



Measurement of Environmental Noise

Report Reference Number: 9782-1

For:

Benz Travel Limited

Project/Site Address

Leek County Building, Fountain Street, Leek, Staffordshire, ST13 6JR

Prepared by

John Ashe

Test Date

30th September 2019

Report Date

02nd October 2019

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Measurement Survey
Undertaken By

Richard Stockdale



Report Completed By

John Ashe



2.0 – Objectives

E2 Consultants were instructed by Sunder Kripalani to prepare a noise assessment for the proposal of a material change of use of a currently disused office building into flats.

The methodology used for the purpose of this assessment is BS 4142. In order to determine the impact of the nearby public house and hotel on the proposal and the background noise levels of the area, noise levels were measured at a location closest to the nearby noise-sensitive dwellings most likely to be affected and away from the site in a location with similar background noise levels without the commercial noise. These measurements were taken during the day and night of 30th of September.

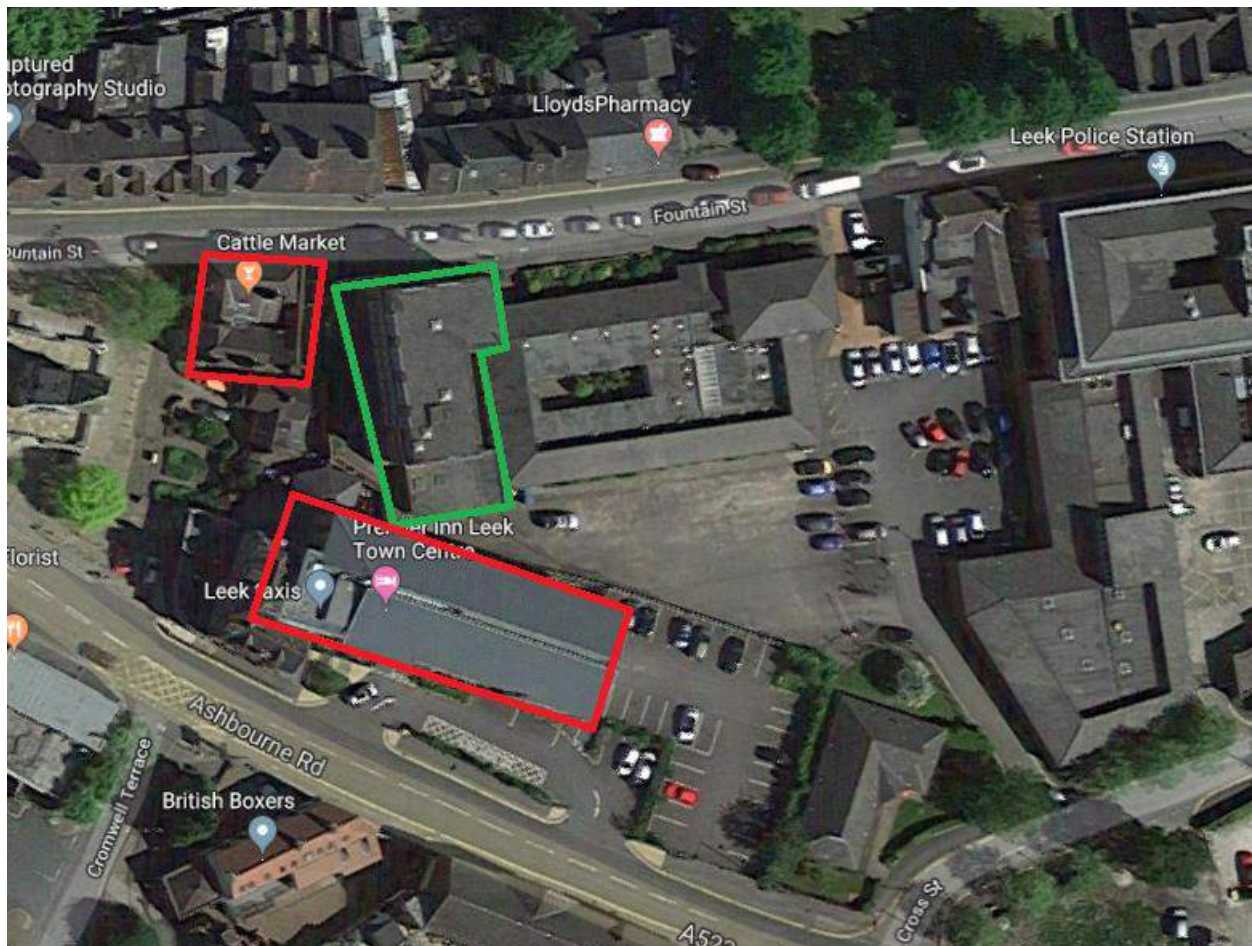
The noise levels measured have been considered and assessed against this national guidance in order to establish the acceptability of the development.

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

The proposal is currently an office building on

The proposal can be seen below highlighted in green with the potential problem sources highlighted in red:

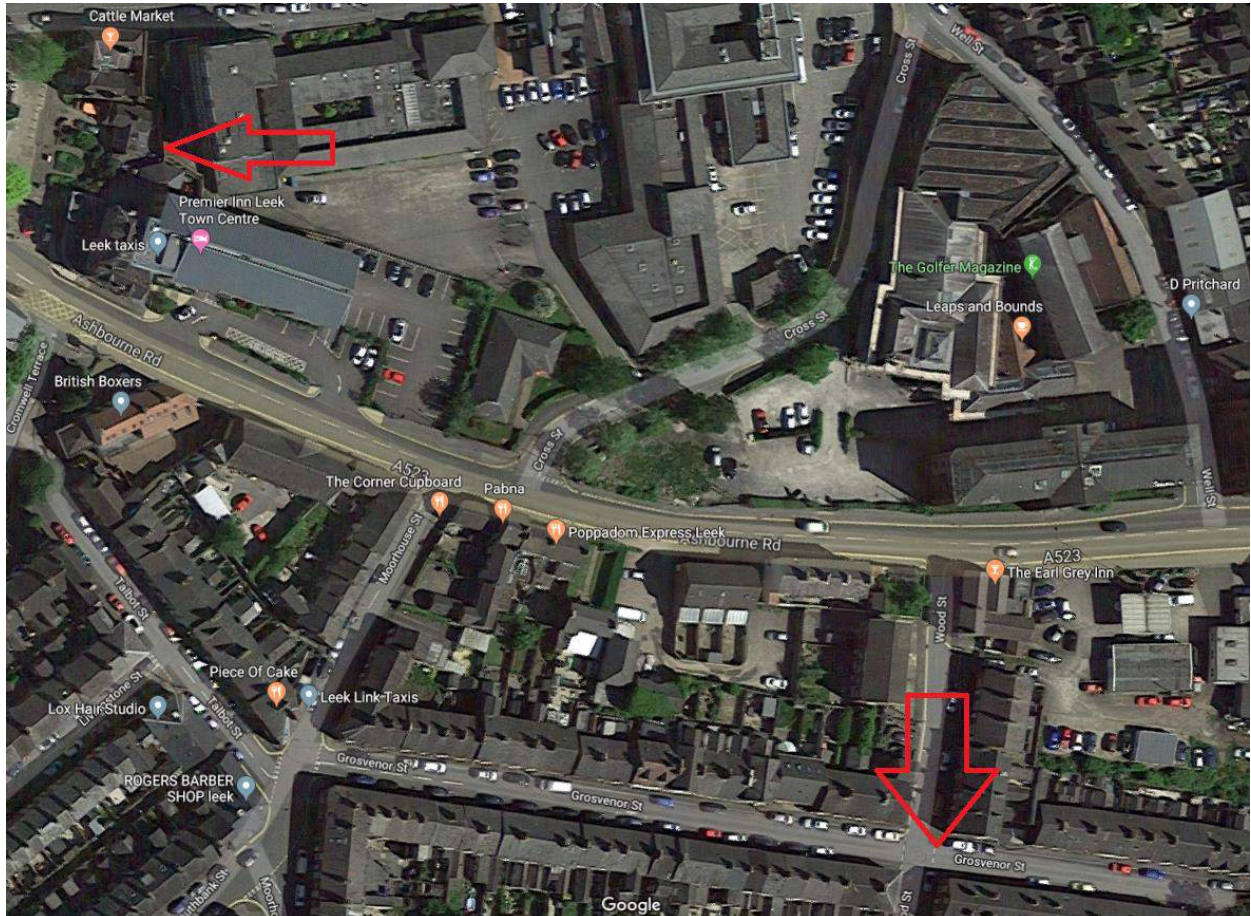


As can be seen in the above site image, there is a Premier Inn to the rear of the building and a public house to the side of the building both of which have the potential to cause adverse effects on the occupants of the building. Measurement's will be simulated internal measurements based on windows open using a maximum reduction in noise of 15dB.

4.0 – Microphone Position

The microphone was placed in location in which both the noise from the premier inn and the public house was audible on the site.

The locations can be seen below:



The following measurements were taken:

Measurement Time	Location	Duration	Reading Reference
30/09/2019 22:15 – 23:45	Proposed Development	1.5 Hours	190930r_0001
01/10/2019 00:20 – 01:50	Grosvenor St	1.5 Hours	191001r_0001
01/10/2019 11:04 – 12:34	Proposed Development	1.5 Hours	191001r_0002
01/10/2019 13:01 – 14:31	Grosvenor St	1.5 Hours	191001r_0003

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.

	Before Measurements	After Measurements
Wind speed:	1m/s - NW	2m/s - NW
Humidity:	52%	52%
Temperature:	14°C	10°C
Barometric pressure:	1013mb	1013mb

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 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

The data taken from site is shown below:

Measurement Time	Location	Laeq
30/09/2019 22:15 – 23:45	Proposed Development	57.3dB ~ 57dB

Measurement Time	Location	Laeq	L90
01/10/2019 00:20 – 01:50	Grosvenor St	46.1dB ~ 46dB	27.3dB

Measurement Time	Location	Laeq
01/10/2019 11:04 – 12:34	Proposed Development	69.3dB ~ 69dB

Measurement Time	Location	Laeq	L90
01/10/2019 13:01 – 14:31	Grosvenor St	56.7dB ~ 57dB	46dB

BS8233 Assessment

The main prevailing source of noise on the site is from the road traffic noise from Fountain Street and Ashborne Td. These roads carry both domestic vehicles and commercial vehicles for the surrounding areas.

The guidelines of BS8233:2014 which states the following:

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 $L_{Aeq,8hour}$

As can be seen in the above the measurements, the measured noise levels are not excessive and can be mitigated.

Windows:

Based on the above results all external windows to the building should achieve a minimum of 30dB + C_{tr} such as the below:

Sound insulation data for standard products

Glass	Sound reduction index (dB)									
	Octaveband Centre Frequency (Hz)						R _w (C; 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

As per EN 12758 the below is a generally accepted value for 10 mm / (6 - 16 mm) / 4 mm glazing will achieve 35dB + 5dB Ctr giving an overall reduction of 30dB + Ctr.

Any trickle ventilation installed to the windows likewise are to achieve a minimum Value of 32dB + Ctr.

Ventilation

Any ventilation on the front or rear elevations should be acoustically rated to achieve a minimum resistance of 32dB + Ctr to achieve acceptable internal noise levels such as the acoustic solutions from Greenwood AirVac.

However, mechanical ventilation to all rooms will be required as the maximum sound resistance as assumed from BS8233 with windows open are 15dB from outside to inside. Based on this the noise levels for the night time would be in excess of the requirements.

Mechanical ventilation will need to be installed to all living and bed rooms within the property and ensure that a minimum of 30dB + Ctr attenuation can be achieved.

BS4142 Assessment

As can be seen by the measurements taken, the noise levels on site from the commercial units adjacent to the property are audible.

This is mostly from installed plant equipment and external activities associated with the businesses.

The BS4142 assessment is below:

The predicted problem noise level at the nearest dwellings would be as below:

NIGHT

$$10\log(10^{5.7} - 10^{4.6}) = 56\text{dB}$$

DAY

$$10\log(10^{6.9} - 10^{5.6}) = 69\text{dB}$$

Background Noise Levels

NIGHT

L90 – 27dB

DAY

L90 – 46dB

As can be seen above the noise levels are in excess of the BS4142 standard for industrial noise.

However, there is no external amenity area for the development and internal noise levels should be assessed to BS8233 as above in which noise levels can be mitigated by the installation of new glazing and mechanical ventilation.

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.

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CALIBRATION



0789

Certificate number: U29823

Certificate of Calibration and Conformance

Test object: Sound Calibrator
Manufacturer: Norsonic
Type: 1251
Serial no: 33547

Customer: E2 Consultants
Address: E2 HOUSE, South Park Way,
Wakefield 41 Business Park,
Wakefield. WF2 0XJ.
Contact Person: John Ashe
Order No: 97451

Measurement Results:	Level	Level Stability	Frequency	Frequency Stability	Distortion
1:	114.06 dB	0.06 dB	1000.45 Hz	0.00 %	<0.3 %
2:	114.07 dB	0.06 dB	1000.45 Hz	0.00 %	<0.3 %
3:	114.06 dB	0.06 dB	1000.45 Hz	0.00 %	<0.3 %
Result (Average):	114.06 dB	0.06 dB	1000.45 Hz	0.00 %	<0.3 %
Expanded Uncertainty:	0.10 dB	0.02 dB	1.00 Hz	0.01 %	0.10 %
Degree of Freedom:	>100	>100	>100	>100	>100
Coverage Factor:	2.00	2.00	2.00	2.00	2.00

The stated level is relative to 20µPa. The level is traceable to National Standards.

The stated level is valid at reference conditions. The following correction factors have been applied during the measurement: Pressure: 0.0005 dB/kPa Temperature: 0.003 dB/°C Relative humidity: 0.000 dB/%RH Load volume: 0.0003 dB/mm³

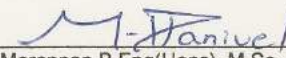
The reported expanded uncertainty of measurements is based on a standard uncertainty multiplied by the coverage factor of k=2, providing a level of confidence of approximately 95%. The uncertainty has been determined in accordance with UKAS requirements.

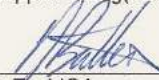
Records: K:\C A\Calibration\Nor-1504\Nor-1018 CalCal\2018\NOR1251_33547_M1.nmf

Environmental conditions:	Pressure:	Temperature:	Relative humidity:
Reference conditions:	101.325 kPa	23.0 °C	50 %RH
Measurement conditions:	101.362 ± 0.042 kPa	22.2 ± 0.1 °C	39.9 ± 1.2 %RH

Date received for calibration: 15/10/2018
Date of calibration: 17/10/2018
Date of issue: 17/10/2018
Engineer

Supervisor


Palanivel Marappan B.Eng(Hons), M.Sc


Darren Batten TechIOA

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Campbell Associates Ltd
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www.campbell-associates.co.uk
Phone 01371 871030 Facsimile 01371879106



CALIBRATION



0789

Certificate of Calibration and Conformance

Certificate No.: U25734

Test object: Sound Level Meter, BS EN IEC 61672-1:2003 Class 1 (Precision) and associated Frequency Analyser BS EN IEC 61260, Class 1
Manufacturer: Norsonic
Type: 140
Serial no: 1405312
Customer: E2 Specialist Consultants Ltd
Address: 3B South Park Way, Wakefield Junction 41 Business Park, Wakefield. WF2 0XJ.
Contact Person: John Ashe.

Method :

Calibration has been performed as set out in CA Technical Procedures TP01 & 02 as appropriate. These are based on the procedures for periodic verification of sound level meters as set out in BS EN IEC 61672-3:2006 and for electrical testing of frequency filters as set out in BS EN IEC 61260. Results and conformance statement are overleaf and detailed results are in the attached Test Report.

	Producer:	Type:	Serial No:	Certificate number
Microphone	Norsonic	1225	168187	25733
Calibrator*	Norsonic	1251	33547	U25732
Preamplifier	Norsonic	1209	15370	Included

Additional items that also have been submitted for verification

Wind shield	Norsonic	Nor1451
Attenuator	None	
Extension cable	None	

These items have been taken into account wherever appropriate.

Environmental conditions:	Pressure:	Temperature:	Relative humidity:
Reference conditions:	101.325 kPa	23.0 °C	50.0 %RH
Measurement conditions:	99.95 ±0.01kPa	22.4 ±0.2°C	48.5 ±2%RH

Date received : 24/05/2017
Date of calibration: 05/06/2017
Date of issue: 05/06/2017

Engineer


Michael Tickner

Supervisor


Darren Batten TechIOA

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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*

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