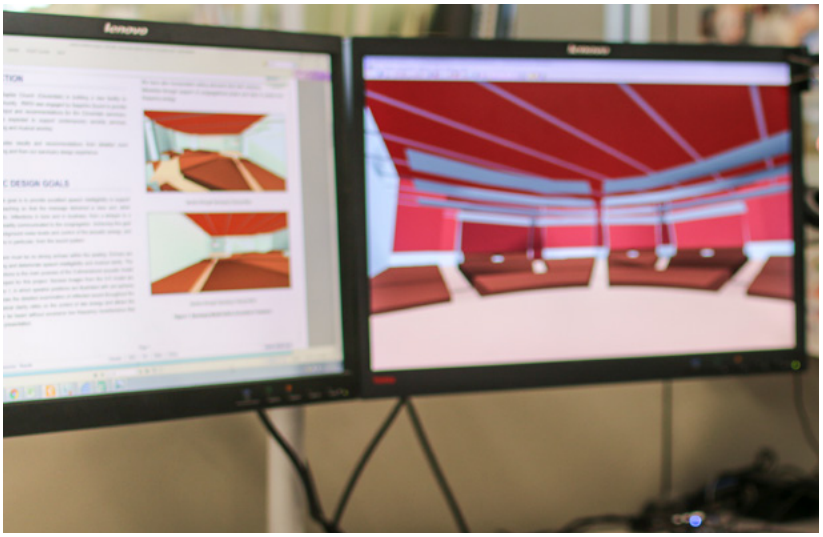
ACOUSTICS

Improving privacy, comfort and performance by managing sound in the built environment



Good acoustics help create a usable and comfortable environment. Any space, system or activity can benefit from work to improve its acoustic character.

Our Service

We help make your project "sound right." Our goal is to help create occupied environments that are comfortable for listening and free from distraction. Our work can also help you integrate your project into the surrounding community in the least obtrusive way. The science behind our acoustics work can range from simple to quite complicated. Often the greatest value we provide is engineering judgment: applying the science in a practical way that you can use.

To back up our engineering judgment, we use various tools to calculate and evaluate how sound is generated or how it will propagate, reflect and transmit. These tools range from simple hand calculations, to spreadsheets, to detailed commercial modeling packages and sophisticated measurement technology. We further increase our confidence in these methods through field assessment, extensive project experience and references from all over the world. These reference sources include measured data, research papers, regulations, codes, publications, standards, textbooks and product literature.

Our acoustics group is truly international, with project experience from Antarctica to the Arctic Circle and practitioners from North America to Australia. Our experienced acoustical consultants are highly regarded by our clients. Group members bring a broad range of educational and professional backgrounds to your project. Also, because we contribute to projects across all of RWDI's engineering services, we have experience with many "atypical" issues. We bring an exceptionally broad perspective to our work and confidently tackle any acoustics challenge, large or small.

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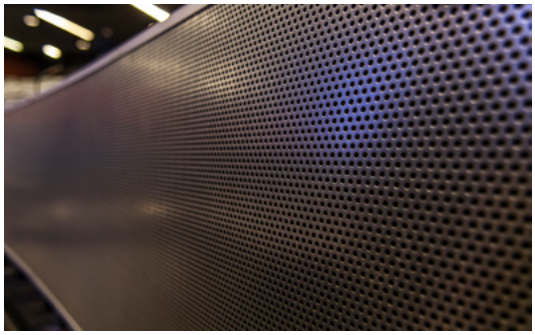

RWDI is a valuable partner to clients seeking to...

Explore Innovations

- Complement advanced visual aesthetics with a welcoming, usable, comfortable acoustic environment
- Develop livable, sought-after communities by limiting sources of conflict and complaints
- Utilize sophisticated modeling to design surface finishes to optimize internal acoustics

Create Opportunities

- Improve working conditions for greater productivity
- Create healthcare environments conducive to healing
- Improve tenant retention by creating comfortable, effective spaces
- Create desirable spaces for gatherings and performance

Meet Challenges

- Increase privacy in residential or healthcare spaces while containing costs
- Enhance privacy and communication in commercial spaces (e.g., offices, restaurants)
- Integrate noisy—or delicate—equipment systems
- Address complaints with effective and economically viable retrofits
- Smoothly integrate new construction into existing built environment
- Improve local acceptance of construction, resource extraction and industrial operations
- Improve quality of life near industrial activity and transportation routes (road, rail, air, shipping)

Fulfill Expectations

- Provide solutions to meet building code, LEED/WELL requirements or project specifications for noise and vibration
- Protect workers' hearing and health by controlling industrial noise as required by law

How we work

The word “acoustics” has several senses. One sense is “room acoustics.” That covers the factors that determine the audibility and fidelity of sounds in a space. However, our clients often have a much broader interest: namely, anything and everything to do with sound. Our scope of work ranges from city masterplanning, campus planning and development sites, to building configuration, to room layout and construction details. Thus, as acoustic consultants, we routinely go beyond room acoustics and into the science of sound as it affects an entire building.

Among the issues we consider are the following:

- Room acoustics and interior acoustic quality (RT60/NRC/diffusion)
- Mechanical and electrical noise and vibration (NC/RC/VC)
- Sound isolation and partition design (STC/Rw)
- Impact insulation (IIC/Ln)
- Privacy and intelligibility issues (STI/AI)
- Design of audiovisual and sound systems for buildings
- Construction noise and vibration (dBA/VC)
- Environmental noise intrusion (OITC)
- Environmental noise impacts on surroundings (dBA/dBC/Leq/LDN)
- Floor and ground vibration (VC)
- Building performance testing
- Wind-induced noise (a key specialty of RWDI)

Room acoustics

A common room issue is too much reverberant energy from people speaking or from background music or noise. An example is a restaurant where people have to shout to be heard across a small table. The same can happen in large spaces too, such as auditoriums, stadia, swimming pools, atriums, and gymnasiums—as well as airports and train stations, which are notorious for unintelligible announcements. This issue is especially important in critical shared spaces such as theaters, teleconference rooms, halls, places of worship, courtrooms, studios, etc. In these spaces, our job is to help control the reflected sound energy by appropriate placement of acoustic finishes.

Background noise

Complaints about background noise are common when mechanical systems have not been treated “acoustically.” Such complaints are most common in residential and office spaces. However, they can also afflict any occupied space where mechanical or environmental sources are present. Background noise issues are best solved with controls placed as close to the source as possible (e.g., noise barriers, silencers, room boundary construction).

Privacy

Inadequate construction of walls, ceilings, and floors construction or lack of acoustic treatment, or both, may deprive occupants of privacy. Lack of privacy can be quite problematic: Conversations in a “private” office may be subject to eavesdropping; neighbors’ lives may intrude through walls—or ceilings—at all hours. To solve sound isolation issues, partitions must be designed appropriately to reduce sound transfer. To improve privacy in open offices, appropriate sound masking and acoustic finishes are required.