



To:	Liam Garrow	of:	MSMCR
Author:	Ross Chamberlain	of:	AEC
Checked:	Paul Knowles	of:	AEC

59 Upper Chorlton Road – Verification Measurements

1.0 Introduction

- 1.1 Further to the request from Manchester City Council, AEC has returned to site to carry out verification measurements within the above development.
- 1.2 Noise measurements were undertaken within a living room on the ground floor of 59 Upper Chorlton Road, Manchester, between approximately 1300 and 1400h on Thursday 14 March 2024. The results of the measurements and our comments are presented in this technical note.
- 1.3 This letter is in support of AEC letter: P4465/L01a/RDC which provided the results of measurements undertaken within other rooms of the property. The original letter presented the results of a measurement carried out in the same living room. The measured internal noise level exceeded the requirements of Manchester City Council by 2dB due to the mechanical ventilation system not being balanced. The system has now been balanced and this letter provides the results of the updated measurements.

2.0 Measured Noise Levels and Comparison with Requirement

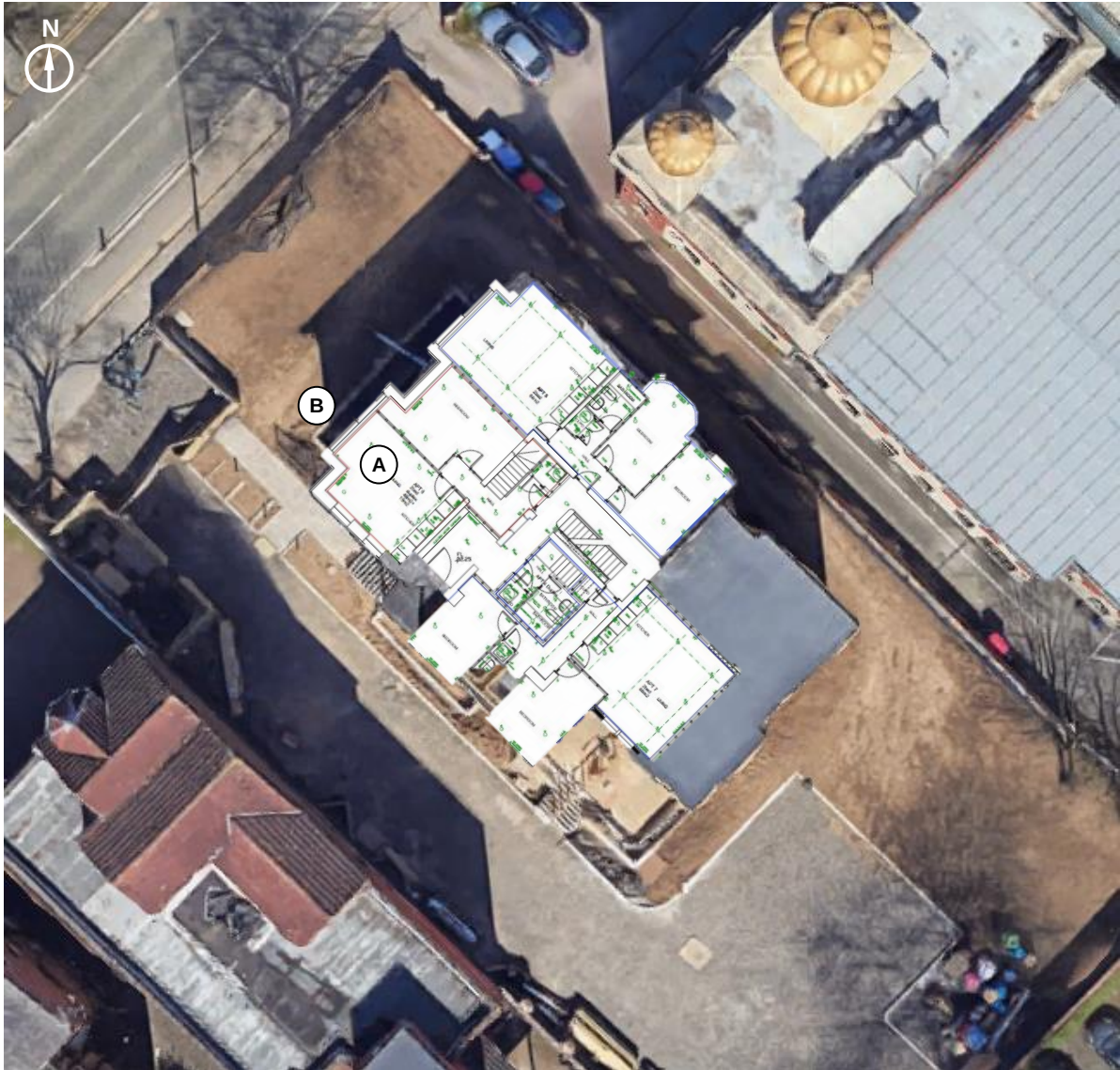
- 2.1 The measurements were carried out in general accordance with BS EN ISO 16283-3:2016 '*Acoustics – Field measurement of sound insulation in buildings and of building elements. Part 3: Façade Sound Insulation*' and the Association of Noise Consultants' document '*Measurement of Sound Levels in Buildings*'. A summary of the measurement survey and locations is in Appendix A and the results are shown in Appendix B. All calibration certificates for the equipment used during the survey is presented in Appendix C.
- 2.2 An external noise level measurement was carried out to confirm that the external noise climate was unchanged from AEC's original noise assessment.
- 2.3 However, given that the free-field ambient noise level external to the elevation facing Upper Chorlton Road was 3dB higher than during the original noise survey, the measurements have been accordingly corrected. It should be noted that AEC are satisfied that the noise climate was representative of typical conditions.
- 2.4 The resultant internal noise level measurement has been corrected by the above figure and the result is presented in Table 2.1, below, along with the Local Authorities required internal noise level limits for reference purposes.

Table 2.1 – Measured Resultant Level Difference & Calculated Internal Noise Levels

Meas. No. / Appendix A Ref	Floor	Room	Ambient Noise Level, dBL _{Aeq,T}		Criterion Met?
			Measured Noise Level	Criteria	
01 / A	Ground Floor	Living Room / Kitchen	30	35	✓

- 2.5 The noise levels were a combination of road traffic and the mechanical ventilation system.
- 2.6 As identified above, the Living Room has now met the requirements which should satisfy the requirements of Manchester City Council.

Appendix A – Measurement Location



A – Ground floor living room
B – External Measurement

Appendix B – Measurement Details

Table B.1 – Noise Survey Details

Date & Time of Survey:	Thursday 14 March 2024, 1404 – 1427h.					
Personnel:	Ross Chamberlain (AEC).					
Equipment Used:	B&K 2260 Real Time Analyser (AEC Kit 2).					
Calibration:	The sound level analysers, which conforms to BS EN 61672-1: 2013 ' <i>Electroacoustics – Sound level meters - Part 1 Specifications</i> ' for Class 1 Type Z meters, was in calibration and check calibrated before and after the measurement periods using a Brüel & Kjær type 4231 (94dB) calibrator. There was no significant drift of calibration. Calibration certificates are available on request.					
Weather Conditions:	Date	Period	Wet/Dry	Temp°C	Wind Speed & Direction	Cloud Cover
	12.05.23	Day	Dry	12°C	Negligible	50%
Measurement Details:	Measurements at Location B were undertaken under facade conditions. Measurements were undertaken over various periods in terms of L_{eq}, L_{90}, and L_{max} and were logged continuously over 1s for post processing and assessment. Full results for the measurements are given in Table B.2.					
Measured Data:	Full octave band centre frequency data was obtained for all measurements.					

Table B.2 – Measured Daytime Noise Levels

Location	Period, h	Noise Level, dB			Comments
		L_{Aeq}	L_{A90}	$L_{Amax, F}$	
A (Ground Floor Bedroom)	1404 - 1419	33.4	29.4	51.4	MVHR Running
B (North-West External Façade)	1422 - 1427	67.6	57.6	77.4	Dominated by road traffic.

Appendix C – Calibration Details

Certificate of Calibration Issued by University of Salford (Acoustic Calibration Laboratory)		
Page 1 of 2		
APPROVED SIGNATORIES Claire Lomax [] Sean Furlong [] Harry Bulger [x] Daniel Wong-McSweeney []		
acoustic calibration laboratory The University of Salford, Salford, Greater Manchester, M5 4WT, UK http://www.acoustics.salford.ac.uk t 0161 295 3030/0161 295 3319 f 0161 295 4456 e c.lomax1@salford.ac.uk		

Certificate Number: 06455/2

Date of Issue: 23 October 2023

VERIFICATION OF A TYPE 1 SOUND LEVEL METER to BS7580 Part 1

FOR:	Acoustic & Engineering Consultants Ltd Suite 316, 3rd Floor Broadstone Mill Broadstone Road Stockport Cheshire SK5 7DL
FOR THE ATTENTION OF:	Ross Chamberlain
DATE RECEIVED:	26/09/2023
CALIBRATION DATE:	23/10/2023
LOCATION OF CALIBRATION:	Acoustic Calibration Laboratory, Newton G31, University of Salford
TEST PROCEDURE:	CTP08 (Laboratory Manual)

Equipment details:-

Type	Manufacturer	Model	Serial Number
Sound Level Meter	B&K	2260	2305157
Microphone	B&K	4189	2573885
Preamplifier	B&K	ZC 0026	3630
Calibrator	Cirrus	CR-517	94328

Test Engineer (initial):	GP	Name:	Gary Phillips
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Results in this certificate relate only to instruments tested.

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 the units of measurement realized at the National Physical Laboratory or other recognized 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 Calibration

Issued by University of Salford (Acoustic Calibration Laboratory)

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Certificate Number: 06455/2

Date of Issue: 23 October 2023

SET-UP INFORMATION

The instrument was running software module BZ7202 Version 2.0. The tests were performed with the pre-amplifier directly connected to the instrument. The reference range, reference SPL, primary indicator range, pulse range and linearity range as specified by the manufacturer have been used. The instrument was adjusted to read 94.1 dB (A) in response to the associated calibrator. This reading was obtained from the calibration certificate of the calibrator, 06455/1 and information in the manufacturer's instruction manual, when the instrument is fitted with the supplied UA0237 windscreen.

MEASUREMENTS

The levels of self-generated noise were 14.7 dB (A), 16.5 dB (C), 23.6 dB (Lin).

At the end of the tests the indication of the sound level meter in response to the associated sound calibrator was 94.1 dB (A) which corresponds to the following level at 101.325 kPa:

Sound Pressure Level 94.1 dB (A)

This reading should be used henceforth to set up the sound level meter for field use.

THE SOUND LEVEL METER WAS VERIFIED ACCORDING TO THE PROCEDURE GIVEN IN BS7580: Part 1 1997 WITH THE FOLLOWING EXCEPTIONS:

A stricter test than that specified in 5.5.10 and 5.5.11 of BS 7580 has been used by not applying the low-level signal.

STATEMENT OF RESULT:

THE SOUND LEVEL METER CONFORMS* TO THE TYPE 1 REQUIREMENTS OF BS7580: PART1 1997.

*Specification: Calibration and tolerances as defined by the requirements defined in BS 7580 Part 1: 1997.

*Decision Rule: Conformance is demonstrated when the instrument conforms with the accuracy requirements defined in BS 7580 Part 1: 1997 AND the expanded measurement uncertainty ($k = 2$ for approximately 95 % coverage probability) is no greater in magnitude than the accuracy requirements in defined in BS 7580 Part 1: 1997.

Instruments used in the verification procedure were traceable to National Standards. The method of acoustic calibration employed a standard sound pressure calibrator for the 1 kHz test whilst the tests at 125 Hz and 8 kHz were performed by the electrostatic actuator method. The uncertainty of the Laboratory's 1 kHz calibrator was ± 0.07 dB. The uncertainty of the standard calibrator is not included in the applied tolerances. It is assumed that the sound level meter was manufactured in accordance with BSEN60651: 1994 Type 1, and BSEN60804: 1994 Type 1.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a level of confidence of approximately 95%. All measurement results are retained at the acoustic calibration laboratory for at least four years.

-----END OF CERTIFICATE-----

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 the units of measurement realized 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.

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APPROVED SIGNATORIES Claire Lomax [] Sean Furlong [] Harry Bulger [x] Daniel Wong-McSweeney []		
acoustic calibration laboratory The University of Salford, Salford, Greater Manchester, M5 4WT, UK http://www.acoustics.salford.ac.uk t 0161 295 3030/0161 295 3319 f 0161 295 4456 e c.lomax1@salford.ac.uk		



Certificate Number: 06445/1 Date of Issue: 23 October 2023

CALIBRATION OF A SOUND CALIBRATOR

FOR: Acoustic & Engineering Consultants ltd
Suite 316, 3rd Floor
Broadstone Mill
Broadstone Road
Stockport
Cheshire
SK5 7DL

FOR THE ATTENTION OF: Ross Chamberlain

DESCRIPTION: Calibrator with housing for half-inch microphones.

MANUFACTURER: Cirrus

TYPE: CR:517

SERIAL NUMBER: 94328

DATE RECEIVED: 6 October 2023

DATE OF CALIBRATION: 19 October 2023

LOCATION OF CALIBRATION: Acoustic Calibration Laboratory,
Newton G31, University of Salford.

TEST PROCEDURE: CTP06 (Laboratory Manual)

Test Engineer (initial): GP Name: Gary Phillips

Results in this certificate relate only to instruments tested.

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Certificate of Calibration

Issued by University of Salford (Acoustic Calibration Laboratory)

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Certificate Number: 06445/1

Date of Issue: 23 October 2023

MEASUREMENTS

The sound pressure level generated by the calibrator was measured using a calibrated, WS2P condenser microphone as specified in this certificate. The calibration was carried out with the calibrator in the half-inch configuration.

Five determinations of the sound pressure level, frequency and total distortion were made.

The reported results are valid at the environmental conditions at the time of calibration. Corrections to the stated level may be required depending on the actual environmental conditions at the time of use. Consult the manufacturer's instruction manual for further information.

RESULTS

Coupler configuration: Half-inch
Microphone type: GRAS 40AG
Output level (dB re 20 μ Pa): 93.99 dB $\pm$ 0.12 dB
Frequency (Hz): 1000.35 Hz $\pm$ 0.12 Hz
Total Distortion (%): 0.38 % $\pm$ 0.26 %

Average environmental conditions at the time of measurement were:

Pressure: 97.576 kPa $\pm$ 0.014 kPa
Temperature: 22.8 °C $\pm$ 0.4 °C
Relative humidity: 48.4 % $\pm$ 2.7 %

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%.

All measurement results are retained at the acoustic calibration laboratory for at least four years.

-----END OF CERTIFICATE-----

This certificate provides traceability of measurement to the SI system of units and/or to the 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.