PureGym, Barnsley

Environmental Noise Impact Assessment

Reference: 13031.RP01.NAR.2
Prepared: 19 December 2023
Revision Number: 2

PureGym
Town Centre House
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PureGym, Barnsley

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Revision	Comment	Date	Prepared By	Reviewed By	Approved By
0	First issue	26 September 2023	James Melville	Martin Raisborough	Torben Andersen
1	Minor Amendments	27 September 2023	James Melville	Martin Raisborough	Torben Andersen
1	Including Car Park Noise Assessment	19 December 2023	James Melville	Martin Raisborough	Torben Andersen

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Contents

1.0 EXECUTIVE SUMMARY

RBA Acoustics has been appointed by PureGym to undertake an environmental noise impact assessment for a potential new facility within a former Jack's unit, Wombwell Lane, Barnsley.

This report presents the details and results of environmental sound monitoring undertaken at the site between Friday 15th and Monday 18th September 2023 to establish the existing prevailing noise conditions close to the noise sensitive receptors to the site.

Sound insulation testing of the external building fabric of the building has been carried out at the site to understand the existing levels of sound insulation performance provided. From these tests, assessments have been undertaken to determine the expected impact of noise from Studio and Functional classes on the nearby existing noise sensitive properties. From the results of our assessments, it has been determined that noise from Studio/spin Studio classes may adversely impact on the dwellings during late evening periods where background sound levels are lower. As such, recommendations for mitigation treatment have been proposed and are presented in Section 5.0 of this report.

An assessment of the impact of anticipated external noise generating plant items has been undertaken. From the results of our assessment it is not expected that any mitigation measures are required to reduce noise emissions from the plant. The details and results of our assessments are presented in Section 6.0 of this report.

An assessment was undertaken to determine the likely potential for noise impacts associated with the car parking facilities at the proposed PureGym facility. The assessment has focussed on the potential noise impacts at the identified key receptor at 88A Wombwell Lane that immediately borders the car park of the Barnsley Retail Park site. The predicted noise levels from car door slams and from vehicles manoeuvring in the car park are below the recognised threshold level for adverse health impacts. As such, no mitigation measures are considered necessary to reduce noise emissions from car parking activities. The details and results of our assessments are presented in Section 7.0 of this report.

2.0 INTRODUCTION

RBA Acoustics has been appointed by PureGym to undertake an environmental noise impact assessment for a potential new facility within a former Jack's unit, Wombwell Lane, Barnsley.

This report presents the details and results of environmental sound monitoring undertaken at the site and sound insulation testing of the external building fabric carried out on Friday 15th September 2023. The purpose of these studies is to benchmark the currently prevailing background sound levels to use as a basis for assessing the impact of activity noise from Studio and Functional classes on the nearby existing noise sensitive properties in addition to the impact of noise from proposed items of building services plant.

The data has also been used as a basis for an assessment of the impact of noise from late evening and night time car parking activities on the site, close to the existing noise sensitive receptors.

This report occasionally employs technical acoustic terminology. In order to assist the reader, a brief description of the acoustic parameters used in this report is included within Appendix A.

3.0 SITE DESCRIPTION

The proposed PureGym unit is a standalone retail unit located within Barnsley Retail Park, off Wombwell Lane, Barnsley and was formerly tenanted by a Jack's supermarket. The surrounding area hosts a number of retail units including a Tesco Extra, B&M and Dunelm. The proposed PureGym unit is located at the northern end of the retail park with a large grade level car park to the east and south of the unit.

The nearest affected noise sensitive receptors to the site are houses located on Wombwell Road northeast of the unit at an approximate distance of 45 metres.

A site plan indicating the location of the building, the location of the nearest noise sensitive property and the immediate site environment are indicated in the site plan in Appendix B.

4.0 ENVIRONMENTAL SOUND MONITORING

4.1 Survey Methodology

Monitoring of the prevailing background noise was undertaken over the following period:

- 11:00 Friday 15th September to 08:45 Monday 18th September 2023

As the survey was unattended it is not possible to comment with certainty regarding meteorological conditions throughout the entire survey period. However, based on observations during the site visits and weather reports for the area, conditions were generally considered suitable for obtaining representative noise measurements, being predominantly dry with little wind.

Measurements were made of the L_{A90}, L_{Amax} and L_{Aeq} noise levels over sample periods of 15 minutes.

4.2 Measurement Location

To determine the existing noise climate around the site measurements were undertaken at the following location:

Measurement Position 1 – The microphone was positioned approximately 1.4m from the ground along the norther east boundary of the site. The microphone was positioned away from any reflective surfaces and is considered free field. The noise climate was dominated by road traffic noise from the surrounding road network as well as birdsong.

The measurement position is also illustrated on the site plan attached in Figure 1 (Appendix B).

4.1 Instrumentation

For information regarding the equipment used for the measurements please refer to Appendix C.

The sound level meter was calibrated both prior to and on completion of the survey with no significant calibration drift observed.

4.2 Results

The noise levels measured are shown as time-histories on the attached Graphs 1 and 2 (Appendix D).

5.0 AIRBORNE SOUND BREAKOUT TO THE ENVIRONMENT

There are no standard guideline or reference documents that consider the issue of noise and vibration associated with Gym activities specifically.

5.1 Activity Noise Levels

Table 1 below presents the results of typical activity noise within a PureGym unit, based on measurements undertaken by RBA Acoustics at a number of PureGym facilities across the country.

Table 1 – Typical PureGym Activity Noise Levels

Space	Measured Sound Pressure Level (dB re $20x10^{-6}$ Pa.) @ Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Studio - Group Class	85	85	84	88	85	80	73	70	90
Functional Area - Group Class	68	74	71	74	74	68	65	62	77

The above data will be used in subsequent analysis to predict likely levels of noise transfer to adjacent units and to determine the need and extent of any mitigation measures.

5.2 Noise Breakout to Nearby Noise Sensitive Properties

In order that noise breakout from the unit due to amplified music and speech during formal class activities does not adversely impact on the nearest affected noise sensitive property, it is recommended that the L_{Aeq} noise level of the breakout sound does not exceed a level 5dB below the otherwise ambient L_{Aeq} sound in any 1/3 octave band at the façade of the nearest affected noise sensitive property.

In addition to the above, there may be a planning requirement from the Local Authority in relation to the control of noise breakout from the unit. RBA Acoustics should be informed if any planning requirement exists and differs from the above, so we may update our recommendations as appropriate.

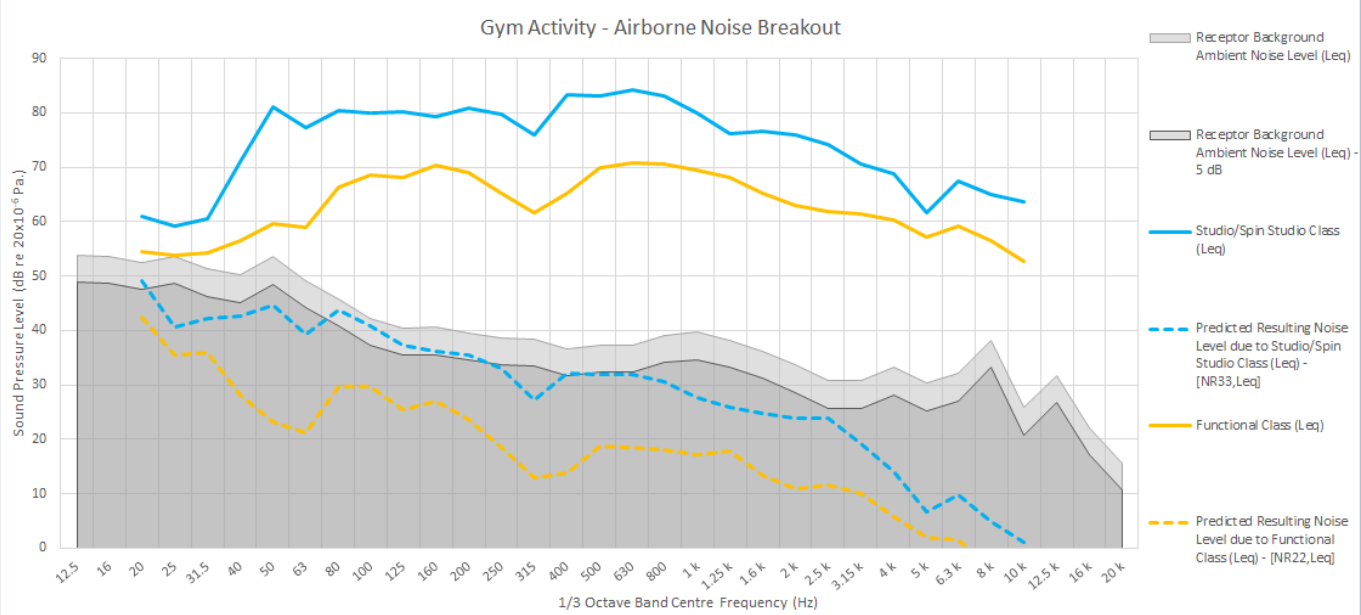
5.3 Activity Noise Breakout Assessment

In order to investigate the issues of noise associated with activities within the proposed PureGym unit, a site visit was undertaken by James Melville (BSc, MSc, AMIOA) of RBA Acoustics on Friday 15th September 2023.

Based on the measured noise levels outlined within Section 4.0, the measured background noise levels taken in the later evening period were quieter than the daytime and, therefore, the assessment will consider background noise levels during this period in order to represent a worst-case assessment. The latest formal class activities that take place within a typical PureGym are from 21:30 to 22:30 hours. These classes generate higher levels of airborne sound due to amplified music and raised voices from instructors compared with general use of the gym.

Considering the above and based on the ambient sound levels measured during this later evening period, up to 22:30 hours, Figure 1 below presents the results of an assessment of activity noise breakout during this critical period. This assessment has assumed distance attenuation from the unit to the façade of the nearest affected receptor based on standard line source attenuation theory (circa 45 metres).

Figure 1 – Assessment of Airborne Noise Breakout to dwellings along Wombwell Lane



It can be seen from the above that activity noise is expected to be at least 5dB below the otherwise prevailing ambient sound level at the façade of the nearest affected noise sensitive properties at the majority of frequencies.

However, there are exceedances to the criteria between 63Hz and 250Hz for studio music noise breakout. Based on the above assessment, it is therefore recommended that mitigation is applied if it is proposed to locate the studio along this façade in order that the impact of noise on the nearby noise sensitive receptors is reduced.

The mitigation should comprise either of the following:

Acoustic Wall Linings

a. A drywall lining should be applied to the external wall of the studio area in order improve the sound insulation performance of the lightweight cladding. The drywall lining should achieve a minimum sound insulation performance of 20dB R_w. Typically, 2x layers 12.5mm plasterboard with 25mm mineral wool in a minimum 100mm cavity is considered suitable in achieving this performance.

b. Any Unused ventilation openings in the wall should be removed and made good to the same specification of the external wall itself.

Noise Limiter to the Audio Systems

As an alternative to the above treatment, installing a noise limiter to the PA system to reduce noise levels in the 63Hz and 125Hz Octave bands by 5dB will be suitable. The noise limiter should ensure the following reverberant sound pressure levels are not exceeded within the Studio:

Table 2 – Maximum Studio/Spin Studio Noise Levels

Space	Measured Sound Pressure Level (dB re 20x10^{-6} Pa.) @ Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Studio/Spin Studio	80	80	84	88	85	80	73	70	89

6.0 PLANT NOISE IMPACT ASSESSMENT

The requirements of Barnsley Metropolitan Borough Council's Environmental Health Department regarding new building services plant are understood to be as follows.

> *"No fixed plant and/or machinery shall come into operation until details of the fixed plant and machinery serving the development hereby permitted, and any mitigation measures to achieve this condition, are submitted to and approved in writing by the local planning authority. The rating level of the sound emitted from the site shall not exceed 50 dBA between 0700 and 2300 and 38 dBA at all other times. The sound levels shall be determined by measurement or calculation at the nearest noise sensitive premises. The measures and assessment shall be made according to BS4142:2014."*

In line with BS 4142: 2014, should the proposed plant be identified as having intermittent or tonal characteristics, a further penalty should be subtracted from any of the above proposed noise emission limits.

It should be noted that the above requirements are applied at the nearest residential adjacencies and alternative criteria should be incorporated if there are also commercial properties affected by the proposed plant installations.

6.1 Proposed Plant Items

Detailed information regarding the proposed plant items for the proposed Gym are not yet known. At this stage, however, general assumptions of the proposed condenser units are made based on a standard 'large box' gym format. The assumed items of plant are considered:

- 9No. Condensing Units (Mitsubishi PUZ-M250YKA), externally mounted.

6.2 Noise Sensitive Receptor

The nearest noise sensitive receptors re those along Wombwell Lane, the location of which are identified in Figure A in Appendix B.

6.3 Noise Levels

Information regarding the noise levels of the proposed plant has been provided by the manufacturers of the units. The associated plant noise levels are detailed in Table 3 below.

Table 3 – Plant Noise Levels

Plant Details	Parameter	Sound Level (dB) at Octave Band Centre Frequency (Hz)								dBA
		63	125	250	500	1k	2k	4k	8k	
9No. Condensing Units (Mitsubishi PUZ-M250YKA)	Lp @ 1m (per condenser)	72	62	61	61	57	53	49	43	62

Review of the octave band data provides no indication of any tonal characteristics associated with the proposed plant.

6.1 Plant Layout

We understand that the plant is likely to be located externally at ground level close to the commercial unit housing the PureGym. At this stage it is assumed this this location will be closest to the noise sensitive properties along the northeastern façade of the unit, to represent a worst case assessment.

6.2 Plant Noise Levels

Our calculation method for predicting noise levels from the proposed plant at the nearest residential windows, based on the information stated above, is summarised below.

- Source Term SPL / SWL
- 20LogR Distance Attenuation
- Directivity
- Reflections

From the review of the noise data, and the expected operation of the units, it is not expected that there will be any attention-grabbing characteristics of the noise audible at the nearest noise sensitive properties that would attract any rating corrections based on BS 4142 methodology.

Considering the above, the results of the calculations indicate the following noise levels at 1 metre from the façade of the affected proposed dwellings (Location 1).

Table 4 – Plant Noise Assessment – Location 1

Plant Details	Predicted Noise Level @ Nearest Noise-Sensitive Receptor		
	Specific Noise Level	Rating Corrections	BS 4142 Rating Noise Level
9No. Condensing Units (Mitsubishi PUZ-M250YKA)	38 dBA	0	38 dB $L_{Ar,T}$
Total Noise Level @ Receptor Location 1			**38 dB $L_{Ar,T}$**

From the above it can be seen that the predicted noise level at residential Receptor 1 meets the adopted plant noise limits for both the daytime and night-time.

6.3 Uncertainty

Uncertainty is an unavoidable feature of measurements in the field, which can be subject to many factors; the weather typically being the most significant of which with respect to the measurement of sound. Uncertainty is also unavoidable in the prediction of sound levels, where naturally, before the scenario being considered becomes a reality, a number of assumptions need to be relied upon. There is also the uncertainty of people's reactions, which can be influenced by a number of factors, not just the magnitude or character of the sound in question.

In keeping with the scale of each project, therefore, it is the aim of RBA Acoustics to minimise uncertainty at each stage as far as reasonably practicable. With this is mind, RBA Acoustics follow the best practise methodologies based on the guidance within BS 4142:2014 and our experience in undertaking assessments of these nature.

Crucially, it has been determined that environmental noise measurements have been undertaken by suitably qualified staff, using in calibration equipment and avoiding adverse weather conditions.

The predictions have also been undertaken by suitably qualified staff, whilst using the best available information, an industry standard calculation method, and the most applicable calculation procedures.

Notwithstanding this, naturally some uncertainty remains. Given the sheer number of factors involved, however, it is not feasible to place a value on the level of uncertainty, without resulting in an unhelpful range

of possible outcomes. It is the professional position of RBA Acoustics that uncertainty has been kept to a realistic minimum and that the outcome of this assessment is sufficiently representative.

7.0 CAR PARK - NOISE IMPACT ASSESSMENT

There is no formal methodology for assessing car park noise specifically. As such, it is considered appropriate to refer to the guidance and information in following documents:

- World Health Organization (WHO) Guidelines for Community Noise (1999)
- ProPG – Planning and noise (including supplementary documents) (2017)
- British Standard 8233 Guidance on sound insulation and noise reduction for buildings (2014)
- Institute of Environmental Management & Assessment (IEMA) Guidelines for Environmental Noise Impact Assessment (2014)

The WHO, ProPG and BS 8233 guidance documents all work an internal maximum noise level in bedrooms of 45dB L_{Amax} during the night time periods (23:00 to 07:00) and correspond to external noise level of 55dB L_{Amax}, assuming the attenuation provided by a slightly open window of at least 10dB.

The IEMA guidelines present criteria for assessing the significance of a new noise source in relation to it's noise level. The document provides guidance on how to scope a noise assessment, defining the baseline noise environment, prediction of changes in noise levels as a result of the development proposals and evaluation the significance of the effect of changes in noise levels.
Effects of noise are divided into two categories:

- Behavioural indicators; and
- Physiological/medical indicators.

The guidelines provide a framework for a noise impact assessment to be undertaken but do not prescribe an assessment methodology. As such, professional judgement by experienced practitioners is required in order to identify appropriate assessment approaches.

One of the primary methods for assessment of the significance of noise related to a new development is to review the relationship between a measure of noise and the consequent community response. This can be considered by making a judgement on whether or not the change in noise level as a result of the development will result in an effect in terms of human response, and whether or not that effect is significant.

In addition to the simple numerical change in level, however, the document states that other factors should be considered, including the type of noise source, the nature of the change and other pertinent factors.
The document provides a number of matrices for considering the effect of the change. The table considered most pertinent to this type of assessment is presented Table 5 below.

Table 5 – IEMA Effect of changes in noise level

Effect	Description of Level Change
Very Substantial	Greater than 10 dB L_{Aeq} change in sound level perceived at a receptor of great sensitivity to noise
Substantial	Greater than 5 dB L_{Aeq} change in sound level at a noise-sensitive receptor; or a 5 to 9.9 dB L_{Aeq} change in sound level at a receptor of great sensitivity to noise
Moderate	A 3 to 4.9 dB L_{Aeq} change in sound level at a sensitive or high sensitive noise receptor, or a greater than 5 dB L_{Aeq} change in sound level at a receptor of some sensitivity to noise
Slight	A 3 to 4.9 dB L_{Aeq} change in sound level at a receptor of some sensitivity

Effect	Description of Level Change
None/Not Significant	Less than 2.9 dB L_{Aeq} change in sound level and/or all receptors are of negligible sensitivity to noise or marginal to the zone of influence of the proposals

There are two main sources of noise associated with vehicular movements within the car park:

1. Noise from vehicle door slams
2. Noise associated with vehicles driving and manoeuvring within the car park

It is anticipated that members of the proposed Gym unit visiting the Gym during the late evening and night time periods will park in the area of the car park immediately outside of the unit.

This assessment focuses on the potential noise impacts at the identified key receptor at 88A Wombwell Lane that immediately borders the car park of the Barnsley Retail Park site. This dwelling is a two storey detached house. The property is 14 metres from the nearest car parking space within the car park. There is a circa 1.8m fence along boundary of the site with the residential property, however, it is not considered that this fence is of sufficient height to provide any effective acoustic screening to the property.

The results of the noise impact assessment from expected vehicle movements within the car park during the late evening and night time periods are presented in the following sections.

7.1 Noise from Vehicle Door Slams

Due to the nature of noise associated with a car door slam, the L_{Amax} is considered the most suitable metric to determine potential noise impacts.

There are two main zones where cars are expected to park during the late evening and night time periods to access the Gym:

- Zone 1 - The nearest car parking spaces to the identified noise sensitive receptor, approximately 14 metres from the façade of the noise sensitive property. There are 5 car parking spaces at this location.

- Zone 2 - The bank of car parking spaces in the centre of the car park outside of the PureGym unit. The parking spaces are at distance of approximately 30 metres from the façade of the noise sensitive property. There are 12 car parking spaces at this location.

It is considered likely that members of the Gym will generally park in these two car park zone areas during the late evening and night time periods as they are nearest to the main entrance. Both of these parking zones have direct line of sight to the first floor windows of the noise sensitive property, As such, no screening correction is considered appropriate in the assessment of noise impact at this receptor.

Table 6, below, presents the assessment of our assessment of noise from the slamming of vehicle door from both parking zones at the nearby residential dwellings. Based on data from the RBA Acoustics database of car door slams, a level of 72dB L_{Amax} at 1 metre is used in this assessment.

Table 6 – Assessment of Car Door Slams at Residential Receptor

Car Park Zone Area	Car Door Slam Noise level at 1m (L_{Amax})	Distance correction to residential façade*	Screening correction	Noise level at receptor façade (L_{Amax})
Zone 1	72dB	14 metres (-23dB)	0dB	49dB
Zone 2	72dB	30 metres (-30dB)	0dB	42dB

**Assuming point source propagation due to distance from receptor*

The predicted noise levels from car door slams at the nearest identified car parking spaces to the Gym are below the recognised threshold level for adverse health impacts at residential receptors of 55dB $L_{Amax, fast}$, assuming that windows of the property may be partially open.

Therefore, potential noise effects associated with car door slams upon the nearest affected noise sensitive property are considered to be negligible.

7.2 Noise from Cars Driving within the Car Park

Based on information provided by PureGym on car movements for similar sized facilities, the following vehicle movements within the car park are expected during the following three key scenarios during critical operational periods:

- 8no. car movements per hour between 20:00 and 23:00
- 4no. car movements per hour between 23:00 and 06:00
- 13no. car movements between 06:00 and 07:00

The above car park movements assume 2no. movements per vehicle at the site, one on arrival and one when leaving within the same hour period.

From previously measurements of car movements within car parks by RBA Acoustics, a Sound Exposure Level (SEL) of 77dBA at 2m is used in this assessment. This level considers a car driving onto site and manoeuvring into a parking bay, and a car starting up, manoeuvring into a parking bay, and driving away.

For the purposes of this assessment, it is assumed that all vehicles will park within the 5 spaces along the immediate site boundary, identified as Zone 1 in Section 7.2. This is a pessimistic assumption as, in reality, the vehicles are expected to park within Zone 2 parking spaces also.

The results of the noise impact assessment at the nearest noise sensitive receptor are presented in Table 7. The assessment has considered the existing ambient sound levels at the site as presented in the RBA Acoustics report 13031.RP01.NAR.1 dated 27th September 2023

Table 7 – Assessment of Car Park Noise at Noise Sensitive Receptor

Time period	SEL at 2m per movement	Distance correction to residential façade*	Screening correction	Calculated noise level at the receptor façade ($L_{Aeq,1hr}$)	Lowest ambient noise level at receptor ($L_{Aeq,1hr}$)	Difference
23:00 – 23:00	77dBA	14 metres (-17dB)	0dB	36dB	43dB	-7dB
23:00 – 06:00	77dBA	14 metres (-17dB)	0dB	33dB	36dB	-3dB
06:00 – 07:00	77dBA	14 metres (-17dB)	0dB	39dB	44dB	-5dB

**Assuming point source propagation due to distance from receptor*

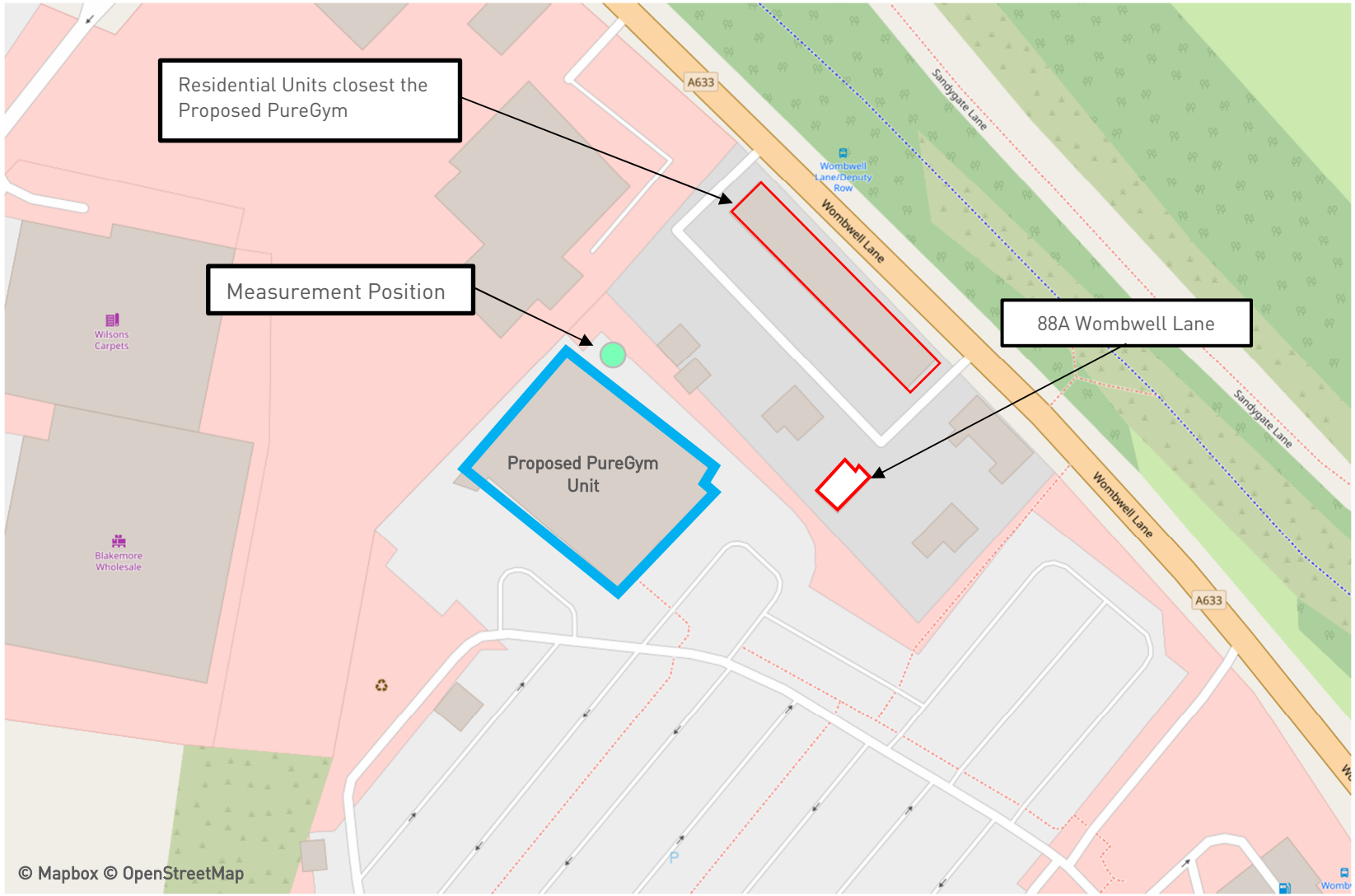
The predicted noise level at the receptor from cars driving within the anticipated car park area are, at worst, 3dB below the existing measured ambient noise level during the survey. This would equate for a relative change in equivalent noise level of less than 2dB $L_{Aeq,T}$. Therefore, based on the guidance within Table 5, the associated potential noise effects from car park movements upon the worst affected noise sensitive receptor are considered negligible.

APPENDICES

Appendix A Acoustic Terminology

dB	Decibel - Used as a measurement of sound pressure level. It is the logarithmic ratio of the noise being assessed to a standard reference level.
dB(A)	The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the 'A' weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average human. It is also possible to calculate the 'A' weighted noise level by applying certain corrections to an un-weighted spectrum. The measured or calculated 'A' weighted noise level is known as the dB(A) level. Because of being a logarithmic scale noise levels in dB(A) do not have a linear relationship to each other. For similar noises, a change in noise level of 10dB(A) represents a doubling or halving of subjective loudness. A change of 3dB(A) is just perceptible.
L_{eq}	L_{eq} is defined as a notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (1 hour).
L_{Aeq}	The level of notional steady sound which, over a stated period of time, would have the same A-weighted acoustic energy as the A-weighted fluctuating noise measured over that period.
L_{An} (e.g L_{A10}, L_{A90})	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time, hence L_{10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the average minimum level and is often used to describe the background noise.
$L_{max,T}$	The instantaneous maximum sound pressure level which occurred during the measurement period, T. It is commonly used to measure the effect of very short duration bursts of noise, such as for example sudden bangs, shouts, car horns, emergency sirens etc. which audibly stand out from the general level of, say, traffic noise, but because of their very short duration, maybe only a very small fraction of a second, may not have any effect on the L_{eq} value.
Noise Rating (NR)	A standardised set of curves relating octave-band sound pressure level to the centre frequency of the octave bands, each of which is characterised by a 'noise rating' (NR), which is numerically equal to the sound pressure level at the intersection with the ordinate at 1kHz.

Appendix B Site Plan



PureGym, Barnsley
Site Location
Project 13031

Figure A
19 December 2023
Not to Scale

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Appendix C Measurement Equipment

Manufacturer	Model Type	Serial No.	Calibration	
			Certificate No.	Valid Until
Norsonic Type 1 Sound Level Meter	Nor140	1406007	U41328	22 June 2024
Norsonic Pre Amplifier	1209	20043		
Norsonic ½“ Microphone	1225	208146	41327	22 June 2024
Norsonic Sound Calibrator	1251	34127	U41326	22 June 2024
Norsonic Type 1 Sound Level Meter	Nor140	1405945	U44502	15 June 2025
Norsonic Pre Amplifier	1209	15314		
Norsonic ½“ Microphone	1225	208218	44501	15 June 2025
Norsonic Sound Calibrator	1251	34057	U44500	15 June 2025

Appendix D Graphs

PureGym, Barnsley

L_{Aeq} Time History

Measurement Position 1

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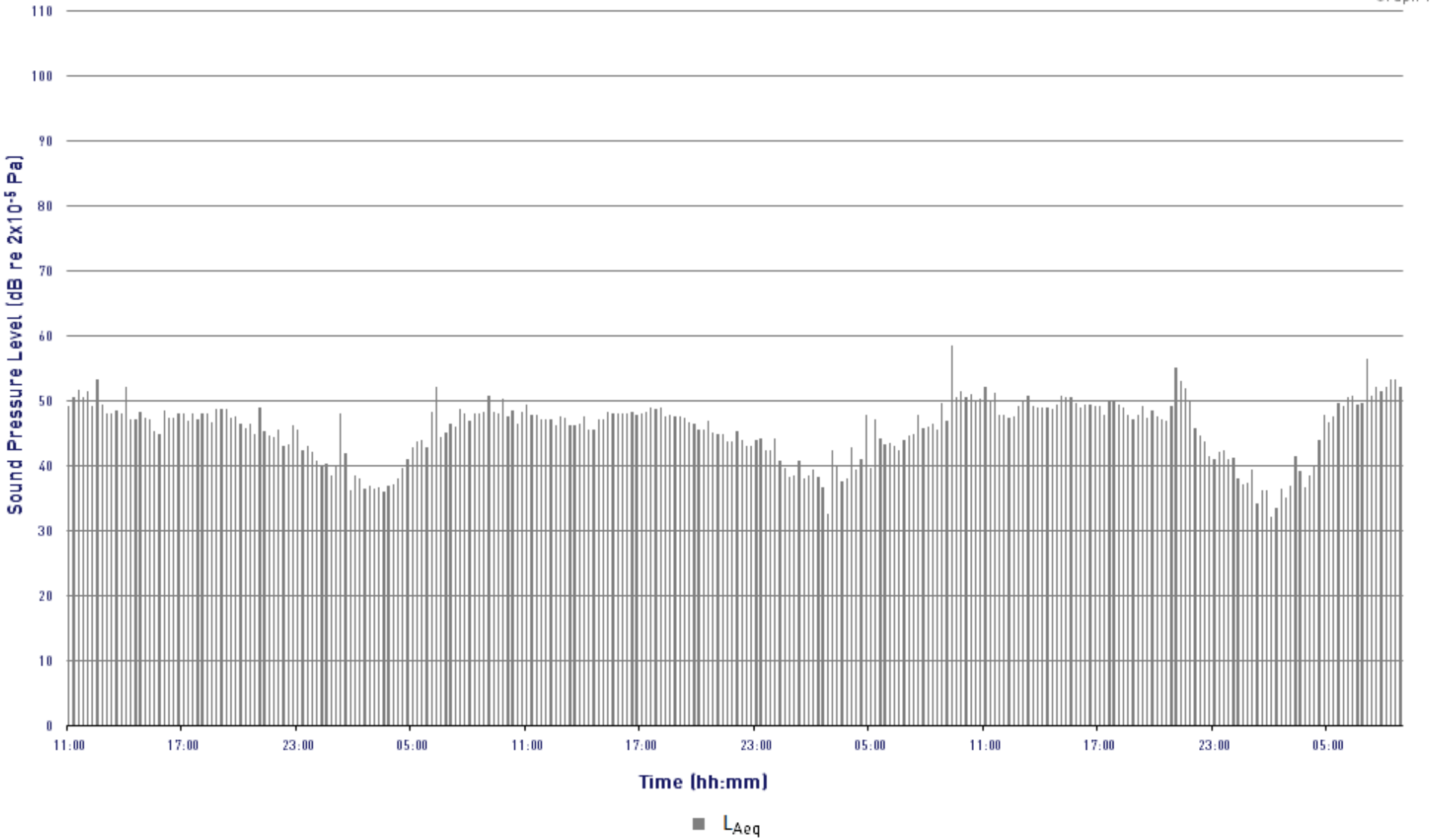
Graph 1



PureGym, Barnsley

$L_{Amax,f}$ and L_{A90} Time History

Measurement Position 1

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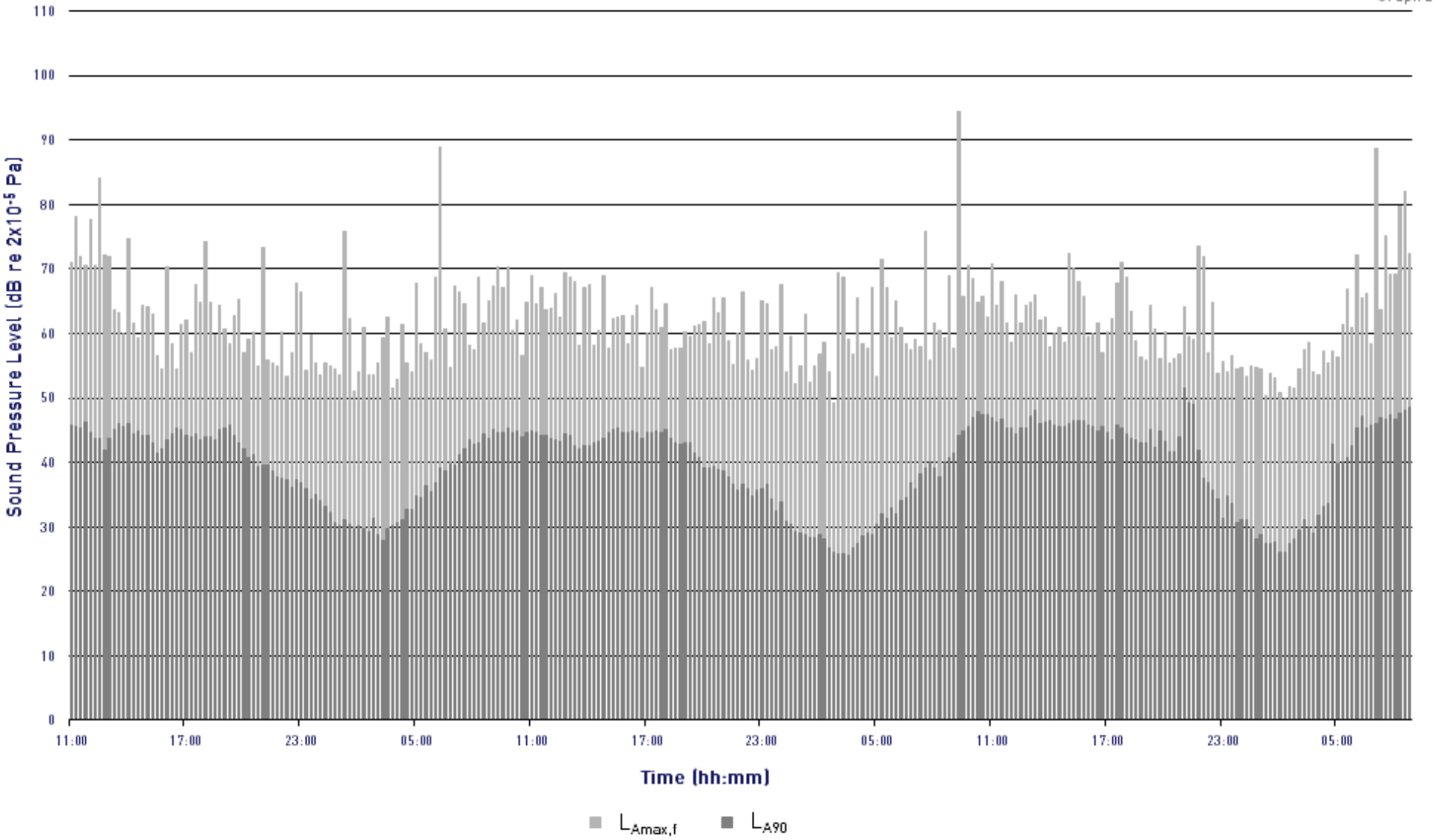
Project: 13031

Graph 2



Appendix E Measurement Results

Standardised Level Difference According to BS EN ISO 16283-1:2014

Field Measurements of Airborne Sound Insulation Between Rooms

Client : PureGym **Date of Test : 15 September 2023**

Operative : James Melville
Test Methodology : BS EN ISO 16283-1:2014

Construction Details & Test Arrangement :
Lightweight Cladding

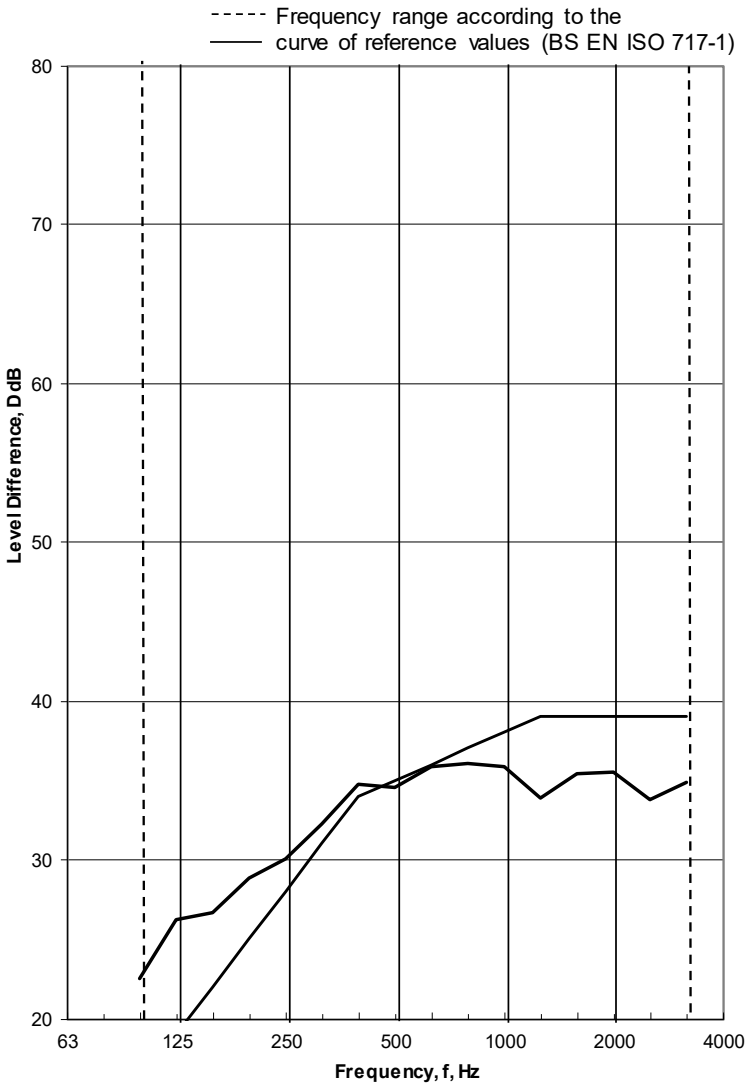
Test Type : Airborne Party Wall
Source Room : PureGym Unit
Receive Room : External

Equipment Details :
See Appendix B

Source Room Volume: m^3
Receive Room Volume: m^3

Frequency, f (Hz)	D (1/3 octave) dB
50	
63	
80	
100	22.5
125	26.2
160	26.7
200	28.8
250	30.1
315	32.2
400	34.7
500	34.5
630	35.8
800	36.1
1000	35.9
1250	33.9
1600	35.4
2000	35.5
2500	33.8
3150	34.9
4000	
5000	

≥ indicates maximum background correction



Rating according to BS EN ISO 717-1 :

D_w ($C;C_{tr}$) = 35 (-1;-2) dB

Evaluation based on field measurement results obtained in one-third octave bands by an engineering method.

No. of test report : Test A
Name of test company : RBA Acoustics

Date of Test Report : 15 September 2023
Signature :

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