

Planning Stage Environmental Noise Assessment

Millwood Primary School

Radcliffe, Manchester

M26 3BW

Stroma Built Environment Ltd.

SBE Ref: OPP-105121 – AC - 1v1

I. Revision History

Revision	Date	Description	
1v1	16/10/2023	Initial Issue	
		Compiled By	Authorised By
		Matt Jones MIOA Senior Acoustic Consultant	Tom Chaffer MIOA Principal Acoustic Consultant

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II. Executive Summary

Millwood Primary School in Radcliffe, Manchester is planning to build a new extension to their existing school building. To support their planning application, Stroma Built Environment (SBE) have completed an environmental noise assessment. This has been based on the measurements taken during a noise survey on site.

The Indoor Ambient Noise Levels (IANL) for school buildings given in 'Building Bulletin 93. *Acoustic design of schools: performance standards*' (BB93) can be met in all areas with appropriate specification of building envelope, glazing and ventilation strategy.

Calculations indicate that compliant IANL can be achieved throughout the development with the use of standard thermal double glazing providing a minimum sound insulation of 27 dB R_w .

External noise levels in unoccupied playgrounds and outdoor areas around the school building have been considered and are calculated to meet best practice guidance levels for school use. As such no mitigation is considered necessary to reduce external noise levels.

Representative site background noise levels have been used to inform noise limits proposed to control noise emissions from new sources of building services noise introduced by the scheme, in line with guidance given in BS 4142:2014 '*Methods for rating and assessing industrial and commercial sound*'. The rating level from new building services plant should be controlled to 5 dB below the existing site representative background sound level. This would meet the planning requirements of the Local Authority.

An assessment of the potential impact from the proposed playgrounds has also been completed. This found that the use of the playgrounds is not likely to impact the nearby noise sensitive receptors.

Noise survey results, site observations and noise assessment indicate that with the implementation of the proposed mitigation, typical operational noise due to the proposed development is not predicted to significantly impact the local area or identified noise sensitive receptors.

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1. Introduction

- 1.1 Stroma Built Environment (SBE) have been appointed by ISG (the client) to complete a noise survey and noise impact assessment for the proposed extension at Millwood Primary School, Radcliffe.
- 1.2 The project consists of building a new single storey extension containing classrooms, a hall and the associated ancillary areas. Millwood Primary School is a Special Educational Needs (SEN) school, so all classrooms are being designed with the SEN requirements in mind.
- 1.3 The purpose of this assessment is to consider the existing and future noise climate around the proposed development site in order to determine suitability of the development proposals. The assessment will also consider potential noise impacts at nearby noise sensitive receptors due to the proposed scheme.
- 1.4 This document has been prepared for the sole use, benefit and information of the client for the purposes set out in the document or instructions commissioning the works. The liability of SBE in respect of the information contained herein will not extend to any third party.
- 1.5 This report is limited to addressing the specific acoustic issues contained herein and is based on information and drawings provided by the client.
- 1.6 Whilst every effort has been made to ensure that this report is easy to understand, it is technical in nature. To assist the reader a glossary of terminology is included in Appendix II.

2. Relevant Acoustic Guidance and Criteria

National Planning Policy Framework

- 2.1 The current planning guidance for the assessment of the potential environmental noise impact is outlined in the National Planning Policy Framework (NPPF). Whilst the NPPF does not set criteria that must be achieved, the NPPF states the following in relation to the appropriate control of potential noise impacts (paragraph 185):
- 2.2 “Planning policies and decisions should also ensure that new development is appropriate for its location considering the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:
- a) *mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life; [...]*”
- 2.3 Therefore, the policy requires that new developments are not affected to an unacceptable degree by environmental noise and existing development is not put at an unacceptable risk from noise due to adjacent new development.

Noise Policy Statement for England

- 2.4 The Noise Policy Statement for England (NPSE) provides further guidance on the Government’s policy with regard to the potential impacts of noise. The NPSE states the aims of Government policy relating to noise are:
- 2.5 “Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:
- *avoid significant adverse impacts on health and quality of life;*
 - *mitigate and minimise adverse impacts on health and quality of life; and*
 - *where possible, contribute to the improvement of health and quality of life”*
- 2.6 The Explanatory Note to the NPSE provides further guidance on how significant noise effects should be determined. The concepts of No Observed Effect Level (NOEL), Lowest Observed Adverse Effect Level (LOAEL – the lowest noise level at which an adverse effect can be observed) and Significant Observed Adverse Effect Level (SOAEL – the noise level above which significant adverse effects on health and quality of life can be observed) are introduced, however the NPSE also states that:

- 2.7 “It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times.”
- 2.8 The document ‘*Guidelines for Environmental Noise Impact Assessment*’ published by the Institute of Environmental Management and Assessment (2014) provides further guidance and suggests that the daytime threshold of Lowest Observed Adverse Effect Level is typically 50 dB $L_{Aeq,16hours}$ for residential dwellings.

Part E Building Regulations – BB93 Acoustic Performance Standard for Teaching Spaces

- 2.9 Section 8 of Approved Document E states that the normal way of satisfying Requirement E4 of Part E to Schedule 1 of the Building Regulations 2010 for new school buildings is to meet the performance standards set out in Building Bulletin 93 ‘*Acoustic design of schools: performance standards*’ (BB93).
- 2.10 Section 1.1 of BB93 presents Indoor Ambient Noise Level upper limit criteria (IANL) for various types of teaching, study, and ancillary spaces. Teaching spaces intended specifically for students with special hearing and communication needs are to achieve a maximum IANL of 30 dB $L_{Aeq,30mins}$. In addition, BB93 states that the indoor ambient noise level should not regularly exceed 60 dB $L_{A1,30min}$.
- 2.11 Note that the BB93 IANL criteria include contributions from external sources outside the school premises and building services noise but exclude contributions from teaching activity/equipment, staff, and students within the school premises.

BS 4142:2014 ‘Methods for rating and assessing industrial and commercial sound’ (BS 4142)

- 2.12 BS 4142 describes a method for assessing the potential adverse impact from noise sources that are of an industrial nature (e.g. fans, pumps, chillers, air handling units etc.). The assessment methodology is based upon determining a ‘rating level’ for the equipment being assessed, which is the level of noise from the item or items of plant being assessed (measured as L_{Aeq}).
- 2.13 The rating level is then compared with the underlying background noise level (measured as L_{A90}) in the absence of noise from the item or items of plant being assessed.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
 - 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.

- 2.14 BS 4142 states that a penalty should be added for any plant which gives rise to noise features that may increase disturbance such as tonal, impulsive, or intermittent characteristics. With respect to the acoustic feature correction, BS 4142 states:
- 2.15 “Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level.”
- 2.16 Generally, a rating penalty for a sound should be based on a subjective assessment of its characteristics.

Manchester City Council: Planning and Noise – Technical Guidance

- 2.17 Although Millwood Primary School falls within the jurisdiction of Bury Council, I understand that the noise planning guidance for Manchester City Council is adopted by Bury Council.
- 2.18 Manchester City Council: Planning and Noise (MCC) details the noise emission planning requirements for various developments that have the potential to disturb nearby residences.
- 2.19 This project has the potential to have fixed items of building services plant. MCC requires that the noise emission from any fixed items of building services plant meet the following condition:
- 2.20 ‘The development should be designed so as to achieve a rating level of 5 dB ($L_{Aeq,T}$) below the typical background ($L_{A90,T}$) level at the nearest noise sensitive location.’
- 2.21 This limit has been used in the noise impact assessment.

World Health Organisation ‘Guidelines for Community Noise’

- 2.22 The World Health Organisation (WHO) has published guidelines that relate to acceptable levels of noise from a health perspective detailed in the WHO ‘Guidelines for Community Noise’, 1999. The ‘Guidelines for Community Noise’ set out the following criteria that should be achieved on residential balconies, terraces and in outdoor living areas to protect the majority of people from being annoyed during the daytime. This is applicable to the assessment of noise impact on residential areas.

Table 1: Guideline values for community noise in specific environments (WHO)

Specific Environment	Guidance	Criteria Limit (dB $L_{Aeq,16hr}$)
Outdoor living area	‘Few seriously annoyed’ in outdoor living areas	≤ 55
	‘Few moderately annoyed’ in outdoor living areas	≤ 50

3. Site Conditions and Noise Survey

Site Description

- 3.1 The development site lies within the existing Millwood Primary School. The proposals are to develop the open area on the west side of the site into a new block containing six classrooms, a hall and the associated staff and ancillary spaces. The new school block will also have four outdoor play areas on all four of the facades of the block. The proposed site plan is shown in Appendix II.
- 3.2 The site is bound to the west and north by the disused Manchester, Bolton and Bury Canal. Across from the canal to the west is open ground. Commercial units lie approximately 100m to the north. Directly to the east is Radcliffe Park, another open space, with residential properties on the other side of the park. School Street lies on the school's southern boundary with residential properties on the other side of the street.
- 3.3 The nearest noise sensitive receptors (NSR) to the development site are adjacent to School Street. The nearest of these is referred to in the assessment as NSR A.
- 3.4 The site, surrounding area and the nearby noise sensitive receptors are shown on Figure 1, below.



Figure 1: Site and Surrounding area

Noise Survey

- 3.5 Attended noise measurements were taken at Measurement Position 1 and Measurement Position 2 between 15:00 and 15:45 on Wednesday 4th October 2023. Unattended noise monitoring was undertaken at the Logger position between 15:30 on Friday 6th October and 15:30 on Monday 9th October 2023.
- 3.6 Noise levels were measured using two NTi XL2 TA Class 1 sound level meters fitted with a weather protection kits and mounted on tripods. The sound level meters were field calibrated prior to the survey period and no significant drift was detected.
- 3.7 Noise was measured in terms of broadband A-weighted indices and octave band spectral terms.
- 3.8 Weather conditions during the attended survey period were mostly fine and dry, with wind speeds of < 5 m/s noted.
- 3.9 The general noise climate at the site was found to be primarily controlled by distant road traffic noise and overhead aircraft.
- 3.10 Table 2 shows a summary of the attended and unattended measurements. The loudest 30-minute period from the logger data during the school operating hours is shown as the summary for the measurements taken at the logger position. School activities, such as play times have also been excluded. This follows the guidance in BB93.

Table 2: Summary of attended and unattended noise measurements

Position	Period	$L_{Aeq,T}$ (dB)	$L_{A1,T}$ (dB)
MP1	04/10/2023 15:00 – 15:15	49	55
MP2	04/10/2023 15:30 – 15:45	47	52
LP1	09/10/2023 12:15 – 12:45	45	54

- 3.11 The full measured noise data is presented in Appendix I.

Background Noise Levels

- 3.12 A statistical analysis of the measurement data has been conducted to determine the background sound levels representative of the daytime and night-time periods following the guidance in BS 4142. The location of the logger position was such that the noise levels measured there can be considered as representative of the noise levels at NSR A.
- 3.13 The unattended survey took place over a weekend period. Weekend noise data can be considered as atypical and so has been excluded from this assessment.
- 3.14 The statistical analysis of the background noise levels is shown in Figure 2 and Figure 3.

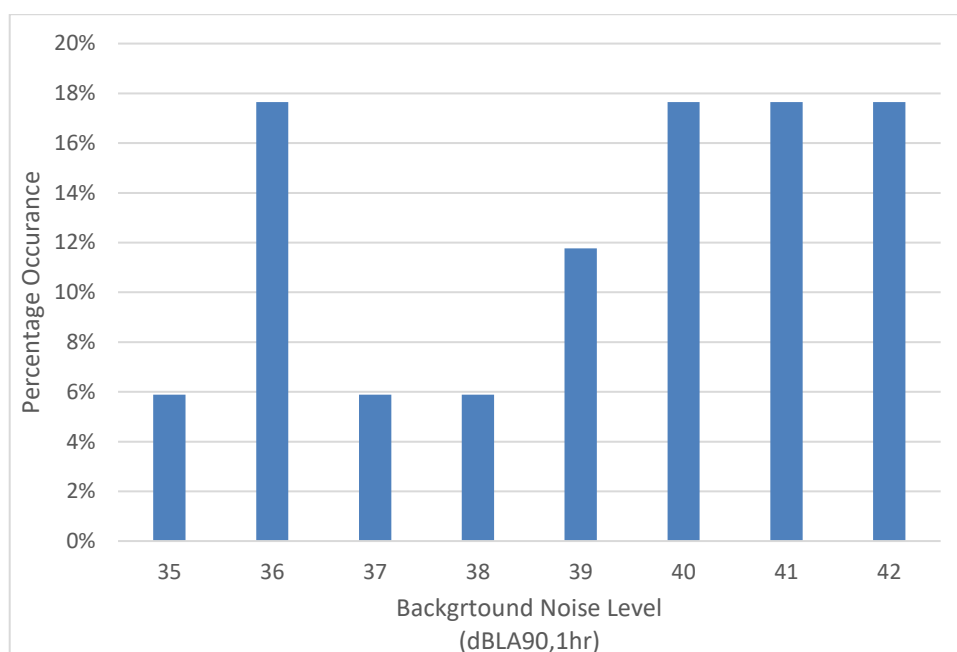


Figure 2: Statistical Analysis of Daytime Background Noise Levels

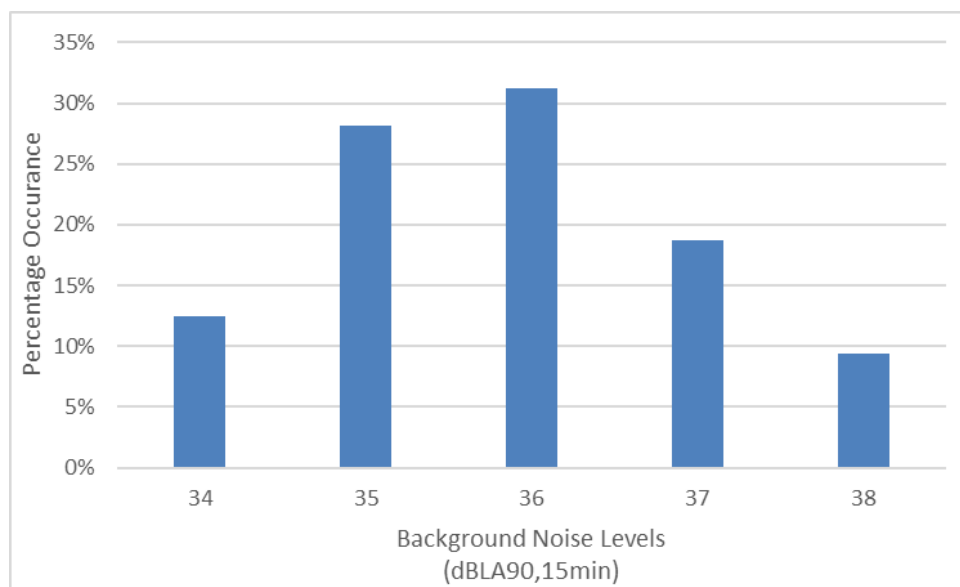


Figure 3: Statistical Analysis of Night-time Background Noise Levels

3.15 Based on the statistical analysis shown in the above Figures, Table 3 shows the typical daytime and night-time background noise levels used in the assessment.

Table 3: Typical Background Noise Levels

Period	Typical Background Noise Level (dB $L_{A90,T}$)
Daytime (07:00 – 23:00)	36
Night-time (23:00 – 07:00)	36

4. Noise Impact Assessment

Façade Noise Impact Assessment

- 4.1 BB93 defines various internal ambient noise level (IANL) criteria for different spaces. The strictest of these criteria for this project would be the SEN classrooms. These require an IANL of 30 dB $L_{Aeq,30mins}$. BB93 also states that the noise levels in teaching spaces should not regularly exceed 60 dB $L_{A1,30min}$. This is to protect students from maximum noise events.
- 4.2 The building envelope is required to provide adequate sound reduction of external noise levels to achieve the internal design criteria. Façade, glazing and roof construction details for new build elements are currently not known. Based on existing site noise survey data, minimum façade construction sound insulation performances outlined in Table 4 are calculated to provide BB93 compliant ambient and maximum internal noise levels.

Table 4: Minimum building façade sound insulation requirements

Building Element	Minimum Airborne Sound Insulation Performance
Facade	40 dB R_w
Glazing / External doors /Roof lights	27 dB R_w
Roof	30 dB R_w

- 4.3 For all spaces, glazing rated 27 dB R_w (or higher) is calculated to provide BB93 compliant internal noise levels with windows closed. This rating is typically provided with 'standard' double glazed units, as is typically required for thermal purposes, e.g. 6 mm panes separated by a 16 mm cavity.

Normal Ventilation Strategy

- 4.4 Section 1.1.3 of BB93 addresses natural and hybrid ventilation in schools and states that a 5 dB relaxation of BB93 indoor ambient noise levels is applicable in teaching spaces when the proposed ventilation systems are operating in their normal condition. Section 1.1.3 of BB93 defines the normal condition for a natural or hybrid ventilation system as follows:

"The normal condition for a ventilation system in natural or hybrid mode is defined as when the system is operating to limit the daily average carbon dioxide concentration to no more than 1,500ppm with the maximum concentration not exceeding 2,000ppm for more than 20 consecutive minutes on any day. This would normally equate to a minimum ventilation rate of approximately 5l/s per person."

- 4.5 The ventilation strategy is currently undefined. BB93 states that for facades where the external noise levels 16 dB above the IANL criterion, single sided ventilation using partially openable windows would be suitable. For SEN spaces, this limit is 46 dB $L_{Aeq,30mins}$. Based on typical noise levels incident on the

building façades of up to 45 dB $L_{Aeq,30mins}$, it is possible to achieve the BB93 internal ambient noise levels (IANL) requirements by employing a natural ventilation strategy with openable windows.

- 4.6 All ancillary spaces can implement open windows as part of a normal ventilation strategy. This will comply with the requirements of BB93.
- 4.7 Alternatively, a hybrid or mechanical ventilation system would also be appropriate, provided that the noise from the mechanical services meets the BB93 IANL requirements. This can be reviewed at a later design stage.

Boost Ventilation and Control of Summertime Overheating

- 4.8 Control of summertime overheating and boost/purge ventilation is typically provided by open windows in addition to the normal ventilation strategy.
- 4.9 BB93 states that SEN spaces must meet the normal ventilation IANL requirements in the boost/purge and overheating ventilation conditions.
- 4.10 Based on typical noise levels incident on the building façades of up to 45 dB $L_{Aeq,30mins}$, an assessment indicates that all spaces are suitable to use open windows to provide short term intermittent boost / purge ventilation under the control of the teacher in the SEN spaces.
- 4.11 All ancillary spaces may use openable windows as part of any boost/purge or overheating ventilation strategy.
- 4.12 Alternatively, a hybrid or mechanical ventilation system may also be employed. For the SEN spaces, the noise from the mechanical services must achieve the normal ventilation IANL requirements. This can be reviewed at a later design stage.

External Noise Levels

- 4.13 Although not included in the BB93 mandatory performance standards, additional guidance published in '*Acoustics of Schools: A Design Guide*' states that noise levels in unoccupied playgrounds, playing fields and other outdoor areas should generally not exceed 60 dB $L_{Aeq,30min}$. The level of 55 dB $L_{Aeq,30min}$ is quoted as a good practice level for external areas, and there should be at least one area suitable for outdoor teaching activities where noise levels are below 50 dB $L_{Aeq,30min}$.
- 4.14 Based on site noise levels, external spaces are expected to be exposed to typical noise levels of 50 dB $L_{Aeq,30min}$ or less. The external noise levels therefore meet this design target.

Playground Noise Impact Assessment

- 4.15 There are four playgrounds proposed as part of the new development, one on each façade of the building. These playgrounds have the potential to impact the nearby residential receptors.
- 4.16 The playgrounds on the north, east and west of the proposed building will be screened from the receptor by the building itself. I do not anticipate that these playgrounds will cause a noise disturbance.
- 4.17 The playground to the south of the proposed building is approximately 100m from the nearby noise sensitive receptor, NSR A.
- 4.18 The WHO have published guidelines that relate to acceptable levels of noise from a health perspective detailed in the WHO '*Guidelines for Community Noise*', 1999. Based on this guidance, for a 'few people to be moderately annoyed,' the outdoor noise level from the playgrounds at NSR A must be louder than 50 dB $L_{Aeq,16hr}$.
- 4.19 SBE have previously measured noise levels from a playground. The noise level measured was 60 dB $L_{Aeq,T}$ at a distance of 10m.
- 4.20 Assuming that the playground will not operate for more than three hours per day, the calculated noise level of the playground at NSR A is 45 dB $L_{Aeq,16hr}$.
- 4.21 The noise from the playground is calculated to be below the WHO guidelines and is not likely to cause a disturbance.
- 4.22 Due to being screened by the development itself, the noise from the other playgrounds on site will be significantly lower than this. They are also not likely to cause a disturbance.

Noise Emissions from Fixed Building Services Plant

- 4.23 The current ventilation strategy for the proposed development is not yet known. Potentially, the building may use fixed items of plant for building services. These plant items could impact the nearby receptors.
- 4.24 To control the noise emissions from any fixed items of building services plant, noise limits have been set at the nearby receptor, NSR A.
- 4.25 I understand that Bury Council, using the MCC guidance, require that the rating level of any items of fixed building services plant should be 5 dB below the typical background noise level at the receptor. On this basis, please see the noise limits for fixed items of plant in Table 5, below.

Table 5: BS 4142:2014 Plant Noise Limits

Period	Typical Background Noise Level (dB $L_{A90,T}$)	Plant Noise Limit (dB $L_{A,r,Tr}$)
Daytime (07:00 – 23:00)	36	31
Night-time (23:00 – 07:00)		

- 4.26 It is anticipated that plant operation at night will be minimal and limited to frost protection and night-time purge ventilation only.
- 4.27 It is recommended that mechanical engineers are made aware of the proposed plant noise limits in order to inform plant unit specification and selection. The rating level should be assessed in accordance with BS 4142, including appropriate consideration of any tonal or impulsive characteristics of the proposed mechanical services plant.
- 4.28 At this stage of the development, details of proposed plant selections are not available for detailed assessment. Once plant selections have been made, a building services noise impact assessment will be undertaken prior to completion to determine if the noise limits have been met.

Operational Noise Impact

- 4.29 Millwood Primary School site is already an existing school. The development proposals are limited to a single block extension to provide additional teaching capacity. The school currently has approximately 160 pupils and the development will increase this number to around 220 pupils.
- 4.30 Typically, a doubling in pupil numbers would result in an increase of 3 dB to existing operational noise.
- 4.31 The proposed expansion is calculated to result in a 1 dB increase in day to day operational noise. A 1 dB change in environmental noise level is considered to be imperceptible. It is concluded that day to day increase in operational noise from the existing school site will not result in a perceptible noise impact.

Appendix I. Noise Survey Data





Appendix III. Acoustic Glossary

Sound pressure level and the decibel, dB

A sound wave is a small fluctuation of atmospheric pressure. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. In order to cope with this wide range of pressure variations, a logarithmic scale is used to convert the values into manageable numbers. The decibel is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120 dB (threshold of pain).

Frequency and hertz, Hz

Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or hertz (Hz). Sometimes large frequency values are written as kilohertz (kHz), where 1 kHz = 1000 Hz. The human range of hearing is commonly accepted to be 20 Hz to 20,000 Hz. Additionally, an octave can be used to describe the interval between a frequency in Hz and either half or double that frequency.

Frequency weighting

Different weighting networks can be applied to a given sound level in each stated octave band by a specified amount, in order to better represent the response of the human ear. The most commonly used weighting network is the 'A' weighting, and the letter 'A' will be included within a descriptor to indicate that the value has been 'A' weighted, e.g. $L_{Aeq,T}$ or L_{A90} . An 'A' weighted noise level may also be written as dB(A). Other weightings less commonly used are 'C' and 'D' weighting.

Noise indices

When a noise level varies with time, the measured 'A' weighted dB level will vary as well. In this case it is therefore not possible to represent the noise climate with a simple 'A' weighted dB value. In order to describe noise where the level is continuously varying, a number of other indices, including statistical parameters, are used. The various indices used are described as below:

$L_{Aeq,T}$	The 'A' weighted 'equivalent continuous noise level' which is an average of the total sound energy measured over a specified time period, T
L_{Amax}	The maximum 'A' weighted noise level that was recorded during the monitoring period.
L_{A10}	The 'A' weighted noise level that was recorded for at least 10% of the monitoring period.
L_{A90}	The 'A' weighted noise level that was recorded for at least 90% of the monitoring period, usually taken as the underlying 'background' noise level.

Sound level difference, D

The sound level difference between two internal spaces, or between internal and external spaces. The 'D' value is used to denote the differences at each third octave or octave band, with a single figure 'weighted' value to

describe an overall performance. Note that the 'D' value will always describe an in-situ or on-site acoustic performance. All values are described using the decibel.

D_w	Single figure weighted sound level difference, simply the measured source noise level minus receiver noise level, not adjusted to reference conditions
$D_{nT,w}$	Weighted normalised sound level difference – a single, weighted sound insulation value, normalised to a reference reverberation time using the measured reverberation time in the receive room
$D_{nT,w} + C_{tr}$	As above, with a spectral adaptation term applied to account for the effects of low frequency noise, and based on urban traffic noise
$D_{nf,w}$	Overall flanking normalised level difference - A parameter that defines the flanking transmission of sound from room to room where a dividing partition or floor construction abuts a flanking building element common to both rooms, such as the building façade or ceiling
$D_{n,e,w}$	Element normalised level difference. A level difference level derived transmission through the small technical element only, irrespective of area. This value is used to represent the sound insulation of façade ventilators.
$D_{n,e,w} + C_{tr}$	As above, with a spectral adaptation term applied to account for the effects of low frequency noise, and based on urban traffic noise

Sound reduction index, R

This describes the sound transmitted through a material or building element, such as a wall, door or window. It is measured in a laboratory with suppressed flanking transmission. The 'R' value is used to denote the differences at each third octave or octave band, with a single figure 'weighted' value to describe an overall performance. All values are described using the decibel.

R_w	Weighted single figure sound reduction index
$R_w + C_{tr}$	As above, with a spectral adaptation term applied to account for the effects of low frequency noise, and based on urban traffic noise
R'_w	The 'apparent sound reduction index', a field measurement to obtain the sound reduction index of a material or element, with all effects of site installation accepted.

Standardised impact sound pressure level, $L'_{nT,w}$

$L'_{nT,w}$ is the single figure used to characterise the impact sound pressure level in a receiving room, normalised to a reference reverberation time. Impact noise can be classified as (but is not limited to) the result of footfall impact on a separating floor to a habitable space below. All values are described using the decibel.

Reverberation time, T and T_{mf}

The reverberation time of a space is a measure of the rate at which sound decays, measured in seconds. It is defined as the time taken for the sound pressure level to reduce by 60 dB from its original impulse level.

Reverberation time is commonly quoted in terms of the mid-frequency reverberation time, T_{mf} , the arithmetic average of the reverberation times in the 500 Hz, 1 kHz and 2 kHz octave bands.

Absorption Coefficient

The acoustic absorption provided by a surface is defined as the sound absorption coefficient α , which denotes the fraction of sound energy absorbed between 0 (no absorption) and 1 (no reflection). The absorption coefficient of a material varies with the frequency of incident sound waves, therefore is considered for different frequencies.

Absorption Class

Based on the absorption coefficients, the overall sound absorption of a material is classified from Class A to Class E as defined in BS EN ISO 11654:1997, with Class A providing the highest level of acoustic absorption.

Noise rating, NR

The noise rating or NR system is commonly used in the design of noise emitted by internal building services systems. The system is frequency dependent, and was empirically derived to prevent disturbance to occupants in habitable or working areas from building services noise that exhibits 'tonal' elements, e.g. rumbles, whines, whistles etc. There is no direct relationship between the average 'A' weighted noise level in dB and the NR. However, as a guide, and assuming the absence of strong low frequency content in a given noise, the NR could generally be said to be 6 dB less than the average 'A' weighted dB value.

Privacy

Privacy is the addition of the level of sound insulation between two rooms and the background noise within a receiving room. It can be used to assess the level of privacy afforded in the 'receiving room' for speech from the 'source room'. The 'privacy factor' is a unit-less value that is the combination of the average 'A' weighted background noise level in dB and the weighted sound level difference (D_w) in dB.

Appendix IV. SBE Acoustic Credentials

SBE have specialised in providing the UK Construction Industry with a range of acoustics services since 2006. Specialising in Building Acoustics, all SBE acousticians are members of the Institute of Acoustics.

SBE is accredited for on-site acoustic testing by United Kingdom Accreditation Service (UKAS) (Testing Laboratory Number 2731).

SBE meet the relevant acoustic requirements typically required in the UK, including for sound insulation testing as defined in Approved Document E for the purposes of testing for Part E to the Building Regulations 2010.

This report has been prepared by Matt Jones, a Senior Acoustic Consultant who meets the BREEAM requirements for a suitably qualified acoustician (SQA) as follows;

1. Holds an MEng degree in Acoustical and Audio Engineering from the University of Salford
2. Has been an Acoustic Consultant for more than three year's (within the last five years). This experience includes a practical understanding of factors affecting acoustics in relation to construction and the built environment; including, acting in an advisory capacity to provide recommendations for suitable acoustic performance levels and mitigation measures.
3. Holds Membership of the Institute of Acoustics - MIOA membership.

This report has been read and reviewed by Tom Chaffer and has been found to;

1. Represent sound industry practice
2. Be appropriate given the building being assessed and scope of works proposed
3. Avoid invalid, biased and exaggerated recommendations.

Appendix V. Report Conditions

This document has been prepared for the sole use, benefit and information of the Client. The liability of Stroma Built Environment Ltd. in respect of the information contained herein will not extend to any third party unless prior agreement is obtained in writing from Stroma Built Environment Ltd.

This report is limited to addressing the specific acoustic issues contained herein. Advice has been provided for acoustic reasons only and it is recommended that appropriate expert advice be sought on all the ramifications, e.g. safety, fire, structural, CDM etc., associated with any proposals contained herein.

The in-situ performance of acoustic measures is influenced to a large extent by the quality of workmanship and compliance with the specifications on-site during construction, as such, Stroma Built Environment Ltd. accepts no liability for issues with acoustic performance arising from such factors.

Acoustic survey and testing work carried out for the project is representative of the prevailing conditions at the time of the work. Conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times.

In particular, it should be noted that where calculations are carried out that are based on assumptions regarding certain aspects where information has not been supplied, these are provided for indicative purposes only and should be treated as such.