

Café Bianco
19-21 The Parade, High Street, Watford

Environmental Noise Survey and Noise Impact Assessment Report 1328.00

Prepared for

Café Bianco
19-21 The Parade
High Street
Watford

5 March 2021

By

dBa Acoustics
Acoustic Consultancy

Railway Cottage
49 Arnold Road
WOKING
Surrey
GU21 5JX

01483 771282
david@dbaacoustics.co.uk
www.dbaacoustics.co.uk

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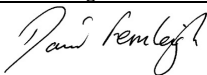
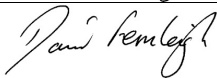
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Report	Signed	Name and Position	Relevant Qualification
Undertaken and Prepared By		David Fernleigh Principal	MIOA
Checked By		David Fernleigh Principal	MIOA

This report has been prepared with all reasonable skill and care by dBA Acoustics for the Client named. The information contained herein is the property of, and confidential to, the Client. Any third party information required and/or provided for the completion of this report should not be considered as verified by dBA Acoustics, unless otherwise stated.

1.0 Introduction

1.1 New items of building services plant have recently been installed to the rear of Café Bianco, 19-21 The Parade, High Street, Watford. Retrospective planning permission is sought for these items.

1.2 dBA Acoustics have been commissioned to undertake a noise impact assessment in accordance with the requirements of the Local Authority and, if/where possible, provide outline guidance for the control of noise.

1.3 This report concerns the assessment and/or control of atmospheric noise and/or vibration affecting neighboring noise sensitive property. Detailed mechanical, structural, H, S&E, conservation and legal considerations are beyond the expertise of this practice and should be dealt with by the relevant professional service providers.

1.4 Where sound pressure levels are quoted, they are in decibels ref: 2×10^{-5} Pa. Where sound power levels are quoted, they are in decibels ref: 1×10^{-12} W, unless otherwise indicated.

2.0 Summary

2.1 A part manned, part automated environmental noise survey has been undertaken at the project site. The prevailing background noise and plant noise emissions have been quantified.

2.2 A noise impact assessment has been undertaken in accordance with BS4142:2014 (+A1:2019) in order to assess the noise impact at the worst affected residential receptor.

2.3 The noise impact assessment of the unmitigated plant indicates significant adverse impact.

2.4 Mitigation measures have been detailed such that the noise emissions can be reduced to a level indicating low impact.

3.0 Site

3.1 The image below shows the project site (at ground floor) of the building. The plant area is at the rear. The nearest residential property is at 1st floor level directly above:



Image Courtesy © Ordnance Survey 2021 (north top of the page)

4.0 Survey

4.1 Part manned, part automated environmental noise monitoring was undertaken for approximately 2 hours commencing approximately 07:45 on Wednesday 24 February 2021. The prevailing L_{Aeq} , L_{Amax} and L_{A90} levels were logged at 15, 5 or 1minute intervals. The following sound level meters and calibrator were deployed:

Table 1

1 Static, at 1m from receptor	SLM	Preamplifier	Microphone	Calibrator
Manufacturer	Norsonic AS	Norsonic AS	Norsonic AS	B&K
Type	140	1209	1225	4231
Serial No.	1405948	15806	212903	1839133
Latest Calibration	26/06/2020			18/11/2020
Certificate No.	35058			U36013

Table 2

2 Hand Held	SLM	Preamplifier	Microphone	Calibrator
Manufacturer	Norsonic AS	Norsonic AS	Norsonic AS	B&K
Type	140	1209	1227	4231
Serial No.	1406112	20299	151737	1839133
Latest Calibration	18/11/2020			18/11/2020
Certificate No.	U36332			U36330

4.2 The calibration of the sound level meters used complies with IEC 61672-3:2006 class 1.

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4.3 The static sound level meter was tripod mounted at a height of approximately 2.2m above the rear flat roof. The monitoring location was approximately 1m from the nearest window of the 1st floor residential dwelling as shown in the photo below:



4.4 A proprietary windshield was deployed. The entire signal path was checked for calibration pre and post survey. The calibrated meter readings pre and post survey indicated no calibration shift greater than 0.1dB.

4.5 In order to gain a better understanding of the impact of the noise sources further short-term measurements were undertaken close to the plant using a hand held sound level meter.

4.6 For the hand held measurements a proprietary windshield and extension cable was deployed. The entire signal path was checked for calibration pre and post survey. The

calibrated meter readings pre and post survey indicated no calibration shift greater than 0.1dB.

4.7 The following table details the weather conditions during the survey period:

Table 3

Condition	Beginning	End
Wind Speed ms^{-1}	<1.5	<2.1
Wind Direction (from)	northeast	northeast
Precipitation or Fog	no	no
Wet Ground	no	no
Frozen Ground or Snow	no	no
Temperature $^{\circ}\text{C}$	12	13
Cloud Cover %	50	90

4.8 When building services plant noise emissions were not present, the prevailing ambient sound was noted to be dominated by road traffic noise and birdsong.

4.9 The conditions measured or noted above were deemed acceptable for obtaining suitably representative measurements of the currently prevailing noise levels. However, due to reduced business and traffic activity as a result of the coronavirus lockdown the environmental noise levels obtained may be lower than those that might be typical in the past/future.

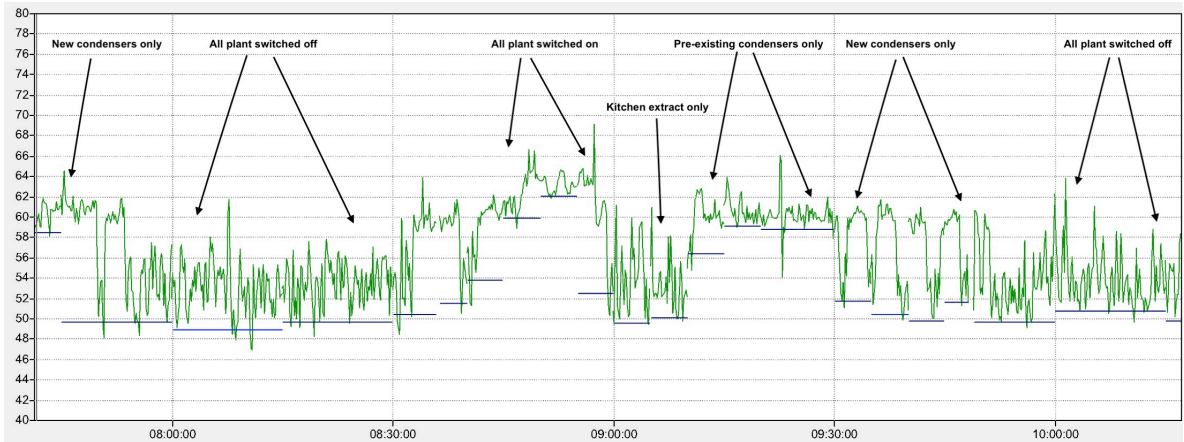
5.0 Results and Commentary

5.1 The following table provides a summary of the prevailing L_{Amax} , L_{Aeq} ambient and L_{A90} sound levels measured between 07:45 and 10:15 on 24 February 2021:

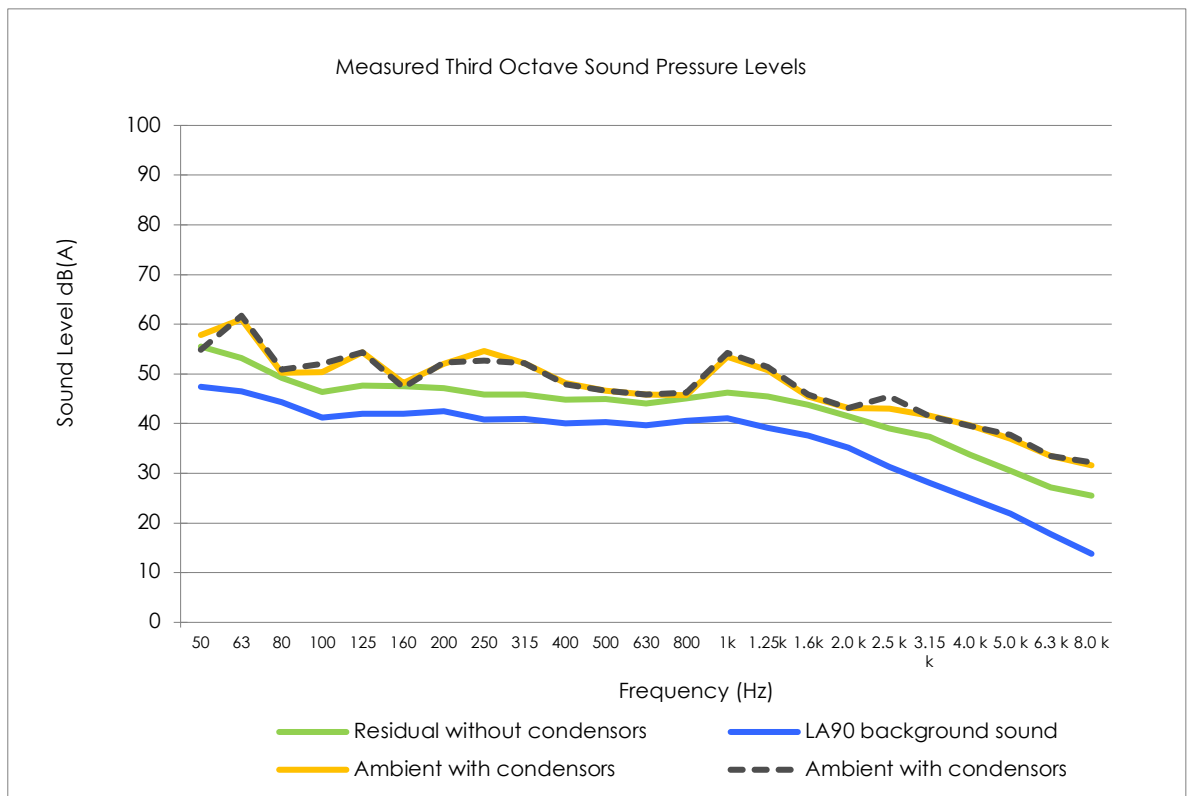
Table 4

Summary of Measured Noise Levels dBA at Residential Window					
Time	Duration (min)	L_{Aeq}	L_{Amax}	L_{A90}	Plant Condition
08:00	15	53.9	71.4	48.9	All off
08:50	5	63.3	67.3	62	Everything on
09:00	5	55.3	69	49.5	Kitchen extract only
09:15	5	60.8	71.5	59.1	Existing condensers only
09:30	5	58.9	71.7	51.7	New condensers only
10:00	15	55.1	71.6	49.7	All off

5.2 A detailed ambient noise time history graph is shown below, (L_{Aeq} is shown in green)
 $L_{A90,T}$ is shown in blue):



5.3 The measurements undertaken with the new condensers both on and off, along with the background sound, are presented in the third octave band center frequency graph below:



5.4 Short hand held measurements were also undertaken close to the new plant. A table presenting the results of these measurements is contained within the appendix.

6.0 Criteria

6.1 The Local Authority planning enforcement have made the following comments:

“There are three issues reported with the site.

- 1. The new compressor units on the flat roof which require a noise report to be submitted as part of the planning application.*
- 2. The two rectangular air vents on the side wall of the property. I have been told by Mr Farooq that one (previously for the existing large kitchen flue) is now just for fresh air and does not have any extractor fan attached. The other towards the rear is for the new kitchen flue ventilation. This one will need a planning permission with a noise report.*
- 3. The existing a/c units on the rear wall and one on the flat roof. I understand that these have been there for more than four years (unused for some time) and the owner is now using them again.*

The main issue is the noise caused by all the units. The Council’s Environmental Health Service are able to look at noise complaints as a statutory nuisance complaint and planning will deal with any new development which is involving noise requires an independent noise report.”

6.2 Further to the above comments the Duty Officer has confirmed that any noise impact assessment should be undertaken in accordance with BS4142:2014. It is also understood that the Local Authority require the new condensers to be assessed against the background sound prevailing when the pre-existing plant is switched off.

6.3 In the assessment of sound, BS4142: 2014 Methods for Rating and Assessing Industrial and Commercial Sound is a key guidance document. The standard sets out a methodology that considers the likely impact of a noise that is commercial or industrial noise “in nature” when measured and/or predicted against the acoustic environment. It is often used to assess complaints and is considered the most appropriate in this instance.

6.4 Corrections are given for times, duration and the presence of acoustic feature characteristics that could make the sound more intrusive.

6.5 The magnitude of the corrections that can be applied to the noise in question are dependent upon its severity/prominence. A penalty of between 0dB to +3dB may be applied for sound that is intermittent; 0dB to +6dB for sound that is tonal and 0dB to +9dB for sound that is impulsive. The maximum levels are applied where the acoustic feature is

highly perceptible. The corrections are additive with the maximum correction being +15dB in any given case.

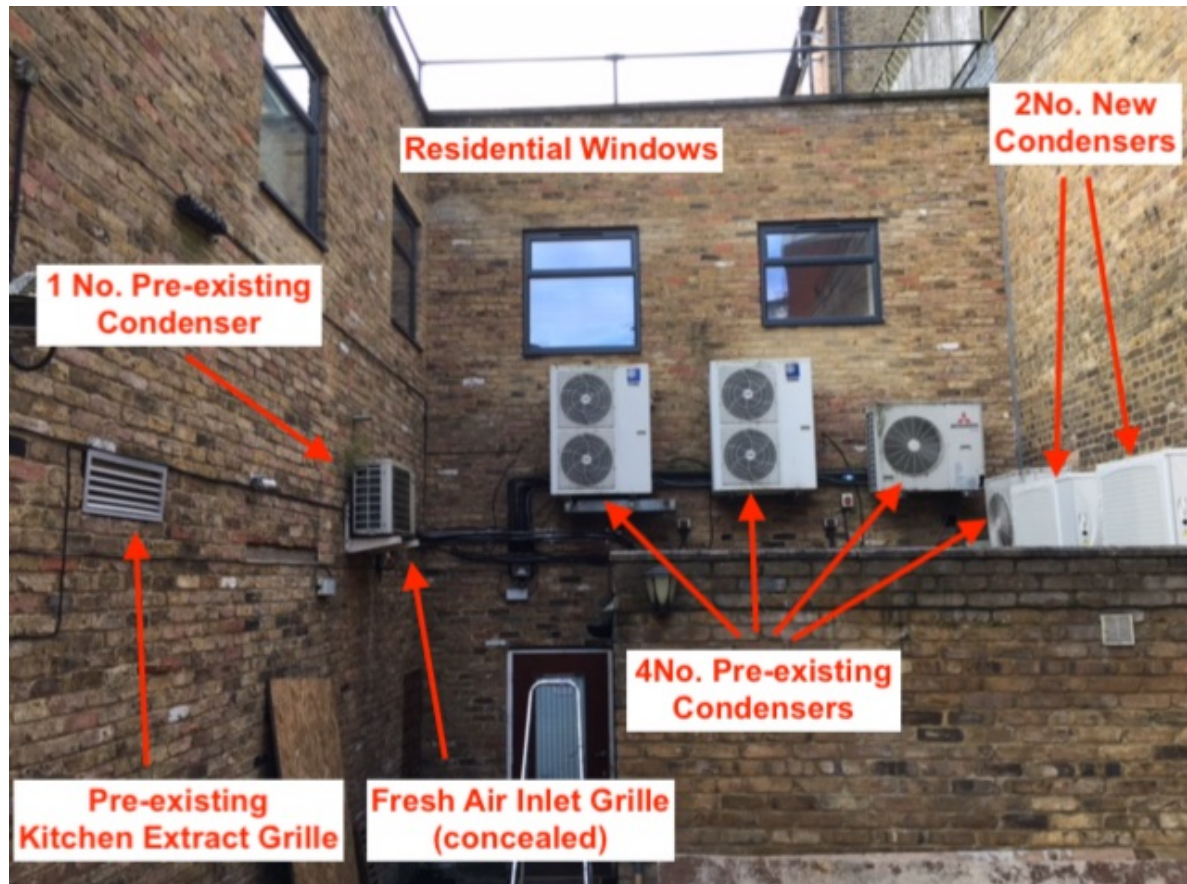
6.6 The standard states that generally, the greater the margin by which the specific sound emerges above the background sound level, the greater the magnitude of impact.

6.7 Guidance is given on the assessment of impact as follows:

- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5dB or more is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely the specific sound source will have an adverse impact or a significant adverse impact.
- Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

7.0 Noise Impact Assessment

7.1 The plant items located to the rear of Café Bianco are shown in the photo below:



7.2 The items are either pre-existing or new items installed by the present business, the table below details the plant:

Table 5

Plant Items			
Plant item	Location	Operation	Comment
2 No Tecumseh Wintsys WINFH2511ZFZ	Flat roof	24 hours	New
1 No Mistubishi FDC125VN condenser	Flat roof	Daytime	Pre-existing
1 No Mistubishi FDC125VN condenser	Rear wall	Daytime	Pre-existing
2 No York YKJC48FS-BCR condensers	Rear wall	Daytime	Pre-existing
1 No passive fresh air inlet grille	Side wall	n/a	n/a
1 No kitchen flue extract outlet	Side wall	Daytime	Pre-existing
1 No Daikin condenser	Side wall	Not operational	Pre-existing

7.3 The plant under consideration for this application consists the new items recently installed by the present business. Contrary to the comments from the Local Authority, noted in point 2 of section 6.1 above, it has been confirmed by the current business owner that the kitchen flue extractor is pre-existing. As such, this assessment considers just the 2 no. newly installed Tecumseh condensers located on the flat roof at the rear.

7.4 The following assessment considers the noise emissions at the worst affected residential window in terms of BS4142:2014. This assessment is based on the loudest 5min period of condenser noise emissions measured and compares this with the lowest background noise level measured without any plant operational.

7.5 The following table sets out the noise impact at the receptor:

Table 6

BS4142 Noise Impact Assessment	
Ambient level at receptor	59 L _{Aeq,5mins}
Residual level at receptor	54 L _{Aeq,15mins}
Specific level at receptor	57 L _{Aeq,15mins}
Acoustic character correction (intermittent +3)	+3dB
Rating level	60 L _{Aeq,15mins}
Background sound level	49 L _{A90,15mins}
Excess over Background sound	+11 dB
Noise impact	significant adverse impact
Uncertainty	moderate

7.6 From the table above it can be seen that the noise emission rating level from the new condensers exceeds the background sound level by approximately +11dB indicating a significant adverse impact.

7.7 There is a degree of uncertainty as the measured background could quite possibly be lower than in pre/post lockdown conditions. Also, the new condensers are 24hour operation and the prevailing background noise at night has not been determined.

7.8 Given this uncertainty it is recommended to assume/apply a further -5 dB reduction to the measured background sound level. This would be equivalent to a night-time background sound level of approximately 44 dB, which is considered typical for urban/commercial environments.

8.0 Mitigation

8.1 The Local Authority have not defined a specific noise emission limit but indicated that assessments should be undertaken in accordance with BS4142.

8.2 As noted previously, BS4142:2014 states that:

"Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context"

In this instance the context is urban and close to numerous commercial activities. A degree

of tolerance to legitimate commercial activity should therefore be expected. It is therefore recommended to attenuate the noise emissions from the 2no. new condensers to a level that is at least as low as the (-5dB adjusted) background sound level.

8.3 In order to achieve this level of attenuation it will be necessary to fully enclose the external units within acoustic enclosures. For units this size such enclosures can be designed or obtained as proprietary products from some suppliers, off-the-shelf. For sourcing such equipment please see suitable suppliers contact details in the appendix.

8.4 The specification of this mitigation has been calculated such that the noise emissions at the worst affected receptor are estimated to be no higher than -5dB below the measured background sound level. This equates to a reduction of the source noise of approximately 17dB.

8.5 The table below details the maximum limiting sound pressure level (hemispherical, free field) required of the enclosed units, with 2 options presented for if the units are enclosed separately, or together:

Table 7

Plant Noise Emission Limits at 1m from Condenser Enclosure (with plant operating at any duty)*		
Plant Location	If each unit is enclosed within a separate enclosure	If both units are enclosed within a single enclosure
Flat roof, not significantly closer to any residential window than as currently.	46 dBA	49dBA

*No tonal characteristics should be present following the noise reduction effect of the mitigation.

8.6 The above noise emission limit is considered to be onerous but achievable.

8.7 High levels of tactile vibration were not noticeable during the survey. However, the equipment location is structurally linked to residential property. To avoid the likelihood of unwanted vibration from the equipment transmitting into residential properties it is good practice and recommended that the equipment is suitably isolated from the supporting structure. Suitable vibration isolators should be installed within the enclosure in between the unit and the enclosure. All services to and from the unit should be via flexible connectors. For sourcing acoustic enclosures and vibration isolators please see suitable suppliers contact details in the appendix.

9.0 Conclusion

9.1 A part manned, part automated environmental noise survey has been undertaken at the project site. The prevailing background sound and plant noise emissions have been quantified.

9.2 A noise impact assessment has been undertaken in order to assess the noise impact at the worst affected residential receptor.

9.3 The noise impact assessment undertaken indicates significant adverse noise impact.

9.4 Mitigation measures have been proposed and a specification for acoustic enclosure(s) provided such that the noise emissions can be reduced to a level indicating low noise impact.

Report 1328.00
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Appendix

Measurement Results Tables

Suitable Suppliers

Glossary of Acoustic Terminology

Measurement Results Tables

Static Tripod Mounted Noise Level Measurements dBA at Residential Window					
Time	Duration (min)	L _{Aeq}	L _{Amax}	L _{A90}	Plant Condition
07:45	15	58.6	70.9	58.5	New condensers only
08:00	15	53.9	71.4	48.9	All off
08:15	15	54	69.9	49.7	All off
08:45	5	63	78.2	59.9	Everything on
08:50	5	63.3	67.3	62	Everything on
08:55	5	62.5	76.9	52.5	Everything on
09:00	5	55.3	69	49.5	Kitchen extract only
09:05	5	54.2	72.2	50.2	Kitchen extract only
09:10	5	60.4	71.4	56.4	Existing cond only
09:15	5	60.8	71.5	59.1	Existing cond only
09:20	5	60.7	76.8	58.8	Existing cond only
09:25	5	60.2	69.8	58.8	Existing cond only
09:30	5	58.9	71.7	51.7	New condensers only
09:40	5	58.4	72.3	50.4	New condensers only
09:48	11	58	71.6	49.7	New condensers only
10:00	15	55.1	71.6	49.7	All off

Short Hand Held Noise Level Measurements dBA at Plant in-situ					
No.	Time	L _{Aeq,1min}	L _{Amax}	Location	Comment
1	07:44	65 ¹	66.6	1m offset	New condensers only ¹
2	07:47	68.5 ¹	71.8	1m above	New condensers only ¹
3	07:49	66.6 ¹	73.9	1m in front	New condensers only ¹
4	08:51	64.7	66	1m from pre-existing condenser fan	All plant on
5	08:54	65.7	66.9	1m from pre-existing condenser fan	All plant on
6	09:03	56.6*	68.3	1m from grille	Kitchen extract only*
7	09:06	56.4*	59.2	1m from grille	Kitchen extract only*
8	09:13	59.3	61.1	1m from pre-existing condenser fan	Pre existing condensers only

*not possible to reliably measure-approximately equal or less than prevailing ambient noise level at source.

¹ The manufacturers data for this item states a sound pressure level of 63 dB at 1m. This compares reasonably well with the in-situ measurements considering the plant location near a reflecting wall and one fan being intermittent.

Suitable Suppliers

Acoustically Lined Panels

Allaway Acoustics Ltd
1 Queens Road
Hertford
SG14 1EN
Tel: 01992 550825
www.allawayacoustics.co.uk

Environmental Equipment Corporation Ltd
Richmond House, Churchfield Road
Walton-on-Thames, Surrey
KT12 2TP
Tel: +44 (0) 1932 230940
Email: info@eecnoisecontrol.co.uk
Web: <http://eec.co.uk>

Acoustic Enclosures

Environmental Equipment Corporation Ltd
Richmond House, Churchfield Road
Walton-on-Thames, Surrey
KT12 2TP
Tel: +44 (0) 1932 230940
Email: info@eecnoisecontrol.co.uk
Web: <http://eec.co.uk>

Environ Technologies Ltd
Regus House,
1010 Cambourne Business Park,
Cambourne,
Cambridgeshire, UK. CB23 6DP
Tel: 0870 383 3344
www.environ.co.uk

Vibration Isolation hardware

Environmental Equipment Corporation Ltd
Richmond House, Churchfield Road
Walton-on-Thames, Surrey
KT12 2TP
Tel: +44 (0) 1932 230940
Email: info@eecnoisecontrol.co.uk
Web: <http://eec.co.uk>

Noise Solutions Ltd
Unit 6, LDL Business Centre,
Station Road West,
Ash Vale,
Aldershot GU12 5RT
Tel: 01252 519881
www.noisesolutions.co.uk

Acoustic Attenuators

IAC
IAC House, Electron Way
Chandlers Ford
Hampshire
SO53 4SE
Tel: 01962 873000
Email: info@iac-uk.com
www.iacacoustics.com

Environmental Equipment Corporation Ltd
Richmond House, Churchfield Road
Walton-on-Thames, Surrey
KT12 2TP
Tel: +44 (0) 1932 230940
Email: info@eecnoisecontrol.co.uk
Web: <http://eec.co.uk>

Glossary of Acoustic Terminology

$L_{Aeq,T}$ is the equivalent continuous A-weighted sound pressure level defined IN BS4142:2014 as the value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval, $T = t_2 - t_1$, has the same mean-squared sound pressure as a sound that varies with time.

L_{A90} is the background sound level as defined in BS4142:2014 as the A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T , measured using time weighting F and quoted to the nearest whole number of decibels.

L_{Amax} is defined in WHO as the maximum outdoor sound pressure level associated with an individual noise event.

Background Sound Level is the L_{A90} , see above.

BB93 is Building Bulletin 93 "Acoustic Design of Schools: Performance standards" and sets out the minimum performance standards for the acoustics of school buildings.

IANL as defined in BB93 is the indoor ambient noise level within teaching accommodation and is comprised of a 30minute LAeq.

Ambient Sound as defined by BS4142:2014 is the totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far.

Specific Sound as defined by BS4142:2014 is the sound source being assessed.

Residual Sound as defined by BS4142:2014 is the ambient sound remaining at the assessment location when the specific sound is suppressed to such a degree that it does not contribute to the ambient sound.

Rating Level as defined by BS4142:2014 is the specific sound level plus any adjustment for the characteristic features of the sound.

Tonal Characteristic as defined by BS4142:2014 Annex C: For a prominent, discrete tone to be identified as present, the time-averaged $L_{Zeq,T}$ sound pressure level in the one-third-octave band of interest is required to exceed the time-averaged $L_{Zeq,T}$ sound pressure levels of both adjacent one-third-octave bands by some constant level difference.

The level differences between adjacent one-third-octave bands that identify a tone are:

- 15 dB in the low-frequency one-third-octave bands (25 Hz to 125 Hz);
- 8 dB in the middle-frequency one-third-octave bands (160 Hz to 400 Hz); and
- 5 dB in the high-frequency one-third-octave bands (500 Hz to 10 000 Hz).

WHO refers to the World Health Organisation.