



LPES, Inc.

Engineering and Planning

Acoustics in Worship Spaces

Churches, temples, cathedrals, meetinghouses, mosques...these are the places we go to improve our conscious contact with God. We pray, sing, play instruments, minister and read to enhance our spiritual journey. The place where this all comes together requires special attention to both spiritual and acoustical matters. For example, we would like to pray quietly, sing and play instruments with fullness, minister and read clearly and directly. The physical characteristics of a sanctuary, the types of sounds, and the ability of the people to hear, are all important when it comes to church acoustics. Church acoustics is a combination of construction, psychoacoustics, and sound system design. There are several common issues important to sanctuary design.

Reverberation

Reverberation makes music (both singing and instrumental) sound better. Conversely, it makes “the spoken word” more difficult to be heard and understood by a congregation. This is especially true with children or an aging congregation. Whether it is contemporary, classical, or mixed, the reverberative field of a worship space or sanctuary should be designed to be suitable for a given style of worship.

Sound Reinforcement

Musical instruments, choirs and all musical elements should be co-located. Sound reinforcement (architectural and electrical) can enhance the music. Music can be amplified, steered and distribute evenly with proper architectural underpinning.

Background noise

Eliminating and controlling unwanted sound is very important when it comes to church acoustics. Background noises should be limited through careful design. Noise from HVAC, mechanical rooms, fans, and kitchens should be isolated. Diffusers and other equipment should be chosen and placed carefully to minimize unwanted sound. Mechanical rooms should not be located adjacent to sanctuaries or meeting rooms. Many common background noise problems can be easily avoided.

A general approach for evaluating acoustics in worship spaces includes:

- Thorough review of building plans before (and if necessary, after) construction.
- Field test for acoustical properties such as reverberation and speech intelligibility
- Reengineer and troubleshoot acoustical hotspots and unwanted noises and effects
- Carefully design sound systems

Recommended Readings

Acoustics of Worship Spaces, David Lubman and Ewart A. Wetherill, Eds. American Institute of Physics, 1985

Acoustics in the Worship Space, Scott R. Reidel Concordia Publishing House, 1986