

Mr Barry Winterbottom

New Commercial Unit, 159 Windermere Road, Manchester

Acoustics Assessment



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1. Introduction

Peninsular Acoustics has been commissioned by Mr Barry Winterbottom (hereafter referred to as “the Client”), to conduct an Acoustics Assessment to support a planning application for a new industrial /commercial unit at 159 Windermere Road, Manchester M24 5NQ (hereafter referred to as “the Site”).

The Site lies within a residential area therefore an assessment of noise impact is necessary to maintain acceptable levels of amenity to nearby receptors of any new industrial /commercial noise sources. As the unit is not yet built and the exact use of the building unknown, this report establishes Rating Level limits in accordance with BS 4142¹.

This report is necessarily technical in nature and therefore to assist the reader an acoustics glossary is provided in Appendix A.

1.1. Site Description

Existing Site

The existing Site is a disused patch of wasteland located behind a row of shops and surrounded by residential dwellings. Various mechanical plant items are present at the rear of the shops including ventilation systems serving takeaways and air-conditioning units for shops.

A Vodafone telephone mast is also present on the east perimeter of the Site with associated electrical boxes at its base, which emit noise.

The Noise Sensitive Receptors (NSR) are identified as follows:

- **NSR 1:** Centre of the nearest residential garden in relation to the Site at 1.5m receiver height (west, circa 15m from Site);
- **NSR 2:** 1st floor rear window of residential houses along Crummock Drive (west, circa 19m);

Development Proposals

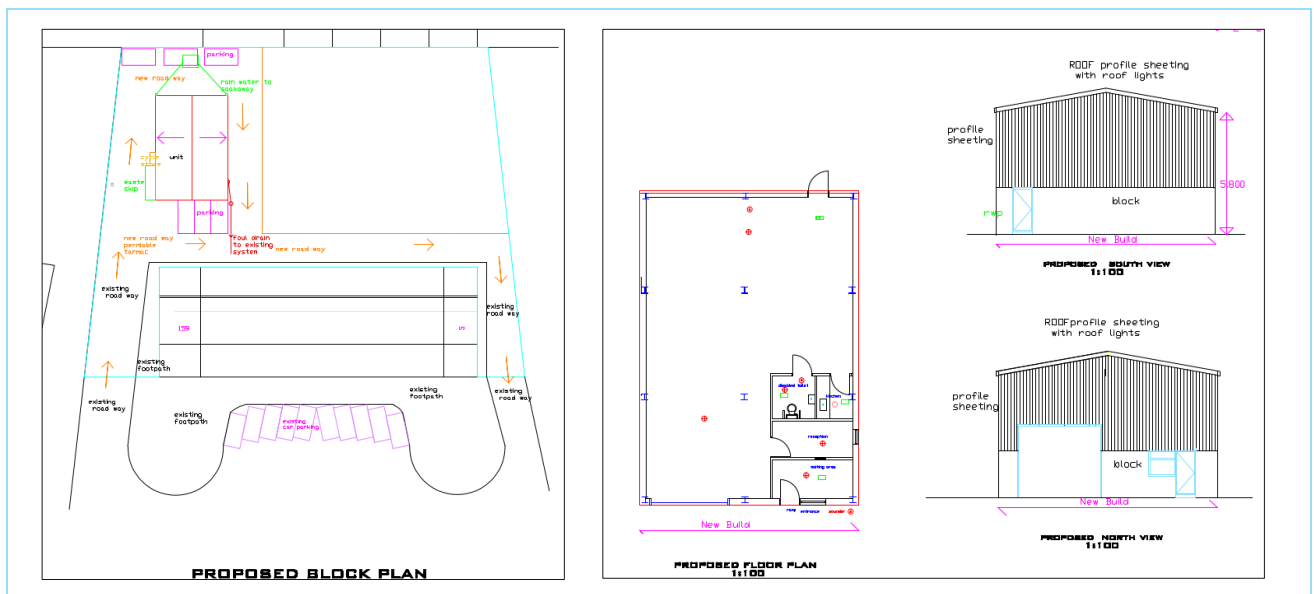
The development proposals comprise the erection of a new industrial /commercial unit with associated parking. The use of the unit is currently unknown.

¹ BS 4142:2014+A1:2019 ‘Methods for rating and assessing industrial and commercial sound’

Figure 1.1: Approximate redline boundary, residential receptors and existing industrial noise sources



Figure 1.2: Proposed floorplan and elevation drawings



1.2. Scope of Works

The following scope of works has been undertaken:

- The nearest Noise Sensitive Receptors to the Site have been identified;
- An attended environmental sound survey to determine prevailing acoustic conditions within the local vicinity of the Site has been undertaken; and
- Noise limits for any new industrial processes carried out on Site to safeguard future residential amenity in the surrounding area have been determined.

2. Standards, Guidance and Criteria

2.1. Proposed Criteria

To ensure the noise level from any new plant or industrial activity introduced does not significantly impact on nearby NSRs the following criteria should be demonstrated:

The Rating Level, as defined in BS4142:2014+A1:2019 should be below the measured daytime and/or night-time background sound level at the closest sensitive premises at any time.

2.2. BS 4142: 2014+A1: 2019

BS 4142 describes methods for rating and assessing industrial and/or commercial sound and includes, but is not limited to, the assessment of:

- Sound from industrial and manufacturing processes;
- Sound from fixed installations which comprise mechanical and electrical equipment;
- Sound from the (un)loading of goods and materials at industrial/commercial premises; and
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes such as that from forklift trucks on or around an industrial and/or commercial site.

A summary of the approach set out in BS 4142 is set out below:

- Establish or predict the specific sound level of the source(s) by considering both the ambient (includes the source to be assessed) and residual (excludes the source to be assessed but includes all remaining sources) sound level;
- Measure the representative background sound levels, typically by measuring close to the receptor location;
- Rate the specific sound level to account for any distinguishing characteristics (see below);
- Estimate the impact by subtracting the background sound level from the rating level; and
- Consider the initial estimate of impact, as determined above, in the context of the noise and its environment.

The specific sound level is rated to account for distinguishing characteristics by using penalties for tonality, impulsivity, intermittency, and other sound characteristics.

An initial estimate of impact of the specific sound is obtained by subtracting the background sound level from the rating level. Typically, the greater the difference, the greater the magnitude of impact.

- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context;
- At differences lower than +5 dB a low impact is likely, depending on the context. The lower the rating level is to the measured background sound level, the less likely it is that the specific sound source will have an impact.

The results of the initial assessment should then be considered considering all pertinent contextual factors.

3. Sound Surveys

3.1. Methodology and Equipment

An attended environmental sound survey was conducted between 08:30 and 12:00 on 19th February and between 04:00 and 07:00 on 26th February 2025 to establish typical background sound levels at a location representative of the nearest NSRs.

Since the Site includes existing industrial noise sources (i.e., telephone mast and ventilation systems), the measurement position was chosen to reflect typical noise levels at the rear of houses along Crummock Drive. Receptors at this position are furthest from the existing industrial noise, therefore are likely to experience the greatest impact from any new noise sources introduced. The chosen measurement position is therefore determined as the worst-case background level since the receptors closer to the existing industrial noise sources will experience higher noise levels.

Figure 3.1: Photographs of existing industrial noise sources

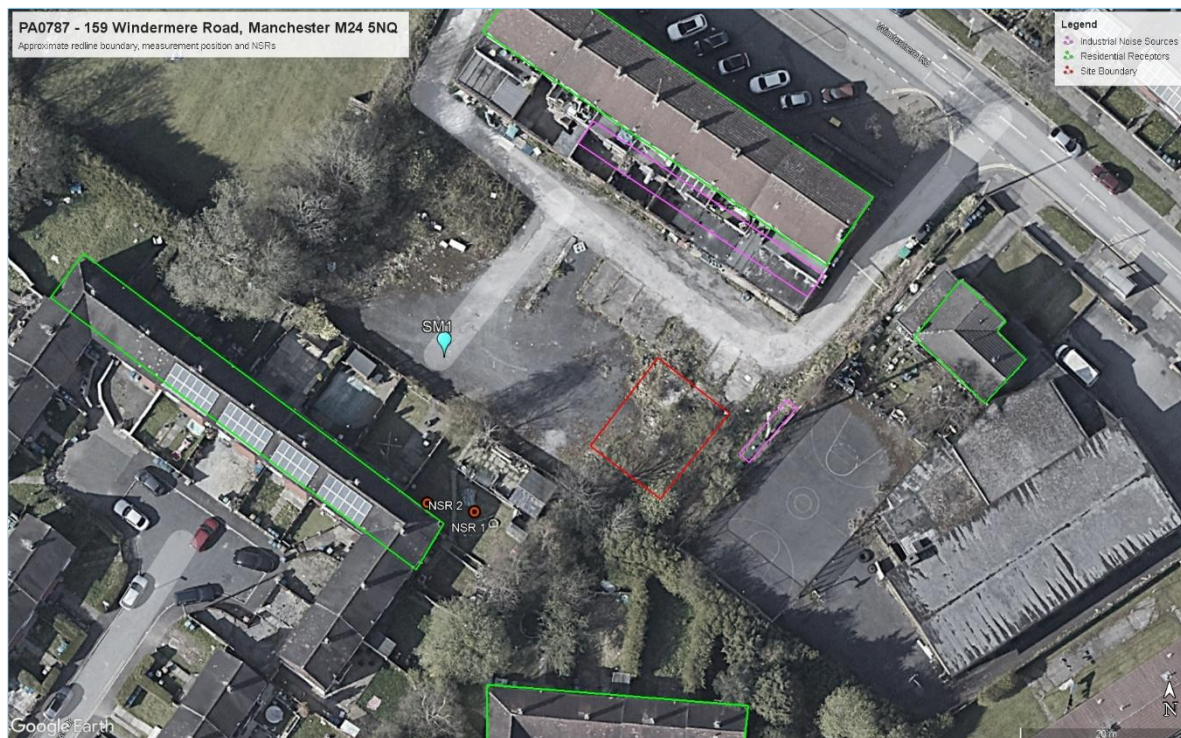


The measurement position is described as follows and shown in Figure 3.2.

- **Sample Measurement Position (SM1):** Free field conditions, circa 1.5m above the ground and 15m from the nearest sensitive receptor (rear of houses which front Crummock Drive).

Full time-histories of measured noise levels are presented in Appendix B.

Figure 3.2: Site Map: Approximate survey location, NSRs and existing noise sources



Measurements were taken using Class 1 integrating/averaging sound level meters (SLMs) housed, where appropriate, in environmental protection apparatus. The SLMs were field calibrated before and after the survey, using a Class 1 calibrator, with no significant drift in calibration noted.

3.2. Survey Conditions and Observations

3.2.1. Meteorological Conditions

Weather conditions during the daytime survey were favourable i.e., low wind speeds and no rain. For the night-time survey wind speeds remained low, though heavy rainfall was observed from around 05:30 until after 07:00. The rain is expected to have increased noise levels artificially however, the critical period of measurement was during the early morning hours when no rain was observed therefore the measurement data is valid for the purposes of this assessment.

3.2.2. Site Observations

The dominant source of noise at the survey location during the daytime is road traffic from Windermere Road however, the electrical boxes for the Vodafone telecommunications mast on the east perimeter of the Site were also notable during the lulls in the traffic.

Various mechanical plant serving the shops and takeaways along Windermere Road were operational and could be heard in close proximity but did not influence sound levels at the measurement location.

At night-time the dominant source of noise was from the telecommunications mast and car passes when occurring.

3.3. Results

The statistical analysis of background sound levels (L_{A90}) measured during the daytime and night-time sample periods are presented below which show a prevailing background sound level of:

- 44 dB $L_{A90, 15\text{mins}}$ during the daytime; and
- 42 dB $L_{A90, 15\text{mins}}$ during the night-time.

Figure 3.3: Statistical analysis of daytime background levels – SM1

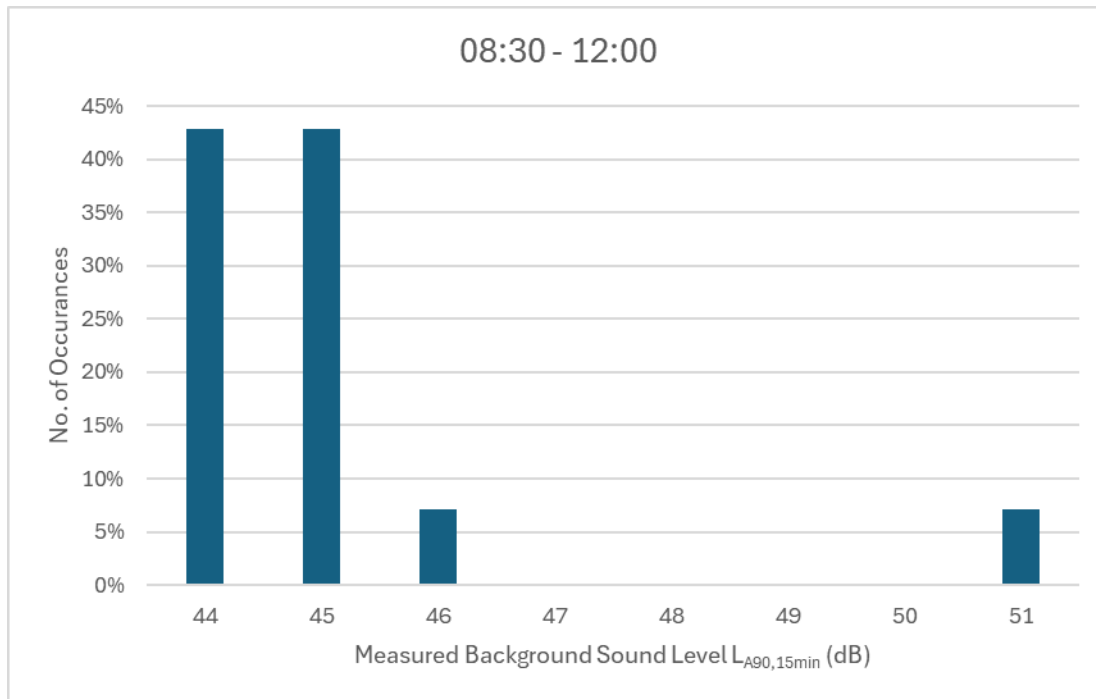
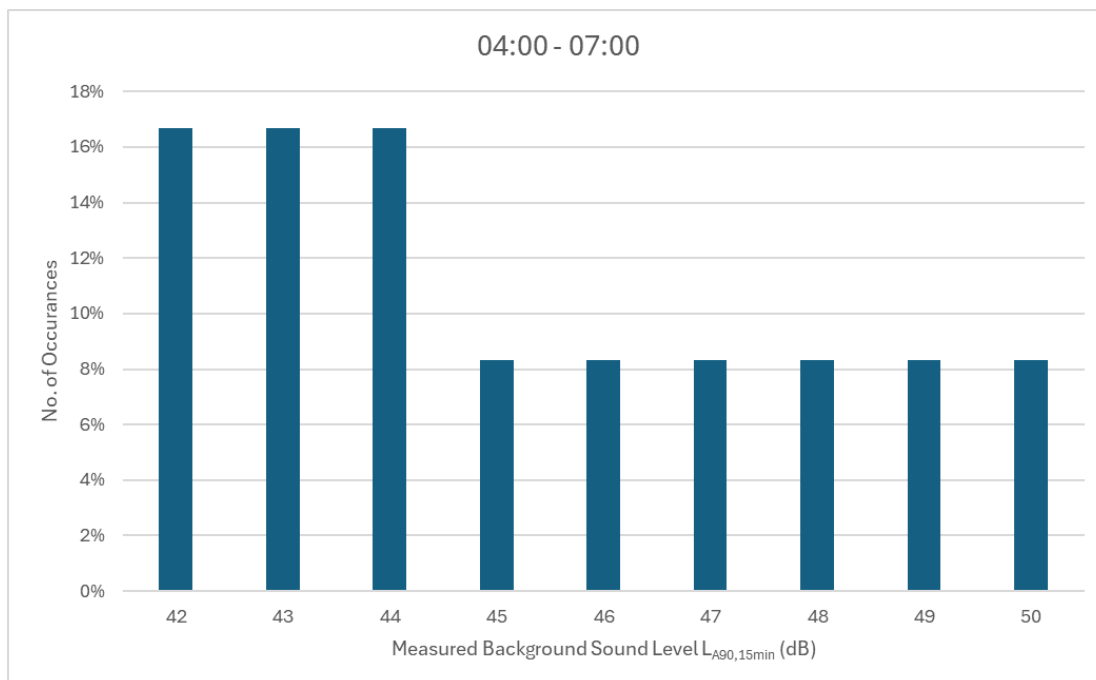


Figure 3.4: Statistical analysis of night-time background levels – SM1



4. Limiting Sound Levels

The limiting sound levels for industrial and commercial sources at the Site have been determined in accordance with BS 4142.

To reduce the risk of adverse impacts on nearby sensitive receptors, the limiting levels have been set to ensure that the Rating Level of any industrial or commercial noise is below the background sound level at each noise sensitive receptor as per the proposed criteria.

This approach is intended to ensure a low impact on the amenity of receptors throughout the lifetime of the proposal Site.

The limiting Rating Levels from any future commercial /industrial noise source at nearby receptors are as follows for daytime and night-time periods:

- **44 dB Daytime (07:00 – 23:00)**
- **42 dB Night-time (23:00 – 07:00)**

5. Conclusions

Peninsular Acoustics has been commissioned by Mr Barry Winterbottom to conduct an Acoustics Assessment in support of a planning application for the proposed erection of a new industrial /commercial unit on disused land at 159 Windermere Road, Manchester M24 5NQ.

The use of the unit is currently unknown therefore this report establishes noise limits in accordance with BS 4142 to ensure the noise from any new industrial /commercial noise source does not adversely affect the amenity of nearby sensitive receptors.

Background sound levels were monitored at a position representative of the nearest noise sensitive receptor during the daytime and night-time which showed prevailing noise levels of 44 dB $L_{A90,15mins}$ and 42 dB $L_{A90,15mins}$ respectively.

The limiting sound levels have therefore been set at 44 dB and 42 dB for daytime /night-time such that there is likely to be a low impact in accordance with BS 4142.

Limitations applicable to this report are contained in Appendix C.



Appendix A

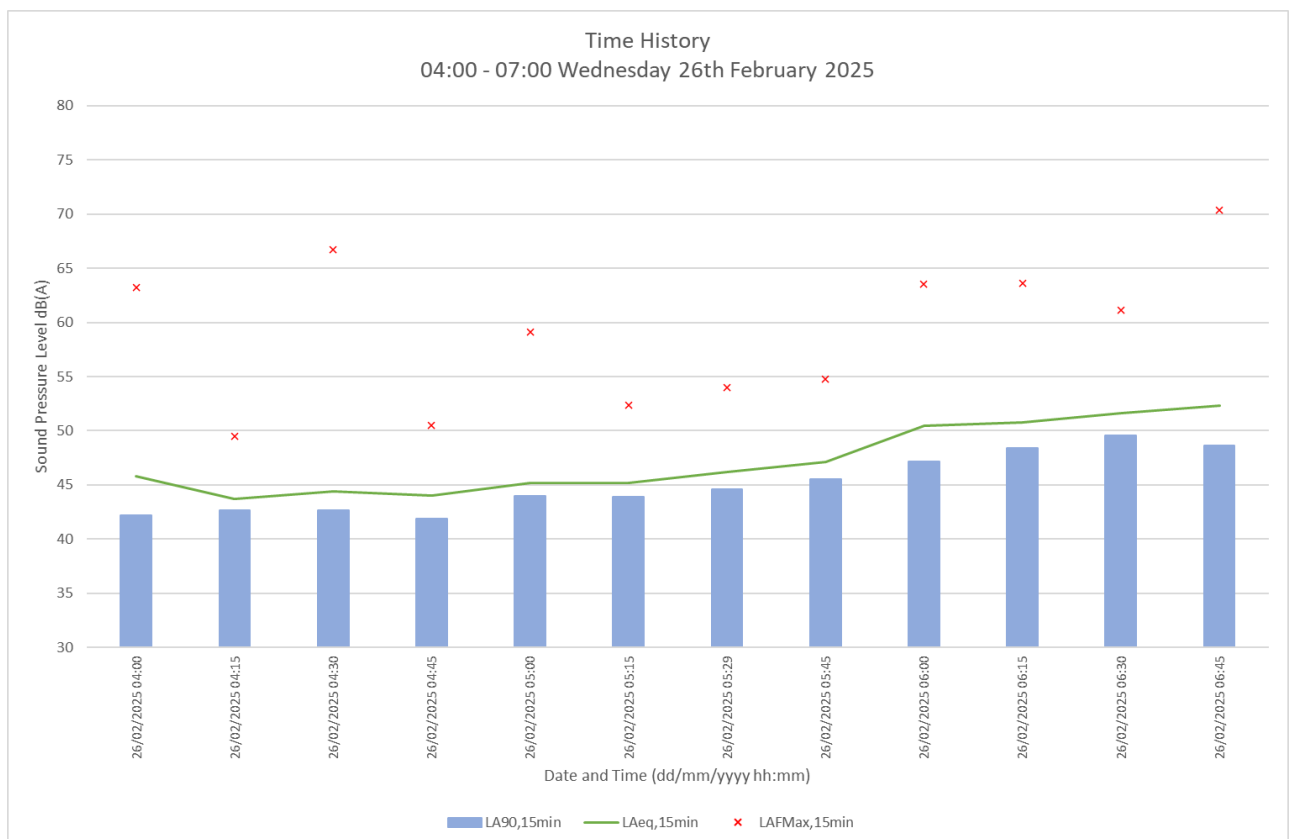
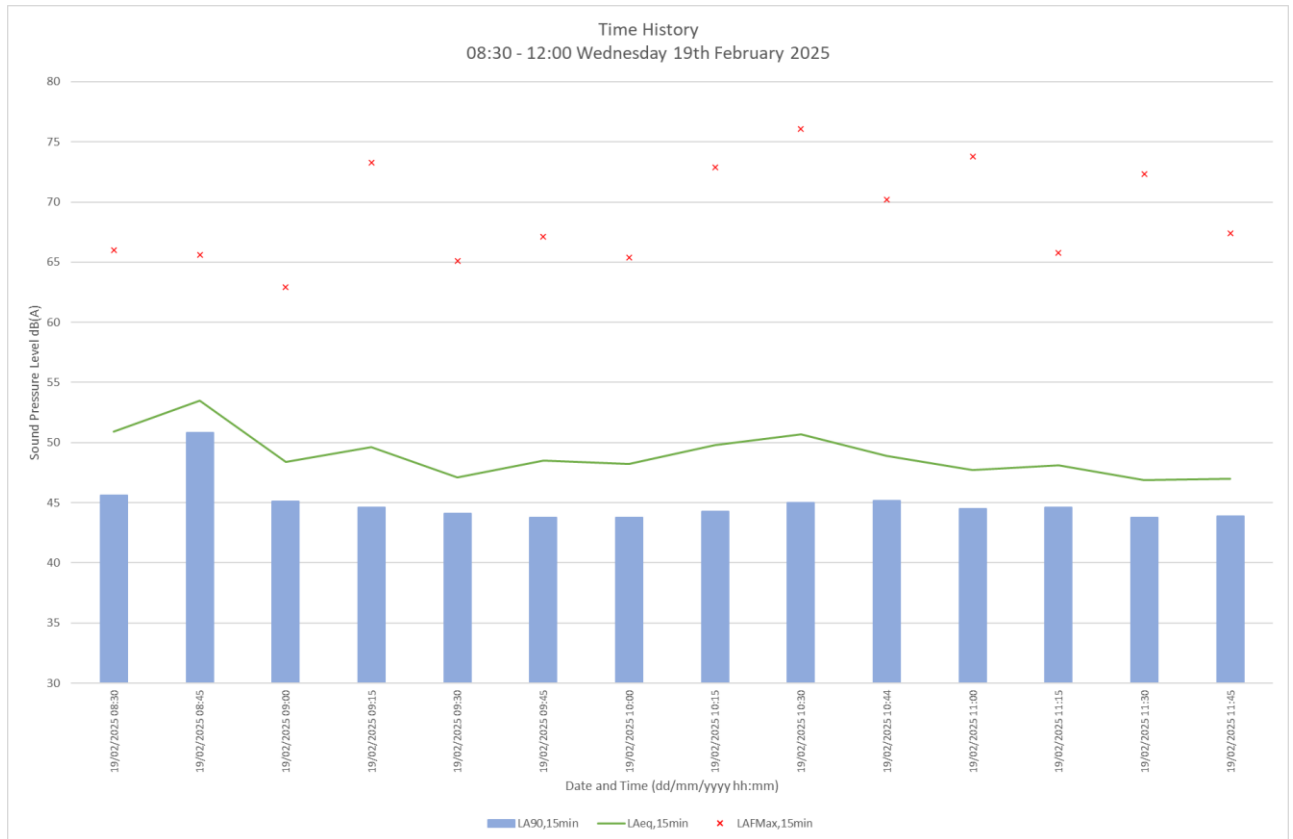
Technical Terminology

Noise	Typically defined as unwanted, unpleasant or disturbing sound
Frequency (Hz)	The number of oscillations in acoustic pressure per second. It represents the 'tone' of the sound. Often determined in octave bands
Maximum sound pressure level (L_{Fmax})	The maximum or highest sound pressure level measured with a 'fast' time weighting
Equivalent continuous sound pressure level ($L_{eq,T}$)	The average of the total sound energy over a specified time period (T). L_{eq} represents the equivalent sound level that a fluctuating source would have compared to a steady source with the same total sound energy over a specific time period. Commonly used as a descriptor of human perception of sound over time.
'A' weighting	Frequency-dependent weighting based on the response of the human auditory system which has been found to correlate well with the subjective response to sound. Denoted by the use of the letter 'A'. For example, dBA denotes an 'A' weighted sound level in decibels, or L_{Amax} denotes an 'A' weighted maximum sound pressure level.
Internal Ambient Noise Level (IANL)	The noise level within a room or enclosed space. Usually determined as an equivalent continuous sound pressure level over a specific time period ($L_{Aeq,T}$, dB)
Noise Rating (NR) curve	A single figure term used to reflect the spectral frequency content of noise. Although originally proposed to assess environmental noise, NR curves are now typically used to describe noise from mechanical ventilation systems in buildings.
$L_{night,outside}$	The incident external A-weighted long-term average sound level as defined in ISO 1996-2: 1987, determined over all the night periods of a year, in which the night is eight hours between 23:00 and 07:00.
AVO	Acoustics, Ventilation, Overheating (e.g. AVO Guide, AVO Group).
Overheating Strategy Overheating Condition	The situation where measures are in place to mitigate overheating to meet agreed compliance criteria.
Dynamic thermal modelling	A technique that can be used to simulate internal temperatures in dwellings before they are built
Ventilative cooling	Cooling by means of introducing external ambient temperature air at a high ventilation rate. Can be either passive (no fans) or mechanical (with fans).
Purge ventilation	Ventilation to aid removal of high concentrations of pollutants and water vapour released from occasional activities such as painting and decorating or accidental releases such as smoke from burnt food or spillage of water.
Mechanical cooling	Cooling by means of a refrigerant cycle. This would include 'air conditioning' systems and the use of fan coil units (FCUs).

MEV	Mechanical extract ventilation.
“Free area” as used in AD-O	Approved Document O uses the term “Minimum free area” that is required to be achieved by the Equivalent area of the window openings. AD-O provides the accepted definition of Equivalent area for the description of “free area”. The term “free area” is therefore avoided in this document to avoid further confusion.
Acoustic open area	The measurable, cross-sectional, geometric area of an opening. For a partially open window, this is considered to be the lesser of either the size of the hole in the window frame that is left by the opening light, or the combined cross-sectional area around the opening light through which air must pass to move from outside to inside. The area around a hinged opening light includes the triangular areas on the sides adjacent to the hinge, and the rectangular area on the side opposite the hinge. This should not be used for comparing the air-flow performance of elements because this will also be dependent on factors such as depth (length of air-path), surface roughness and tortuosity. Refer to reference 6 for further information.
Effective area, A_{eff}	Defined as the product of the free area and discharge coefficient, this is the preferred parameter for comparing the air-flow performance of elements. Refer to reference 6 for further information.
Equivalent area, A_{eq}	The area of a sharp-edged, circular orifice that gives the same flow rate as the actual opening at a given pressure-difference. In other words, the free-area of a notional circular hole made in an infinitely thin, infinite extent baffle that gives the same air-flow performance as the real opening. Used to describe the area of trickle vents in Approved Document F. Not to be confused with Effective area. Refer to reference 6 for further information.
Coefficient of Discharge, C_d	The ratio of the mass flow rate at the discharge end of the nozzle to that of an ideal nozzle which expands an identical working fluid from the same initial conditions to the same exit pressures.
$D_{n,e} / D_{n,e,w}$	The laboratory tested sound insulation of small building elements, normalised to an equivalent absorption area of 10m ² .
Façade level	The sound pressure level measured close to a building façade that includes contribution from both the incident sound and the sound reflected from the façade. Normally taken to be 3dB higher than the equivalent free-field level, when located at 1 metre from a façade.
Free-field level	A measured sound pressure level that is independent of any contributions due to reflections from nearby surfaces and is therefore representative of the direct path only.
R / R_w	The laboratory tested airborne sound insulation of a building element
Sound insulation	The capacity of a structure to prevent sound from reaching a receiving location. Sound energy is not necessarily absorbed; impedance mismatch, or reflection back toward the source, is often the principal mechanism

Appendix B

Time-histories of Measured Noise Levels at SM1





Appendix C

Report Limitations

This report has been prepared for the titled project or named part thereof and should not be used in whole or part and relied upon for any other project without the written authorisation of Peninsular Acoustics Limited. Peninsular Acoustics Limited accept no responsibility or liability for the consequences of this document if it is used for a purpose other than that for which it was commissioned. Persons wishing to use or rely upon this report for other purposes must seek written authority to do so from the owner of this report and/ or Peninsular Acoustics Limited and agree to indemnify Peninsular Acoustics Limited for any and all loss or damage resulting therefrom. Peninsular Acoustics Limited accepts no responsibility or liability for this document to any other party other than the person by whom it was commissioned.

The findings and opinions expressed are relevant to the dates of the site works and design drawings/specifications and should not be relied upon to represent conditions at substantially later dates. Opinions included therein are based on information gathered during the study and from our experience. If additional information becomes available which may affect our comments, conclusions or recommendations Peninsular Acoustics Limited reserve the right to review the information, reassess any new potential concerns and modify our opinions accordingly.



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