



PUREGYM, NEATH

Plant Noise
Commissioning
Assessment

Reference: 11245.RP01.PNCA.0

Prepared: 8 January 2025

Revision Number: 0

PureGym

Town Centre House

Merrion Centre

Leeds

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Plant Noise Commissioning Assessment



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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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Contents

1.0 INTRODUCTION..... 1

2.0 SITE DESCRIPTION & PLANT NOISE EMISSION LIMITS 2

3.0 PLANT NOISE COMMISSIONING ASSESSMENT 3

4.0 CONCLUSIONS..... 6

APPENDIX A - ACOUSTIC TERMINOLOGY

APPENDIX B – SITE PLANS & MEASUREMENT POSITIONS

APPENDIX C - INSTRUMENTATION

INTRODUCTION

As part of the refurbishment and fit out of the Unit at Neath Retail Park, Neath, Wales for PureGym, a number of new external noise generating plant items have been installed. Condition 4 of the planning approval reference P2024/0257 states the following:

The noise rating level emitted from external plant shall not be greater than the existing background noise level. The noise levels shall be determined at the nearest noise-sensitive premises or at another location that is deemed suitable by the Local Planning Authority. Measurements and assessments shall be made in accordance with "BS 4142:2014 Method for rating and assessing industrial and commercial sound".

RBA Acoustics has been commissioned to undertake an assessment of noise from the external plant items in order to ensure that the target noise levels identified in the submitted Noise Impact Assessment are complied with. The noise impact assessment submitted with the planning application is the acoustics report reference 13484.RP02.ENS dated 4th April 2024.

Now that the plant has been installed and commissioned, and the recommended mitigation measures applied, this report presents the details and results of acoustic commissioning assessments undertaken to demonstrate practical compliance with the Planning Condition 4 above.

The report occasionally employs technical acoustic terminology. In order to assist the reader, a glossary of terms is included in Appendix A.

SITE DESCRIPTION & PLANT NOISE EMISSION LIMITS

2.1 Site Description

The Gym is located at Neath Retail Park in Neath, Wales. The unit is located along the northeastern end of the retail park, adjacent Golwg-Y-Gamlas, beyond which are a number of residential properties.

The plant serving the new Gym is located at the rear of the unit, along the eastern elevation. The rear of the unit is at a lower level than Golwg-Y-Gamlas and the residential properties beyond, such that there is a degree of natural acoustic screening provided.

A plan of the site is provided in the Figure A in Appendix B.

2.2 Location of Nearest Residential Receptors

The closest affected noise sensitive properties are identified to be those on the opposite side of Golwg-Y-Gamlas to the site.

These properties are indicated below in Figure A in Appendix B.

2.3 Plant Noise Emission Limits

As stated within the planning conditions (ref. P2024/0257 dated 26 April 2024):

The noise rating level emitted from external plant shall not be greater than the existing background noise level. The noise levels shall be determined at the nearest noise-sensitive premises or at another location that is deemed suitable by the Local Planning Authority. Measurements and assessments shall be made in accordance with "BS 4142:2014 Method for rating and assessing industrial and commercial sound".

Based on the above planning condition, and the typically lowest noise levels representative of those at the nearest affected noise sensitive properties along Golwg-Y-Gamlas, the following plant noise emission limits were recommended in the RBA Acoustics report reference 13484.RP02.ENS dated 4th April 2024.

Table 1 – Plant Noise Emission Limits

Period	Cumulative Plant Noise Limit (dB)
Daytime (07:00 – 23:00)	47dB $L_{Ar,T}$
Night-time (23:00 – 07:00)	32dB $L_{Ar,T}$

These limits are to be achieved at 1 metre from the façade of the noise sensitive properties along Golwg-y-Gamlas due to cumulative operation of the proposed PureGym plant at representative worst-case duty.

In line with BS4142, 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.

PLANT NOISE COMMISSIONING ASSESSMENT

3.1 General

Measurements and observations of noise from the installed plant items were undertaken by Aaron Moroney (Bsc, MIOA) and Joe Day (BEng, AMIOA) of RBA Acoustics on Friday 13th December 2025.

During the measurement period weather conditions were considered appropriate for the measurement of noise, it being dry with light winds around 2 m/s. The temperature was recorded to be around 7 degrees centigrade and partly cloudy with still winds.

Details of the instrumentation used to undertake the measurements are provided in Appendix C. The sound level meter was calibrated both prior to and on completion of the survey with no significant calibration drift observed. The measurements equipment has been laboratory calibrated within the past 2 years, with the field calibrator having undergone an additional calibration check within the past year.

3.2 Measurement Locations

Measurements of noise were undertaken for each item of noise generating plant, where noise from the plant was audible above the otherwise residual sound level at close range. Measurements of noise for each plant item were undertaken over a period of time considered suitable so as to not have been significantly affected by residual sound, but not less than 1 minute.

Additionally, a measurement of the residual sound level close to the plant location was undertaken with all plant switched off in order that a suitable correction may be applied to the ambient sound levels measured close to the plant in order to determine the specific sound levels, in accordance with the methodology within BS 4142 (Methods for rating and assessing industrial and commercial sound) methodology.

3.3 Identified Noise Generating Plant Items

Immediately prior to the measurements of noise from the plant, the heating within the PureGym unit was turned up high so as to present a high load on the condenser units lined up along the rear façade of the unit, as indicated in Figure 1 below. This was considered to represent worst case operation of these units.

Figure 1 – Installed Condenser Units



In addition, all other items of air handling plant were confirmed to be switched on and operating at design duty, however, no noise was audible from the external louvres and grilles at close location. As such, noise from the air handling plant has not been considered further in this assessment as it was not audible.

From our observations on site, noise from the installed condenser units was noted to be audible at close inspection and are considered further in this assessment of noise impact.

3.4 Assessment of Noise from Condenser Units

The results of the sound level measurements close to the installed condenser units are presented in Table 2 below.

Table 2– Measured Sound Levels

Measurement	Measured Sound Pressure Level (dB re 20x10 ⁻⁶ Pa.) @ Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Residual Sound Level with condenser units off (L _{eq, T} , dB)	58	49	46	42	42	38	34	30	46
Ambient Sound Level with condenser units operating (L _{eq, T} , dB)	73	70	65	66	65	59	53	47	69

In correcting the ambient sound level measurements of the plant for residual sound, the following specific sound levels of the plant are obtained:

Table 3– Plant Specific Sound Levels

Measurement	Specific Sound Pressure Level (dB re 20x10 ⁻⁶ Pa.) @ Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Specific Sound Level with condenser units operating (L _{eq, T} , dB)	72	70	65	66	65	59	53	47	69

Finally, correcting the above specific sound levels of plant for distance (50 metres) and screening, the following sound levels are expected at the façade of the nearest affected noise sensitive properties along Golwg-Y-Gamlas.

Table 4–Specific Sound Level at the Identified Noise Sensitive Receptors

Measurement	Specific Sound Pressure Level (dB re 20x10 ⁻⁶ Pa.) @ Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Condenser Units @ 1 metre	27	22	14	12	11	5	-1	-7	15

The total noise level at the noise sensitive receptors is 15 dB L_{A,r,T}. This is within the adopted plant noise emission limit of 47dB L_{A,r,T} during the daytime and 32dB L_{A,r,T} during the night.

It is concluded, therefore, that plant noise emissions are in accordance with the requirements of the Local Authority such that planning Condition 4 can be discharged.

CONCLUSIONS

RBA Acoustics has been commissioned to undertake an assessment of noise from the external plant items in order to ensure that the target noise levels identified in the submitted Noise Impact Assessment are complied with. These target noise levels are referenced within Condition 4 of the planning approval reference P2024/0257.

Now that the plant has been installed and commissioned, measurements of environmental noise were undertaken for each item of noise generating plant, where noise from the plant was audible above the otherwise residual sound level at close range.

Based on the measured noise levels at the site, the total noise level at the nearest affected noise sensitive receptors along Golwg-Y-Gamlas to the north of the site due to the operation of the plant is calculated to be 15dBA. This is within the adopted plant noise emission limit of 47dB $L_{A,r,T}$ during the daytime and 32dB $L_{A,r,T}$ during the night., and it is concluded, therefore, that plant noise emissions are in accordance with the requirements of the Local Authority such that planning Condition 4 can be discharged.

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.

Appendix B – Site Plans & Measurement Positions



Appendix C - Instrumentation

The following equipment was used for the measurements

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 1/2" Microphone	1225	496124		
Norsonic Sound Calibrator	1255	125526425	Cal 022-2023-17161	5 May 2025

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