 7 – MEASURED MUSIC NOISE LEVELS

Location	Measured Noise Level, L_{A10} dB
C1	54 (Inaudible)
C2	51 (Inaudible)
R1	51 (Inaudible)
R2	50 (Inaudible)

2.5 MEASURED NOISE LEVELS – ATLAS STONE DROPS

Noise levels associated with atlas stone drops are listed below in Table 8, the relevant parameter is the L_{Amax}.

At two of the measurement locations, atlas stone drop noise was inaudible, while they were just audible at the other two.

TABLE 8 – MEASURED ATLAS STONE DROP NOISE LEVELS

Location	Measured Noise Level, L_{Amax} dB
C1	51 (Inaudible)
C2	58 (Inaudible)
R1	52 (Audible)
R2	55 (Audible)

Note: From an inspection of the noise level measurements, the weight drops would not be considered impulsive. Thus, no penalties would be applicable for these events.

2.6 ASSESSMENT

Noise levels at the adjacent commercial premises were measured inside the premise, hence, the applicable adjustments for the locations of the calculated noise levels are as listed in Table 9 below.

Where measurements were inaudible, a level 12 dB below the measurement level at that premise has been assigned, as this is the maximum level that would not influence the measurement at that location.

TABLE 9 – APPLICABLE ADJUSTMENTS FOR CHARACTERISTICS AND MEASUREMENT LOCATION, dB(A)

Noise Source	Location	Measured Noise Level, dB(A)	Adjustment for Inaudibility	Adjustment for Music	Calculation Location		Adjusted Noise Level, dB(A)
					Inside Windows / Doors Open	Inside Windows / Doors Closed	
Deadlift Drops	C1	51 (Inaudible)	-12	-	-	+ 15	54 L_{Amax}
	C2	50 (Inaudible)	-12	-	-	-	38 L_{Amax}
	R1	45 (Audible)	-	-	-	-	45 L_{Amax}
	R2	55 (Audible)	-	-	-	-	55 L_{Amax}
Music	C1	54 (Inaudible)	-12	None, as music inaudible	-	+15	57 L_{A10}
	C2	51 (Inaudible)	-12	None, as music inaudible	-	-	39 L_{A10}
	R1	51 (Inaudible)	-12	None, as music inaudible	-	-	39 L_{A10}
	R2	50 (Inaudible)	-12	None, as music inaudible	-	-	38 L_{A10}
Atlas Stone Drops	C1	51 (Inaudible)	-12	-	-	+15	54 L_{Amax}
	C2	58 (Inaudible)	-12	-	-	-	46 L_{Amax}
	R1	52 (Audible)	-	-	-	-	52 L_{Amax}
	R2	55 (Audible)	-	-	-	-	55 L_{Amax}

TABLE 10 – ASSESSMENT OF NOISE LEVEL EMISSIONS

Noise Source	Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned Level (dB)	Exceedance to Assigned Noise Level (dB)
Deadlift Drops	C1	54 L_{Amax}	All Hours	80 L_{Amax}	Complies
	C2	38 L_{Amax}	All Hours	80 L_{Amax}	Complies
	R1	45 L_{Amax}	Night	70 L_{Amax}	Complies
	R2	55 L_{Amax}	Night	70 L_{Amax}	Complies
Music	C1	57 L_{A10}	All Hours	60 L_{A10}	Complies
	C2	39 L_{A10}	All Hours	60 L_{A10}	Complies
	R1	39 L_{A10}	Night	50 L_{A10}	Complies
	R2	38 L_{A10}	Night	50 L_{A10}	Complies
Atlas Stone	C1	54 L_{Amax}	All Hours	80 L_{Amax}	Complies
	C2	46 L_{Amax}	All Hours	80 L_{Amax}	Complies
	R1	52 L_{Amax}	Night	70 L_{Amax}	Complies
	R2	55 L_{Amax}	Night	70 L_{Amax}	Complies

The noise level associated with the weight drops and music is compliant at all times for both the commercial and residential premises.

3. CONCLUSION

The noise impact associated with the use of the proposed gym is considered to be in compliance with the *Environmental Protection (Noise) Regulations 1997* at all times.

To achieve compliance at all times, it is recommended that:

- Music noise levels in the gym to not exceed a level of 55 dB(A) at any time.