PENINSULAR
ACOUSTICS

Man Pets Living Ltd

Dog and Cat Hotel

Acoustic Assessment

PUBLIC

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CONTENTS

1. Introduction

1.1. Scope of Works 5

1.2. Proposed Site Plan 5

1.3. Assessment Criteria 6

2. Survey Procedure 7

2.1. Methodology and Equipment 7

2.2. Meteorological Conditions 8

2.3. Site Survey Notes 8

2.4. Results 8

3. Assessment 10

3.1. External Noise Breakout Assessment 10

3.2. Internal Noise Transfer Assessment 13

4. Conclusions 15

Appendices

Appendix A

Technical Terminology

Appendix B

Time-History of Measured Survey Results

Appendix C

Insul Graphs

Appendix D

Report Limitations

1. Introduction

Peninsular Acoustics Ltd has been commissioned by Man Pets Ltd (hereafter referred to as 'the Client') to undertake a noise impact assessment for a newly introduced dog and cat hotel in Manchester, Unit 6 Botanic Avenue, Manchester M15 6AE (hereafter referred to as 'the Site').

1.1. Scope of Works

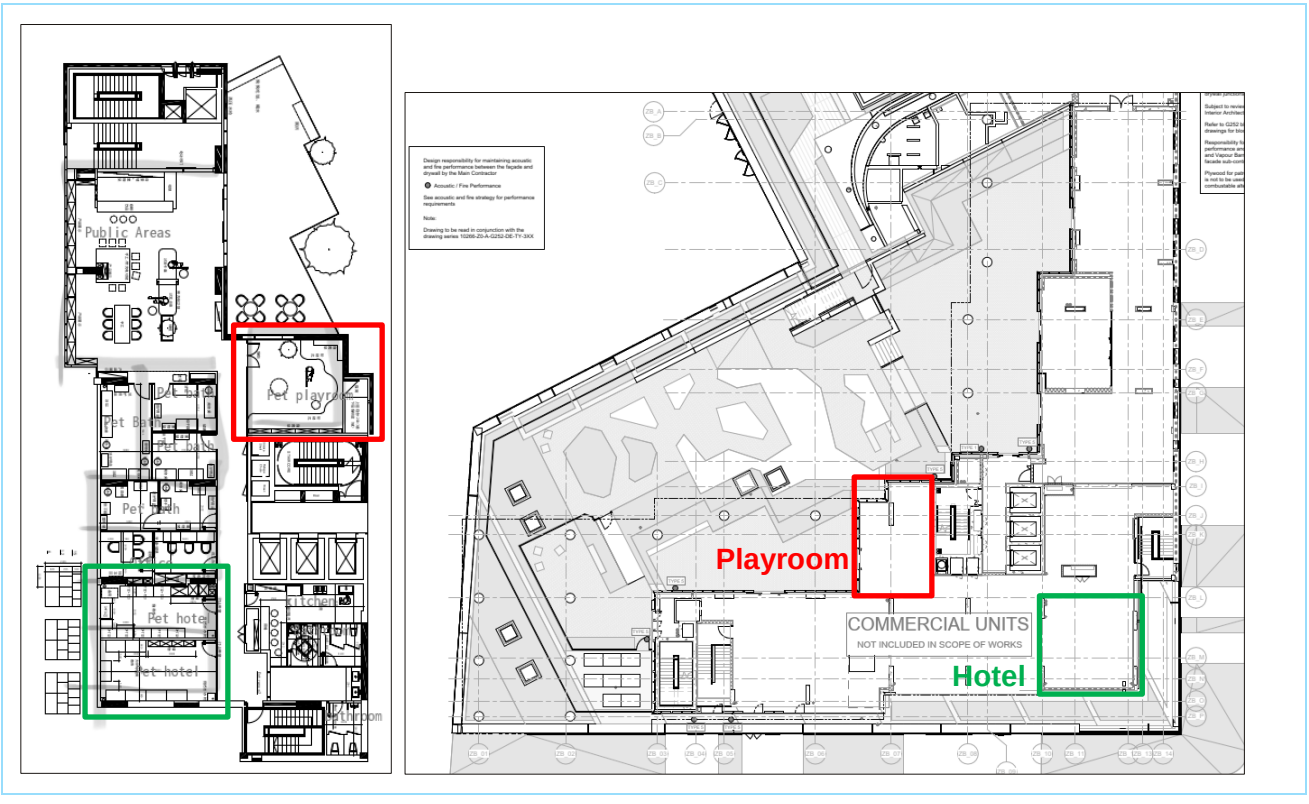
To determine the potential impact, the following scope of works has been undertaken:

- Nearby Noise Sensitive Receptors (NSRs) have been identified using satellite images, client information and site observations.
- Background sound levels have been established through an unattended environmental sound survey;
- Specific sound levels at the nearest NSRs have been predicted, using previously measured data of activity at a dog daycare centre in accordance with BS EN 12354-4 '*Estimation of acoustic performance of the buildings from the performance of elements – Part 4: Transmission of indoor sound to the outside*; and
- An assessment based on the South Holland District Council approach, which broadly follows the relative assessment methods of BS 4142.

This report is necessarily technical in nature and therefore; to assist the reader, an acoustics glossary is provided in Appendix A.

1.2. Proposed Site Plan

Figure 1.1: Proposed Layout



1.3. Assessment Criteria

1.3.1. External Noise Breakout

A widely accepted guideline for the measurement of dog noise does not presently exist, meaning that assessment criteria must be based both upon methods utilised in prior assessments of similar sites, and in the use of existing acoustic guidelines that has proven useful for evaluating dog kennel noise.

One such reference is 'The 1999 Supplementary Planning Guidance' published by South Holland District Council, which outlines an approach for considering noise from multiple dogs barking. It suggests evaluating noise in terms of $L_{Aeq,T}$ over a typical one-hour. The guidance also includes a key for objective for assessment as follows:

- **The specific noise level should not exceed the background sound level**

This approach is broadly based on the methodology in BS 4142:2014+A1:2019 *'Methods for rating and assessing industrial and commercial sound'*. BS 4142 provides a framework for determining the specific sound level at a receptor and comparing it with the background sound level to assess the potential for adverse impact on residential amenity.

For this assessment, source levels have been taken from library data of a dog daycare facility, where approximately 30–40 dogs were barking excitedly in a reverberant indoor space for a short period. The measured reverberant sound pressure level was 97 dB $L_{Aeq,T}$. Assuming the dogs barked for 50% of the time over an hour, the corrected ambient noise level is estimated at 94 dB $L_{Aeq,1hour}$.

1.3.2. Internal Noise Transfer

To assess internal noise transfer between the Pet Hotel and the residential rooms above, we propose a target of achieving internal levels below 20 dB L_{Aeq} and 30 dB L_{AFmax}.

2. Survey Procedure

2.1. Methodology and Equipment

An unattended survey of the existing background sound levels was undertaken between 16:00 on 28th March and 08:30 on 1st April 2025, in a shielded position on the terrace area. The measurement position, shown in Figure 2.1 and Figure 2.2, was:

- 1.5m above local ground height;
- Just out of direct line of sight to the surrounding road networks; and
- In a representative location of Noise Sensitive Receptor 1 (NSR1)

Figure 2.1: Site Plan

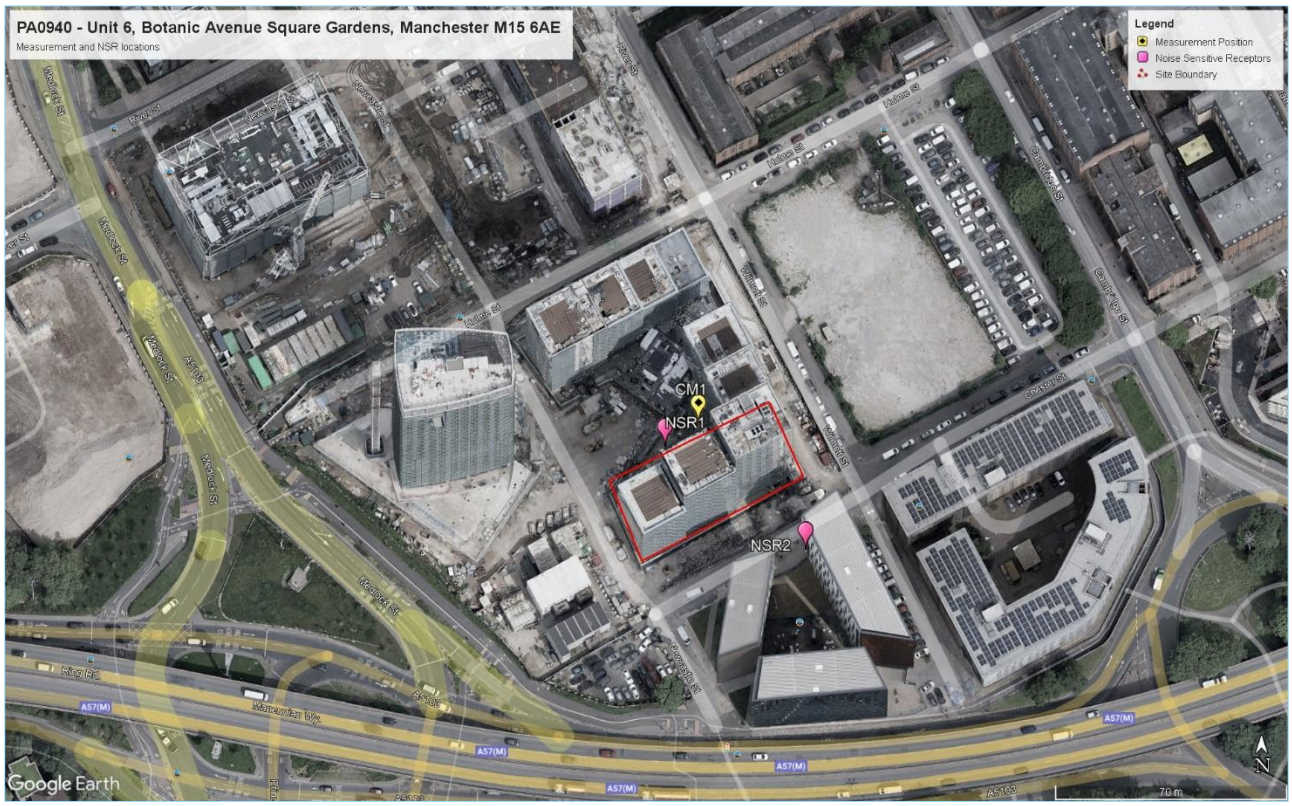
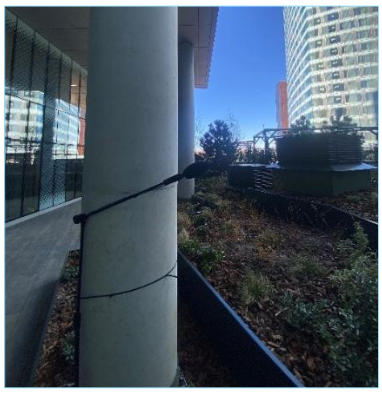


Figure 2.2: Photograph of measurement position – CM1



Sound levels were measured using a Class 1 Sound Level Meter (SLM). The SLM was field calibrated before and after the survey using a Class 1 calibrator, with no significant drift in calibration levels recorded (> ± 0.5dB). The equipment was set up to capture ambient (L_{Aeq}) and background (L_{A90}) levels as a minimum.

2.2. Meteorological Conditions

During the survey, weather conditions were monitored which showed steady state wind speeds of less than 5 m/s. There was no rainfall for the duration of the survey.

2.3. Site Survey Notes

The noise environment at CM1 was dominated by road traffic from the Mancunian Way flyover (A57). The chosen measurement position was placed just out direct line of sight from the A57 to represent a worst-case scenario; where residential dwellings above the proposed site are completely shielded from the road network.

There were some construction works from the neighbouring building which were audible at the measurement position during weekdays however the dominant noise source was road traffic from a busy, continuous source therefore the background data collected is considered representative of conditions without construction noise present.

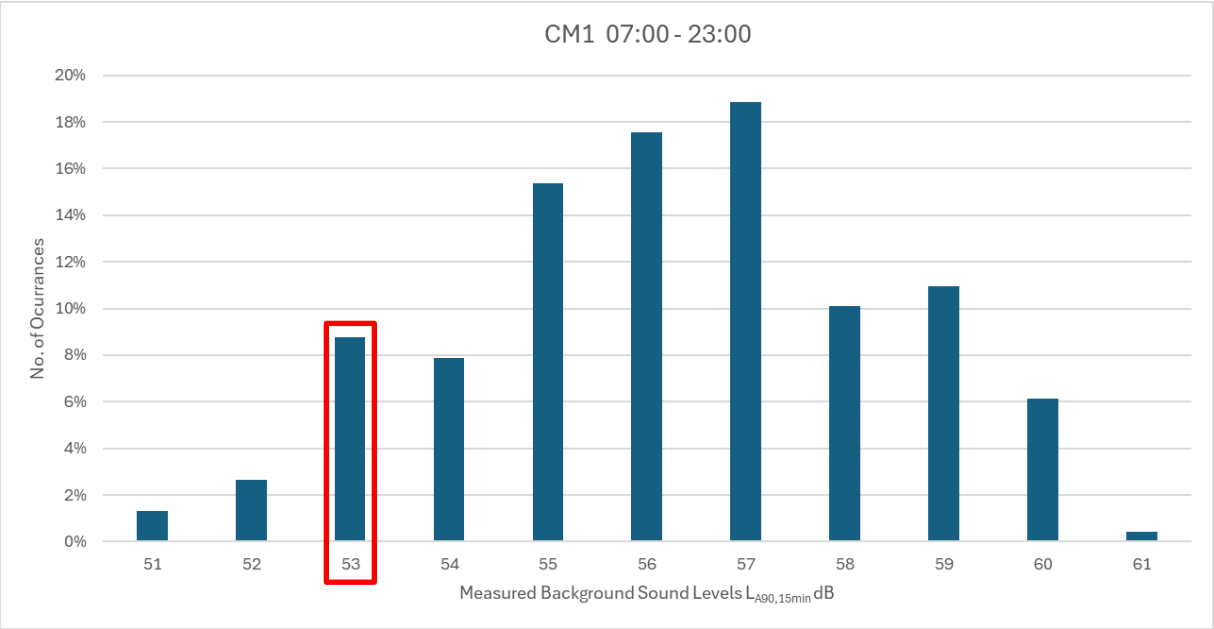
The Site is located on the 2nd floor of the building with residential units above.

2.4. Results

A statistical analysis of measured background sound levels at CM1 are presented below for daytime and night-time periods. A full time-history of measured noise survey results is presented in Appendix B.

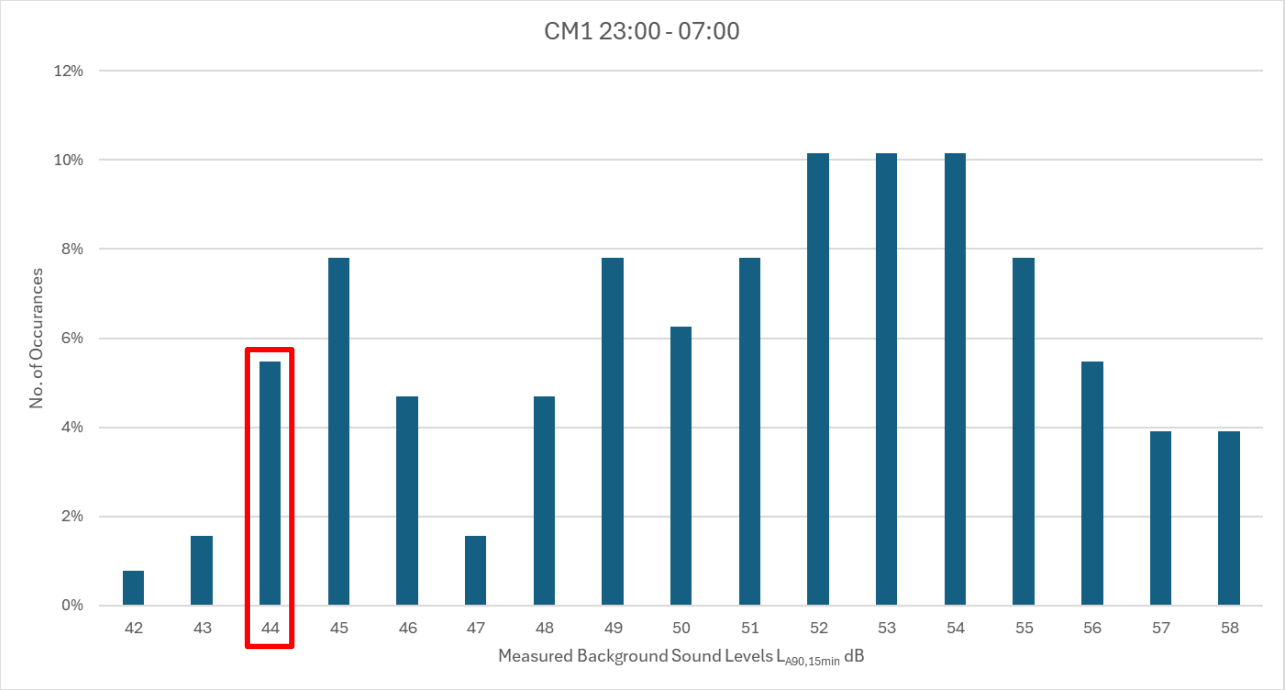
The lowest, frequently occurring daytime background sound level considered for assessment is 53 dB $L_{A90,15min}$.

Figure 2.3: Daytime Background Sound Levels – L_{A90}



The lowest, frequently occurring night-time background sound level considered is 44 dB $L_{A90,15min}$.

Figure 2.4: Night-time Background Sound Levels – L_{A90}



3. Assessment

3.1. External Noise Breakout Assessment

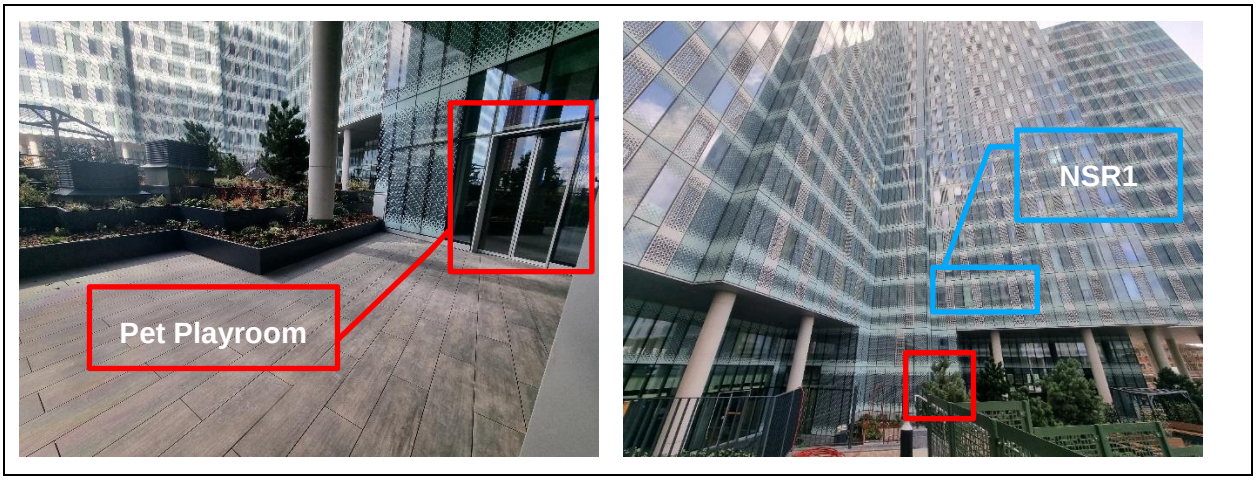
As shown in Figure 2.1, the distances to the nearest NSRs are set out below.

- Pet Playroom to NSR1 = 16m
- Pet Hotel to NSR2 = 19m

The specific sound level at each receptor has been determined in accordance with BS 4142 and calculated using the methodology set out in BS EN 12354-4, as outlined below.

The Pet Playroom includes a large glazed opening, which must remain closed at all times. The nearest NSR is considered to be the residential communal area located on the floor above the playroom, with the closest window facing the internal terrace and courtyard of the development as identified below:

Figure 3.1: Photographs of Pet Playroom in relation to NSR1



The Pet Hotel will be located in the opposite corner of the site, with the nearest noise-sensitive receptors being the inward-facing windows of the neighbouring apartment block across Chester Street, as shown below:

Figure 3.2: Pet Hotel in relation to NSR2

The Pet Playroom is understood to be used exclusively during daytime hours; therefore, only a daytime assessment is deemed necessary. In contrast, the Pet Hotel is believed to operate during both the day and night, and as such, separate daytime and night-time assessments have been undertaken.

For daytime assessments, a 50% on-time of noise activity has been assumed over a 1-hour reference period. For the night-time assessment, a worst-case scenario has been adopted, assuming 100% on-time over a 15-minute period.

The specific noise level from the Pet Playroom to NSR1 during the daytime period is predicted to be 45 dBA, shown below in Figure 3.3.

Figure 3.3: Pet Playroom to NSR1 – Daytime 07:00 – 23:00

PET PLAYROOM NOISE EMISSION CALCULATIONS

Calculation to NSR1

			63	125	250	500	1000	2000	4000	8000	dB(A)	NR
Sound pressure level inside, Lp,in		dB	64	67	71	93	91	82	67		94	
Via Wall												
			63	125	250	500	1000	2000	4000	8000	dB(A)	NR
Diffusivity term for the inside sound field, Cd	-6	dB	-6	-6	-6	-6	-6	-6	-6			
Sound reduction of the segment, R'		dB	41	39	44	52	59	63	68			
Width of segment	11.6 m											
Height of segment	4 m											
Area of the segment	46.2 m2		17	17	17	17	17	17	17			
Sound power level of the substitute point source, Lw			33	38	38	51	43	30	10			
Directivity correction in the direction of the receptor, Dc	0		0	0	0	0	0	0	0			
Distance to receptor	16 m											
Acoustic screening		dB										
Total attenuation from building element to receptor			29	29	29	29	29	29	29			
Sound pressure level at receptor, Lp			4	9	9	22	14	0	-20		20	
Via Glazing												
			63	125	250	500	1000	2000	4000	8000	dB(A)	NR
Diffusivity term for the inside sound field, Cd	-6	dB	-6	-6	-6	-6	-6	-6	-6			
Sound reduction of the segment, R'		dB	10	10	9	22	31	35	28			
Width of segment	3.1 m											
Height of segment	4 m											
Area of the segment	12.4 m2		11	11	11	11	11	11	11			
Sound power level of the substitute point source, Lw			58	62	67	76	65	52	44			
Directivity correction in the direction of the receptor, Dc	0		0	0	0	0	0	0	0			
Distance to receptor	16 m											
Acoustic screening		dB										
Total attenuation from building element to receptor			29	29	29	29	29	29	29			
Sound pressure level at receptor, Lp			29	33	38	47	36	23	15		44	
			63	125	250	500	1000	2000	4000	8000	dB(A)	NR
Total receptor Lp			29	33	38	47	36	23	15		45	

The specific noise level from the Pet Hotel to NSR2 is predicted to be 36 dBA and 39 dBA for daytime and night-time periods respectively as shown below in Figure 3.4 and Figure 3.5.

Figure 3.4: Pet Hotel to NSR2 – Daytime 07:00 – 23:00

PET HOTEL NOISE EMISSION CALCULATIONS

Calculation to NSR2

			63	125	250	500	1000	2000	4000	8000	dB(A)	NR
Sound pressure level inside, Lp,in		dB	64	67	71	93	91	82	67		94	
Via Wall												
			63	125	250	500	1000	2000	4000	8000	dB(A)	NR
Diffusivity term for the inside sound field, Cd	-6	dB	-6	-6	-6	-6	-6	-6	-6			
Sound reduction of the segment, R'		dB	41	39	44	52	59	63	68			
Width of segment	3.5 m											
Height of segment	4 m											
Area of the segment	14 m2		11	11	11	11	11	11	11			
Sound power level of the substitute point source, Lw			28	33	33	46	38	24	4			
Directivity correction in the direction of the receptor, Dc	2		2	2	2	2	2	2	2			
Distance to receptor	19 m											
Acoustic screening		dB										
Total attenuation from building element to receptor			31	31	31	31	31	31	31			
Sound pressure level at receptor, Lp			-1	5	4	18	9	-4	-24		16	
Via Glazing												
			63	125	250	500	1000	2000	4000	8000	dB(A)	NR
Diffusivity term for the inside sound field, Cd	-6	dB	-6	-6	-6	-6	-6	-6	-6			
Sound reduction of the segment, R'		dB	10	10	9	22	31	35	28			
Width of segment	1.5 m											
Height of segment	1 m											
Area of the segment	1.5 m2		2	2	2	2	2	2	2			
Sound power level of the substitute point source, Lw			49	53	58	66	56	43	35			
Directivity correction in the direction of the receptor, Dc	2		2	2	2	2	2	2	2			
Distance to receptor	19 m											
Acoustic screening		dB										
Total attenuation from building element to receptor			31	31	31	31	31	31	31			
Sound pressure level at receptor, Lp			21	24	29	38	27	14	6		36	
			63	125	250	500	1000	2000	4000	8000	dB(A)	NR
Total receptor Lp			21	24	29	38	28	14	6		36	

Figure 3.5: Pet Hotel to NSR2 - Night-time 23:00 – 07:00

PET HOTEL NOISE EMISSION CALCULATIONS

Calculation to NSR2

			63	125	250	500	1000	2000	4000	8000	dB(A)	NR
Sound pressure level inside, Lp,in		dB	67	70	74	96	94	85	70		97	
Via Wall												
			63	125	250	500	1000	2000	4000	8000	dB(A)	NR
Diffusivity term for the inside sound field, Cd	-6	dB	-6	-6	-6	-6	-6	-6	-6			
Sound reduction of the segment, R'		dB	41	39	44	52	59	63	68			
Width of segment	3.5 m											
Height of segment	4 m											
Area of the segment	14 m2		11	11	11	11	11	11	11			
Sound power level of the substitute point source, Lw			31	36	36	49	41	27	7			
Directivity correction in the direction of the receptor, Dc	2		2	2	2	2	2	2	2			
Distance to receptor	19 m											
Acoustic screening		dB										
Total attenuation from building element to receptor			31	31	31	31	31	31	31			
Sound pressure level at receptor, Lp			2	8	7	21	12	-1	-21		19	
Via Glazing												
			63	125	250	500	1000	2000	4000	8000	dB(A)	NR
Diffusivity term for the inside sound field, Cd	-6	dB	-6	-6	-6	-6	-6	-6	-6			
Sound reduction of the segment, R'		dB	10	10	9	22	31	35	28			
Width of segment	1.5 m											
Height of segment	1 m											
Area of the segment	1.5 m2		2	2	2	2	2	2	2			
Sound power level of the substitute point source, Lw			52	56	61	69	59	46	38			
Directivity correction in the direction of the receptor, Dc	2		2	2	2	2	2	2	2			
Distance to receptor	19 m											
Acoustic screening		dB										
Total attenuation from building element to receptor			31	31	31	31	31	31	31			
Sound pressure level at receptor, Lp			24	27	32	41	30	17	9		39	
			63	125	250	500	1000	2000	4000	8000	dB(A)	NR
Total receptor Lp			24	27	32	41	31	17	9		39	

Based on standard double glazing achieving 36 R_w and a conservative estimate of the external wall performance achieving a minimum 55 R_w, the predicted levels at receptors are a minimum of 5 dB below the measured background sound level at CM1 which would be considered low impact in accordance with BS 4142.

Table 3.1: Noise Breakout Assessment Summary

Source Room	External Receptor	Specific Noise Level at Receptor	Background Sound Level	Level Difference
Playroom	NSR1	45 dBA	53 dB $L_{A90,15min}$ (Daytime)	-8 dBA
Hotel	NSR2	36 dBA		-17 dBA
		39 dBA	44 dB $L_{A90,15min}$ (Night-time)	-5 dBA

3.2. Internal Noise Transfer Assessment

An internal noise transfer assessment has been undertaken based on the existing floor construction, understood to comprise minimum 275mm reinforced concrete slab. As the proposed Pet Hotel operates overnight, only a night-time assessment has been undertaken; demonstrating compliance with this more stringent criteria ensures the daytime criteria will also be met by default.

The existing 275mm concrete slab floor is assumed to provide a sound reduction performance of approximately R_w 60 dB, determined using Insul[1] sound insulation prediction software. An internal level of 97 dB L_{AEq} and maximum level of 105 dB L_{AFmax} has been taken from library data representing ambient and peak barking noise from dogs in a reverberant space.

Table 3.2: Predicted Internal Noise Transfer – Existing Construction

Source Level	Predicted performance of existing separating structure	Receive Level
97 dB L_{Aeq}	60 R_w	37 dBA
105 dB L_{AFmax}		45 dBA

Currently based on the existing structure, the resultant noise level from dog noise within the adjoined residential unit exceeds the proposed internal criteria and therefore mitigation is necessary. The separating floor structure needs enhancing to a minimum of 77 dB R_w. To achieve this, the separating structure requires the installation of a suitable specialist independent ceiling system to be confirmed at detailed design. This would typically consist of a suspended metal frame on specilist

[1] Insul Modelling Accuracy: *'Comparisons with test data show that it's generally within 3 STC/R_w points for most constructions.'*

acoustic hangers, with insulation and layers of high-density plasterboard; specialist manufacturers should be consulted.

Flanking performance via continuous elements such as external walls and columns should be considered at the detailed design stage to ensure it doesn't limit the performance and effectiveness of the sound insualtion of the separating floor structure.

The enhanced ceiling system should be installed in all areas to ensure residential amenity is suitably protected, and as previously discussed the large glazed opening to the pet playroom should remain closed at all times.

4. Conclusions

Peninsular Acoustics Ltd has been commissioned by Man Pets Living Ltd to undertake an acoustic assessment for a proposed dog and cat hotel within a residential apartment building located at Unit 6 Botanic Avenue, Manchester M15 6AE.

A background sound survey was undertaken to determine the existing noise environment at a representative location of nearby receptors considered as 53 dB L_{A90} and 44 dB L_{A90} for daytime and night-time periods respectively.

The calculated noise breakout to both NSRs is below the representative background sound level for each period assessed. No further treatment is required for external noise breakout.

The internal transfer assessment found that the existing ceiling needs to be improved by at least an R_w of 17 dB to reduce noise to the residential units above. This upgraded ceiling should be installed across the whole site, and should not be limited by flanking conditions which will require enhancements.

If these principles are followed and implemented, the proposed dog and cat hotel should be suitable and not cause any adverse impact on nearby residents.

Appendix A

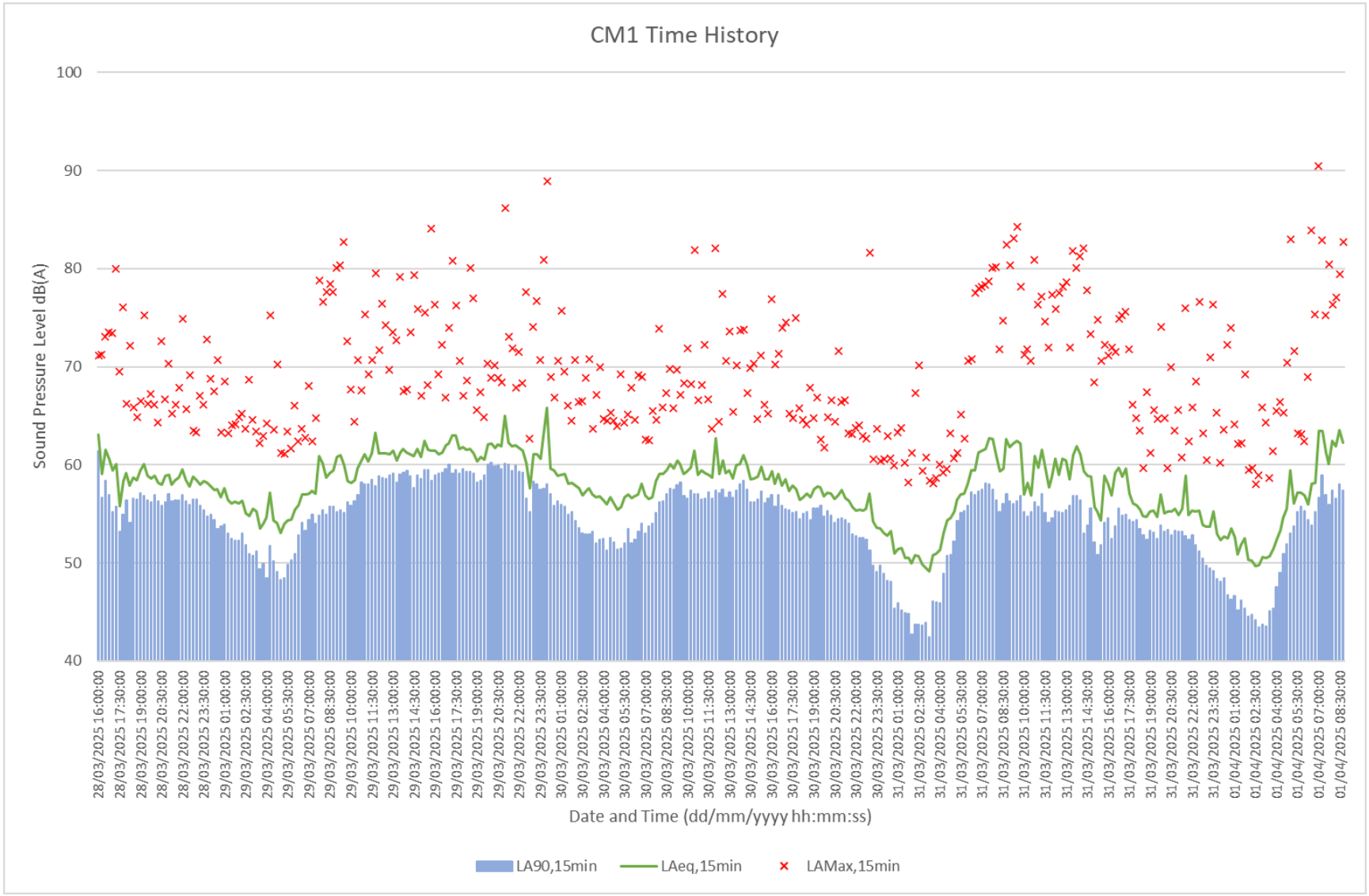
Technical Terminology

Noise	Typically defined as unwanted, unpleasant or disturbing sound
Frequency (Hz)	The number of oscillations in acoustic pressure per second. It represents the 'tone' of the sound. Often determined in octave bands
Maximum sound pressure level (L_{Fmax})	The maximum or highest sound pressure level measured with a 'fast' time weighting
Equivalent continuous sound pressure level ($L_{eq,T}$)	The average of the total sound energy over a specified time period (T). L_{eq} represents the equivalent sound level that a fluctuating source would have compared to a steady source with the same total sound energy over a specific time period. Commonly used as a descriptor of human perception of sound over time.
'A' weighting	Frequency-dependent weighting based on the response of the human auditory system which has been found to correlate well with the subjective response to sound. Denoted by the use of the letter 'A'. For example, dBA denotes an 'A' weighted sound level in decibels, or L_{Amax} denotes an 'A' weighted maximum sound pressure level.
Internal Ambient Noise Level (IANL)	The noise level within a room or enclosed space. Usually determined as an equivalent continuous sound pressure level over a specific time period ($L_{Aeq,T}$, dB)
Noise Rating (NR) curve	A single figure term used to reflect the spectral frequency content of noise. Although originally proposed to assess environmental noise, NR curves are now typically used to describe noise from mechanical ventilation systems in buildings.
$L_{night,outside}$	The incident external A-weighted long-term average sound level as defined in ISO 1996-2: 1987, determined over all the night periods of a year, in which the night is eight hours between 23:00 and 07:00.
AVO	Acoustics, Ventilation, Overheating (e.g. AVO Guide, AVO Group).
Ventilative cooling	Cooling by means of introducing external ambient temperature air at a high ventilation rate. Can be either passive (no fans) or mechanical (with fans).
Purge ventilation	Ventilation to aid removal of high concentrations of pollutants and water vapour released from occasional activities such as painting and decorating or accidental releases such as smoke from burnt food or spillage of water.
Mechanical cooling	Cooling by means of a refrigerant cycle. This would include 'air conditioning' systems and the use of fan coil units (FCUs).
MEV	Mechanical extract ventilation.
Effective area, A_{eff}	Defined as the product of the free area and discharge coefficient, this is the preferred parameter for comparing the air-flow performance of elements. Refer to reference 6 for further information.

Equivalent area, A_{eq}	The area of a sharp-edged, circular orifice that gives the same flow rate as the actual opening at a given pressure-difference. In other words, the free-area of a notional circular hole made in an infinitely thin, infinite extent baffle that gives the same air-flow performance as the real opening. Used to describe the area of trickle vents in Approved Document F. Not to be confused with Effective area. Refer to reference 6 for further information.
Coefficient of Discharge, Cd	The ratio of the mass flow rate at the discharge end of the nozzle to that of an ideal nozzle which expands an identical working fluid from the same initial conditions to the same exit pressures.
$D_{n,e}$ / $D_{n,e,w}$	The laboratory tested sound insulation of small building elements, normalised to an equivalent absorption area of 10m2.
Façade level	The sound pressure level measured close to a building façade that includes contribution from both the incident sound and the sound reflected from the façade. Normally taken to be 3dB higher than the equivalent free-field level, when located at 1 metre from a façade.
Free-field level	A measured sound pressure level that is independent of any contributions due to reflections from nearby surfaces and is therefore representative of the direct path only.
R / R_w	The laboratory tested airborne sound insulation of a building element
Sound insulation	The capacity of a structure to prevent sound from reaching a receiving location. Sound energy is not necessarily absorbed; impedance mismatch, or reflection back toward the source, is often the principal mechanism

Appendix B

Time-History of Measured Survey Results


CM1 Time History
Sound Pressure Level dB(A)
100
90
80
70
60
50
40
28/03/2025 16:00:00
28/03/2025 17:30:00
28/03/2025 19:00:00
28/03/2025 20:30:00
28/03/2025 22:00:00
28/03/2025 23:30:00
29/03/2025 01:00:00
29/03/2025 02:30:00
29/03/2025 04:00:00
29/03/2025 05:30:00
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31/03/2025 13:00:00
31/03/2025 14:30:00
31/03/2025 16:00:00
31/03/2025 17:30:00
31/03/2025 19:00:00
31/03/2025 20:30:00
31/03/2025 22:00:00
31/03/2025 23:30:00
01/04/2025 01:00:00
01/04/2025 02:30:00
01/04/2025 04:00:00
01/04/2025 05:30:00
01/04/2025 07:00:00
01/04/2025 08:30:00
Date and Time (dd/mm/yyyy hh:mm:ss)
LA90,15min
LAeq,15min
LAMax,15min

.

Appendix C

Insul Graphs

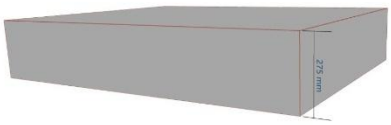
Appendix C.1: Predicted separating floor performance - Existing

Sound Insulation Prediction (v9.0.24)

INSUL

Program copyright Marshall Day Acoustics 2017
Margin of error is generally within Rw ±3 dB
- Key No. 6541
Job Name:
Job No.: Initials:User
Date:12/05/2025
File Name:insul

Notes:



Rw 63 dB
C -1 dB
Ctr -5 dB

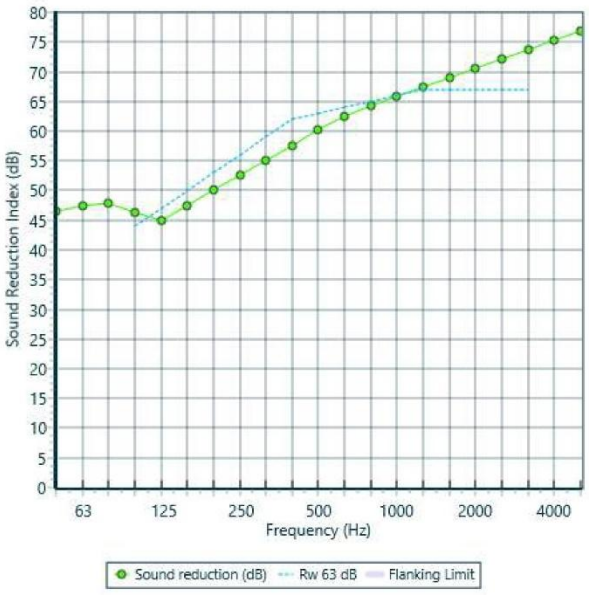
Panel Size = 2.7 m x 4.0 m

Partition surface mass = 644 kg/m²

System description

Panel 1 : 1 x 275 mm Concrete

freq.(Hz)	R(dB)	R(dB)
50	47	
63	47	47
80	48	
100	46	
125	45	46
160	47	
200	50	
250	53	52
315	55	
400	58	
500	60	60
630	63	
800	64	
1000	66	66
1250	67	
1600	69	
2000	70	70
2500	72	
3150	74	
4000	75	75
5000	77	



Appendix D

Report Limitations

This report has been prepared for the titled project or named part thereof and should not be used in whole or part and relied upon for any other project without the written authorisation of Peninsular Acoustics Limited. Peninsular Acoustics Limited accept no responsibility or liability for the consequences of this document if it is used for a purpose other than that for which it was commissioned. Persons wishing to use or rely upon this report for other purposes must seek written authority to do so from the owner of this report and/ or Peninsular Acoustics Limited and agree to indemnify Peninsular Acoustics Limited for any and all loss or damage resulting therefrom. Peninsular Acoustics Limited accepts no responsibility or liability for this document to any other party other than the person by whom it was commissioned.

The findings and opinions expressed are relevant to the dates of the site works and design drawings/specifications and should not be relied upon to represent conditions at substantially later dates. Opinions included therein are based on information gathered during the study and from our experience. If additional information becomes available which may affect our comments, conclusions or recommendations Peninsular Acoustics Limited reserve the right to review the information, reassess any new potential concerns and modify our opinions accordingly.

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