Green Corner

How to Design With Energy Efficiency in Mind ***By Leigha Dickens***

Let's face it: saving energy helps planet and people alike, and homes these days use way more energy than they need to. Energy efficiency is one of many reasons to consider building a Deltec home, as many of the base characteristics of a Deltec improve greatly upon the energy efficiency of standard dwellings. Yet design choices play an important role, and while it's true that a Deltec home is amazingly energy efficient, there are some key design steps the energy-conscious can take to reap full potential for superior energy performance--and avoid energy pitfalls that may not be easily addressable once the home is built.

1. Locate Your Mechanicals

The location of your heating and cooling system may seem trivial but can make a tremendous difference in heating and cooling costs. In winter, ducts in attics or crawlspaces transfer warm air to rooms but must travel through a cold environment to do so, and will lose heat in the process—in fact, the colder it is, the more heat they lose. Yet ducts are usually *not* air-tight, and may leak as much of 25% of their contents. When their environment is a cold crawlspace or attic, a quarter of the heated air is wasted, never even having a chance to keep you warm.

While sealing and insulating ducts is an excellent idea in this situation, before the house is built one has the design freedom to avoid putting ducts in an attic or crawlspace at all. If building a basement this is an easy choice, but even without one, consider setting aside a closet or a piece of a room for your mechanical equipment, *inside* the house. Then rather than making your heat outside and transferring it in, losing a great deal in the process, you can keep it all where it is intended to go.

Note that this principle applies to hot water storage tanks as well: more heat will be lost from pipes and tank alike, the colder is their surrounding environment. Since hot water heating already comprises a third of average home electricity costs, the savings for moving the tank inside can be substantial.

2. Mind the Attic, Can the Can Lights

Attics are the locations of a home's most pernicious air leaks, and air leakage is the leading waster of precious heating and cooling energy. Many design ideas have us making more holes in our ceilings: attic hatches, fireplaces and wood stove flues, attic or whole-house fans, and especially recessed lighting, or "can lights." Can lights, which are not air-tight, should be used with care when designing a home to be extremely energy efficient.

To address air sealing from the beginning, encourage your builder to air seal where the top of interior walls meet the ceiling and also around all holes cut in the attic for plumbing, duckwork, lighting--or even see to those details yourself with a tube of caulk or canned foam. Special air-tight and insulating covers can be installed over can lights, attic fans, and attic hatches. Alternatively, one solution to all attic air-tightness problems--and additionally one that is greatly beneficial if ducts *must* go in the attic--is to use spray foam insulation on the *underside* of the roof. That's right, no more pink stuff in the floor of your attic; instead reap the benefits of insulating at the ceiling of the attic, bringing the attic area into the conditioned part of your home. While this adds to the volume of space that must be heated and cooled, the benefits of minimizing air and duct leakage often far outweigh the cost of conditioning a little extra space.

3. Pay Attention to Cardinal Direction

Which way do your windows face? While those who follow a passive solar design path know this all too well, any home can benefit—or suffer—from how it is oriented. In the Northern hemisphere, south-facing windows let in considerable sunlight, which can offer free warmth in winter made better by how thoroughly the house is designed to harness it. West-facing windows let in considerable afternoon sunlight as well, which, in an already-warm summer afternoon, can add quite a bit to cooling costs. North rooms are often the coldest in the house, because north windows see no direct sunlight to counteract the heat they lose. Minimizing window area on the north side, allowing the largest windows on the south side of the home, and employing good shading for east and west windows are basic design principles to allow you to take advantage of the environment around your home.

For all energy efficiency related design concerns, Deltec's green department is here to help.