APPENDIX GLOSSARY OF TERMS

Sound is transmitted to the ear by pressure fluctuations in the air at different frequencies. The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from $20x10^{-6}$ Pascals to 200 Pascals, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB), with 0 dB representing the normal threshold of hearing ($20x10^{-6}$ Pascals) and 120 dB representing the threshold of pain (20 Pascals). In general terms, a person can hear mid frequencies (500 Hz, 1000 Hz and 2000 Hz) more effectively than lower or higher frequencies. A young person can hear sound from around 20 to 20,000 Hz. As one gets older the ability to hear higher frequencies diminishes.

A change in sound level of less than 3 dB is not perceptible under normal conditions and a change of 10 dB subjectively equates to a doubling or halving of the loudness of a sound.

The ear is frequency sensitive, in that it doesn't ascribe the same importance to all frequencies in the audible frequency range. A frequency filtering system in a sound level meter approximates the frequency response of the human ear. This weighting network is called "A-weighting" and the "A-weighted" sound pressure level is expressed in dB(A). This weighting is typically used to measure and assess environmental noise.

As sound levels are constantly fluctuating, a number of statistical metrics are used to describe the sound. The most commonly used measurement descriptors of environmental noise are as follows:

- $L_{Aeq,T}$ - The value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval, T, has the same mean-square sound pressure as a sound that varies with time. This is in effect the average noise level, used to describe the ambient (all encompassing) noise level.

- $L_{A90,T}$ - The A-weighted sound pressure level in decibels exceeded 90% of a given time interval, T. L_{A90} is typically taken as representative of background noise.

- L_{AFmax} - The maximum A-weighted noise level recorded during the measurement period. The subscript 'F' denotes a fast time weighting, which equates to the time averaging of the human ear.

The ambient noise is defined as the totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far.

For the assessment of noise, the 24 hour day is typically broken down into two or three segments, consisting of daytime from 07:00 to 23:00 hours (further divided to daytime from 07:00 to 19:00 hours and evening from 19:00 to 23:00 hours) and night time from 23:00 to 07:00 hours.

The Sound Exposure Level (SEL or L_{AE}) is the energy produced by a discrete noise event averaged over one second, no matter how long the event actually took. This allows for comparison between different noise events which occur over different lengths of time.

The weighted sound reduction index (R_w) is the single number quantity which characterises the airborne sound insulation properties of a material or building element over a defined range of frequencies (R_W is used to characterise the insulation of a material or product that has been measured in a laboratory).