

A Newsletter from **Stewart Acoustical Consultants**

**Our 29<sup>th</sup> Year**

7406 L Chapel Hill Road, Raleigh, NC 27607

Ph. 919-858-0899

Fax 919-858-0878

## Meet Obadiah Kilonzo

We welcome Obadiah Kilonzo to our firm. Obadiah will be with us part-time as he continues his doctoral studies at NC State in the area of Mechatronics. Obadiah was born in the US, grew up in Kenya and received his initial engineering degree there, then received an MS from the Rochester Institute of Technology. He will be helping us primarily with administration of the office and creation of some databases, but may occasionally help with some chargeable tasks helping set up computer models or creating figures for reports. He will in the near future be working mornings until 11 and 1 on Fridays.



## Condos – Many Problems Out There - BEWARE

As reported a couple of issues ago the condo market is booming. However, we are seeing many built without good guidance on acoustical issues and this is creating serious problems. The most serious is floor-ceilings that do not meet the basic building code requirements for IIC rating. Such problems are extremely difficult to fix after the building is constructed as impact isolation must be designed into the heart of the floor structure. Tearing into structure after a unit is occupied means relocating people. Getting the materials in and out can be very difficult. Raising a floor to add materials creates problems with doors and counter heights. You might have difficulty getting fire approvals for a design that has never been tested.

Much of the information available from suppliers of materials can be misleading. Some test results may be the best ever achieved with a design and not representative. Laboratory results can differ greatly from expected results in the field because laboratory results do not include flanking of impact sound into walls. Wood-frame structures behave very differently from concrete structures. Some products that can work with concrete structures do not work on wood frame. In one case recently after noticing a test result that was unbelievably good, we questioned the test lab which was embarrassed to find they had forgotten to mention that the system was tested with a ceiling below the concrete slab. The people selling the product did not know enough to recognize something was wrong. Most test data is for either wood-frame or heavy concrete construction. Risk is greater for any other structure type due to lack of information.

The features that provide acoustical quality are not visible or immediately noticeable by a potential buyer. However, those buyers expect the acoustical quality to match the visual quality they see. Reducing the money spent on acoustical isolation is false economy and very risky. We strongly encourage developers and designers to consider their floor-ceiling designs carefully and get independent advice before construction.

## New Equipment to Serve You Better

With wider use of the EASE model for room acoustics we have invested in a dual core computer for dedicated use running EASE and possibly other advanced programs in the future. This allows us to run multiple models simultaneously and without interfering with other work. We also have added a VOIP phone line for easier access and more long distance communication at lower cost. You may be receiving calls from us on this new line at 919-521-4376.

## Impact Isolation in Steel Deck Construction

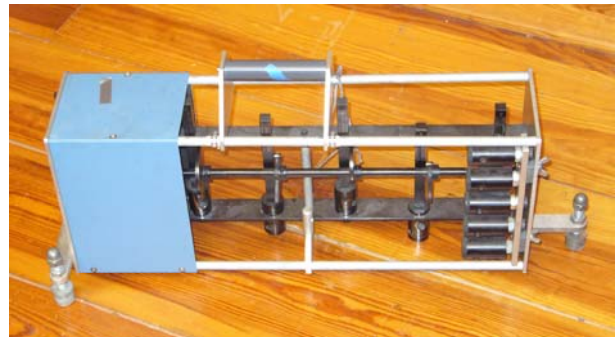
We are seeing a growing interest in use of steel deck systems for residential use and these are also widely used for schools and commercial structures. We have particular concern about residential and school applications because of the IIC ratings required in the building code and classroom acoustics standard. The concern is that these often use relatively thin layers of concrete and joists to support them similar to wood frame structures. The deflections are often greater than for wood frame structures, and there is very little impact test data on these constructions. If anyone needs to use such structures where impact isolation requirements must be met, we strongly encourage testing a mockup of the planned construction as soon as possible in construction. Some suppliers of materials and systems for impact isolation have expressed interest in helping support such testing.

## Green Guide for Health Care gives points for Acoustics

In January, the *Green Guide for Health Care* (GGHC) Steering Committee unanimously revised the “Acoustic Environment” voluntary credit to make two points available for acoustics. The *Green Guide for Health Care* (GGHC) is a joint project of the Center for Maximum Potential Building Systems and Health Care without Harm. It is structured, with permission, on the U.S. Green Building Council’s LEED for New Construction rating system. The *Green Guide* has a Pilot program including 115 projects representing over 30 million square feet of construction across the USA, Canada, and internationally. The new *Green Guide for Health Care*, Version 2.2 can be downloaded for free [www.gghc.org](http://www.gghc.org). For details on the “Acoustic Environment” credits, look for the section “Environmental Quality Credit 9 – Acoustic Environment.”

## Tapping Machine

Impact sound ratings for floor-ceiling assemblies are evaluated using as standardized machine that taps on the floor while the sound is measured below. See photo at right. These machines are rare. We have made arrangements with Fagen Acoustical Consultants of Florida to use their tapping machine at a cost much less than the cost of weekly rental and shipping from other sources.



## Green Schools with Credit for Acoustics

The US Green Building Council is developing a LEED for Schools program that will include credit for good acoustical characteristics in schools. According to the current proposal open for comment, one point would be awarded for meeting most of the requirements of the Classroom Acoustics standard ANSI S12.60 except the requirements of HVAC noise, and a second point would awarded for meeting the HVAC noise requirement. A minimal HVAC noise requirement would apply to get the first point.

## 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.

## **Al Ruocchio 1937-2007**

We note the passing of Al Ruocchio on February 8. Al had come to Raleigh as an electrical engineer with IBM in 1966 after working his way through school. He was very active in his church, in the Knights of Columbus fundraising efforts for mentally handicapped children, and in leadership for the Frankie Lemmon School and Development Center. He was an avid collector of model trains and national president of the Train Collectors of America. Al was widely known for his knowledge and love of opera and his weekly radio program on WCPE. His interests led him to study acoustics and then to offer his services to churches and others in attempts to resolve acoustical problems.

## **ASTM to meet in Norfolk April 16-17**

The [ASTM committee E33](#) on environmental and building acoustics will meet this spring in Norfolk. This committee writes the standards for measuring and rating acoustical performance of materials used in buildings and field measurements of building performance. Dr. Stewart is vice-chair of this committee and chairs the task group for field measurement of isolation between spaces. This meeting provides an opportunity for those interested in the work of the committee to attend a meeting. Visitors are welcome at no charge.

## **Acoustics in Single Family Residences – Road and Fan Noise, Reverberation**

We occasionally get calls regarding sound problems in single family homes. The most common complaint by far is road noise, especially when bedrooms are close to a road. We recommend making windows in such bedrooms smaller and using the money saved to buy better windows or to install an interior or exterior storm window. Another problem historically has been noisy HVAC air returns in inappropriate places. These should be silenced with a long run of flexduct or lined duct, and located where they will not be a problem. Recently we have seen the trend to double height spaces such as a high living room which is often open to a loft. This creates two problems. First the high ceilings without extra absorption for the extra volume create a strong reverberation. The lack of walls also creates acoustical interferences between activities in various spaces that are not well isolated. [Owens-Corning](#) is now marketing a stretched-cloth ceiling system for residential applications at much lower cost than similar systems for commercial applications. This can help in many cases where such high ceilings are desired.

## **Resilient Channel Installation Problems- a Possible Solution**

Though there are new products ([Isomax](#), [Pac-Intl](#)) that can provide better isolation and less chance of installation problems, the most common way to isolate gypsum from studs and joists is the resilient channel originally developed by USG. However, problems abound with resilient channel due to many substandard products and mistakes in installation. The one resilient channel we know that meets the original standards set by USG is the Dietrich RCSD also called RC Deluxe. Important features are 25 gauge metal, the angle of the web, the three-inch long slots separated by one-inch solid areas, and the location of the screw holes for attachment to joists and studs at the center of the slots. Unfortunately, the [Dietrich](#) catalog illustrations show the screw holes in the wrong place, and show the channel attached to studs and joists at the solid part of the web. The slot should be aligned with the joists or studs. The other common installation problem is the use of long screws to attach the gypsum to the channel and placement of those screws where they can enter the joist or studs and short out the channel. Recently, [Keene](#) has introduced a spacer to provide 3/8 inch extra space between the gypsum and studs, and a solid surface that makes it difficult for a screw to penetrate into a stud. It is yet to be established whether these provide performance close to that of the newer systems at lower cost.

## **Celotex, Capaul and decoustics Now Part of St. Gobain Certaineed**

The [Celotex](#) ceiling line and the [Capaul](#) line of ceiling and wall panels, and the [decoustics](#) line of custom acoustical products are now part of the Certaineed family of products in North America, joining [Certaineed](#) fiberglass products and [Ecophon](#) ceiling products. The combined marketing effort should provide wider availability of some unique Ecophon products.

## **Thermocon Cellulose Spray-on merged into ICC K13**

The [Thermocon](#) line of cellulose spray-on absorptive surfaces has been purchased by [International Cellulose Corporation](#), the producers of the K13 and Sonaspray fc products. This leaves one dominant supplier of these products.

## **Quieter Cooling Towers More Widely Available**

It used to be that the major suppliers of cooling towers offered only basic noisy fans. If these were too noisy for a location, we were faced with either finding a way to silence them or turning to a smaller specialty supplier that did offer quieter fans. Now, most of the major suppliers are offering a variety of quieter fans to meet needs.

## **Origins of Acoustics in the Region- 1940's-50's**

Over the next few issues we will discuss some of the pioneers who laid the groundwork for acoustics in the Carolinas and Virginia. This time we concentrate on the 1940's and 50's. The earliest work we know is that of the [Acoustics Branch](#) of the NACA (now NASA) Langley Research Center in Hampton, VA headed by [Harvey Hubbard](#). Early efforts involved silencing propeller aircraft for use on reconnaissance missions. In Blacksburg, Bert Kinzey a young organist and professor in architectural engineering at Virginia Tech was getting interested in architectural acoustics. He would leave to start the architectural acoustics program at the University of Florida, but has recently returned to Blacksburg in retirement. In the early 50's, a young Bill Manson had graduated from Virginia Tech and joined his father's [business](#) that had started installing tin ceilings in 1915. Bill recognized the importance of acoustics, participated in the first BBN-MIT summer class in acoustics with Leo Beranek, and joined the Acoustical Society of America. Up until this time if you wanted a sound system for a church or auditorium, you went to RCA, the Bell System, or one of a small number of other loudspeaker manufacturers. However, in the late 1950's, Long Engineering in Winston-Salem became one of the first of a new breed of independent sound systems contractors who could design and install a system using components purchased from various suppliers. The Bell System established a major development and manufacturing presence in the Triad area that included Bell Labs and Western Electric specialists in underwater sound. In Raleigh, two young engineering students were completing their undergraduate degrees without realizing they would quickly in the next decade become involved in acoustics and begin to bring many others into the field. More on them next time.

## **NC ASA Meeting and Student Competition**

The Spring Meeting of the NC chapter of the Acoustical Society of America will be held March 30 in Raleigh and will feature the student poster competition for the Royster Award of \$2500 and \$1500 in other prizes.

## **Horrible Sounds – Voting Results**

About a year ago we told you of a website conducting a worldwide poll on the most horrible sound. After 1.1 million votes, the [results](#) are in. The most horrible sound was a person vomiting, followed by microphone feedback and in a virtual tie for third the sound of crying babies and a train scraping on tracks.