KP Acoustics Ltd.
info@kpacoustics.com
1 Galena Road, W6 0LT London, UK
+44 (0) 208 222 8778
www.kpacoustics.com

The Cock Tavern, Phoenix Road London

Noise Impact Assessment Report
Report 11674.NIA.02

Flamestrike Limited
1st Floor, 9 Hampstead West
224 Iverson Road
London NW6 2HL

Registered in England Company No. 7947892
KP Acoustics is the Trading Name of KP Acoustics Limited

Report 11674.NIA.02 Revision History			
First Issue Date: 09/03/2021			
A		D	
B		E	
C		F	

Written by:	Checked by:	Approved by:
Adam Slaymark AMIOA Graduate Acoustic Consultant	**Daniel Green MIOA** Senior Acoustic Consultant	**Kyriakos Papanagiotou MIOA** Managing Director

Contents

List of Attachments

1.0 INTRODUCTION

KP Acoustics Ltd has been commissioned by Flamestrike Limited, 1st Floor, 9 Hampstead West, 224 Iverson Road, London, NW6 2HL, to assess the suitability of the upper floors of the site at The Cock Tavern, Phoenix Road, London, NW1 1HB for a residential development in accordance with the provisions of the National Planning Policy Framework and the Noise Policy Statement for England (NPSE).

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 SITE SURVEYS

2.1 Site Description

The site is bounded by existing residential properties to the North, South East And West, with Phoenix Road and Chalton street to the South and West.

At the time of the survey, the background noise climate was dominated by road traffic noise.

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 11:24 on 02/12/2020 and 11:24 on 03/12/2020.

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	The microphone was installed at the front of the property on the balcony wall. A correction of 3dB has been applied to account for non-free field conditions

Table 2.1 Measurement positions and description

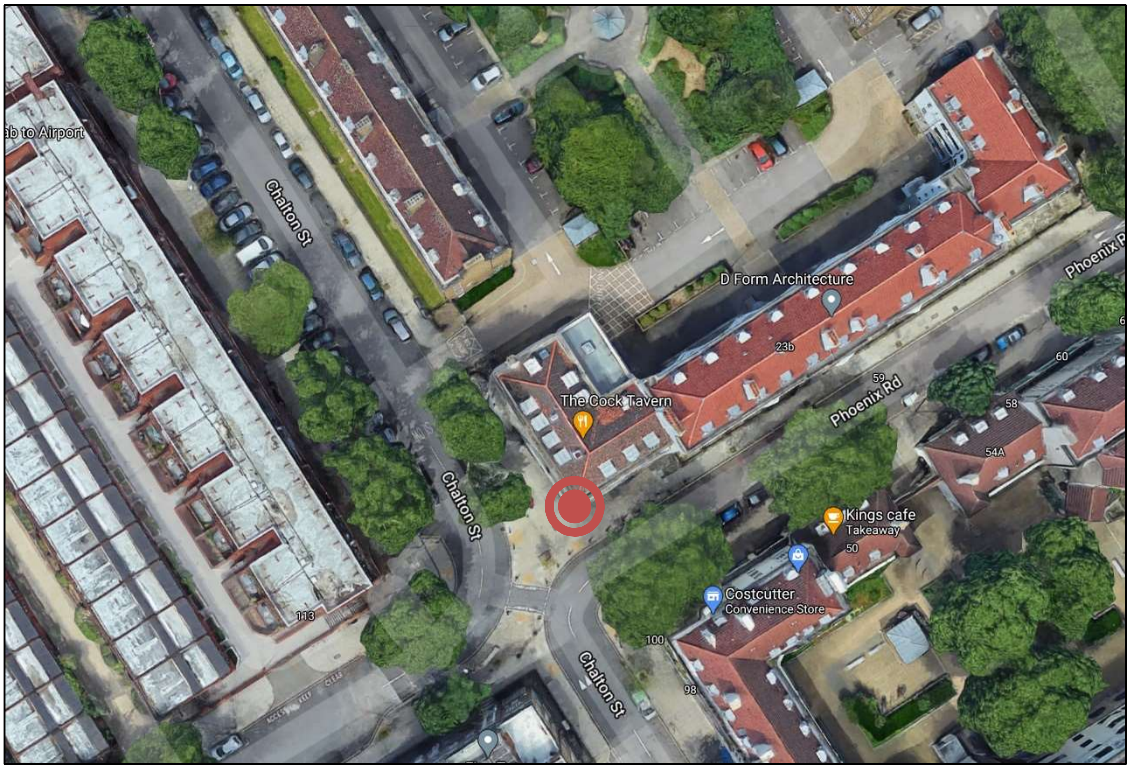


Figure 2.1 Site measurement positions (Image Source: Google Maps)

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.

Measurement instrumentation		Serial no.	Date	Cert no.
Noise & Vibration Kit 1	Svantek Type 958A Class 1 Sound Level Meter	45579	03/09/2020	14012949-02
	Free-field microphone MTG MK255	11697		
	Preamp Svantek 2v12L	41535		
	Svantek External windshield	-	-	-

Table 2.2 Measurement instrumentation

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 11674.TH1.

Measured noise levels are representative of noise exposure levels expected to be experienced by all facades of the proposed development, and are shown in Table 3.1.

Time Period	Average Ambient Noise Level $L_{Aeq,T}$ Position 1	Representative Background Noise Level $L_{A90, T}$ Position 1
Daytime $L_{Aeq,16hour}$	54	46
Night-time $L_{Aeq,8hour}$	49	38

Table 3.1 Site average noise levels for daytime and night time

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.

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

The external building fabric would need to be carefully designed to achieve these recommended internal levels.

4.3 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.

It should be noted that this impact is increasingly being regarded as 'LOAEL' for this number of exceedances, as described in Section 4.1.

The external building fabric would need to be carefully designed to ensure that the above guidance is achieved.

5.0 EXTERNAL BUILDING FABRIC SPECIFICATION

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 4.1, taking into account average and maximum noise levels monitored during the environmental noise survey.

As a more robust assessment, L_{Amax} spectrum values of night-time peaks have also 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.

It is understood that due to the listed status of the building, some of the current glazed window units will be retained. In order to assess whether the current windows units are compliant with the above requirements, an assessment of the current sound reduction indices of the window units was undertaken. Manual measurements were undertaken internally and assessed against the external noise survey results in order to calculate this performance.

The current performance of the existing window units is shown in Table 5.1 below:

Existing Glazed Window Units	Octave band centre frequency SRI, dB					
	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
Front Elevation	19	20	25	27	22	16

Table 5.1 Existing glazing performance

Based on the measured performance of the existing window units, additional upgrade measures would be necessary in order to achieve the recommended levels as stipulated in the BS8233:2014.

A full glazing proposal is included in Section 5.1 below.

5.1 Non-Glazed Elements

It is currently understood that the non-glazed building façade is comprised of the elements as shown within Table 5.2 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 Table 5.2 when tested in accordance with BS EN ISO, 140-3:1995.

Element	Octave band centre frequency SRI, dB					
	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
20mm external render 330 Brickwork 15mm internal plaster	41	43	48	50	55	55

Table 5.2 Assumed sound reduction performance for non-glazed elements

5.2 Glazed Elements

Minimum octave band sound reduction index (SRI) values required for all glazed elements to be installed are shown in Table 5.3.The performance is specified for the whole window unit, including the frame and other design features such as the inclusion of trickle vents. Sole glass performance data would not demonstrate compliance with this specification.

Glazing performance calculations have been based both on average measured night-time noise levels as well as verified against the L_{Amax} spectrum of individual events in order to comply with a maximum internal noise level of 45dB(A) in bedrooms as recommended by World Health Organisation Guidelines. The combined most robust results of these calculations are shown in Table 5.3.

Elevation	Octave band centre frequency SRI, dB						R_w (C;C_{tr}), dB
	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	
All Elevations	22	24	30	34	31	22	31

Table 5.3 Required glazing performance

It is understood that part of the existing windows cannot be replaced due to the listed nature of the building. We would therefore recommend the installation of a secondary glazing system (5mm-7mm) at a minimum distance of 100mm from the existing primary window panes, incorporating padded absorptive reveals. In addition, we would recommend the upgrade of any sash windows with a Ventrola system, or similar.

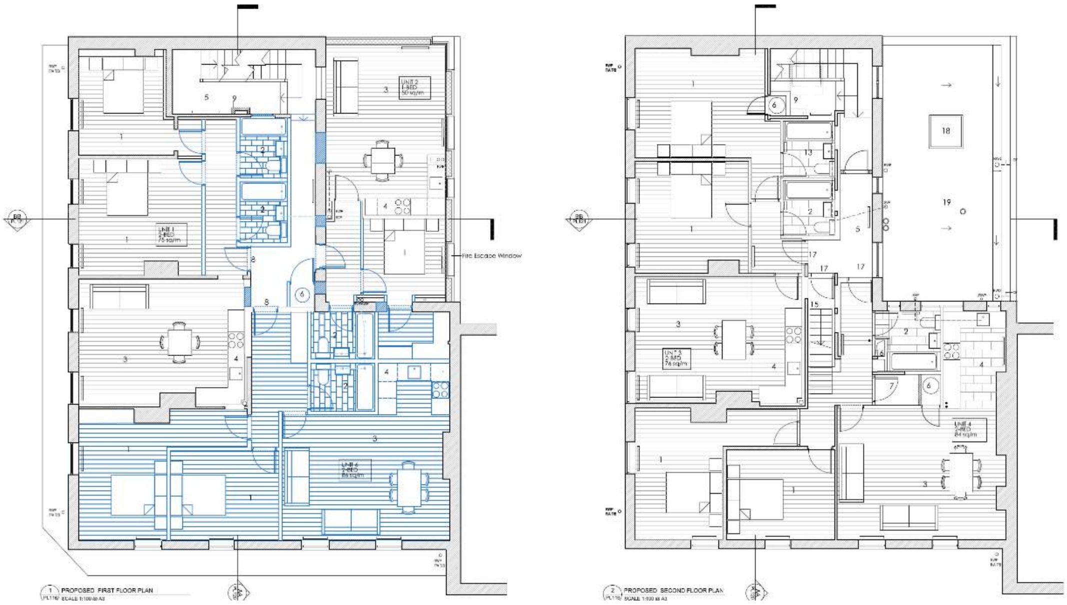
All major building elements should be tested in accordance with BS EN ISO 140-3:1995.

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

6.0 INTERNAL BUILDING FABRIC SPECIFICATION

It is understood that current proposals involve converting the majority of the First and Second Floor to residential units, with a proportion of the First Floor being a Function Room.

The proposed layout of the First and Second Floor is shown in Figure 7.1 below.



Due to the proposed location of noise sensitive spaces adjacent to the Ground Floor Pub, consideration and careful acoustic design would need to be applied.

6.1 Floor Upgrade - Ground Floor Pub & First Floor Flats

It is understood that the proposed floor construction between the Ground Floor Pub and the First Floor Flat is as follows:

- Engineering timber floor (Thickness unknown)
- 20mm Versapanel board fixed to the 50mm timber battens with 25mm mineral wool insulation installed within the void (nominal density)
- Existing wood block flooring (Thickness unknown)
- Existing 130 mm Concrete Slab
- Existing plasterboard finish

The above floor system would be expected to achieve airborne sound insulation performance values of approximately 43-45dB $D_{nT,w}$ + C_{tr}, therefore satisfying Building Regulations requirements.

6.2 General Advice

For airborne sound insulation, special attention should be given to workmanship regarding the proper sealing of junctions and penetration details. Where any gaps between external (flanking) walls and floors exist, they should be caulked with sealant or similar type material. It should be also noted that flanking strips (Yelofon ES5/100) should be installed around the perimeter of the floor to isolate the floor from walls and skirtings. The strip should be turned up so that the skirting boards rest on them and any excess cut away.

Ideally, a gap between the head of the wall and the underside of the soffit should not be greater than 10mm. A polyethylene backing rod could be inserted in the gap with tightly packed mineral wool while silicone caulk is used to seal the joint.

In the case of any new walls, isolation strips would need to be used, which would isolate the wall leaves from the sub-floor, therefore minimising any flanking paths. Please note that a material such as Monarfloor or Regupol Isolation Strip can be used to isolate any new walls built on any steel structure.

Chimney breasts which bridge two or more separate dwellings should be bricked up in order to stop any flanking of noise via the cavity. The section directly adjacent to the separating floor should be completely filled and any gaps sealed with non-setting mastic of packed with mineral wool. Should the use of bricks not be desired, we would recommend the pattressing of the fireplace by two layers of 15mm SoundBloc with proper sealing of the junctions with non-setting mastic. The installation of a blockage at right angles to the direction of the chimney shaft would also be recommended. We would suggest the installation of a layer of SuperLag Quietslab. This is a sandwich system which is comprised of two 50mm layers of compressed high-density mineral wool slabs (60kg/m^3) separated by a 10kg/m^2 heavy PVC film.

7.0 CONCLUSION

An environmental noise survey has been undertaken at The Cock Tavern, Phoenix Road, London, NW1 1HB, 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.

A floor specification has been reviewed and it will be expected to achieve airborne sound insulation performance that would satisfy Building Regulations requirements.

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

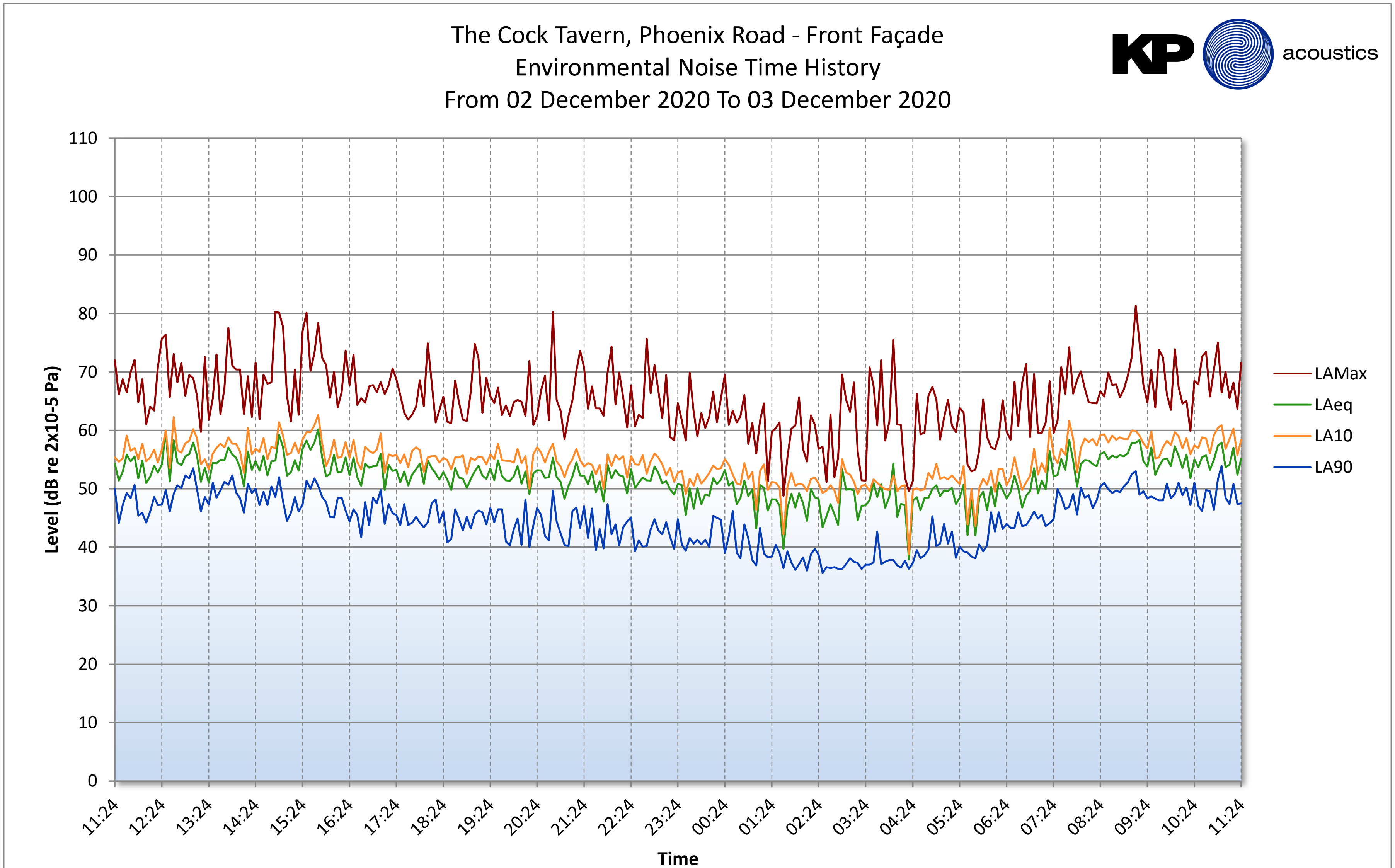


Figure 11674.TH1

Appendix A

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*.

APPENDIX A

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.