

THE FITNESS MOSAIC
Noise Assessment
Rp 001 r01 20140501UK

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Project: **THE FITNESS MOSAIC**

Prepared for: **Leisure Asset Management
81-84 Chalk Farm Road
London
NW1 8AR**

Attention: **Joe Proops**

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Registered office: 1-5 Offord Street, London, N1 1DH

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EXECUTIVE SUMMARY

Marshall Day Acoustics has been requested by Leisure Asset Management to undertake an assessment of the music noise emitted from the Fitness Mosaic gym, 81-84 Chalk Farm Road, London, NW1 8AR. It has been understood that there have been complaints, regarding the music noise, from nearby residents.

A noise survey has been undertaken around the surrounding area to establish the music noise level. The results have been compared against Camden Council's noise policies.

The assessment of the music emanating from the Fitness Mosaic has shown it complies with the limits provided within Camden's Development Policy DP 28.

Further mitigation, to minimise complaints, could be undertaken. Our general recommendations would be as follows.

- Fit locks to the secondary glazing so windows cannot readily be opened.
- Close the windows to Studio 4.
- Reduce the music level within Studio 1.

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APPENDIX A GLOSSARY OF TERMINOLOGY

1.0 INTRODUCTION

Marshall Day Acoustics has been requested by Leisure Asset Management to undertake an assessment of the music noise emitted from the Fitness Mosaic gym, 81-84 Chalk Farm Road, London, NW1 8AR. It has been understood that there have been complaints, regarding the music noise, from nearby residents.

A noise survey has been undertaken around the surrounding area to establish the music noise level. The results have been compared against Camden Council's noise policies.

This report details our survey, assessment and findings. A glossary of acoustic terminology used in this report may be found in Appendix A.

2.0 CRITERIA

The Fitness Mosaic is located within the London Borough of Camden. The most relevant guidance, in relation to music noise, is contained within the document *Camden Development Policies 2010-2025 Local Development Framework*. Table D in Development Policy 28 – *Noise and Vibration* provides Camden’s policy on noise from ‘places of entertainment’ which is assumed to cover music noise. It states:

“Noise levels from places of entertainment on adjoining residential sites at which planning permission will not be granted

| Noise description and measurement location | Period | Time | Sites adjoining places of entertainment |
|---|-----------------|-------------|---|
| Noise at 1 metre external to a sensitive façade | Day and evening | 0700-2300 | $L_{Aeq,5m}$ shall not increase by more than 5dB* |
| Noise at 1 metre external to a sensitive façade | Night | 2300-0700 | $L_{Aeq,5m}$ shall not increase by more than 3dB* |
| Noise inside any living room of any noise sensitive premises, with the windows open or closed | Night | 2300-0700 | $L_{Aeq,5m}$ (in the 63Hz Octave band measured using the ‘fast’ time constant) should show no increase in dB* |

** As compared to the same measure, from the same position, and over a comparable period, with no entertainment taking place”*

As the Fitness Mosaic operates within 0700 to 2300 hours, the daytime and evening period will apply.

3.0 NOISE SURVEY

The Fitness Mosaic is a gym located in a detached three storey building, setback of Chalk Farm Road. It is located in a courtyard and is generally surrounded by residential properties.

A survey of the existing noise environment was made around the Fitness Mosaic in areas representative of the nearest noise sensitive receivers. Noise measurements were also made inside the Studios with classes taking place.

Details of the noise survey are presented below.

3.1 Date & Personnel

The noise survey was undertaken on the evening of Wednesday 7th May 2014 between 1700 and 2000 hours. This period was selected as all of the main Studios were in operation.

Measurements were undertaken by Daryl Prasad of Marshall Day Acoustics.

3.2 Instrumentation

Measurements were undertaken using the following equipment:

- Brüel and Kjær Type 2250 Sound Level Meter Serial No. 3002076;
- Brüel and Kjær Type 4189 ½" Microphone Serial No. 2839811, and;
- Brüel and Kjær Type 4231 Sound Calibrator Serial No. 3004051.

The calibration of the sound level meter was checked both before and after the measurements with no significant drift noted.

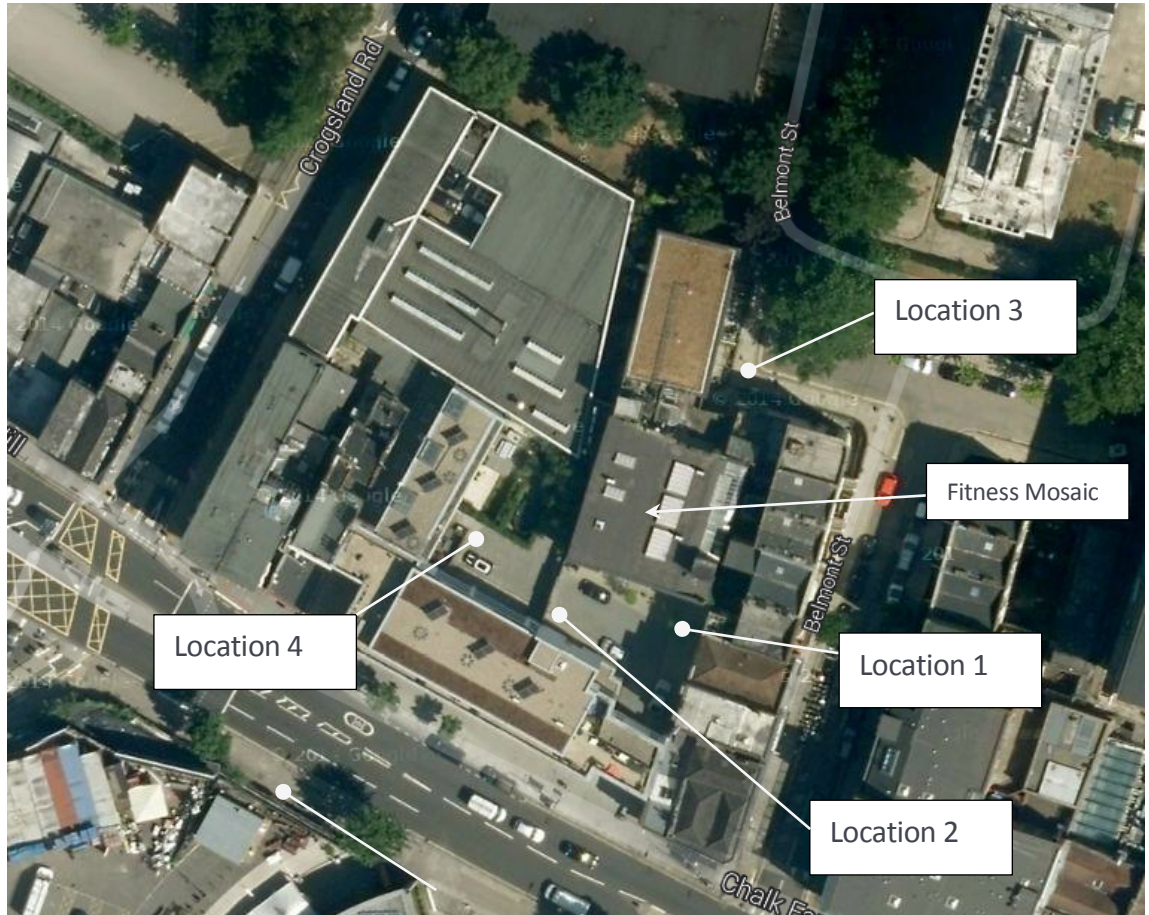
3.3 Weather

The weather was generally overcast with a gusty breeze. Recorded temperatures ranged from 14 to 16 °C.

3.4 Measurement Locations

Figure 1 shows the measurement locations. All measurement locations, except Location 3, were made one metre from a façade. In location 3 we were unable to measure close to a façade and these measurements are generally free from the influence of façades.

Figure 1: Site plan and measurement locations



3.5 Ambient Environment

The general noise environment consisted of road traffic noise and wind in trees. There were the occasional aircraft and helicopter pass-bys.

3.6 Results

A wide variety of acoustic variables were measured during our survey however the most relevant is the 'average' noise level (L_{Aeq}), which is presented in Table 1 below. Internal measurements within the Studios are shown in Table 2.

Table 1: Summary of music noise levels

| Location | Start Time (hhmm) | Measured Noise Level dB L _{Aeq} , 5 mins | Primary Music Source |
|----------|-------------------|--|-------------------------------------|
| 1 | 1722 | 60 | Ambient (no music) |
| 1 | 1820 | 60 | Studio 4, windows open |
| 2 | 1730 | 56 | Ambient (no music) |
| 2 | 1845 | 58 | Studio 1 (secondary glazing open) |
| 2 | 1906 | 57 | Studio 1 (secondary glazing closed) |
| 3 | 1738 | 55 | Ambient (no music) |
| 3 | 1936 | 54 | Studio 1 (music not audible) |
| 4 | 1915 | 50* | Ambient (no music) |
| 4 | 1900 | 51 | Studio 1 (secondary glazing closed) |
| 4 | 1945 | 54 | Studio 4 music loud, windows open |

*Measured between classes, duration 4 minutes and 26 seconds

Table 2: Internal music noise levels

| Studio | Start Time (hhmm) | Measured Noise Level dB L _{Aeq} | Class |
|--------|-------------------|---|--------------|
| 1 | 1838 | 92 | Body Booster |
| 1 | 1929 | 91 | Dance Fusion |
| 2 | 1834 | 83 | Group Cycle |
| 3 | 1950 | 77 | Tabata |

4.0 DISCUSSIONS

During our visit, music noise was audible in Locations 1, 2 and 4 but was not audible in Location 3. Outside the main sources of music noise, that was audible, were from Studios 1 and 4. Studio 1 has a large sound system and is able to generate a high noise level, particularly in the lower frequencies. The windows in Studio 4 were open allowing sound to freely escape.

Studios 2 and 3 were not audible outside. Studio 2 has no external windows and generally there is no direct connection to the external façade. The levels in Studio 3 were relatively low and this was not audible outside.

Table 3 below shows the relative increase in ambient noise level due to music from the gym. None of the levels exceed the ambient noise level by more than 5 dB and therefore would comply with the limits provided within Camden’s Development Policy DP 28.

Table 3: Summary of music noise levels

| Location | Increase in Ambient Level dB L _{Aeq, 5 mins} | Music Noise Source |
|----------|--|-------------------------------------|
| 1 | 0 | Studio 4, windows open |
| 2 | +1 | Studio 1 (secondary glazing closed) |
| 2 | +2 | Studio 1 (secondary glazing open) |
| 4 | +1 | Studio 1 (secondary glazing closed) |
| 4 | +4 | Studio 4 music loud, windows open |

To minimise future complaints it may be possible to undertake a few simple steps to mitigate music noise to the surrounding residential. Our general recommendations would be as follows.

1. Fit locks to the secondary glazing so windows cannot readily be opened (we intentionally closed these during our visit but they were opened by either staff or patrons).
2. Close the windows to Studio 4, this could provide a 10 to 15 dB reduction in music noise, at the residential properties, which would effectively make Studio 4 inaudible.
3. Reduce the music level within Studio 1. A 1 to 2 dB decrease in sound level may significantly reduce the number of complaints whilst still maintaining a relatively high level inside. From our visual inspection it appears the amplifiers already have equalisation and limiters inbuilt. It may be a simple case of enabling these, to both limit, and maximise (EQ), the internal level.

5.0 CONCLUSIONS

- The assessment of the music noise emanating from the Fitness Mosaic has shown it complies with the limits provided within Camden's Development Policy DP 28.
- Further mitigation, to minimise complaints, could be undertaken.
- Our general recommendations would be as follows.
 1. Fit locks to the secondary glazing so windows cannot readily be opened.
 2. Close the windows to Studio 4.
 3. Reduce the music level within Studio 1.

APPENDIX A GLOSSARY OF TERMINOLOGY

| | |
|--------------------------------|--|
| SPL or L_p | <u>Sound Pressure Level</u> A logarithmic ratio of a sound pressure measured at distance, relative to the threshold of hearing (20 μ Pa RMS) and expressed in decibels. |
| dB | <u>Decibel</u> The unit of sound level. Expressed as a logarithmic ratio of sound pressure P relative to a reference pressure of $P_r=20 \mu\text{Pa}$ i.e. $\text{dB} = 20 \times \log(P/P_r)$ |
| dBA | The unit of sound level which has its frequency characteristics modified by a filter (A-weighted) so as to more closely approximate the frequency bias of the human ear. |
| A-weighting | The process by which noise levels are corrected to account for the non-linear frequency response of the human ear. |
| $L_{Aeq}(t)$ | The equivalent continuous (time-averaged) A-weighted sound level. This is commonly referred to as the average noise level. The suffix "t" represents the time period to which the noise level relates, e.g. (8 h) would represent a period of 8 hours, (15 min) would represent a period of 15 minutes and (2200-0700) would represent a measurement time between 10 pm and 7 am. |
| Frequency | The number of pressure fluctuation cycles per second of a sound wave. Measured in units of Hertz (Hz). |
| Hertz (Hz) | Hertz is the unit of frequency. One hertz is one cycle per second. One thousand hertz is a kilohertz (kHz). |
| Octave Band | A range of frequencies where the highest frequency included is twice the lowest frequency. Octave bands are referred to by their logarithmic centre frequencies, these being 31.5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, and 16 kHz for the audible range of sound. |
| Noise | A sound that is unwanted by, or distracting to, the receiver. |
| Ambient | The ambient noise level is the noise level measured in the absence of the intrusive noise or the noise requiring control. Ambient noise levels are frequently measured to determine the situation prior to the addition of a new noise source. |