

A Newsletter from **Stewart Acoustical Consultants**

Our 28th Year

7406 L Chapel Hill Road, Raleigh, NC 27607

Ph. 919-858-0899

Fax 919-858-0878

ASA Policy Statement on Classroom Amplification

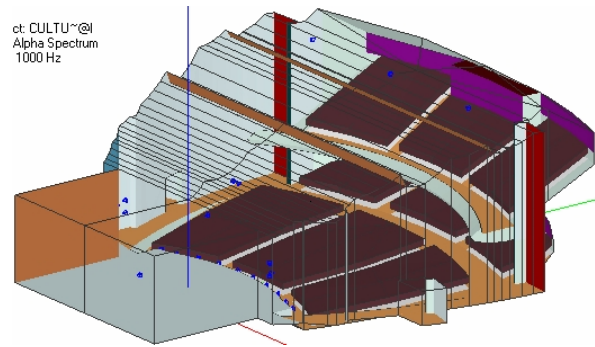
The Acoustical Society of America has taken the unusual step of issuing a policy statement on the issue of amplification in classrooms. This was brought about by the rising use of loudspeakers in classrooms in attempts to overcome bad design. The statement recognizes the recently adopted standard for classroom acoustics, and notes that there are three channels for speech communication in classrooms: (1) student to student, (2) student to teacher, and (3) teacher to student. Sound amplification only improves the 3rd channel, if at all. If the room is too reverberant, then sound amplification does nothing to improve communication; it only increases the sound level. Sound amplification may actually worsen student to student and student to teacher communication. The basic position is stated in two points:

1. Sound amplification should not be routinely employed in typical small mainstream classrooms.
2. All new or renovated small mainstream classrooms should be designed to conform with ANSI S12.60 to insure satisfactory speech communication for learning.

The full statement can be found at <http://asa.aip.org/amplification.pdf>

Seminar on Acoustical Modeling

The regional chapter of the Acoustical Society of America hosted seminars on acoustical modeling using two programs recently. Bruce Olsen of Olsen Sound Design in Minnesota taught the larger groups on use of the EASE and AURA programs to model the acoustics of rooms. Chapter member Richard Honeycutt taught a smaller session on the use of the CATT Acoustic program. The EASE seminar attracted students who flew in from around the country and others who participated over a GoToMeeting connection online.



Interesting Quote from FAA Administrator Marion Blakey

“Silence is a commodity, a resource, a tangible thing we’ve lost track of. Truth be told, we spend a great deal of time deathly afraid of silence, afraid of dead air. - - In life, there’s precious little attention given to silence, and maybe that’s why there’s often precious little thinking going on out there. Silence gives you the time to reflect, to meditate. - - - Silence is a gift – an opportunity for you to breathe. - - - If you don’t use silence as a tool in your tool kit, you’ll miss an important opportunity both to see and to assess the kinds of opportunities coming at you that you may not expect. - - And put silence in your tool kit every day. You may find it strange, but I schedule silence into my day.”

Paid Advertisement seen in Raleigh News & Observer March 19, 2006

"CONCERNED ABOUT AIRPLANE NOISE?"

Before you buy go to: www.rduaircraftnoise.com Raleigh-Durham Airport Authority"

The Importance of HVAC Noise Control in New Listening Spaces

Architects, churches, and others often ask us for advice on the acoustical design of new auditoriums or worship spaces but do not want us to assist with control of the HVAC noise. It seems that until someone has a problem with the noise of their heating and cooling system, it is taken for granted that it will be quiet. It does not matter how good the acoustics of the room are if you cannot understand what is being said because the ventilation system is too loud. On several occasions we have investigated complaints about difficulty hearing or understanding in new or existing buildings to find that the real problem was a noisy ventilation system. As a result of these experiences, we will no longer agree to do only room acoustics in new spaces for critical listening. HVAC noise control will be included in the scope and budget.

Green Buildings and Design for LEED Certification

We are seeing more projects trying to achieve LEED certification. Unfortunately the LEED program does not emphasize acoustics, and in fact some of the objectives in the program make it more difficult to achieve good acoustics. An effort to emphasize the factors leading to high LEED scores without recognizing the acoustical implications could lead to serious problems. Any new or unusual construction should be reviewed for acoustical implications.

Condos Booming

We have seen a major increase in interest in condominiums. These present major challenges in providing acceptable isolation between owners. Developers often want to cut costs for necessary invisible acoustical features to preserve budgets for visible features that add to the initial perception of quality and value. However, this initial perception leads the buyer to expect comparable acoustical quality and the lack of such only becomes apparent to the buyer after they move in. It is imperative that the acoustical quality of the project match the buyer expectations. Achieving high acoustical quality is difficult, especially in wood-frame structures. When striving for high isolation, very small details can make a big difference.

Band Rooms Booming

We have always been aware of the problem of loud band rooms, especially when the room is not properly sized for the number of players. As a result we have insisted on enough absorption to control the loudness where possible even if this meant less than desirable reverberation due to the small size of the room. This emphasis on controlling loudness is essential because band directors can be heavily exposed to this loud sound several hours a day. Some have suffered hearing damage. Proper room design is essential to control this exposure to loud sound. A room that is far too small for the number of musicians will be too loud even with maximum treatment. Recently we have encountered situations where the location of the treatment in a room left the room much louder than would be expected. Much of the loudness in music is transient and dependent on initial reflections rather than reverberant level. Thus, it is important to get absorption on the lower walls and directly over the players.

The Sky's the Limit in Local Noise Ordinances

Some communities have recognized that outdoor barriers often do not protect the upper floors of neighboring buildings from noise coming over the top of the barrier. In response, they have written into their ordinances a provision that the noise limits must be met at any point in the boundary plane regardless of height above the ground. Such provisions make vertical barriers totally worthless in compliance with the ordinance. The barrier must at least curve over or almost over the source to limit the sound high up. It would help make the situation more practical if the communities would specify a maximum height at which the limits must be met.

Noisy Rooftop System – Check the shipping restraints and springs

Whenever we check out a noisy rooftop system one of the steps is to check the vibration isolation. For systems involving compressors there are usually some rubber mounts installed at the factory. Some type of restraint is usually applied during shipment, and these restraints must be loosened or removed during installation. On a number of occasions we have found the compressors rigidly mounted. Sometimes the removal of the restraint is as simple as loosening a bolt. In other cases the rubber mount must be removed and a metal cylinder removed from inside. We also often find springs put under the overall system have been improperly selected. They either have too little static deflection, or they have not been properly matched to the unevenly distributed weight of the system. As a result, one of the springs could be bottomed out.

Fire! And Fire Again! On the Same Day?

Several years ago I reviewed the recommendations of another consultant and concurred that the ceiling of a local church should be painted to seal an inappropriate acoustical plaster to improve musical reverberation and congregational singing. A year or so later in talking to the audio contractor who had done the new sound system I mentioned the painting of the ceiling. He asked if I had heard what happened during the painting. Seems they covered the light fixtures with paper or burlap while painting. Someone turned the lights on and the paper or burlap caught on fire and fell on the pews below. That very same afternoon, I was at a project site in an office building doing some measurements and observations. One of the office staff recognized I was an acoustician, and thought I might be interested in something that had occurred while he was on the staff at Duke University. Duke Chapel had been built with a special product that was acoustically absorptive but looked like limestone. They had several years ago painted it to increase the reverberation for a new organ. I told him I was familiar with that project, and that it was a coincidence that I had been just that morning discussing a similar project. He then said something unusual had happened during the painting. They had masked the lights with paper or burlap, and someone had turned the lights on setting the masking on fire. That I did not know. Now what are the odds of hearing two such similar stories on the same day? Noral Stewart

Products Mentioned on our Website and in our Newsletter

Mentions of products in our Newsletter are not intended as general endorsements and are not paid advertisements. These are usually unique products available from only one supplier that meet special needs. Our intent is to make you aware of these new products. Suppliers with new or unique products should feel free to contact us.

Porous Expanded Polypropylene Sound Absorber



Sound absorptive panels are now available made from porous expanded polypropylene. The surface looks like many small cylindrical pellets bonded together. The advantages of the panels are their durability and washability. They can be used in many areas where other materials are not suitable for the environment. They are even somewhat rigid structurally and resistant to bacteria and fungi. The disadvantage is poor low-frequency absorption.

Labor Saving Hanger Isolation Systems

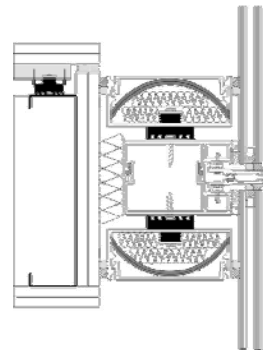
Sometimes it is necessary to use a neoprene isolator in conjunction with a hanger wire to support equipment or an isolated ceiling. Traditionally this isolator element has been spliced into the wire either into the middle or at one end. Anchors for the top end of the hanger wire are now available that eliminate labor steps by building the neoprene element into the anchor. Examples are the Kinetics Isogrid <http://www.kineticsnoise.com/arch/isogrid.html> and the Pac International decouple clip <http://www.pac-intl.com/decoupled.htm>.

Garage Door Noise - Clarification

An article in our last issue talked about the isolation of garage doors and mentioned problems when such doors are located below condominium residences but not controlled by the condominium unit owner. Isolation of the motor systems can reduce the noise and produce usually acceptable results for condominium, townhouse, or single family homes where the owner of the space above the garage controls the garage. However, experience shows results usually are not satisfactory for condominium owners who do not control the garage door below them.

A Window Mullion Solution

Office buildings in particular often have separation walls meeting the exterior walls at a mullion in an otherwise continuous window system. The mullion is usually hollow aluminum and acoustically weak. There is also difficulty getting a seal between the wall and mullion and cracks are often found. These conditions strongly reduce the isolation. In the past we have had to develop fixes that could be built in the field to extend the dividing wall over the mullion to the window adding mass and a good seal. Now, Pac International has developed and tested a cover to fit over the mullion between the wall and window that provides very high degrees of isolation.



ASTM E497 on Lightweight Partitions to be dropped

Dr. Stewart chaired an ASTM task group that reviewed E497 Standard Practice for Installing Sound Isolating Lightweight Partitions. This covered gypsum walls typically used in residential and commercial construction. The standard provided good advice on several practices to maintain good isolation with such partitions. However, it became apparent that it was very incomplete and could give a false sense of security. The practices discussed were not always required, and in some cases they were inadequate to assure good isolation. A proper document would be too extensive to be prepared as a standard. After much discussion, the task group decided to allow the standard to lapse.

Book Review - Architectural Acoustics Design Guide, by James Cowan, order from Acentech, Inc., 33 Moulton Street, Cambridge, MA 02138, \$59.95

This book is an excellent resource for architects and engineers involved in building design. It provides the basics of architectural acoustics and design guides for many problems plus a large number of useful case histories. While there are a few minor details I would have handled a little differently, these details are indeed minor compared to the overall picture. A companion interactive CD-ROM with animations and audio demonstrations is also available for \$199.

Professor Gilbert H. Gottlieb 1929-2006

Professor Gottlieb passed away July 13. He spent his career in North Carolina as a researcher and professor at Dorothea Dix Hospital, UNC Greensboro, and UNC Chapel Hill. He was known for his research on the early social development of birds including the effects of sounds on their development and their ability to recognize the sound of their species. He was the featured speaker at the first meeting of the North Carolina Chapter of ASA in 1966, and recently gave a review of his research to the chapter at its 40th anniversary meeting.

A Reminder – It is the Busy Season Coming Up

We are beginning our busiest period of the year when everyone seems to have the same deadline for work and we often have to turn work down when it cannot wait until January. If you need help this year, please do not delay in contacting us before it is too late.