



PureGym, Neath

## Acoustic Validation Testing Report

Reference: 13484.RP01.AVT.0

Prepared: 8 January 2025

Revision Number: 0

PureGym

Town Centre House

Merrion Centre

Leeds

LS2 8LY





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| Revision | Comment               | Date           | Prepared By | Approved By        |
|----------|-----------------------|----------------|-------------|--------------------|
| 0        | First issue of report | 8 January 2025 | Joe Day     | Martin Raisborough |
|          |                       |                |             |                    |
|          |                       |                |             |                    |
|          |                       |                |             |                    |

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The recommendations within this report relate to acoustics performance only and will need to be integrated within the overall design by the lead designer to incorporate all other design disciplines such as fire, structural integrity, setting-out, etc. Similarly, any sketches appended to this report illustrate acoustic principles only and again will need to be developed into full working drawings by the lead designer to incorporate all other design disciplines.



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## 1.0 EXECUTIVE SUMMARY

RBA Acoustics has been appointed by PureGym to undertake an acoustic validation test for the recently installed acoustic control measures at Unit 1 Bridge Retail Park, Torquay. The recommendations for acoustic treatment in the various areas are presented in the acoustic report 13484.RP01.001.0.04042024 dated 4<sup>th</sup> April 2024.

This report presents the details and results of acoustic validation tests undertaken by RBA Acoustics on Thursday 12<sup>th</sup> December 2024, the purpose of which are to confirm compliance with the adopted acoustic criteria at the nearest residential dwellings along Golwg-y-Gamlas. The following tests were undertaken:

| Test Details                                                                                                                                                | Pass / Fail | Comment                                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------------------------------------------------------------------------------------|
| Amplified music noise from the Studio transferring through the external building fabric to the nearest residential dwellings along Golwg-y-Gamlas.          | Pass        | No sound was noted above the otherwise ambient sound level at the external façade of the Gym. |
| Amplified music noise from the Functional Area transferring through the external building fabric to the nearest residential dwellings along Golwg-y-Gamlas. | Pass        | No sound was noted above the otherwise ambient sound level at the external façade of the Gym. |

## 2.0 INTRODUCTION

RBA Acoustics has been appointed by PureGym to undertake an acoustic validation test for the recently installed acoustic control measures at PureGym Neath. The recommendations for acoustic treatment in the various areas are presented in the acoustic report 13484.RP01.001.2 dated 7<sup>th</sup> August 2024.

This report presents the details and results of acoustic validation tests undertaken by RBA Acoustics on 12<sup>th</sup> December 2024 the purpose of which are to confirm compliance with the adopted acoustic criteria at the nearest residential dwellings along Golwg-y-Gamlas. The following tests were undertaken:

- Amplified music noise from the Studio breaking out through the external facade,
- Amplified music noise from the Functional Area breaking out through the external façade

The details and results of these tests are considered in turn in this report.

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.

A plan of the site showing the Gym and the nearest noise sensitive dwellings along Golwg-y-Gamlas are shown in the site plan in Figure A of Appendix B of this report, while the layout plan of the Gym is shown in Figure B in Appendix B of this report.

### 3.0 GYM NOISE & VIBRATION CRITERIA

From the recommendations for acoustic treatment in the various areas are presented in the acoustic report 13484.RP01.001.2 dated 7<sup>th</sup> August 2024, it was recommended that the  $L_{Aeq}$  noise level of the breakout sound does not exceed a level 5dB below the otherwise ambient  $L_{Aeq}$  sound level in any 1/3 octave band at the façade of the nearest affected noise sensitive property.

In addition to the above, Planning Condition 13 states the following with respect to noise breakout from the premises:

*The  $L_{Aeq}$  noise level of the breakout sound shall not exceed a level 5dB below the otherwise ambient  $L_{Aeq}$  sound level in any 1/3 octave band at the façade of the nearest affected noise sensitive property.*

## 4.0 AIRBORNE NOISE BREAKOUT TESTS

Acoustic Validation testing was undertaken by Aaron Moroney (Bsc, MIOA) and Joe Day (BEng, AMIOA) of RBA Acoustics on 12<sup>th</sup> December 2024.

The equipment used to undertake the tests is presented in Appendix C. The equipment was calibrated before and after the tests using the field calibrators. No drift in calibration was observed. The sound level meter has been calibrated within the past 2 years, while the field calibrators have themselves been laboratory calibrated within the past year. Calibration certificated for all equipment are available on request.

Measurements and observations of airborne noise breakout from the PureGym unit were undertaken during the site tests. The details of the tests undertaken for each noise generating area of the Gym are presented in the following sections.

### 4.1 Studio Area

The electroacoustic system within the Studio area was used with a typical exercise music track, with the volume turned up to the highest level permitted by the limiter system. Measurements of sound level were made within the Studio area of the Gym. The results of the measurements are presented in Table 1 below.

Table 1– Measured Noise Levels from Electroacoustic system in Studio

| Space       | Measured Sound Pressure Level (dB re 20x10 <sup>-6</sup> Pa.)<br>@ Octave Band Centre Frequency (Hz) |     |     |     |    |    |    |    | dBA |
|-------------|------------------------------------------------------------------------------------------------------|-----|-----|-----|----|----|----|----|-----|
|             | 63                                                                                                   | 125 | 250 | 500 | 1k | 2k | 4k | 8k |     |
| Studio Area | 75                                                                                                   | 78  | 70  | 73  | 76 | 66 | 60 | 59 | 77  |

Observations of noise breakout were undertaken at the external façade of the Gym, and the nearest residential dwellings closest to the Studio area of the Gym. No noise from Gym amplified music noise was audible above the otherwise ambient sound levels in these areas, which was measured to be NR41.

Based on the above, it cannot be determined quantitatively that amplified sound transfer from the Studio area of the Gym is compliant with the adopted criterion at the nearest noise sensitive properties along Golwg-Y-Gamlas, however, given that music noise was noted to be inaudible immediately outside of the Gym, it is considered that this is a positive indication of compliance with the planning condition.

### 4.2 Functional Area

The electroacoustic system within the Functional area was used with a typical exercise music track, with the volume turned up to the highest level permitted by the limiter system. Measurements of sound level were made within the Functional area of the Gym. The results of the measurements are presented in Table 1 below.

Table 2– Measured Noise Levels from Electroacoustic system in Functional Area

| Space           | Measured Sound Pressure Level (dB re 20x10 <sup>-6</sup> Pa.)<br>@ Octave Band Centre Frequency (Hz) |     |     |     |    |    |    |    | dBA |
|-----------------|------------------------------------------------------------------------------------------------------|-----|-----|-----|----|----|----|----|-----|
|                 | 63                                                                                                   | 125 | 250 | 500 | 1k | 2k | 4k | 8k |     |
| Functional Area | 70                                                                                                   | 84  | 80  | 78  | 82 | 76 | 73 | 69 | 85  |

Observations of noise breakout were undertaken at the external façade of the Gym, and the nearest residential dwellings closest to the Studio area of the Gym. No noise from Gym amplified music noise was audible above the otherwise ambient sound levels in these areas, which was measured to be NR49.

Based on the above, it cannot be determined quantitatively that amplified sound transfer from the Studio area of the Gym is compliant with the adopted criterion at the nearest noise sensitive properties along Golwg-Y-Gamlas, however, given that music noise was noted to be inaudible immediately outside of the Gym, it is considered that this is a positive indication of compliance with the planning condition.

# APPENDICES

## Appendix A      Acoustic Terminology

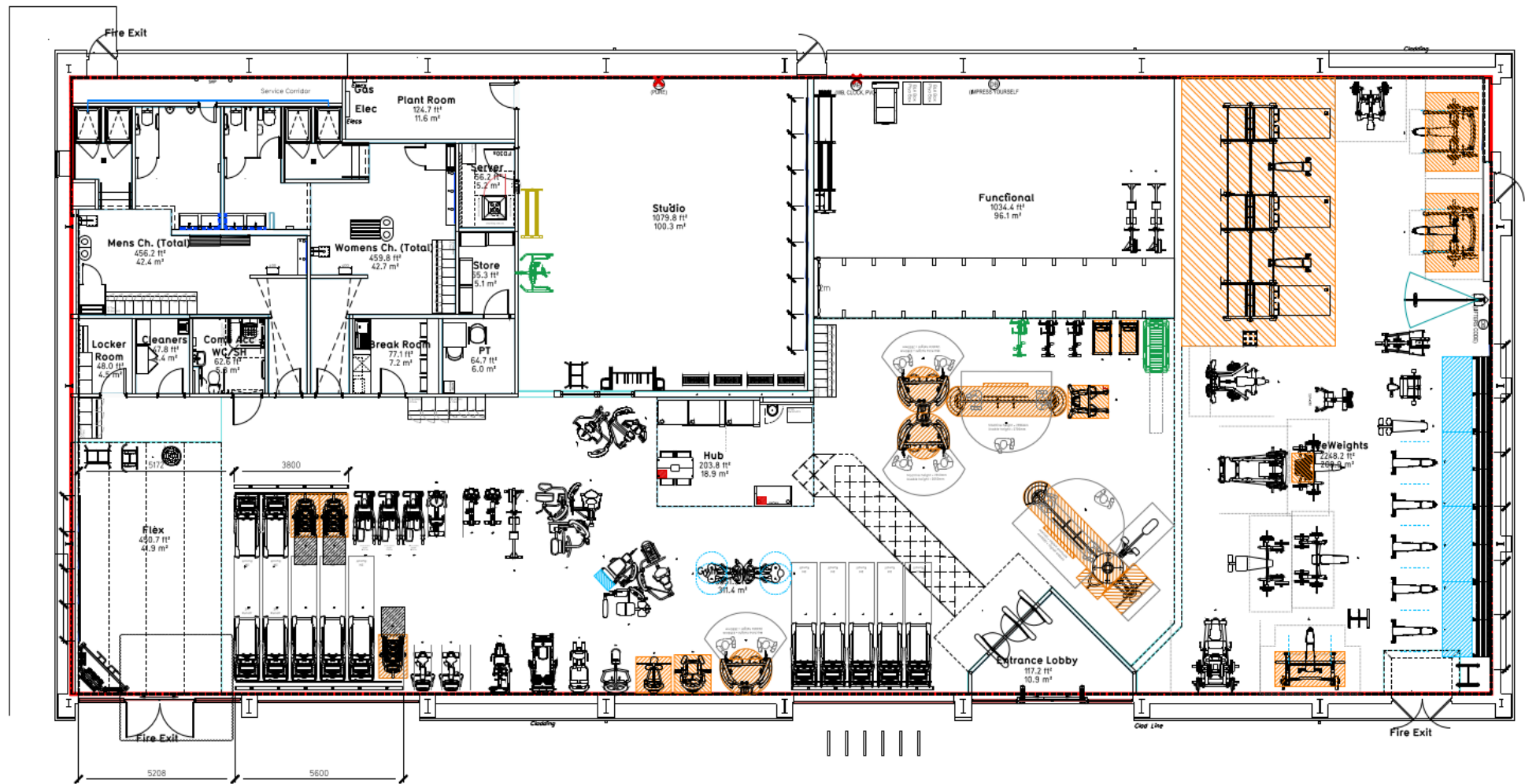
|                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 Layout Plans



PureGym, Neath  
Site Plan

Figure A  
Not to Scale



PureGym, Neath  
 PureGym Layout Plan

Figure B  
 Not to Scale

## Appendix C      Details of Measurement Equipment

| Manufacturer                      | Model Type | Serial No. | Calibration        |             |
|-----------------------------------|------------|------------|--------------------|-------------|
|                                   |            |            | Certificate No.    | Valid Until |
| Norsonic Type 1 Sound Level Meter | Nor140     | 1407961    | 477987612          | 8 May 2025  |
| Norsonic Pre Amplifier            | 1209       | 23789      |                    |             |
| Norsonic ½" Microphone            | 1225       | 496124     |                    |             |
| Norsonic Sound Calibrator         | 1255       | 125526425  | Cal 022-2023-17161 | 5 May 2025  |

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