## FAQ's

1. **Define Frequency & Wavelength**

   Frequency is defined as vibration cycles per second. It is expressed in Hertz (Hz). Wave length is defined as distance between identical points on a wave.

2. **Explain the design parameters for Speech and music frequencies**

   Reverberation Time (RT) of around 1.1 seconds at mid-frequencies is appropriate for speech in small to medium spaces, and that the RT should not rise too much at low frequencies as this lowers intelligibility by an effect known as 'masking'. With good early reflections this figure becomes more flexible. An audience's expectation regarding the actual quality of the speech signal is usually not too critical, as long as the speaker's voice and accent are clearly recognizable and any vocal information is understandable.

   Rooms for music will be expected to have longer reverberation times than rooms for speech.

   RTs up to 2.4 seconds occur in large concert halls, and a value of 2s is typical in recent work. The currently accepted optimum range is 1.8-2.2s. Another difference is that music can consist of a great range of frequencies (20 Hz to 20 kHz) whilst speech is basically a narrow band signal (500 Hz to 4 kHz).

3. **What is Reverberation time?**

   A reverberation, or reverb, is created when a sound or signal is reflected causing a large number of reflections to build up and then decay as the sound is absorbed by the surfaces of objects in the space – which could include furniture and people, and air. The time interval between reflections is usually so short that distinct echoes are not heard. Instead, this series of reflections will blend with the direct sound to add "depth". Reverberation time is defined as the length of time required for sound to decay 60 decibels from its initial level. Reverberation time plays a crucial role in the quality of music and the ability to understand speech in a given space.

4. **What are the factors to be considered during site selection?**

   A satisfactory indoor acoustical environment actually starts by knowing what is going on outdoors. Avoid sites in high noise areas—airfields, highways, factories, and railways. Ensure compatibility with existing facilities—do not site a school in an industrial area, for example.

Determine what else is planned for the site in the future, as if future buildings are acoustically incompatible with yours, significant remediation measures may be necessary to return the interior sound environment to an acceptable level. To protect the spaces in a building from noise from a nearby highway or railway, lay out the building so that restrooms, mechanical and electrical equipment rooms, and other less noise-sensitive spaces are adjacent to the roadway. When designing a campus near high noise activity, locate gymnasiums and other less noise-sensitive facilities closer to the noise source and place buildings needing quiet surroundings in the shadow of those facilities. As always, while siting for noise control, incorporate sustainable site planning into the decision-making process.

5. **How does Shape & volume of a space affect the acoustic qualities?**

A rectangular shoebox type hall, with a stage across one narrow end, may be excellent for music where an audience can be seated farther away and a greater ratio of reverberant sound is desirable. However, a rectangular geometry is only suitable for a relatively small speech hall.

For unamplified speech, it is often necessary to limit the overall room volume. This is because a large volume requires more speech power than a small room. This volume minimization is contrary to rooms designed for music, where a relatively large volume is desirable.