Part of the KP Acoustics Group

TECHNICAL MEMORANDUM

Project:	Stoney Wood Quarter, Mill Hill, London		
Subject:	Response to LBB Environmental Health and Planning Comments		
To:	Alex Kuropatwa		
Written By:	Jacob Tyler-White MIOA	**Checked By:**	Oliver Packman MIOA
Memo Ref.:	28113.TM.01 RevA	**Date:**	15 May 2026

1.0 INTRODUCTION

KP Acoustics Ltd has been commissioned to provide formal technical clarification regarding the Noise Impact Assessment (NIA) report (Ref: 28113.NIA.01 Rev.E). This note specifically addresses feedback from the London Borough of Barnet (LBB) Environmental Health (EH) team and the Planning Officer regarding the suitability of the noise survey data.

The following sections provide a detailed response to the specific concerns raised by the local authority, incorporating direct quotes from their feedback to ensure all points are addressed comprehensively.

2.0 INTERNAL NOISE LEVEL CRITERIA

British Standard BS8233:2014 *Sound Insulation and Noise Reduction for Buildings* provides recommended internal ambient noise levels for residential dwellings. The recommended criteria are reproduced in Table 2.1 below.

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

Table 2.1 BS8233 recommended internal background noise levels

It should be noted that the above internal noise level criteria are not intended to apply during "purge ventilation" conditions, as defined within Approved Document F of the Building Regulations, since this mode of ventilation would only occur occasionally (for example, to remove excess heat, odours, or smoke from cooking). However, the recommended internal noise levels should be achieved under normal background ventilation conditions, whether through passive or mechanical means.

In addition, the WHO Guidelines for Community Noise (1999) recommend that individual night-time noise events within bedrooms should not regularly exceed 45 dB L_{Amax} more than 10 to 15 times per night.

Accordingly, the external building fabric, glazing systems and ventilation strategy have been designed to ensure compliance with the above guidance.

3.0 RESPONSE TO LBB ENVIRONMENTAL HEALTH AND PLANNING COMMENTS

The following comments were received from the London Borough of Barnet (LBB) Environmental Health team. Responses to each point are provided alongside the relevant comments below.

3.1 Duration of Measurements and Reliability of Dataset

Comment from LBB Environmental Health:

> *"Having reviewed the submitted documents, I am not satisfied with the noise survey data from Location-A (described as being at the nearest position to the M1) where only a single short term attended measurement was taken on 16/11/2024 between 11:45-12:00am (15 minutes duration)."*

Response:

The attended measurement at Position A was intentionally limited to a short-term attended exercise as this location comprised an open and easily accessible area adjacent to the western boundary of the site. Unlike Positions 1 and 2, which were located within a secure compound suitable for unattended deployment, Position A was not considered appropriate for unattended long-term monitoring equipment due to security and access constraints.

However, Position A was not assessed in isolation. Continuous long-term unattended monitoring was also undertaken at Positions 1 and 2 between Thursday 12 December 2024 and Monday 16 December 2024, providing a robust dataset covering multiple days, weekday and weekend conditions and full diurnal cycles.

The unattended monitoring durations were as follows:

- Position 1: 92 hours
- Position 2: 91 hours 15 minutes.

Full time-history data showing maximum noise levels (L_{AFmax}), ambient noise levels ($L_{Aeq,T}$) and background noise levels (L_{AF90}) are enclosed within Appendix TH1 and TH2. The attended measurement at Position A was undertaken during a representative daytime period under normal motorway operating conditions.

The purpose of the attended measurement at Position A was to establish the relative difference in noise level between the closest practical position to the M1 motorway and the long-term unattended monitoring locations, rather than to independently characterise temporal variation across the site.

The long-term unattended measurements allow the attended measurement at Position A to be calibrated against concurrent measurements at Position 1, enabling representative daytime and night-time noise levels to be derived over the full survey duration. This approach is consistent with the representative measurement principles contained within ISO 1996-2:2017, particularly in situations where site access or security constraints prevent unattended monitoring at the closest façade location.

Importantly, the dominant noise source affecting both Position 1 and Position A was steady-state motorway traffic associated with the M1. As the same dominant source governed the noise climate at both locations, the relative difference in measured noise level between the positions remained consistent. This therefore allowed representative façade noise exposure at Position A to be robustly derived from the long-term unattended monitoring data.

Accordingly, the assessment is not reliant upon a single 15-minute attended measurement in isolation, but instead utilises a combination of long-term unattended monitoring and a short-term attended measurement to derive representative worst-case façade noise levels across the site.

3.2 Position of Measurement Location A

Comment from LBB Environmental Health:

> *Firstly: the site measurement position for location A, shown in Figure 2.1 (page 2 of the Noise Impact Assessment (NIA) by 'KP Acoustics', dated 28/03/2025) is not near to the site boundary and not at the nearest position to the M1.*

Comment from Planner:

> *The EH Team's first concern is that the noise measurement for Location A was taken from a point that is neither close to the site boundary nor the nearest part of the site to the M1. Although this position may give a general indication of noise levels in that part of the site, the EH Team advise that it is not suitable for assessing the constant traffic noise from the M1 that would affect Blocks A and B of the proposed development.*

Response:

The following table and figure present the environmental noise survey measurement positions referred to throughout this technical memorandum.

Icon	Location Description
1	The microphone was installed on a tripod approximately 1.5m above ground level to the southwest of the site. The microphone was positioned in free-field conditions, approximately 1.5 metres from the nearest reflective surface.
2	The microphone was installed on a tripod approximately 1.5m above ground level to the east of the site. The microphone was positioned in free-field conditions, approximately 1.5 metres from the nearest reflective surface.
A	The microphone was installed on a tripod atop a mound to the northwest of the site, at the closest practical position to the M1. The microphone was positioned in free-field conditions, approximately 1.5 metres from the nearest reflective surface.

Table 3.1 Measurement positions and descriptions

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

Position A was located approximately 120 metres from the M1 motorway, whilst the nearest proposed façades are located approximately 90 metres to 100 metres from the motorway.

The figure demonstrates that Position A was located along the north-western edge of the site boundary at the closest practical and accessible location to the M1 motorway within the application site.

The measurement position was selected to achieve suitable free-field measurement conditions in accordance with ISO 1996-2:2017, whilst also accounting for site access and security constraints associated with unattended monitoring equipment.

The relative difference in distance between Position A and the most onerous façades is limited (approximately 20-30 metres). Accordingly, standard distance corrections can be applied in order to derive representative worst-case façade noise levels (refer Section 3.3).

Furthermore, given that the dominant noise source across this part of the site is steady-state motorway traffic from the M1, the noise climate across the western boundary of the site is considered relatively spatially uniform.

3.3 Representativeness of the Measurement Data

Comment from LBB Environmental Health:

> *Whilst it may be argued that the measurement location will be representative of the noise level 'across' this area of the site, when considering the potential impact of steady-state noise from the M1 on blocks A & B of the proposed development, the potential impact is too significant to accept measurements taken at this location for such a short duration.*
>
> *Secondly: the duration of the measurement at location A (one measurement of 15-minute duration) is woefully inadequate and will not be accepted as representative of the noise climate in this area of the site nearest to the M1 Motorway.*

Comment from Planner:

> *The second concern is that the 15 minute noise measurement taken at Location A (as identified in the report) is far too short and cannot be treated as a reliable indication of noise levels in part of the site that is closest to the M1 motorway.*

Response:

The measured survey results are summarised below. Table 3.2 presents the ambient noise levels measured over the full unattended survey duration at Positions 1 and 2.

Position	Survey Duration	Daytime $L_{Aeq,T}$	Night-time $L_{Aeq,T}$
1	12/12/2024 16:01 to 16/12/2024 12:01	60 dBA	57 dBA
2	12/12/2024 16:12 to 16/12/2024 11:27	56 dBA	51 dBA

Table 3.2 Long-term unattended monitoring results

The attended measurement undertaken at Position A was not intended to independently characterise temporal variation across the site. Instead, the purpose of the attended measurement was to establish the relative difference in noise level between the closest practical position to the M1 motorway and the long-term unattended monitoring locations.

Table 3.3 below compares the attended measurement undertaken at Position A against the concurrent measurement recorded at Position 1 during the same representative daytime period.

Position	Measurement Period	Measured $L_{Aeq,T}$
1	16/12/2024 11:45 to 12:00	62
A	16/12/2024 11:45 to 12:00	64

Table 3.3 Comparison Between Position 1 and Position A

The attended measurement undertaken at Position A recorded a noise level 2 dB higher than Position 1 during the same measurement period. This differential was subsequently applied to the long-term unattended monitoring data at Position 1 in order to derive representative daytime and night-time noise levels at Position A, as follows:

- Daytime: 60 + (2) = 62 dBA $L_{eq,T}$
- Night-time: 57 + (2) = 59 dBA $L_{eq,T}$

The next step is to account for the reduced setback distance between Position A and the nearest worst-case affected façades.

Description	Derive Noise Level at Worst-Case Affected Facades	
	Façade at 100m from M1	Façade at 90m from M1
Derived noise level at Position A (Daytime / Night-time)	62 / 59 dBA	62 / 59 dBA
Correction for reduced setback distance to M1*	+0.8 dB	+1.2 dB
Derived worst-case façade level (Daytime / Night-time)	63 / 60 dBA	63 / 60 dBA

Table 3.4 Deriving worst case façade noise levels

* A line-source propagation correction of 10Log(r1/r2) has been applied to account for the reduced setback distance between Position A and the nearest proposed façades relative to the M1 motorway.

The calculations above demonstrate that, even when applying conservative corrections to derive worst-case façade exposure along the western boundary façades, the resultant façade noise levels are approximately 63 dBA daytime and 60 dBA night-time.

Furthermore, given that the dominant noise source across this part of the site is steady-state motorway traffic from the M1, the noise climate across the western boundary of the site is considered relatively spatially uniform.

These calibrated façade noise levels were subsequently used to derive the glazing and ventilation specifications for the development. Please note that the full octave-band calculations used to derive the required glazing and trickle ventilation specifications are enclosed within Appendix B(1-3).

The calculations demonstrate that the predicted internal noise levels at the worst-case affected façades (refer Appendix B(3) - Glazing Type 3) remain compliant with the BS8233:2014 recommended internal ambient noise criteria of:

- 35 dBA $L_{Aeq,T}$ during daytime periods within living rooms and bedrooms
- 30 dBA $L_{Aeq,T}$ during night-time periods within bedrooms.

The calculations also demonstrate compliance with the WHO Guidelines for Community Noise (1999), which recommend that individual night-time noise events should not regularly exceed 45 dBA L_{max} more than 10-15 times per night.

Accordingly, the assessment demonstrates that acceptable internal residential noise conditions can be achieved through the specified glazing and ventilation measures across the development, including the worst-case façades adjacent to the M1 motorway.

The required glazing and trickle ventilation specifications are summarised in the following table.

Glazing Configuration	Sound Reduction Indices (dB) at Octave Band Centre Frequency (Hz)						R_w ($C;C_{tr}$), dB	Trickle Vents dB $D_{n,e,w}$
	125	250	500	1k	2k	4k		
Glazing Type 1 (BLUE)	20	21	29	38	34	45	32 (-1;-4)	39
Glazing Type 2 (GREEN)	24	20	25	35	38	35	31 (-1;-4)	31
Glazing Type 3 (RED)	20	25	29	38	34	45	33 (-1;-4)	39

Table 3.5 Required glazing performance

Figure 3.2 Glazing layouts

3.4 Additional Measurements Requested by EH

Comment from LBB Environmental Health:

> *"We will require additional noise measurements to be taken at the boundary to the West of the site (and location-A). If only attended measurements can be provided (possibly for security reasons) we will require a number of measurements that are taken throughout the day and include both early morning and early evening rush-hour periods, with additional measurements take throughout the day overall."*

Comment from Planner:

> *"As such, they have advised that additional noise measurements would need to be taken at the western site boundary (and Location A) and that if the method of recording can only be undertaken in person (as opposed to an unmanned survey) then several individual measurements would be required during the early morning and early evening rush hour periods, along with further measurements through the daytime, so that the typical noise conditions of the site can be captured."*

Response:

The Environmental Health team have requested additional attended measurements at Position A in order to demonstrate that the short-term measurement is representative of noise conditions throughout the day, including peak traffic periods associated with the M1 motorway.

However, the assessment methodology already incorporates long-term unattended monitoring undertaken over periods exceeding 91 hours at Positions 1 and 2. These measurements captured weekday and weekend conditions, including daytime, evening, night-time and rush-hour traffic periods.

The attended measurement undertaken at Position A was not intended to represent the full temporal variation at the site in isolation. Instead, it was undertaken to establish the relative difference in noise level between the closest practical position to the M1 motorway and the long-term unattended monitoring locations.

By comparing the attended measurement at Position A against concurrent measurements at Position 1, it was possible to establish a representative correction factor between the locations. This correction factor was subsequently applied to the full long-term unattended dataset in order to derive representative daytime and night-time noise levels at Position A.

Accordingly, the long-term unattended measurements already capture the temporal variation requested by the Environmental Health team, including peak traffic periods and representative daily fluctuations associated with the M1 motorway.

Accordingly, the additional attended measurements requested would not materially alter the conclusions of the assessment, as the calibrated long-term unattended dataset already provides a representative and robust assessment of worst-case façade noise exposure across the development site.

3.5 Alleged Discrepancies Between Table 2.1 and Figure 2.1

Comment from Planner:

> *"Aside from concerns about the methodology, the EH Team have noted discrepancies within the report in respect of the measurement positions noted in Table 2.1 and Figure 2.1 on page two of the assessment. Along with addressing the above methodology concerns, they require that these discrepancies be corrected and clarified."*

Response:

No discrepancies have been identified between Table 2.1 and Figure 2.1 of the 28113.NIA.01 RevE Noise Impact Assessment report.

Table 2.1 defines the survey locations as follows:

- Position 1: southwest of the site
- Position 2: east of the site

- Position A: northwest of the site at the closest practical position to the M1 motorway.

Figure 2.1 spatially corroborates these positions and demonstrates the relative relationship between the measurement locations and the surrounding site context.

At present, no specific discrepancy between the table and figure has been identified within the consultation comments received from the Local Planning Authority or Environmental Health team.

Nevertheless, the Figure 3.1 presented within this technical memorandum has been overlaid with the proposed site layout in order to provide further clarity regarding the relationship between the survey positions and the proposed development.

4.0 CONCLUSION

This technical memorandum has been prepared in response to comments received from the London Borough of Barnet Environmental Health team and Planning Officer regarding the environmental noise survey methodology presented within the 28113.NIA.01 RevE Noise Impact Assessment report.

As demonstrated throughout this memorandum, the assessment was not based solely upon a single 15-minute attended measurement. The survey methodology incorporated over 91 hours of unattended monitoring at Positions 1 and 2, capturing representative daytime, evening, night-time and peak traffic conditions associated with the M1 motorway.

The attended measurement undertaken at Position A was used as a supplementary façade-specific calibration exercise to establish the relative difference in noise level between the closest practical position to the M1 motorway and the long-term unattended monitoring locations.

Importantly, the dominant noise source affecting all monitoring positions was steady-state motorway traffic associated with the M1. Accordingly, the calibrated Position A data provides a representative and robust basis for deriving worst-case façade noise levels along the western boundary of the development site.

The derived façade noise levels were subsequently used to inform the glazing and ventilation strategy for the development. The enclosed calculations demonstrate that the proposed façade design is capable of achieving compliance with BS8233:2014 and WHO internal noise guidance, including at the façades closest to the M1 motorway.

Accordingly, it is considered that the submitted Noise Impact Assessment, together with the supplementary clarification provided within this memorandum, provides a robust basis upon which the Local Planning Authority can reach an informed planning judgement regarding environmental noise impacts associated with the proposed development.

Any remaining detailed acoustic design matters can be appropriately secured through suitably worded planning conditions during the detailed design stage.

On the basis of the long-term time-history data, the attended Position A measurement, the distance correction and the façade calculations appended to this Technical Memorandum, further attended measurements at Position A would not materially alter the required glazing and ventilation specification or the overall planning conclusion. The submitted information provides a robust basis for assessing the M1-exposed façades and demonstrates that acceptable internal residential noise conditions can be achieved through the specified façade, glazing and ventilation measures.

A summary of the comments raised and the corresponding responses provided within this memorandum is presented in Table 4.1 below.

Comment	Response	Evidence / Action
Position A not at boundary / not nearest to M1.	Position A was located at the closest practical and accessible position to the M1 within the site boundary. The difference in setback distance between Position A and the nearest façades is limited.	Figure 3.1 overlaid with proposed site layout. Distance corrections applied in Section 3.3.
15-minute attended measurement inadequate.	The assessment was not based solely on the attended measurement. Long-term unattended monitoring exceeding 91 hours was undertaken at Positions 1 and 2.	Long-term monitoring data and time histories enclosed within Appendix TH1 and TH2.
Require additional measurements at western boundary.	The attended measurement at Position A was calibrated against long-term unattended monitoring in order to derive representative worst-case façade levels.	Section 3.3 calibration methodology and façade derivation calculations.

Comment	Response	Evidence / Action
Require rush-hour and daytime measurements.	Long-term unattended monitoring captured daytime, evening, night-time, weekday, weekend and peak traffic conditions associated with the M1 motorway.	Continuous monitoring over periods exceeding 91 hours at Positions 1 and 2.
Require results and time history.	Full time-history data showing $L_{Aeq,T}$, L_{AF10}, L_{AF90} and L_{AFmax} measurements have been provided.	Appendix TH1 and TH2 enclosed.
Alleged discrepancy between Table 2.1 and Figure 2.1.	No discrepancies identified between the measurement location descriptions and the survey figure. Additional overlay plan provided for clarification.	Figure 3.1 within this memorandum.

Table 4.1 Summary of comments and responses

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.

APPENDIX B(1)
Stoneywood Quarter

EXTERNAL BUILDING FABRIC CALCULATIONS
GLAZING TYPE 1

British Standard BS8233:2014, Section G.2 - Internal noise level calculation method:

$$L_{eq,2} = L_{eq,ff} + 10\log_{10}\left(\frac{A_0}{S}10^{\frac{-D_{n,e}}{10}} + \frac{S_{wi}}{S}10^{\frac{-R_{wi}}{10}} + \frac{S_{ew}}{S}10^{\frac{-R_{ew}}{10}} + \frac{S_{rr}}{S}10^{\frac{-R_{rr}}{10}}\right) + 10\log_{10}\left(\frac{S}{A}\right) + 3$$

$L_{eq,2}$	Sound pressure level in a room (dB).	**S**	is the total area in m^2 of the elements through which sound enters the room.
$L_{eq,ff}$	Equivalent continuous free-field sound pressure level outside the room façade.	**$D_{n,e}$**	is the insulation of the trickle ventilation measured according to BS EN ISO 10140.
A_0	is a reference absorption area of 10m2 and is independent of frequency.	**R_{wi}**	is the sound reduction index SRI of the window.
S_f	is the total façade area in m^2 of the room in question.	**R_{ew}**	is the sound reduction index SRI of the external wall.
S_{wi}	is the area in m^2 of the windows of the room.	**R_{rr}**	is the sound reduction index SRI of the roof/ceiling.
S_{ew}	is the area in m^2 of the external wall of the room.	**A**	is the equivalent absorption area of receiving room being considered.
S_{rr}	is the area in m^2 of the ceiling of the room.		

Description	Measured External Free-Field Noise Levels (dB)						dBA
	125	250	500	1k	2k	4k	
Daytime Ambient Noise Level (Leq,T)	53	52	55	59	52	39	60
Night-Time Ambient Noise Level (Leq,T)	49	49	52	55	48	37	57
15th Highest Night-time Lmax	64	64	67	69	61	49	71

Room Properties	
Façade width (m)	3
Room height (m)	2.5
Room depth (m)	2.8
Window area (m^2)	5.4
No. of trickle Vents	1

Element	Sound reduction index of elements (dB) at octave band centre frequency (Hz)						Overall (dB)	
	125	250	500	1k	2k	4k		
Non-Glazed	41	43	48	50	55	55	51(-1;-3)	Rw(C; Ctr)
Glazing	20	21	29	38	34	45	32(-1;-4)	Rw(C; Ctr)
Trickle Vents	35	34	45	38	49	49	39	Dn,e,w

Predicted Internal Noise Levels (dB)							dBA	Criteria
Description	125	250	500	1k	2k	4k		
Daytime Ambient Noise Level (Leq,T)	37	36	27	26	18	-4	32	35
Night-Time Ambient Noise Level (Leq,T)	34	32	25	23	14	-6	28	30
15th Highest Night-time Lmax	49	47	40	37	27	6	43	45

APPENDIX B(2)

Stoneywood Quarter

EXTERNAL BUILDING FABRIC CALCULATIONS
GLAZING TYPE 2

British Standard BS8233:2014, Section G.2 - Internal noise level calculation method:

Leq,2	Sound pressure level in a room (dB).	**S**	is the total area in m2 of the elements through which sound
Leq,ff	Equivalent continuous free-field sound pressure level outside	**Dn,e**	is the insulation of the trickle ventilation measured
A0	is a reference absorption area of 10m2 and is independent of	**Rwi**	is the sound reduction index SRI of the window.
Sf	is the total façade area in m2 of the room in question.	**Rew**	is the sound reduction index SRI of the external wall.
Swi	is the area in m2 of the windows of the room.	**Rrr**	is the sound reduction index SRI of the roof/ceiling.
Sew	is the area in m2 of the external wall of the room.	**A**	is the equivalent absorption area of receiving room being
Srr	is the area in m2 of the ceiling of the room.		

Description	**Measured External Free-Field Noise Levels (dB)**						**dBA**
	125	**250**	**500**	**1k**	**2k**	**4k**	
Daytime Ambient Noise Level (Leq,T)	53	51	51	54	47	33	56
Night-Time Ambient Noise Level (Leq,T)	49	47	47	49	41	29	51
15th Highest Night-time Lmax	59	55	64	62	52	40	65

Room Properties	
Façade width (m)	3
Room height (m)	2.5
Room depth (m)	2.8
Window area (m2)	5.4
No. of trickle Vents	1

Element	**Sound reduction index of elements (dB) at octave band centre frequency (Hz)**						**Overall (dB)**	
	125	**250**	**500**	**1k**	**2k**	**4k**		
Non-Glazed	41	43	48	50	55	55	51(-1;-3)	Rw(C; Ctr)
Glazing	24	20	25	35	38	35	31(-1;-4)	Rw(C; Ctr)
Trickle Vents	30	31	31	32	28	28	31	Dn,e,w

Predicted Internal Noise Levels (dB)							**dBA**	**Criteria**
Description	**125**	**250**	**500**	**1k**	**2k**	**4k**		
Daytime Ambient Noise Level (Leq,T)	35	36	29	27	21	8	32	35
Night-Time Ambient Noise Level (Leq,T)	31	31	25	21	16	3	28	30
15th Highest Night-time Lmax	41	40	42	35	26	15	41	45

APPENDIX B(3)
Stoneywood Quarter

EXTERNAL BUILDING FABRIC CALCULATIONS
GLAZING TYPE 3

British Standard BS8233:2014, Section G.2 - Internal noise level calculation method:

Leq,2	Sound pressure level in a room (dB).	**S**	is the total area in m2 of the elements through which sound
Leq,ff	Equivalent continuous free-field sound pressure level outside	**Dn,e**	is the insulation of the trickle ventilation measured
A0	is a reference absorption area of 10m2 and is independent of	**Rwi**	is the sound reduction index SRI of the window.
Sf	is the total façade area in m2 of the room in question.	**Rew**	is the sound reduction index SRI of the external wall.
Swi	is the area in m2 of the windows of the room.	**Rrr**	is the sound reduction index SRI of the roof/ceiling.
Sew	is the area in m2 of the external wall of the room.	**A**	is the equivalent absorption area of receiving room being
Srr	is the area in m2 of the ceiling of the room.		

Description	**Measured External Free-Field Noise Levels (dB)**						**dBA**
	125	**250**	**500**	**1k**	**2k**	**4k**	
Daytime Ambient Noise Level (Leq,T)	56	55	57	61	54	41	63
Night-Time Ambient Noise Level (Leq,T)	52	51	55	58	50	39	60
15th Highest Night-time Lmax	67	66	70	72	64	51	74

Room Properties	
Façade width (m)	3
Room height (m)	2.5
Room depth (m)	2.8
Window area (m2)	5.4
No. of trickle Vents	1

Element	**Sound reduction index of elements (dB) at octave band centre frequency (Hz)**						**Overall (dB)**	
	125	**250**	**500**	**1k**	**2k**	**4k**		
Non-Glazed	41	43	48	50	55	55	51(-1;-3)	Rw(C; Ctr)
Glazing	20	25	29	38	34	45	33(-1;-4)	Rw(C; Ctr)
Trickle Vents	35	34	34	38	49	49	39	Dn,e,w

Predicted Internal Noise Levels (dB)							**dBA**	**Criteria**
Description	**125**	**250**	**500**	**1k**	**2k**	**4k**		
Daytime Ambient Noise Level (Leq,T)	39	33	32	29	20	-1	34	35
Night-Time Ambient Noise Level (Leq,T)	35	30	29	25	16	-3	30	30
15th Highest Night-time Lmax	50	45	45	39	30	8	45	45

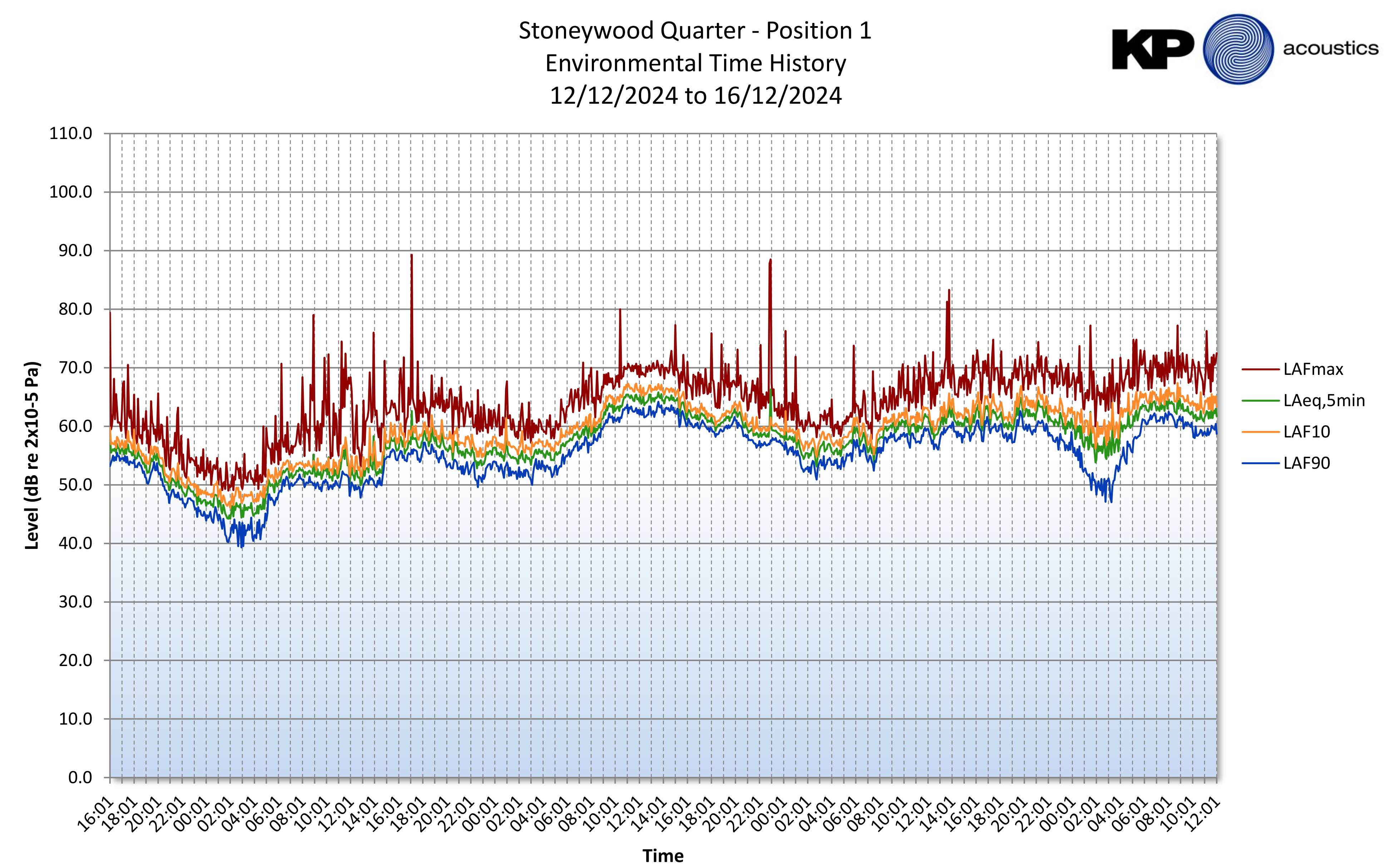

Figure 28113.TH1

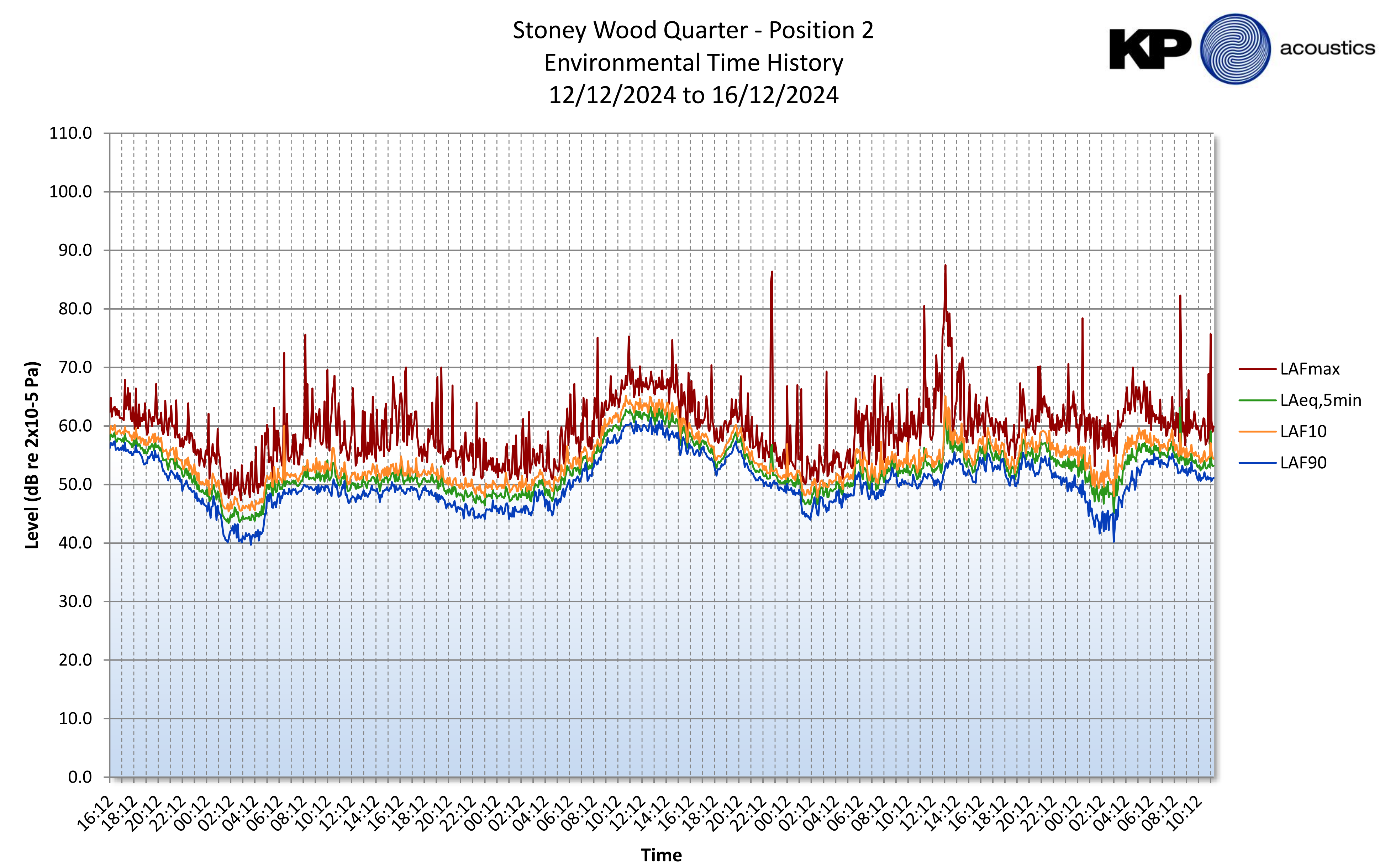

Figure 28113.TH2