Appendix 1   Acoustic terminology

1.   Sound Pressure Level (L_p)

The basic unit of sound measurement is the sound pressure level, based on pressure measurement. As the pressures to which the human ear responds can range from 20 mPa to 200 Pa, a linear measurement of sound levels would involve very large numbers. To avoid this, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$$L_p = 20 \log (p/p_0)$$

where L_p = sound pressure level in dB; p = rms sound pressure level; and p_0 = reference sound pressure (20 mPa).

2.   Sound Level (L_{pA})

Sound level is the value measured with a sound level meter which incorporates frequency weighting networks. These attenuate the signal at some frequencies and amplify it at others. Sound levels measured with the A-weighting network are expressed in dB(A). The A-weighting network approximately corresponds to the frequency response of the human ear.

3.   Sound Power Level (L_W)

The sound power level of a source is an absolute measure of the sound output, but it cannot be measured directly. It is usually calculated from a sound pressure level and the distance from the source at which that sound pressure level is measured. For sound radiating uniformly and hemispherically from a point source on a flat reflecting surface, the equation is:

$$L_W = L_p + 20 \log r + 8$$

where L_W = sound power level in dB re 10^{-12} W; and L_p = sound pressure level in dB re 20 mPa at a distance r metres from the source.

4.   Equivalent Continuous Sound Level (L_{Aeq})

Sound levels invariably fluctuate. A summation can be made of the sound energy in the fluctuating sound and a steady level of the same total energy calculated. This steady level is termed the equivalent continuous sound level. L_{Aeq} can be determined over any time period, which is indicated as $L_{Aeq,T}$ where T is the time period (eg. $L_{Aeq,1\ hour}$, $L_{Aeq,12\ hour}$, etc).

In mathematical terms, L_{Aeq} is given by:

$$L_{Aeq} = 10 \log \left\{ \frac{1}{T} \int_{t=0}^{t=T} \left(\frac{p_A(t)}{p_0} \right)^2 dt \right\}$$

where L_{Aeq} = equivalent continuous sound level in dB over a time period T; $p_A(t)$ = instantaneous sound pressure in Pa varying with time t; and p_0 = reference sound pressure (20 mPa).

5. **Background Noise** ($L_{A90,T}$)

Background noise is the noise level exceeded for 90% of the time over the specified period T. It is the basic noise level in a locality and does not include the effects of short duration noise.

6. **Ambient Noise** ($L_{Aeq,T}$)

Ambient noise is a measure of the average noise level over the specified time period T and include contributions of all noise sources.

7. **Maximum Noise** (L_{Amax})

This is the highest A-weighted sound pressure level recorded by the sound level meter during the measurement period.

8. **Level Exceeded for 10% of the Time** ($L_{A10,T}$)

This is a measure of the higher noise levels to which a locality is exposed during time T. The noise produced from road traffic is generally expressed in terms of $L_{A10,18\ hour}$.

9. **Sound Exposure Level** (SEL or L_{AE})

This is the energy produced by a discrete noise event averaged over one second no matter how long the event actually took. This allows for comparisons to be made between different noise events which occur for different lengths of time.

In mathematical terms, L_{AE} is given by:

$$L_{AE} = 10 \log \left\{ \frac{1}{T_0} \int_{t=0}^{t=T} \left(\frac{p_A(t)}{p_0} \right)^2 dt \right\}$$

where L_{AE} = sound exposure level in dB;
$P_A(t)$ = instantaneous sound pressure in Pa varying with time t;
T = time interval long enough to encompass all significant sound energy
P_O = reference sound pressure (20 µPa);
T_O = reference duration (1 second).

The equivalent continuous A-weighted sound pressure level can be calculated for a series of events over a given time period as follows:

$$L_{Aeq,T} = L_{AE} + 10 \log N - 10 \log T$$

where   N = number of events during time T;
T = time period in second.

Appendix 2 Equipment used

Equipment
CEL 480 Sound Level Meter, Identity Number 098321
CEL 284/2 Calibrator, Serial No: 4/07022678

REVISED

Acoustic
Statement.
2010

MAV024

Dear Soufian

Here is my letter report.

On the basis that the other noise in the area has not changed significantly since 2007, the increase in noise from the extra two units will not be sufficient to change the conclusions of the original report.

If you have any queries, please don't hesitate to contact me.

Regards
Richard Clough
07718 661611

(See attached file: Microsoft Word - letter report 270410 14603.pdf)

"Soufian Shamsi" <s.shamsi@mavericktv.co.uk>	To	<richard.clough@nwl.co.uk>
	cc	
27/04/2010 11:45	Subject	Air con

Hi Richard,

Further to our conversation earlier- the units we will be having installed at the below address are x2 2no Fujitsu asya14LC with a maximum decibel level of 48dB(A).

Please would it be possible to forward me an up-to-date acoustic testing assessment asap so we would be able to submit that with our planning application.

An email attachment on your headed paper would work and would be greatly appreciated.

Many thanks.

Soufian Shamsi
Office Runner
40 Churchway
Euston
NW11LW

Tel. 0207 874 6638 | s.shamsi@mavericktv.co.uk
Fax. 0207 874 6635 | www.mavericktv.co.uk
(Embedded image moved to file: pic00041.jpg)