

# SOUND ADVICE

## FIND PEACE OF MIND THROUGH PROACTIVE ACOUSTICAL PLANNING

By: Amador Castro, Jeff Elliott, Dustin Griesmann, and Alberto Ruiz

We have all heard a horror story or two about large-dollar building projects that shortly after completion received a **flood of noise complaints** requiring considerable effort and spending to address the concerns. Sadly enough, many of these situations could have been avoided by **proactively discussing and planning for the acoustical needs** of the project up front. By evaluating these needs early on in the planning stage and deciding if there is a need to hire an acoustical consultant, you can minimize the likelihood of complaints.

### What kind of questions should you be asking?

#### 1) Where is the proposed build site and are there any noise concerns with this location?

Significant savings can be obtained by selecting a site that already meets the exterior ambient noise level needs of your project. However, **environmental noise sources** such as road traffic, air traffic, and other outdoor noise emitters can cause a preselected site to have a higher than desired exterior ambient level. In such instances, an acoustical consultant can advise you on design elements that can bring the interior noise levels down to an acceptable level. The following issues regarding the impact of the proposed site to its surrounding community should also be considered:

- Are you building next to a residential area where the neighbors are not expecting construction noise?
- Are there any existing noise ordinances in the proposed community?
- Will the use of the space you are building increase the exterior ambient noise level of the community (typically associated with mechanical equipment)?

Working closely with the local authorities having jurisdiction and the surrounding neighbors to address ways to minimize any noise-related impact upfront will go a long way in keeping your project on schedule and on budget.

#### 2) Has the acoustical use of each room been considered and will the walls that separate each room create compatible noise levels between adjacent spaces?

During the project planning stage, ask yourself what the primary use of each room will be and what acoustical design considerations will be necessary to facilitate that use. For example, many rooms in medical facilities must allow for private patient-doctor interactions. To accomplish this, the walls, ceilings, and floors that separate adjacent rooms must be designed with a high enough **Sound Transmission Class (STC)** and **Impact Insulation Class (IIC)** to minimize the level of airborne and structure-borne sound that is transmitted between two spaces. Not only can a well isolated room keep sensitive information undisclosed, it can also keep unwanted distractions to a minimum. Consider a **school** with adjacent classrooms or an office building with work stations next to a break room. Sound transmission between these areas must be kept at a minimum for an effective use of each space. Adding mass to a partition, decoupling wall studs, and using resilient channels between wall studs and finish materials are effective ways of lower sound transmission, all of which are easier to achieve during construction.



#### 3) Have the interior materials been selected to facilitate an effective acoustical use?

The interior materials of a room, when selected properly, can favorably influence a room's acoustical attributes. Therefore, matching the interior materials with the intended use of a space can help you avoid costly post construction fixes. Hard surfaces such as brick or glass tend to be reflective and contribute to a room having "lively" characteristics, while soft materials like carpet offer more sound absorption reducing the amount of reflected sound you hear. Acoustical consultants can suggest appropriate materials for each room in your project as well as alert you to any potential mismatches of acoustical use and interior materials. Consider a conference/meeting room for example. An acoustical consultant can propose interior wall materials that will offer a high level of **speech intelligibility**, ensuring effective communication.

#### 4) Has the mechanical equipment been designed and located in an area that will not negatively impact the surrounding areas of the building?

Be intentional with the selection of quiet mechanical equipment and take the time to install it in a location and manner that will minimize any impact on the surrounding rooms. A consultant knowledgeable in the area of mechanical noise control can recommend duct silencers, duct lining, as well as rubber or spring isolators to help reduce both airborne and structure-borne noise in the system. Duct silencers make the airflow go through several passages that use fiberglass and perforated sheets to reduce noise introduced by high velocity duct currents, while duct lining fits the interior ductwork with absorptive material that aides in the reduction of airborne noise. Fixing an existing mechanical noise problem can get rather expensive, so be sure to consider a consultant for equipment mounting designs and duct run modeling to minimize **HVAC noise**.

#### 5) Are there sustainability goals that need to be met in the building design?

If the acoustical design is considered early in the project development then the location of structures, such as a security or reinforced concrete wall can be effective in reducing unwanted noise and can also be made from recycled materials. Acoustical products like ceiling tiles, insulation, and carpeting can help meet the project's **sustainability goals**, since many of them are manufactured from recycled content and can be recycled eliminating material that would end up in a landfill. Even the existing landscape such as mature trees or natural soil berms can play a minor role in the overall noise reduction plan of the site.

While there are other questions that may arise, answering these five early in the design process can save you time and money. An acoustical consultant can help identify noise related concerns and work collectively with architects, contractors and engineers to develop solutions to the situations discussed above. Whether you are working on a small office remodel, a large multi-unit building, or some other type of structure, take the time to consider the acoustical needs of your project early on in the process and use the five questions above to get started.

## MEET THE ACOUSTICS TEAM

The Cotter Acoustics Team, led by **Dustin Griesmann** and technicians **Amador Castro, Jeff Elliott, and Alberto Ruiz**, is a key aspect of Cotter's work on the Residential Sound Insulation Program (RSIP). This program reduces airplane noise in neighborhoods surrounding O'Hare and Midway Airports. Dustin and his team's expertise is applicable to multiple types of construction. Have acoustical concerns on an upcoming construction project? Get in touch with Dustin: [d.griesmann@cotterconsulting.com](mailto:d.griesmann@cotterconsulting.com)