
THE PRIORY (PEASE HOUSE), HITCHIN

Noise Impact Assessment Report
Report 31325.NIA.01.Rev.A

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Report 31325.NIA.01.Rev.A		
Revision History		
Revision	Written by	Checked by
First Issue 16/10/2025	Prabath Alagiyawanna Assistant Acoustic Consultant	Daniel Stuart MIOA Principal Consultant
Rev.A 17/10/2025	Add a summary to the report	
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SUMMARY

KP Acoustics Ltd has been commissioned to assess the suitability of the site at The Priory (Pease House), Tilehouse Street, Hitchin, SG5 2DW for a residential development in accordance with Permitted Development Rights (Class MA).

An environmental noise survey has been undertaken on site in order to establish the current ambient noise levels, as shown in Table 3.1 of the main report.

Sound reduction performance calculations have been undertaken in order to specify the minimum performance required from glazed elements in order to meet the recommendations of BS8233:2014, taking into consideration the non-glazed external building fabric elements. The results of these calculations and the sound reduction performance requirements for the glazed elements are shown in Table 5.2.

1.0 INTRODUCTION

KP Acoustics Ltd has been commissioned by Metric and Maker Limited, 24 Capital Business Centre, 22 Carlton Road, South Croydon, Surrey, CR2 0BS, to assess the suitability of the site at The Priory (Pease House), Hitchin, SG5 2DW for a residential development in accordance with Permitted Development rights, as outlined in Class MA (offices to dwellinghouses) of The Town and Country Planning (General Permitted Development) (England) Order 2021.

The Permitted Development Rights require only the consideration of impacts of noise from commercial premises on the intended occupiers of the development; therefore, this report will only consider sources of commercial noise in the assessment.

This report 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 a commercial office building to the north and west, the A602 highway to the south, and a communal park to the east. The entrance to the site is located on the northern elevation. During the survey, the background noise climate was primarily influenced by road traffic noise from the A602 highway and activities within the park.

2.2 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, including those from nearby commercial premises.

Continuous automated monitoring was undertaken for the duration of the survey between 01.00 pm on 15/10/2025 and 1.00 pm on 16/10/2025.

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 mounted on the wall at ground-floor level on the north façade, as shown in Figure 2.2 The microphone was located within 3.5 metres of the nearest surface and therefore includes local reflections.
②	Noise Measurement Position 2	The microphone was installed on a monopod on the ground floor level of the south façade, as shown in Figure 2.2. The microphone was positioned within free-field conditions at least 3.5 metres from the nearest surface.

Table 2.1 Measurement positions and descriptions

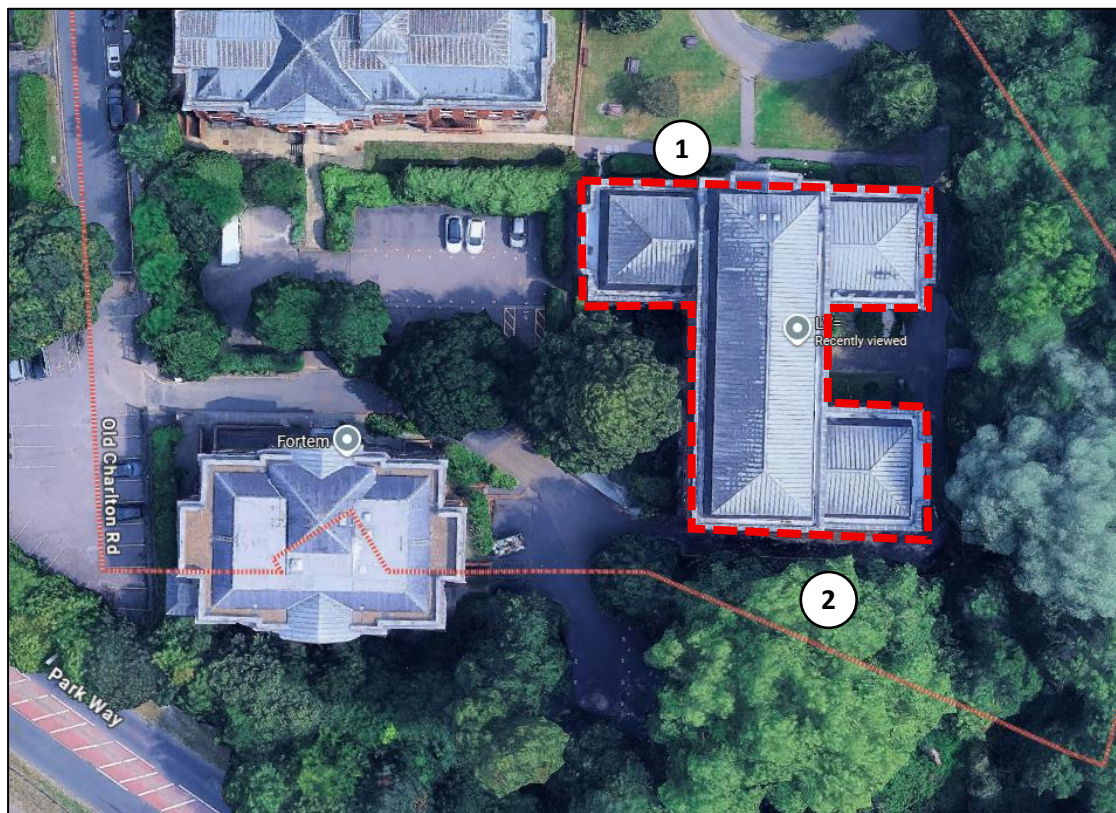


Figure 2.1 Site measurement positions (Image Source: Google Maps)

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.

Measurement instrumentation		Serial no.	Calibration Date	Cert no.
Noise Kit 28	NTI Audio XL2 Class 1 Sound Level Meter	A2A-21140-E0	11/09/2025	TCRT25/1689
	Free-field microphone NTI Acoustics MC230A	A23592		
	Preamp NTI Acoustics MA220	10981		
	NTI Audio External Weatherproof Shroud	-	-	-
Noise Kit 30	NTI Audio XL2 Class 1 Sound Level Meter	A2A-21149-E0	07/08/2024	TCRT24/1626
	Free-field microphone NTI Acoustics MC230A	A23572		
	Preamp NTI Acoustics MA220	10997		
B&K Type 4231 Class 1 Calibrator		2147411	10/09/2025	UCRT25/2295

Table 2.2 Measurement instrumentation

3.0 RESULTS

3.1 External Noise Surveys

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 Figures 31325.TH1-2.

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

Time Period	External Noise Measurement Position 1 (Measured Noise level – dBA)	External Noise Measurement Position 2 (Measured Noise level – dBA)
Daytime $L_{Aeq,16hour}$	47	58
Night-time $L_{Aeq,8hour}$	40	53

Table 3.2 Site average noise levels for daytime and night time

Please note that measurements at Noise Measurement Position 1 are located at a distance less than 3.5 meters from the nearest reflective surface and therefore a 3dB correction has been applied to the results in Table 3.2 to obtain a free-field measurement as per ISO1996 Part 2.

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 has been 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 above clause specifically requires assessment only of the impact from commercial premises; noise from other sources does not need to be considered.

However, the measurements undertaken on site not only encompass noise generated by any nearby commercial sources; they also inherently include noise from the full spectrum of sources in the area.

4.2 Internal Noise Levels

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”* and the relevant World Health Organisation guidance.

BS8233:2014 describes recommended internal average noise levels for residential spaces. These levels are shown in Table 4.1. The standard advises that these internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved

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 4.2 BS8233 recommended internal background noise levels

BS8233:2014 also suggests that regular individual noise events can cause disturbance and that a guideline value can be set for the design, but does not provide any guidance on suitable criteria.

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.

5.0 GLAZED EXTERNAL BUILDING FABRIC SPECIFICATION

Following discussions with the client, it is understood that all existing windows are planned to be replaced with new windows. Therefore, sound reduction performance calculations have been undertaken 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 the average and maximum noise levels monitored during the environmental noise survey.

Technically class MA of permitted development only considers commercial noise source, of which we are not aware that any were present during our survey. However the below specification is to achieve good practice levels internally during the daytime and nighttime.

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.

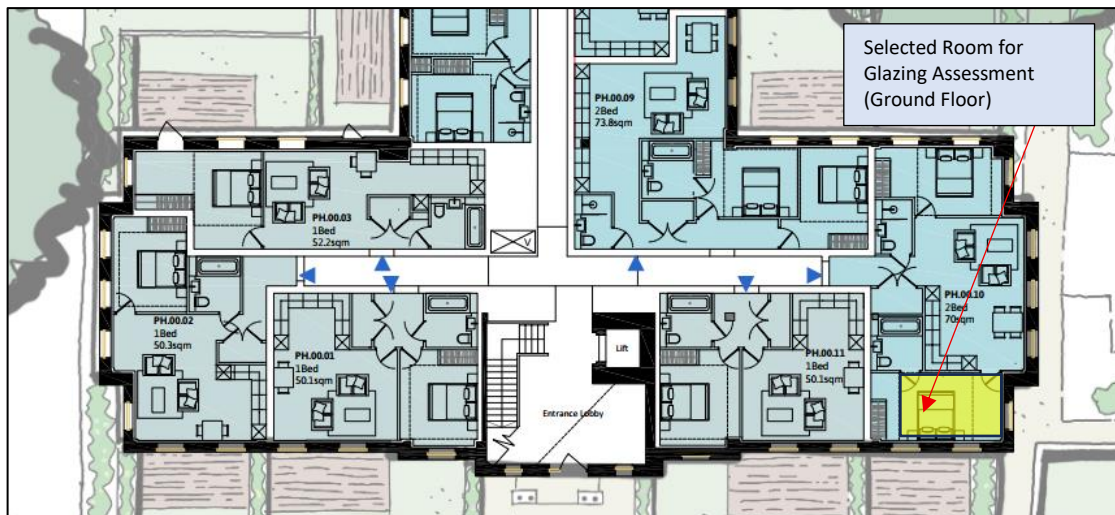


Figure 5.2: Selected room for glazing assessment on the North elevation (Image source: Azure Architecture Limited)

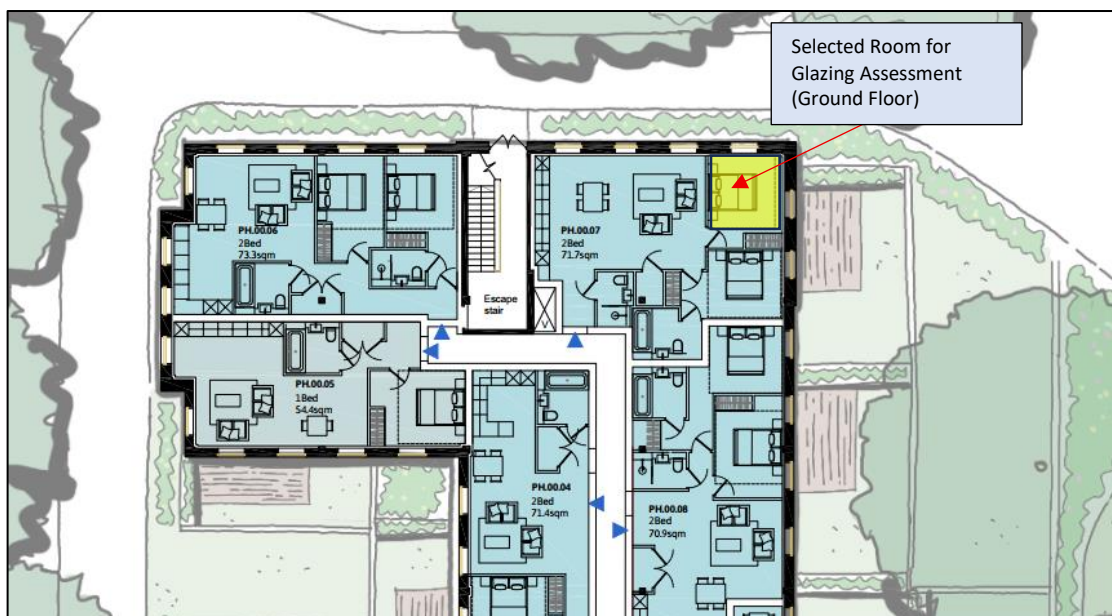


Figure 5.2: Selected room for glazing assessment on the south elevation (Image source: Azure Architecture Limited)

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

5.1 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.

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 5.2.

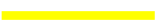
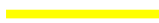
Elevation	Sound Reduction Index , dB, at Octave Band Centre Frequency, Hz						$R_w(C;C_{tr})$, dB
	125	250	500	1k	2k	4k	
North Elevations 	22	20	26	36	39	31	31(-1;-4)
East Elevations 	22	20	26	36	39	31	31(-1;-4)
East Elevations 	27	26	25	34	35	38	32(-1;-3)
South Elevation 	27	26	25	34	35	38	32(-1;-3)
West Elevations 	27	26	25	34	35	38	32(-1;-3)
West Elevations 	22	20	26	36	39	31	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 and locations for their installation shown in Figure 5.3 below.

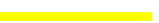
Glazing type	Example Glazing Type
	SGG 4/12/4mm
	SGG 5/6/5mm

Table 5.3 Example glazing types

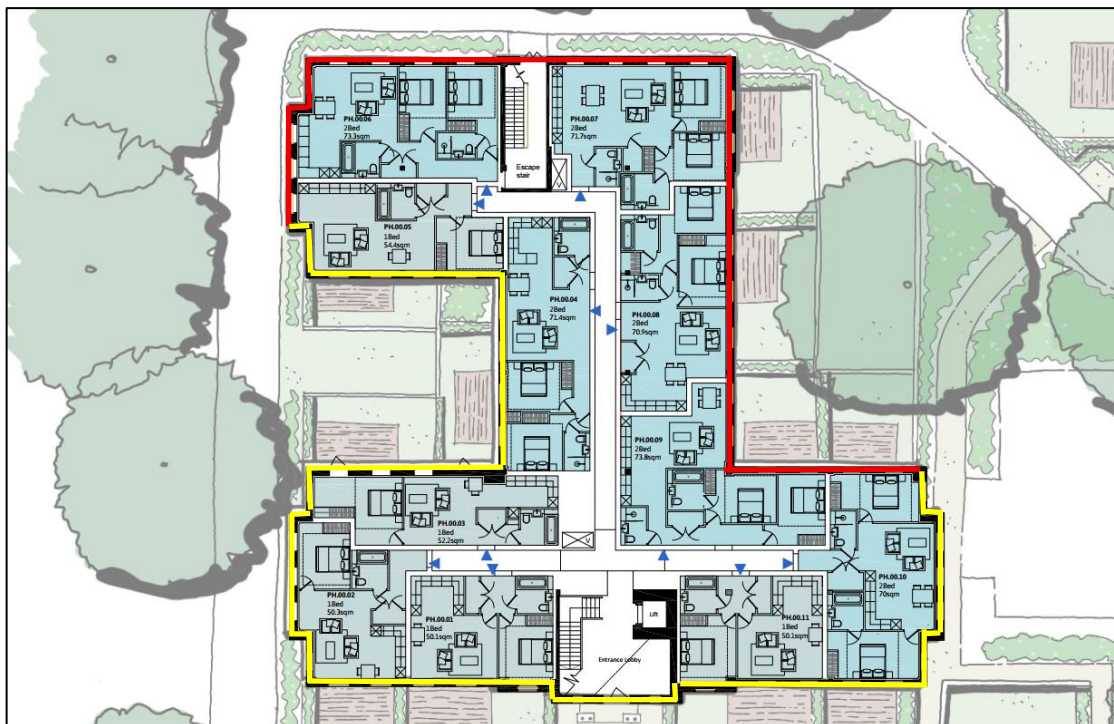


Figure 5.3 Required glazing performance

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	Minimum Trickle Ventilator Performance (dB $D_{n,e,w}$)
North Elevations 	23
East Elevations 	23
East Elevations 	31
South Elevation 	31
West Elevations 	31
West Elevations 	23

Table 6.2 Suitability and required performance of ventilation systems

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 façade. 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.

7.0 CONCLUSION

External noise surveys have been undertaken at The Priory (Pease House), Hitchin, SG5 2DW allowing the assessment of daytime and night-time levels likely to be experienced by the

proposed development. The assessment has been completed in accordance with the requirements of the Permitted Development Rights.

No commercial noise sources were noted onsite and therefore technically there are no acoustic mitigation measures required under part MA permitted development.

Following discussions with the client, it is understood that all existing windows are planned to be replaced with new windows. Therefore, as good practice, 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.

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

PEASE HOUSE, TILEHOUSE STREET, HITCHIN, SG5 2DW - Position 1
Environmental Time History
15/10/2025 to 16/10/2025

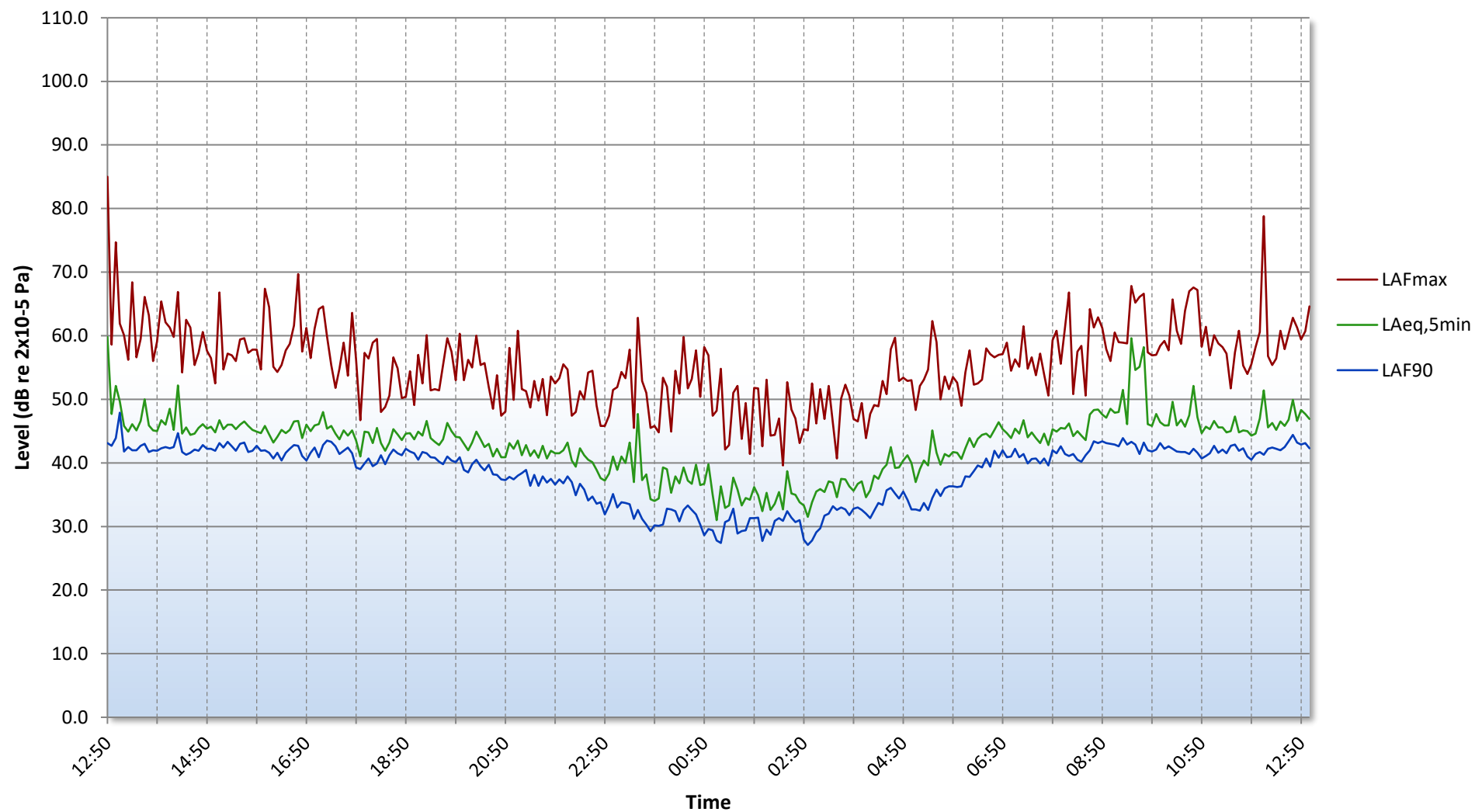


Figure 30325.TH1

PEASE HOUSE, TILEHOUSE STREET, HITCHIN, SG5 2DW - Position 2
Environmental Time History
15/10/2025 to 16/10/2025

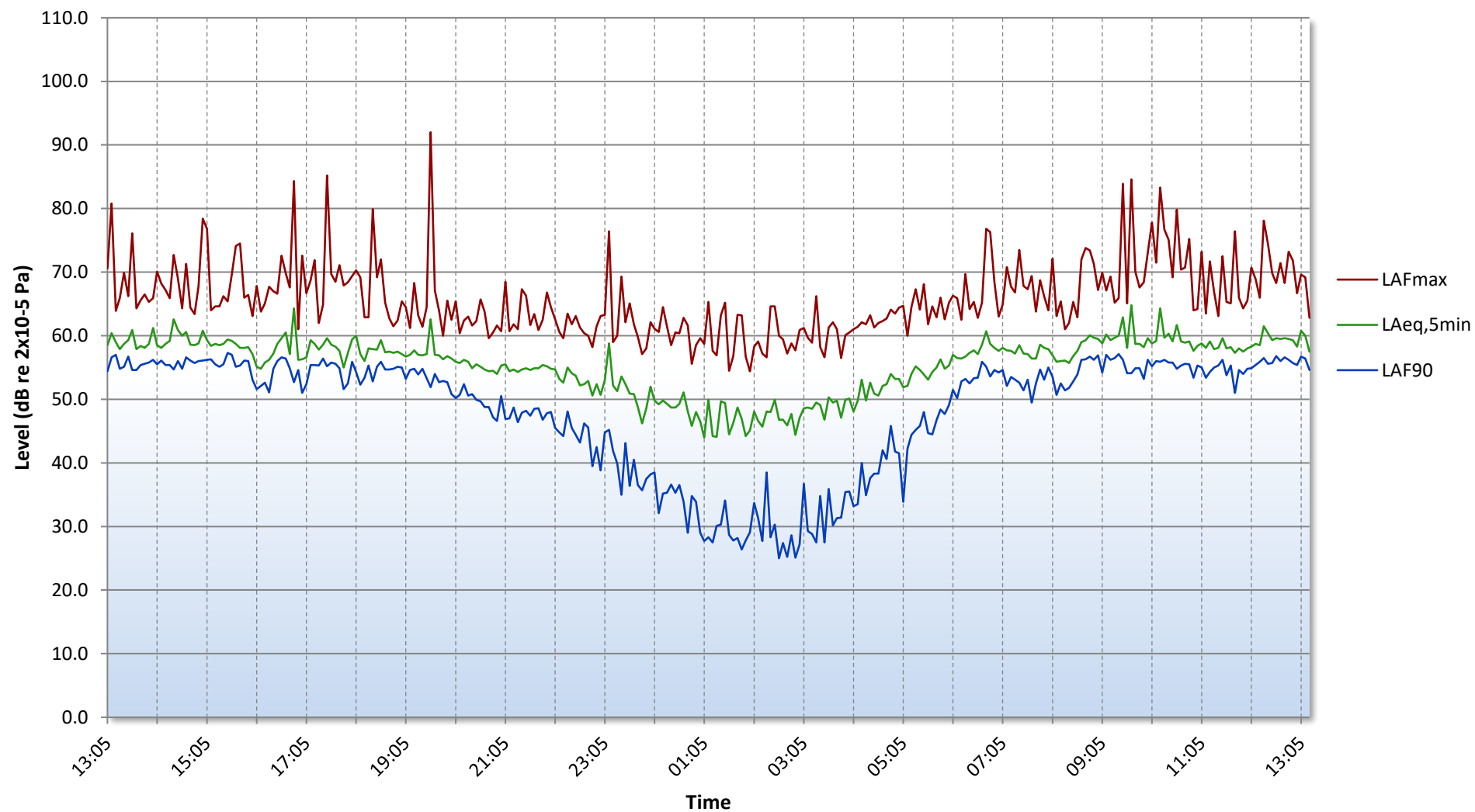


Figure 30325.TH2

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.