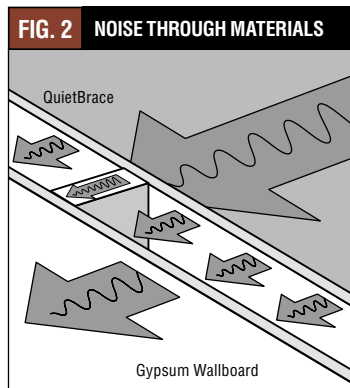
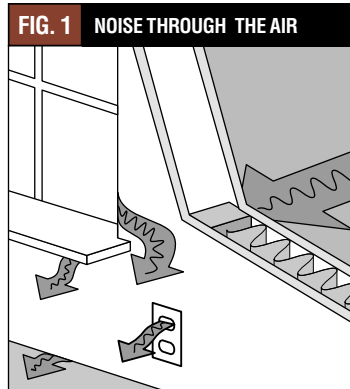


## What's the value of noise absorption?

Noise is a problem. It can cause fatigue, irritability and headaches. It can disturb rest and concentration. It can reduce productivity. It can even raise blood pressure. That's why controlling or reducing the intensity of noise is now a major emphasis for homebuilders and homebuyers trying to create a more enjoyable living environment. To understand how this can be done, let's find out more about how sound works.



### Noise Characteristics

Sound waves are air pressure fluctuations or vibrations that radiate from a source like the ripples in a pond. As these fluctuations reach your ear, they start your eardrum vibrating and your brain interprets them as sounds.

There are three key characteristics of sound: frequency, pitch and volume. "Frequency" is a measure of how many sound waves reach you within a given period of time. "Pitch" describes whether the sound is high or low. "Volume" is a measure of how hard or intensely the sound waves strike your eardrum.

The main concern in sound control, though, is reducing volume. Diminishing the energy with which one air molecule collides with another. Or at least introducing a material, like QuietBrace, between the source and the listener that inhibits the efficiency of the vibration or force transfer. Then as the air pressure peaks decrease, the noise gets softer and softer.

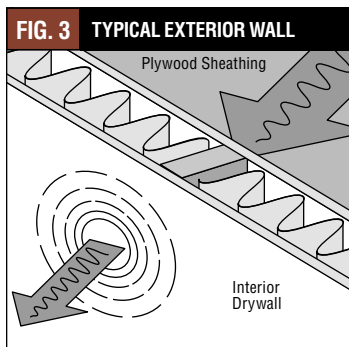
### Noise Movement

There are two primary paths along which noise travels. One is through the air and the other is through the materials of the home itself.

Airborne noise can go under, around and even through ordinary windows and doors. It can go under the bottom plate of the wall, around the edges of drywall sheets, through the openings for plumbing or electrical service or any small opening it can find. Remember, sound vibrations are transferred from one air molecule to the next, and air molecules are quite small. Once through the opening, sound waves spread out in all directions throughout the new space. (FIG. 1)

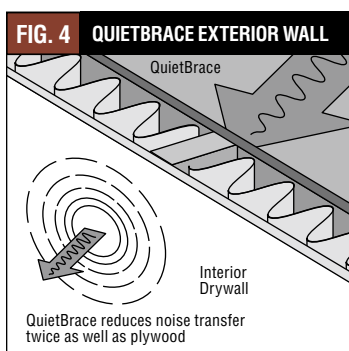
Noise can also travel directly through the walls and floors of a home by striking the surface material on one side of a partition and making it vibrate. Those vibrations in turn are transferred to the air space inside the wall or floor and then to the surface material on the other side of the partition, which radiates them into the interior. (FIG. 2)

In both processes, some of the noise energy is lost as the vibrations are transferred, but it can still be quite disturbing depending on the intensity of the noise at the source.



**Design, Materials and Construction**

Managing noise, then, becomes managing the process of vibration transfer. Blocking the pathways of airborne movement. Interrupting the efficiency of direct material-to-material transfers. And absorbing or diffusing sound energy.



That can involve many different strategies throughout the structure depending on the noise to be controlled, but for our purposes we will focus our attention on one of the largest single components of a home's sound management system – its exterior walls. Well designed and constructed walls can easily provide as much as 50% better sound reduction performance than unimproved walls.

Assuming the exterior wall surface is the same, all wall openings where air and sound can infiltrate are sealed, the wall cavity itself is filled with a

non-settling insulation and the interior wall is covered with a typical 1/2" gypsum wallboard, the best way to improve the wall's sound control quality is to use a noise-absorbing sheathing material. (FIG. 3)

**QuietBrace Effectively Reduces Noise**

QuietBrace sound-deadening structural sheathing provides a noise reduction coefficient that is twice as high as popular wood structural panels. The reason is the molecules in harder materials are more densely compacted and therefore transfer more sound vibration energy from one to another easier than softer material like QuietBrace. Its interknit wood fibers not only deliver reliable strength, but also absorb more sound energy than other sheathings. (FIG. 4)

Completely sheathing a home in QuietBrace helps produce an extremely effective barrier to airborne noise transmission. It also creates an ideal vibration isolator between the exterior wall's harder materials to reduce the sound wave energy of structurally transmitted noise.

This is an especially labor- and cost-efficient sound control strategy because it does not require modifying the home's design or purchasing some expensive specialty material. In fact, it will save money if you're using OSB or plywood. Since sheathing is code-required, installing a material that is more effective at reducing noise and more efficient on the bottom line is a wise choice.

**TYPICAL NOISE LEVEL COMPARISONS**

DB LEVEL	NOISE SOURCE
130	Threshold of pain
120	Jet take-off at 100 meters
100	Loud car horn
80	Noisy office
60	Loud television
50	Normal conversation
30	Quiet conversation
10	Normal breathing

Typical decibel (dB) values of some common noise sources.

**NOISE REDUCTION EFFECTIVENESS COMPARISON**

Material	Thickness*	Noise Reduction Value**
QuietBrace Sheathing	1/2"	.30
Plywood	1/2"	.15
Gypsum wallboard	1/2"	.05
Masonry	3 1/2"	.05
Batt insulation	3 1/2"	1.0
Glass	1/4"	.05

\* Thicknesses are normal dimensions found in residential construction.  
 \*\* Typical noise reduction coefficients – the higher the value the better.