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Castleton, Rochdale

15 November 2023

17170-EBF-01

External Building Fabric Report

Project Number
17170

Issued For
Mr Steven Buckley

EXECUTIVE SUMMARY

This assessment has been undertaken so external building fabric elements can be specified in order to meet appropriate internal noise criteria at 836 Manchester Road, Castleton, Rochdale.

The assessment considers the Local Authority requirements, the principles provided by the *National Planning Policy Framework: 2021 (NPPF)* and internal noise criteria stated within BS 8233: 2014 '*Guidance on sound insulation and noise reduction for buildings*'.

The site currently comprises a recently formed first floor flat above a ground floor commercial unit. The first floor was in use as offices prior to the development works.

Internal noise surveys have been undertaken as detailed in the report, in order to establish the internal noise levels at the site further to the development works, which included installation of new double glazed units.

A subsequent detailed analysis has been carried out of road traffic, railway traffic and commercial noise intrusion through the external building fabric.

The assessment has demonstrated that the internal noise levels being achieved can be considered to be suitable, when considering the requirements of the Local Authority in combination with the guidance of the relevant British Standard.

This report is designed to be suitable to discharge typical noise planning conditions, as per our original scope of work.

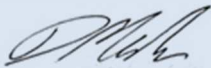
Clement Acoustics has used all reasonable skill and professional judgement when preparing this report. The report relies on the information as provided to us at the time of writing and the assumptions as made in our assessment. This report contains confidential information and should not be disclosed to third parties.

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LIST OF ATTACHMENTS

17170-SP1	Indicative Site Plan
17170-TH1 & TH2	Internal Noise Time History
Appendix A	Glossary of Acoustic Terminology

Issue	Date of Issue	Author
0	15/11/2023	
		Duncan Martin Director BSc (Hons) MIOA

Issue	Comment
0	First Issue

1.0 INTRODUCTION

Clement Acoustics has been commissioned by Mr Steven Buckley to assess the suitability development works undertaken to the site at 836 Manchester Road, Castleton, Rochdale for residential development.

Recent development works have seen a residential flat formed on the first floor of the existing building in place of offices, above retained commercial uses at ground floor.

This report presents the results of internal noise surveys undertaken in order to measure the level of noise that would be experienced by residents, and provides an assessment to established internal noise level criteria.

2.0 SITE DESCRIPTION

The proposed development site is an existing building which previously comprised commercial use at lower and upper ground floors and offices on the first floor. Development works have formed a residential flat at first floor level in place of the offices, with commercial uses below retained.

The site is in a mixed residential and commercial area facing on to Manchester Road, a street largely populated by commercial retail units, takeaways and a pub, some with residential accommodation on upper floors. A railway line runs immediately to the north of the site, entering Castleton Station which is to the east of the site (out the front façade).

At the time of the survey, the background noise climate was dominated by passing road traffic noise on Manchester Road.

It is noted that there were some ongoing roadworks on Manchester Road, although it was observed that there was a constant stream of road traffic, with bus routes unaffected.

3.0 ESTABLISHED DESIGN TARGETS

3.1 Local Authority Requirements

It is understood that the following requirements for internal noise levels have been imposed by the Local Authority:

“Given the close proximity to the road network and the town centre, an acoustic assessment will need to be carried to inform the design of the flats in order to achieve the following internal and external noise levels:

- *35 dB(A) Leq in the bedrooms with windows shut and other means of ventilation provided between 7 am and 11pm;*
- *30 dB(A) Leq in the bedrooms with windows shut and other means of ventilation provided between 11pm and 7am;*
- *35 dB(A) Leq in the living room/s with windows shut and other means of ventilation provided between 7 am and 11pm;*
- *40 dB(A) Leq in other habitable rooms with windows shut and other means of ventilation provided at all times.”*

3.2 National Planning Policy Framework: 2021 (NPPF)

The NPPF, which was first published in 2012 with the latest revision in 2021, outlines the Government’s environmental, economic and social policies for England. The NPPF aims to enable local authorities to produce their own distinctive local and neighbourhood plans, which should be applied in order to meet the needs and priorities of their communities.

Paragraph 185 of The *Ground Conditions and Pollution* section of the NPPF relates specifically to noise stating that:

‘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 impacts 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...’*

3.3 BS 8233: 2014 Internal Noise Criteria

BS 8233: 2014: 'Guidance on sound insulation and noise reduction for buildings' [BS 8233] describes recommended acceptable internal noise levels for residential spaces during daytime and night-time hours. These levels are shown in Table 3.1.

Activity	Location	Design Range $L_{eq,T}$	
		Daytime (07:00 - 23:00)	Night-time (23:00 – 07:00)
Resting	Living Room	35 dB(A)	-
Dining	Dining Room/Area	40 dB(A)	-
Sleeping	Bedroom	35 dB(A)	30 dB(A)

Table 3.1 BS 8233: 2014 recommended internal background noise levels

Note 7 of BS 8233 is considered relevant, which states the following:

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

3.4 Proposed Noise Level Criteria

On the basis of Sections 3.1 to 3.3 above, Table 3.2 presents the proposed design targets to be achieved in the worst affected spaces.

Location	Period	Recommended Criteria	
		Desirable Level $L_{eq,T}$	Worst Case Limit $L_{eq,T}$
Living Rooms	Daytime (07:00-23:00 hours)	35 dB(A)	40 dB(A)
Bedrooms	Daytime (07:00-23:00 hours)	35 dB(A)	40 dB(A)
	Night-time (23:00-07:00 hours)	30 dB(A)	35 dB(A)
Kitchen/Diner	Daytime (07:00-23:00 hours)	40 dB(A)	45 dB(A)

Table 3.2 Proposed noise level criteria

The above design targets and limits will be considered when assessing the measured internal noise levels.

4.0 INTERNAL NOISE SURVEYS

4.1 Unattended Noise Survey Procedure

Measurements were undertaken at two positions in internal spaces as shown on indicative site drawing 17170-SP1. The choice of these positions was based on collecting representative noise data in relation to both facades of the apartment, in rooms with the most stringent requirements (bedrooms).

The positions used for each monitoring location are described in Table 4.1.

Position No.	Description
1	The microphone was mounted on a tripod in the centre of the proposed bedroom on the front façade overlooking Manchester Road.
2	The microphone was mounted on a tripod in the centre of the proposed bedroom on the rear façade with line of sight to the nearby railway lines.

Table 4.1 Description of unattended monitoring locations

Continuous automated monitoring was undertaken for the duration of the survey between 16:30 on 9 November 2023 and 10:30 on 13 November 2023.

The measurement procedure generally complied with BS 7445: 1991: 'Description and measurement of environmental noise, Part 2- Acquisition of data pertinent to land use'.

4.2 Measurement of Reverberation Time

Criteria for internal noise levels assume a typical level of decoration and furnishing, with habitable rooms expected to have a normalised reverberation time of 0.5 seconds,

The reverberation times of the rooms tested were measured, such that the measured internal noise levels could be corrected to account for the unfurnished nature of the rooms.

Reverberation time measurements were taken following the procedure described below in order to correct the receiver levels for room characteristics.

High volume "white noise" was generated in the rooms and stopped instantaneously in order to measure the reverberation time in each of the one-third octave bands between 50 Hz and 10 kHz. The internal programme of the sound level meter was used to measure the decay time of sound in the room. This was repeated several times in each room in order to obtain an average result.

4.3 Equipment

The equipment calibration was verified, by means of a field verification check, before and after use and no abnormalities were observed.

The equipment used was as follows.

- 1 No. Svantek Type 977 Class 1 Sound Level Meter [*Front Bedroom*]
- 1 No. Svantek Type 958 Class 1 Sound Level Meter [*Rear Bedroom*]
- 1 No. Norsonic Nor 145 Class 1 Sound Level Meter [*Reverberation Time Measurements*]
- Norsonic Type 1251 Class 1 Calibrator

5.0 RESULTS

5.1 Unattended Noise Survey Results

The $L_{Aeq, 5min}$ acoustic parameter was measured at the locations shown in site drawing 17170-SP1. Corrections were applied to account for the measured reverberation times relative to a normalised reverberation time of 0.5 seconds.

It should be noted that for the front façade, the daytime assessment has focussed on weekend noise levels as roadworks and construction site works in close proximity to the front façade of the building could erroneously affect the internal noise profile.

Measured noise levels are shown as time histories in Figure 17170-TH1 and Figure 17170-TH2. A summary of the corrected noise levels is presented in Table 5.1.

Position	Time Period	Average ambient noise level $L_{Aeq, T}$, dB
1	Daytime (07:00 - 23:00)	38
	Night-time (23:00 - 07:00)	32
2	Daytime (07:00 - 23:00)	33
	Night-time (23:00 - 07:00)	29

Table 5.1 Average ambient and maximum noise levels

As shown in Table 5.1, the measured internal noise levels are between the established desirable levels and noise limits. Based on the guidance of the relevant British Standard, this indicates that reasonable internal conditions are expected in the bedroom and lounge on the front façade of the building.

The internal ambient noise levels are below the desirable noise levels, demonstrating that full compliance is achieved for the bedroom and kitchen/diner on the rear façade of the building.

5.2 Site Context

When assessing the suitability of residential noise levels, the context of the site is important. This site is located close to a number of commercial uses, which will provide shopping, dining and entertainment opportunities for future residents. The site is also located very close to the strategic transport network, being in easy walking distance to a number of bus stops and Castleton train station.

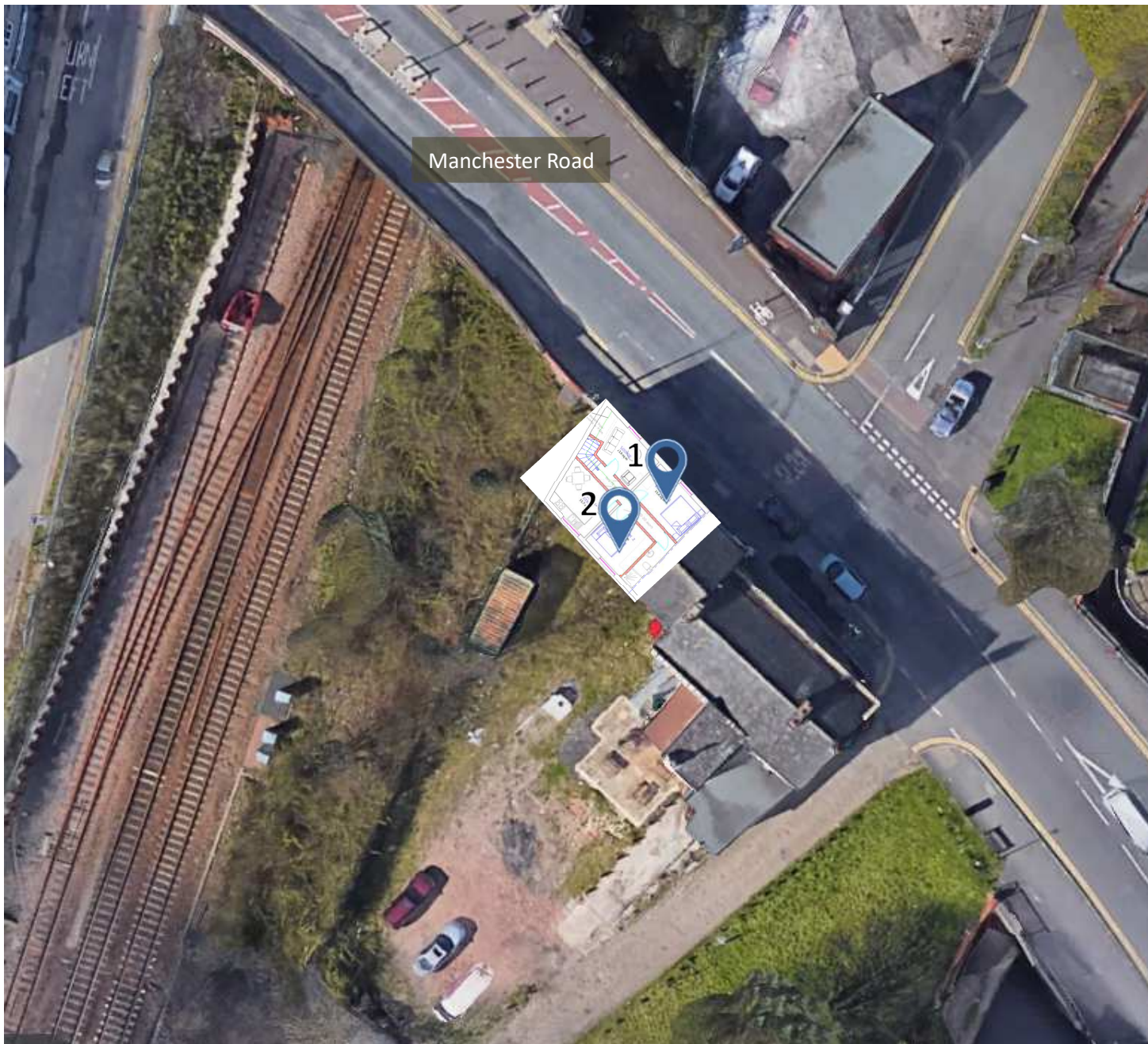
It is therefore considered that a resident living in the flat would expect to experience a higher level of noise due to the location, and achieving reasonable conditions as defined in the standard is appropriate.

6.0 CONCLUSION

Internal noise surveys have been undertaken at 836 Manchester Road, Castleton, Rochdale in order to measure ambient noise levels in recently formed bedrooms.

Measured noise levels have allowed an assessment of the level of exposure to noise of the proposed development site to be made.

Measured noise levels indicate that habitable rooms experience a reasonable level of noise on the front façade and a fully compliant level of noise on the rear façade. Based on the context of the site, the achieved levels are considered suitable to protect the amenity of future residents.



Not to scale

Description:

Indicative site plan showing noise monitoring position and nearest sensitive receiver

Date	15 November 2023
Reference	17170-SP1
Project Name	836 Manchester Road
Image ©	Google Earth, Architectural Services

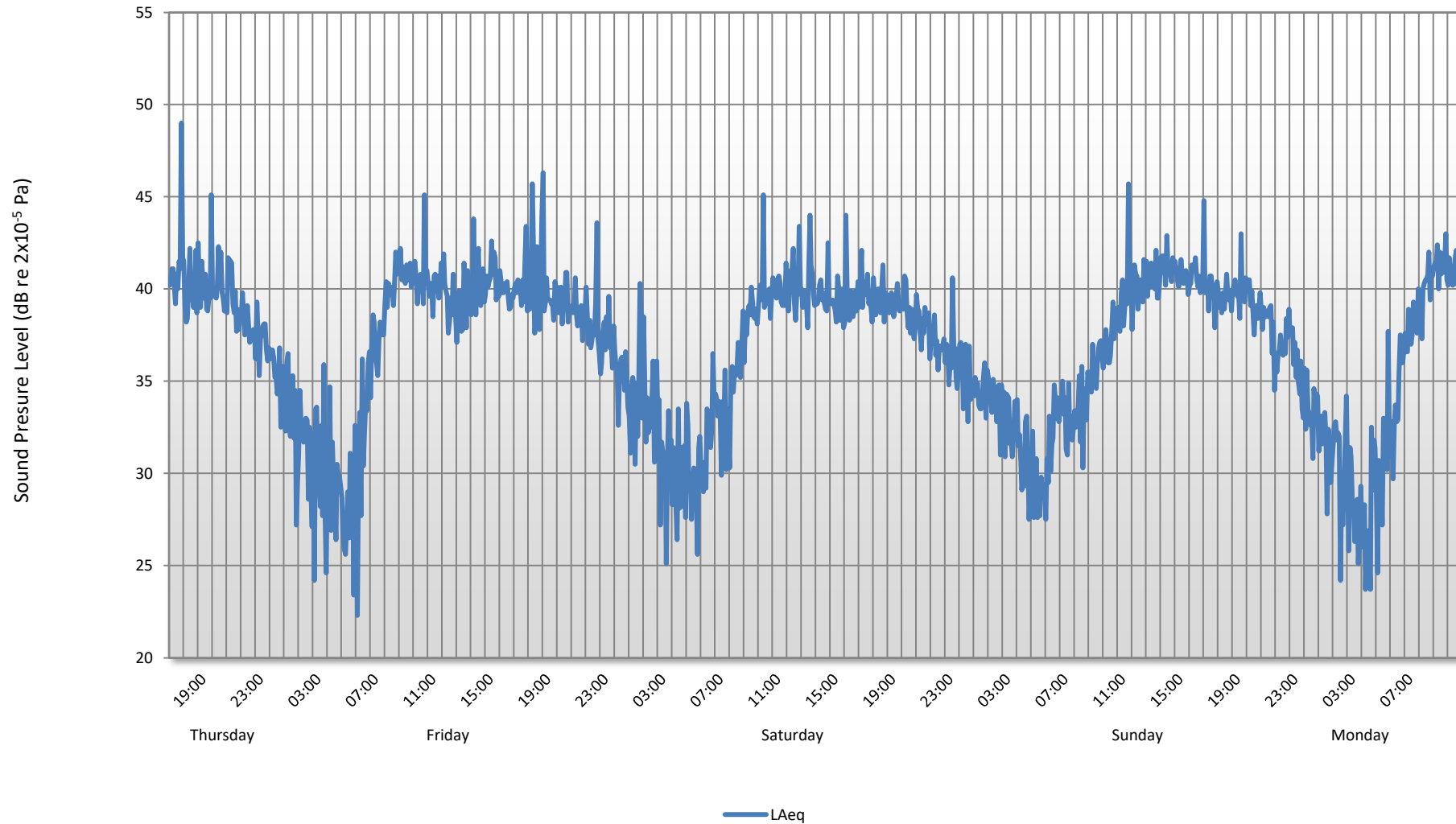
Key:

Unattended Noise Survey Position

836 Manchester Road, Castleton, Rochdale

Position 1

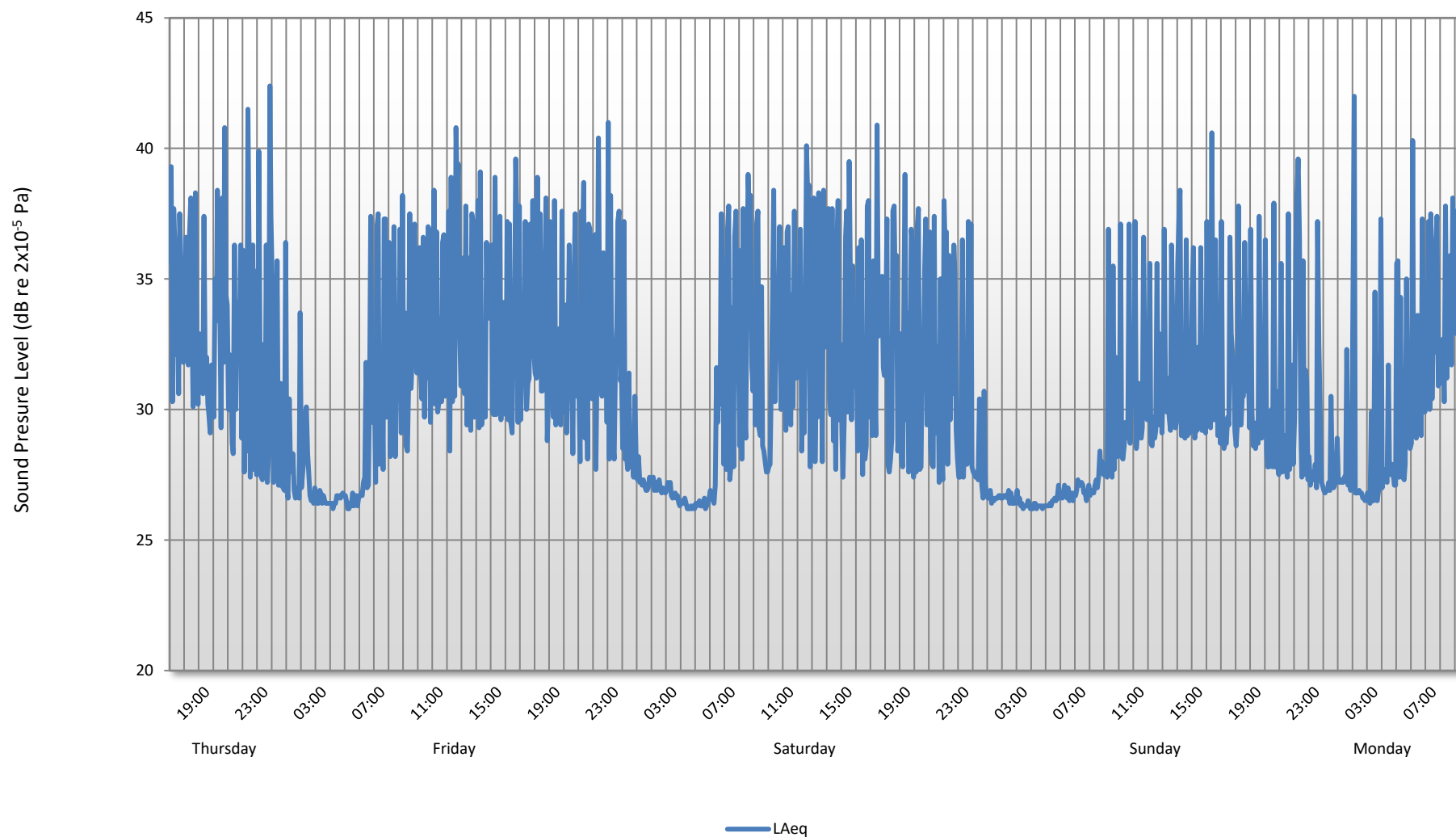
Internal Noise Time History
09 November 2023 to 13 November 2023



836 Manchester Road, Castleton, Rochdale

Position 2

Internal Noise Time History
09 November 2023 to 13 November 2023



GLOSSARY OF ACOUSTIC TERMINOLOGY

dB(A)

The human ear is less sensitive to low (below 125Hz) and high (above 16kHz) frequency sounds. A sound level meter duplicates the ear's variable sensitivity to sound of different frequencies. This is achieved by building a filter into the instrument with a similar frequency response to that of the ear. This is called an A-weighting filter. Measurements of sound made with this filter are called A-weighted sound level measurements and the unit is dB(A).

L_{eq}

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq} . The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

L_{10}

This is the level exceeded for not more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise

L_{90}

This is the level exceeded for not more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{max}

This is the maximum sound pressure level that has been measured over a period.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 10 such octave bands whose centre frequencies are defined in accordance with international standards.

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than one alone and 10 sources produce a 10 dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3 dB for each doubling of distance.

Subjective impression of noise

Sound intensity is not perceived directly at the ear; rather it is transferred by the complex hearing mechanism to the brain where acoustic sensations can be interpreted as loudness. This makes hearing perception highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a reasonable guide to help explain increases or decreases in sound levels for many acoustic scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud
20	About 4 times as loud

Barriers

Outdoor barriers can be used to reduce environmental noises, such as traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and its construction.

Reverberation control

When sound falls on the surfaces of a room, part of its energy is absorbed and part is reflected back into the room. The amount of reflected sound defines the reverberation of a room, a characteristic that is critical for spaces of different uses as it can affect the quality of audio signals such as speech or music. Excess reverberation in a room can be controlled by the effective use of sound-absorbing treatment on the surfaces, such as fibrous ceiling boards, curtains and carpets.