



Measurement of Environmental Noise

Report Reference Number: 13372-1

For:

Jodie Hull

Project/Site Address

Spring House, Holyhead Road, Chirk, Wrexham County, LL14 5NA

Prepared by

John Ashe

Test Date

9th August 2022

Report Date

22nd August 2022

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Measurement Survey
Undertaken By

Richard Stockdale



Report Completed By

John Ashe



2.0 – Objectives

2.1 - E2 Consultants were instructed by Jodie Hull to prepare a noise assessment. The report has been compiled following a request from the LPA regarding the application to convert an existing building of a property into a dwelling.

2.2 - The methodology used for this assessment is BS8233 to confirm that the noise from nearby sources at the proposed site is within acceptable levels and, if not, propose mitigation measures to reduce the internal noise levels.

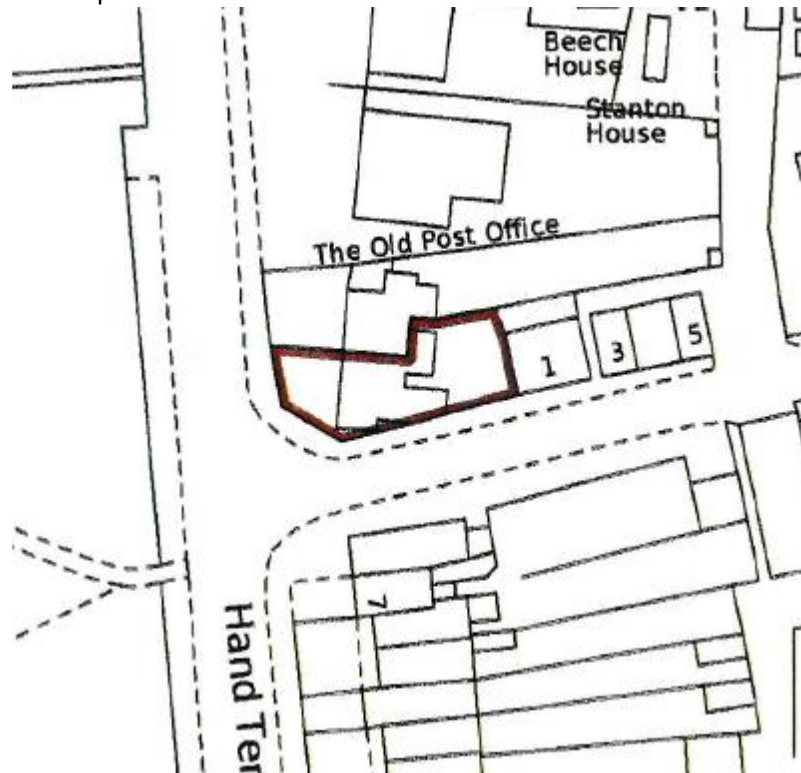
2.3 - The noise levels measured have been considered and assessed against BS8233 to establish the acceptability of the development.

2.4 - Details regarding the assessment methodology used, together with the results of the survey undertaken and the conclusions and recommendations, are presented within this report.

3.0 – Site Description

3.1 - An assessment has been requested to ensure that the noise levels at and within the new dwelling will be within acceptable levels in accordance with BS8233 from surrounding noise sources.

3.2 - The development is to convert the building to form a new dwelling. The plan can be seen below with the proposed development.

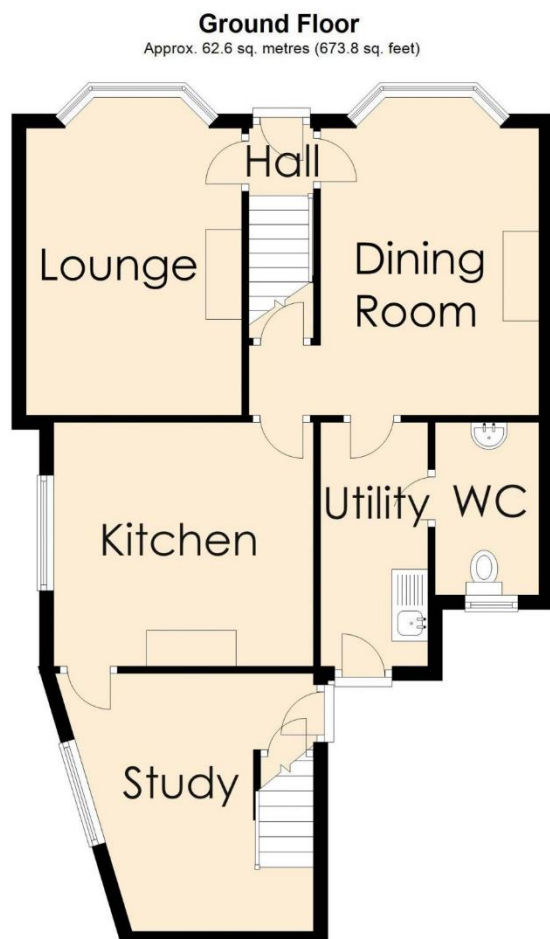


3.3 – The conversion works consists of forming a new dwelling within the building.

4.0 – Microphone Position

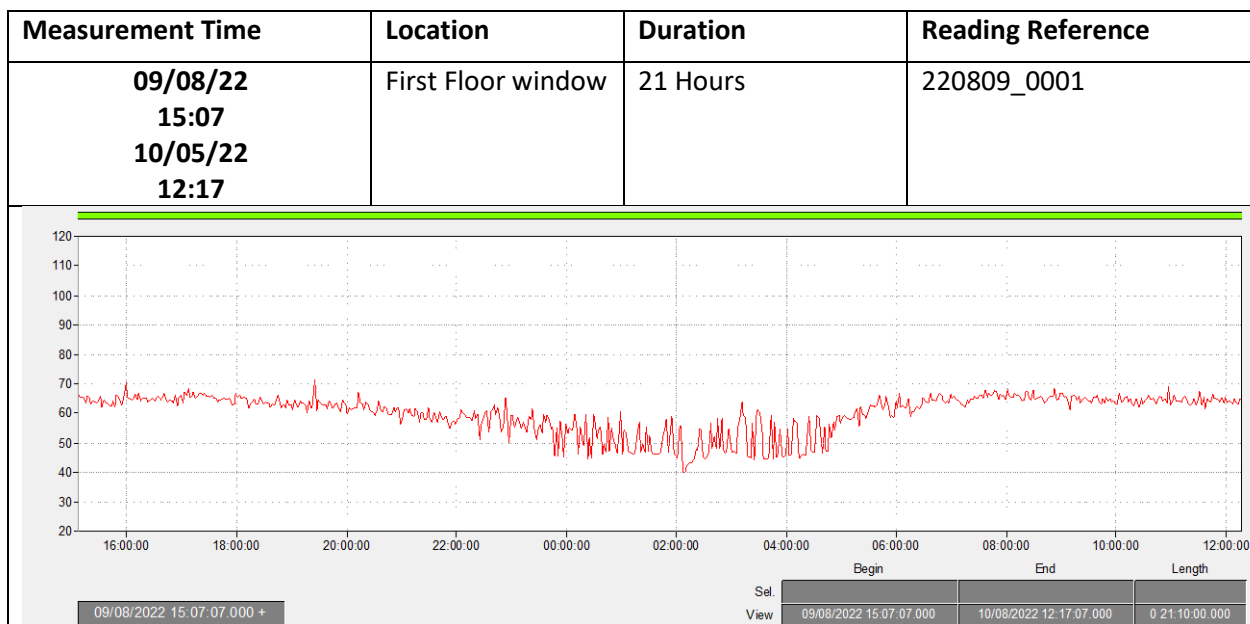
4.1 - The microphone was placed inside the property on the first floor directly facing the main road. The microphone was placed on a tripod and extended 2m out of the window on the extendable arm of the tripod.

Proposed Accommodation



4.2 - This was deemed to be an acceptable location as this would capture the most relevant noise levels. The microphone was placed at the first floor level for security reasons as the ground floor windows are large and had no way to secure the microphone.

4.3 - The measurement location is marked above:



4.4 – The above date and time period had been chosen to provide the worst-case scenario data. Due to the location and traffic levels.

5.0 – Uncertainties

5.1 - The following points are noted to allow for and minimise where possible any uncertainties in the measurements taken.

5.2 - A class one microphone has been used for the survey (**Norsonic 140 SLM – serial number 1406414**).

5.3 - Weather conditions (external) – 70% cloud cover.

	Before Measurements	After Measurements
Wind speed:	2m/s - NW	2m/s - NW
Humidity:	48%	48%
Temperature:	14°C	12°C
Barometric pressure:	1011mb	1011mb

5.4 - The weather during the day was noted as cloudy with winds of less than 5m/s with no prevailing directional component.

5.5 - Noise levels at the time of the measurements were noted to be reasonably constant, with no sudden increases or decreases in noise levels.

5.6 - All results seen in this report will be rounded; for example, 82.5 will be rounded up to 83.

6.0 – Recommendations & Results

6.1 Data Collected

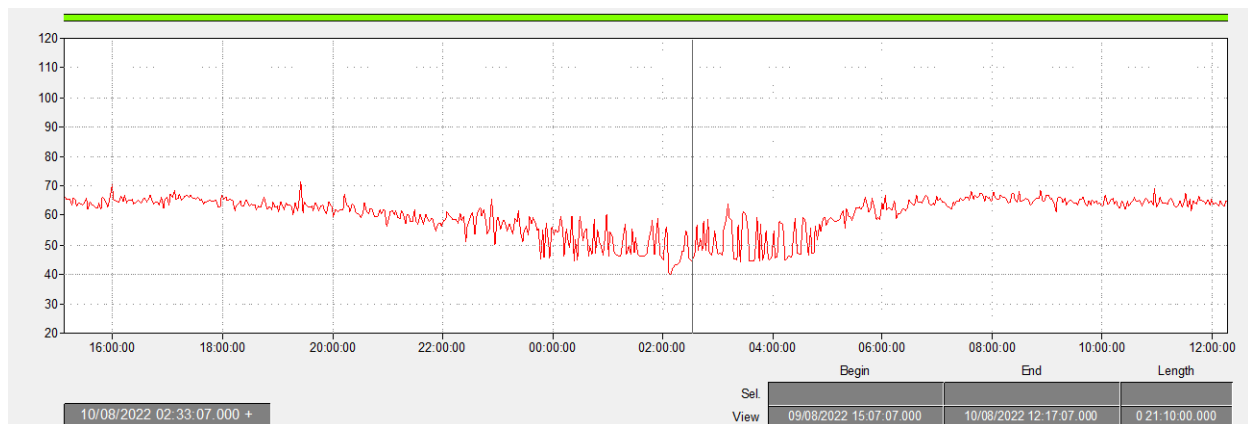
6.1.1 The data taken from the site is shown below:

Measurement Time	Location	L _{Aeq}
09/08/22 15:07 10/05/22 12:17	First Floor window	See Below

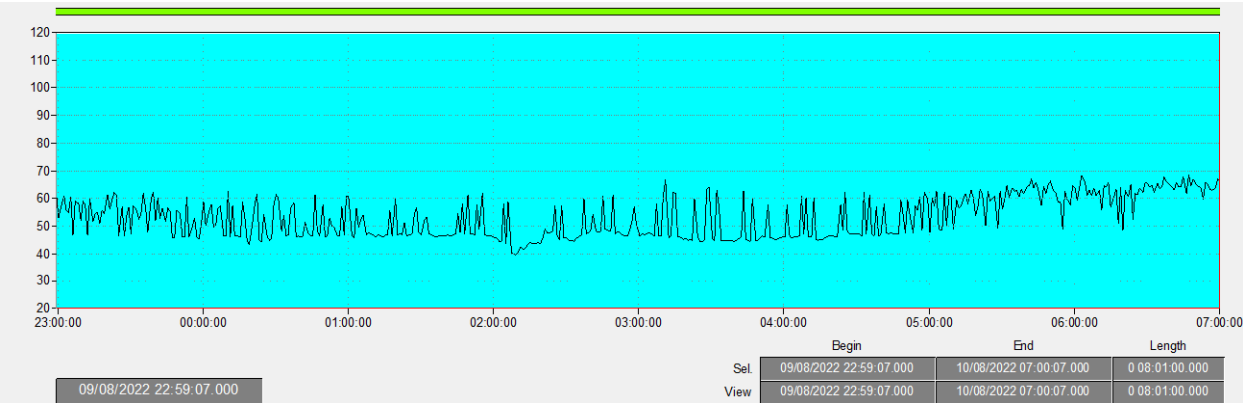
6.1.2 – The data has been analysed within NorReview, split and averaged for the applicable day and night measurements.

6.2 – Measured Data

6.2.1 – Below is the full data set recorded over the 24 hour period

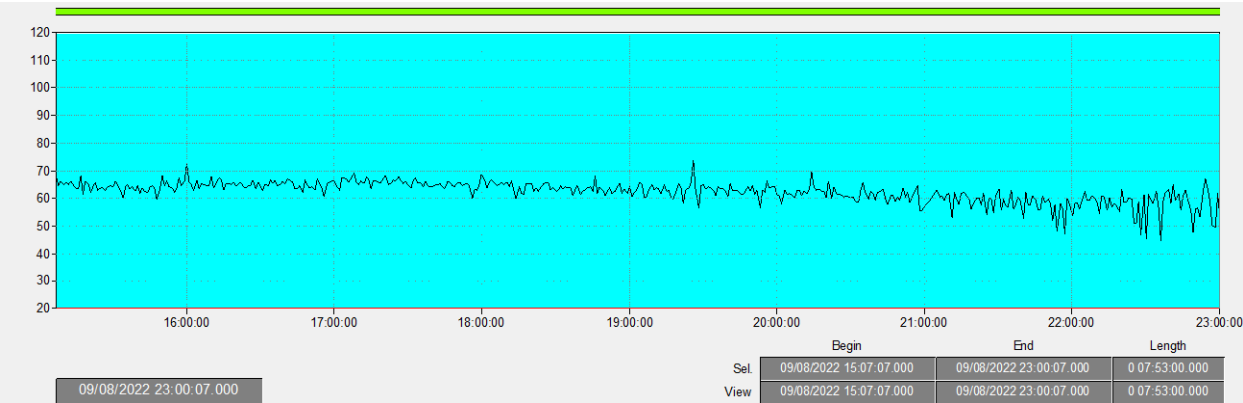


6.2.2 – Night time data – 09th August 23:00 – 10th August 07:00



L_{Aeq} 8 Hour – 59dB

6.2.3 – Day time data – 09th August 15:07 – 23:00



L_{Aeq} – 64dB

6.3 – BS8233 Assessment

6.3.1 BS8233 states that the internal noise levels are required to meet a certain standard along with the noise levels within the amenity areas of the dwellings.

The required levels are as below:

Table 4 Indoor ambient noise levels for dwellings

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	—
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	—
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

6.3.2 - The internal noise levels can be demonstrated from the noise measurements taken on site. Additional measures will need to be put into place during the development to ensure that internal noise levels according to BS8233 can be met

Day Windows

	dB	Commentary
External Noise Level	64dBA	This is the background noise level on-site during the day
Assumed façade reduction with the window open	15dBA	This is the maximum allowable façade reduction that can be allowed for with an opened window
Internal Noise level	49dBA	
Required by BS8233	35dBA	
Level Under/Over	14dBA	This is the total amount that the noise levels are over the BS8233 standards.

Night Windows

	dB	Commentary
External Noise Level	59dBA	This is the background noise level on-site during the night
Assumed façade reduction with the window open	15dBA	This is the maximum allowable façade reduction that can be allowed for with an opened window
Internal Noise level	44dBA	
Required by BS8233	30dBA	
Level Under/Over	14dBA	This is the total amount that the noise levels are over the BS8233 standards.

6.3.3 - As can be seen above, the internal noise levels during the day time and night are above that of the BS8233 standards.

6.3.4 - The results with windows closed are shown below:

Day Windows Closed

	dB	Commentary
External Noise Level	64dBA	This is the background noise level on-site during the day
Assumed façade reduction with the window closed	34dBA	This is the maximum allowable façade reduction
Internal Noise level	30dBA	
Required by BS8233	35dBA	
Level Under/Over	-5dBA	This is the total amount that the noise levels are over the BS8233 standards.

Night Windows Closed

	dB	Commentary
External Noise Level	59dBA	This is the background noise level on-site during the night
Assumed façade reduction with the window closed	34dBA	This is the maximum allowable façade reduction
Internal Noise level	25dBA	
Required by BS8233	30dBA	
Level Under/Over	-5dBA	This is the total amount that the noise levels are over the BS8233 standards.

6.3.5 - This reduction on the windows can be achieved by using a product such as 10mm / 16mm Argon / 6mm laminated glazing displayed below. This can also be achieved by using a secondary glazing system.

Glass	Sound reduction index (dB)									
	Octaveband Centre Frequency (Hz)						R _w (C _r ; C _{tr})	R _w	R _w + C	R _w + C _{tr}
	125	250	500	1000	2000	4000				
Single glazing										
4 mm Float Glass	17	20	26	32	33	26	29 (-2; -3)	29	27	26
6 mm Float Glass	18	23	30	35	27	32	31 (-2; -3)	31	29	28
8 mm Float Glass	20	24	29	34	29	37	32 (-2; -3)	32	30	29
10 mm Float Glass	23	26	32	31	32	39	33 (-2; -3)	33	31	30
12 mm Float Glass	27	29	31	32	38	47	34 (0; -2)	34	34	32
6 mm Laminated Glass	20	23	29	34	32	38	32 (-1; -3)	32	31	29
8 mm Laminated Glass	20	25	32	35	34	42	33 (-1; -3)	33	32	30
10 mm Laminated Glass	24	26	33	33	35	44	34 (-1; -3)	34	33	31
12 mm Laminated Glass	24	27	33	32	37	46	35 (-1; -3)	35	34	32
16 mm Laminated Glass	26	31	30	35	43	51	36 (-1; -3)	36	35	33
Insulating glass units										
4 mm / (6 - 16 mm) / 4 mm	21	17	25	35	37	31	29 (-1; -4)	29	28	25
6 mm / (6 - 16 mm) / 4 mm	21	20	26	38	37	39	32 (-2; -4)	32	30	28
6 mm / (6 - 16 mm) / 6 mm	20	18	28	38	34	38	31 (-1; -4)	31	30	27
8 mm / (6 - 16 mm) / 4 mm	22	21	28	38	40	47	33 (-1; -4)	33	32	29
8 mm / (6 - 16 mm) / 6 mm	20	21	33	40	36	48	35 (-2; -6)	35	33	29
10 mm / (6 - 16 mm) / 4 mm	24	21	32	37	42	43	35 (-2; -5)	35	33	30
10 mm / (6 - 16 mm) / 6 mm	24	24	32	37	37	44	35 (-1; -3)	35	34	32
6 mm / (6 - 16 mm) / 6 mm Laminated	20	19	30	39	37	46	33 (-2; -5)	33	31	38
6 mm / (6 - 16 mm) / 10 mm Laminated	24	25	33	39	40	49	37 (-1; -5)	37	36	32

The above are generally accepted values for generic products taken from EN 12758. They are conservative values that can be used in the absence of measured data.
 Data for laminated glass is based on pvb interlayers (excluding acoustic pvb interlayers). Glass thickness for laminated glass excludes interlayer thickness.
 Data can be adopted for air or argon gas-filled cavities

6.3.6 In addition to the glazing, mechanical ventilation will be required to any rooms with a window to allow for ventilation during summer months whilst still keeping within the noise levels outlined above. This will reduce the need for open windows and keep the noise within acceptable levels.

7.0 – On-Site Microphone Calibration

Microphone calibration: 114.0 dB 113.9dB = Drift of -0.1dB

(The drift value is within acceptable limits of +/-0.3dB)

8.0 – Technical Appendix

Class 1 Microphone: Norsonic 140 SLM

Calibrator: Norsonic 1251

SITE DATA:

Please see attached sheets sent with this document.

Laboratory Location

Campbell Associates Ltd

5b Chelmsford Road Industrial Estate
GREAT DUNMOW, Essex, GB-CM6 1HD
Phone 01371 871030



Certificate of Calibration and Conformance

Certificate number: **U38570**

Test Object: Sound Level Meter, BS EN IEC 61672-1:2003 Class 1
Associated Frequency Analyser to BS EN IEC 61260:1996 Class 1

Producer: Norsonic
Type: 140
Serial number: 1406414
Customer: E2 Consultants
Address: 3B South Park Way,
Wakefield 41 Business Park,
Contact Person: John Ashe
Order No:

Introduction:

Calibration has been performed as set out in CA Technical Procedures which are based on the procedures for periodic verification of sound level meters as per the **Test Object** listed above. Results and conformance statement are overleaf and detailed results, where appropriate, are provided in the attached Measurement Report.

Tested:	Producer	Type	Serial No	Certificate No
Microphone	Norsonic	1225	226969	38569
Calibrator*	Norsonic	1251	34494	U38568
Preamplifier	Norsonic	1209	20695	included

* The calibrator was complete with any required coupler for the microphone specified.

Additional items that have also been submitted for verification:

Wind shield -
Attenuator N/A
Extension cable

These items have been taken into account wherever appropriate.

Instruction manual: Im140_1Ed8R0En. Firmware version: v3.0.1842 The test object is a single channel instrument.

Conditions	Pressure kPa	Temperature °C	Humidity %RH
Reference conditions	101.325	23	50
Measurement conditions	100.19 +/-0.17	21.35 +/-0.1	48.28 +/-1.4

Calibration Dates:

Received date: 13/07/2021 Reviewed date: 29/07/2021
Calibration date: 28/07/2021 Issued date: 29/07/2021

Technicians: (Electronic certificate)

Calibrated by: *Palanivel Marappan B.Eng (Hons), M.Sc*

Reviewed by: *Darren Batten*

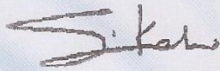
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Certificate of Competence in Environmental Noise Measurement

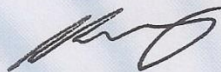
This is to certify that

John William Matthew Ashe

*has completed a course of instruction approved by the
Institute of Acoustics and designed to enable the candidate
to undertake environmental noise measurements in a
competent manner and has achieved a satisfactory
performance in the written and practical examinations
thereof and that this fact has been recorded in a
Register kept by the Institute for this purpose.*



Education Committee Chairman



Institute Secretary

Date 16 May 2014

Centre Leeds Metropolitan University

Reference Number EK161

*For the purposes of Credit Transfer or Professional Development this Certificate
may be considered to be equivalent to 25 points or hours*

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