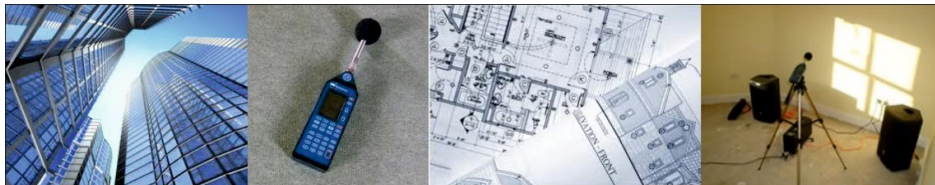


Ian Sharland LIMITED

Noise & Vibration Control Specialists

Ashfield House
Back Lane
Marlborough
Wiltshire SN8 1JJ
Telephone: (01672) 515761
Facsimile: (01672) 512761
Email: office@iansharland.co.uk



THE GATE THE MEADWAY READING RG30 4NX

ACOUSTIC DESIGN SPECIFICATION

v.1 initial draft for comment

Client:

CPL ARCHITECTS

First Floor
Unit A3, Chaucer Business Park
Ditton Road
Polegate
East Sussex
BN26 6QH

23rd October 2018

Ref: M4274

CONTENTS

1. INTRODUCTION	2
2. DESIGN CONSIDERATIONS	3
2.1 National Planning Policy Framework (July 2018).....	3
2.2 Noise Policy Statement for England	4
2.3 BS8233:2014 – 'Guidance on Sound Insulation and Noise Reduction for Buildings'	10
2.4 WHO 'Guidelines for Community Noise (1999).....	11
2.5 BS4142:2014 - 'Method for Rating and Assessing Industrial and Commercial Sound'	11
3. SURVEY OF EXISTING AMBIENT NOISE LEVELS	13
4. PREDICTIONS OF INTERNAL NOISE LEVELS	16
5. ACTIVITY NOISE BREAK-OUT FROM THE BUILDING	18
6. MECHANICAL SERVICES NOISE EMANATING FROM THE BUILDING	20
Figure 1: Ground Floor Plan	21
Figure 2: 1 st Floor Plan	22
Figure 3: 2 nd Floor Plan	22
Figure 4: SLM Location	23
Figure 5: Variation of Ambient Noise Levels.....	25
Appendix A: Calculation of Predicted Internal Noise Levels.....	26
Appendix B: Calculation of Predicted Noise Levels at Nearest Facade	41
Appendix C: Terminology Relating To Noise	49

Project Reference	M4274
Issue No.	1
Reviewed	Richard Sharland MA MSc CEng MIOA
Signature	
Author	Eddie Oxborough MSc MIOA
Signature	
Date	23 rd October 2018

This report has been prepared by Ian Sharland Ltd with all reasonable skill, care and diligence, and taking account of the Services and the Terms agreed between Ian Sharland Ltd and the Client. This report is confidential to the client, and Ian Sharland Ltd accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known, unless formally agreed by Ian Sharland Ltd beforehand. Any such party relies upon the report at their own risk.

Ian Sharland Ltd disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the Services.

1. INTRODUCTION

- 1.1 Ian Sharland Limited has been instructed by CPL Architects to consider the acoustic design implications for the redevelopment of The Gate, The Meadway, Reading, RG30 4NX.
- 1.2 The scheme involves the redevelopment of the existing building to provide a new church and community centre (see Figures 1, 2 & 3 – Proposed Floor Plans).
- 1.3 As part of the overall design of the project, it will be necessary to ensure that the acoustic performance provides acceptable conditions both inside and outside the new building. The primary considerations are as follows:
 - (i) To control the level of external environmental noise breaking into the building;
 - (ii) To ensure noise breaking out of the new building does not adversely affect existing neighbouring residents;
 - (iii) To provide sufficient airborne and impact sound insulation between adjacent areas within the new building;
 - (iv) To design primary performance and meeting areas with an appropriate level of acoustic absorption, thereby providing acceptable acoustic conditions within each noise-sensitive room.
- 1.4 This report discusses the works involved in each of these areas, and the recommendations which should be included within the final specification of works.

2. DESIGN CONSIDERATIONS

- 2.0 This section of the report will describe acoustic standards and guidelines which will be pertinent to the design of the new building.

2.1 National Planning Policy Framework (July 2018)

- 2.1.1 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for housing and other development can be produced.
- 2.1.2 Planning law requires that applications for planning permission be determined in accordance with the development plan, unless material considerations indicate otherwise. The National Planning Policy Framework must be taken into account in preparing the development plan and is a material consideration in planning decisions. Planning policies and decisions must also reflect relevant international obligations and statutory requirements.
- 2.1.3 The purpose of the planning system is to contribute to the achievement of sustainable development. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs.
- 2.1.4 Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):
- a) an economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;
 - b) a social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and
 - c) an environmental objective – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.
- 2.1.5 These objectives should be delivered through the preparation and implementation of plans and the application of the policies in this Framework; they are not criteria against which every decision can or should be judged. Planning policies and decisions should play an active role in guiding

development towards sustainable solutions, but in doing so should take local circumstances into account, to reflect the character, needs and opportunities of each area.

2.1.6 So that sustainable development is pursued in a positive way, at the heart of the Framework is a presumption in favour of sustainable development

2.1.7 Paragraph 180 of the NPPF states:

180. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account 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 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 life¹*
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*
- c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

2.1.8 The Framework continues:

182. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.

183. The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.

2.2 Noise Policy Statement for England

¹ Refers here to the NPSE, discussed in Section 4.2 of this report.

- 2.2.1 The document "Noise Policy Statement for England" sets out the following vision for on-going noise policy:

"Promote good health and quality of life through the effective management of noise within the context of Government policy on sustainable development."

This vision should be achieved through the following Noise Policy Aims:

"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".*

- 2.2.2 To achieve these objectives the Noise Policy Statement sets out three noise levels to be defined by the assessor:

- **NOEL** - No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level there is no detectable effect on health and quality of life due to the noise.

- **LOAEL** - Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected. Where levels lie between the LOAEL and SOAEL, the Statement requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development, as set out in the NPPF.

- **SOAEL** - Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur. It notes, however, that "it is not possible to have a single objective noise-based measure that describes 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".

- 2.2.3 Paragraph 2.7 states that "... the application of the NPSE should enable noise to be considered alongside other relevant issues and not to be considered in isolation. In the past, the wider benefits of a particular policy, development or other activity may not have been given adequate weight when assessing the noise implications".

- 2.2.4 This provides clear guidance that noise must not be considered in isolation but as part of the overall scheme, taking into account the overall sustainability and associated impacts of the proposed development; there is no benefit in reducing noise to an excessively low level if this

creates or increases some other adverse impact. Similarly, it may be appropriate in some cases for noise to have an adverse impact if this is outweighed by the reduction or removal of some other adverse impact that is of greater significance to the development as a whole.

- 2.2.5 The Noise Policy Statement considers that noise levels above the SOAEL would be seen to have, by definition, significant adverse effects and would be considered unacceptable. Where the assessed noise levels fall between the LOAEL and the SOAEL noise levels, the Policy Statement requires that:

"all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development... .. This does not mean that such adverse effects cannot occur."

- 2.2.6 Where noise levels are below the LOAEL it is considered there will be no adverse effect. Once noise levels are below the NOEL there will be no observable change. An indication of the numerical definition of LOAEL may be derived from the following guidance.

2.3 DCLG Guidance Note 'Noise' (August 2013)

- 2.3.1 The Department of Communities and Local Government provided further guidance to support the NPPF. The section, Noise, published in August 2013 advises:

Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. When preparing local or neighbourhood plans, or taking decisions about new development, there may also be opportunities to consider improvements to the acoustic environment.

Noise may override other planning concerns in certain circumstances, neither the [Noise Policy Statement for England](#) nor the National Planning Policy Framework (which reflects the Noise Policy Statement) expects noise to be considered in isolation, separately from the economic, social and other environmental dimensions of proposed development.

Local planning authorities' plan-making and decision taking should take account of the acoustic environment and in doing so consider:

- *whether or not a significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur; and*
- *whether or not a good standard of amenity can be achieved.*

This would include identifying whether the overall effect of the noise exposure is, or would be, above or below the [significant observed adverse effect level](#) and the lowest observed adverse effect level for the given situation.

At the lowest extreme, when noise is not noticeable, there is by definition no effect. As the noise exposure increases, it will cross the no observed effect level as it becomes noticeable. However, the noise has no adverse effect so long as the exposure is such that it does not cause any change in behaviour or attitude. The noise can slightly affect the acoustic character of an area but not to the extent there is a perceived change in quality of life. If the noise exposure is at this level no specific measures are required to manage the acoustic environment.

As the exposure increases further, it crosses the lowest observed adverse effect level boundary above which the noise starts to cause small changes in behaviour and attitude, for example, having to turn up the volume on the television or needing to speak more loudly to be heard. The noise therefore starts to have an adverse effect and consideration needs to be given to mitigating and minimising those effects (taking account of the economic and social benefits being derived from the activity causing the noise).

Increasing noise exposure will at some point cause the significant observed adverse effect level boundary to be crossed. Above this level the noise causes a material change in behaviour such as keeping windows closed for most of the time or avoiding certain activities during periods when the noise is present. If the exposure is above this level the planning process should be used to avoid this effect occurring, by use of appropriate mitigation such as by altering the design and layout. Such decisions must be made taking account of the economic and social benefit of the activity causing the noise, but it is undesirable for such exposure to be caused.

At the highest extreme, noise exposure would cause extensive and sustained changes in behaviour without an ability to mitigate the effect of noise. The impacts on health and quality of life are such that regardless of the benefits of the activity causing the noise, this situation should be prevented from occurring.

2.3.2 The table below summarises the noise exposure hierarchy, based on the likely average response:

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level	
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

2.3.3 The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation. These factors include:

- *the source and absolute level of the noise together with the time of day it occurs. Some types and level of noise will cause a greater adverse effect at night than if they occurred during the day – this is because people tend to be more sensitive to noise at night as they are trying to sleep. The adverse effect can also be greater simply because there is less background noise at night;*
- *for non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise;*
- *the spectral content of the noise (i.e. whether or not the noise contains particular high or low frequency content) and the general character of the noise (i.e. whether or not the noise contains particular tonal characteristics or other particular features). The local topology and topography should also be taken into account along with the existing and, where appropriate, the planned character of the area.*

2.3.4 The adverse effects of noise may be mitigated in one of the four broad approaches:

- *engineering;*
- *layout;*
- *using planning conditions/obligations to restrict activities; and*
- *mitigating the impact on areas likely to be affected by noise.*

2.3.5 The noise impact on residential developments may be partially off-set if the residents of those dwellings have access to:

- *a relatively quiet facade (containing windows to habitable rooms) as part of their dwelling, and/or;*
- *a relatively quiet external amenity space for their sole use, (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced with increasing noise exposure and could be such that significant adverse effects occur, and/or;*
- *a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings, and/or;*
- *a relatively quiet, protected, external publically accessible amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minutes walking distance).*

2.4 BS8233:2014 – 'Guidance on Sound Insulation and Noise Reduction for Buildings'

- 2.4.1 There is much guidance on the levels of intrusive noise which would be considered acceptable within residential accommodation and new buildings. Typical advice is found in British Standard 8233:2014 "Guidance on Sound Insulation and Noise Reduction for buildings". Following similar guidance in the 1999 World Health Organisation report "Guidelines for Community Noise", the Standard sets out the following limits for indoor ambient noise levels within living rooms and bedrooms. This suggests:

BS 8233 Guideline Values

Activity	Location	0700 - 2300	2300 - 0700
Resting	Living Room	35 dB(A) LAeq, 16 hr	-
Dining	Dining room/Area	40 dB(A) LAeq, 16 hr	-
Sleeping	Bedroom	35 dB(A) LAeq, 16 hr	30 dB(A) LAeq, 8 hr

- 2.4.2 It is usually considered that an open window will provide a reduction of some 10-15 dB(A)². Therefore the 'good' internal standards quoted above would equate to the following targets immediately outside:

Activity	Location	0700 - 2300	2300 - 0700
Resting	Living Room	48 dB(A) LAeq, 16 hr	-
Dining	Dining room/Area	53 dB(A) LAeq, 16 hr	-
Sleeping	Bedroom	48 dB(A) LAeq, 16 hr	43 dB(A) LAeq, 8 hr

- 2.4.3 BS8233 recognises that, where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB, and reasonable conditions will be achieved.
- 2.4.4 For non-domestic buildings, Table 6 within the standard suggests the following limits for internal ambient noise levels;

Activity	Location	Design Range dB LAeq,T
Speech or telephone communications	Department store	50 – 55
	Cafeteria, canteen, kitchen	
	Concourse Corridor, Circulation Space	45 - 55
Study and work requiring concentration	Library, Gallery, Museum	40 - 50
	Staff meeting room, training room	35 - 45
	Executive office	35 - 40

² Reference PPG24 Planning & Noise, which adopted a mid-range value of 13 dB(A)

Listening	Place of worship, counselling, meditation, relaxation	30 - 35
-----------	--	---------

- 2.4.5 It should be noted that the levels quoted in BS8233 are intended to reflect the acceptability of steady, continuous noise. Sources of intermittent and tonal noise may generate greater annoyance for a similar overall magnitude. Whilst BS8233 does not explicitly state a correction for those circumstances, it may be appropriate to consider that the Good and Reasonable standards would be achieved with levels which are perhaps 5 dB lower than stated in the table above.
- 2.4.6 It is also noted that BS8233 was written from a view of designing new buildings to protect occupants from existing noise sources. This does necessarily infer, however, that the acceptability of an occupant to an absolute level noise within a building will be different if the introduction of the noise source post-dates the construction of the building.

2.5 WHO 'Guidelines for Community Noise (1999)

- 2.5.1 The World Health Organisation indicates that, to protect the majority of people from being seriously annoyed during the daytime, the sound pressure level on balconies, terraces and outdoor living areas should not exceed 55 dB L_{Aeq} for a steady, continuous noise. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound pressure level should not exceed 50 dB L_{Aeq} .
- 2.5.2 The document also provides guidance on the impact of peak noise levels on sleeping conditions. This suggests that levels above 45 dB(A) L_{Amax} inside a bedroom would be disturbing to sleep. With windows open, this would equate to a level of approximately 58 dB(A) L_{Amax} externally.

2.6 BS4142:2014 - 'Method for Rating and Assessing Industrial and Commercial Sound'

- 2.6.1 Any formal assessment of noise arising from mechanical equipment affecting existing residential properties would usually be based upon the recommendations of British Standard 4142:2014 "Method for rating and assessing industrial and commercial sound".
- 2.6.2 In brief, this rating method determines "specific sound level" generated by the new plant, assessed immediately outside the residential properties most likely to be affected. For daytime (07.00 – 23.00hrs) only operation of the new plant, this would be the equivalent continuous noise level of the new noise, evaluated over a 1hr sampling period, its $L_{Aeq,1hr}$. For plant operating during the night-time (23.00 – 07.00 hrs) only the reference time interval is 15mins.

- 2.6.3 Corrections of up to + 9 dB (A) are then made to this “specific sound level” if the new noise has certain acoustic features such as tonality, impulsivity, intermittency and any other sound characteristics, to give the "rating level".
- 2.6.4 An assessment of the impact of the specific sound level can be determined by subtracting the measured background level from the rating level, and consider the following;
- a) Typically, the greater this difference, the greater the magnitude of the impact.
 - b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
 - c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
 - d) 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.
- NOTE: Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.*
- 2.6.5 It is usually good practice to ensure to design new plant to a level which would be effectively inaudible to neighbouring residents, namely 10 dB below the existing ambient climate.

3. SURVEY OF EXISTING AMBIENT NOISE LEVELS

- 3.1 In order to assess the likely levels of noise affecting the façade of the new building and the potential break-out noise from the building onto nearby residential properties, a noise survey was undertaken at the site between Thursday 11th and Tuesday 16th October 2018.
- 3.2 The Gate is situated between The Meadway and Keswick Drive, west of Reading city centre, (see Figure 4 – Site Location).
- 3.3 A Rion-NL52 sound level meter was located on the roof at the northern end of the existing church overlooking houses of Keswick Drive, with the microphone attached to an extendable light stand and temporarily fixed to the boiler flue stack, (see Figure 4 – Sound Level Meter Location).
- 3.4 The meter was configured to record 5 minutes samples of the following acoustic parameters:
- L_{Aeq} The A-weighted equivalent continuous sound pressure level which, over the sample period, contains the same acoustic energy as the time-varying signal being recorded.
- L_{Amax} The A-weighted maximum sound pressure level recorded during each sample period (as measured on fast response).
- L_{A90} A statistical parameter, representing the A-weighted noise level exceeded for 90% of each sample period. This gives a measure of the underlying noise and is commonly used to describe the ambient background noise.
- 3.5 The equipment was calibrated before and after the survey and showed no significant variance. Weather conditions throughout the survey period are shown in the following table:

Date	Average Temperature (°C)	Rain (mm)	Average Wind Speed (m/s)	Wind Direction
Thursday 11/10	16	0.0	6.1	SSE
Friday 12/10	16	0.2	9.7	S
Saturday 13/10	20	0.0	8.5	S
Sunday 14/10	10	0.0	4.7	NNW
Monday 15/10	10	0.4	4.2	NNE
Tuesday 16/10	14	0.0	2.5	SSE

Information supplied by: Wunderground.com

- 3.6 Figure 5 provides a graphical representation of the measured noise levels received during the survey.

3.7 Whilst the existing church is empty, the main noise sources appear to be traffic on The Meadway and Keswick Drive, there is also a boiler exhaust stack on the roof at the north end of the building.

3.8 During the course of the survey, there were services and other activities taking place within the church. These included:

Messy Church	Friday 12 th , 10.00 - 11.30am
Intercessors	Friday 12 th , 19.00 – 20.30pm
Prayer Service	Sunday 14 th , 09.00 – 10.30am
Celebration Service	Sunday 14 th , 11.00 – 12.30am

3.9 Reference to the survey data shown in Figure 5 does not indicate any particularly significant increase in levels externally during these periods (short term uplifts are concluded to be due to a boiler flue located close to the survey location).

3.10 The table below confirms the highest measured levels ($L_{Aeq,30mins}$ and $L_{Amax,fast}$), during each of the standard day time (07.00 – 23.00hrs) periods, as well as the lowest background $L_{A90,5mins}$ during each of the standard day time (07.00 – 23.00hrs) and night-time (23.00 – 07.00 hrs) periods:

Period		Day Time $L_{Aeq, 16hrs}$	Day Time $L_{Aeq, 30mins}$	Typical $L_{Amax, fast}$ Daytime	Typical $L_{A90,5mins}$ Day / Night ³
Thursday 11/10	dB(A)	48.9*	44 – 53	66	42 / 35
Friday 12/10	dB(A)	51.0	48 – 54	67	45 / 37
Saturday 13/10	dB(A)	50.0	42 – 55	66	38 / 28
Sunday 14/10	dB(A)	51.7	42 – 55	68	39 / 31
Monday 15/10	dB(A)	48.2	40 - 51	66	36 / 27
Tuesday 16/10	dB(A)	62.1* ⁴	n/a	n/a	

*Part measurements

3.11 The L_{Amax} levels shown in the tables above are the peak values based on the 90th percentile and may exclude exceptional 'one-off' events which occurred during the day.

³ These are the most frequent measurements during each of the daytime and night-time periods and may not be the lowest.

⁴ This noise level as a result of noise from the boiler flue.

3.12 From the survey, the following key information may be determined:

Period	Typical Background Noise Levels	Typical Noise Levels
07.00 – 2300	36 dB(A) L_{A90}	50 dB(A) L_{Aeq} , 30 mins ⁵ 48 dB(A) L_{Aeq} , 16 hrs
23.00 – 07.00	27 dB(A) L_{A90}	-

⁵ This is the typical noise level that occurs most frequently during the survey period.

4. PREDICTIONS OF INTERNAL NOISE LEVELS

4.1 Table 1 confirms the recommended noise limits for each room within the new development;

Table 1: Recommended internal noise targets

Space	Limiting Background Noise Levels dB(A) $L_{Aeq,30mins}$
Ground Floor	
<i>Foyer/Lobby</i>	45 - 55
<i>Kitchen / Cafe</i>	50 - 55
<i>Meeting Rooms</i>	35 - 45
<i>Sanctuary</i>	45 - 55
<i>Toilets</i>	45 - 50
1st Floor	
<i>Toilets</i>	45 - 50
<i>Offices</i>	35 - 40
<i>Kitchen</i>	50 - 55
<i>Meeting Rooms</i>	35 - 45
2nd Floor	
<i>Meeting Rooms</i>	35 - 45
<i>Offices</i>	35 - 40
<i>Prayer Room</i>	30 - 35
<i>Art Studio</i>	35 - 45

4.2 The facade of the building should be designed to ensure external noise is limited to these levels, and any new building services plant serving the rooms should also be designed with these targets included within the specification.

4.3 It is understood from the drawings supplied that the building shell will be made up with the following constructions, and the assessment of intrusive noise will be based on these assumptions:

External Walls: Partly 100mm Stonework facing, 100mm cavity with 60mm Celotex insulation and 150mm internal blockwork with 2 x 12.5mm plasterboard on dabs.

External Glazing: 4 / 12 / 6 in Sanctuary, 4 / 12 / 4 in all other rooms

External Doors: Solid timber doors, with seals all round to provide a sound insulation of R_w of 30 – 35 dB.

Flat Roof: Sedum roof finish: Single Ply fully adhered Metal deck with plasterboard ceiling Vapour Control Layer - 170mm King span Thermaroom TR27 LPC/FM or equal approved on top of metal deck.

Pitched Roof: Copper finish on 22mm ply 50x50mm counter battens with vapour barrier - 170mm King span insulation or equal approved on top of metal purlins and steel rafters with 12.5mm plasterboard ceiling.

- 4.4 Based on the external constructions outlined above, Table 2 confirms the predicted internal noise levels for each of the areas within the building - firstly when windows are closed (assuming the rooms are ventilated by mechanical means) or with windows closed but open trickle vents (assumed to be a standard type). Appendix A provides calculations to substantiate the predictions.

Table 2 - Predicted Internal Noise Levels: Ground Floor

Space	Internal Target L _{Aeq} , 30 min dB(A)	Predicted Internal Level L _{Aeq} , 30 mins dB(A)	
		Windows Closed No Vents	Windows Closed c/w Trickle Vents
Ground Floor			
Entrance Hall / Lobby	45 - 55	24	26
Kitchen / Cafe	50 - 55	30	30
Meeting Prayer	30 - 35	16	16
Sanctuary	45 - 55	12	12
Toilets	45 - 50	20	23
1 st Floor			
Toilets	45 – 55	20	23
Meeting 01	35 - 45	17	16
Meeting 02	35 - 45	18	19
Meeting 03	35 - 45	28	28
Meeting 04	35 - 45	25	26
Meeting 05	35 - 45	17	16
2 nd Floor			
Open Plan Office	35 - 40	26	27
Youth Office	35 - 40	26	27
Yinka’s Office	35 - 40	23	23
Art Studio	35 – 45	22	23
Prayer Room / Meeting Room	30 - 35	21	22

- 4.5 It can be seen from Table 2 that all rooms will fall within the target noise levels based on the external facade constructions stated in section 4.1.3.

5. ACTIVITY NOISE BREAK-OUT FROM THE BUILDING

- 5.1 The new building will be approximately 16m from existing residential dwellings to the west, 35m to the south, 18m to the east and 21m to the north and therefore, consideration should be taken into account of noisy activities within the building impinging on the nearby residents.
- 5.2 In respect of activity within the new building, it is recommended that noise be limited to a level which is some 10 dB below the lowest existing ambient levels. Therefore, based on use between the hours of 07.00 - 23.00, the following limit should be adopted⁶:

Noise from any activity within the new building shall be limited to the following noise level, assessed at 1m from the facade of neighbouring residential properties:

07.00 – 23.00 40 dB(A) $L_{Aeq,30mins}$

- 5.3 Sections 2.3.2 & 2.4.1 of this report have stated the following criteria for noise levels affecting residents, and it is suggested that these noise levels also be used to assess noise emanating from inside the building:

Standard	Condition	Target
BS8233	At Residential Facade Level (to allow for open windows)	<48 dB(A) $L_{Aeq,16hrs}$
WHO	Outdoor amenity areas	<50 dB(A) L_{Aeq}

- 5.4 Appendix B provides detailed calculations of the expected noise break-out from most onerous areas of the church, based on the following maximum internal noise levels:

Church Hall & Cafe	90 dB(A) $L_{Aeq,30mins}$
Standard Meeting Rooms	70 dB(A) $L_{Aeq,30mins}$
Offices	60 dB(A) $L_{Aeq,30mins}$

- 5.5 Predictions are offered for the situation with windows/doors closed and, if relevant, open:

⁶ If the building is to be used outside these hours for noisy activities, a further assessment will be required.

Source	Elevation	Predicted Noise Level at Neighbouring Facade L _{Aeq,30mins} dB(A)	
		Windows Shut	Windows / Doors Open
Ground Floor			
Sanctuary	North	34	45
Sanctuary	West	40	53
Sanctuary	East	39	52
Cafe	North	33	46
Cafe	South	38	51
Cafe	East	40	53
1 st Floor			
Meeting 01	West	22	35
Meeting 02	West	22	35
Meeting 03	South	22	35
Meeting 04	South	21	34
Meeting 05	East	21	34
2 nd Floor			
Open Plan Office	West	13	26
Open Plan Office	South	9	21
Yinka’s Office	West	14	27
Youth Office	East	12	25

- 5.6 The table above shows that the predicted noise levels at the adjacent neighbouring houses will meet the suggested criteria, if the windows are closed.
- 5.7 If windows were open in rooms on the 1st and 2nd floors, it would be also being concluded that residual noise emanating from the building would be acceptable.
- 5.8 The only exception indicated by calculations would be noise breakout from the Sanctuary and Café if windows were open.
- 5.9 It is therefore noted that the Sanctuary and Café spaces must be managed to ensure that, whenever internal noise levels exceed 75 dB(A), all windows or doors must be kept closed.

6. MECHANICAL SERVICES NOISE EMANATING FROM THE BUILDING

- 6.1 As indicated earlier, noise from Building Services plant should be designed in accordance with the guidance of British Standard 4142:2014 "Method for rating and assessing industrial and commercial sound".
- 6.2 It is usually good practice to ensure to design new plant to a level which would be effectively inaudible to neighbouring residents, namely 10 dB below the existing ambient climate.
- 6.3 It is understood that the building will generally be used during the hours of, say 07.00 – 23.00, and that any plant would therefore be limited to these hours. However, it is possible that some equipment may operate overnight.
- 6.4 It is therefore recommended that the following design targets be applied to the project:

Noise from any new building services plant shall be limited to the following noise levels, assessed at 1m from the facade of neighbouring residential properties:

07.00 – 23.00hrs	26 dB(A) $L_{Aeq,1hr}$
23.00 – 07.00hrs	17 dB(A) $L_{Aeq,15mins}$

If the noise from the plant is tonal or intermittent, these limits should be reduced to account for the acoustic characteristics of the noise as recommended in BS4142.

- 6.5 Within the building, it will similarly be necessary to control noise to suitable levels. The table below indicates the maximum acceptable noise arising from mechanical plant:

Room Type	Limiting Noise Rating (NR) Target
Sanctuary	NR25
Meeting Rooms	NR30
Office/Prayer	NR25
Corridors & Circulation Areas	NR35
Kitchen	NR40
W/Cs, Changing Rooms	NR35

Figure 1: Ground Floor Plan



Figure 2: 1st Floor Plan

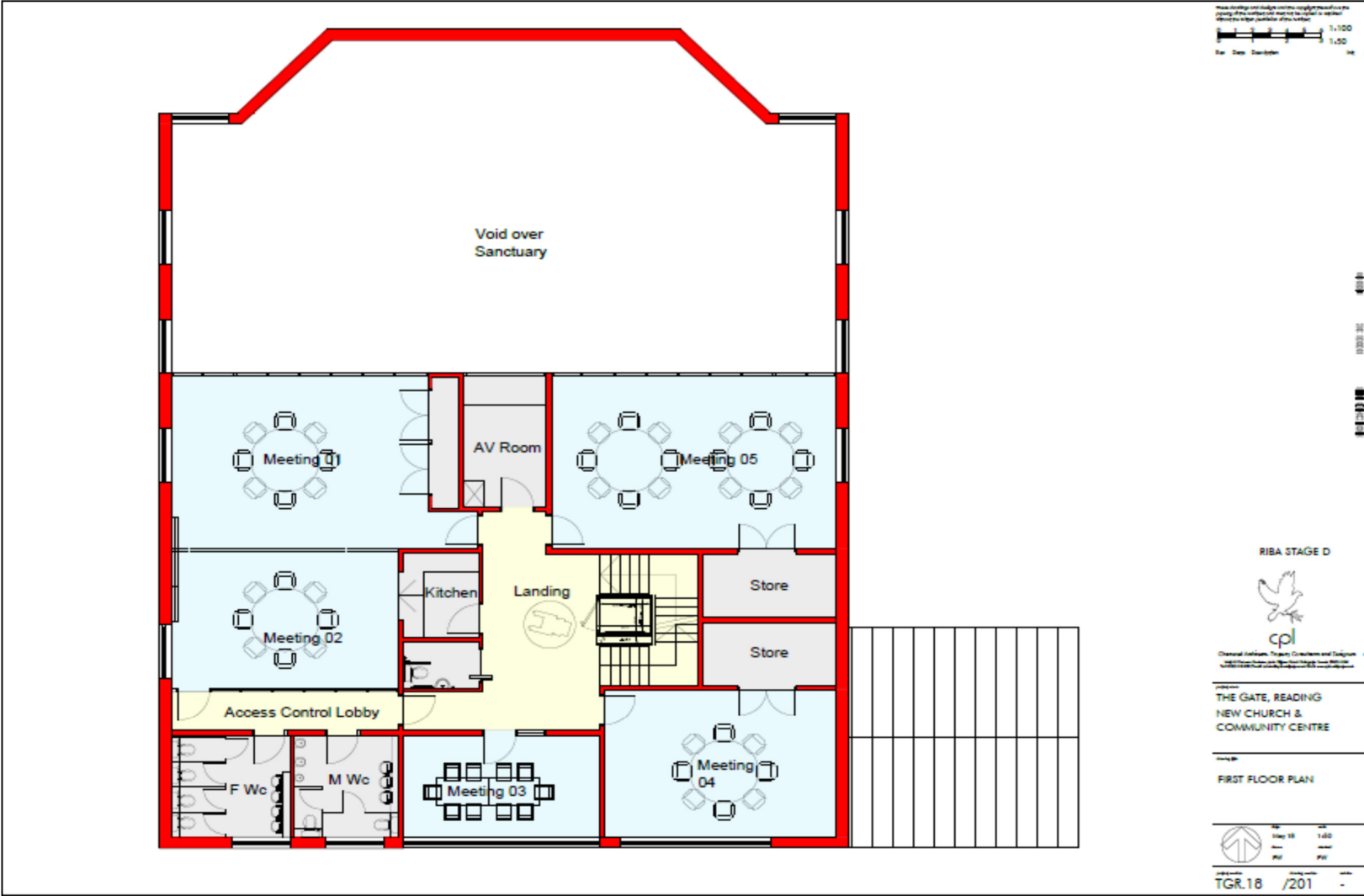


Figure 3: 2nd Floor Plan



Figure 4: SLM Location

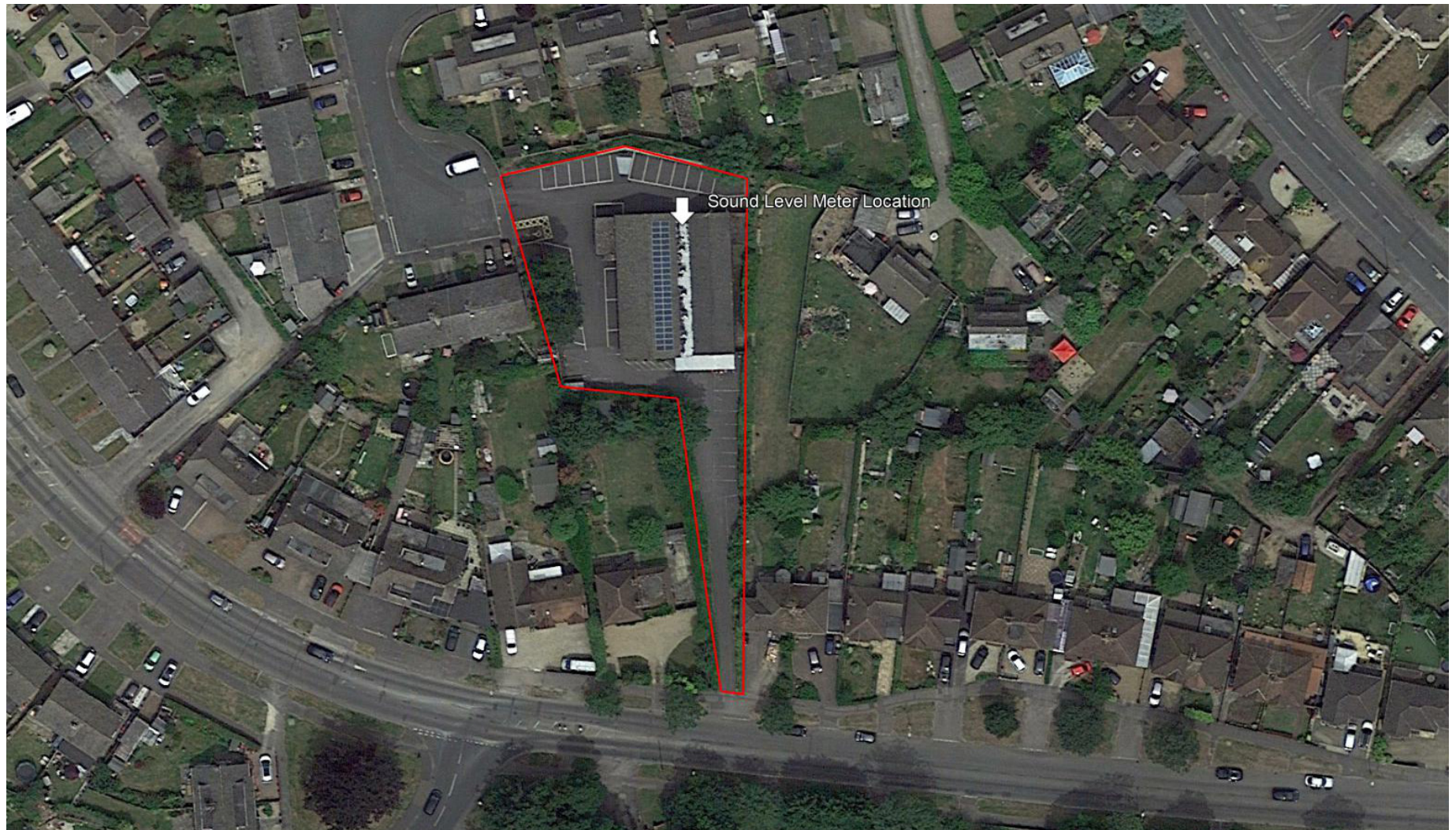
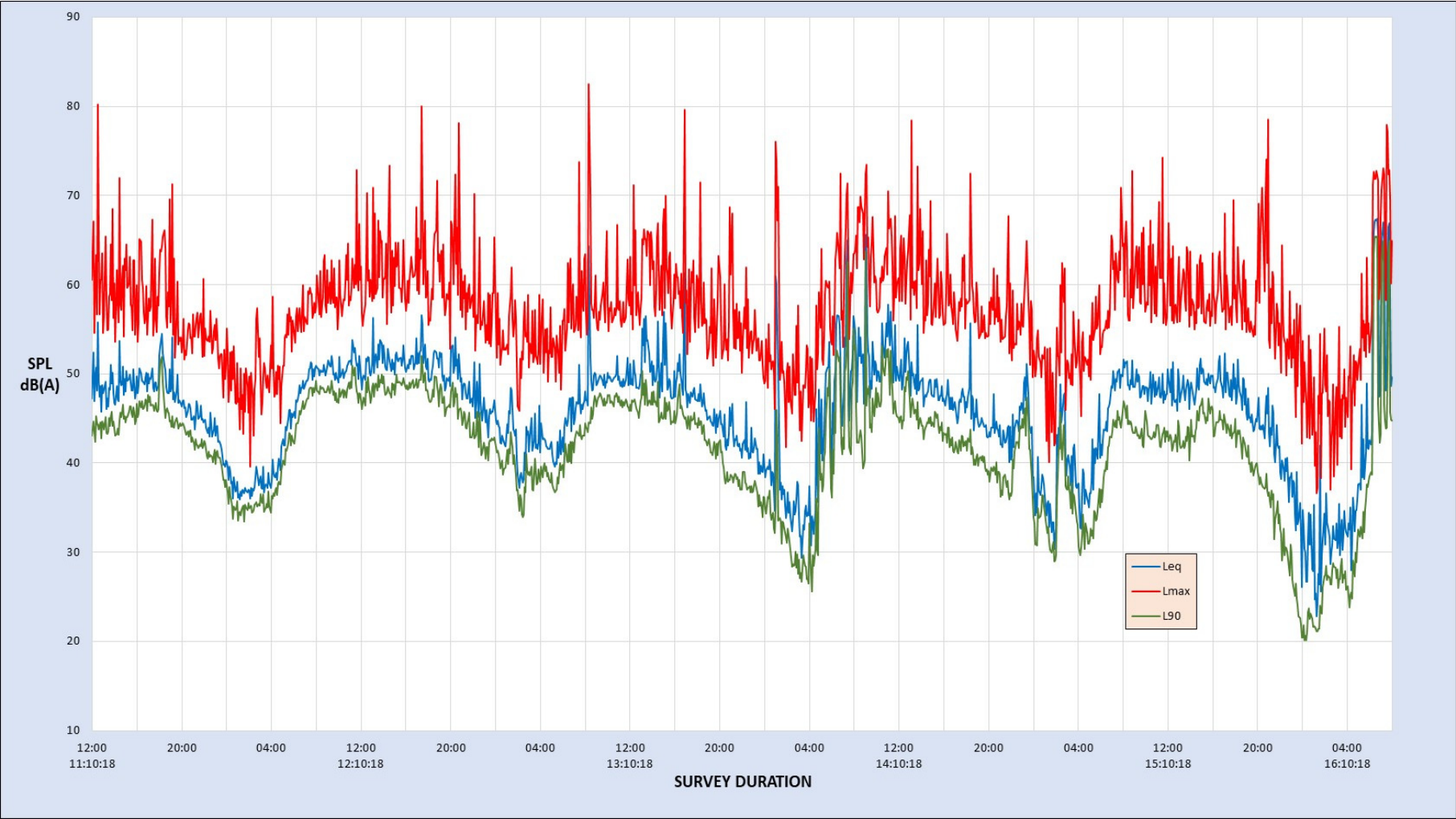


Figure 5: Variation of Ambient Noise Levels



Appendix A: Calculation of Predicted Internal Noise Levels

Church Hall										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	52	44	43	43	46	45	38	26	50
Glazing Specified: 4 / 12 / 6	dB	15	27	21	29	40	39	43	40	
Area of Window	dB	29	29	29	29	29	29	29	29	
Area Correction	dB	15	15	15	15	15	15	15	15	
Likely RT in Room	sec	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Room Volume	m3	1290	1290	1290	1290	1290	1290	1290	1290	
Absorption		206	206	206	206	206	206	206	206	
Absorption Correction	dB	23	23	23	23	23	23	23	23	
Net SPL Inside	dB	28	8	13	5	-3	-3	-14	-23	9
External Wall	dB	41	46	49	47	55	65	76	76	
Area of Wall	dB	240	240	240	240	240	240	240	240	
Area Correction	dB	24	24	24	24	24	24	24	24	
Likely RT in Room	sec	1	1	1	1	1	1	1	1	
Room Volume	m3	1290	1290	1290	1290	1290	1290	1290	1290	
Absorption		206	206	206	206	206	206	206	206	
Absorption Correction	dB	23	23	23	23	23	23	23	23	
Net SPL Inside	dB	12	-1	-5	-3	-8	-19	-37	-49	-3
Dn,e Vents	dB	30	41	41	38	45	50	50	50	
10logN (number of vents)	dB	6	6	6	6	6	6	6	6	
Likely RT in Room	sec	1	1	1	1	1	1	1	1	
Room Volume	m3	1290	1290	1290	1290	1290	1290	1290	1290	
Absorption		206	206	206	206	206	206	206	206	
Absorption Correction	dB	13	13	13	13	13	13	13	13	
Net SPL inside via vent	dB	15	-4	-5	-2	-6	-12	-19	-31	-1
Combined Level from windows, wall & vents	dB	29	9	14	7	0	-2	-12	-22	10
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	32	12	17	10	3	1	-9	-19	13
Combined Level from window and wall	dB	29	9	14	6	-2	-2	-14	-23	9
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level no vents	dB	32	12	17	9	1	1	-11	-20	12

Toilets										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	55	47	46	46	49	48	41	29	53
Glazing Specified: 4 / 12 / 4	dB	13	23	18	26	38	44	38	36	
Area of Window	dB	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Area Correction	dB	-1	-1	-1	-1	-1	-1	-1	-1	
Likely RT in Room	sec	0.80	1.00	1.25	1.50	1.50	1.50	1.40	1.30	
Room Volume	m3	24	24	24	24	24	24	24	24	
Absorption		5	4	3	3	3	3	3	3	
Absorption Correction	dB	7	6	5	4	4	4	4	5	
Net SPL Inside	dB	34	17	22	15	6	-1	-2	-13	17
External Wall	dB	41	46	49	47	55	65	76	76	
Area of Wall	dB	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	
Area Correction	dB	8	8	8	8	8	8	8	8	
Likely RT in Room	sec	0.8	1	1.25	1.5	1.5	1.5	1.4	1.3	
Room Volume	m3	24	24	24	24	24	24	24	24	
Absorption		5	4	3	3	3	3	3	3	
Absorption Correction	dB	7	6	5	4	4	4	4	5	
Net SPL Inside	dB	15	3	0	3	-2	-13	-31	-44	3
Dn,e Vents	dB	30	41	41	38	45	50	50	50	
10logN (number of vents)	dB	3	3	3	3	3	3	3	3	
Likely RT in Room	sec	0.8	1	1.25	1.5	1.5	1.5	1.4	1.3	
Room Volume	m3	24	24	24	24	24	24	24	24	
Absorption		5	4	3	3	3	3	3	3	
Absorption Correction	dB	-3	-4	-5	-6	-6	-6	-6	-5	
Net SPL inside via vent	dB	31	13	13	17	13	7	0	-13	18
Combined Level from windows, wall & vents	dB	36	19	23	19	14	8	2	-10	20
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	39	22	26	22	17	11	5	-7	23
Combined Level from window and wall	dB	34	17	22	15	7	-1	-2	-13	17
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level no vents	dB	37	20	25	18	10	2	1	-10	20

Entrance Hall										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	55	47	46	46	49	48	41	29	53
Glazing Specified: 4 / 12 / 4	dB	13	23	18	26	38	44	38	36	
Area of Window	dB	13	13	13	13	13	13	13	13	
Area Correction	dB	11	11	11	11	11	11	11	11	
Likely RT in Room	sec	0.80	1.00	1.25	1.50	1.50	1.50	1.40	1.30	
Room Volume	m3	95	95	95	95	95	95	95	95	
Absorption		19	15	12	10	10	10	11	12	
Absorption Correction	dB	13	12	11	10	10	10	10	11	
Net SPL Inside	dB	40	23	28	21	12	5	4	-7	23
External Wall	dB	41	46	49	47	55	65	76	76	
Area of Wall	dB	1	1	1	1	1	1	1	1	
Area Correction	dB	0	0	0	0	0	0	0	0	
Likely RT in Room	sec	0.8	1	1.25	1.5	1.5	1.5	1.4	1.3	
Room Volume	m3	95	95	95	95	95	95	95	95	
Absorption		19	15	12	10	10	10	11	12	
Absorption Correction	dB	13	12	11	10	10	10	10	11	
Net SPL Inside	dB	1	-11	-14	-11	-16	-27	-45	-58	-11
Dn,e Vents	dB	30	41	41	38	45	50	50	50	
10logN (number of vents)	dB	6	6	6	6	6	6	6	6	
Likely RT in Room	sec	0.8	1	1.25	1.5	1.5	1.5	1.4	1.3	
Room Volume	m3	95	95	95	95	95	95	95	95	
Absorption		19	15	12	10	10	10	11	12	
Absorption Correction	dB	3	2	1	0	0	0	0	1	
Net SPL inside via vent	dB	28	10	10	14	10	4	-3	-16	15
Combined Level from windows, wall & vents	dB	41	24	28	22	14	8	5	-6	24
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	44	27	31	25	17	11	8	-3	27
Combined Level from window and wall	dB	40	23	28	21	12	5	4	-7	23
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level no vents	dB	43	26	31	24	15	8	7	-4	26

1st Floor Toilets										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	55	47	46	46	49	48	41	29	53
Glazing Specified: 4 / 12 / 4	dB	13	23	18	26	38	44	38	36	
Area of Window	dB	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Area Correction	dB	-1	-1	-1	-1	-1	-1	-1	-1	
Likely RT in Room	sec	0.80	1.00	1.25	1.50	1.50	1.50	1.40	1.30	
Room Volume	m3	26	26	26	26	26	26	26	26	
Absorption		5	4	3	3	3	3	3	3	
Absorption Correction	dB	7	6	5	4	4	4	5	5	
Net SPL Inside	dB	34	17	22	15	6	-1	-3	-13	17
External Wall	dB	41	46	49	47	55	65	76	76	
Area of Wall	dB	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	
Area Correction	dB	9	9	9	9	9	9	9	9	
Likely RT in Room	sec	0.8	1	1.25	1.5	1.5	1.5	1.4	1.3	
Room Volume	m3	26	26	26	26	26	26	26	26	
Absorption		5	4	3	3	3	3	3	3	
Absorption Correction	dB	7	6	5	4	4	4	5	5	
Net SPL Inside	dB	16	4	0	3	-2	-13	-31	-43	3
Dn,e Vents	dB	30	41	41	38	45	50	50	50	
10logN (number of vents)	dB	3	3	3	3	3	3	3	3	
Likely RT in Room	sec	0.8	1	1.25	1.5	1.5	1.5	1.4	1.3	
Room Volume	m3	26	26	26	26	26	26	26	26	
Absorption		5	4	3	3	3	3	3	3	
Absorption Correction	dB	-3	-4	-5	-6	-6	-6	-5	-5	
Net SPL inside via vent	dB	31	13	13	17	13	7	-1	-13	17
Combined Level from windows, wall & vents	dB	36	18	22	19	14	7	1	-10	20
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	39	21	25	22	17	10	4	-7	23
Combined Level from window and wall	dB	34	17	22	15	6	-1	-3	-13	17
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level no vents	dB	37	20	25	18	9	2	0	-10	20

Café										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	55	47	46	46	49	48	41	29	53
Glazing Specified: 4 / 12 / 4	dB	13	23	18	26	38	44	38	36	
Area of Window	dB	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	
Area Correction	dB	17	17	17	17	17	17	17	17	
Likely RT in Room	sec	0.80	1.00	1.25	1.50	1.50	1.50	1.40	1.30	
Room Volume	m3	155	155	155	155	155	155	155	155	
Absorption		31	25	20	17	17	17	18	19	
Absorption Correction	dB	15	14	13	12	12	12	12	13	
Net SPL Inside	dB	44	27	32	24	15	8	7	-3	27
External Wall	dB	41	46	49	47	55	65	76	76	
Area of Wall	dB	25	25	25	25	25	25	25	25	
Area Correction	dB	14	14	14	14	14	14	14	14	
Likely RT in Room	sec	0.8	1	1.25	1.5	1.5	1.5	1.4	1.3	
Room Volume	m3	155	155	155	155	155	155	155	155	
Absorption		31	25	20	17	17	17	18	19	
Absorption Correction	dB	15	14	13	12	12	12	12	13	
Net SPL Inside	dB	13	1	-2	1	-4	-15	-34	-46	1
Dn,e Vents	dB	30	41	41	38	45	50	50	50	
10logN (number of vents)	dB	10	10	10	10	10	10	10	10	
Likely RT in Room	sec	0.8	1	1.25	1.5	1.5	1.5	1.4	1.3	
Room Volume	m3	155	155	155	155	155	155	155	155	
Absorption		31	25	20	17	17	17	18	19	
Absorption Correction	dB	5	4	3	2	2	2	2	3	
Net SPL inside via vent	dB	30	12	12	16	12	6	-1	-14	17
Combined Level from windows, wall & vents	dB	44	27	32	25	17	10	8	-3	27
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	47	30	35	28	20	13	11	0	30
Combined Level from window and wall	dB	44	27	32	25	16	9	7	-3	27
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level no vents	dB	47	30	35	28	19	12	10	0	30

Meeting Prayer										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	52	44	43	43	46	45	38	26	50
Glazing Specified: 4 / 12 / 4	dB	13	23	18	26	38	44	38	36	
Area of Window	dB	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	
Area Correction	dB	6	6	6	6	6	6	6	6	
Likely RT in Room	sec	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	
Room Volume	m3	76	76	76	76	76	76	76	76	
Absorption		20	20	20	20	20	20	20	20	
Absorption Correction	dB	13	13	13	13	13	13	13	13	
Net SPL Inside	dB	32	14	18	10	1	-6	-7	-17	13
External Wall	dB	41	46	49	47	55	65	76	76	
Area of Wall	dB	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	
Area Correction	dB	9	9	9	9	9	9	9	9	
Likely RT in Room	sec	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	
Room Volume	m3	76	76	76	76	76	76	76	76	
Absorption		20	20	20	20	20	20	20	20	
Absorption Correction	dB	13	13	13	13	13	13	13	13	
Net SPL Inside	dB	7	-6	-10	-8	-13	-24	-42	-54	-8
Dn,e Vents	dB	30	41	41	38	45	50	50	50	
10logN (number of vents)	dB	0	0	0	0	0	0	0	0	
Likely RT in Room	sec	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	
Room Volume	m3	76	76	76	76	76	76	76	76	
Absorption		20	20	20	20	20	20	20	20	
Absorption Correction	dB	3	3	3	3	3	3	3	3	
Net SPL inside via vent	dB	19	0	-1	2	-2	-8	-15	-27	3
Combined Level from windows, wall & vents	dB	32	14	18	10	3	-4	-7	-17	13
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	35	17	21	13	6	-1	-4	-14	16
Combined Level from window and wall	dB	32	14	18	10	1	-6	-7	-17	13
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level no vents	dB	35	17	21	13	4	-3	-4	-14	16

Meeting 01 & 05										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	52	44	43	43	46	45	38	26	50
Glazing Specified: 4 / 12 / 4	dB	13	23	18	26	38	44	38	36	
Area of Window	dB	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	
Area Correction	dB	6	6	6	6	6	6	6	6	
Likely RT in Room	sec	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	
Room Volume	m3	85	85	85	85	85	85	85	85	
Absorption		17	17	17	17	17	17	17	17	
Absorption Correction	dB	12	12	12	12	12	12	12	12	
Net SPL Inside	dB	32	14	18	10	1	-6	-7	-17	13
External Wall	dB	41	46	49	47	55	65	76	76	
Area of Wall	dB	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	
Area Correction	dB	9	9	9	9	9	9	9	9	
Likely RT in Room	sec	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Room Volume	m3	85	85	85	85	85	85	85	85	
Absorption		17	17	17	17	17	17	17	17	
Absorption Correction	dB	12	12	12	12	12	12	12	12	
Net SPL Inside	dB	8	-5	-9	-7	-12	-23	-41	-53	-7
Dn,e Vents	dB	30	41	41	38	45	50	50	50	
10logN (number of vents)	dB	0	0	0	0	0	0	0	0	
Likely RT in Room	sec	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Room Volume	m3	85	85	85	85	85	85	85	85	
Absorption		17	17	17	17	17	17	17	17	
Absorption Correction	dB	2	2	2	2	2	2	2	2	
Net SPL inside via vent	dB	20	1	0	3	-1	-7	-14	-26	4
Combined Level from windows, wall & vents	dB	33	15	19	11	3	-3	-6	-16	14
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	36	18	22	14	6	0	-3	-13	17
Combined Level from window and wall	dB	33	15	19	11	2	-5	-7	-17	13
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level no vents	dB	36	18	22	14	5	-2	-4	-14	16

Meeting 02										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	52	44	43	43	46	45	38	26	50
Glazing Specified: 4 / 12 / 4	dB	13	23	18	26	38	44	38	36	
Area of Window	dB	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	
Area Correction	dB	6	6	6	6	6	6	6	6	
Likely RT in Room	sec	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	
Room Volume	m3	56	56	56	56	56	56	56	56	
Absorption		11	11	11	11	11	11	11	11	
Absorption Correction	dB	10	10	10	10	10	10	10	10	
Net SPL Inside	dB	34	16	20	12	3	-4	-5	-15	15
External Wall	dB	41	46	49	47	55	65	76	76	
Area of Wall	dB	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	
Area Correction	dB	7	7	7	7	7	7	7	7	
Likely RT in Room	sec	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Room Volume	m3	56	56	56	56	56	56	56	56	
Absorption		11	11	11	11	11	11	11	11	
Absorption Correction	dB	10	10	10	10	10	10	10	10	
Net SPL Inside	dB	8	-5	-9	-7	-12	-23	-41	-53	-7
Dn,e Vents	dB	30	41	41	38	45	50	50	50	
10logN (number of vents)	dB	0	0	0	0	0	0	0	0	
Likely RT in Room	sec	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Room Volume	m3	56	56	56	56	56	56	56	56	
Absorption		11	11	11	11	11	11	11	11	
Absorption Correction	dB	0	0	0	0	0	0	0	0	
Net SPL inside via vent	dB	22	3	2	5	1	-5	-12	-24	5
Combined Level from windows, wall & vents	dB	35	17	20	13	5	-1	-4	-14	16
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	38	20	23	16	8	2	-1	-11	19
Combined Level from window and wall	dB	34	16	20	12	3	-4	-5	-15	15
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level no vents	dB	37	19	23	15	6	-1	-2	-12	18

Meeting 03										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	55	47	46	46	49	48	41	29	53
Glazing Specified: 4 / 12 / 4	dB	13	23	18	26	38	44	38	36	
Area of Window	dB	14	14	14	14	14	14	14	14	
Area Correction	dB	11	11	11	11	11	11	11	11	
Likely RT in Room	sec	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	
Room Volume	m3	45	45	45	45	45	45	45	45	
Absorption		9	9	9	9	9	9	9	9	
Absorption Correction	dB	10	10	10	10	10	10	10	10	
Net SPL Inside	dB	44	26	30	22	13	6	5	-5	25
External Wall	dB	41	46	49	47	55	65	76	76	
Area of Wall	dB	1	1	1	1	1	1	1	1	
Area Correction	dB	0	0	0	0	0	0	0	0	
Likely RT in Room	sec	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Room Volume	m3	45	45	45	45	45	45	45	45	
Absorption		9	9	9	9	9	9	9	9	
Absorption Correction	dB	10	10	10	10	10	10	10	10	
Net SPL Inside	dB	4	-9	-13	-11	-16	-27	-45	-57	-10
Dn,e Vents	dB	30	41	41	38	45	50	50	50	
10logN (number of vents)	dB	6	6	6	6	6	6	6	6	
Likely RT in Room	sec	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Room Volume	m3	45	45	45	45	45	45	45	45	
Absorption		9	9	9	9	9	9	9	9	
Absorption Correction	dB	0	0	0	0	0	0	0	0	
Net SPL inside via vent	dB	31	12	11	14	10	4	-3	-15	15
Combined Level from windows, wall & vents	dB	44	26	30	23	15	8	6	-5	25
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	47	29	33	26	18	11	9	-2	28
Combined Level from window and wall	dB	44	26	30	22	13	6	5	-5	25
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level no vents	dB	47	29	33	25	16	9	8	-2	28

Meeting 04										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	55	47	46	46	49	48	41	29	53
Glazing Specified: 4 / 12 / 4	dB	13	23	18	26	38	44	38	36	
Area of Window	dB	11	11	11	11	11	11	11	11	
Area Correction	dB	10	10	10	10	10	10	10	10	
Likely RT in Room	sec	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	
Room Volume	m3	74	74	74	74	74	74	74	74	
Absorption		15	15	15	15	15	15	15	15	
Absorption Correction	dB	12	12	12	12	12	12	12	12	
Net SPL Inside	dB	41	23	27	19	10	3	2	-8	22
External Wall	dB	41	46	49	47	55	65	76	76	
Area of Wall	dB	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	
Area Correction	dB	12	12	12	12	12	12	12	12	
Likely RT in Room	sec	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Room Volume	m3	74	74	74	74	74	74	74	74	
Absorption		15	15	15	15	15	15	15	15	
Absorption Correction	dB	12	12	12	12	12	12	12	12	
Net SPL Inside	dB	14	1	-3	-1	-6	-17	-35	-47	0
Dn,e Vents	dB	30	41	41	38	45	50	50	50	
10logN (number of vents)	dB	5	5	5	5	5	5	5	5	
Likely RT in Room	sec	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Room Volume	m3	74	74	74	74	74	74	74	74	
Absorption		15	15	15	15	15	15	15	15	
Absorption Correction	dB	2	2	2	2	2	2	2	2	
Net SPL inside via vent	dB	29	10	9	12	8	2	-5	-27	13
Combined Level from windows, wall & vents	dB	43	25	27	24	19	13	7	-4	24
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	46	28	30	27	22	16	10	-1	27
Combined Level from window and wall	dB	41	23	27	19	10	3	2	-8	22
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level no vents	dB	44	26	30	22	13	6	5	-5	25

Open Plan Office										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	55	47	46	46	49	48	41	29	53
Glazing Specified: 4 / 12 / 4	dB	13	23	18	26	38	44	38	36	
Area of Window	dB	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	
Area Correction	dB	11	11	11	11	11	11	11	11	
Likely RT in Room	sec	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Room Volume	m3	66	66	66	66	66	66	66	66	
Absorption		11	11	11	11	11	11	11	11	
Absorption Correction	dB	10	10	10	10	10	10	10	10	
Net SPL Inside	dB	42	24	28	20	11	4	3	-7	23
External Wall	dB	41	46	49	47	55	65	76	76	
Area of Wall	dB	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	
Area Correction	dB	12	12	12	12	12	12	12	12	
Likely RT in Room	sec	1	1	1	1	1	1	1	1	
Room Volume	m3	66	66	66	66	66	66	66	66	
Absorption		11	11	11	11	11	11	11	11	
Absorption Correction	dB	10	10	10	10	10	10	10	10	
Net SPL Inside	dB	15	2	-2	0	-5	-16	-34	-46	1
Dn,e Vents	dB	30	41	41	38	45	50	50	50	
10logN (number of vents)	dB	6	6	6	6	6	6	6	6	
Likely RT in Room	sec	1	1	1	1	1	1	1	1	
Room Volume	m3	66	66	66	66	66	66	66	66	
Absorption		11	11	11	11	11	11	11	11	
Absorption Correction	dB	0	0	0	0	0	0	0	0	
Net SPL inside via vent	dB	31	12	11	14	10	4	-3	-15	15
Combined Level from windows, wall & vents	dB	43	25	28	21	14	7	4	-6	24
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	46	28	31	24	17	10	7	-3	27
Combined Level from window and wall	dB	42	24	28	20	11	4	3	-7	23
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level no vents	dB	45	27	31	23	14	7	6	-4	26

Youth Office										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	55	47	46	46	49	48	41	29	53
Glazing Specified: 4 / 12 / 4	dB	13	23	18	26	38	44	38	36	
Area of Window	dB	5	5	5	5	5	5	5	5	
Area Correction	dB	7	7	7	7	7	7	7	7	
Likely RT in Room	sec	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Room Volume	m3	28	28	28	28	28	28	28	28	
Absorption		4	4	4	4	4	4	4	4	
Absorption Correction	dB	7	7	7	7	7	7	7	7	
Net SPL Inside	dB	42	24	28	20	11	4	3	-7	23
External Wall	dB	41	46	49	47	55	65	76	76	
Area of Wall	dB	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	
Area Correction	dB	11	11	11	11	11	11	11	11	
Likely RT in Room	sec	1	1	1	1	1	1	1	1	
Room Volume	m3	28	28	28	28	28	28	28	28	
Absorption		4	4	4	4	4	4	4	4	
Absorption Correction	dB	7	7	7	7	7	7	7	7	
Net SPL Inside	dB	18	5	1	3	-2	-13	-31	-43	3
Dn,e Vents	dB	30	41	41	38	45	50	50	50	
10logN (number of vents)	dB	3	3	3	3	3	3	3	3	
Likely RT in Room	sec	1	1	1	1	1	1	1	1	
Room Volume	m3	28	28	28	28	28	28	28	28	
Absorption		4	4	4	4	4	4	4	4	
Absorption Correction	dB	-3	-3	-3	-3	-3	-3	-3	-3	
Net SPL inside via vent	dB	31	12	11	14	10	4	-3	-15	15
Combined Level from windows, wall & vents	dB	43	25	29	22	14	8	4	-6	24
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	46	28	32	25	17	11	7	-3	27
Combined Level from window and wall	dB	42	25	28	21	12	5	3	-7	23
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level no vents	dB	45	28	31	24	15	8	6	-4	26

Yinka's Office										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	52	44	43	43	46	45	38	26	50
Glazing Specified: 4 / 12 / 4	dB	13	23	18	26	38	44	38	36	
Area of Window	dB	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	
Area Correction	dB	8	8	8	8	8	8	8	8	
Likely RT in Room	sec	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Room Volume	m3	45	45	45	45	45	45	45	45	
Absorption		7	7	7	7	7	7	7	7	
Absorption Correction	dB	9	9	9	9	9	9	9	9	
Net SPL Inside	dB	39	21	25	17	8	1	0	-10	20
External Wall	dB	41	46	49	47	55	65	76	76	
Area of Wall	dB	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	
Area Correction	dB	5	5	5	5	5	5	5	5	
Likely RT in Room	sec	1	1	1	1	1	1	1	1	
Room Volume	m3	45	45	45	45	45	45	45	45	
Absorption		7	7	7	7	7	7	7	7	
Absorption Correction	dB	9	9	9	9	9	9	9	9	
Net SPL Inside	dB	7	-6	-10	-8	-13	-24	-42	-54	-7
Dn,e Vents	dB	30	41	41	38	45	50	50	50	
10logN (number of vents)	dB	3	3	3	3	3	3	3	3	
Likely RT in Room	sec	1	1	1	1	1	1	1	1	
Room Volume	m3	45	45	45	45	45	45	45	45	
Absorption		7	7	7	7	7	7	7	7	
Absorption Correction	dB	-1	-1	-1	-1	-1	-1	-1	-1	
Net SPL inside via vent	dB	26	7	6	9	5	-1	-8	-20	10
Combined Level from windows, wall & vents	dB	39	21	25	17	10	3	0	-10	20
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	42	24	28	20	13	6	3	-7	23
Combined Level from window and wall	dB	39	21	25	17	8	1	0	-10	20
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level no vents	dB	42	24	28	20	11	4	3	-7	23

Art Studio										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	52	44	43	43	46	45	38	26	50
Glazing Specified: 4 / 12 / 4	dB	13	23	18	26	38	44	38	36	
Area of Window	dB	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	
Area Correction	dB	10	10	10	10	10	10	10	10	
Likely RT in Room	sec	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	
Room Volume	m3	65	65	65	65	65	65	65	65	
Absorption		13	13	13	13	13	13	13	13	
Absorption Correction	dB	11	11	11	11	11	11	11	11	
Net SPL Inside	dB	38	20	24	16	7	0	-1	-11	19
External Wall	dB	41	46	49	47	55	65	76	76	
Area of Wall	dB	15	15	15	15	15	15	15	15	
Area Correction	dB	12	12	12	12	12	12	12	12	
Likely RT in Room	sec	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Room Volume	m3	65	65	65	65	65	65	65	65	
Absorption		13	13	13	13	13	13	13	13	
Absorption Correction	dB	11	11	11	11	11	11	11	11	
Net SPL Inside	dB	12	-1	-5	-3	-8	-19	-37	-49	-3
Dn,e Vents	dB	30	41	41	38	45	50	50	50	
10logN (number of vents)	dB	6	6	6	6	6	6	6	6	
Likely RT in Room	sec	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Room Volume	m3	65	65	65	65	65	65	65	65	
Absorption		13	13	13	13	13	13	13	13	
Absorption Correction	dB	1	1	1	1	1	1	1	1	
Net SPL inside via vent	dB	27	8	7	10	6	0	-7	-19	11
Combined Level from windows, wall & vents	dB	38	20	24	17	10	3	0	-10	20
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	41	23	27	20	13	6	3	-7	23
Combined Level from window and wall	dB	38	20	24	16	7	0	-1	-11	19
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level no vents	dB	41	23	27	19	10	3	2	-8	22

Prayer Room / Meeting Room										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	52	44	43	43	46	45	38	26	50
Glazing Specified: 4 / 12 / 4	dB	13	23	18	26	38	44	38	36	
Area of Window	dB	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	
Area Correction	dB	9	9	9	9	9	9	9	9	
Likely RT in Room	sec	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	
Room Volume	m3	48	48	48	48	48	48	48	48	
Absorption		13	13	13	13	13	13	13	13	
Absorption Correction	dB	11	11	11	11	11	11	11	11	
Net SPL Inside	dB	37	19	23	15	6	-1	-2	-12	18
External Wall	dB	41	46	49	47	55	65	76	76	
Area of Wall	dB	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	
Area Correction	dB	11	11	11	11	11	11	11	11	
Likely RT in Room	sec	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	
Room Volume	m3	48	48	48	48	48	48	48	48	
Absorption		13	13	13	13	13	13	13	13	
Absorption Correction	dB	11	11	11	11	11	11	11	11	
Net SPL Inside	dB	11	-2	-6	-4	-9	-20	-38	-50	-4
Dn,e Vents	dB	30	41	41	38	45	50	50	50	
10logN (number of vents)	dB	6	6	6	6	6	6	6	6	
Likely RT in Room	sec	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	
Room Volume	m3	48	48	48	48	48	48	48	48	
Absorption		13	13	13	13	13	13	13	13	
Absorption Correction	dB	1	1	1	1	1	1	1	1	
Net SPL inside via vent	dB	27	8	7	10	6	0	-7	-19	11
Combined Level from windows, wall & vents	dB	38	19	23	16	9	3	-1	-11	19
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	41	22	26	19	12	6	2	-8	22
Combined Level from window and wall	dB	37	19	23	15	6	-1	-2	-12	18
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level no vents	dB	40	22	26	18	9	2	1	-9	21

Appendix B: Calculation of Predicted Noise Levels at Nearest Facade

WINDOWS SHUT										
Sanctuary - North Elevation										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	85	85	86	89	85	80	78	77	90
Cavity Blockwork Wall	dB	-41	-46	-49	-47	-55	-65	-76	-76	
Area correction, 113m ²	dB	21	21	21	21	21	21	21	21	
Distance correction, 21m	dB	-26	-26	-26	-26	-26	-26	-26	-26	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL from walls	dB	27	22	20	25	13	-2	-15	-16	23
Glazing 4/12/6	dB	-15	-27	-21	-29	-40	-39	-43	-40	
Area correction, 4.2m ²	dB	6	6	6	6	6	6	6	6	
Distance correction, 21m	dB	-26	-26	-26	-26	-26	-26	-26	-26	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL Inside	dB	39	27	34	29	14	10	4	6	29
Roof	dB	-20	-41	-54	-57	-63	-62	-66	-66	
Area correction, 230m ²	dB	24	24	24	24	24	24	24	24	
Distance correction, 21m	dB	-26	-26	-26	-26	-26	-26	-26	-26	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL inside via vent	dB	51	30	18	18	8	4	-2	-3	26
Combined Level from windows, wall & roof	dB	51	32	34	31	17	11	5	6	31
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	54	35	37	34	20	14	8	9	34

WINDOWS OPEN										
Sanctuary - North Elevation										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	85	85	86	89	85	80	78	77	90
Cavity Blockwork Wall	dB	-41	-46	-49	-47	-55	-65	-76	-76	
Area correction, 113m ²	dB	21	21	21	21	21	21	21	21	
Distance correction, 21m	dB	-26	-26	-26	-26	-26	-26	-26	-26	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL from walls	dB	27	22	20	25	13	-2	-15	-16	23
Glazing 4/12/6	dB	-2	-14	-8	-16	-27	-26	-30	-27	
Area correction, 4.2m ²	dB	6	6	6	6	6	6	6	6	
Distance correction, 21m	dB	-26	-26	-26	-26	-26	-26	-26	-26	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL Inside	dB	52	40	47	42	27	23	17	19	42
Roof	dB	-20	-41	-54	-57	-63	-62	-66	-66	
Area correction, 230m ²	dB	24	24	24	24	24	24	24	24	
Distance correction, 21m	dB	-26	-26	-26	-26	-26	-26	-26	-26	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL inside via vent	dB	51	30	18	18	8	4	-2	-3	26
Combined Level from windows, wall & roof	dB	55	40	47	42	27	23	17	19	42
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	58	43	50	45	30	26	20	22	45

WINDOWS SHUT										
Sanctuary - West Elevation										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	85	85	86	89	85	80	78	77	90
West Elevation										
Cavity Blockwork Wall	dB	-41	-46	-49	-47	-55	-65	-76	-76	
Area correction, 51.5m ²	dB	17	17	17	17	17	17	17	17	
Distance correction, 16m	dB	-24	-24	-24	-24	-24	-24	-24	-24	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL from walls	dB	26	21	19	24	12	-3	-16	-17	22
Glazing 4/12/6										
Area correction, 14.4m ²	dB	12	12	12	12	12	12	12	12	
Distance correction, 16m	dB	-24	-24	-24	-24	-24	-24	-24	-24	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL Inside	dB	47	35	42	37	22	18	12	14	36
Roof										
Area correction, 230m ²	dB	24	24	24	24	24	24	24	24	
Distance correction, 16m	dB	-24	-24	-24	-24	-24	-24	-24	-24	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL inside via vent	dB	54	33	21	21	11	7	1	0	28
Combined Level from windows, wall & roof										
Combined Level from windows, wall & roof	dB	54	37	42	37	22	18	12	14	37
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	57	40	45	40	25	21	15	17	40

WINDOWS OPEN										
Sanctuary - West Elevation										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	85	85	86	89	85	80	78	77	90
West Elevation										
Cavity Blockwork Wall	dB	-41	-46	-49	-47	-55	-65	-76	-76	
Area correction, 51.5m ²	dB	17	17	17	17	17	17	17	17	
Distance correction, 16m	dB	-24	-24	-24	-24	-24	-24	-24	-24	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL from walls	dB	26	21	19	24	12	-3	-16	-17	22
Glazing 4/12/6										
Area correction, 14.4m ²	dB	12	12	12	12	12	12	12	12	
Distance correction, 16m	dB	-24	-24	-24	-24	-24	-24	-24	-24	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL Inside	dB	60	48	55	50	35	31	25	27	49
Roof										
Area correction, 230m ²	dB	24	24	24	24	24	24	24	24	
Distance correction, 16m	dB	-24	-24	-24	-24	-24	-24	-24	-24	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL inside via vent	dB	54	33	21	21	11	7	1	0	28
Combined Level from windows, wall & roof										
Combined Level from windows, wall & roof	dB	60	48	55	50	35	31	25	27	50
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	63	51	58	53	38	34	28	30	53

WINDOWS SHUT										
Sanctuary - East Elevation										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	85	85	86	89	85	80	78	77	90
East Elevation										
Cavity Blockwork Wall	dB	-41	-46	-49	-47	-55	-65	-76	-76	
Area correction, 51.5m ²	dB	17	17	17	17	17	17	17	17	
Distance correction, 18m	dB	-25	-25	-25	-25	-25	-25	-25	-25	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL from walls	dB	25	20	18	23	11	-4	-17	-18	21
Glazing 4/12/6										
Area correction, 14.4m ²	dB	12	12	12	12	12	12	12	12	
Distance correction, 18m	dB	-25	-25	-25	-25	-25	-25	-25	-25	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL Inside	dB	45	33	40	35	20	16	10	12	35
Roof										
Area correction, 230m ²	dB	24	24	24	24	24	24	24	24	
Distance correction, 18m	dB	-25	-25	-25	-25	-25	-25	-25	-25	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL inside via vent	dB	53	32	20	20	10	6	0	-1	27
Combined Level from windows, wall & roof										
Combined Level from windows, wall & roof	dB	53	36	41	36	21	17	11	13	36
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	56	39	44	39	24	20	14	16	39

WINDOWS OPEN										
Sanctuary - East Elevation										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	85	85	86	89	85	80	78	77	90
East Elevation										
Cavity Blockwork Wall	dB	-41	-46	-49	-47	-55	-65	-76	-76	
Area correction, 51.5m ²	dB	17	17	17	17	17	17	17	17	
Distance correction, 18m	dB	-25	-25	-25	-25	-25	-25	-25	-25	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL from walls	dB	25	20	18	23	11	-4	-17	-18	21
Glazing 4/12/6										
Area correction, 14.4m ²	dB	12	12	12	12	12	12	12	12	
Distance correction, 18m	dB	-25	-25	-25	-25	-25	-25	-25	-25	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL Inside	dB	58	46	53	48	33	29	23	25	48
Roof										
Area correction, 230m ²	dB	24	24	24	24	24	24	24	24	
Distance correction, 18m	dB	-25	-25	-25	-25	-25	-25	-25	-25	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL inside via vent	dB	53	32	20	20	10	6	0	-1	27
Combined Level from windows, wall & roof										
Combined Level from windows, wall & roof	dB	59	47	53	48	34	29	23	25	49
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	62	50	56	51	37	32	26	28	52

WINDOWS SHUT										
Café - East Elevation										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	85	85	86	89	85	80	78	77	90
East Elevation										
Cavity Blockwork Wall	dB	-41	-46	-49	-47	-55	-65	-76	-76	
Area correction, 8.4m ²	dB	9	9	9	9	9	9	9	9	
Distance correction, 24m	dB	-28	-28	-28	-28	-28	-28	-28	-28	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL from walls	dB	15	10	8	13	1	-14	-27	-28	11
Glazing 4/12/4	dB	-13	-23	-18	-26	-38	-44	-38	-36	
Area correction, 17.85m ²	dB	13	13	13	13	13	13	13	13	
Distance correction, 24m	dB	-28	-28	-28	-28	-28	-28	-28	-28	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL Inside	dB	46	36	42	37	21	10	14	15	37
Roof	dB	-20	-41	-54	-57	-63	-62	-66	-66	
Area correction, 49.5m ²	dB	17	17	17	17	17	17	17	17	
Distance correction, 24m	dB	-28	-28	-28	-28	-28	-28	-28	-28	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL inside via vent	dB	43	22	10	10	0	-4	-10	-11	18
Combined Level from windows, wall & roof	dB	48	36	42	37	21	10	14	15	37
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	51	39	45	40	24	13	17	18	40

WINDOWS OPEN											
Café - East Elevation											
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)	
External Noise Level LAeq	dB	85	85	86	89	85	80	78	77	90	
East Elevation											
Cavity Blockwork Wall	dB	-41	-46	-49	-47	-55	-65	-76	-76		
Area correction, 8.4m2	dB	9	9	9	9	9	9	9	9		
Distance correction, 24m	dB	-28	-28	-28	-28	-28	-28	-28	-28		
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14		
Facade Correction	dB	3	3	3	3	3	3	3	3		
Net SPL from walls	dB	15	10	8	13	1	-14	-27	-28	11	
Glazing 4/12/4											
Area correction, 17.85m2	dB	13	13	13	13	13	13	13	13		
Distance correction, 24m	dB	-28	-28	-28	-28	-28	-28	-28	-28		
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14		
Facade Correction	dB	3	3	3	3	3	3	3	3		
Net SPL Inside	dB	59	49	55	50	34	23	27	28	50	
Roof											
Area correction, 49.5m2	dB	17	17	17	17	17	17	17	17		
Distance correction, 24m	dB	-28	-28	-28	-28	-28	-28	-28	-28		
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14		
Facade Correction	dB	3	3	3	3	3	3	3	3		
Net SPL inside via vent	dB	43	22	10	10	0	-4	-10	-11	18	
Combined Level from windows, wall & roof	dB	59	49	55	50	34	23	27	28	50	
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3		
Predicted Internal Noise Level with vents	dB	62	52	58	53	37	26	30	31	53	

WINDOWS SHUT										
Café - South Elevation										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	85	85	86	89	85	80	78	77	90
South Elevation										
Cavity Blockwork Wall	dB	-41	-46	-49	-47	-55	-65	-76	-76	
Area correction, 5.7m ²	dB	8	8	8	8	8	8	8	8	
Distance correction, 31m	dB	-30	-30	-30	-30	-30	-30	-30	-30	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL from walls	dB	11	6	4	9	-3	-18	-31	-32	7
Glazing 4/12/4										
Area correction, 17.85m ²	dB	13	13	13	13	13	13	13	13	
Distance correction, 31m	dB	-30	-30	-30	-30	-30	-30	-30	-30	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL Inside	dB	44	34	40	35	19	8	12	13	35
Roof										
Area correction, 49.5m ²	dB	17	17	17	17	17	17	17	17	
Distance correction, 31m	dB	-30	-30	-30	-30	-30	-30	-30	-30	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL inside via vent	dB	41	20	8	8	-2	-6	-12	-13	16
Combined Level from windows, wall & roof										
Combined Level from windows, wall & roof	dB	46	34	40	35	19	8	12	13	35
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	49	37	43	38	22	11	15	16	38

WINDOWS OPEN										
Café - South Elevation										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	85	85	86	89	85	80	78	77	90
South Elevation										
Cavity Blockwork Wall	dB	-41	-46	-49	-47	-55	-65	-76	-76	
Area correction, 5.7m ²	dB	8	8	8	8	8	8	8	8	
Distance correction, 31m	dB	-30	-30	-30	-30	-30	-30	-30	-30	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL from walls	dB	11	6	4	9	-3	-18	-31	-32	7
Glazing 4/12/4										
Area correction, 17.85m ²	dB	13	13	13	13	13	13	13	13	
Distance correction, 31m	dB	-30	-30	-30	-30	-30	-30	-30	-30	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL Inside	dB	57	47	53	48	32	21	25	26	48
Roof										
Area correction, 49.5m ²	dB	17	17	17	17	17	17	17	17	
Distance correction, 31m	dB	-30	-30	-30	-30	-30	-30	-30	-30	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL inside via vent	dB	41	20	8	8	-2	-6	-12	-13	16
Combined Level from windows, wall & roof										
Combined Level from windows, wall & roof	dB	57	47	53	48	32	21	25	26	48
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	60	50	56	51	35	24	28	29	51

WINDOWS SHUT										
Café - North Elevation										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	85	85	86	89	85	80	78	77	90
North Elevation										
Cavity Blockwork Wall	dB	-41	-46	-49	-47	-55	-65	-76	-76	
Area correction, 1.6m ²	dB	2	2	2	2	2	2	2	2	
Distance correction, 40m	dB	-32	-32	-32	-32	-32	-32	-32	-32	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL from walls	dB	3	-2	-4	1	-11	-26	-39	-40	-1
Glazing 4/12/4										
Area correction, 10.9m ²	dB	10	10	10	10	10	10	10	10	
Distance correction, 40m	dB	-32	-32	-32	-32	-32	-32	-32	-32	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL Inside	dB	39	29	35	30	14	3	7	8	30
Roof										
Area correction, 49.5m ²	dB	17	17	17	17	17	17	17	17	
Distance correction, 40m	dB	-32	-32	-32	-32	-32	-32	-32	-32	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL inside via vent	dB	39	18	6	6	-4	-8	-14	-15	14
Combined Level from windows, wall & roof										
Combined Level from windows, wall & roof	dB	42	30	35	30	14	4	7	8	30
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	45	33	38	33	17	7	10	11	33

WINDOWS OPEN										
Café - North Elevation										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	85	85	86	89	85	80	78	77	90
North Elevation										
Cavity Blockwork Wall	dB	-41	-46	-49	-47	-55	-65	-76	-76	
Area correction, 1.6m ²	dB	2	2	2	2	2	2	2	2	
Distance correction, 40m	dB	-32	-32	-32	-32	-32	-32	-32	-32	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL from walls	dB	3	-2	-4	1	-11	-26	-39	-40	-1
Glazing 4/12/4										
Area correction, 10.9m ²	dB	10	10	10	10	10	10	10	10	
Distance correction, 40m	dB	-32	-32	-32	-32	-32	-32	-32	-32	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL Inside	dB	52	42	48	43	27	16	20	21	43
Roof										
Area correction, 49.5m ²	dB	17	17	17	17	17	17	17	17	
Distance correction, 40m	dB	-32	-32	-32	-32	-32	-32	-32	-32	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL inside via vent	dB	39	18	6	6	-4	-8	-14	-15	14
Combined Level from windows, wall & roof										
Combined Level from windows, wall & roof	dB	53	42	48	43	27	16	20	21	43
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	56	45	51	46	30	19	23	24	46

WINDOWS SHUT											
Meeting 01											
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)	
External Noise Level LAeq	dB	74	74	74	67	63	60	58	57	70	
West Elevation											
Cavity Blockwork Wall	dB	-41	-46	-49	-47	-55	-65	-76	-76		
Area correction, 8.6m ²	dB	9	9	9	9	9	9	9	9		
Distance correction, 16m	dB	-24	-24	-24	-24	-24	-24	-24	-24		
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14		
Facade Correction	dB	3	3	3	3	3	3	3	3		
Net SPL from walls	dB	7	2	-1	-6	-18	-31	-44	-45	-5	
Glazing 4/12/4	dB	-13	-23	-18	-26	-38	-44	-38	-36		
Area correction, 3.8m ²	dB	6	6	6	6	6	6	6	6		
Distance correction, 16m	dB	-24	-24	-24	-24	-24	-24	-24	-24		
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14		
Facade Correction	dB	3	3	3	3	3	3	3	3		
Net SPL Inside	dB	32	22	27	12	-4	-13	-9	-8	19	
Roof	dB	-20	-41	-54	-57	-63	-62	-66	-66		
Area correction, 22m ²	dB	13	13	13	13	13	13	13	13		
Distance correction, 16m	dB	-24	-24	-24	-24	-24	-24	-24	-24		
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14		
Facade Correction	dB	3	3	3	3	3	3	3	3		
Net SPL inside via vent	dB	32	11	-2	-12	-22	-24	-30	-31	7	
Combined Level from windows, wall & roof	dB	35	22	27	12	-4	-13	-9	-8	19	
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3		
Predicted Internal Noise Level with vents	dB	38	25	30	15	-1	-10	-6	-5	22	

WINDOWS OPEN											
Meeting 01											
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)	
External Noise Level LAeq	dB	74	74	74	67	63	60	58	57	70	
West Elevation											
Cavity Blockwork Wall	dB	-41	-46	-49	-47	-55	-65	-76	-76		
Area correction, 8.6m2	dB	9	9	9	9	9	9	9	9		
Distance correction, 16m	dB	-24	-24	-24	-24	-24	-24	-24	-24		
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14		
Facade Correction	dB	3	3	3	3	3	3	3	3		
Net SPL from walls	dB	7	2	-1	-6	-18	-31	-44	-45	-5	
Glazing 4/12/4	dB	0	-10	-5	-13	-25	-31	-25	-23		
Area correction, 3.8m2	dB	6	6	6	6	6	6	6	6		
Distance correction, 16m	dB	-24	-24	-24	-24	-24	-24	-24	-24		
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14		
Facade Correction	dB	3	3	3	3	3	3	3	3		
Net SPL Inside	dB	45	35	40	25	9	0	4	5	32	
Roof	dB	-20	-41	-54	-57	-63	-62	-66	-66		
Area correction, 22m2	dB	13	13	13	13	13	13	13	13		
Distance correction, 16m	dB	-24	-24	-24	-24	-24	-24	-24	-24		
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14		
Facade Correction	dB	3	3	3	3	3	3	3	3		
Net SPL inside via vent	dB	32	11	-2	-12	-22	-24	-30	-31	7	
Combined Level from windows, wall & roof	dB	45	35	40	25	9	0	4	5	32	
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3		
Predicted Internal Noise Level with vents	dB	48	38	43	28	12	3	7	8	35	

WINDOWS SHUT										
Open Plan Office										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	64	64	64	57	53	50	48	47	60
West Elevation										
Cavity Blockwork Wall	dB	-41	-46	-49	-47	-55	-65	-76	-76	
Area correction, 4.6m ²	dB	7	7	7	7	7	7	7	7	
Distance correction, 16m	dB	-24	-24	-24	-24	-24	-24	-24	-24	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL from walls	dB	-5	-10	-13	-18	-30	-43	-56	-57	-18
Glazing 4/12/4										
Area correction, 5m ²	dB	7	7	7	7	7	7	7	7	
Distance correction, 16m	dB	-24	-24	-24	-24	-24	-24	-24	-24	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL Inside	dB	23	13	18	3	-13	-22	-18	-17	10
Roof										
Area correction, 28m ²	dB	14	14	14	14	14	14	14	14	
Distance correction, 16m	dB	-24	-24	-24	-24	-24	-24	-24	-24	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL inside via vent	dB	23	2	-11	-21	-31	-33	-39	-40	-2
Combined Level from windows, wall & roof										
Combined Level from windows, wall & roof	dB	26	13	18	3	-13	-22	-18	-17	10
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	29	16	21	6	-10	-19	-15	-14	13

WINDOWS OPEN										
Open Plan Office										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
External Noise Level LAeq	dB	64	64	64	57	53	50	48	47	60
West Elevation										
Cavity Blockwork Wall	dB	-41	-46	-49	-47	-55	-65	-76	-76	
Area correction, 4.6m ²	dB	7	7	7	7	7	7	7	7	
Distance correction, 16m	dB	-24	-24	-24	-24	-24	-24	-24	-24	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL from walls	dB	-5	-10	-13	-18	-30	-43	-56	-57	-18
Glazing 4/12/4										
Area correction, 5m ²	dB	7	7	7	7	7	7	7	7	
Distance correction, 16m	dB	-24	-24	-24	-24	-24	-24	-24	-24	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL Inside	dB	36	26	31	16	0	-9	-5	-4	23
Roof										
Area correction, 28m ²	dB	14	14	14	14	14	14	14	14	
Distance correction, 16m	dB	-24	-24	-24	-24	-24	-24	-24	-24	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Net SPL inside via vent	dB	23	2	-11	-21	-31	-33	-39	-40	-2
Combined Level from windows, wall & roof										
Combined Level from windows, wall & roof	dB	36	26	31	16	0	-9	-5	-4	23
Tolerance on Calculation	dB	3	3	3	3	3	3	3	3	
Predicted Internal Noise Level with vents	dB	39	29	34	19	3	-6	-2	-1	26

Appendix C: Terminology Relating To Noise

Sound Pressure	A fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level	The sound level is the sound pressure relative to a standard reference pressure of $20\mu\text{Pa}$ (20×10^{-6} Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s_1 and s_2 is given by $20 \log_{10} (s_1 / s_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is $20\mu\text{Pa}$.
A-weighting, dB(A)	The unit of sound level, weighted according to the A scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
$L_{eq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level during the period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the "average minimum" noise level and is often used to describe the background noise.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m.
Façade	At a distance of 1m in front of a large sound reflecting object such as a building
Fast/Slow Time Weighting	Averaging times used in sound level meters.
Octave Band	A range of frequencies whose upper limit is twice the frequency of the lower limit.
$D_{nT,w}$	The single number quantity that characterises airborne sound insulation between rooms over a range of frequencies.
R_w	Single number quantity that characterises the airborne sound insulating properties of a material or building element over a range of frequencies.
Reverberation	The persistence of sound in a space after a sound source has been stopped