Recommendations for Improved Acoustics

Architectural acoustics is concerned mainly with sound transition through air. Sound transition in a room or space is affected by the surfaces of the room or space. Sound is affected by reverberation and absorption of sound waves as they come in contact with the architectural surfaces.

The science of controlling a room's surfaces based on sound absorbing and reflecting properties is referred to as interior space acoustics. Excessive reverberation time, which can be calculated, is generally due to excessive hard surfaces in a room and can lead to poor speech and sound intelligibility. Sound reflections create standing waves that produce natural resonances that can be heard as a pleasant sensation or an annoying one. Architectural acoustics attempt to control these reflections to the advantage of a room's certain usage.

Potential Effects of Poor Sound Control

- Aside from general annoyance caused by poor acoustics, other noise health effects can include hearing impairment, tinnitus, hypertension and even cardiovascular impacts.

- Poor sound quality can affect communication and worship services, including delivery of liturgy and music ministry.

Recommended Sound Control Techniques

- In a new space, reflective surfaces can be designed, angled and coordinated to provide good coverage of sound for a listener in a worship hall or classroom space. Soft materials such as fabic covered foam wall panels, mineral-fiber ceiling tiles and/or carpet flooring can be used to absorb sound and control reverberation. Building materials such as acoustical block can also be used to control reverberation times.

- Generally, there are three ways to improve acoustics in an existing space and solve architectural sound problems – the ABCs.

  A = Absorb (via drapes, carpets, ceiling tiles, etc.)
  B = Block (via panels, walls, floors, ceilings and layout)
  C = Cover-up (via sound masking)

To ensure an effective solution is found for acoustical problems, an Acoustical consultant should be retained to offer advice. While this may require some capital outlay, churches must weigh the return on investment: sometimes, paying a little more up front for solid advice can save a lot of money down the road.

Related Links:

- www.acoustics.com
- www.acousticalsociety.org/
- www.acousticalsolutions.com/architectural-acoustics
- www.wbdg.org/resources/acoustic.php

Contact LCEF to find an Architectural Advisory Committee member near you for additional information.

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