

102-104 Market Street Manchester



Noise Impact Assessment Report Report 29297.NIA.01

Vicknam Holdings Ltd C/O Alliance Managing Agents Ltd
6 Cochrane House
Admirals Way
Canary Wharf
London E14 9UD

Report 29297.NIA.01 Revision History			
First Issue Date: 25/10/2024			
A		D	
B		E	
C		F	
Written by:		Checked by:	
Jamie Murray MIOA Principal Acoustic Consultant		Oliver Packman MIOA Principal Acoustic Consultant	
Disclaimer KP Acoustics Ltd. has used reasonable skill and care to complete this technical document, within the terms of its brief and contract with the resources devoted to it by agreement with the client. We disclaim any responsibility to the client and others in respect of any matters outside the stated scope. This report is confidential to the client and we accept no responsibility to third parties to whom this report, or any part thereof, is made known. KP Acoustics Ltd. accepts no responsibility for data provided by other bodies and no legal liability arising from the use by other persons of data or opinions contained in this report. KP Acoustics Ltd. 2024			

Contents

1.0	INTRODUCTION.....	1
2.0	NOISE ASSESSMENT GUIDANCE.....	1
2.1	Permitted Development Rights.....	1
2.2	BS8233:2014	1
2.3	WHO Guidelines for Community Noise (1999)	2
3.0	SITE SURVEYS	2
3.1	Site Description.....	2
3.2	Environmental Noise Survey Procedure	2
3.3	Noise Climate	3
3.4	Measurement Positions	3
3.5	Equipment.....	4
4.0	RESULTS.....	4
5.0	DISCUSSION.....	5
6.0	EXTERNAL BUILDING FABRIC SPECIFICATION	5
6.1	Non-Glazed Elements.....	6
6.2	Glazed Elements.....	6
7.0	CONCLUSION.....	7

List of Attachments

29297.TH1-2	Environmental Noise Time Histories
Appendix A	Glossary of Acoustics Terminology

1.0 INTRODUCTION

KP Acoustics Ltd has been commissioned by Vicknam Holdings Ltd C/O Alliance Managing Agents Ltd, 6 Cochrane House, Admirals Way, Canary Wharf, London E14 9UD, to assess the suitability of the site at 102-104 Market Street, Manchester for a residential development in accordance with Permitted Development rights.

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

2.0 NOISE ASSESSMENT GUIDANCE

2.1 Permitted Development Rights

It is understood that the office development would be converted into residential units under 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;”

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”*.

2.2 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 2.1 BS8233 recommended internal background noise levels

2.3 WHO Guidelines for Community Noise (1999)

WHO Guidelines for Community Noise (1999) recommends that internal noise levels for individual events should not exceed 45dB L_{Amax} more than 10-15 times per night.

3.0 SITE SURVEYS

3.1 Site Description

The main application site comprises vacant former offices on the upper floors of an existing building and a retail unit at ground floor (currently occupied by EE).

The site is bounded by Fountain St (a heavily trafficked one way street) to the east, Market St (a heavily trafficked pedestrianised street) to the north and existing buildings to all other sides.

The buildings immediately adjacent are:

- a) 6-12 Fountain Street
 - i. Lower floors – vacant retail unit
 - ii. Upper floors – serviced apartments
- b) 90-100 Market Street
 - i. Lower floors – retail unit (MANGO clothing shop)
 - ii. Upper floors – non-noise generating ancillary commercial/retail space*

* Although there is a PureGym that occupies the upper floors of 90-100 Market Street, the gym occupies the area to the rear away from the front façade (the unit extends back approximately 45 m from the Market St façade). It is understood that there are no gym areas that adjoin directly to the proposed apartments and the area near the front façade that would adjoin any of the proposed apartments is used for non-noise generating activities (storage etc.).

3.2 Environmental Noise Survey Procedure

A noise survey was undertaken on the proposed site as shown in Figure 3.1. The locations were chosen in order to collect data representative of the worst-case levels expected on each façade due to all nearby sources.

Continuous automated monitoring was undertaken for the duration of the survey between 16:00 on 18/10/2024 and 14:00 on 22/10/2024.

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'.

3.3 Noise Climate

At the time of the survey, the noise climate at the Market Street elevation was dominated by noise from pedestrians along Market Street, while the noise climate along Fountain Street was dominated by vehicles using Fountain Street. Regular tram movements also contributed to noise levels at all facades.

No noise was audible from any commercial activities at any façade, with the noise climate dominated solely by transport / pedestrian noise. Further, no noise was audible internally within the building except for the aforementioned transport and pedestrian noise.

3.4 Measurement Positions

Measurement positions are as described within Table 3.1 and shown within Figure 3.1.

Icon	Descriptor	Location Description
①	Noise Measurement Position 1	The microphone was installed from a window on the 1 st floor overlooking Market Street, as shown in Figure 2.1. The microphone was located within 1.5 metres of the nearest surface and therefore includes local reflections.
②	Noise Measurement Position 2	The microphone was installed from a window on the 3 rd floor overlooking Fountain Street, as shown in Figure 2.1. The microphone was located within 1.5 metres of the nearest surface and therefore includes local reflections.

Table 3.1 Measurement positions and descriptions

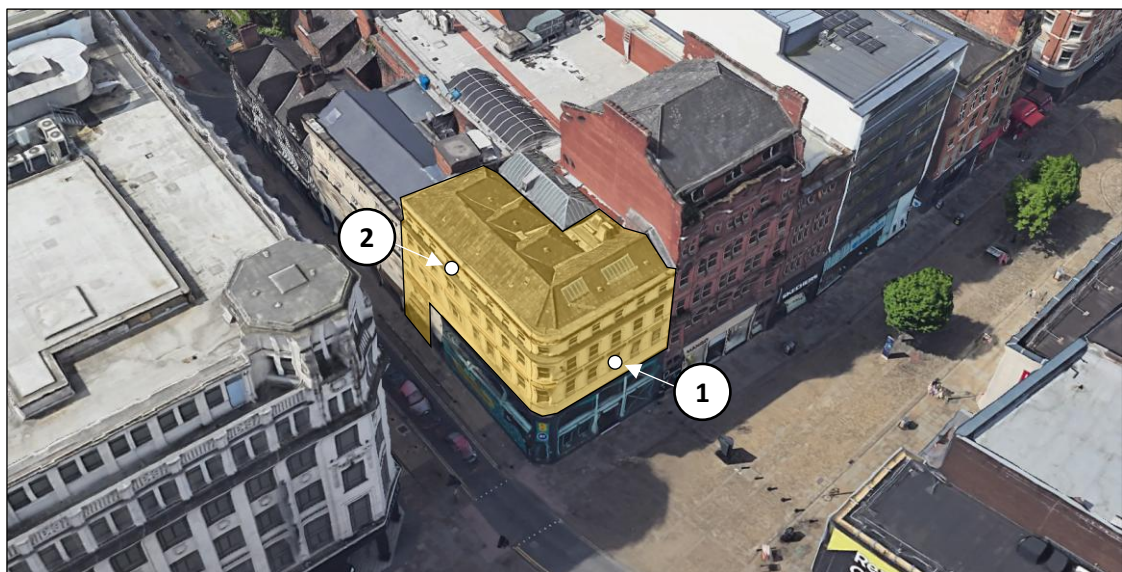


Figure 3.1 Site measurement positions (Image Source: Google Maps)

3.5 Equipment

The equipment calibration was verified before and after use and no abnormalities were observed. The equipment used is described within Table 3.2.

Measurement instrumentation		Serial no.	Date	Cert no.
Noise Kit 34	NTI Audio XL2 Class 1 Sound Level Meter	A2A-21069-E0	07/08/2024	TCRT24/1630
	Free-field microphone NTI Acoustics MC230A	A23544		
	Preamp NTI Acoustics MA220	11020		
	NTI Audio External Weatherproof Shroud	-	-	-
Noise Kit 35	NTI Audio XL2 Class 1 Sound Level Meter	A2A-21110-E0	07/08/2024	TCRT24/1627
	Free-field microphone NTI Acoustics MC230A	A23570		
	Preamp NTI Acoustics MA220	10995		
	NTI Audio External Weatherproof Shroud	-	-	-
Larson Davis CAL200 Class 1 Calibrator – KP North		8932	07/08/2024	UCRT24/2065

Table 3.2 Measurement instrumentation

4.0 RESULTS

The $L_{Aeq: 5min}$, $L_{Amax: 5min}$, $L_{A10: 5min}$ and $L_{A90: 5min}$ acoustic parameters were measured throughout the survey. Measured levels are shown as a time history in Figure 29297.TH1-3. Measured noise levels as used in all subsequent assessment are shown in Table 4.1.

Position	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)	
	$L_{Aeq,16hour}$	$L_{Aeq,8hour}$	10 th Highest $L_{Amax,5min}$
1	69 dB	62 dB	83 dB
2	67 dB	61 dB	84 dB

Table 4.1 Site average noise levels for daytime and night time

All measurements were located at a distance within 1.5 metres of the nearest reflective surface and therefore a -3 dB correction has been applied when presenting the results in Table 4.1 to obtain a free-field measurement as per ISO1996 Part 2.

5.0 DISCUSSION

The existing glazing is proposed to be retained and currently comprises traditional single glazing (assumed 4 mm min.).

During the survey, no evidence was found of significant noise generated by nearby commercial sources that would affect the site's conversion to residential use under Permitted Development Rights. The identified premises did not appear to contribute meaningfully to the overall noise environment, therefore no specific noise mitigation measures related to commercial activity are required or should be enforced under permitted development rights.

The noise climate is largely dominated by transport sources such as road traffic and tram movements, as well as noise from people along Market Street.

With regards to noise from adjacent commercial/retail units as outlined in Section 3.1, none of the uses are particularly noise generating and should be readily controlled by any wall/floor build-up that achieves the minimum requirements of the Building Regulations.

Outcome: No specific noise mitigation measures related to commercial activity are required or should be enforced under the requirements of Class MA under Permitted Development Rights.

Notwithstanding the above, should there be no improvements to the existing glazing, noise from nearby transport sources would be expected to exceed the limits recommended in BS8233:2014 for residential environments. While mitigation is not strictly required, we would recommend controlling the impact of road noise for future occupants by upgrading the existing glazing to provide appropriate sound insulation. An appropriate specification is outlined as an optional upgrade in Section 6.0, but would not be required, nor should it be enforced, under the requirements of Class MA under Permitted Development Rights.

6.0 EXTERNAL BUILDING FABRIC SPECIFICATION

Since commercial noise sources were not found to impact our assessment in Section 5.0, no glazing upgrades are required under permitted development rights. However, we would recommend controlling noise from environmental sources in line with the below.

Sound reduction performance calculations have been undertaken in order to specify the minimum performance required from glazed and non-glazed elements in order to achieve the recommended internal noise levels shown in Table 2.1, taking into account average and maximum noise levels monitored during the environmental noise survey.

L_{Amax} spectrum values of night-time peaks have been considered and incorporated into the glazing calculation in order to cater for the interior limit of 45 dB L_{Amax} for individual events, as recommended in WHO Guidelines.

Please note that the glazed and non-glazed element calculations would need to be finalised once all design proposals are finalised.

6.1 Non-Glazed Elements

It is currently understood that the non-glazed building façade is comprised of the elements as shown within Table 6.1 based on the construction detail provided. The anticipated sound reduction index has been calculated and would be expected to provide the minimum figures shown in the following table when tested in accordance with the BS EN ISO 10140 series of standards.

Element	Sound Reduction Performance (dB R) at Octave Band Centre Frequency (Hz)					
	125	250	500	1k	2k	4k
Masonry Cavity Wall	41	43	48	50	55	55

Table 6.1 Assumed sound reduction performance for non-glazed elements

6.2 Glazed Elements

Minimum octave band sound reduction index (SRI) values required for all glazed elements to be installed are shown in Table 6.2. The performance is specified for the whole window unit, including the frame, seals, etc. as appropriate. Sole glass performance data would not demonstrate compliance with this specification.

Glazing performance calculations have been based both on average and maximum measured night-time noise levels. The combined most robust results of these calculations are shown in Table 6.2.

Elevation	Sound Reduction (R dB) at Octave Band Centre Frequency (Hz)						Overall ($R_w + C_{tr}$, dB)
	125	250	500	1k	2k	4k	
Market Street	27	29	35	45	55	55	40
Fountain Street	24	26	34	44	55	55	38

Table 6.2 Required glazing performance

As changes to the external building fabric cannot be made under permitted development rights, the existing windows would need to be upgraded internally to meet the recommended internal noise levels stipulated in BS8233:2014 and meet the minimum octave band sound

reduction values outlined in Table 6.2. We would therefore recommend that a secondary glazing system is installed.

It should be noted that if the windows are replaced at a later stage under a full planning application, the minimum octave band sound reduction values outlined in Table 6.2 should be met for all new window systems.

The nominated glazing supplier should verify that their proposed window system meets the attenuation figures shown at each centre frequency band as shown in Table 6.2.

Example glazing types that would be expected achieve the above spectral values are shown in Table 6.3.

Elevation	Example glazing type
Market Street	4 mm primary pane / 150 mm airgap / 6 mm secondary pane
Fountain Street	4 mm primary pane / 100 mm airgap / 6 mm secondary pane

Table 6.3 Example glazing types

All major building elements should be tested in accordance with the BS EN ISO 10140 series of standards.

Independent testing at a UKAS accredited laboratory will be required in order to confirm the performance of the chosen system for an 'actual' configuration.

7.0 CONCLUSION

An environmental noise survey has been undertaken at 102-104 Market Street, Manchester, allowing the assessment of daytime and night-time levels likely to be experienced by the proposed development.

Measured noise levels allowed a robust glazing specification to be proposed which would provide internal noise levels for all residential environments of the development commensurate to the design range of BS8233:2014.

While mitigation measures have been recommended to protect the proposed habitable spaces from external noise intrusion, it is important to note that these measures are not strictly required under permitted development (PD) rights. However, implementing the suggested upgrades would improve the overall living environment and ensure compliance with the recommended internal noise levels for residential use.

The noise assessment has demonstrated that there should be no unacceptable impacts from noise generated by nearby commercial uses on the intended occupiers of the residential development, satisfying the requirements of Class MA under Permitted Development Rights.

102-104 Market Street, Manchester - Position 1
Environmental Time History
18/10/2024 to 22/10/2024

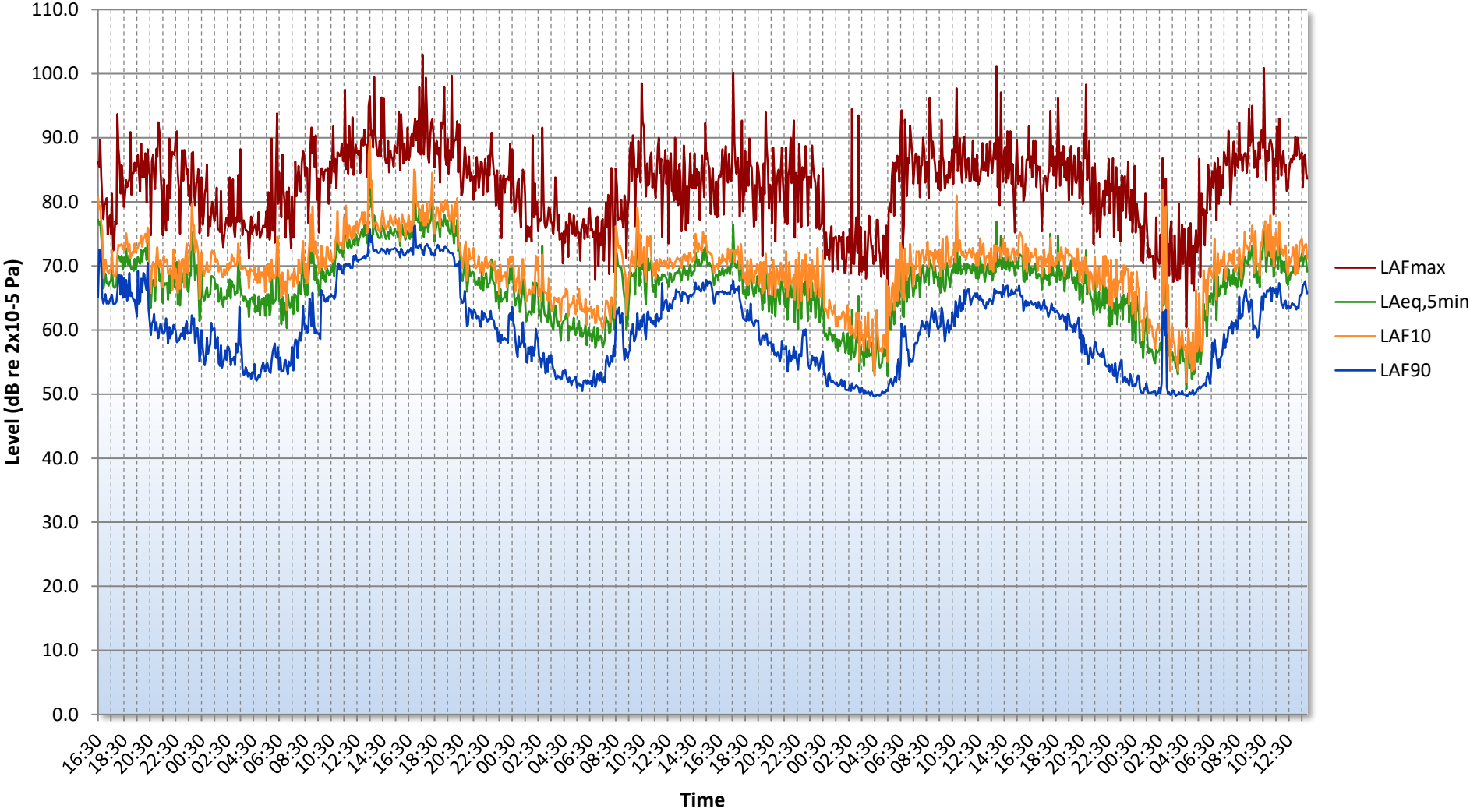


Figure 29297.TH1

102-104 Market Street, Manchester - Position 2
Environmental Time History
18/10/2024 to 22/10/2024

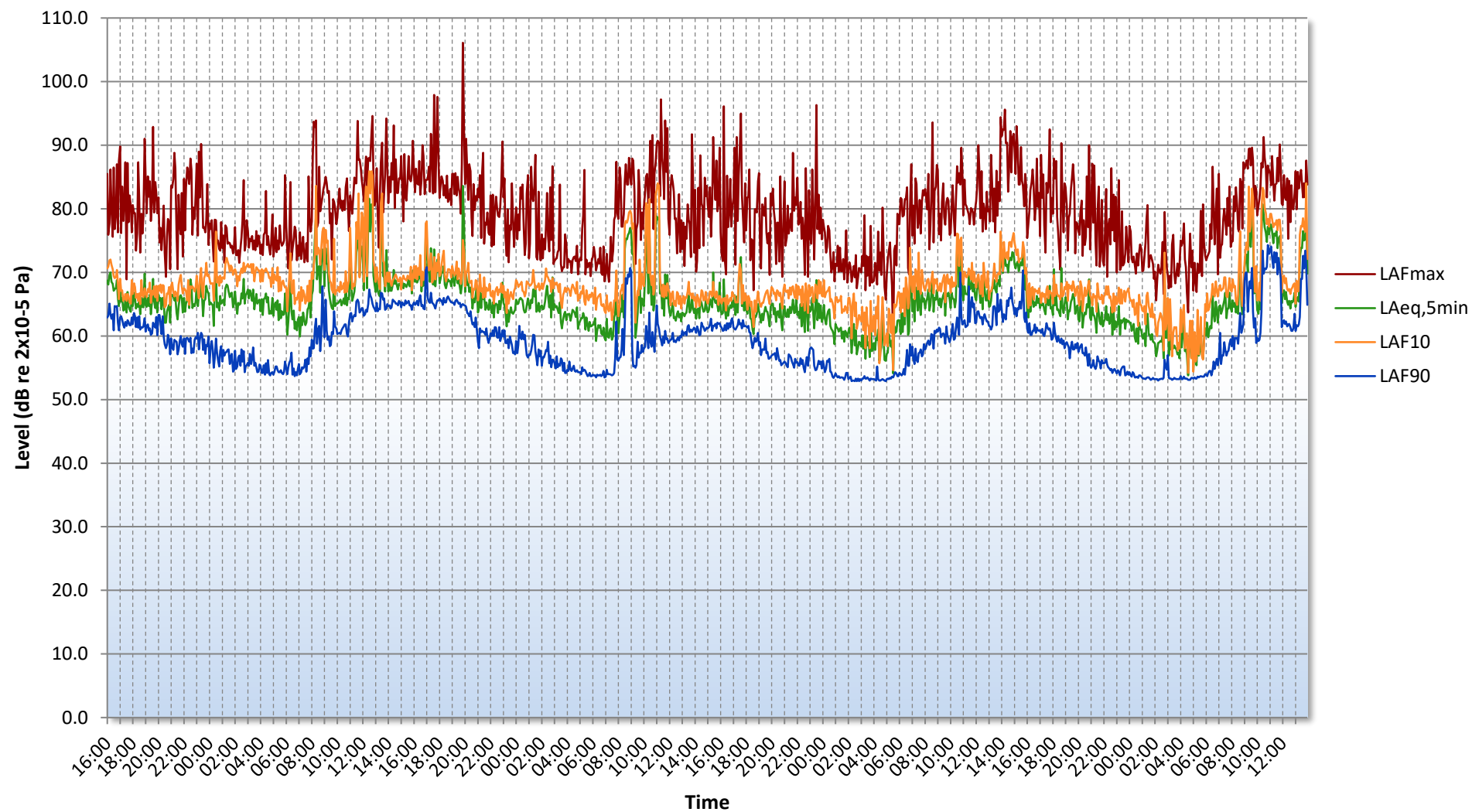


Figure 29297.TH2

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.