Noise Abatement
by Liz Ernst
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When construction was completed on the upscale, 49-unit Lexington Apartment Building in Hoboken, N.J., real estate agents pitched each unit's high-end amenities including granite countertops, stainless appliances, hardwood floors and the hidden soundproofing material installed within the walls and floors to potential renters.

In an age when noise pollution is surpassing mold as the top health offender in multi-unit construction, more and more architects and builders are incorporating some sort of noise abatement solution into residential properties, as well as commercial and industrial buildings to meet a growing demand to address not only noise but the threat of noise complaint litigation. As noise abatement technology becomes more sophisticated, a growing movement to rid our home, work and leisure spaces of high decibel intrusion is taking shape, and sound abatement manufacturers are competing like never before to restore quiet to living spaces.

A host of elements have stirred demand for noise reduction applications: global economic factors, urban and suburban build-out and oppressive land price increases have spawned higher density, multi-unit development. More people are living and working in highly concentrated environments. Unwanted noise from neighbors has become a high-priority lifestyle issue for people living in apartment and condominium housing complexes. In a national survey of 1,500 multi-family housing residents conducted by Richmond, Va.,-based Alan Newman Research, noisy neighbors are the number one cause of irritation when it comes to multifamily living. More than 60-percent of those polled rated noisy neighbors who can be heard through the walls as the top noise compliant, with loud music following a distant second.

In the case of The Lexington, JDA Group commercial and residential developers installed sound abatement material under the drywall and subflooring of each unit during construction to create living spaces that are void of ambient noise from outside traffic, as well as adjoining apartments. This patented material, made by Tampa, Fla.-based Acoustiblok Inc., is attached to the studs before drywall is hung during the construction or renovation phase. This flexible material is a heavy, mineral-filled viscoelastic polymer that absorbs sound and transforms it into inaudible friction energy. Since the product can be cut to fit during installation, it can be applied to any type of project.

Easily cut to size with a utility knife, Acoustiblok requires no special tools or preparation, and can be installed anytime before drywall or floor covering.

In the hospitality industry, including hotels, resorts, and bed and breakfast accommodations, surveyed guests have repeatedly rated noise from common areas and other rooms the number one annoyance that would keep them from returning. Competition for a dwindling customer base has hoteliers looking for materials and techniques to combat noise issues in an effort to keep their rooms quiet and their guests happy.

For that reason, Acoustiblok was recently installed in the 3,100-square-foot ballroom of the Parsippany, N.J., Holiday Inn. Noise generated from the ballroom was infiltrating courtyard-side rooms, and guests were complaining. The Acoustiblok went in during a total renovation in June, and General Manager Joel Hecht says the noise problem was eradicated completely.

"We completely refurbished and remodeled the whole property, and when we got to the ballroom, we decided to do it right and take care of the noise problem," Hecht says.

Growing attention to noise abatement and privacy demands are driving the development of new building materials that significantly reduce sound transmission. Older methods of blocking sound with concrete or other barrier materials have proven ineffective at best, as sound often reverberates off of these materials. In certain settings, sound can be worsened due to an echo effect that some barriers create within certain acoustical settings.

One recent example of the acoustical problems concrete barriers can cause occurred at the Pinellas County, Fla. jail and adjacent courthouse when videoconferencing technology, installed to streamline certain court proceedings, was rendered unusable due to the acoustical echo chamber created by the jail's concrete block walls.

Win Ellwood, technology manager for the Sixth Court, researched different solutions before concluding that certain options like layered gypsum, carpet and sound absorbing ceiling tiles would not work adequately in this situation.

"We needed a solution that was indestructible," Ellwood says. "It had to be totally fireproof, something that could be cleaned easily, could not be torn off the wall and adheres to all current building codes."

The jail used Acoustiblok all-weather sound panels for the project since they met all code requirements, could be hosed down for cleaning and had a sound absorption capability of NRC 1.00. The panels can be used in indoor and outdoor applications and are approximately 2¼ inches thick with a welded aluminum frame and perforated aluminum grill. Installation varies depending on the project. Elwood says they were wall mounted in a few hours.

Other variables—proximity to light rail trains, highways, airports and other external offenders are creating new challenges for urban planners, architects and builders when noise mitigation demands come into play. Studies are being released routinely warning of the increased health risks due to noise-related stress, and people are becoming more aware of the dangers. Ironically, as awareness increases and demand for noise pollution solutions is raised, new problems arise as mass transportation projects expand to residential areas and other industrial and commercial projects add to the din.

GOVERNMENT/INDUSTRY STANDARDS

A cutaway rendering of a stud wall layered with a 1/8 inch thickness of sound abatement material and batt insulation beneath the drywall. Government and industry standards, when it comes to sound reduction in construction, is translated in sound transmission class, a system that measures the ability of a wall partition to prevent noise from penetrating a wall between adjoining rooms. The higher the rating, the greater the noise reduction. For apartment dwellers or hotel guests, an STC-55 rated wall is enough to prevent the penetration of normal sounds. To prevent the intrusion of sound from loud music or any other unusually high volume source, an STC-60 rating may be called for.

In an effort to increase STC rating, contractors use one or a combination of noise abatement techniques including: Increasing the wall's ability to disperse vibrational energy that is produced by sound waves within a partition, also known as damping.

Adding to the wall's mass, literally adding layers of drywall or other material to create a barrier that sound waves must penetrate to pass from one room to the next.

Creating flexibility in the wall assembly to enhance sound absorption. Too much stiffness reduces a wall's ability to absorb sound. Metal studs have more flexibility than wood studs, and should be used in walls where noise abatement is important.

A cutaway rendering of a stud wall layered with a 1/8 inch thickness of sound abatement material and batt insulation beneath the drywall.

Less framing, which will improve acoustical performance, with 24-inch o.c. framing spacing proven to be a better option for sound abatement than 16-inch o.c. framing.

Increasing wall cavity depth and packing the empty space with insulation or another sound-absorbing material.

RESILIENT CHANNELS

Sound panels installed at an industrial sewage pumping site to eliminate noise pollution to the surrounding park and residential areas.

Resilient channels are a noise abatement application that utilizes several design options. This solution uses flexible metal channels to create a barrier in between the stud and the wallboard, which removes the direct conduit for transmitting sound waves between rooms.

The resilient channels solution can be costly, as it requires additional material and labor, but it is a proven option for boosting STC rating up to five points in some applications.

Almost every noise abatement or soundproofing solution requires added expense in both materials and labor, and with few exceptions, the deeper wall cavities created by these solutions can eat up floor space.

Of course, any soundproofing solution is only as good as its installation. Even the best technology in noise abatement materials requires proper installation. Most products, including Acoustiblok and National Gypsum's SoundBreak, come with detailed installation instructions backed by live expert advice from company representatives. Following each manufacturer's instructions is critical in successfully completing any soundproofing project, such as using proper acoustical sealants and the spacing of framing.

Architects and contractors are finally beginning to take noise abatement seriously, and the liability of ignoring this important aesthetic in the design process is getting costly. Increased litigation over noise problems are becoming more the norm than the exception. With new studies being released routinely on the health implications caused by noise pollution today, consumers are beginning to demand quiet in their homes and businesses. W&C

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