

INTERNAL AMBIENT NOISE REPORT

**501 BARLOW MOOR ROAD, CHORLTON, MANCHESTER, M21
8AG**

REPORT REFERENCE NO. J004347-7096-LK-02

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Tel: 01925 759380

Email: enquiries@pdaltd.com

Web: www.pdaltd.com



Document Control Sheet

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Client Address:	Company Address:
Southern Gate 729 Princess Road Didsbury Manchester M20 2LT	Philip Dunbavin Acoustics Ltd 3 Bridgewater Court Barsbank Lane Lymm WA13 0ER

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01	23/05/2023	LK	Initial Issue	Final
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	Name	Position
Prepared By	Liam Kavaney MIOA	Consultant
Checked By	Chris Lalley MIOA	Senior Consultant

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This report has been prepared based upon a scope of works and associated resources agreed between the client and Philip Dunbavin Acoustics Ltd (PDA). This report has been prepared with all reasonable skill, care and diligence and has been based upon the interpretation of data collected. This has been accepted in good faith as being accurate and valid at the time of the collection. This report has been based solely on the specific design assumptions and criteria stated herein.



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1.0 SUMMARY

PDA has been commissioned by Southway Housing Trust to carry out an acoustic assessment of the internal ambient noise at the conversion development at 501 Barlow Moor Road, Chorlton-cum-Hardy, Manchester, M21 8AG.

The conversion development consists of 3 no. bedsit type flats over the three floors.

The results of the survey were used to evaluate the internal ambient noise level and to assess compliance with the Planning Condition.

The assessment has demonstrated that for both the daytime and the night-time measurements the internal noise environment in the ground, first & second floor accommodation meets the requirements of the planning condition.

2.0 SITE DESCRIPTION

The conversion development consists of a change of use of a former ground floor shop to form 3 no. residential dwelling flats over the ground, first and second floors.

The front of the property overlooks the busy junction of Barlow Moor Road, High Lane, Sandy Lane and Zetland Road. The rear of the property is shielded from line-of-sight sound propagation from the surrounding roads by the building itself and other buildings along Barlow Moor Road which form a continuous barrier between the road and the rear of the property.

A site plan showing the location of the site and surrounding local area is shown in Figure 1 below.

Figure 1. Site Location in red



3.0 NOISE ASSESSMENT CRITERIA

3.1 Planning Condition

The development has Planning Permission ref. 132693/P3MAP/2022, dated 2 February 2022. Planning Condition b states:

b) Prior to first occupation of the residential units, a verification report shall be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic consultant's report. The report shall also undertake post completion testing to confirm that the internal noise criteria have been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the internal noise criteria.

Reason: To secure a reduction in noise from traffic or other sources in order to protect future residents from noise disturbance.

3.2 BS8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

Section 7 of British Standard 8233:2014, *Guidance on Sound Insulation and noise reduction for buildings*, gives guidance on internal noise levels within dwellings, flats and rooms in residential use when unoccupied. The following criteria are for Living and Dining Rooms for daytime use and Bedrooms for night time.

Table 1. BS8233 recommended indoor ambient noise levels

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 L _{Aeq,16hour}	–
Dining	Dining room/area	40 L _{Aeq,16hour}	–
Sleeping (daytime resting)	Bedrooms	35 L _{Aeq,16hour}	30 L _{Aeq,8hour}

It should however be stressed that the above criterion relates to steady noise, in this case from road traffic etc, excluding unusual noise events departing from the typical noise character of the area.

3.3 WHO Guidelines for Community Noise

In 1999, the WHO (World Health Organisation) published Guidelines for Community Noise, stating the following internal noise levels are applicable within dwellings.

Table 2. WHO Guidelines for Community Noise criteria

Specific Environment	Critical Health Effect(s)	L _{Aeq} dB	Time Base (hours)*
Dwelling, indoors	Speech intelligibility & moderate annoyance, daytime & evening	35	16
Inside bedrooms	Sleep disturbance, night time	30	8

* Typically taken to be daytime/evening - 07:00 – 23:00 hours and night time 23:00 – 07:00 hours.

In addition to the above continuous equivalent noise levels, WHO guidelines indicates that exceedances of 45 dB L_{Amax} for single sound events should be limited to no more than 10 – 15 times per night, when measured with a 'fast' time weighting.

4.0 NOISE SURVEY DETAILS

4.1 Survey Times and Dates

Measurements were conducted between 14:35 hours on 9 May 2023 and 12:55 hours on 10 May 2023 and between 16:30 hours on 3 August 2023 and 12:10 hours on 24 August 2023 encompassing full night time periods. It should be noted that measurements from the surveys have been grouped into “day” and “night” categories in accordance with the following times:-

Daytime: Between 0700 and 2300 hours

Night-time: Between 2300 and 0700 hours

5 minute sample durations were taken over the daytime and night time measurement periods, with all measurements being made and partially attended by Mr Liam Kavaney of PDA Ltd.

It should be noted during the daytime period, occasional ongoing construction works from site were in operation and therefore noise measurements where construction activity dominated the internal noise environment have been omitted from the survey results.

4.2 Equipment Used

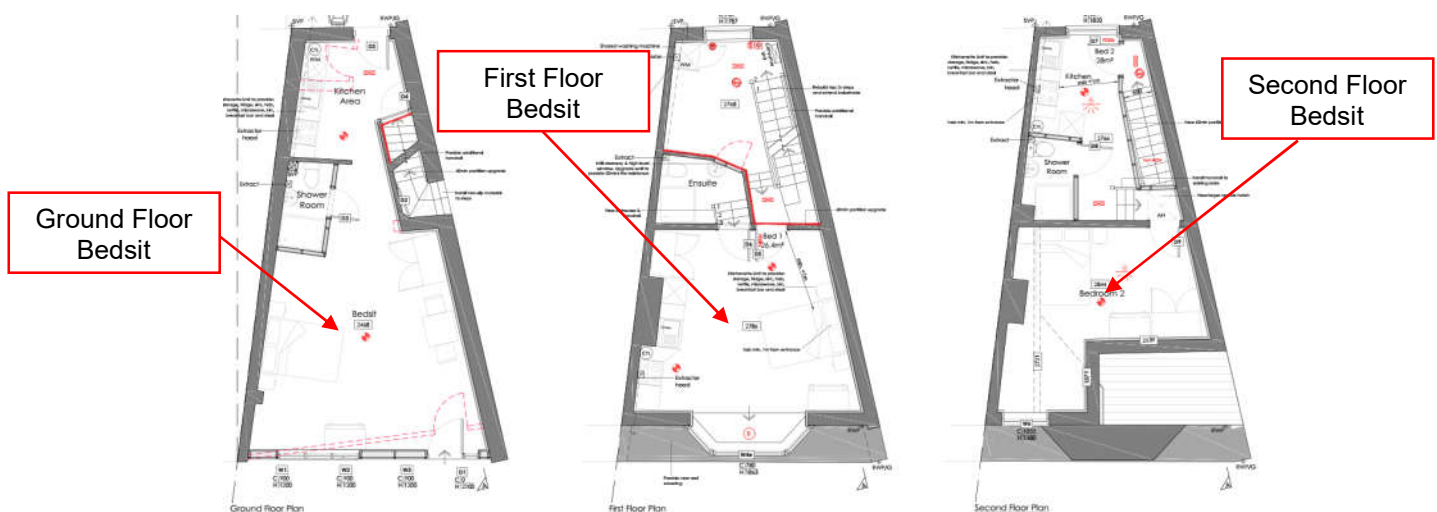
Throughout the survey measurements were undertaken with NTi XL2 and Rion NL-52 sound level meters. The meters are precision grade Class 1 sound level meters (as per BS EN 61672-1: 2002) for which current calibration certificates are held. The meters were set to A-Weighted and fast response. The meters were calibrated directly before any measurement took place and immediately afterwards and no significant drift was observed.

4.3 Measurement Locations

Daytime and overnight measurements were undertaken in three of the bedsits/bedrooms located on the ground, first and second floors of the development. The windows to the rooms all overlooked the dominant noise sources, this being traffic on Barlow Moor Road and High Lane as detailed in Figure 2 below.

All measurements were undertaken with sound level meters mounted on a tripod at a 1.2m height and centrally located within each room. Where acoustic trickle vents were installed, these were left open for the duration of the measurement period. The measurements were undertaken within the following rooms:

Figure 2. Floor Plan Highlighting the Rooms where Noise Monitoring was undertaken



4.4 Description of Noise Sources

Traffic on Barlow Moor Road and High Lane was the main noise source during the survey period. During the initial visits roadworks were observed on Zetland Road and Barlow Moor Road. Occasional internal snagging works contributed to the acoustic climate when in operation. During the August visit rooftop works were in operation on the 4th and therefore where construction activity dominated the internal noise environment the periods have been omitted from the survey results.

4.5 Reverberation Time Within Spaces

It should be noted that these measurements were undertaken within unoccupied rooms that were generally unfurnished and did not include soft furnishings such as bedding, curtains, etc.

Acoustic theory would indicate that noise levels are directly related to the amount of absorption within the space, with a greater amount of absorption reducing the noise level. As the rooms were not fully furnished we have applied a correction to account for a typically furnished 'lived in' room i.e. with a reverberation time of 0.5 seconds in accordance with BS EN ISO 16283-1:2014.

5.0 MEASURED RESULTS

A summary of the noise level measurements is given below. The levels presented in the tables have been rounded to the nearest decibel. The L_{Aeq} levels are the logarithmic average of all the measured noise levels. It should be noted that during the daytime period, some ongoing internal construction works were in operation and therefore noise measurements where construction activity dominated the internal noise environment have been omitted from the survey results. The noise measurements from the survey are summarised in the tables below:

Table 3. Summary of Daytime Noise Levels

Room	Date	Time Period (hh:mm)	Criteria $L_{Aeq,T}$ (dB)	Measured $L_{Aeq,T}$ (dB)
Ground Floor Bedsit	16 th to 17 th May 2023	08:15 – 23:00 07:00 – 08:40	35	34
First Floor Bedsit	9 th to 10 th May 2023	14:35 – 23:00 07:00 – 12:45	35	30
Second Floor Bedroom	3 rd to 4 th August 2023	16:30 – 23:00 07:00 – 07:45 09:55 – 10:40	35	27

Table 4. Summary of Night-time Noise Levels

Room	Date	Time Period (hh:mm)	Criteria $L_{Aeq,T}$ (dB)	Measured $L_{Aeq,T}$ (dB)	No. of Times 45dB L_{Amax} Exceeded*
Ground Floor Bedsit	16 th to 17 th May 2023	23:00 – 07:00	30	18	14
First Floor Bedsit	9 th to 10 th May 2023	23:00 – 07:00	30	23	6
Second Floor Bedroom	3 rd to 4 th August 2023	23:00 – 07:00	30	21	5

* WHO guidelines state that for a good sleep, the indoor sound pressure levels should not exceed approximately 45dB L_{Amax} more than 10 – 15 times a night.



5.1 Discussion of Results

The tables above indicate that the measured internal noise levels within the ground, first & second floor bedsit/bedrooms meet the requirements of BS8233:2014 and WHO Guidelines for Community Noise and therefore it is considered that the measurements within these rooms demonstrate compliance of with the Planning Condition.

APPENDIX A – DEFINITION OF ACOUSTIC TERMS

The decibel

This is the basic unit of noise, denoted dB.

A Weighting

This is a weighting process which simulates the human ear's different sensitivity at different frequencies. A weighting can be shown two typical ways, 50 dB(A) L_{eq} or 50 dB L_{Aeq} . Both mean the same thing. (See below for a definition of L_{eq}). The dB(A) level can be regarded as the overall level perceived by human beings.

L_{eq} and $L_{eq(s)}$

This is the equivalent continuous noise level which contains the same acoustic energy as the actual time-varying sound. In other words it is a kind of average noise level. It is denoted dB L_{eq} or, for A-weighted figures dB(A) L_{eq} or dB L_{Aeq} . It can also be expressed in terms of frequency analysis (see later). $L_{eq(s)}$ is the sample L_{eq} level.

L_n

This is the level exceeded for n% of the time. It is denoted dB L_n or, for A-weighted figures dB(A) L_n or dB L_{An} . It can be expressed in terms of frequency analysis (see later). L_{90} is the level exceeded for 90% of the time and is a measure of the lowest level typically reached. L_{10} is the level exceeded for 10% of the time and is the highest level typically reached. L_{50} is the level exceeded for 50% of the time and, mathematically, it is the median.

L_{max}

This is the maximum level reached during a measurement period. The "time constant", or the ability of the equipment to respond to impulses is usually expressed along with it, e.g. "Fast", "Slow", etc. It is denoted dB L_{max} or, for A-weighted figures dB(A) L_{max} , dB L_{Amax} , etc. It can also be expressed in terms of frequency analysis.

Frequency Analysis

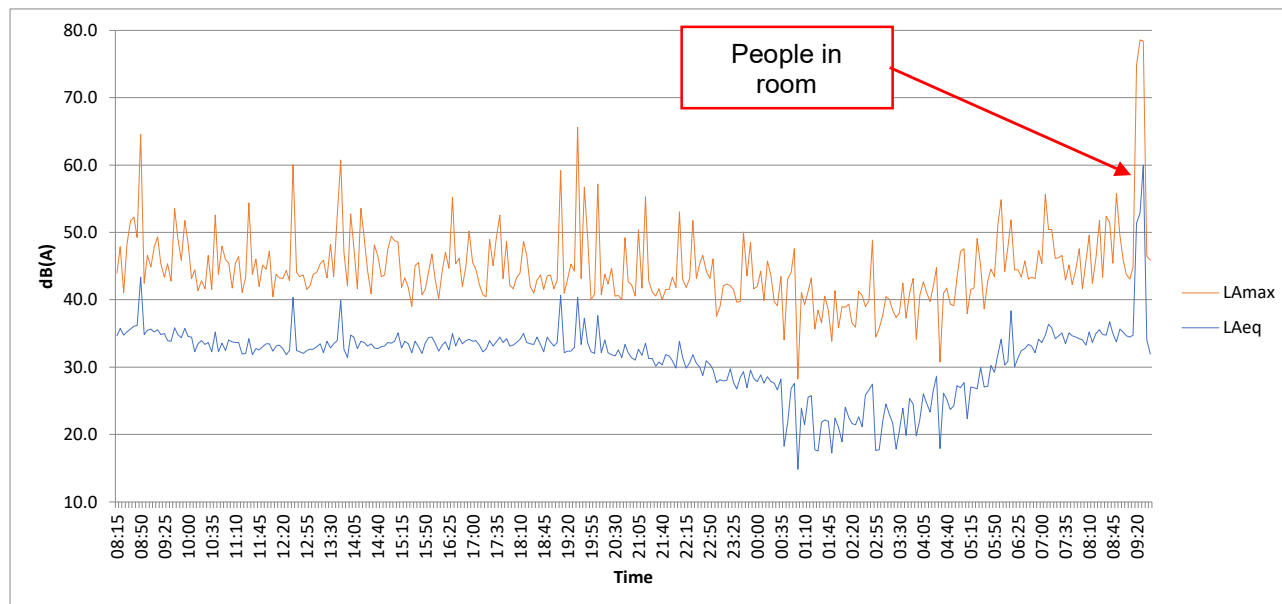
Whereas dB(A) gives a very useful overall figure, it has its limitations in that it cannot be used to model or predict the effect of noise control and mitigation as this nearly always has radically different performance at different frequencies.

Frequency analysis expresses an overall noise level at each frequency or band of frequencies in the audible range. Octave band analysis divides the audible range into 10 bands from 31.5 Hz to 16 kHz and the noise level in each band can be expressed in any form e.g. L_{eq} , L_{90} , L_{max} etc. One third octave band analysis uses 30 bands.

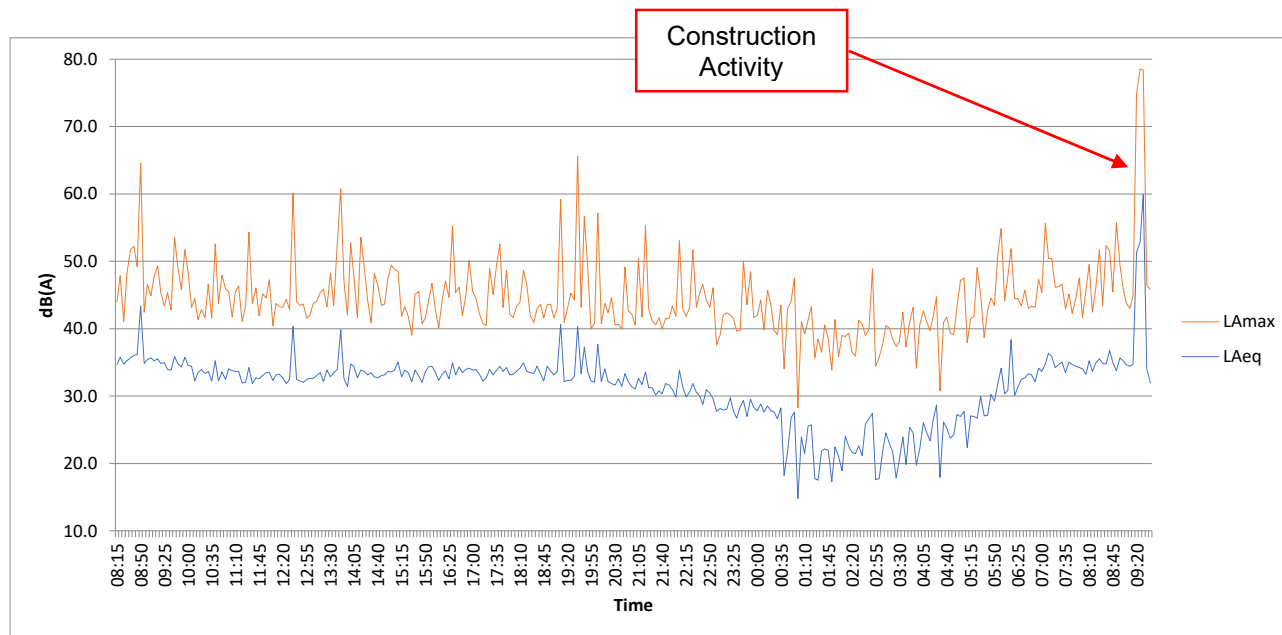
Narrow band analysis takes the process to resolutions of less than 1 Hz. This is useful for identifying the existence of tones (whines, hums, etc.) and in pin-pointing the sources.

APPENDIX B – NOISE SURVEY RESULTS

Internal Noise measurements – Ground Floor Room



Internal Noise measurements – First Floor Room



Internal Noise measurements – Second Floor Room

