The transmission of sound through rigid partitions is accomplished principally by the forced vibration of the wall; that is, the entire rigid wall is forced into vibration by the impact of the sound waves against it. The vibrating thus becomes a secondary source of sound and radiates a certain amount of sound to the space on the opposite side. It is therefore to be expected that the noise insulation value of a wall will depend primarily upon the mass or inertia of the wall, the stiffness of the wall, and the internal damping of the wall. The ideal noise insulator is a "limp-heavy" wall. When one side is sealed with paint, plaster, or gypsum board, the concrete masonry wall fits this description precisely.

STC		**Nominal**	100	125	150	200	250	300
		Actual	90	115	140	190	240	290
hollow	Standard Weight		46	47	48	50	52	54
solid filled	Standard Weight		-	50	52	56	58	60

Sound Transmission

Sound transmission The higher the transmission loss of a wall, the better it functions as a barrier to the passage of sound. Sound Transmission Class, STC, is a means of rating sound reduction by a single number.

To determine the effectiveness of wall construction as a means of sound isolation, a two room test method is employed. In ASTM E-90-75 a steady sound is generated and measured on one side of a wall, and the sound which passes through is measured in an adjacent room.

Reliability

An important asset of concrete masonry in noise control is its reliability. Unlike the so-called "special" partition constructions, which are touted as sound barriers, concrete masonry walls require no special installation procedures to be effective. All too often the staggered stud isn't staggered; the decoupled membrane ends up rigidly connected; and the floating wall is sunk by poor workmanship in the field. The specially

constructed stud wall that had an STC of 45 in the acoustical laboratory ends up with a lower STC in the field because of improper installation. This does not happen with concrete masonry walls. Designers know from experience that the concrete masonry wall is not as sensitive to workmanship and can be relied upon to act as an effective noise barrier.

Specification

Masonry units are not specified to a particular transmission class. Where the separation is required to provide a particular loss, the weight class or concrete density is selected by the consultant. The specifying authority should be familiar with the three concrete densities and specify accordingly.

Sound Absorption

Where design requires wall surfaces of high sound absorption consideration should be given to the use of a structural load bearing concrete masonry acoustical unit. Applications range from gymnasiums. music rooms to heavy duty industrial plants and transformer rooms. Confirm availability with local manufacturer.