Noise Impact Assessment for Proposed Student Accommodation

58A Birkenhead Street, London

Client: West London Mission

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0. SUMMARY

0.1. This Noise Impact Assessment accompanies a planning application for part demolition, extension and reconfiguration of the existing building to provide a replacement church with ancillary café and replacement student accommodation, together with associated plant, cycle and refuse storage at 58A Birkenhead Street, London. ACA Acoustics Limited has been commissioned by the applicant to carry out an assessment of external sound levels to the development, and, where necessary, to make recommendations for a suitable mitigation scheme.

0.2. An unattended sound level survey was carried out nominally between the 3rd and 8th July 2024. Measured sound levels to the external front façade of the proposed site are $L_{Aeq\ 16\text{-}hour}$ 61dB during the daytime and $L_{Aeq\ 8\text{-}hour}$ 60dB overnight. Short-term individual noise events overnight do not regularly exceed a level of LAfmax 78dB.

0.3. A Stage 1: Initial Site Noise Risk Assessment, in accordance with ProPG Planning & Noise, identifies the site as being in an area with a low daytime noise risk, but a high nighttime noise risk. In order to reduce the risk of a negative impact on residents, an Acoustic Design Statement has been prepared.

0.4. A Stage 2 detailed acoustic design process has been followed, in accordance with ProPG. Details of the Acoustic Design Statement are included in this report.

0.5. Resultant internal sound levels during the daytime will not exceed LAeq 28dB. Sound levels at night shall not exceed LAeq 27dB and LAfmax 45dB.

0.6. In conclusion, ACA Acoustics recommend that the site is suitable for the proposed student accommodation and that planning consent may be granted for the proposed development.

1. INTRODUCTION

This Noise Impact Assessment accompanies a planning application for part demolition, extension and reconfiguration of the existing building to provide a replacement church with ancillary café and replacement student accommodation, together with associated plant, cycle and refuse storage at 58A Birkenhead Street, London. ACA Acoustics Limited have been commissioned to carry out a sound survey and assessment at the site and where necessary, make recommendations for a suitable sound mitigation scheme.

The objective of the assessment is to determine the impact that existing noise sources would have on the proposed student accommodation in accordance with local and national planning policies and other relevant British Standards and guidance documents.

This report presents results of the sound level survey and assessment along with a scheme for sound insulation such that suitable internal sound levels are achieved.

2. ACOUSTIC CRITERIA

2.1 National Planning Policy Framework (NPPF) and Noise Policy Statement for England (NPSE)

The National Planning Policy Framework (referred to as NPPF) sets out the Government's planning policies for England and provides guidance on how these are expected to be applied, providing a framework within which Local Authorities can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.

Paragraph 187 of the NPPF states that,

> "*Planning policies and decisions should contribute to and enhance the natural and local environment by … e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability*".

Paragraph 198 also talks specifically about noise and advises,

> "*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 a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and quality of life.*
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*."

The Government's long-term policy aims relating to noise are contained in the Noise Policy Statement for England (referred to as NPSE). Stated aims of the NPSE are:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy of 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."*

Paragraphs 2.19 to 2.24 clarify the above aims, referring to established concepts from toxicology; NOEL (No Observed Effect Level) and LOAEL (Lowest Observed Adverse Effect Level). It also introduces a new concept relating to "significant adverse" of SOAEL (Significant Observed Adverse Effect Level), however noting,

"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".

The first aim of NPPF Paragraph 198 and the second underlying aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also considering the guiding principles of sustainable development, as set out in the NPPF. As neither the NPPF nor NPSE includes any numerical criteria, it is necessary to consider guidance provided in other documents to determine suitable limits that would define the LOAEL on an individual basis.

Finally, it is also of benefit to consider Paragraph 2.7 of NPSE, which advises 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".

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.

2.2 Planning Practice Guidance – Noise (PPG-N)

Related to the NPSE and the NPPF, The Department for Communities and Local Government has published additional guidance and clarifications within the Planning Practice Guidance – Noise (PPG-N), available at https://www.gov.uk/guidance/noise--2.

Paragraph 003 of the PPG advises that:

"Plan-making and decision making need to 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.*

In line with the Explanatory Note of the Noise Policy Statement for England, 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."

This guidance is like that set out in the NPPF and NPSE, however, Paragraph 005 of the PPG-N provides outline guidance of the definition of "*significant adverse*" and "*adverse*" effects. A copy of the table appended to Paragraph 005 is repeated below.

Response	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, 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 small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, 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
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Figure 1: Noise exposure hierarchy, taken from Planning Practice Guidance – Noise

Although this table provides descriptions of definitions for the NOEL, LOAEL and SOAEL, as with the NPPF and NPSE there are no numerical values provided.

Paragraph 011 of the PPG-N also provides examples where any residual concern of potential noise impact may be offset, including through the use of local amenity areas, noting:

"Noise impacts may be partially offset if residents have access to one or more of:

- *a relatively quiet facade (containing windows to habitable rooms) as part of their dwelling;*

- *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 if this area is exposed to noise levels that result in significant adverse effects;*
- *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 publicly 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 minute walking distance).*"

2.3 ProPG: Planning & Noise

ProPG: Planning & Noise is a collaborative document prepared by the Institute of Acoustics, Association of Noise Consultants, and the Chartered Institute of Environmental Health.

The document brings together guidance and recommendations in assessing the noise impact on new residential developments from various documents including the NPPF, NPSE, PPG-N, BS 8233:2014 and the World Health Organisation guidance. The aim is to regularise the assessment process and to encourage good acoustic design for new noise-sensitive developments.

The assessment process is split into two sequential stages:

- Stage 1 – An initial noise risk assessment of the proposed development site; and
- Stage 2 – A systematic consideration of four key elements:
  - Element 1 – Demonstrating a "Good Acoustic Design Process";
  - Element 2 – Observing internal "Noise Level Guidelines";
  - Element 3 – Undertaking an "External Amenity Area Noise Assessment"; and
  - Element 4 – Consideration of "Other Relevant Issues".

The Stage 1 risk assessment requires sound levels to be measured at the external façade of the site over daytime and night-time periods and, if necessary, any anticipated significant changes to the climate to be predicted to determine a "'*typical worst case' 24-hour day either now or in the foreseeable future*".

The assessment should include all relevant sources of transport noise that affect the site (road, railway, aircraft). It may also include industrial and commercial noise, where this is present but not dominant.

The measured/calculated daytime $L_{Aeq,\ 16\text{-hour}}$ and night-time $L_{Aeq,\ 8\text{-hour}}$ sound levels are then compared with Figure 1 of ProPG to complete the site's initial noise risk assessment. Copy of Figure 1 from ProPG is included in Figure 2 below.

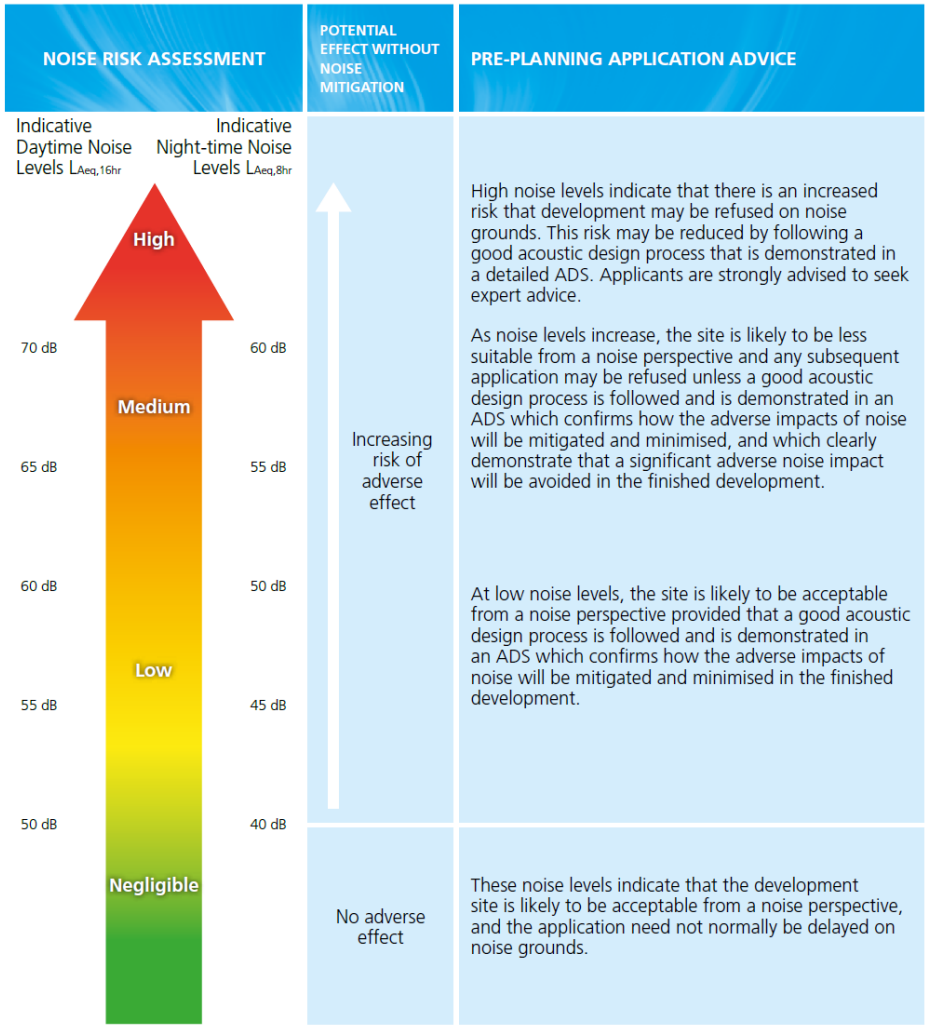


Figure 2: Noise Risk Assessment, taken from Figure 1 of ProPG Planning & Noise

The outcome of the Stage 1 initial risk assessment determines the next step and whether an Acoustic Design Statement is necessary. It is of benefit to note guidance in Paragraph 2.10 of ProPG:

> *"The indicative noise levels are intended to provide a sense of the noise challenge at a potential residential development site and should be interpreted flexibly having regard to the locality, the project and the wider context."*

A site being placed in the High-Risk category is not necessarily an indication that the development should be refused, but rather should be viewed considering the context of the development and highlights the importance of following a good acoustic design process from an early stage.

Element 2 of the Stage 2 assessment provides recommended internal sound levels to the residential dwellings. Criteria are taken from BS 8233:2014 with an additional criterion for individual short-term sound levels at night (LAfmax) and various clarifications and notes. These include an expansion on advice relating to the potential relaxation of the internal sound levels which is often overlooked when considering BS 8233:2014.

Paragraphs 2.33 to 2.36 discuss the impact of ventilation and opening windows. It is clearly stated that:

> "*Most residents value the ability to open windows at will, for a variety of reasons, and LPAs should therefore normally request that designers principally aim, through the use of good acoustic design, to achieve the internal noise level guidelines in noise-sensitive rooms with windows open*".

However, Paragraph 2.33 confirms that an open window typically reduces the sound insulation performance of the façade to 10 to 15dBA. This means that any site with a noise risk assessment above "*Negligible*" or lower end of "*Low*" would fail to achieve the internal sound level criteria with windows open. Paragraph 2.34 acknowledges this, confirming that internal sound levels for sites in urban areas and adjacent to transportation noise sources may only be practically achieved with windows closed.

> "*In such circumstances, internal noise levels can be assessed with windows closed but with any façade openings used to provide "whole dwelling ventilation" in accordance with Building Regulations Approved Document F (e.g., trickle ventilators) in the open position. Furthermore, in this scenario the internal LAeq target noise levels should not generally be exceeded.*"

Copy of Figure 2 of ProPG is included in Figure 3 below.

ACTIVITY	LOCATION	07:00 – 23:00 HRS	23:00 – 07:00 HRS
Resting	Living room	35 dB $L_{Aeq,16\ hr}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16\ hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16\ hr}$	30 dB $L_{Aeq,8\ hr}$ **45 dB $L_{Amax,F}$** (Note 4)

NOTE 1 The Table provides recommended internal L_{Aeq} target levels for overall noise in the design of a building. These are the sum total of structure-borne and airborne noise sources. Ground-borne noise is assessed separately and is not included as part of these targets, as human response to ground-borne noise varies with many factors such as level, character, timing, occupant expectation and sensitivity.

NOTE 2 The internal L_{Aeq} target levels shown in the Table are based on the existing guidelines issued by the WHO and assume normal diurnal fluctuations in external noise. In cases where local conditions do not follow a typical diurnal pattern, for example on a road serving a port with high levels of traffic at certain times of the night, an appropriate alternative period, e.g. 1 hour, may be used, but the level should be selected to ensure consistency with the internal L_{Aeq} target levels recommended in the Table.

NOTE 3 These internal L_{Aeq} target levels are based on annual average data and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks night or New Year's Eve.

NOTE 4 Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events (see Appendix A).

NOTE 5 Designing the site layout and the dwellings so that the internal target levels can be achieved with open windows in as many properties as possible demonstrates good acoustic design. Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded, subject to the further advice in Note 7.

NOTE 6 Attention is drawn to the requirements of the Building Regulations.

NOTE 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal L_{Aeq} target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved. The more often internal L_{Aeq} levels start to exceed the internal L_{Aeq} target levels by more than 5 dB, the more that most people are likely to regard them as "unreasonable". Where such exceedances are predicted, applicants should be required to show how the relevant number of rooms affected has been kept to a minimum. Once internal L_{Aeq} levels exceed the target levels by more than 10 dB, they are highly likely to be regarded as "unacceptable" by most people, particularly if such levels occur more than occasionally. Every effort should be made to avoid relevant rooms experiencing "unacceptable" noise levels at all and where such levels are likely to occur frequently, the development should be prevented in its proposed form **(see Section 3.D)**.

Figure 3: Internal sound level guidelines, taken from Figure 2 of ProPG: Planning & Noise

Sound levels in external amenity areas are considered in Element 3 of the Stage 2 assessment. This requires that, where practical, sound levels in amenity areas that are an intrinsic part of the overall design, should ideally not be above the range $LAeq_{,\ 16\text{-hour}}$ 50 to 55dB. It does however quote BS 8233:2014, that:

> *"These guideline values may not be achievable in all circumstances where development might be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels in these amenity spaces but should not be prohibited."*

2.4 The Building Regulations Approved Document O

Although not applicable to planning matters, it is beneficial to consider the impact of how complying with The Building Regulations Approved Document O will affect the ventilation strategy.

Requirement O1 of Schedule 1 to The Building Regulations 2010 requires that the following is met.

Requirement

Requirement	*Limits on application*
O1 Overheating mitigation	
(1) Reasonable provision must be made in respect of a dwelling, institution or any other building containing one or more rooms for residential purposes, other than a room in a hotel ("residences") to—	
(a) limit unwanted solar gains in summer;	
(b) provide an adequate means to remove heat from the indoor environment.	
(2) In meeting the obligations in paragraph (1)—	
(a) account must be taken of the safety of any occupant, and their reasonable enjoyment of the residence; and	
(b) mechanical cooling may only be used where insufficient heat is capable of being removed from the indoor environment without it.	

Figure 4: Requirement O1 of The Building Regulations 2010

The aim of Requirement O1 is to protect the health and welfare of the occupants of residential buildings, by reducing the occurrence of high indoor temperatures.

Where practical, this should be achieved through limiting solar gains through the design of the building and façade elements. Excess heat should then be removed through opening windows, ventilation louvres in external walls, a mechanical ventilation system, or a mechanical cooling system. Paragraph 2.11 of Approved Document O confirms that "*The building should be constructed to meet requirement O1 using passive means as far as reasonably practicable*".

However, requirement O1(2)(a) requires that any successful overheating mitigation strategy must also consider other potential adverse impacts, including sound levels inside bedrooms at night.

Paragraphs 3.2 and 3.3 consider the impact of noise on the overheating strategy. These have been included below.

"*3.2 In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).*

3.3 Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.
a. 40dB LAeq, T averaged over 8 hours (between 11pm and 7am).
b. 55dB LAfmax more than 10 times a night (between 11pm and 7am)."

The Institute of Acoustics and Association of Noise Consultants have issued guidance on complying with the requirements of Approved Document O. Whilst it is commonly accepted that partially open windows to provide some ventilation offers a loss of around 10-15dBA, to achieve the required window open area to mitigate overheating the guidance recommends a 4dB open window loss is applicable for most properties within London.

On this basis, where sound levels incident on a bedroom window do not exceed $L_{Aeq,\ 8\text{-hour}}$ 44dB and LAfmax 59dB more than 10 times per night, then the criteria in paragraph 3.3 of Approved Document O should be achieved and an overheating mitigation strategy allowing for open windows is appropriate. When external sound levels exceed these levels then it is likely windows will be closed by occupants overnight, or not opened sufficiently to adequately mitigate overheating, and an alternative strategy is required.

Note that this does not mean that windows should be sealed closed as most residents would desire the choice of whether to open windows or not. For example, a resident may choose to open windows to a bedroom to help mitigate overheating to the property whilst the bedroom is not in use during the daytime, then close the windows when sleeping in the bedroom overnight.

In accordance with The Building Regulations Approved Document F, it is recommended that if continuous mechanical ventilation is used, sound levels in bedrooms overnight should not exceed a level of LAeq 30dB when the system is operating at its minimum low rate. Although, evidence reference in The Association of Noise Consultants' *Acoustics Ventilation and Overheating: Residential Design Guide*, notes that "*a more prudent limit for mechanical services noise around 24-26dBA is likely to be required to prevent an adverse reaction from most occupants while falling asleep*".

2.4 British Standard 8233:2014

The introduction to BS 8233:2014 *Guidance on sound insulation and noise reduction for buildings* advises that "*this guide suggests criteria, such as suitable sleeping/resting conditions, and proposes noise levels that normally satisfy these criteria*". As such it is considered that guideline noise limits set out in BS 8233:2014 are suitable to protect future occupants of the dwelling from noise disturbance and compliance with these values would ensure sound levels within the new development are below the Lowest Observed Adverse Effect Level and comply with the principles of the NPPF, NPSE and PPG-N, along with corresponding to the recommended criteria provided by the Local Authority.

Guidance limits for internal sound levels within living rooms and bedrooms are provided in Table 4 of BS 8233:2014 and are identical to those shown in Figure 3 above.

3. REVIEW OF SITE LOCATION & DEVELOPMENT PROPOSALS

The proposal is for part demolition, extension and reconfiguration of the existing building to provide a replacement church set across ground, lower ground and part first floor; with student accommodation provided at first, second and new third floor level. There is already student accommodation at the upper (first and second floors) of the existing building which the proposal seeks to re-provide, expand and enhance.

The site is situated between Birkenhead Street and Crestfield Street, very close to the busy commuter, tourist and retail area outside King's Cross St Pancras station. Though the streets either side of the site are reasonably shielded from traffic from the station, the access route to the station means that noise levels are consistent throughout both daytime and overnight. Road traffic is also very prolific on the nearby A501, with consistent traffic and peak time congestion occurring outside the train station. This, paired with an abundance of restaurants and pubs in the vicinity, gives similarly high maximum noise events overnight.

A site layout drawing of the proposed development, along with the survey monitoring positions, is shown in Figure 5 below.

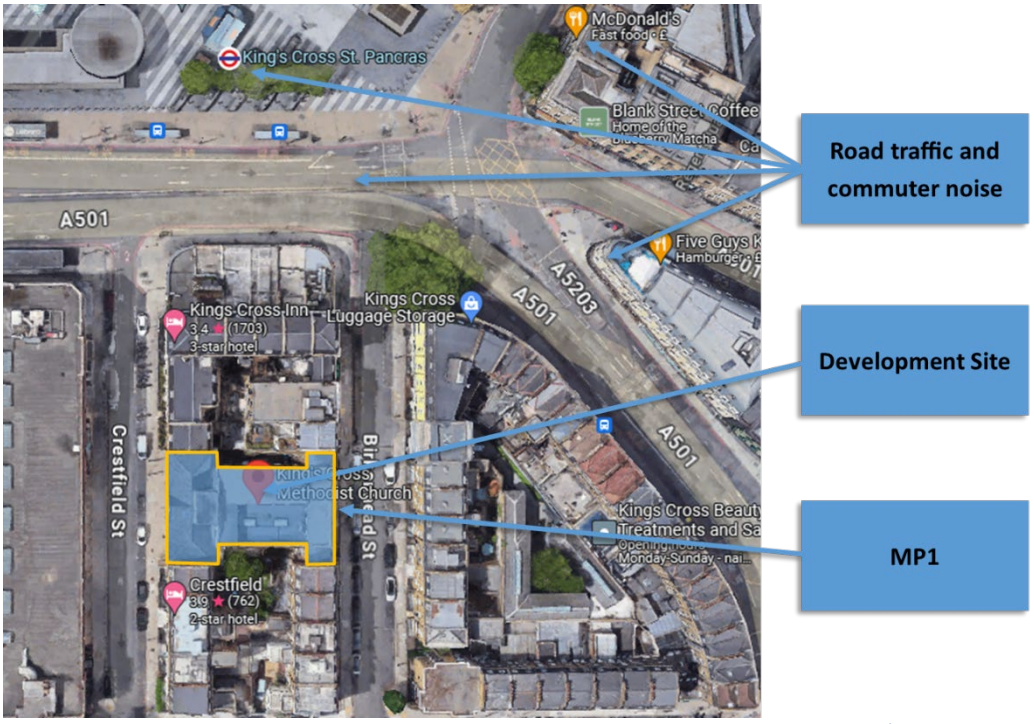


Figure 5: Aerial photograph of the current development site (Available at www.google.com/maps)

4. SOUND LEVEL SURVEY

To assess the impact of existing sound sources, a sound level survey was conducted at the development site. Details of the sound level survey carried out by ACA Acoustics are provided below.

An unattended survey was carried out over a nominal period between the 3rd and 8th July 2024.

The measurement position is marked on the aerial photograph in Figure 5 and described below.

Position Reference	Description
MP1	The microphone was positioned at the front façade of the building, overlooking Birkenhead Street. The soundscape here is considered similar to the façade facing Crestfield Street but ongoing building works meant that a second survey position here was not feasible on this side.

Table 1: Sound level survey measurement position

The following equipment was used during the survey; the sound level meter was calibrated before the survey and checked after with no deviation noted.

Equipment	Serial Number
Svantek Class 1 sound level meter type SVAN 971 with weatherproof outdoor environmental kit	84045
Svantek calibrator type SV33B. Compliant to IEC 60942-1:2003	83826

Table 2: Equipment used for the sound level survey (MP1)

The extended nature of the survey ensures that a reasonable sample of results have been recorded with appropriate weather conditions. Meteorological conditions are not considered to have adversely impacted the survey results.

Results of the survey in terms of raw data are shown in the graph below.

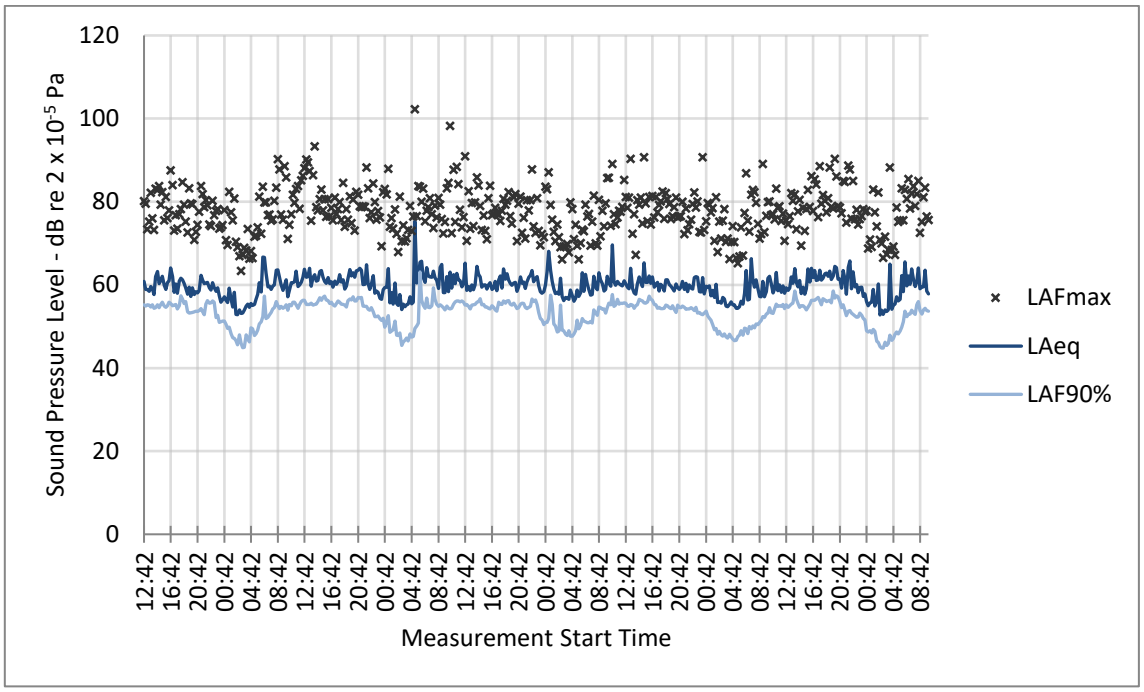


Figure 6: Sound level survey results (MP1) – 3rd to 8th July 2024

Sound level measurements were recorded in consecutive 15-minute samples of overall LAfmax, LAeq, and LA90 values along with other statistical indices and octave band spectra. The sound level meter was set to also log short-term levels simultaneously, to assist with assessment of individual noise events overnight.

Summary of the daytime and night-time sound level results are shown in tabular form in Table 3 below. In accordance with criteria in Figure 3, short-term individual noise events should not exceed LAfmax 45dB inside residential bedrooms more than 10-15 times per night and therefore the 10th highest measured LAfmax value is shown in the table.

Measurement Position	**Daytime (07:00 – 23:00) LAeq**	**Night-Time (23:00 – 07:00) LAeq**	**Night-Time (23:00 – 07:00) Typical LAfmax**
MP1	61dB	60dB	78dB

Table 3: Summary sound level survey results

5. ProPG STAGE 1 INITIAL NOISE RISK ASSESSMENT

Results of the sound level survey have been plotted on the image in Figure 2 to determine the relevant noise risk category. Results of the initial risk assessment are included below.

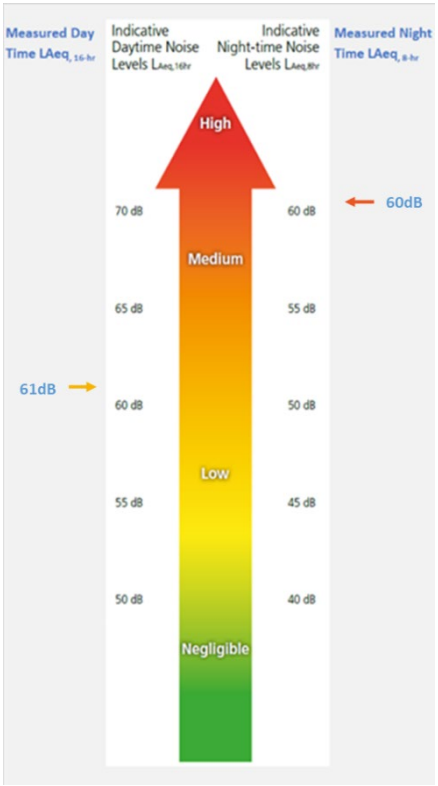


Figure 7: ProPG initial noise risk assessment (MP1)

It is appropriate to consider that this is the raw data and does not include any proposed mitigation. Paragraph 2.12 confirms that:

> *"It is important that the assessment of noise risk at a proposed residential development site is not the basis for the eventual recommendation to the decision maker. The recommended approach is intended to give the developer, the noise practitioner, and the decision maker an early indication of the likely initial suitability of the site for new residential development from a noise perspective and the extent of the acoustic issues that would be faced."*

The initial site risk assessment indicates that the site is in an area where there is a low noise risk during the daytime and a high noise risk overnight.

At these noise levels it is necessary that an appropriate acoustic design is recommended, particularly noting the high measured Lmax levels.

6. ProPG STAGE 2 ACOUSTIC DESIGN STATEMENT

As discussed in Section 2.3, Stage 2 of ProPG is separated into four elements: an overview ensuring a good acoustic design process, assessment of internal sound levels, consideration of sound levels in external amenity areas, and finally an assessment of any other relevant issues.

The four elements are considered in more detail within this Section.

6.1 Element 1 – Good Acoustic Design Process

The pre-planning application advice contained in ProPG confirms:

> "*As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS* [Acoustic Design Statement] *which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrates that a significant adverse noise impact will be avoided in the finished development.*"

ProPG and the supplementary documents provide guidance on the typical matters that should be considered in an Acoustic Design Statement. These matters are discussed in Table 4.

Principle/Topic	**Discussion**
Identify significant existing and potential noise sources and measure or estimate sound levels	Local road traffic has been identified as the dominant noise source across the site. Results and discussion of the sound level survey are included in Section 4.
Consider the feasibility of reducing sound levels or relocating noise sources	It is not feasible to relocate the noise source as part of this relatively minor application.
Consider the potential to mitigate sound through planning of the site and orientation of the buildings	With relatively consistent sound levels observed throughout the site, this would not offer any material benefit to inhabitants.
Mitigating the sound through use of barriers or screens	With the development on the first to third floors and access needed to the church premises below, barriers and screens would not be feasible.
Select construction types and methods to achieve the internal sound level criteria	An appropriate acoustic specification for façade elements has been proposed. Refer Section 6.3.
Consider the acoustic impact of the proposed ventilation strategy	This is discussed in more detail in Section 6.2.
Assess sound levels to external amenity areas	This is discussed in more detail in Section 6.4.

Principle/Topic	Discussion
Assess the viability of alternative solutions	Where appropriate, alternative solutions have been considered during the design phase and the most appropriate scheme has been put forward.
Examine the effects of noise control measures on ventilation, fire regulation, H&S, costs, CDM, or other unintended consequence	Under the Construction (Design and Management) Regulations 2015, ACA Acoustics are acting as a Designer. This Acoustic Design Statement and the supporting evidence has considered best practice to reduce or control foreseeable risks. It is recommended that other relevant parties, including the Principal Designer, consider all non-acoustic aspects of the design.

Table 4: Acoustic Design Statement details

6.2 Ventilation Strategy

Section 2.3 confirms that any site with a noise risk assessment above '*Negligible*' or '*Low*' would fail to achieve internal sound level criteria with windows open and in this instance ProPG and the supplementary guidance requires that internal sound level criteria are achieved whilst providing the '*whole dwelling ventilation*' rate as set out in The Building Regulations Approved Document F through the use of above-window or through-wall trickle ventilators.

Values in Table 5 below show a specification schedule of ventilator sound insulation performance used in the computer model. Note that there are many different passive ventilators including through-wall type and those built into the window frame. If the Dn,e,w performance is not lower than that shown in Table 5 then any alternative ventilator may be used.

Description	Dn,e,w (dB)	Typical Ventilator Type
Vents to habitable rooms	38	Acoustic Trickle Vent (4000mm^2)

Table 5: Specification for ventilator Element Normalized Level Difference - Dn,e,w (dB)

In accordance with Approved Document O of The Building Regulations, where sound levels to inside bedrooms exceed $L_{Aeq,\ 8\text{-hour}}$ 40dB or LAfmax 55dB more than 10 times per night, then it may not be appropriate to rely on open windows to mitigate overheating. In this instance dynamic thermal modelling may be necessary to determine an appropriate overheating mitigation strategy.

Based on measured levels to the façade of LAeq 61dB and LAfmax 78dB and allowing a reduction of 4dBA through a wide-open window to mitigate overheating, as detailed in Section 2.4, internal sound levels within bedrooms to the rear façade will be nominally LAeq 57dB and LAfmax 74dB with windows open. Due to these raised levels an alternative overheating strategy is likely appropriate to ensure that occupants will not need to open windows in order to mitigate

overheating to these bedrooms at night. However, detailed thermal and ventilation design is beyond the scope of this assessment and should be considered by others accordingly.

Should it be considered necessary to include mechanical ventilation systems such as MVHR or MEV it is important that any self-noise (i.e., noise from the fans) and external noise intrusion through the ducted system must not cause internal sound levels to exceed the design requirements. To achieve these limits, it is recommended that the overall noise from any mechanical ventilation system will need to be no higher than LAeq 25dB to allow for accumulation of noise sources. Suitable MVHR systems must also incorporate summer bypass mode to minimise the potential for overheating during summer months.

6.3 Element 2 – Internal Noise Level Guidelines

A scheme for sound insulation is necessary to ensure sound levels inside rooms of the new replacement student accommodation are reasonable and comply with the requirements of ProPG and BS 8233:2014.

A computer model has been set up using the measured/calculated sound levels incident on the façade of the development along with anticipated façade elements. The computer model is based on the calculation procedures outlined in BS EN ISO 12354-3:2000 and BS 8233:2014.

Confirmation of the acoustic performance of the building envelope elements used in the calculation model is provided in Table 6 below. Ventilators are as shown in Table 5.

Description	Location	Rw (dB)	Rw + C'tr (dB)	Typical Construction
Façade walls	Entire development	52	48	Typical existing masonry wall – such as 105mm brick, 75mm cavity, 100mm block or similar
Windows	Entire development	39	34	Thermal double glazing such as 10-16-6 or equivalent
Roof	Entire development	52	47	Typical roof buildup based on 100mm reinforced concrete
Single Doors	Third floor flats with terrace	36	28	Typical PVC door
Patio Doors	Third floor, front centre room	34	30	Thermal double glazing such as 4-16-6 or equivalent

Table 6: Acoustic performance specification for facade elements

The specification for glazed elements is for the window/door as a complete unit, including frames and seals and is based on data provided by Guardian Glass. It is recommended the glazing supplier submit test data confirming their unit will comply with the specified performance.

A copy of acoustic calculations for daytime and night-time noise intrusion into the apartment is provided in Appendix A. Summary results are confirmed in Table 7 below and demonstrate that intrusive sound levels will comfortably comply with guidance limits in ProPG and BS 8233:2014.

Plot / Room	Description	Calculated Internal Sound Level	Criteria
1st Floor Front Single	Daytime LAeq	28dB	≤ 35dB
	Nighttime LAeq	27dB	≤ 30dB
	Nighttime LAfmax	45dB	≤ 45dB
1st Floor Front Twin	Daytime LAeq	26dB	≤ 35dB
	Nighttime LAeq	25dB	≤ 30dB
	Nighttime LAfmax	43dB	≤ 45dB
1st Floor Side Single	Daytime LAeq	26dB	≤ 35dB
	Nighttime LAeq	25dB	≤ 30dB
	Nighttime LAfmax	43dB	≤ 45dB
1st Floor Rear Corner Studio	Daytime LAeq	27dB	≤ 35dB
	Nighttime LAeq	26dB	≤ 30dB
	Nighttime LAfmax	43dB	≤ 45dB
2nd Floor Front Single	Daytime LAeq	28dB	≤ 35dB
	Nighttime LAeq	27dB	≤ 30dB
	Nighttime LAfmax	45dB	≤ 45dB
2nd Floor Front Twin	Daytime LAeq	26dB	≤ 35dB
	Nighttime LAeq	25dB	≤ 30dB
	Nighttime LAfmax	43dB	≤ 45dB
2nd Floor Side Single	Daytime LAeq	26dB	≤ 35dB
	Nighttime LAeq	25dB	≤ 30dB
	Nighttime LAfmax	43dB	≤ 45dB
2nd Floor Rear Single (1 Window)	Daytime LAeq	26dB	≤ 35dB
	Nighttime LAeq	25dB	≤ 30dB
	Nighttime LAfmax	43dB	≤ 45dB
2nd Floor Rear Single (2 Windows)	Daytime LAeq	27dB	≤ 35dB
	Nighttime LAeq	26dB	≤ 30dB
	Nighttime LAfmax	44dB	≤ 45dB
2nd Floor Rear Corner Studio	Daytime LAeq	27dB	≤ 35dB
	Nighttime LAeq	26dB	≤ 30dB
	Nighttime LAfmax	43dB	≤ 45dB
3rd Floor Front Single (Sides)	Daytime LAeq	26dB	≤ 35dB
	Nighttime LAeq	25dB	≤ 30dB

Plot / Room	Description	Calculated Internal Sound Level	Criteria
	Nighttime LAfmax	43dB	≤ 45dB
3rd Floor Front Single (patio doors)	Daytime LAeq	26dB	≤ 35dB
	Nighttime LAeq	25dB	≤ 30dB
	Nighttime LAfmax	43dB	≤ 45dB
3rd Floor Rear Corner Studio	Daytime LAeq	26dB	≤ 35dB
	Nighttime LAeq	25dB	≤ 30dB
	Nighttime LAfmax	43dB	≤ 45dB

Table 7: Summary internal sound levels within sample habitable rooms

6.4 Element 3 – External Amenity Area Noise Assessment

The proposed development includes a small terrace space serving the communal living/kitchen/dining room, facing Crestfield Street. This space is set further back from the road – the primary source of background noise – so it will benefit from increased distance and significant screening from the source. With the background level measured at first floor level at LAeq 61dB in the daytime and LAeq 60dB overnight, it is likely that levels will fall to below LAeq 55dB at the terrace. This meets the requirement set out in BS 8233:2014 and as such is expected to be considered acceptable by the local authority.

A second external amenity area is to be located on the centre of the main roof at third floor level. Being set behind the third floor built elements on both the east and west, this location is expected to be screened more significantly from road traffic noise than the west-facing terrace discussed above. As such it is anticipated that noise levels from background noise identified in the survey will meet the criteria of BS 8233:2014 and be considered acceptable by the local authority.

7. CONCLUSION

This Noise Impact Assessment accompanies a planning application for part demolition, extension and reconfiguration of the existing building to provide a replacement church with ancillary café and student accommodation, together with associated plant, cycle and refuse storage at 58A Birkenhead Street. There is existing student accommodation at the site already.

ACA Acoustics have undertaken a sound level survey at the site. A ProPG Stage 1 initial noise risk assessment has indicated the site is in a high-risk area. Through a good acoustic design process ACA Acoustics have developed an Acoustic Design Statement, included in this report.

Allowing for the benefit of the acoustic specification of façade elements shown in this report, calculated internal sound levels within habitable rooms will comply with recommended criteria set out in ProPG and BS 8233:2014.

It is the author's assessment that the Acoustic Design Statement has demonstrated that potential significant adverse impacts can be adequately mitigated to ensure noise is not detrimental to the amenity of future occupants.

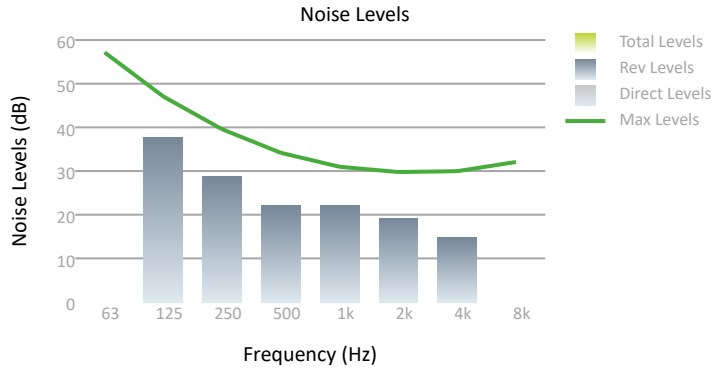
In accordance with guidance in ProPG, it is recommended that planning consent may be granted for the proposed development.

Appendix A

External sound intrusion calculations

Kings Cross Methodist Church

Reference	FF Front Single Day
Description	
Target Sound Level	35dB(A)
Max Sound Level	40dB(A)
Calculated Sound Level	28dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	38.2



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Day)	1	-	37.7	28.7	22.0	22.0	19.2	14.7	-

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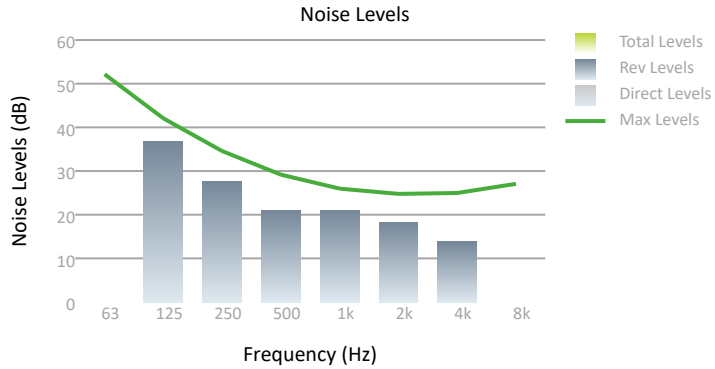
Kings Cross Methodist Church

Reference	FF Front Single Night
Description	
Target Sound Level	30dB(A)
Max Sound Level	35dB(A)
Calculated Sound Level	27dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	38.2



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Night)	1	-	36.7	27.7	21.0	21.0	18.2	13.8	-

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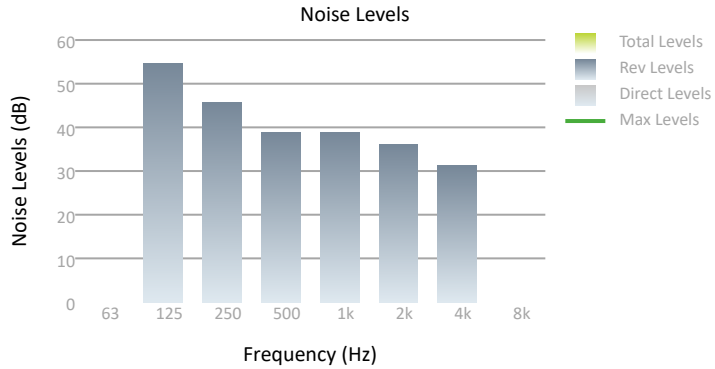
Kings Cross Methodist Church

Reference	FF Front Single Lmax
Description	
Target Sound Level	45dB(A)
Max Sound Level	-
Calculated Sound Level	44.9dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	38.2



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Lmax, ff (Night)	1	-	54.7	45.7	38.9	38.9	36.0	31.2	-

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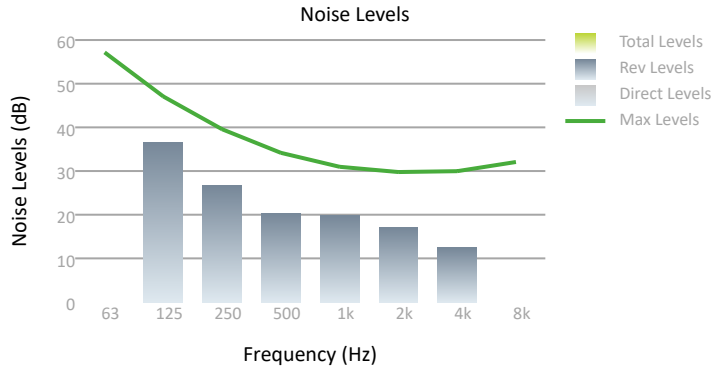
Kings Cross Methodist Church

Reference	FF Front Twin Day
Description	
Target Sound Level	35dB(A)
Max Sound Level	40dB(A)
Calculated Sound Level	26.1dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	68.3



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Day)	1	-	36.6	26.6	20.4	19.8	17.0	12.4	-

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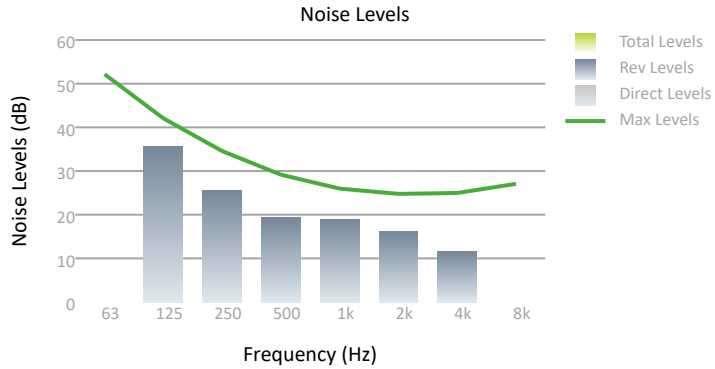
Kings Cross Methodist Church

Reference	FF Front Twin Night
Description	
Target Sound Level	30dB(A)
Max Sound Level	35dB(A)
Calculated Sound Level	25.2dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	68.3



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Night)	1	-	35.6	25.7	19.4	18.8	16.1	11.6	-

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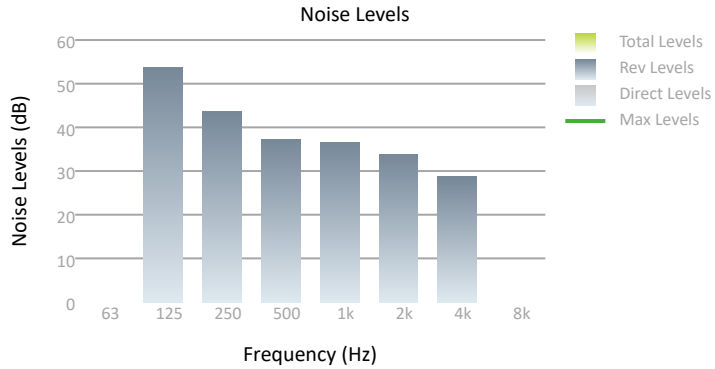
Kings Cross Methodist Church

Reference	FF Front Twin Lmax
Description	
Target Sound Level	45dB(A)
Max Sound Level	-
Calculated Sound Level	43dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	68.3



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Lmax, ff (Night)	1	-	53.6	43.6	37.2	36.6	33.8	28.7	-

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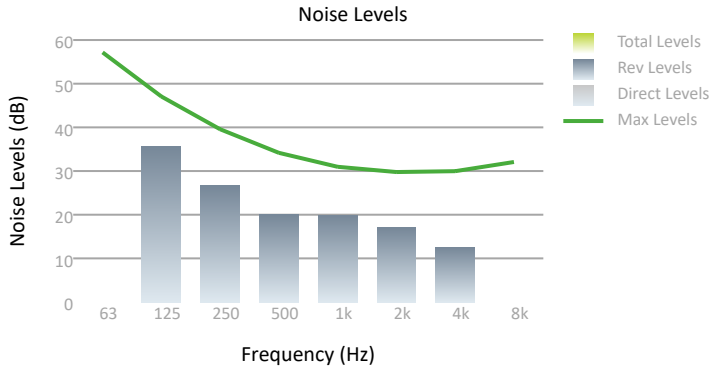
Kings Cross Methodist Church

Reference	FF Side Single Day
Description	
Target Sound Level	35dB(A)
Max Sound Level	40dB(A)
Calculated Sound Level	25.9dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	63.6



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Day)	1	-	35.6	26.6	20.0	19.9	17.0	12.6	-

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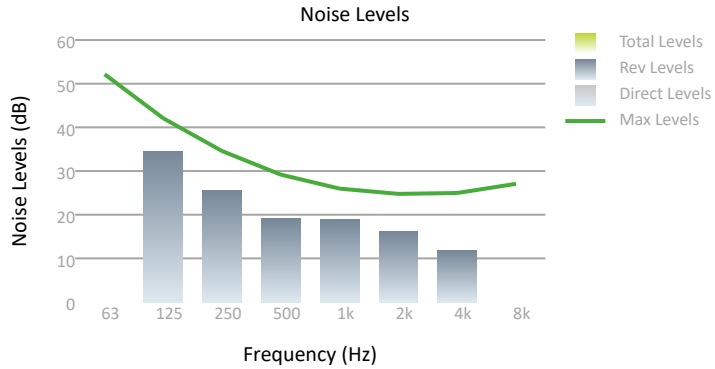
Kings Cross Methodist Church

Reference	FF Side Single Night
Description	
Target Sound Level	30dB(A)
Max Sound Level	35dB(A)
Calculated Sound Level	24.9dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	63.6



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Night)	1	-	34.6	25.6	19.1	18.9	16.1	11.8	-

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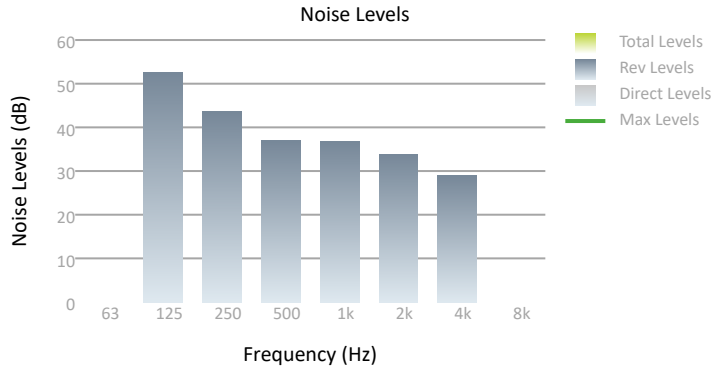
Kings Cross Methodist Church

Reference	FF Side Single Lmax
Description	
Target Sound Level	45dB(A)
Max Sound Level	-
Calculated Sound Level	42.7dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	63.6



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Lmax, ff (Night)	1	-	52.6	43.5	36.9	36.7	33.8	29.0	-

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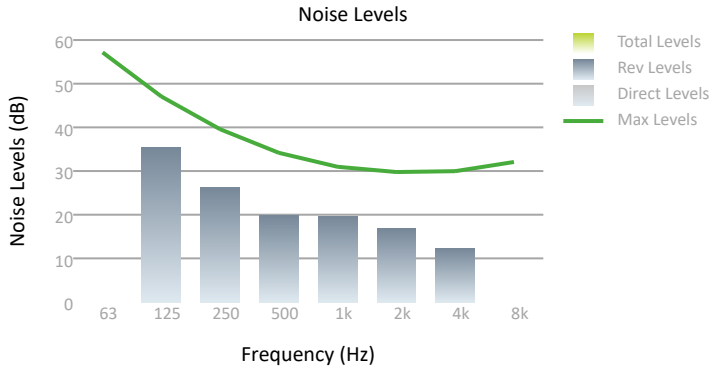
Kings Cross Methodist Church

Reference	FF Side Accessible Day
Description	
Target Sound Level	35dB(A)
Max Sound Level	40dB(A)
Calculated Sound Level	25.6dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	67.3



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Day)	1	-	35.3	26.3	19.8	19.6	16.8	12.4	-

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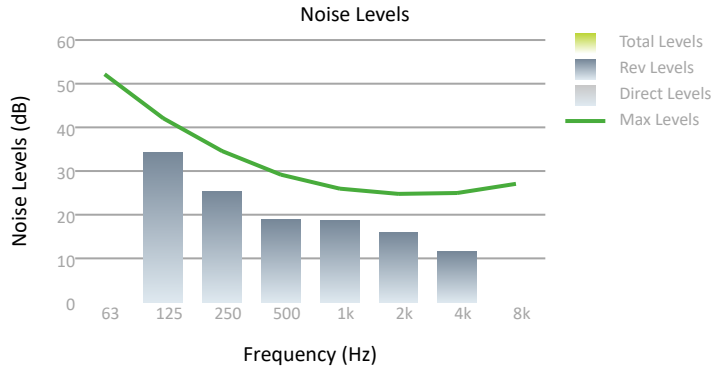
Reference	FF Side Accessible Night
Description	
Target Sound Level	30dB(A)
Max Sound Level	35dB(A)
Calculated Sound Level	24.7dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	67.3



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Night)	1	-	34.3	25.4	18.9	18.6	15.9	11.5	-

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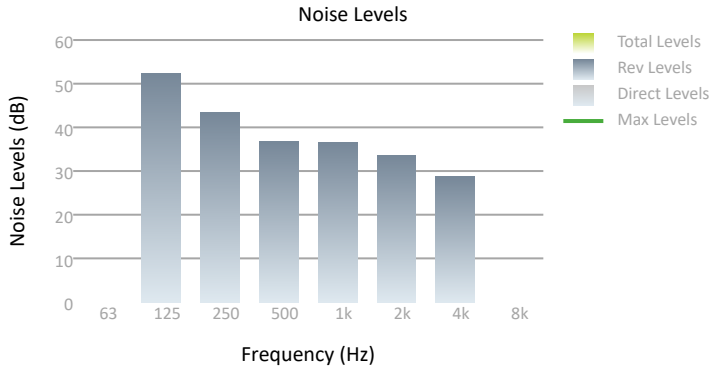
Reference	FF Side Accessible Lmax
Description	
Target Sound Level	45dB(A)
Max Sound Level	-
Calculated Sound Level	42.5dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	67.3



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Lmax, ff (Night)	1	-	52.3	43.3	36.7	36.5	33.5	28.7	-

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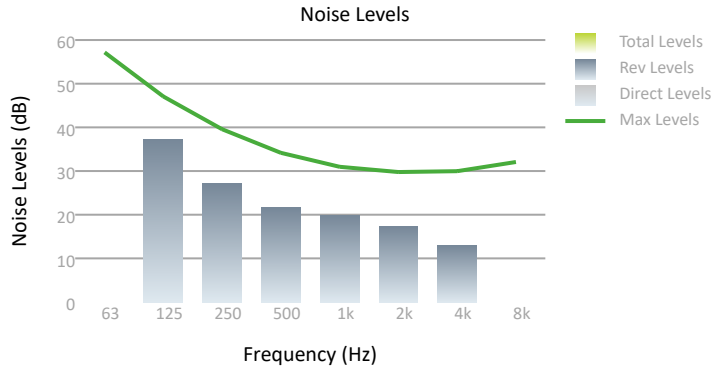
Reference	FF Rear Corner Twin Day
Description	
Target Sound Level	35dB(A)
Max Sound Level	40dB(A)
Calculated Sound Level	26.6dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	74.4



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Day)	1	-	37.3	27.0	21.6	19.9	17.3	13.0	-

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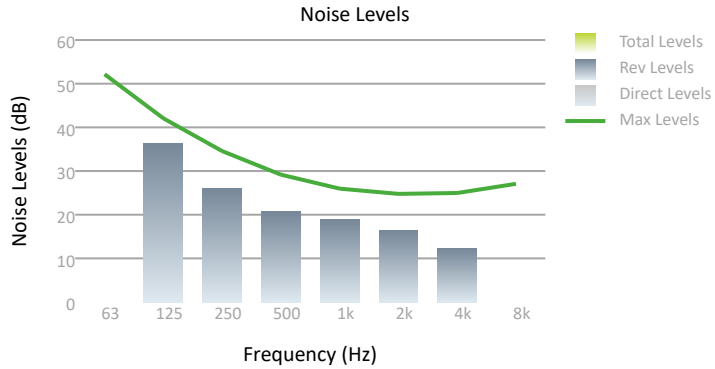
Kings Cross Methodist Church

Reference	FF Rear Corner Twin Night
Description	
Target Sound Level	30dB(A)
Max Sound Level	35dB(A)
Calculated Sound Level	25.7dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	74.4



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Night)	1	-	36.3	26.1	20.6	19.0	16.4	12.3	-

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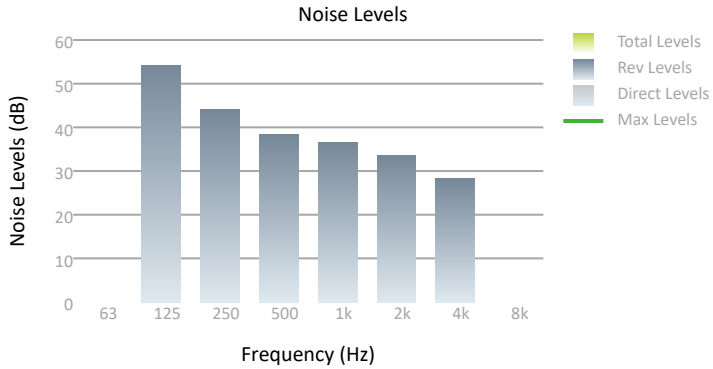
Kings Cross Methodist Church

Reference	FF Rear Corner Twin Lmax
Description	
Target Sound Level	45dB(A)
Max Sound Level	-
Calculated Sound Level	43.4dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	74.4



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Lmax, ff (Night)	1	-	54.2	44.0	38.4	36.6	33.6	28.4	-

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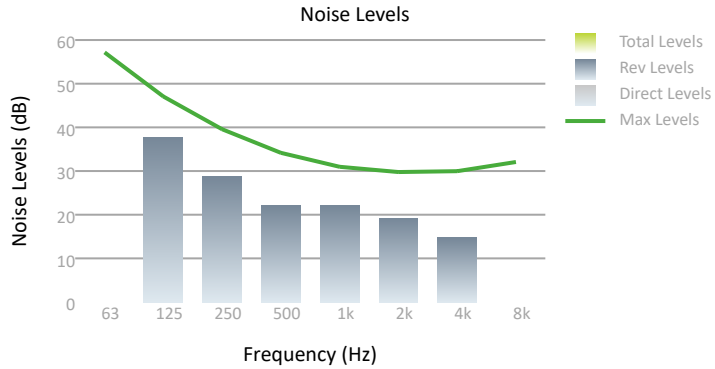
Kings Cross Methodist Church

Reference	SF Front Single Day
Description	
Target Sound Level	35dB(A)
Max Sound Level	40dB(A)
Calculated Sound Level	28dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	38.2



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Day)	1	-	37.7	28.7	22.0	22.0	19.2	14.7	-

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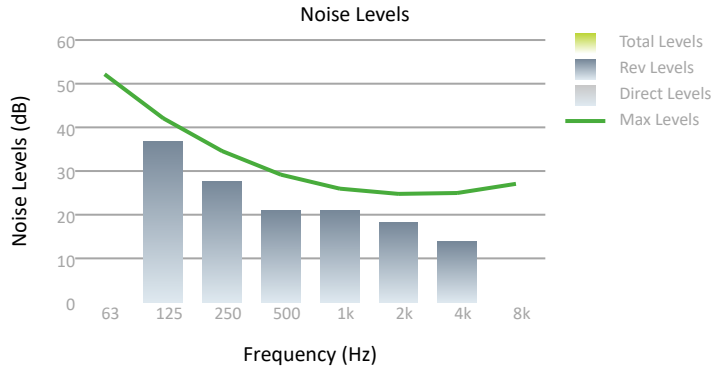
Kings Cross Methodist Church

Reference	SF Front Single Night
Description	
Target Sound Level	30dB(A)
Max Sound Level	35dB(A)
Calculated Sound Level	27dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	38.2



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Night)	1	-	36.7	27.7	21.0	21.0	18.2	13.8	-

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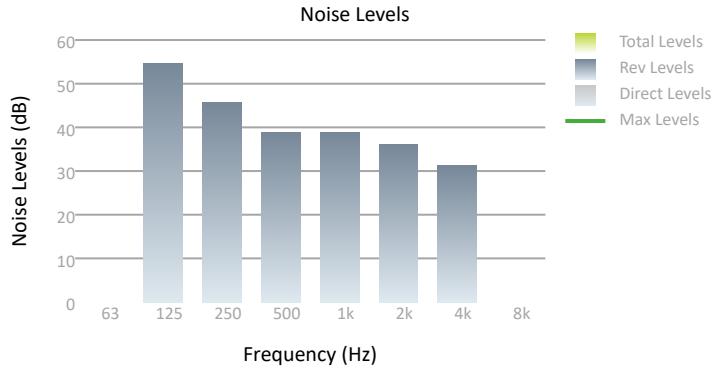
Kings Cross Methodist Church

Reference	SF Front Single Lmax
Description	
Target Sound Level	45dB(A)
Max Sound Level	-
Calculated Sound Level	44.9dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	38.2



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Lmax, ff (Night)	1	-	54.7	45.7	38.9	38.9	36.0	31.2	-

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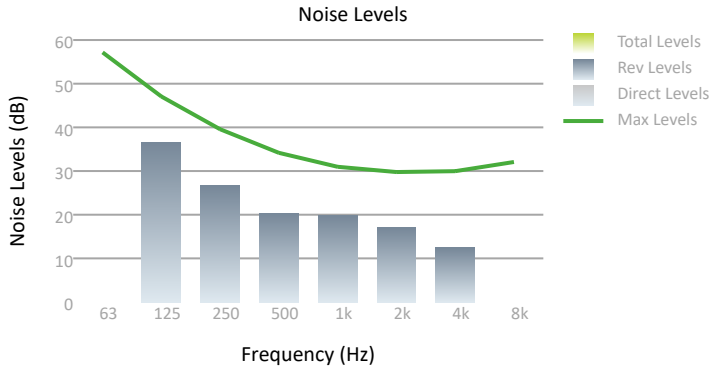
Kings Cross Methodist Church

Reference	SF Front Twin Day
Description	
Target Sound Level	35dB(A)
Max Sound Level	40dB(A)
Calculated Sound Level	26.1dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	68.3



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Day)	1	-	36.6	26.6	20.4	19.8	17.0	12.4	-

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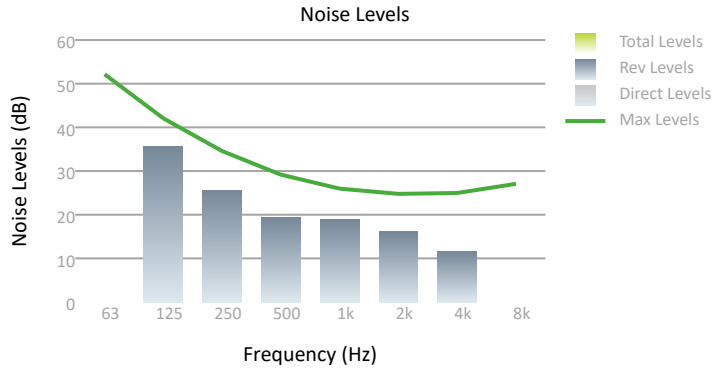
Kings Cross Methodist Church

Reference	SF Front Twin Night
Description	
Target Sound Level	30dB(A)
Max Sound Level	35dB(A)
Calculated Sound Level	25.2dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	68.3



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Night)	1	-	35.6	25.7	19.4	18.8	16.1	11.6	-

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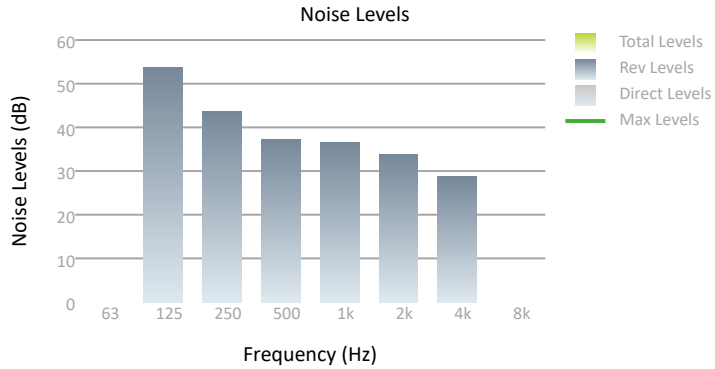
Kings Cross Methodist Church

Reference	SF Front Twin Lmax
Description	
Target Sound Level	45dB(A)
Max Sound Level	-
Calculated Sound Level	43dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	68.3



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Lmax, ff (Night)	1	-	53.6	43.6	37.2	36.6	33.8	28.7	-

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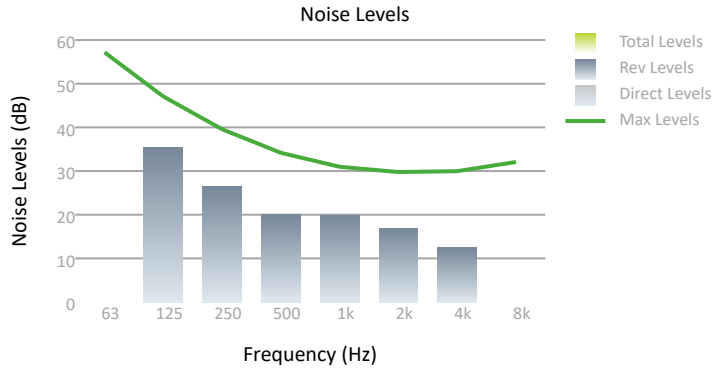
Kings Cross Methodist Church

Reference	SF Side Single Day
Description	
Target Sound Level	35dB(A)
Max Sound Level	40dB(A)
Calculated Sound Level	25.8dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	64.7



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Day)	1	-	35.5	26.5	20.0	19.8	17.0	12.5	-

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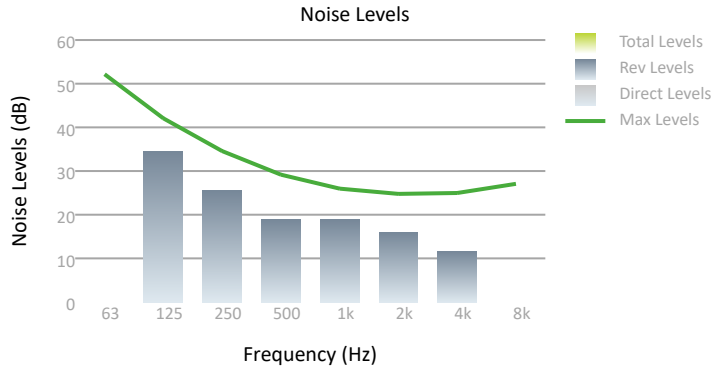
Kings Cross Methodist Church

Reference	SF Side Single Night
Description	
Target Sound Level	30dB(A)
Max Sound Level	35dB(A)
Calculated Sound Level	24.8dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	64.7



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Night)	1	-	34.5	25.5	19.0	18.8	16.0	11.7	-

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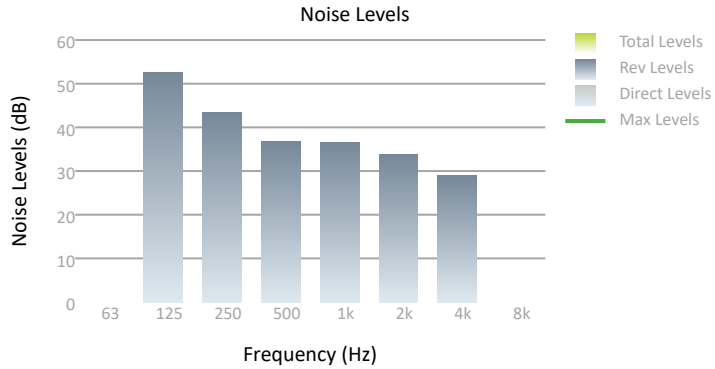
Kings Cross Methodist Church

Reference	SF Side Single Lmax
Description	
Target Sound Level	45dB(A)
Max Sound Level	-
Calculated Sound Level	42.7dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	64.7



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Lmax, ff (Night)	1	-	52.5	43.5	36.8	36.6	33.7	28.9	-

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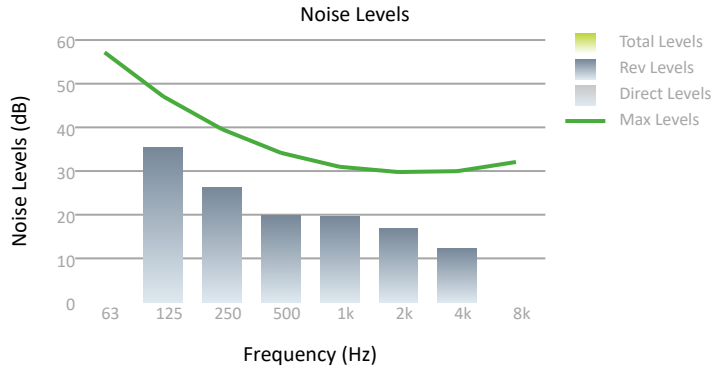
Kings Cross Methodist Church

Reference	SF Side AWC Day
Description	
Target Sound Level	35dB(A)
Max Sound Level	40dB(A)
Calculated Sound Level	25.6dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	67.3



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Day)	1	-	35.3	26.3	19.8	19.6	16.8	12.4	-

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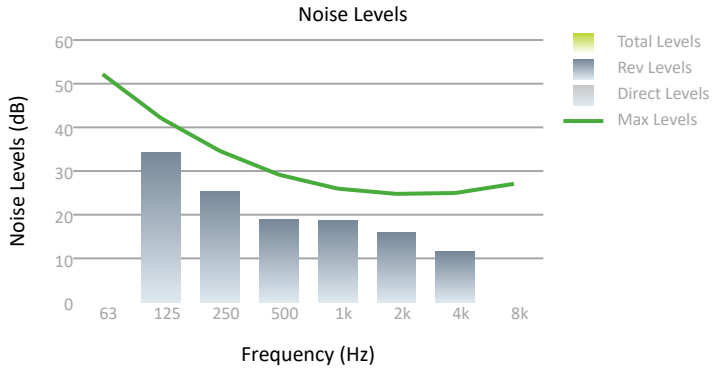
Kings Cross Methodist Church

Reference	SF Side AWC Night
Description	
Target Sound Level	30dB(A)
Max Sound Level	35dB(A)
Calculated Sound Level	24.7dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	67.3



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Night)	1	-	34.3	25.4	18.9	18.6	15.9	11.5	-

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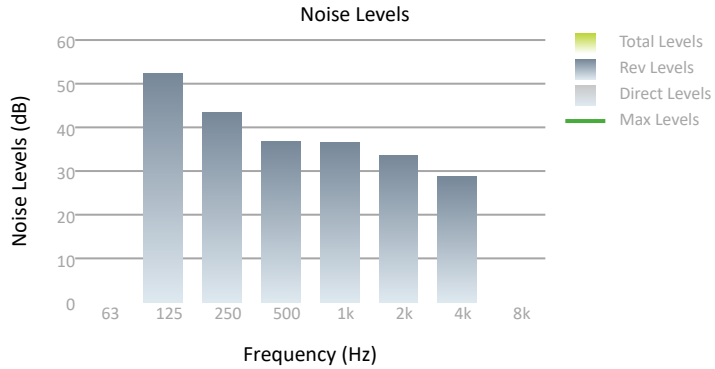
Kings Cross Methodist Church

Reference	SF Side AWC Lmax
Description	
Target Sound Level	45dB(A)
Max Sound Level	-
Calculated Sound Level	42.5dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	67.3



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Lmax, ff (Night)	1	-	52.3	43.3	36.7	36.5	33.5	28.7	-

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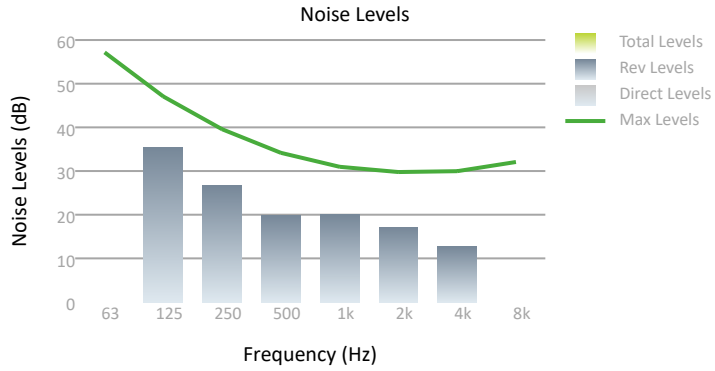
Kings Cross Methodist Church

Reference	SF Rear Single (1w) Day
Description	
Target Sound Level	35dB(A)
Max Sound Level	40dB(A)
Calculated Sound Level	25.9dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	60.1



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Day)	1	-	35.4	26.7	19.9	20.0	17.1	12.7	-

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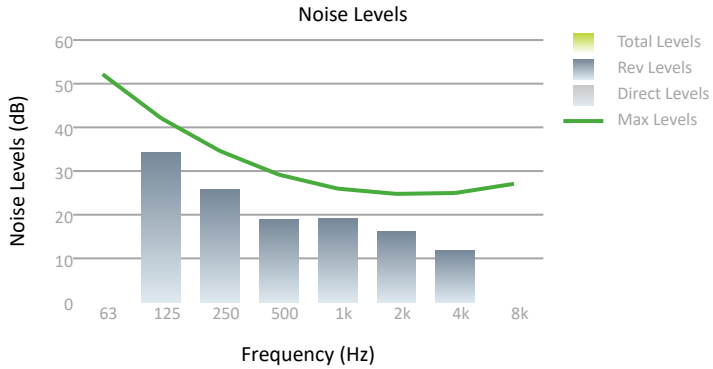
Kings Cross Methodist Church

Reference	SF Rear Single (1w) Night
Description	
Target Sound Level	30dB(A)
Max Sound Level	35dB(A)
Calculated Sound Level	24.9dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	60.1



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Night)	1	-	34.4	25.7	19.0	19.0	16.2	11.8	-

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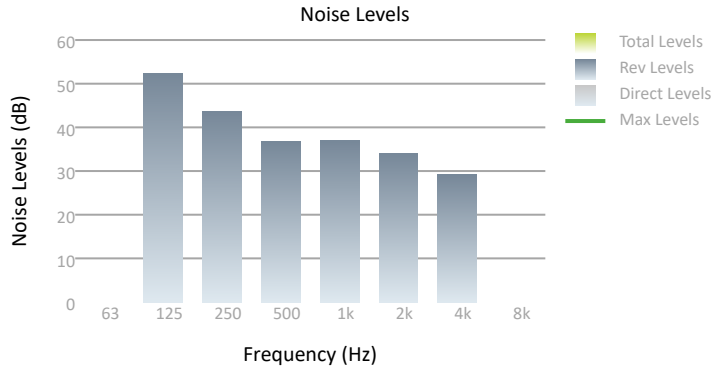
Reference	SF Rear Single (1w) Lmax
Description	
Target Sound Level	45dB(A)
Max Sound Level	-
Calculated Sound Level	42.8dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	60.1



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Lmax, ff (Night)	1	-	52.3	43.6	36.8	36.9	33.9	29.2	-

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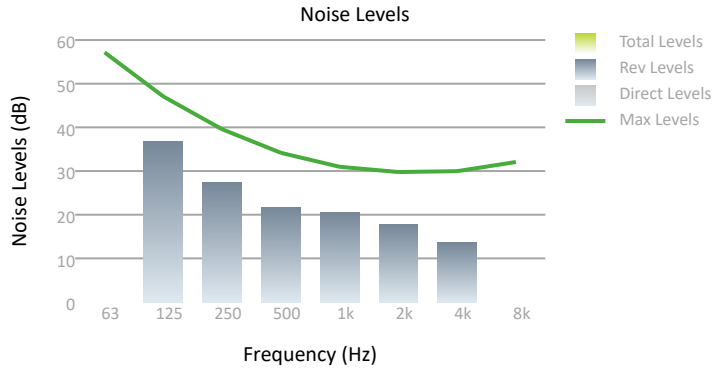
Reference	SF Rear Single (2w) Day
Description	
Target Sound Level	35dB(A)
Max Sound Level	40dB(A)
Calculated Sound Level	26.8dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	60.1



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Day)	1	-	36.7	27.5	21.7	20.5	17.7	13.6	-

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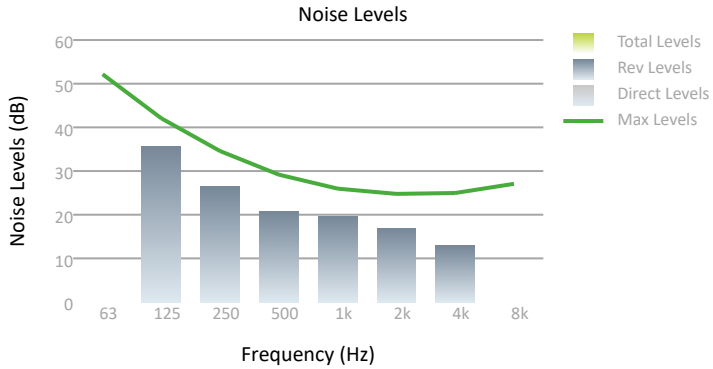
Reference	SF Rear Single (2w) Night
Description	
Target Sound Level	30dB(A)
Max Sound Level	35dB(A)
Calculated Sound Level	25.9dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	60.1



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Night)	1	-	35.7	26.5	20.8	19.6	16.9	13.0	-

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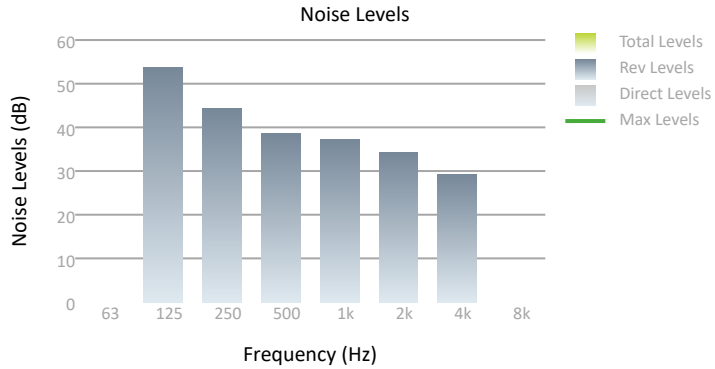
Kings Cross Methodist Church

Reference	SF Rear Single (2w) Lmax
Description	
Target Sound Level	45dB(A)
Max Sound Level	-
Calculated Sound Level	43.6dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	60.1



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Lmax, ff (Night)	1	-	53.7	44.4	38.5	37.2	34.2	29.3	-

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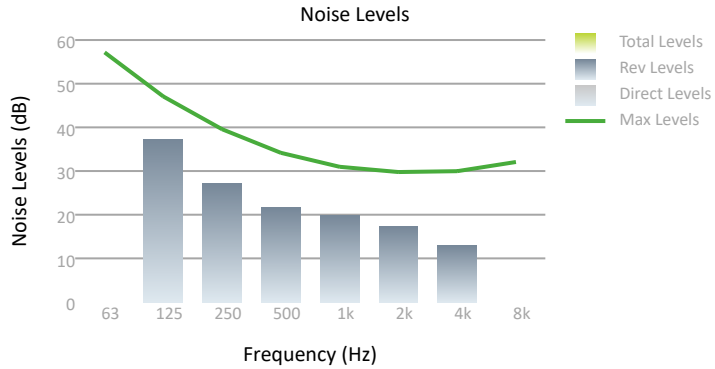
Reference	SF Rear Corner Day
Description	
Target Sound Level	35dB(A)
Max Sound Level	40dB(A)
Calculated Sound Level	26.6dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	74.4



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Day)	1	-	37.3	27.0	21.6	19.9	17.3	13.0	-

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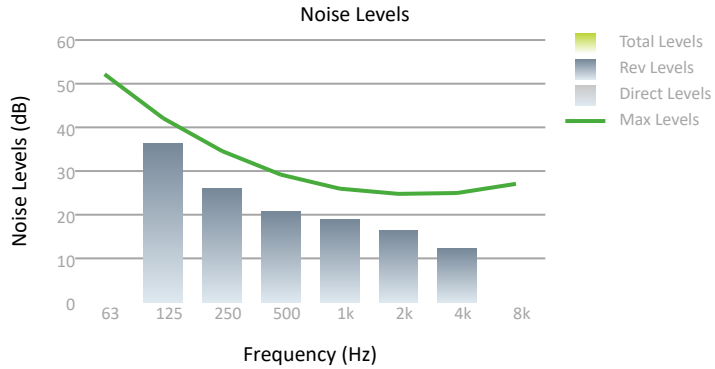
Reference	SF Rear Corner Night
Description	
Target Sound Level	30dB(A)
Max Sound Level	35dB(A)
Calculated Sound Level	25.7dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	74.4



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Night)	1	-	36.3	26.1	20.6	19.0	16.4	12.3	-

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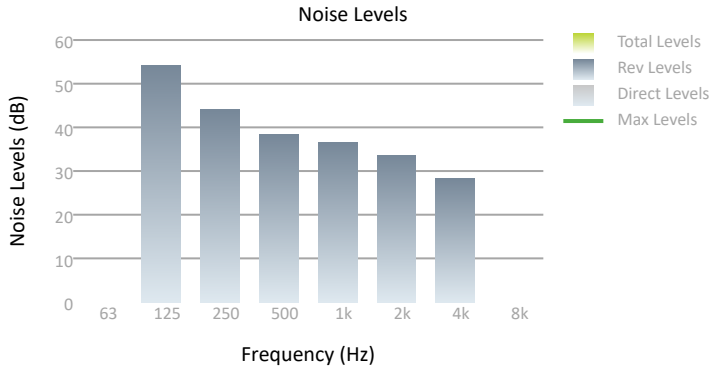
Reference	SF Rear Corner Lmax
Description	
Target Sound Level	45dB(A)
Max Sound Level	-
Calculated Sound Level	43.4dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	74.4



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Lmax, ff (Night)	1	-	54.2	44.0	38.4	36.6	33.6	28.4	-

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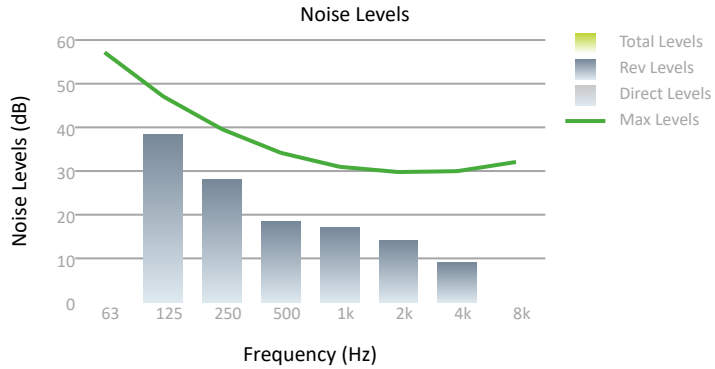
Kings Cross Methodist Church

Reference	TF Front Single L Day
Description	
Target Sound Level	35dB(A)
Max Sound Level	40dB(A)
Calculated Sound Level	25.9dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	127.5



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Day)	1	-	38.4	27.9	18.5	17.1	14.1	9.0	-

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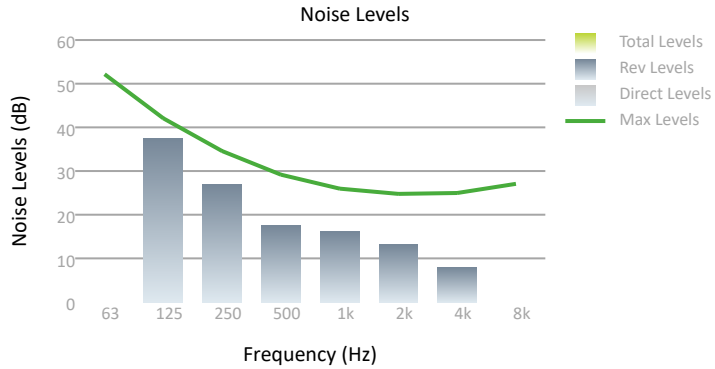
Kings Cross Methodist Church

Reference	TF Front Single L Night
Description	
Target Sound Level	30dB(A)
Max Sound Level	35dB(A)
Calculated Sound Level	24.9dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	127.5



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Night)	1	-	37.4	26.9	17.5	16.1	13.1	8.0	-

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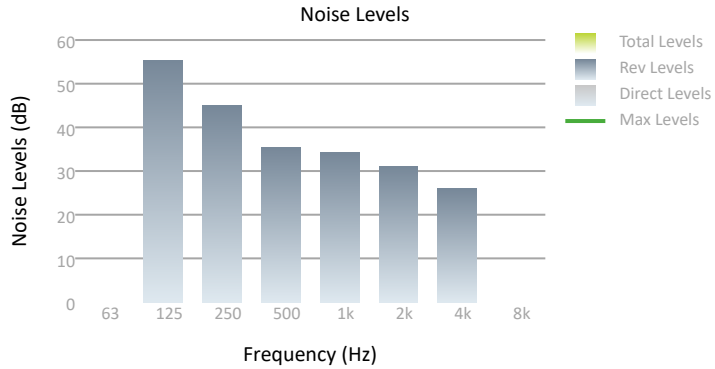
Kings Cross Methodist Church

Reference	TF Front Single L Lmax
Description	
Target Sound Level	45dB(A)
Max Sound Level	-
Calculated Sound Level	42.9dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	127.5



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Lmax, ff (Night)	1	-	55.4	44.9	35.5	34.1	31.1	26.0	-

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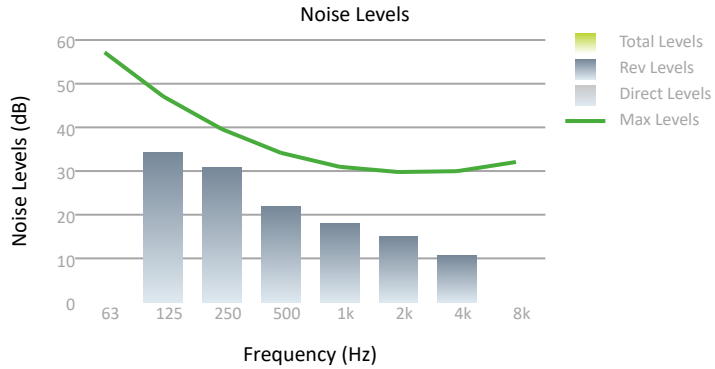
Kings Cross Methodist Church

Reference	TF Front Single C Day
Description	
Target Sound Level	35dB(A)
Max Sound Level	40dB(A)
Calculated Sound Level	26.3dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	104.8



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Day)	1	-	34.3	30.8	21.9	18.0	15.0	10.7	-

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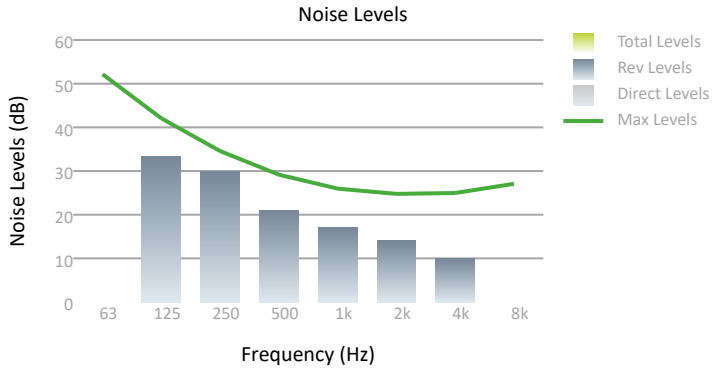
Kings Cross Methodist Church

Reference	TF Front Single C Night
Description	
Target Sound Level	30dB(A)
Max Sound Level	35dB(A)
Calculated Sound Level	25.3dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	104.8



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Night)	1	-	33.3	29.8	21.0	17.0	14.0	9.9	-

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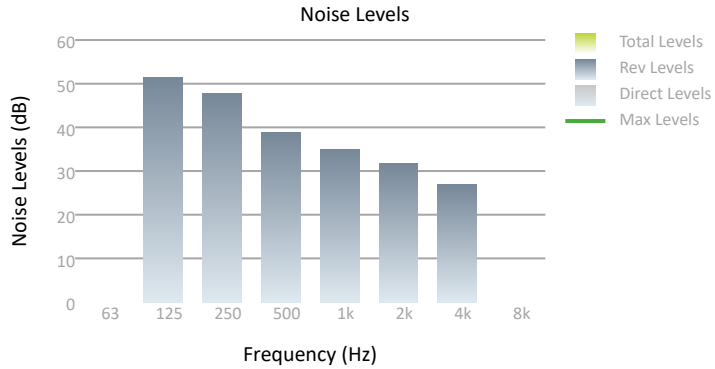
Kings Cross Methodist Church

Reference	TF Front Single C Lmax
Description	
Target Sound Level	45dB(A)
Max Sound Level	-
Calculated Sound Level	43.2dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	104.8



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Lmax, ff (Night)	1	-	51.3	47.8	38.9	34.9	31.7	27.0	-

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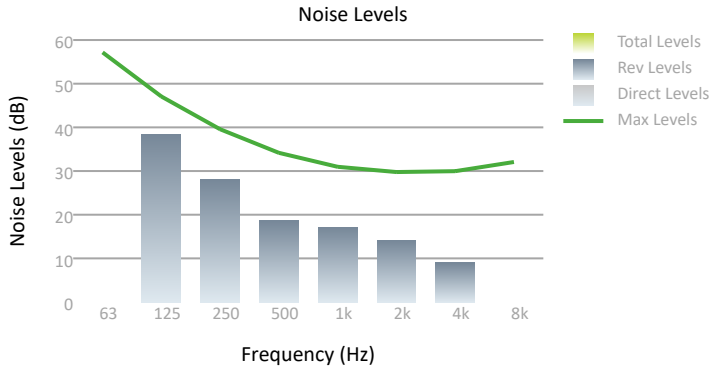
Kings Cross Methodist Church

Reference	TF Front Twin Day
Description	
Target Sound Level	35dB(A)
Max Sound Level	40dB(A)
Calculated Sound Level	25.9dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	127.3



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Day)	1	-	38.4	28.1	18.6	17.2	14.1	9.0	-

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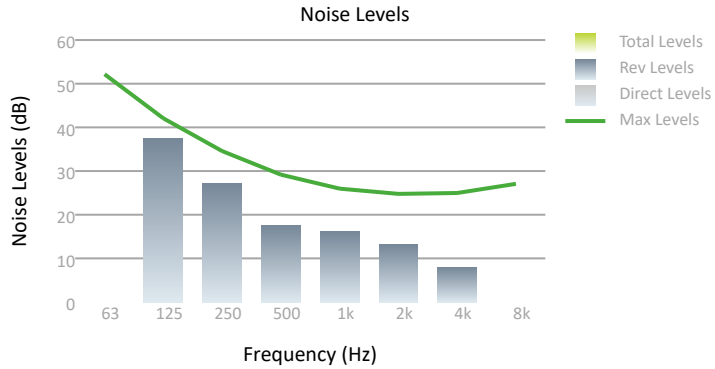
Kings Cross Methodist Church

Reference	TF Front Twin Night
Description	
Target Sound Level	30dB(A)
Max Sound Level	35dB(A)
Calculated Sound Level	24.9dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	127.3



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Night)	1	-	37.4	27.1	17.6	16.2	13.1	8.0	-

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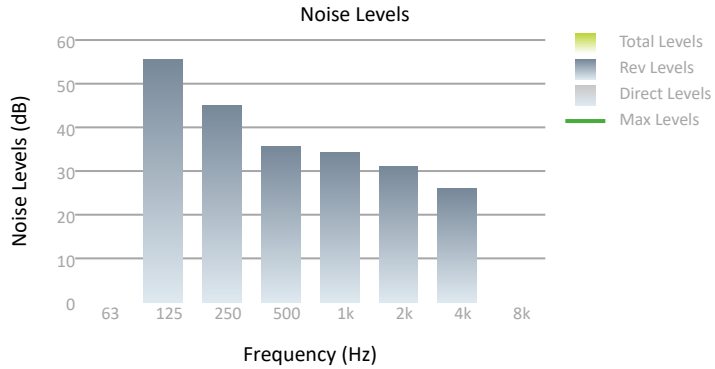
Kings Cross Methodist Church

Reference	TF Front Twin Lmax
Description	
Target Sound Level	45dB(A)
Max Sound Level	-
Calculated Sound Level	42.9dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	127.3



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Lmax, ff (Night)	1	-	55.4	45.1	35.6	34.2	31.1	26.0	-

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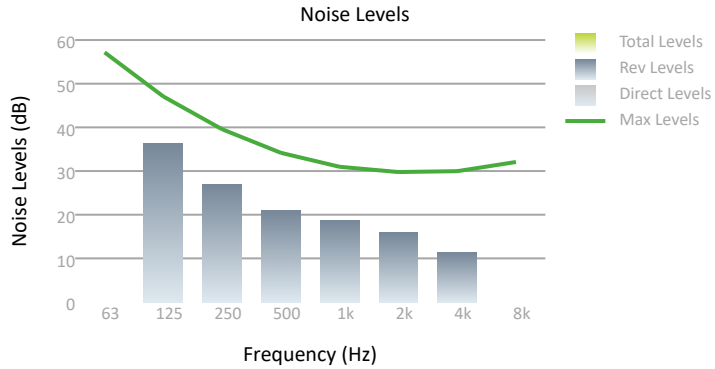
Kings Cross Methodist Church

Reference	TF Rear Corner Day
Description	
Target Sound Level	35dB(A)
Max Sound Level	40dB(A)
Calculated Sound Level	25.8dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	104.1



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Day)	1	-	36.4	27.0	21.0	18.7	15.8	11.4	-

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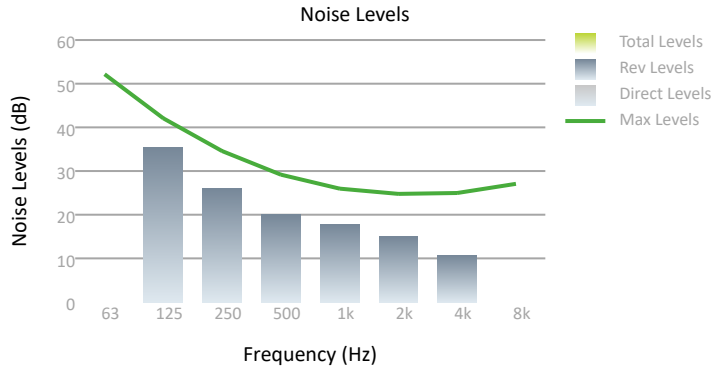
Kings Cross Methodist Church

Reference	TF Rear Corner Night
Description	
Target Sound Level	30dB(A)
Max Sound Level	35dB(A)
Calculated Sound Level	24.8dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	104.1



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Night)	1	-	35.4	26.0	20.0	17.8	15.0	10.7	-

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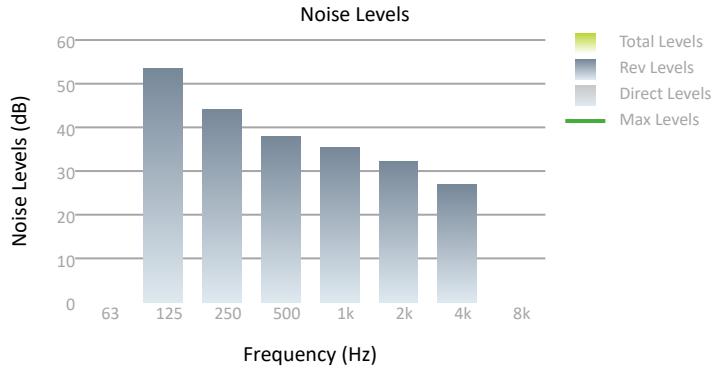
Kings Cross Methodist Church

Reference	TF Rear Corner Lmax
Description	
Target Sound Level	45dB(A)
Max Sound Level	-
Calculated Sound Level	42.6dB(A)
Calculated Tmf T60 (s)	0.45
Volume (m^3)	104.1



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Lmax, ff (Night)	1	-	53.4	44.0	37.8	35.4	32.3	27.0	-

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Calculation Sheet

FF Front Single Day

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Daytime Leq)										
Source dBA	**61.0**									
Octave Band Frequencies										
Leq,ff		**65.0**	**63.0**	**59.0**	**57.0**	**57.0**	**53.0**	**48.0**	**42.0**	**Row A**
Facade Wall Element										
		-40.4	*-43.4*	*-47.4*	*-47.4*	*-56.4*	*-60.4*	*-62.4*	*-67.4*	
Facade Glazed Element										
		-	*-33.2*	*-44.2*	*-46.2*	*-51.2*	*-48.2*	*-61.2*	*-*	
Ventilators										
		-32.0	*-31.0*	*-34.0*	*-39.0*	*-38.0*	*-37.0*	*-36.0*	*-37.0*	
Cumulative Lp										
Result		**-**	**34.2**	**25.6**	**19.3**	**19.3**	**16.5**	**12.5**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*3.5*	*3.1*	*2.7*	*2.7*	*2.7*	*2.2*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - FF Front Single Day **Reverberant Field, LPrev:**		**-**	**37.7**	**28.7**	**22.0**	**22.0**	**19.2**	**14.7**	**-**	

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Calculation Sheet

FF Front Single Night

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Leq)										
Source dBA	**60.0**									
Octave Band Frequencies										
Leq,ff		**64.0**	**62.0**	**58.0**	**56.0**	**56.0**	**52.0**	**47.0**	**41.0**	**Row A**
Facade Wall Element										
		-40.4	*-43.4*	*-47.4*	*-47.4*	*-56.4*	*-60.4*	*-62.4*	*-67.4*	
Facade Glazed Element										
		-	*-33.2*	*-44.2*	*-46.2*	*-51.2*	*-48.2*	*-61.2*	*-*	
Ventilators										
		-32.0	*-31.0*	*-34.0*	*-39.0*	*-38.0*	*-37.0*	*-36.0*	*-37.0*	
Cumulative Lp										
Result		**-**	**33.2**	**24.6**	**18.4**	**18.4**	**15.6**	**11.6**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*3.5*	*3.1*	*2.7*	*2.7*	*2.7*	*2.2*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - FF Front Single Night **Reverberant Field, LPrev:**		**-**	**36.7**	**27.7**	**21.0**	**21.0**	**18.2**	**13.8**	**-**	

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Calculation Sheet

FF Front Single Lmax

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Lmax)										
Source dBA	**78.0**									
Octave Band Frequencies										
Leq,ff		**82.0**	**80.0**	**76.0**	**74.0**	**74.0**	**70.0**	**65.0**	**59.0**	**Row A**
Facade Wall Element										
		-40.4	*-43.4*	*-47.4*	*-47.4*	*-56.4*	*-60.4*	*-62.4*	*-67.4*	
Facade Glazed Element										
		-	*-33.2*	*-44.2*	*-46.2*	*-51.2*	*-48.2*	*-61.2*	*-*	
Ventilators										
		-32.0	*-31.0*	*-34.0*	*-39.0*	*-38.0*	*-37.0*	*-36.0*	*-37.0*	
Cumulative Lp										
Result		**-**	**51.2**	**42.6**	**36.2**	**36.2**	**33.3**	**29.0**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*3.5*	*3.1*	*2.7*	*2.7*	*2.7*	*2.2*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - FF Front Single Lmax										
Reverberant Field, LPrev:		**-**	**54.7**	**45.7**	**38.9**	**38.9**	**36.0**	**31.2**	**-**	

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Kings Cross Methodist Church

Calculation Sheet

FF Front Twin Day

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Daytime Leq)										
Source dBA	**61.0**									
Octave Band Frequencies										
Leq,ff		**65.0**	**63.0**	**59.0**	**57.0**	**57.0**	**53.0**	**48.0**	**42.0**	**Row A**
Facade Wall Element										
		-39.8	*-42.8*	*-46.8*	*-46.8*	*-55.8*	*-59.8*	*-61.8*	*-66.8*	
Facade Glazed Element										
		-	*-32.0*	*-43.0*	*-45.0*	*-50.0*	*-47.0*	*-60.0*	*-*	
Ventilators										
		-33.8	*-32.8*	*-35.8*	*-40.8*	*-39.8*	*-38.8*	*-37.8*	*-38.8*	
Cumulative Lp										
Result		**-**	**33.8**	**24.2**	**18.4**	**17.8**	**15.1**	**11.0**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*2.8*	*2.4*	*2.0*	*2.0*	*2.0*	*1.5*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - FF Front Twin Day **Reverberant Field, LPrev:**		**-**	**36.6**	**26.6**	**20.4**	**19.8**	**17.0**	**12.4**	**-**	

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Calculation Sheet

FF Front Twin Night

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Leq)										
Source dBA	**60.0**									
Octave Band Frequencies										
Leq,ff		**64.0**	**62.0**	**58.0**	**56.0**	**56.0**	**52.0**	**47.0**	**41.0**	**Row A**
Facade Wall Element										
		-39.8	*-42.8*	*-46.8*	*-46.8*	*-55.8*	*-59.8*	*-61.8*	*-66.8*	
Facade Glazed Element										
		-	*-32.0*	*-43.0*	*-45.0*	*-50.0*	*-47.0*	*-60.0*	*-*	
Ventilators										
		-33.8	*-32.8*	*-35.8*	*-40.8*	*-39.8*	*-38.8*	*-37.8*	*-38.8*	
Cumulative Lp										
Result		**-**	**32.8**	**23.2**	**17.4**	**16.8**	**14.1**	**10.1**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*2.8*	*2.4*	*2.0*	*2.0*	*2.0*	*1.5*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - FF Front Twin Night										
Reverberant Field, LPrev:		**-**	**35.6**	**25.7**	**19.4**	**18.8**	**16.1**	**11.6**	**-**	

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Calculation Sheet

FF Front Twin Lmax

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Lmax)										
Source dBA	**78.0**									
Octave Band Frequencies										
Leq,ff		**82.0**	**80.0**	**76.0**	**74.0**	**74.0**	**70.0**	**65.0**	**59.0**	**Row A**
Facade Wall Element										
		-39.8	*-42.8*	*-46.8*	*-46.8*	*-55.8*	*-59.8*	*-61.8*	*-66.8*	
Facade Glazed Element										
		-	*-32.0*	*-43.0*	*-45.0*	*-50.0*	*-47.0*	*-60.0*	*-*	
Ventilators										
		-33.8	*-32.8*	*-35.8*	*-40.8*	*-39.8*	*-38.8*	*-37.8*	*-38.8*	
Cumulative Lp										
Result		**-**	**50.8**	**41.2**	**35.3**	**34.7**	**31.8**	**27.2**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*2.8*	*2.4*	*2.0*	*2.0*	*2.0*	*1.5*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - FF Front Twin Lmax										
Reverberant Field, LPrev:		**-**	**53.6**	**43.6**	**37.2**	**36.6**	**33.8**	**28.7**	**-**	

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Calculation Sheet

FF Side Single Day

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Daytime Leq)										
Source dBA	**61.0**									
Octave Band Frequencies										
Leq,ff		**65.0**	**63.0**	**59.0**	**57.0**	**57.0**	**53.0**	**48.0**	**42.0**	**Row A**
Facade Wall Element										
		-39.8	*-42.8*	*-46.8*	*-46.8*	*-55.8*	*-59.8*	*-61.8*	*-66.8*	
Facade Glazed Element										
		-	*-34.3*	*-45.3*	*-47.3*	*-52.3*	*-49.3*	*-62.3*	*-*	
Ventilators										
		-33.1	*-32.1*	*-35.1*	*-40.1*	*-39.1*	*-38.1*	*-37.1*	*-38.1*	
Cumulative Lp										
Result		**-**	**33.2**	**24.6**	**18.5**	**18.3**	**15.5**	**11.6**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*2.4*	*2.0*	*1.5*	*1.5*	*1.5*	*1.0*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - FF Side Single Day **Reverberant Field, LPrev:**		**-**	**35.6**	**26.6**	**20.0**	**19.9**	**17.0**	**12.6**	**-**	

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ACA acoustics

Kings Cross Methodist Church

Calculation Sheet

FF Side Single Night

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Leq)										
Source dBA	**60.0**									
Octave Band Frequencies										
Leq,ff		**64.0**	**62.0**	**58.0**	**56.0**	**56.0**	**52.0**	**47.0**	**41.0**	**Row A**
Facade Wall Element										
		-39.8	*-42.8*	*-46.8*	*-46.8*	*-55.8*	*-59.8*	*-61.8*	*-66.8*	
Facade Glazed Element										
		-	*-34.3*	*-45.3*	*-47.3*	*-52.3*	*-49.3*	*-62.3*	*-*	
Ventilators										
		-33.1	*-32.1*	*-35.1*	*-40.1*	*-39.1*	*-38.1*	*-37.1*	*-38.1*	
Cumulative Lp										
Result		**-**	**32.2**	**23.6**	**17.5**	**17.3**	**14.6**	**10.7**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*2.4*	*2.0*	*1.5*	*1.5*	*1.5*	*1.0*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - FF Side Single Night **Reverberant Field, LPrev:**		**-**	**34.6**	**25.6**	**19.1**	**18.9**	**16.1**	**11.8**	**-**	

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Calculation Sheet

FF Side Single Lmax

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Lmax)										
Source dBA	**78.0**									
Octave Band Frequencies										
Leq,ff		**82.0**	**80.0**	**76.0**	**74.0**	**74.0**	**70.0**	**65.0**	**59.0**	**Row A**
Facade Wall Element										
		-39.8	*-42.8*	*-46.8*	*-46.8*	*-55.8*	*-59.8*	*-61.8*	*-66.8*	
Facade Glazed Element										
		-	*-34.3*	*-45.3*	*-47.3*	*-52.3*	*-49.3*	*-62.3*	*-*	
Ventilators										
		-33.1	*-32.1*	*-35.1*	*-40.1*	*-39.1*	*-38.1*	*-37.1*	*-38.1*	
Cumulative Lp										
Result		**-**	**50.2**	**41.5**	**35.4**	**35.2**	**32.2**	**27.9**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*2.4*	*2.0*	*1.5*	*1.5*	*1.5*	*1.0*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - FF Side Single Lmax										
Reverberant Field, LPrev:		**-**	**52.6**	**43.5**	**36.9**	**36.7**	**33.8**	**29.0**	**-**	

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Calculation Sheet

FF Side Accessible Day

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Daytime Leq)										
Source dBA	**61.0**									
Octave Band Frequencies										
Leq,ff		**65.0**	**63.0**	**59.0**	**57.0**	**57.0**	**53.0**	**48.0**	**42.0**	**Row A**
Facade Wall Element										
		-39.7	*-42.7*	*-46.7*	*-46.7*	*-55.7*	*-59.7*	*-61.7*	*-66.7*	
Facade Glazed Element										
		-	*-34.5*	*-45.5*	*-47.5*	*-52.5*	*-49.5*	*-62.5*	*-*	
Ventilators										
		-33.3	*-32.3*	*-35.3*	*-40.3*	*-39.3*	*-38.3*	*-37.3*	*-38.3*	
Cumulative Lp										
Result		**-**	**33.0**	**24.4**	**18.4**	**18.2**	**15.3**	**11.4**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*2.3*	*1.9*	*1.4*	*1.4*	*1.4*	*0.9*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - FF Side Accessible Day **Reverberant Field, LPrev:**		**-**	**35.3**	**26.3**	**19.8**	**19.6**	**16.8**	**12.4**	**-**	

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Calculation Sheet

FF Side Accessible Night

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Leq)										
Source dBA	**60.0**									
Octave Band Frequencies										
Leq,ff		**64.0**	**62.0**	**58.0**	**56.0**	**56.0**	**52.0**	**47.0**	**41.0**	**Row A**
Facade Wall Element										
		-39.7	*-42.7*	*-46.7*	*-46.7*	*-55.7*	*-59.7*	*-61.7*	*-66.7*	
Facade Glazed Element										
		-	*-34.5*	*-45.5*	*-47.5*	*-52.5*	*-49.5*	*-62.5*	*-*	
Ventilators										
		-33.3	*-32.3*	*-35.3*	*-40.3*	*-39.3*	*-38.3*	*-37.3*	*-38.3*	
Cumulative Lp										
Result		**-**	**32.0**	**23.4**	**17.4**	**17.2**	**14.4**	**10.6**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*2.3*	*1.9*	*1.4*	*1.4*	*1.4*	*0.9*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - FF Side Accessible Night **Reverberant Field, LPrev:**		**-**	**34.3**	**25.4**	**18.9**	**18.6**	**15.9**	**11.5**	**-**	

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Calculation Sheet

FF Side Accessible Lmax

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Lmax)										
Source dBA	**78.0**									
Octave Band Frequencies										
Leq,ff		**82.0**	**80.0**	**76.0**	**74.0**	**74.0**	**70.0**	**65.0**	**59.0**	**Row A**
Facade Wall Element										
		-39.7	*-42.7*	*-46.7*	*-46.7*	*-55.7*	*-59.7*	*-61.7*	*-66.7*	
Facade Glazed Element										
		-	*-34.5*	*-45.5*	*-47.5*	*-52.5*	*-49.5*	*-62.5*	*-*	
Ventilators										
		-33.3	*-32.3*	*-35.3*	*-40.3*	*-39.3*	*-38.3*	*-37.3*	*-38.3*	
Cumulative Lp										
Result		**-**	**50.0**	**41.4**	**35.3**	**35.0**	**32.1**	**27.8**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*2.3*	*1.9*	*1.4*	*1.4*	*1.4*	*0.9*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - FF Side Accessible Lmax										
Reverberant Field, LPrev:		**-**	**52.3**	**43.3**	**36.7**	**36.5**	**33.5**	**28.7**	**-**	

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Calculation Sheet

FF Rear Corner Twin Day

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Daytime Leq)										
Source dBA	**61.0**									
Octave Band Frequencies										
Leq,ff		**65.0**	**63.0**	**59.0**	**57.0**	**57.0**	**53.0**	**48.0**	**42.0**	**Row A**
Facade Wall Element										
		-38.7	*-41.7*	*-45.7*	*-45.7*	*-54.7*	*-58.7*	*-60.7*	*-65.7*	
Facade Glazed Element										
		-	*-34.8*	*-45.8*	*-47.8*	*-52.8*	*-49.8*	*-62.8*	*-*	
Ventilators										
		-37.8	*-36.8*	*-39.8*	*-44.8*	*-43.8*	*-42.8*	*-41.8*	*-42.8*	
Cumulative Lp										
Result		**-**	**30.9**	**21.1**	**16.1**	**14.4**	**11.7**	**8.0**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*6.4*	*6.0*	*5.5*	*5.5*	*5.5*	*5.0*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - FF Rear Corner Twin Day **Reverberant Field, LPrev:**		**-**	**37.3**	**27.0**	**21.6**	**19.9**	**17.3**	**13.0**	**-**	

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Calculation Sheet

FF Rear Corner Twin Night

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Leq)										
Source dBA	**60.0**									
Octave Band Frequencies										
Leq,ff		**64.0**	**62.0**	**58.0**	**56.0**	**56.0**	**52.0**	**47.0**	**41.0**	**Row A**
Facade Wall Element										
		-38.7	*-41.7*	*-45.7*	*-45.7*	*-54.7*	*-58.7*	*-60.7*	*-65.7*	
Facade Glazed Element										
		-	*-34.8*	*-45.8*	*-47.8*	*-52.8*	*-49.8*	*-62.8*	*-*	
Ventilators										
		-37.8	*-36.8*	*-39.8*	*-44.8*	*-43.8*	*-42.8*	*-41.8*	*-42.8*	
Cumulative Lp										
Result		**-**	**29.9**	**20.1**	**15.1**	**13.5**	**10.9**	**7.3**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*6.4*	*6.0*	*5.5*	*5.5*	*5.5*	*5.0*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - FF Rear Corner Twin Night **Reverberant Field, LPrev:**		**-**	**36.3**	**26.1**	**20.6**	**19.0**	**16.4**	**12.3**	**-**	

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Calculation Sheet

FF Rear Corner Twin Lmax

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Lmax)										
Source dBA	**78.0**									
Octave Band Frequencies										
Leq,ff		**82.0**	**80.0**	**76.0**	**74.0**	**74.0**	**70.0**	**65.0**	**59.0**	**Row A**
Facade Wall Element										
		-38.7	*-41.7*	*-45.7*	*-45.7*	*-54.7*	*-58.7*	*-60.7*	*-65.7*	
Facade Glazed Element										
		-	*-34.8*	*-45.8*	*-47.8*	*-52.8*	*-49.8*	*-62.8*	*-*	
Ventilators										
		-37.8	*-36.8*	*-39.8*	*-44.8*	*-43.8*	*-42.8*	*-41.8*	*-42.8*	
Cumulative Lp										
Result		**-**	**47.9**	**38.0**	**32.9**	**31.1**	**28.1**	**23.4**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*6.4*	*6.0*	*5.5*	*5.5*	*5.5*	*5.0*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - FF Rear Corner Twin Lmax **Reverberant Field, LPrev:**		**-**	**54.2**	**44.0**	**38.4**	**36.6**	**33.6**	**28.4**	**-**	

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Calculation Sheet

SF Front Single Day

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Daytime Leq)										
Source dBA	**61.0**									
Octave Band Frequencies										
Leq,ff		**65.0**	**63.0**	**59.0**	**57.0**	**57.0**	**53.0**	**48.0**	**42.0**	**Row A**
Facade Wall Element										
		-40.4	*-43.4*	*-47.4*	*-47.4*	*-56.4*	*-60.4*	*-62.4*	*-67.4*	
Facade Glazed Element										
		-	*-33.2*	*-44.2*	*-46.2*	*-51.2*	*-48.2*	*-61.2*	*-*	
Ventilators										
		-32.0	*-31.0*	*-34.0*	*-39.0*	*-38.0*	*-37.0*	*-36.0*	*-37.0*	
Cumulative Lp										
Result		**-**	**34.2**	**25.6**	**19.3**	**19.3**	**16.5**	**12.5**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*3.5*	*3.1*	*2.7*	*2.7*	*2.7*	*2.2*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Front Single Day **Reverberant Field, LPrev:**		**-**	**37.7**	**28.7**	**22.0**	**22.0**	**19.2**	**14.7**	**-**	

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Calculation Sheet

SF Front Single Night

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Leq)										
Source dBA	**60.0**									
Octave Band Frequencies										
Leq,ff		**64.0**	**62.0**	**58.0**	**56.0**	**56.0**	**52.0**	**47.0**	**41.0**	**Row A**
Facade Wall Element										
		-40.4	*-43.4*	*-47.4*	*-47.4*	*-56.4*	*-60.4*	*-62.4*	*-67.4*	
Facade Glazed Element										
		-	*-33.2*	*-44.2*	*-46.2*	*-51.2*	*-48.2*	*-61.2*	*-*	
Ventilators										
		-32.0	*-31.0*	*-34.0*	*-39.0*	*-38.0*	*-37.0*	*-36.0*	*-37.0*	
Cumulative Lp										
Result		**-**	**33.2**	**24.6**	**18.4**	**18.4**	**15.6**	**11.6**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*3.5*	*3.1*	*2.7*	*2.7*	*2.7*	*2.2*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Front Single Night **Reverberant Field, LPrev:**		**-**	**36.7**	**27.7**	**21.0**	**21.0**	**18.2**	**13.8**	**-**	

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Calculation Sheet

SF Front Single Lmax

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Lmax)										
Source dBA	**78.0**									
Octave Band Frequencies										
Leq,ff		**82.0**	**80.0**	**76.0**	**74.0**	**74.0**	**70.0**	**65.0**	**59.0**	**Row A**
Facade Wall Element										
		-40.4	*-43.4*	*-47.4*	*-47.4*	*-56.4*	*-60.4*	*-62.4*	*-67.4*	
Facade Glazed Element										
		-	*-33.2*	*-44.2*	*-46.2*	*-51.2*	*-48.2*	*-61.2*	*-*	
Ventilators										
		-32.0	*-31.0*	*-34.0*	*-39.0*	*-38.0*	*-37.0*	*-36.0*	*-37.0*	
Cumulative Lp										
Result		**-**	**51.2**	**42.6**	**36.2**	**36.2**	**33.3**	**29.0**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*3.5*	*3.1*	*2.7*	*2.7*	*2.7*	*2.2*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Front Single Lmax										
Reverberant Field, LPrev:		**-**	**54.7**	**45.7**	**38.9**	**38.9**	**36.0**	**31.2**	**-**	

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ACA acoustics

Kings Cross Methodist Church

Calculation Sheet

SF Front Twin Day

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Daytime Leq)										
Source dBA	**61.0**									
Octave Band Frequencies										
Leq,ff		**65.0**	**63.0**	**59.0**	**57.0**	**57.0**	**53.0**	**48.0**	**42.0**	**Row A**
Facade Wall Element										
		-39.8	*-42.8*	*-46.8*	*-46.8*	*-55.8*	*-59.8*	*-61.8*	*-66.8*	
Facade Glazed Element										
		-	*-32.0*	*-43.0*	*-45.0*	*-50.0*	*-47.0*	*-60.0*	*-*	
Ventilators										
		-33.8	*-32.8*	*-35.8*	*-40.8*	*-39.8*	*-38.8*	*-37.8*	*-38.8*	
Cumulative Lp										
Result		**-**	**33.8**	**24.2**	**18.4**	**17.8**	**15.1**	**11.0**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*2.8*	*2.4*	*2.0*	*2.0*	*2.0*	*1.5*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Front Twin Day **Reverberant Field, LPrev:**		**-**	**36.6**	**26.6**	**20.4**	**19.8**	**17.0**	**12.4**	**-**	

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Calculation Sheet

SF Front Twin Night

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Leq)										
Source dBA	**60.0**									
Octave Band Frequencies										
Leq,ff		**64.0**	**62.0**	**58.0**	**56.0**	**56.0**	**52.0**	**47.0**	**41.0**	**Row A**
Facade Wall Element										
		-39.8	*-42.8*	*-46.8*	*-46.8*	*-55.8*	*-59.8*	*-61.8*	*-66.8*	
Facade Glazed Element										
		-	*-32.0*	*-43.0*	*-45.0*	*-50.0*	*-47.0*	*-60.0*	*-*	
Ventilators										
		-33.8	*-32.8*	*-35.8*	*-40.8*	*-39.8*	*-38.8*	*-37.8*	*-38.8*	
Cumulative Lp										
Result		**-**	**32.8**	**23.2**	**17.4**	**16.8**	**14.1**	**10.1**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*2.8*	*2.4*	*2.0*	*2.0*	*2.0*	*1.5*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Front Twin Night										
Reverberant Field, LPrev:		**-**	**35.6**	**25.7**	**19.4**	**18.8**	**16.1**	**11.6**	**-**	

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Calculation Sheet

SF Front Twin Lmax

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Lmax)										
Source dBA	**78.0**									
Octave Band Frequencies										
Leq,ff		**82.0**	**80.0**	**76.0**	**74.0**	**74.0**	**70.0**	**65.0**	**59.0**	**Row A**
Facade Wall Element										
		-39.8	*-42.8*	*-46.8*	*-46.8*	*-55.8*	*-59.8*	*-61.8*	*-66.8*	
Facade Glazed Element										
		-	*-32.0*	*-43.0*	*-45.0*	*-50.0*	*-47.0*	*-60.0*	*-*	
Ventilators										
		-33.8	*-32.8*	*-35.8*	*-40.8*	*-39.8*	*-38.8*	*-37.8*	*-38.8*	
Cumulative Lp										
Result		**-**	**50.8**	**41.2**	**35.3**	**34.7**	**31.8**	**27.2**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*2.8*	*2.4*	*2.0*	*2.0*	*2.0*	*1.5*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Front Twin Lmax										
Reverberant Field, LPrev:		**-**	**53.6**	**43.6**	**37.2**	**36.6**	**33.8**	**28.7**	**-**	

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Calculation Sheet

SF Side Single Day

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Daytime Leq)										
Source dBA	**61.0**									
Octave Band Frequencies										
Leq,ff		**65.0**	**63.0**	**59.0**	**57.0**	**57.0**	**53.0**	**48.0**	**42.0**	**Row A**
Facade Wall Element										
		-39.8	*-42.8*	*-46.8*	*-46.8*	*-55.8*	*-59.8*	*-61.8*	*-66.8*	
Facade Glazed Element										
		-	*-34.3*	*-45.3*	*-47.3*	*-52.3*	*-49.3*	*-62.3*	*-*	
Ventilators										
		-33.1	*-32.1*	*-35.1*	*-40.1*	*-39.1*	*-38.1*	*-37.1*	*-38.1*	
Cumulative Lp										
Result		**-**	**33.2**	**24.6**	**18.5**	**18.3**	**15.5**	**11.6**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*2.3*	*1.9*	*1.5*	*1.5*	*1.5*	*1.0*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Side Single Day **Reverberant Field, LPrev:**		**-**	**35.5**	**26.5**	**20.0**	**19.8**	**17.0**	**12.5**	**-**	

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Calculation Sheet

SF Side Single Night

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Leq)										
Source dBA	**60.0**									
Octave Band Frequencies										
Leq,ff		**64.0**	**62.0**	**58.0**	**56.0**	**56.0**	**52.0**	**47.0**	**41.0**	**Row A**
Facade Wall Element										
		-39.8	*-42.8*	*-46.8*	*-46.8*	*-55.8*	*-59.8*	*-61.8*	*-66.8*	
Facade Glazed Element										
		-	*-34.3*	*-45.3*	*-47.3*	*-52.3*	*-49.3*	*-62.3*	*-*	
Ventilators										
		-33.1	*-32.1*	*-35.1*	*-40.1*	*-39.1*	*-38.1*	*-37.1*	*-38.1*	
Cumulative Lp										
Result		**-**	**32.2**	**23.6**	**17.5**	**17.3**	**14.6**	**10.7**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*2.3*	*1.9*	*1.5*	*1.5*	*1.5*	*1.0*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Side Single Night **Reverberant Field, LPrev:**		**-**	**34.5**	**25.5**	**19.0**	**18.8**	**16.0**	**11.7**	**-**	

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Calculation Sheet

SF Side Single Lmax

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Lmax)										
Source dBA	**78.0**									
Octave Band Frequencies										
Leq,ff		**82.0**	**80.0**	**76.0**	**74.0**	**74.0**	**70.0**	**65.0**	**59.0**	**Row A**
Facade Wall Element										
		-39.8	*-42.8*	*-46.8*	*-46.8*	*-55.8*	*-59.8*	*-61.8*	*-66.8*	
Facade Glazed Element										
		-	*-34.3*	*-45.3*	*-47.3*	*-52.3*	*-49.3*	*-62.3*	*-*	
Ventilators										
		-33.1	*-32.1*	*-35.1*	*-40.1*	*-39.1*	*-38.1*	*-37.1*	*-38.1*	
Cumulative Lp										
Result		**-**	**50.2**	**41.5**	**35.4**	**35.2**	**32.2**	**27.9**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*2.3*	*1.9*	*1.5*	*1.5*	*1.5*	*1.0*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Side Single Lmax										
Reverberant Field, LPrev:		**-**	**52.5**	**43.5**	**36.8**	**36.6**	**33.7**	**28.9**	**-**	

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Calculation Sheet

SF Side AWC Day

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Daytime Leq)										
Source dBA	**61.0**									
Octave Band Frequencies										
Leq,ff		**65.0**	**63.0**	**59.0**	**57.0**	**57.0**	**53.0**	**48.0**	**42.0**	**Row A**
Facade Wall Element										
		-39.7	*-42.7*	*-46.7*	*-46.7*	*-55.7*	*-59.7*	*-61.7*	*-66.7*	
Facade Glazed Element										
		-	*-34.5*	*-45.5*	*-47.5*	*-52.5*	*-49.5*	*-62.5*	*-*	
Ventilators										
		-33.3	*-32.3*	*-35.3*	*-40.3*	*-39.3*	*-38.3*	*-37.3*	*-38.3*	
Cumulative Lp										
Result		**-**	**33.0**	**24.4**	**18.4**	**18.2**	**15.3**	**11.4**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*2.3*	*1.9*	*1.4*	*1.4*	*1.4*	*0.9*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Side AWC Day **Reverberant Field, LPrev:**		**-**	**35.3**	**26.3**	**19.8**	**19.6**	**16.8**	**12.4**	**-**	

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Calculation Sheet

SF Side AWC Night

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Leq)										
Source dBA	**60.0**									
Octave Band Frequencies										
Leq,ff		**64.0**	**62.0**	**58.0**	**56.0**	**56.0**	**52.0**	**47.0**	**41.0**	**Row A**
Facade Wall Element										
		-39.7	*-42.7*	*-46.7*	*-46.7*	*-55.7*	*-59.7*	*-61.7*	*-66.7*	
Facade Glazed Element										
		-	*-34.5*	*-45.5*	*-47.5*	*-52.5*	*-49.5*	*-62.5*	*-*	
Ventilators										
		-33.3	*-32.3*	*-35.3*	*-40.3*	*-39.3*	*-38.3*	*-37.3*	*-38.3*	
Cumulative Lp										
Result		**-**	**32.0**	**23.4**	**17.4**	**17.2**	**14.4**	**10.6**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*2.3*	*1.9*	*1.4*	*1.4*	*1.4*	*0.9*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Side AWC Night **Reverberant Field, LPrev:**		**-**	**34.3**	**25.4**	**18.9**	**18.6**	**15.9**	**11.5**	**-**	

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Calculation Sheet

SF Side AWC Lmax

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Lmax)										
Source dBA	**78.0**									
Octave Band Frequencies										
Leq,ff		**82.0**	**80.0**	**76.0**	**74.0**	**74.0**	**70.0**	**65.0**	**59.0**	**Row A**
Facade Wall Element										
		-39.7	*-42.7*	*-46.7*	*-46.7*	*-55.7*	*-59.7*	*-61.7*	*-66.7*	
Facade Glazed Element										
		-	*-34.5*	*-45.5*	*-47.5*	*-52.5*	*-49.5*	*-62.5*	*-*	
Ventilators										
		-33.3	*-32.3*	*-35.3*	*-40.3*	*-39.3*	*-38.3*	*-37.3*	*-38.3*	
Cumulative Lp										
Result		**-**	**50.0**	**41.4**	**35.3**	**35.0**	**32.1**	**27.8**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*2.3*	*1.9*	*1.4*	*1.4*	*1.4*	*0.9*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Side AWC Lmax										
Reverberant Field, LPrev:		**-**	**52.3**	**43.3**	**36.7**	**36.5**	**33.5**	**28.7**	**-**	

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Calculation Sheet

SF Rear Single (1w) Day

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Daytime Leq)										
Source dBA	**61.0**									
Octave Band Frequencies										
Leq,ff		**65.0**	**63.0**	**59.0**	**57.0**	**57.0**	**53.0**	**48.0**	**42.0**	**Row A**
Facade Wall Element										
		-40.2	*-43.2*	*-47.2*	*-47.2*	*-56.2*	*-60.2*	*-62.2*	*-67.2*	
Facade Glazed Element										
		-	*-34.7*	*-45.7*	*-47.7*	*-52.7*	*-49.7*	*-62.7*	*-*	
Ventilators										
		-32.2	*-31.2*	*-34.2*	*-39.2*	*-38.2*	*-37.2*	*-36.2*	*-37.2*	
Cumulative Lp										
Result		**-**	**33.6**	**25.3**	**19.1**	**19.1**	**16.3**	**12.4**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*1.7*	*1.3*	*0.9*	*0.9*	*0.9*	*0.4*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Rear Single (1w) Day **Reverberant Field, LPrev:**		**-**	**35.4**	**26.7**	**19.9**	**20.0**	**17.1**	**12.7**	**-**	

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Calculation Sheet

SF Rear Single (1w) Night

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Leq)										
Source dBA	**60.0**									
Octave Band Frequencies										
Leq,ff		**64.0**	**62.0**	**58.0**	**56.0**	**56.0**	**52.0**	**47.0**	**41.0**	**Row A**
Facade Wall Element										
		-40.2	*-43.2*	*-47.2*	*-47.2*	*-56.2*	*-60.2*	*-62.2*	*-67.2*	
Facade Glazed Element										
		-	*-34.7*	*-45.7*	*-47.7*	*-52.7*	*-49.7*	*-62.7*	*-*	
Ventilators										
		-32.2	*-31.2*	*-34.2*	*-39.2*	*-38.2*	*-37.2*	*-36.2*	*-37.2*	
Cumulative Lp										
Result		**-**	**32.6**	**24.3**	**18.1**	**18.2**	**15.3**	**11.5**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*1.7*	*1.3*	*0.9*	*0.9*	*0.9*	*0.4*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Rear Single (1w) Night **Reverberant Field, LPrev:**		**-**	**34.4**	**25.7**	**19.0**	**19.0**	**16.2**	**11.8**	**-**	

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Calculation Sheet

SF Rear Single (1w) Lmax

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Lmax)										
Source dBA	**78.0**									
Octave Band Frequencies										
Leq,ff		**82.0**	**80.0**	**76.0**	**74.0**	**74.0**	**70.0**	**65.0**	**59.0**	**Row A**
Facade Wall Element										
		-40.2	*-43.2*	*-47.2*	*-47.2*	*-56.2*	*-60.2*	*-62.2*	*-67.2*	
Facade Glazed Element										
		-	*-34.7*	*-45.7*	*-47.7*	*-52.7*	*-49.7*	*-62.7*	*-*	
Ventilators										
		-32.2	*-31.2*	*-34.2*	*-39.2*	*-38.2*	*-37.2*	*-36.2*	*-37.2*	
Cumulative Lp										
Result		**-**	**50.6**	**42.3**	**36.0**	**36.0**	**33.1**	**28.8**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*1.7*	*1.3*	*0.9*	*0.9*	*0.9*	*0.4*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Rear Single (1w) Lmax										
Reverberant Field, LPrev:		**-**	**52.3**	**43.6**	**36.8**	**36.9**	**33.9**	**29.2**	**-**	

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Calculation Sheet

SF Rear Single (2w) Day

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Daytime Leq)										
Source dBA	**61.0**									
Octave Band Frequencies										
Leq,ff		**65.0**	**63.0**	**59.0**	**57.0**	**57.0**	**53.0**	**48.0**	**42.0**	**Row A**
Facade Wall Element										
		-38.7	*-41.7*	*-45.7*	*-45.7*	*-54.7*	*-58.7*	*-60.7*	*-65.7*	
Facade Glazed Element										
		-	*-36.9*	*-47.9*	*-49.9*	*-54.9*	*-51.9*	*-64.9*	*-*	
Ventilators										
		-36.9	*-35.9*	*-38.9*	*-43.9*	*-42.9*	*-41.9*	*-40.9*	*-41.9*	
Cumulative Lp										
Result		**-**	**30.2**	**21.4**	**16.1**	**14.9**	**12.1**	**8.5**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*6.5*	*6.1*	*5.6*	*5.6*	*5.6*	*5.1*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Rear Single (2w) Day **Reverberant Field, LPrev:**		**-**	**36.7**	**27.5**	**21.7**	**20.5**	**17.7**	**13.6**	**-**	

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Calculation Sheet

SF Rear Single (2w) Night

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Leq)										
Source dBA	**60.0**									
Octave Band Frequencies										
Leq,ff		**64.0**	**62.0**	**58.0**	**56.0**	**56.0**	**52.0**	**47.0**	**41.0**	**Row A**
Facade Wall Element										
		-38.7	*-41.7*	*-45.7*	*-45.7*	*-54.7*	*-58.7*	*-60.7*	*-65.7*	
Facade Glazed Element										
		-	*-36.9*	*-47.9*	*-49.9*	*-54.9*	*-51.9*	*-64.9*	*-*	
Ventilators										
		-36.9	*-35.9*	*-38.9*	*-43.9*	*-42.9*	*-41.9*	*-40.9*	*-41.9*	
Cumulative Lp										
Result		**-**	**29.2**	**20.4**	**15.2**	**14.0**	**11.3**	**7.9**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*6.5*	*6.1*	*5.6*	*5.6*	*5.6*	*5.1*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Rear Single (2w) Night **Reverberant Field, LPrev:**		**-**	**35.7**	**26.5**	**20.8**	**19.6**	**16.9**	**13.0**	**-**	

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Calculation Sheet

SF Rear Single (2w) Lmax

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Lmax)										
Source dBA	**78.0**									
Octave Band Frequencies										
Leq,ff		**82.0**	**80.0**	**76.0**	**74.0**	**74.0**	**70.0**	**65.0**	**59.0**	**Row A**
Facade Wall Element										
		-38.7	*-41.7*	*-45.7*	*-45.7*	*-54.7*	*-58.7*	*-60.7*	*-65.7*	
Facade Glazed Element										
		-	*-36.9*	*-47.9*	*-49.9*	*-54.9*	*-51.9*	*-64.9*	*-*	
Ventilators										
		-36.9	*-35.9*	*-38.9*	*-43.9*	*-42.9*	*-41.9*	*-40.9*	*-41.9*	
Cumulative Lp										
Result		**-**	**47.2**	**38.3**	**32.9**	**31.6**	**28.6**	**24.2**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*6.5*	*6.1*	*5.6*	*5.6*	*5.6*	*5.1*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Rear Single (2w) Lmax										
Reverberant Field, LPrev:		**-**	**53.7**	**44.4**	**38.5**	**37.2**	**34.2**	**29.3**	**-**	

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Calculation Sheet

SF Rear Corner Day

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Daytime Leq)										
Source dBA	**61.0**									
Octave Band Frequencies										
Leq,ff		**65.0**	**63.0**	**59.0**	**57.0**	**57.0**	**53.0**	**48.0**	**42.0**	**Row A**
Facade Wall Element										
		-38.7	*-41.7*	*-45.7*	*-45.7*	*-54.7*	*-58.7*	*-60.7*	*-65.7*	
Facade Glazed Element										
		-	*-34.8*	*-45.8*	*-47.8*	*-52.8*	*-49.8*	*-62.8*	*-*	
Ventilators										
		-37.8	*-36.8*	*-39.8*	*-44.8*	*-43.8*	*-42.8*	*-41.8*	*-42.8*	
Cumulative Lp										
Result		**-**	**30.9**	**21.1**	**16.1**	**14.4**	**11.7**	**8.0**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*6.4*	*6.0*	*5.5*	*5.5*	*5.5*	*5.0*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Rear Corner Day **Reverberant Field, LPrev:**		**-**	**37.3**	**27.0**	**21.6**	**19.9**	**17.3**	**13.0**	**-**	

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Calculation Sheet

SF Rear Corner Night

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Leq)										
Source dBA	**60.0**									
Octave Band Frequencies										
Leq,ff		**64.0**	**62.0**	**58.0**	**56.0**	**56.0**	**52.0**	**47.0**	**41.0**	**Row A**
Facade Wall Element										
		-38.7	*-41.7*	*-45.7*	*-45.7*	*-54.7*	*-58.7*	*-60.7*	*-65.7*	
Facade Glazed Element										
		-	*-34.8*	*-45.8*	*-47.8*	*-52.8*	*-49.8*	*-62.8*	*-*	
Ventilators										
		-37.8	*-36.8*	*-39.8*	*-44.8*	*-43.8*	*-42.8*	*-41.8*	*-42.8*	
Cumulative Lp										
Result		**-**	**29.9**	**20.1**	**15.1**	**13.5**	**10.9**	**7.3**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*6.4*	*6.0*	*5.5*	*5.5*	*5.5*	*5.0*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Rear Corner Night **Reverberant Field, LPrev:**		**-**	**36.3**	**26.1**	**20.6**	**19.0**	**16.4**	**12.3**	**-**	

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Calculation Sheet

SF Rear Corner Lmax

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Lmax)										
Source dBA	**78.0**									
Octave Band Frequencies										
Leq,ff		**82.0**	**80.0**	**76.0**	**74.0**	**74.0**	**70.0**	**65.0**	**59.0**	**Row A**
Facade Wall Element										
		-38.7	*-41.7*	*-45.7*	*-45.7*	*-54.7*	*-58.7*	*-60.7*	*-65.7*	
Facade Glazed Element										
		-	*-34.8*	*-45.8*	*-47.8*	*-52.8*	*-49.8*	*-62.8*	*-*	
Ventilators										
		-37.8	*-36.8*	*-39.8*	*-44.8*	*-43.8*	*-42.8*	*-41.8*	*-42.8*	
Cumulative Lp										
Result		**-**	**47.9**	**38.0**	**32.9**	**31.1**	**28.1**	**23.4**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*6.4*	*6.0*	*5.5*	*5.5*	*5.5*	*5.0*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - SF Rear Corner Lmax **Reverberant Field, LPrev:**		**-**	**54.2**	**44.0**	**38.4**	**36.6**	**33.6**	**28.4**	**-**	

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Calculation Sheet

TF Front Single L Day

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Daytime Leq)										
Source dBA	**61.0**									
Octave Band Frequencies										
Leq,ff		**65.0**	**63.0**	**59.0**	**57.0**	**57.0**	**53.0**	**48.0**	**42.0**	**Row A**
Facade Wall Element										
		-41.5	*-44.5*	*-48.5*	*-48.5*	*-57.5*	*-61.5*	*-63.5*	*-68.5*	
Facade Glazed Element										
		-	*-35.3*	*-46.3*	*-48.3*	*-53.3*	*-50.3*	*-63.3*	*-*	
Facade Roof Element										
		-39.4	*-42.4*	*-43.4*	*-52.4*	*-56.4*	*-60.4*	*-63.4*	*-*	
Facade Door Element										
		-30.7	*-29.7*	*-36.7*	*-50.7*	*-60.7*	*-63.7*	*-66.7*	*-*	
Ventilators										
		-36.8	*-35.8*	*-38.8*	*-43.8*	*-42.8*	*-41.8*	*-40.8*	*-41.8*	
Cumulative Lp										
Result		**-**	**35.4**	**25.3**	**16.3**	**15.0**	**11.9**	**7.3**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*3.0*	*2.6*	*2.2*	*2.2*	*2.2*	*1.7*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - TF Front Single L Day **Reverberant Field, LPrev:**		**-**	**38.4**	**27.9**	**18.5**	**17.1**	**14.1**	**9.0**	**-**	

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Calculation Sheet

TF Front Single L Night

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Leq)										
Source dBA	**60.0**									
Octave Band Frequencies										
Leq,ff		**64.0**	**62.0**	**58.0**	**56.0**	**56.0**	**52.0**	**47.0**	**41.0**	**Row A**
Facade Wall Element										
		-41.5	*-44.5*	*-48.5*	*-48.5*	*-57.5*	*-61.5*	*-63.5*	*-68.5*	
Facade Glazed Element										
		-	*-35.3*	*-46.3*	*-48.3*	*-53.3*	*-50.3*	*-63.3*	*-*	
Facade Roof Element										
		-39.4	*-42.4*	*-43.4*	*-52.4*	*-56.4*	*-60.4*	*-63.4*	*-*	
Facade Door Element										
		-30.7	*-29.7*	*-36.7*	*-50.7*	*-60.7*	*-63.7*	*-66.7*	*-*	
Ventilators										
		-36.8	*-35.8*	*-38.8*	*-43.8*	*-42.8*	*-41.8*	*-40.8*	*-41.8*	
Cumulative Lp										
Result		**-**	**34.4**	**24.3**	**15.3**	**14.0**	**10.9**	**6.3**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*3.0*	*2.6*	*2.2*	*2.2*	*2.2*	*1.7*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - TF Front Single L Night **Reverberant Field, LPrev:**		**-**	**37.4**	**26.9**	**17.5**	**16.1**	**13.1**	**8.0**	**-**	

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Calculation Sheet

TF Front Single L Lmax

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Lmax)										
Source dBA	**78.0**									
Octave Band Frequencies										
Leq,ff		**82.0**	**80.0**	**76.0**	**74.0**	**74.0**	**70.0**	**65.0**	**59.0**	**Row A**
Facade Wall Element										
		-41.5	*-44.5*	*-48.5*	*-48.5*	*-57.5*	*-61.5*	*-63.5*	*-68.5*	
Facade Glazed Element										
		-	*-35.3*	*-46.3*	*-48.3*	*-53.3*	*-50.3*	*-63.3*	*-*	
Facade Roof Element										
		-39.4	*-42.4*	*-43.4*	*-52.4*	*-56.4*	*-60.4*	*-63.4*	*-*	
Facade Door Element										
		-30.7	*-29.7*	*-36.7*	*-50.7*	*-60.7*	*-63.7*	*-66.7*	*-*	
Ventilators										
		-36.8	*-35.8*	*-38.8*	*-43.8*	*-42.8*	*-41.8*	*-40.8*	*-41.8*	
Cumulative Lp										
Result		**-**	**52.4**	**42.3**	**33.3**	**32.0**	**28.9**	**24.3**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*3.0*	*2.6*	*2.2*	*2.2*	*2.2*	*1.7*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - TF Front Single L Lmax **Reverberant Field, LPrev:**		**-**	**55.4**	**44.9**	**35.5**	**34.1**	**31.1**	**26.0**	**-**	

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Calculation Sheet

TF Front Single C Day

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Daytime Leq)										
Source dBA	**61.0**									
Octave Band Frequencies										
Leq,ff		**65.0**	**63.0**	**59.0**	**57.0**	**57.0**	**53.0**	**48.0**	**42.0**	**Row A**
Facade Wall Element										
		-43.3	*-46.3*	*-50.3*	*-50.3*	*-59.3*	*-63.3*	*-65.3*	*-70.3*	
Facade Roof Element										
		-38.4	*-41.4*	*-42.4*	*-51.4*	*-55.4*	*-59.4*	*-62.4*	*-*	
Facade Door Element										
		-	*-37.4*	*-33.4*	*-40.4*	*-54.4*	*-53.4*	*-55.4*	*-*	
Ventilators										
		-36.9	*-35.9*	*-38.9*	*-43.9*	*-42.9*	*-41.9*	*-40.9*	*-41.9*	
Cumulative Lp										
Result		**-**	**30.3**	**27.2**	**18.8**	**14.8**	**11.8**	**8.0**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*4.0*	*3.6*	*3.2*	*3.2*	*3.2*	*2.7*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - TF Front Single C Day										
Reverberant Field, LPrev:		**-**	**34.3**	**30.8**	**21.9**	**18.0**	**15.0**	**10.7**	**-**	

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Calculation Sheet

TF Front Single C Night

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Leq)										
Source dBA	**60.0**									
Octave Band Frequencies										
Leq,ff		**64.0**	**62.0**	**58.0**	**56.0**	**56.0**	**52.0**	**47.0**	**41.0**	**Row A**
Facade Wall Element										
		-43.3	*-46.3*	*-50.3*	*-50.3*	*-59.3*	*-63.3*	*-65.3*	*-70.3*	
Facade Roof Element										
		-38.4	*-41.4*	*-42.4*	*-51.4*	*-55.4*	*-59.4*	*-62.4*	-	
Facade Door Element										
		-	*-37.4*	*-33.4*	*-40.4*	*-54.4*	*-53.4*	*-55.4*	-	
Ventilators										
		-36.9	*-35.9*	*-38.9*	*-43.9*	*-42.9*	*-41.9*	*-40.9*	*-41.9*	
Cumulative Lp										
Result		**-**	**29.3**	**26.2**	**17.8**	**13.9**	**10.9**	**7.2**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	-	
Room Corrections										
		-	*4.0*	*3.6*	*3.2*	*3.2*	*3.2*	*2.7*	-	
Internal Receiver Noise										
Internal Receiver Noise - TF Front Single C Night **Reverberant Field, LPrev:**		**-**	**33.3**	**29.8**	**21.0**	**17.0**	**14.0**	**9.9**	**-**	

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Calculation Sheet

TF Front Single C Lmax

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Lmax)										
Source dBA	**78.0**									
Octave Band Frequencies										
Leq,ff		**82.0**	**80.0**	**76.0**	**74.0**	**74.0**	**70.0**	**65.0**	**59.0**	**Row A**
Facade Wall Element										
		-43.3	*-46.3*	*-50.3*	*-50.3*	*-59.3*	*-63.3*	*-65.3*	*-70.3*	
Facade Roof Element										
		-38.4	*-41.4*	*-42.4*	*-51.4*	*-55.4*	*-59.4*	*-62.4*	*-*	
Facade Door Element										
		-	*-37.4*	*-33.4*	*-40.4*	*-54.4*	*-53.4*	*-55.4*	*-*	
Ventilators										
		-36.9	*-35.9*	*-38.9*	*-43.9*	*-42.9*	*-41.9*	*-40.9*	*-41.9*	
Cumulative Lp										
Result		**-**	**47.3**	**44.1**	**35.7**	**31.7**	**28.5**	**24.3**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*4.0*	*3.6*	*3.2*	*3.2*	*3.2*	*2.7*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - TF Front Single C Lmax										
Reverberant Field, LPrev:		**-**	**51.3**	**47.8**	**38.9**	**34.9**	**31.7**	**27.0**	**-**	

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Kings Cross Methodist Church

Calculation Sheet

TF Front Twin Day

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Daytime Leq)										
Source dBA	**61.0**									
Octave Band Frequencies										
Leq,ff		**65.0**	**63.0**	**59.0**	**57.0**	**57.0**	**53.0**	**48.0**	**42.0**	**Row A**
Facade Wall Element										
		-42.1	*-45.1*	*-49.1*	*-49.1*	*-58.1*	*-62.1*	*-64.1*	*-69.1*	
Facade Glazed Element										
		-	*-35.8*	*-46.8*	*-48.8*	*-53.8*	*-50.8*	*-63.8*	*-*	
Facade Roof Element										
		-38.8	*-41.8*	*-42.8*	*-51.8*	*-55.8*	*-59.8*	*-62.8*	*-*	
Facade Door Element										
		-31.3	*-30.3*	*-37.3*	*-51.3*	*-61.3*	*-64.3*	*-67.3*	*-*	
Ventilators										
		-37.3	*-36.3*	*-39.3*	*-44.3*	*-43.3*	*-42.3*	*-41.3*	*-42.3*	
Cumulative Lp										
Result		**-**	**34.9**	**24.9**	**15.8**	**14.5**	**11.4**	**6.8**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*3.6*	*3.2*	*2.7*	*2.7*	*2.7*	*2.2*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - TF Front Twin Day **Reverberant Field, LPrev:**		**-**	**38.4**	**28.1**	**18.6**	**17.2**	**14.1**	**9.0**	**-**	

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Calculation Sheet

TF Front Twin Night

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Leq)										
Source dBA	**60.0**									
Octave Band Frequencies										
Leq,ff		**64.0**	**62.0**	**58.0**	**56.0**	**56.0**	**52.0**	**47.0**	**41.0**	**Row A**
Facade Wall Element										
		-42.1	*-45.1*	*-49.1*	*-49.1*	*-58.1*	*-62.1*	*-64.1*	*-69.1*	
Facade Glazed Element										
		-	*-35.8*	*-46.8*	*-48.8*	*-53.8*	*-50.8*	*-63.8*	*-*	
Facade Roof Element										
		-38.8	*-41.8*	*-42.8*	*-51.8*	*-55.8*	*-59.8*	*-62.8*	*-*	
Facade Door Element										
		-31.3	*-30.3*	*-37.3*	*-51.3*	*-61.3*	*-64.3*	*-67.3*	*-*	
Ventilators										
		-37.3	*-36.3*	*-39.3*	*-44.3*	*-43.3*	*-42.3*	*-41.3*	*-42.3*	
Cumulative Lp										
Result		**-**	**33.9**	**23.9**	**14.8**	**13.5**	**10.4**	**5.8**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*3.6*	*3.2*	*2.7*	*2.7*	*2.7*	*2.2*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - TF Front Twin Night **Reverberant Field, LPrev:**		**-**	**37.4**	**27.1**	**17.6**	**16.2**	**13.1**	**8.0**	**-**	

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Calculation Sheet

TF Front Twin Lmax

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Lmax)										
Source dBA	**78.0**									
Octave Band Frequencies										
Leq,ff		**82.0**	**80.0**	**76.0**	**74.0**	**74.0**	**70.0**	**65.0**	**59.0**	**Row A**
Facade Wall Element										
		-42.1	*-45.1*	*-49.1*	*-49.1*	*-58.1*	*-62.1*	*-64.1*	*-69.1*	
Facade Glazed Element										
		-	*-35.8*	*-46.8*	*-48.8*	*-53.8*	*-50.8*	*-63.8*	*-*	
Facade Roof Element										
		-38.8	*-41.8*	*-42.8*	*-51.8*	*-55.8*	*-59.8*	*-62.8*	*-*	
Facade Door Element										
		-31.3	*-30.3*	*-37.3*	*-51.3*	*-61.3*	*-64.3*	*-67.3*	*-*	
Ventilators										
		-37.3	*-36.3*	*-39.3*	*-44.3*	*-43.3*	*-42.3*	*-41.3*	*-42.3*	
Cumulative Lp										
Result		**-**	**51.9**	**41.9**	**32.8**	**31.5**	**28.4**	**23.8**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*3.6*	*3.2*	*2.7*	*2.7*	*2.7*	*2.2*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - TF Front Twin Lmax **Reverberant Field, LPrev:**		**-**	**55.4**	**45.1**	**35.6**	**34.2**	**31.1**	**26.0**	**-**	

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Calculation Sheet

TF Rear Corner Day

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Daytime Leq)										
Source dBA	**61.0**									
Octave Band Frequencies										
Leq,ff		**65.0**	**63.0**	**59.0**	**57.0**	**57.0**	**53.0**	**48.0**	**42.0**	**Row A**
Facade Wall Element										
		-39.7	*-42.7*	*-46.7*	*-46.7*	*-55.7*	*-59.7*	*-61.7*	*-66.7*	
Facade Glazed Element										
		-	*-37.3*	*-48.3*	*-50.3*	*-55.3*	*-52.3*	*-65.3*	*-*	
Facade Roof Element										
		-41.4	*-44.4*	*-45.4*	*-54.4*	*-58.4*	*-62.4*	*-65.4*	*-*	
Ventilators										
		-40.3	*-39.3*	*-42.3*	*-47.3*	*-46.3*	*-45.3*	*-44.3*	*-45.3*	
Cumulative Lp										
Result		**-**	**29.0**	**20.0**	**14.4**	**12.1**	**9.2**	**5.3**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*7.5*	*7.0*	*6.6*	*6.6*	*6.6*	*6.1*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - TF Rear Corner Day **Reverberant Field, LPrev:**		**-**	**36.4**	**27.0**	**21.0**	**18.7**	**15.8**	**11.4**	**-**	

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Calculation Sheet

TF Rear Corner Night

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Leq)										
Source dBA	**60.0**									
Octave Band Frequencies										
Leq,ff		**64.0**	**62.0**	**58.0**	**56.0**	**56.0**	**52.0**	**47.0**	**41.0**	**Row A**
Facade Wall Element										
		-39.7	*-42.7*	*-46.7*	*-46.7*	*-55.7*	*-59.7*	*-61.7*	*-66.7*	
Facade Glazed Element										
		-	*-37.3*	*-48.3*	*-50.3*	*-55.3*	*-52.3*	*-65.3*	*-*	
Facade Roof Element										
		-41.4	*-44.4*	*-45.4*	*-54.4*	*-58.4*	*-62.4*	*-65.4*	*-*	
Ventilators										
		-40.3	*-39.3*	*-42.3*	*-47.3*	*-46.3*	*-45.3*	*-44.3*	*-45.3*	
Cumulative Lp										
Result		**-**	**28.0**	**19.0**	**13.4**	**11.2**	**8.4**	**4.7**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*7.5*	*7.0*	*6.6*	*6.6*	*6.6*	*6.1*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - TF Rear Corner Night **Reverberant Field, LPrev:**		**-**	**35.4**	**26.0**	**20.0**	**17.8**	**15.0**	**10.7**	**-**	

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Calculation Sheet

TF Rear Corner Lmax

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Lmax)										
Source dBA	**78.0**									
Octave Band Frequencies										
Leq,ff		**82.0**	**80.0**	**76.0**	**74.0**	**74.0**	**70.0**	**65.0**	**59.0**	**Row A**
Facade Wall Element										
		-39.7	*-42.7*	*-46.7*	*-46.7*	*-55.7*	*-59.7*	*-61.7*	*-66.7*	
Facade Glazed Element										
		-	*-37.3*	*-48.3*	*-50.3*	*-55.3*	*-52.3*	*-65.3*	*-*	
Facade Roof Element										
		-41.4	*-44.4*	*-45.4*	*-54.4*	*-58.4*	*-62.4*	*-65.4*	*-*	
Ventilators										
		-40.3	*-39.3*	*-42.3*	*-47.3*	*-46.3*	*-45.3*	*-44.3*	*-45.3*	
Cumulative Lp										
Result		**-**	**45.9**	**36.9**	**31.2**	**28.9**	**25.7**	**20.9**	**-**	
ISO 12354-3 Lfs Correction										
		-	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-*	
Room Corrections										
		-	*7.5*	*7.0*	*6.6*	*6.6*	*6.6*	*6.1*	*-*	
Internal Receiver Noise										
Internal Receiver Noise - TF Rear Corner Lmax										
Reverberant Field, LPrev:		**-**	**53.4**	**44.0**	**37.8**	**35.4**	**32.3**	**27.0**	**-**	

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