



Measurement of Environmental Noise

Report Reference Number: 7580-1

For: Nationwide Structures

Project/Site Address

Phoenix Works, Thurlstone, S36 9QU

Prepared by

John Ashe

Test Date

14th February 2018

Report Date

17th February 2018

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Measurement Survey
Undertaken By

John Ashe



Report Completed By

John Ashe

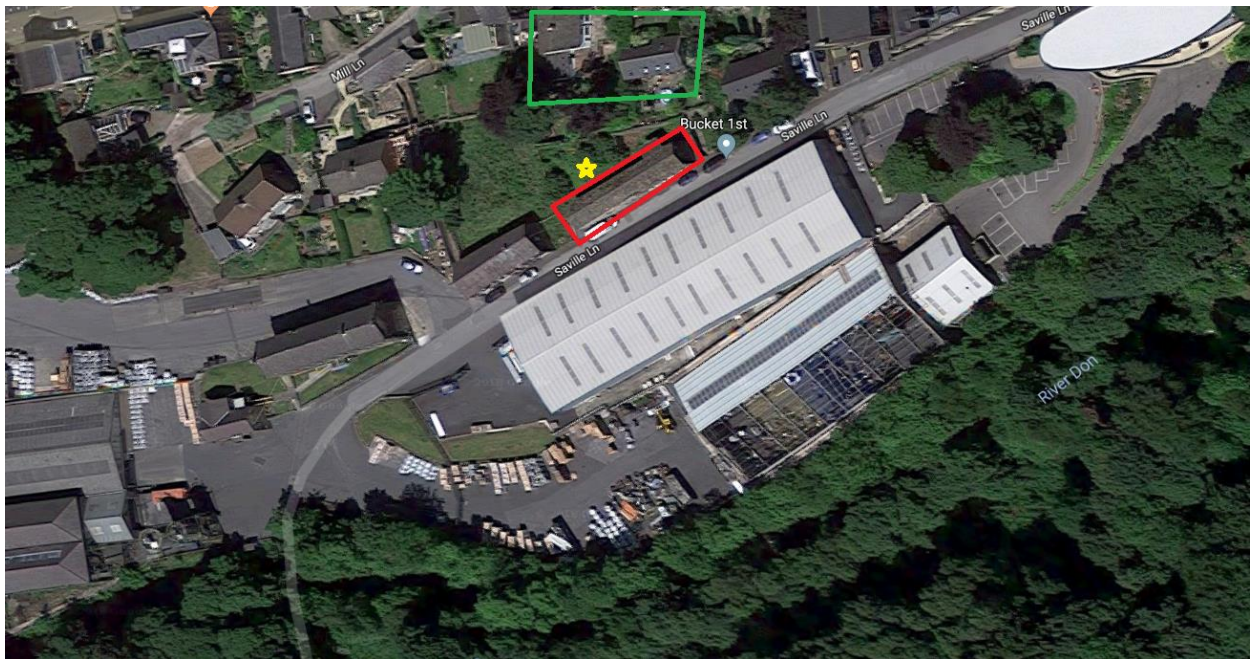


2.0 – Objectives

The purpose of the survey was to assess the proposed new building to be erected using a steel frame building to form a new metal fabrication workshop for the Phoenix Works company.

The report will be based from assumptions using general metal fabrication noise levels and by using generic façade resistance levels and improved façade resistance levels to create the proposed noise levels for the new building.

Below is the site plan of the existing site showing the existing building to be demolished highlighted in red. The nearest domestic dwellings highlighted in green and the microphone position highlighted in red.



3.0 – Site Description

The proposed development at Phoenix Works, Thurlstone, S36 9QU consists of a number existing industrial units, old buildings containing workshops and a new office / administration building.

The old administration building on the edge of the site boarding the nearest dwellings is to be demolished and replaced with a new metal fabrication building.

Pictures of the rear of the existing administration building are below showing the existing dwellings.





The main sources of noise on site are from the existing industrial units, road traffic noise from the main road at the top of the hill and site vehicles moving materials between buildings.

There is a hill directly to the rear of the building to be demolished meaning that the houses are at a higher level than the new proposed unit will be. As this is soft land, it will absorb some of the noise levels.

4.0 – Microphone Position

The microphone was placed at the rear of the of the administration building as close as possible to the dwelling without being on the hill.

The microphone was placed 4m away from the façade of the existing administration building on soft land.

No frequency analysis was done as the proposed unit is not yet constructed so the “problem” noise was not available to measure.

The following measurements were taken:

Measurement Time	Location	Duration	Reading Reference
10:54 – 11:24	At Site	1 Hour	180214-0001S

The closest dwelling to the proposed new metal fabrication unit is approximately 10m away.

5.0 – Uncertainties

The following has been done to minimise the uncertainty of the measurements:

- 1) A class one microphone has been used for the purpose of the survey. **Norsonic 140 SLM**
- 2) Weather conditions – 100% Cloud cover

	Before Measurements	After Measurements
Wind speed:	5mph - East	5mph - East
Humidity:	64%	64%
Temperature:	8°C	8°C
Barometric pressure:	1022mb	1023mb

- 3) Noise on site was fairly constant with no sudden increases or decreases in noise levels.
- 4) All results seen in this report will be rounded. (0.5 will be rounded up).
- 5) It was not possible to get access to the dwellings. Instead the measurement was done on the soft land to the rear of the building to be demolished and replaced. The Microphone was placed over 3.5m away from the façade of the building 1.3m high. Care was taken to avoid being too close to the hill.

6.0 – Recommendations

As can be seen from the results section of this report if the building is insulated acoustically to a good standard and have a minimum R_w value of 47dB then the noise from the proposed unit will not have an adverse effect on the existing dwellings.

However, there is still a number of things than can be done to further improve the reduction of noise at the nearest dwellings as below:

1. Ensure that the façade of the building directly facing the dwellings has no openings, as this will provide a weakness in the structure allowing extra noise break-out from the unit.
2. Ensure that all and any doors to the unit are kept closed as much as reasonably practicably to avoid excess noise break-out
3. A Fence/denser fence (than the existing) could be erected at the rear of the dwellings to provide a further barrier from the noise.
4. Ensure that any equipment is not directly connected to the façade of the building as this will cause vibration of the structure and could cause the structure to then become a noise source within itself.

The calculations in the results section of this report, do not take into account the effect of the hill directly to the rear of the dwellings or the shrubbery / existing fences in place. These would normally be expected to reduce noise levels further.

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 – Results

Time	Reading – LAeq dB	L90
11:12 – 12:12	49.9dB ~ 50dB	45.9dB

The "problem" noise, in terms of LAeq - termed the "ambient" noise level. For the purpose of this report, an estimate of predicted noise levels for a metal fabrication workshop will be used.

Noise excluding the "problem" noise in terms of both LAeq and LA90; these measurements are termed the "residual" and "background" noise levels respectively.

It would be predicted that internal noise levels within the workshop (with it being metal fabrication) would be at its highest levels 110dB. A typical cladding Rw value for metal cladding insulated with Rockwool Acoustic insulation is 47dB leaving the external noise (at the façade of the building) as 63dB (assuming no openings on the façade). Once this is calculated over the distance to the nearest property the problem noise level will be 42dB.

Since the noise from the proposed unit due to being metal fabrication, and assuming the use of equipment that may produce sudden loud noises, a 6dB penalty should be applied.

The background noise levels (L90) are then compared to the rating level. For the purpose of this survey the "rating" level should not exceed 10dB that of the background level (L90).

"Rating" Level = 48dB

Daytime Background Noise Level = 46dB

As can be seen the noise level will not be 5dB more than existing back ground noise levels

9.0 – 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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Certificate of Calibration and Conformance

CALIBRATION UKAS Laboratory 0789

Certificate Number:- U17883

Test object: Sound Level Meter, Class 1 (Precision)
Manufacturer: Norsonic
Type: 140
Serial no: 1405312
Customer: Elite Energy Assessors Ltd
Address: Unit 9 John O'Gaunts Trading Estate,
Off Leeds Road, Rothwell, Leeds. LS26 0JB.
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 set out in BS EN IEC 61672-3:2006. 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	17882
Calibrator*	Norsonic	1251	33547	U17881
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 %RH
Measurement conditions:	101.77 kPa	24.9 °C	38.0 %RH

Date received : 21/01/2015
Date of calibration: 27/01/2015
Date of issue: 27/01/2015

Engineer

Michael Tickner

Supervisor

Darren Batten Tech IOA

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CALIBRATION



UKAS Laboratory 0789

Certificate number: U17881

Certificate of Calibration and Conformance

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

Customer: Elite Energy Assessors Ltd
Address: Unit 9 John O'Gaunts Trading Estate,
Off Leeds Road, Rothwell, Leeds. LS26 0JB.
Contact Person: John Ashe.

Measurement Results:	Level	Level Stability	Frequency	Frequency Stability	Distortion
1:	114.03 dB	0.06 dB	1000.70 Hz	0.00 %	<0.3 %
2:	114.02 dB	0.06 dB	1000.70 Hz	0.00 %	<0.3 %
3:	114.01 dB	0.06 dB	1000.70 Hz	0.00 %	<0.3 %
Result (Average):	114.02 dB	0.06 dB	1000.70 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 20 μ Pa. 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%. Where the degrees of freedom are insufficient to maintain this confidence level, the coverage factor is increased to maintain this confidence level. The uncertainty has been determined in accordance with UKAS requirements.

Records: K:\C A\Calibration\Nor-1504\Nor-1018 CalCal\2015\NOR1251_33547_M1.nmf

Environmental conditions:	Pressure:	Temperature:	Relative humidity:
Reference conditions:	101.325 kPa	23.0 °C	50 %RH
Measurement conditions:	101.828 $\pm$ 0.042 kPa	24.5 $\pm$ 0.1 °C	38.1 $\pm$ 1.3 %RH

Date received for calibration: 16/01/2015
Date of calibration: 27/01/2015
Date of issue: 27/01/2015
Engineer

Supervisor

Michael Tjckner

Darren Batten TechIOA

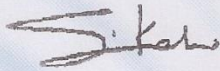
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Certificate of Competence in Environmental Noise Measurement

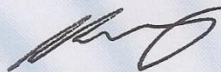
This is to certify that

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*

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Certificate of Competence in Environmental Noise Measurement

This is to certify that

Luke Edward Murphy

*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
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Register kept by the Institute for this purpose.*


Education Committee Chairman

Institute Secretary

Date 10 October 2014

Centre Leeds Beckett University

Reference Number EK166

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