



# Measurement of Environmental Noise

Report Reference Number: 12271-1

For:

Peter Mitchell

Project/Site Address

2 New Dwellings Land Adj 71 Woodhead Road, Honley, West Yorkshire, HD9 6PP

Prepared by

John Ashe

Test Date

13<sup>th</sup> September 2021

Report Date

15<sup>th</sup> September 2021

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Measurement Survey  
Undertaken By

Richard Stockdale

Report Completed By

John Ashe

## 2.0 – Objectives

E2 Consultants were instructed by Peter Mitchell to prepare a noise assessment. The report has been compiled following a request from the planners and environmental health regarding the erection of 2 new build detached houses on Woodhead Road.

The methodology used for the purpose of this assessment is BS8233 in order to confirm that the noise from the noise on the proposed site is within acceptable levels and if not, proposed mitigation measures to combat the noise levels.

The noise levels measured have been considered and assessed against this national guidance in order to establish the acceptability of the development.

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

An assessment has been requested to ensure that the noise levels at the new dwellings will be within acceptable levels according to BS8233 from the road traffic.

The dwellings are set back from the road by approximately 14 meters. This is shown on the below plan:



A good design of the properties mean that the amenity areas are at the rear of the property shielded from the road noise and thus reducing the rear noise levels significantly.

#### 4.0 – Microphone Position

The microphone was placed at the boundary of the dwellings directly adjacent to Woodhead Road. This was the most suitable place for measuring the noise levels as the microphone was left unattended for the duration of the survey

The measurement was taken at the boundary of the dwelling.

The Locations are marked on the below plan:

Measurement Time	Location	Duration	Reading Reference
13/09/2021 15:34 – 14/09/2021 09:20	Directly facing road	1.5 Hour	210913_0001

The microphone location is shown below with the red arrow:



## 5.0 – Uncertainties

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

- 1) A class one microphone has been used for the purpose of the survey (**Norsonic 140 SLM – serial number 1405312**).
- 2) Weather conditions – 90% cloud cover.

	<b>Before Measurements</b>	<b>After Measurements</b>
<b>Wind speed:</b>	<b>1m/s - NW</b>	<b>2m/s - NW</b>
<b>Humidity:</b>	<b>52%</b>	<b>52%</b>
<b>Temperature:</b>	<b>18°C</b>	<b>14°C</b>
<b>Barometric pressure:</b>	<b>1013mb</b>	<b>1013mb</b>

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

- 3) Noise levels at the time of the measurements were noted to be fairly constant with no sudden increases or decreases in noise levels.
- 4) 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

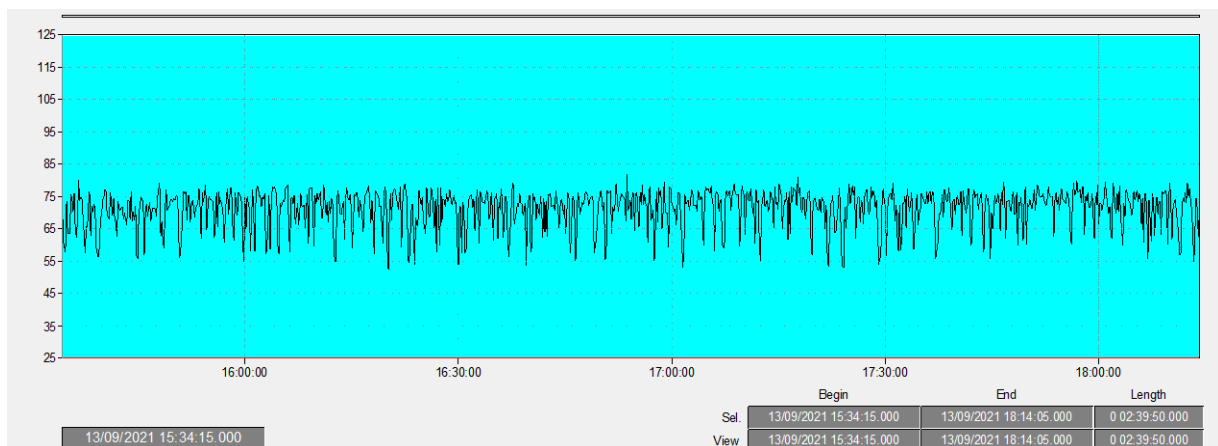
The data taken from site is shown below:

The microphone was left unattended for the duration of the survey, the site was empty with no work being carried out. Traffic levels had been noted as normal for the area at the start of the survey with no potential impact with the current COVID19 situation.

The measurement includes both day and night time periods which can be split using software into separate measurement. The graphs for these and total noise levels are shown below

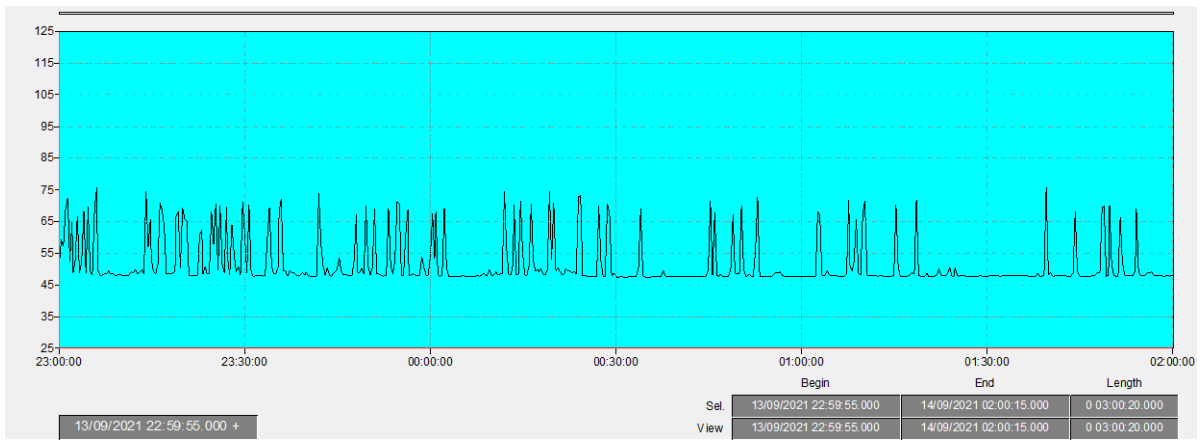
Measurement Time	Location	Laeq
13/09/2021 15:34 – 14/09/2021 09:20	Front of dwelling facing road.	71dB (entire measurement)

#### Day Time Rush Hour – 15:30 – 18:30



#### Laeq – 3 Hour – 74dB(A)

### Night time 23:00 – 02:00



Laeq – 62dB(A)

## 6.2 – BS8233 Assessment

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 $L_{Aeq,8hour}$

The internal noise levels can easily be demonstrated from the noise measurements taken on site. The document also states that the noise levels within the amenity area need to be below 50dB between the hours of 07:00 and 23:00, although an upper limit of 55dB may be acceptable.

### 6.1.3 – Conclusion

Below is a BS8233 assessment of the proposed new dwellings. However, as the measurement was taken at road side, a correction can be applied to the measured noise levels to take into account the distance from the measurement position to the house.

This distance was 10 meters from the microphone to proposed façade location with the microphone 2 meters from the road and the calculation can be seen below:

$$20\text{Log}(10/4) = 14\text{dB}$$

$$\text{Day time Noise levels} = 74\text{dB(A)} - 14\text{dB(A)} = 60\text{dB(A)} \text{ at façade}$$

$$\text{Night time noise levels} = 62\text{dB(A)} - 14\text{dB(A)} = 48\text{dB(A)}$$

#### Night Windows Open

	dB	Commentary
<b>External Noise Level (calculated at façade)</b>	48dB	This is the background noise level on-site during the night
<b>Assumed façade reduction with the window open</b>	15dB	This is the maximum allowable façade reduction that can be allowed for with an opened window
<b>Internal Noise level</b>	33dB	
<b>Required by BS8233</b>	30dB	
<b>Level Under/Over</b>	+3dB	This is the total amount that the noise levels are over the BS8233 standards.

#### Day Windows Open

	dB	Commentary
<b>External Noise Level</b>	60dB	This is the background noise level on-site during the night
<b>Assumed façade reduction with the window open</b>	15dB	This is the maximum allowable façade reduction that can be allowed for with an opened window
<b>Internal Noise level</b>	45dB	
<b>Required by BS8233</b>	35dB	
<b>Level Under/Over</b>	+10dB	This is the total amount that the noise levels are over the BS8233 standards.

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

To mitigate the noise during the day, acoustic trickle vents to achieve 2 – 4 air changes per hour will be required and installed along side windows within an acoustic rating.

Both the windows and trickle vents above should achieve a minimum of 34dB Rw + Ctr rating and should easily be achievable using standing double glazed unit.

The results with windows closed are shown below:

#### Night Windows Closed

	dB	Commentary
<b>External Noise Level (calculated at façade)</b>	48dB	This is the background noise level on-site during the night
<b>Assumed façade reduction with the window open</b>	34dB	This is the maximum allowable façade reduction
<b>Internal Noise level</b>	14dB	
<b>Required by BS8233</b>	30dB	
<b>Level Under/Over</b>	-16dB	This is the total amount that the noise levels are over the BS8233 standards.

Lmax during this period was 76dB taking into account the distance attenuation, the Lmax is 62dB. With the reduction of the windows at 34dB this would bring night time noise levels internally to 28dB which would be below that of the limit set out in the WHO Night time and day time standards.

#### Day Windows Closed

	dB	Commentary
<b>External Noise Level</b>	60dB	This is the background noise level on-site during the night
<b>Assumed façade reduction with the window open</b>	34dB	This is the maximum allowable façade reduction
<b>Internal Noise level</b>	26dB	
<b>Required by BS8233</b>	35dB	
<b>Level Under/Over</b>	-9dB	This is the total amount that the noise levels are over the BS8233 standards.

This reduction on the windows can be achieved by using a product such as 6mm / 16mm Argon / 6.8mm Pilkington Optiphon glazing displayed below:

## Sound insulation data for Pilkington **Optiphon™**

Glass	Sound reduction index (dB)									
	Octaveband Centre Frequency (Hz)						R <sub>w</sub> (C; C <sub>v</sub> )	R <sub>w</sub>	R <sub>w</sub> +C	R <sub>w</sub> +C <sub>v</sub>
	125	250	500	1000	2000	4000				
<b>Single glazing</b>										
6.8 mm Pilkington <b>Optiphon™</b>	22	26	31	37	40	40	36 (-1; -4)	36	35	32
8.8 mm Pilkington <b>Optiphon™</b>	27	29	34	38	40	43	37 (0; -2)	37	37	35
10.8 mm Pilkington <b>Optiphon™</b>	26	30	35	39	40	46	38 (-1; -3)	38	37	35
12.8 mm Pilkington <b>Optiphon™</b>	29	32	36	41	42	51	40 (-1; -3)	40	39	37
16.8 mm Pilkington <b>Optiphon™</b>	31	33	38	41	43	54	41 (-1; -3)	41	40	38
<b>Insulating glass units</b>										
6 mm / 16 mm argon / 6.8 mm Pilkington <b>Optiphon™</b>	21	28	37	48	48	54	40 (-2; -6)	40	38	34
6 mm / 16 mm argon / 8.8 mm Pilkington <b>Optiphon™</b>	25	27	38	48	47	55	41 (-2; -6)	41	39	35
8 mm / 16 mm argon / 8.8 mm Pilkington <b>Optiphon™</b>	21	30	39	47	50	55	42 (-3; -8)	42	39	34
10 mm / 16 mm argon / 8.8 mm Pilkington <b>Optiphon™</b>	28	31	42	45	50	58	44 (-2; -6)	44	42	38
10 mm / 20 mm argon / 8.8 mm Pilkington <b>Optiphon™</b>	28	36	43	47	49	58	46 (-2; -6)	46	44	40
8.8 mm Pilkington <b>Optiphon™</b> / 16 mm argon / 12.8 mm Pilkington <b>Optiphon™</b>	28	36	45	53	56	64	48 (-2; -7)	48	46	41
10.8 mm Pilkington <b>Optiphon™</b> / 24 mm argon / 16.8 mm Pilkington <b>Optiphon™</b>	35	41	48	53	55	65	52 (-2; -6)	52	50	46
12.8 mm Pilkington <b>Optiphon™</b> / 20 mm argon / 16.8 mm Pilkington <b>Optiphon™</b>	35	45	49	50	54	65	51 (-1; -4)	51	50	47

Measurements undertaken in accordance with BS EN ISO 10140 and R<sub>w</sub> (C; C<sub>v</sub>) determined in accordance with BS EN ISO 717-1.

For insulating glass units, there is little difference in the sound insulation for cavity widths in the range 6 to 16 mm.

To calculate performance data for Pilkington products, please use our Spectrum online calculator at <https://spectrum.pilkington.com/>

For glass combinations to achieve an R<sub>w</sub> value higher than 52 dB, please contact us for more details.



## 8.0 – Technical Appendix

Class 1 Microphone: Norsonic 140 SLM
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Calibrator: Norsonic 1251
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### **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: **U38564**

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: **1405312**  
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	168187	38563
Calibrator*	Norsonic	1251	34823	U38562
Preamplifier	Norsonic	1209	15370	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 - -  
Extension cable

These items have been taken into account wherever appropriate.

Instruction manual: Im140\_1Ed8R0En Firmware version: v2.1.670 The test object is a single channel instrument.

Conditions	Pressure kPa	Temperature °C	Humidity %RH
Reference conditions	101.325	23	50
Measurement conditions	100.04 +/-0.02	21.35 +/-0.15	48.65 +/-0.2

**Calibration Dates:**

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

**Technicians: (Electronic certificate)**

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

Reviewed by: *Darren Batten*

This certificate is issued in accordance with the laboratory accreditation requirements of the UKAS 1117 provides traceability of...

**Campbell Associates Ltd**  
 Sonitus House  
 5B Chelmsford Road Industrial Estate  
 Great Dunmow, Essex, CM6 1HD  
[www.campbell-associates.co.uk](http://www.campbell-associates.co.uk)  
 Phone: 01371 871030, Facsimile: 01371 879106



**CALIBRATION**

**0789**

**Certificate of Calibration**  
**Floor Tapping Machine**

**Certificate number: U32450**

**Manufacturer: Norsonic**  
**Type: 277**  
**Serial no: 2775929**

**Client: E2 Specialist Consultants Ltd**  
**3B South Park Way**  
**Wakefield Junction 41 Business Park**  
**Wakefield, WF2 0XJ**

**Contact Name: John Ashe**

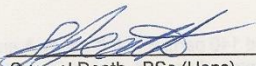
**Method:**

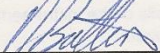
This certificate is issued against the requirements of Annex A of both BS EN ISO 16283-2:2015 and 140-6/7:1998 in respect of regular verification and also meet the requirements of UKAS publication LAB23 covering the verification of floor tapping machines used for building acoustics applications.

The machine was inspected for mechanical soundness and tested for electrical safety. It was cleaned and lubricated in accordance with the manufacturers instructions. The cams and hammer guides were inspected to ensure a free fall of the hammers. The mass of each of the hammers were measured in situ along with their curvature and diameter of the impact face. The machine was set up as per the manufacturers specification using the calibration gauge provided (where applicable) and checked for level, then the direction of fall of the hammer set was checked against the requirements of the standard. The time between successive hammer impacts was measured over a 30 second period and the mean and range of successive values calculated.

Environmental Conditions	Temperature	Relative Humidity
Reference Conditions:	23 °C	50 %RH
Measurement Conditions:	22.4 °C	53.5 %RH

Date received: 23 July 2019  
 Date of Calibration: 31 July 2019  
 Date of issue: 31 July 2019

Engineer:   
 Samuel Death - BSc (Hons)

Supervisor:   
 Darren Batten - Tech IOA

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

# *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*

The Institute of Acoustics Limited, 3rd Floor, St Peter's House, 45-49 Victoria Street, St Albans, Hertfordshire AL1 3WZ  
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