

Environmental Impact Assessment Report (EIAR)

Volume 6 of 6: Appendices

(Appendix A6.1) Acoustic Terminology

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1. Acoustic Terminology

ambient noise	The totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, near and far.
background noise	The steady existing noise level present without contribution from any intermittent sources. The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 per cent of a given time interval, T ($L_{AF90,T}$).
broadband	Sounds that contain energy distributed across a wide range of frequencies.
dB	Decibel - The scale in which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the RMS (Root Mean Square) pressure of the sound field and the reference pressure of 20 micro-pascals (20 μ Pa).
dB L_{pA}	An 'A-weighted decibel' - a measure of the overall noise level of sound across the audible frequency range (20 Hz – 20 kHz) with A-frequency weighting (i.e. 'A'-weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
Hertz (Hz)	The unit of sound frequency in cycles per second.
impulsive noise	A noise that is of short duration (typically less than one second), the sound pressure level of which is significantly higher than the background.
L_{Aeq,T}	This is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period (T). The closer the L _{Aeq} value is to either the L _{AF10} or L _{AF90} value indicates the relative impact of the intermittent sources and their contribution. The relative spread between the values determines the impact of intermittent sources such as traffic on the background.
L_{AFN}	The A-weighted noise level exceeded for N% of the sampling interval. Measured using the "Fast" time weighting.
L_{AFmax}	The instantaneous slow time weighted maximum sound level measured during the sample period (usually referred to in relation to construction noise levels).
L_{Ar,T}	The Rated Noise Level, equal to the L _{Aeq} during a specified time interval (T), plus specified adjustments for tonal character and impulsiveness of the sound.
L_{AF90}	Refers to those A-weighted noise levels in the lower 90 percentile of the sampling interval; it is the level which is exceeded for 90% of the measurement period. It will therefore exclude the intermittent features of traffic and is used to estimate a background level. Measured using the "Fast" time weighting.
L_{AF10}	This is the noise level exceeded for 10% of the measurement period with 'A' frequency weighting, calculated by statistical analysis from samples of the Fast time weighted sound level
L_{AT(DW)}	Equivalent continuous downwind sound pressure level.
L_{rT(DW)}	Equivalent continuous downwind octave-band sound pressure level.

L_{day}	L _{day} is the average noise level during the day time period of 07:00hrs to 19:00hrs.
L_{night}	L _{night} is the average noise level during the night-time period of 23:00hrs to 07:00hrs.
low frequency noise	LFN - noise which is dominated by frequency components towards the lower end of the frequency spectrum.
noise	Any sound that has the potential to cause disturbance, discomfort or psychological stress to a person exposed to it, or any sound that could cause actual physiological harm to a person exposed to it, or physical damage to any structure exposed to it, is known as noise.
noise sensitive location	NSL – Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.
octave band	A frequency interval, the upper limit of which is twice that of the lower limit. For example, the 1,000Hz octave band contains acoustical energy between 707Hz and 1,414Hz. The centre frequencies used for the designation of octave bands are defined in ISO and ANSI standards.
rating level	See L _{A,r,T} .
sound power level	The logarithmic measure of sound power in comparison to a referenced sound intensity level of one picowatt (1pW) per m ² where: $L_w = 10 \text{Log} \frac{P}{P_0} \text{ dB}$ Where: p is the rms value of sound power in pascals; and P ₀ is 1 pW.
sound pressure level	The sound pressure level at a point is defined as: $L_p = 20 \text{Log} \frac{P}{P_0} \text{ dB}$
specific noise level	A component of the ambient noise which can be specifically identified by acoustical means and may be associated with a specific source. In BS 4142, there is a more precise definition as follows: 'the equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific noise source over a given reference time interval (L _{Aeq, T})'.
tonal	Sounds which cover a range of only a few Hz which contains a clearly audible tone i.e. distinguishable, discrete or continuous noise (whine, hiss, screech, or hum etc.) are referred to as being 'tonal'.
1/3 octave analysis	Frequency analysis of sound such that the frequency spectrum is subdivided into bands of one-third of an octave each.