

# Silence is Golden

by Glen Salas, for the PATH Partners

Your home is a factory. It has all the equipment and processes of almost any factory: fans, blowers, pumps, cleaning and laundering, waste disposal, heating and cooling, refrigeration, even accounting.

Unlike a factory, your home should also be designed to provide a calm, livable environment – one that maximizes comfort and minimizes intrusions, both from the outside world and from within the home.

In a serene home, your family controls the noise level in each room. You aren't startled

when the neighbors take out the trash or every time the heat clicks on. You can carry on a normal conversation in the kitchen while the range hood is running. And you can relax on the porch on a warm summer evening instead of being chased indoors by the loud whir of the air conditioner. (Screaming children are another matter, for which we refer you to *Psychology Today*.)

Now, for some serendipity: Most of what makes a home quieter also makes the home more efficient, and that makes it more earth-friendly and affordable. Here's how:

“Your home should also be designed to provide a calm, livable environment – one that maximizes comfort and minimizes intrusions, both from the outside world and from within the home.”

### **CONTROLLING STREET NOISE - AND NOISY NEIGHBORS**

It's easy to dramatically reduce the amount of outside noise that enters your home through good insulation and tight, leak-proof construction. Happily, this makes the home more energy efficient, too. Insulation keeps the cold outside in winter and the heat outside in summer; the more insulation there is, the more it reduces sound. Leak-proof construction blocks air and sound from moving through the walls. Better insulation and tight construction also reduce or eliminate drafts.

In conventionally built homes with wood-framed walls (also called “stick-built” construction), two types of insulation can be used to impede sound better than the standard fiberglass. Cellulose insulation, made of recycled paper products, is denser than fiberglass, and therefore blocks sound and seals air gaps more effectively. Sprayed-in insulation has the added benefit of expanding into tight areas before it dries, forming an even better wind and noise barrier than cellulose.

Cellulose insulation is more expensive than fiberglass, and sprayed-in is more expensive than cellulose, but their energy-saving properties will also lower your utility bills.

If you and your builder are not tied to conventional stick-built homes, two increasingly popular types of construction – insulated concrete forms (ICFs) and structural insulated panels (SIPs) – dramatically block outside noise. They also result in extremely tight (meaning energy-efficient) homes. Depending on the market, ICFs and SIPs homes are comparable in price to stick-built. Both are also more durable than conventional homes.

ICF walls are built by stacking hollow foam blocks and then filling them with concrete. You end up with almost indestructible, solid concrete walls insulated on both sides.

Structural Insulated Panels are at least

4'x8' and made from a thick layer of foam sandwiched between two layers of wood or wood substitute. They are custom cut in a factory and then quickly assembled at the building site. Though not as indestructible as ICF homes, they withstand high wind and seismic forces very well.

**IF IT'S NOISY, IT'S INEFFICIENT** Here's a basic thermodynamic principle: It takes energy to make noise. Rattling refrigerator? Loud air conditioning? They're not only irritating, they're less efficient than they should be.

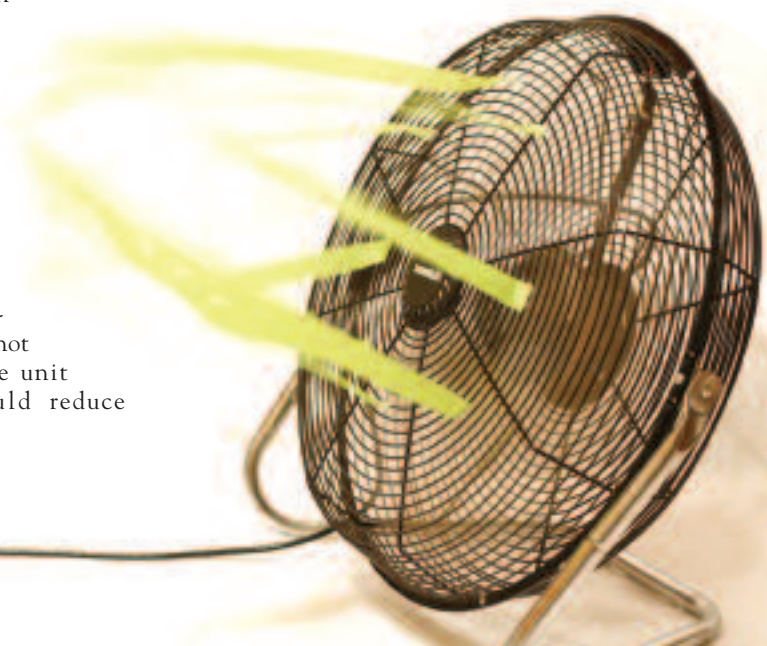
For the kitchen or basement, choose ENERGY STAR® qualified refrigerators and dishwashers. You'll eliminate a lot of the hum and whir that you find in non-qualified models. (Also be sure to choose ENERGY STAR qualified clothes washers, too. They save a lot of energy and water.)

Now for your heating and air conditioning system. The part of the central air conditioner that sits outside is the condenser. There are loud condensers and there are quiet condensers. A loud one will annoy you (and your neighbors). Again, the quiet ones are usually the most efficient. Choose an ENERGY STAR qualified system with a nominal sound level of 76 decibels (db) or less, and talk to your contractor about locating the condensing unit where it will be the most unobtrusive – sonically and visually. Make sure walls or landscaping features do not block airflow to the unit because that would reduce its efficiency.

Also be sure that heating and air conditioning equipment, including blowers and ducts, are sized correctly. “Right-sized” units operate less frequently, more quietly, and more efficiently. Ask your builder to use *Manual J* to determine the correct size for your HVAC equipment, rather than relying on the rule-of-thumb method, which can be highly inaccurate.

Radiant floor heating is a very quiet way to heat a home. You can eliminate the blowers, ducts and banging baseboards of conventional heating and cooling systems, as well as the drafts associated with forced air. In radiant floor heating, hot water is pumped through pipes buried in the floor. While it can be more expensive than your other heating options, radiant floor heating is known for its superior comfort. Indeed, those warm floorboards are awfully easy on the feet.

The quietest home conditioning system is passive solar, which heats the home's walls and floors with the sun's radiation. If you use insulated concrete forms or another very dense wall like stone or brick, the material will store the heat for release throughout the night. During the summer, nighttime ventilation cools the walls





## AT THE END OF THE DAY



L e a r n

I m a g i n e

F o l l o w t h r o u g h

E n j o y !

**A**t the beginning of each year, it is important for me to take stock of my life. I imagine 2006 as a blank sheet of paper. What do I want to look like? Act like? Achieve? Give?

It starts with **learning** – really learning who I am. What is at my core? What makes me act and react? What is okay – and what needs adjustment? If I had to describe myself in one sentence, what would I say?

Then I **imagine** what I could be. How I could act and react. How would I imagine the descriptive sentence reading if I really did make changes?

**Follow through** is where it usually falls apart for me. Life gets in the way. But if I follow through with how I imagine my life can be, then I begin to take steps. Steps lead to a walk, a walk to a journey and a journey leads to a destination.

All the above doesn't matter if I don't enjoy the process. Learning is tedious. Imagining is soul searching. Follow through can be painful. So what's to enjoy? I can enjoy the journey – no matter how difficult – if I take time and live. I celebrate the fact that I want to change, stretch and grow. I celebrate the fact that I have been given the opportunity and finally, I **enjoy** the journey.

So at the end of the day – or at the beginning of a new year – I want my life sentence to define what I am becoming, not what I've been!

*Linda*

and reduces the need for daytime air conditioning. Passive solar homes also don't usually require the mechanical equipment, blowers, ducts and baseboards of conventional heating systems.

### **STOP THE NOISE, BUT GET OUT THE FUNK!**


Ever stayed in a hotel where the bathroom exhaust fan was wired to the light switch and the fan was so loud you considered showering in the dark? Often, it's no different at home. Many homeowners cite noise as a primary reason they do not use their exhaust fans. Since healthy air starts with good ventilation, everyday activities like cooking (especially with gas), showering and even breathing make indoor air more polluted than the air outdoors if homeowners don't use their ventilation fans.

The good news is that whisper-quiet fans often provide the most effective ventilation. Enjoy the sounds of silence with furnaces that have variable speed fans, ultra-quiet bathroom exhaust fans and kitchen range hoods that are so inconspicuous, you need an indicator light to know they're running.

Selecting quiet fans helps ensure your family will use them. Good ventilation habits will also minimize odors and reduce the odds of mold or moisture problems in your home.

Before selecting a fan, listen to several to see what noise level is acceptable to you. The amount of noise a fan makes is measured in *sones*. Fans that produce under 0.3 sones are very quiet. Remember that the bathroom is not as noisy as the display floor in a showroom or store, so fans that appear quiet in the store may seem noisy in your home.

ENERGY STAR qualified fans are always a good choice because of their energy efficiency and quiet operation. In-line fans, where the fan is mounted along the exhaust duct, are also available. They are frequently quieter because the fan is further away from the bathroom or kitchen.

So find your favorite room in your home. Read or plan or just relax. If you and your builder selected the proper materials and systems, you won't have to worry about being jarred out of your reverie. At least not until the kids come home... 

The Partnership for Advancing Technology in Housing is dedicated to speeding the development and use of advanced building technologies to improve the quality and affordability of America's homes. For more information, visit the "homeowners" section of [www.PATHnet.org](http://www.PATHnet.org)

*Glen Salas is a senior engineer with the energy and environmental consulting firm, D & R International in Silver Spring, Maryland.*