



Polaris Acoustics | Acoustic Consultants

Environmental Noise Assessment Report

229 Moston Lane East, Manchester

MGD PEDDER LTD

P1924-PA-ZZ-ZZ-REP-01

10th November 2025



Report Detail

Report	Environmental Noise Assessment
Site	229 Moston Lane East, Manchester, M40 3HY
Client	MGD PEDDER LTD
Reference	P1924-PA-ZZ-ZZ-REP-01

Revision History

Rev.	Issued Date	Notes	Prepared and checked by
01	10 th September 2025	Original Issue	Mathew Vaughan BA (Hons) MSc MIOA

Disclaimer

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Executive Summary

Polaris Acoustics ("Polaris") has been commissioned by MGD PEDDER LTD to undertake an environmental noise and acoustic design assessment to support the discharge of a planning condition for the proposed development at 229 Moston Lane East, Manchester, M40 3HY.

The purpose of this assessment is to evaluate the scheme in relation to intrusive noise impacts from the surrounding acoustic environment, and to determine the appropriate acoustic performance requirements for the building envelope, based on:

- The environmental noise survey conducted by Polaris Acoustics in September 2025;
- Predicted façade noise levels obtained through a computer-based noise model prepared in accordance with ISO 9613-2:2024;
- The guidance of BS 8233:2014 and the ProPG: Planning and Noise (2017);
- The architectural design information made available for the proposed development, and;
- Condition 13 of the Decision Notice (LPA ref. CDN/25/0686).

Acoustic guidance is also presented concerning the impact of mitigating residential overheating in accordance with the assessment framework provided in the Acoustics, Ventilation and Overheating, Residential Design Guide 2020 ("AVO Guide") and the requirements of Approved Document: O of the Building Regulations.

It is concluded that, with the implementation of the recommended glazing and ventilation strategy as summarised in Section 7 of this report, internal ambient noise levels within all proposed habitable rooms will be below the recommended criteria values of BS 8233:2014. Other non-acoustic design considerations, such as architectural detailing, SAP compliance, and overheating mitigation, should be verified by the relevant design specialists.

It is concluded that the proposed development can achieve an appropriate acoustic environment in accordance with relevant national and local planning policy, subject to implementation of the mitigation measures and performance specifications set out in this assessment. The proposed acoustic design measures suitably demonstrate compliance with part (a) of Condition 13 of Decision Notice LPA ref. 132185/FO/2021. On this basis, it is recommended that part (a) of the condition is discharged.

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1. Introduction

1.1. Overview

Polaris Acoustics ("Polaris") has been commissioned by MGD PEDDER LTD to undertake an environmental intrusive noise assessment at 229 Moston Lane East, Greater Manchester, M40 3HY (the "Development"). The local planning authority is Manchester City Council.

Planning permission for the proposed scheme (LPA ref. 132185/FO/2021) was previously granted. Condition 13 of this decision notice requires that:

"a) Before the development commences a scheme for acoustically insulating the proposed residential accommodation against noise from Moston Lane East shall be submitted to and approved in writing by the City Council as local planning authority. There may be other actual or potential sources of noise which require consideration on or near the site, including any local commercial/industrial premises which may be significant sources of noise. The approved noise insulation and ventilation scheme shall be completed before any of the dwelling units are occupied.

Noise survey data shall include measurements taken during a rush-hour period and night-time to determine the appropriate sound insulation measures necessary. The following noise criteria shall be required to be achieved:

Bedrooms (night time - 23.00 - 07.00) 30 dB LAeq (individual noise events shall not exceed 45 dB L_{Amax,F} by more than 15 times)

Living Rooms (daytime - 07.00 - 23.00) 35 dB LAeq

Gardens and terraces (daytime) 55 dB LAeq

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

Reason - To protect the amenity of the occupants of the premises once the development hereby approved is occupied, pursuant to policies SP1, H1 and DM1 of the Core Strategy."

Upon an original submission to discharge Condition 13 (noise), the local authority was unable to discharge the condition since *“The information submitted to discharge condition 13 is not sufficient. A scheme for acoustically insulating the proposed residential accommodation against noise from Moston Lane East has not been provided for review”*.

It has therefore been determined that a noise assessment in accordance with BS 8233:2014 is required to support the discharge of Condition 13.

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 during the week commencing 3rd November 2025 and is intended to address part (a) of Condition 13. Part (b) of the condition will be addressed at a later stage through post-completion verification testing, prior to occupation of the development.

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.

Background and industrial/commercial noise have been assessed in accordance with BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (BS 4142). Noise outside the scope of BS 8233 and BS 4142 has been assessed with reference to the Guidelines for Environmental Noise Impact Assessment (IEMA, now ISEP, 2014).

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.

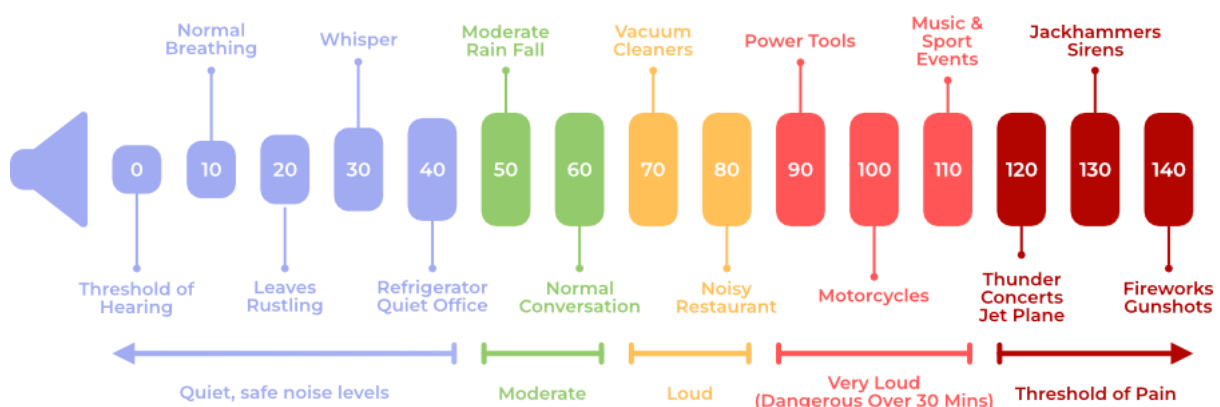
The human ear is sensitive to an exceptionally wide range of sound levels: the threshold of pain is more than one million times greater in sound pressure than the quietest audible sound. To accommodate this range, sound levels are expressed on a logarithmic decibel scale (dB), referenced to the threshold 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 application site is located at 229 Moston Lane East, Manchester (M40 3HY), within an established residential area of north-east Manchester.

The site currently comprises the end unit of an existing terraced row, positioned along a well-trafficked local distributor road that connects the Moston and Newton Heath areas. The surrounding environment is predominantly residential in character, with a mix of traditional two-storey brick dwellings, interspersed with small commercial premises fronting the main road.

The local noise climate is primarily influenced by road traffic movements along Moston Lane East, with additional contributions from occasional pedestrian activity and distant urban sources typical of the wider area. The site location plan is shown in **Figure 2.1** below.

Figure 2.1: Site Location Plan



Please Note: North-orientated. For reference only, do not scale.

2.2. Development Proposal

The proposed Development comprises the erection of a two-storey end-terrace dwellinghouse (Use Class C3) adjoining the existing property at No. 229 Moston Lane East, together with the formation of rear roof dormers to both the existing and proposed dwellings. The scheme will effectively extend the existing terrace to provide an additional self-contained residential unit, reflecting the scale, form and architectural detailing of the adjoining properties.

Figure 2.2 presents the ground floor site layout, which includes both the proposed (green boundary) and existing (blue boundary) dwellings, with the red line boundary illustrating the application boundary.

Figure 2.2: Proposed Front Elevation



3. Noise Survey

3.1. Overview

In order to inform the residential environmental and intrusive noise study, it will be necessary to determine the potential noise impact expected from the key identified noise sources, namely road traffic noise from Moston Lane East, in addition to distant road traffic noise from Broadway (A663, Hollinwood Avenue and the M60).

This assessment also considers the potential contributions of rail noise from the Calder Valley Line, which is situated ~250m to the west of the Development site. Noise from aircraft is also considered within this assessment.

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 μ Pa 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.

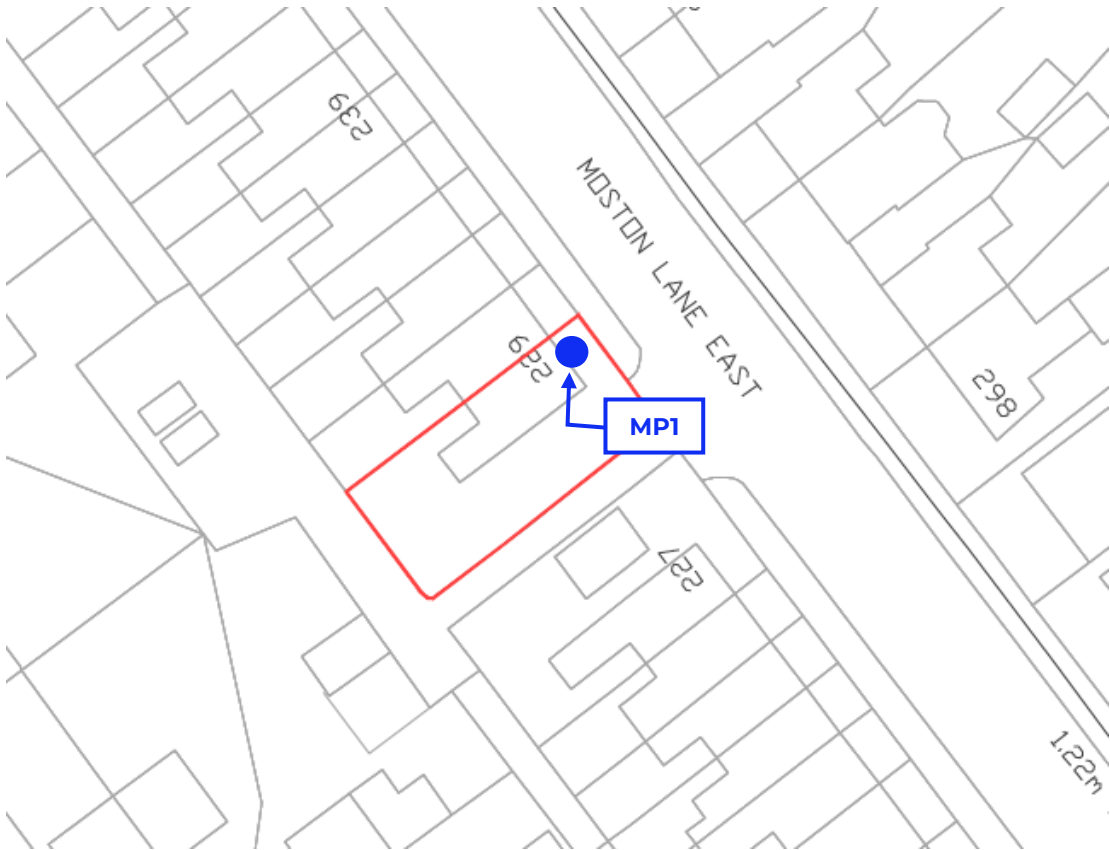
3.3. Survey Details

A 24-hour unattended environmental noise survey was conducted by Polaris between the 3rd and 4th (inclusive) November 2025. This consisted of a single measurement position, as shown in blue on **Figure 3.1**, and described in **Table 3.1** below.

Table 3.1: Noise Monitoring Measurement Positions Summary

Position	Description
MP1	A microphone on a tripod was set up at first-floor height, 1 m in front of the building façade, facing directly towards Moston Lane East. The sound level measurement position is a façade position.

Figure 3.1: Noise Monitoring Positions



The prevailing weather conditions were conducive to successful environmental noise monitoring. Wind speeds did not exceed 5m/s for the duration of the survey.

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 of Polaris Acoustics. Mathew is an acoustic consultant with 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.

Table 3.2: Summary of the measured broadband noise levels

Measurement Position	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	57.5 – 69.6	40.3 – 55.8	39.2 – 66.8	43.0 – 84.5	37.6 – 48.6

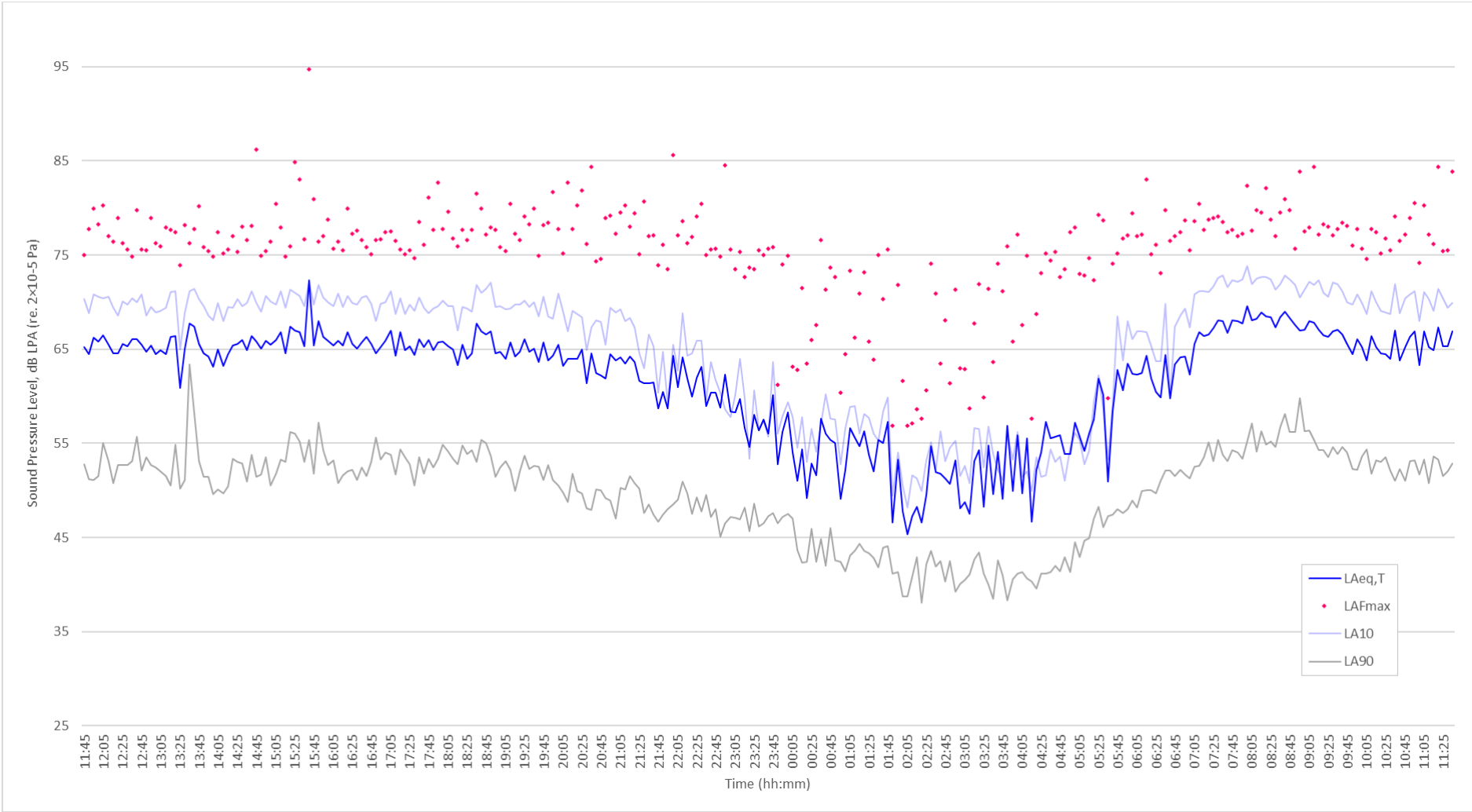
Table 3.3 provides a corresponding time-averaged daytime and nighttime ambient noise levels used for the assessment, in addition to the linear 1/1 octave band terms.

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

Period (Hours)	Ambient SPL dB $L_{Aeq,T}$	Unweighted Sound Pressure Level dB, $L_{eq,T}$ @ Octave Band Centre Frequency, Hz							
		63	125	250	500	1k	2k	3k	4k
Measurement Position 1 (MPI)									
Daytime (07:00 – 23:00)	65.7	65.6	58.4	59.4	59.0	63.3	58.3	51.4	65.6
Nighttime (23:00 – 07:00)	57.5	61.4	53.7	51.3	50.8	54.8	50.0	44.8	61.4

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**.

Figure 3.2: Noise Measurements



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

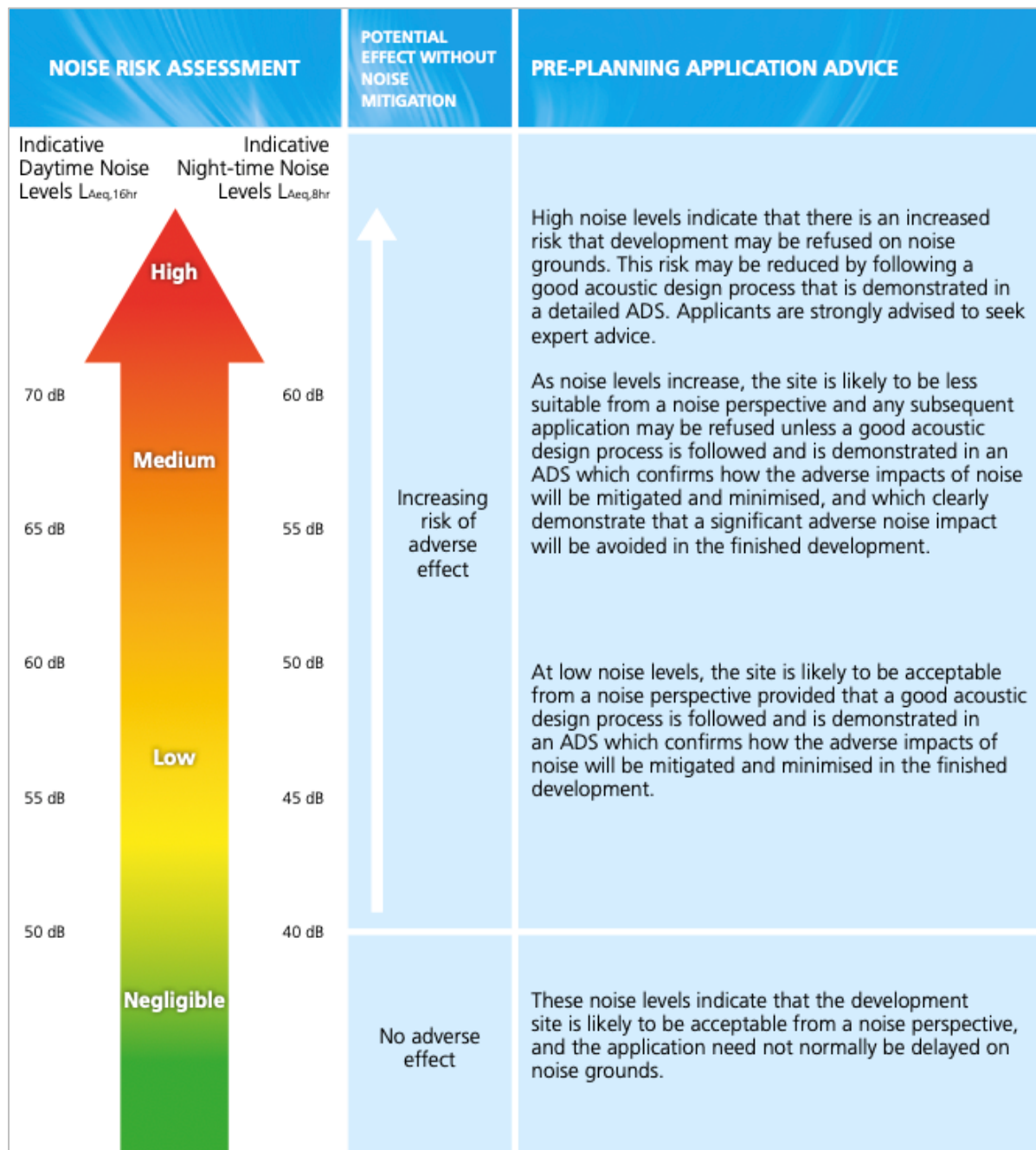
The Stage 1 assessment provides an early indication if the noise levels across a proposed development site are likely to provide greater acoustic challenges, based on a sliding scale of Risk of Adverse Effect, as replicated in **Figure 4.1. Table 4.1** below provides a summary of the Stage 1 assessment.

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	68	63
ProPG Noise Risk	Medium	Medium to High
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 “Medium” to “High” risk. For a medium to high-risk site, the pre-planning application advice requires a Stage 2 Acoustic Design Statement. This is presented from **Section 6** of this report.

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.

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

5.1. Overview

The Stage 1 ProPG site risk assessment indicates a ‘Low–Medium’ 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 avoided, 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_{Amax} 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_{Amax}) levels within bedrooms, the ProPG supplements this by advising that individual noise events at night should not normally exceed 45 dB L_{Amax} 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)	63	55
BS 8233 Criteria	35	30
Internal Noise Levels (assuming R_w of 33 dB)	30	22
Comparison to BS 8233 Criteria	-5	-8
Action	Suitable internal noise levels can be achieved with standard double glazing, with a minimum R_w of 33 dB.	

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** confirm that the estimated internal ambient noise levels are at least 5 dB below the criteria as set out in BS 8233:2014. Accordingly, additional detailed calculations are not necessary.

Regarding the maxima noise events, the ProPG notes that there should be no more than 10-15 45 dB L_{AFmax} events during the nighttime. At this site, the 11th highest L_{AFmax} (design criteria) is 77.2 dB L_{AFmax} . When converted to free field, this translates to 74.2 dB(A). Based on standard double glazing, assuming a typical R_w of 33 dB, it would be estimated that the 11th highest internal maxima would be 41 dB L_{AFmax} , at least 4 dB below the 45 dB L_{AFmax} criteria of the ProPG.

It can be concluded that suitable noise levels can be achieved with windows closed, with the installation of standard double glazing, with a minimum R_w value of 33 dB.

As the levels of noise to the rear and for habitable rooms without a direct view of Moston Lane East are likely to be >5 dB below the levels of noise on the front façade, it can be assumed that standard double glazing with a minimum R_w value of 33 dB would also be suitable for all other facades.

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 (project-specific calculations) indicates the site cannot achieve the internal targets with windows open, the design 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: Internal Noise Levels (Windows Open)

	Daytime dB $L_{Aeq,16hrs}$	Nighttime dB $L_{Aeq,16hrs}$	Nighttime dB L_{AFmax}
External Freefield Noise Levels	63	55	71
Attenuation for Opened Windows	13 dB		
Internal Noise Levels (Assuming Opened Windows)	50	42	58

The noise survey has noted that external daytime ambient noise levels are 63 dB $L_{Aeq,16hr}$, and 55 dB $L_{Aeq,8h}$ at night, with typical maxima events not regularly exceeding 71 dB L_{AFmax} . Based on the onsite noise levels, it indicates that at this site, any ventilation system ADF systems 1/2, 3 (MEV) or 4 (MVHR) would be appropriate at this site for rooms with a direct view to Moston Lane East.

As all other building façades are subject to lower incident sound levels, any of the ADF ventilation strategies would be acceptable for those elevations.

Window opening 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 Moston Lane East, as presenting a “Medium” risk based on the criteria set out in **Table 8.3** of this report and the measured external noise levels.

For sites classified as “Medium” risk, windows may be opened as a means of passively mitigating overheating, depending on the duration, due to the potential for unacceptable noise ingress with windows being excessively used to manage overheating.

It is important to note, however, that windows should not be sealed: residents should retain the option to open windows for purge ventilation (e.g. rapid dilution of smells, water vapour, or VOCs), but they should not be required to do so to maintain acceptable thermal comfort conditions.

Where mechanical ventilation or cooling systems are preferred, it will be necessary to ensure that:

- Self-noise from fans does not exceed the internal noise limits set out in the AVO Guide.
- Ventilation design adequately attenuates noise ingress via external vents, with attenuation specified in relation to local external noise levels.

These requirements are typically addressed at the detailed design stage, with the ventilation system supplier specifying the necessary acoustic attenuation to ensure compliance.

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.

At this site, there will be external amenity at the rear of the property. Since the proposed development will result in a barrier to sound from Moston Lane East and the M60, it would be anticipated that the levels of noise to the rear would be at least 10 dB lower than on the front façade. Based on the above, external amenity areas are expected to experience typical noise levels of approximately 53 dB $L_{Aeq,T}$. This is below the BS 8233:2014 upper guideline value of 55 dB $L_{Aeq,T}$ for external amenity. Therefore, the external amenity areas are considered suitable in terms of noise.

5.5. Element 4 – Other Relevant issues

Good acoustic design principles which have been followed mean that the proposed development is in general compliance of the ProPG.

Steps should be taken through effective architectural and ventilation design to minimise the regularity and duration that windows are required to be open. This, in conjunction with the good acoustic design principles adopted, would be considered to mitigate and minimise any potential adverse effects of noise on the future occupants.

5.6. Advice to the Decision Maker

As the internal and external noise criteria set out in BS 8233 and the ProPG guidance framework can be met, and a reasonable level of acoustic design has been demonstrated, it is recommended that planning consent be granted.

This should, however, be subject to the inclusion of appropriate noise conditions to ensure suitable internal and external noise levels are maintained and to protect the amenity of future occupants.

It is acknowledged that part-b of Condition 13 will require post-completion verification testing.

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).

In general, the construction activities with the greatest potential to generate noise are expected to be the initial earthworks required to level the site, demolition works and piling for foundations. By contrast, the subsequent building construction phase typically produces lower noise levels.

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. Conclusion

Polaris Acoustics has been commissioned by MGD PEDDER LTD to undertake an acoustic design assessment of the 229 Moston Lane East Development in Manchester.

The purpose of this report is to assess the scheme in terms of intrusive noise, and to determine an appropriate acoustic performance specification for the building envelope, as informed by the baseline environmental noise survey conducted on site in November 2025, predicted noise model results, the requirements of BS 8233:2014, and the currently available architectural design drawings.

The assessment has identified that the site is subject to noise from surrounding roads and local activity, placing it in a “*medium*” category under the ProPG: Planning & Noise guidance, with prevailing sound levels in excess of the Significant Observed Adverse Effect Level (SOAEL). Accordingly, noise must be considered and mitigated through suitable acoustic design to ensure that the development provides acceptable internal and external amenity conditions.

Using the guidance and calculation methods contained within BS 8233:2014, it has been demonstrated that the recommended internal ambient noise criteria for habitable rooms can be achieved through the provision of appropriately specified glazing and ventilation. The recommended strategy is detailed within this report, and a summary of performance requirements is provided in **Table 7.1** below.

Table 7.1: Summary of Recommendations to Achieve Suitable Internal Noise Levels

		All façades
Minimum Glazing Sound Reduction Index (R_w)		Standard Double Glazing with an $R_w + C_{tr}$ of ≥ 33 dB
Ventilation Strategy	Background Ventilation	Based on the onsite noise levels, any ADF ventilation system would be appropriate.
	Purge Ventilation	Windows should remain openable to allow purge ventilation.
Overheating & Thermal Comfort		Based on the onsite noise levels, windows can be opened to deal with overheating,

In addition, environmental noise limits for proposed M&E plant have been derived in accordance with BS 4142:2014. These limits, alongside the proposed glazing and ventilation strategy, provide a framework to ensure that the development will not give rise to unacceptable noise impact, and that planning consent can be granted subject to suitably worded conditions.



This report therefore demonstrates that, in terms of noise, the proposed development is consistent with the guidance of BS 8233:2014, the ProPG framework, and the objectives of the National Planning Policy Framework (NPPF), and that noise should not be considered a constraint upon the development of the site.

It is concluded that the proposed development can achieve an appropriate acoustic environment in accordance with relevant national and local planning policy, subject to implementation of the mitigation measures and performance specifications set out in this assessment. The proposed acoustic design measures suitably demonstrate compliance with part (a) of Condition 13 of Decision Notice LPA ref. 132185/FO/2021. On this basis, it is recommended that part (a) of the condition is discharged.

8. Reference Documents

8.1. National and Local Planning Policy Context

8.1.1. 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:

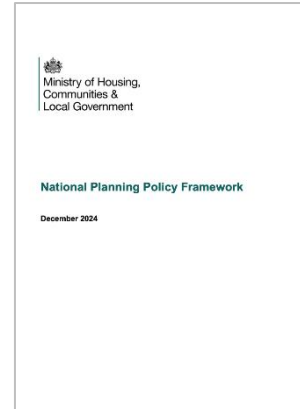
"Planning policies and decisions should contribute to and enhance the natural and local environment by... preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land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

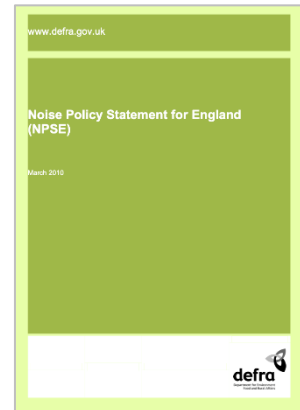


8.1.2. Noise Policy Statement for England (NPSE) (2010)

The Noise Policy Statement for England (NPSE) provides additional guidance relevant to the NPPF. It states:

“Within the context of sustainable development:

- avoid significant adverse impacts on health and quality of life;*
- mitigate and minimise adverse impacts on health and quality of life; and*
- where possible contribute to the improvement of health and quality of life.”*



The NPSE introduces three key concepts, adapted from toxicology and applied to noise impacts:

- **NOEL – No Observed Effect Level:** the level of noise below which no effect can be detected. In other words, noise at or below this level has no observable impact on health or quality of life.
- **LOAEL – Lowest Observed Adverse Effect Level:** the level of noise above which adverse effects on health and quality of life can be detected.
- **SOAEL – Significant Observed Adverse Effect Level:** the level above which significant adverse effects on health and quality of life occur.

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

8.1.3. Planning Practice Guidance (PPG)

--The Noise Planning Practice Guidance (NPPG), first published in 2014 and most recently updated in July 2019, provides supporting guidance to the NPPF. It expands on the concepts of NOEL, LOAEL and SOAEL introduced in the NPS E and sets out how noise should be considered in planning decisions.

The NPPG states: *“Local planning authorities’ plan-making and decision taking should take account of the acoustic environment and in doing so consider:*

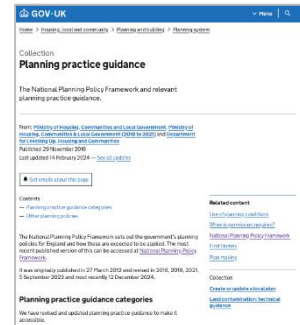
- *whether or not a significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur; and*
- *whether or not a good standard of amenity can be achieved.”*

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.”



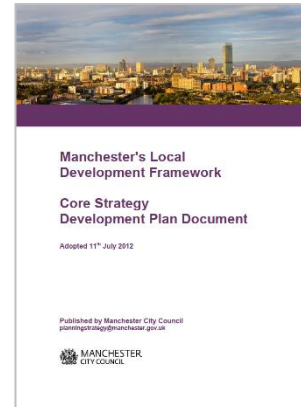
8.1.4. Manchester Core Strategy (2012)

The Development has been considered in the context of the Manchester Core Strategy (2012), which forms part of the adopted Local Development Framework for Manchester City Council and was adopted on the 11th July 2012.

In the Decision Notice (LPA ref. 132185/FO/2021), reference is made to **Policies SP1 (Spatial Principles), H1 (Overall Housing Provision), and DM1 (Development Management)**.

- **Policy SP1** promotes sustainable, high-quality development within accessible locations that contribute positively to the built environment and community wellbeing.
- **Policy H1** supports the delivery of new housing to meet the city's growth objectives, ensuring a range of accommodation types and tenures.
- **Policy DM1** outlines general development management considerations, requiring proposals to demonstrate appropriate design, access, amenity, and environmental performance.

This noise assessment has been prepared regarding these policies, ensuring that the proposed residential accommodation will provide an acceptable standard of internal and external amenity consistent with the principles of sustainable development.

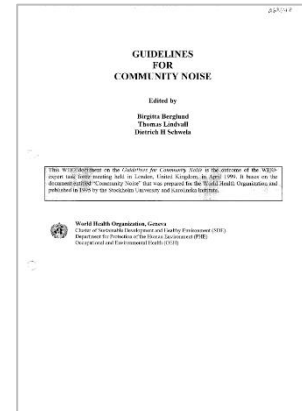


8.2. Technical Standards and Guidance

8.2.1. 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**.



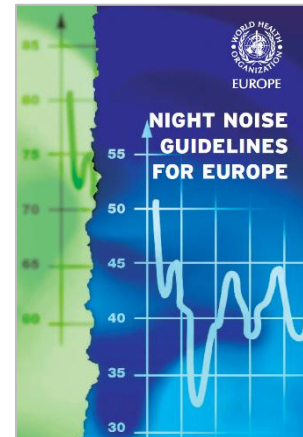
In 2018, the WHO issued the Environmental Noise Guidelines for the European Region, lowering several recommended limits—particularly for transport noise—based on evidence of links to cardiovascular disease, sleep disturbance, and reduced quality of life. However, BS 8233:2014 remains based on the 1999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

Table 8.1: 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

8.2.2. 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.

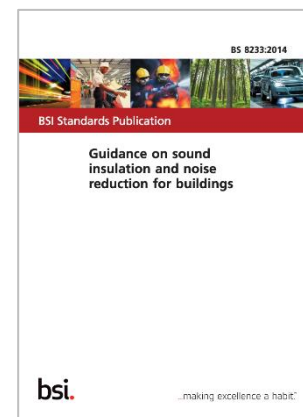


8.2.3. BS 8233:2014

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 8.2: 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

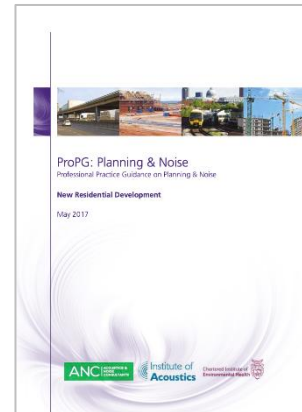
noise levels and other planning considerations. In such cases, development should aim for the lowest practicable external levels, but noise should not be a barrier to development.

8.2.4. 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.”

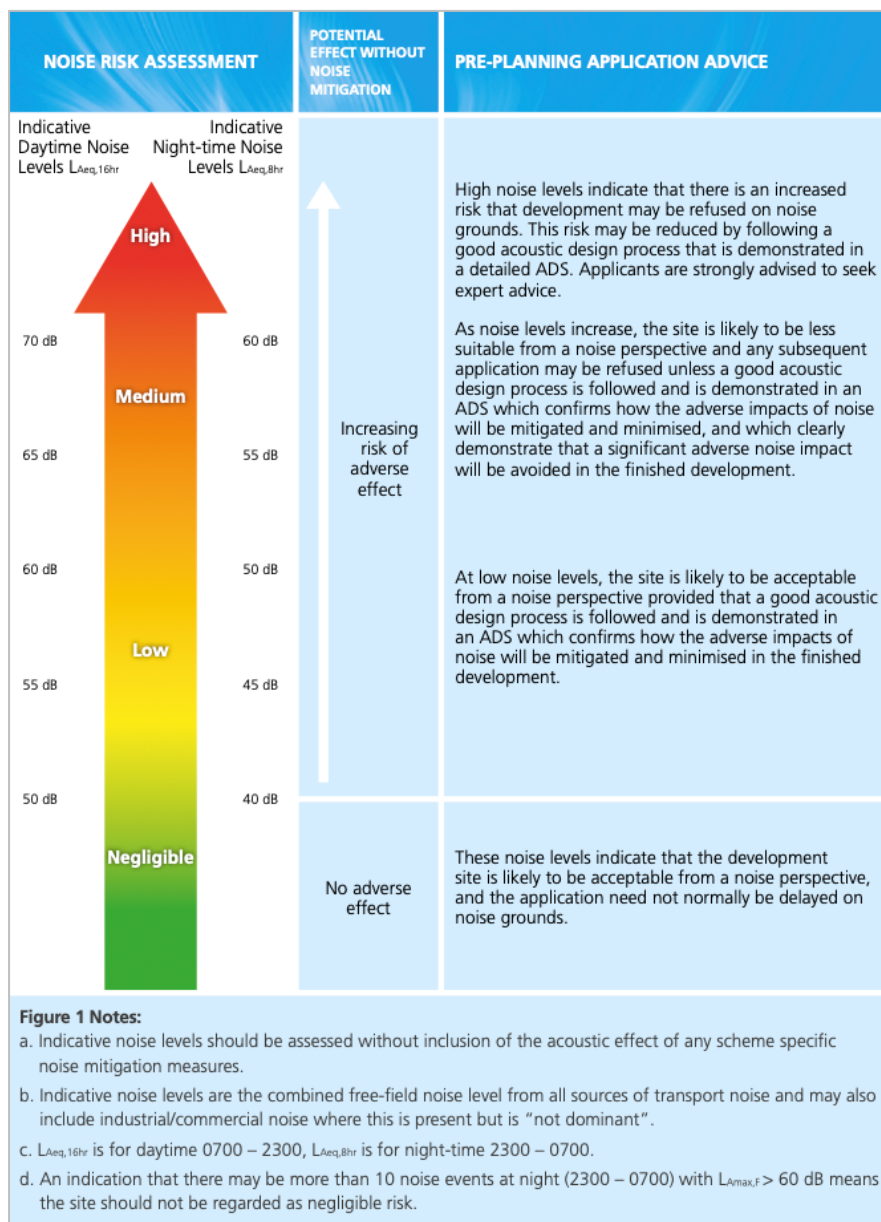
Where open-window conditions cannot achieve targets, the ProPG (notes to Figure 2) advises:

“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 8.1: ProPG: Stage 1 Initial Site Noise Risk Assessment



8.2.5. 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

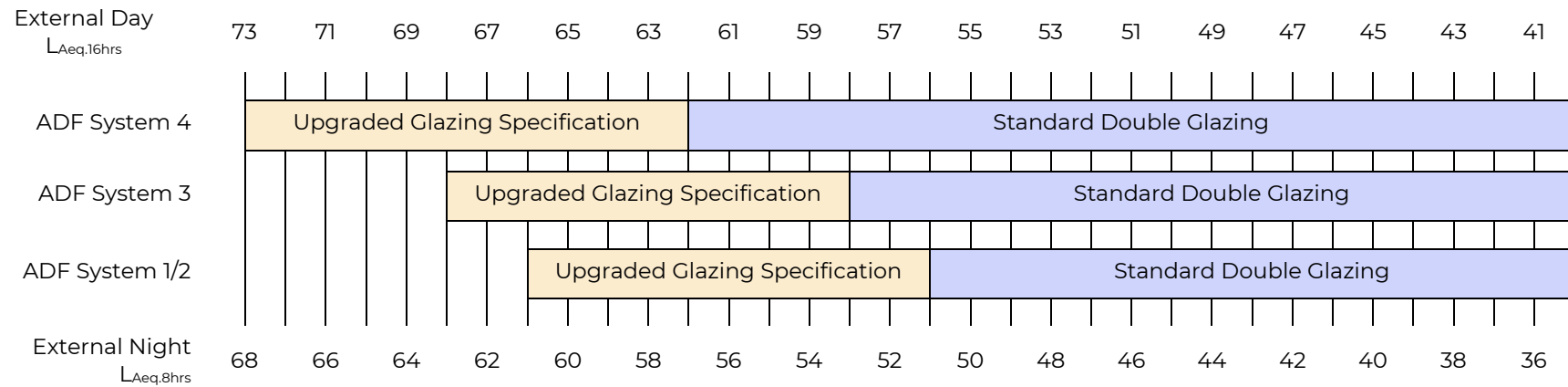
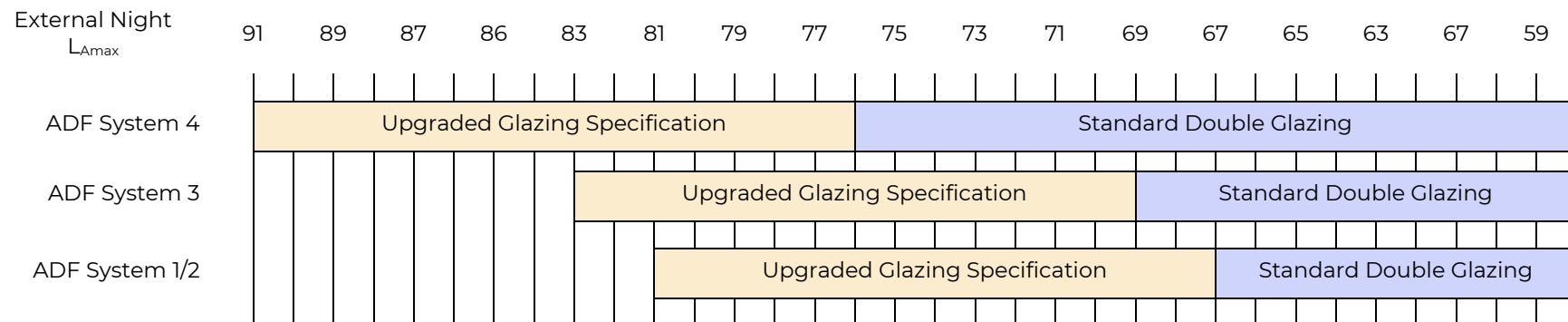
The Guide accepts some flexibility under overheating conditions:

“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 8.2: Guideline Values for Ventilation in AD: F – External L_{Aeq} **Figure 8.3: 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 8.3: 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



8.2.6. 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.



8.2.7. 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 8.4: 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.

8.2.8. BS 4142:2014+A1:2019

British Standard BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound', sets out how to measure and rate industrial or industrial-type noise against background levels outside dwellings in mixed residential/industrial areas. The rating level is applied to the "specific noise source" and compared with the background level to indicate the likelihood of complaints.

The guidance states:

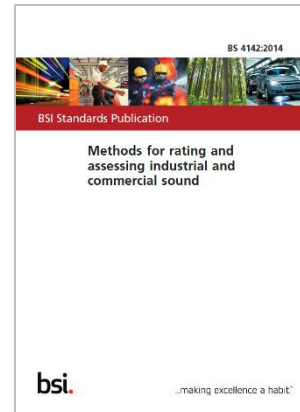
- "A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context."
- "A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context."
- "The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact ... Where the rating level does not exceed the background sound level, this is an indication of ... low impact, depending on the context."

"Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."

BS 4142 further notes:

"Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night."

Accordingly, assessments should also consider absolute noise levels at the receptor, with reference to the relevant BS 8233 and WHO guidelines.



8.2.9. BS 4142:2014+A1:2019 Technical Note (2020)

In March 2020, the Association of Noise Consultants (ANC) published a Technical Note to support BS 4142. The Note recognises “concerns for some users of BS 4142” and aims “to assist readers with a reasonable interpretation and application of BS 4142 as a whole.” While not official guidance, it provides clarification and examples of best practice. The following points are most relevant to this assessment.



Internal Noise Levels

The Note confirms that BS 4142 *“is not intended to be applied to the assessment of indoor sound levels”* and therefore cannot be used for façade design. While BS 4142 can help assess the likelihood of adverse impacts, internal design and mitigation should be guided by other standards, notably BS 8233, subject to its scope and limitations.

New Noise-Sensitive Receptors

A limitation of BS 4142 is its lack of differentiation between new noise sources and new receptors. Subclause 8.5 acknowledges that when introducing a new receptor, existing industrial/commercial sound is part of the acoustic environment, and *“other guidance and criteria ... can also inform the appropriateness”* of development and mitigation.

The Technical Note advises maintaining BS 4142’s core principles while supplementing with other standards where appropriate, for example:

- **BS 8233:** where continuous industrial/commercial sound is present near new housing;
- **ProPG:** where night-time maxima are critical;
- **DMRB:** where traffic changes dominate;
- **BS 5228:** for temporary/construction-type activity.

It cautions that using BS 4142 for new receptors can be problematic, as separating *“legitimate commercial residual sources”* from background may exaggerate adverse outcomes. In such cases, *“alternative guidance and standards should be referenced,”* with careful regard to their scope. Different approaches may be required depending on whether the source is continuous, intermittent, or dominated by one premises.

Background Sound Levels

BS 4142 gives no fixed method for determining background sound levels. The Technical Note similarly avoids prescribing one but advises that a single value may not always be appropriate. Instead, *“a range of values over one or more time periods may be more*

appropriate,” with assessments focusing on the period of greatest interest (e.g. quietest night period or complaint time).

It stresses that background levels must be representative of typical conditions, supported by time histories, histograms, and cumulative data. The ANC Working Group noted that *“there are no ‘correct’ answers, only judgement and justification.”*

Context

BS 4142 requires consideration of context but provides little detail. The Technical Note clarifies that absolute sound levels may outweigh relative differences when both background and rating levels are low. For instance, a 30 dB rating level exceeding a 20 dB background (normally indicating a significant adverse impact) may in practice be acceptable. Conversely, low absolute levels could sometimes worsen perceived impact.

Although BS 4142 does not define *“low,”* the 1997 version suggested <30 dB L_{A90} as very low background and <35 dB $L_{A,T,r}$ as low rating levels. The Working Group noted these values *“would not be unreasonable”* but should be applied with professional judgement.

Other contextual factors include:

- neighbourhood character;
- legitimacy of the industrial use (e.g. planning consent, permits);
- implementation of best practicable means;

Examples highlight how context may alter conclusions, such as recent vs historic industrial activity, or a drive-thru adjacent to a busy road where baseline noise already masks impacts.

8.2.10. The Little Red Book of Acoustics (4th ed., 2024)

First published in 2007, The Little Red Book of Acoustics: A Practical Guide remains a widely used reference, valued for its clarity and inclusion in Institute of Acoustics reading lists.

The 4th edition (2024) incorporates updates to BS 8233 and BS 4142 and introduces the LRB Method for determining representative background sound levels under BS 4142. Recognising the absence of a fixed method in BS 4142, the LRB Method applies a modal approach with a distribution threshold:

1. Count the frequency of each background sound level value.
2. Start with the most common value (or lowest if multiple are tied).
3. Test whether $\leq 45\%$ of data fall below it.
 - a. If more than 45% fall below, reject the candidate.
 - b. If $\leq 45\%$, accept it as the representative level.

This method provides a structured approach to identifying representative background sound levels while aligning with the principles of BS 4142.



8.2.11. 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**.

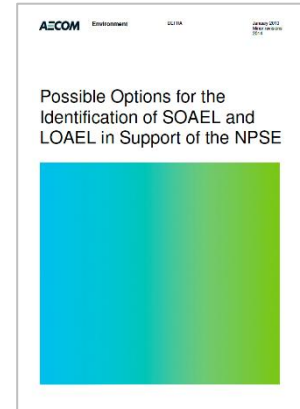


Table 8.5: Possible Value & Ranges of Values for LOAELs & SOAELs

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.
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

Time	dB $L_{Aeq,T}$	dB L_{AFmax}	dB L_{A10}	dB L_{A50}	dB L_{A90}
07:00	67.0	80.4	60.9	60.9	53.5
08:00	68.3	83.9	65.2	65.2	56.2
09:00	66.7	84.4	61.0	61.0	54.3
10:00	65.4	80.5	59.2	59.2	52.7
11:00	65.7	84.4	59.8	59.8	52.2
12:00	65.5	80.3	60.9	60.9	53.0
13:00	65.5	80.2	59.8	59.8	53.3
14:00	65.2	86.2	59.1	59.1	51.7
15:00	67.3	94.7	62.2	62.2	54.0
16:00	65.7	79.9	61.3	61.3	52.5
17:00	65.6	82.7	61.0	61.0	52.9
18:00	65.7	81.5	59.7	59.7	53.9
19:00	64.8	81.7	57.9	57.9	52.1
20:00	63.7	84.4	54.2	54.2	49.6
21:00	62.3	80.7	53.7	53.7	48.8
22:00	61.8	85.6	52.5	52.5	48.3
23:00	57.5	75.8	51.0	51.0	47.1
00:00	54.6	76.6	48.9	48.9	44.1
01:00	54.7	75.6	48.6	48.6	42.9
02:00	50.7	74.1	45.6	45.6	41.0
03:00	52.3	75.9	45.9	45.9	40.8
04:00	54.6	77.4	45.4	45.4	41.2
05:00	59.5	79.3	49.7	49.7	46.4
06:00	62.8	83.0	54.0	54.0	50.6
Day	65.7	94.7	59.3	59.3	52.4
Night	57.5	83.0	48.6	48.6	44.3

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

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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).

