

Ask Jon Eakes

How do you sound proof a floor over another apartment?

Last Updated: Monday, January 15th, 2001, Created: Monday, January 15th, 2001

One of our viewers lives in an apartment over a noisy basement suite and wants to know what are their options to blocking the noise.

Soundproofing is never a perfect thing and although each possible action can have an important effect, the sum of all the actions together can be less than you expect. That is because each step only reduces what is left of the sound. A rough example would be, if three different actions could each reduce the sound by 20%, all three together would not reduce the sound by 60%, but only by 51.2% (20% reduction, then 20% of what is left, then 20% of what is left). I say that only to warn you that you will not get total silence unless you build an isolated sound studio out of one apartment or the other.

In fact, research by CMHC has indicated that what you think about your neighbors is more important than the actual physical sound resistance of the wall between you. You don't tolerate well what does not fit your own lifestyle.

So, how do we improve the situation?

First, soft floor surfaces, like cushioned rugs will reduce the sound going down a lot, and the sound coming up a little. Why the difference? Well actually it muffles it to the same degree in both directions -- it is just that in addition to muffling sounds overall, walking on a rug prevents the creation of impact noises compared to walking on a hard finish.

If you have hot air heating ducts that service both apartments, it is hardly worth bothering to try to soundproof -- too much of the noise will simply travel through the ductwork. You can put sound mufflers inside the ducts, and insulate the outside and that will help, but direct air connections between the apartments are the worst culprits for sound.

That leads to the first practical task, the one that most people miss and the one that makes soundproofing so discouraging: sealing up all air leaks between the apartments. You need to caulk, foam or otherwise block every electrical wire hole, every plumbing hole, every air passage in the floor / ceiling assembly. You can do it from either, or better yet, both sides. Electrical outlets are large sound transmitters. Air gaps behind floor boards as well. Plumbing holes under the sink. Even the open space under the bathtub.

Then, if the ceiling is open to exposed joists like during renovations, you can add regular insulation batts, or slightly better, sound-proofing batts. Fill most, but not all the space with batts. An air gap actually helps break up sound transmission. If the ceiling is closed, you can shoot in cellulose insulation to block the noise. The insulation's function is to absorb the high frequency noises.

Then affix resilient channels to the ceiling joists or the existing finished ceiling. These are "Z" shaped pieces of sheet metal 8 feet long. One side is screwed to the floor joists, the other receives the drywall screws. In between the two is an angled flexible piece of metal. The function of the resilient bar is to uncouple the ceiling drywall from the floor structure and reduce the transmission of the low frequency noises like drums and footsteps.

Then put one or possibly two layers of drywall on the ceiling. We want heavy mass, not light ceiling tiles. This will dampen the high frequency noises. Don't cut holes in the ceiling for electrical boxes or light fixtures, unless they can be sealed air tight.

How about a suspended ceiling? It does very little for stopping sound transmission between rooms because it is too light and allows too many air paths around the panels. The function of acoustical tiles is to change the quality of the sound inside the room, not to prevent it from passing through the ceiling.

Keywords:

Floors, Noise, Sound, Sound Proofing

Article 1249

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