14 Appendix A – Glossary

Sound

Sound is a cyclic change in air pressure. The rate at which the air pressure cycles occur determines whether

sound is high pitched (e.g. piccolo) or low pitched (e.g. tuba). The rate at which the air pressure cycles, or

the frequency is measured in cycles/per second or Hertz. The amount the air pressure fluctuates determines

the loudness of the sound.

Sound Pressure Level (SPL)

The sound pressure level closely corresponds to human hearing, converted into a logarithmic scale with units

of decibel, or dB as follows:

Sound Pressure Level (SPL) = 20 log*log10 (P/Pref)

Where:

P - Pressure in Pa

Pref - reference pressure which roughly corresponds to the threshold of human hearing (2*10-5 Pa)

Sound Power Level (SWL)

The sound power level is the energy emitted by a noise source. It is also a logarithmic scale and is defined as:

Sound Power Level (SWL) = 10 *log10 (W/Wref))

Where:

P - sound power in Watts (W)

Pref - reference sound power (10-12 W)

Sound Power is the sound energy that is emitted whereas sound pressure is the result of this as perceived by

the ear or meter. The ear and microphones measure sound pressure, not sound power.

Room Correction factor

Room Correction factor is an indicative factor in the absorption of sound level in dB when inclusion of typical furnishings as per a subject area is taken into consideration. The inclusions generally result in improvement in absorption within the room, thereby reducing the resultant noise level for accurate measurements.

Absorption

Conversion of sound energy to heat, often by the use of a porous material.

Absorption coefficient

A quantity characterizing the effectiveness of a sound absorbing surface. The proportion of sound energy absorbed is given as a number between zero (for a fully reflective surface) and one (for a fully absorptive

surface). Note that sound absorption coefficients determined from laboratory measurements may have values

slightly larger than one.

Absorptive material

Material that absorbs sound energy.

Airborne sound

Sound propagating through the air.

Audiometric facilities

Rooms used for hearing tests and associated activities.

Bathroom pod

A prefabricated ensuite bathroom.

Competent Person

Someone with appropriate training, qualifications, experience and skill. The person will normally have a diploma or degree in acoustics or a related subject.

Decibel (dB)

The unit used for many acoustic quantities to indicate the level with respect to a reference level.

Decibel (dB(A))

The measure of sound pressure level (“A” weighted) in decibels as specified in British Standard BS EN 61672-2: 2003(a).

Frequency

The number of pressure variations (or cycles) per second that gives a sound its distinctive tone. The unit of

frequency is the Hertz (Hz).

Frequency band

A continuous range of frequencies between stated upper and lower limits (see also octave band and one-third octave band).

Frequency-weighted acceleration

The acceleration multiplied by a specified weighting value.

Hertz (Hz)

The unit of the frequency of a sound (formerly called cycles per second).

Noise

Unwanted sound.

Noise intrusion

Noise from external noise sources.

Octave band

A frequency band in which the upper limit of the band is twice the frequency of the lower limit.

One-third octave band

A frequency band in which the upper limit of the band is 21/3 times the frequency of the lower limit.

Impact sound insulation

The reduction of sound created by impacts e.g. footfalls on floor slabs over a room.

IPS panel

Integrated plumping systems i.e. pre–plumped and prefabricated panels sometimes used for clinical hand wash basins etc.

Reverberation

The persistence of sound in a space after a sound source has been stopped.

Reverberation time-T60

The time, in seconds, taken for the sound to decay by 60dB after a sound source has been stopped.

Spectrum

The composition of a particular sound in terms of separate frequency bands.

Ambient Noise

Noise level measured in the absence of the intrusive noise or the noise requiring control

LAeq(t)

The equivalent continuous (time-averaged) A-weighted sound level. The suffix "t" represents the time period to which the noise level relates to.

LA90(t)

The A-weighted noise level equaled or exceeded for 90% of the measurement period. The suffix "t"

represents the time period to which the noise level relates to.

L'nT,w

The weighted standardized impact sound pressure level, a single-number quantity used to characterize the impact sound insulation of floors over a range of frequencies. The lower the rating, the better is the impact sound insulation.

IIC

The Impact Insulation Class (IIC) is a single number rating derived from measured values of normalized impact sound pressure levels, in accordance with ASTM E492, when measured under controlled laboratory conditions. It provides an estimate of the impact sound insulating performance of a floor / ceiling assembly.

IIC is a laboratory value. The higher the IIC rating, better is impact sound performance.

D_w

Weighted sound level difference which is a measure for rating the airborne sound insulation on the field.

The higher the IIC rating, the better is impact sound performance.

DnT,w

The weighted standardized level difference, a single-number quantity that characterized the airborne sound insulation between rooms. Note: The higher the rating, the better the airborne sound insulation.

DnT,w + Ctr

The weighted standardized level difference with spectrum adaptation term, single quantity which DnT, w characterizes the airborne sound insulation between rooms using the Ctr : spectrum adaptation term. The higher the rating, the better the airborne sound insulation.

Rw (Weighted Sound Reduction Index)

Single number quantity which characterizes the airborne sound insulation properties of a material or building

element over a range of frequencies. Rw is a laboratory value. The higher the rating, the better the airborne sound insulation.

STC (Sound Transmission Class)

The STC is a single number rating of a material's or assembly's ability to resist airborne sound for transfer frequencies ranging from 125-4000 Hz. In general, a higher STC rating blocks more noise from transmitting through a partition. The higher the rating, the better the airborne sound insulation.

Sound Insulation

The ability of a building element or building structure to reduce the sound transmission through it. The sound insulation is measured at different frequencies, normally 100-3150 Hz. Airborne sound insulation is expressed by a single value, Dn,f,w, Rw, R'w or STC. Impact sound insulation is expressed by a single value Ln,w or L' n,w.

Correction Terms (dB)

"C" is a correction for incident sound typical of living activities (talking, music, radio and TV); it is typically represented in frequency bands 50-3150, 50-5000 or 100-5000 Hz. "Ctr" is a low frequency correction term

for transportation etc.

Mechanical service noise

Noise generated by mechanical and electrical services.

Crosstalk

Noise transfer between rooms, often via ventilation ductwork

Flanking transmission

Transmission of sound from a source room to an adjacent receiving room but not via the common partition.

Transmission loss

Reduction in sound pressure level between two designated locations in a sound transmission system, one location often being at a reference distance from the source.

Insertion loss

The reduction of noise level by the introduction of a noise control device: established by the substitution method of test.

Tmf

Tmf is the mid-frequency reverberation time. The sound absorption of surfaces usually varies with frequency and therefore the reverberation time in a space also varies with frequency. Tmf descriptor is widely used in standards for speech sensitive areas.

NRC (Noise Reduction Coefficient)

A single number rating system used to compare the sound absorbing characteristic of building material, calculated by averaging its sound absorption co efficient at mid-frequency, expressed to the nearest value.

Speech Intelligibility

A measure of how comprehensible a speech is. Directly dependent on the level of background noise,

reverberation time and the shape of the room.

STI – speech intelligibility index

A measure of how intelligible speech is.

Attenuator

A device that reduces noise, particularly plant noise and crosstalk – also known as a silencer.

Vibration Dose Value (VDV)

The vibration dose value (VDV) is the measure of vibration exposure used in ISO 2631, BS 6841 or BS 6472.

It gives better correlation with human response than RMS-based measures when the vibration includes short bursts of high amplitudes such as impulses and shocks. It is the fourth root of the integral of the fourth power of vibration value with respect to time.

$$VDV = \left(\int_0^T a^4(t)dt\right)^{1/4}$$

VDV is the vibration dose value in m/s1.75

a(t) is the frequency weighted acceleration in m/s2

T is the total measurement period in seconds

RMS

The root-mean-square pressure (abbreviated as rms pressure) is the square root of the average of the square of the pressure of the sound signal over a given duration

Warble tones

Sounds used in audiometric testing, normally played over loudspeakers in paediatric test rooms.