Appendix 12.1 - Glossary of Acoustics Terminology

Decibel (dB)

The decibel scale is used in relation to sound because it is a logarithmic rather than a linear scale. The decibel scale compares the level of a sound relative to another. The human ear can detect a wide range of sound pressures, typically between $2x10^{-5}$ and 200 Pa, so the logarithmic scale is used to quantify these levels using a more manageable range of values.

Sound Pressure Level (SPL)

The Sound Pressure Level has units of decibels, and compares the level of a sound to the smallest sound pressure generally perceptible by the human ear, or the reference pressure. It is defined as follows:

$$SPL\ (dB) = 20\ Log_{10}(P/P_{ref})$$ where P = Sound Pressure (in Pa)

P_{ref}=Reference Pressure $2x10^{-5}$ Pa

An SPL of 0dB suggests the Sound Pressure is equal to the reference pressure. This is known as the *threshold of hearing*.

An SPL of 140dB represents the *threshold of pain*.

A-Weighting

The human ear can detect a wide range of frequencies, from 20Hz to 20kHz, but it is more sensitive to some frequencies than others. Generally, the ear is most sensitive to frequencies in the range 1 to 4 kHz. The A-weighting is a filter that can be applied to measured results at varying frequencies, to mimic the frequency response of the human ear, and therefore better represent the likely perceived loudness of the sound. SPL readings with the A-weighting applied are represented in dB(A).

L_{10} or L_{A10} and other percentile measure

This represents the SPL which is exceeded 10% of the time, expressed in dB or dB(A). L_{A10} is used to quantify road noise levels. Other percentiles exist and are used for various types of noise assessment. These include L_{01}, L_{50}, L_{90}, L_{99}.

Noise

A noise can be described as an unwanted sound. Noise can cause nuisance.

Noise Sensitive Receptors (NSR's)

Any identified receptor likely to be affected by noise. These are generally human receptors, which may include residential dwellings, work places, schools, hospitals, and recreational spaces.