



Goodtime Games – 212 Burton Road

Acoustic Verification Measurements

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Client: Goodtime Games

Date: 30/11/2022

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REVISION HISTORY

Revision	Date	Revision Details	Author	Checked
R01	30/11/2022	Original Issue	<i>Susan Witterick</i> Susan Witterick BSc MIOA	<i>Ben Tomlin</i> Ben Tomlin BSc MIOA

1 INTRODUCTION

- 1.1 dBx Acoustics Ltd has been appointed by Goodtime Games to undertake acoustic measurements and assessment at their premises at 212 Burton Road, West Didsbury, M20 2LW, to support the discharge of planning conditions associated with planning permission reference 126232/P3CPA/2020.
- 1.2 Accordingly, this report details verification measurements of the external plant installation and of entertainment noise levels, as well as measurement and assessment of airborne sound insulation between the Goodtime Games premises ('the Café') and first floor offices.
- 1.3 The site is within the jurisdiction of Manchester City Council (MCC).

2 ASSESSMENT CRITERIA

Planning Conditions

- 2.1 The following planning conditions relating to noise are applicable to this development;

Figure 1: Noise Break-Out

The premises shall be acoustically insulated and treated to limit the break out of noise in accordance with a noise study of the premises and a scheme of acoustic treatment that has been submitted to and approved in writing by the City Council as local planning authority. The scheme shall be implemented in full before the use commences or as otherwise agreed in writing by the City Council as local planning authority.

Upon completion of the development a verification report will be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic consultant's report. The report shall also undertake post completion testing to confirm that acceptable criteria has been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.

Reason - To safeguard the amenities of the occupiers of the building and occupiers of nearby properties, pursuant to Policy DM1 in the Manchester Core Strategy

Figure 2: External Plant

Any externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location.

The scheme shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the site. The approved scheme shall be completed before the premises is occupied.

Upon completion of the development a verification report will be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic report. The report shall also undertake post completion testing to confirm that the noise criteria has been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.

Reason - To minimise the impact of the development and to prevent a general increase in pre-existing background noise levels around the site, pursuant to Policy DM1 in the Manchester Core Strategy.

Local Authority Guidance

- 2.2 On 24 August 2022, MCC issued partial approval of details reserved by condition as follows;

Noise Break-Out

- 2.3 dBx Acoustics Ltd's report reference 20029 212 Burton Road R01 dated 18th May 2020 presented an assessment of entertainment noise break-out from the premises in accordance with MCC's *Planning and Noise Technical Guidance* document. The December 2015 version of this document was used in the assessment.
- 2.4 This document sets out Manchester City Council's requirements with regard to current guidance and policy, with the aspiration that new developments achieve the highest standards without compromising the health and wellbeing of residents. The guidance refers to the NPPF and NPSE as described below.
- 2.5 The following requirements were considered relevant to this project;
- Where entertainment noise is proposed the L_{Aeq} (entertainment noise) shall be controlled to 10 dB below the L_{A90} (without entertainment noise) in each octave band at the façade of the nearest noise sensitive location, and internal noise levels at structurally adjoined residential properties in the 63 Hz and 125 Hz octave frequency bands shall be controlled so as not to exceed (in habitable rooms) 47 dB and 41 dB respectively.*
- 2.6 "Entertainment noise" is not clearly defined within the guidance but makes reference to "recorded music, live bands or karaoke".
- 2.7 There are no structurally adjoined residential properties; the first floor of 212 Burton Road is in use as a Counselling office.
- 2.8 The submitted report (referenced in 2.3 above) assessed potential noise break-out via the single-glazed shop front and set limiting internal levels within the premises based on compliance with the MCC criteria.
- 2.9 This condition has not been discharged, with the response from MCC as follows;

Figure 3: Noise Break-Out

5 - Noise insulation of the premises

5) Noise insulation of the premises - Insufficient information has been submitted to discharge this condition.

- 2.10 dBx Acoustics Ltd contacted Sharon McAndrew, Environmental Protection Officer at MCC, to request further detail on the information required. Ms McAndrew's response included the following requirements;

You will need to take some noise measurements in the upstairs offices when the Café is operational, to confirm that levels in the offices are acceptable. As the games café is not operating during the day, I would expect that you could establish the existing noise levels on the first floor without the café operating, and then take readings when the café is at its busiest. Subjective listening tests will be useful as part of the assessment, but these should be done as well as taking noise readings.

If music is played on the premises, then this must also be considered as the LAeq (entertainment noise) shall be controlled to 5 dB below the LA90 (without entertainment noise) in each octave band at the façade of the nearest noise sensitive location, and internal noise levels at structurally adjoined residential properties in the 63 Hz and 125 Hz octave frequency bands shall be controlled so as not to exceed 47 dB and 41 dB respectively.

Once this has been done your report should detail if any sound insulation is required to meet the MCC noise requirements.

You have said that in your original assessment submitted for planning you set limiting noise levels within the Café in Table 3, so you will need to confirm whether these are being adhered to within in the space itself as part of the acoustic assessment of the games café.

- 2.11 The MCC guidance does not present absolute noise criteria to be adhered to when considering noise transfer between adjacent commercial businesses within the same property. In the absence of this, reference has been made to the guidance presented within the Department of Health guidance *Health Technical Memorandum 08-01: Acoustics*.

External Plant

- 2.12 dBx Acoustics Ltd's report reference 20029 212 Burton Road R01 dated 18th May 2020 presented a BS4142 assessment of the externally mounted extract fan at the rear of the premises.
- 2.13 MCC has issued partial approval of this assessment as follows;

Figure 4: External Plant

6 - Noise insulation of external plant

6) Noise insulation of external plant - The submitted information is considered acceptable to discharge the first part of the condition. In order to fully discharge the verification report will need to be submitted.

- 2.14 The results of verification measurements made on site are presented within this report.

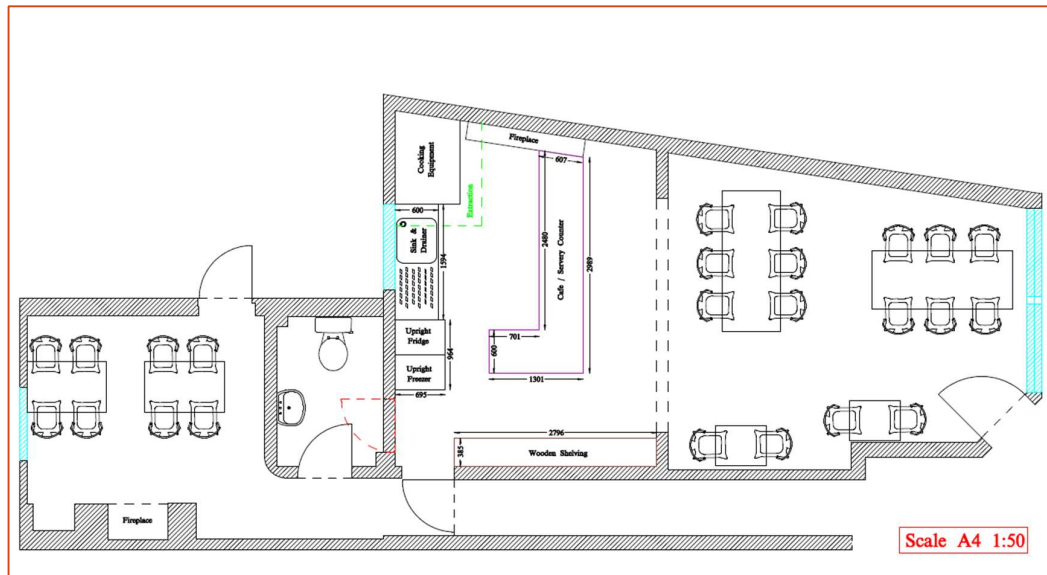
Health Technical Memorandum 08-01: Acoustics (HTM 08-01)

- 2.15 This guidance document is intended to cover the acoustic design criteria which are important for healthcare premises, including noise levels in rooms, and sound insulation between rooms.
- 2.16 Table 1 of HTM 08-01 sets criteria for noise intrusion from external sources. For a "small office-type space" (including consulting rooms), a criterion of 40dB_{LAeq,1hr} is suggested.
- 2.17 Table 3 of HTM 08-01 indicates that consulting rooms and counselling rooms have a "confidential" privacy requirement as a source room (i.e. that conversations within the consulting room should not be overheard in adjacent spaces), and are of medium sensitivity to noise. It also indicates that a public dining area (the closest space to a café considered within the guidance) has potentially 'high' noise generation but no expectation of speech privacy.
- 2.18 On this basis, Table 4 of HTM 08-01 would recommend that the separating construction should achieve an on-site sound insulation performance of 42dB D_{nT,w}.
- 2.19 In the absence of specific guidance from MCC on their requirements for airborne sound insulation performance between the ground floor Café and first floor consulting rooms, the guidance within HTM 08-01 has been referred to within this assessment.

3 SITE DESCRIPTION

- 3.1 Goodtime Games is located at 212 Burton Road, West Didsbury. The internal layout of the premises is shown in Figure 5, below.

Figure 5: Cafe Floor Plan



- 3.2 The entrance from Burton Road is shown at the bottom right of this drawing. There are single glazed windows to the front and rear of the premises, and a rear fire escape door.
- 3.3 The kitchen area of the café is open to the main seating area.
- 3.4 The entrance to the first-floor consulting rooms is immediately adjacent to the Café entrance. This opens onto a short corridor before stairs rise to the first floor. There are two consulting rooms, both of which are above the main café space.
- 3.5 There is a kitchen / rest area at first floor level, above the rear seating area of the Café premises.

4 OBSERVATIONS

- 4.1 dBx Acoustics visited the premises on the evening on Saturday 19th November 2022 between 19:00h and 22:00h, and the morning of Sunday 27th November 2022 between 08:30h and 10:00h when the Café was closed.
- 4.2 On Saturday 19th November the Café was fully occupied. Typical noise levels within the Café main area were typically 70dB_{L_{Aeq,15min}} in the period to 20:00h. Beyond 20:00h, typical noise levels increased to 85dB_{L_{Aeq,15min}} as patrons' involvement in their games intensified.
- 4.3 During this period, it was observed that patron voices within the café were audible within the first-floor consulting rooms, however speech was not intelligible. Within the main consulting room at the front of the premises, music noise from "Volta" on the far side of Burton Road as well as noise from road traffic and pedestrians was also audible.
- 4.4 Within the smaller consulting room, unintelligible speech from the café was audible.
- 4.5 Music from a single loudspeaker was playing quietly within the kitchen area of the Café on Saturday 19th November. This was not audible above patron voices within the seating areas and was not audible within the first-floor premises.
- 4.6 The opening hours of Goodtime Games are understood to be as follows;
- 17:00h-22:00h on Monday, Wednesday and Thursday
 - 17:00-22:30h on Friday
 - 10:30h-22:30h on Saturday
 - 10:30h-22:00h on Sunday
 - Closed on Tuesday
- 4.7 The opening hours of the first-floor consulting rooms are not known, however it is assumed that some clients will require evening and/or weekend appointments.
- 4.8 The construction of the separating floor is not known. The first floor is carpeted and it appears that the original floorboards have been overlaid or replaced with flooring particle board. The property is assumed to have a timber joist construction due to its age.
- 4.9 The ceiling within the Café is monolithic plasterboard. It is not known how this is supported, nor how many layers of board are installed, nor whether there is an original lath and plaster ceiling above this.
- 4.10 The separating wall between the Café and the stairwell to the first-floor premises is of unknown construction but appears to be a lightweight, potentially single board construction.

5 MEASURED DATA

Activity Noise

- 5.1 On Saturday 19th November, measurements were made of activity noise within the Café, and of ambient noise levels within the first-floor consulting rooms, as follows;

Table 1: Ambient Noise Levels, Cafe and Consulting Rooms, dBL_{Aeq}

Location	Time	Duration, T	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	dBL _{Aeq,T}
Café – back room	19:20h	5 min	53	51	53	58	60	56	47	63
Café – main space	19:25h	5 min	61	66	67	69	65	61	54	70
	19:35h	15 min	59	66	67	66	64	61	55	69
	20:00h	15 min	61	71	75	81	77	68	62	81
	20:30h	15 min	59	72	76	83	79	71	63	83
	20:45h	15 min	60	70	74	80	77	68	60	81
	21:45h	15 min	59	72	76	84	82	75	66	85
First Floor – Main Room	21:10h	2 min	40	39	37	36	32	27	19	37
First Floor – Smaller Room	21:13h	2 min	33	39	35	32	26	19	13	33
First Floor - Kitchen	21:16h	2 min	34	35	32	26	23	17	13	29

- 5.2 It can be seen from the data presented in Table 1 that post 20:00h, the noise levels generated in the Café space were relatively consistent, ranging between 81 and 85dBL_{Aeq,15min}. This is considered to represent a ‘worst case’ for noise generation in the Café, on a busy weekend evening.
- 5.3 Measurements within the first-floor spaces were of limited duration, but were sufficient to obtain a steady and representative reading within each space. A comparison of the results shows that the highest ambient noise levels were recorded within the consulting room at the front of the premises; this was affected both by noise from the Café and external noise sources, including music noise from Volta (visible in the data at 63Hz), road traffic noise, and pedestrian noise.
- 5.4 Noise from activity within the Café was not audible or measurable above the ambient noise level on Burton Road, and has not been considered further within this report.

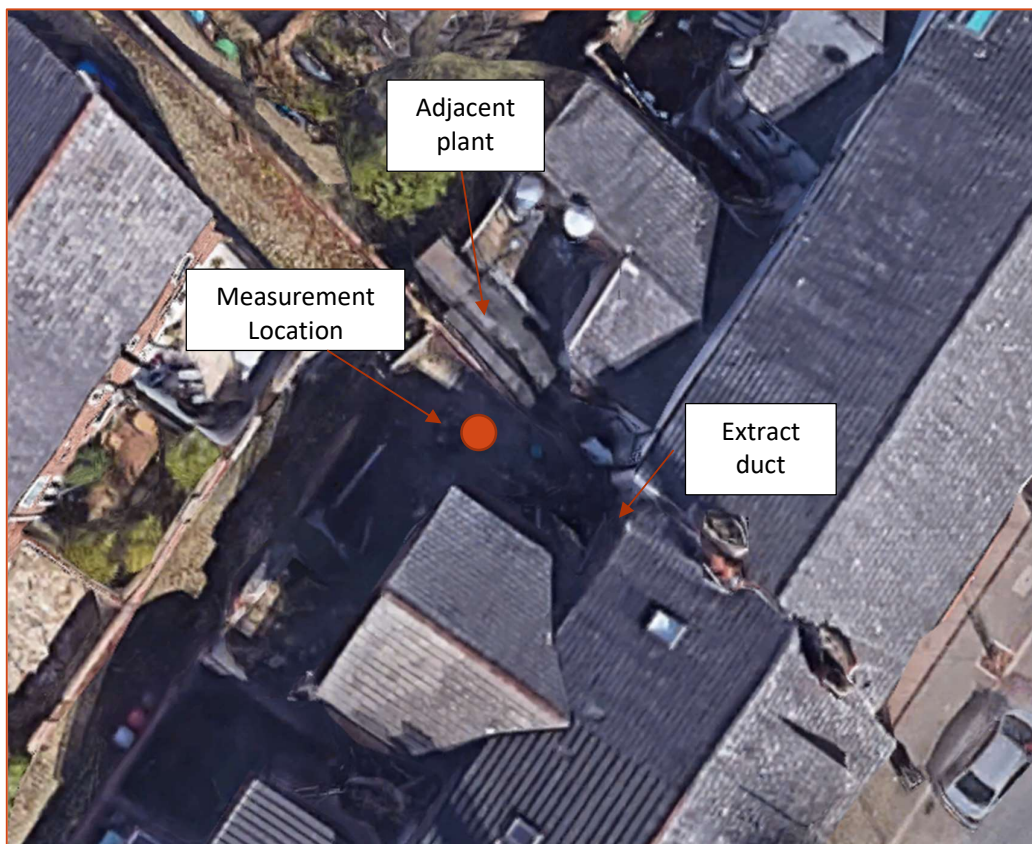
Plant Noise

- 5.5 Measurements were made at the rear of the premises with the extract fan switched on, and switched off. The fan location and measurement location are shown in Figures 6 and 7, below.

Figure 6: Plant Location



Figure 7: Plant Measurement Location



- 5.6 The noise climate at the rear of the building was controlled by plant on the first-floor roof of the adjacent premises, which comprised a number of fans and external condensing units.
- 5.7 Noise from the extract fan installed at 212 Burton Road was not audible at this location, or at the façade of the nearby residential premises.
- 5.8 The ambient noise levels measured with the fan switched on, and switched off, are presented in Table 2, below.

Table 2: Plant Noise Measurements, $dB_{Leq,T}$

Measurement	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	$dB_{Leq,T}$
Fan off	57	56	52	51	51	44	40	54
Fan on	56	57	53	51	50	44	41	54

Airborne Sound Insulation

- 5.9 Airborne sound insulation between the ground and first floor was measured on the morning of Sunday 27th November 2022.
- 5.10 Table 3 presents the results in terms of $D_{nT,w}$ to allow comparison with the criteria presented in HTM 08-01.

Table 3: Airborne Sound Insulation, D_{nTw}

Source	Receiver	$D_{nT,w}$, dB
Café – Main Space	1 st Floor Main Consulting Room	48
Café – Main Space	1 st Floor Small Consulting Room	45
Café – Rear Space	1 st Floor Kitchen	49

Background Sound Levels

- 5.11 Background sound levels were measured within the first-floor spaces between 09:00h and 10:00h on Sunday 27th November 2022. The café was closed during this period, as were the surrounding commercial premises. There was light traffic on Burton Road. The measured background sound levels are presented in Table 4, below, and are considered to represent the lowest typical background sound levels during the potential operating hours of the consulting rooms.

Table 4: Measured Background Sound Levels, First Floor

Room	$dB L_{Aeq,T}$
1 st Floor Main Consulting Room	32
1 st Floor Small Consulting Room	25
1 st Floor Kitchen	31

6 ASSESSMENT

Entertainment Noise

- 6.1 MCC requires that internal noise levels due to entertainment noise at '*structurally adjoined residential properties in the 63 Hz and 125 Hz octave frequency bands shall be controlled so as not to exceed (in habitable rooms) 47 dB and 41 dB respectively*'.
- 6.2 There are no structurally adjoined residential properties, however, from Table 1 it can be seen that the highest noise levels measured in the first-floor space at these frequencies with the café open were 40dB at 63Hz and 39dB at 125Hz. This is therefore compliant with MCC requirements.

Noise Transfer to First Floor

- 6.3 As discussed above, MCC has no numerical assessment criteria for noise transfer between commercial premises.
- 6.4 As the first floor is occupied by counselling / consulting rooms, reference has been made to the guidance within HTM 08-01 for medical facilities, as detailed in Section 2, above.
- 6.5 Within HTM 08-01 it is recommended that noise intrusion from external sources should not exceed 40dB_{L_{Aeq,1hr}} for consulting rooms. It can be seen from Table 1, above, that noise levels from all sources within the first floor spaces are between 29dB_{L_{Aeq,T}} and 37dB_{L_{Aeq,T}}, with the highest levels measured in the room overlooking Burton Road which was subject to noise transfer both from the café and from external sources via the single glazed windows.
- 6.6 *This demonstrates that the overall noise levels within the consulting rooms during peak periods of operation in the café do not exceed appropriate levels within the first-floor space.*
- 6.7 These measurements were made during the busiest period of operation within the Café. Measurements earlier in the evening indicate that during quieter periods, activity noise levels within the Café are 10-15dB lower.
- 6.8 The ambient noise level measured within the small consulting room on Sunday morning was 25dB_{L_{Aeq,T}} with no activity within the café. It can therefore be deduced that the level of activity noise transferred during daytime and early evening periods would be 6-11dB lower than the ambient noise level within the space.
- 6.9 Similarly, the ambient noise level measured within the main consulting room overlooking Burton Road on Sunday morning was 32dB_{L_{Aeq,T}}. It can therefore be deduced that the level of activity noise transferred during daytime and early evening periods would be 5-10dB lower than the ambient noise level within the space.
- 6.10 *This demonstrates that during non-peak periods of activity within the Café, the level of noise transferred to the first floor space would be at least 5dB below the ambient noise level arising from all other sources.*
- 6.11 When considering potential noise transfer from a public area such as a dining area with 'high' noise generation, and a counselling room with 'medium' sensitivity to noise, HTM 08-01 recommends an on-site sound insulation performance of 42dB_{D_{nT,w}}.
- 6.12 It can be seen that this performance is exceeded at 212 Burton Road, with a measured sound insulation performance of 45-49dB_{D_{nT,w}}.
- 6.13 *The level of airborne sound insulation achieved between the ground and first floor spaces at 212 Burton Road is therefore considered appropriate for the simultaneous use of the café and consulting rooms.*

Plant Noise

- 6.14 Table 2, above, presents verification measurements made at the rear of the premises with the extract fan at 212 Burton Road on, and off.
- 6.15 The noise climate at this location and at the nearby noise sensitive receptors was controlled by plant noise from the adjoining premises.
- 6.16 The extract fan was not audible, and as can be seen from the measured data there was no difference in the measured ambient noise level with the fan operational. This therefore indicates that noise from the fan is at least 10dB below the ambient noise level at all frequencies.
- 6.17 This is compatible with the desktop assessment submitted for planning which indicated a low likelihood of adverse noise impact with a BS4142 rating level at least 5dB below background sound levels, compliant with MCC's requirements
- 6.18 *There is therefore no noise impact arising due to the use of the extract fan at 212 Burton Road, and this condition can therefore be discharged.*

7 CONCLUSION

- 7.1 In support of discharge of noise-related planning conditions associated with application reference 126232/P3CPA/2020, a series of noise measurements has been undertaken at Goodtime Games, 212 Burton Road, West Didsbury.
- 7.2 In the absence of numerical criteria for noise transfer between commercial properties within Manchester City Council's (MCC) guidance, reference has been made to the guidance provided within HTM 08-01 for healthcare settings, taking into account that the first-floor space is occupied by consulting rooms.
- 7.3 Measurements on site indicate that the level of noise transfer to the first floor during peak periods are within the recommended limits in HTM 08-01 for consulting rooms, and the airborne sound insulation between the ground and first floor meets the HTM 08-01 criterion for sound insulation between public dining spaces and counselling rooms.
- 7.4 Noise levels within the first-floor spaces also do not exceed MCC requirements for 'entertainment noise' transfer.
- 7.5 This assessment is based on measurements taken during peak (Saturday evening) periods of activity in the Café and therefore represents a worst-case assessment.
- 7.6 Measurements of plant noise at the rear of the building demonstrate that the extract fan installed does not have any impact on noise levels at the nearby noise sensitive receptors and is therefore compliant with MCC requirements.
- 7.7 It would therefore appear that the noise-related planning conditions associated with this application be discharged.

APPENDIX A – GLOSSARY OF ACOUSTIC TERMINOLOGY

Decibel, dB	A unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. For sound pressure level (L_p) the reference quantity is 2×10^{-5} N/m ² . The sound pressure level existing when microphone measured pressure is 2×10^{-5} N/m ² is 0 dB, the threshold of hearing.
L	Instantaneous value of Sound Pressure Level (L_p) or Sound Power Level (L_w).
Frequency	Number of cycles per second, measured in Hertz (Hz), related to sound pitch.
A-weighting	Arithmetic corrections applied to values of L_p according to frequency. When logarithmically summed for all frequencies, the resulting single "A weighted value" becomes comparable with other such values from which a comparative loudness judgement can be made, then, without knowledge of frequency content of the source.
$L_{eq,T}$	Equivalent continuous level of sound pressure which, if it actually existed for the integration time period T of the measurement, would possess the same energy as the constantly varying values of L_p actually measured.
$L_{Aeq,T}$	Equivalent continuous level of A weighted sound pressure which, if it actually existed for the integration time period, T, of the measurement would possess the same energy as the constantly varying values of L_p actually measured.
$L_{n,T}$	L_p which was exceeded for n% of time, T.
$L_{An,T}$	Level in dBA which was exceeded for n% of time, T.
L_{Fmax}	The instantaneous maximum sound pressure level which occurred during the measurement. F indicates that the fast time-weighting is used.
L_{AFmax}	The instantaneous maximum A weighted sound pressure level which occurred during the measurement. F indicates that the fast time-weighting is used.
$L_{Ar,Tr}$	The rating level: the equivalent continuous A-weighted sound pressure level of the noise, plus any adjustment for the characteristic features of the noise.
Reverberation Time, T	The time that would be required for the sound pressure level to decrease by 60 dB after the sound source has stopped. The descriptor T, often includes other nomenclature to describe the type of reverberation time measurement or if the reverberation time is an average taken for specific frequencies. For example, a T_{mf} is the mid-frequency reverberation time.
Absorption Coefficient, α	The fraction of reverberant sound energy absorbed by a material. It is expressed as a value between 1.0 which equates to perfect absorption and 0 which equates to zero absorption.
Acoustic Class, A - E	Classification of sound absorbers into Sound Absorption Classes A-E, according to BS EN ISO 11654, including frequencies 200-5000 Hz
NRC	A single-number rating system used to compare the sound-absorbing characteristics of building materials. A measurement of the acoustical absorption performance of a material, calculated by averaging its Sound Absorption Coefficients at 250, 500, 1000 and 2000 Hz
STI	Speech Transmission Index , Metric ranging between 0 and 1 representing the transmission quality of speech with respect to intelligibility by a speech transmission channel
R	Sound Reduction Index , the laboratory measured sound insulation properties of a material or building element in octave or third octave bands.
R_w	Weighted Sound Reduction Index , a single number which represents the sound reduction of a material. It is derived by plotting the sound reduction index against a set of reference curves. The curves are shifted until a best-fit is established and the curve which best fits the sound reduction spectrum is used to represent the single figure value.
D_w	Weighted Level Difference , the weighted level difference between a pair of rooms, stated as a single figure.

D_{nT}	Standardised Level Difference, a frequency-dependent measurement of airborne sound insulation, calculated using the following formula: $D_{nT} = L_1 - L_2 + 10\log(T/T_0)$ dB Where: L_1 is the energy-averaged sound pressure level due to the pink noise source measured in the source room using a sweep technique. L_2 is the energy-averaged sound pressure level measured in the receiving room using a sweep technique. T is the mean receiving room reverberation time (derived from T_{30} measured in seconds). T_0 is the reference reverberation time (= 0.5s for dwellings).
D_{nT,w}	Weighted Standardised Level Difference, a single-figure value of airborne sound insulation performance, derived according to procedures in BS EN ISO 717-1, based on the D_{nT} values at different frequencies (100-3150 Hz third octave bands).
D_{nFw}	Weighted, Normalised Flanking Level Difference, the normalised, weighted difference in sound level between a pair of rooms via a flanking element, such as mullion or ceiling detail. The level difference in octave bands is first normalized to a reference amount of absorption and then plotted against a set of reference curves to establish a single figure value.
D_{ne}	Normalised Element Level Difference, The normalised difference in sound level between a pair of rooms via a small element such as a trickle ventilator. The level difference in octave bands is normalized to a reference amount of absorption.
D_{new}	Weighted, Normalised Element Level Difference, The normalised, weighted difference in sound level between a pair of rooms via a small element such as a trickle ventilator, stated as a single figure. The level difference in octave bands is normalized to a reference amount of absorption and then plotted against a set of reference curves to establish a single figure value.
C_{tr}	Spectrum Adaptation Term, a correction term applied to the sound insulation single-number values (R_w, D_w, and $D_{nT,w}$) in accordance with BS EN ISO 717-1. Applying the C_{tr} penalises a construction's performance if its low frequency performance is poor in relation its performance at higher frequencies.
Impact Sound	The noise generated by an impact on a structure. This is normally used to describe the noise created by people walking or moving furniture on a floor structure.
L_{nT}	Standardised Impact Sound Pressure Level, a frequency dependent measurement of impact sound insulation, calculated using the following formula: $L_{nT} = L_1 + 10\log(T/T_0)$ dB Where: L_1 is the mean sound pressure level due to the tapping machine measured in the receiving room using a sweep technique. T is the mean receiving room reverberation time (derived from T_{30} measured in seconds). T_0 is the reference reverberation time (0.5s for dwellings)
L'_{nT,w}	Weighted Standardised Impact Sound Pressure Level, a single-figure value (@ 500 Hz) of impact sound insulation, performance, derived according to BS EN ISO 717-2, based on the L_{nT} values at different frequencies (100Hz- 3150 Hz third octave bands).
Insertion Loss, IL	The reduction of noise level due to the presence of a noise control device such as an attenuator, excluding any regeneration noise created by its presence.
NR	The Noise Rating level. This is a single figure value derived by plotting a noise spectrum against a set of curves. The curve under which the spectrum fits is the resulting NR level.