Simple acoustic solutions to address sound levels - by Neeraj Chander

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Ever go to a restaurant and realize that you can't hear the person seated across from you but can hear everyone around you? Or attend a meeting and can't hear the presenter? Perhaps walk down a corridor and feel like you are wearing concrete boots with every step you take? These environments make us acutely aware of the lack of acoustic management and how the interior finishes can impact our experience within these spaces. While acoustics and managing them is a specialized science unto itself, there are ways to address them in our daily environments that don't necessitate invasive solutions or complicated acoustical testing. We can address these issues with options that can be aesthetically appealing and the cost to do so can be relatively inexpensive. The issue of managing acoustics can be broken into three different categories:

Sound Absorption
Sound Diffusion
Sound Blocking

Each category can offer a spectrum of solutions, but for the sake of this article, we'll discuss options that can be applied non-invasively with off-the-shelf products.

Prior to tackling any acoustic issue, it's important to understand the material properties that are covering the surfaces and how they react to the environment. A rule to remember is the largest square footage in any room is usually the walls. Addressing what's in them, what material is covering them, and what's attached to their surface will go a long way in helping address the issue. Combine the walls with materials used on the ceiling and floor, and this allows you to begin to understand how sound will react within any given space based on a quick glance.

The space and its needs will dictate when to use sound absorption, sound diffusion or a combination of the two. For the sake of this article, we'll ignore sound blocking/sound isolation since it has a much more focused criteria that most residential and commercial spaces don't require or necessarily need.

Sound absorption, while ideal for a smaller room, can be used in any space where sound is not

meant to be reflected back into the space. Sound that is reflected into the space usually makes the room feel noisy and speech tends to sound muffled and unclear. Spaces that are designed for small meetings usually try to keep the reflection down to short distances by using absorptive materials, whereas spaces designed for music tend to use materials that diffuse the sound through the space, such as concert halls, large lecture rooms and theaters.

Most often, sound absorption is achieved through the use of wall coverings, ceiling panels, flooring and floor coverings; spaces where materials and surfaces tend to be reflective in nature like tables, chairs, glass partitions, bare flooring, etc. Using materials that have absorptive properties helps control the amount of sound reflected off surfaces into the space, in essence, reducing the echo. Sound absorption would be ideal in long hallways and corridors to keep noise to a minimum, especially in residential areas.

Sound diffusion is the act of scattering sound waves throughout the room by using materials that reduce the echo without removing the sound. This helps maintain speech and sound clarity without creating an echo or hollow effect throughout the space. Sound diffusion usually is not recommended for small rooms but is ideal for large conference rooms, meeting halls, concert halls, cafeterias, etc.

Some recommendations of materials that can be used to create sound absorption, sound diffusion or a combination of both are below:

Wall coverings

Acoustical drapery for windows (non-porous reflective surfaces)
Fabric wrapped acoustic panels
Art panels wrapped in a printable porous material
Foam Panels (melamine foam) – class A fire rated

Ceilings

Fabric wrapped ceiling cloud mount panels
Hanging baffles (come in a variety of shapes and sizes to create a zone or area)

Flooring

Cork Flooring
Carpets, rugs and padding (limited absorption based on material and size)
Free-standing acoustic partitions (used to divide a room or provide a quiet space)
Adding mid-size to large indoor plants helps absorb sound between seating areas.

With buildings, both commercial and residential, looking to update their spaces focusing on managing sound should be near the top of the priority list. The current pandemic environment has forced numerous lifestyle changes and with these changes has come the need to work from home or in spaces that were not designed or intended to be used for other purposes. By using the above-mentioned combination of materials, spaces can be transformed into environments that can be conducive to serving different roles at different times.

Neeraj Chander, AIA, LEED AP, is a senior architect at The Falcon Group, Bridgewater, N.J.