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B&Q Cricklewood
ES Volume III

Appendix 13-1: Acoustic Terminology

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"A" Weighting (dB(A))	The human ear does not respond uniformly across the audible frequency range. The "A" weighting is commonly used to simulate the frequency response of the ear.
Ambient Noise Level, $L_{Aeq,T}$	The equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time that is usually composed of sound from many sources near and far.
Background Noise Level $L_{A90,T}$	The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90% of a given time interval, T, measured using the fast time weighting, F, and quoted to the nearest whole number.
Decibel (dB)	The decibel is a logarithmic ratio of two values of a variable. The range of audible sound pressures is approximately 2×10^{-5} Pa to 200 Pa. Using decibel notation presents this range in a more manageable form, 0 dB to 140 dB.
Frequency (Hz)	The number of cycles per second (i.e., the number of vibrations that occur in one second); subjectively this is perceived as pitch.
Frequency Spectrum	The relative frequency contributions that make up a noise.
Level $L_{A10,T}$	The A-weighted sound pressure level exceeded for 10% of a given time interval, T, measured using the fast time weighting, F.
Maximum Noise Level L_{Amax}	The maximum RMS A-weighted sound pressure level occurring within a specified time period. Fast time weighting indicates sound pressure level measurements undertaken using a 125-millisecond moving average time weighting period
Noise	Unwanted or unexpected sound.
Peak particle velocity (PPV), mm/s	Greatest instantaneous particle velocity during a given time interval. If measurements are made in 3-axis then the resultant PPV (Peak Particle Velocity) is the vector sum i.e. the square root of the summed squares of the maximum velocities, regardless of when in the time history those occur.
Rating Level, $L_{Ar,Tr}$	The specific noise level plus any adjustment for any characteristic features of the noise.
Reference Time Interval, *Tr*	The specified interval over which an equivalent continuous A-weighted sound pressure level is determined.
Sound Pressure Level (L_p)	Equal to 20 times the logarithm to the base 10 of the ratio of the root mean squared (RMS) sound pressure to the reference sound pressure. In air the reference sound pressure is 2×10^{-5}Pa. Mathematically: Sound Pressure Level (dB) $= 20 \log_{10} \{p(t) / P_0\}$ Where $P_0 = 2 \times 10^{-5}$ Pa

Specific Noise Level, $L_{Aeq,Tr}$ The equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific noise source over a given reference time interval.

Weighted sound reduction index, R_w A single-figure value of sound reduction index, derived according to procedures given in BS5821, used for rating and comparing partitions and based on the values of sound reduction index at different frequencies. R_w+C_{tr} indicates the sound reduction index adapted for a typical road traffic noise spectrum.

Between the quietest audible sound and the loudest tolerable sound, there is a ten million to one ratio in sound pressure (measured in pascals, Pa). Because of this wide range, a noise level scale based on logarithms is used in noise measurement called the decibel (dB) scale. Audibility of sound covers a range of approximately 0 to 140 dB.

Sound Pressure Level in dB L_A for Common Situations

Typical Noise Level, dB L_A	Example
0	Threshold of hearing
30	Rural area at night, still air
40	Public library Refrigerator humming at 2 m
50	Quiet office, no machinery Boiling kettle at 0.5 m
60	Normal conversation
70	Telephone ringing at 2 m Vacuum cleaner at 3 m
80	General factory noise level
90	Heavy goods vehicle from pavement Powered lawnmower, operator's ear
100	Pneumatic drill at 5 m
120	Discotheque – 1 m in front of loudspeaker
140	Threshold of pain