

697 Uxbridge Road Hayes



Noise Impact Assessment Report
Report 23706.NIA.01

Islamic Educational & Cultural Society
3 Pump Lane
Hayes
UB3 3NB

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1.0 INTRODUCTION

KP Acoustics Ltd has been commissioned by Islamic Educational & Cultural Society, 3 Pump Lane, Hayes, UB3 3NB to undertake an environmental noise survey and noise breakout assessment at 697 Uxbridge Road, Hayes, UB4 8HX.

The purpose of the assessment is to assess the suitability of the site for change of use from E to a F1 Community Facility and assess any noise implications of the change of use.

This report presents the results of the environmental survey undertaken in order to measure prevailing background noise levels, assess noise breakout from the space and outlines any necessary mitigation measures.

2.0 SITE SURVEYS

2.1 Site Description

The site is bounded by Uxbridge Road to the North, Angel Lane to the East, residential buildings to the south and a currently empty site to the west. Entrance to the site is located on Uxbridge Road and Angle Lane. At the time of the survey, the background noise climate was dominated by road traffic noise from Uxbridge Road.

2.2 Environmental Noise Survey Procedure

A noise survey was undertaken on the proposed site as shown in Figure 2.1. The location was chosen in order to collect data representative of the worst-case levels expected on the site due to all nearby sources.

Continuous automated monitoring was undertaken for the duration of the survey between 10:44 on 19/11/2021 and 10:44 on 22/11/2021.

Weather conditions were generally dry with light winds and therefore suitable for the measurement of environmental noise. The measurement procedure complied with ISO 1996-2:2017 Acoustics '*Description, measurement and assessment of environmental noise - Part 2: Determination of environmental noise levels*'.

2.3 Measurement Positions

Measurement positions are as described within Table 2.1 and shown within Figure 2.1.

Icon	Descriptor	Location Description
	Noise Measurement Position 1	The meter was installed on a window on the 1 st floor of the Angel Lane façade, as shown in Figure 2.1. A correction of 3dB has been applied to account for non-free field conditions
	Noise Measurement Position 2	The meter was installed on a pipe in the car park, as shown in Figure 2.1. A correction of 3dB has been applied to account for non-free field conditions
	Closest Noise Sensitive Receiver 1	Window of first floor flat at 693A Uxbridge Rd, London
	Closest Noise Sensitive Receiver 2	Window of first floor flat at 2 Angle Lane, London

Table 2.1 Measurement positions and descriptions

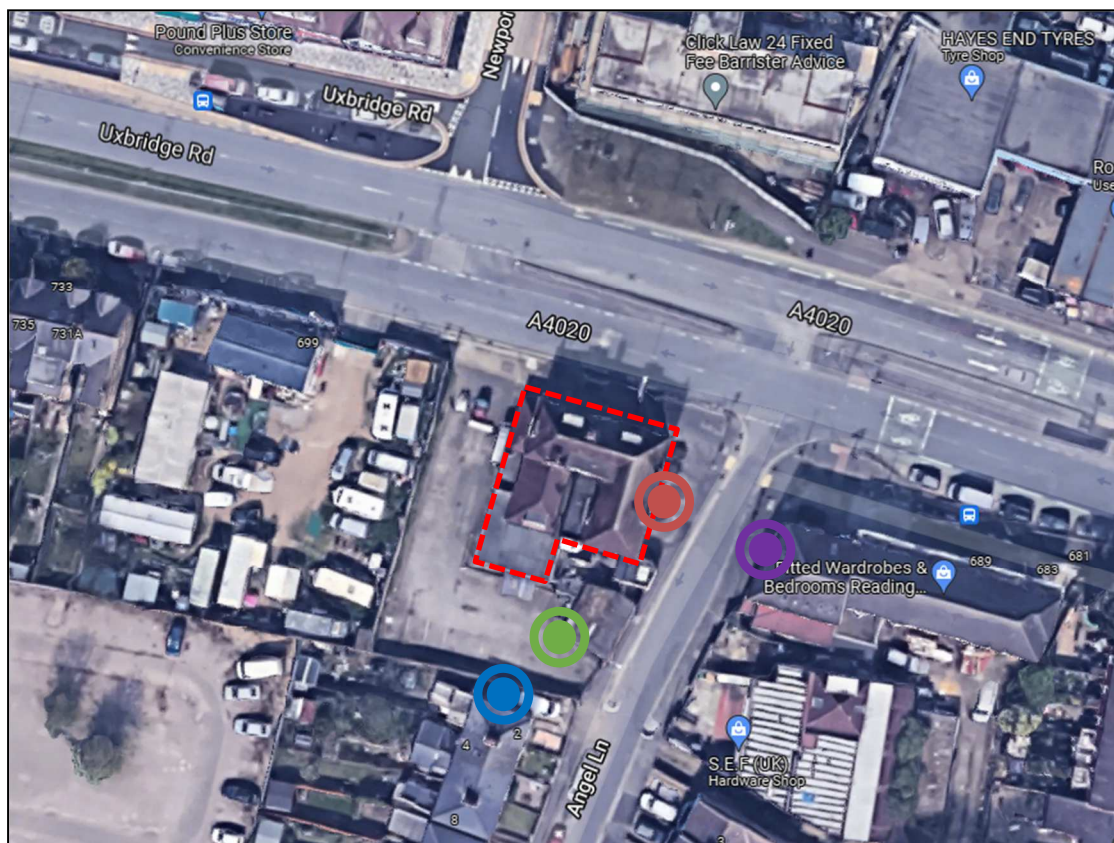


Figure 2.1 Site measurement positions (Image Source: Google Maps)

2.4 Equipment

The equipment calibration was verified before and after use and no abnormalities were observed. The equipment used is described within Table 2.2 and 2.3.

Measurement instrumentation		Serial no.	Date	Cert no.
Noise Kit 5	Svantek Type 977 Class 1 Sound Level Meter	46459	9/05/2019	14012954
	Free-field microphone Aco Pacific 7052H	43114		
	Preamp Svantek 2v12L	18929		
	Svantek External windshield	-	-	-
Noise Kit 8	Svantek Type 958A Class 1 Sound Level Meter	59559	26/09/2019	14012947
	MTG MK250 Free-field microphone	10904		
	Preamp Svantek SV12L	33619		
	Svantek External windshield	-	-	-
Larson Davis CAL200 Class 1 Calibrator		17148	27/04/2021	05223/1

Table 2.2 Measurement instrumentation (Environmental Survey)

Instrument	Manufacturer and Type	Serial Number
Precision integrating sound level meter & analyser SLM 1	NTi Audio, XL2-TA Calibration No: 04624/3-5 Calibration Date 20/02/2020	A2A-09521-E0
LS1 Active Loudspeaker	RCF ART 310A	KLXF29324
Pink Noise Source	NTi Audio Minirator MR-PRO	G2P-RAEXP-G0
Calibrator 3	Rion NC-74 Calibration No: 04174/1 Calibration Date 27/05/2021	34904938

Table 2.3 Measurement instrumentation (Façade Measurements)

3.0 RESULTS

3.1 Noise Survey

The L_{Aeq} : 5min, L_{Amax} : 5min, L_{A10} : 5min and L_{A90} : 5min acoustic parameters were measured throughout the duration of the survey. Measured levels are shown as a time history in Figure 23706.TH1-2.

Measured noise levels are representative of noise exposure levels expected to be experienced by the nearby receivers, and are shown in Tables 4.1 and 4.2.

Time Period	Representative background noise level L_{A90} dB(A)	Average ambient noise level L_{Aeq} dB(A)
Daytime	56	66

Table 4.1 Site noise levels for daytime and night time (position 1)

Time Period	Representative background noise level L_{A90} dB(A)	Average ambient noise level L_{Aeq} dB(A)
Daytime	46	54

Table 4.2 Site noise levels for daytime and night time (position 2)

4.0 NOISE ASSESSMENT GUIDANCE

4.1 Noise Policy Statement For England 2019

The National Planning Policy Framework (NPPF) has superseded and replaces Planning Policy Guidance Note 24 (PPG24), which previously covered issues relating to noise and planning in England. Paragraph 170 of the NPPF states that planning policies and decisions should aim to:

- 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. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans

In addition, Paragraph 180 of the NPPF states that '*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:*

- Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life
- 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 Noise Policy Statement for England (NPSE) was developed by DEFRA and published in March 2010 with the aim to ‘Promote good health and good quality of life through the effective management of noise within the context of Government policy on sustainable development.’

Noise Policy Statement England (NPSE) noise policy aims are as follows:

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

- *Avoid significant adverse impacts on health and quality of life;*
- *Mitigate and minimise adverse impacts on health and quality of life; and*
- *Where possible, contribute to the improvement of health and quality of life*

The Noise Policy Statement England (NPSE) outlines observed effect levels relating to the above, as follows:

- NOEL – No Observed Effect Level
 - This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.
- LOAEL – Lowest Observed Adverse Effect Level
 - This is the level above which adverse effects on health and quality of life can be detected.
- SOAEL – Significant Observed Adverse Effect Level
 - This is the level above which significant adverse effects on health and quality of life occur.

As stated in The Noise Policy Statement England (NPSE), it is not currently possible to have a single objective based measure that defines SOAEL that is applicable to all sources of noise in all situations. Specific noise levels are not stated within the guidance for this reason, and allow flexibility in the policy until further guidance is available.

5.0 NOISE TRANSFER AND BREAKOUT PREDICTIONS

5.1 Noise Breakout Through the External Façades

In the recreation room, it is expected that no amplified speech will occur, but a number of people may be playing games such as table tennis or pool. Therefore the main noise source is expected to be unamplified speech, and a correction has been added for an expected maximum of 30 people in the room. A typical noise level for unamplified speech has been used, shown in Table 6.1 below.

In order to assess a realistic scenario of noise transfer from the prayer area to the external environment, source noise data will be used from a previous internal noise assessment undertaken whilst the community centre was operational.

A spectrum of the highest measured L_{Aeq} events at the previous survey with approximately 200 worshippers being present, is shown in Table 6.1 below. It should be noted that the proposed new community facility would accommodate up to 50 worshippers. Because the noise source is very similar, the noise level measured represents a worst-case scenario and should not be revised down for the smaller number of proposed worshippers.

It is understood that amplified vocals for prayer/recitation are allowed within the proposed community facility, but no music is allowed within any part of the building.

Internal Noise Measurement	Octave band centre frequency SRI, dB								Overall SPL @1m
	63	125	250	500	1k	2k	4k	8k	
Typical unamplified speech	48	51	57	60	54	49	44	39	60
Worst case $L_{Aeq\ 5\ min}$ with approximately 200 worshippers in attendance	69	62	68	72	72	67	60	54	75

Table 6.1 Measured worst case internal noise activity, L_{Aeq}

Using the source levels described above and taking into account the measured D_w rating of the façades, Table 6.2 shows the predicted sound pressure level at 1m from the residential windows at the nearest sensitive receivers, as shown in Figure 2.2 and 2.3 above. This has been compared with the measured representative background noise level during daytime hours. Detailed calculations are shown in Appendix B1-2.

The client indicated that windows may be open at infrequent times during the operation of the community centre for ventilation and cooling, so the typical noise reduction of a partially open window is considered below.

Receiver	Representative Background Noise	Noise Level at Receiver (1m from window)
Window of first floor flat at 693A Uxbridge Rd, London	56 dB(A)	36 dB(A)
Window of first floor flat at 2 Angle Lane, London	46 dB(A)	36 dB(A)

Table 6.2 Predicted noise level at 1m from the closest noise sensitive window

As shown in Table 6.2, noise breakout from the façade of the ground floor recreation area is 20dB below the measured representative background noise level during daytime opening hours, demonstrating that any breakout noise from the community centre would be non-significant at 1 metre from the closest noise sensitive window.

As shown in Table 6.2, noise breakout from the façade of the ground floor prayer area is 10dB below the measured representative background noise level during daytime opening hours, demonstrating that any breakout noise from the community centre would be non-significant at 1 metre from the closest noise sensitive window.

Please note that this assessment has been undertaken with the existing external building fabric and existing glazed elements and existing doors.

5.2 Externally Generated Noise - Noise Management Plan

A high percentage of the attendees are from the local community, meaning that vehicular transport would be avoided in many cases. Therefore, increased noise levels due to vehicular activity would be unlikely to cause any significant adverse effects.

With regards to noise generated due to attendees entering and exiting the premises, most attendees would be accessing the site individually and therefore high levels of speech would not be prevalent. Furthermore, the existing noise profile of the area would largely mask any typical speech at the Angel Lane entrance of the community centre, and therefore patron noise would not negatively impact the amenity of the closest residents. Table 6.3 includes an assessment of external activity due to worshippers entering and exiting the premises at Angel Lane elevation.

	Daytime
Noise level of typical conversation between 5No. worshippers at 1m	65 dB(A)
Attenuation provided by distance to receiving window (minimum 14m)	-23dB
Noise level at 1m from receiving window	42dB(A)
Existing ambient noise profile of the area (07:00-23:00), L_{Aeq}	66dB(A)
Assessment level	24dB(A) below existing ambient noise level during daytime opening hours

Table 6.3 Noise assessment of external public worshipper activity at Green Lane elevation

As shown in Table 6.3, externally generated noise from worshippers would be 24dB below the existing ambient noise level at the receiving window during daytime opening hours. This would demonstrate that existing noise profile at this position would mask any potential noise generated from patron activity to within acceptable levels.

Furthermore, users of the community centre are considered peaceful people who would not use raised voice upon entry or exit from the premises. It is likely that users would not be arriving in large groups and would be expected to be individuals or small groups of no more than 5 people. Even considering a worst-case scenario of this group of people having a low-level conversation upon entry to the community facility, it would not be significant enough as to cause disturbance to the neighbouring properties. Furthermore, it is understood that conversation does not involve multiple people talking at once, and as such generally one person would be talking at a time at a normal speech level i.e. not raised voice or shouting.

It should be noted that the levels generated would be in the category of 'Noticeable and not intrusive', as stipulated in the National Planning Policy Guidance as shown in Table 6.4 below, and therefore falls within the No Observed Adverse Effect category.

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

Table 6.4 Noise exposure hierarchy based on likely average response (NPP Guidance)

Noise complaints are not expected to occur due to the proposed community centre operations, however, in order to minimise the possibility of any complaints due to noise from the proposed community facility operations and worshippers entering and exiting the premises, we would highly recommend the adoption of the following conditions to be considered as the noise management plan for the proposed Community Centre. The key considerations are shown below:

- The core operations of the proposed community facility should be carried out between the hours of 07:00 to 23:00. Therefore, no other activities are allowed outside of the proposed operating hours.
- Deliveries and servicing operations are not allowed outside of the daytime hours (between 07:00 and 23:00).
- Please ensure that deliveries and servicing are undertaken by suppliers, transport operators and any other vehicles that follow good practice guidance for quiet deliveries. Good practice guidance can be found in the TFL code of practice for quiet deliveries: <http://content.tfl.gov.uk/codeofpractice.pdf>.
- It is understood that in regard to noise generated due to attendees entering and exiting the premises, most attendees would be accessing the site individually and therefore high levels of speech would not be prevalent. However, to minimize the impact on the amenity of the closest residents as much as is practically possible, it is recommended that the attendees should not gather outside of the community facility.
- In addition, in order to minimise the risk of any noise disturbance caused by the attendees or other members of the public, clear signage should be displayed in the area requesting all who use the space to respect local residents and use the premises in a quiet and respectful manner.
- Should signage not have the desired effect on customer behaviour, staff interaction would be necessary, requesting that attendees avoid unnecessary noise (such as shouting or uses of raised voices).
- It should be ensured that the community facility does not accommodate more than 50 worshippers/attendees at any time, therefore a sound limiter is recommended to be installed. Amplified music and vocals within the proposed community facility should be limited to 75 dB at any time.
- All external doors shall be kept closed except for access and egress.
- Windows may be partially opened, but not fully.
- A high percentage of the attendees are from the local community, meaning that vehicular transport will be avoided in many cases. However, the worshippers who use vehicular transport should be instructed by members of staff to park quietly and

respectfully, for instance, avoiding slamming car doors, switch off the radio, or any music when open the car doors, using external bells or horns, and not shout or whistle to get the attention of other worshippers.

Given the above noise-management plan conditions it is expected that the access and egress of worshippers, deliveries and community facility operations during the daytime period would not have an impact on the amenity of the closest residential receivers.

6.0 NOISE MITIGATION PROPOSALS

Installation of a Sound Limiter

In order to ensure that the source noise levels are controlled within the ground floor Prayer area due to amplified sounds, we would recommend that a sound limiter is installed. The system designer should be able to advise on the type and standard of sound limiter suitable for the proposed installation.

The limiter should enable the separate control of the different zones and incorporate all elements of the sound system, including any additional filters or amplifiers. Programmable limiters are preferred as these permit more sophisticated control of frequency content and volume and are fully tamper-proof. Programmed limits should match those shown in Table 6.5.

Noise Limiter	Octave band centre frequency SRI, dB								Overall SPL @1m
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
Maximum permissible levels within the Community Centre to meet the requirements	69	62	68	72	72	67	60	54	75

Table 6.5 Maximum permissible noise levels within the Community Centre

7.0 CONCLUSION

A noise assessment of community facility activity noise has been undertaken at 697 Uxbridge Road, Hayes, UB4 8HX. The assessment includes calculations of noise breakout to the external environment.

The calculation and assessment show that noise breakout is below the representative background noise levels measured on both monitoring positions, and there would be no negative impact on the occupiers of the identified closest noise sensitive receiver, as well as other nearby residential receivers.

Furthermore, activity noise of worshippers leaving the premises would be non-significant whether it be by foot or vehicle and would fall well below the existing ambient noise profile of the area.

No further mitigation measures would be required in order to protect the surrounding residences from noise due to community centre activity.

697 Uxbridge Road, Hayes, UB4 8HX
Environmental Noise Time History
From 19 November 2021 To 22 November 2021

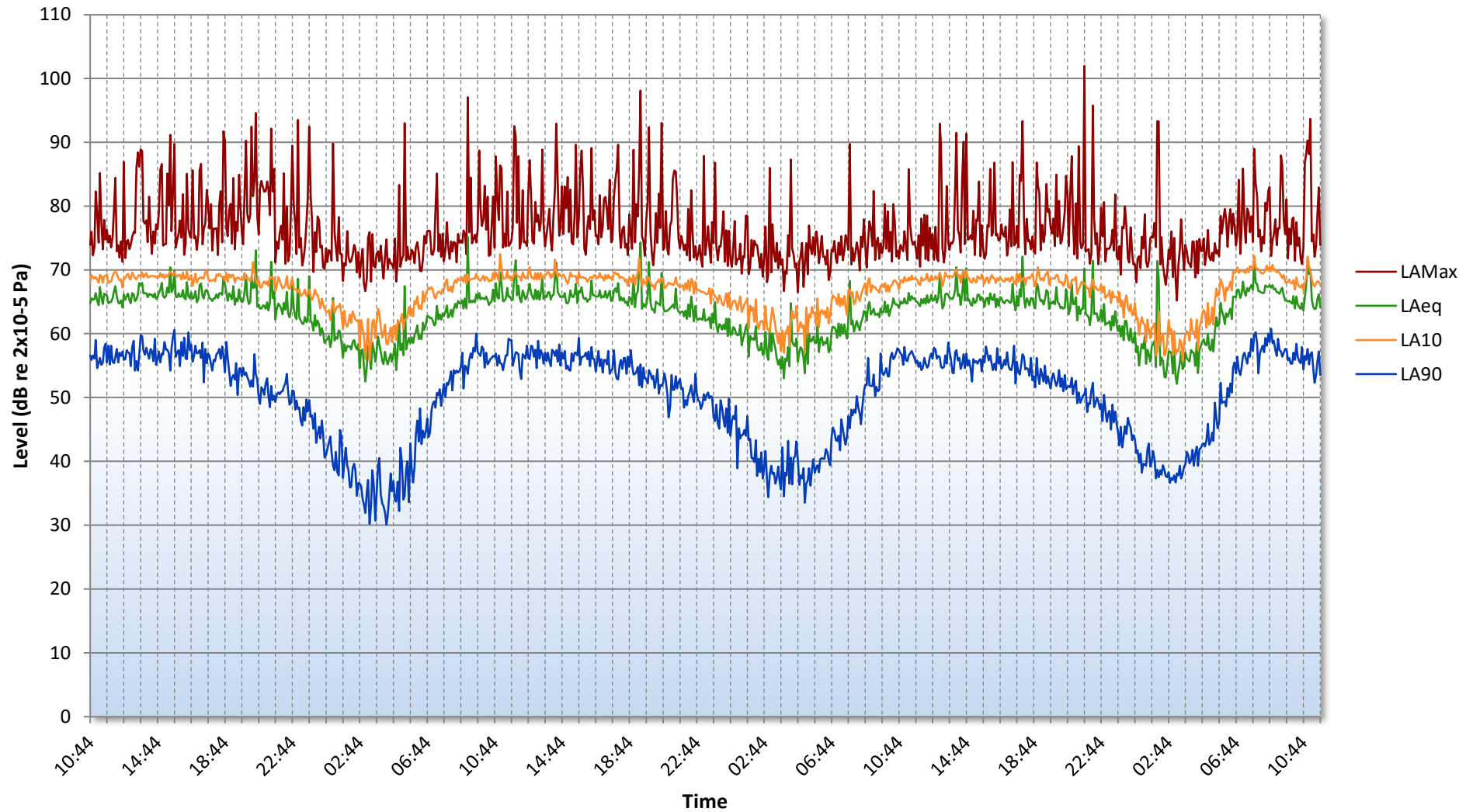


Figure 23706.TH1

697 Uxbridge Road, Hayes, UB4 8HX
Environmental Noise Time History
From 19 November 2021 To 22 November 2021

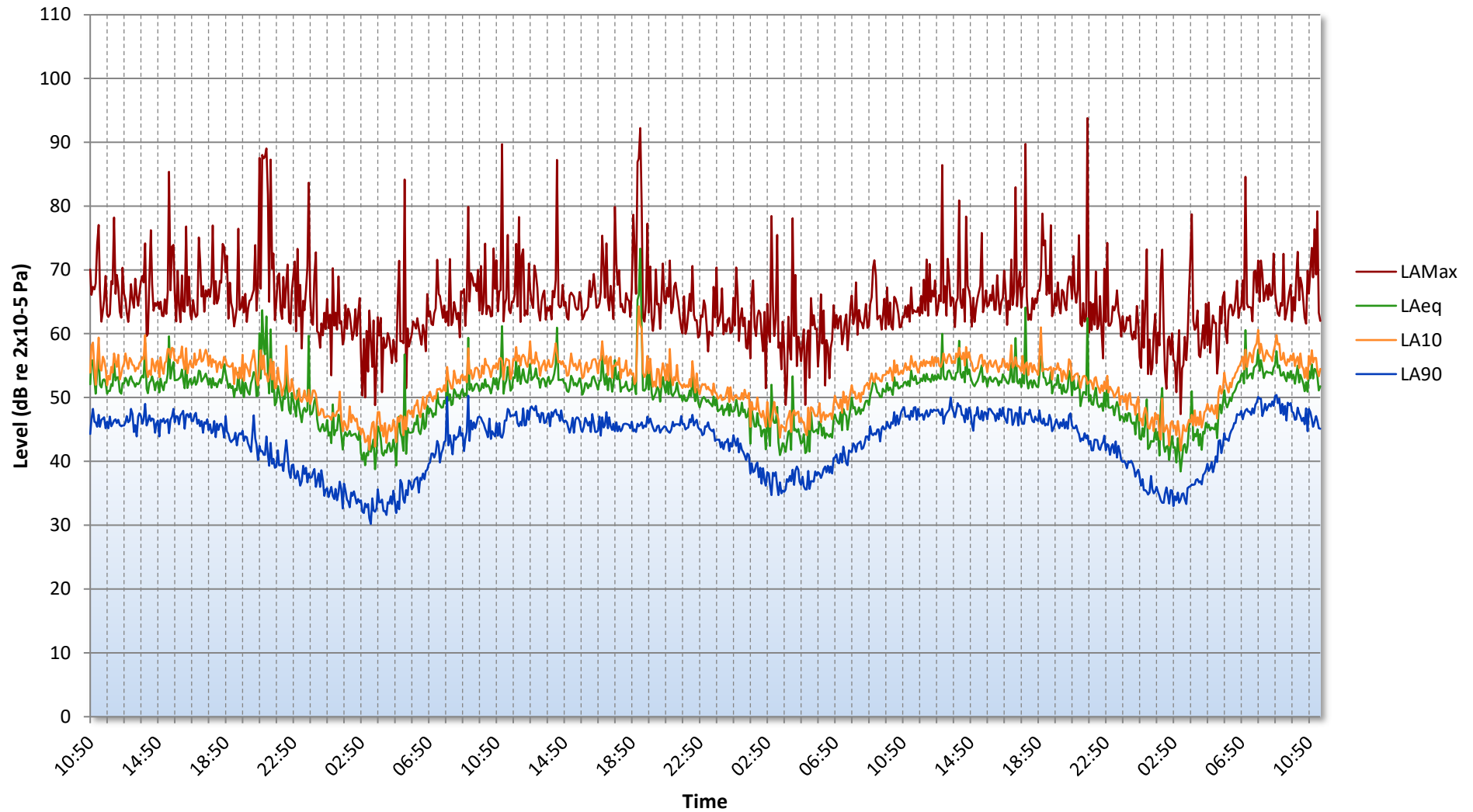


Figure 23706.TH2

GENERAL ACOUSTIC TERMINOLOGY

Decibel scale - dB

In practice, when sound intensity or sound pressure is measured, a logarithmic scale is used in which the unit is the 'decibel', dB. This is derived from the human auditory system, where the dynamic range of human hearing is so large, in the order of 10^{13} units, that only a logarithmic scale is the sensible solution for displaying such a range.

Decibel scale, 'A' weighted - dB(A)

The human ear is less sensitive at frequency extremes, below 125Hz and above 16Khz. A sound level meter models the ears variable sensitivity to sound at different frequencies. This is achieved by building a filter into the Sound Level Meter with a similar frequency response to that of the ear, an A-weighted filter where the unit is dB(A).

L_{eq}

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq} . The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

L_{10}

This is the level exceeded for no more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise.

L_{90}

This is the level exceeded for no more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{max}

This is the maximum sound pressure level that has been measured over a period.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 11 such octave bands whose centre frequencies are defined in accordance with international standards. These centre frequencies are: 16, 31.5, 63, 125, 250, 500, 1000, 2000, 4000, 8000 and 16000 Hertz.

Environmental noise terms are defined in BS7445, *Description and Measurement of Environmental Noise*.

APPLIED ACOUSTIC TERMINOLOGY

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than a single source and 4 sources produce a 6dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.

Subjective impression of noise

Hearing perception is highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a guide to explain increases or decreases in sound levels for many scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud

Transmission path(s)

The transmission path is the path the sound takes from the source to the receiver. Where multiple paths exist in parallel, the reduction in each path should be calculated and summed at the receiving point. Outdoor barriers can block transmission paths, for example traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and construction.

Ground-borne vibration

In addition to airborne noise levels caused by transportation, construction, and industrial sources there is also the generation of ground-borne vibration to consider. This can lead to structure-borne noise, perceptible vibration, or in rare cases, building damage.

Sound insulation - Absorption within porous materials

Upon encountering a porous material, sound energy is absorbed. Porous materials which are intended to absorb sound are known as absorbents, and usually absorb 50 to 90% of the energy and are frequency dependent. Some are designed to absorb low frequencies, some for high frequencies and more exotic designs being able to absorb very wide ranges of frequencies. The energy is converted into both mechanical movement and heat within the material; both the stiffness and mass of panels affect the sound insulation performance.

APPENDIX B1 691 Green Lane, London, RM8 1UU

Noise Breakout Calculation

Source: Ground Floor Recreation Area Receiver: First Floor Window of Receiver 1	Frequency, Hz								dB(A)
	63	125	250	500	1k	2k	4k	8k	
L_{Aeq} of typical unamplified speech, sound pressure level at 1m	48	51	57	60	54	49	44	39	60
Correction for number of attendees who may be talking at once (30)	15	15	15	15	15	15	15	15	
Total noise level within recreation area, sound pressure level at 1m	63	66	72	75	69	64	59	54	75
Approximate area S of the facade looking onto the closest residence (sq.m)	23	23	23	23	23	23	23	23	
Correction for area 10log(S)	14	14	14	14	14	14	14	14	
Sound reduction of partially open window	-15	-15	-15	-15	-15	-15	-15	-15	
Distance r to closest residence (m)	14	14	41	14	14	14	14	14	
Directivity factor Q for wall transmission	2	2	2	2	2	2	2	2	
Combined correction for directivity and distance (dB)	-31	-31	-40	-31	-31	-31	-31	-31	
Sound Pressure Level at Within Receiver Space	24	27	24	36	30	25	20	15	36

APPENDIX B2

691 Green Lane, London, RM8 1UU

Noise Breakout Calculation

Source: Ground Floor Prayer Area Receiver: First Floor Window of Receiver 2	Frequency, Hz								dB(A)
	63	125	250	500	1k	2k	4k	8k	
L_{Aeq} of worst case activity within the prayer area (approximately 200 worshippers), sound pressure level at 1m	69	62	68	72	72	67	60	54	75
Approximate area S of the facade looking onto the closest residence (sq.m)	23	23	23	23	23	23	23	23	
Correction for area 10log(S)	14	14	14	14	14	14	14	14	
Sound reduction of partially open window	-15	-15	-15	-15	-15	-15	-15	-15	
Distance r to closest residence (m)	15	15	15	15	15	15	15	15	
Directivity factor Q for wall transmission	2	2	2	2	2	2	2	2	
Combined correction for directivity and distance (dB)	-32	-32	-32	-32	-32	-32	-32	-32	
Sound Pressure Level at Within Receiver Space	30	23	29	33	33	28	21	15	36