Sound Advice

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FLANKING OF SOUND AROUND PARTITIONS

By Noral D. Stewart

A common misconception is that all that is required for isolation is to choose an appropriate wall or floor-ceiling design and build it properly. Unfortunately, that attitude can result in very disappointing results. We also must take steps to avoid flanking around the partition. The STC and IIC ratings are specifically for the partition or floor-ceiling itself as tested in a laboratory. However, especially with very high-performance designs, flanking often controls the actual isolation. More than a good partition is needed to achieve the kind of isolation that condominium owners expect.

How does flanking occur? Flanking can occur by two mechanisms. Airborne flanking occurs though a leak that might occur around the perimeter of the partition, or possibly through a path such as though an acoustical ceiling into a plenum and over the top of a wall. Structural flanking occurs through the structure. A most common example is a continuous floor under a wall. Suppose the floor is a layer of wood with no topping other than the floor finish. You can build a very good STC 60 or better wall over this floor, yet the perceived or apparent STC of the wall can be less than 50. This is because the sound gets into the floor, travels along the floor and radiates into the adjacent space. The same thing can happen with footstep sound even side to side.

Achieving good isolation just begins with selecting appropriate basic wall and floor-ceiling designs, it also includes working out details to minimize flanking. Wherever possible no continuous panel should extend from one room to another. As a minimum, some break must exist in the surface material seen in each room. The less the connection between such surfaces in the isolated rooms, the better the isolation. When a floor is continuous, a topping of gypsum concrete can help, and floating that topping on a resilient element such as used for reducing footstep sound can help even more.

For best results, a floor should have a clear break in it between rooms. For concrete, this may be an expansion joint. For wood, this is should be separate framing with a small gap in the floor. This gap would be between two separate base plates. Research has shown that a very small gap or gap stuffed with mineral wool is adequate for fire blockage. However, fire codes are slow to react and change.