
NS & PS DEVELOPMENT (UK3) LIMITED

NOISE IMPACT ASSESSMENT REPORT

**CRAFTY BARON, 5-7 REGENT STREET, HINCKLEY, LE10
0AZ**

Client: NS & PS Development (UK3) Limited

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REPORT VERSION CONTROL:

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1 INTRODUCTION

1.1 Overview

1.1.1 By instruction from NS & PS Development (UK3) Limited ('the client'), NoiseAir was commissioned to undertake a noise impact assessment (NIA) to support a planning application proposing the conversion of upper floors to create 4no. flats (25/00591/FUL) at Crafty Baron, 5-7 Regent Street, Hinckley, LE10 0AZ; herein referred to as the 'proposed development site'.

1.1.2 General limitations with respect to this NIA are outlined in **Appendix A**.

1.2 Comments from the Local Authority

1.2.1 The local authority has raised the following concerns with regard to the noise impact on future residents of the proposed flats:

"With regard to noise a Noise Impact Assessment (NIA) should be carried out prior to determination. The NIA should assess the impact of noise from the street on the proposed residential use, particularly noise from traffic and the night-time economy.

The NIA should also assess the transfer of noise between the retained commercial (public house) element of the site and the proposed residential use above and provide recommendations for mitigation.

Any external plant including kitchen ventilation systems should be assessed using BS4142:2014."

1.3 Site Description

1.3.1 At the time of writing, the proposed development site is currently situated in a mixed-use area in Hinckley town centre with predominant land usage in the area comprising commercial use buildings including convenience stores, fast-food takeaways, pubs, restaurants, and banks etc.

1.3.2 The site fronts onto Regent Street and is subject to pedestrian and road traffic noise. This includes contributions from the surrounding roads in the area. It is considered that road traffic noise is the prevailing residual noise source in the locality.

1.3.3 At the time of writing, the first-floor roof garden area contains a large number of mechanical plant units including AC condenser units and extraction flues.

1.3.4 The first and second floors are primarily being used for storage and customer bathrooms. The ground floor is currently in active use as a pub and uses amplified music.

- 1.3.5 **Figure 1** presents a site aerial photograph of the development site with respect to the local area and its context.



Figure 1: Site Aerial Photograph.

1.4 Development Proposals

- 1.4.1 At the time of writing, proposals outline the conversion of upper floors to create 4no. flats at the site. The proposed floor plans and elevations are shown below in **Figure 2** and **Figure 3** respectively.



Figure 2: Proposed Floor Plans



Figure 3: Proposed Elevations

- 1.4.2 The client has advised that the ground floor kitchen is to be decommissioned. Mechanical plant units associated with the decommissioned kitchen which are located within the proposed first-floor garden area are to be removed as part of the proposed development. These have been highlighted in **Figure 4** for reference.



Figure 4: Mechanical plant to be removed in the first-floor rooftop garden area

- 1.4.3 **Figure 5** shows the location of existing AC units which are located in close proximity to proposed bedroom windows.



Figure 5: Existing AC units adjacent the first-floor rooftop garden area

2 ASSESSMENT METHODOLOGY AND SCOPE OF WORKS

2.1 National Planning Policy Framework [NPPF 2024]

- 2.1.1 The NPPF sets out the government's planning policies for England and how they are expected to be applied. It aims to achieve sustainable development; stating that planning policies and decisions should prevent unacceptable levels of noise pollution from new and existing development while affirming that National Policy Statements form part of the national planning policy framework and should be considered in planning decisions.

2.2 Noise Policy Statement for England (NPSE)

- 2.2.1 The Noise Policy Statement for England (NPSE), published in March 2010, states the long-term vision of Government noise policy is to "promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development".
- 2.2.2 The NPSE sets out the government's overall policy on noise within the context of sustainable development. It introduces three concepts for noise management: avoid significant adverse effects; mitigate and minimise adverse effects; and where possible, contribute to improvements in health and quality of life.
- 2.2.3 It also establishes a hierarchy of noise management actions: avoid; reduce; remedy; mitigate; compensate.
- 2.2.4 The NPSE also introduces the below categories with respect to 'adverse impacts'.

'NOEL – No Observed Effect Level

- This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level

- This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level

- This is the level above which significant adverse effects on health and quality of life occur.'

- 2.2.5 The NPSE states that significant adverse effects on health and quality of life should be avoided. Where the impact lies somewhere between LOAEL and SOAEL, it requires that all reasonable steps are taken to mitigate and minimise the adverse effects of noise. In this regard, a certain degree of impact between LOAEL and SOAEL would be acceptable in

terms of planning policy, provided that the impact has been mitigated and minimised by design.

2.3 Planning Practice Guidance - Noise [PPG 2019]

2.3.1 PPG 2019 provides guidance on how noise should be considered in planning decisions. It was published in 2014 and updated in 2019. The document advises on how to avoid, mitigate, or minimise adverse effects of noise through good acoustic design and appropriate conditions or obligations.

2.3.2 **Table 1** summarises the noise exposure hierarchy outlined within the PPG.

Table 1: National Planning Practice Guidance noise exposure hierarchy		
Perception	Increasing Effect Level	Action
Not noticeable	No Observed Effect	No specific measures required
Noticeable and not intrusive	No Observed Adverse Effect	No specific measures required
Lowest Observed Effect Level		
Noticeable and intrusive	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Effect Level		
Noticeable and disruptive	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Unacceptable Adverse Effect	Prevent

2.4 Scope of Works

2.4.1 The proposed development site is located in a mixed-use area, with residential flats proposed above an existing pub with amplified music and in close proximity to existing mechanical plant.

2.4.2 The NIA will, therefore, assess the following noise sources and their potential impact to future residents of the proposed dwellings:

- **Road Traffic & Pedestrian Noise** – General non-descript road traffic and pedestrian noise from Regent Street and surrounding roads.
- **Mechanical Plant Noise** – Tonal noise from AC units in the first-floor roof garden.
- **Music & Patron Noise** – Music and patron noise ingress through the separating floor between the pub and first-floor flats.

2.5 Assessment Criteria

- 2.5.1 In order to achieve noise levels which are considered to be in alignment with the planning approaches and policies discussed in Section 2.1, it is considered that all efforts are made to ensure that future occupants are unlikely to be exposed to noise levels which might breach the LOAEL criteria.
- 2.5.2 It should be noted however that planning guidance does not preclude development where the LOAEL is likely to be breached in certain circumstances as long as reasonable efforts are made to mitigate and reduce such an effect.
- 2.5.1 The noise sources affecting the proposed development are presented below alongside the relevant standards/guidance documents which have been adopted for each assessment:
- **Road Traffic & Pedestrian Noise** – BS 8233:2014
 - **Mechanical Plant Noise** – BS 4142:2014+A1:2019
 - **Music & Patron Noise** – BS 8233:2014
- 2.5.2 A summary of these standards/guidance documents is provided below for reference.

2.6 British Standard 8233:2014 (BS 8233:2014)

- 2.6.1 British Standard 8233:2014 – *Guidance on sound insulation and noise reduction for buildings* (BS 8233) provides guidance on internal ambient noise levels, resulting from break-in of external environmental noise that should not be exceeded in various locations within dwellings.
- 2.6.2 Guidelines for buildings in terms of internal noise level are reported in **Table 2**.

Table 2: Summary of internal noise guidelines.			
Activity	Location	0700 – 2300 hours	2300 – 0700 hours
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}

- 2.6.3 The standard clarifies that the criteria above are for ‘noise without character’. It explains that for noise with character, lower levels may be required, depending on the character of the noise. In the context of this report, a reasonable interpretation would be that noise ingress from music and raised voices through the separating floor and front façade of the development comprises a mix of music noise and raised voices which have a degree of character and should therefore fall below the criteria above within nearby residential dwellings.

2.6.4 We have chosen to adopt reduced internal noise targets of 25 dB $L_{Aeq,16hr}$ (daytime) and 20 dB $L_{Aeq,8hr}$ (night-time) for assessment of the music noise and patron.

2.7 British Standard 4142:2014 (BS 4142:2014+A1:2019)

2.7.1 British Standard 4142:2014+A1:2019 - Methods for rating and assessing industrial and commercial sound, sets the methodology for rating and assessing sound of an industrial and commercial nature, which includes sound from fixed installations such as mechanical and electrical plant and equipment.

2.7.2 In BS 4142:2014+A1:2019, a noise rating is determined and compared with the existing local background sound level based on several more cumulative acoustic feature corrections to apply where appropriate. For example, if the noise includes a distinguishable tone, impulse, intermittency or other readily distinguishable sound characteristic, then additional cumulative penalties individually ranging from 0 to 9 dB may be applied depending on the type of noise.

2.7.3 BS 4142:2014+A1:2019, seeks to determine a “representative” background sound level, stating that “...the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods”.

2.7.4 The assessment of the impact depends upon the margin by which the rating level of the specific sound source exceeds the background sound level but also promotes a consideration of the context in which the sound occurs when making an assessment. BS 4142:2014+A1:2019 states that an initial estimate of the impact of the specific sound is made by subtracting the measured background sound level from the rating level, while considering the following points:

- Typically, the greater this difference, the greater the magnitude of the impact;
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and,
- 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 or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

2.7.5 Therefore, a BS 4142:2014+A1:2019 assessment may deduce a low impact where the specific sound level is below the background sound level.

3 ACOUSTIC SURVEY

3.1 Unattended Noise Monitoring

- 3.1.1 NoiseAir conducted unattended noise monitoring from the 6th-10th of February 2026 at the development site. Unattended noise monitoring was undertaken at the monitoring locations ML1 and ML2 as presented in **Figure 6**.
- 3.1.2 ML1 was positioned in a first-floor window to the front façade, with ML2 being placed on the first-floor roof towards the rear approximately 1.5 m above the local floor level.
- 3.1.3 ML1 was placed within the window cavity (flush with the façade and therefore not exposed to façade reflections), and ML2 was placed away from any reflective surfaces. Therefore, all measurements are considered to be free-field.

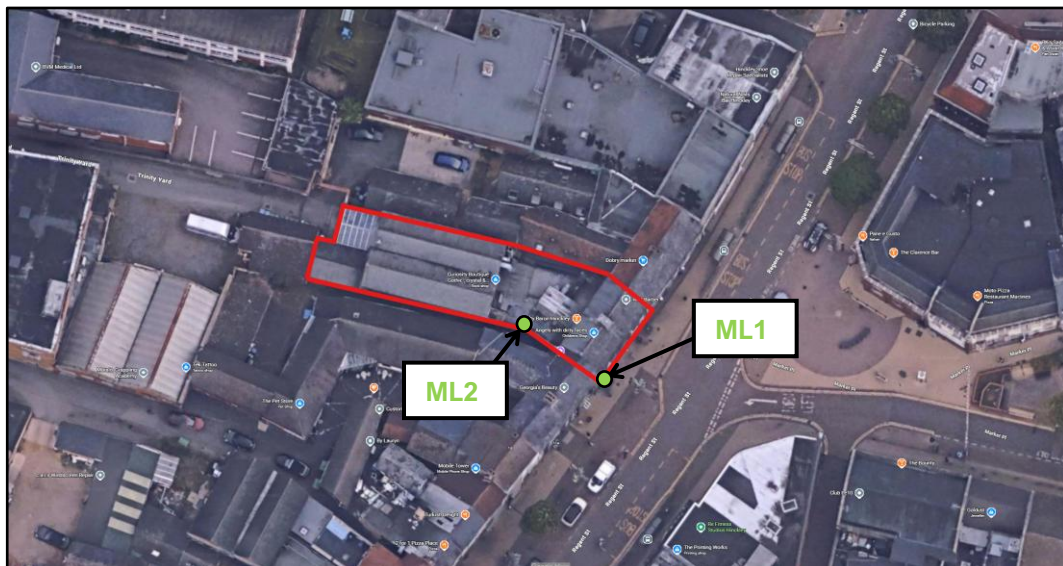


Figure 6: Approximate noise monitoring locations

- 3.1.4 The noise measurements were made using Class 1, integrating sound level meters (SLMs).
- 3.1.5 The acoustic equipment was calibrated to comply with Section 4.2 of BS 7445-1:2003¹, before and after the noise monitoring periods. The results are summarised in **Table 3**.

ML	(Serial No.)	Preamp (Serial No.)	Microphone (Serial No.)	Calibrator (Serial No.)	Start Calibration	End Calibration	Drift
1	NOR140 (1402867)	NOR1209 (12113)	NOR1225 (38650)	B&K 4231 (2431761)	-25.9	-25.7	0.2
2	NOR140 (1405016)	NOR1209 (12113)	NOR1225 (38650)		-25.6	-25.8	0.2

¹ BS 7445-2003 "Description and measurement of environmental noise – Part 1: Guide to quantities and procedures.

- 3.1.6 The weather conditions were noted to be as outlined in **Table 4** during the site visits at the start and end of the monitoring period.

Table 4: Summary of weather conditions noted at the start and end of the monitoring duration.		
	6 th February 2026	10 th February 2026
Roads (Wet / Dry)	Wet	Dry
Temperature (°C)	7	8
Wind direction and speed (ms ⁻¹)	3.6 E	4.5 SE
Cloud Cover (Approx. %)	100	100
Humidity (%)	96	96

3.2 Measured Sound Levels & Audio

- 3.2.1 The SLM was set up with an audio recording trigger when measuring sound above a certain level in order to identify the character and source of different noise events.
- 3.2.2 This, alongside site observations at the start and end of the survey monitoring period and floor tests provided opportunity for observations and detailed notes to be made of the significant noise sources, which contribute to each of the measured levels at the proposed development.

ML1 (Front Façade)

- **General Ambient Noise (Road/Pedestrian Traffic)** – Non-descript ambient noise from road traffic and pedestrians as well as vehicle idling.
- **Music Noise & Raised Voices** – *High levels of music noise were recorded during evening and night-time periods over the weekend. Raised voices determined to be directly outside the pub entrance were also recorded.*

ML2 (Rear Façade)

- **General Ambient Noise (Road Traffic)** – Non-descript ambient noise from distant road traffic.
- **Mechanical Plant Noise** – *Noise from existing AC units located to the rear. Clearly audible against the background noise environment.*

- 3.2.3 The data shown in **Figure 7** and **Figure 8** details a level vs time graph of the recorded L_{Amax} , L_{Aeq} and L_{A90} sound levels over 15-minute time periods for the entire measurement duration at ML1 and ML2 respectively.

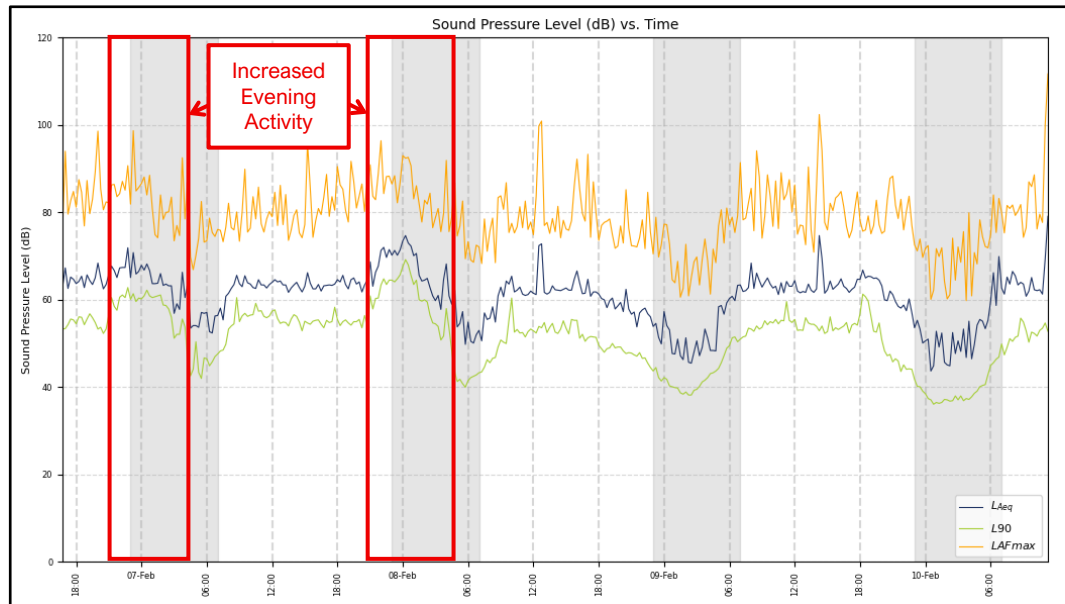


Figure 7: Level vs. time graph showing L_{Amax} , L_{Aeq} and L_{A90} sound levels – ML1

3.2.4 The data presented in **Figure 7** shows a marked increase in $L_{Aeq,T}$ levels during evening and night-time periods on Friday 6th to Saturday 7th February 2026, reflecting elevated noise at the front façade due to music noise breakout.

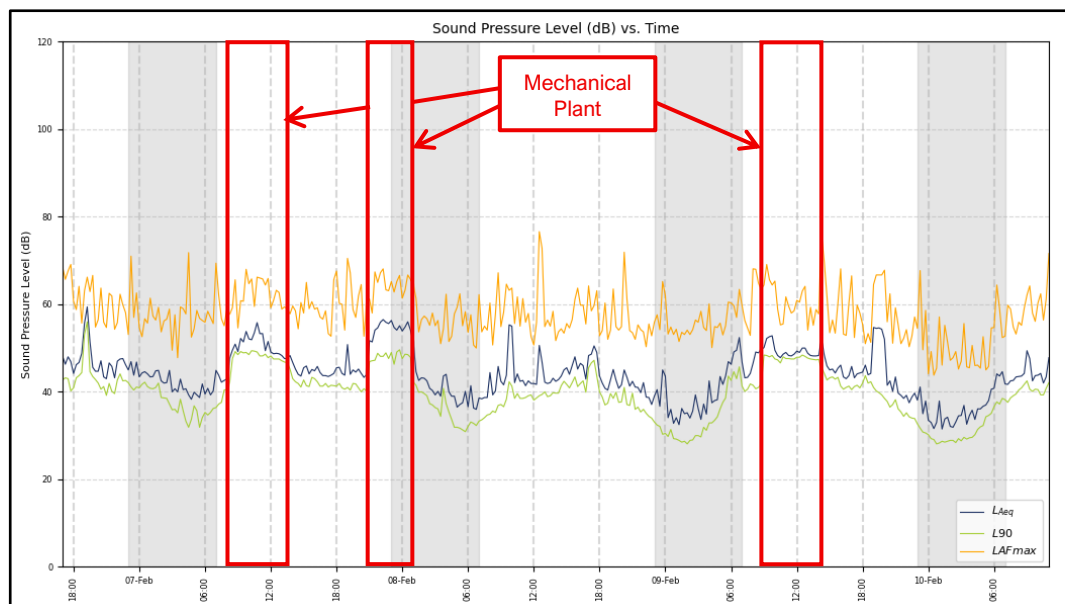


Figure 8: Level vs. time graph showing L_{Amax} , L_{Aeq} and L_{A90} sound levels – ML2

3.2.5 The data presented in **Figure 8** also shows an increase during the evening and night-time period on Saturday 7th February 2026, although to a lesser extent due to the acoustic attenuation provided by the building façade.

3.2.6 Periods of mechanical plant activity are also identifiable through the distinct $L_{A90,15min}$ plateaus observed in the graph.

3.2.7 The results during the daytime and night-time periods over the course of the unattended monitoring period are summarised in **Table 5** below.

Table 5: Average Measured Daytime and Night-time Noise Levels (Equivalent Free-Field Levels)		
Monitoring Location	Time	Measured Noise Level
		dB $L_{Aeq,16hour}$ / dB $L_{Aeq,8hour}$ / dB $L_{AFmax,2min}$
ML1	07:00-23:00	62.7 – 68.5
	23:00-07:00	55.5 – 67.8
	23:00-07:00	77.2* – 87.0*
ML2	07:00-23:00	44.6 – 50.0
	23:00-07:00	38.0 – 49.6

* $L_{max,2min}$ values exceeded more than 10 times per night.

3.3 Background Sound Levels

3.3.1 A histogram showing the $L_{A90,15min}$ sound levels at ML2 for the daytime and night-time periods throughout the entire survey is presented in **Figure 9** and **Figure 10** respectively.

3.3.2 Periods influenced by mechanical plant operation or activity from the night-club have been excluded from this dataset to avoid artificially elevating the background sound levels.

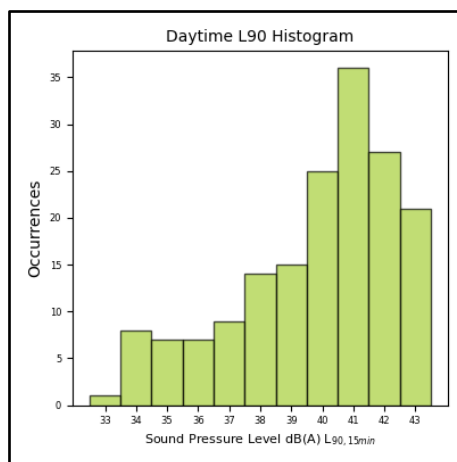


Figure 9: $L_{A90,15mins}$ noise readings at ML2 Daytime.

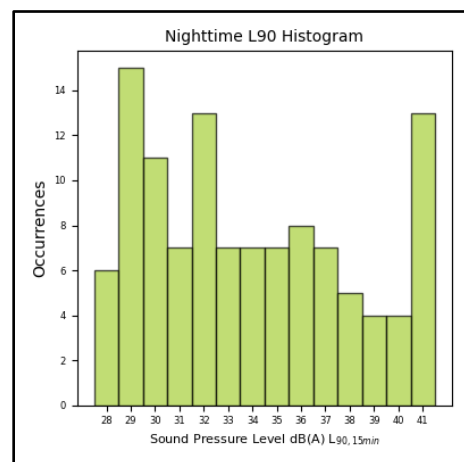


Figure 10: $L_{A90,15mins}$ noise readings at ML2 Night-time.

3.3.3 For ML2, conservative L_{A90} background sound levels of 40 dB(A) and 32 dB(A) have been adopted for the daytime and night-time periods respectively.

3.4 Ambient & Residual Sound Levels

3.4.1 The recorded ambient noise level from the combined performance of the nearby AC units at ML2 is 49.7 dB $L_{Aeq,T}$.

3.4.2 The recorded residual noise level at ML2 is 44.6 dB $L_{Aeq,T}$.

- 3.4.3 Therefore, the combined contribution from existing AC units at ML2 is calculated by logarithmically subtracting the recorded residual sound level from the ambient sound level.

$$10 * \log \left(10^{\frac{L_{ambient}}{10}} - 10^{\frac{L_{residual}}{10}} \right) = 10 * \log(10^{4.97} - 10^{4.46}) = 48.1 \text{ dB } L_{Aeq,T}$$

- 3.4.4 This has been used in order to inform and calibrate the 3D sound model in Section 5.

3.5 Sound Insulation Test

- 3.5.1 Airborne sound insulation tests were undertaken between the GF pub/bar area and the proposed flat locations to the front and rear of 1F areas.
- 3.5.2 The tests were undertaken by Miles May MIOA of NoiseAir, who is an experienced pre-completion tester for determining building regulations Approved Document E compliance.
- 3.5.3 The tests were conducted in accordance with ISO 140-4 and the subsequent rating determined in accordance with ISO 717-1.
- 3.5.4 The monitoring equipment consisted of a NOR150 Class 1 sound level meter (SLM) with enhanced windshield and calibrated to traceable standards.
- 3.5.5 The SLM was calibrated upon installation and collection of the survey and found to have no drift (0.0 dB).

Table 6: Summary of SLM used for survey and associated field calibration						
SLM (Serial Number)	Preamp (Serial Number)	Microphone (Serial Number)	Calibrator (Serial Number)	Start Calibration	End Calibration	Drift
NOR150 (1503010 5)	NOR1209 (15801)	NOR1225 (72900)	SVAN SV30A (10818)	-26.1	-26.1	0.0

- 3.5.6 A summary of the measured result for the first-floor areas to the front and rear are presented below:

- Front Façade: **49 dB $D_{nT,w}+C_{tr}$**
- Front Façade: **51 dB $D_{nT,w}+C_{tr}$**

- 3.5.7 A full set of results are shown in **Figure 11** and **Figure 12** overleaf.
- 3.5.8 For the front façade, external noise from the street meant that the limit of measurement (denoted by $\geq B$) was reached in several bands, meaning that D_{nT} values are higher in reality, but higher values could not be measured over residual noise during the floor test.
- 3.5.9 This means that in reality the floor test results are likely more similar than shown by the test results and the floor at the front may be closer to 51 dB $D_{nT,w}+C_{tr}$ in reality.

Standardised level difference according to ISO 140-4. Field measurements of airborne sound insulation between rooms

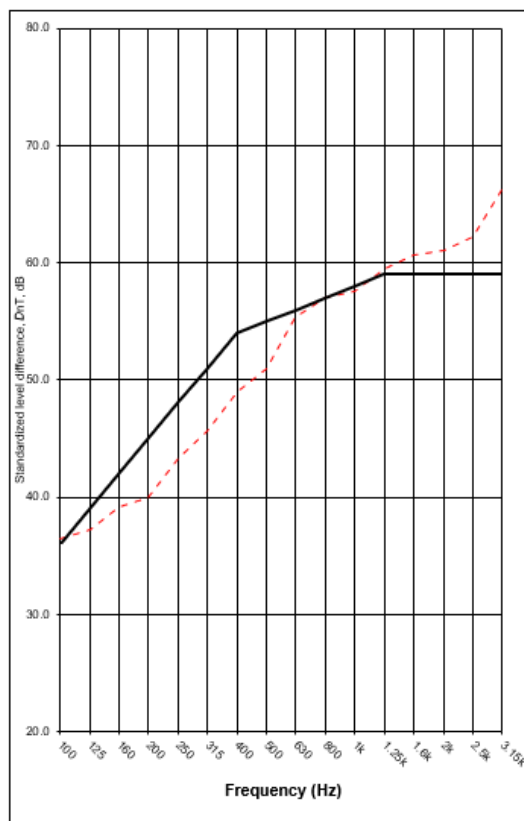
Test date: 08/09/2025

Test: 1

Source room: GF Pub/Bar Area

Receive room: 1FL Rooms to the Front Façade

Freq (Hz)	Limit	D_{nT} dB	Corr
50		24.3	b
63		34.2	
80		36.0	
100		36.4	
125		37.2	
160		39.2	
200		39.9	
250		43.3	
315		45.7	
400		49.0	
500		50.9	
630	IV	55.4	B
800	IV	57.1	B
1000	IV	57.5	B
1250	IV	59.5	B
1600	IV	60.7	B
2000		61.1	b
2500		62.2	
3150		66.2	b
4000		69.8	b
5000		71.3	



Rating according to ISO 717-1

$D_{nT,w}$ = 55 dB

$D_{nT,w}+C_{tr}$ = 49 dB

$D_{nT,w}+C$ = 53 dB

Evaluation based on field measurement results obtained in one-third octave bands by an engineering method

Signature:

MM

Figure 11: Full airborne sound insulation test results

Standardised level difference according to ISO 140-4. Field measurements of airborne sound insulation between rooms

Client: Mr Client Man
 Site: Crafty Baron, 5-7 Regent Street, Hinckley

Test date: 24/02/2026

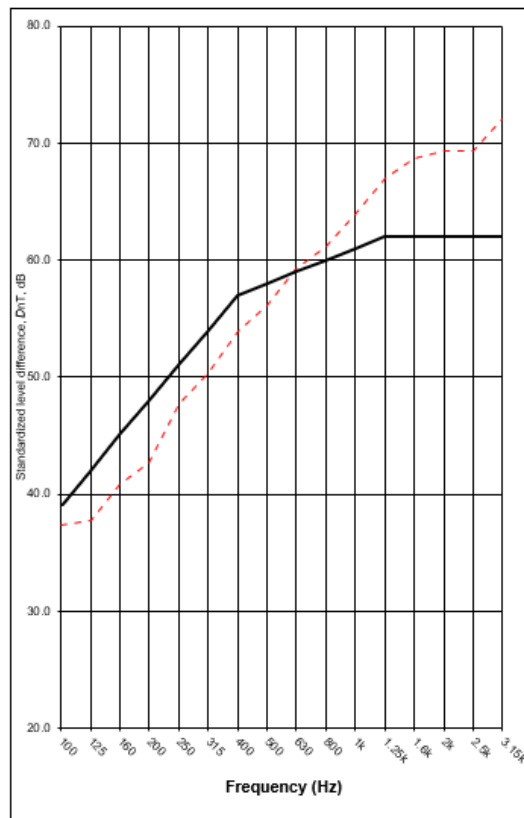
Test: 2

Source room: GF Pub/Bar Area

Receive room: 1FL Bathrooms to the Rear Façade

Floor construction: 0
 Construction type number: 0

Freq (Hz)	Limit	D_{nT} dB	Corr
50		32.3	
63		34.3	
80		39.2	
100		37.3	
125		37.7	
160		40.8	
200		42.7	
250		47.7	
315		50.3	
400		53.9	
500		56.1	
630		59.3	
800		61.2	
1000		63.9	
1250		67.0	
1600		68.7	
2000		69.3	
2500		69.3	
3150		72.0	b
4000		73.9	
5000		74.6	



Rating according to ISO 717-1

$D_{nT,w} = 58$ dB

$D_{nT,w} + C_{tr} = 51$ dB

$D_{nT,w} + C = 56$ dB

Evaluation based on field measurement results obtained in one-third octave bands by an engineering method

Signature:

MM

Figure 12: Full airborne sound insulation test results

4 MUSIC NOISE ASSESSMENT

4.1 Overview

- 4.1.1 At the time of writing, development proposals outline the conversion of first floor spaces into residential flats.
- 4.1.2 Given that the premises is to operate during daytime and night-time hours, it is recommended that target internal noise levels are adopted based on the recommendations as outlined in BS 8233:2014.

4.1 Target Internal Criteria

- 4.1.1 It should be noted that the criteria presented within section 2.4 is intended for noise sources without character. BS 8233:2014 clarifies that for noise with character, lower levels may be required, depending on the character of the noise.
- 4.1.2 In the context of this report, a reasonable interpretation would be that noise ingress through the separating floor comprises a mix of music noise and raised voices which have a degree of character and should therefore fall below the typical BS 8233:2014.
- 4.1.3 The reduced criteria which have been adopted for assessment of music noise through the separating floor from the pub to proposed flats is 25 dB $L_{Aeq,T}$ (daytime) and 20 dB $L_{Aeq,T}$ (night-time).

4.2 Internal Reverberant Noise Levels

- 4.2.1 It is NoiseAir's professional opinion that noise levels within pubs can vary depending on various factors such as size and popularity; however, it is considered that noise levels in establishments such as the proposed will likely range between 70-75 dB (A).
- 4.2.2 It is therefore considered appropriate to adopt an internal reverberant noise level of 75 dB L_{Aeq} for assessment, which represents a conservative approach.
- 4.2.3 The approach taken by this report is first to assess the required performance uplift to the separating floor based on 75 dB of patron noise, then to consider music noise limits within the proposed development.

4.3 Performance Requirements

- 4.3.1 Based on the internal noise level of 75 dB $L_{Aeq,T}$ reasoned in Section 4.2, it is recommended that an enhanced level of sound insulation be incorporated across the separating floor between the commercial premises and the proposed residential units.
- 4.3.2 It is desirable for the separating floor performance to be increased towards approximately 55 dB $D_{nT,w} + C_{tr}$ in order to assist in achieving internal noise levels of at least 20 dB $L_{Aeq,T}$ within the receiving residential accommodation. This corresponds to an indicative uplift of at

least 4 dB $D_{nT,w} + C_{tr}$ to the existing separating floor between the pub/bar and the proposed flats.

4.3.3 In this specific case, the appropriate way to approach this is by design specification rather than in-situ testing. The reason for this is that test results between 50-55 dB $D_{nT,w} + C_{tr}$ are not always measurable in-situ due to residual noise levels when testing. In the case of this site, noise from the street outside on the front elevation meant that only 49 dB $D_{nT,w} + C_{tr}$ could be measured before hitting the limit of measurement relative to existing residual noise levels within the test room.

4.3.4 For example, this would mean that any planning obligation to test the in-situ performance would likely set a measurement performance target that is not necessarily practicable to measure even if the performance is achieved.

4.3.5 We would therefore recommend that upgrades are specified by design. Final noise levels should then be set based on subjective listening tests within the proposed first-floor flats to confirm that noise levels are suitably controlled. This approach would mean that test limitations would not result in limitations or risk to the desired outcome in the proposed first floor flats.

4.4 Recommendations

4.4.1 It is recommended that acoustic enhancement be applied to the separating floor.

4.4.2 At the time of testing, a limited visual inspection identified the existing separating floor to be of timber construction. However, at the time of writing, the exact construction detail is unconfirmed.

4.4.3 It is recommended that a high mass floating subfloor is installed on top of the existing floorboards. This should have a minimum mass per unit area of 25 kg/m².

4.4.4 These are typically supplied as an 18 mm cement board with a 10 mm integrated resilient layer (example product, Hush CEM-28 see **Figure 13**). Lower mass chipboard products are also available, but please note that in this case the recommendation is for a higher mass product such as cement board.



Figure 13: Hush CEM-28

- 4.4.5 Although there is uncertainty in the precise construction in-situ, the information from the sound insulation test can be used to assist in sound insulation calculations to determine the anticipated relative uplift of the floor treatment outlined above.
- 4.4.6 **Figure 14** presents a sound insulation calculation constructed via sound insulation modelling (Insul 'Marshall Day Acoustics (2023)) of a timber-joisted floor construction with a suspended ceiling at 49 dB R_w+C_{tr} (for use as a 'calibration' point against the 49 dB $D_{nT,w}+C_{tr}$ test result measured on-site).

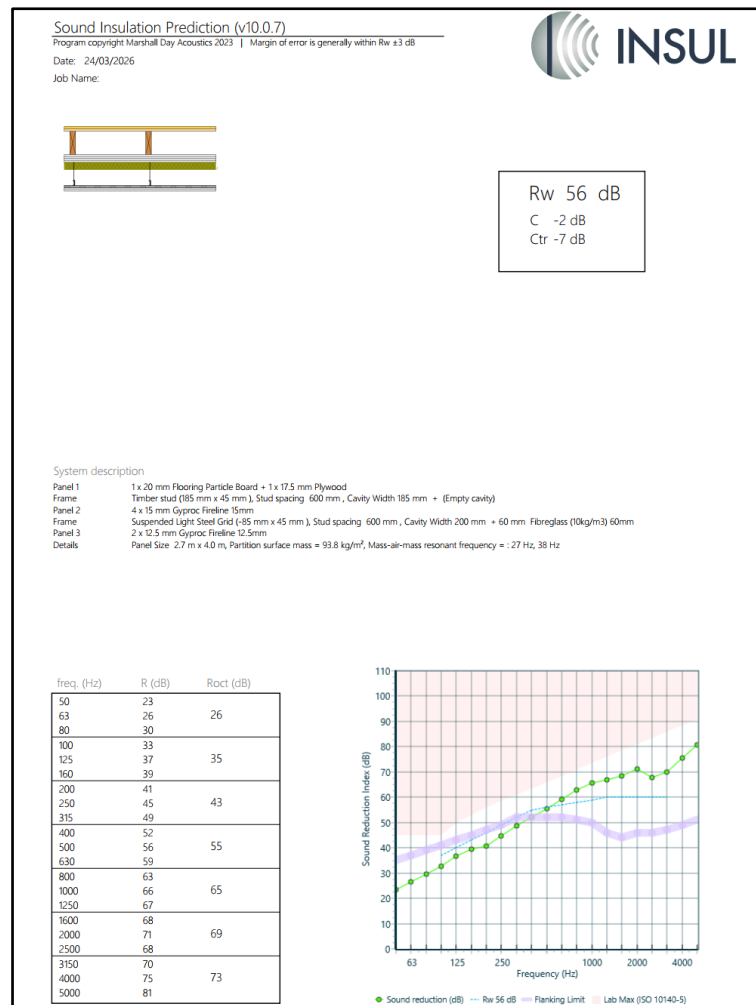


Figure 14: Sound Insulation Performance – Baseline Performance for Existing Floor

- 4.4.7 **Figure 15** shows a further calculation with the addition of high mass floating sub floor. Although the calculation is not a direct prediction of the final construction, the potential performance uplift between the two calculations can be utilised as an estimate of the performance improvement at Crafty Baron, 5-7 Regent Street, Hinckley, LE10 0AZ.

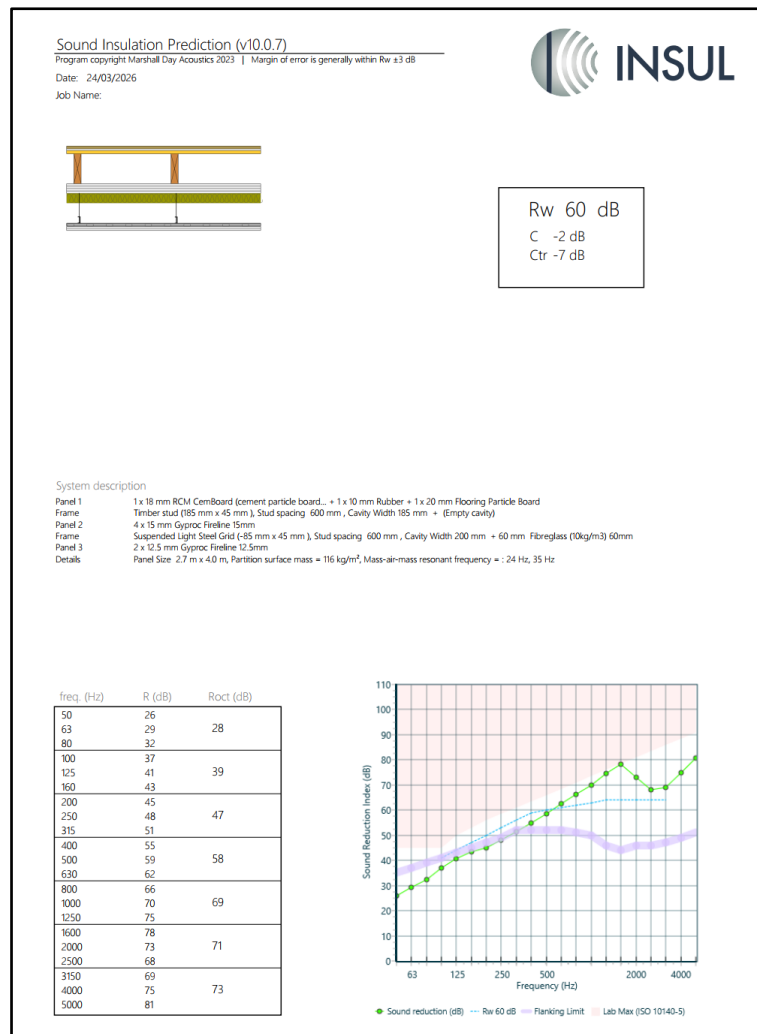


Figure 15: Sound Insulation Performance – Recommended Acoustic Enhancement.

- 4.4.8 The broadband relative uplift between the two calculations is 4 dB. However, this is just for the partition in isolation, and a performance uplift of this extent would begin to be limited by flanking paths.
- 4.4.9 Provided that flanking transmission is appropriately controlled, an airborne sound insulation performance in the region of 53-55 dB $D_{nT,w}+C_{tr}$ is considered achievable. While this may be marginally below the target value of 55 dB $D_{nT,w}+C_{tr}$, a shortfall of only 2 dB, combined with the use of a deliberately conservative assumption of 75 dB for internal reverberant sound levels within the pub, indicates that the resulting performance is likely to remain acceptable in most scenarios when assessing patron noise.
- 4.4.10 For a separating timber floor upgrade in a building of this type, the primary flanking path is via the walls. This would be addressed by the addition of a high mass independent wall lining consisting of independent studwork (e.g., studwork 10 mm clear of the existing masonry, fixed at the base and head with no rigid connections) with 2 no. layers of high mass

plasterboard (e.g., 15 mm SoundBloc) and fibreglass insulation in the cavity (e.g., 60 mm 10 kg/m³ fibreglass).

- 4.4.11 This is categorised as 'Wall Treatment 1' in Section 4 of Approved Document E of the Building Regulations and is typically the primary method of implementing sound insulation upgrades to existing masonry walls with plasterboard.

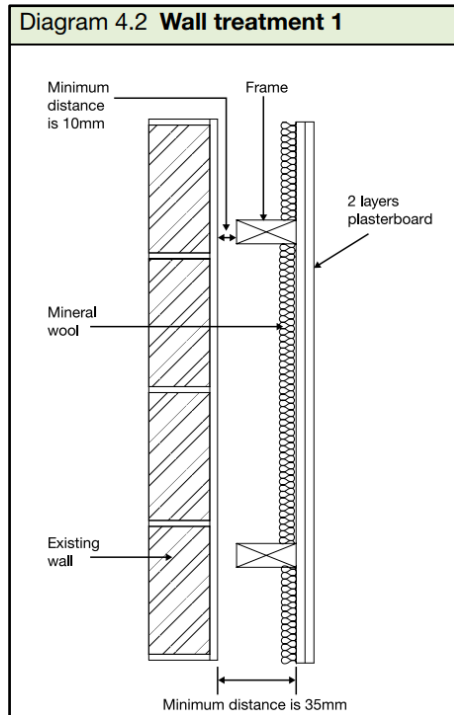


Figure 16: ADE Wall Treatment 1

- 4.4.12 Alternatively, a slimmer version of this construction can be achieved by fixing the new plasterboard with resilient bars. This is most effective as a space saving measure when the brick facing is suitable to fix resilient bars too. Space saved is reduced if battens must be fixed vertically to the wall first to act as a fixing point for the resilient bars.
- 4.4.13 It is important that the independent wall lining maintains clearance from existing brick for the entirety of the wall area to be upgraded.

4.5 Music Noise Limits

- 4.5.1 Unattended noise monitoring has identified music breakout noise levels at the front façade of up to 72 dB(A) $L_{Aeq,T}$ during the current operation of the pub. Noise levels of this magnitude are not considered compatible with the proposed development of residential flats above the premises if maintained.
- 4.5.2 Noise ingress calculations indicate that, if music noise levels remain at their current magnitude, there is no practicable mitigation strategy capable of achieving acceptable internal noise levels within the proposed first-floor flats.

-
- 4.5.3 In addition to the above, it is considered that, with the recommended upgrades to the separating floor, a broadband sound insulation performance of approximately 53–55 dB $D_{nT,w}+C_{tr}$ may be achievable between the ground-floor pub and the proposed flats.
- 4.5.4 Accordingly, in order to maintain the recommended internal noise criteria of 25 dB $L_{Aeq,16hr}$ (daytime) and 20 dB $L_{Aeq,8hr}$ (night-time), music noise within the pub should be controlled such that it is not within 10 dB of patron noise.
- 4.5.5 On this basis, music noise should be limited to an upper level of approximately 65 dBA as an internal reverberant level within the proposed pub. This will help to reduce noise breakout to the front façade as well as noise ingress through the separating floor. In practical terms therefore the music in the proposed pub would be restricted to ‘background’ levels at all times.
- 4.5.6 It should be noted, however, that the broadband level does not fully reflect the contribution of low-frequency noise, which is typically more intrusive and less effectively attenuated by the separating floor.
- 4.5.7 Accordingly, it is recommended once any upgrades to the separating floor have been implemented, that final music noise levels are set based on noise measurements and subjective listening tests within the proposed first-floor flats. Listening tests should also allow for any adjustments to bass noise to reduce audibility in rooms above.
- 4.5.8 Audio system installation is also an important consideration. The precise frequency characteristics of any music system will depend on the type of equipment installed and the manner in which it is mounted, as these factors can significantly influence the resulting low-frequency output.
- 4.5.9 Consideration should be given to the location and orientation of audio systems to be installed, and we would recommend that any speakers are not installed on or near the separating floor to the proposed dwellings.
- 4.5.10 Any music noise limits/levels should be considered as an ongoing management matter that may be altered if problems arise.

5 BS 8233:2014 NOISE ASSESSMENT

5.1 Overview

- 5.1.1 As outlined in Section 4.5, the proposed development of residential flats above the premises is not considered compatible with use of the pub if current music noise levels are maintained.
- 5.1.2 Music noise limits have therefore been specified to ensure suitable internal environments. Implementation of these limits is expected to reduce music noise breakout incident upon the front and rear façades of the development.
- 5.1.3 Given the above, the measured noise levels at the front façade are not considered representative of future conditions once the recommended mitigation measures are in place. Therefore, they have been excluded from the BS 8233:2014 assessment.
- 5.1.4 The recommended acoustic specification is therefore based on mitigating measured noise levels associated with the night-time economy, which are considered representative of the residual external noise environment once music noise limits and mitigation measures are implemented.

5.2 BS 8233:2014 Assessment of Daytime and Night-time Noise Levels in Living Rooms and Bedrooms

- 5.2.1 The highest measured noise levels—excluding music noise from the pub itself—for both the daytime and night-time periods, together with the corresponding façade attenuation required to achieve BS 8233:2014+A1:2019 internal criteria, are presented in **Table 7**.
- 5.2.2 These are considered representative of the prevailing acoustic environment, including general night-time activity, patron noise from nearby venues, and other typical noise sources within the surrounding area.

Table 7: Level of Attenuation Required to Achieve the Internal Noise Guideline Levels.				
Measurement Location	Daytime (L _{Aeq,16hours}) / Night-Time (L _{Aeq,8hours} / L _{Amax})	Worst Case Noise Level at the Façade of the Property (dB(A))	Target Internal Level (dB(A))	Excess Over Target Internal Level (dB)
Front Façade (ML1)	Daytime L _{Aeq,16hours}	64	35	+29
	Night-Time L _{Aeq,8hours}	56	30	+26
	Night-Time L _{Amax}	74	45	+29
First-Floor Garden Area (ML2)	Daytime L _{Aeq,16hours}	43	35	+8
	Night-Time L _{Aeq,8hours}	40	30	+10
	Night-Time L _{Amax}	59	45	+14

5.2.3 It is noted that the noise levels presented in **Table 7** are expressed as broadband values and do not fully account for the frequency content of noise incident on the façades, particularly at low frequencies. The required levels of façade attenuation should therefore be regarded as indicative estimates, subject to further consideration of spectral characteristics during detailed noise ingress calculations.

5.3 Building Envelope Performance – Windows Open

5.3.1 The sound performance requirements for bedrooms, living and dining rooms at the development during the daytime and night-time in rooms with windows closed are summarised in Section 6.

5.3.2 However, with windows open, the attenuation provided by the façade will be approximately 10 -15 dB(A). This would potentially allow the recommended internal noise limit to be exceeded in most rooms at the development during certain parts of a typical day / night.

5.3.3 **Table 8** shows the level of exceedance for partially open windows at the front, rear and side façades.

Table 8: Summary of Internal Noise Levels with Windows Partially Open (based on a Partially Open Window Providing up to 15 dB(A) Attenuation).				
Measurement Location	Room Type	Day / Night	Yes / No	Excess (dB)
Front Façade (ML1)	Living/Dining/Kitchen Room	Day	No	+17
	Bedroom	Night		+17
First-Floor Garden Area (ML2)	Living/Dining/Kitchen Room	Day	Yes	-4
	Bedroom	Night		+2

5.3.4 It is considered that in many circumstances, such as urban/ sub-urban developments, an exceedance of up to 5 dB(A) in accordance with BS 8233:2014 is likely to be acceptable to

future residents and therefore is unlikely to breach the LOEL criteria discussed in Section 2 of this report.

5.3.5 Where exceedances are likely to be greater than +5 dB, on occasions, this may be acceptable to a resident, but when quiet conditions are required, the resident should be able to close the windows whilst maintaining adequate ventilation.

5.3.6 **Table 7** demonstrates that internal noise criteria will generally be exceeded at the front façade during both daytime and night-time periods when relying solely on open windows.

5.3.7 Based on the results, the development should incorporate an upgraded sound insulation scheme which accommodates windows in the closed position, without compromising required ventilation to habitable areas.

5.4 Sound Insulation Scheme

5.4.1 When assessing sound levels in habitable areas of the proposed development, the sound attenuation provided by the overall building facade should be considered. To mitigate sound levels, the composition of the building facade can be designed to provide the level of attenuation required.

5.4.2 Glazing is generally the building element which attenuates noise the least, so the proportion of glazing in a building facade is an important consideration when assessing overall sound attenuation. Additionally, any façade penetrations should also be considered such as for ventilation, e.g., trickle ventilation.

5.4.3 Based on the design details forwarded, worst case façade attenuation calculations have been undertaken in accordance with the BS 8233:2014 “*Rigorous Calculation Method*”.

5.4.4 **Table 9** presents a summary of the different elements for living rooms and bedrooms.

Table 9: Summary of Building Envelope Performance Requirements – Passive Ventilation					
Measurement Location	Room Type	Ventilation Strategy	Wall R_w+C_{tr} (dB)	Glazing R_w+C_{tr} (dB)	Ventilation $D_{n,ew}+C_{tr}$ (dB) (2500EA)
Front Façade (ML1)	Living Room	Active (System 4 MVHR)	50	40	-
	Bedrooms				
First-Floor Garden Area (ML2)	Living Room	Passive (Trickle Ventilators)	50	27	35
	Bedrooms				

5.4.5 The acoustic performance values stated are for guidance and based on information provided at the time of writing, changes to location, size and orientation of rooms/ facades can have impacts on the calculated internal noise levels and subsequently the required acoustic performance criteria.

5.4.6 **Table 10** provides a typical example summary for each element type outlined in **Table 9** above.

Table 10: Summary of Building Element - Typical Examples		
Element Type	Acoustic Performance	Typical Example
Wall	50 dB R_w+C_{tr}	Double leaf, 112 mm brickwork, 50 mm cavity, rigid wall ties
Window	Up to 40 dB R_w+C_{tr}	6 mm pane, 150 mm cavity, 4 mm pane (Secondary Glazing)
Window	Up to 27 dB R_w+C_{tr}	4 mm pane, 12 mm cavity, 4 mm pane
Acoustic Slot Vent (Window)	Up to 35 dB $D_{ne,w} + C_{tr}$ (up to 2 no. per room)	BS8233 Example - Sound attenuated trickle vent

5.4.7 It should be noted that the examples provided in **Table 10** are for guidance only, however any adopted solution must achieve the acoustic performance values presented in **Table 9**.

5.4.8 It is noted that noise monitoring could not be undertaken at the rear façade of the development site, which is understood to be used as a smoking area. To mitigate potential patron noise in this location, it is recommended that the same design measures proposed for the front façade are also applied to the rear.

5.5 Ventilation Requirements

5.5.1 It is recommended that the ventilation system proposed at the site should, as a minimum, comply with Building Regulations 2010 Approved Document F1 2021 Means of Ventilation and British Standard BS5925 1991: “Code of Practice for Ventilation Principles and Designing for Natural Ventilation”. Acoustic ventilation is only recommended for noise sensitive rooms, which are bedrooms and living/ dining rooms.

5.5.2 As detailed in Section 5.1 of this report, it is likely that noise levels in noise sensitive rooms within the proposed dwellings will likely rely on the windows being in the closed position and therefore appropriate ventilation design should be completed.

5.5.3 The implementation of the recommended glazing would ensure that the required internal daytime and night-time noise limits are achieved.

5.5.4 It should be further noted that the glazing configurations within this report are for guidance only. Similar products to those used in NoiseAir calculations may achieve a similar level of sound reduction, however this should be verified by the manufacturer.

5.5.5 **Table 9** demonstrates that adequate noise levels can be achieved with passive ventilation to façades fronting onto the first-floor roof garden area, however, system 4 MVHR is recommended for proposed flats at the front façade.

5.6 Assessment of Daytime Noise Levels in Outdoor Living Areas

5.6.1 At the time of writing, plans indicate an external amenity area within the first-floor garden space.

5.6.2 WHO guidelines provide two set of criteria for noise levels in external amenity areas; they are as follows:

- For people being moderately annoyed, noise levels should be between 50.0 and 54.9 dB(A) $L_{Aeq, 16hours}$; and
- For people being seriously annoyed, noise levels have to exceed 55.0 dB(A).

5.6.3 The worst-case measured $L_{Aeq,T,16hour}$ noise level within the first-floor garden area is 43 dB(A) which is 7 dB below the 50 dB(A) limit value. The external noise environment is considered acceptable in terms of noise impact.

6 BS 4142 ASSESSMENT OF MECHANICAL PLANT NOISE

6.1 3D Sound Model

- 6.1.1 A 3D sound model has been constructed in SoundPLAN™ to calculate the predicted sound pressure levels at selected potential receiver facades due to noise from nearby AC units.
- 6.1.2 The model uses the calculation method from ISO 9613-2:1996² to account for the distance between the source and receiver and any screening or reflections provided by the surrounding buildings.
- 6.1.3 The 3D sound model has been calibrated based on ambient and residual measurements of existing AC units as outlined in Section 3.4 of this report.
- 6.1.4 Receptor locations used in the noise model are presented below in **Figure 17**.



Figure 17: Illustration of the 3D sound model Receptor Locations

- 6.1.5 **Figure 7** shows the worst predicted specific noise level from existing AC units to the proposed receiver façades is 29.1 dB(A).
- 6.1.6 It is noted that the proposed corridor connecting the front and rear flats on the first floor provides substantial acoustic attenuation and acts as a barrier against noise from the nearby AC units.

² ISO9613-2:1996 "Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation"

6.2 BS 4142 Initial Assessment

6.2.1 A BS 4142:2014 assessment has been undertaken considering the noise impact from existing AC units to proposed residential receptors at the first-floor flats to the rear.

6.2.2 The client has advised that, due to the kitchen being decommissioned, all mechanical plant within the first-floor garden area is to be removed.

Specific Sound Level

6.2.3 The worst-case specific sound level calculated to proposed receiver façades is 29.1 dB(A) as outlined in Section 4.

Background Sound Level

6.2.4 For ML1, an L_{A90} background sound level of 32 dB(A) has been adopted for the daytime.

Character Corrections

6.2.5 Based on the characteristic noise produced by extraction flues, the following character corrections have been applied:

- **Tonality:** It is likely that low-mid tones will be audible against the residual noise climate. Therefore, a +2 dB(A) correction for tonality has been applied.
- **Intermittency:** No correction for intermittency has been applied.
- **Impulsivity:** No correction for impulsivity has been applied.

Initial Assessment

6.2.6 The BS 4142:2014 initial assessment for an unmitigated scenario is presented in **Table 11** overleaf.

Table 11: BS 4142:2014 Assessment to Determine the Likelihood of Adverse Impacts on the Worst Affected Noise Sensitive Receptors (Unmitigated Scenario)		
Quantity	Daytime	Night-time
Specific Sound Level	29	
Acoustic Feature Correction	+2	
Rating Level	31	
Background Sound Level dB L_{A90}	40	32
Excess of Rating Level over Background Sound Level	-9	-1
Initial Indication of Potential Impact	Low Impact	

6.3 BS 4142:2014 Assessment and Context

6.3.1 The initial assessment indicates the excess of rating level above the existing background sound level is -9 dB and -1 dB during daytime and night-time periods respectively.

6.3.2 The initial assessment therefore indicates that a '**low impact**' is likely at the nearest NSRs.

6.3.3 It is also noted that a specific sound level of 29 dB(A) is considered to be 'low' in absolute terms and is unlikely to cause disturbance.

6.4 Uncertainty

6.4.1 Uncertainty of measurements can have a significant effect on the outcome and findings of an assessment and therefore such constraints are documented and discussed below.

6.4.2 The SLM used was a Norsonic Class 1 SLM, it is generally recognised that Class 1 SLM's offer an uncertainty of ± 1.0 dB. The instrumentation used for the survey has been calibrated by UKAS approved laboratories.

6.4.3 The sound levels measured (which include busier and quieter periods) are considered typical for the area.

6.4.4 The specific sound source was measured on site under favourable weather conditions.

6.4.5 Local wind speeds during the survey visits were typically less than 5 ms^{-1} and the effect of wind generated noise is not considered to have a significant impact on this assessment.

6.4.6 It is therefore considered that, in this instance, the uncertainty of the calculations is not likely to have any influence on the outcome of the assessment.

7 CONCLUSIONS

7.1 Overview

7.1.1 By instruction from NS & PS Development (UK3) Limited, NoiseAir was commissioned to undertake a noise impact assessment (NIA) to support a planning application proposing the conversion of upper floors to create 4no. flats at the proposed development site.

7.1.2 The assessment has considered the following key noise sources:

- **Music and patron noise** from the ground-floor pub
- **Road traffic and pedestrian noise** incident at the front façade
- **Mechanical plant noise** from existing AC units near the first-floor garden area
- **General night-time activity** within the surrounding mixed-use town-centre environment

7.1.3 Unattended noise monitoring, sound insulation testing and predictive modelling have been used to establish existing acoustic conditions and to determine the level of mitigation required.

7.2 Conclusions

7.2.1 A review of the sound test results against the performance criteria reasoned within this report demonstrates that further enhancement is likely to be required, with a subsequent recommendation detail presented within **Figure 13** and **Figure 15**.

7.2.2 The report also sets initial limits and makes recommendations in relation to music noise. Final music noise levels are to be set based on noise measurements and subjective listening tests within the proposed first-floor flats and any music noise limits/levels should be considered as an ongoing management matter that may be altered if problems arise.

7.2.3 By incorporating the recommended enhancement detailed within **Figure 15**, and by enforcing low frequency noise limits, it is considered that a suitable level of noise transfer will be achieved via the separating floor in relation to the development proposals.

7.2.4 Calculations show that to achieve a reasonable internal acoustic environment in habitable rooms as specified within BS 8233:2014, the building envelope constructions for façades to the front, rear, and at the first-floor garden area should be selected to meet the sound reduction index (SRI) values presented in **Table 9**.

7.2.1 A BS 4142:2014 assessment of AC units near the first-floor garden area indicates an excess of rating level above the existing background sound level of -9 dB and -1 dB during the daytime and night-time periods respectively, indicating a '**low**' impact at the nearest NSRs.

-
- 7.2.2 Measured noise levels within the proposed external amenity space is below the 50 dB(A) limit value and is considered to be acceptable in terms of noise impact
- 7.2.3 All recommendations in this report are initial recommendations only subject to verification. Feasible music noise levels should be reviewed after and verified after any upgrades are made to the separating wall and any audio systems installed.

APPENDIX A - REPORT LIMITATIONS

This Report is presented to NS & PS Development (UK3) Limited and may not be used or relied on by any other person or by the client in relation to any other matters not covered specifically by the scope of this report.

Notwithstanding anything to the contrary contained in the report, NoiseAir Limited is obliged to exercise reasonable skill, care and diligence in the performance of the services required by NS & PS Development (UK3) Limited and NoiseAir shall not be liable except to the extent that it has failed to exercise reasonable skill, care and diligence, and this report shall be read and construed accordingly.

This report has been prepared by NoiseAir Limited. No individual is personally liable in connection with the preparation of this report. By receiving this report and acting on it, the client or any other person accepts that no individual is personally liable whether in contract, tort, for breach of statutory duty or otherwise.

The conclusions and recommendations contained in this report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from who it has been requested and that such information is accurate. Information obtained by NoiseAir Limited has not been independently verified by NoiseAir Limited unless otherwise stated in the report and should be treated accordingly.

Where assessments of works or costs identified in this report are made, such assessments are based upon the information available at the time and where appropriate are subject to further investigations or information which may become available.

Where / if estimates and projects are made within this report, are made based on reasonable assumptions as of the date of this report, such statements however by their very nature involve risks and uncertainties that could cause actual results to differ materially from the results predicted. NoiseAir Limited specifically does not guarantee or warrant any estimates or projects contained in this report.

DISCLAIMER- This report was prepared by NoiseAir Limited. The material in it contains NoiseAir Limited best judgment in light of the information available at the time of preparation of this report. Any use which a third party makes of this report, or any reliance on, or decisions based on it are the responsibility of such third parties. NoiseAir Limited accept no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

APPENDIX B – NOISE INGRESS CALCULATIONS

BS 8233:2014 - Noise Ingress Calculation											
Term	Description	Value	Project: Crafty Baron, 5-7 Regent Street, Hinckley, LE1								
S _f	Total facade area (m ²)	8.16	Description: P9535-NA1-V1								
S _{wt}	Window area (m ²)	2.20	by: Marius								
S _{ew}	External wall area (Sf - Swt) (m ²)	5.96	Date: 19/03/2026								
S _{tr}	Area of the ceiling (m ²)	17.00	Space: Evening/Night								
S	Total area exposed to noise ingress (Sf + Srr)	25.16	Period: Evening/Night								
x	Room length (x)	3.40	Results: 32 dB LAeq NR 22								
y	Room width (y)	5.00									
z	Room height (z)	2.40									
V	Room Volume (m ³)	40.80									
K	Facade Measuremet Correction	0.00									
A0	Ref. qbs area (m2)	10.00									
k	k=3 in BS 8233:2014 + Tolerance	3.00									
r	Number of vents	2.00									
r	Distance to window / vent (m)	0.00									
α	Angle of incidence (deg)	180.00									

Term	Description	Description of noise level	Octave Band Centre Frequency (Hz)								Broadband	
			63	125	250	500	1000	2000	4000	8000	dB(A) 63-8k	dB(A) 125-2k
L _{eq,ff}	Free-field L _{eq} outside room		70	66	64	62	60	55	49	41	64	64

Term	Description	Specification									Dn,e,w	Rw	C	Ctr	Rw + Ctr	Comments
											Dn,e,w	Rw	C	Ctr	Rw + Ctr	Comments
R _{gl}	SRI of glazing/window:	40 dB Rw+Ctr 6:150:4 mm	23	29	35	45	56	52	50	50	-	47	-2	-7	40	Acoustics Bulletin Sept/Oct 1994
R _{ext}	SRI of external wall:	48 dB Rw+Ctr Double leaf, 112mm brickwork, 50mm cavity, rigid wall ties	31	37	42	52	60	63	68	68	-	54	-2	-6		0.0
R _{tr}	SRI of roof and ceiling:	39 dB Rw+Ctr BS8233 Example	22	28	34	40	45	49	49	49	-	44	-2	-5		0.0

BS 8233:2014 - Noise Ingress Calculation											
Term	Description	Value	Project: Crafty Baron, 5-7 Regent Street, Hinckley, LE1								
S _f	Total facade area (m ²)	8.16	Description: P9535-NA1-V1								
S _{wt}	Window area (m ²)	2.20	by: Marius								
S _{ew}	External wall area (Sf - Swt) (m ²)	5.96	Date: 19/03/2026								
S _{tr}	Area of the ceiling (m ²)	17.00	Room Assessed: Night/Day:								
S	Total area exposed to noise ingress (Sf + Srr)	25.16	Results: 22 dB LAeq NR 10								
x	Room dimension x	3.40									
y	Room dimension y	5.00									
z	Room dimension z	2.40									
V	Volume of receiving room (m ³)	40.80									
K	Facade Measuremet Correction	0.00									
A0	Ref. qbs area (m2)	10.00									
k	k=3 in BS 8233:2014 + Tolerance	3.00									
r	No. of vents in external wall	2.00									
r	Distance to window / vent (m)	0.00									

Term	Description	Description of noise level	Octave Band Centre Frequency (Hz)								Broadband	
			63	125	250	500	1000	2000	4000	8000	dB(A) 63-8k	dB(A) 125-2k
L _{eq,ff}	Free-field L _{eq} outside room		59	56	53	52	52	46	46	37	56	55
L _{max}	Free-field L _{max} outside room		84	80	77	75	70	59	49	40	75	75

Term	Description	Specification									Dn,e,w	Rw	C	Ctr	Rw + Ctr	Comments
											Dn,e,w	Rw	C	Ctr	Rw + Ctr	Comments
R _{gl}	SRI of glazing/window:	40 dB Rw+Ctr 6:150:4 mm	23	29	35	45	56	52	50	50	-	47	-2	-7	40	Acoustics Bulletin Sept/Oct 1994
R _{ext}	SRI of external wall:	48 dB Rw+Ctr Double leaf, 112mm brickwork, 50mm cavity, rigid wall ties	31	37	42	52	60	63	68	68	-	54	-2	-6		0.0
R _{tr}	SRI of roof and ceiling:	39 dB Rw+Ctr BS8233 Example	22	28	34	40	45	49	49	49	-	44	-2	-5		0.0

BS 8233:2014 - Noise Ingress Calculation											
Term	Description	Value	Project: Crafty Baron, 5-7 Regent Street, Hinckley, LE1								
S _f	Total facade area (m ²)	8.64	Description: P9535-NA1-V1								
S _{wt}	Window area (m ²)	1.44	by: Marius								
S _{ew}	External wall area (Sf - Swt) (m ²)	7.20	Date: 19/03/2026								
S _{tr}	Area of the ceiling (m ²)	24.48	Space: Evening/Night								
S	Total area exposed to noise ingress (Sf + Srr)	33.12	Period: Evening/Night								
x	Room length (x)	3.60	Results: 16 dB LAeq NR 7								
y	Room width (y)	6.80									
z	Room height (z)	2.40									
V	Room Volume (m ³)	58.75									
K	Facade Measuremet Correction	0.00									
A0	Ref. qbs area (m2)	10.00									
k	k=3 in BS 8233:2014 + Tolerance	3.00									
r	Number of vents	2.00									
r	Distance to window / vent (m)	0.00									
α	Angle of incidence (deg)	180.00									

Term	Description	Description of noise level	Octave Band Centre Frequency (Hz)								Broadband	
			63	125	250	500	1000	2000	4000	8000	dB(A) 63-8k	dB(A) 125-2k
L _{eq,ff}	Free-field L _{eq} outside room		51	48	43	40	39	34	28	23	43	43

Term	Description	Specification									Dn,e,w	Rw	C	Ctr	Rw + Ctr	Comments
											Dn,e,w	Rw	C	Ctr	Rw + Ctr	Comments
Dn,e	Dn,e of each ventilator	35 dB Dn,e+Ctr BS8233 Example - Sound attenuated trickle vent	31	37	36	35	36	34	34	34	-	36	-	-	-1	Dnew (C,Ctr) = 35 (0;0), Free Area = ?
	Cumulative Dn,e for all ventilators		28	34	33	32	33	31	31	31						
R _{gl}	SRI of glazing/window:	27 dB Rw+Ctr 4:12:4 mm	18	24	20	25	35	38	35	35	-	31	-1	-4	27	Acoustics Bulletin Sept/Oct 1994
R _{ext}	SRI of external wall:	48 dB Rw+Ctr Double leaf, 112mm brickwork, 50mm cavity, rigid wall ties	31	37	42	52	60	63	68	68	-	54	-2	-6		0.0
R _{tr}	SRI of roof and ceiling:	39 dB Rw+Ctr BS8233 Example	22	28	34	40	45	49	49	49	-	44	-2	-5		0.0

BS 8233:2014 - Noise Ingress Calculation

Term	Description	Value	Project:
S _f	Total facade area (m ²)	8.64	Description:
S _{wf}	Window area (m ²)	1.44	by:
S _{ew}	External wall area (Sf - Swf) (m ²)	7.20	Date:
S _{cr}	Area of the ceiling (m ²)	24.48	Room Assessed:
S	Total area exposed to noise ingress (Sf + Srr)	33.12	Night/Day:
x	Room dimension x	3.60	Results:
y	Room dimension y	6.80	
z	Room dimension z	2.40	12 dB L _{Aeq} NR 5
V	Volume of receiving room (m ³)	58.75	
K	Facade Measurement Correction	0.00	33 dB LA _{max}
A0	Ref. qbs area (m ²)	10.00	
k	k=3 in BS 8233:2014 + Tolerance	3.00	
n	No. of vents in external wall	2.00	
r	Distance to window / vent (m)	0.00	

Term	Description	Description of noise level	Octave Band Centre Frequency (Hz)								Broadband	
			63	125	250	500	1000	2000	4000	8000	dB(A) 63-8k	dB(A) 125-2k
L _{eq,rr}	Free-field L _{eq} outside room		45	43	41	37	34	30	27	22	40	40
L _{max}	Free-field L _{max} outside room		57	62	63	60	44	42	39	32	59	59

Term	Description	Specification											D _{n,e,w}	R _w	C	C _{tr}	R _w + C _{tr}	Comments
													D _{n,e,w}	R _w	C	C _{tr}		Comments
D _{eq}	D _{eq} of each ventilator:	35 dB D _{n,e,w} +Ctr BS8233 Example - Sound attenuated trickle vent	31	37	36	35	36	34	34	34	-	-	36	-	-	-1		D _{n,e,w} (C,Ctr) = 35 (0,0), Free Area = ?
	Cumulative D _{eq} for all ventilators		28	34	33	32	33	31	31	31								
R _{eq}	SRI of glazing/window:	27 dB R _w +C _{tr} 4:12:4 mm	18	24	20	25	35	38	35	35	-	-	-	31	-1	-4	27	Acoustics Bulletin Sept/Oct 1994
	SRI of external wall:	48 dB R _w +C _{tr} Double leaf, 112mm brickwork, 50mm cavity, rigid wall ties	31	37	42	52	60	63	68	68	-	-	-	54	-2	-6		0.0
R _{rr}	SRI of roof and ceiling:	39 dB R _w +C _{tr} BS8233 Example	22	28	34	40	45	49	49	49	-	-	-	44	-2	-5		0.0

APPENDIX C – GLOSSARY

A-weighted sound pressure, p_A	Value of overall sound pressure, measured in pascals (Pa), after the electrical signal derived from a microphone has been passed through an A-weighting network. <i>NOTE: The A-weighting network modifies the electrical response of a sound level meter with frequency in approximately the same way as the sensitivity of the human hearing system.</i>
A-weighted sound pressure level, L_{pA}	Quantity of A-weighted sound pressure in decibels (dBA).
Acoustic environment	Sound from all sound sources as modified by the environment [BS ISO 12913-1:2013].
Ambient sound	Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far. <i>NOTE: The ambient sound comprises the residual sound and the specific sound when present.</i>
Ambient sound level, $L_a = L_{Aeq,T}$ (BS 4142:2014)	Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T <i>NOTE: The ambient sound level is a measure of the residual sound and the specific sound when present.</i>
Background sound	Underlying level of sound over a period, T, which might in part be an indication of relative quietness at a given location.
Background sound level, $L_{A90,T}$ (BS 4142:2014)	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels.
Break-in	Noise transmission into a structure from outside.
Break-out	Noise transmission from inside a structure to the outside.
Cross-talk	Noise transmission between one room and another room or space via a duct or other path.
C_{tr}	Correction term applied against the sound insulation single-number values (R_w , D_w , and $D_{nT,w}$) to provide a weighting against low frequency performance. <i>NOTE: The reference values used within the C_{tr} calculation are based on urban traffic noise.</i>
Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$	Value of the A-weighted sound pressure level in decibels (dB) of a continuous, steady sound that, within a specified time interval, T, has the same mean-squared sound pressure as the sound under consideration that varies with time.
Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$ (BS 4142:2014)	Value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval, $T = t_2 - t_1$, has the same mean-squared sound pressure as a sound that varies with time.
Equivalent sound absorption area of a room, A	Hypothetical area of a totally absorbing surface without diffraction effects, expressed in square metres (m ²), which, if it were the only absorbing element in the room, would give the same reverberation time as the room under consideration
Facade level	Sound pressure level 1 m in front of the façade. <i>NOTE: Facade level measurements of L_{pA} are typically 1 dB to 2 dB higher than corresponding free-field measurements because of the reflection from the facade.</i>
Free-field level	Sound pressure level away from reflecting surfaces. <i>NOTE: Measurements made 1.2 m to 1.5 m above the ground and at least 3.5 m away from other reflecting surfaces are usually regarded as free-field. To minimize the effect of reflections the measuring position has to be at least 3.5 m to the side of the reflecting surface (i.e. not 3.5 m from the reflecting surface in the direction of the</i>

	source). Estimates of noise from aircraft overhead usually include a correction of 2 dB to allow for reflections from the ground.
Impact sound pressure level, L_i	Average sound pressure level in a specific frequency band in a room below a floor when it is excited by a standard tapping machine or equivalent.
Indoor ambient noise	Noise in a given situation at a given time, usually composed of noise from many sources, inside and outside the building, but excluding noise from activities of the occupants. <i>NOTE: The location(s) within the room at which the ambient indoor noise is to be measured or calculated ought to be considered.</i>
Measurement time interval, T_m (BS 4142:2014)	Total time over which measurements are taken. <i>NOTE: This may consist of the sum of a number of non-contiguous, short-term measurement time intervals.</i>
Noise criteria	Numerical indices used to define design goals in a given space.
Noise rating, NR	Graphical method for rating a noise by comparing the noise spectrum with a family of noise rating curves.
Normalised impact sound pressure level, L_n	Impact sound pressure level normalized for a standard absorption area in the receiving room. <i>NOTE: Normalised impact sound pressure level is usually used to characterize the insulation of a floor in a laboratory against impact sound in a stated frequency band.</i>
Octave band	Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit.
Percentile level, $L_{AN,T}$	A-weighted sound pressure level obtained using time-weighting "F," which is exceeded for $N\%$ of a specified time interval.
Reference time interval, T_r (BS 4142:2014)	Specified interval over which the specific sound level is determined. <i>NOTE: This is 1 h during the day from 07:00 h to 23:00 h and a shorter period of 15 min at night from 23:00 h to 07:00 h.</i>
Residual sound (BS 4142:2014)	Ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.
Residual sound level, $L_r = L_{Aeq,T}$ (BS 4142:2014)	Equivalent continuous A-weighted sound pressure level of the residual sound at the assessment location over a given time interval, T .
Rating level, L_{A,r,T_r}	Equivalent continuous A-weighted sound pressure level of the noise, plus any adjustment for the characteristic features of the noise. <i>NOTE: This is used in BS 7445 and BS 4142 for rating industrial noise, where the noise is the specific noise from the source under investigation.</i>
Reverberation time, T	Time that would be required for the sound pressure level to decrease by 60 dB after the sound source has stopped.
Sound exposure level, LAE	Level of a sound, of 1 s duration, which has the same sound energy as the actual noise event considered.
Sound level difference, D	Difference between the sound pressure level in the source room and the sound pressure level in the receiving room.
Sound pressure, p	Root-mean-square value of the variation in air pressure, measured in pascals (Pa) above and below atmospheric pressure, caused by the sound.

Sound pressure level, L_p	Quantity of sound pressure, in decibels (dB).
Sound reduction index, R	Laboratory measure of the sound insulating properties of a material or building element in a stated frequency band.
Specific sound level, $L_s = L_{Aeq,T_r}$ (BS 4142:2014)	Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r .
Specific sound source (BS 4142:2014)	Sound source being assessed.
Standardised impact sound pressure level, L_{nT}	Impact sound pressure level normalized to a reverberation time in the receiving room of 0.5 s.
Standardised level difference, D_{nT}	Difference in sound level between a pair of rooms, in a stated frequency band, normalized to a reference reverberation time of 0.5 s for dwellings.
Ground borne noise	Audible noise caused by the vibration of elements of a structure, for which the vibration propagation path from the source is partially or wholly through the ground. <i>NOTE Common sources of ground-borne noise include railways and heavy construction work on adjacent construction sites.</i>
Structure-borne noise	Audible noise caused by the vibration of elements of a structure, the source of which is within a building or structure with common elements. <i>NOTE Common sources of structure-borne noise include building services plant, manufacturing machinery and construction or demolition of the structure.</i>
Third octave band	Band of frequencies in which the upper limit of the band is 2% times the frequency of the lower limit.
Weighted level difference, D_w	Single-number quantity that characterizes airborne sound insulation between rooms, but which is not adjusted to reference conditions. <i>NOTE Weighted level difference is used to characterize the insulation between rooms in a building as they are. Values cannot normally be compared with measurements made under other conditions (see BS EN ISO 717-1).</i>
Weighted normalised impact sound pressure level, $L'_{n,w}$	Single-number quantity used to characterize the impact sound insulation of floors over a range of frequencies.
Weighted sound reduction index, R_w	Single-number quantity which characterizes the airborne sound insulating properties of a material or
Weighted standardised impact sound pressure level $L'_{nT,w}$	Single-number quantity used to characterize the impact sound insulation of floors over a range of frequencies.
Weighted standardised level difference, $D_{nT,w}$	Single-number quantity that characterizes the airborne sound insulation between rooms.

Symbols

D_w	Weighted level difference (dB)
D_{nT}	Standardized level difference (dB)
$D_{nT,w}$	Weighted standardized level difference (dB)
L_{Amax}	Maximum noise level (dB)
$L_{Ar,Tr}$	Rating level (dB)
L_n	Normalised impact sound pressure level (dB)
L'_{nT}	Standardised impact sound pressure level (dB)
$L'_{nT,w}$	Weighted standardised impact sound pressure level (dB)
$L'_{n,w}$	Weighted normalised impact sound pressure level (dB)
L_p	Sound pressure level (dB)
L_{pA}	A-weighted sound pressure level (dB)
$L_{AN,T}$	Percentile level (dB)
L_{AE}	Sound exposure level (dB)
$L_{Aeq,T}$	Equivalent continuous A-weighted sound pressure level (dB)
p	Sound pressure (Pa)
p_A	A-weighted sound pressure (dB)
$p_{A(t)}$	Instantaneous A-weighted sound pressure (Pa)

R	Sound reduction index (dB)
R_w	Weighted sound reduction index (dB)
T	Time interval (also used for reverberation time) (s)
t_0	Reference time interval (s)

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