



Noise Survey

BS 8233:2014 Analysis

Land at Hanging Heaton

Reference Number: A001230

Date: March 2021

Issue 1

Project name and reference number: Hanging Heaton . Ref: A001230

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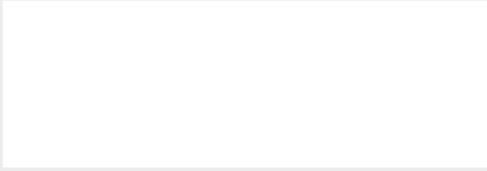
Origination Date: March 2021

Reviser: -

Date of last revision: -

Issue Number: 1

Summary of changes: -

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Contents

Section	Page
Introduction	4
Requirements	4
Method	5
Results and Analysis	7
Conclusions and Recommendations	12
Appendices	13
Appendix A – Measurement data	
Appendix B – Instrument and weather data	

Company Profile

Established in 2007 as a family business, we set out to create a sustainable, resilient business, establishing a happy and positive working environment for both clients and colleagues. It was important for us to offer adaptable and growing solutions for the areas of the construction industry that would benefit from them the most.

Creating an environment that was a pleasure to work in for both colleagues and clients was, and remains, incredibly important to us. Building our future on the foundations of honest relationships, flexibility and efficiency means that we value every client's success as though it were our own.

We have grown to become a trusted construction compliance partner. We continue to grow, to offer packages of sustainability, environmental and acoustic services, with the long-term aim of making our clients' lives easier, so they can focus on the jobs that they enjoy.

Today, the business works with a wide spectrum of clients from household name plc firms, one-off builds and everything in between. Our client list includes many of the nation's major house builders and contractors, as well as universities and public sector organisations. The team also lends their know-how to many architectural practices, M&E consultants and planners.

Introduction

FES Acoustics were instructed by Vistry Partnerships Yorkshire to carry out a two-point noise survey at the site of a proposed development at High Street, Hanging Heaton, Dewsbury WF12 7HF in order to assess compliance with BS 8233:2014 requirements, in terms of internal noise levels, overnight $L_{AF,MAX}$ events and amenity area noise levels.

Requirements

BS 8233:2014 gives guideline limits for noise both within buildings and in external garden and other amenity areas. These are as follows:

Table 1 - BS 8233:2014 guidelines for internal noise levels

Daytime Maximum L_{Aeq} (07.00 to 23.00)	Night Time Maximum L_{Aeq} (23.00 to 07.00)
Living Rooms	Bedrooms
35 dB(A)	30 dB(A)

Table 2- BS 8233:2014 and WHO guidelines for noise levels in external amenity areas

Desirable Amenity Space Maximum Noise Level	Upper Guideline Value for Amenity Space Noise Level (for noisier environments)
50 dB(A)	55 dB(A)

The internal noise levels will be determined by the external noise level and the degree of attenuation offered by the external envelope of the building. External levels will be determined by the noise level of the source, the distance to the amenity spaces and any barriers (e.g. fences, walls) in the pathway of the sound.

Method

Two measurement positions was chosen as shown in Figure 1 below.

Due to the proximity of neighbouring roads and potential other noise sources (including the petrol station) and based on the proposed layout, 2 no. measuring points were undertaken for a 24-hour period. Measuring Position A covers the High Street and measuring Position B covers Challenge Way, the petrol station and the Working Men's Club.

Image 1 – SLM Location



Results – Position A

Graphical representations of the recorded data are presented in Appendix 2. Analysis of the data is given below.

The actual measured noise level is shown below in Tables 3 to 6.

Table 3 - Measured noise level – Position A

Period	L_{Aeq} (dB)
Daytime, 09:56 – 23:00 hrs	52.5
Night-time, 23.00 – 07.00hrs	47.7
Daytime, 07:00 – 09:56 hrs	55.1

Table 4 – L_{Aeq} Day and Night Averages Position A

Period	L_{Aeq} (dB)
Daytime, 07.00 – 23.00hrs	53
Night-time, 23.00 – 07.00hrs	48

Table 3 above outlines the L_{Aeq} levels of the three periods over the 24-hour recording period. These figures could then be averaged to determine the $L_{Aeq,8hr}$ and $L_{Aeq,16hr}$ within Table 4. This data can then be assessed to account for distance attenuation to the façade of the nearest sensitive receptors.

An opened window is expected to provide approximately 10-15dB attenuation from external noise sources, and as such both the day-time and night-time periods, which would leave both the day-time and night-time period over the limits by between 3dB-8dB if windows were open for the entire duration. As such, a minimum standard of glazing and ventilation provisions should be stipulated to ensure suitable internal noise levels are provided.

This would consist of windows providing a minimum of 18dB $D_{nT,w+Ctr}$ accompanied by trickle vents with a minimum attenuation of 24dB $D_{n,e,w}$, unless superseded by $L_{AF,MAX}$ requirements on the following page. This should be achievable by the majority of standard double glazing and trickle vent specifications and should be confirmed with manufacturers details. For example, a 4/20/4 or 6/16/6 standard 28mm double glazed unit could expect performance of around 28dB R_{w+Ctr} . Any standard construction external wall build-up would be capable of bettering this attenuation, ensuring a suitable composite wall performance,

As such, the façade requirements of Table 1 would be met by adopting the standard specification proposed by Vistry Partnerships Yorkshire of double glazing and brick and block cavity wall construction with standard attenuation trickle vents.

Given the calculated noise levels, amenity area noise levels should be sufficient on site with no additional attenuation requirements to meet the Desirable Amenity Space Maximum Noise Levels as outlined within Table 2, other than standard boundary fencing, and sound attenuation through building structures and distance from the noise source.

LAF,MAX

The data below outlines the LAF,MAX results recorded during the survey at Position B, which is a limit of 45dB LAF,MAX internally that should be exceeded no more than 10 times during the night-time period (23:00-07:00). Analysis has shown that to limit the number of instances to less than 10 events, window attenuation would require an increase to be a minimum of 22dB $D_{nT,w+Ctr}$ and 29dB $D_{n,e,w}$ in this location, setting a theoretical limit of 67dB $L_{AF,MAX}$. This was exceeded 7 times during recording.

Table 5 – $L_{AF,MAX}$ Values

Calculation interval (absolute time)	LAFmax [dB]	Time of Max
09/03/2021 23:00:00.000 - 09/03/2021 23:04:59.999	60.7 dB	09/03/2021 22:56:43.000
09/03/2021 23:05:00.000 - 09/03/2021 23:09:59.999	59.7 dB	09/03/2021 23:06:43.000
09/03/2021 23:10:00.000 - 09/03/2021 23:14:59.999	59.7 dB	09/03/2021 23:06:43.000
09/03/2021 23:15:00.000 - 09/03/2021 23:19:59.999	60.5 dB	09/03/2021 23:16:43.000
09/03/2021 23:20:00.000 - 09/03/2021 23:24:59.999	60.5 dB	09/03/2021 23:16:43.000
09/03/2021 23:25:00.000 - 09/03/2021 23:29:59.999	58.8 dB	09/03/2021 23:21:43.000
09/03/2021 23:30:00.000 - 09/03/2021 23:34:59.999	57.8 dB	09/03/2021 23:31:43.000
09/03/2021 23:35:00.000 - 09/03/2021 23:39:59.999	57.8 dB	09/03/2021 23:31:43.000
09/03/2021 23:40:00.000 - 09/03/2021 23:44:59.999	56.2 dB	09/03/2021 23:36:43.000
09/03/2021 23:45:00.000 - 09/03/2021 23:49:59.999	57.4 dB	09/03/2021 23:46:43.000
09/03/2021 23:50:00.000 - 09/03/2021 23:54:59.999	62.9 dB	09/03/2021 23:51:43.000
09/03/2021 23:55:00.000 - 09/03/2021 23:59:59.999	62.9 dB	09/03/2021 23:51:43.000
10/03/2021 00:00:00.000 - 10/03/2021 00:04:59.999	61.7 dB	10/03/2021 00:01:43.000
10/03/2021 00:05:00.000 - 10/03/2021 00:09:59.999	61.7 dB	10/03/2021 00:01:43.000
10/03/2021 00:10:00.000 - 10/03/2021 00:14:59.999	58.9 dB	10/03/2021 00:11:43.000
10/03/2021 00:15:00.000 - 10/03/2021 00:19:59.999	60.3 dB	10/03/2021 00:16:43.000
10/03/2021 00:20:00.000 - 10/03/2021 00:24:59.999	60.3 dB	10/03/2021 00:16:43.000
10/03/2021 00:25:00.000 - 10/03/2021 00:29:59.999	62.0 dB	10/03/2021 00:26:43.000
10/03/2021 00:30:00.000 - 10/03/2021 00:34:59.999	62.0 dB	10/03/2021 00:26:43.000
10/03/2021 00:35:00.000 - 10/03/2021 00:39:59.999	67.4 dB	10/03/2021 00:36:43.000
10/03/2021 00:40:00.000 - 10/03/2021 00:44:59.999	67.4 dB	10/03/2021 00:36:43.000
10/03/2021 00:45:00.000 - 10/03/2021 00:49:59.999	72.9 dB	10/03/2021 00:46:43.000
10/03/2021 00:50:00.000 - 10/03/2021 00:54:59.999	72.9 dB	10/03/2021 00:46:43.000
10/03/2021 00:55:00.000 - 10/03/2021 00:59:59.999	65.3 dB	10/03/2021 00:51:43.000
10/03/2021 01:00:00.000 - 10/03/2021 01:04:59.999	62.3 dB	10/03/2021 00:56:43.000
10/03/2021 01:05:00.000 - 10/03/2021 01:09:59.999	60.1 dB	10/03/2021 01:06:43.000
10/03/2021 01:10:00.000 - 10/03/2021 01:14:59.999	60.1 dB	10/03/2021 01:06:43.000
10/03/2021 01:15:00.000 - 10/03/2021 01:19:59.999	60.6 dB	10/03/2021 01:16:43.000
10/03/2021 01:20:00.000 - 10/03/2021 01:24:59.999	60.6 dB	10/03/2021 01:16:43.000
10/03/2021 01:25:00.000 - 10/03/2021 01:29:59.999	60.0 dB	10/03/2021 01:21:43.000
10/03/2021 01:30:00.000 - 10/03/2021 01:34:59.999	58.3 dB	10/03/2021 01:31:43.000
10/03/2021 01:35:00.000 - 10/03/2021 01:39:59.999	62.9 dB	10/03/2021 01:36:43.000
10/03/2021 01:40:00.000 - 10/03/2021 01:44:59.999	62.9 dB	10/03/2021 01:36:43.000
10/03/2021 01:45:00.000 - 10/03/2021 01:49:59.999	60.5 dB	10/03/2021 01:41:43.000
10/03/2021 01:50:00.000 - 10/03/2021 01:54:59.999	60.1 dB	10/03/2021 01:46:43.000
10/03/2021 01:55:00.000 - 10/03/2021 01:59:59.999	61.4 dB	10/03/2021 01:56:43.000
10/03/2021 02:00:00.000 - 10/03/2021 02:04:59.999	61.4 dB	10/03/2021 01:56:43.000
10/03/2021 02:05:00.000 - 10/03/2021 02:09:59.999	56.5 dB	10/03/2021 02:01:43.000
10/03/2021 02:10:00.000 - 10/03/2021 02:14:59.999	63.3 dB	10/03/2021 02:11:43.000
10/03/2021 02:15:00.000 - 10/03/2021 02:19:59.999	63.3 dB	10/03/2021 02:11:43.000
10/03/2021 02:20:00.000 - 10/03/2021 02:24:59.999	71.9 dB	10/03/2021 02:21:43.000
10/03/2021 02:25:00.000 - 10/03/2021 02:29:59.999	71.9 dB	10/03/2021 02:21:43.000
10/03/2021 02:30:00.000 - 10/03/2021 02:34:59.999	64.9 dB	10/03/2021 02:26:43.000
10/03/2021 02:35:00.000 - 10/03/2021 02:39:59.999	62.5 dB	10/03/2021 02:31:43.000
10/03/2021 02:40:00.000 - 10/03/2021 02:44:59.999	57.3 dB	10/03/2021 02:41:43.000
10/03/2021 02:45:00.000 - 10/03/2021 02:49:59.999	57.4 dB	10/03/2021 02:46:43.000
10/03/2021 02:50:00.000 - 10/03/2021 02:54:59.999	64.6 dB	10/03/2021 02:51:43.000
10/03/2021 02:55:00.000 - 10/03/2021 02:59:59.999	64.6 dB	10/03/2021 02:51:43.000
10/03/2021 03:00:00.000 - 10/03/2021 03:04:59.999	70.9 dB	10/03/2021 03:01:43.000
10/03/2021 03:05:00.000 - 10/03/2021 03:09:59.999	70.9 dB	10/03/2021 03:01:43.000
10/03/2021 03:10:00.000 - 10/03/2021 03:14:59.999	58.2 dB	10/03/2021 03:11:43.000
10/03/2021 03:15:00.000 - 10/03/2021 03:19:59.999	58.2 dB	10/03/2021 03:11:43.000
10/03/2021 03:20:00.000 - 10/03/2021 03:24:59.999	59.3 dB	10/03/2021 03:21:43.000
10/03/2021 03:25:00.000 - 10/03/2021 03:29:59.999	59.3 dB	10/03/2021 03:21:43.000

L_{AF,MAX} Cont.

Table 6 – L_{AF,MAX} Values

10/03/2021 03:30:00.000 - 10/03/2021 03:34:59.999	53.5 dB	10/03/2021 03:26:43.000
10/03/2021 03:35:00.000 - 10/03/2021 03:39:59.999	60.3 dB	10/03/2021 03:36:43.000
10/03/2021 03:40:00.000 - 10/03/2021 03:44:59.999	60.3 dB	10/03/2021 03:36:43.000
10/03/2021 03:45:00.000 - 10/03/2021 03:49:59.999	66.2 dB	10/03/2021 03:46:43.000
10/03/2021 03:50:00.000 - 10/03/2021 03:54:59.999	66.2 dB	10/03/2021 03:46:43.000
10/03/2021 03:55:00.000 - 10/03/2021 03:59:59.999	68.3 dB	10/03/2021 03:56:43.000
10/03/2021 04:00:00.000 - 10/03/2021 04:04:59.999	68.6 dB	10/03/2021 04:01:43.000
10/03/2021 04:05:00.000 - 10/03/2021 04:09:59.999	68.6 dB	10/03/2021 04:01:43.000
10/03/2021 04:10:00.000 - 10/03/2021 04:14:59.999	65.2 dB	10/03/2021 04:06:43.000
10/03/2021 04:15:00.000 - 10/03/2021 04:19:59.999	59.8 dB	10/03/2021 04:16:43.000
10/03/2021 04:20:00.000 - 10/03/2021 04:24:59.999	59.8 dB	10/03/2021 04:16:43.000
10/03/2021 04:25:00.000 - 10/03/2021 04:29:59.999	57.4 dB	10/03/2021 04:26:43.000
10/03/2021 04:30:00.000 - 10/03/2021 04:34:59.999	63.1 dB	10/03/2021 04:31:43.000
10/03/2021 04:35:00.000 - 10/03/2021 04:39:59.999	63.1 dB	10/03/2021 04:31:43.000
10/03/2021 04:40:00.000 - 10/03/2021 04:44:59.999	57.8 dB	10/03/2021 04:41:43.000
10/03/2021 04:45:00.000 - 10/03/2021 04:49:59.999	57.9 dB	10/03/2021 04:46:43.000
10/03/2021 04:50:00.000 - 10/03/2021 04:54:59.999	57.9 dB	10/03/2021 04:46:43.000
10/03/2021 04:55:00.000 - 10/03/2021 04:59:59.999	66.0 dB	10/03/2021 04:56:43.000
10/03/2021 05:00:00.000 - 10/03/2021 05:04:59.999	70.0 dB	10/03/2021 05:01:43.000
10/03/2021 05:05:00.000 - 10/03/2021 05:09:59.999	70.0 dB	10/03/2021 05:01:43.000
10/03/2021 05:10:00.000 - 10/03/2021 05:14:59.999	64.9 dB	10/03/2021 05:06:43.000
10/03/2021 05:15:00.000 - 10/03/2021 05:19:59.999	60.5 dB	10/03/2021 05:16:43.000
10/03/2021 05:20:00.000 - 10/03/2021 05:24:59.999	60.5 dB	10/03/2021 05:16:43.000
10/03/2021 05:25:00.000 - 10/03/2021 05:29:59.999	59.7 dB	10/03/2021 05:21:43.000
10/03/2021 05:30:00.000 - 10/03/2021 05:34:59.999	61.9 dB	10/03/2021 05:31:43.000
10/03/2021 05:35:00.000 - 10/03/2021 05:39:59.999	62.9 dB	10/03/2021 05:36:43.000
10/03/2021 05:40:00.000 - 10/03/2021 05:44:59.999	62.9 dB	10/03/2021 05:36:43.000
10/03/2021 05:45:00.000 - 10/03/2021 05:49:59.999	61.1 dB	10/03/2021 05:41:43.000
10/03/2021 05:50:00.000 - 10/03/2021 05:54:59.999	62.5 dB	10/03/2021 05:51:43.000
10/03/2021 05:55:00.000 - 10/03/2021 05:59:59.999	63.2 dB	10/03/2021 05:56:43.000
10/03/2021 06:00:00.000 - 10/03/2021 06:04:59.999	63.2 dB	10/03/2021 05:56:43.000
10/03/2021 06:05:00.000 - 10/03/2021 06:09:59.999	66.4 dB	10/03/2021 06:06:43.000
10/03/2021 06:10:00.000 - 10/03/2021 06:14:59.999	66.4 dB	10/03/2021 06:06:43.000
10/03/2021 06:15:00.000 - 10/03/2021 06:19:59.999	63.3 dB	10/03/2021 06:16:43.000
10/03/2021 06:20:00.000 - 10/03/2021 06:24:59.999	63.3 dB	10/03/2021 06:16:43.000
10/03/2021 06:25:00.000 - 10/03/2021 06:29:59.999	68.8 dB	10/03/2021 06:26:43.000
10/03/2021 06:30:00.000 - 10/03/2021 06:34:59.999	68.8 dB	10/03/2021 06:26:43.000
10/03/2021 06:35:00.000 - 10/03/2021 06:39:59.999	66.6 dB	10/03/2021 06:36:43.000
10/03/2021 06:40:00.000 - 10/03/2021 06:44:59.999	66.6 dB	10/03/2021 06:36:43.000
10/03/2021 06:45:00.000 - 10/03/2021 06:49:59.999	63.7 dB	10/03/2021 06:41:43.000
10/03/2021 06:50:00.000 - 10/03/2021 06:54:59.999	71.7 dB	10/03/2021 06:51:43.000
10/03/2021 06:55:00.000 - 10/03/2021 06:59:59.999	71.7 dB	10/03/2021 06:51:43.000

Results – Position B

Graphical representations of the recorded data are presented in Appendix 2. Analysis of the data is given below.

The actual measured noise level is shown below in Tables 7 to 10.

Table 3 - Measured noise level – Position A

Period	L_{Aeq} (dB)
Daytime, 09:49 – 23:00 hrs	51.5
Night-time, 23.00 – 07.00hrs	49.5
Daytime, 07:00 – 09:49 hrs	54.3

Table 4 – L_{Aeq} Day and Night Averages Position A

Period	L_{Aeq} (dB)
Daytime, 07.00 – 23.00hrs	52
Night-time, 23.00 – 07.00hrs	50

Table 3 above outlines the L_{Aeq} levels of the three periods over the 24-hour recording period. These figures could then be averaged to determine the $L_{Aeq,8hr}$ and $L_{Aeq,16hr}$ within Table 4. This data can then be assessed to account for distance attenuation to the façade of the nearest sensitive receptors.

An opened window is expected to provide approximately 10-15dB attenuation from external noise sources, and as such both the day-time and night-time periods, which would leave both the day-time and night-time period over the limits by between 2dB-7dB daytime and 5dB-10dB night-time if windows were open for the entire duration. As such, a minimum standard of glazing and ventilation provisions should be stipulated to ensure suitable internal noise levels are provided.

This would consist of windows providing a minimum of 20dB $D_{nT,w+Ctr}$ accompanied by trickle vents with a minimum attenuation of 27dB $D_{n,e,w}$ unless superseded by $L_{AF,MAX}$ requirements on the following page. This should be achievable by the majority of standard double glazing and trickle vent specifications and should be confirmed with manufacturers details. For example, a 4/20/4 or 6/16/6 standard 28mm double glazed unit could expect performance of around 28dB R_{w+Ctr} . Any standard construction external wall build-up would be capable of bettering this attenuation, ensuring a suitable composite wall performance,

As such, the façade requirements of Table 1 would be met by adopting the standard specification proposed by Vistry Partnerships Yorkshire of double glazing and brick and block cavity wall construction with standard attenuation trickle vents.

Given the calculated noise levels, amenity area noise levels should be sufficient on site with no additional attenuation requirements to meet the Desirable Amenity Space Maximum Noise Levels as outlined within Table 2, other than standard boundary fencing, and sound attenuation through building structures and distance from the noise source.

LAF,MAX

The data below outlines the LAF,MAX results recorded during the survey at Position B, which is a limit of 45dB LAF,MAX internally that should be exceeded no more than 10 times during the night-time period (23:00-07:00). By applying the previously discussed minimum attenuation requirement of 20dB $D_{nT,w+C_{tr}}$, a theoretical limit of 65dB can be applied to represent that highest external noise at the façade with a closed window to remain within limits. This was exceeded four times during recording.

Table 5 – LAF,MAX Values

Calculation interval (absolute time)	LAFmax [dB]	Time of Max
09/03/2021 23:00:00.000 - 09/03/2021 23:04:59.999	56.0 dB	09/03/2021 23:04:38.000
09/03/2021 23:05:00.000 - 09/03/2021 23:09:59.999	56.0 dB	09/03/2021 23:04:38.000
09/03/2021 23:10:00.000 - 09/03/2021 23:14:59.999	55.3 dB	09/03/2021 23:09:38.000
09/03/2021 23:15:00.000 - 09/03/2021 23:19:59.999	55.3 dB	09/03/2021 23:14:38.000
09/03/2021 23:20:00.000 - 09/03/2021 23:24:59.999	61.6 dB	09/03/2021 23:24:38.000
09/03/2021 23:25:00.000 - 09/03/2021 23:29:59.999	61.6 dB	09/03/2021 23:24:38.000
09/03/2021 23:30:00.000 - 09/03/2021 23:34:59.999	53.0 dB	09/03/2021 23:29:38.000
09/03/2021 23:35:00.000 - 09/03/2021 23:39:59.999	51.5 dB	09/03/2021 23:39:38.000
09/03/2021 23:40:00.000 - 09/03/2021 23:44:59.999	51.5 dB	09/03/2021 23:39:38.000
09/03/2021 23:45:00.000 - 09/03/2021 23:49:59.999	52.4 dB	09/03/2021 23:49:38.000
09/03/2021 23:50:00.000 - 09/03/2021 23:54:59.999	55.9 dB	09/03/2021 23:54:38.000
09/03/2021 23:55:00.000 - 09/03/2021 23:59:59.999	55.9 dB	09/03/2021 23:54:38.000
10/03/2021 00:00:00.000 - 10/03/2021 00:04:59.999	67.5 dB 1	10/03/2021 00:04:38.000
10/03/2021 00:05:00.000 - 10/03/2021 00:09:59.999	67.5 dB	10/03/2021 00:04:38.000
10/03/2021 00:10:00.000 - 10/03/2021 00:14:59.999	56.5 dB	10/03/2021 00:14:38.000
10/03/2021 00:15:00.000 - 10/03/2021 00:19:59.999	56.5 dB	10/03/2021 00:14:38.000
10/03/2021 00:20:00.000 - 10/03/2021 00:24:59.999	57.5 dB	10/03/2021 00:24:38.000
10/03/2021 00:25:00.000 - 10/03/2021 00:29:59.999	57.5 dB	10/03/2021 00:24:38.000
10/03/2021 00:30:00.000 - 10/03/2021 00:34:59.999	56.6 dB	10/03/2021 00:29:38.000
10/03/2021 00:35:00.000 - 10/03/2021 00:39:59.999	55.3 dB	10/03/2021 00:39:38.000
10/03/2021 00:40:00.000 - 10/03/2021 00:44:59.999	55.3 dB	10/03/2021 00:39:38.000
10/03/2021 00:45:00.000 - 10/03/2021 00:49:59.999	56.4 dB	10/03/2021 00:49:38.000
10/03/2021 00:50:00.000 - 10/03/2021 00:54:59.999	56.4 dB	10/03/2021 00:49:38.000
10/03/2021 00:55:00.000 - 10/03/2021 00:59:59.999	54.9 dB	10/03/2021 00:59:38.000
10/03/2021 01:00:00.000 - 10/03/2021 01:04:59.999	54.9 dB	10/03/2021 00:59:38.000
10/03/2021 01:05:00.000 - 10/03/2021 01:09:59.999	50.9 dB	10/03/2021 01:09:38.000
10/03/2021 01:10:00.000 - 10/03/2021 01:14:59.999	60.0 dB	10/03/2021 01:14:38.000
10/03/2021 01:15:00.000 - 10/03/2021 01:19:59.999	60.0 dB	10/03/2021 01:14:38.000
10/03/2021 01:20:00.000 - 10/03/2021 01:24:59.999	55.5 dB	10/03/2021 01:24:38.000
10/03/2021 01:25:00.000 - 10/03/2021 01:29:59.999	55.5 dB	10/03/2021 01:24:38.000
10/03/2021 01:30:00.000 - 10/03/2021 01:34:59.999	58.6 dB	10/03/2021 01:34:38.000
10/03/2021 01:35:00.000 - 10/03/2021 01:39:59.999	58.6 dB	10/03/2021 01:34:38.000
10/03/2021 01:40:00.000 - 10/03/2021 01:44:59.999	55.0 dB	10/03/2021 01:44:38.000
10/03/2021 01:45:00.000 - 10/03/2021 01:49:59.999	55.2 dB	10/03/2021 01:49:38.000
10/03/2021 01:50:00.000 - 10/03/2021 01:54:59.999	55.2 dB	10/03/2021 01:49:38.000
10/03/2021 01:55:00.000 - 10/03/2021 01:59:59.999	52.7 dB	10/03/2021 01:59:38.000
10/03/2021 02:00:00.000 - 10/03/2021 02:04:59.999	52.7 dB	10/03/2021 01:59:38.000
10/03/2021 02:05:00.000 - 10/03/2021 02:09:59.999	51.0 dB	10/03/2021 02:04:38.000
10/03/2021 02:10:00.000 - 10/03/2021 02:14:59.999	50.5 dB	10/03/2021 02:14:38.000
10/03/2021 02:15:00.000 - 10/03/2021 02:19:59.999	52.2 dB	10/03/2021 02:19:38.000
10/03/2021 02:20:00.000 - 10/03/2021 02:24:59.999	63.3 dB	10/03/2021 02:24:38.000
10/03/2021 02:25:00.000 - 10/03/2021 02:29:59.999	63.3 dB	10/03/2021 02:24:38.000
10/03/2021 02:30:00.000 - 10/03/2021 02:34:59.999	47.0 dB	10/03/2021 02:34:38.000
10/03/2021 02:35:00.000 - 10/03/2021 02:39:59.999	61.3 dB	10/03/2021 02:39:38.000
10/03/2021 02:40:00.000 - 10/03/2021 02:44:59.999	61.3 dB	10/03/2021 02:39:38.000
10/03/2021 02:45:00.000 - 10/03/2021 02:49:59.999	49.9 dB	10/03/2021 02:49:38.000
10/03/2021 02:50:00.000 - 10/03/2021 02:54:59.999	52.5 dB	10/03/2021 02:54:38.000
10/03/2021 02:55:00.000 - 10/03/2021 02:59:59.999	52.5 dB	10/03/2021 02:54:38.000
10/03/2021 03:00:00.000 - 10/03/2021 03:04:59.999	44.9 dB	10/03/2021 03:04:38.000
10/03/2021 03:05:00.000 - 10/03/2021 03:09:59.999	47.6 dB	10/03/2021 03:09:38.000
10/03/2021 03:10:00.000 - 10/03/2021 03:14:59.999	50.2 dB	10/03/2021 03:14:38.000
10/03/2021 03:15:00.000 - 10/03/2021 03:19:59.999	50.2 dB	10/03/2021 03:14:38.000
10/03/2021 03:20:00.000 - 10/03/2021 03:24:59.999	55.0 dB	10/03/2021 03:24:38.000
10/03/2021 03:25:00.000 - 10/03/2021 03:29:59.999	55.0 dB	10/03/2021 03:24:38.000

L_{AF,MAX} Cont.

Table 6 – L_{AF,MAX} Values

10/03/2021 03:30:00.000 - 10/03/2021 03:34:59.999	58.7 dB	10/03/2021 03:34:38.000
10/03/2021 03:35:00.000 - 10/03/2021 03:39:59.999	59.5 dB	10/03/2021 03:39:38.000
10/03/2021 03:40:00.000 - 10/03/2021 03:44:59.999	59.5 dB	10/03/2021 03:39:38.000
10/03/2021 03:45:00.000 - 10/03/2021 03:49:59.999	53.6 dB	10/03/2021 03:49:38.000
10/03/2021 03:50:00.000 - 10/03/2021 03:54:59.999	53.6 dB	10/03/2021 03:49:38.000
10/03/2021 03:55:00.000 - 10/03/2021 03:59:59.999	57.1 dB	10/03/2021 03:59:38.000
10/03/2021 04:00:00.000 - 10/03/2021 04:04:59.999	57.1 dB	10/03/2021 03:59:38.000
10/03/2021 04:05:00.000 - 10/03/2021 04:09:59.999	57.0 dB	10/03/2021 04:04:38.000
10/03/2021 04:10:00.000 - 10/03/2021 04:14:59.999	52.4 dB	10/03/2021 04:09:38.000
10/03/2021 04:15:00.000 - 10/03/2021 04:19:59.999	52.1 dB	10/03/2021 04:14:38.000
10/03/2021 04:20:00.000 - 10/03/2021 04:24:59.999	52.1 dB	10/03/2021 04:24:38.000
10/03/2021 04:25:00.000 - 10/03/2021 04:29:59.999	59.6 dB	10/03/2021 04:29:38.000
10/03/2021 04:30:00.000 - 10/03/2021 04:34:59.999	59.6 dB	10/03/2021 04:29:38.000
10/03/2021 04:35:00.000 - 10/03/2021 04:39:59.999	55.5 dB	10/03/2021 04:34:38.000
10/03/2021 04:40:00.000 - 10/03/2021 04:44:59.999	54.8 dB	10/03/2021 04:44:38.000
10/03/2021 04:45:00.000 - 10/03/2021 04:49:59.999	62.5 dB	10/03/2021 04:49:38.000
10/03/2021 04:50:00.000 - 10/03/2021 04:54:59.999	62.5 dB	10/03/2021 04:49:38.000
10/03/2021 04:55:00.000 - 10/03/2021 04:59:59.999	60.5 dB	10/03/2021 04:54:38.000
10/03/2021 05:00:00.000 - 10/03/2021 05:04:59.999	56.7 dB	10/03/2021 05:04:38.000
10/03/2021 05:05:00.000 - 10/03/2021 05:09:59.999	56.7 dB	10/03/2021 05:04:38.000
10/03/2021 05:10:00.000 - 10/03/2021 05:14:59.999	59.1 dB	10/03/2021 05:14:38.000
10/03/2021 05:15:00.000 - 10/03/2021 05:19:59.999	59.1 dB	10/03/2021 05:14:38.000
10/03/2021 05:20:00.000 - 10/03/2021 05:24:59.999	54.7 dB	10/03/2021 05:24:38.000
10/03/2021 05:25:00.000 - 10/03/2021 05:29:59.999	56.4 dB	10/03/2021 05:29:38.000
10/03/2021 05:30:00.000 - 10/03/2021 05:34:59.999	60.1 dB	10/03/2021 05:34:38.000
10/03/2021 05:35:00.000 - 10/03/2021 05:39:59.999	71.7 dB 2	10/03/2021 05:39:38.000
10/03/2021 05:40:00.000 - 10/03/2021 05:44:59.999	75.3 dB 3	10/03/2021 05:44:38.000
10/03/2021 05:45:00.000 - 10/03/2021 05:49:59.999	76.6 dB 4	10/03/2021 05:49:38.000
10/03/2021 05:50:00.000 - 10/03/2021 05:54:59.999	76.6 dB	10/03/2021 05:49:38.000
10/03/2021 05:55:00.000 - 10/03/2021 05:59:59.999	65.5 dB 5	10/03/2021 05:54:38.000
10/03/2021 06:00:00.000 - 10/03/2021 06:04:59.999	61.5 dB	10/03/2021 05:59:38.000
10/03/2021 06:05:00.000 - 10/03/2021 06:09:59.999	59.5 dB	10/03/2021 06:09:38.000
10/03/2021 06:10:00.000 - 10/03/2021 06:14:59.999	59.5 dB	10/03/2021 06:09:38.000
10/03/2021 06:15:00.000 - 10/03/2021 06:19:59.999	60.2 dB	10/03/2021 06:19:38.000
10/03/2021 06:20:00.000 - 10/03/2021 06:24:59.999	67.6 dB	10/03/2021 06:24:38.000
10/03/2021 06:25:00.000 - 10/03/2021 06:29:59.999	67.6 dB	10/03/2021 06:24:38.000
10/03/2021 06:30:00.000 - 10/03/2021 06:34:59.999	62.5 dB	10/03/2021 06:29:38.000
10/03/2021 06:35:00.000 - 10/03/2021 06:39:59.999	59.9 dB	10/03/2021 06:34:38.000
10/03/2021 06:40:00.000 - 10/03/2021 06:44:59.999	62.0 dB	10/03/2021 06:44:38.000
10/03/2021 06:45:00.000 - 10/03/2021 06:49:59.999	62.0 dB	10/03/2021 06:44:38.000
10/03/2021 06:50:00.000 - 10/03/2021 06:54:59.999	62.3 dB	10/03/2021 06:54:38.000
10/03/2021 06:55:00.000 - 10/03/2021 06:59:59.999	62.3 dB	10/03/2021 06:54:38.000

Conclusions and Recommendations

As discussed through the report, it has been concluded that a standard double glazing and brick and block cavity wall construction with standard specification windows and trickle vents will be sufficient to ensure compliance with BS 8233:2014 internal noise levels as stated within Table 1. Analysis of overnight $L_{AF,MAX}$ levels have determined that standard specification windows would be limited to less than 10 $L_{AF,MAX}$ events in all locations

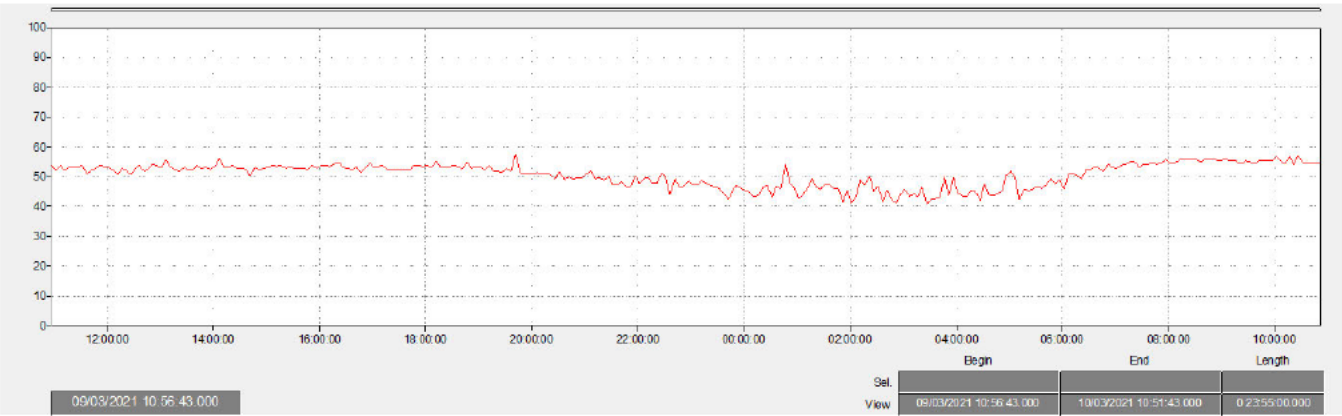
The minimum glazing attenuation requirements would be 22dB R_{w+Ctr} at Position A, and 20dB R_{w+Ctr} at Position B. This could be achieved by a 4/20/4 or 6/12/6 standard double-glazing unit, expected to achieve in the region of 28dB R_{w+Ctr} , and attenuation performance should be confirmed by the manufacturer. Addition of standard trickle vents, minimum $D_{n,e,w}$ of 29dB should be confirmed to provide suitable ventilation under Approved Document F. This should allow openable windows to remain closed at the discretion of the occupant to achieve suitable internal noise levels.

No additional attenuation measures will be required for plots on site to enjoy desirable levels of amenity area noise as stipulated within Table 2.

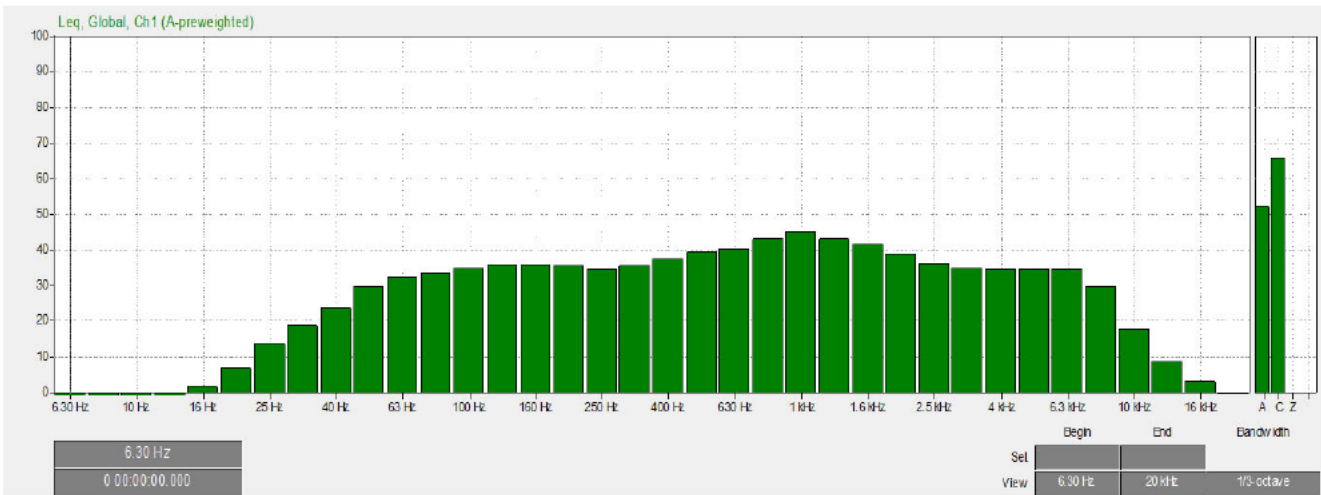
Appendix A

MEASUREMENT DATA – POSITION A

Sound level over time



Frequency profile of recording



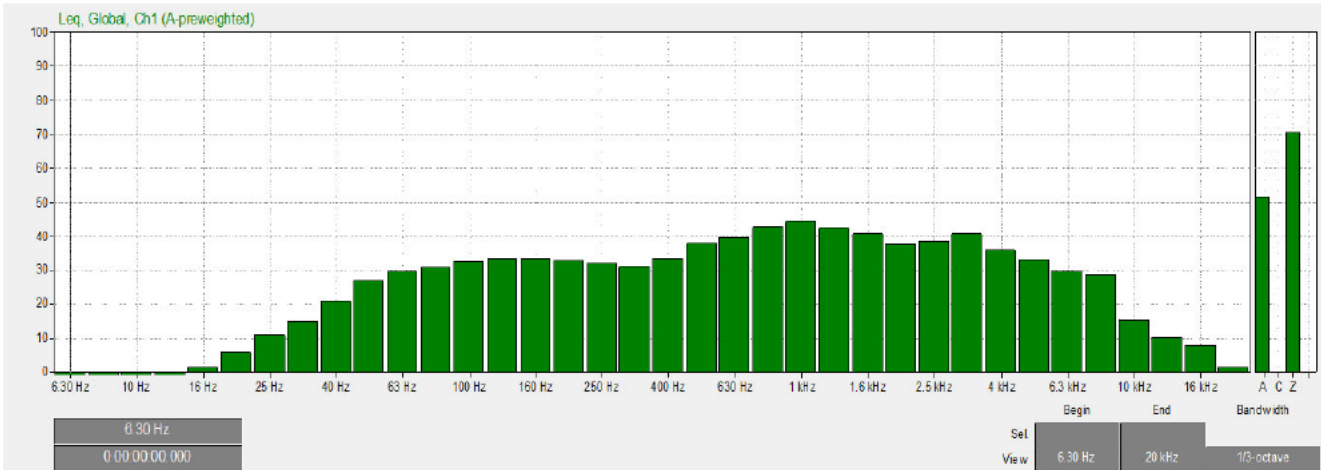
Appendix A

MEASUREMENT DATA – POSITION B

Sound level over time



Frequency profile of recording



Appendix B

INSTRUMENT AND WEATHER DATA

	Serial Number	Calibration Date	Certificate Number
Sound level meter Norsonic 140	1406857	22 nd February 2021	U37139
Field calibrator Norsonic 1251	34960	22 nd February 2021	U37137

	Serial Number	Calibration Date	Certificate Number
Sound level meter Norsonic 140	1406548	22 nd Sept 2020	U31402
Field calibrator Norsonic 1251	34674	22 nd Sept 2020	U34510

At the time of the measurements at position A there was 1 – 2 m/s wind, the temperature was 10°C, and the relative humidity was 65%.

The SLM was field calibrated at the beginning and the end of the measurements with no significant drift recorded.