

# 108 Swain's Lane London



Noise Impact Assessment Report  
Report 25487.NIA.01

John Bott  
108 Swain's Lane  
London N6 6PH

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25487.TH1-2	Internal Noise Time Histories
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## **1.0 INTRODUCTION**

KP Acoustics Ltd has been commissioned by John Bott, 108 Swains Lane, London N6 6PH, to assess the suitability of the site at 108 Swain's Lane, London N6 6PH for a residential development in accordance with Permitted Development rights as outlined in Class MA (offices to dwelling/houses) of The Town and Country Planning (General Permitted Development) (England) Order 2021.

This report presents the results of internal noise surveys undertaken in order to measure the current internal noise climate for compliance with current guidance, and presents the results of the external environmental surveys undertaken in order to measure the prevailing background noise levels.

## **2.0 SITE SURVEYS**

### **2.1 Site Description**

The site is bounded by South Grove to the north, a religious building to the west, a private residential parking to the south, and Swain's Lane to the east. Entrance to the site is located to the east. At the time of the survey, the background noise climate was dominated by road noise from Swain's Lane.

### **2.2 Internal Noise Survey Procedure**

Noise surveys were undertaken within internal areas of the building in order to assess worst-case levels with the current external building fabric configuration.

Continuous automated monitoring was undertaken for the duration of the survey between 11:50 on 27/01/2023 and 13:30 on 30/01/2023.

Microphones installed internally were positioned within the diffuse field of the room, ensuring the microphone was at least 1.5m from any reflective surface. Noise measurement positions are detailed in Table 2.1 and shown in Figure 2.1.

### **2.3 Environmental Noise Survey Procedure**





External noise surveys were 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 11:50 on 27/01/2023 and 13:30 on 30/01/2023. Additional attended measurements were also undertaken externally to record the road traffic noise on the east façade of the development.

Weather conditions were generally dry with light winds and therefore suitable for the measurement of environmental noise. The measurement procedure complied with ISO 1996-2:2007 Acoustics ‘Description, measurement and assessment of environmental noise - Part 2: Determination of environmental noise levels’.

**2.4 Measurement Positions**

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

Icon	Descriptor	Location Description
	Internal Unattended Noise Measurement Position 1	Located on the ground floor of the building within a room on the west façade overlooking the rear garden space. The microphone was installed on a tripod at a distance of 1.5m from the window on the external façade and positioned at 1.5m above ground floor
	Internal Unattended Noise Measurement Position 2	Located on the ground floor of the building within a room on the east façade overlooking Swain’s Lane. The microphone was installed on a tripod at a distance of 1.5m from the window on the external façade and positioned at 1.5m above ground floor
	External Unattended Noise Measurement Position 3	The microphone was positioned within free-field conditions at approximately 1.5 metres from the nearest surface.
	External Attended Noise Measurement Position 4	The microphone was positioned within free-field conditions at approximately 1.5 metres from the nearest surface for the duration of the attended noise survey.

**Table 2.1 Measurement positions and descriptions**



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

**2.5 Equipment**

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

Measurement instrumentation		Serial no.	Date	Cert no.
Noise Kit 3	Svantek Type 977 Class 1 Sound Level Meter	34104	23/03/2022	1502092-1
	Free-field microphone ACO 7052E	66830		
	Preamp Svantek SV12L	17293		
	Svantek External windshield	-	-	-
Noise Kit 21	NTI Audio XL2 Class 1 Sound Level Meter	A2A-21099-E0	21/07/2022	UK-22-064
	Free-field microphone NTI Acoustics MC230A	A23571		
	Preamp NTI Acoustics MA220	10996		
	NTI Audio External Weatherproof Shroud	-	-	-

Measurement instrumentation		Serial no.	Date	Cert no.
Noise Kit 22	NTI Audio XL2 Class 1 Sound Level Meter	A2A-21138-E0	21/07/2022	UK-22-068
	Free-field microphone NTI Acoustics MC230A	A21849		
	Preamp NTI Acoustics MA220	11031		
	NTI Audio External Weatherproof Shroud	-	-	-
SLM4	Precision integrating sound level meter & analyser NTi Audio, XL2-TA	A2A-09207-E0	26/10/2021	UCRT21/23 24, UCRT21/23 33 & UCRT21/23 28
B&K Type 4231 Class 1 Calibrator		2147411	24/05/2022	UCRT22/15 81

**Table 2.2 Measurement instrumentation**

### 3.0 RESULTS

#### 3.1 Internal Noise Surveys

The  $L_{Aeq:5min}$  and  $L_{Amax:5min}$  acoustic parameters were measured throughout the duration of the internal noise surveys. Measured levels are shown as time histories in Figures 25487.TH1-2 for internal monitoring positions 1 and 2 respectively.

Measured noise levels are representative of noise exposure levels expected to be experienced in all spaces on the east and west façades of the development, and are shown in Table 3.1.

Time Period	Internal Noise Measurement Position 1 (Measured Noise level – dBA)	Internal Noise Measurement Position 2 (Measured Noise level – dBA)
Daytime $L_{Aeq,16hour}$	33	33
Night-time $L_{Aeq,8hour}$	25	24

**Table 3.1 Current internal average noise levels for daytime and night time**

#### 3.2 External Noise Surveys

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 time histories in Figures 25487.TH3.



Measured noise levels are representative of noise exposure levels expected to be experienced by the east and west façades of the proposed development, and are shown in Table 3.2.

Time Period	External Noise Measurement Position 3 (Derived Noise level – dBA)
Daytime $L_{Aeq,16hour}$	47
Night-time $L_{Aeq,8hour}$	46

**Table 3.2 Site average noise levels for daytime and night time**

Further manual measurements have been undertaken to derive the expected noise levels for the east facades of the proposed development. The results of these measurements are as follows:

Manned Measurement Location	Measurement Period	Manned Noise Level Measurement (dBA)	
		$L_{Aeq,T}$	$L_{A90}$
External Attended Noise Measurement Position 4	13:05-13:35	62	48

**Table 3.2 Manned noise measurements**

#### 4.0 NOISE ASSESSMENT GUIDANCE

##### 4.1 Permitted Development Rights

It is understood that the office development would be converted into residential units under the Permitted Development Rights. Therefore, this assessment would be targeted to demonstrate the noise requirement as per Citation “*Amendments in relation to change of use of offices to dwelling houses*” of The Town and Country Planning (General Permitted Development) (England) (Amendment) Order 2021:

“(2) Before beginning development under Class MA, the developer must apply to the local planning authority for a determination as to whether the prior approval of the authority will be required as to –

- (a) transport impacts of the development, particularly to ensure safe site access;
- (b) contamination risks in relation to the building;
- (c) flooding risks in relation to the building;
- (d) impacts of noise from commercial premises on the intended occupiers of the development;”



The measurements undertaken on site would not only encompass noise generated by any nearby commercial units, but it would also encompass the full spectrum of noise sources in the area affecting the premises.

In order to demonstrate if the current external building fabric of the site would be sufficient to protect the future residents, the measured internal noise levels would be assessed against the recommendations of the British Standard BS8233:2014 “*Sound insulation and noise reduction for buildings*”.

**4.2 BS8233:2014**

BS8233:2014 ‘*Sound insulation and noise reduction for buildings*’ describes recommended internal noise levels for residential spaces. These levels are shown in Table 4.1.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Rooms	35 dB(A)	-
Dining	Dining Room/area	40 dB(A)	-
Sleeping (daytime resting)	Bedrooms	35 dB(A)	30 dB(A)

**Table 4.1 BS8233 recommended internal background noise levels**

**5.0 DISCUSSION**

As shown in Table 3.1, internally measured noise levels would be generally commensurate with the design criteria of BS8233:2014.

If the surrounding area were to remain unchanged, the existing external building fabric would be sufficient in controlling noise break-in from commercial sources and would provide a suitable residential environment.

**6.0 CONCLUSION**

Internal noise surveys and environmental noise surveys have been undertaken at 108 Swains Lane, London N6 6PH allowing the assessment of daytime and night-time levels likely to be experienced by the proposed development.

Noise levels measured internally demonstrate that the existing external building fabric would be sufficient in providing a suitable residential environment, and existing noise levels meet the design criteria of BS8233:2014.

No further mitigation measures should be required in order to protect the proposed habitable spaces from external noise intrusion.

108 Swain's Lane, London - Position 1  
Environmental Time History  
27/01/2023 to 30/01/2023

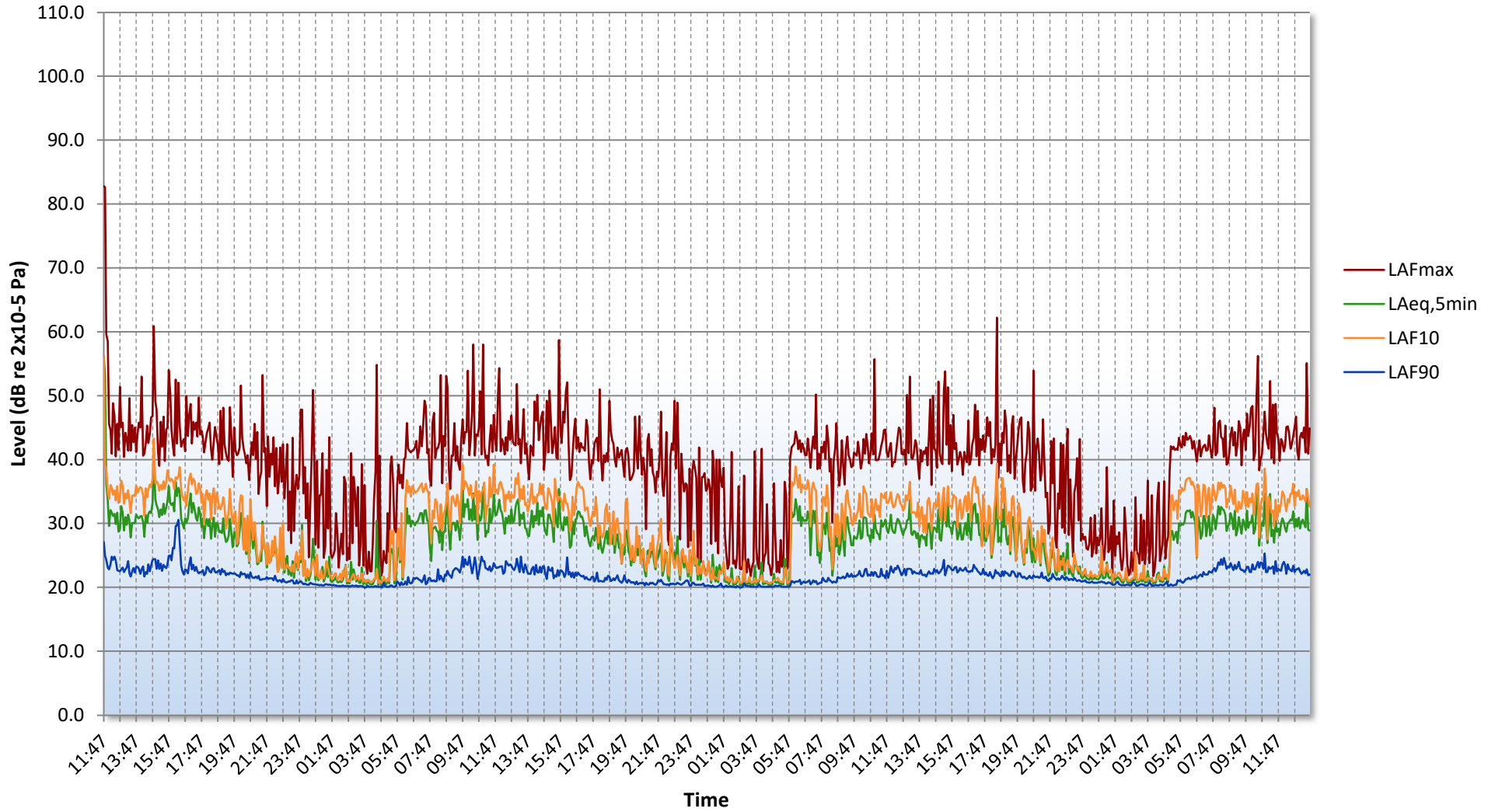


Figure 25487.TH1

108 Swain's Lane, London N6 6PH - Position 2  
Environmental Noise Time History  
From 27 January 2023 To 30 January 2023

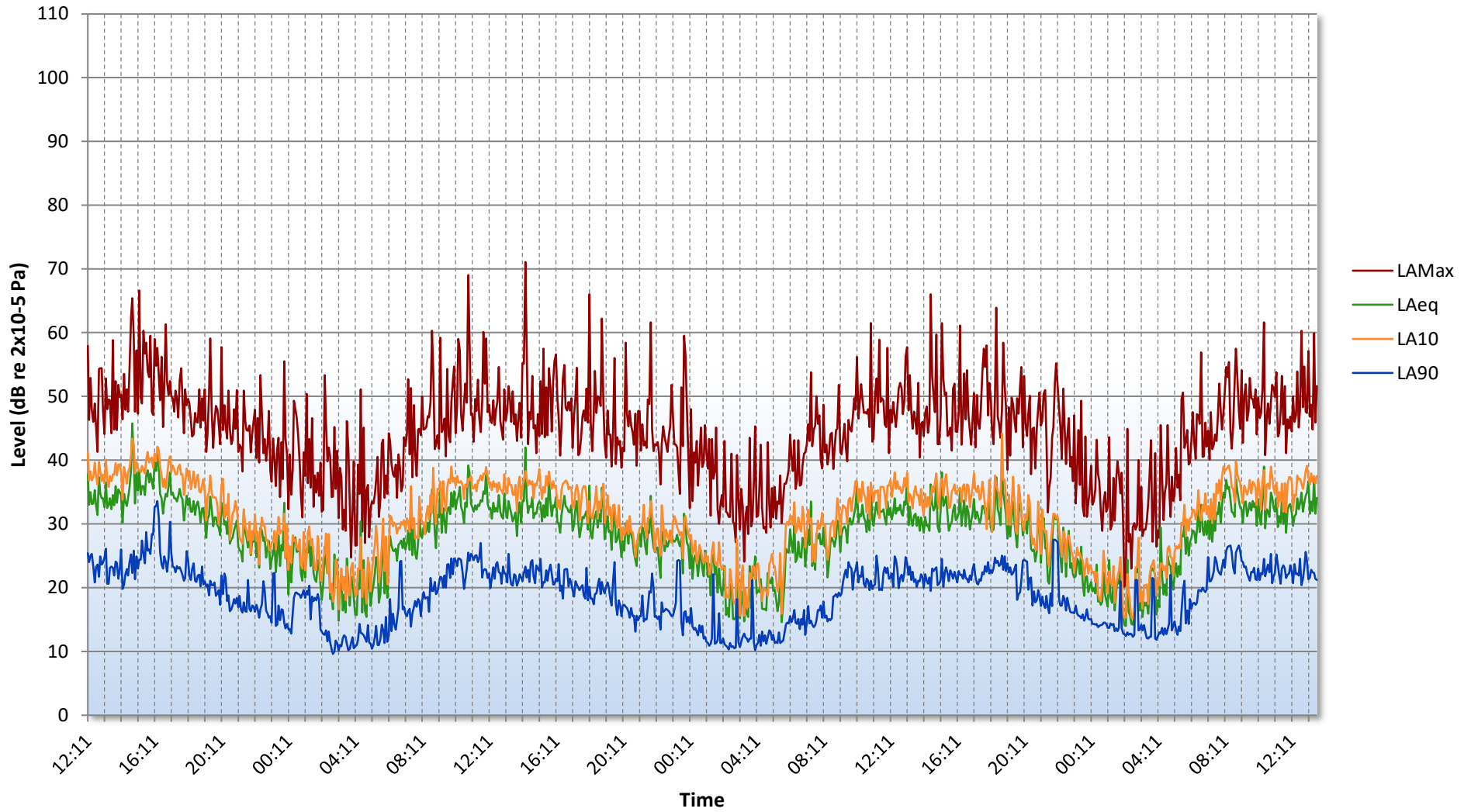


Figure 25487.TH2

108 Swain's Lane, London - Position 3  
Environmental Time History  
27/01/2023 to 30/01/2023

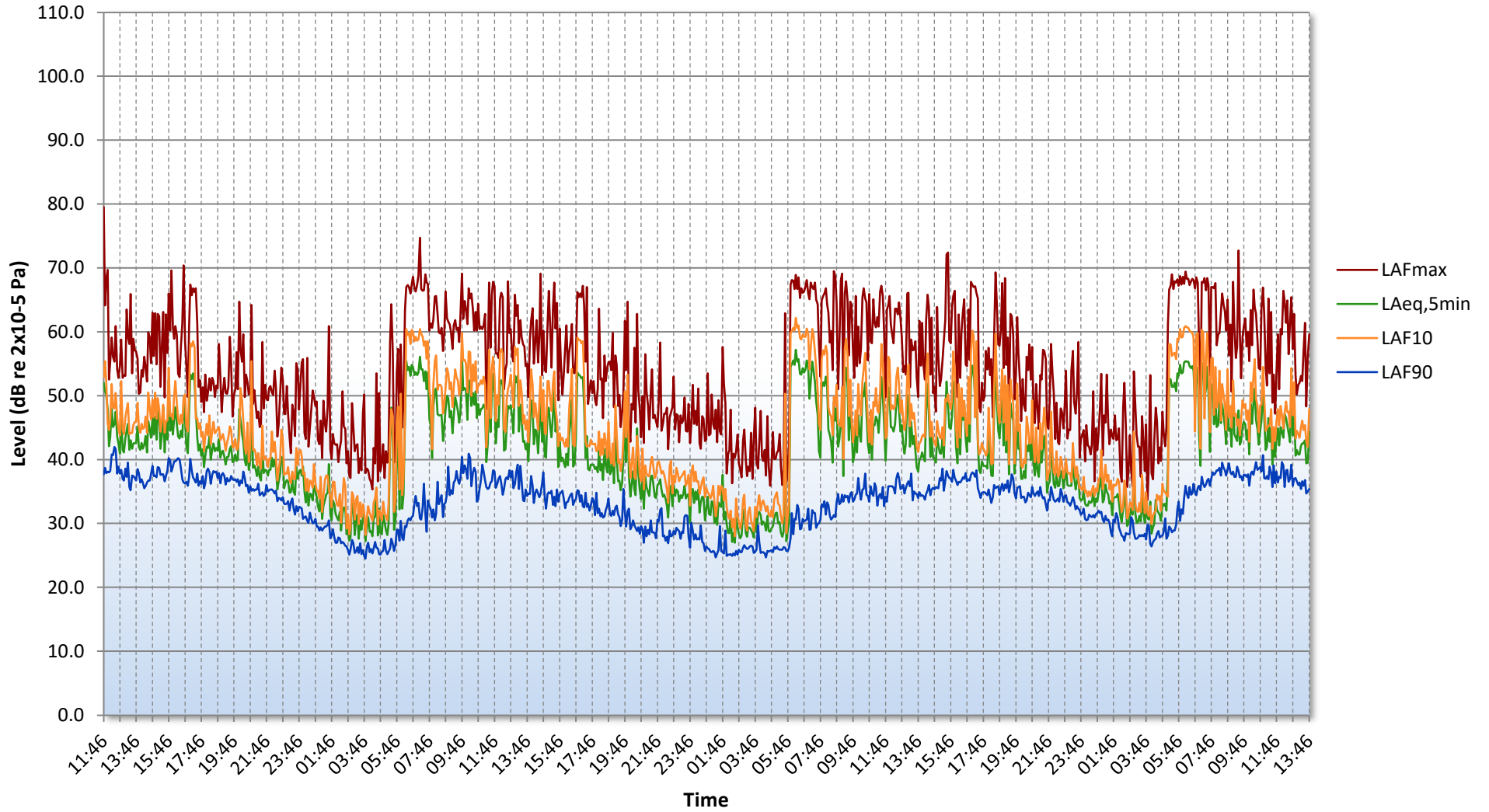


Figure 25487.TH3

## 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.