Chapter 12 Noise

Turley

Appendix 12.1 Noise Monitoring Locations

Turley

Appendix 12.1: Noise Monitoring Locations

Figure B.1: Sound level meter on a tripod on Bradford Road

Figure B.2: Sound level meter on a tripod on Cliff Hollins Lane

Figure B.3: Sound level meter on a tripod on west boundary of residential zone, along Cliff Hollins Lane

Appendix 12.2 Calibration Certificates

Turley

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5b Chelmsford Road Industrial Estate
GREAT DUNMOW, CM6 1HD, England
www.campbell-associates.co.uk
info@campbell-associates.co.uk
Phone 01371 871030 Facsimile 01371879106

CALIBRATION UKAS Laboratory 0789

Certificate number: U13982

Certificate of Calibration and Conformance

Test object:	**Sound Calibrator**
Manufacturer:	**Brüel and Kjær**
Type:	**4231**
Serial no:	**2328978**
Customer	AECOM
Address	6th Floor, One New York Street, Manchester. M1 4HD
Contact Person	Jon Casey

Measurement Results:	Level	Level Stability	Frequency	Frequency Stability	Distortion
1:	93.91 dB	0.01 dB	999.97 Hz	0.00 %	0.35 %
2:	93.91 dB	0.01 dB	999.97 Hz	0.00 %	0.35 %
3:	93.91 dB	0.01 dB	999.97 Hz	0.00 %	0.35 %
Result (Average):	**93.91 dB**	**0.01 dB**	**999.97 Hz**	**0.00 %**	**0.35 %**
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: 0.00008 dB/kPa Temperature: 0.0015 dB/°C Relative humidity: 0.001 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 AVCalibration\Nor-1504\Nor-1018 Cal\Cal\2013\BNK4231\U1_2328978_MT.xml

Environmental conditions:	Pressure:	Temperature:	Relative humidity:
Reference conditions:	101.325 kPa	23.0 °C	50 %RH
Measurement conditions:	102.763 ± 0.043 kPa	22.1 ± 0.1 °C	60.9 ± 2.0 %RH

Date received for calibration: 03/07/2013
Date of calibration: 08/07/2013
Date of issue: 09/07/2013
Engineer:

Michael Tickner

Supervisor:

Darren Batten TechIOA

Template FE v2.0

Calibration Report

Certificate No.:14442

Norsonic Type: 118 Serial no: 31509

Customer: AECOM
Address: 6th Floor, 1 New York Street, Manchester. M1 4HD.
Contact Person: Jon Casey.

Instrument software version: V2.0.752

Microphone:	GRAS	Type: 40AF	Serial no: 95658	Sens: 25.98dB
Preamplifier	Norsonic	Type: 1206	Serial no: 30651	
Calibrator:	Norsonic	Type: 1251	Serial no: 27485	Level:114.06dB

Mains adapter was included
This sound level meter has been calibrated as specified in BS 7580. PART 1. 1997. The results are traceable to NPL, UK.

Measurement Results

Calibration of sound level meter - BS7580 Clause 5.4	Passed
Noise test - BS 7580 Clause 5.5.2	Passed
Level Linearity Test - BS 7580, Clause 5.5.3	Passed
Frequency weightings: A Network - BS 7580 Clause 5.5.4	Passed
Frequency weightings: C Network - BS 7580 Clause 5.5.4	Passed
Frequency weightings: Z Network - BS 7580 Clause 5.5.4	Passed
Time weightings F and S - BS7580 Clause 5.5.5	Passed
Peak response - BS7580 Clause 5.5.6	Passed
RMS accuracy - BS7580 Clause 5.5.7	Passed
Time weighting I - BS7580 Clause 5.5.8	Passed
Integrating Test : Time averaging - BS7580 Clause 5.5.9	Passed
Integrating Test : Pulse range - BS7580 Clause 5.5.10	Passed
Integrating Test : Sound exposure level - BS7580 Clause 5.5.11	Passed
Overload SPL Test - BS 7580 Clause 5.5.12	Passed
Overload Leq Test - BS 7580 Clause 5.5.12	Passed
Acoustic tests - BS 7580 Clause 5.4 and 5.5	Passed
Summation of acoustic tests - BS 7580 Clause 5.5.4	Passed

The sound level meter in the configuration tested conforms to the requirements of BS 7580 Part 1.

Comment:
Correct level with associated calibrator is 113.9dB(A).

Environmental conditions:

Pressure:	Temperature:	Relative humidity:
99.492 kPa	23.0 °C	48.5 %RH

Date of calibration: 16/09/2013
Date of issue: 16/09/2013
Supervisor: Darren Betten Tech/OA
Engineer

Michael Tickner

Campbell Associates

Software version: 5.0d

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CALIBRATION UKAS Laboratory 0789

Certificate number: U15805

Certificate of Calibration and Conformance

Test object:	**Sound Calibrator**
Manufacturer:	**Norsonic**
Type:	**1251**
Serial no:	**27485**
Customer:	AECOM
Address:	6th Floor, One New York Street. Manchester, M1 4HD.
Contact Person:	Jon Casey

Measurement Results:	Level	Level Stability	Frequency	Frequency Stability	Distortion
1:	114.03 dB	0.06 dB	999.40 Hz	0.00 %	<0.3 %
2:	114.02 dB	0.06 dB	999.40 Hz	0.00 %	<0.3 %
3:	114.03 dB	0.06 dB	999.40 Hz	0.00 %	<0.3 %
Result (Average):	**114.03 dB**	**0.06 dB**	**999.40 Hz**	**0.00 %**	**<0.3 %**
Expanded Uncertainty:	0.10 dB	0.02 dB	1.00 Hz	0.01 %	0.12 %
Degree of Freedom:	>100	>100	>100	>100	27
Coverage Factor:	2.00	2.00	2.00	2.00	2.13

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%. 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 CalCa\2014\NOR1251_27485_M1.mwf

Environmental conditions:	Preasure:	Temperature	Relative humidity:
Reference conditions:	101.325 kPa	23.0 °C	50 %RH
Measurement conditions:	99.774 ± 0.043 kPa	23.0 ± 0.1 °C	48.1 ± 1.8 %RH

Date received for calibration: 11/03/2014
Date of calibration: 20/03/2014
Date of issue: 20/03/2014
Engineer:

Michael Tickner

Supervisor:

David Egan - Laboratory Manager

Norsonic

Certificate of Calibration

Certificate No.: CAL 022-2015-5248

Test object:	Sound Calibrator
Manufacturer:	Norsonic
Type:	1251
Serial no:	34393

Customer:

	Level	Level Stability	Frequency	Frequency Stability	Distortion
Measurement Results:	114,01 dB	0,05 dB	1000,08 Hz	0,00 %	0,40 %
Expanded Uncertainty:	0.11 dB	0.02 dB	1.0 Hz	0.1 %	0.2 %

The stated levels are relative to 20μPa.
The stated level is valid at reference conditions.The following correction factors have been applied during the measurement:
Pressure: 0,0005 dB/kPa Temperature: 0,000 dB/°C Relative humidity: 0,000 dB/%RH Load volume : 0,0003 dB/mm3
The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k, which for a t-distribution with the reported effective degree of freedom corresponds to coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA publication EA-4/02.

Records: L:\PROJECTS\CALLAB\PROGRAM\Cal\2015\NOR1251_34393_M1.nmf

	Pressure:	Temperature:	Relative humidity:
Environmental conditions:			
Reference conditions:	101,325 kPa	23,0 °C	50 %RH
Measurement conditions:	99,000 ± 0,010 kPa	23,7 ± 0,2 °C	37,5 ± 1,0 %RH

Date received for calibration:	
Date of calibration:	2015-04-09
Date of issue:	2015-04-09
Engineer	Terje Hansen
Supervisor	

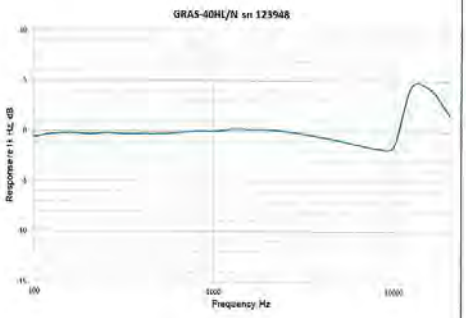
Terje Hansen

Calibration Report

Certificate Number:-16528

Manufacturer: GRAS
Type: 40HL-N
Serial no: 123948

Customer: AECOM
Address: 6th Floor, One New York Street, Manchester. M1 4HD.
Contact Person: Jon Casey.



Measurement Results:

	Sensitivity: (dB re 1V/Pa)
1:	-1.48
2:	-1.49
3:	-1.51
Result (Average):	**-1.49**
Expanded Uncertainty:	0.10
Degree of Freedom:	>100
Coverage Factor:	2.00

The following correction factors have been applied during the measurement:
Pressure:0.000 dB/kPa Temperature:0.000 dB/°C Relative humidity:0.000 dB/%RH

Reference Calibrator: WSC6 - B&K-4231-1882939 Volume correction: 0.000 dB
Records:K:\C A\Calibration\Nor-1504\Nor-1017 MicCal\2014\GRAS40HL-N_123948_M2.nmf
Measurement procedure: TP05
All results quoted are directly traceable to National Physical Laboratory, London

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k = 2, which for a normal distribution corresponds to coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA publication EA-4/02.

Comment:

Environmental conditions:

Pressure:	Temperature:	Relative humidity:
101.447 ± 0.040 kPa	22.1 ± 0.4 °C	50.1 ± 2.6 %RH

Date of calibration: 03/07/2014
Date of issue: 03/07/2014

Supervisor : David Egan, Laboratory Manager
Engineer :

Ian Campbell MSc MIOA
Software version: 6.0h

Campbell Associates
www.campbell-associates.co.uk

CERTIFICATE OF CALIBRATION

ISSUED BY AV CALIBRATION

Date of issue 08 January 2014 Certificate N° 07487

UKAS CALIBRATION
0653

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Email: lab@avcalib.co.uk
www.avcalibration.co.uk
Acoustics Noise and Vibration Ltd trading as AV Calibration

Approved Signatory

G. Parry [ ] B. Baker [✓]

CLIENT	URS Infrastructure & Environment UK Ltd 12 Regan Way Chetwynd Business Park Chilwell Notts NG9 6RZ
F.A.O.	David Gerard
ORDER No	CH 73253 Job No UKAS13/12271/02
DATE OF RECEIPT	11 December 2013
PROCEDURE	AV Calibration Engineer's Handbook, section 25: periodic testing of sound level meters to IEC 61672-3:2006 (BS EN 61672-3:2006) as modified by UKAS TPS 49 Edition 2:June 2009
IDENTIFICATION	Sound level meter Norsonic type 140 serial No 1403909 connected via a preamplifier type 1209 serial No 13283 to a half-inch microphone type GRAS 40AF serial No 102590. Associated calibrator Brüel & Kjær type 4231 serial No 3005464 with a one-inch housing and adapter type UC 0210 for half-inch microphone.
CALIBRATED ON	08 January 2014
PREVIOUS CALIBRATION	Calibrated on 20 December 2011, Certificate No. 06278 issued by this laboratory.