

PEAK acoustics



Post Completion Validation

Client: Roger Finch

Site: 194 Rochdale Road, Middleton, M24 2QA

Reference No. 0702234NR

Revision: 0.0

Date of Issue: 12/07/2024

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1. Introduction

1.1. Assessment Summary

A Post Completion Validation Assessment has been conducted at 194 Rochdale Road, Middleton to determine whether internal noise levels in habitable rooms are within the assessment criteria of BS8233:2014 as requested within Rochdale Council decision notice for the application. The proposal is for the change of use of 1st floor to a self-contained flat.

2. Installed Façade Elements

Observations from the validation survey site visit noted that new glazing units had been installed on site which the client confirmed to be of the specifications noted within the original noise assessment report (1310222NR).

It was also noted that through wall vents have been fitted throughout the residential areas of the site as recommended within the previous survey.

3. Design Criteria

Guidance on sound insulation and noise reduction for buildings, Table 4, Section 7.7.2., will be used as the indoor criteria assessment levels.

In the case of individual noise events (L_{AFmax} events), additions of ProPG states the following:

“NOTE 4 Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events.”

The criteria values for the assessment are summarised below.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$
Sleeping	Bedroom	-	45 dB L_{AFmax}

Table 1: Indoor Ambient Noise Levels for Dwellings

4. Internal Noise Survey

4.1. Survey Measurement

To assess the internal noise levels within the site, an unattended noise survey has been undertaken over 24 hours. Windows were closed throughout the survey.

The sound level meter was positioned within the 1st floor bedroom of the site at a height of approximately 1.5 metres from the floor and an equal distance from the surrounding walls.

The room was unfurnished and not carpeted at the time of the survey.

Measurements of $L_{Aeq,T}$ and L_{AFmax} were logged in 5-minute intervals in accordance with the provisions of BS7445 - 'Description and Measurement of Environmental Noise'.

The monitoring location is shown on the site plan below in **Figure 1**:

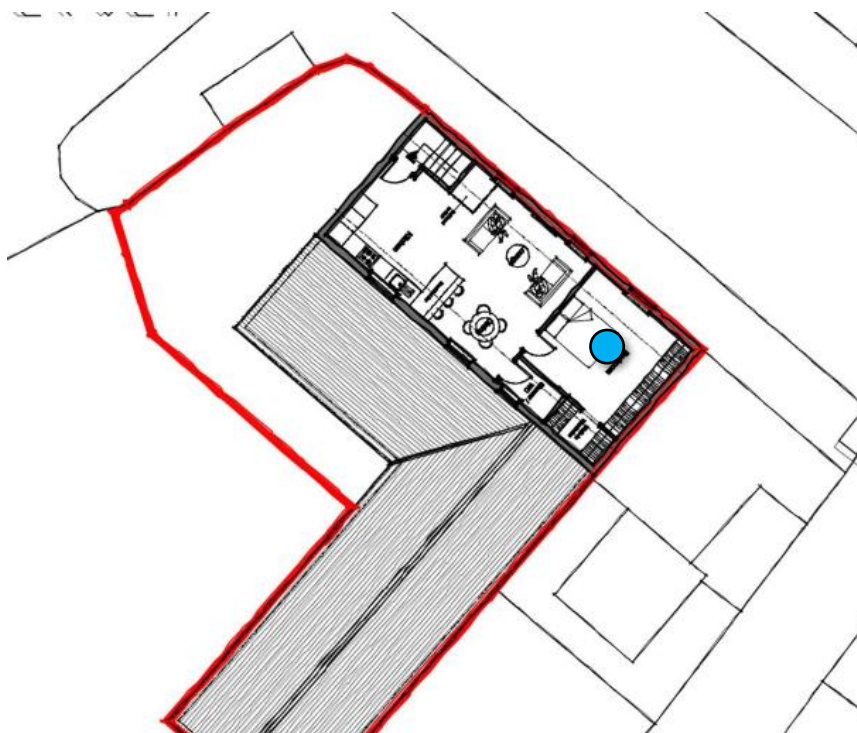


Figure 1: Site layout and Monitoring Location

● Monitoring Location M1

External daytime temperatures of between 13 - 15 °C were noted during the survey with winds of 3 – 4m/s. Detailed weather conditions are given in **Appendix C**.

4.2. Measurement Equipment

Measurement equipment complies with accuracy requirements for common environmental noise measurement standards. Equipment was calibrated before and after use and no significant drift

occurred during measurements. Up-to-date calibration certification can be provided upon request. A detailed equipment list is given in **Appendix B** with calibration information in **Appendix D**.

5. Internal Noise Levels

Noise levels measured within the site are provided below:

Internal Space	Noise Parameter	Internal Noise Level (dB)	Within Design Criteria?
Bedroom	Daytime $L_{Aeq, 16hr}$	28	Yes
	Night-time $L_{Aeq, 8hr}$	24	Yes
	Night-time $L_{Amax F}$	45	Yes

Table 2: Validation Survey Result

All results are within the 'desirable' criteria of BS8233:2014 and achieve the requirements of condition 4 of Rochdale Council's planning decision.

It is noted that measured levels are also likely to be further reduced once the interior of the site is fully furnished with final floor coverings in place.

6. Conclusions

A Post Completion Validation Assessment has been conducted at 194 Rochdale Road, Middleton, M24 2QA to determine compliance with BS8233:2014 criteria as requested by Rochdale Council in the decision notice for the application.

To validate the internal noise levels an unattended noise survey has been undertaken at the site over a period of 24 hours from the 2nd – 3rd July 2024.

Internal ambient noise levels were determined via measurement to achieve the necessary criteria.

APPENDIX A – Measurement Details

Measurement(s)	Kit	Start Date	Start Time	End Date	End Time
M1	A8	02/07/2024	11:25	03/07/2024	10:55

APPENDIX B - Equipment Details

Kit	Equipment	Make	Model	Class	Serial Number
A8	Sound Meter	Svantek	977	1	45494
A8	Pre-Amp	Svantek	SV12L	1	49995
A8	Microphone	ACO	7052E	1	72673
4	Calibrator	Svantek	SV33	1	90107

APPENDIX C - Meteorology Details

Date	Temp C°	Wind Speed m/s	Wind Direction	Humidity %	Precipitation mm	Cloud Cover (Oktas)
02/07/2024	15	4	NW	62	0.0	5/8
03/07/2024	13	3	SW	82	0.0	7/8

APPENDIX D - Calibration Details

Kit	Calibrator Ref Level (dB)	Deviation Before (dB)	Deviation After (dB)
A8	113.80	0.07	0.40

APPENDIX E – Noise Survey Time History

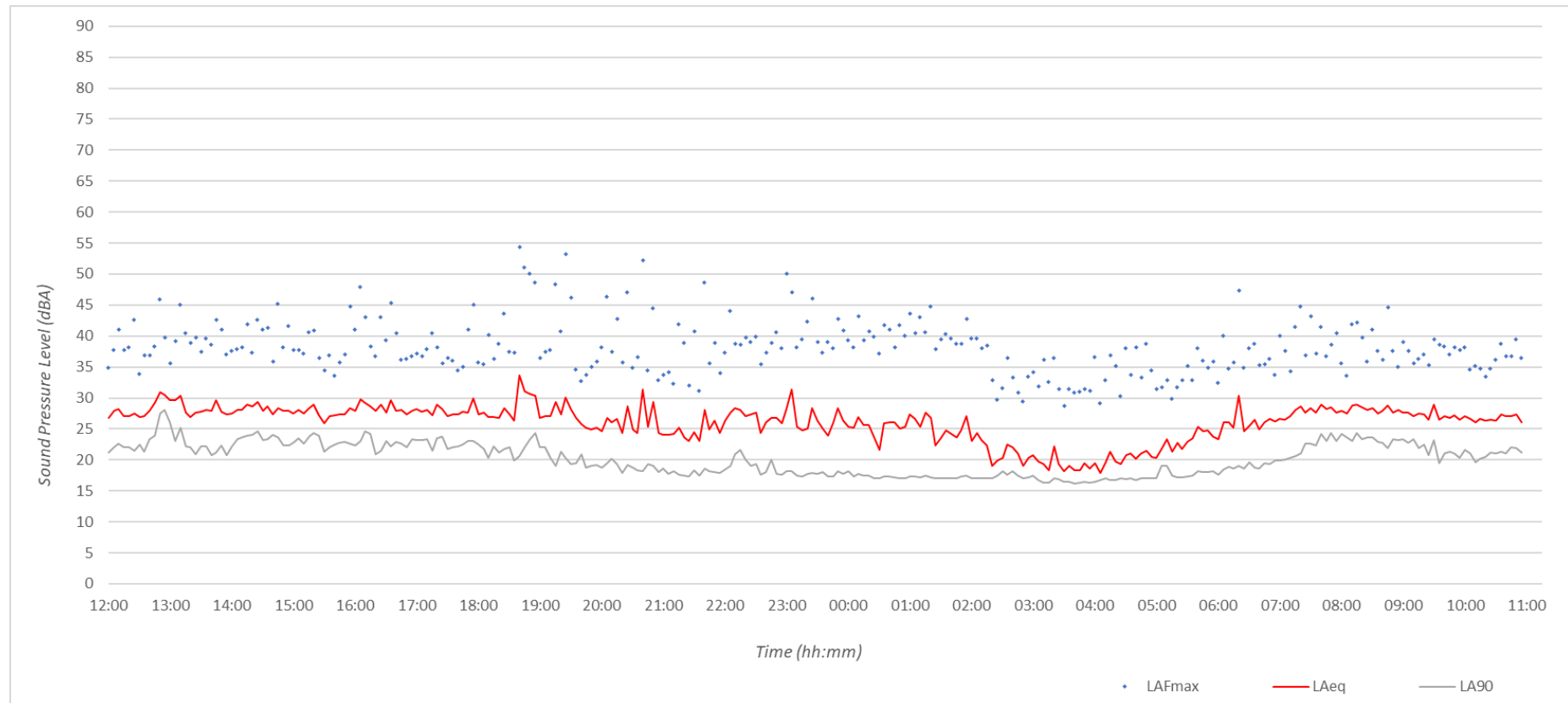


Figure 2: Internal Noise Measurement M1 Time History – 3rd – 4th July 2024

APPENDIX F – Legislation, Policy and Guidance

Guidance for the assessment of noise affecting new residential development is given in the National Planning Policy Framework (NPPF). Section 15 of the NPPF states:

“174. Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of...noise pollution.”

Section 185 further states:

“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

A. Mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

B. Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.”

Section 187 states:

“Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.”

To avoid and mitigate adverse noise effects on health arising from and impacting on new development, the NPPF makes reference to NPSE. The Noise Policy Statement for England (NPSE) was published in March 2010 and covers all forms of noise other than occupational noise.

The Noise Policy Statement for England (NPSE) states the following aims in paragraph 2.2.

NOEL – No Observed Effect Level.

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level.

This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level.

This is the level above which significant adverse effects on health and quality of life occur.

The NPSE does not define the SOAEL numerically, stating in paragraph 2.22:

"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the "NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."

There is no local or national guidance on how the three terms should be defined numerically, it is for the assessor to collate and interpret appropriate guidance on noise, such as may be found in British Standards, and correlate the guidance with the concepts of NOEL, LOAEL and SOAEL.

BS8233:2014 - *Guidance on sound insulation and noise reduction for buildings* suggests indoor ambient noise levels for dwellings in Table 4, Section 7.7.2. These are summarised below.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

BS8233 states that the guideline values given above are for 'noise without character', further stating:

"Noise has a specific character if it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content, in which case lower noise limits might be appropriate."

Table 4 of BS8233 also has accompanying notes that were subject to additions in ProPG. The relevant notes with the additions of ProPG are given below.

"NOTE 4 Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events."

"NOTE 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal L_{Aeq} target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved."

APPENDIX G – Acoustic Terminology

To aid the understanding of acoustic terminology and the relative difference between noise levels the following background information is provided.

We perceive sound when the ear detects fluctuations in air pressure (sound waves), which are then processed by the brain and perceived as sound. Humans can hear an incredibly wide range of sound intensities ranging from jet engines to fingertips lightly brushing against each other. This range is quantified using a logarithmic scale called the decibel scale (dB). The comfortable range of the decibel scale typically ranges from 0dB (the threshold of hearing) to around 140dB. Here are some examples of common environments and their typical noise levels.

Noise Level	Environment
0 dB(A)	Threshold of hearing
20 to 30 dB(A)	Quiet bedroom at night
30 to 40 dB(A)	Living room during the day
40 to 50 dB(A)	Typical office
50 to 60 dB(A)	Inside a moving car
60 to 70 dB(A)	Typical high street
100 to 110 dB(A)	Fire alarm at 1 meter away
140 dB(A)	Threshold of pain

Terminology

dB (decibel) – A unit used to quantify the pressure level of sound. Defined as 20 times the logarithm of the ratio between the root-mean-square pressure of a given sound field and a reference pressure level (2×10^{-5} Pa – threshold of hearing).

$L_{Aeq, T}$ – The equivalent continuous sound pressure level over a stated period. It quantifies a fluctuating sound level over a given period as the equivalent continuous sound level over which the same amount of acoustic energy is contained over. This is A-weighted in order to assess human perception.

L_{Amax} – the maximum RMS A-weighted sound pressure level occurring within a specified time period; the time weighting is typically either Fast or Slow.

A-Weighting – A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.

R_w – The Weighted Sound Reduction Index (R_w) is a number used to rate the effectiveness of a soundproofing system or material.

$D_{n,e,w}$ – The Weighted Sound Reduction Index specifically for ventilators.

C_{tr} – C_{tr} is a spectrum adaptation term which method is defined in BS EN ISO 717. The standard uses a reference curve to determine the weighted value of airborne sound insulation. The spectrum adaptation terms C and C_{tr} may be used to take into account different source spectra. ' C_{tr} ' is the A-weighted urban traffic noise spectrum.