

A Newsletter from *Stewart Acoustical Consultants*

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Celebrating 30 Years of Service

Are we ready for the green revolution?

This newsletter is expanded to provide three pages of coverage of the effect of the growing Green movement and government actions on the acoustics of facilities. More and more facilities are being designed with emphasis on energy and environmental concerns using the LEED rating system. The LEED system is now including acoustical pre-requisites and points for several facility types. Government agencies are moving toward requiring new facilities be LEED certified. This newsletter will give you some idea of how we are gearing up to meet this challenge. Other topics covered include staff expansion, new backup alarms, alternatives to fiberglass duct lining, interior storm windows, plastic outdoor barriers, and even a little humor.

How has LEED for schools grown and are we ready?

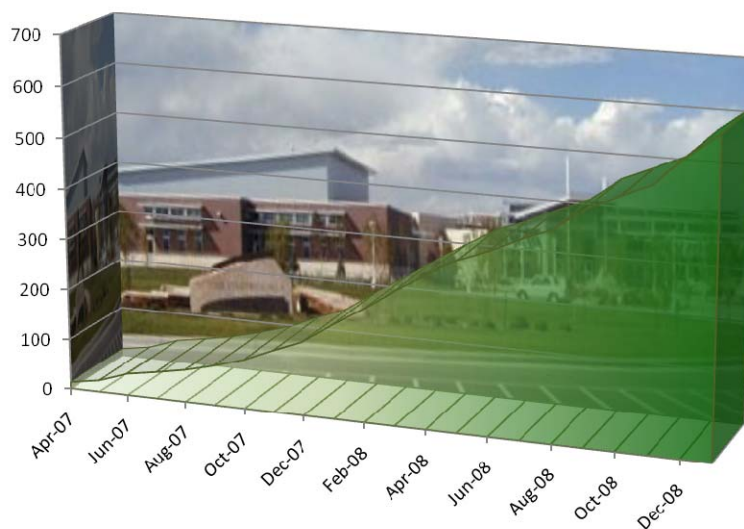
1255 schools are currently LEED™ registered or LEED™ certified (all levels of education, all forms of LEED). Since April 2007 (inception of LEED for schools), 608 schools are actively registered for LEED for Schools™ but only **TWO** have been finished and certified, the [Bethke Elementary School](#) in Timnath, Colorado and a classroom addition at [Bishop John J. Snyder High School](#).

This is simply a matter of the timeline for a project from start to completion. As the graph illustrates, the growth has been tremendous, and based on moves since then at federal, state, and local levels, the percentage of schools going green is expected to skyrocket. The question is, are **we ready?**

Many architects (including many of our clients) are still unaware of the acoustical requirements in LEED for schools (both 2007 and 2009 versions). More importantly, they are not aware of the design effort required to achieve those requirements. We have been involved in at least 20% (based on current proposals that

number may reach 30%) of the LEED for schools projects in NC and VA. In almost every case, we either had to make clients aware of the acoustics requirements (they wanted our involvement on other aspects of the design) or the client discovered acoustics requirements late in the process. Some clients mistakenly think that their LEED AP on staff can handle the effort, but many current LEED AP's who do not frequently work on schools are not even aware of the new acoustics requirements, and certainly do not have the technical skills required to do the work. To stay up to date on USGBC K-12 schools sign up for their newsletter [here](#).

Total Number of Active Registered LEED for Schools™ Projects by Month



How will the stimulus package affect the school construction business?

The new law includes about \$54 billion for a State Fiscal Stabilization Fund, a portion of which will go to school districts to fill in unmet needs – which may include school construction. Roughly \$9 billion of this fund will be available for use by governors to address public safety and other government services, which may include school modernization, renovation, and repair consistent with a recognized green building rating system. The act also establishes a new kind of tax credit bond that may be issued by states and local governments for the construction, rehabilitation, or repair of a public school facility or for the acquisition of land on which such a facility is to be constructed (source- USGBC).

How are state and local governments viewing the greening of schools and other buildings?

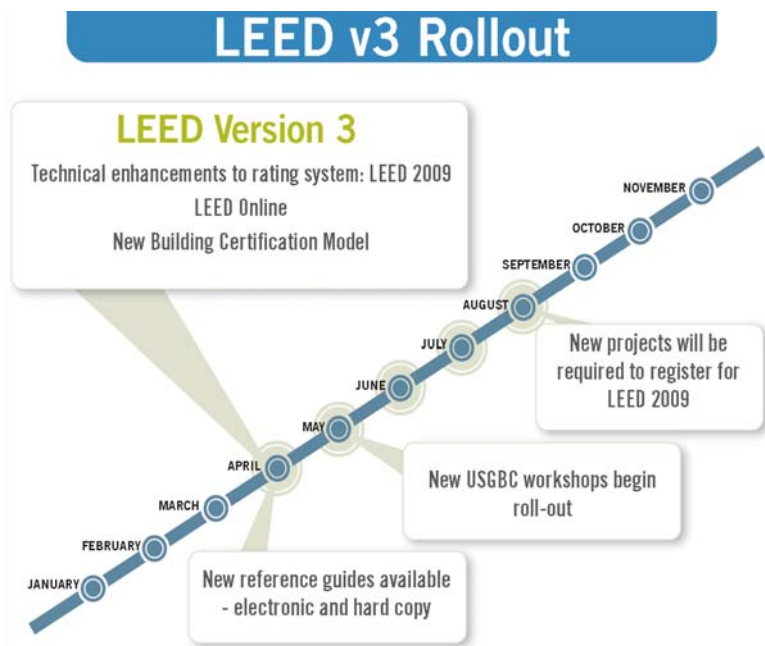
10 states now **require** that all schools have some form of green building certification. We are seeing many governors (including VA, NC and SC) requiring some form of green building effort for all government buildings. A list of various government (state, county, local) and school districts that are requiring or emphasizing green buildings can be found [here](#).

How is the acoustics portion of the LEED rating system changing with LEED for schools 2009 and LEED v3?

Both the 2007 and 2009 versions have prerequisites for room acoustics and HVAC (background) noise control. The 2009 version does not have STC requirements. Points for meeting more stringent requirements are available in both versions. The details have been covered in our Fall 2008 newsletter. We have learned that projects registering under the 2007 LEED rating system will have the option to upgrade to LEED 2009 during the transition time when the new system launches with LEED online, or they can continue to use the version of LEED under which they registered (source – USGBC).

How is the LEED process and LEED AP changing?

Other changes include the ending of the LEED AP current testing program under LEED v2 (must register for test by end of March, 2009), and the requirement by August that all new projects be registered for LEED 2009. During the transition, schools will have the option to pursue 2007 or 2009. The new online portal for LEED v3 is officially to roll out the beginning of next month. Also administration of the LEED process now takes place through the GBCI, and a list of independent 3rd party certification entities are charged with certifying the building.



Are there acoustical requirements in other LEED rating systems?

LEED for Healthcare 2009 (draft) and LEED for Operations and Maintenance 2009 both have acoustics weaved in. More information will be provided on our new green acoustics blog soon.

How we can help you on LEED Projects

Knowledge, Skills, and Experience - We are intimately familiar with the HVAC noise control requirements, and the underlying standards (ANSI-ASA S12.60 Classroom acoustics and the 2007 ASHRAE Handbook HVAC Applications Chapter 47 Sound and Vibration Control). We have analyzed well over a hundred systems to control noise in the most noise sensitive spaces. We are guided by practical building experience. Mechanical engineers and architects simply do not have the time to invest in becoming proficient in this area. We bring those skills to the green building team. We have a thorough understanding of how to achieve the sound isolation and room acoustics requirements.

Tips for designing HVAC systems for LEED for Schools Prerequisites - We have developed a guidance sheet of good practices usually required to meet the LEED for Schools prerequisite for HVAC noise and it is posted on our [website here](#).

Technical Tools to fit the work – Most of the programs for HVAC noise analysis commercially available today are geared towards selling silencers, or were created back in the days before powerful computers, windows, and sophisticated programs like Microsoft Excel were around. They have not been updated to service the current needs, and are difficult to work with. We have created a new tool to aid in streamlining the noise control calculations and analysis making it more efficient and powerful. It is set up to permit faster entry of data, and faster analysis. It is our goal to provide the option for mechanical engineers and architects to provide the inputs we require, for some of the more redundant calculations, and eventually we hope to offer it as an online tool. A more robust calculation program is the heart of the main fan noise analysis and our sample classroom calculations. We believe it is the best tool for detailed HVAC analysis available. Designed and written by Joe Bridger, it uses an intuitive object interface, and the best of both the programming and Excel spreadsheet worlds. It has just been upgraded to work with Excel 2007. We are now making substantial improvements to expand its capabilities to meet this new market. At some point, we hope to offer it as an online tool for mechanical engineers, who we would provide training and oversight. We also have tools for room acoustics, INSUL to calculate sound isolation, and a wealth of test reports and research papers on the subject.

A new way of serving the building community - We hope to provide online education about acoustics (starting with LEED for schools), tutorials, useful tools (software as a service) and other useful resources. The purpose is to provide the opportunity for more simple acoustical analysis to be performed by architects and engineers, with assistance and review by a knowledgeable consultant. This does not fit for large sanctuaries and school auditoriums, but it does fit for classrooms

Our new Green Acoustics Blog <http://green.sacnc.com>

The start of this effort is our new blog at green.sacnc.com. We will use this as a means to communicate new opportunities, such as forums, a newsletter, online elearning programs, new etools. It may look a bit empty right now, but soon it will be filled with posts. The first thing will likely be a flash video presentation providing an overview of the acoustical requirements of LEED for schools (both 2007 and 2009). Go to <http://green.sacnc.com>, fill out your email address and click "Subscribe." A link will be emailed to you. Click on the link in your email to confirm. Once postings are available, click on the subject of your choice and you can read the topic, corresponding replies, and can post your own reply.

Welcome Dr. John Gagliardi

We are pleased to announce the addition of Dr. John Gagliardi to our team on a part-time basis. Dr. Gagliardi not only has his BS, MS, and PhD from Marquette University, but has continued his education in acoustics with many classes from Georgia Tech, University of Minnesota, University of Wisconsin, University of Michigan, and Purdue University. He was a practicing acoustical consultant for many years with experience in architectural, environmental, and product noise. In recent years he has been Technical Director at Technicon Industries, and will continue in that position as he works for us. John is initially helping us with HVAC noise evaluations for schools. We will be looking for opportunities for John to assist us with field investigations in the western part of North Carolina, Virginia and South Carolina.

New Developments in Backup Alarms

A backup alarm is an essential safety system for vehicles used at workplaces. Unfortunately, the sound of the traditional backup alarm can be heard far away in quiet places. Since it is a sound designed to get attention, it can be very irritating to those hearing it in places where there is no danger. Systems have been available for years with selectable levels so the alarm could be set to the lowest level still loud enough to provide safety. Also, systems have been available that automatically sense the background level nearby and adjust the signal appropriately. Now some new concepts are available to reduce the degree to which these sounds are heard far from the vehicle.

The first of the new alarms is a [broad-band system](#) developed in England. Rather than a beep-beep concentrated at a single frequency, this uses sound over a broad continuous band of frequencies. Near the source the higher pitched part of the sound stands out and most people would probably describe the sound from this as a hiss-hiss. The high-frequency parts of the sound die off quickly with distance, and the lower-frequency parts at reduced level blend in with other environmental sound. The developers claim it is also easier for people near a vehicle to localize where it is at. Our clients who have used them verify this. These alarms are now required in New York City.

In the US, the two major suppliers Ecco and Preco have recently merged but each part of the business has a new offering. [Ecco](#) has teamed with a San Diego company that specializes in sound sources with strong directional control. Their effort has concentrated on aiming the signal to the back and minimizing the spread in other directions. To some extent this occurs with any signal mounted on the back of a vehicle, so the difference between the new signal and traditional signals is not as great as tests of the signal alone indicate. The Preco Safety division has developed an alarm that is a mix between the traditional pure-tone alarm and the broad-band alarm. It uses sound at a series of individual frequencies, not continuous but closely spaced. This creates a sound that has some of the characteristics of the traditional beep especially near the source, but also some of the characteristics of the broad-band signal especially far from the source.

Plastic Outdoor Barriers with Absorption

Outdoor noise barriers are commonly made of metal, concrete, or wood. Often it is desirable or necessary to have an absorptive face on the barrier. [Sound Fighter Systems](#) has an absorptive barrier system made of plastic. This is lightweight which could be an advantage in some cases, though that also means that it does not do as good a job as a heavier barrier for low frequencies.

Interior Storm Windows

As we face more situations of homes offices and other buildings close to roads or other noise sources, we face greater needs to increase the sound blockage of existing windows. The easiest way to do this is usually with a storm window either indoors or outdoors. Such windows can be of acrylic or regular 1/8 inch glass. However, the best performance is achieved with laminated glass 1/4 inch thick or in extreme cases thicker. We have discussed this before, but now we are finding more sources of these windows. Here are some:

<http://www.stormwindows.com/index.htm> 1/8 inch glass

<http://www.soundproofwindows.com/photos.html> nothing really soundproof, but these are good.

<http://www.maine-glass.com/>

<http://www.citiquiet.com/products.php>

<http://thermolitewindows.com/noise.htm>

<http://www.alliedwindow.com/>

Alternatives to Fiberglass Duct Liner

We know that some facilities do not allow the use of fiberglass duct liner. The objections appear to be concerns about moisture retention – mold growth, cancer and volatile organic compound emissions such as formaldehyde. We believe these concerns have been addressed. A 1996 study by the University of Nevada Las Vegas confirms the results of numerous earlier studies which showed that fiber content in the indoor air from fiber glass lined systems is insignificant and does not adversely affect the health of building occupants. A 1997 study by Duke University showed that mold is no more likely to grow on fiber glass than on any other surface in the duct system. A second study by UNLV shows that mold grows at the same rate on lined sheet metal, duct board or bare metal. The International Agency for Research on Cancer [IARC](#) has established that fiberglass materials of the type used in duct liners are not classifiable as carcinogenic. GREENGUARD certified fiberglass liners are available with low formaldehyde emissions.

Often facilities that do not allow fiberglass lining will allow the use of regular silencers that include fiberglass or mineral wool filler and flex duct that contains fiberglass. This combination can usually get the job done. Some manufacturers are offering silencers with cotton or polyester fiber packing or can provide a film between the perforated metal and filler. Silencers are also available with no fiberglass packing, often called “no fill” or “packless” silencers. These are typically less effective than regular silencers. McGill AirFlow makes both [round](#) and [rectangular](#) double wall duct with perforated inner wall and thicknesses of 1, 2, and 3 inches, and can provide a film between the perforated wall and fiberglass if desired. Alternative duct liners are available in two types of fire safe foam, [polyimide](#) and [melamine](#), and in [cotton](#).

A Little Humor

An attorney wanted to take the unusual step of interrupting testimony to cross examine the witness on some points before allowing him to continue. The judge asked the opposing attorney how many more questions he had to finish. “Your honor” he replied “my questions are lettered. I am on “m” and I only have to go to “p.” At which point the judge responded “So do I, court recessed five minutes.” This really happened in Charlotte in 1983. The attorney with the lettered questions happened to be on crutches from a skiing accident. He laughed so hard he fell.

A university maintenance mechanic walked into an office where he saw some textile machine components he recognized. He asked what was going on. Upon being told it was a project to reduce noise to prevent hearing loss, he responded “I worked in the textile industry in noisy plants for 20 years with no ear plugs, and I only went deaf twice. Today I have perfect hearing.” How? He had an excessive earwax problem. He produced his own ear plugs until he could not hear and had to have his ears cleaned. Those plugs were effective for him.