

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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1.0 INTRODUCTION

- 1.1 Hepworth Acoustics Ltd was commissioned by Circle Square Green Company Ltd to carry out a noise impact assessment in connection with a planning application for an extension of hours at gym/fitness studio at Circle Square off Oxford Road, Manchester.
- 1.2 The current approved use as a gym/fitness studio is permitted to operate between 06:00 and 01:00 hours seven days a week. Permission was granted in December 2020 (planning reference 128803/FO/2020) and condition 3 of the decision notice related to the control of noise break out from the premises. It is proposed to extend the hours of operation to 24 hours.
- 1.3 The premises are located at basement level within the North Pavilion low rise building on Symphony Park, 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. The northern external envelope is double glazed with non-openable windows. The ground floor is a reception/entrance with access to stairs/lifts. The fitness studio and changing rooms are located at basement level (more than 5 metres below ground).
- 1.4 The nearest dwellings to the proposed premises are at the apartment block approximately 14 metres from the northern elevation of the building.
- 1.5 The noise assessment has included:
- An inspection of the site and surrounding area;
 - Measurement of noise levels over the night-time period of a weekday;
 - An assessment of the potential impact of trading noise break-out from the development outside the nearest dwellings during the proposed extended hours;
 - Recommendation of appropriate sound insulation and noise mitigation measures if/where necessary.
 - Recommendation of appropriately worded planning conditions
- 1.6 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.

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 strictly an entertainment premises in the absence of specific guidance the following criteria regarding the transmission of noise:

'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 Therefore, considering the latest guidance from Manchester City Council it is recommended that the conditions are appropriately reworded.
- 2.8 Our noise assessment is described in Section 3.0.

3.0 NOISE SURVEY

- 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 (01:00 – 06:00 hours)	53 – 58	49 – 55

- 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 The representative octave band background noise levels have been adopted from the arithmetic average of each of the measured octave bands over the proposed extension period (i.e. 01:00 to 06:00 hours) and are presented in Table 2.

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 level over extension period	40	42	46	46	47	41	31	50

- 3.9 Therefore, these noise levels have been adopted in our assessment described in Section 4.0.

4.0 NOISE ASSESSMENT

Potential Exercise Class Noise Break Out

- 4.1 Hepworth Acoustics has carried out numerous noise assessments in connection with proposed gyms/fitness studios in the past and we have a library of noise levels for a variety of establishment styles. The previous occupier of the gym operated a High-intensity interval training (HIIT) exercise sessions and the following trading noise levels (shown in Table 3 below) were measured at an existing premises during a busy training session.

Table 3: Adopted trading noise levels (dB)

Description	Octave Band Centre Frequency (Hz)							A
	63	125	250	500	1k	2k	4k	
HIIT session noise level (L_{eq})	84	90	92	95	91	91	81	97

- 4.2 The noise measurements included loud ‘pumping’ music and amplified instructions/encouragement from the session trainer as is typical with HIIT sessions. However, we understand that a more traditional gym is proposed which would not involve loud music etc. Nevertheless, these noise levels provide a robust assessment.
- 4.3 Table 1 below shows the calculated noise level breaking-out from the building envelope to outside the nearest apartments opposite the site. Although the building envelope is a glazed façade, the studio space is fully enclosed within the basement area and set back from the atrium/open space. Therefore, the calculation considers the noise break out initially through the solid blockwork studio wall (which includes a door) into the atrium space and then breaking out through the glazed building envelope with corrections for distance attenuation only.
- 4.4 Table 4 shows the calculated noise levels outside the nearest apartments alongside the adopted noise limits, which are based upon the adopted representative background noise levels as shown in Table 2, minus 5 dB in line with Manchester City Council’s standard noise criteria.

Table 4: Calculated noise break-out (dB)

Description	Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Outside apartments (L_{eq})	35	30	36	32	14	8	-6
Adopted noise limit ($L_{90} - 5$ dB)	35	37	41	41	42	36	26
Difference	0	-7	-5	-9	-28	-28	-32

- 4.5 The noise levels calculated outside the nearest apartments are within the adopted octave band noise criteria.
- 4.6 Nevertheless, some recommendations to the premises are proposed to ensure best practicable control of potential noise-break out. See recommendations detailed further in this section.

Planning Conditions

- 4.7 We recommend the following noise control/mitigation measures are carried out;

“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 4.8) Report No: P24-015-R01v2 March 2024

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 5dB below the LA90 (without entertainment noise) in each octave band at the facade of the nearest noise sensitive location.

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

Monday to Sunday 24 hours”

Recommendations

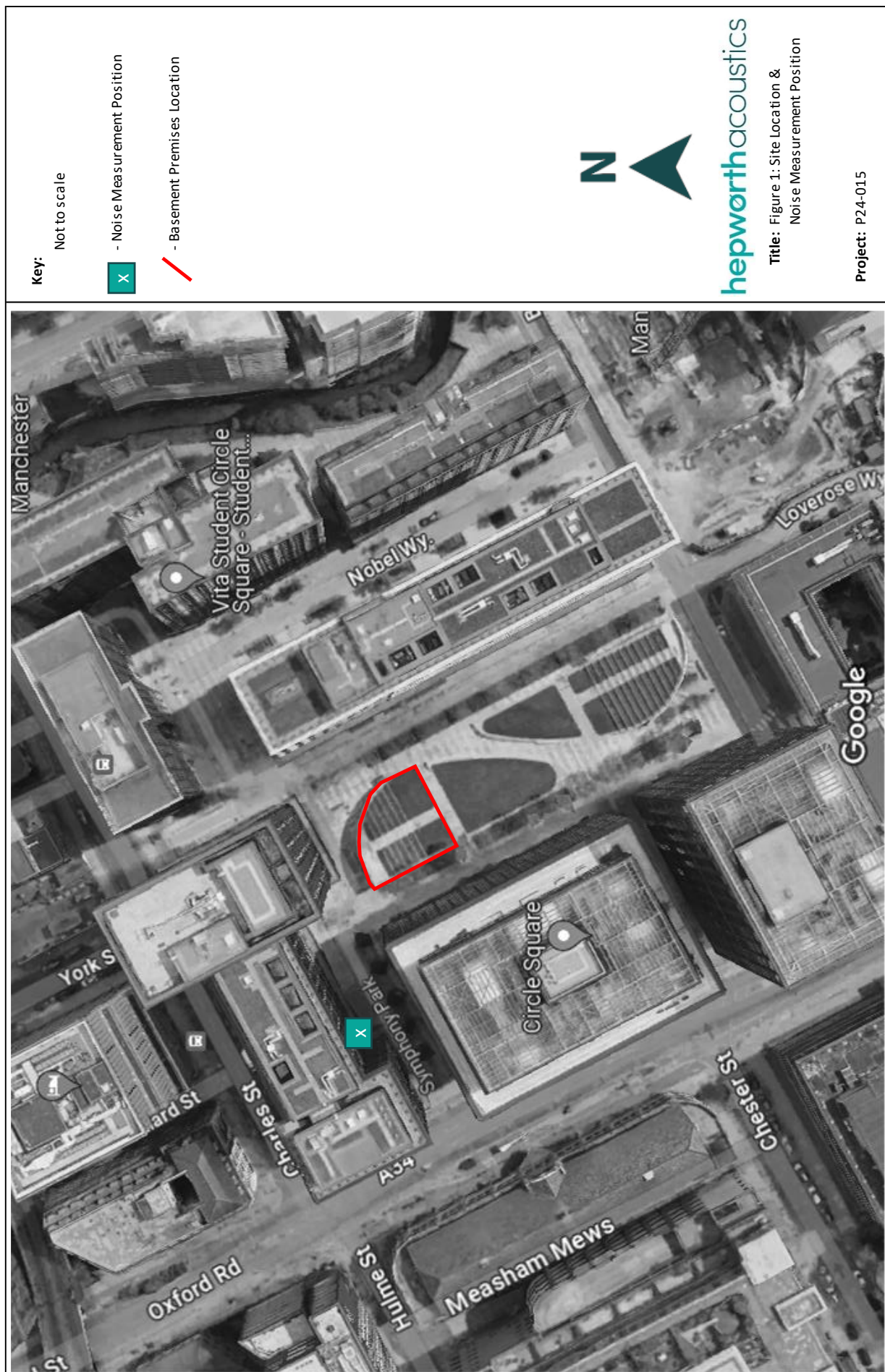
- 4.8 We recommend the following noise control/mitigation measures are carried out;
- Careful and appropriate design of the PA system to be installed in the premises is recommended in order to minimise noise levels at the entrance i.e. by locating/orientating loudspeakers away from the entrance, etc;
 - The entrance doors should be fitted with effective perimeter seals and should not be pinned open.

Conclusion

- 4.9 Subject to the recommendations made above we conclude that noise break-out from operation of the proposed Gym/Fitness Studio premises during the proposed hours of extension would not result in any unacceptable harm to residential amenity by reason of noise disturbance.
- 4.10 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 Gym/Fitness Studio at the Circle Square development off Oxford Road, Manchester.
- 5.2 A 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.
- 5.3 Our calculations have demonstrated that potential noise break-out from the premises will be well within Manchester City Council's noise control design criteria. Nevertheless, some noise control measures have been recommended in order to ensure that this remains the case.
- 5.4 On this basis we conclude that noise break-out from the premises would not result in any unacceptable impact on residential amenity.



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)

