

NCAC Deals with Acoustical Concerns of the Day

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Compared to many other scientific or engineering disciplines, consultants tend to concentrate more on applications than on detailed research. Many consultants juggle dozens of 'chargeable' projects, not to mention corresponding proposals, seminars, teaching and business concerns. As a result, articles such as those from NCAC members in this issue are clearly the result of additional effort in a generous spirit of cooperation.

Much of acoustical consulting involves making our clients' decisions easier and more effective. Similarly, much of the hard work of the officers and directors of NCAC is intended to make NCAC a great resource, available to help members' businesses become more effective.

Many consultants try to share as many insights as possible at meetings such as the Acoustical Society of America (ASA) or the Institute of Noise Control Engineering (INCE). Our research tends to come from our many and varied projects. As a result, our meetings tend to burst with energy and new ideas. It is also interesting, if not surprising, to note that those who work independently on similar projects tend to arrive at similar conclusions regarding the data and objective information. On the other hand, there are several areas in which consultants can use the same data and information to develop different types of approaches or recommendations. It is highly important for us to discuss the meaning of the data and information, more to provide the best consulting possible than to find a homogeneous response to all problems.

Several categories of concern have been debated with some intensity over the past several years, including concerns for acoustical forensics, classroom and educational spaces acoustics, and safety issues of 'acoustical' products. Each of these areas has common ground to which most of us can agree, but with different slants concerning recommendations and implementations.

Acoustical Forensics. Many consultants are involved with expert witnessing, public hearings, and other forensic issues. Several special sessions were devoted to the subject at the recent ASA meeting in Austin (November 2003). The ASA and NCAC cosponsored a full day seminar on forensics in acoustics, organized by former NCAC president Jack Randorff. Virtually all attendees agreed on the importance of speaking concisely and truthfully, and above all, avoiding becoming flustered under the pressure of a trial or public hearing.

One interesting area of discussion, with differing viewpoints, involves the

reproduction of sounds in a courtroom setting. All would agree that any such demonstration should be done very carefully, with attention to detail and careful calibration of the playback system. This implies significant time and expense to the clients. On the other hand, virtually anybody can easily tell the difference between a well-reproduced sound and the original sound. Most of us have had the opportunity to be in an environment to listen to the actual sounds, with all of the background noise, directivity, reverberation, reflections and other influences, and during this experience also listen to the same environment with a calibrated microphone, high-quality reproduction system and quality headphones. Although most might claim that the reproduced sound gives many clues about the actual sounds, virtually anybody would be able to distinguish the two. Therefore, in a courtroom situation, it is important to make sure that the clients and attorneys understand the desirable features of the demonstration, but must also be aware of the drawbacks. One obvious concern includes our ability to distinguish a particular person's speech, even in the midst of similar speech sounds, but this is much more problematic and difficult using microphones and a reproduction system. If the "other side" intends to use a boom box for sound reproduction, be prepared to point out all of the difficulties, if not make an attempt to throw out the demonstration.

Classroom Acoustics. The recently drafted "classroom acoustics" standard, ANSI S12.60.02, finally assembles the collected wisdom of a variety of interested parties into a single standard, with the goal to assure relatively good hearing conditions in learning spaces. Virtually everyone would agree that the audible portion of teaching is highly important. Furthermore, most would agree that low background noise, appropriate reverberation times and relatively good sound isolation are important for proper classroom acoustics. However, there continues to be a great amount of discussion, and perhaps some disagreement, about the value of the criteria and the ease of implementation. It is important to remember that while most of us are hired for our acoustics expertise, it is also important to be aware of the other factors involved, such as budgets, regional styles, owners' tastes, experience and so on.

Many of the concerns about the standard involve cost. Sometimes, there are even comments that the criteria are either too lax or too severe. These concerns must be addressed, and are components

of an overall design. None the less, we should bear in mind that an ambient noise level of 35 dBA (one of the main criteria in the standard) is not impossible, and perhaps even appropriate, because many of us would consider 45 dBA (10 dBA more, or approximately twice as loud as the criteria) to be an appropriate level for a masking system, whose goal is to minimize speech intelligibility. In other words, it is important to question whether our recommendations should be based primarily on acoustics or primarily on cost. I would suggest that our recommendations should be about the acoustics, while maintaining a clear understanding and appreciation of costs.


Estimates of costs seem to range from 2% of the total budget to 30% of the total budget. This wide range is not particularly helpful. Instead, we must continue to gather information and share the results. For example, regions where unit ventilators are quite common would expect a greater increase in the cost of quieting HVAC noise by redesigning to a central HVAC system, than regions where central HVAC systems are more prevalent. Of course, collecting information about the costs to society and long-term costs of poor acoustics should continue.

Safety. Another area of discussion concerns the safety of 'acoustical' materials. 'Acoustical' can mean different things to different people. To acousticians, 'acoustical' typically refers to materials that are sound absorptive. However, to much of the public, an 'acoustical' material means any product that solves any audible problem; it should go without saying that acoustic ceiling tile is not the solution to improving sound isolation from traffic noise.

Two types of 'acoustical' materials have been especially noteworthy. There are different types of sound absorptive foams, and manufacturers and suppliers of these foams are quite open about the different classes of fire rating and flammability. However, it becomes important to understand what these fire ratings imply and how they may relate to actual occupied installations, including concerns for toxicity, out-gassing and maintaining heat as happens in actual fire situations. It appears important to come to grips with this variety of concerns, rather than simply refusing to recommend these materials. In our consulting journeys we are certain to stumble upon the application of these materials, whether they are recommended by us or not. Another material is internal duct lining, which is one of the most effective tools for reducing mid and high frequency duct-borne noise

in an HVAC system. However, many facilities refuse to allow duct lining, and it is difficult to obtain specific reasons other than a generalized and perhaps somewhat inappropriate concern about potential safety issues, typically involving the growth of microbes or concerns for particulate matter in the airflow. Most anecdotes, which are said to be based on actual research, indicate that these safety issues are no more of concern in lined duct than in unlined duct, but again these are merely anecdotes.

The Technical Committee on Architectural Acoustics of the ASA has recently initiated an ad hoc committee to collect relevant information about safety and health issues for acoustical materials. This committee will not do research, but intends to collect and share appropriate information from interested parties.

I am constantly impressed by the willingness of our members to work hard and to help each other to the best of our abilities. We are proud of NCAC members who have taken the time and effort to provide the articles in this issue. Please do not hesitate to contact any NCAC officer or director with any of your ideas, or become more involved in the wide array of NCAC activities. 

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