

Sound Advice

Helpful Information from *Stewart Acoustical Consultants*

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Acoustics in Schools

Much of our work is in helping architects and mechanical engineers to create better learning environments. There are several areas of a school where we have seen problems in proposed designs and existing schools.

Auditoriums - These should be properly sized and shaped to provide enhancement of natural sound, and prevent bad reflections. They should allow for a sound amplification system that does not have to be very complex to achieve clear speech. These should be well isolated from noisy areas, and the HVAC system must be designed to be quiet.

Music Suites - Many band rooms are far too small for the number of students, resulting in loud sound that could even result in OSHA violations and hearing damage especially for instructors. Band and chorus rooms should be properly sized and treated for acceptable reverberation and diffusion. Good isolation must be provided between spaces.

Gymnasiums - Many older gyms were echo chambers. They were loud and you could not understand speech beyond a few feet. All uses of the gym should be considered in determining the amount and type of treatment. Gyms require treatment for noise control and clear speech. However, the amount of treatment is sometimes reduced to provide crowd noise during games and some reverberation of music.

Cafeterias - Many students may not mind a noisy cafeteria, but the teachers do. They appreciate a peaceful lunch. Students with hearing difficulties also need a quiet environment. Our research shows that cafeteria design can make a difference. Students actually lower their voices and pay more attention to teachers in a well-designed cafeteria.

Common Areas - Many schools have large lobby or common areas. These areas can become very noisy if not properly treated. This noise can disturb adjacent areas.

Classrooms - Classrooms have not traditionally received attention to good acoustics. As a result, we have many classrooms with poor acoustical conditions, especially loud HVAC systems. Some rooms are also overly reverberant. This makes it more difficult for students to understand, especially the very young, those with hearing difficulties, and those listening to a second language. The trend to daylighting of classrooms increases their volume, requiring more absorption to control reverberation. A new standard on classroom acoustics adopted by the American National Standards Institute in 2002 provides guidance.