PCI MIDWEST
A Chapter of Precast/Prestressed Concrete Institute

PRECAST FOCUS

NOISE REDUCTION WITH PRECAST CONCRETE

The inherent mass of precast concrete makes it an excellent unwanted sound or noise barrier. Noise can be isolated from rooms where it is not desired by utilizing precast concrete walls, floors and ceiling construction. Large reductions of noise levels from room to room can be accomplished only by continuous, impervious barriers. The ability of a barrier to reduce the intensity of airborne sound is designated by its sound transmission class (STC). As the unit weight of a precast concrete wall or floor increases, the STC also increases. STC ratings for various precast concrete wall and floor/ceiling systems are listed below.

The Department of Housing and Urban Development (HUD) recommends minimum airborne STC ratings of 45 between living units and 50 between living units and public spaces. Precast concrete walls, floors, and roofs typically do not require additional treatments to provide adequate noise reduction. If greater sound insulation is required, it can be obtained by using a resiliently attached layer of gypsum board or other absorptive building material. Precast concrete floors in combination with resilient materials can control impact sounds as well. One common solution consists of good quality carpeting mounted on resilient padding.

Most walls are acoustically composite and consist of different elements. Doors and windows are often the weak link in an otherwise effective continuous sound barrier. A relatively small hole can significantly reduce the STC of the acoustical barrier. All noise that reaches a space by paths other than through the primary barrier is called flanking.

Flanking can be reduced with good attention to joints, gaps, and openings with proper caulking and sealants. Suspended ceilings in rooms where walls do not extend from the ceiling to the roof or floor above allow sounds to travel to adjacent rooms. Use of full-height walls will prevent this source of flanking. The probability of flanking paths in a precast concrete structure is much less than in a conventional steel or wood structure.

Additional information on Noise Reduction with Precast Concrete can be found in Chapter 11 of the "PCI Design Handbook" (MNL-120) available for purchase on the PCI Online Bookstore.

DESCRIPTION	STC
4-inch-thick flat panel, 54 PSF	49
6-inch-thick flat panel, 75 PSF	55
8-inch-thick flat panel, 95 PSF	58
8-inch hollow-core plank, 57 PSF	50
14-inch double tee with 2" thick concrete topping, 75 PSF	54
4-inch-thick flat slab, 54 PSF	49
6-inch-thick flat slab, 75 PSF	55
8-inch-thick flat slab, 95 PSF	58

(The STC rating of sandwich wall panels is approximately the same as the thickness of the two concrete wythes combined.)

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