

Q. Soundproofing an Apartment

I'm renovating a downstairs apartment in an older four-unit building and have been asked to make the apartment quieter. The floors in the second-story apartments are newly carpeted, so any soundproofing measures would need to be limited to the first-floor apartment's ceiling. I've recommended screwing resilient channel over the existing plaster-and-lath ceilings and installing new drywall, but are there other steps that I should consider?

A. *Bonnie Schnitta, an acoustic consultant at SoundSense in East Hampton, N.Y., responds:* Resilient channel will add flexibility to the ceiling assembly, which is needed to deal with foot traffic and other types of structure-borne noise. But when you fasten the drywall to the metal channels, be sure your screws don't penetrate the old ceiling or framing, a common installation error that short-circuits their effectiveness. Adding a layer of insulation between the channels will also help absorb some sound frequencies and prevent the airspace from reverberating. Make sure that the added insulation won't be compressed after the drywall is installed — we typically use 1/2-inch-thick hvac duct liner, which is reasonably priced and works well with 7/8-inch channel.

If the budget allows, use decoupler clips instead of resilient channel. Though less widely available and considerably more expensive than channel, decoupler clips will give the ceiling assembly a higher STC (sound transmission class) and IIC (impact insulation class) rating (see chart, below). Most of the time we use standard RSIC-1 clips (866/774-2100, pac-intl.com) or, if the ceiling needs to be leveled, RSIC-DC04 or RSIC-EXT04 clips. A 10-foot by 12-foot room would require about 40 clips, which cost between \$4.50 and \$6.50 per clip.

To combat airborne noise, you should also add mass to the ceil-

ing assembly. The standard approach is to add a second layer of drywall, but I suggest a layer of 1/8-inch-thick mass-loaded vinyl instead. Sandwiching 1-pound-per-square-foot mass-loaded vinyl between the resilient channels (or decoupler clips) and new drywall will improve the ceiling's STC rating even more than adding two extra layers of 1/2-inch drywall would. It will also contribute further resiliency to the assembly to help muffle structure-borne noise. One-pound-per-square-foot mass-loaded vinyl sells for about \$2 a square foot. If you're dealing with low-frequency noise, such as amplified sound from a stereo system, you could install heavier 2-pound mass-loaded vinyl, but it would be much easier to add this material to the floor above.

If you open up the ceiling for any reason, make sure to add a few inches of insulation. While fiberglass batts, recycled cotton, and blown cellulose aren't specifically designed to stop noise, any of these will help by absorbing certain sound frequencies and muffling reverberation within the empty joist bays. First, though, check for hvac ducts, plumbing, and other types of conduits. Plumbing pipes containing water typically don't cause acoustic problems, but sound can travel easily from one apartment to another through empty waste lines or hvac ducts that aren't covered with acoustic duct wrap. Make sure the duct wrap has an STC rating of at least 32, and if your hvac ducts seem especially noisy, you may want to consider installing acoustic duct liner as well.

Airborne noise can also "leak" through gaps around these conduits wherever they intersect floors or ceilings between apartments. Many of these leaks are hidden, so we usually test to find them, sealing gaps narrower than 1/8 inch with Big Stretch acrylic latex caulk (800/289-7290, sashco.com), and blocking wider gaps with flanges made from mass-loaded vinyl or duct wrap.

**STC and IIC Ratings for a Typical 2x8 Ceiling Assembly
(plywood subfloor, 1/2-inch drywall ceiling below)**

	STC (est.)	IIC (est.)	Perceived Noise
No insulation, no carpet	37	32	loud speech audible but unintelligible, loud footfalls
3 inches fiberglass insulation	41	35	loud speech sounds like a murmur, moderate footfalls
Second layer drywall	44	37	must strain to hear loud speech, moderate footfalls
Resilient channel, insulation, & new drywall	46	44	loud speech not audible, footfalls softly audible
Insulation, decoupler clips, 2 layers drywall	55	49	loud speech not audible, footfalls barely audible
Resilient channel & 1-lb mass-loaded vinyl			
MLV between RC and drywall	51	51	loud speech not audible, footfalls barely audible
MLV underneath subfloor	55	67	loud speech and footfalls inaudible

Most building codes require multifamily party walls or ceilings to have minimum STC (sound transmission class) and IIC (impact insulation class) ratings of 50. Installing carpet over padding on the floor above is an effective way to significantly boost the IIC rating of all of these ceiling assemblies.