



SALTHOUSE PUB COMPANY LTD

**WITHINGTON, 437 WILMSLOW ROAD
MANCHESTER**

**NOISE IMPACT ASSESSMENT
FOR PLANNING PURPOSES**

08 December 2021

AEC REPORT: P4510/R1/RDC

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1.0 INTRODUCTION

- 1.1 Acoustic & Engineering Consultants Limited (AEC) has been instructed by Salthouse Pub Company Ltd to undertake a noise impact assessment in relation to the proposed public house / bar, to be called Withington, at 437 Wilmslow Road, Manchester.
- 1.2 This report details the baseline noise levels used for the assessment of the proposed development, presents the assessment criteria and discusses the implications on the building design, to ensure noise breakout from the proposed development is appropriately controlled and in line with the requirements of Manchester City Council (MCC).
- 1.3 It should be noted that the baseline noise levels used for this assessment have been based off a noise survey conducted on the roof of the proposed development in 2019. These noise levels were included in a noise assessment for planning application 125929/JO/2020. The use of these noise levels has been agreed with Sharon McAndrew, a Neighborhood Officer within the Environmental Protection Section of MCC. Further details of this are discussed in Section 3.0.
- 1.4 Acoustic terminology is discussed in brief in Appendix A.

2.0 BACKGROUND AND SITE DESCRIPTION

- 2.1 The proposed development is located on the junction of Wilmslow Road and Swinbourne Grove, at 437 Wilmslow Road, Manchester. The site was previously a bank and is being renovated to become a new public house (pub) to be called Withington. A site location plan is presented in Figure 1, at the back of this report.
- 2.2 The pub will be accessed off Wilmslow Road and it is understood that it will operate from 1000h to 0100h, Monday to Sunday. The site will have two seating areas: one on Wilmslow Road with 40 seats and one with 20 seats on Swinbourne Grove. This seating area will be enclosed by an existing 2m high brick wall.
- 2.3 A proposed site plan detailing these both seating areas is presented in Figure 2, at the back of this report.
- 2.4 Located opposite the site on Wilmslow Road (north-west) are existing takeaway restaurants and The Victoria Pub.
- 2.5 There is also a neighboring property to the proposed pub: 2 Swinbourne Grove, with which it shares a party wall. Whilst 2 Swinbourne Grove was previously office space, it is currently unoccupied and it is unknown whether it will be refurbished or converted into residential apartments. This assessment is based on the building being converted in apartments with bedrooms adjacent to the pub.
- 2.6 To the south is a four-storey apartment block that has the address: 4 Swinbourne Grove. As per Section 1.3, this is the development that relates to planning application 125929/JO/2020. It is understood that the apartment block was completed in June 2021.

- 2.7 Based on the location of the proposed development, 2 Swinbourne Grove and the apartment block at 4 Swinbourne Grove are the nearest noise sensitive receptors to the proposed development.
- 2.8 It is understood that while there are provisions for a DJ inside the proposed pub, it will only play background music and there will be no live music. In addition, there will be no externally mounted speakers.
- 2.9 It is understood that the glazed areas at the proposed development will be retained as part of the works. Based on on-site observations, these were single pane glass with a sound insulation performance of approximately 29dB_{Rw}. As the external walls are solid masonry, they will have a sound insulation performance 10dB higher than the glazing and as such, noise from this element does not need to be considered. Furthermore, the entrance to the pub is gained via lobbied doors and, therefore, there is no concern for noise breakout from this element either and this does not need to be considered.
- 2.10 Following conversations with the Client, there will be items of building services plant located on the roof. Although the exact make and model of the units has not been confirmed. It is understood they will operate during the hours presented above.

3.0 BASIS OF ASSESSMENT

- 3.1 Based on AECs experience of these types of developments, the following will need to be considered:
- (1) Internal noise breakout via separating wall to 2 Swinbourne Grove, and internal noise breakout via the external envelope from patrons and DJ playing background music;
 - (2) Noise emitted from the external seating areas;
 - (3) Noise emitted from the external building services plant.
- 3.2 MCC has produced '*Planning & Noise – Technical Guidance (P&NTG)*' (2015) to outline their requirements for noise assessments to accompany planning applications. PNTG and other appropriate guidance documents have been considered to determine suitable limits for each noise source identified above and these are discussed separately, below.

(1) Internal Noise Breakout (via Separating Wall to 2 Swinbourne Grove and via External Envelope)

- 3.3 In instances where entertainment venues are structurally connected to a residential property, PNTG states that:
- "Music noise levels in the 63Hz and 125Hz octave centre frequency bands (L_{eq}) should be controlled so as to not exceed (in habitable rooms) 47dB and 41dB (L_{eq}), respectively".*
- 3.4 Based on the above, we would propose that maximum noise levels inside the proposed public house / bar are controlled such that the above criterion is met. In all other frequency bands, we would propose that NR25_{Max} is not exceeded.

- 3.5 In relation to locations that are not structurally connected, PNTG states that:

“Entertainment noise (L_{Aeq}) should be controlled to 10dB below the background noise level (L_{A90}) without the entertainment noise present, in each octave band at the nearest noise sensitive location”.

(2) External Noise Breakout via External Seating Areas

- 3.6 AEC are not aware of any specific guidance in PNTG relating to noise breaking out from external seating areas.
- 3.7 Therefore, based on AECs experience of this noise source, we would propose that ambient and maximum noise levels breaking out from the seating areas do not exceed the existing background and ambient noise levels, respectively, external to the nearest noise sensitive receptor. This would ensure that while noise may be just perceptible, it would not be deemed intrusive.

(3) Externally Mounted Building Services Plant

- 3.8 In relation to controlling noise from building services plant PNTG states that:

“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 (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.”

4.0 NOISE CLIMATE

- 4.1 As stated above, the nearest noise sensitive receptors are 2 Swinbourne Gove and the apartment block at 4 Swinbourne Grove.
- 4.2 Based on a review of the supporting documents submitted as part of the planning application for the apartment block, a noise assessment was carried out for the site prior to the Covid-19 pandemic in May 2019.
- 4.3 The noise levels for the assessment were measured on the roof of the proposed pub (when it was previously a bank) from 1430h on Thursday 11 April 2019 to 1000h on Sunday 14 April 2019.
- 4.4 During the daytime, the typical ambient and background noise levels were 58dBL_{Aeq,T} and 49dBL_{A90,T}, respectively
- 4.5 During the night-time periods between 2300 and 0100h (the period during which the proposed pub will close), the typical ambient and background noise levels were 55dBL_{Aeq,T} and 40dBL_{A90,T}, respectively.

- 4.6 An appropriate glazing and ventilation strategy was then implemented based on the noise levels presented in Table 3.1, above, and a subsequent internal noise level verification report was carried out in June 2021.
- 4.7 The verification report highlighted that internal noise level limits in line with PNTG had been achieved within the apartments.
- 4.8 Based on the above, as the nearest noise sensitive receptor has recently had approved verification testing based on the external noise levels measured in Table 3.1, above, we would propose that these noise levels are used for the proposed pub.

Noise Levels within the Pub

- 4.9 As previously stated, is understood that there will be provisions for a DJ that will play background music inside the proposed pub.
- 4.10 AEC has previously measured ambient and maximum noise levels within a busy city centre bar that had a live DJ and the octave band noise level data is presented in Table 4.2, below.

Table 4.2 – Measured Noise Levels in Busy City Centre Bar

Noise Type	Overall Noise Level, dB(A)	Noise Levels, dB @ Octave Band Centre Frequency, Hz							
		63	125	250	500	1k	2k	4k	8k
Maximum, L _{max}	94	93	98	89	89	90	87	80	76
Ambient, L _{eq}	85	72	77	79	83	80	77	72	66

AEC Sound Insulation Testing of Separating Wall to 2 Swinbourne Grove

- 4.11 AEC attended site on 01 December 2021 in order to measure the sound insulation performance of the party wall between the proposed pub to 2 Swinbourne Grove.
- 4.12 The party wall separates the proposed main bar area and two rooms in 2 Swinbourne Grove (a front and rear office). The walls achieved sound insulation performances of 52dB_{Dw} to the front office and 35dB_{Dw} to the rear office.
- 4.13 It should be noted that a former doorway has been blocked off using a single layer of breeze block between the proposed bar and the rear office and this was the main acoustic weakness.
- 4.14 The remainder of the wall in this room appeared to be constructed from solid masonry finished with either wooden panelling (pub side) or plasterboard (2 Swinbourne Grove side).

5.0 ASSESSMENT OF THE PROPOSED DEVELOPMENT

- 5.1 As stated in Section 3.0, there are three main sources of noise associated with pubs and these are discussed separately below:

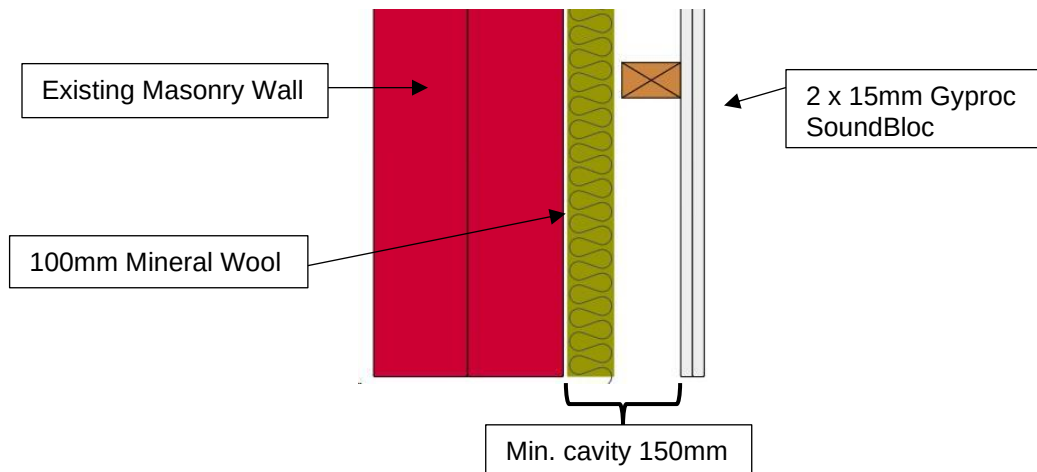
(1) Internal Noise Breakout (via Separating Wall to 2 Swinbourne Grove and via External Envelope)

- 5.2 As stated in Section 3, the assessment of noise breaking out from the proposed development will be based on the internal ambient and maximum noise levels of presented in Table 4.2. Noise breaking out via the separating wall and via the external envelope is discussed separately, below.

Separating Wall to 2 Swinbourne Grove

- 5.3 As stated above, there are two rooms within 2 Swinbourne Grove that share a separating wall to the proposed pub.
- 5.4 In the front office, the wall achieved a sound insulation performance of 52dB_{Dw} and mitigation measures are required.
- 5.5 In this location, the wall should be lined with two layers of 15mm Gyproc SoundBloc (or board of equivalent density) supported off an independent timber frame set at least 150mm from the existing masonry wall. The cavity formed should be partially filled with 100mm thick mineral wool (minimum density of 10kg/m³). A sketch of the proposed lining is presented in Figure 5.1, below. Please note that the sketch is not to scale.

Figure 5.1 – Independent Wall Lining



- 5.6 As stated above, a doorway between the pub and the rear office area has been blocked off using a single leaf of breeze block. To improve the sound insulation performance of this wall it is recommended that an independent brick wall should be constructed at least 100mm from the bare face of the breeze block. 50mm thick mineral wool insulation with a minimum density of 10kg/m³ should be installed in the cavity formed.
- 5.7 The entire wall should then be lined as presented above. At this stage it is recommended that the first floor walls are also lined, however, additional testing may be suitable once the pub has opened.

Noise Level from Patrons / DJ

- 5.8 As stated in Section 3.6, ambient noise levels breaking out of the external envelope must be controlled to not exceed 10dB below the existing background noise levels at the receptors.
- 5.9 Based on the location of the site, the nearby receptors are any rooms on the northern elevation of 2 Swinbourne Grove, and within one of the apartments at 4 Swinbourne Grove.
- 5.10 As per the noise levels presented in Section 4.5, the typical background noise level between 2300 – 0100h was 40dB_{LA90,T}. Therefore, in order to ensure the requirements are met, ambient noise levels breaking out from the external envelope of the proposed pub should not exceed 30dB_{LAeq}.
- 5.11 Following AEC's site visit, the weakest element of the external envelope is the glazing.
- 5.12 Calculations based on the internal ambient source noise levels of 85dB_{LAeq,T}, presented in Table 4.2, the sound insulation performance of the glazing (29dB_{Rw}) and area of glazing, indicate that ambient noise levels external to both receptors would be approximately 44dB_{LAeq,T}. Therefore, the requirements would be exceeded.
- 5.13 In order to control noise breaking out of the glazing, it is proposed a secondary pane of 6mm glass is installed 200mm from the existing pane in all locations. Calculations indicate that this would reduce external noise levels so that the limit of 30dB_{LAeq,T} is not exceeded at either receptor.

(2) External Noise Breakout via External Seating Areas

- 5.14 Based on the provided drawings it is understood that there will be seating areas for approximately 40 patrons out the front (north-western) and 20 patrons to the side (north-eastern) of the venue.
- 5.1 Noise levels in the external seating areas have been determined using the calculation method presented in the J.H. Rindel, C.I Christensen, A.C. Grade research paper: '*Dynamic sound source for simulating the Lombard effect in room acoustic modelling software*' (Proceedings of Inter-Noise 2012, New York, USA, (2012)).
- 5.2 For ambient noise levels, it has been deemed appropriate to use a noise level representative of '*normal*' speech conversation levels. The sound power level of a person speaking in a *raised* voice is equal to roughly 68dB_{LWA} (ref. ANSI 3.5).

- 5.3 An example calculation methodology is subsequently presented where the first step is to calculate the number of speaking persons (NS) at any one time, where N is the total number of persons (40) and G is the assumed group size (typically 4).

$$\text{Number of speaking persons (NS)} = N/G$$

- 5.4 In this scenario, this equates to 10 people speaking at once within the seating area. Considering the number of people speaking and the sound power level of raised conversation (68dB_{L_{WA}}) the resultant sound power level would be around 86dB_{L_{WA}}.
- 5.5 The equation shown below is then used, to convert the sound power to a sound pressure level, where r is the distance to the nearest noise sensitive receiver.

$$\text{Sound pressure level, } L_p = L_{WA} - 20\log(r) - 8$$

$$L_{WA} = 68\text{dB}$$

$$r = 10\text{m}$$

- 5.6 Based on the above, the ambient noise level external to the receptor, in this example, would be 47dB_{L_{Aeq, T}}.
- 5.7 Table 5.1, below, presents a summary of the ambient noise levels from both external seating areas and the resultant noise levels external to the two nearest noise sensitive receptors. As neither receptor has direct line of sight, acoustic attenuation of at least 10 - 15dB has been applied, depending on the receptor.
- 5.8 For assessing maximum levels from the external seating areas, this has been based on the sound power level of a person *shouting*, of around 91dB_{L_{WA}} (ref. ANSI 3.5). Maximum noise levels breaking out from the seating areas and impacting the nearby receptors have been determined based off the screening and distance attenuation discussed above, and are also presented in Table 5.1, below.
- 5.9 For comparison purposes, the noise level limits are also stated in Table 5.1. It should be noted that as the calculated levels in Table 5.1 are the same for both the daytime and night-time periods, they have been compared against the more onerous night-time noise level limits.

Table 5.1 – Calculation for External Seating Area Breakout

Receptor	Source Type	Noise Levels, dB(A)			
		Seating Area 1	Seating Area 2	Total	Noise Level Limit
2 Swinbourne Grove	Ambient, L _{eq}	32	40	41	40
4 Swinbourne Grove, Apartment Block		24	31	32	
2 Swinbourne Grove	Maximum, L _{max,F}	44	54	54	55
4 Swinbourne Grove, Apartment Block		37	46	46	

- 5.10 Based on the noise levels presented in Table 5.1, the calculated ambient and maximum noise levels breaking out from the two seating areas would only exceed the noise level limit at the 2 Swinbourne Grove receptor (by 1dB). The ambient noise levels breaking out from Seating Area 2 is the primary cause for this exceedance.
- 5.11 While there is this exceedance, it should be noted that the seating area is only open until 0100h, in line with the pub. Furthermore, an exceedance of 1dB would be considered measurement tolerance and as such, should be deemed acceptable.
- 5.12 If it is deemed that the above is not acceptable, however, the most practicable mitigation measures would be for the client to ensure that Seating Area 2 is closed off to patrons past 2300h each evening. Seating Area 1, however, could remain open.

(3) External Building Services Plant

- 5.13 In order to comply with MCC's requirements, noise from external building services plant would need to be controlled as to not exceed a rating level of 5dB below the typical background noise level at the nearest receptor.
- 5.14 It is understood that any plant serving the development would need to operate in line with the establishment itself and therefore, could operate up to 0100h seven days a week. Therefore, the most onerous period of operation would be during the night-time.
- 5.15 As the make and model of the exact plant machinery has not been proposed at this time, a noise level limit has been set.
- 5.16 Based on the noise levels presented in Table 4.1, the lowest typical background noise level was 40dB_{LA90,T}. As such, the noise emitted from the plant should be controlled to not exceed a free-field rating level external to the nearest residential window of 30dB_{LA,r,T,r}.
- 5.17 The above noise limits assume that there is no acoustic character associated with the mechanical services plant (e.g. tonality or intermittency), this would need to be reviewed once the plant has been specified.

Summary of Assessment

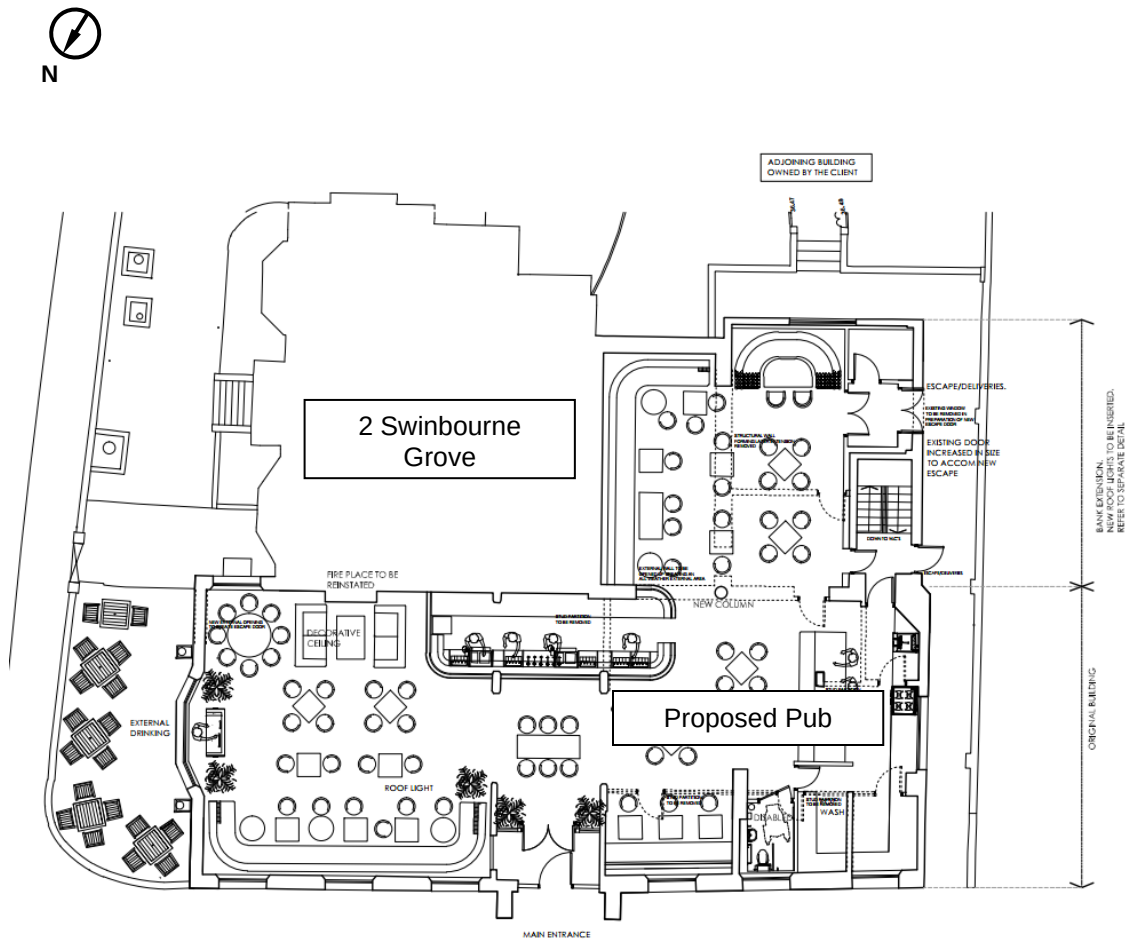
- 5.18 Based on the above assessment, by ensuring that the proposed mitigation measures (where applicable) are appropriately implemented, noise should not be considered a determining factor in relation to any planning permission being sought.

FIGURE 1 – Site Location Plan Identifying Monitoring Locations



Map data © 2021 Google United Kingdom

FIGURE 2 – Proposed Site Layout



GROUND FLOOR PLAN AS PROPOSED (1:100)

APPENDIX A – Acoustic Terminology in Brief

Sound Description

Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air. The rate at which the pressure fluctuations occur determines the pitch or *frequency* of the sound. The frequency is expressed in Hertz (*Hz*), that is, cycles per second. The human ear is sensitive to sounds from about 20 Hertz to 20,000 Hertz. Although sound can be of one discrete frequency - a 'pure tone' - most sound is made up of many different frequencies.

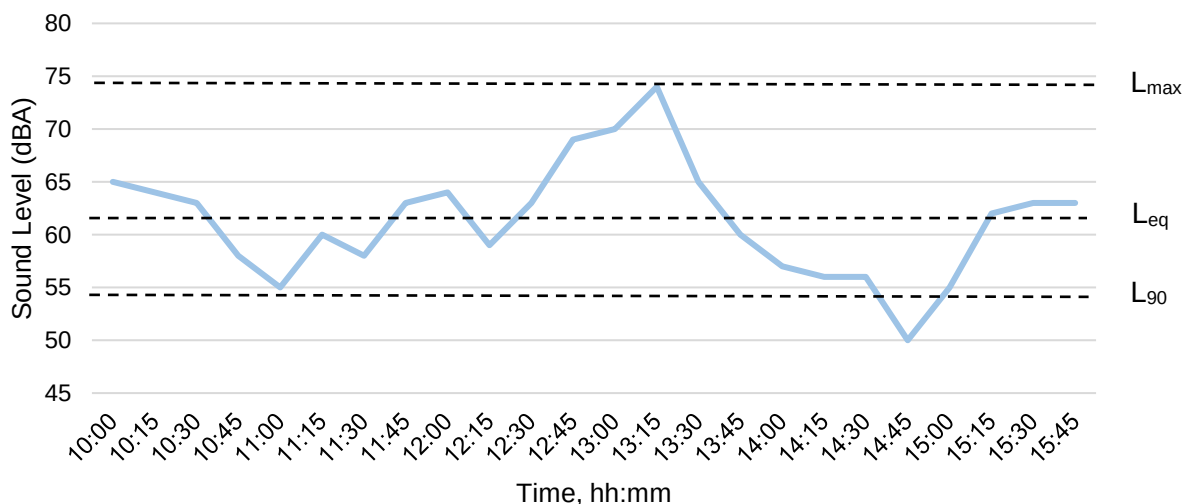
The human ear is more sensitive to some frequencies than others, and modern instruments can measure sound in the same subjective way. This is the basis of the A-weighted sound pressure level *dBA*, normally used to assess the effect of noise on people. The *dBA* weighting emphasises or reduces the importance of certain frequencies within the audible range.

Sound Units

In order to assess environmental noise, measurements are carried out by sampling over specific periods of time, such as fifteen minutes or one hour, the statistically determined results being used to quantify various aspects of the sound.

The figure below shows an example of sound level varying with time. Because of this time variation, the same period of sound can be described by several different levels. The most common of these are described below. It should be noted that in many instances in the main body of text, the unit will be preceded by a dB descriptor in the report e.g. $L_{Aeq,T}$ could be written $dBL_{Aeq,T}$.

Example of Sound Varying with Time



Unit Type	Acoustic Unit	Description
Ambient Sound Level	$L_{Aeq, T}$	The equivalent continuous (A-weighted) sound level. It may be thought of as the “average” sound level over a given time, T. It is used for assessing noise from various sources: industrial and commercial premises, construction sites, railways and other intermittent noises and can be considered as the “ambient” noise level.
Background Sound Level	L_{A90}	The (A-weighted) sound level exceeded for 90% of a measurement period. It is the value often used to describe background noise.
Sound reduction index	R_w	Single number rating used to describe the <u>laboratory</u> airborne sound insulation properties of a material or building element over a range of frequencies, typically 100-3150Hz.
Weighted Level Difference	D_w	Single number rating used to describe the on-site airborne sound insulation properties of a material or building element over a range of frequencies, typically 100-3150Hz.
Rating Level	$L_{Ar, Tr}$	Specific sound level plus any adjustment for the characteristic features of the sound