

REPORT TITLE:

346-348 Oxford Road, Reading RG30 1AQ:

Noise Survey

CLIENT DETAILS:

Irongate Property Asset Management Limited.

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Document Status and Revision Schedule

Issue/Revision	Description/Comments	Date	Prepared by	Approved by
0	Checked & Authorised	19/06/26	JCB	MJ
A	Commercial unit sound insulation	07/10/26	JCB	MJ
B	Latest design information	08/10/26	JCB	MJ

1 Executive Summary

This report details an acoustic assessment undertaken at 346–348 Oxford Road, Reading, RG30 1AQ. The primary objective is to quantify the existing noise environment, assess the potential noise impacts associated with the retained ground-floor commercial unit (Class E), and propose effective mitigation strategies for the planned residential conversion at the rear of the site.

The site is subject to external noise exposure from road traffic on Oxford Road as well as patron noise from the rear garden of the adjacent public house (The White Eagle). In line with the Noise Policy Statement for England (NPSE), this assessment aims to prevent "significant adverse impacts on health and quality of life" for future residents. To achieve this, the assessment adopts criteria from the World Health Organization (WHO) guidelines, the recommended internal ambient noise levels specified in British Standard BS 8233:2014, and the night-time overheating thresholds outlined in Approved Document O.

In addition, an acoustic review of the retained 101 m² ground-floor Class E commercial unit has been conducted to safeguard future residential amenity. As the commercial space is currently vacant, an enhanced acoustic design standard has been established. To prevent internal noise transmission, the separating party wall dividing the commercial space from the residential dwellings is specified to achieve at least 10 dB above standard Building Regulations Approved Document E requirements (target $D_{nT,w} + C_{tr} \geq 53 - 55$ dB). This is

achieved using a minimum 200 mm solid dense masonry core wall paired with a fully independent acoustic stud lining (with mineral wool insulation and dual-layer acoustic plasterboard) on the residential side. External noise breakout from the commercial shopfront is physically screened from the rear residential windows by the building envelope, and any future commercial mechanical plant will be controlled via planning condition under BS 4142:2014+A1:2019 to not exceed prevailing background sound levels.

To shield future occupants from external environmental noise, building envelope mitigation measures—including target acoustic glazing configurations, acoustically rated trickle ventilators, and sealed acoustic entrance doors—have been specified. Provided these building envelope and internal separating wall specifications are implemented, internal ambient noise levels will comply with BS 8233:2014, night-time criteria under Approved Document O will be satisfied, and future residents will be robustly protected against all neighbouring noise sources.

2 Introduction

Pace Consult was commissioned by Irongate Property Asset Management Limited to undertake an assessment of the noise impact associated with the proposed residential development at 346-348 Oxford Road, Reading, RG30 1AQ.

Given the site's proximity to a public house with an active rear garden, there is potential for patron noise to impact the proposed development. Therefore, a comprehensive assessment of the existing noise environment was undertaken to determine the site's suitability for residential use and to inform the necessary acoustic design considerations.

This assessment was carried out in strict accordance with relevant national standards and guidelines pertaining to noise control for residential dwellings.

3 The Site

3.1 Location and Description

The property located at 346-348 Oxford Road, Reading, RG30 1AQ, is an existing two-storey building. It is positioned with its northern elevation facing Oxford Road. The southern and western elevations are bordered by existing residential properties, while the eastern elevation overlooks the rear garden of the adjacent public house, The White Eagle.

The primary noise sources affecting the proposed residential development are road traffic from Oxford Road and patron noise when the public house's rear garden is in use. Observations indicate that the rear garden is particularly well-attended during Saturday afternoons and evenings, as well as Sunday afternoons. Notably, no mechanical plant noise originating from the adjacent public house was detected during the site visits.

Overall, the prevailing noise climate at the rear of the site is dominated by distant road traffic and, during operational hours, vocal noise from patrons using the adjacent pub garden.

The precise boundary of the proposed development and the specific locations where noise measurements were obtained are illustrated in Figure 1 below.

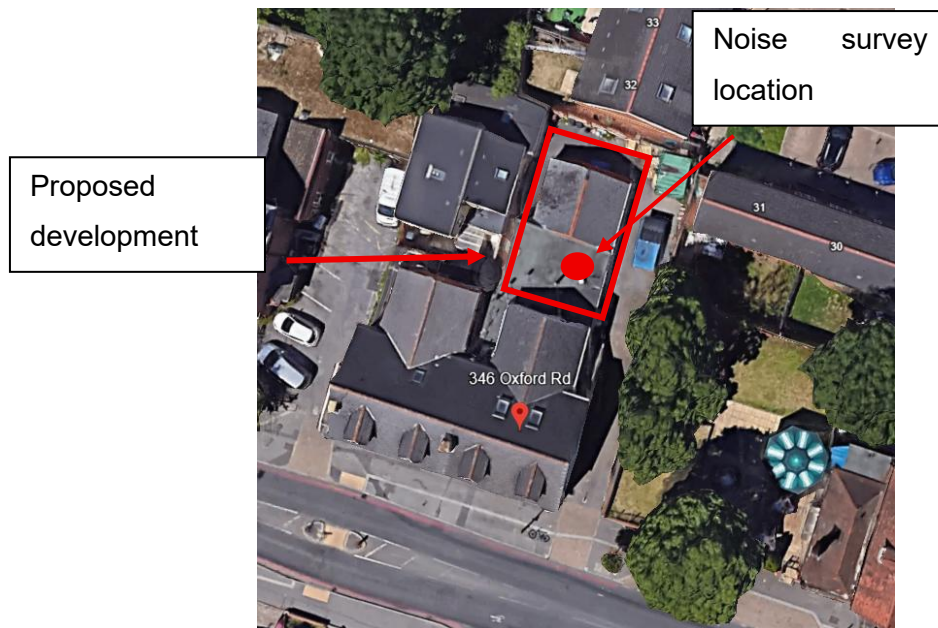


Figure 1. Proposed development location and measurement position.

3.2 Proposed Development

The proposed development comprises the change of use and refurbishment of the rear portion of the existing ground-floor commercial unit to create two new residential dwellings. The layout positions the retail unit at the front of the building facing Oxford Road, providing a degree of physical screening for the residential units situated at the rear.

The image below highlights the location of the proposed residential units at the ground floor level.

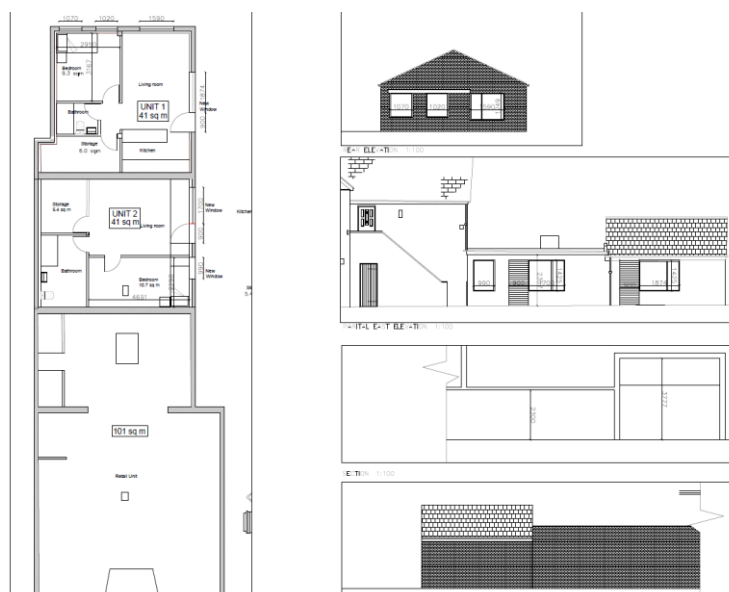


Figure 2. Proposed development.

4 Assessment Methodology

4.1 National Planning Policy Framework and the Noise Policy Statement for England

National Planning Policy Framework and the Noise Policy Statement for England

The National Planning Policy Framework (NPPF) sets out the general requirements for gaining planning permission. Comments regarding noise found within the document are as follows.

Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) 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.

Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

The NPPF references the Noise Policy Statement for England (NPSE) which in turn references two concepts used by the World Health Organisation (WHO) which can be used to ascertain relevant noise levels for individual sites. The concepts are LOAEL (Lowest Observed Adverse Effect Level) and SOAEL (Significant Observed Adverse Effect Level).

The NPPF then gives three aims to adhere to:

Aim 1 – Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

Aim 2 – Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

Aim 3 – Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

In the context of assessing noise impact from the site, acceptable amenity levels for gardens are discussed within WHO Guidelines for Community noise, these criteria are also taken up by BS 8233: 2014 'Guidance on sound insulation and noise reduction for buildings'.

4.2 British Standard BS8233:2014 – Guidance on Sound Insulation and Noise Reduction for Buildings

The scope of BS8233 is the provision of recommendations for the control of noise in and around buildings. It suggests appropriate criteria and limits for different situations, which are primarily intended to guide the design of new or refurbished buildings undergoing a change of use rather than to assess the effect of changes in the external noise climate.

BS8233 suggests suitable internal noise levels within different types of buildings, including residential dwellings. It suggests an internal noise level of 35 dB $L_{Aeq,T}$ during day time, and 30 dB $L_{Aeq,T}$ during night time within bedrooms. In the daytime, the standard recommends 35 dB $L_{Aeq,T}$ in living rooms and in 40 dB $L_{Aeq,T}$ dining rooms. Table 4 below is extracted from this document.

BS8233:2014 Excerpt:

7.7.2 Internal ambient noise levels for dwellings

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.

Table 4 Indoor ambient noise levels for dwellings

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	—
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	—
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

Figure 3. BS8233:2014 recommended indoor ambient noise levels in residential areas.

Regarding the potential for out of hours deliveries which may encroach into the night time period, BS8233:2014 states the following:

NOTE 4 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.

NOTE 5 If relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level.

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

4.3 World Health Organisation (WHO) ‘Guidelines for Community Noise’

This document states that, in dwellings, the critical effects of noise are on sleep, annoyance and speech interference. According to this document, to protect the majority of people from being seriously annoyed during the daytime, the sound pressure level on balconies, terraces and outdoor living areas should not exceed 55 dB L_{Aeq} for a steady, continuous noise. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound pressure level should not exceed 50 dB L_{Aeq} .

To avoid any possibility of sleep disturbance, indoor guideline values for bedrooms are 30 dB L_{Aeq} for continuous noise and 45 dB L_{Amax} for single sound events. These indoor noise levels correspond to sound pressure levels at the outside façades of the living spaces of 45 dB L_{Aeq} and 60 dB L_{Amax} . These values have been obtained by assuming that the noise reduction from outside to inside with the window partly open is 15 dB.

4.5 ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise.

This document encourages improvements in the consistency and quality of planmaking and decision-taking in relation to acoustic matters. The context is primarily development control, although some of the content is relevant to strategic planning. The preparation of this ProPG acknowledges and reflects the Government’s overarching Noise Policy Statement for England (NPSE), the National Planning Policy Framework (NPPF) and Planning Practice Guidance (including PPG-Noise), as well as other authoritative sources of guidance. This ProPG provides advice for Local Planning Authorities (LPAs) and developers, and their respective professional advisers.

The primary goal of this ProPG is to assist the delivery of sustainable development by promoting good health and wellbeing through the effective management of noise. It seeks to do that through encouraging a good acoustic design process in and around proposed new residential development having regard to national policy on planning and noise.

The recommended approach is also considered suitable where some industrial or commercial noise contributes to the acoustic environment provided that it is “not dominant”.

This ProPG advocates a systematic, proportionate, risk based, 2-stage, approach.

Stage 1 – an initial noise risk assessment of the proposed development site; and

Stage 2 – a systematic consideration of four key elements.

The four key elements to be undertaken in parallel during Stage 2 of the recommended approach are:

- *Element 1 – demonstrating a “Good Acoustic Design Process”;*
- *Element 2 – observing internal “Noise Level Guidelines”;*
- *Element 3 – undertaking an “External Amenity Area Noise Assessment”;* and
- *Element 4 – consideration of “Other Relevant Issues”.*

The two stages are described below:

Stage 1:

This section illustrates how an initial noise risk assessment is linked with an increasing risk of adverse effect from noise and how this in turn is broadly associated with indicative noise levels derived from current guidance and experience. The indicative noise levels are intended to provide a sense of the noise challenge at a potential residential development site and should be interpreted flexibly having regard to the locality, the project and the wider context. The figure 1 is included below.

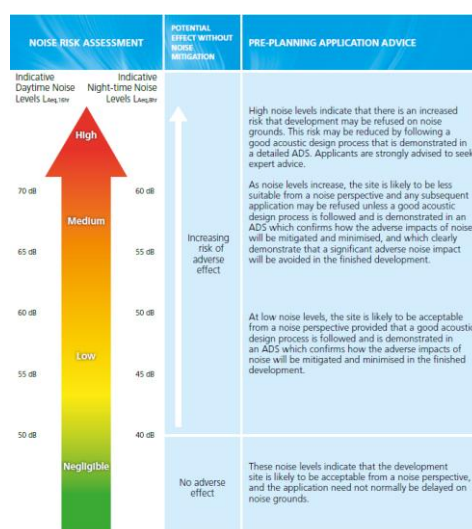


Figure 4. Noise risk assessment.

Figure 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”.
- LAeq,16hr is for daytime 0700 – 2300, LAeq,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.

Stage 2: The four key elements.

Stage 2: Element 1 – Good Acoustic design Process.

Good acoustic design should provide an integrated solution whereby the optimum acoustic outcome is achieved, without design compromises that will adversely affect living conditions

and the quality of life of the inhabitants or other sustainable design objectives and requirements.

Stage 2: Element 2 – Internal Noise Levels Guidelines.

The recommended ProPG internal noise level guidelines are included below.

ACTIVITY	LOCATION	07:00 – 23:00 HRS	23:00 – 07:00 HRS
Resting	Living room	35 dB LAeq,16 hr	-
Dining	Dining room/area	40 dB LAeq,16 hr	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq,16 hr	30 dB LAeq,8 hr 45 dB LAeq,16 hr (Note 4)

Figure 5. Recommended internal noise levels.

NOTE 1 The Table provides recommended internal LAeq target levels for overall noise in the design of a building. These are the sum total of structure-borne and airborne noise sources.

NOTE 2 The internal LAeq target levels shown in the Table are based on the existing guidelines issued by the WHO and assume normal diurnal fluctuations in external noise.

NOTE 3 These internal LAeq target levels are based on annual average data and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks night or New Year's Eve.

NOTE 4 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 LAmax,F, depending on the character and number of events per night. Sporadic noise events could require separate values. 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 LAmax,F more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events (see Appendix A).

NOTE 5 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 to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal LAeq target levels should not normally be exceeded, subject to the further advice in Note 7.

NOTE 6 Attention is drawn to the requirements of the Building Regulations.

NOTE 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal LAeq target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved. The more often internal LAeq levels start to exceed the internal LAeq target levels by more than 5 dB, the more that most people are likely to regard them as "unreasonable". Where such exceedances are predicted, applicants should be required to show how the relevant number of rooms affected has been kept to a minimum. Once internal LAeq levels exceed the target levels by more than 10 dB, they are highly likely to be regarded as "unacceptable" by most people, particularly if such levels occur more than occasionally. Every effort should be made to avoid relevant rooms experiencing "unacceptable" noise levels at all and where such levels are likely to occur frequently, the development should be prevented in its proposed form (see Section 3.D).

Stage 2. Element 3 – External Amenity Area Noise Assessment.

The ProPG external amenity area noise assessment reflects and extends the advice contained in BS8233:2014 and the current Government guidance in PPGNoise as detailed in the Element 3 box below.

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 LAeq,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 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.

Stage 2: Element 4 – Assessment of Other Relevant Issues.

This element seeks to build upon relevant national and local planning and noise policies (item 4(i)) to provide a systematic list of recommendations for the issues that should be considered before making a judgement about the noise aspects of a particular planning proposal for new residential development. The recommended relevant issues are included below.

4(i) compliance with relevant national and local policy

4(ii) magnitude and extent of compliance with ProPG

4(iii) likely occupants of the development

4(iv) acoustic design v unintended adverse consequences

4(v) acoustic design v wider planning objectives

4.6 Overheating Approved Document O.

Section 3 of this document includes the minimum internal noise levels in bedrooms during night time. sections 3.2, 3.3, and 3.4 are included below for reference.

Noise

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. 40dB LAeq,T, averaged over 8 hours (between 11pm and 7am).

b. 55dB LAFmax, more than 10 times a night (between 11pm and 7am).

3.4 Where in-situ noise measurements are used as evidence that these limits are not exceeded, measurements should be taken in accordance with the Association of Noise Consultants' Measurement of Sound Levels in Buildings with the overheating mitigation strategy in use.

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).

5 Survey Method and Equipment

5.1 Survey

A baseline noise survey was conducted between Thursday, 11th June 2026, and Monday, 15th June 2026, to capture representative noise levels at the proposed development site during typical weekday and weekend periods.

The measurements taken during the Friday and Saturday afternoon periods successfully captured the worst-case scenario for noise originating from the adjacent public house's rear garden. The weather was warm on both of these days, leading to high patron attendance in the outdoor areas.

The survey comprised one unattended continuous monitoring position on site, strategically chosen to capture the dominant noise sources affecting the development. This location is detailed below:

- Eastern Boundary (MP1): This unattended monitoring position continuously recorded noise levels at the eastern boundary, which is the elevation subjected to the highest noise levels due to the presence of the pub's rear garden. The sound level meter was positioned on the roof of the existing building, at least 3 metres from any vertical reflective surface (constituting free-field conditions), and 1.5 metres above the roof level.



Figure 6 Measurement location 1.

All noise measurements were performed using calibrated, precision-grade sound level meters that fully comply with the requirements of BS EN 61672-1:2013 (Electroacoustics - Sound level meters - Part 1: Specifications). The survey methodology adhered to the principles outlined in BS 7445 Parts 1-3 (Description and Measurement of Environmental Noise) and British Standard BS 4142:2014+A1:2019 (Methods for rating and assessing industrial and commercial sound), ensuring the robustness and comparability of the collected data.

5.2 Equipment

- Svantek 971 precision grade sound level meters. Serial number 34927.
- Norsonic Sound Calibrator 1251. Serial number 32199.
- Environmental wind shields

Crucially, the sound level meters were calibrated both before and after the survey using the Norsonic Sound Calibrator. No significant drift was observed between these two reference checks, confirming the reliability and accuracy of the measurements obtained.

5.3 Weather

The weather conditions were measured on-site using a Kestrel 4500 Pocket Weather Tracker. As indicated by the low wind speeds (all well below 5 m/s, which is generally the upper limit for accurate outdoor noise measurements to prevent wind-induced microphone noise) and stable conditions, the environmental parameters were considered highly conducive to accurate environmental noise measurement.

Four manual weather checks were conducted during the noise survey, as detailed in Table 1 below:

Table 1. Weather condition.				
	°C	Wind speed m/s	Relative Humidity %	Wind direction
10:00 Thursday	17	0.3	85	N
17:00 Friday	22	0.2	65	S
18:00 Saturday	23	1.7	70	N
12:00 Monday	22	1.5	64	E

ight rain was observed on Thursday morning. However, a comparative analysis of the acoustic data during and immediately after the rainfall revealed no perceptible differences in the ambient noise levels. Consequently, the noise readings recorded during this brief period of precipitation have been retained and included in the final assessment.

6 Survey Results

The noise measurement survey conducted at the monitoring location encompassed consecutive measurement periods, aligning with the requirements of relevant acoustic standards and guidelines. The following tables present the recorded noise levels during both the daytime and night-time periods.

Table 2 summarizes the continuous noise levels measured at MP1, which is predominantly affected by distant road traffic noise and sporadic vocal noise from patrons utilizing the adjacent rear garden.

Table 2. Measured continuous noise levels at MP1.

Table 2. Measured continuous noise level at MP1			
Time	L _{Aeq,T} dB	L _{Amax(fast), T} dB	L _{A90,T} dB Typical Background
Thursday 11 th June			
Day Time 10:00 to 23:00	54	N/A	48
Friday 12 th June			
Day Time (07:00 to 23:00)	55	N/A	48
Night Time (23:00 to 07:00)	50	67	40
Saturday 13 th June			
Day Time (07:00 to 23:00)	54	N/A	48
Night Time (23:00 to 07:00)	50	73	35
Sunday 14 th June			
Day Time (07:00 to 23:00)	52	N/A	45
Night Time (23:00 to 07:00)	51	79	33
Monday 15 th June			
Day Time (07:00 to 12:30)	53	N/A	46
Night Time (23:00 to 07:00)	47	70	35

The octave band spectra of the highest measured average sound levels during the daytime and night-time, alongside the highest individual night-time noise events, are detailed in Table 3 below.

Table 3 Octave band spectra at MP1 for typical worst-case periods.								
Freq. Hz	63	125	250	500	1 k	2 k	4 k	Average dBA
Day-time L_{eq}	63	57	52	50	50	48	43	55
Night-time L_{eq}	56	48	47	48	46	44	40	51
Night-time $L_{max}(fast)$	65	59	58	57	60	75	74	79

The following figure visually represents the sound readings recorded across the entire measurement period at MP1.

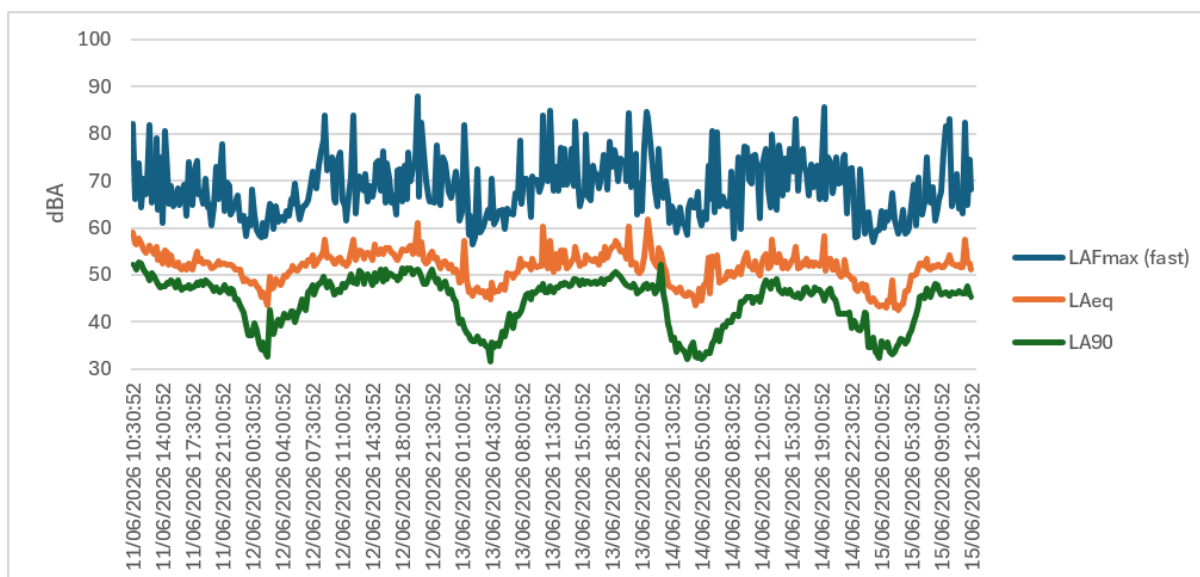


Figure 7. Continuous noise measurement time-history at MP1.

To verify that the measured noise levels accurately captured patrons using the pub's rear garden, two site visits were conducted during the afternoon. It was directly observed that the rear garden was actively in use. This contextual observation allowed us to confidently isolate the peak noise period associated with the garden's operation within our dataset, which occurred between 18:00 and 20:30.

The highest measured sound level during this specific period of active garden use was 60 dB LAeq. Therefore, this level has been utilized to evaluate the absolute worst-case scenario during the daytime period. Conversely, during the night-time period (after 23:00), the ambient noise levels were observed to be affected solely by distant road traffic.

Table 4 below includes the full octave band spectrum of the highest measured noise level recorded during the active use of the pub's rear garden.

Table 4. Worst-case daytime octave band spectrum at MP1 (Pub Garden Active: 18:00 - 20:30).

Table 4 Octave spectrums MP1 location.								
Freq. Hz	63	125	250	500	1 k	2 k	4 k	Average dBA
Day-time L_{eq}	63	54	49	50	57	56	42	60

7 Site Suitability for Residential Development

7.1 Noise Risk Assessment.

While ProPG: Planning & Noise – Professional Practice Guidance on Planning and Noise for New Residential Development is primarily designed for new-build projects, its comprehensive assessment methodology is highly relevant and has been adapted for this refurbishment project.

Based on the measured day and night-time noise levels presented in Section 6, the initial noise risk affecting the proposed residential development is assessed as Low according to the ProPG methodology.

ProPG clearly states that when developments are exposed to low noise levels, the site is likely to be acceptable from a noise perspective, provided that a good acoustic design process is followed. This must be demonstrated in an Acoustic Design Statement (ADS) which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.

The subsequent sections of this report will outline the recommended acoustic building envelope specifications designed to minimise and reduce the impact of the external noise environment, as advised by ProPG. Furthermore, the proposed building envelope will ensure that the development achieves sufficient levels of sound reduction to meet the internal noise criteria recommended by relevant acoustic guidelines, specifically BS 8233:2014 and the World Health Organization (WHO) guidelines. This approach aims to safeguard the acoustic amenity and well-being of future residents.

7.2 Building Envelope Sound Insulation

The proposal includes the retention of the existing roof and external walls. Based on a site inspection, the existing external wall is a masonry wall 100 mm thick. The roof structures above the residential units comprise both flat and pitched sections. The expected construction build-ups are assumed to be as follows:

External wall

Table 5 Calculated sound reduction index for the existing external wall.								
Freq. Hz	63	125	250	500	1 k	2 k	4 k	Rw dB
100 mm masonry	35	38	34	38	46	53	59	44

Flat Roof Build-Up

Weatherproofing: Single-ply membrane

Thermal Layer: 120mm+ rigid PIR or phenolic insulation board.

Vapour Control: Foil-backed vapour control layer.

Decking: 18mm plywood.

Structural Elements: Timber joists.

Acoustic Infill: 100mm mineral wool laid between the joists.

Ceiling: one layers of 15mm plasterboard.

The calculated sound reduction of the above roof is included below.

Table 6 Calculated sound reduction index for the flat roof.								
Freq. Hz	63	125	250	500	1 k	2 k	4 k	Rw dB
Flat Roof	16	22	40	48	53	55	59	49

Pitched Roof Build-Up

External Finish: slate tiles.

Support: Timber battens and counter-battens.

Membrane: Breathable roofing membrane.

Thermal Layer: 50mm rigid PIR insulation board.

Structural Elements: Timber rafters.

Infill: 100mm mineral wool fitted between rafters

Resilient bars fixed to the underside of the rafters.

One layer of 15mm plasterboard

Table 7 Calculated sound reduction index for the pitched roof.								
Freq. Hz	63	125	250	500	1 k	2 k	4 k	Rw dB
Pitched roof	19	29	43	51	55	53	61	52

The recommended sound rating of the glazing is included in the table below

Glazing and Ventilation Mitigation

The recommended acoustic ratings for the windows and trickle vents to achieve the necessary internal criteria are detailed in the tables below.

Table 8 Recommended minimum window sound reduction index.							
Freq. Hz	125	250	500	1 k	2 k	4 k	Rw dB
8 mm / (6 - 16 mm) / 6 mm	20	21	33	40	36	48	35

Table 9 Recommended minimum trickle vent sound reduction.							
Freq. Hz	125	250	500	1 k	2 k	4 k	Dn,e,w dB
Trickle vent	36	38	36	32	37	39	35

Table 10 below outlines the minimum sound rating for the entrance doors. It is critical to note that these doors must be installed with high-quality acoustic compression seals around the full perimeter of the frame to maintain the stated acoustic performance.

Table 10 Recommended minimum entrance door sound reduction index.								
Freq. Hz	63	125	250	500	1 k	2 k	4 k	Rw dB
Solid Door with Seals	26	30	33	30	33	42	50	35

By employing these recommended mitigation measures, it will be possible to attain the internal noise levels within the dwellings as recommended in British Standard BS 8233:2014. Specifically, it is anticipated that night-time noise levels resulting from single sound events will not regularly exceed the recommended 45 dB L_{Amax,F} in bedrooms, and the daytime equivalent continuous noise level will not exceed 35 dB L_{Aeq,T} in living rooms. A detailed noise intrusion assessment supporting these conclusions is included in the Annex.

7.3 External Amenity Area.

The survey data indicates that the highest measured ambient noise level affecting the external area is 55 dB LAeq. This complies directly with the upper guideline criteria recommended by BS 8233:2014 and the WHO for external amenity spaces.

7.4 Overheating.

Approved Document O (Overheating) of the Building Regulations (for England) provides guidance on mitigating overheating in new residential buildings. While the primary focus of this acoustic report is noise, the interrelationship between noise mitigation and overheating strategies is critical, particularly when relying on natural ventilation is not feasible due to high external noise.

Approved Document O sets out the following maximum internal noise levels for mitigation of overheating via openable windows:

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

The average measured noise level during the night-time period was 51 dB LAeq. Considering the typical sound reduction offered by a partially open window for ventilation (which is established at 15 dB), the expected internal noise level is 36 dB LAeq. This is 4 dB below the recommended 40 dB LAeq target, demonstrating compliance with Approved Document O.

Individual Noise Event Assessment:

Regarding individual maximum noise events, the highest measured night-time noise level was 79 dB LAmax,F. Applying the 15 dB sound reduction for a partially open window results in an expected internal peak level of 64 dB LAmax,F. While this isolated level exceeds the 55 dB LAmax,F target, an analysis of the data shows that the total number of exceedances occurring over the night-time period was 6. This falls below the maximum allowable threshold of 10 exceedances per night. Therefore, the site remains fully compliant with the recommended night-time noise criteria outlined in Approved Document O for overheating conditions.

7.5 Acoustic Review of Retained Ground Floor Class E Commercial Space

During the baseline noise survey undertaken between 11th and 15th June 2026, the ground floor commercial unit was fully vacant and stripped back to its shell. Consequently, direct operational noise measurements within the unit could not be obtained. In accordance with standard acoustic practice for mixed-use developments, the acoustic assessment evaluates the operational risk based on potential Class E uses and establishes appropriate mitigation measures to protect the adjoining proposed residential dwellings.

Internal Sound Transmission & Party Wall Specification The proposed ground floor layout introduces a party wall separating the retained 101 m² Class E unit at the front from the proposed residential units at the rear.

Under Building Regulations Approved Document E (ADE), the minimum requirement for airborne sound insulation across a party wall for a material change of use is $D_{nT,w} + C_{tr} \geq 43 \text{ dB}$ (or $\geq 45 \text{ dB}$ for new build). However, to prevent adverse impact from potential commercial activity within Class E, we recommend an enhanced acoustic performance standard designed to achieve at least 10 dB above standard Building Regulations (i.e. target performance of $D_{nT,w} + C_{tr} \geq 53 - 55 \text{ dB}$ / $R_w + C_{tr} \geq 55 \text{ dB}$).

To achieve this standard between the commercial unit and the residential rooms, the separating partition should be constructed as follows:

- Core Wall: Minimum 200 mm solid dense aggregate masonry blockwork (minimum mass per unit area $\geq 1800 \text{ kg/m}^2$) fully pointed with mortar joints on both faces.
- Acoustic Independent Lining (Residential Side):
 - Minimum 20–50 mm clear air cavity between the blockwork and the new studwork (no mechanical ties).
 - Independent metal stud framework (minimum 50 mm / 70 mm 'C' studs).
 - Cavity fully infilled with minimum 50 mm acoustic mineral wool quilt (minimum density $\geq 45 \text{ kg/m}^3$).
 - Lining faced with two layers of 15 mm high-density acoustic plasterboard (e.g., British Gypsum SoundBloc, Gyproc Habito, or Knauf Soundshield Plus; minimum mass 12.5 kg/m^2 per board), with joints staggered between layers.
 - Perimeter sealed air-tight with non-hardening acoustic sealant.

This separating build-up will achieve an airborne sound reduction in excess of $55 - 60 \text{ dB } R_w + C_{tr}$. This provides robust attenuation against typical commercial noise sources (speech, background audio, office equipment, foot traffic) and ensures internal ambient noise levels within the adjoining habitable rooms will comfortably comply with the daytime criteria of $35 \text{ dB } L_{Aeq,16hr}$ recommended in BS 8233:2014.

External Noise Breakout

- The commercial frontage and shop entrance face north onto Oxford Road.
- The proposed residential dwellings are positioned strictly to the rear of the site, with habitable room windows opening onto the rear and eastern courtyard elevations.
- The building itself acts as a complete physical barrier between the Oxford Road commercial shopfront and the rear residential windows.
- Typical thermal double-glazed commercial shopfront glazing provides at least $30 - 32 \text{ dB } R_w$. Any sound breaking out to the street will be heavily shielded around the building envelope and will be completely masked by the prevailing road traffic noise on Oxford Road. Flanking sound transmission via the external envelope to the rear residential facades is negligible.

Mechanical Services & Plant (BS 4142:2014+A1:2019)

No fixed mechanical services or extract plant were present during the survey. If mechanical plant (such as air conditioning condensers, refrigeration units, or commercial ventilation extract) is installed to serve the retained Class E unit in the future, its operational noise impact should be controlled via a standard planning condition adhering to BS 4142:2014+A1:2019:

- *The cumulative rating level ($L_{A_{r,Tr}}$) of any fixed mechanical plant associated with the commercial unit shall not exceed the prevailing representative background sound level (L_{A90}) at 1 metre from the facade of the nearest noise-sensitive residential window during any operational period.*

Compliance with this condition can readily be verified through Stage 4 plant selection, attenuators, or acoustic enclosures once specific tenant fit-out plant schedules are known.

8 Conclusions

An environmental noise assessment has been undertaken by Pace Consult on behalf of Irongate Property Asset Management Limited for the proposed residential development at 346-348 Oxford Road, Reading, RG30 1AQ.

The baseline environmental noise survey successfully captured the prevailing acoustic climate at the site, which is primarily dictated by distant road traffic and daytime/evening vocal noise from patrons utilizing the adjacent public house's rear garden. Evaluating this measured data against the ProPG: Planning & Noise methodology, the site falls comfortably within the Low noise risk category.

In addition, an acoustic review of the retained ground floor Class E commercial unit has been undertaken to ensure adequate protection for the adjoining proposed residential dwellings. To safeguard residential amenity against potential internal noise transmission, the separating party wall between the commercial unit and the residential dwellings will be specified to achieve an enhanced acoustic performance of at least 10 dB above standard Building Regulations Approved Document E requirements (target performance $\geq 53 - 55 \text{ dB } D_{nT,w} + C_{tr}$). This standard will be achieved by constructing a minimum 200 mm dense masonry wall complemented by an independent acoustic stud lining on the residential side with mineral wool insulation and dual-layer acoustic plasterboard. External noise breakout from the commercial shopfront is negligible at the rear residential windows due to the orientation of the building and physical envelope screening. Any future mechanical services or plant serving the commercial space will be controlled via a standard planning condition limiting cumulative rating levels to not exceed prevailing background sound levels in accordance with BS 4142:2014+A1:2019.

To ensure future residents are provided with a high standard of acoustic amenity, specific mitigation measures have been detailed within this report. By diligently implementing the recommended acoustic building envelope specifications—which include targeted acoustic glazing configurations, appropriately rated trickle ventilation, and solid acoustic entrance doors with perimeter seals—the proposed dwellings will readily achieve the internal ambient noise criteria set out in British Standard BS 8233:2014 and the World Health Organization (WHO) Guidelines for Community Noise.

Furthermore, the assessment demonstrates that the proposed development complies with the stringent night-time noise limits stipulated in Approved Document O (Overheating) when relying on partially open windows for overheating mitigation. Noise levels affecting the external amenity areas also fall within the recommended 50 – 55 dB LAeq guideline range.

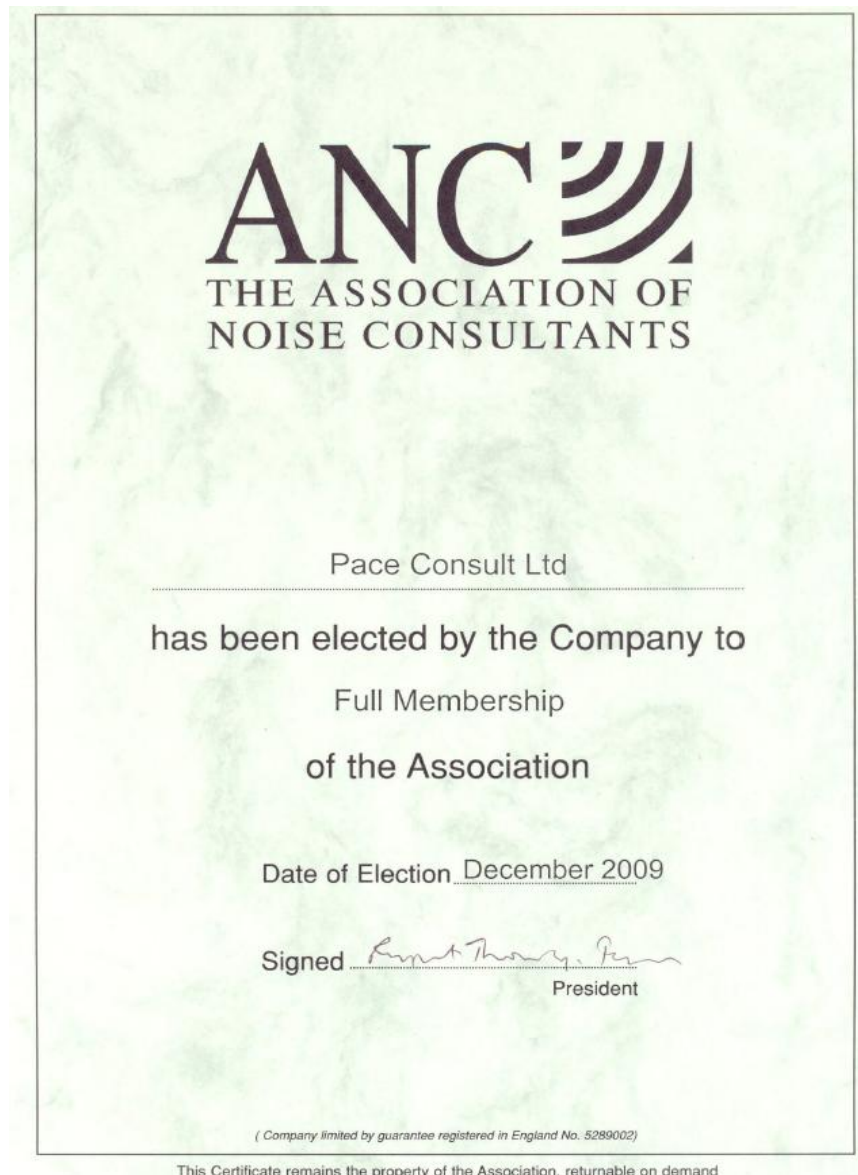
In conclusion, provided the recommended acoustic design strategy is fully integrated into the construction, future occupants will be adequately protected from the existing noise climate. Therefore, there are no adverse noise impacts that would preclude the granting of planning permission for this residential development.

9 References

1. National Planning Policy Framework
2. World Health Organisation Criteria – Environmental criteria
3. BS8233:2014 “*Guidance on sound insulation and noise reduction for buildings*”
4. British Standard BS4142: 2014+A1:2019, *Method for Rating and assessing industrial and commercial sound*.
5. Calculation of Road Traffic Noise. Department of Transport.
6. ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise
7. Overheating Approved Document O.

Appendix 1 – ANC membership.

The author is a corporate member of the Institute of Acoustics (IOA) which satisfies the experience and qualification requirements for a 'suitably qualified acoustician'. Pace Consult are also full member of the Association of Noise Consultants.



Appendix 2 – Noise Intrusion Assessment.

The noise intrusion assessment has been conducted in accordance with the methodology recommended in BS 8233:2014, Section G.2, "Typical design problems: More rigorous calculation." This approach ensures a detailed and accurate prediction of internal noise levels within the proposed residential units.

The following table presents the calculated internal noise levels in bedrooms, specifically focusing on rooms exposed to the highest night-time individual noise events ($LA_{max,fast}$ dB). The calculations incorporate the measured external noise levels (as detailed in Section 6) and the sound reduction performance of the recommended building envelope (as specified in Section 7.2).

BS8233:2014 Calculation of Sound transmission into a building								
Project:				Date:				
Client:				Consultant: JCB				
Building elements & Areas				Total M ²				
S _{ew} - External Wall Area				8.10				
S _{wi} - Area of Windows within Room				0.90				
S _{tr} - Area of Ceiling within Room				9.00				
Total Façade Area:				9.00				
Total Area of transmitting elements:				18.00				
				W	L	H	V	Rt (s)
Room Data				3.45	2.55	3	26.3925	0.5
Constructions & Performance Data:								
Construction	63	125	250	500	1K	2K	4K	
Window: Double glazing	17	20	21	33	40	36	48	
Vent:	29	36	38	36	32	37	39	
Wall	35	38	34	38	46	53	59	
Ceiling	16	22	40	48	53	55	59	
Source Noise & Element Contributions								
	63	125	250	500	1K	2K	4K	
Source Lp	65	59	58	57	60	75	74	
Window	-30.0	-33.0	-34.0	-46.0	-53.0	-49.0	-61.0	
Vent	-31.6	-38.6	-40.6	-38.6	-34.6	-39.6	-41.6	
Wall	-38.5	-41.5	-37.5	-41.5	-49.5	-56.5	-62.5	
Ceiling	-19.0	-25.0	-43.0	-51.0	-56.0	-58.0	-62.0	
Cumulative SRI	-18.4	-24.1	-31.5	-36.1	-34.3	-39	-41.4	
Plus 10log S/A	3.3	3.3	3.3	3.3	3.3	3.3	3.3	
Façade Effect	0	0	0	0	0	0	0	
RESULT	49.9	38.2	29.8	24.2	29.0	39.3	35.9	
A weighted Internal Level					42.3			

Figure 9. Calculated indoor noise levels in bedrooms nighttime (highest individual noise event).

As evident from the above table inserted table, the calculated internal noise level in bedrooms is 42 dBA. This result demonstrates full compliance with the recommended noise criterion for individual noise events in bedrooms, which is ≤ 45 dB $L_{Amax(fast)}$. This confirms that the proposed building envelope design is effective in mitigating peak external noise events, ensuring a suitable acoustic environment for sleep and rest.

The table below includes the calculated noise intrusion in living rooms based on the measured average noise levels L_{Aeq} dB during daytime.

BS8233:2014 Calculation of Sound transmission into a building								
Project:					Date:			
Client:					Consultant:	JCB		
Building elements & Areas				Total M ²				
S _{ew} - External Wall Area				8.10				
S _{wi} - Area of Windows within Room				0.90				
S _{ri} - Area of Ceiling within Room				9.00				
Total Façade Area:				9.00				
Total Area of transmitting elements:				18.00				
				Constants				
				A0		10		
				A (0.16w/T)		8.4456		
				No. Vents		1		
				W	L	H	V	Rt (s)
Room Data				3.45	2.55	3	26.3925	0.5
Constructions & Performance Data:								
Construction	63	125	250	500	1K	2K	4K	
Window: Double glazing	17	20	21	33	40	36	48	
Vent:	29	36	38	36	32	37	39	
Wall	35	38	34	38	46	53	59	
Ceiling	16	22	40	48	53	55	59	
Source Noise & Element Contributions								
	63	125	250	500	1K	2K	4K	
Source Lp	63	54	49	50	57	56	42	
Window	-30.0	-33.0	-34.0	-46.0	-53.0	-49.0	-61.0	
Vent	-31.6	-38.6	-40.6	-38.6	-34.6	-39.6	-41.6	
Wall	-38.5	-41.5	-37.5	-41.5	-49.5	-56.5	-62.5	
Ceiling	-19.0	-25.0	-43.0	-51.0	-56.0	-58.0	-62.0	
Cumulative SRI	-18.4	-24.1	-31.5	-36.1	-34.3	-39	-41.4	
Plus 10log S/A	3.3	3.3	3.3	3.3	3.3	3.3	3.3	
Façade Effect	0	0	0	0	0	0	0	
RESULT	47.9	33.2	20.8	17.2	26.0	20.3	3.9	
A weighted Internal Level					29.1			

Figure 10. Calculated indoor noise levels in living rooms day time.

As shown in the table above, the calculated internal noise level in the living rooms is 29 dB L_{Aeq} . This result demonstrates full compliance with the recommended daytime noise criterion for resting areas, which is ≤ 35 dB L_{Aeq} .

It should be noted that the external noise levels used in this noise intrusion assessment represent the highest levels measured during the active use of the adjacent public house's rear garden. This confirms that the proposed building envelope design effectively mitigates worst-case daytime noise, ensuring a comfortable acoustic environment for future residents in these habitable spaces.

Furthermore, potential suppliers of construction elements must demonstrate to the design team that their supplied acoustic performance data directly relates to the specific products proposed for this project. All acoustic performance information must be supported by laboratory test certificates measured in strict accordance with BS EN ISO 10140-2:2021 (Acoustics — Laboratory measurement of sound insulation of building elements — Part 2: Measurement of airborne sound insulation).