



PLANNING NOISE ASSESSMENT

LAND OFF MILL LANE, SAYERS COMMON, BN6 9JA

CHRIS HARRIS

AUGUST 2026

PLANNING NOISE ASSESSMENT LAND OFF MILL LANE, SAYERS COMMON, BN6 9JA

Our Ref: 8768_002R_1-0_JN

Client: **Chris Harris,**
Land off Mill Lane
Sayers Common
BN6 9JA

Report by: **Anderson Acoustics Limited**
Tempus Wharf,
33A Bermondsey Wall West,
London, SE16 4ST

www.andersonacoustics.co.uk
T: 01273 696 887

Date: **3 August 2026**

Project No: **8768**
Status: **ISSUED**

Author	Jack Naumann MIOA	3 August 2026
---------------	-----------------------------	----------------------

Reviewed	Joe Baggaley MIOA	3 August 2026
-----------------	-----------------------------	----------------------

Approved	Joe Baggaley MIOA	3 August 2026
-----------------	-----------------------------	----------------------

This document has been prepared using all reasonable skill and care. Anderson Acoustics Ltd accepts no responsibility or liability for any third-party data presented in this report or used for the basis of drawing any conclusions. This document is confidential to the named client above and Anderson Acoustics Ltd accepts no responsibility or liability resulting from third party use of this document or for a purpose other than for which it was commissioned.

REVISION HISTORY

Version	Comments	Date	Changes made by	Approved by
1.0	First draft version	03/08/2026	JN	JB

PAGE LEFT INTENTIONALLY BLANK

CONTENTS

1	INTRODUCTION	6
2	RELEVANT GUIDANCE AND CRITERIA	7
3	PROPOSED DEVELOPMENT	10
4	BASELINE NOISE CONDITIONS	11
5	PRO-PG STAGE 1: INITIAL SITE NOISE RISK ASSESSMENT	13
6	PRO-PG STAGE 2: FULL ACOUSTIC DESIGN ASSESSMENT	18
7	SUMMARY	25

1 INTRODUCTION

Anderson Acoustics Ltd have been commissioned by Chris Harris to undertake a noise assessment in support of a planning application for the development of 9 residential dwellings at Land off Mill Lane, Sayers Common, BN6 9JA.

This report presents the results of a baseline noise survey, an assessment of internal ambient noise levels, the suitability of open windows to provide cooling during the overheating condition and an assessment of noise levels in external amenity areas.

This report is technical in nature and, as such, a summary of noise units and acoustic terminology can be found [here](#) for reference.

2 RELEVANT GUIDANCE AND CRITERIA

2.1 British Standard 8233

BS 8233:2014 *Guidance on sound insulation and noise reduction for buildings* is the most relevant Standard in terms of noise and the scope of this report. All relevant details are incorporated into the Professional Practice Guidance on Planning & Noise (ProPG: Planning & Noise, 2017), as presented below, and so there is no need to represent the guidance here. Compliance with the ProPG ensures compliance with BS 8233.

2.2 ProPG: Planning & Noise

The ProPG was jointly developed by the Institute of Acoustics (IOA), the Association of Noise Consultants (ANC) and the Chartered Institute of Environmental Health (CIEH) to guide Local Planning Authorities (LPA's) and Practitioners in assessing the suitability for residential development on sites predominantly exposed to airborne transport noise.

ProPG introduced a sequential 2-stage approach allowing for early consideration of noise issues at Stage 1 followed by more detailed consideration of noise issues at Stage 2, should this be necessary.

Stage 1 introduces the concept of noise risk categories ranging from Negligible Risk to High Risk to help LPA's in making accelerated straightforward decisions for negligible-risk sites and to provide guidance for more detailed consideration associated with challenging higher risk sites.

Following the outcome of Stage 1, Stage 2 then applies to sites assessed as low to high risk. This stage should not be necessary for sites assessed as negligible risk.

Stage 2 requires consideration be given to four key elements:

- Element 1: Good Acoustic Design Process
- Element 2: Internal Noise Level Guidelines
- Element 3: External Amenity Area Noise Assessment
- Element 4: Other Relevant Issues

Table 2.1 provides a summary of ProPG's noise risk categories and their associated external free-field noise levels, along with the assessment implications.

Table 2.1: Interpretation of the Stage 1 initial site noise risk assessment thresholds

Noise risk category	L _{Aeq,16h} (07-23)	L _{Aeq,8h} (23-07)	L _{Afmax} (23-07)	Stage 2 assessment?	Pre-planning application advice
High	> 70 dB	> 60 dB	> 10 events > 60 dB	Required	"...an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process..."
Medium	61 – 70 dB	51 – 60 dB			"...application may be refused unless a good acoustic design process is followed and is demonstrated... how the adverse impacts of noise will be mitigated and minimised, and... a significant adverse noise impact will be avoided..."
Low	51 – 60 dB	41 – 50 dB			"...the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed..."
Negligible	≤ 50 dB	≤ 40 dB	Less than the above	Not normally required	"...the development site is likely to be acceptable from a noise perspective, and the application need not normally be delayed on noise grounds."

As noted above, the rating or categorisation at this stage is not to be taken as the final word on the site, but rather an initial guide as to the degree of measures likely to be required to achieve an acceptable development.

With regard to Element 2, the internal noise level guidelines presented in ProPG are primarily based on the guidance in BS 8233, with further guidance incorporated based on the WHO guidelines and current good practice. The resultant internal levels and associated guidance is presented within Figure 2 of ProPG, which is reproduced as Table 2.2 below.

Table 2.2: ProPG Internal Noise Level Guidelines (as per ProPG Figure 2)

Activity	Location	07:00 – 23:00 Hrs	23:00 – 07:00 Hrs
Resting	Living room	35 dB $L_{Aeq,16h}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16h}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16h}$	30 dB $L_{Aeq,8h}$ 45 dB $L_{Amax,F}$ (Note 1)

Note 1. In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night.

With regard to Element 3, the external noise level guidelines presented in ProPG are primarily based on the guidance in BS 8233, which states that:

For traditional external areas that are used for amenity space, such as gardens and patios, 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 is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.

ProPG also states the following:

- 3(i) *"If external amenity spaces are an intrinsic part of the overall design, the acoustic environment of those spaces should be considered so that they can be enjoyed as intended".*
- 3(ii) *"The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB $L_{Aeq,16hr}$."*
- 3(iii) *"These guideline values may not be achievable in all circumstances where development might be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels in these external amenity spaces."*
- 3(iv) *Whether or not external amenity spaces are an intrinsic part of the overall design, consideration of the need to provide access to a quiet or relatively quiet external amenity space forms part of a good acoustic design process.*
- 3(v) *Where, despite following a good acoustic design process, significant adverse noise impacts remain on any private external amenity space (e.g. garden or balcony) then that impact may be partially off-set if the residents are provided, through the design of the development or the planning process, with access to:*
 - *a relatively quiet facade (containing openable windows to habitable rooms) or a relatively quiet externally ventilated space (i.e. an enclosed balcony) as part of their dwelling; and/or*
 - *a relatively quiet alternative or additional external amenity space for sole use by a household, (e.g. a garden, roof garden or large open balcony in a different, protected, location); and/or*
 - *a relatively quiet, protected, nearby, external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings; and/or*
 - *a relatively quiet, protected, publically [sic] accessible, external amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a*

5 minutes walking distance). The local planning authority could link such provision to the definition and management of Quiet Areas under the Environmental Noise Regulations.

In summary, therefore, key external amenity space should be designed such that noise levels are as low as practicable, and ideally not above 55 dB $L_{Aeq,16h}$.

2.3 Building Regulations Approved Document O

In June 2022, the Building Regulations Approved Document O: *Overheating* came into force, setting standards to control overheating in new residential buildings. The document also includes specific criteria with regard to noise levels in bedrooms during the overheating condition, as defined in the regulations.

Section 3 of ADO includes a sub-section on Noise, which states the following:

3.2 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).

3.3 Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

- a. 40 dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am).*
- b. 55 dB L_{AFmax} , more than 10 times a night (between 11pm and 7am).*

NOTE: *Guidance on reducing the passage of external noise into buildings can be found in the National Model Design Code: Part 2 – Guidance Notes (MHCLG, 2021) and the Association of Noise Consultants' Acoustics, Ventilation and Overheating: Residential Design Guide (2020).*

The above statements do not specifically mention living rooms or any other habitable room (only bedrooms) and are limited to the night-time period. The above criteria are likely to have been derived from BS 8233 internal noise guidance levels + a 10 dB allowance during the overheating condition.

3 PROPOSED DEVELOPMENT

The proposed development consists of 9 residential units (8 no. semi-detached, 1 no. detached), with access and private gardens. The proximity of the plots to the A23 ranges from 20 metres to 30 metres from the nearside lane as shown in Figure 3.1.

Figure 3.1: Proposed Block Plan (Landivar Architects ©).



4 BASELINE NOISE CONDITIONS

4.1 Introduction

A detailed environmental noise survey was undertaken on site between 4th and 10th February 2026. Long term unattended monitoring took place at the position indicated by the red dot (UMP) in Figure 4.1. A short-term survey was also carried out at the position AMP indicated by the blue dot.

Figure 4.1: Baseline noise monitoring locations



During our time on site, the noise climate was observed to be dominated by road traffic from the A23 to the east of the site.

4.2 Instrumentation

All noise measurements were undertaken by consultants certified as competent in noise monitoring. All acoustic measurement equipment used during the noise survey conformed to Class 1 specification of British Standard 61672. A full inventory of this equipment is shown in Table 4.1 below. All equipment's calibration certificates are available on request.

Table 4.1 Inventory of Measurement Equipment

Equipment ID	Item	Make and Model	Serial Number	Calibration	
				Certificate number	Expiry Date
1 (UMP)	Sound Level Meter	01 dB DUO	10664	TR-REP-10749	28/02/2026
2 (AMP)	Sound Level Meter	Rion NL-52	00743139	TCRT25/1371	09/05/2027
3	Sound Calibrator	Rion NC-74	35134397	TCRT25/1587	29/07/2026

The noise measurement equipment used during the survey was calibrated at the start and end of each measurement. The calibrator used had itself been calibrated by a UKAS accredited calibration laboratory within the twelve months preceding the measurements. No significant drift in calibration was found to have occurred.

4.3 Survey results

A summary of the daytime ambient $L_{Aeq,16hr}$ and night-time ambient $L_{Aeq,8hr}$ noise levels measured during the unattended survey is presented below in Table 4.2 along with the typical background $L_{A90,T}$ noise levels and the typical $L_{Amax,F}$ level not exceeded more than 10 times per night.

Table 4.2: Noise survey results at UMP (free-field levels), dB – Overlooking A23

Monitoring Period	Daytime		Night-time		
	$L_{Aeq,16hr}$	Typical $L_{A90,T}$	$L_{Aeq,8hr}$	Typical $L_{A90,T}$	$L_{Amax,F}^{[1]}$
Wed 04/02/2026 ^[2]	66	65	63	44	74
Thu 05/02/2026	68	65	63	47	74
Fri 06/02/2026	68	66	61	48	73
Sat 07/02/2026	68	65	61	49	73
Sun 08/02/2026	67	64	63	44	74
Mon 09/02/2026	67	63	63	39	74
Tue 10/02/2026	69	66	-	-	-
Summary	68 ^[3]	64 ^[4]	62	44	74

Note ^[1]: The $L_{Amax,F}$ levels presented are representative of the value not exceeded more than 10 times each night.

^[2]: Data obtained during the daytime was not a full 16-hour measurement (start time = 16:25 hours).

^[3]: Logarithmic average (same for night-time).

^[4]: Modal value of all individual levels (same for night-time).

An average noise level of 70dB $L_{Aeq,T}$ was also measured over a period of 30 minutes at the attended noise monitoring location, 3m from the kerb of Mill Lane.

5 PRO-PG STAGE 1: INITIAL SITE NOISE RISK ASSESSMENT

Following ProPG guidance, a Stage 1 – Initial Site Noise Risk assessment has been undertaken to characterise the development site in terms of the likely risk of adverse effects from noise on the future occupants of the development, as detailed in the previous section.

In order to predict the impact of road noise sources on the proposed development, the baseline noise measurement results presented in Section 4 were used to produce a detailed 3D noise model of the existing site, which was adjusted / calibrated to match the measured levels summarised above. Once the model was calibrated, the proposed development has been built into the model and future noise levels predicted across the site, with evenly distributed points around the buildings being predicted, approximately representing the mid-point of the windows on each floor.

The predictions were carried out using the noise-modelling suite Cadna/A 2026, in accordance with the CRTN and ISO 9613 prediction methodologies, which allow consideration of the effects of the acoustic screening provided by both existing buildings surrounding the site and buildings of the development itself.

The results of the noise modelling were used to determine the likely noise levels incident on each building across the completed site. These predictions have formed the basis of the mitigation recommendations.

In addition to the road source noise levels used in the predictions, the model considers the effects of the topographical conditions throughout the area, ground absorption, atmospheric absorption, acoustic reflections and acoustic screening, as well as applying a light downwind propagation correction to represent a worst-case.

Figures 5.1 and 5.2 below show the predicted noise contours across the site based on the noise risk categories in Table 2.1. Noise contours have been calculated at a height of 4.5m above ground level, representing a first-floor window.

Figure 5.1: ProPG Stage 1 site noise risk assessment (daytime $L_{Aeq,16hr}$ noise contours predicted at 4.5 metres agl)



Figure 5.2: ProPG Stage 1 site noise risk assessment (night-time $L_{Aeq,8hour}$ noise contours predicted at 4.5 metres agl)



If we compare the above predicted noise levels to the ProPG guidance presented in Table 2.1, we can see that the eastern facades of all plots fall in the medium noise risk category for the day and nighttime periods. The western facades are all low risk during both the day and night.

The site plan indicated the inclusion of an acoustic bund along the eastern boundary of the site. Discussions with the project architect have suggested the bund is likely to be 2m high with a 2.1m high solid fence running atop the length of the bund. Car ports will also be positioned along the eastern boundary. The earth bund will butt up against the rear and side of the car ports forming a continuous acoustic barrier along the eastern perimeter. The model has been rerun with these mitigation measures in place with the results shown in Figures 5.3 and 5.4.

The mitigation has reduced noise levels across the site with the north and south facades being low risk during the day periods. It should also be noted that the benefit of the mitigation will be greater at first floor level (rather than at first floor level/4.5m agl as shown in the plots).

Figure 5.3: ProPG Stage 1 site noise risk assessment (daytime $L_{Aeq,16hour}$ noise contours predicted at 4.5 metres agl) with 2m earth bund and 2.1m fence on top

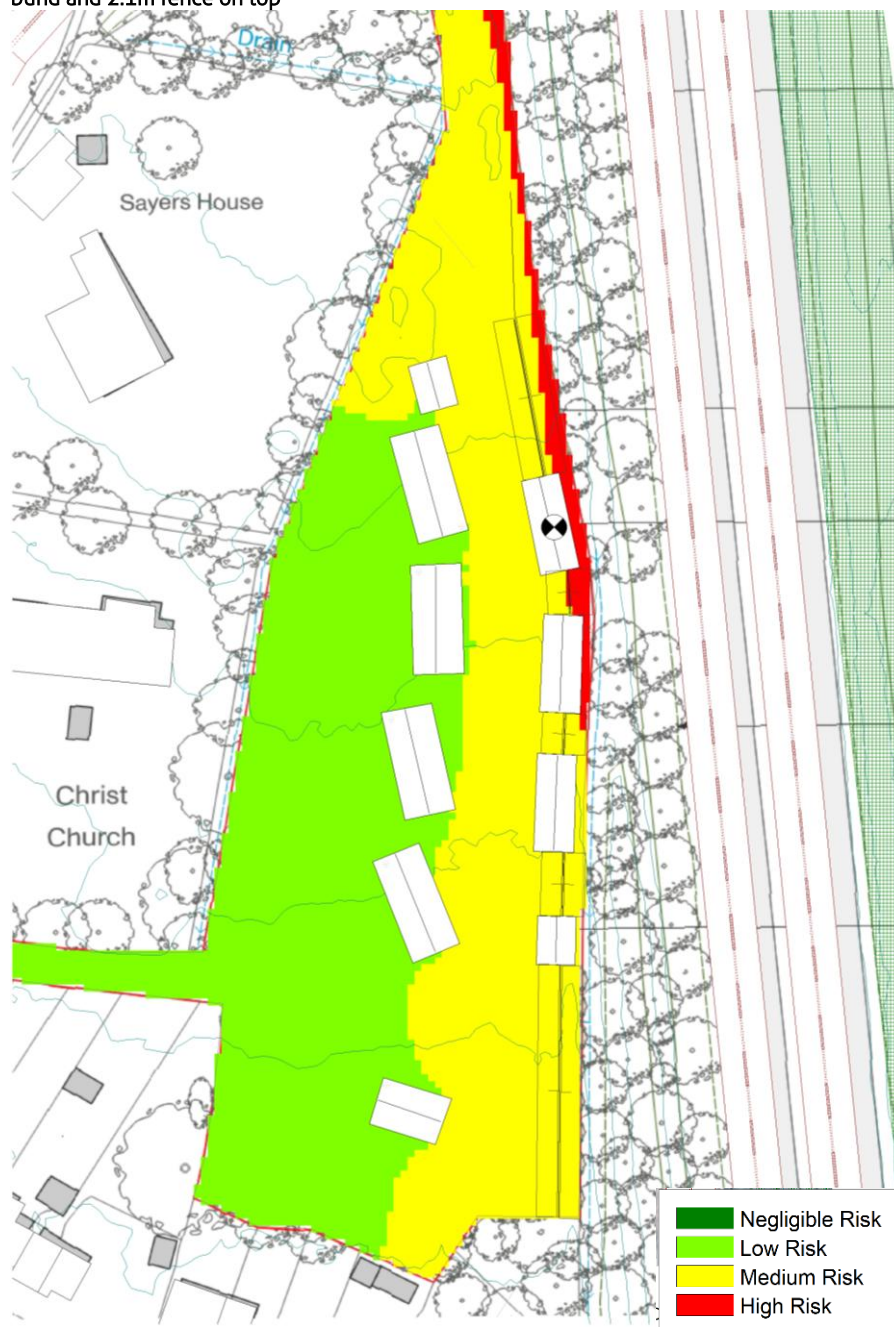


Figure 5.4: ProPG Stage 1 site noise risk assessment (night-time $L_{Aeq,8hour}$ noise contours predicted at 4.5 metres agl) with 2m earth bund and 2.1m fence



With most of the site falling in the medium risk category, it should be noted that Table 2.1 states the "...application may be refused unless a good acoustic design process is followed and is demonstrated... how the adverse impacts of noise will be mitigated and minimised, and... a significant adverse noise impact will be avoided...".

Based on the above, a Stage 2 ProPG assessment is required.

6 PRO-PG STAGE 2: FULL ACOUSTIC DESIGN ASSESSMENT

6.1 Element 1: Good Acoustic Design Process

Following a good acoustic design process is implicit to achieving good overall design, as required by the Government's planning and noise policy documents NPSE and NPPF.

This process requires a high level, multi-faceted and integrated approach across all disciplines with a view to optimising acoustic conditions inside habitable rooms and in external amenity space.

Section 5 of BS 8233: 2014 contains guidance on the sequence of stages to be followed in the planning and early acoustic design of a new development. Section 5.4 of BS 8233:2014 outlines a general approach to determining appropriate noise control measures including the following suggested steps (which may be iterative):

- i. Check the feasibility of reducing noise levels and/or relocating noise sources.
- ii. Consider options for planning the site or building layout.
- iii. Consider the orientation of proposed building(s).
- iv. Select construction types and methods for meeting building performance requirements.
- v. Examine the effects of noise control measures on the requirements for ventilation, fire regulation, health and safety, cost, CDM (construction, design and management) etc.
- vi. Assess the viability of alternative solutions.

The designer should then decide which of the following options can be applied to reduce noise levels:

- i. Quietening or removing the source of noise.
- ii. Attenuating the sound on its path to the receiver.
- iii. Obstructing the sound path between source and receiver.
- iv. Improving the sound insulation of the building envelope.
- v. Using agreements to manage noise.

The main source of noise affecting the proposed development is road traffic noise from the nearby A23. This source cannot be removed, or its noise levels directly reduced at source by the developer, therefore efforts should focus on providing attenuation via other alternatives from the elements stated above.

- A 2m earth bund topped with a 2.1m solid fence will follow the eastern boundary, interspersed with four carports (with a total height of 5m).
- It is understood that continuous mechanical supply and extract with heat recovery systems (MVHR) will be installed throughout which will allow for the control of external noise intrusion and provision of whole dwelling ventilation without the need to necessarily rely on opening windows to control either day-to-day ventilation or overheating (certainly if habitable rooms are proposed facing the A23).
- While it would not be feasible for all habitable rooms to be placed on the quieter façade, the plans generally have prioritised non-sensitive spaces (bathrooms, WCs, hallways, en-suites) along the eastern façade.
- The access road will be placed between the properties and the A23 increasing distance from source to receiver whilst also allowing the private gardens to be shielded from the road noise by the dwellings themselves.

6.2 Element 2: Internal noise level guidelines

In order to achieve the internal noise guidelines as set out in Table 2.2, it is necessary to estimate internal noise levels with windows closed using glazing and ventilation products.

An assessment of the external building fabric elements has been undertaken based on the unattended spectral data of $L_{Aeq,T}$ and L_{AFmax} levels measured during daytime and night-time periods. Guidance is given in the following sections regarding suitable glazing, ventilation, and external wall configurations to achieve the required internal ambient noise levels within the proposed dwellings. Calculations have been undertaken following the general method set out in BS EN 12354-3:2017.

6.2.1 Modelled Noise Levels at the Façade

The calibrated noise model has been used to estimate noise levels at the façade of the proposed development. The results are given in Table 6.1.

Table 6.1: Estimated noise levels incident on each facade, dBA (free-field noise levels)

Plot	Room	Noise level at façade (free field)		
		Day ($L_{Aeq,16hrs}$)	Night ($L_{Aeq,8hrs}$)	Night (L_{AMax})
1	Living Room	56	-	-
	Bedroom (master)	62	56	64
	Bedroom 2 (double)	55	49	57
	Bedroom 3 (single)	56	49	57
2	Living Room	57	-	-
	Bedroom (master)	62	56	64
	Bedroom 2 (double)	55	49	57
	Bedroom 3 (single)	55	49	57
3	Living Room	55	-	-
	Bedroom (master)	59	53	64
	Bedroom 2 (double)	54	48	56
	Bedroom 3 (single)	54	48	56
4	Living Room	56	-	-
	Bedroom (master)	60	54	64
	Bedroom 2 (double)	54	48	56
	Bedroom 3 (single)	54	48	56
5	Living Room	55	-	-
	Bedroom (master)	59	53	64
	Bedroom 2 (double)	54	47	55
	Bedroom 3 (single)	54	47	55
6	Living Room	56	-	-
	Bedroom (master)	60	54	64
	Bedroom 2 (double)	54	48	56
	Bedroom 3 (single)	54	47	55
7	Living Room	56	-	-
	Bedroom (master)	60	54	64
	Bedroom 2 (double)	53	47	55
	Bedroom 3 (single)	53	47	55
8	Living Room	56	-	-
	Bedroom (master)	61	55	64
	Bedroom 2 (double)	54	48	56
	Bedroom 3 (single)	53	47	55

Plot	Room	Noise level at façade (free field)		
		Day ($L_{Aeq,16hrs}$)	Night ($L_{Aeq,8hrs}$)	Night (L_{Amax})
9	Living Room	55	-	-
	Bedroom (master)	58	52	61
	Bedroom 2 (double)	61	55	64
	Bedroom 3 (single)	59	53	64

The highest daytime noise level in Living Rooms is 57dB $L_{Aeq,16hrs}$. For bedrooms, the highest average daytime noise level is 62dB $L_{Aeq,16hrs}$. During the night, the highest average and maximum noise levels are 56dB $L_{Aeq,8hrs}$ and 64 dB L_{Amax} respectively. Example calculations provided in the Appendix are based upon these levels.

6.2.2 Assumptions

Drawings

Our assessment has been based on the following Architect's drawings.

Table 6.2: Drawings used in the assessment

Drawing Title	Drawing Number	Date
Site plan	1795_3.002_RevE_Proposed Site Plan	Jan 2026
Proposed Plans – Semi-detached	1795_3.005_RevE_Proposed House Plans	Jan 2026
Proposed Plans – Detached	1795_3.006_RevD_Proposed House Plans	Jan 2026

Room Reverberation

In order to calculate the internal ambient noise levels within habitable rooms, our analysis has assumed typical reverberation times in furnished bedrooms and living rooms, which have been based on a flat reverberation time of 0.5 seconds across the frequency spectrum between 125 Hz and 4kHz.

External Wall Construction

It is understood that the proposed external wall areas to residential units will be of masonry construction. The below assumption has been made for the external wall system, based on experience of similar constructions.

Table 6.3: Assumed sound reduction index (dB) of the external wall construction

Wall	125	250	500	1k	2k	4k	$R_w / R_w + C_{tr}$
Masonry	41	45	45	54	58	58	52/48

Roof Construction

The following indicative construction has been used to undertake our calculations: tiled/slatted roof with 12 mm plasterboard ceiling and no mineral wool. Table 6.1 details the estimated sound reduction performance of the proposed roof. Please note that alternative constructions to the above, capable of achieving the below sound reduction performance, may also be suitable.

Table 6.1: Sound reduction index (dB) of the assumed roof construction

125	250	500	1k	2k	4k	$R_w / R_w + C_{tr}$
21	26	33	33	35	35	34/30

6.2.3 Ventilation

As discussed in Section 6.1, it is understood that MVHR will be installed throughout.

We have assumed that noise break-in through any ventilation opening is negligible (as any ventilation ducts will be located above the ceiling, not through the window or external wall within room height as it would be with an MEV system).

Windows will still be openable for purge or rapid ventilation, as required by Approved Document F. Internal noise level guidelines are generally not applicable under these exceptional events, which should only occur occasionally (i.e. to remove odour from painting, cooking, etc.).

6.2.4 Glazing

Based upon the above assumptions, indicative calculations have been undertaken in accordance with BS 12354-3 to determine the minimum acoustic performances required for the glazed elements of the façade, in order to provide appropriate internal noise levels in habitable rooms, during both daytime and night-time periods. The resulting minimum performance requirements are presented in Table 6.4, with example specifications provided.

Table 6.4: Indicative sound reduction performance R (dB) for the glazed elements of the façade

Glazing Example	125	250	500	1k	2k	4k	$R_w / R_w + C_{tr}$
4/12/6mm	23	22	27	38	40	41	35 / 29

6.3 Element 3: external amenity area noise assessment

The site plan shows that all dwellings in the development will contain private gardens, which are considered amenity areas. Given that the proposed development is neighboured by a large infrastructure (A23), BS8233's upper external noise limit of 55 dB $L_{Aeq,T}$ has been considered appropriate for our assessment, in accordance with ProPG.

Figure 6.1 shows a noise contour across the development calculated at a height of 1.5 m. It can be seen that most of the gardens, with the exception of small areas at the front of the buildings and a part towards the rear of the gardens to Plots 1-3, will experience external noise levels that meet the upper guideline limit of 55 dB $L_{Aeq,16hr}$ recommended in ProPG.

Figure 6.1: External amenity area noise contour (predicted $L_{Aeq,16hr}$ at 1.5 metres above ground level)



BS8233:2014 states that "These guideline values may not be achievable in all circumstances where development might be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels in these external amenity spaces but should not be prohibited."

With the earth bund, the acoustic fence and car ports in place, in addition to the shielding provided by the dwellings themselves, it may be considered that the lowest practicable noise levels are achieved across the site. The model does not take into account any additional screening by individual garden fences which would only serve to further reduce noise levels in the gardens.

6.4 Element 4: Other Relevant Issues

6.4.1 Overheating

A qualitative assessment has been undertaken in this section to determine whether openable windows can be used to provide thermal comfort to the proposed dwellings.

The measurements undertaken on site indicate that the proposed dwellings are likely to be mostly affected by road traffic from nearby sources.

Glazing and ventilation systems are considered to be the 'acoustically weak' elements of a residential façade (i.e. most prone to external noise intrusion), however, both elements are central to the provision of thermal comfort. This section details the impact of using partially open windows as a form of controlling overheating, and the impact this may have on to the internal noise levels within dwellings.

It is best practice, from an energy efficiency standpoint, to allow the simple opening of windows for occupant control of overheating. This, however, may lead to increased risk of excessive noise intrusion where the proposed building(s) are exposed to external noise sources, forcing the occupant to choose between excessive heat or excessive noise break-in.

Approved Document O allows for a 10 dB increase in internal ambient noise levels within bedrooms at night.

It is possible to determine the façades where opening windows can be used to prevent overheating based on the assumption that partially open windows at the façade typically provide a sound level difference from external free field to internal noise level of 13 dB.

Table 6.4: Internal noise levels in bedroom at night and ADO compliance

Plot	Room	External Noise Level at Façade		Internal Noise Level		Meets ADO criteria?
		Night (L _{Aeq,8hrs})	Night (L _{AMax})	Night (L _{Aeq,8hrs})	Night (L _{AMax})	
1	Bedroom (master)	56	64	43	51	N
	Bedroom 2 (double)	49	57	36	44	Y
	Bedroom 3 (single)	49	57	36	44	Y
2	Bedroom (master)	56	64	43	51	N
	Bedroom 2 (double)	49	57	36	44	Y
	Bedroom 3 (single)	49	57	36	44	Y
3	Bedroom (master)	53	64	40	51	N
	Bedroom 2 (double)	48	56	35	43	Y
	Bedroom 3 (single)	48	56	35	43	Y
4	Bedroom (master)	54	64	41	51	N
	Bedroom 2 (double)	48	56	35	43	Y
	Bedroom 3 (single)	48	56	35	43	Y
5	Bedroom (master)	53	64	40	51	N
	Bedroom 2 (double)	47	55	34	42	Y
	Bedroom 3 (single)	47	55	34	42	Y
6	Bedroom (master)	54	64	41	51	N
	Bedroom 2 (double)	48	56	35	43	Y
	Bedroom 3 (single)	47	55	34	42	Y

Plot	Room	External Noise Level at Façade		Internal Noise Level		Meets ADO criteria?
		Night (L _{Aeq,8hrs})	Night (L _{AMax})	Night (L _{Aeq,8hrs})	Night (L _{AMax})	
7	Bedroom (master)	54	64	41	51	N
	Bedroom 2 (double)	47	55	34	42	Y
	Bedroom 3 (single)	47	55	34	42	Y
8	Bedroom (master)	55	64	42	51	N
	Bedroom 2 (double)	48	56	35	43	Y
	Bedroom 3 (single)	47	55	34	42	Y
9	Bedroom (master)	52	61	39	48	Y
	Bedroom 2 (double)	55	64	42	51	N
	Bedroom 3 (single)	53	64	40	51	N

Table 6.4 demonstrates that at least one bedroom (the master bedroom in Plots 1-8 and the double and single room in Plot 9) in each plot would exceed the ADO criteria. **Such levels would not allow the occupants to rely on open windows to control overheating.**

There are several systems that can be used to provide ventilative cooling, some examples are provided below:

- An MVHR system with an integrated tempered air supply (e.g. Zehnder ComfoCool Q);
- and MVHR system with an external cooling module (e.g. Nuaire MRXBOXAB-ECO5-AESC with CM-XBOX-INLINE cooling module);
- an MVHR system assisted with ceiling mounted purge vent fan(s) in habitable rooms (e.g. Titon HRV 1.6Q Plus with individual Titon Purge Vent Fans, or VECTAIRE Maxi Plus with individual Vectaire Microbox 200/2DC purge ventilation fans).

It should be noted that all the above systems have been provided for information purposes only and are based on limited information on likely overheating risks (which would require a TM59 assessment undertaken by the relevant specialist) and any other passive design measures that could be incorporated into the buildings' specification. The design of any of the above ventilation and cooling strategies requires significant input from M&E and thermal/energy consultants, therefore remains their responsibility to design systems that can achieve the relevant cooling requirements of ADO and suitable ventilation rates for residential use as required by ADF.

The extent of the above measures will be subject to the results of the overheating assessment and will depend on the expected duration and frequency of the overheating condition in the proposed dwellings.

7 SUMMARY

This report presents the results of noise impact assessment for the residential development proposed at Land off Mill Lane, Sayers Common. The main outcome of the assessment is as follows:

With mitigation in the form of a 2m high earth bund and 2.1m high solid acoustic fence following the eastern boundary of the site providing some screening from noise from the A23, most of the site falls into the 'Medium Risk' category.

Following this, an indicative Stage 2 assessment has been undertaken, the key points being:

- The external building fabric proposals should be sufficient to control external noise ingress to habitable spaces, providing glazing units to achieve a minimum sound insulation performance of $29 R_w + C_{tr}$ in bedrooms and living rooms
- It is understood that MVHR will be installed throughout.
- None of the dwellings may rely on open windows to provide cooling during the overheating condition and a form of ventilative cooling should be installed alongside the MVHR unit.
- Noise levels in external amenity areas will be reduced as far as practicable with the inclusion of the screening to the east of the site.

Based on the ProPG approach followed in this assessment, our recommendation to the decision maker with regard to noise is that "Planning consent may be granted subject to the inclusion of suitable noise conditions". These would be expected with regards to the achievement of appropriate internal noise levels within habitable spaces intended for residential use, as well as noise levels in external amenity areas.

APPENDIX A

EXAMPLE NOISE BREAK-IN CALCULATIONS

Figure A.1: Worst case noise break-in calculations (Plot 1 – Master Bedroom)

Job name:	Land off Mill Lane, Sayers Common	RESULT SUMMARY:	L _{Aeq} Day	62	
Job no.:	8768	Predicted Internal Level:	30	dB L _A	
Facade:	Master Bedroom - Plot 1	Criterion:	35.0	dB L _A	
		Difference:	-5	dB L _A	

RESULT SUMMARY:	L _{Aeq} Night	56	
Predicted Internal Level:	21	dB L _A	
Criterion:	30.0	dB L _A	
Difference:	-9	dB L _A	

RESULT SUMMARY:	L _{Amax} Night	64	
Predicted Internal Level:	36	dB L _A	
Criterion:	45.0	dB L _A	
Difference:	-9	dB L _A	

Formula	Description	Data	Units	Octave band centre frequency, Hz	
				125 250 500 1000 2000 4000	dB(A)
Reverberation Time		0.5	s	0.5 0.5 0.5 0.5 0.5 0.5	
Receiver Room Volume		31.3	m ³		

Element 1				Free-field	
L1	Wall	Rw + Ctr	Leq	59 55 54 59 55 49	62
-R	260kg/m ² brick wall	-		36 40 41 45 52 52	
+10logS	Element Area	19.4	m ²	13 13 13 13 13 13	
-10logA	where A=0.16V/T			10 10 10 10 10 10	
#N/A				3 3 3 3 3 3	
=L2				29 21 19 20 9 3	23
L2tot	Running total			29 21 19 20 9 3	23

Element 2				Free-field	
L1	Glazing	Rw + Ctr	Leq	59 55 54 59 55 49	
-R	SGG 4/12/6mm	29		23 22 27 38 40 41	
+10logS	Element Area	4.1	m ²	6 6 6 6 6 6	
-10logA	where A=0.16V/T			10 10 10 10 10 10	
#N/A				3 3 3 3 3 3	
=L2				35 32 26 20 14 7	28
L2tot	Running total			36 32 27 23 15 9	29

Element 3				Free-field	
L1	Roof	Rw + Ctr	Leq	59 55 54 59 55 49	62
-R	ceiling, sound absorbing layer (e.g.	-4		24 34 40 45 49 49	
+10logS	Element Area	9.4	m ²	10 10 10 10 10 10	
-10logA	where A=0.16V/T			10 10 10 10 10 10	
#N/A				3 3 3 3 3 3	
=L2				38 24 17 17 9 3	24
L2tot	Running total			40 33 27 24 16 10	30

Octave band centre frequency, Hz	
125 250 500 1000 2000 4000	dB(A)
0.5 0.5 0.5 0.5 0.5 0.5	

Free-field	
40 46 45 49 47 52	56
36 40 41 45 52 52	
13 13 13 13 13 13	
10 10 10 10 10 10	
3 3 3 3 3 3	
10 12 10 10 1 6	14
10 12 10 10 1 6	14

Free-field	
66 62 59 59 57 53	64
36 40 41 45 52 52	
13 13 13 13 13 13	
10 10 10 10 10 10	
3 3 3 3 3 3	
36 28 24 20 11 7	26
36 28 24 20 11 7	26

Figure A.2: Worst case noise break-in calculations (Plot 1 – Living Room)

Job name:	Land off Mill Lane, Sayers Common	RESULT SUMMARY: LAeq Day 57					
Job no.:	8768	Predicted Internal Level: 24 dB LA					
Façade:	Living Room - Plot 1	Criterion: 35.0 dB LA					
		Difference: -11 dB LA					

SOUND INSULATION BY ELEMENT										
Formula	Description	Data	Units	Octave band centre frequency, Hz						
				125	250	500	1000	2000	4000	dB(A)
	Reverberation Time	0.5	s	0.5	0.5	0.5	0.5	0.5	0.5	
	Receiver Room Volume	35.0	m ³							

Element 1

L1	Wall	Rw + Ctr	Leq							
-R	260kg/m2 brick wall	-								57
+10logS	Element Area		16.2	m ²						
-10logA	where A=0.16V/T									
#N/A										
=L2										16
L2tot	Running total									16

Element 2

L1	Glazing	Rw + Ctr	Leq							
-R	SGG 4/12/6mm	29								
+10logS	Element Area		4.5	m ²						
-10logA	where A=0.16V/T									
#N/A										
=L2										23
L2tot	Running total									24