Planning Noise Impact Assessment

Whitworth Community High School

Rochdale

OL12 8TS

Stroma Built Environment Ltd.

SBE Ref: 01-21-86079 - NC2 v2.1

ALL SBE WORKS CARRIED OUT IN-HOUSE AND OFFERED NATIONWIDE
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I. Revision History

Revision	Date	Description		
NC2 v1	22/04/2021	First Issue		
		Compiled By	**Authorised By**	
		Andrew Gibson MIOA Principal Acoustic Consultant	Tom Chaffer MIOA Principal Acoustic Consultant	
NC2 v2.1	28/04/2021	Second Issue		
		Compiled By	**Authorised By**	
		Andrew Gibson MIOA Principal Acoustic Consultant	Tom Chaffer MIOA Principal Acoustic Consultant	

II. Executive Summary

Stroma Built Environment (SBE) has been appointed to provide a planning noise impact assessment for the proposed new Whitworth Community High School building on the site of the existing Whitworth Community High School, Whitworth, Rochdale, OL12 8TS.

The scheme involves part demolition and redevelopment of the school, including the erection of a new main school building of up to 3 storeys, reconfigured / relocated car parking, new grass pitches and landscaping.

The purpose of this assessment is to consider the existing noise climate around the proposed development site in relation to the acoustic influence on the development with a view to achieving BB93 performance standards and to assess the noise impact due to the scheme with consideration to existing background sound levels at nearby noise sensitive receptors.

Predicted façade noise levels are such that indoor ambient noise levels set out in BB93 are predicted to be met in all areas with appropriate specification of the building envelope, glazing and ventilation strategy.

Additional guidance to BB93 states that noise levels in unoccupied playgrounds, playing fields and other outdoor areas should not exceed certain noise levels. Based on site noise levels, the external spaces are expected to meet these requirements.

Noise from new building services should be at least 5 dB below the representative background noise level. Based on measured background noise survey data, maximum plant noise rating levels at the nearest noise sensitive receptors are provided.

Assessment indicates that the development site is suitable for a new school building, and acoustic requirements for a school building can be met.

With consideration to the operational impact of the development within the context of the development site, the scheme is considered to have a negligible impact.

III. Contents

1. Introduction

1.1 SBE has been appointed by Wates Construction Ltd. to carry out a planning noise impact assessment for the proposed new Whitworth Community High School building on the site of the existing Whitworth Community High School, Whitworth, Rochdale, OL12 8TS.

1.2 The scheme involves part demolition and redevelopment of the school, including the erection of a new main school building of up to 3 storeys, reconfigured / relocated car parking, new grass pitches and landscaping.

1.3 The purpose of this assessment is to consider the existing noise climate around the proposed development site in relation to the acoustic influence on the development and assess the noise impact due to the scheme with consideration to existing background sound levels at nearby noise sensitive receptors.

1.4 This document has been prepared for the sole use, benefit and information of Wates Construction Ltd. 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. A glossary of terminology is included in Appendix II.

2. Relevant Acoustic Standards & Guidelines

Building Bulletin 93 *'Acoustic design of schools: performance standards'*

2.1 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).

2.2 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 are required to achieve an IANL ≤ 35 dB $L_{Aeq,30min}$. Teaching spaces intended specifically for students with special hearing and communication needs are to achieve a maximum IANL of ≤ 30 dB $L_{Aeq,30min}$. Additionally, BB93 states that the indoor ambient noise level should not regularly exceed 60 dB $L_{A1,30min}$.

2.3 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.

Planning Guidance

National Planning Policy Framework

2.4 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 170):

"The planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability…"

2.5 Therefore, the policy requires that new developments are not affected to an unacceptable degree by environmental noise.

Noise Policy Statement for England

2.6 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:

"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"

2.7 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:

"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."

WHO 'Guidelines for Community Noise'

2.8 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 document sets 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, outlined in Table 1.

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

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

IEMA 'Guidelines for Environmental Noise Impact Assessment'

2.9 The document 'Guidelines for Environmental Noise Impact Assessment' published by the Institute of Environmental Management and Assessment (2014) provides further guidance on the effect of noise levels. The effect of a change of 3 dB L_{Aeq} or less is considered 'Not Significant' and the effect of a change between 3 and 5 dB on a sensitive or highly sensitive receptor is considered 'Moderate'.

BS 4142:2014 *'Methods for rating and assessing industrial and commercial sound'*

2.10 BS 4142 describes a method for assessing the likelihood of complaints 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 an L_{Aeq}).

2.11 The rating level is then compared with the underlying background noise level (measured as a L_{A90}) in the absence of noise from the item or items of plant being assessed:

- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- 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.

2.12 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. Generally, a rating penalty for a sound should be based on a subjective assessment of its characteristics.

3. Baseline Noise Conditions

Site Description

3.1 An illustration of the proposed development is shown in Figure 1.

Figure 1: Illustration of proposed development

3.2 The closest Noise Sensitive Receptors (NSR) to the proposed school building is the residential property on Thor Drive identified as NSR A in Figure 1 . The closest Noise Sensitive Receptors (NSR) to the proposed grass pitch is the residential property on Water Street identified as NSR B in Figure 1.

Noise Survey

3.3 A baseline noise survey has been undertaken at the site previously by a third-party consultant Miller Goodall (MG) as summarised in their report 'Noise Assessment on behalf of Campbell Reith for the site at Whitworth Community School, Hall Fold, Rochdale OL12 8TS Report Date; 29 October 2020 Report Number: 102423'.

3.4 An extract from the Miller Goodall reports showing the measured noise levels is provided in Appendix I.

4. Building Envelope

Noise Affecting the Development

4.1 There are various indoor ambient noise level (IANL) criteria defined in BB93 for different spaces. standard classrooms, for example, are required to achieve an IANL of ≤ 35 dB $L_{Aeq,30min}$. Less noise sensitive teaching spaces such as food rooms, ICT rooms and science laboratories, are required to achieve an IANL of ≤ 40 dB $L_{Aeq,30min}$. SEN rooms have a more onerous requirement of ≤ 30 dB $L_{Aeq,30min}$.

4.2 Based on site noise measurements free-field noise levels on all façades are expected to be ≤ 50 dB $L_{Aeq,30mins}$.

Ventilation Strategy

4.3 Based on site noise measurements open windows could be used as part of the normal ventilation for general teaching and ancillary spaces with an IANL target of 35 dB $L_{Aeq,30min}$ or above, however in practice ventilation to general teaching spaces will be provided by a hybrid system featuring façade ducted Heat Recovery Units (HRU).

4.4 Teaching spaces intended specifically for students with special hearing and communication needs will be provided with a mechanical ventilation system such that required ventilation rates will be achieved with windows closed.

4.5 Control of summertime overheating is typically to be provided by open windows in addition to hybrid ventilation units. Open windows may be used in all teaching spaces and ancillary spaces to control overheating during the hottest 200 hours of the year.

4.6 Teaching spaces intended specifically for students with special hearing and communication will be provided with a mechanical ventilation system such as to control overheating with windows closed.

External Noise Levels

4.7 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 $L_{Aeq,30min}$. 55 dB $L_{Aeq,30min}$ is quoted as a good practice level for external teaching areas, and there should be at least one area suitable for outdoor teaching activities where noise levels are below 50 dB $L_{Aeq,30min}$. Based on the site noise survey the majority of external spaces are expected to be exposed to noise levels of less than 50 dB $L_{Aeq,30min}$.

5. Noise Impact Assessment

Control of External Noise Impact from Building Services

5.1 It is good practise for the noise level of all operational plant to be designed to be at least 5 dB below the prevailing background noise levels at the nearest residential properties, and that this be assessed in accordance with the relevant method as set out in BS 4142:2014 'Methods for rating industrial and commercial sound'.

5.2 Based on measured background noise survey data an assessment in accordance with BS 4142 indicates that total emission levels for plant noise, including acoustic feature corrections where applicable, should not exceed the maximum rating levels provided in Table 2.

Table 2: BS 4142:2014 Provisional maximum plant noise limits

Location	Period	Representative background noise level, L_{A90} (dB)	BS 4142 Rating level $L_{Ar,Tr}$ (dB)
Residences on Thor Drive	Daytime (07:00-23:00)	31	≤ 26
	Night time (23:00-07:00)	-[1]	≤ 25[2]

1. *The current site noise survey only has measurements during the daytime period, the noise limit for night time noise levels and validation of the daytime noise level will be confirmed with a 24 hours survey by SBE.*

2. *BS 42142 notes that where background sound level and rating levels are low, absolute levels might be more relevant. The rating level proposed for the night time in absolute terms is such that the noise impact would be considered to be low irrespective of the background noise level.*

5.3 The rating level in Table 2 should be assessed in accordance with BS 4142, including appropriate consideration of any tonal or impulsive characteristics of the proposed building services plant. It is prudent to ensure that building services noise is designed to be sufficiently below the recommended plant noise limit criteria such that the cumulative noise level from all sources does not exceed the stated target level.

5.4 Wherever possible, the general principal of reducing the level of noise at source is recommended as the best way of reducing noise impact. Where this measure on its own may not be sufficient, additional suitably designed mitigation measures such as noise barriers, lagging materials, or acoustic attenuators/louvres may be used to control the plant noise in order to achieve the required rating level.

Operational Noise Impact

5.5 The position of the hard court Multi Use Games Areas (MUGAs) will remain as existing and therefore the noise impact associated with these will not change as a result of the development.

5.6 Although the car park will be revised as part of the proposed development the actual position of the proposed car park is similar to that of the existing car park and existing access road leading to the sports hall. Any change in noise level therefore is anticipated to be less than 3 dB, at any of the noise sensitive receivers, which would be considered as 'Not Significant' according to the IEMA guidance.

5.7 Two new grass 5v5 pitches are proposed at the position of the existing school building once demolished at the position indicated in Figure 1.

5.8 The Sport England document 'Artificial Grass Pitch (AGP) Acoustics - Planning Implications', 2015, provides guidance on noise levels for artificial pitches and Multi Use Games Areas (MUGAs), including provision of typical noise levels, stating:

"a typical free-field noise level of 58 dB $L_{Aeq(1\ hour)}$ at a distance of 10 metres (m) from the side-line halfway marking has been determined as representative for noise from an AGP."

5.9 The ground absorption of a grass pitch will change depending on weather conditions, however a grass pitch will provide at least the same amount of ground absorption as an artificial grass pitch and therefore using the measurements from an artificial grass pitch represents a prudent assumption.

5.10 The closet NSR is approximately 25 metres from the halfway side-line and based on the above guidance the resultant noise levels at the closest NSR are calculated to be around 54 dB $L_{Aeq,T}$ whilst the pitch is in use.

5.11 This noise level is below the level considered to result in 'Few seriously annoyed' according to the World Health Organisation on the assumption that the noise is continuous for the daytime period between 07:00 and 23:00.

5.12 In practice the pitches will be used only during school hours with some community use during daylight hours. This will reduce the overall daytime noise impact.

5.13 Considering the context of the proposed development being constructed on an existing school site the overall change in operational noise would be considered to have a negligible impact.

6. Conclusions

6.1 SBE has been appointed by Wates Construction Ltd to carry out a planning noise impact assessment for the proposed new Whitworth Community High School building on the site of the existing Whitworth Community High School, Whitworth, Rochdale, OL12 8TS.

6.2 The scheme involves part demolition and redevelopment of the school, including the erection of a new main school building of up to 3 storeys, reconfigured / relocated car parking, new grass pitches and landscaping.

6.3 Predicted façade noise levels are such that indoor ambient noise levels set out in BB93 are predicted to be met in all areas with appropriate specification of the building envelope, glazing and ventilation strategy.

6.4 Additional guidance to BB93 states that noise levels in unoccupied playgrounds, playing fields and other outdoor teaching areas should not exceed certain noise levels. Based on site noise levels, the external spaces are expected to meet these requirements.

6.5 Noise from new building services should be at least 5 dB below the representative background noise level. Based on measured background noise survey data, maximum plant noise rating levels at the nearest noise sensitive receptors are provided.

6.6 Assessment indicates that the development site is suitable for a new school building, and acoustic requirements for a school building can be met.

6.7 With consideration to the operational impact of the development within the context of the development site, the scheme is considered to have a negligible impact.

Appendix I. Survey Data

Miller Goodall Noise Survey

Figure B1 : Measurement Positions & NSR's

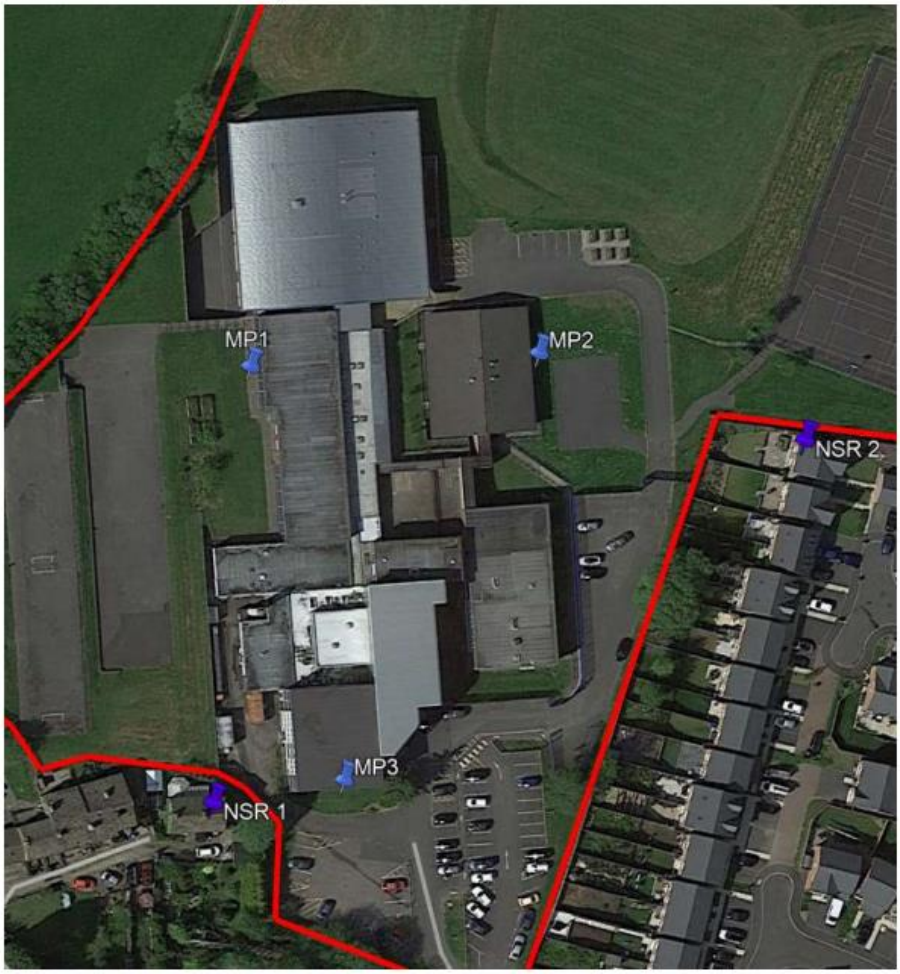

Table B3: Measured Data

Measurement Position	Start Time	Elapsed Time (min:sec)	L_{Aeq}	L_{AFmax}	L_{AF90}
MP 1	09:08	12:53	38.3	56.9	33.9
MP 2	09:27	15:00	46.7	65.7	43.5
MP 3	09:47	15:00	43.4	65.8	40.3
MP 1	10:16	15:00	39.5	59.7	37
MP 3	11:30	13:55	46.4	62.2	40.8
MP 2	11:56	15:00	46.2	61.7	43.0
MP 3	12:15	15:00	52.8	64.5	47.3

Table B4: Measured Data includes -3dB for facade reflection

Measurement Position	Start Time	Elapsed Time (min:sec)	L_{Aeq}	L_{AFmax}	L_{AF90}
MP 1	09:08	12:53	35.3	53.9	30.9
MP 2	09:27	15:00	43.7	62.7	40.5
MP 3	09:47	15:00	40.4	62.8	37.3
MP 1	10:16	15:00	36.5	56.7	34.0
MP 3	11:30	13:55	43.4	59.2	37.8
MP 2	11:56	15:00	43.2	58.7	40.0
MP 3	12:15	15:00	49.8	61.5	44.3

Appendix II. 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:

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

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 III. 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 Andrew Gibson, Principal Acoustic Consultant who meets the BREEAM requirements for a suitably qualified acoustician (SQA) as follows;

1. Holds an MEng degree in Electronic and Electrical Engineering from the University of Birmingham
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 Andrew Gibson 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 IV. 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.