



Polaris Acoustics | Acoustic Consultants

Environmental Noise Assessment Report

92 Audley Street, Reading

FECV Property Assets Ltd

P1940-PA-REP-02

1st February 2026



Report Detail

Report	Environmental Noise Assessment
Site	92 Audley Street, Reading
Client	FECV Property Assets Ltd
Reference	P1940-PA-REP-02

Revision History

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01	1 st February 2026	Original Issue	Mathew Vaughan BA (Hons) MSc MIOA
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Executive Summary

Polaris Acoustics (“Polaris”) has been commissioned by FECV Property Assets Ltd to undertake an environmental noise and acoustic design assessment in support of the proposed redevelopment of 92 Audley Street, Reading (RG30 1DH) under Class MA permitted development.

The purpose of this assessment is to evaluate the suitability of the proposed residential use in relation to noise from the surrounding environment and adjacent commercial premises, and to define appropriate acoustic design requirements to protect the living conditions of future occupiers. The assessment has been undertaken with specific regard to the matters requiring prior approval under paragraph MA.2(d) of the Town and Country Planning (General Permitted Development) (England) Order 2015 (as amended).

The assessment is informed by:

1. A multi-day environmental noise survey undertaken by Polaris Acoustics in January 2026, including attended observations and unattended monitoring with audio recordings;
2. Predicted façade noise levels derived from a computer-based noise model prepared in accordance with ISO 9613-2:2024;
3. Relevant guidance contained within BS 8233:2014, BS 4142:2014+A1:2019, and ProPG: Planning & Noise (2017); and
4. The architectural and layout information available for the proposed development.

The assessment considers the interaction between noise, ventilation, and overheating with reference to the AVO Guide (2020) and Approved Document O. The site noise environment is shown to be dominated by road traffic noise, with no measurable or audible contribution from adjacent commercial uses identified during the survey period. A conservative internal-noise-led assessment has been undertaken in accordance with BS 8233:2014, incorporating precautionary allowances for potential subjective characteristics of commercial sound; even under these assumptions, predicted internal noise levels remain comfortably compliant with the relevant daytime and night-time criteria.

The assessment confirms that a suitable internal acoustic environment can be achieved through standard good practice measures, including appropriate façade design, glazing specification, and coordinated ventilation provision, while allowing flexibility to manage overheating. On this basis, the proposed development is considered acceptable in principle in respect of noise, and the prior approval considerations under Class MA can be satisfactorily addressed, subject to standard conditions securing detailed acoustic design and post-completion validation.

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1. Introduction

1.1. Overview

Polaris Acoustics ("Polaris") has been commissioned by FECV Property Assets Ltd to undertake an environmental intrusive noise assessment of 92 Audley Street, Reading RG30 1DH (the "Development"). The local planning authority ("LPA") is Reading Borough Council.

This assessment follows the refusal of a previous application (LPA Ref. PL/25/1376). Reason 1 for refusal states that:

"The applicant has failed to satisfactorily demonstrate that future occupiers of the proposed development would not be subject to impact from noise from commercial premises. Therefore, the proposal gives rise to unacceptable harm to the living conditions of future occupiers, contrary to the requirements of paragraph MA.2(d) of Class MA of the Town and Country Planning (General Permitted Development) (England) Order 2015 (as amended), Policies CC8 and EN16 of the Reading Borough Local Plan 2019 and the advice contained within the NPPF 2024 (para 198)."

The purpose of this report is to evaluate the proposed development in relation to external noise intrusion and to define the necessary acoustic performance requirements for the building envelope. This assessment is based on the existing baseline environmental noise climate measured between the Thursday, 29th January 2026 and Saturday, 31st January 2026.

1.2. Planning Policy and Guidance Framework

This assessment has been undertaken in accordance with Government planning policy on noise, including the National Planning Policy Framework (NPPF), National Planning Practice Guidance (NPPG) on Noise, and the Noise Policy Statement for England (NPSE).

The methodology follows the Professional Practice Guidance on Planning and Noise: New Residential Development (ProPG), which incorporates the criteria of BS 8233:2014 Guidance on sound insulation and noise reduction for buildings (BS 8233).

Additional consideration has been given to Approved Documents F and O of the Building Regulations and the Association of Noise Consultants' Acoustics, Ventilation and Overheating (AVO) Guide.

Measurements were undertaken in accordance with BS 7445-2:1991 Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use. Propagation calculations were undertaken in accordance with BS ISO 9613:2024 Attenuation of sound during propagation outdoors.

1.3. Fundamentals of Environmental Noise

Noise is commonly defined as sound that is unwanted by the recipient. While nuisance cannot be measured directly, the loudness, frequency spectrum, and character of sound can be quantified. Loudness is determined by both sound pressure and frequency, which can be measured instrumentally.

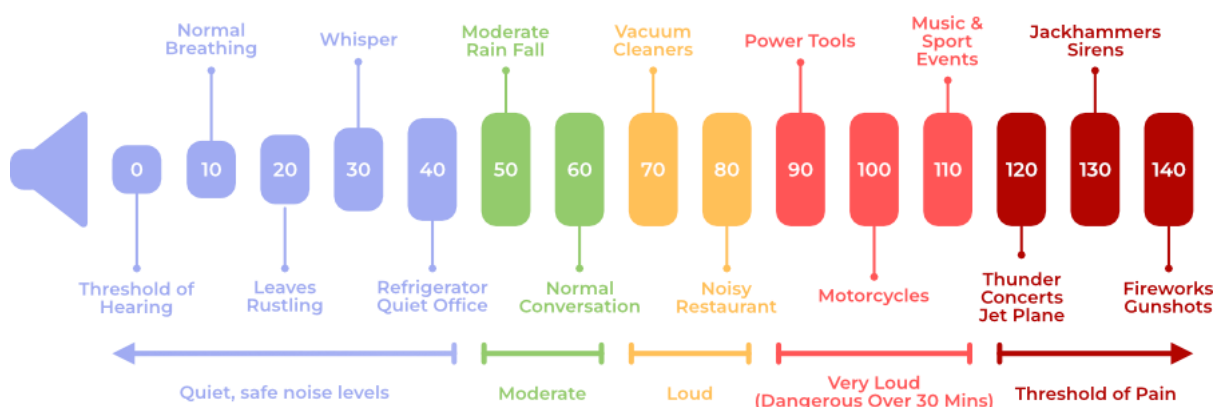
The human ear is sensitive to an exceptionally wide range of sound levels: the threshold of pain is more than one million times greater in sound pressure than the quietest audible sound. To accommodate this range, sound levels are expressed on a logarithmic decibel scale (dB), referenced to the threshold of hearing.

Because the ear does not respond equally across all frequencies, measured sound levels are typically frequency-weighted to approximate human hearing sensitivity. The most widely used metric is the A-weighted decibel, dB(A), which correlates closely with subjective human perception. In terms of perceptibility:

- An increase of 10 dB(A) (e.g. 60 → 70 dB(A)) is generally perceived as a doubling of loudness.
- A reduction of 10 dB(A) is perceived as a halving of loudness.
- A change of around 3 dB(A) is generally regarded as the minimum perceptible difference.

In addition to loudness, the character of noise plays an important role in perception. Sounds with tonal (distinct pitch), impulsive (sudden or sharp), or irregular features may be more intrusive than steady, broadband noise of the same level. Such characteristics are explicitly recognised in assessment methodologies, for example BS 4142, where penalties are applied to reflect their increased impact. **Table 1.1** presents typical noise levels for context, and a glossary of acoustic terms is provided in **Appendix 1**.

Figure 1.1: Decibel Chart



2. Site Description

2.1. General Overview of the Site and Surrounding Environment

The development site is located on the northern side of Audley Street within a predominantly residential area, with limited commercial uses present at No. 92 Audley Street. The host building is effectively divided into two distinct halves. The western half of the building is subject to the proposed Class MA change of use from Class E (Commercial, Business and Service) to Class C3 (Residential).

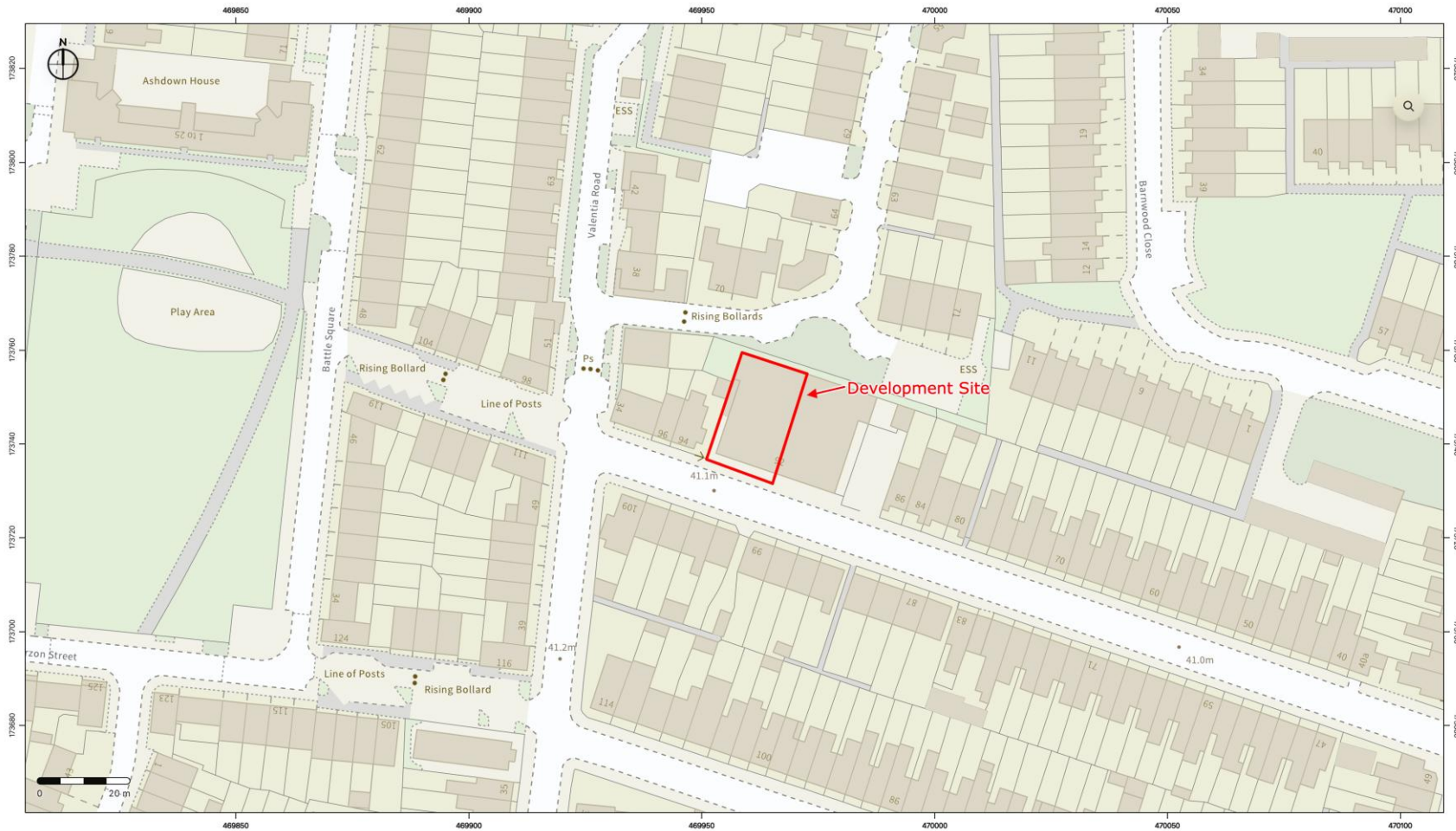
The eastern half of the building remains in commercial use and comprises a ground-floor welding workshop. At first-floor level, the eastern portion accommodates a dog grooming business, whilst the western portion comprises a dance studio, which adjoins the party wall with the proposed residential development. During the noise survey, noise associated with the commercial uses was not perceptible or measurable within the areas proposed for redevelopment. Although the welding workshop, dance studio, and dog grooming business are understood to be active and operational uses, no audible noise from these sources was detected within the development footprint over the monitoring period.

When positioned externally with a direct line of sight to the eastern façade, intermittent dog barking from within the grooming premises was audible. However, this noise was not audible or measurable within the western section of the building that is proposed for residential use. Noise from the welding workshop was not audible onsite, despite the workshop being operational at the time of the survey on all three days at which noise was monitored. Several items of external building services plant were observed fixed to the building, primarily consisting of flues on the eastern façade serving the workshop; however, these were not operational during the survey period. Where applicable, plant model numbers and identification labels were recorded for reference.

The prevailing acoustic environment at the site is characterised by continuous distant road traffic noise, with intermittent contributions from local vehicle movements along Audley Street. Occasional short-duration noise events were also noted from vehicles stopping briefly outside the building for dog drop-off and collection. Whilst isolated barking events were occasionally audible at the front of the building, dog noise was not audible along the southern façade or within the proposed residential areas. No externally audible noise was detected from the dance studio or welding workshop.

The baseline noise climate at the site is therefore dominated by road traffic noise from the wider surrounding road network, with secondary, low-level and intermittent contributions from local vehicle movements on Audley Street. A Site Location Plan illustrating the site context and surrounding road network is provided in **Figure 2.1**.

Figure 2.1: Site Location Plan



2.2. Development Proposal

The proposed development comprises the change of use of an existing two-storey building at 92/92B Audley Street, Reading, from Commercial, Business and Service use (Class E) to provide 10 self-contained residential flats (Class C3), pursuant to the provisions of Schedule 2, Part 3, Class MA of the Town and Country Planning (General Permitted Development) (England) Order 2015 (as amended).

The building is located within a mixed-use urban area, although the surrounding frontage along Audley Street is predominantly residential in character. The site is not listed, is not located within a Conservation Area, and is not subject to any statutory landscape or heritage designations. The property has been confirmed as being in continuous Class E use for the requisite qualifying period, as established through the determination of application PL/24/1564.

The proposed development involves internal conversion works only, with no external alterations required to the building envelope. The existing fenestration is retained and provides adequate natural light to all proposed habitable rooms, ensuring the residential accommodation is suitable for long-term occupation without the need for additional openings or façade modifications.

The residential layout provides 10 self-contained flats arranged across the existing floor plates, with internal circulation areas, ancillary spaces, and service infrastructure integrated within the building footprint. Provision is made internally for refuse and cycle storage, accessed from the front of the building, utilising the existing roller shutter opening to maintain a secure and practical arrangement for future occupants.

The site does not benefit from on-site car parking, and no parking provision is proposed as part of the development. Servicing arrangements would remain consistent with the existing lawful Class E use, with deliveries and refuse collection undertaken from Audley Street. Given the change from active commercial use to residential occupation, the proposed development is anticipated to result in a reduction in vehicular movements compared to the existing baseline.

Overall, the proposed change of use represents an efficient and appropriate reuse of an existing commercial building within a built-up area, delivering new residential accommodation without adverse impacts on the surrounding highway network, local amenity, or townscape. The development is fully consistent with the scope and intent of Class MA permitted development rights and responds positively to the established urban context of Audley Street and the wider Reading area.

3. Noise Survey

3.1. Overview

To inform the residential environmental noise assessment, the baseline acoustic environment has been characterised with reference to the principal noise sources influencing the site. The prevailing noise climate is dominated by distant, continuous road traffic noise, which establishes a relatively steady background noise level at the site.

In addition to this dominant source, occasional and localised vehicle movements along Audley Street, immediately in front of the site, contribute intermittently to the noise environment. These vehicle pass-bys are generally infrequent and short in duration and do not materially influence the underlying ambient noise levels.

Occasional dog barking was also audible at the site, associated with customers briefly transferring dogs between parked vehicles and the adjacent dog grooming premises. These events were short-duration and infrequent, and no dog barking was audible while dogs were inside the grooming facility. As such, these events manifested as isolated maximum sound levels only and did not materially affect the underlying ambient noise climate.

Overall, the site is characterised by a stable road traffic noise environment, with only minor and intermittent localised contributions.

3.2. Metrology and Methodology

All noise monitoring was undertaken using an ACOEM (formerly 01dB) Fusion 4G sound level meter (serial no. 14844), which conforms to the requirements of BS EN IEC 61672-1:2003 as a Class 1 precision measurement system for broadband, 1/1 and 1/3 Octave Band sound pressure level measurements.

An 01dB Cal 01 Acoustic Calibrator (serial no. 990456) was employed before and after each measurement period to verify instrument stability. The calibrator generates a sound pressure level of 94 dB re. 20 µPa at 1 kHz, with an accuracy of ±0.3 dB.

All equipment has been calibrated in accordance with BS EN IEC 61672-2:2003, with additional electrical testing of frequency filters carried out in line with BS EN IEC 61260. Sound level meters are subject to laboratory calibration on a one to two-year cycle, while field calibrators undergo laboratory calibration annually. Details of the equipment, including serial numbers and calibration certification, are provided in **Appendix 2**.

All monitoring was undertaken in accordance with BS 7445-2:1991 Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use. This standard specifies the information to be recorded alongside measured noise levels, including meteorological conditions and descriptions of the prevailing noise sources.



A 24-hour unattended environmental noise survey was undertaken by Polaris between 29 and 31 January 2026 (inclusive). The survey comprised a single long-term measurement position, shown in blue on **Figure 3.1** and detailed in **Table 3.1**. In addition, short duration attended measurements and qualitative observations were carried out internally within the building and externally at the eastern end of the site, adjacent to the workshop and dog groomers.

Position	Description
MP1	A façade-mounted microphone was installed at a first-floor window on the northern boundary of the Development site, with an unobstructed line of sight towards Audley Street and New Bridge Road. The sound level measurement position is therefore representative of a façade location.

The prevailing meteorological conditions were suitable for environmental noise measurement in accordance with recognised guidance. Wind speeds remained below 5 m/s for the duration of the survey, and no periods of excessive wind-induced microphone noise were identified in the data.

Intermittent light rainfall occurred between approximately 00:00 and 06:30 on Friday 30 January 2026. Review of the time-history data confirms that these brief showers did not give rise to anomalous noise events or invalidate the measured sound levels. On this basis, the dataset is considered representative of the prevailing noise climate.

It is further noted that wet road surfaces can marginally increase road traffic noise levels due to changes in tyre-road interaction. As such, any influence of rainfall during this period would tend to represent a reasonable worst-case scenario for road traffic noise exposure, rather than an underestimation of typical conditions.

Notwithstanding the weather conditions recorded, the microphone systems were entirely weatherproofed and fitted with all-weather environmental windshields and bird-spikes.

The survey was conducted by Mathew Vaughan T/A Polaris Acoustics. Mathew is an acoustic consultant with over 5 years of experience in acoustics and more than a decade of experience in sound engineering. Mathew holds a Master of Science (MSc) in Applied Acoustics from Southampton Solent University and is a full corporate member of the Institute of Acoustics (MIOA).

3.4. Measurement Results

Table 3.2 provides a basic summary of the broadband free field environmental noise levels measured at Measurement Position 1 for each day of the survey.

Table 3.2: Summary of the measured broadband noise levels

Measure Location	Daytime		Nighttime		
	Ambient dB $L_{Aeq,16hrs}$	Background dB $L_{A90,1hr}$	Ambient dB $L_{Aeq,8hrs}$	Maxima dB L_{AFmax}	Background dB $L_{A90,15mins}$
MP1 29/1/26 to 30/1/26	48.3 – 57.7	41.3 – 44.6	38.3 – 56.7	58.2 – 87.8	33.9 – 44.5
MP1 30/1/26 to 31/1/26	46.6 – 56.7	40.1 – 51.3	37.4 – 54.2	56.8 – 84.6	33.3 – 45.5
MP1 31/1/26	47.6 – 53.2	41.5 – 44.5	N/A	N/A	N/A

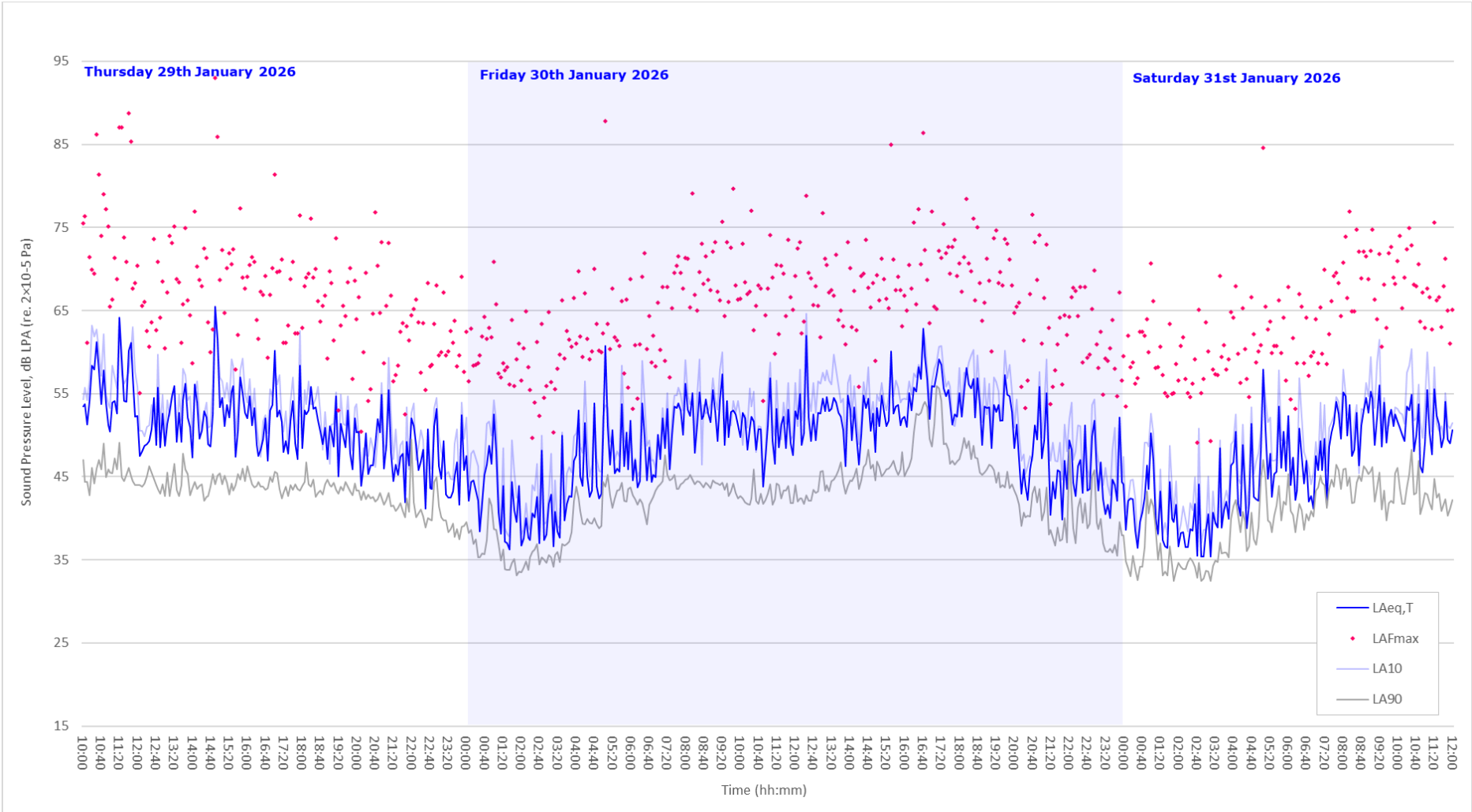
Table 3.3 provides a corresponding time-averaged daytime and nighttime ambient noise levels used for the assessment, in addition to the linear 1/1 octave band terms and the 11th highest L_{AFmax} sound levels.

Table 3.3: Summary of the ambient maxima and 1/1 octave band noise levels

Period (Hours)	Ambient SPL dB $L_{Aeq,T}$	Maxima dB $L_{AFmax,11th}$	Unweighted Sound Pressure Level dB, $L_{eq,T}$ @ Octave Band Centre Frequency, Hz							
			63	125	250	500	1k	2k	4k	8k
Measurement Position 1 (MP1) – 29/1/26 to 30/1/26										
Daytime (12:00 – 23:00)	51.4	N/A	58.1	51.8	49.1	47.9	47.1	43.5	39.1	34.7
Nighttime (23:00 – 07:00)	47.8	67.2	55.1	48.7	47.1	45.2	44.6	41.7	38.7	34.4
Measurement Position 1 (MP1) – 30/1/26 to 31/1/26										
Daytime (07:00 – 23:00)	53.2	N/A	62.8	55.7	51.6	48.9	47.8	45.7	43.4	39.7
Nighttime (23:00 – 07:00)	46.1	66.1	57.9	51.2	48.3	45.5	44.9	42.2	39.9	36.2
Measurement Position 1 (MP1) – 31/1/26										
Daytime (07:00 – 13:00)	47.3	N/A	53.5	47.3	45.6	43.3	42.7	39.8	36.6	31.9

The measured environmental noise levels are also presented below in **Figure 3.2**. The hourly summary of the environmental noise measurements is presented in **Appendix 2**. Please note that **Appendix 4** provides the noise contours of the site during the daytime and nighttime periods.

Figure 3.2: Noise Measurements



3.5. Background Sound Levels

Background sound levels have been determined in line with BS 4142:2014+A1:2019, with reference to the Little Red Book of Acoustics (4th ed., 2024), which introduces the “*LRB Method*” for selecting representative background sound level values.

Earlier editions of BS 4142 often relied on the lowest measured LA90, but the current standard is clear that this is not appropriate. Clause 8.1.4 states that “*there is no ‘single’ background sound level as this is a fluctuating parameter. However, the background sound level used for the assessment should be representative of the period being assessed.*” Note 1 further advises that a representative level should reflect the overall range of measurements, not simply the minimum or modal value.

The LRB Method applies this by:

1. Ordering all measured background L_{A90} values for the reference periods (daytime: 1 hr; night-time: 15 min).
2. Identifying candidate values from the most frequent occurrences. Considering the lowest to highest dB values if there are ties or other data ambiguity.
3. Applying the 45% test: if more than 45% of results fall below a candidate, it is rejected until one meets the criterion.

This ensures that the adopted background sound levels are representative of the typical background sound levels during the daytime and nighttime, and not unduly influenced by outliers, lowest, average or mode values.

During the daytime periods at the measurement location (7am to 11pm), **Figure 3.3** shows that the background sound level values ranged 40–51 dB $L_{A90,1hr}$, with the highest number of occurrences at 44 dB(A). Since less than 45% of the data exists below this value, 44 dB(A) is adopted as the representative background sound level during the daytime.

During the nighttime (11pm to 7am), **Figure 3.4** shows that the background sound level values ranged 33–46 dB $L_{A90,15mins}$, with the highest number of occurrences at 34 dB(A). Since less than 45% of the data exists below this value, 34 dB(A) is adopted as the representative background sound level during the nighttime.

Table 3.4: Summary of the Background Sound Levels

Period (Hours)	Background Sound Level
Daytime (7am to 11pm)	44 dB(A)
Nighttime (11pm to 7am)	34 dB(A)

Figure 3.3: Background Sound Levels – Daytime (7am to 11pm) – $L_{A90,1hr}$

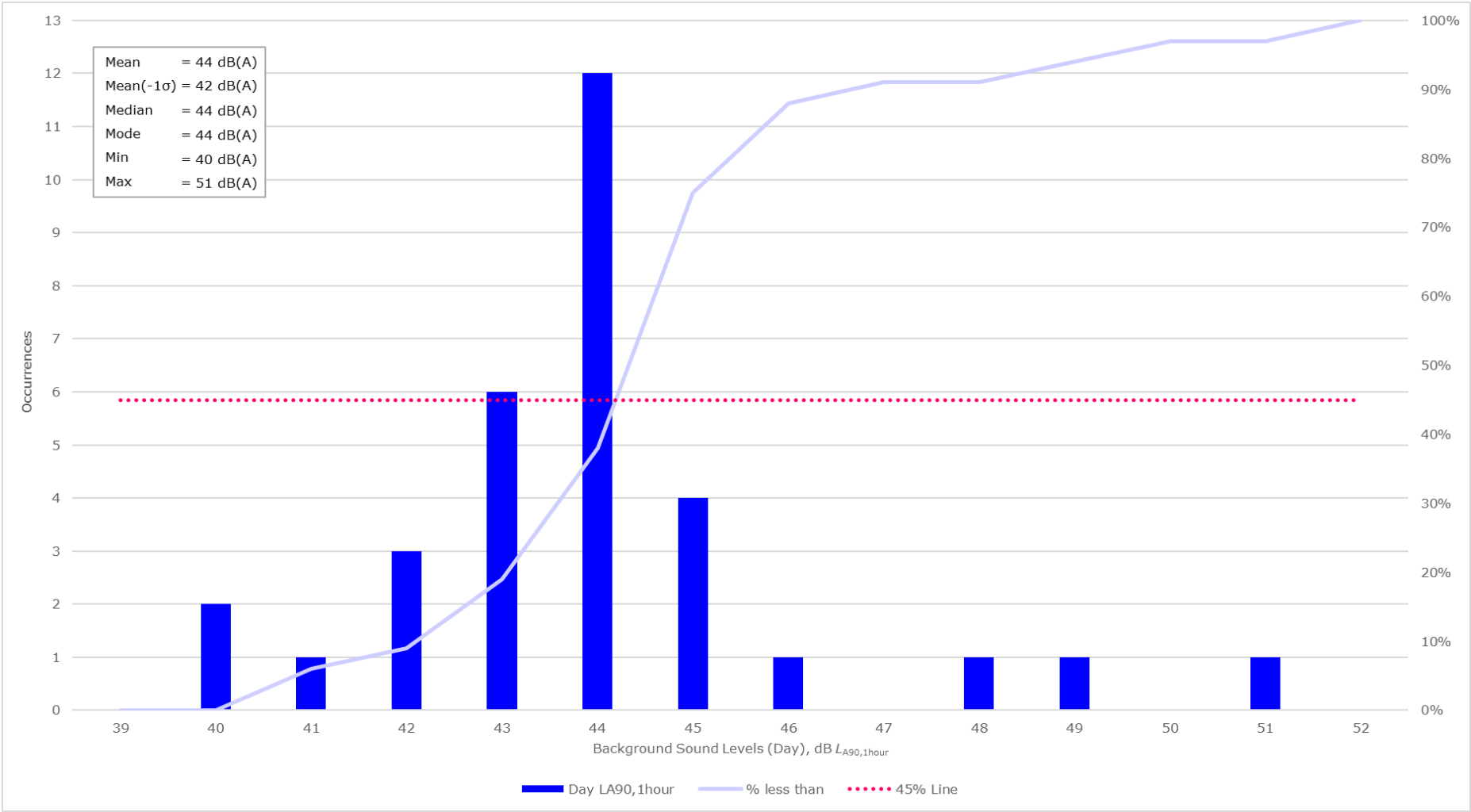
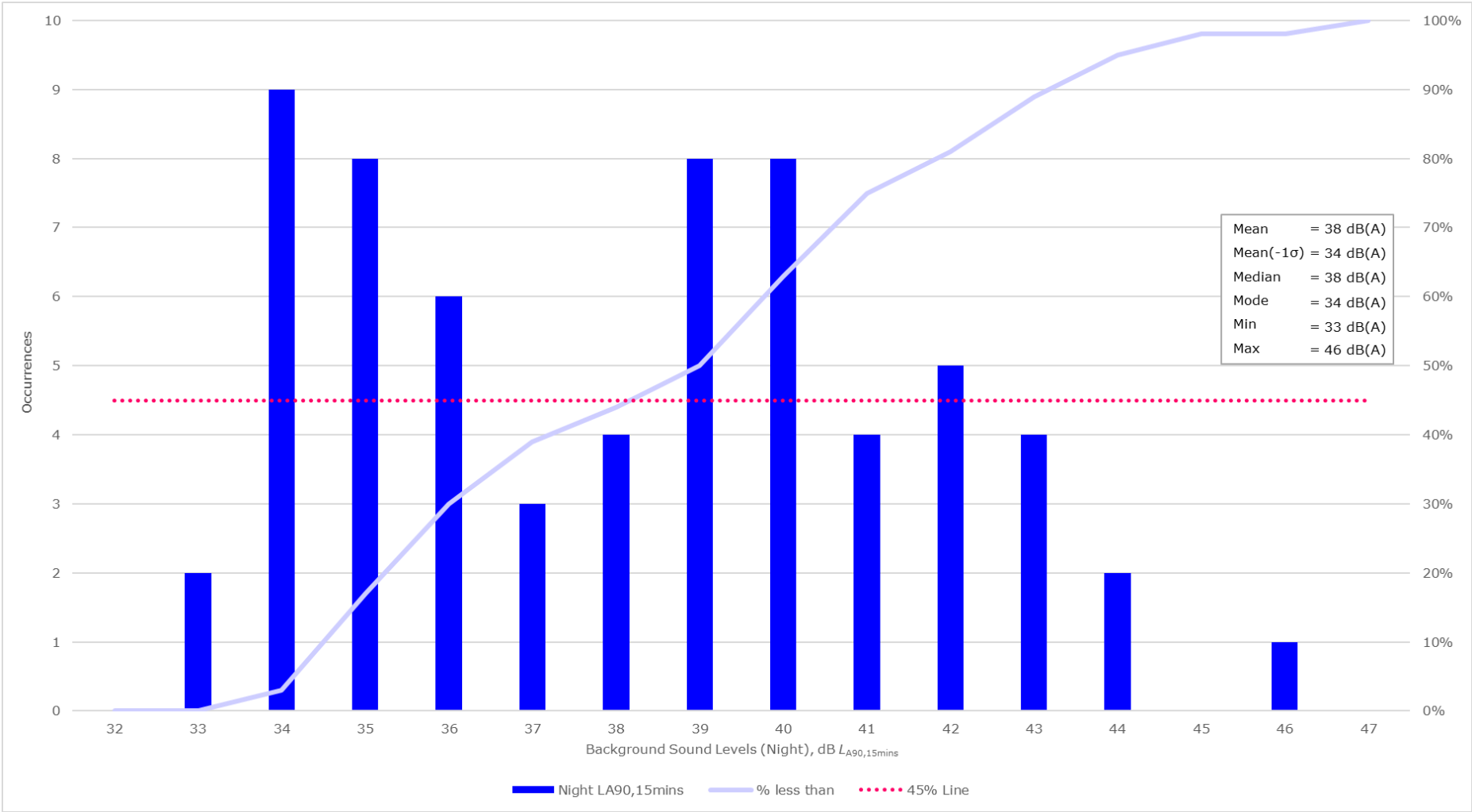


Figure 3.4: Background Sound Levels – Nighttime (11pm to 7am) – $L_{A90,15mins}$



4. ProPG: Stage 1 – Site Noise Risk Assessment

4.1. Stage 1 Assessment

The Professional Planning Guidance: Planning and Noise (“ProPG”), provides a risk-based assessment framework to assist with delivering high quality sustainable development by promoting good health and wellbeing by the effective management of noise through good acoustic design.

The ProPG provides a 2-stage systematic approach as follows:

1. An initial noise risk assessment of the proposed Development;
2. Stage 2– Systematic consideration of four key elements:
 - a. Good Acoustic Design Process
 - b. Internal Noise Levels
 - c. External Amenity Noise Levels
 - d. Consideration of other relevant issues

The Stage 1 assessment provides an early indication if the noise levels across a proposed development site are likely to provide greater acoustic challenges, based on a sliding scale of Risk of Adverse Effect, as replicated in **Figure 4.1. Table 4.1** below provides a summary of the Stage 1 assessment. Please note that all measured levels were conducted at a façade position. Accordingly, a 3 dB correction has been applied to obtain the representative free field sound levels. The highest $L_{Aeq,16hr}$ and $L_{Aeq,8hr}$ sound levels are presented below.

Table 4.1: ProPG: Stage 1 Risk Assessment Summary

Period (Hours)	Daytime (07:00 – 23:00) dB $L_{Aeq,16hrs}$	Nighttime (23:00 – 07:00) dB $L_{Aeq,8hrs}$
Results	49	45
ProPG Noise Risk	Negligible	Low
Action	A ProPG Stage 2 Assessment with Acoustic Design Assessment is required.	

The ProPG Stage 1 noise risk assessment has established that the development site is a “Low” risk. For a low-risk site, the pre-planning application advice still requires a Stage 2 Acoustic Design Statement. This is presented from **Section 6** of this report.

It should be noted that this assessment principally considers noise at the measurement location, which is at a location representative of the southern facade fronting Audley Street, which is expected to represent a ‘worst-case’ monitoring location. To consider the distribution of noise across the development site, please refer Section 5 of this document.

Figure 4.1: ProPG: Stage 1 Initial Site Noise Risk Assessment

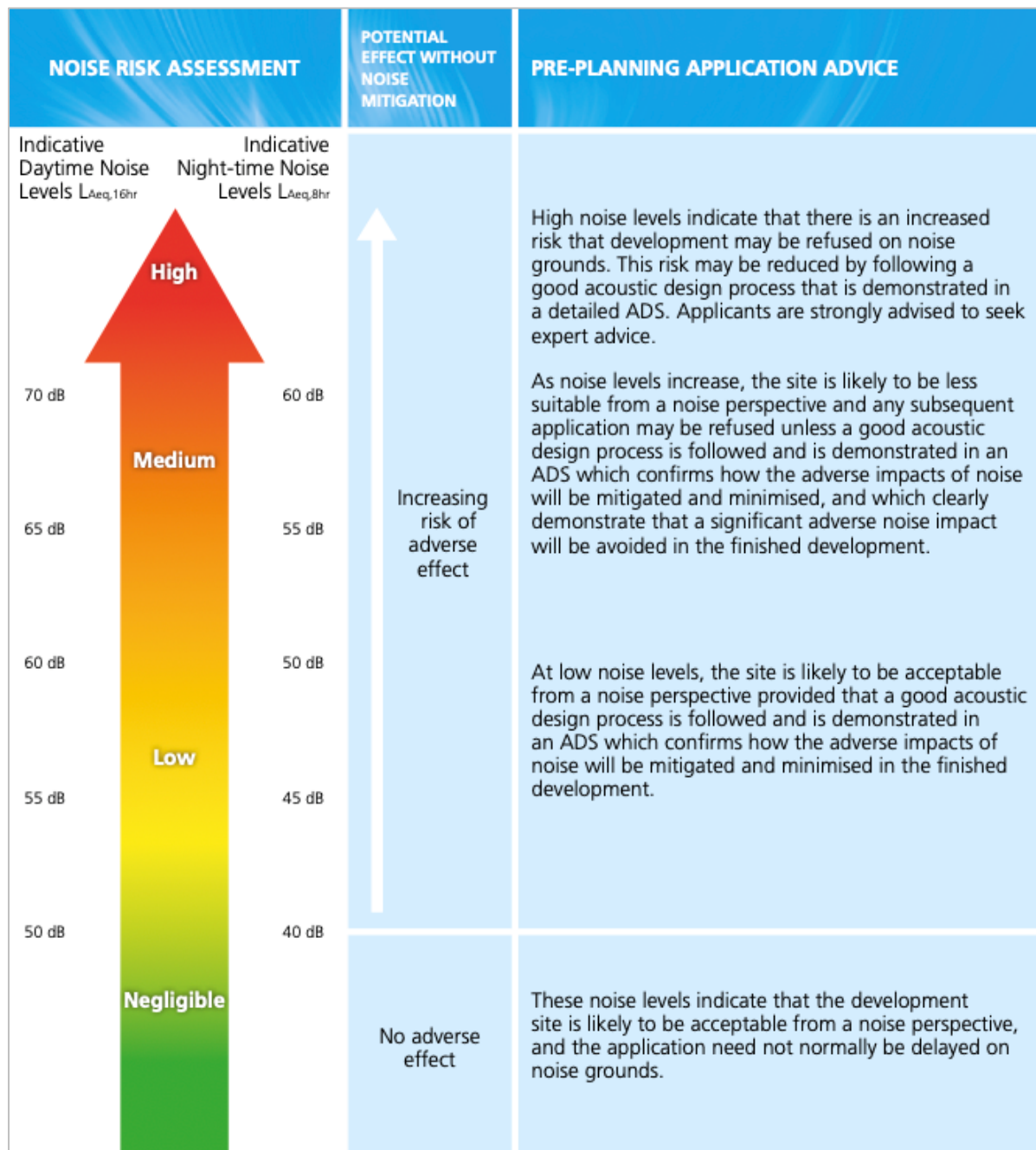


Figure 1 Notes:

- Indicative noise levels should be assessed without inclusion of the acoustic effect of any scheme specific noise mitigation measures.
- Indicative noise levels are the combined free-field noise level from all sources of transport noise and may also include industrial/commercial noise where this is present but is "not dominant".
- $L_{Aeq,16hr}$ is for daytime 0700 – 2300, $L_{Aeq,8hr}$ is for night-time 2300 – 0700.
- An indication that there may be more than 10 noise events at night (2300 – 0700) with $L_{Amax,F} > 60$ dB means the site should not be regarded as negligible risk.

4.2. Adjacent Commercial Noise

4.2.1. Context and Applicability of Assessment Standards and Guidance

The proposed development is located adjacent to established commercial uses within the eastern half of the same building. These include a ground-floor welding workshop, a dog grooming business, and a first-floor women's dance studio. The proposed residential development occupies the western half of the building.

It is noted that BS 4142:2014+A1:2019 is primarily intended to assess the impact of new or modified industrial or commercial sound sources on existing noise-sensitive receptors. It is not expressly designed to assess scenarios where new residential receptors are introduced adjacent to long-established commercial activities that are already operating without complaint. For this reason, direct application of BS 4142 in such circumstances is often of limited relevance and must be interpreted with caution.

In practice, many acoustic consultancies adopt an alternative and more appropriate approach in such cases, placing emphasis on BS 8233:2014 internal noise criteria, with additional conservatism applied to account for the potential subjective characteristics of commercial sound, typically in the form of a 5 dB betterment of the criteria. This assessment is consistent with the agent of change principle, ensuring that existing lawful commercial uses are not unduly constrained.

4.2.2. Building Layout and Separation

Based on the site visits, drawings, CGI images, photographs, and information provided by the building owner, the proposed development is not directly adjacent to the welding workshop via a party wall or party floor. The building is effectively subdivided into two halves, with the welding workshop located within the eastern portion and separated from the development by a substantial internal structural wall of solid construction, reported to comprise concrete or blockwork.

The building is understood to be of precast concrete construction, with solid concrete floor slabs, cast ceilings, and thick internal walls. Such construction would typically be expected to provide a high level of airborne sound insulation, with real-world performance sufficient to significantly attenuate industrial noise transmission with an expected $D_{nT,w}$ of 50 dB or more. In the absence of a direct structural interface, the potential for significant airborne or structure-borne transmission into the proposed development is considered inherently limited.

4.2.3. Welding Workshop – Likely Noise Levels and Observations

Welding activities can generate elevated sound levels at source, with published data indicating typical internal levels in the order of 70–85 dB(A) at 1 m for common welding

processes (HSE guidance). However, such noise is generally localised, intermittent, and strongly dependent on task, scale, and enclosure.

During the site survey, which included both attended observations and longer-term unattended monitoring with audio recordings, no noise attributable to welding activity was audible or measurable at the monitoring locations. No impulsive, tonal, or distinctive events consistent with welding operations were identified in the measured data.

This finding aligns with site observations, which indicated that welding noise was not audible externally at the workshop façade. In practical terms, if welding activity were generating noise levels capable of affecting the proposed residential units, such noise would reasonably be expected to be audible externally and detectable at the façade-mounted monitoring position. The absence of any such audibility provides strong corroborative evidence that transmission through the intervening solid construction would be negligible.

In addition, review of publicly available information suggests that the workshop operates at a relatively small scale, undertaking smaller bespoke fabrication tasks, with larger or more intensive work likely completed off-site. The workshop appears to be professionally managed and conducted with care and attention, and no abnormal or poorly controlled activities were observed.

4.2.4. Other Commercial Uses

Notwithstanding the above, a highly conservative assessment position has been considered. In line with common industry practice where BS 4142 is of limited applicability, a notional 5 dB penalty has been applied to the relevant BS 8233 internal noise criteria, representing a precautionary allowance for the potential subjective characteristics of commercial sound.

Even under this conservative assumption, predicted internal noise levels associated with adjacent commercial activity, assuming standard double glazing with a laboratory-rated sound insulation performance of $R_w = 33$ dB, remain at least 10 dB below the adjusted assessment criterion. This margin of compliance is substantial and indicates that commercial noise does not represent a constraint to internal amenity of the proposed scheme.

4.2.5. Ventilation, Validation, and Best Practice

Although commercial noise is not considered to be a material issue, the proposed ventilation strategy provides future occupants with control and resilience, allowing windows to be closed when required while maintaining adequate ventilation via alternative means. This further reduces the potential for any residual commercial noise influence.

It is recommended that post-completion validation testing, undertaken in accordance with BS 8233:2014, is carried out prior to occupation to confirm that internal ambient and

maximum noise levels are compliant. This represents best practice and is not anticipated to identify any deficiencies.

Given the level of compliance predicted, no structural alterations are anticipated to be necessary. In the unlikely event that further mitigation was required, this would be readily achievable through conventional measures such as the addition of supplementary linings to the relevant internal walls, with careful attention to flanking transmission paths. However, based on the measured data, construction details, and assessment presented, such measures are not expected to be required.

4.2.6. Summary of Commercial Noise Impacts

Considering the building layout, construction, measured noise data, observed site conditions, and conservative assessment assumptions, it is concluded that adjacent commercial noise does not give rise to an unacceptable impact on the proposed development. The assessment is consistent with the intent of BS 8233, the cautious application of BS 4142 principles, and established planning practice for mixed-use environments.

5. ProPG: Stage 2 – Acoustic Design Statement (ADS)

5.1. Overview

The Stage 1 ProPG site risk assessment indicates a “Low” noise risk. Consequently, a Stage 2 ‘full assessment’ and ADS is necessary to demonstrate that a good acoustic design process has been adopted and to set out, where required, how adverse noise impacts will be mitigated, or reduced to a minimum.

5.2. Element 1 – Good Acoustic Design Process

Following a good acoustic design process is an implicit requirement of Government planning and noise policy, and it is essential that acoustic considerations are addressed at the earliest stages of development. The ProPG emphasises that noise should inform the design process from the outset, rather than being retrofitted at a later stage.

In line with this, the design process for the proposed scheme has explored the feasibility of reducing or relocating noise sources, optimising the site and building layout, and considering options for screening and orientation. These steps reflect the hierarchy of acoustic design measures:

1. reducing or quietening the source of noise;
2. attenuating sound along its transmission path;
3. obstructing or screening the path between source and receiver; and
4. improving the sound insulation of the building envelope.



5.3. Element 2 – Internal Noise Levels

5.3.1. Internal Noise Level Criteria

The Stage 1 risk assessment, together with the good acoustic design process outlined above, confirms that the proposed development requires enhanced sound insulation of the building envelope to achieve acceptable internal conditions. It is therefore necessary to address noise in the detailed design to ensure compliance with BS 8233:2014, the ProPG, and the NPPF.

BS 8233:2014 ‘Guidance on sound insulation and noise reduction for buildings’ provides appropriate design criteria for habitable rooms. Section 7.2.2 of BS 8233:2014, Internal Ambient Noise Levels in Dwellings, advises that “in general, for steady external noise sources, it is desirable that the internal ambient noise level does not exceed the guideline values in Table 4”. These values, reproduced below as **Table 5.1**, are widely adopted as the benchmark for residential developments.

Table 5.1: BS 8233:2014 – Indoor Ambient Noise Levels for Dwellings

Activity	Locations	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hr}$	–
Dining	Dining room/area	40 dB $L_{Aeq,16hr}$	–
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$
Night-time Maxima Events	Bedroom	–	45 dB L_{Amax} ^{NOTE}

NOTE: In noise sensitive rooms at night (e.g. bedrooms), individual noise events (from all sources) should not normally exceed 45 dB L_{AFmax} more than 10 times at night.

BS 8233:2014 states that for developments that are considered necessary and/or desirable, the target internal noise level criteria may be relaxed by up to 5 dB and would still achieve “reasonable” internal acoustic conditions.

It should be noted that while BS 8233 does not itself provide a formal recommendation on maximum (L_{AFmax}) levels within bedrooms, the ProPG supplements this by advising that individual noise events at night should not normally exceed 45 dB L_{AFmax} more than ten times during the sleep period.

5.3.2. Glazing Specification

The Sound Reduction Index (R_w , also referred to as SRI) represents the level of sound attenuation provided by a construction element. It can be used to assess the overall sound

insulation of a façade and to predict internal noise levels based on measured external conditions.

Typical values are well established: masonry walls generally achieve R_w ratings of 50 dB or higher, often reaching 55–60 dB. However, the performance of glazing varies considerably. BS 8233:2014 notes that a good quality double-glazed window unit typically provides a minimum R_w of around 33 dB.

Annex G of BS 8233:2014 provides calculation methods for estimating internal noise levels. The Standard recommends starting with a simplified approach to determine whether more detailed calculations are necessary. This method recognises that windows and any associated trickle ventilators usually represent the weakest part of a brick-and-block façade. Assuming the use of appropriate sound-attenuating trickle ventilators, internal noise levels may be estimated by subtracting 33 dB from the measured external free-field noise levels.

The results of these simplified calculations are presented in **Table 5.2** below. The values are based on façade sound levels, with a free field correction of 3 dB.

Table 5.2: The Simplified Calculation Procedure from BS 8233:2014 – Annex G

Criteria	Daytime dB $L_{Aeq,16hrs}$	Nighttime dB $L_{Aeq,16hrs}$
External (Freefield)	49	45
BS 8233 Criteria	35	30
Internal Noise Levels (assuming R_w of 33 dB)	16	12
Comparison to BS 8233	-19	-18
Action	The predicted internal levels are > 5 dB below the BS 8233 criteria, more rigorous calculations are not required.	

The simplified method outlined in Annex G of BS 8233:2014 carries a margin of error, as R_w values are based on pink noise spectra, C (tending to overstate façade performance against traffic noise, C_{tr}) and do not account for internal absorption from finishes and furnishings. As a result, internal noise may be underestimated by up to 5 dB in a worst-case scenario.

The results presented in **Table 5.2** indicate that the estimated internal ambient noise levels are more than 15 dB below the relevant BS 8233:2014 guideline values. Accordingly, there is sufficient margin to confidently demonstrate an appropriate acoustic environment without a more robust assessment.

The R_w rating provides a single-number descriptor of airborne sound insulation. BS 8233:2014 notes that this value is generally representative for comparing similar constructions but may not accurately reflect performance differences between dissimilar systems (e.g. masonry versus lightweight façades) where low-frequency behaviour can vary significantly. In such cases, examination of the full octave-band data is advised.

The C_{tr} correction assists in identifying low-frequency performance relevant to transport noise sources. For example, glazing rated at $R_w (C_{tr}) = 33 (-3)$ will typically offer better attenuation of road traffic noise than glazing rated $R_w (C_{tr}) = 33 (-7)$, despite the identical single figure R_w values of 33.

Given the above, it is recommended that final glazing and ventilation products are verified using full octave-band sound insulation data to demonstrate suitability against BS 8233:2014 and the specific noise characteristics at this site.

At this stage, it is demonstrated that suitable glazing and ventilation solutions are readily achievable, when assuming a worst-case façade noise levels.

5.3.3. Ventilation

The ProPG encourages designers, in principle, to aim to meet the internal noise guidelines with windows open; where that is not realistically achievable, assessment may be undertaken with windows closed and any background ventilation openings in the open position, and the internal $L_{Aeq,T}$ targets should then generally not be exceeded. “Purge ventilation” conditions are not what the internal noise targets are set against, as it is assumed that windows should always be openable to deal with purge ventilation, irrespective of the levels of internal ambient noise.

The AVO Guide distinguishes two ventilation/cooling situations with different noise implications:

1. ADF (whole-dwelling) ventilation condition — applies continuously; assess with background ventilation operating.
2. Overheating condition — applies intermittently (when mitigation for heat is required).

Under Approved Document F (“ADF”) of the Building Regulations, background ventilation is normally via purpose-provided openings (e.g., trickle ventilators or wall ventilators) and purge ventilation is typically provided by opening windows, or an equivalent mechanical provision; ADF also advises locating intakes/vents to minimise pollutant/noise exposure.

Table 5.3 below indicates the site may marginally not achieve the internal targets with windows open, the design of the building should not rely on open windows for meeting the

ADF condition. An alternative ventilation strategy must therefore be provided in line with ADF, noting the AVO Guide's integrated approach to balancing acoustics with ventilation/overheating.

Table 5.3: The Simplified Calculation Procedure (with Windows Open)

Criteria	Daytime dB $L_{Aeq,16hrs}$	Nighttime dB $L_{Aeq,16hrs}$
External (Freefield)	49	45
BS 8233 Criteria	35	30
Internal Noise Levels (assuming R_w of 13 dB)	36	32
Comparison to BS 8233	+1	+2

The noise survey has noted that external daytime ambient noise levels are 49 dB $L_{Aeq,16hr}$, and 45 dB $L_{Aeq,8h}$ at night, with typical maxima events not regularly exceeding 64 dB L_{AFmax} . Based on the measured onsite noise levels, it indicates that at this site, any ventilation system would be appropriate at this site.

Opening of windows for purge ventilation remains suitable across all façades. This maintains flexibility in ventilation design without adverse acoustic implications.

5.3.4. Overheating

In relation to overheating, the AVO Guide identifies the site, specifically the front façade with a direct view to New Bridge Road, as presenting a “Low” risk based on the criteria set out in **Table 8.3** of this report and the measured external noise levels.

For façades classified as “Low” risk, the AVO Guide confirms that windows may be opened to provide passive cooling without the need to restrict or control the duration for which windows remain open. On this basis, reliance on natural ventilation via openable windows is considered acceptable from both an acoustic and overheating perspective.

Where background ventilation is required (for example, via trickle vents), the acoustic performance of the ventilators shall be specified such that they do not compromise the overall façade sound insulation. In practice, this is achieved by specifying ventilators with a sound insulation performance approximately 7 dB higher than the associated glazed element. Accordingly, where standard double glazing with a laboratory-rated performance of $R_w = 33$ dB is assumed, any associated trickle vents should achieve a minimum sound insulation performance of approximately $D_{n,e,w} = 40$ dB, or equivalent, to maintain balanced façade performance.

Where mechanical ventilation and/or cooling systems may optionally be specified, these systems shall be designed to ensure that:

- The self-noise generated by fans and associated equipment does not exceed the relevant internal noise limits defined within the AVO Guide; and
- Noise ingress via external ventilation openings is adequately attenuated, with the acoustic performance of ventilators specified with reference to the prevailing external noise climate.

These matters are typically resolved at the detailed design stage, at which point the ventilation system supplier will be responsible for specifying and confirming the required acoustic attenuation to demonstrate compliance with the applicable internal noise criteria.

5.3.5. Consideration of Approved Document: O

In accordance with Appendix C of Approved Document O (AD-O), the site falls within a “Medium Risk Location”, as the measured onsite noise levels exceed the maximum recommended values set out in **Table 8.4** for the respective risk category.

Where external noise levels exceed the thresholds in **Table 8.4**, compliance with AD-O must be demonstrated using the Dynamic Thermal Modelling Method. Importantly, exceedance of these thresholds does not, in itself, preclude the use of openable windows or necessitate the installation of mechanical ventilation. In practice, adequate heat removal may still be achievable through design measures such as:

- Incorporating smaller openable window areas (e.g. restricted opening panels).
- Integrating ventilation louvres within external walls.

It should also be emphasised that the AD-O overheating assessment is concerned solely with night-time noise in bedrooms, rather than general daytime or living-space conditions.

5.4. Element 3 – External Amenity

BS 8233 provides guidance on acceptable noise levels within gardens and outdoor amenity areas, recommending that external noise levels should not normally exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ in noisier environments.

No on-site external amenity areas are proposed as part of the development. However, the site is located within a short walking distance (less than 200 metres, approximately 5 minutes’ walk) of existing public open spaces, including West Village Park and Beresford Road Recreation Ground, which provide readily accessible alternative outdoor amenity provision for future occupants.

In accordance with BS 8233:2014 and the principles set out in the ProPG: Planning & Noise – New Residential Development, the suitability of external amenity space is assessed with

reference to typical noise exposure and the availability of reasonably accessible alternative spaces where on-site provision is constrained. The nearby public open spaces are subject to a broadly comparable environmental noise climate to the development site, being influenced by the same local road traffic sources.

Having regard to the measured environmental noise levels presented in this report, it is considered reasonable to conclude that sound levels within these nearby amenity areas would typically fall below the BS 8233:2014 upper guideline value of 55 dB LAeq,T for external amenity areas. On this basis, and consistent with the proportionate, context-led approach advocated by ProPG, the absence of on-site external amenity space is not considered to give rise to an unacceptable noise impact in planning terms.

5.5. Element 4 – Other Relevant issues

Good acoustic design principles will be incorporated as the scheme progresses, consistent with the intent of ProPG: Planning & Noise. At this stage, it is anticipated that appropriate dwelling orientation, layout, and ventilation strategy can be developed to minimise the reliance on open windows for achieving internal comfort conditions.

Through these standard design measures, the proposed development can be delivered in a manner that effectively mitigates and minimises the potential adverse effects of environmental noise on future occupants, with detailed solutions to be confirmed at the Reserved Matters stage.

5.5.1. Advice to the Decision Maker

As the internal and external noise criteria set out in BS 8233:2014 and the ProPG guidance can reasonably be achieved through standard good acoustic design measures, it is considered that the proposed development is capable of providing an acceptable acoustic environment for future occupants. On this basis, the scheme can be supported in principle in terms of noise.

It is recommended that planning consent be granted subject to appropriate noise-related conditions, ensuring that detailed façade and ventilation design at Reserved Matters stage delivers the necessary internal and external acoustic performance.

6. Construction Noise

Given the scale of the development and the early outline stage of the proposals, a quantitative construction noise and vibration assessment has not been undertaken. Instead, a qualitative assessment has been completed, focusing on the application of Best Practicable Means (BPM).

To minimise noise impacts during construction, it is proposed that works are restricted to standard construction hours:

- Monday – Friday: 08:00 – 18:00
- Saturday: 08:00 – 13:00
- Sundays and Public Holidays: No construction permitted

It is recommended that the appointed contractor be required to adopt BPM to reduce potential noise impacts on the local community. This should include, but not be limited to, the following measures:

- Adherence to agreed working hours, with advance notification provided to local residents of any changes.
- Ensuring all plant and equipment comply with noise emission limits.
- Where practicable, the design and use of site hoardings or screens to provide acoustic screening of noisy equipment.
- Proper use and regular maintenance of plant and machinery to minimise noise. All vehicles and mechanical plant should be fitted with effective exhaust silencers and maintained in good working order.
- Selection of inherently quieter plant where appropriate. Major compressors should be “sound-reduced” models with lined and sealed acoustic covers kept closed when in operation. Ancillary pneumatic percussive tools should be fitted with mufflers or manufacturer-recommended silencers.
- Shutting down or throttling down machines during periods of inactivity.
- Use of noise-attenuating linings for equipment such as flatbed lorries, skips, and chutes. Materials should be handled carefully and placed rather than dropped, with deliveries scheduled during normal working hours.
- Positioning ancillary plant (e.g. generators, compressors, pumps) to minimise disturbance, ideally suited away from receptors or behind acoustic barriers/enclosures where necessary.
- Establishing proactive communication with local residents and providing updates on construction activities. Where appropriate, these measures should be formalised within a Construction Environmental Management Plan (CEMP).

- Requiring contractors to comply with the relevant codes of practice set out in BS 5228, including the guidance on noise control measures.
- Referring to the Building Research Establishment (BRE) Pollution Control guidance (Parts 1–57: Noise Monitoring).

7. Plant Noise Limits

At the time of writing, specific details of any fixed building services plant associated with the proposed development (e.g. ventilation systems, comfort cooling/heat pump outdoor units, extract fans and associated condensers) are not yet confirmed. Notwithstanding, it is appropriate to set design noise limits at the nearest noise-sensitive receptors to ensure that any future plant installation can be demonstrated as acceptable.

Baseline background sound levels have been established from the site noise survey and interpreted in general accordance with BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*. In particular, representative background sound levels (L_{A90}) have been derived for the daytime and night-time periods, giving 44 dB(A) during the day and 34 dB(A) at night. These values provide the reference background sound level against which the specific sound from any proposed plant would be assessed under BS 4142.

In order to provide a robust and straightforward design criterion at this stage (in advance of detailed plant selection), it is recommended that the cumulative rating level of all fixed plant (i.e. the combined BS 4142 rating sound level, L_{Ar}) when assessed at the nearest noise-sensitive receptor façades, should not exceed the representative background sound level for the relevant period, namely:

- Daytime: $L_{Ar} \leq 44$ dB(A)
- Night-time: $L_{Ar} \leq 34$ dB(A)

For clarity, these limits apply to the total (cumulative) plant contribution, inclusive of any BS 4142-character corrections (e.g. for tonality, intermittency, impulsivity or other acoustic features) and should be demonstrated at the most exposed receptor locations. Where multiple items of plant are proposed, the combined rating level should be derived on an energy basis.

Compliance with the above criteria would indicate that the rating level is at or below background, which BS 4142 identifies as a positive indication of low impact, and would therefore provide a suitable basis for securing acceptable acoustic performance through detailed design and any subsequent discharge of planning conditions.

8. Conclusion

This Noise Assessment has been prepared in direct response to the previous refusal of the Class MA prior approval application (LPA Ref. PL/25/1376), specifically Reason 1, which cited insufficient information to demonstrate that future occupiers would not be adversely affected by noise from adjacent commercial premises. The assessment confirms that the site noise environment is dominated by road traffic, with no measurable or audible contribution from adjacent commercial uses identified during the survey period; no noise attributable to welding activities or the first-floor dance studio was observed, and occasional daytime dog barking was limited to short-duration maximum events only, with no material influence on the underlying ambient noise climate.

A conservative, internal-noise-led assessment has therefore been undertaken in accordance with BS 8233:2014, addressing both daytime and night-time conditions and integrating glazing performance, ventilation strategy, and overheating considerations. The resulting acoustic design requirements and assessment outcomes are summarised in **Table 8.1**.

Table 8.1: Assessment Summary

Design Aspect (All Facades)	Daytime (07:00–23:00)	Night-time (23:00–07:00)
Glazing performance	Standard double glazing assumed with $R_w = 33$ dB.	
Background ventilation	Where required, background ventilators (e.g. trickle vents) are specified to achieve $D_{n,e,w} \geq 40$ dB, ensuring ventilation does not undermine glazing performance. Windows may always be openable to deal with purge ventilation.	
Commercial noise impact	Adjacent commercial noise is not dominant within the daytime noise climate and not observed to materially affect internal noise levels.	No impulsive or dominant commercial noise events identified during night-time monitoring.
Overheating considerations	Façades classified as Low overheating risk; windows may be opened for passive cooling without restriction.	

Even when a deliberately conservative precautionary allowance equivalent to a 5 dB penalty is applied to reflect the potential subjective characteristics of commercial noise, the predicted internal noise levels—based on standard double glazing with a laboratory-rated sound insulation performance of $R_w = 33$ dB, remain comfortably at least 10 dB below the relevant adjusted assessment criteria. Furthermore, even if commercial activity within the adjoining units were to increase beyond that observed during the survey period, the conservative assumptions adopted and the mitigation measures identified would continue to ensure that internal noise levels within the proposed dwellings meet the relevant BS 8233 and WHO guideline criteria.

Accordingly, the potential noise impacts arising from adjacent commercial premises have been assessed on a robust, precautionary, and proportionate basis. The concerns cited in

Reason 1 of the previous refusal are therefore demonstrably resolved, and the proposed development is acceptable in respect of noise under paragraph MA.2(d) of Class MA, with no reasonable prospect of unacceptable harm to the living conditions of future occupiers; any necessary detailed acoustic mitigation can be appropriately secured and verified through standard planning conditions requiring final façade and ventilation specifications and post-completion acoustic validation.

9. Reference Documents

9.1. National and Local Planning Policy Context

9.1.1. National Planning Policy Framework (NPPF) (2024)

The National Planning Policy Framework (NPPF), first published in 2012 and most recently updated in December 2024, sets out the Government's planning policies for England and how they should be applied. It establishes the framework for Local Planning Authorities (LPAs) to prepare local and neighbourhood plans, which must reflect the needs and priorities of their communities.

The NPPF confirms: *"The purpose of the planning system is to contribute to the achievement of sustainable development, including the provision of homes, commercial development, and supporting infrastructure in a sustainable manner"* (Paragraph 7). Sustainable development should be delivered across the economic, social and environmental dimensions (P. 8).

A presumption in favour of sustainable development lies "at the heart of the Framework" (Paragraph 10). In relation to the environment, the NPPF requires:

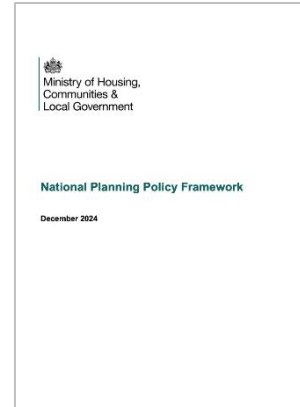
"Planning policies and decisions should contribute to and enhance the natural and local environment by... preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability" (Paragraph 187).

With regard to noise, Paragraph 198 specifies that planning should:

- *"Mitigate and reduce to a minimum potential adverse impact(s) resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
- *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value..."*

Paragraph 200 also highlights the "Agent of Change" principle, ensuring that:

"New development can be integrated effectively with existing businesses and community facilities... Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established... the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed."



- whether or not a significant adverse effect is occurring or likely to occur;
- whether or not an adverse effect is occurring or likely to occur; and
- whether or not a good standard of amenity can be achieved."

The guidance highlights the **subjective nature of noise**, noting that impacts depend on factors such as the source and timing of noise, its frequency, tonal or spectral content, and the sensitivity of the local context. It also advises that cumulative impacts, external amenity areas, and specific site characteristics should be considered.

The NPPG introduces a noise impact hierarchy, showing how effects relate to NOEL, LOAEL and SOAEL. Importantly, only noise that is "noticeable and very disruptive" is considered unacceptable and should be prevented. Other outcomes may be acceptable depending on the level of mitigation proposed.

In relation to existing businesses, the NPPG reinforces the "Agent of Change" principle from the NPPF:

"The applicant (or 'agent of change') will need to clearly identify the effects of existing businesses that may cause a nuisance (including noise...) and the likelihood that they could have a significant adverse effect on new residents/users... The agent of change will also need to define clearly the mitigation being proposed to address any potential significant adverse effects."

9.1.4. The Town and Country Planning (General Permitted Development etc.) (England) (Amendment) Order 2021

The Town and Country Planning (General Permitted Development) (England) Order 2015 (as amended, including the 2021 amendments) introduces Class MA, which permits the change of use of buildings and associated curtilage from Use Class E (Commercial, Business and Service) to Use Class C3 (Dwellinghouses).

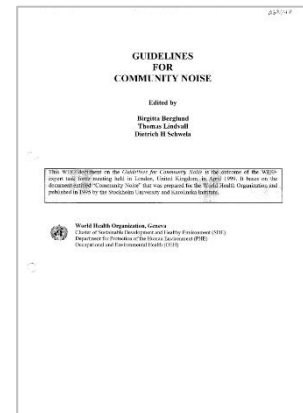
Development under Class MA is subject to a prior approval process, whereby the Local Planning Authority must determine whether prior approval is required in respect of specified matters. These include consideration of the potential impacts of noise from commercial premises on the intended occupiers of the development, among other factors.



9.2. Technical Standards and Guidance

9.2.1. WHO Guidelines for Community Noise (1999)

The World Health Organisation's (WHO) 1999 Guidelines for Community Noise provide recommended maximum internal and external noise levels for a range of situations. These values were developed from a comprehensive review of the scientific evidence on community noise exposure and its associated health and social effects.



Although not adopted as formal policy, the 1999 guidelines have been widely cited and have strongly influenced subsequent national and international standards. Their recommendations form the basis of the criteria set out in BS 8233:2014 (Guidance on sound insulation and noise reduction for buildings) and other related guidance documents. A summary of the 1999 guideline values is presented in **Table 8.1**.

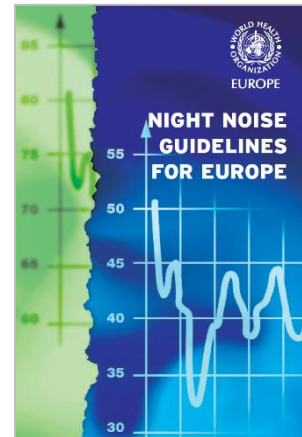
In 2018, the WHO issued the Environmental Noise Guidelines for the European Region, lowering several recommended limits—particularly for transport noise—based on evidence of links to cardiovascular disease, sleep disturbance, and reduced quality of life. However, BS 8233:2014 remains based on the 1999 WHO guidance and does not incorporate the 2018 updates, creating a gap between UK practice and the more precautionary WHO recommendations.

Table 9.1: Summary of WHO Noise Criteria

Residential Environment	Critical Health Effect	L _{Aeq}	L _A F _{max}	Time Base
Outdoor living area	Serious annoyance, daytime and evening	55	-	07:00-23:00
	Moderate annoyance, daytime and evening	50	-	07:00-23:00
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	-	07:00-23:00
Inside bedrooms	Sleep disturbance, night-time	30	45	23:00-07:00
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	60	23:00-07:00

9.2.2. WHO Night Noise Guidelines for Europe (2009)

In 2009, the World Health Organization released the Night Noise Guidelines for Europe as a partial revision and expansion of the Guidelines for Community Noise, focusing on advances in scientific understanding of night-time noise exposure. The 2009 document advises that an $L_{\text{night, outside}}$ level of 40 dB should be the goal of the Night Noise Guideline (NNG) to safeguard the population, particularly vulnerable groups such as children, older adults, and those with chronic illnesses. Recognising that this benchmark is not realistically attainable in many contexts, the guidelines also propose an interim target of 55 dB $L_{\text{night, outside}}$ for countries where the 40 dB objective cannot be met in the near term and where policymakers pursue a gradual, stepwise implementation.

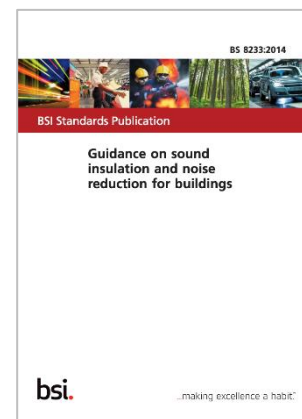


9.2.3. BS 8233:2014

British standard BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings' was originally published in 1999. The current version of the standard was published in 2014.

BS 8233:2014 indicates that to control external noise ingress into a proposed development, a number of planning stages should occur as follows:

1. Site Assessment:
 - a. Identify significant existing and potential noise sources
 - b. Measure and/or estimate noise levels
 - c. Evaluate layout options of the proposed scheme.
2. Establish design noise levels for internal and external spaces.
3. Determine the building envelope performance, including sound insulation and the ventilation strategy.



BS 8233:2014 also provides recommended design noise levels for different types of buildings. For dwellings, flats, and other residential rooms (when unoccupied), the values are given in **Table 8.2** below (reproduced from Table 4, Section 7.7.2 of BS 8233:2014).

The guidance states: "In general, for steady external noise sources, it is desirable that the internal ambient noise level does not exceed the guideline values."

Table 9.2: BS 8233:2014 – Indoor Ambient Noise Levels for Dwellings

Activity	Locations	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hr}$	–
Dining	Dining room/area	40 dB $L_{Aeq,16hr}$	–
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$
Night-time Maxima Events	Bedroom	–	45 dB L_{Amax} ^{NOTE}

NOTE: In noise sensitive rooms at night (e.g. bedrooms), individual noise events (from all sources) should not normally exceed 45 dB L_{AFmax} more than 10 times at night.

When considering the internal and external noise criteria set out in BS 8233, the following points should be noted:

1. BS 8233:2014 advises that its criteria should be applied flexibly. *“Where development is considered necessary or desirable... the internal target level may be relaxed by up to 5 dB and reasonable internal conditions still achieved.”*
2. The quoted noise levels are annual averages and *“do not need to be achieved in all circumstances”* (e.g. New Year’s Eve, fireworks night).
3. The internal values apply primarily to steady external noise sources (e.g. traffic, fixed plant). Unlike BS 8233:1999, the 2014 version does not prescribe criteria for maximum noise events. Instead, it notes: *“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.”* For sites affected by such events, it is appropriate to refer to the WHO Guidelines on Community Noise, which advise that good sleep is generally protected where internal L_{AFmax} does not exceed 45 dB more than 10–15 times per night.
4. Where compliance with BS 8233 relies on closed windows, the standard emphasises the need for *“appropriate alternative ventilation that does not compromise the facade insulation or resulting noise level.”*
5. BS 8233 also provides guidance on external amenity spaces, stating: *“It is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments.”* However, it recognises this is not always achievable. In locations such as city centres or near strategic transport corridors, a balance may be required between higher external

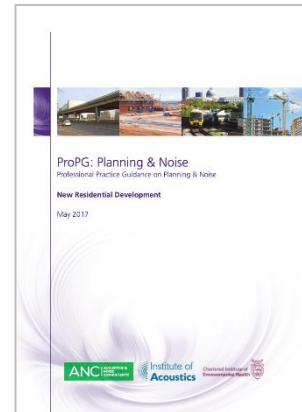
noise levels and other planning considerations. In such cases, development should aim for the lowest practicable external levels, but noise should not be a barrier to development.

9.2.4. ProPG: Professional Practice guidance on Planning & Noise

The Professional Practice Guidance on Planning and Noise (ProPG, 2017) sets out a proportionate, risk-based approach for assessing noise in new residential developments.

It involves two stages:

- **Stage 1 – Initial Risk Assessment:** External noise is assessed against the risk of adverse effects, indicating the site's likely acoustic challenges.
- **Stage 2 – Detailed Assessment:** Four key elements are considered to confirm site suitability, ensuring good acoustic design, compliance with internal noise limits in habitable rooms, and acceptable noise levels in gardens and outdoor spaces. This stage functions as an acoustic design statement (ADS).



This framework helps developers, practitioners, and decision-makers gauge the acoustic suitability of a site, with higher-risk sites recognised as requiring more robust mitigation.

Figure 8.1 sets out the initial site risk assessment. Stage 2 then considers whether the site is suitable for housing, ensuring that good acoustic design principles are applied from the outset, with appropriate internal noise levels in habitable rooms and acceptable external levels in gardens and amenity spaces.

The ProPG promotes “*good acoustic design for all developments with the aim of protecting future residents from the effects of noise.*”

Para 2.21 highlights that suitable internal noise levels should first be achieved with windows open:

“Using fixed unopenable glazing for sound insulation purposes is generally unsatisfactory and should be avoided; occupants generally prefer the ability to have control over the internal environment using openable windows, even if the acoustic conditions would be considered unsatisfactory when open. Solely relying on sound insulation of the building envelope ... is not regarded as good acoustic design.”

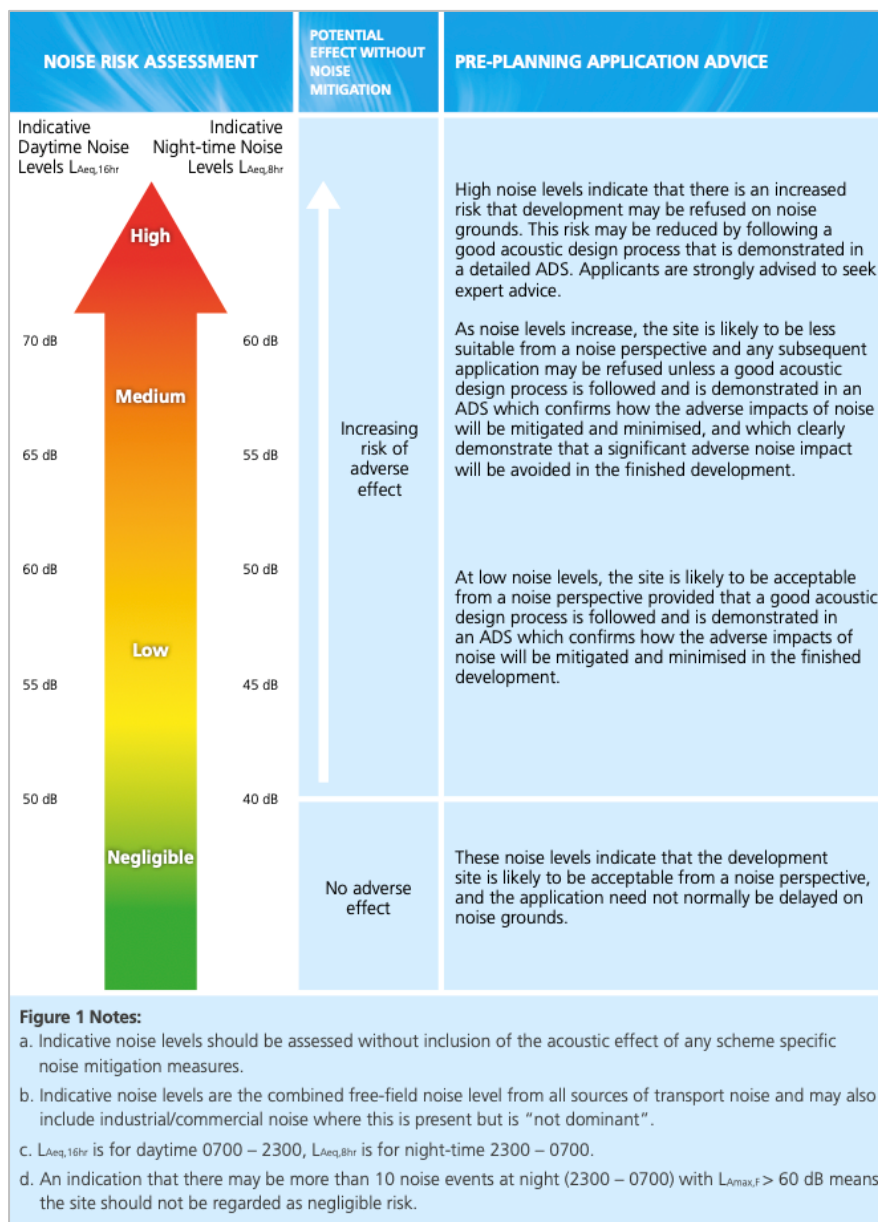
Where open-window conditions cannot achieve targets, the ProPG (notes to Figure 2) advises:

“Designing the site layout and the dwellings so that the internal target levels can be achieved with open windows in as many properties as possible demonstrates good acoustic design. Where it is not possible ... internal noise levels can be assessed with windows closed...”

In such cases, ventilation and overheating must also be considered. Para 2.36 notes:

“Where a scheme is reliant on open windows to mitigate overheating, it is also necessary to consider the potential noise impact during the overheating condition. In this case a more detailed assessment of the potential impact on occupants should be provided.”

Figure 9.1: ProPG: Stage 1 Initial Site Noise Risk Assessment



9.2.5. Acoustics, Ventilation and Overheating (AVO) Guide (2020)

The AVO Guide, published by the Association of Noise Consultants (ANC), sets out an approach for acoustic assessments that recognises the interdependence of acoustics, ventilation, and overheating. Its purpose is to ensure the ventilation strategy is considered as part of the acoustic design process.

The Guide emphasises:

“The starting position when considering mitigation of noise impact on new residential development is to apply good acoustic design, site-wide, as described in the ProPG.”



Since the ProPG prioritises attempting to achieve suitable internal noise levels with windows open, the AVO Guide should only be applied after good acoustic design principles have been addressed.

Ventilation and Overheating Conditions

The Guide distinguishes between:

- ADF ventilation condition – whole-house ventilation, required at all times; and
- Overheating condition – additional ventilation to prevent overheating, required only part of the time.

“In terms of noise effect, the important distinction between these two situations is that the ADF ventilation condition applies for the entire time whereas the overheating condition applies only for part of the time.”

Three-Step Process

The AVO Guide sets out a three-step process:

1. Quantify external noise levels – as in a standard ProPG assessment.
2. Assess noise & ventilation – evaluate the effect of ventilation strategies on noise levels in bedrooms and living rooms.
3. Assess noise & overheating – categorise rooms (Negligible, Low, Medium, High risk) to establish the need for further analysis or mitigation, including mechanical system noise.

Step 2 – Ventilation Condition

Internal noise levels must remain acceptable when adequate ventilation is provided. Figures 3.2 and 3.3 of the AVO Guide provide guidance on suitable strategies based on external noise.

At the time of publication, these strategies aligned with Approved Document F (ADF) systems¹:

- **System 1** – Background ventilators & intermittent extract fans
- **System 2** – Passive stack ventilation
- **System 3** – Continuous mechanical extract (MEV)
- **System 4** – Mechanical supply & extract with heat recovery (MVHR)

In practice, **Figures 8.2** and **8.3** assume:

- Systems 1/2 include two trickle vents,
- System 3 includes one trickle vent,
- System 4 requires none.

Note: The 2021 revision of ADF (effective June 2022) replaced the “System 1–4” terminology with descriptive names (e.g. Natural Ventilation, MEV, MVHR) and no longer provides detailed guidance for System 2 (Passive Stack Ventilation).

Step 3 – Overheating Condition

The Guide accepts some flexibility under overheating conditions:

“It is considered reasonable to allow higher levels of internal ambient noise from transport sources when higher rates of ventilation are required in relation to the overheating condition... occupants may, at their own discretion, be more willing to accept higher short-term noise levels in order to achieve better thermal comfort. The importance of control is relevant to daytime exposure, but not to night time exposure where the consideration is sleep disturbance.”

Assessment follows a two-level approach:

- **Level 1** – Compare external noise against risk categories, assuming a 13 dB attenuation for open windows.
 - Negligible sites: open windows are sufficient.
 - Medium/high-risk sites: proceed to Level 2.
- **Level 2** – Calculate internal noise with windows open to assess impacts when windows are used for cooling.

¹ Note: The 2021 revision of ADF (effective June 2022) replaced the “System 1–4” terminology with descriptive names (e.g. Natural Ventilation, MEV, MVHR) and no longer provides detailed guidance for System 2 (Passive Stack Ventilation).

Figure 9.2: Guideline Values for Ventilation in AD: F – External L_{Aeq}

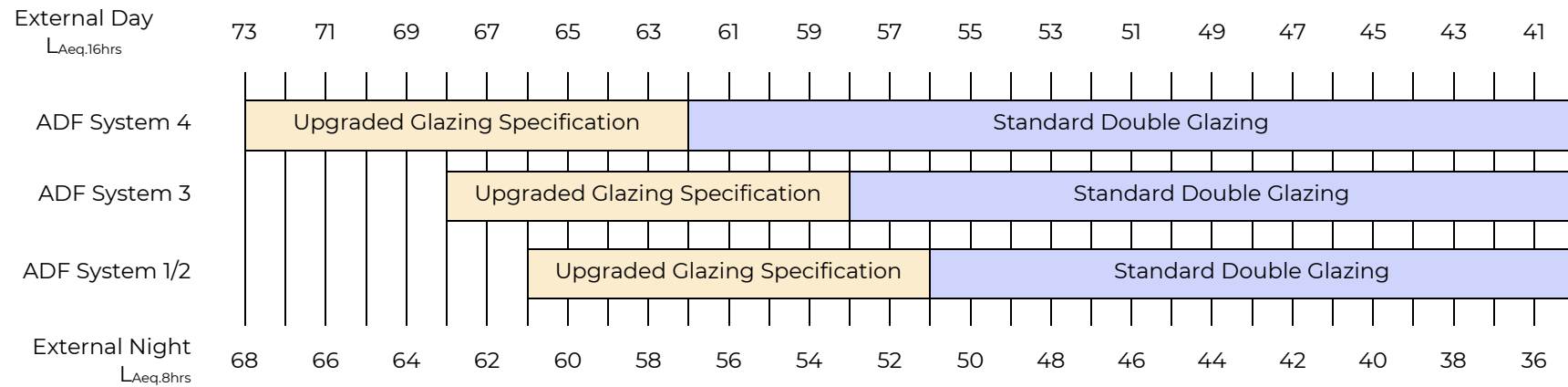
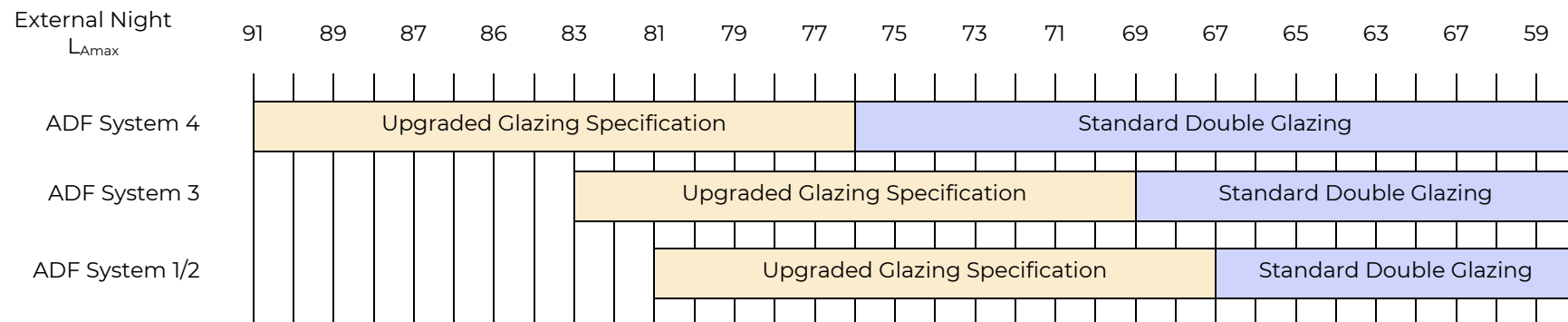


Figure 9.3: Guideline Values for Ventilation in AD: F – External L_{Amax}



Note: The above external L_{Amax} values should not be exceeded more than 10 times per day. Standard double glazing refers to units with a minimum SRI (R_w) of 33 dB.

Table 9.3: Initial Site Risk Assessment in Relation to Overheating Condition

Daytime dB $L_{Aeq,16hr}$	Night-time dB $L_{Aeq,8hr}$	Night-time dB L_{AFmax}	Level 1 Risk	Level 2 Assessment	Outcome	Openable Windows?
≤ 48 dB(A)	≤ 43 dB(A)	-	Negligible	Not Required	Noise can be heard, but does not cause any change in behaviour or attitude	Yes
> 48 dB(A) to ≤ 53 dB(A)	> 43 dB(A) to ≤ 48 dB(A)	-	Low	Optional	Limited behavioural change is expected unless conditions are prevalent for most of the time.	Yes
> 53 dB(A) to ≤ 63 dB(A)	> 48 dB(A) to ≤ 55 dB(A)	Normally Exceeds > 74 dB(A) to ≤ 78 dB(A)	Medium	Recommended	At higher noise levels, more significant behavioural change is expected and may only be considered suitable if occurring for limited periods.	Yes, Depending on Duration
> 63 dB(A)	> 55 dB(A)	Normally Exceeds 78 dB(A) at night	High	Recommended	Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	No



9.2.6. Overheating: Approved Document O

Approved Document O (AD-O), Overheating, was published in December 2021 and came into effect in England on 15 June 2022. Its purpose is to protect occupant health and welfare by reducing the risk of excessively high indoor temperatures.

AD-O requires that residential buildings:

- limit unwanted solar gains in summer; and
- provide adequate means of removing excess heat.

When meeting these requirements:

- the safety and reasonable enjoyment of occupants must be considered; and
- mechanical cooling should only be used where natural and mechanical ventilation cannot adequately remove heat.

Although AD-O is a Building Regulations requirement rather than a planning requirement, overheating and the amenity of future residents are material planning considerations. As such, AD-O should be considered as part of a development's overall glazing, ventilation, and overheating strategy.

Methods of Compliance

AD-O sets out two routes to compliance:

1. **Simplified Method** – limits glazing areas depending on dwelling location, orientation, and cross-ventilation.
2. **Dynamic Thermal Modelling Method** – required if the Simplified Method is not met. This involves detailed modelling and may require additional measures such as opening windows, ventilation louvres in external walls or mechanical ventilation.

Noise Considerations

Paragraph 3.2 highlights:

“In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).”

Paragraph 3.3 further notes that windows are likely to be closed at night if internal noise in bedrooms exceeds:

- 40 dB $L_{Aeq,8h}$ (11pm–7am); and
- 55 dB L_{AFmax} , more than 10 times per night.



9.2.7. Approved Document O: Noise Guide (2024)

The Approved Document O Noise Guide was published in November 2024 by the Institute of Acoustics (IOA) and the Association of Noise Consultants (ANC). It was produced to support acoustic professionals in demonstrating compliance with Approved Document O (AD-O) of the Building Regulations.

While AD-O sets internal noise limits for situations where open windows cannot be used to manage overheating, the IOA/ANC Guidance translates these into external noise thresholds.



Table 8.4 identifies the external levels above which the Simplified Method cannot be used to demonstrate compliance with AD-O. The Guidance notes:

“It may be possible to increase these values and still satisfy the requirements of the simplified method using acoustically specified balconies.”

It further cautions:

“Based on the external noise levels presented in (Table 3.5), it is likely that external noise will be an issue for many sites exposed to only modest levels of noise.”

Table 9.4: External Noise Levels that Exclude the Simplified Method

Parameter	High Risk Location ¹	Moderate Risk Location ²
$L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am)	45 dB $L_{Aeq,8hr}$	50 dB $L_{Aeq,8hr}$
L_{AFmax} , more than 10 times per night (between 11pm and 7am)	60 dB L_{AFmax}	65 dB L_{AFmax}

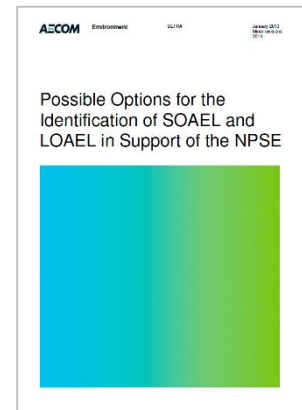
Note 1: High Risk Locations have been identified in Appendix C of AD-O as certain postcodes in London and select postcodes in Central Manchester.

Note 2: Moderate Risk Locations are all other locations in England not previously identified as High-Risk Locations.

If noise levels exceed those in Table 3.5, compliance with AD-O must be demonstrated using the Dynamic Thermal Modelling Method. However, exceeding the thresholds does not automatically mean that windows cannot be opened or that mechanical ventilation is required. In some cases, sufficient heat removal may still be achieved using smaller openable window areas (e.g. restricted panels) in combination with ventilation louvres in external walls. The AVO Guide offers more detailed guidance on when windows can and cannot be relied upon in relation to noise.

9.2.8. Possible Options for the identification of SOAELs and NOAELs in Support of the NPSE (2014)

Commissioned by Defra and prepared by AECOM, Possible Options for the Identification of SOAELs and NOAELs in Support of the NPSE sought to assign values to the concepts of SOAEL (Significant Observed Adverse Effect Level) and NOAEL (No Observed Adverse Effect Level) introduced by the Noise Policy Statement for England (NPSE).



Following the withdrawal of PPG24: Planning and Noise in 2012, which provided Noise Exposure Categories with defined numerical boundaries, the NPSE was criticised for lacking specific numerical guidance. Although both the NPSE and NPPF promote developing location-specific criteria, in practice the absence of benchmarks made implementation difficult.

The Defra project therefore proposed both specific values and ranges of values for SOAELs and NOAELs across different noise sources. These are summarised in **Table 8.5**.

Table 9.5: Possible Value & Ranges of Values for LOAELs & SOAELs

Source	Effect	LOAEL	SOAEL
Road	Annoyance (Daytime)	56 (53-59)	66 (64-68)
	Sleep (Night-time)	46 (43-52)	56 (51-64)
Rail	Annoyance (Daytime)	63 (61-66)	72 (70-74)
	Sleep (Night-time)	55 (52-63)	68 (61-77)
Air	Annoyance (Daytime)	52 (50-54)	60 (58-62)
	Sleep (Night-time)	41 (40-49)	53 (47-60)

Appendices

Appendix 1: Glossary of Acoustics Terminology

Term	Explanation
Absorption Coefficient	Fraction of incident sound absorbed by a material (0 = none, 1 = complete absorption).
AD-F (Approved Document F)	UK Building Regulations guidance on ventilation. Formerly described “Systems 1–4”; now uses descriptive names (Natural Ventilation, MEV, MVHR).
AD-O (Approved Document O)	UK Building Regulations guidance on overheating. Requires mitigation strategies that consider external noise constraints on open windows.
Ambient Noise	All-encompassing background sound at a location, including natural and man-made sources.
Background Sound Level	In BS 4142, the A-weighted sound level exceeded for 90% of the time, representing the underlying sound environment.
BS 8233	<i>Guidance on Sound Insulation and Noise Reduction for Buildings</i> . Provides internal and external noise criteria for residential and non-residential buildings.
BS 4142	<i>Methods for rating and assessing industrial and commercial sound</i> . Describes how to assess industrial/commercial noise against background levels.
Context	In BS 4142, consideration of wider acoustic and site-specific factors beyond numerical results.
dB(A)	A-weighted decibels. Adjusts measurements to reflect the sensitivity of human hearing. Standard in environmental noise assessment.
Decibel (dB)	Logarithmic unit for sound level, expressing a ratio relative to a reference pressure (20 µPa). Used for sound pressure levels, changes in level, and sound insulation.
$D_{n,e,w}$	Weighted element-normalised level difference. Field measure of façade or external element sound insulation.
$D_{nT,w}$	Weighted standardized level difference. Field measure of airborne sound insulation between rooms.

Term	Explanation
Frequency (Hz)	Unit of frequency, equal to one cycle per second. Determines pitch.
Hertz (Hz)	See <i>Frequency</i> .
$L_{A10,T}$	A-weighted sound level exceeded for 10% of the period. Historically used to describe road traffic noise.
$L_{A90,T}$	A-weighted level exceeded for 90% of the period. Used as background sound level in BS 4142.
$L_{Aeq,T}$	Equivalent continuous A-weighted sound level over a given period T. Represents the energy-averaged noise level. Used in BS 8233 and ProPG.
L_{AFmax}	Maximum A-weighted sound level recorded during a measurement period. Relevant to sleep disturbance criteria.
LOAEL	Lowest Observed Adverse Effect Level – where adverse effects begin to be observed.
SOAEL	Significant Observed Adverse Effect Level – where significant adverse effects begin to be observed.
NOAEL	No Observed Adverse Effect Level – below which no adverse effects are observed.
ProPG	<i>Professional Practice Guidance on Planning and Noise</i> (2017). Provides staged risk-based approach for residential noise assessment.
Rating Level (L _{Ar} ,Tr)	In BS 4142, the specific sound level with penalties for acoustic features (e.g. tonality, impulsivity).
Reverberation Time (RT60 / T60)	Time for sound to decay by 60 dB after the source stops. Indicates room “liveliness.”
R _w (or SRI)	Weighted sound reduction index. Laboratory measure of a building element's sound insulation. Higher = better.

Appendix 2: Summary of Noise Measurement Results

Thursday 29th to Friday 30th January 2026

Time	dB $L_{Aeq,T}$	dB L_{AFmax}	dB L_{A10}	dB L_{A50}	dB L_{A90}
07:00	-	-	-	-	-
08:00	-	-	-	-	-
09:00	-	-	-	-	-
10:00	56.1	86.2	57.2	50.4	44.9
11:00	57.5	88.7	57.2	50.2	46.1
12:00	53.9	85.3	53.8	47.2	44.6
13:00	52.9	75.1	53.9	47.5	44.2
14:00	52.5	76.9	53.2	46.9	43.7
15:00	57.7	93.0	56.8	48.5	44.4
16:00	52.7	77.3	53.6	47.1	44.5
17:00	53.4	81.4	53.8	46.7	43.9
18:00	53.3	76.4	54.1	46.6	44.0
19:00	50.7	73.7	51.1	45.8	43.8
20:00	48.5	76.8	49.0	44.6	42.9
21:00	50.4	73.2	50.7	43.8	41.9
22:00	48.3	68.3	48.7	43.2	41.3
23:00	47.5	68.0	48.2	42.9	40.2
00:00	45.7	69.1	46.6	40.1	37.4
01:00	46.1	70.9	46.1	39.7	36.9
02:00	40.1	64.9	41.6	36.8	34.7
03:00	43.5	66.2	43.1	37.4	35.6
04:00	48.5	70.0	49.3	42.6	40.2
05:00	52.1	87.8	49.8	44.8	42.3
06:00	48.8	71.9	49.3	44.0	42.0
$L_{Aeq,16hr}$	53.0	93.0	53.3	46.8	43.9
L_{day}	53.7	93.0	54.8	47.9	44.5
$L_{evening}$	49.6	76.8	49.9	44.4	42.5
L_{night}	47.8	87.8	46.8	41.0	38.7

Friday 30th to Saturday 31st January 2026

Time	dB $L_{Aeq,T}$	dB L_{AFmax}	dB L_{A10}	dB L_{A50}	dB L_{A90}
07:00	50.2	70.4	50.3	46.1	44.3
08:00	53.2	79.1	54.1	46.7	44.3
09:00	53.4	75.7	54.0	46.2	43.9
10:00	51.3	79.7	52.4	45.5	42.7
11:00	51.2	74.1	51.8	45.9	42.9
12:00	54.3	78.8	54.5	46.2	42.5
13:00	53.2	76.7	56.4	48.5	44.6
14:00	52.2	73.5	53.9	48.0	45.0
15:00	53.8	85.0	54.5	48.8	46.0
16:00	56.3	86.4	56.4	51.0	48.7
17:00	56.7	76.9	57.8	53.2	51.3
18:00	55.1	78.4	56.1	49.7	47.8
19:00	53.2	74.6	54.8	47.3	45.2
20:00	50.2	76.5	50.5	44.4	42.0
21:00	50.1	74.1	50.8	43.1	40.1
22:00	46.6	67.8	49.0	42.9	40.4
23:00	46.0	69.8	47.5	41.0	38.9
00:00	44.3	67.2	43.4	38.2	35.3
01:00	44.2	70.7	45.0	39.9	37.6
02:00	38.9	61.8	41.0	36.3	34.1
03:00	41.6	69.2	41.6	36.6	34.4
04:00	46.3	67.9	46.7	40.9	38.9
05:00	50.2	84.6	50.4	44.6	41.1
06:00	47.8	67.8	48.7	43.6	40.8
$L_{Aeq,16hr}$	53.2	86.4	53.6	47.1	44.5
L_{day}	53.8	86.4	54.4	48.0	45.3
$L_{evening}$	50.6	76.5	51.3	44.4	41.9
L_{night}	46.1	84.6	45.5	40.1	37.6

Saturday 31st January 2026

Time	dB $L_{Aeq,T}$	dB L_{AFmax}	dB L_{A10}	dB L_{A50}	dB L_{A90}
07:00	47.6	69.9	48.9	44.5	42.9
08:00	52.1	76.9	52.5	47.3	44.5
09:00	53.2	74.7	54.9	46.4	43.9
10:00	51.9	74.9	54.0	47.6	43.8
11:00	51.6	75.6	53.1	46.5	42.6
12:00	51.3	71.2	52.2	44.0	41.5
13:00	-	-	-	-	-
14:00	-	-	-	-	-
15:00	-	-	-	-	-
16:00	-	-	-	-	-
17:00	-	-	-	-	-
18:00	-	-	-	-	-
19:00	-	-	-	-	-
20:00	-	-	-	-	-
21:00	-	-	-	-	-
22:00	-	-	-	-	-
23:00	-	-	-	-	-
00:00	-	-	-	-	-
01:00	-	-	-	-	-
02:00	-	-	-	-	-
03:00	-	-	-	-	-
04:00	-	-	-	-	-
05:00	-	-	-	-	-
06:00					
$L_{Aeq,16hr}$	47.3	76.9	52.6	46.0	43.2
L_{day}	48.6	76.9	52.6	46.0	43.2
$L_{evening}$	-	-	-	-	-
L_{night}	-	-	-	-	-

Appendix 3: Schedule of Equipment

Equipment Type	Manufacturer	Serial Number	Calibration Type	Date of Last Calibration Check	Date of Next Calibration Check
Fusion 4G Sound & Vibration Analyser	ACOEM	14388	Manufacturer Traceable Calibration to: Class 1 IEC 61672-3	24 th October 2024	October 2026
40CD Microphone Capsule	G.R.A.S.	470605		24 th October 2024	October 2026
PRE22 Pre-Amplifier	ACOEM	2138080		24 th October 2024	October 2026
CAL-01 Calibrator (Class 1)	ACOEM	990456		24 th October 2024	October 2026
DMK01 Weather Protection Kit	ACOEM	Not Applicable			
RAL 135-5M 5m Cable for PRE 22	ACOEM/LEMO	Not Applicable			



Tests report

TR-REP-10875.xls

ISSUED FOR :
ACOUSTIC1
Acoustic1
Overdale
Manordeilo
SA19 7BD Llandeilo
United Kingdom

Name and location of the laboratory of tests:

Acoustic1 - Overdale Manordeilo, Llandeilo
Carmathenshire UK SA19 7BD

TESTED INSTRUMENT

Designation : Integrator Sound Level Meter

Manufacturer : 01dB

Type : FUSION + DMK Serial number : 14388

Identification number :

Date of issue : 24/10/2024

This report includes 7 pages

The measurements are performed according to the IEC 61672-3, Electroacoustics, - Sound level meters – Part 3: Periodic tests.

Steve THOMAS

Head of calibration laboratory at Acoustic 1

THIS REPORT is compliant with THE FD X 07-012 STANDARD DOCUMENTATION

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Instruments used for tests:

Designation	Manufacturer	Type	Serial number	Identification number
Insulated chamber	SKC Acoustic	-	-	-
Waveform generator	KEYSIGHT	33500B	MY57301384	-
Programmable Attenuator	ACOEM	OUT1694000	17-10-208	-
Electrostatic actuator	GRAS	14AA	288498	-
Thermometer, hygrometer, barometer	TESTO	622	39517641/806	-
Calibrator	ACOEM	CAL 21	34675324	-

Results:

Mentioned expanded uncertainties correspond to two standard uncertainty types ($k=2$). Standard uncertainties are calculated including different uncertainty components, reference standards, instruments used, environmental conditions, calibrated instrument contribution, repeatability...

The indicated Maximum Permissible Errors (M.P.E.) are the ones defined in the standard 61672-1 for a class 1 sound level meter.

Indication at the calibration check frequency

Initial indication	Correction	Adjusted indication	Tolerance
(dB)	(dB)	(dB)	(dB)
93.6	0.4	93.8	+/- 1.0

Self-generated noise

0° RA208 + short windscreen

Microphone replaced by the electrical input-signal device	Nominal value (dB)	Displayed value (dB)
Leq dBA	< 14	9.9
Leq dBB	< 15	9.8
Leq dBC	< 20	11.6
Leq dBZ	< 21	17.8

Microphone installed	Nominal value (dB)	Displayed value (dB)
Leq dBA	< 20	15.4

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Acoustical signal tests of a frequency weightings

0° RA208 + short windscreen	Measurement error		Uncertainty (dB)	Maximum Permissible Error (dB)
	C (dB)			
125 Hz	-0.1		0.3	+/- 1,0
1000 Hz	0.0		0.3	+/- 0,7
8000 Hz	-1.2		0.5	-2,5 ; +1,5

Electrical signal tests of frequency weightings

0° RA208 + short windscreen	Measurement error			Uncertainty (dB)	Maximum Permissible Error (dB)
	Z (dB)	A (dB)	C (dB)		
63 Hz	-0.2	-0.2	-0.2	0.4	+/- 1,0
125 Hz	-0.2	-0.3	-0.1	0.4	+/- 1,0
250 Hz	-0.1	-0.2	-0.1	0.4	+/- 1,0
500 Hz	0.0	-0.1	0.0	0.4	+/- 1,0
1000 Hz	0.0	0.0	0.0	0.4	+/- 0,7
2000 Hz	0.1	0.1	0.1	0.4	+/- 1,0
4000 Hz	0.5	0.5	0.5	0.6	+/- 1,0
8000 Hz	-0.5	-1.0	-1.0	0.6	-2,5 ; +1,5
16000 Hz	-3.1	-8.4	-8.4	0.4	-16,0 ; +2,5

Frequency and time weightings at 1 kHz

0° RA208 + short windscreen	Displayed value (dB)	Measurement error (dB)	Uncertainty (dB)	M.P.E. (dB)
Lp dBA / 1000 Hz Fast	94.1	Reference	0.0	
Lp dBA / 1000 Hz Slow	94.1	0.0	0.0	+/- 0,1
LEQ dBA / 1000 Hz	94.0	0.1	0.0	+/- 0,1
Lp dBC / 1000 Hz Fast	94.1	0.0	0.0	+/- 0,2
Lp dBZ / 1000 Hz Fast	94.1	0.0	0.0	+/- 0,2

Long-term stability

0° RA208 + short windscreen

Displayed value (dB)		Measured deviation (dB)	Uncertainty (dB)	Maximum Permissible Error (dB)
Initial indication	Final indication			
94.0	94.0	0.0	0.1	+/- 0,1

Tests report:
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Conclusion

CEI 61672-3 CEI:2013 Chapter:	Tests	Results
5	Preliminary inspection	Compliant
7	Environmental conditions	Compliant
10	Indication at the calibration check frequency	Compliant
11	Self-generated noise	Compliant
12	Acoustical signal tests of a frequency weighting	Compliant
13	Electrical signal tests of frequency weightings	Compliant
14	Frequency and time weightings at 1 kHz	Compliant
15	Long-term stability	Compliant
16	Level linearity on the reference level range	Compliant
18	Toneburst response	Compliant
19	C-weighted peak sound level	Compliant
20	Overload indication	Compliant
21	High-level stability	Compliant

FUSION user manual	DOC1131 version M February 2018
Type-approval certificate	France: LNE-27092 revision 2 dated 04/04/2017 Deutschland: DE-16-M-PTB-0006 dated 28/09/2016

#REF!

End of tests report

Sound Calibrator Certificate



Calibrator: 01dB 01DB CAL 01

Serial no: 990456
Level: 94.02 dB
Frequency: 1000.03 Hz

Reference conditions:
Pressure: 101.325 kPa
Temperature: 23.0 °C
Relative humidity: 50 %RH

The stated level is valid at measurement conditions.
Frequency stability: 0.00 %

Measurement conditions:
Pressure: 99.845 ± 0.005 kPa
Temperature: 23.3 ± 1.0 °C
Relative humidity: 51.5 ± 2.0 %RH

Measured according to IEC 60942.
The stated level is relative to 20µPa.

All results quoted are directly traceable to the National Physical Laboratory, London
with a calculated uncertainty less than 0.10 dB (2×sd).