
BOARSHURST BUILDING CONTRACTORS LIMITED

NOISE IMPACT ASSESSMENT REPORT

35–37 OLDHAM ROAD, ROCHDALE OL16 5QJ

Client: Boarshurst Building Contractors
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1 INTRODUCTION

1.1 Overview

1.1.1 By instruction from Boarshurst Building Contractors Limited ('the client'), NoiseAir was commissioned to undertake a Noise Impact Assessment (NIA) in support of planning application 17/01170/FUL for a proposed residential conversion development at the location: 35–37 Oldham Road, Rochdale OL16 5QJ, herein referred to as the 'development site'.

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

1.2 Site Description

1.2.1 At the time of writing, the development site is a 4-storey commercial use building comprising basement storage, an operational retail unit on the ground floor and disused office use space on the ground, first and second floors located within a wider mixed-use area on the outskirts of Rochdale Town Centre.

1.2.2 The development site is bound to the east by commercial use property, Ink'd, and by an access road and parking spaces associated with Acre Homecare to the south. To the north, the development site is bound by Milnrow Road (A640), a single carriageway A-road trafficked by vehicles travelling up to 30 miles per hour (mph), beyond which are further commercial and residential use properties.

1.2.3 To the west, the development site is bound by Oldham Road, a single carriageway road trafficked by vehicles travelling up to 30 mph. Beyond Oldham Road is land under development as part of approved application 22/01119/FUL to create 81 dwellings and a 5/6 storey mixed use building with associated access and facilities.

1.2.4 **Figure 1** shows an aerial photograph of the development site boundary with respect to the local area and its context.



Figure 1: Development site aerial photograph.

1.3 Development Proposals

- 1.3.1 Proposals for the development site outline the conversion of the first and second floor commercial use spaces into a 9-no. bedroom house in multiple occupation (HMO) with associated bicycle storage at basement level and bin storage at ground floor level. The existing commercial use space on the ground floor is to be retained as a retail unit.
- 1.3.2 This assessment is based on the proposed site layout as presented in **Figure 2** to **Figure 5**.

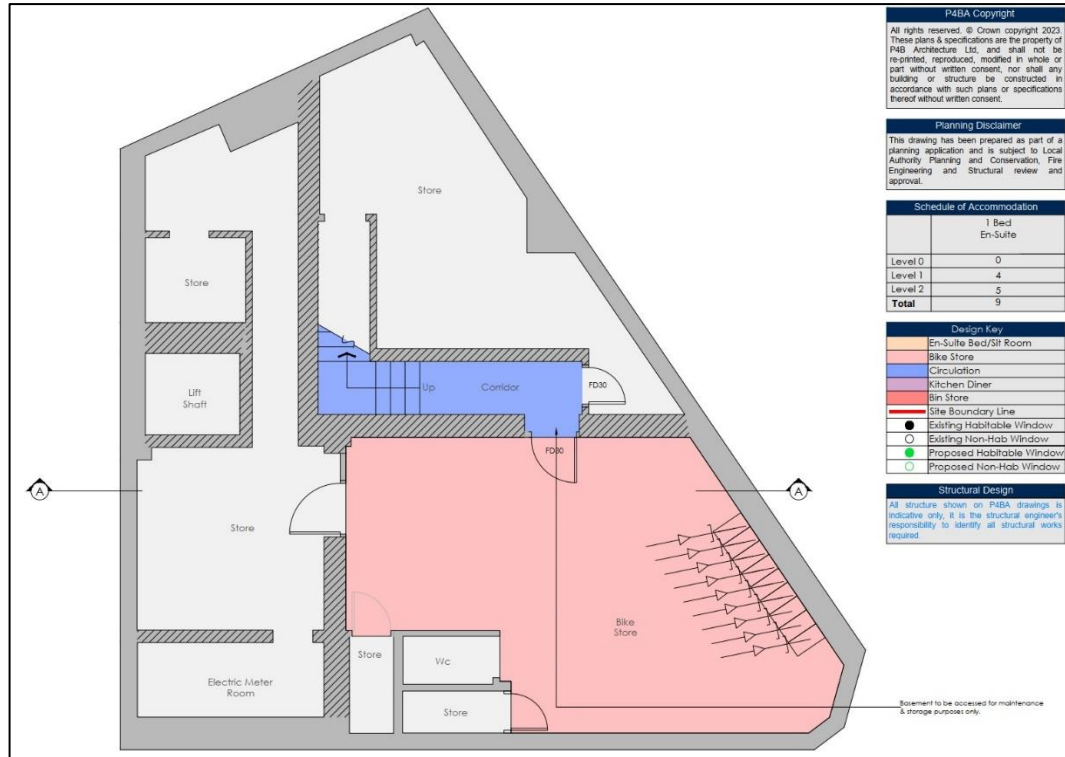


Figure 2: Proposed development site layout – Basement Floor Plan.

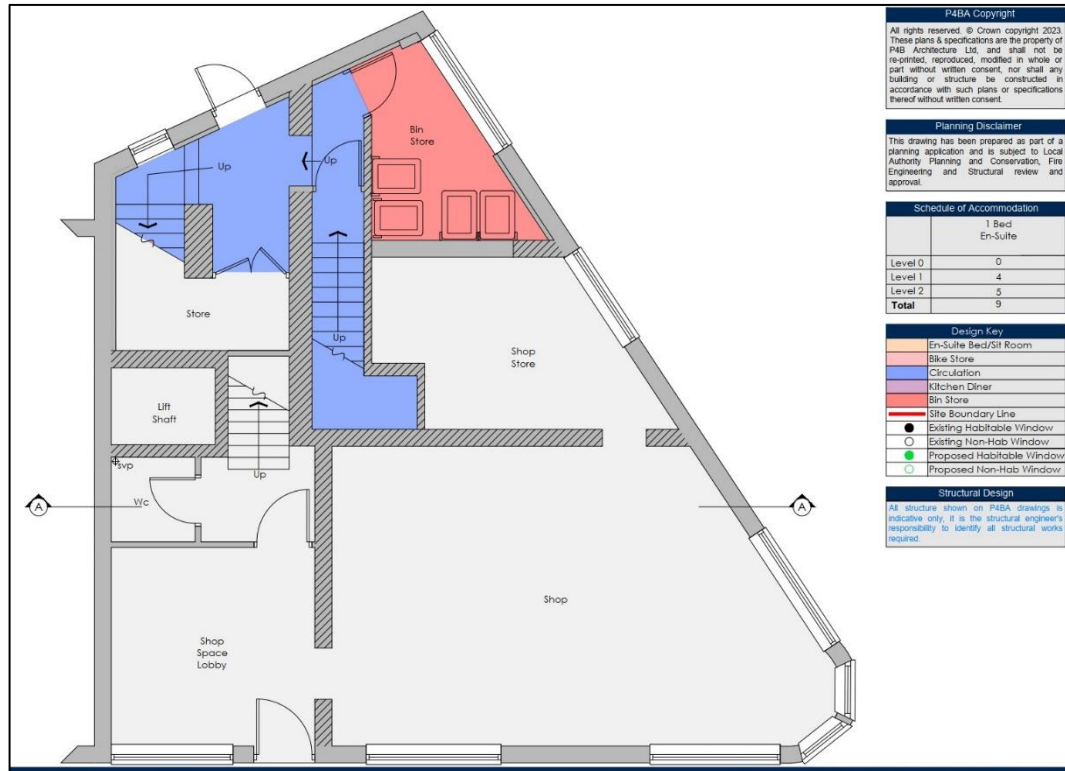


Figure 3: Proposed development site layout – Ground Floor Plan.

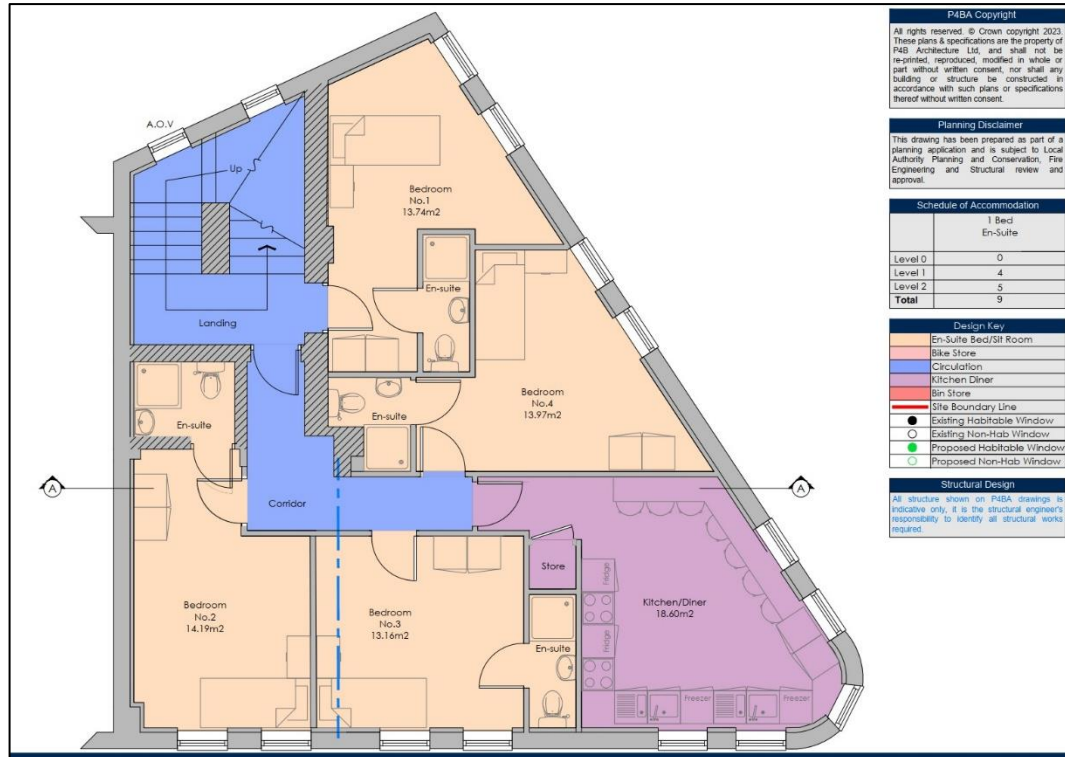


Figure 4: Proposed development site layout – First Floor Plan.

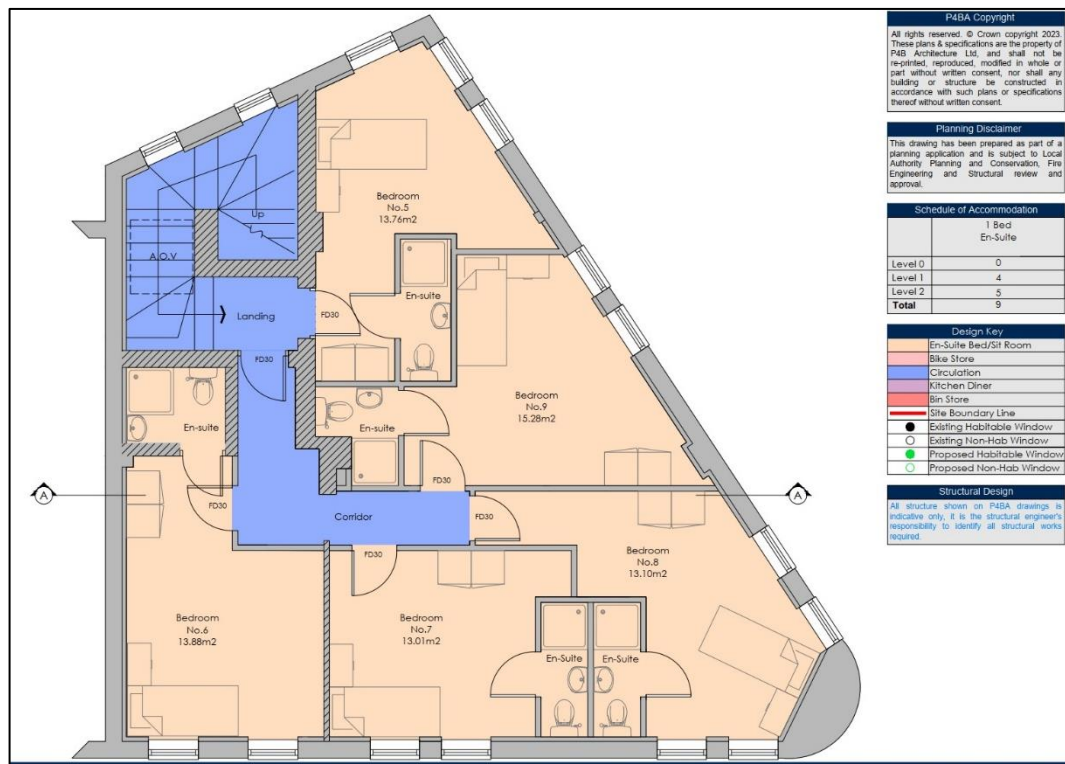


Figure 5: Proposed development site layout – Second Floor Plan.

2 ASSESSMENT METHODOLOGY AND SCOPE OF WORKS

2.1 National Planning Policy Framework [NPPF 2023]

- 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 and states that planning policies and decisions should prevent unacceptable levels of noise pollution from new and existing development while affirming that the 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 location of the development site is in close proximity to Milnrow Road (A640) and Oldham Road, therefore, it is considered that the NIA should consider noise primarily from traffic noise sources.

2.4.2 The scope of this assessment includes consideration of noise at each facade of the development where noise sensitive areas might be located in terms of the potential impact of local noise sources. No external amenity has been proposed as part of this development.

2.4.3 Additionally, the existing commercial space located on the ground floor is proposed to be retained. Consideration should be given to the transmission of noise through the party floor to the proposed first floor residential and any associated flanking paths.

2.4.4 As the proposed development is a residential conversion rather than a new build, it is considered that the noise assessment and subsequent criteria should be undertaken in accordance with BS 8233:2014.

2.4.5 A summary of the above documentation is provided in Section 2.4 of this report.

2.5 Assessment Criteria

British Standard 8233:2014 (BS 8233:2014)

2.5.1 British Standard 8233:2014 – Guidance on sound insulation and noise reduction for buildings (BS 8233:2014) 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.

2.5.2 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 $L_{Aeq,8hour}$

2.5.3 The standard clarifies that these values are based on the existing guidelines issued by the World Health Organisation (WHO). In addition, it states that the internal noise levels may be relaxed by up to 5 dB whilst maintaining a reasonable living condition. Conversely, in terms of internal maximum levels to be achieved during the night, the standard does not recommend any limits for individual noise events. However, a guideline value may be set in terms of SEL or L_{AFmax} , depending on the type and the number of events per night.

2.5.4 Furthermore, BS 8233:2014 provides guidance on desirable noise levels in areas that are intended to be used for external amenity space, such as gardens, balconies and roof gardens which are intended to be used for relaxation. For these spaces it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$ up to a level of 55 dB $L_{Aeq,T}$ for noisier environments.

3 ACOUSTIC SURVEY

3.1 Acoustic Survey Details

3.1.1 NoiseAir conducted unattended noise monitoring between 14th November 2024 and 18th November 2024 at the development site.

3.1.2 Noise monitoring was undertaken at two monitoring locations (ML1 and ML2), the positions of which are shown in **Figure 6** below.



Figure 6: Approximate noise monitoring location.

3.1.3 The noise measurements were made using Class 1, integrating sound level meters (SLMs).

3.1.4 The acoustic equipment was calibrated to comply with Section 4.2 of BS 7445-1:2003¹, before and after the noise monitoring periods.

3.1.5 Details of the SLMs and associated field calibrations can be found in **Table 3**.

SLM (Serial No.)	Preamp (Serial No.)	Microphone (Serial No.)	Calibrator (Serial No.)	Start Calibration	End Calibration	Drift
NOR140 (1406247)	NOR1209 (12739)	NOR1225 (96123)	SV30A (10818)	-25.7	-25.7	0.0 dB
NOR140 (1405015)	NOR1209 (14517)	NOR1225 (42327)		-26.5	-26.6	0.1 dB

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 each site visit.

Table 4: Summary of Weather Conditions Noted During Each Site Visit		
	14 th November 2024	18 th November 2024
Roads (Wet / Dry)	Dry	Damp
Temperature (°C)	6	4
Wind speed (m/s ⁻¹)	<0.5	<1 SE
Cloud Cover (Approx. %)	100	100
Humidity (%)	88	76

3.2 Measured Sound Levels

3.2.1 Data is shown in **Figure 7** and **Figure 8** detailing 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 for ML1 and ML2 respectively.

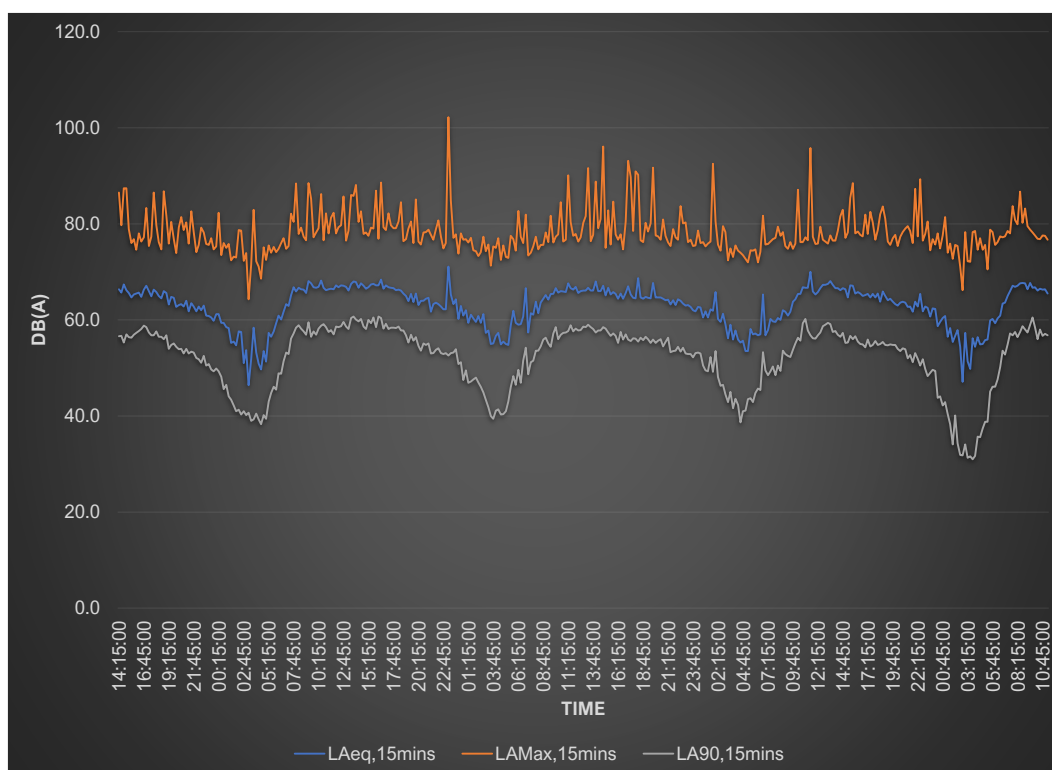


Figure 7: Level vs. time graph showing L_{Amax} , L_{Aeq} and L_{A90} sound levels – ML1.

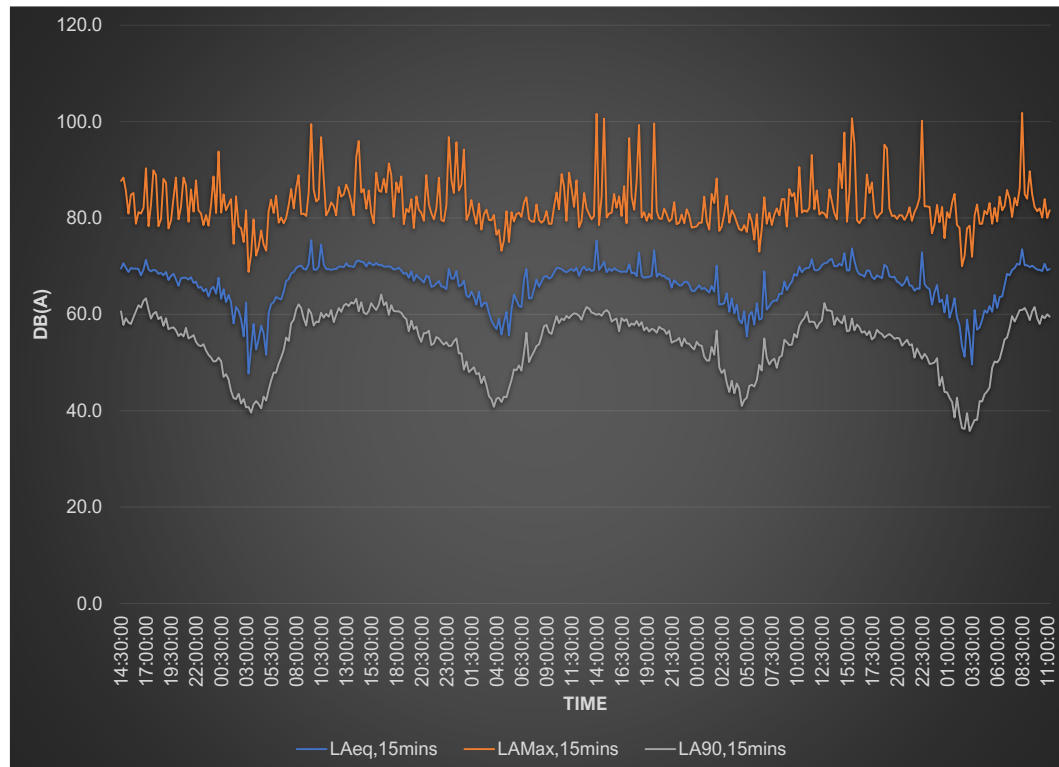


Figure 8: Level vs. time graph showing L_{Amax} , L_{Aeq} and L_{A90} sound levels – ML2.

3.2.2 The results for the monitoring locations during the daytime and night-time periods are presented in **Table 5** below.

Table 5: Average Measured Daytime and Night-time Noise Levels		
Monitoring Location	Time	Measured Noise Level
		dB $L_{Aeq,16hour}$ / dB $L_{Aeq,8hour}$ / dB $L_{AF(max)}$
ML1	07:00-23:00	64.9 – 66.6
	23:00-07:00	58.1 – 61.6
	23:00-07:00	78.0*
ML2	07:00-23:00	68.4 – 70.0
	23:00-07:00	62.0 – 64.2
	23:00-07:00	83.0*
* Maximum night-time noise levels exceeded more than 10 times in a single night-time period.		

4 NOISE IMPACT ASSESSMENT

4.1 Overview

4.1.1 The development site is in close proximity to road traffic. Therefore, the predicted internal noise levels of the development have been assessed against the criteria stated in BS 8233:2014.

4.2 BS 8233:2014 Assessment of Daytime Noise Levels in Living Rooms and Bedrooms

4.2.1 The development has been divided into two façade zones - Zone 1 and Zone 2 - shown in **Figure 9** below.

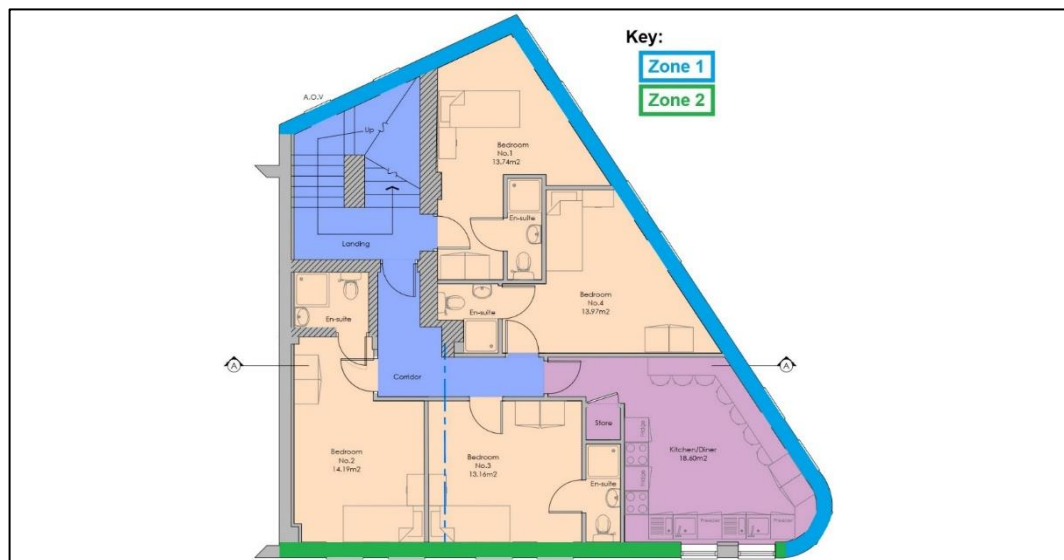


Figure 9: Image showing façade zones across development site.

4.2.2 The predicted noise levels at the façades of the proposed building structures, for the daytime and night-time period, together with the level of attenuation required in accordance with BS 8233:2014, are presented in **Table 6**.

Façade	Daytime ($L_{Aeq,16hours}$) / Night-Time ($L_{Aeq,8hours}$ / L_{Amax})	Worst Case Noise Level at the Façade of the Property (dB(A))	BS 8233:2014 Target Internal Level (dB(A))	Worst Case Level of Attenuation Required (dB(A))
Zone 1	Daytime $L_{Aeq,16hours}$	67	35	32
	Night-Time $L_{Aeq,8hours}$	62	30	32
	Night-Time L_{Amax}	78	45	33
Zone 2	Daytime $L_{Aeq,16hours}$	70	35	35
	Night-Time $L_{Aeq,8hours}$	64	30	34
	Night-Time L_{Amax}	83	45	38

4.3 Building Envelope Performance – Windows Open

- 4.3.1 With windows open, the attenuation provided by the façade will be approximately 10-15 dB(A). Given the incident noise levels, the noise level break-in at the development site facades would likely result in the recommended internal noise limit being exceeded in most rooms at the development during certain parts of a typical day/ night. It is therefore considered that acceptable noise levels within habitable rooms to all facades will rely on windows being in the closed position.
- 4.3.2 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 6.1 of this report.
- 4.3.3 Active ventilation may be considered for habitable rooms where noise levels are considered to be elevated. However, as **Table 7** demonstrates, adequate ventilation can be achieved with passive ventilation.
- 4.3.4 It must be noted that any ventilation requirements are to be designed by others.

5 SOUND INSULATION SCHEME

5.1 Building Envelope Requirements – Windows Closed

- 5.1.1 Proposals for the development site at the time of writing outline residential use. Noise sensitive rooms are proposed to all facades of the property. Therefore, internal noise levels are required to not exceed 35 dB L_{Aeq} during the daytime hours in all rooms and 30 dB L_{Aeq} and 45 dB L_{Amax} during the night-time hours in bedrooms.
- 5.1.2 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. 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.
- 5.1.3 Based on the design details forwarded, worst case façade attenuation calculations have been undertaken in accordance with BS EN ISO 12354-3:2017.
- 5.1.4 Façade specifications have been calculated for all façade zones as noise levels differ across the facades of the proposed development.
- 5.1.5 Calculations assuming a passive and an active ventilation strategy have been undertaken and presented in this section. **Table 7** and **Table 8** below present a summary of the different elements for living rooms and bedrooms using a passive and an active ventilation strategy, respectively.

Table 7: Summary of Building Envelope Performance Requirements - Passive Ventilation				
Façade Zone	Room Type	Wall R_w+C_{tr} (dB)	Glazing R_w+C_{tr} (dB)	Ventilation $D_{n,e,w}+C_{tr}$ (2500 mm ² EA)
1	All	50	34	42
2	All	50	37	50
Note: If a greater mm ² EA is required then the acoustic ventilation performance will have to increase or mechanical ventilation may be more appropriate.				

Table 8: Summary of Building Envelope Performance Requirements - Active Ventilation			
Façade Zone	Room Type	Wall R_w+C_{tr} (dB)	Glazing R_w+C_{tr} (dB)
1	All	50	34
2	All	50	37

5.1.6 It should be noted that 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.

5.1.7 **Table 9** below provides a typical example summary for each element type outlined in **Table 8** overleaf.

Table 9: Summary of Building Element Type Typical Examples		
Element Type	Acoustic Performance	Typical Example
Wall	50 dB R_w+C_{tr}	Concrete / Brick exterior wall with min. 100 mm insulated (60 kg / m ³ rockwool) cavity constructed with timber studwork and resilient bars with min. 10 mm plasterboard lining
Window	Up to 34 dB R_w+C_{tr}	8mm pane : 6mm pane :8.8 mm pane Stadip Silence
Window	Up to 37 dB R_w+C_{tr}	SG Phonip 9mm pane : 12mm gap : 10 mm pane
Acoustic Slot Vent (Wall)	Up to 42 dB $D_{n,e,w} +C_{tr}$ (4 no. per room)	Silavent Freshflo SM2/P Permanent Ventilator
Acoustic Slot Vent (Wall)	Up to 50 dB $D_{n,e,w} +C_{tr}$ (4 no. per room)	Titon Sonair F+ (G2 Filter)

5.1.8 It should be noted that the examples provided in **Table 9** are for guidance only, however any adopted solution must achieve the acoustic performance values presented in **Table 7** and **Table 8**.

5.1.9 The glazing elements outlined in **Table 7** and **Table 8** are based on the performance of the glazing panes only. Advice should be sought from the manufacturer at detailed design stage to ensure that the window framing does not undermine the overall performance requirement recommended.

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- 5.1.10 The building envelope final design should be confirmed through detailed design at the appropriate stage including the consultation of specialist manufacturers to confirm individual building element performance.

5.2 Ventilation Requirements

- 5.2.1 It is recommended that the acoustic ventilation proposed at the site should, as a minimum, comply with Building Regulations 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.
- 5.2.2 The implementation of the recommended glazing would ensure that the required internal daytime and night-time noise limits are achieved.
- 5.2.3 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.
- 5.2.4 As detailed in Section 4.3 it is likely that noise levels in the noise sensitive rooms of the proposed dwelling will likely rely on the windows being in the closed position and therefore appropriate ventilation design should be completed.
- 5.2.5 Consideration could be given to the inclusion of an active ventilation system to habitable rooms where noise levels are considered to be elevated. Such a system would allow future residents to enjoy acceptable internal noise levels while maintaining appropriate ventilation requirements. However, **Table 7** demonstrates, adequate ventilation can be achieved with passive ventilation.
- 5.2.6 Any mechanical ventilation adopted for the noise sensitive rooms should have a noise output which complies with NR25 noise rating curve.

5.3 Overheating

- 5.3.1 Building Regulations Approved Document O Overheating: 2021 describes two methods for an overheating assessment as follows:
- A simplified method; and,
 - Dynamic Thermal Modelling method.

- 5.3.2 The document discusses how windows are likely to be closed during sleeping hours if noise levels within bedrooms exceed $L_{Aeq,8hours}$ 40 dB and / or L_{AFMax} 55 dB more than 10 times a night. Therefore, the dynamic thermal modelling options becomes the requirement.
- 5.3.3 Given the levels at the proposed development exceed the aforementioned external levels and acceptable internal noise levels will likely rely on windows being closed, dynamic thermal modelling is required for the development site and the windows will need to be considered as closed within any overheating assessment.
- 5.3.4 It should be noted that the assessment of overheating is outside the scope of this report.

5.4 Divisional Walls and Floors

- 5.4.1 Proposals indicate that residential dwellings are to be located directly above and adjacent to existing commercial use spaces. As such, consideration should be given to the acoustic performance of the separating walls and floor between commercial and residential use.
- 5.4.2 Currently all surrounding commercial use spaces are retail/office use, however, as it is not possible to predict all future uses, the separating wall and floor sound insulation performances have been based upon restaurant adjacencies as a conservative measure.

Commercial Units

- 5.4.3 A typical ambient sound level of a restaurant with ambient music is likely to be 70-75 dB(A) and therefore we would adopt 75 dB(A) as a typical design value.
- 5.4.4 75 dB(A) is considered an appropriate ambient noise level for a restaurant premises given that patrons typically have conversations at normal levels which may occasionally become marginally elevated. Above 75 dB(A) for such establishments is not generally desirable.
- 5.4.5 BS 8233:2014 advises that an acceptable ambient noise level between 07:00 to 23:00 hours is recommended as 35 dB(A) for living rooms and 30 dB(A) for bedrooms. However, given that the noise source is considered likely to have distinguishable characteristics, an additional reduction of 5 dB(A) is proposed to reduce the internal habitable room target to 30 dB(A) and 25 dB(A) for the living room and bedroom respectively. The sound insulation performance of the separating walls and floors should reduce noise transfer by 50 dB(A).
- 5.4.6 We would therefore propose a targeted sound insulation performance for the separating walls and floors of 50 dB $D_{nt,w}+C_{tr}$.

5.5 Flanking Transmission

- 5.5.1 The noise transmission through the structural elements of the building, i.e., flanking noise, will reduce the expected overall sound insulation and therefore the indoor ambient noise levels would likely be increased.
- 5.5.2 It is essential flanking transmission is considered, assessed and allowances made as part of the conversion process in order to achieve the sound reduction level requirements at a given façade / internal partition.
- 5.5.3 The advice above outlines the general principles involved in improving the sound insulation performance of the ceiling/floors and walls. Further review can be provided at the detailed design stage as necessary.

6 CONCLUSIONS

6.1 Overview

- 6.1.1 By instruction from Boarshurst Building Contractors Limited, NoiseAir was commissioned to undertake a NIA in support of planning application 17/01170/FUL for a proposed residential conversion development at the location: 35–37 Oldham Road, Rochdale OL16 5QJ.
- 6.1.2 Proposals for the development site outline the conversion of the first and second floor commercial use spaces into a 9-no. bedroom HMO retaining the ground floor commercial unit.

6.2 Conclusions

- 6.2.1 Calculations show that to achieve a reasonable internal acoustic environment in habitable rooms as specified within BS 8233:2014, the building envelope constructions should be selected to meet the sound reduction index (SRI) values presented in **Table 7** and **Table 8**.
- 6.2.2 With windows open, the recommended internal noise limit is likely to be exceeded within the development site. Active ventilation should be a consideration for habitable rooms where noise levels are considered to be elevated. However, as **Table 7** demonstrates, adequate ventilation can be achieved with passive ventilation.
- 6.2.3 Given the levels at the proposed development exceed the external levels detailed in Approved Document O and acceptable internal noise levels will likely rely on windows being closed, dynamic thermal modelling is required for the development site and the windows will need to be considered as closed within any overheating assessment.
- 6.2.4 As the potential exists for noise transfer between existing commercial units and proposed residential use, a sound insulation performance of 50 dB $D_{nt,w}+C_{tr}$ is recommended for any separating wall or floor between commercial units and residential use.

APPENDIX A - REPORT LIMITATIONS

This Report is presented to Boarshurst Building Contractors 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 Boarshurst Building Contractors 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.

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APPENDIX B - 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 source). Estimates of noise from aircraft overhead usually include a correction of 2 dB to allow for reflections from the ground.</i>

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_{Ar,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, L_{AE}	Level of a sound, of 1 s duration, that 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.
Groundborne 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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