

## **Higher Ideals: Ceiling Considerations in Rehearsal Rooms**

While practice rooms serve a vital role for individual musicians, rehearsal rooms are where individual talents unite and the ensemble develops. This growth requires an acoustically supportive environment; ceiling decisions will have a tremendous impact on a rehearsal room's effectiveness.

The most critical factor – by far – is adequate ceiling height because this allows the space to achieve sufficient cubic volume. Inadequate cubic volume can make the rehearsal room acoustically unresponsive and excessively, even dangerously, loud. These deficiencies are often impossible to correct completely, even with acoustical treatments.

Adequate ceiling height also allows the sense of musical presence and ensemble; musicians are able to hear themselves and others very well. Sound energy travels at one foot per millisecond and ideally there should be more than a 30 millisecond delay while the sound travels up to the ceiling and back down to the musician. While this delay may seem negligible, our brains require it to properly process the sound.

For band/orchestra rehearsal rooms accommodating 60-75 students, we recommend ceiling height of 18-22 feet and floor space of 2,500 sq. ft., which results in 550-700 cu. ft. per musician. For choral rooms serving 60-80 students, we recommend 16-20 foot ceilings and 1,800 sq. ft. of floor space, equating to 350-500 cu. ft. per musician. (Ceiling height should be measured from the bottom of the drop ceiling.)

Once adequate ceiling height and cubic volume are attained, the next consideration for the rehearsal room is the ceiling finish material. Because it's usually the largest unencumbered area in the room, the ceiling can serve as the primary absorbing surface. With a drop ceiling, fiberglass-backed ceiling tile, 1" thick, does an outstanding job providing cost-effective absorption for a band room. For steel truss deck or concrete beam ceilings, absorber panels can be suspended from the ceiling.

Absorption is less important in choir rooms because sound pressure levels are significantly lower. Here we typically recommend a hard tile, gypsum ceiling, perhaps with a four-foot band of absorptive panels around the perimeter.

For band, orchestra or choir rooms, diffuser panels mounted on the ceiling provide reflective surfaces that help scatter the sound throughout the space. This blending improves the musical cohesiveness of the group because musicians can hear each other, even across the rehearsal room.

The proper combination of absorption and diffusion in a rehearsal room will also help minimize acoustical variations that may otherwise exist between different locations within the room, along with reducing flutter echoes caused by untreated parallel surfaces.

Crescent Heights High School in Medicine Hat, Alberta, added both types of panels to the band rehearsal room; band director Bill Wahl [now retired] said they made an enormous difference.

"Band members commented that they're able to hear each other better or in some cases for the first time," he said. "As a director, I'm now able to hear all

sections. Before the panels, I never heard the clarinets.” He added, “Musicians are also better able to sense the color and timbre of their own instrument. They can also extend their own dynamic levels without the sound turning into noise.”