Part of the KP Acoustics Group

9 Sharps Lane, Ruislip, HA4 7JG London

Noise Impact Assessment Report
Report 30610.NIA.01

Paul McGlynn

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1.0 INTRODUCTION

KP Acoustics Ltd has been commissioned to assess the suitability of the redevelopment of the site at 9 Sharps Lane, Ruislip, HA4 7JG in accordance with the provisions of the National Planning Policy Framework (NPPF) and the Noise Policy Statement for England (NPSE).

The site currently comprises a HMO with a large garden to the rear. The HMO will be retained and an extension is proposed where the existing garden is located to create a care home.

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 Sharps Lane to the north, 11 Sharps Lane to the west, a Dental Practice to the south, and a pub car park to the east. Entrance to the site is located north of site. At the time of the survey, the background noise climate was dominated by road traffic noise from Sharps Lane.

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 11:00 on 20/08/2025 and 12:30 on 21/08/2025.

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
1	Noise Measurement Position 1	The microphone was attached onto an extendable pole which was mounted onto a drainpipe on the 1st floor of the east façade, as shown in Figure 2.2. The microphone was located approximately 1m from the nearest surface and therefore includes local reflections.

Icon	Descriptor	Location Description
2	Noise Measurement Position 2	The microphone was attached to the gate to the south of site approximately 2m above ground, as shown in Figure 2.2. The microphone was located approximately 1m from the surface and therefore includes local reflections.
A	Attended Noise Measurement Position A	The microphone was installed onto a tripod in the front garden, 1.5m above ground and more than 3.5 metres from the nearest surface in free-field conditions.

Table 2.1 Measurement positions and descriptions

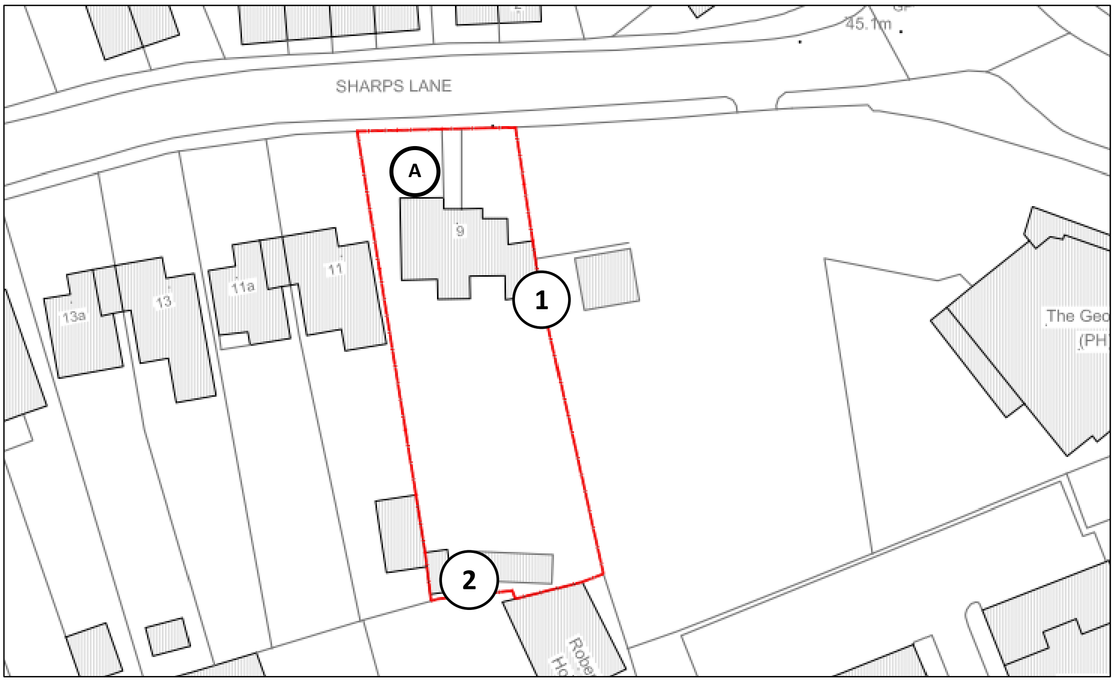

Figure 2.1 Site measurement positions (Image Source: Juttla Architects)

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.	Calibration Date	Cert no.
Noise Kit 3	Svantek Type 977 Class 1 Sound Level Meter	34104	18/03/2024	1507821-1
	Free-field microphone ACO 7052E	66830		
	Preamp Svantek SV12L	17293		
	Svantek External windshield	-	-	-
Noise Kit 41	NTI Audio XL2 Class 1 Sound Level Meter	A2A-24074-E1	15/08/2024	TCRT24/ 1644
	Free-field microphone NTI Acoustics MC230A	A27960		
	Preamp NTI Acoustics MA220	14367		
	NTI Audio External Weatherproof Shroud	-	-	-
Larson Davis CAL200 Class 1 Calibrator		17148	17/12/2024	UCRT24/26 77

Table 2.2 Measurement instrumentation

3.0 RESULTS

The $L_{Aeq,5min}$, $L_{Amax,5min}$ and $L_{A90,5min}$ acoustic parameters were measured throughout the duration of the survey. Measured levels are shown as time histories in Figure 30610.TH1-2.

The measured noise levels, as shown in Table 3.1, are considered representative of the noise exposure levels expected to be experienced at the east, west and south elevations.

Time Period	Noise Measurement Position 1 (Measured Noise level – dBA)	Noise Measurement Position 2 (Measured Noise level – dBA)
Daytime $L_{Aeq,16hour}$	46	44
Night-time $L_{Aeq,8hour}$	41	39

Table 3.1 Site average noise levels for daytime and night time

Both measurement positions were located at a distance approximately 1m from the nearest reflective surface and therefore a 3dB correction has been applied, as per ISO1996 Part 2, to obtain the free-field measurements shown in Table 3.1.

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

Attended Measurement Location	Measurement Period	$L_{eq,15\ minutes}$, dBA
A	12:50-13:05	51

Table 3.2 Attended noise measurements

4.0 NOISE ASSESSMENT GUIDANCE

4.1 National Planning Policy Framework 2024 & Noise Policy Statement for England 2010

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 187 of NPPF 2024 states that planning policies and decisions should contribute to the natural and local environment by:

> "*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 198 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 BS 8233:2014

BS 8233:2014 *'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.

In addition to guidance on internal levels, BS8233:2014 also states the following with regards to noise within external amenity spaces:

'For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$, which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.'

As outlined above, the resulting noise levels in external amenity areas should not be a reason for refusal, providing that the noise levels are designed to be as low as practically possible within external amenity areas.

Expected levels within the proposed external amenity areas are outlined in Section 7.0 in more detail.

4.3 WHO Guidelines for Community Noise (1999) & Night Noise Guidelines for Europe (2009)

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

WHO Night Noise Guidelines for Europe (2009) presents guidelines for noise levels outside dwellings and discusses the relationship between these and the criteria for internal noise presented in Guidelines for Community Noise. The document states that the two should be considered complimentary and that the 1999 guidelines should be considered valid to achieve the 2009 guidelines.

4.4 Approved Document O (ed. 2021) (APPLICABLE?)

Approved Document O (ADO) supports Part O of Schedule 1 to the Building Regulations 2010. ADO introduces requirements for residential premises in order to prevent overheating from occurring. There are two specific requirements from ADO:

<u>Requirement O1 (1):</u>

To limit unwanted solar gains in summer and to provide adequate means to remove heat from the indoor environment.

Requirement O1 (2):

(a) Account must be taken of the safety of the occupant, and their reasonable enjoyment of the residence.

(b) Mechanical cooling may only be used where sufficient heat cannot be removed from the indoor environment without it.

The statutory guidance to support Requirement O1(2)(a) contains requirements relating to noise at night.

4.4.1 Application

The guidance within ADO applies to new residential buildings only and are defined within the following table:

Title	Purpose for which the building is intended to be used.
Residential (dwellings)	Dwellings, which includes both dwellinghouses and flats.
Residential (institutions)	Home, school or other similar establishment, where people sleep on the premises. The building may be living accommodation for the care or maintenance of any of the following. A. Older and disabled people, due to illness or other physical or mental condition. B. People under the age of 5 years.
Residential (other)	Residential college, hall of residence and other student accommodation, and living accommodation for children ages 5 years or older.

Table 4.2 Residential buildings within the scope of ADO (ref. Table 0.1 of Approved Document O)

Paragraphs 3.2 and 3.3 of ADO specifically refer to noise within bedrooms at night. Whilst any habitable room could be used as a bedroom, it is proposed that the scope is confined to those rooms specifically designated as bedrooms.

4.4.2 Internal Noise Level Targets

ADO sets internal noise level targets within Paragraph 3.3 of the document:

"Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

a. 40dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am)

b. 55dB L_{AFmax}, more than 10 times a night (between 11pm and 7am)."

Where an openable window for the removal of excess heat is predicted to result in the above internal noise levels to be exceeded, then the overheating mitigation strategy must adopt one of the alternative means listed within Paragraph 2.10 of ADO (presented within Section 4.7.3 of this report). This constraint applies regardless of which method is used to demonstrate compliance with Requirement O1 (1).

4.4.3 Methods to Remove Excess Heat

Paragraph 2.10 of ADO lists the means for removing excess heat from dwellings according to the following:

- Openable windows
- Ventilation louvres in external walls
- A mechanical ventilation system
- A mechanical cooling system

Where mitigation of impacts related to overheating is required, this must be led by an overheating specialist.

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.

Bedroom 10 has been identified as the room with the largest glazing/room size ratio and therefore represents a worst-case scenario. It has been assumed that the windows span from floor to ceiling.

5.1 Non-Glazed Elements

It is understood that the general performance of the non-glazed external building fabric would be based upon the construction proposed in Table 5.1 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 Index , dB, at Octave Band Centre Frequency, Hz					
	125	250	500	1k	2k	4k
Blockwork Cavity Wall	41	43	48	50	55	55

Table 5.1 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 5.2.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.

The minimum required sound reduction index values for glazed elements are shown in Table 5.2.

Elevation	Sound Reduction Index , dB, at Octave Band Centre Frequency, Hz						R_w (C;C_{tr}), dB
	125	250	500	1k	2k	4k	
All New Windows	24	20	25	35	38	35	31(-1;-4)

Table 5.2 Required glazing performance

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 5.2.

Example glazing types that would be expected achieve the above spectral values are shown in Table 5.3.

Elevation	Example Glazing Type
All New Windows	4/12/4

Table 5.3 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.

6.0 VENTILATION AND OVERHEATING RELIEF

6.1 Ventilation Strategy

Approved Document F 2021 describes the following system types for background and extract ventilation:

Ventilation System Type	Whole Dwelling Ventilation	Extract Ventilation
Natural Ventilation	Trickle ventilators	Intermittent extract fans
Continuous Mechanical Extract Ventilation (MEV)	Continuous mechanical extract (low rate) and trickle vents for supply	Continuous mechanical extract (high rate) with trickle vents providing inlet air
Mechanical Ventilation with Heat Recovery (MVHR)	Continuous mechanical supply and extract (low rate)	Continuous mechanical supply and extract (high rate)

Table 6.1 Ventilation system types as described in ADF 2021

Based on the results of the noise survey, the suitability of each system type and the required trickle ventilator performance (where appropriate) is shown in Table 6.2 below.

Elevation	ADF Ventilation System Type Suitable?		
	Natural Vent	MEV	MVHR
All New Elevations	Yes	Yes	Yes

Table 6.2 Suitability and required performance of ventilation systems

N.B. If trickle vents are proposed, a minimum acoustic performance of $D_{ne,w}$ 23 dB is required.

For our assessment of trickle ventilator performance, we have assumed 2no. vents are proposed in the assessed rooms. As trickle vents introduce a weak point in the building façade, increasing the number of trickle vents will reduce the composite performance of the facade. If trickle vents are proposed, the total number of trickle vents for each sensitive space should be confirmed so that calculations can be accurately revised.

Where mechanical ventilation is proposed, systems should be designed so that the combined internal noise levels from external sources and from the mechanical ventilation meet the BS 8233: 2014 criteria shown in Table 4.1.It is noted that an additional NR noise criterion may also need to be agreed for internal building services.

6.2 Openable Windows for Overheating Relief

Please note that the following section is only applicable to the new proposed elevations to the east, west, and south of the existing building.

Approved Document O (ADO) only applies to Bedrooms during night. The advice within this section would therefore only apply to Bedrooms during night-time hours (23:00-07:00) to ensure that the internal noise level targets of 40dB(A) $L_{eq,T}$ and 55dB(A) L_{max} are not exceeded.

Table 6.4 presents the open area of the window as a % of the floor area which would need to be achieved to ensure that sufficient attenuation is provided from outside to inside.

Elevation	Sound Reduction Required to Achieve ADO Target Internal L_{Aeq} Noise Levels	Sound Reduction Required to Achieve ADO Target Internal L_{Amax} Noise Levels	Maximum Open Area of the Window as a Percentage of the Floor Area to Achieve ADO Target Internal Noise Levels
East and West	1 dB	6 dB	10 %
South	0 dB	7 dB	8 %

Table 6.4 Window open areas

Note: Acoustic open area is the measurable, cross-sectional, geometric area of an opening. For a partially open window, this is considered to be the lesser of either the size of the hole in the window frame that is left by the opening light, or the combined cross-sectional area around the opening light through which air must pass to move from outside to inside. The area around a hinged opening light includes the triangular areas on the sides adjacent to the hinge, and the rectangular area on the side opposite the hinge. This should not be used for comparing the air-flow performance of elements because this will also be dependent on factors such as depth (length of air-path), surface roughness and tortuosity.

The overheating model should inform the design team whether the % open areas above would be sufficient to remove excess heat. In the event they are insufficient, other options to limit solar gains into the building should be investigated by the overheating specialist (such as those outlined in Section 2.7 of Approved Document O), or other means of removing excess heat should be explored (as outlined in Section 2.10 of the Approved Document).

Where mitigation of impacts related to overheating is required, this must be led by an overheating specialist. We would be happy to review the acoustic implications of any proposed mitigation strategies, though this would require a more detailed assessment.

7.0 EXTERNAL AMENITY AREA ASSESSMENT

External amenity areas are proposed to the south-east of the development.

Based on the measured noise levels provided in Table 3.1, and additional manual noise level measurements, the predicted ambient noise levels at each of the external amenity areas is as follows:

- South Façade – 42dB $L_{Aeq,T}$
- East and West Façades - 45dB $L_{Aeq,T}$
- North Façade – 50dB $L_{Aeq,T}$

This meets the BS8233:2014 upper guideline target of 55dB(A), and therefore the proposed location for external areas are considered suitable.

8.0 CONCLUSION

An environmental noise survey has been undertaken at 9 Sharps Lane, Ruislip, HA4 7JG 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.

The maximum openable area for bedroom windows with the development has been presented based upon the requirements of Approved Document O.

An assessment of the external amenity areas with the development has been undertaken. The noise levels within the external amenity areas are in line with the guidance presented within BS8233:2014.

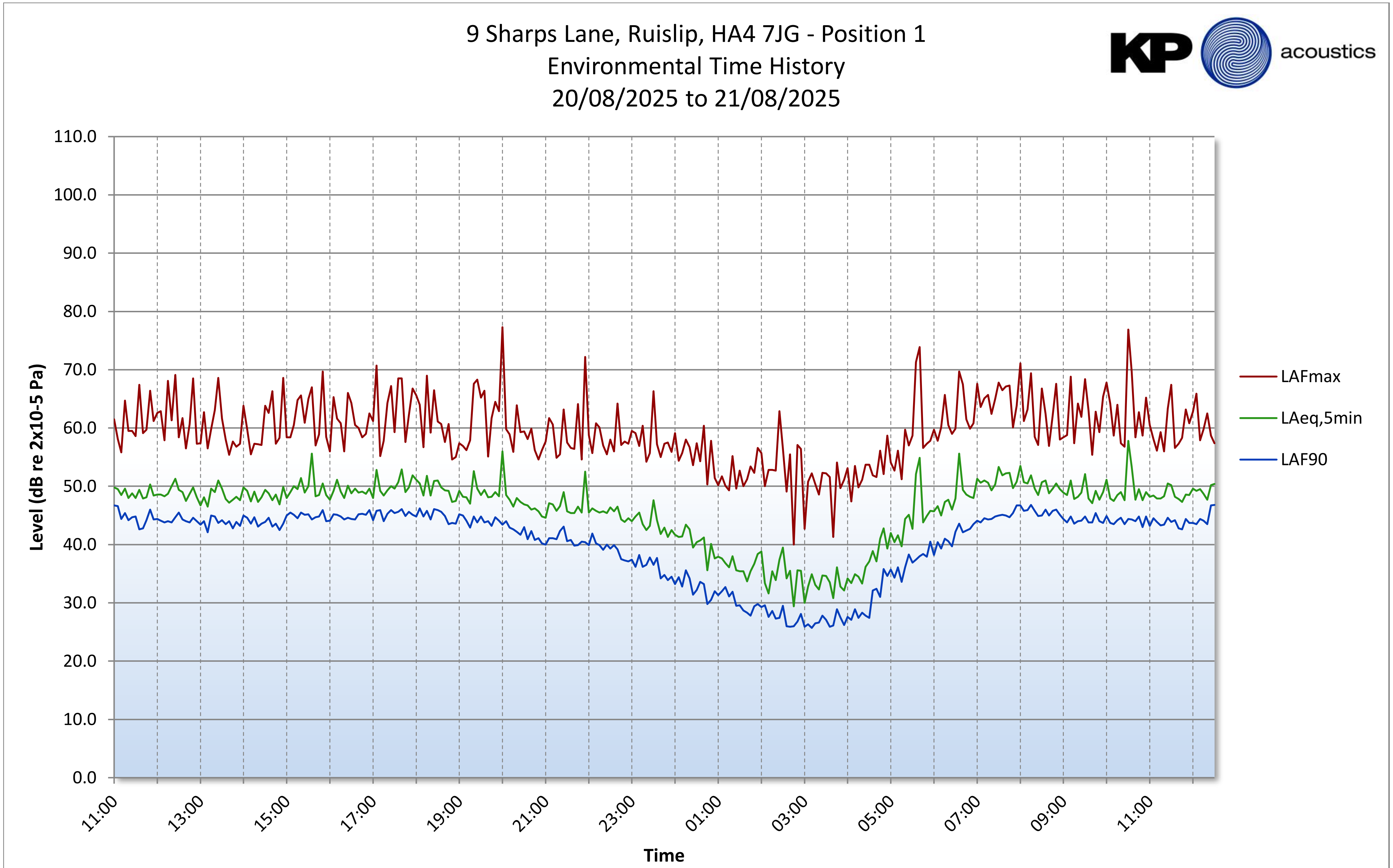

Figure 30610.TH1

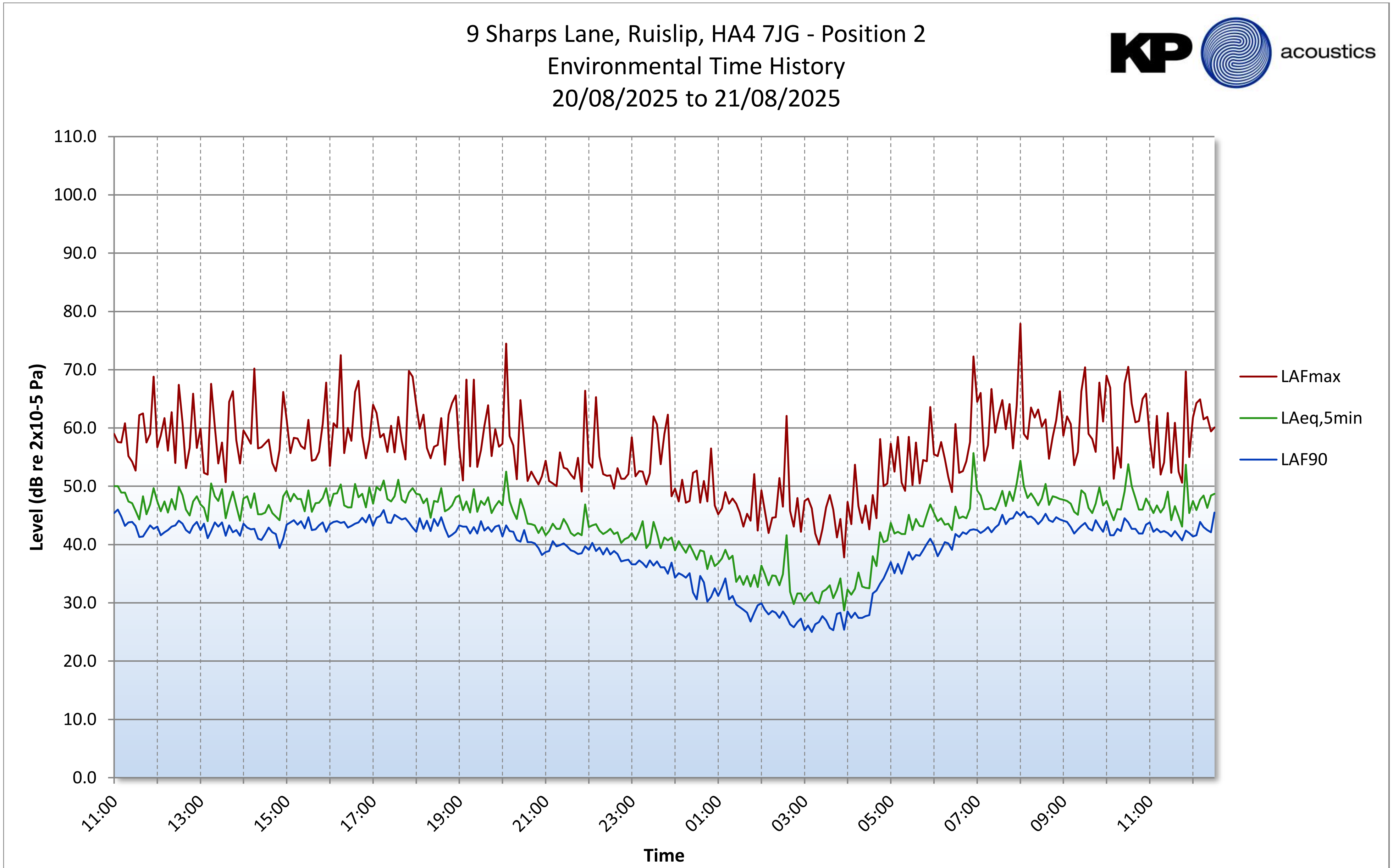

Figure 30610.TH2

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.