

JETTS GYM AT CIRCLE SQUARE, OXFORD ROAD, MANCHESTER - EXTENSION OF HOURS

NOISE IMPACT ASSESSMENT

On behalf of:
Circle Square Green Company Ltd

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NOISE IMPACT ASSESSMENT

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1.0 INTRODUCTION

- 1.1 Hepworth Acoustics Ltd was originally commissioned by Circle Square Green Company Ltd earlier in 2024 to carry out a noise impact assessment in connection with a planning application for an extension of hours at a gym/fitness studio at Circle Square off Oxford Road, Manchester.
- 1.2 This updated report has been prepared to take into account and address feedback from the Manchester City Council Environmental Health Officer (EHO). Specifically, they had requested that the assessment of break-out of internal trading noise be based upon site specific measurements of the trading noise. The gym unit has now been fitted-out (including the premises PA system) by the new operator Jetts (although it is not yet open for use) and so this updated noise assessment describes and uses source trading noise measurements carried out within the new Jetts gym.
- 1.3 We understand that the current approved use as a gym/fitness studio permits operations between 06:00 and 22:00 hours seven days a week. Permission was granted in December 2020 (planning reference 128803/FO/2020), with planning condition 3 of the decision notice related to the control of noise break out from the premises and condition 4 related to control of plant/equipment noise. It is noted that Manchester City Council's noise control criteria have been revised since 2020.
- 1.4 The proposals are to extend the hours of operation of the gym to 24 hours.
- 1.5 The premises are located at basement level within the North Pavilion low rise building on Symphony Park, which is part of Circle Square development. The site location is shown in Figure 1. The above ground part of the building provides a stepped seating area within Symphony Park (formed of cast in-situ concrete). The northern external envelope is double glazed with large non-openable windows. The ground floor immediately inside the glazing is a reception/entrance with access to stairs/lifts to the gym.
- 1.6 The main gym area and changing rooms are at the lower basement level, with the main gym open to the double height reception area. The enclosed upper basement level studio will be used for classes during some periods. The premises PA system is a centralised system with individual controls for the main gym and enclosed class area. Music is to be played over the PA system in the main gym area at fairly modest levels. In the enclosed studio, slightly higher music noise levels will prevail during some classes, but this will not be high level 'pumping' music as was the case with the previous tenant. Indeed, the glazed partition and doors (which will remain closed during classes) that separate the

studio from the rest of the gym will adequately reduce these elevated class music levels such that the resulting music noise levels in the reception area at ground level will not be affected.

- 1.7 Furthermore, there are no loudspeakers in the ground level entrance area, on the stairs to basement level, nor anywhere in the vicinity of the glazing and hence music noise levels at the entrance area (i.e. those incident upon the glazing) are modest.
- 1.8 The nearest dwellings to the premises are at the apartment block approximately 14 metres from the northern elevation of the building.
- 1.9 The updated noise assessment has included:
- An inspection of the site and surrounding area;
 - Measurement of noise levels over the night-time period of a weekday;
 - Measurement of typical internal trading music noise levels within the new Jetts gym;
 - An assessment of the potential impact of trading noise break-out from the development outside the nearest dwellings during the proposed extended hours;
 - An assessment of potential impact from plant noise associated with the unit;
 - Recommendation of appropriate sound insulation and noise mitigation measures if/where necessary.
 - Recommendation of appropriately worded planning conditions.
- 1.10 The various noise units and indices referred to in this report are described in Appendix I. All noise levels mentioned in the text have been rounded to the nearest decibel, as fractions of decibels are imperceptible.

2.0 PLANNING CONDITIONS AND GUIDANCE

Planning Conditions

- 2.1 Planning permission was granted under application reference 128803/FO/2020 with the following conditions:

"3) The Gym (Class E) use shall be implemented (fit out) and operated in accordance with the recommendations and noise levels specified within the Noise Impact Assessment, prepared by Hepworth Acoustics (section 3.7) Report No: P20-338-R01v2 August 2020

The above noise insulation scheme shall be completed prior to occupation. A post completion report to verify that all of the recommended mitigation measures have been installed and meet the above recommendation shall be submitted and agreed in writing by the City Council as local planning authority and any non compliance suitably mitigated in accordance with an agreed scheme prior to occupation. Thereafter the premises shall operate in accordance with the agreed recommendations. Where entertainment noise is proposed the LAeq (entertainment noise) shall be controlled to 10dB below the LA90 (without entertainment noise) in each octave band at the facade of the nearest noise sensitive location, and internal noise levels at structurally adjoined residential properties in the 63Hz and 125Hz octave frequency bands shall be controlled so as not to exceed (in habitable rooms) 47dB and 41dB, respectively.

"4) Any plant and externally mounted ancillary equipment shall be installed and operated in accordance with the recommendations and noise levels specified within the Noise Impact Assessment, prepared by Hepworth Acoustics (section 3.7) Report No: P20-338-R01v2 August 2020. The approved scheme shall be implemented prior to occupancy and shall remain operational thereafter.

For the avoidance of doubt a background noise level of 5dB below the existing background (La90) in each octave band at the nearest noise sensitive location shall be achieved.

A post completion report to verify that all of the recommended mitigation measures have been installed and meet the above recommendation shall be submitted and agreed in writing by the City Council as local planning authority and any non compliance suitably mitigated in accordance with an agreed scheme prior to occupation."

6) The units shall not operate outside of the following hours:

Monday to Sunday 06:00 to 22:00 (classes 06:30 to 21:30)"

NPPF:2023

- 2.2 Paragraph 191 of the National Planning Policy Framework (NPPF), December 2023, states that *"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should: a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;"*

NPSE:2010

- 2.3 The Noise Policy Statement for England (NPSE) 2010, which is referred to in NPPF, includes three aims:
- i. Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
 - ii. Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
 - iii. Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

Local Policy

- 2.4 Manchester's Local Development Framework, Core Strategy, Development Plan was adopted in July 2012, where Policy DM1 Development Management, states that *"all development should have regard to the following specific issues... effects on amenity, including... noise"*.

Manchester City Council Planning & Noise Technical Guidance 2022

- 2.5 Manchester City Council Planning & Noise Technical Guidance 2022 provides guidance for assessing the potential impact from premises such as entertainment premises on residential dwellings. Although a gym/fitness studio is not strictly an entertainment premises, in the absence of specific

Manchester City Council guidance on gyms, the following criterion regarding the transmission of noise (principally from music) is considered applicable:

‘Entertainment noise ($L_{Aeq,5min}$) should be controlled to 5dB below the typical background noise level (L_{A90}) in each octave band at the nearest noise sensitive location’.

2.6 In respect of noise from customer voices only (i.e. without any music), we would recommend that this noise is controlled to within the existing L_{Aeq} noise level as far as is practicable.

2.7 The latest Manchester City Council guidance also recommends the following design objective in terms of controlling noise impact from fixed plant and equipment states:

‘The development should be designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.’

2.8 Therefore, considering the latest guidance from Manchester City Council it is recommended that planning conditions 3 and 4 are appropriately reworded.

2.9 Our noise assessment is described in Section 3.0.

3.0 NOISE SURVEYS

Baseline Noise Measurements

- 3.1 Noise levels were measured outside the nearest apartment building opposite the premises. The noise measurement location was as shown in Figure 1.
- 3.2 The purpose of the noise survey was to establish the prevailing ambient/background noise climate of the area.
- 3.3 The noise measurements were taken with the microphone of the sound level meter located outside a second floor window overlooking Symphony Park. Noise measurements were taken in consecutive 15-minute periods between approximately 14:00 hours on Monday 29 January until 10:00 hours on Tuesday 30 January 2024.
- 3.4 Calibration checks were carried out both before and after the measurement period with no variance in levels noted. Audio was also recorded during the monitoring period in order to identify sources of noise making up the noise climate. Frequency analysis was also carried out.
- 3.5 Weather conditions during the survey were considered acceptable for the purposes of the survey and subsequent assessment.
- 3.6 The results of the noise survey are summarised in Table 1 and are shown in the chart in Appendix II.

Table 1: Summary of Noise Levels Measured (dB)

Period	$L_{Aeq,15\text{ min}}$	$L_{A90,15\text{ min}}$
Extension period (22:00 – 06:00 hours)	53 – 63	49 – 56

- 3.7 During the survey, the noise climate of the area was due to traffic on Oxford Road and pedestrians in the busy city centre area including Symphony Park.
- 3.8 As in the previous version of our assessment, the representative octave band background noise levels have been adopted from the arithmetic average of each of the measured octave bands over the period 01:00 to 06:00 hours as a robust basis for assessment of the proposed extension hours as follows:

Table 2: Adopted representative background noise levels outside apartments (dB $L_{90,T}$)

Description	Octave band centre frequency (Hz)							A
	63	125	250	500	1k	2k	4k	
Adopted background noise levels	40	42	46	46	47	41	31	50

- 3.9 The representative background sound level over this period at the nearest dwellings was 50 dB $L_{A90,T}$. Therefore, based on the requirements of the condition 4 the adopted plant noise limit is 45 dB. These noise levels have been adopted in our assessment described in Section 4.0.

Jetts Trading Noise Levels

- 3.10 We visited the completed (although not yet open) Jetts gym on Friday 12 July 2024 to inspect the gym and carry out measurements of typical worst-case trading music noise levels to be used as a basis for an updated assessment of potential noise break-out to nearby dwellings.
- 3.11 Unlike the operations of the previous 'Trib3' gym at the site, which was characterised HIIT (high intensity interval training) sessions with loud 'pumping' music and amplified instructions/encouragement from the session trainer, the Jetts gym is more traditional in that music is played at more modest levels and classes with the enclosed studio area will not result in any elevated noise levels in the main gym.
- 3.12 Noise measurements were carried out using a Nti Audio XL2-TA sound analyser (serial no. A2A-20361-E0) which was checked calibrated before and after the measurements with no variance observed. The sound analyser was hand-held and the measurements comprised multiple short-term periods that were spatially averaged. During the measurements, the installed PA system was playing typical music at noise levels representative of those that will prevail during busy gym periods. In order to inform the assessment of potential noise break-out to the apartments to the north, the following levels have been adopted from measurements taken in the ground floor reception:

Table 3: Adopted typical busy period Jetts operating noise levels at the entrance area (dB)

Description	Octave Band Centre Frequency (Hz)							A
	63	125	250	500	1k	2k	4k	
Entrance area (L_{eq})	55	64	57	58	59	58	52	64

- 3.13 These trading noise levels are very significantly lower than the previously adopted source 'Trib3' gym HIIT class levels. It is however noted that the very highest noise levels at 'Trib3' were assumed to only exist in what was previously the enclosed lower basement area and hence corresponding 'Trib3' noise levels at the ground floor reception area were more comparable to those in Table 3 above.
- 3.14 It must be further noted that the above noise levels are representative of busy gym periods. Operating noise levels in the middle of the night will likely be lower still. Furthermore, there will be no classes during the middle of the night and the first classes early in the morning will be yoga

without any music. As such, using the above noise levels to assess potential noise impact during the proposed extended period is a robust approach.

4.0 NOISE ASSESSMENT

Gym Noise Break Out

- 4.1 Using the measured busy period trading noise levels inside the ground floor north elevation, we have calculated the corresponding noise break-out to the nearest apartments to the north. Whilst the entrance door will remain closed for the majority of the time and has a self-closing mechanism, we have carried out calculations assuming the door is both closed and open.
- 4.2 The calculations (which are shown in Appendix III) take account of the size of the shopfront, the sound reduction indices of the double-glazing (and the open door where applicable) plus a correction for attenuation of sound over distance. In respect of the larger glazed area, line source propagation has been assumed, whereas for the smaller door, point source propagation has been assumed.
- 4.3 The calculated noise levels outside the nearest apartments, 14m away from the northern elevation are as follows, with the MCC criteria (background minus 5 dB) shown for comparison:

Table 4: Calculated noise break-out (dB)

Description	Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Outside apartments – door closed (L_{eq})	28	31	21	18	24	27	21
Outside apartments – door open (L_{eq})	29	34	26	26	28	29	23
Adopted noise limit ($L_{90} - 5$ dB)	35	37	41	41	42	36	26
Difference – door closed	-7	-6	-20	-23	-18	-9	-5
Difference – door open	-6	-3	-15	-15	-14	-7	-3

- 4.4 The noise levels calculated outside the nearest apartments are within the adopted octave band noise criteria with the door closed and open.
- 4.5 Nevertheless, we recommend that the door is not pinned open at any time, and gym staff encourage customers to arrive/depart without delay, particularly during night-time periods. Staff should also minimise music noise levels within the gym during night-time periods in order to minimise as far as possible the break-out of noise from the premises.

Assessment of External Equipment Noise Impact

- 4.6 We understand that the following equipment is associated with unit A and is located in the roof top plant compound of the adjacent building (shown in the Figure enclosed).
- 4.7 The equipment consists of 2 no. Toshiba Air Conditioning Condensing Units model MMY-MAP1806FT8P and noise output data are as follows:
- Cooling – 83 dB L_{WA} ;
 - Heating – 84 dB L_{WA} .
- 4.8 The units are to be located within an enclosed louvred space and set back such that the building edge and parapet will provide some screening to the nearest apartment windows, which are on a lower floor in the adjacent building.
- 4.9 The likely resulting plant noise level has been calculated, with appropriate allowances for break out via the louvred compound enclosure, distance and any barrier attenuation.
- 4.10 Octave band sound power levels have not been provided for the equipment. Therefore, the assessment has been carried out using the provided broadband noise levels. However, typically Manchester City Council only require an assessment of plant noise in terms of broadband noise levels.
- 4.11 The calculation of the resulting combined noise level outside the nearest dwelling is shown in Table 5 below.

Table 5: Plant Noise Assessment (dB)

Description	Closest Apartment
Calculated Specific Sound Level outside dwelling	44
Adopted Noise Limit (background minus 5 dB)	45
Difference	-1

- 4.12 The noise level from both condensers operating in the noisiest mode i.e. heating is 44 dB which is 1 dB below the adopted noise limit. On the basis that the equipment will not produce any tonal or impulsive noise and there will be no distinct intermittency, the rating level of noise from the equipment will therefore be within the adopted criteria.

Noise Mitigation Measures

4.13 In summary, whilst our assessment has shown that noise break-out from the gym will be within relevant limits even when the entrance door is open, we nevertheless recommend the following operational measures to minimise noise break-out as far as practicable:

- The entrance door should not be pinned open at any time and gym staff encourage customers to arrive/depart without delay, particularly during night-time periods; and
- Staff should minimise music noise levels within the gym as far as practicable during night-time periods.

Conclusion

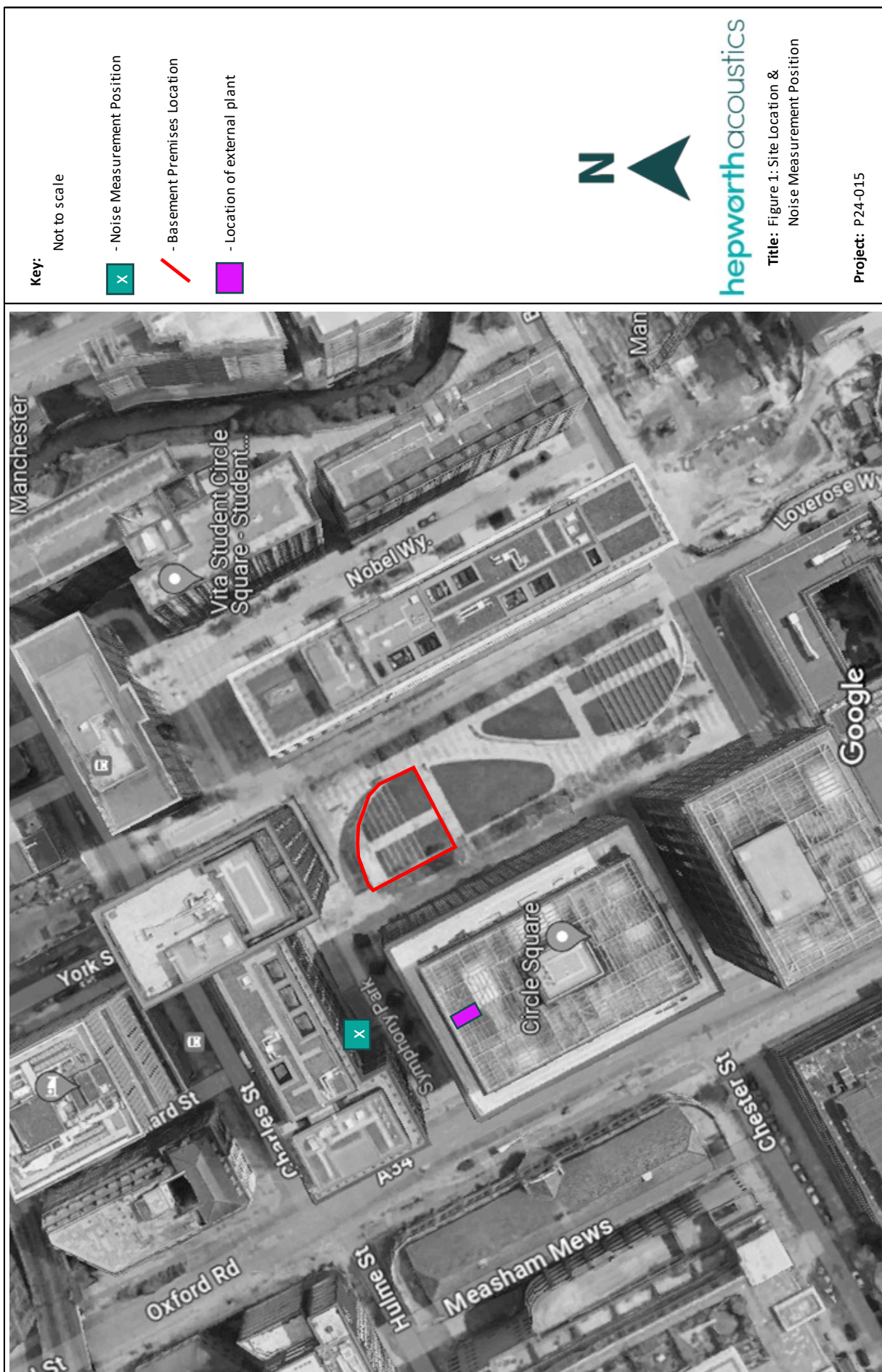
4.14 We conclude that noise break-out from operation of the proposed gym premises during the proposed hours of extension would not result in any unacceptable harm to residential amenity by reason of noise disturbance.

4.15 It is also concluded that there will be no unacceptable noise impact from the operation of the building services equipment.

4.16 Furthermore, 'significant adverse impacts' would be avoided and 'adverse impacts' would be mitigated/minimised, bringing the development in line with the aims of the Noise Policy Statement for England (NPSE) 2010 and local policy.

5.0 SUMMARY

- 5.1 Hepworth Acoustics Ltd have assessed the likely noise impact of the proposed extension of hours of an existing gym at the Circle Square development off Oxford Road, Manchester.
- 5.2 A noise survey has been carried out to measure prevailing noise levels outside the nearest dwellings during the potential most sensitive period i.e. a weekday night-time of the proposed extended operating times.
- 5.3 Updated noise measurements have also been carried to quantify the typical worst-case trading noise levels for the new incoming gym tenant.
- 5.4 Our calculations have demonstrated that potential noise break-out from the premises will be well within Manchester City Council's noise control design criteria.
- 5.5 On this basis we conclude that noise break-out from the premises would not result in any unacceptable impact on residential amenity.
- 5.6 An assessment of potential noise impact from plant associated with the unit also concludes that noise impact will meet Manchester City Council's standard noise criterion.



Appendix I: Noise Units & Indices

Sound and the decibel

A sound wave is a small fluctuation of atmospheric pressure. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. In order to cope with this wide range of pressure variations, a logarithmic scale is used to convert the values into manageable numbers. Although it might seem unusual to use a logarithmic scale to measure a physical phenomenon, it has been found that human hearing also responds to sound in an approximately logarithmic fashion. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120dB (threshold of pain).

Due to the logarithmic nature of decibels, when two noises of the same level are combined together, the total noise level is (under normal circumstances) 3 dB(A) higher than each of the individual noise levels e.g. 60 dB(A) plus 60 dB(A) = 63 dB(A). In terms of perceived 'loudness', a 3 dB(A) variation in noise level is a relatively small (but nevertheless just noticeable) change. An increase in noise level of 10 dB(A) generally corresponds to a doubling of perceived loudness. Likewise, a reduction in noise level of 10 dB(A) generally corresponds to a halving of perceived loudness.

The ear is not equally sensitive to sound at all frequencies. It is less sensitive to sound at low and very high frequencies, compared with the frequencies in between. Therefore, when measuring a sound made up of different frequencies, it is often useful to 'weight' each frequency appropriately, so that the measurement correlates better with what a person would actually hear. This is usually achieved by using an electronic filter called the 'A' weighting, which is built into sound level meters. Noise levels measured using the 'A' weighting are denoted dB(A) or dBA.

Frequency and Hertz (Hz)

As well as the loudness of a sound, the frequency content of a sound is also very important. Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or hertz (Hz). Sometimes large frequency values are written as kiloHertz (kHz), where 1 kHz = 1000 Hz.

Young people with normal hearing can hear frequencies in the range 20 Hz to 20 kHz. However, the upper frequency limit gradually reduces as a person gets older.

Glossary of Terms

When a noise level is constant and does not fluctuate, it can be described adequately by measuring the dB(A) level. However, when the noise level varies with time, the measured dB(A) level will vary as well. In this case it is therefore not possible to represent the noise climate with a simple dB(A) value. In order to describe noise where the level is continuously varying, a number of other indices can be used. The indices used in this report are described below.

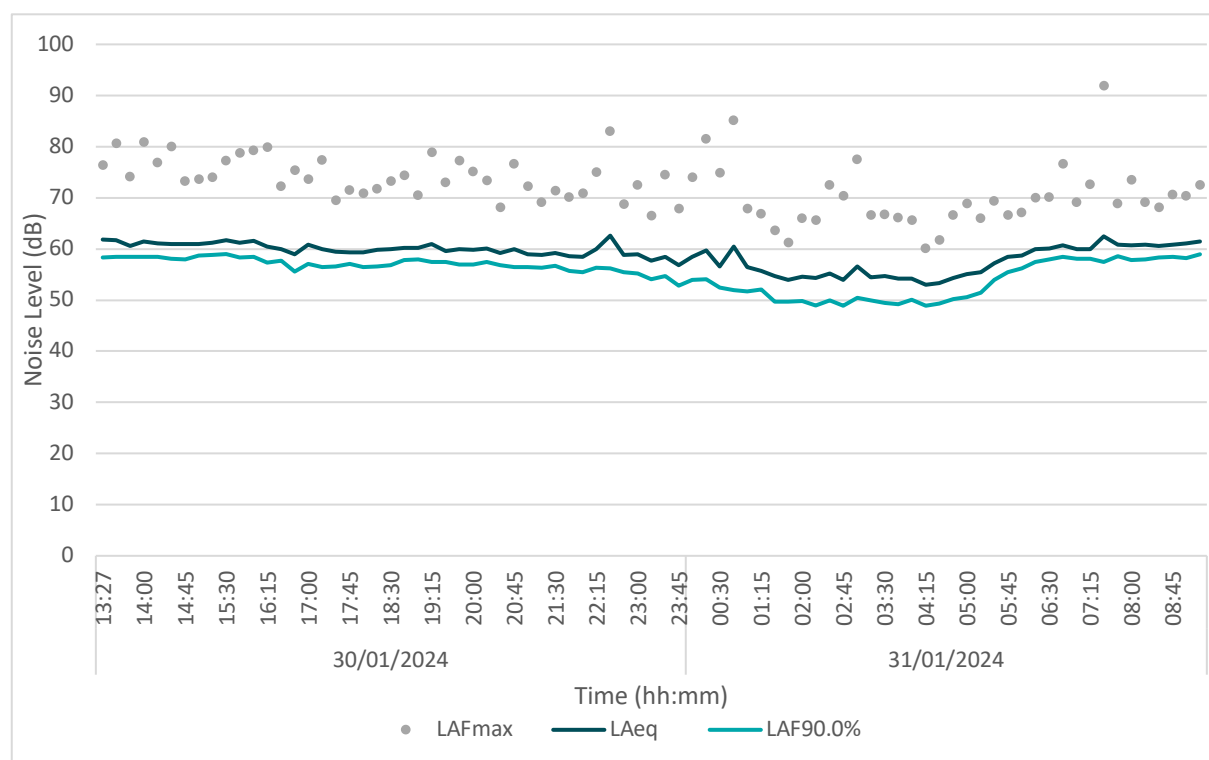
- C_{tr} This is an A-weighted urban traffic noise spectrum, which can be added to $D_{nT,w}$ or R_w in some standards to take into account different source spectra such as low frequency sound.
- R This is the 'Sound Reduction Index' as measured in a laboratory, and is a measure of the sound insulation properties of an building element in a stated frequency band.
- R_w This is the 'Weighted Sound Reduction Index', and is a single figure quantity of R , the laboratory measured Sound Reduction Index.
- $L_{Aeq,T}$ This is the A-weighted 'equivalent continuous noise level' which is an average of the total sound energy measured over a specified time period. In other words, $L_{Aeq,T}$ is the level of a continuous noise which has the same total (A-weighted) energy as the real fluctuating noise, measured over the same time period. It is increasingly being used as the preferred parameter for all forms of environmental noise.
- L_{AFmax} This is the maximum A-weighted noise level that was recorded during the measurement period in terms of 'Fast' time weighting.
- $L_{A90,T}$ This is the A-weighted noise level exceeded for 90% of the time period. $L_{A90,T}$ is used as a measure of background noise.

Appendix II: Noise Survey Results

Date(s):	Monday/Tuesday 30/31 January 2024
Equipment	NTi XL2 'Class 1' sound level meter (s/n: A2A-20259-E0) with associated calibrator and environmental outdoor monitoring kit
Weather	Dry, ~3°C, overcast and calm <3 m/s

All levels in dB(A)

Location : Outside Apartment (second floor)



Appendix III: Noise Break-out Calculations

Project Number	P24-015
Description	Noise break-out to apartments to the north - door closed

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Noise Break-out v6.0 February 2019

Source - Woods Practical Guide to Noise Control

	63	125	250	500	1k	2k	4k	A
SPL_{int}	55	64	57	58	59	58	52	64

Element 1 - Window

SPL_{int}	55	64	57	58	59	58	52	64
Element SRI	20	26	29	33	28	24	24	
Area (S) =	70.5	18	18	18	18	18	18	
Distance (r) =	14.0	-11	-11	-11	-11	-11	-11	

BS8233 Example - 6-12-6 insulated glass unit

At receiver $\rightarrow = SPL_{int} - SRI + 10 \log S - 10 \log(r) - 14$

Element 2 - Door	Is door lobbied?	No						
SPL_{int}	55	64	57	58	59	58	52	64
Element SRI	20	26	29	33	28	24	24	
Area (S) =	2.5	4	4	4	4	4	4	
Distance (r) =	14.0	-23	-23	-23	-23	-23	-23	
Lobby absorption (A) =	18							
At receiver	2	5	-5	-8	-2	1	-5	5

BS8233 Example - 6-12-6 insulated glass unit

No Lobby $\rightarrow = SPL_{int} - SRI + 10 \log S - 20 \log(r) - 14$ Lobby $\rightarrow = SPL_{int} - 2 \times SRI + 10 \log S - 20 \log(r) - 14 - 10 \log(A)$

Overall Results

	63	125	250	500	1k	2k	4k	A
Resulting	28	31	21	18	24	27	21	32

Background/limit $\rightarrow$ 35 37 41 41 42 36 26 45 Input background noise level or relevant noise limits

Difference	-7	-6	-20	-23	-18	-9	-5	-13
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Project Number	P24-015
Description	Noise break-out to apartments to the north - door open

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Noise Break-out v6.0 February 2019

Source - Woods Practical Guide to Noise Control

	63	125	250	500	1k	2k	4k	A
SPL_{int}	55	64	57	58	59	58	52	64

Element 1 - Window

SPL_{int}	55	64	57	58	59	58	52	64
Element SRI	20	26	29	33	28	24	24	
Area (S) =	70.5	18	18	18	18	18	18	
Distance (r) =	14.0	-11	-11	-11	-11	-11	-11	

BS8233 Example - 6-12-6 insulated glass unit

At receiver $\rightarrow = SPL_{int} - SRI + 10 \log S - 10 \log(r) - 14$

Element 2 - Door	Is door lobbied?	No						
SPL_{int}	55	64	57	58	59	58	52	64
Element SRI	0	0	0	0	0	0	0	
Area (S) =	2.5	4	4	4	4	4	4	
Distance (r) =	14.0	-23	-23	-23	-23	-23	-23	
Lobby absorption (A) =	18							
At receiver	22	31	24	25	26	25	19	31

Open door

No Lobby $\rightarrow = SPL_{int} - SRI + 10 \log S - 20 \log(r) - 14$ Lobby $\rightarrow = SPL_{int} - 2 \times SRI + 10 \log S - 20 \log(r) - 14 - 10 \log(A)$

Overall Results

	63	125	250	500	1k	2k	4k	A
Resulting	29	34	26	26	28	29	23	34

Background/limit $\rightarrow$ 35 37 41 41 42 36 26 45 Input background noise level or relevant noise limits

Difference	-6	-3	-15	-15	-14	-7	-3	-10
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